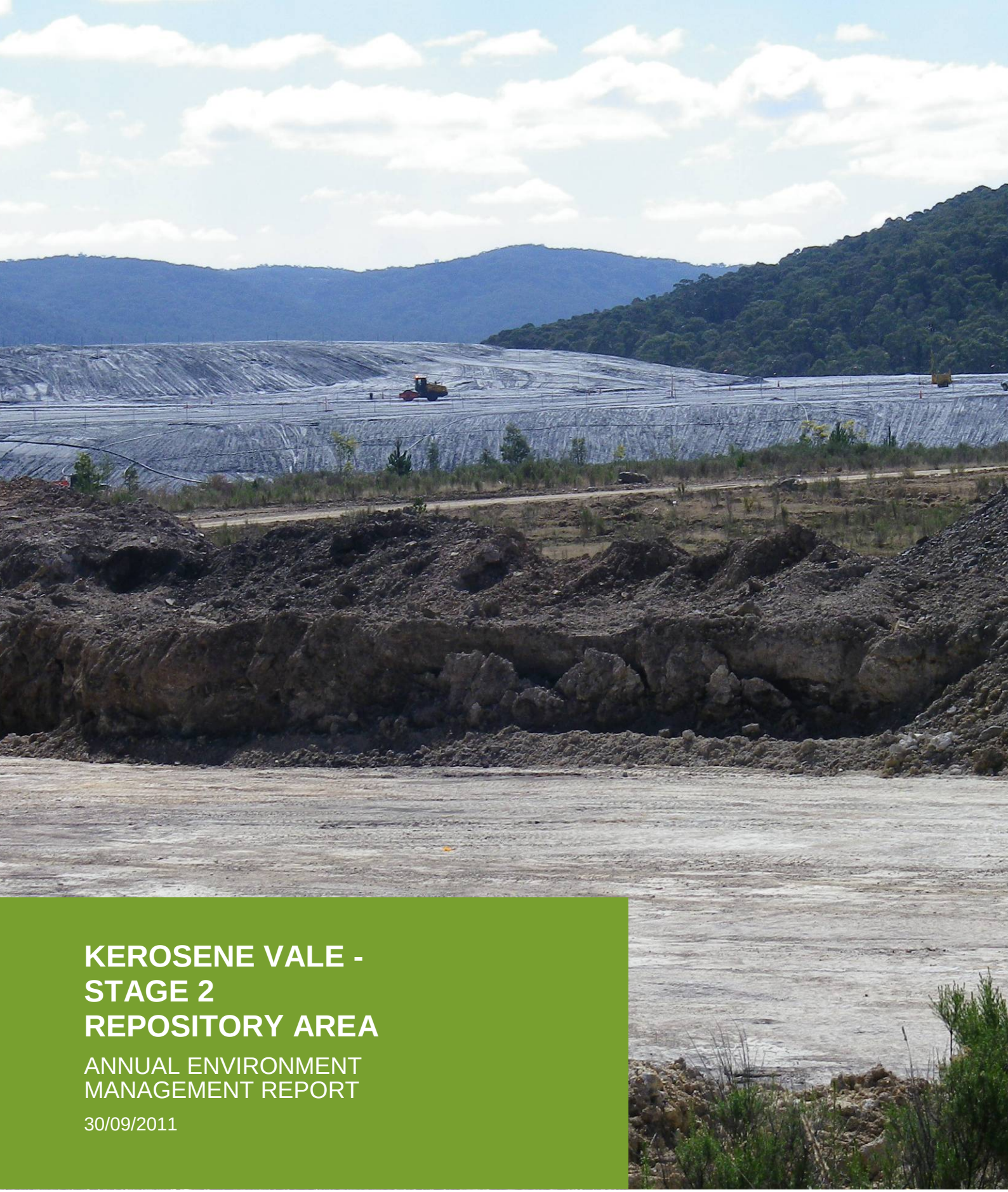

KEROSENE VALE - STAGE 2 REPOSITORY AREA

ANNUAL ENVIRONMENT MANAGEMENT REPORT

30/09/2011

Delta electricity

This report may be cited as:

Cotterill, Emily (2011). *Kerosene Vale Stage 2 Ash Repository Area Annual Environmental Management Report 2010-11*. Delta Electricity- Western, NSW Australia.

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Cover photography: 'Kerosene Vale Ash Repository- Stage 2' *Emily Cotterill, Delta Electricity*

Kerosene Vale Ash Repository Stage 2

Annual Environmental Management Report

Annual Environmental Management Report (AEMR) Approvals:

Primary Author:	**Emily K. G. Cotterill (Delta)**	**Date:**	October 2011
Checker:	**Nino Di Falco (Delta Environment Manager- Western)**	**Objective Ref:**	B794091
Approved for Issue:	**Nino Di Falco (Nominated Environmental Representative)**	**Status:**	Final
Signed:			

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List of Acronyms

AEMR	Annual Environmental Management Report
CoA	Condition of Approval (also known as MCoA – Minister's CoA)
DECCW	Department of Environment, Climate Change and Water
DP&I	Department of Planning and Infrastructure
EPL	Environment Protection Licence
KVAD	Kerosene Vale Ash Dam
KVAR	Kerosene Vale Ash Repository
KVAR 2	Kerosene Vale Ash Repository Stage 2
mAHD	metres Australian Height Datum
MES	Malfroy Environmental Strategies Pty Ltd
OEMP	Operation Environmental Management Plan
PB	Parsons Brinckerhoff Australia Pty Ltd
RL	Relative Level
RMP	Repository Management Plan
SSCAD	Sawyers Swamp Creek Ash Dam

Executive Summary

The project proposing to extend the existing Kerosene Vale Ash Repository (KVAR) Stage 1 Area was approved by the Minister for Planning on 26 November 2008. The project is designed to permit the continued disposal of ash generated by the Wallerawang Power Station.

Condition 7.3 of the Project Approval (Department of Planning, 2008) requires that Delta Electricity prepare and submit an Annual Environmental Management Report (AEMR) for the approval of the Director-General, Department of Planning (DP&I). This AEMR has been prepared to satisfy this requirement. Since the 1st Annual Environmental Management Report was submitted, the ash placement strategy for Kerosene Vale Stage 2 Ash Repository has been updated. This is due to two factors- Centennial Coal declined interest in and relinquished their rights to extract coal from the site, and Delta Electricity no longer required the realignment of Sawyer's Swamp Creek after new geotechnical information was obtained. As a consequence of this, the ash placement strategy has changed from three stages as outlined in the Operational Environmental Management Plan, to a two-staged approach.

Conneq Infrastructure Services (previously Bilfinger Berger Services) is the principal contractor at KVAR, and has been placing ash into Stage 2A of the repository since 2009, which is now nearing capacity (Conneq, May 2011). As such, a Construction Environmental Management Plan for KVAR Stage 2B was developed and submitted to the Department of Planning in August 2011.

With key project guidance from Delta's External Plant Manager, Conneq has effectively mitigated and managed the potential noise, dust/air, surface and groundwater, and other environmental impacts associated with the operation of the Kerosene Vale Stage 2 Ash Repository. Observational evidence combined with data provided to Delta in Conneq's Monthly Client Service Report (May, 2011) indicates that Conneq has approached its contract of management with a view to not only meet the requirements laid out in the OEMP, but to improve on them. This has been achieved through an adaptive management system.

One Non-Compliance was identified through a review undertaken against the Conditions of Approval for the project, and requirements laid out in the OEMP. Recommendations for addressing this non-compliance is presented for consideration in Appendix A- EMR Audit Actions Detailed Review Checklist and Recommendations for Conditions of Approval, and includes the recommendation of an update of the Repository Site Management Plan to better reflect the requirements of the CoA and the OEMP, and as such better incorporate these environmental foci into daily management of KVAR.

1. Introduction

In 2001, there was an operational need for Delta Electricity to change from wet to dry ash-producing activities, and in 2002, approval was granted to use the Kerosene Vale Ash Repository area for dry ash storage. Stage 1 of the storage facility was designed to operate for a period of five years in a limited area over the Kerosene Vale Ash Repository. As this area began to reach capacity, Delta sought approval to expand the storage area.

On 26 November 2008, Delta Electricity received Project Approval from the Minister of Planning for the Extension of the existing Kerosene Vale Ash Repository Area to permit the continued disposal of ash generated by the Wallerawang Power Station under Section 75J of the *Environmental Planning and Assessment Act 1979*. The project is commonly known as Kerosene Vale Ash Repository Stage 2, and is subject to a number of departmental Conditions of Approval (CoA's).

Condition 7.3 of the Project Approval (NSW DP&I, 2008) requires that Delta Electricity prepare and submit an Annual Environmental Management Report (AEMR) for the approval of the Director-General, Department of Planning (DP&I). The AEMR must include, but is not limited to, the following requirements:

- The Proponent shall, throughout the life of the project, prepare and submit for the approval of the Director-General, an Annual Environmental Management Report (AEMR). The AEMR shall review the performance of the project against the Operation Environmental Management Plan (CoA 6.4) and the Conditions of this Approval. The AEMR shall include, but not necessarily by limited to:
- Details of compliance with the Conditions of Approval;
- A copy of the Complaints Register (refer to CoA 5.4) for the preceding twelve-month period (exclusive of personal details), and details of how these complaints were addressed and resolved;
- Identification of any circumstances in which the environmental impacts and performance of the project during the year have not been generally consistent with the environmental impacts and performance predicted in the documents listed under condition 1.1 of this approval, with details of additional mitigation measures applied to the project to address recurrence of these circumstances;
- Results of all environmental monitoring required under conditions 3.3 to 3.8 of this approval, including interpretations and discussion by a suitably qualified person; and
- A list of all occasions in the preceding twelve-month period when environmental goals/objectives/impact assessment criteria for the project have not been achieved, indicating the reason for failure to meet the criteria and the action taken to prevent recurrence of that type of failure.

In March 2010, Parsons Brinckerhoff Australia Pty Ltd (PB) was engaged by Delta Electricity to prepare the first AEMR for the Kerosene Vale Stage 2 Ash Repository Area for the twelve-month period of April 2009 to March/April 2010.

The AEMR for 2010-11 was prepared internally by Delta Electricity.

2. Purpose of AEMR

The purpose of this Annual Environment Management Report (AEMR) is to provide detail to the Director-General of the Department of Planning (DP&I) regarding the environmental performance of Kerosene Vale Ash Repository Stage 2. Environmental performance is measured against the Operation Environmental Management Plan (OEMP) and the Conditions of Approval as outlined the Project Approval document issued by the Minister of Planning in 2008.

2.1 Project Setting

Ash placement within the Kerosene Vale Stage 2 Ash Repository Area commenced in April 2009. No construction activities were required to facilitate the placement of ash in the Stage 2 area as the operation was a progression of ash placement from Stage 1 to Stage 2, utilising existing facilities and infrastructure.

The original ash placement strategy for KVAR Stage 2 (Figure 2-2) comprised three stages- Stage 2A as an extension of Stage 1, Stage 2B to allow time for the re-alignment of Sawyer's Creek and for material to be obtained from the pine plantation area to reinforce the stabilisation berm to the north of KVAR Stage 1, and Stage 2C as a final ash placement area once reinforcements had been carried out. However, as Centennial Coal relinquished their right to extract coal from the areas of mining interest within KVAR Stage 2 (Figure 2-2), and as ash placement had commenced in Stage 2A, Delta's structural engineers reviewed the ash placement strategy and determined that moving the northern boundary of the repository at least 60m from the dam wall, at a depth of no more than 12 m, removed the necessity for the stabilisation berm. As the stabilisation berm was no longer required, and would not therefore encroach upon it, it was deemed unnecessary to realign Sawyers Swamp Creek.

To ensure the stability of the dam wall had not been compromised, a monthly monitoring program was implemented using survey assessment techniques. This monitoring was conducted for the first 12 months after the change in operations.

While this new placement strategy reduced the total ash storage capacity of the site, a cost/benefit analysis determined that the realignment of the creek was an undesirable course of action.

Consequently, Delta Electricity engaged Conneq Industrial Infrastructure (previously Bilfinger Berger Services, or BBS), as the principal contractors for the project, to develop a Repository Management Plan (BBS, 2009). This RMP proposed changes to the original ash placement strategy, reducing it to a simpler two-staged approach- namely, Stage 2A and Stage 2B (Figure 2-1). The revised ash placement strategy was approved by Delta Western's Environment Manager (the nominated Environmental Representative for the project) and External Plant Manager, recognising no further potential environmental risks to the area. Conneq commenced ash placement in KVAR Stage 2A in late 2009.

As Stage 2A is nearing capacity (Conneq, March 2011), and as Centennial Coal had not developed the Stage 2B site as planned, a Construction Environmental Management Plan for KVAR Stage 2B was developed in consultation with Delta Electricity's Western Environment section and submitted to the Department of Planning in August 2011. This CEMP proposes to create the required space within Stage 2B of the repository as Centennial failed to do so, as well as win the materials necessary for continued operation of the site. As the excavation of the Stage 2B area is considered a construction activity, the identified works

will proceed only after the Construction Environmental Management Plan has been approved by the Department of Planning.

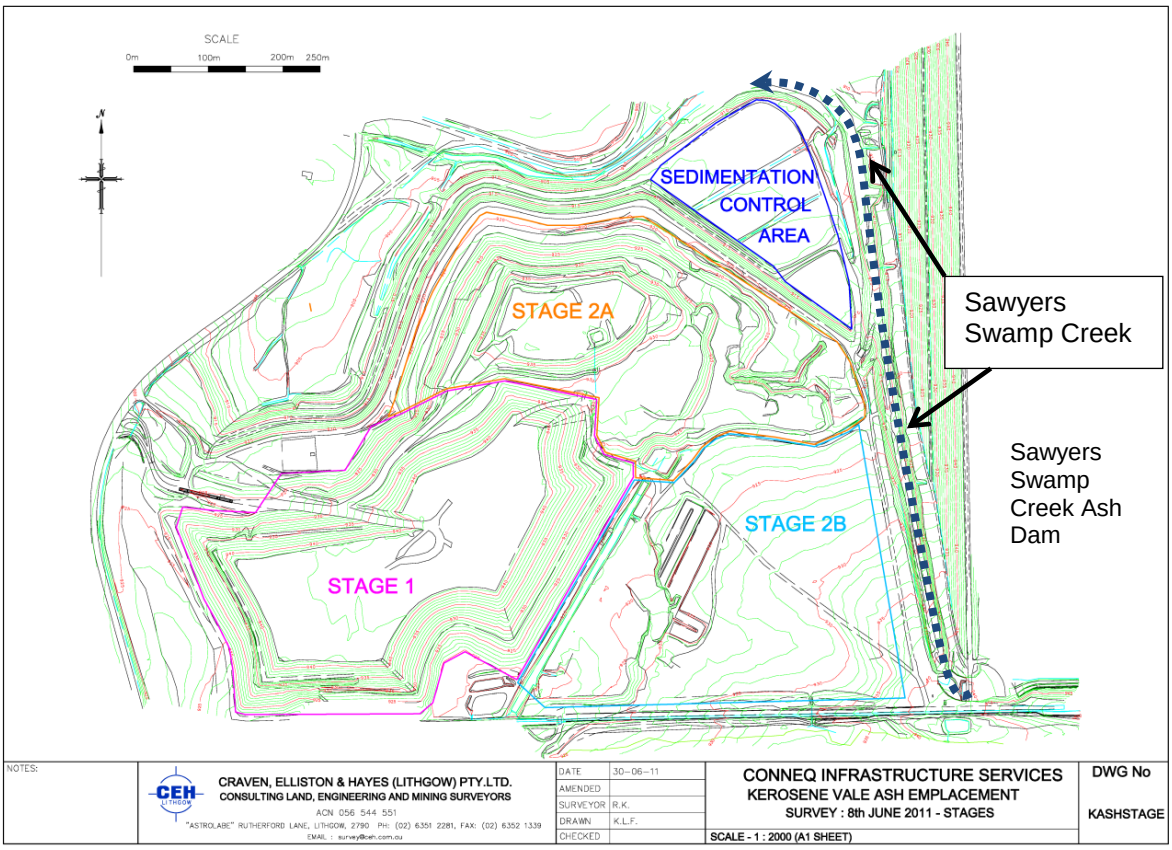

Figure 2-1 Revised Ash Placement Strategy for KVAR- Stages 1, 2A and 2B

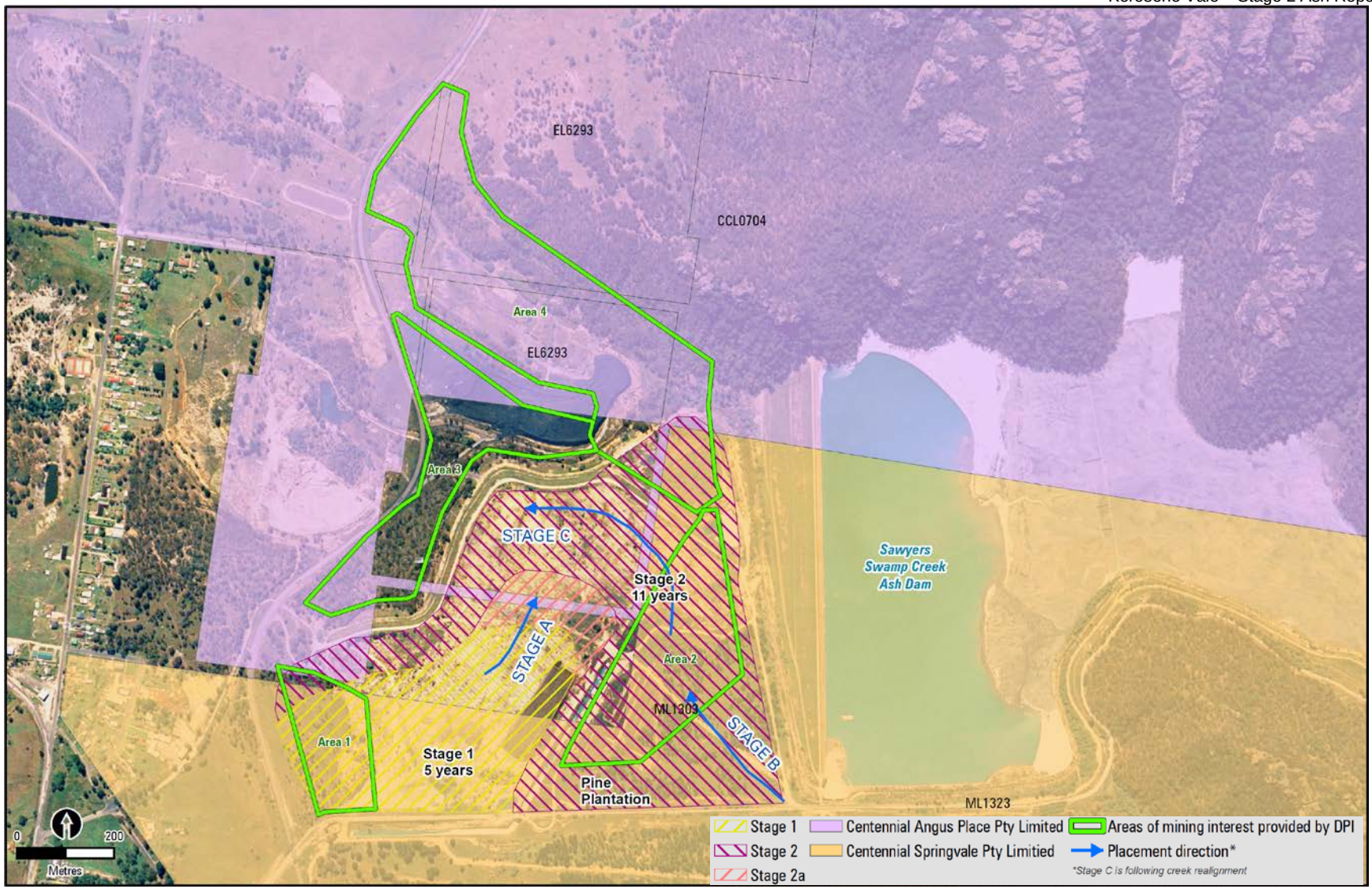

Figure 2-2 Original Kerosene Vale ash placement strategy (Parsons Brinkerhoff, 2008)

2.2 Site Characteristics and Context

KVAR is situated in the centre of the Sawyers Swamp Creek catchment, and receives significant runoff from the surrounding areas. The catchment area upstream of Sawyers Swamp Creek Ash Dam is recognised as being highly biodiverse, with numerous threatened species and ecological communities.

A report produced by Aurecon (2010) on behalf of Delta Electricity provided the following observations. This description provides some detail on the chemical and geomorphic complexity of the site, given its past and present activities, as well as the naturally mineralised nature of the catchment:

The original ash placement operations were at the Kerosene Vale Ash Dam (KVAD) which was built around a former coal mine void which had deposits of coal waste known as chitter. The void was filled with ash transported from the Wallerawang power station as slurry (i.e. wet ash placement). When the KVAD was full, it was capped with a clay capping. The next ash placement operation was at the Sawyers Swamp Creek Ash Dam (SSCAD) which saw wet ash placement take place from 1980 to 2003. At this time ash placement operations were converted to dry ash placement.

The first dry ash placement area was at Kerosene Vale Ash Repository Stage 1, which was located on top of the clay capping of the KVAD. The Kerosene Vale Ash Repository Stage 1 placement works were completed in January 2010. The Kerosene Vale Ash Repository Stage 2 placement works commenced in April 2009.

The reasons for the conversion from wet to dry ash placement are primarily for the significantly lower potential for environmental impacts. As heavy metals occur naturally in coal, in a wet ash handling facility when coal is burnt in the Power Stations most of those heavy metals are contained in the ash effluent from the boiler which is sluiced away to an ash dam (Little, 1984). Whilst most metals form part of the ash itself, small concentrations of heavy metals can dissolve and accumulate in the water systems interconnected with the ash dam.

As such, the conversion to the dry storage of ash at Kerosene Vale for Wallerawang Power Station was developed to ensure environmental and social impacts are minimised. Key benefits of the dry ash handling facility include:

- The potential for ash to be beneficially reused in its dry form;
- An approximate 80% decrease in the water required to transport ash;
- Discharges to the Coxs River are decreased in the long term;
- The Sawyers Swamp Creek Ash Dam can be progressively rehabilitated; and
- There would be a decreased flood risk for Kerosene Vale, Lidsdale and surrounding areas (Burrows, 2001).

It is this dry ash operation that is the focus of this Annual Environmental Management Report (AEMR).

3. Assessment of Compliance with Conditions of Approval

In assessing compliance with the conditions of approval the following compliance categories were used:

- Full Compliance
- Partial Compliance
- Non-Compliance
- Not Applicable

A detailed review checklist for each condition of approval is presented in Appendix A.

The Project Approval consists of 70 Conditions of Approval (CoA). The following is a summary of the compliance assessment findings against the 70 conditions of approval:

- Compliance Findings – 35
- Not Applicable Findings – 30
- Partial Compliance Findings – 3
- Non-Compliance Findings - 1

3.1 Partial Compliances

The following is a summary of the specific details which resulted in Partial Compliance findings for Conditions of Approval 2.9, 2.18, and 2.19:

- Condition 2.9 – Relates to the requirement of the Proponent, Delta Electricity, to prepare and submit a review of logistical arrangements to the Director-General within 6 months of commencement of operations. Ash placement commenced at KVAR in April 2009 and since this time a review of the logistical arrangements for ash haulage has been undertaken. However, this review has not yet been submitted to the Department of Planning. The review determined that the limited storage capacity at Wallerawang Power Station for overnight storage of ash before placement meant the hours of operation could not be reduced.
- Condition 2.18 – Relates to the requirement for the Proponent, Delta Electricity, to prepare and submit a report to the Director-General if any non-compliances with operational noise criteria were found. An Operational Noise Review (PB, 2009) was prepared in accordance with CoA 3.2 of this approval. This Review returned the following findings-

    a) Measured noise levels during May and August 2009 were generally compliant, with potential exceedences of up to 2.5dB(A) identified along Skelly Road

    b) During neutral meteorological conditions full compliance with operational noise criteria was determined

    c) Compliance with operational noise goals at all receivers is achieved during neutral and potential prevailing noise enhancing meteorological conditions

where peak day time and evening period fly ash truck movements do not exceed 5 trucks per 15 minute period

This Operational Noise Review did not return any non-compliances with condition 2.15 as outlined above, and as such a report was not required to be submitted to the Director-General. However, as outlined in section 6.1.1 Ongoing Noise Monitoring (CoA 3.3) no ongoing noise monitoring has occurred for the duration of the project. This condition was found to be a Non-compliance in the previous AEMR (2010). In assessing this CoA it is believed that a finding of Partial compliance is more relevant, as no non-compliances were found in the Operational Noise Review requiring a report to the Director-General.

- Condition 2.19 – Relates to the requirement for the Proponent, Delta Electricity, to implement noise mitigation measures at the private residences of any landholders that make a written request is noise generated by the project exceeds the criterion stipulated in Condition of Approval 2.15. The Stage 2 Kerosene Vale Ash Repository Operational Noise Review determined that since the introduction of new Euro4 specification haulage trucks were purchased and used for ash haulage, no additional noise control or mitigation measures were required (PB, 2010). Delta Electricity has not received any written requests from landholders to implement noise mitigation measures in their homes. However, as aforementioned, since the Operational Noise Review was completed no ongoing noise monitoring has been conducted by Delta Electricity (CoA 3.3); as such it is difficult to ascertain whether the project has achieved ongoing compliance with operational noise criteria.

3.2 Non-Compliances

The following non-conformance was identified with respect to the Conditions of Approval:

- Condition 3.3 – Relates to the requirement for the Proponent, Delta Electricity, to conduct on going operational noise monitoring. Since the completion of the Operational Noise Review (PB, 2009) no further noise monitoring has been undertaken at Kerosene Vale.

  The preparation of a Noise Monitoring Program as referred to in CoA 3.3 to assess compliance against the criteria outlined in CoA 2.15 was conducted as part of the Operation Environmental Management Plan (OEMP) (PB, 2008) for the KVAR Stage 2 project. Section 5.2 ‘Environmental monitoring program’ provides a detailed table outlining the recommendations for noise monitoring at a minimum of 3 most affected locations on a 6 monthly basis.

  According to the monitoring recommendations outlined in the OEMP, since the initial Noise Review a total of 3 ongoing operational noise monitoring events should have taken place by the completion of this reporting period (March/April 2011).

4. Compliance with other Licences, Permits and Approvals that Apply to the Project

The project is located within the operating area of Delta Electricity's Wallerawang Power Station, which holds an Environment Protection Licence (EPL) No. 766.

The following sections of the EPL are relevant with respect to the operations of the Kerosene Vale Stage 2 Ash Repository Area:

- L1 Pollution of Waters: except as may be expressly provided in any other condition of the Licence (EPL 766) the licensee must comply with section 120 of the *Protection of the Environment Operations Act 1997* (POEO Act): Prohibition of pollution of waters.
- L5 Waste: the licensee must not cause, permit or allow any waste generated outside the premises to be received at the premises for storage, treatment, processing, reprocessing or disposal or any waste generated at the premises to be disposed of at the premises, except as expressly permitted by the licence. Only the following types of waste may be disposed of at the premises:
    i. Ash
    ii. Mill pyrites
    iii. Demineralisation and polisher plant effluents
    iv. Chemical clean solutions
    v. Cooling tower sediments
    vi. Ion exchange resins
    vii. Fabric filter bags
    viii. Brine conditioned fly ash
    ix. Biomass co-firing ash
    x. Settling pond sediments
    xi. Oil and grit trap sediments
- L6 Noise Limits: Operational noise from the Kerosene Vale Ash Repository area must not exceed 40dB(A) L_{Aeq}(15 minute), at the nearest most affected noise sensitive location.
- L7 Hours of Operation: Operational activities associated with the Kerosene Vale Ash Repository must only be carried out between the hours of 0700 and 2200 Monday to Sunday.

Table 4-1 EPL Compliance Assessment

EPL requirements	Finding	Relevant Section of AEMR
L1 Pollution of Waters	Compliance	Section 6.1.2 Surface and Groundwater Monitoring

EPL requirements	Finding	Relevant Section of AEMR
L5 Waste	Compliance	Section 6.2.7 Waste Management
L6 Noise Limits	Compliance *	Detailed review checklist for CoA3.2 (Appendix A), Section 5 Complaints Register and Section 6.1.1 Ongoing Operational Noise Monitoring
L7 Hours of Operation	Compliance	Detailed review checklists for MCoA2.8 and MCoA2.10 (Appendix A)

"*" Since the completion of the operational noise review (September 2009) no ongoing operational noise monitoring has been undertaken.

Based on the observations and findings detailed in each of the sections of this AEMR as outlined in the above table, the project is complying with the relevant requirements of Delta Electricity's Environment Protection Licence (No. 766).

5. Complaints Register (April 2010 to March-April 2011)

No complaints were recorded against operations at KVAR in the period running from April 2010 to March – April 2011.

6. Project Environmental Performance

In reviewing the environmental performance of the project, the requirements of the environmental monitoring (as specified in the Conditions of Approval) as well as the OEMP management sub-plans were assessed. For the purposes of this report, the results of compliances with each of these two documents are analysed separately below as sections 6.1 and 6.2.

As contract managers of KVAR Stage 2 operations, Conneq provides Delta with a monthly Client Service Report which provides detail concerning environmental monitoring undertaken on site. These monitoring results intend to confirm targets outlined within the contractual agreement with Delta, and the monthly reporting process comprises part of an accredited environmental management system (Conneq, May 2011). This process also facilitates continual improvement as a process of adaptive management.

The following table outlines the ongoing operations conducted by Conneq as part of management of KVAR.

Table 6-1 Ongoing operations at KVAR

	Item	Status
Data acquisition	Monthly ash compaction testing	Monthly
	Static dust monitoring	Daily
	Water sampling for site surface water- upstream, downstream and dam wall	Monthly
	Groundwater levels along the dam wall	Monthly
	Water use- meters, wheel wash, sprinklers	Ongoing
	Groundwater piezometers, open bores and vibrating wire piezometers on APA	Ongoing/ Monthly
Site Management	Ash placement to Stage 2- works continue on a restricted basis west of the exclusion zone	Ongoing
	Surface water management- including seepage from beneath Stage 1 and KVAD repositories	Ongoing
	Placement of furnace and fly ash mixture	Ongoing
	Irrigation/dust suppression to lower Sawyers Swamp Creek Ash Dam	Ongoing
	Development and implementation of work procedures and competency training	Ongoing
Planning	Update Repository Management Plan to incorporate changes to management and planning for Stage 2B repository operation	Annual
	Kerosene Vale Stage 1 revegetation	Under development
Safety	Continued availability of re-breathers for all vehicles on site	Ongoing
	Site inspections relevant to the working plan for ash placement	Ongoing
Communication	Ash Repository Induction training package- “Base level training requirements” as defined by the OEMP	Ongoing for all personnel
	Ash Repository Work Procedures training package- defining technical details for repository staff	Ongoing for all personnel

Audit	Repository Management Plan six monthly audit by external specialist	Biannually
Review	RMP sprinkler application (dust suppression) rates and management	Ongoing/ Monthly

6.1 Environmental Monitoring- Conditions of Approval

The Annual Environmental Management Report is required to include the results of all environmental monitoring as stipulated under conditions of approval 3.3 to 3.8, including interpretations and discussion by a suitably qualified person. The environmental monitoring associated with Conditions of Approval 3.3 to 3.8 includes the following:

- Condition of Approval 3.3 – Ongoing Noise Monitoring
- Condition of Approval 3.4 – Groundwater Monitoring
- Condition of Approval 3.5 – Surface Water Quality Monitoring
- Condition of Approval 3.6 – Hydrological Monitoring with respect to Sawyers Swamp Creek realignment
- Condition of Approval 3.7 – Ecological Monitoring with respect to the Sawyers Swamp Creek realignment
- Condition of Approval 3.8 – Air Quality Monitoring

In addition, the AEMR is required to present all occasions in the preceding twelve-month period when environmental goals/objectives/impact assessment criteria for the project have not been achieved as well as indicating the reason for the failure and the action taken to prevent the recurrence of that type of failure.

Figure 6-1 outlines the various locations and categories of environmental monitoring that were to be established at the Kerosene Vale Ash Repository, as a minimum, for the duration of the Stage 2 operations as outlined in the OEMP.

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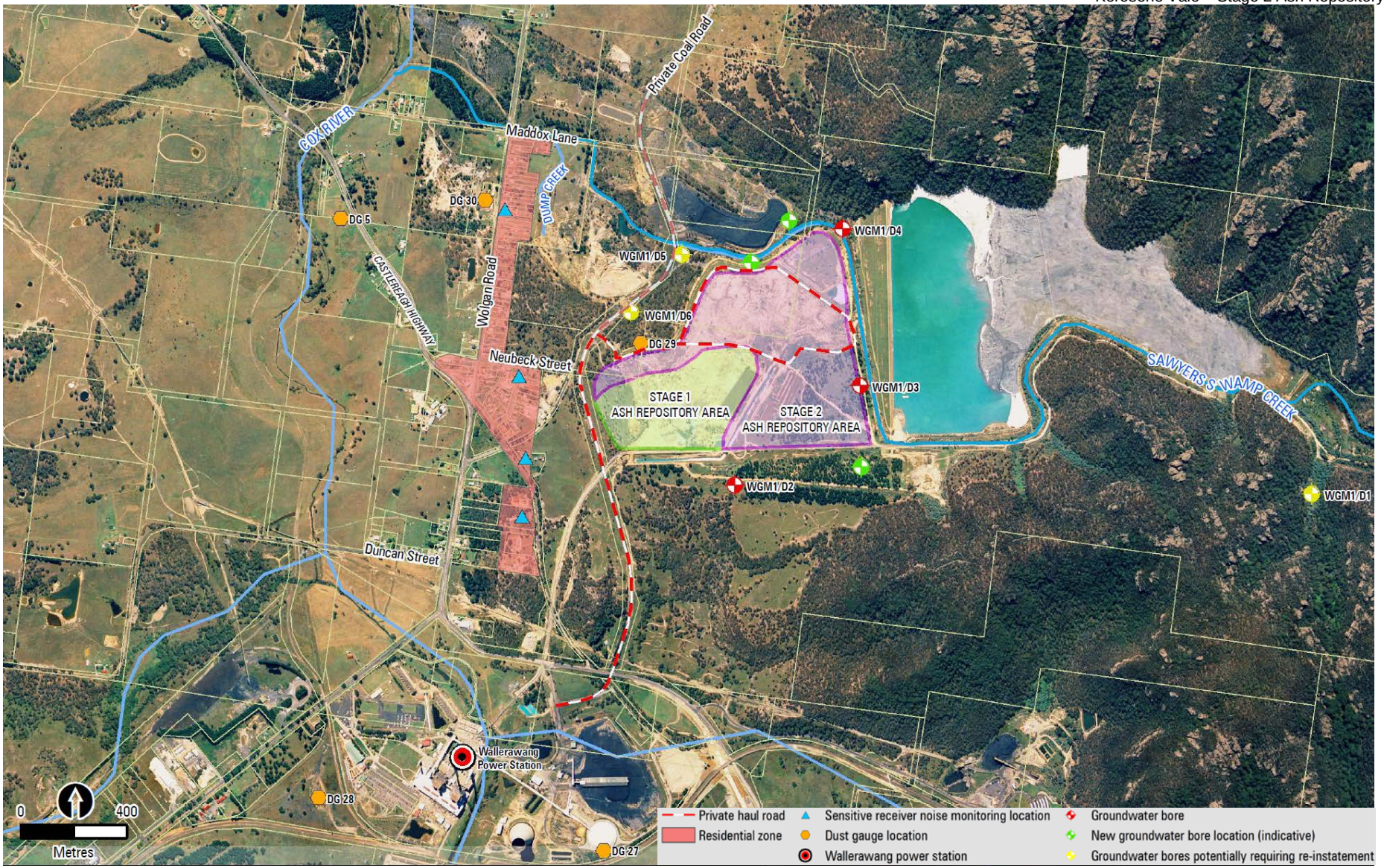

Figure 6-1 Environmental monitoring locations

6.1.1 Ongoing Operational Noise Monitoring (CoA 3.3)

In 2009 NSW Government Department of Planning reviewed and approved the Kerosene Vale Ash Repository Operational Noise Review (2009), indicating that the relevant requirements of condition 3.2 of the Minister's approval had been met. The Department supported the following recommendations as outlined in section 9 of the Operational Noise Review to ensure ongoing noise compliance:

- Routine maintenance of fly ash truck is to be carried out to ensure engine and mechanical component efficiency, minimisation of exhaust noise breakout and appropriate tyre pressure and tread requirements;
- As required by CoA 3.3 and as part of due diligence practice, routine monitoring of ambient noise levels will be undertaken in the surrounding environment for the determination of potential operational influence on noise environs and compliance with the adopted 40 dB(A) LAeq, 15min noise criterion. Periodic operational noise monitoring shall be carried out at a minimum 6 monthly frequency. Within 14 days of completing the noise monitoring any non-compliance with the noise criterion shall be reported to the DECC and the Director-General;
- Where Stage 2 fly ash truck operations are increased from typical existing daily movements resulting in an increased frequency of peak 15-minute pass by events daytime 7 trucks day time period or evening 6 trucks evening period; monitoring of ambient noise levels will be undertaken at nearest receiver locations for the determination of compliance with the adopted operational noise criteria;
- The noise monitoring methodology in the KVAR OEMP be amended to include the measurement of fly ash truck SEL pass by events at the nearest receiver locations; and
- Further monitoring of fly ash truck source noise levels is to be undertaken adjacent to the haul road to, where feasible, identify dominant truck operational noise influence and refine fly ash truck SWL adopted in the operational noise propagation model.

The Repository Site Management Plan (2010) prepared by Conneq encompasses the above as part of the section Implementation, including defining existing locations of noise monitors and transfer to a site plan denoting monitoring locations, collation of existing noise data obtained by Delta, and the implementation of noise reporting.

However, since the completion and approval of the Operational Noise Review, no further noise monitoring has been undertaken for Kerosene Vale.

Condition of Approval 3.3 relates to the preparation and implementation of an Operational Noise Monitoring Program to assess compliance against the operational noise criterion stipulated in Condition of Approval 2.15, throughout the life of the project. This Operational Noise Monitoring Program will form part of the Operational Noise Management Plan which is a requirement of the OEMP.

The development of an Operational Noise Monitoring Program will be based on the recommendations made in the Operational Noise Review, as approved by the Director-General NSW Government Department of Planning in September 2009, and the guidelines stipulated in the OEMP for the KVAR Stage 2 operations.

Given that no ongoing operation noise monitoring has been undertaken it is not possible to present the following as required for this Annual Environmental Management Report:

- Results of all environmental monitoring required under Condition of Approval 3.3 including interpretations and discussion by a suitably qualified person; or
- List of all occasions in the preceding twelve-month period when environmental goals/objectives/impact assessment criteria for the project have not been achieved, indicating the reason for failure to meet the criteria and the action taken to prevent recurrence of that type of failure.

However, as part of ongoing repository management, Conneq has performed routine maintenance of fly-ash trucks and implements a system of adaptive management to continually manage and mitigate environmental impacts, and as no complaints regarding noise have been received throughout the reporting period, it has not been deemed necessary to conduct noise monitoring or reviews. It is however recommended that periodical noise monitoring is conducted in the form of an attended noise monitoring event twice annually as recommended in the OEMP, for the next 12 months, Particularly under the upcoming change in conditions- i.e. construction works for Stage 2B, in order to ascertain if the new activities will impact upon the sensitive noise receivers.

6.1.2 Surface and Groundwater Monitoring

6.1.2.1 *Background*

In 2010 Delta Electricity engaged Aurecon Australia Pty Ltd to conduct an assessment of water quality for Kerosene Vale Ash Dam. The purpose of which was to evaluate the effects of

a) The initial Stage 2 dry ash placement in KVAR on surface and groundwater quality in the area; and

b) The effects of Sawyers Swamp Creek Ash Dam seepage on Sawyers Swamp Creek and local groundwater.

The report made the following observations:

- Insignificant or undetectable effects on surface or groundwater quality, including selenium in receiving waters due to-
  - Limited rainfall infiltration into the groundwater due to the dry ash itself and compaction by machinery;
  - Placement of the dry ash on the clay capping of the KVAD and its limited permeability;
  - The highly mineralised nature of the catchment and effects of the blocked KVAD toe drains; and
  - Attenuation of selenium in ash leachate by uptake by local soils or mine spoil.
- Effects of the Sawyers Swamp Creek Ash Dam seepage on local groundwater and water quality in Sawyers Swamp Creek:

- An increase in boron at bore WGM1/D4;
- High concentrations of iron and manganese in the local groundwater (not originating from the ash dam);
- An increase in boron concentration in Sawyers Swamp Creek- which is already elevated above the local goal due to the mineralised conditions of the catchment;
- An increase in salinity in Sawyers Swamp Creek, which remained below ANZECC (2000) guidelines; and
- No significant selenium effects on receiving waters of the Sawyers Swamp Creek Ash Dam.

Salinity increases and trace metal decreases in the ash dam pond can be attributed to the change in ash placement process from wet to dry ash storage. The salinity increase in the groundwater was most likely due to high concentrations of salts present in the residual pond, caused by a reduction in flushing following the cessation of wet ash placement. The diversion of freshwater inflows away from the ash dam pond to minimise overflows also contributed to this. Conversely, trace metals and elements in the ash dam pond decreased as there was no longer leaching from the slurred ash (Aurecon, 2010).

Based on the Aurecon (2010) assessment, water quality within Sawyers Swamp Creek should not be impacted by Stage 2 operations. However, as part of regular site management, Delta Electricity, through Conneq and the onsite laboratory run by Nalco, routinely sample the surface and groundwater of Kerosene Vale to ensure compliance with the projects various approvals and relevant licences.

6.1.2.2 *Groundwater Monitoring (CoA 3.4)*

The ground waters of Kerosene Vale are monitored regularly to determine the extent of impacts, if any, of Stage 2 operations on regional waters, and to examine the movement of water beneath the site and through the catchment.

Groundwater sampling for Kerosene Vale Ash Repository consists of monthly water sampling according to the following:

- Each site is baled and allowed to recharge for 24 hours before the official sample is collected;
- The height/level of water in the bore at time of sampling is reported; and
- Samples are sent to Nalco's NATA accredited laboratory in Botany, NSW, to perform the tests required.

Results from testing are returned monthly and distributed to Delta for dissemination. Additional sites

The Repository Management Plan (2009) provided by Conneq Industrial Infrastructure includes a Groundwater Management Plan for KVAR and adjacent KVAD. Over the last 12 months (April 2010 to March/April 2011), the main focus of this Management Plan has been to not only understand water quality impacts on the immediate area, but to understand the influence of regional groundwater on the stability of the Stage 2A operations, due to the placement of the site over the reclaimed ash dam.

On site, dry ash placement management has mainly involved limiting rainfall infiltration and reducing seepage from KVAD into the local groundwater. The effectiveness of these activities was demonstrated by improved water quality in the local groundwater during Stage I placement, from 2003 to 2006, before the toe drains of the Ash Dam became blocked

(Aurecon, 2010). Examination of the processes determining groundwater quality showed that the improved water quality was due to reduced KVAD seepage relative to background groundwater flows (Aurecon, 2010).

The blocked toe drains of KVAD were cleared in February 2010, and further monitoring of groundwater levels within the Ash Dam and Stage 2 repository were instigated. This included subsurface investigations, which resulted in the installation of additional water monitoring points (Table 6-2, Figure 6-2).

The Monthly Client Reports supplied by Conneq provide rolling averages of the results from water samples taken at the main regional bores- WGM1/D2 (DW2), WGM1/D3 (DW3), WGM1/D5 (DW5) and WGM1/D6 (DW6) (Figure 6-1). These bores provide information about groundwater flow under KVAD and the dry repository storages of KVAR Stage 1 and Stage 2A (Conneq, May 2011).

Key observations of groundwater in relation to the Kerosene Vale Ash Dam dam-wall drains are as follows:

- Post unblocking of the toe drains (19/2/2010) drain levels have stabilised and main drain outflow indicates levels rise after rainfall and return to normal levels within 7 days;
- Regional groundwater flows (as measured at DW2) from the south-west can be linked to patterns of level change in the Ash Dam at the drain piezometers before outflowing to DW5 and then on to the Lidsdale Cut; and
- Drain levels in the dam wall are constant along the northern boundary and rise and fall on the western boundary.

Regional groundwater general observations are as follows:

- Regional groundwater flows from the east (bore DW3) to the north-west (DW5), and from the south (DW2) to the north-west. This south to north-west flow most likely occurs due to the Lithgow coal seam; and
- Consequently, regional ground water flows underneath and/or through the original KVAD, and Stage 2 KVAR is located directly on top the old KVAD, separated by a clay cap.

This movement of water has potential impacts on local groundwater quality. Impacts of operations on groundwater quality and interpretation of impacts of groundwater movement are presented in Figure 6-2 below and Appendix C.

Based on the data collected by Conneq and Delta Electricity throughout the life of the project, it appears that the quality of groundwater underlying the site is not significantly impacted by Stage 2 operations.

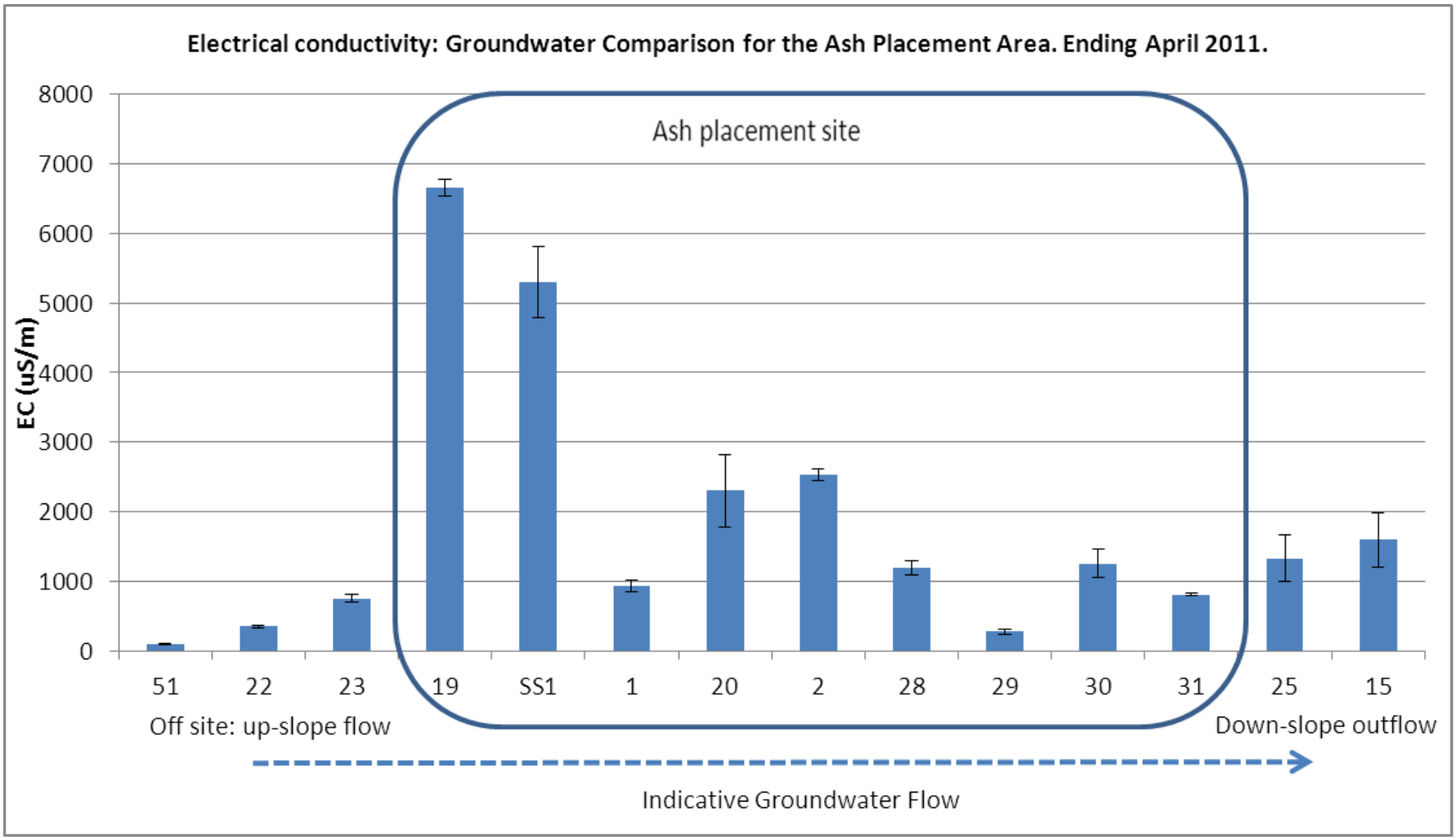

Figure 6-2 Electrical conductivity of Groundwater within and surrounding the KVAR ash placement area

6.1.2.3 *Surface Water Quality Monitoring (CoA 3.5)*

The surface waters of Kerosene Vale are mostly comprised of runoff generated within the ash repository site. All runoff from KVAR is restricted from entering Sawyers Swamp Creek, and is contained for reuse for the conditioning of ash and dust suppression. The Conditions of Approval stipulate that a monitoring program must be implemented to record and observe water quality and potential impacts from repository operations on regional surface waters. This monitoring included a program following the realignment of Sawyers Swamp Creek- however, as the creek has not been realigned, this aspect of monitoring is no longer necessary.

The design concept for managing surface water for the repository, as outlined in the Repository Management Plan (Conneq, 2010), is based on reducing water pooling or ponding on exposed ash benches, and eliminating flow from these areas over batters by implementing the catchment management principle of retaining water high in the landscape.

As such, runoff is contained in a series of ponds within the site, rather than risk overflow at external boundaries (Conneq, 2010), and is reticulated around the site for dust suppression as outlined in section 6.1.5.2 below, using a complex sprinkler system and water cart.

An initial determination of onsite waters has comprised of an assessment of water contained in the onsite detention ponds and groundwater seepage (Conneq, 2010). This was to help determine the surface and groundwater interactions that could potentially impact upon the site.

The Operational Environment Management Plan for KVAR Stage 2 requires sampling within SSC at four locations- two (2) on SSC, one (1) on Dump Creek to the Northwest of the repository, and one (1) in SSC Ash Dam, to ensure operations are not impacting on catchment surface waters, and to comply with Section 120 of the *Protection of the Environment Operations Act 1997*.

Nalco Site ID numbers 38, 39, 40 and 41 (Table 6-2, shaded cells) at Kerosene Vale have been sampled since January 2003, with sites 79, 80, 81, 83 and 84 commencing testing in January 2010. The remaining Nalco sites (86, 87 and 88) commenced sampling in May 2010 (Appendix B).

The other sites (Table 6-2, unshaded cells) form part of the Conneq monthly water sampling routine for a combined total of 18 locations that are regularly monitored for the project, with tests performed including the following:

- pH;
- Alkalinity (CaCO3);
- Sulfate (SO4);
- Conductivity;
- Total Dissolved Solids; and
- Trace metals- including Mercury (Hg), Chloride (Cl), Fluoride (F), Aluminium (Al), Arsenic (As), Barium (Ba), Beryllium (Be), Boron (B), Cadmium (Cd), Calcium (Ca), Chromium (Cr), Copper (Cu), Lead (Pb), Magnesium (Mg), Molybdenum (Mo), Nickel (Ni), Potassium (K), Selenium (Se), Silver (Ag), Sodium (Na), Zinc (Zn), Iron (Fe), Manganese (Mn).

Tests for dissolved oxygen (O_2), turbidity, total phosphorus (TP) and total nitrogen (TN) were determined unnecessary by the previous AEMR due to Sawyers Swamp Creek not requiring realignment. However, these tests are conducted for surface waters upon specific request to the Nalco laboratory, and have been incorporated into routine sampling at the Environment-Western team's request, as of August 2011.

Though no contaminated surface water is allowed to enter the catchment, surface waters are tested to ensure compliance with ANZECC guidelines. For repository close-out, it is proposed that all clean-water collected from capped batters be directed into a constructed wetland for filtration, before eventual release into the catchment. This proposal is currently sitting with the Department of Planning and Infrastructure (as of August 2011) for approval.

The following graph indicates through electrical conductivity levels that the surface waters both up- and downstream of the ash placement area are not significantly affected by ash emplacement operations.

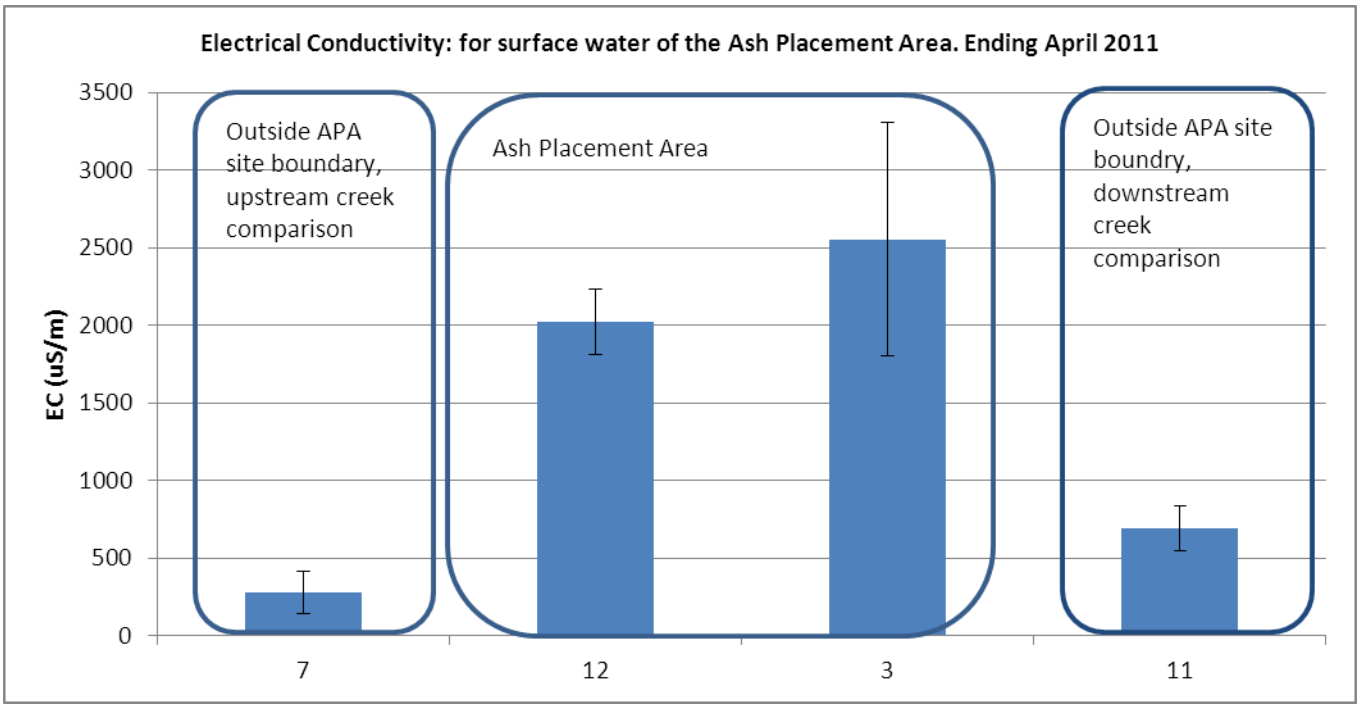

Figure 6-3 Electrical conductivity of Surface Waters up- and downstream of the ash placement area

Table 6-2 Surface and groundwater monitoring points at KVAR

Current Water Sampling Points Surface Water Monitoring KVAR 2010 to 2011							
Site #	**Nalco Site ID**	**Reported Origin**	**Aspect**	**Sample ID**	**Note**	**Easting**	**Northing**
1	86	North KVAD Wall subsurface	Groundwater through-flow	North Wall	Monthly	229908	6302216
2	87	West KVAD Wall subsurface	Groundwater through-flow	WX 50 Outflow	Monthly	229661	6302244
3	88	Dirty Water Collection	Internal ash surface runoff	SW Pond 1	Monthly	N/A*	
4		KVAR North Holding Pond	Groundwater seepage, and stormwater runoff	North Holding Pond	Monthly	230225	6302106
5		Clean Water Collection near compound	Clean Water Runoff Pond 1	Clean Water Runoff-1	Monthly	229396	6301834
6		Clean Water Runoff & Holding Pond	Runoff permanent capping to northern Holding	CW Pond Runoff 2	Monthly	230112	6302059
7		Inflow of Sawyers Swamp Ck	Catchment Quality Comparison	SSC Upstream @ 0m	Indicative	230386	6301545
8		Sawyers Swamp Creek Upper	Catchment Quality Comparison	SSC @ 300m	Monthly	230284	6301969
9		Sawyers Swamp Creek Upper	Catchment Quality Comparison	SSC @ 600m	Monthly	230253	6302120
10	84	Sawyers Swamp Creek Upper	Catchment Quality Comparison	SSC @ 800m	Monthly	229954	6302256
11	83	Sawyers Swamp Creek Lower	Catchment Quality Comparison	SSC @ D5 (1200 m)	Monthly	229650	6302253
12	38	Sawyers Swamp Creek Ash Dam	Dam water	Return water canal	Monthly	229765	6301461
13	79	Sawyers Swamp Creek Ash Dam	SSCAD seepage into SSC	Seepage @ V notch	Monthly	230260	6302287
14	41	Sawyers Swamp Creek Lower	Catchment Quality Comparison	SSC @ WX7	Monthly	228957	6302712
15	40	Lidsdale Cut	Catchment Quality Comparison	LC @ WX5	Monthly	229490	6302227
16	39	Dump Creek	Catchment Quality Comparison	DC	Monthly	229112	6302668
17	80	West KVAD Wall surface right	KVAD Toe Drain seepage	Right	Monthly	229662	6302177
18	81	West KVAD Wall s surface left	KVAD Toe Drain seepage	Left	Monthly	229688	6302194

Groundwater level monitoring via open wells and vibrating wire piezometers for KVAR- 2010 to 2011							
	Nalco Site ID	**Reported Origin**	**Aspect**	**Sample ID**	**Note**	**Easting**	**Northing**
19		South West KVAR subsurface	Groundwater through-flow	Sump 1	Monthly	229441	6301496
20		East KVAD Wall subsurface	Groundwater through-flow1	Sump 2	Monthly	230218	6302032
21	32	Groundwater Bore WGM1/D1	Regional	D1[2]	Upstream	231988.5	6301410
22	33	Groundwater Bore WGM1/D2	Regional	D2[2]	South East	229680	6301388
23	34	Groundwater Bore WGM1/D3	Regional	D3[2]	East below SCAD	230276.1	6301753
24	35	Groundwater Bore WGM1/D4	Regional	D4[2]	NE corner SSC	230160.7	6302350
25	36	Groundwater Bore WGM1/D5	Regional	D5[2]	Down-stream	229642.5	6302206
26	37	Groundwater Bore WGM1/D6	Regional	D6[2]	Up dip coal seam	229412	6302028
27	85	Groundwater Bore GW6	KVAD	GW6[2]	NW at SSC	229754	6302228
28	75	Groundwater Bore GW10	KVAD West Wall Toe Drain	GW10[2]	Toe Drains	229612	6301994
29	76	Groundwater Bore GW11	KVAD West Wall Toe Drain	GW11[2]	Toe Drains	229649	6302093
30	77	Groundwater Bore AP09	KVAD North Wall Toe Drain	AP09[2]	Toe Drains	229833	6302182
31	78	Groundwater Bore AP17	KVAD North Wall Toe Drain	AP17[2]	Toe Drains	229915	6302193
32		Groundwater Well APA02	KVAR Stage 2A	APA02	Stage 1A KVAR	229890	6301839.4
33		Groundwater Well APA09A	KVAR Stage 2A Above clay cap	APA09A	Stage 2A above clay cap north	229849	6302125.4
34		Groundwater Well APA09B	Stage 2A below clay cap	APA09B	Stage 2A KVAD water level north	229849.5	6302125.7
35		Groundwater Well APA10	Subsurface drain KVAD	APA10	Stage 2A KVAD water level west	229694.1	6302054.4
36		Groundwater Well APA11	Subsurface drain KVAD	APAD11	Stage 2A KVAD subsurface drain	229930	6301886
37		Groundwater Well APA12	Subsurface drain KVAD	APAD12	Stage 2A KVAD subsurface drain	229916	6301846
38		Groundwater Well APA13	Subsurface drain KVAD	APAD13	Stage 2A KVAD subsurface drain	229985	6301931

39		Groundwater Well APA14	Subsurface drain KVAD	APAD14	Stage 2A KVAD subsurface drain	230024	6301949
40		Groundwater Well APA15	Subsurface drain KVAD	APAD15	Stage 2A KVAD subsurface drain	230159	6301948
41		Groundwater Well APA16	Subsurface drain KVAD	APAD16	Stage 2A KVAD subsurface drain	230174	6301968
42		Groundwater Well APA17	Subsurface drain KVAD	APAD16B	Stage 2A KVAD subsurface drain	230169	6301969
43		Groundwater VWP[1] APA08	KVAR Stage 2A Above clay cap	APA08	Stage 2A above clay cap	229731.2	6301943.1
44		Groundwater VWP APA07	KVAR Stage 2A Above clay cap	APA07	Stage 2A above clay cap	229891.3	6302057.1
45		Groundwater VWP APA06	KVAR Stage 2A Above clay cap	APA06	Stage 2A above clay cap	230019.4	6302054.3
46		Groundwater VWP APA04	KVAR Stage 2A Above clay cap	APA04	Stage 2A above clay cap	229955.8	6301987.5
47*		Groundwater BH Cent KV_MB	Regional (Centennial Coal)	KV_MB1D	Upslope adjacent to SSCAD	230604.2	6301288.2
48*		Groundwater BH Cent KV_MB	Regional (Centennial Coal)	KV_MB1S	Upslope adjacent to SSCAD	230600	6301290
49*		Groundwater BH Cent KV_MB	Regional (Centennial Coal)	KV_MB6D	KVAR Stage 2B	229982.9	6301782.6
50*		Groundwater BH Cent KV_MB	Regional (Centennial Coal)	KV_MB6S	KVAR Stage 2B	229986.9	6301784.6
51*		Groundwater BH Cent KV_MB	Regional (Centennial Coal)	KV_MB8A	Offsite comparison-undisturbed	229166.4	6301607.4

[1] VWP – Vibrating Wire Piezometer – Pressure Transducer located in fly ash
[2] Water Quality Monitoring Results Available Groundwater KVAR Site - 2010 to 2011
* Previously Centennial Coal bores- now sampled by Delta
Water level measured only

Figure 6-4 Surface and groundwater monitoring points for KVAR

6.1.3 Hydrological Monitoring (CoA 3.6)

Delta Electricity has determined through an assessment conducted by its engineers and an adjusted ash placement strategy that there is no longer any need to realign Sawyers Swamp Creek. As such, hydrological monitoring as required under Condition of Approval 3.6 is not required.

6.1.4 Ecological Monitoring (CoA 3.7)

Delta Electricity has determined that there is no longer any need to realign Sawyers Swamp Creek . As such, ecological monitoring as required under Condition of Approval 3.7 is not required.

6.1.5 Air Quality Monitoring (CoA 3.8)

6.1.5.1 *Background*

The Repository Site Management Plan (Conneq, 2009) for KVAR Stage 2 operations proposes an Implementation Strategy in accordance with the Air Quality Monitoring Program, as required under the Conditions of Approval as stipulated by DP&I and as outlined in the OEMP. The strategy includes specific site management pertaining to the transport and emplacement of ash, managing dust within the ash repository using an extensive sprinkler system and water cart applications, and continuous monitoring for dust/airborne particulates.

Dust management within the site is also included in the responsibilities of all operations, including:

- Wash-down of security roadways, haul road/s and vehicle access roads;
- Use of perimeter sprays at the ash placement area;
- Mobile sprinkler system;
- Ash placement operations;
- Final and temporary capping of ash; and
- General maintenance of the ash placement area (Conneq, 2009).

6.1.5.2 *Dust Suppression- KVAR Sprinkler System*

While sprinklers have been used to control dust within KVAR, monthly water use data is recorded to ensure best practice application for site stability and optimal water conservation. Water application (measured in sprinkler hours) is based on wind velocity, humidity and temperature. The water used for dust suppression in KVAR is sourced from the Sawyer's Swamp Creek Ash Dam return water system- no clean water is used in this application.

The following table is a guide presented in the Repository Management Plan (Conneq, 2009) for sprinkler hours:

Table 6-3 Guide for sprinkler hours

Temperature and Humidity	Wind Speed (h^{-1})	Sprinkler (h d^{-1})

>25°C and <50%	>20kph	10 h $^{d-1}$
15 - 24 °C	<20kph	8 h $^{d-1}$
<15 °C and any %	<20kph	6 h $^{d-1}$

* Operation of sprinklers in extreme hot and dry conditions requires extended irrigation hours

The graph below indicates a downward trend in water use from November 2009 to April/May 2011 as part of a program to optimise the effectiveness of sprinkler application to minimise trace metal infiltration to the surface and groundwater of the site area. Consequently, water usage follows seasonal evaporative trends.

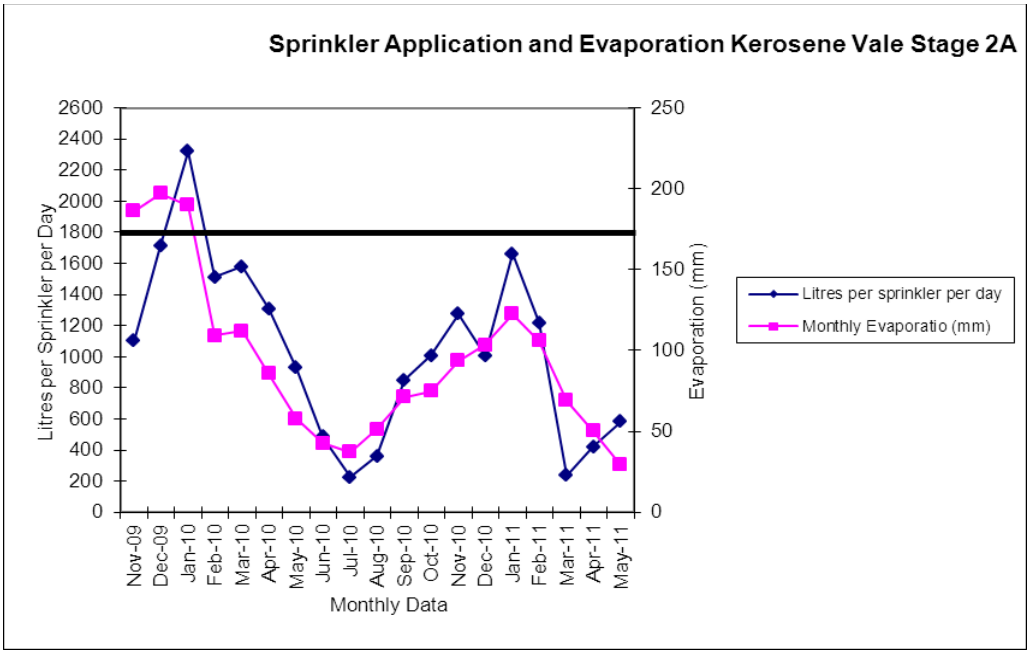

Figure 6-5 Litres of Water Used Nov 09 – May 11

6.1.5.3 *Dust Deposition Monitoring*

In February 2009, eight dust monitors were installed on and around KVAR, with an additional monitor located at the silo (Figure 6-4). Data collection commenced in March 2009, with results reported as a rolling site average (g m-2) unless otherwise stated.

The data from these depositional dust gauges installed and maintained by Conneq provide a comprehensive assessment of potential dust impacts from Kerosene Vale Stage 2 Ash Repository (Malfroy Environmental Strategies Pty Ltd, 2010). The results obtained demonstrate that gauges located within the perimeter of the Kerosene Vale Stage 2 Ash Repository recorded annual average deposition rates of 4.8 g/m^2/month (as insoluble solids). Interpretation of data against wind direction indicates there is a significant influence of black dust when wind comes from the west and east-south-east. Consequently high values of insoluble solids may be associated with the coal haul road to the east of these monitors and possibly the coal stockpile area to the north of the repository.

Dust monitoring results are recorded monthly with colour and textural observations. These results indicate that KVAR is managed effectively for dust and as such is in compliance with Conditions of Approval 2.33 and 3.8.

Delta also undertakes a series of ambient dust deposition gauges outside the KVAR area, closer to residential areas. All results for the 2010-11 year for total insoluble solids have been 1g/m^2/month or less. The locations of these offsite dust monitors are depicted in Figure 6-7 below.

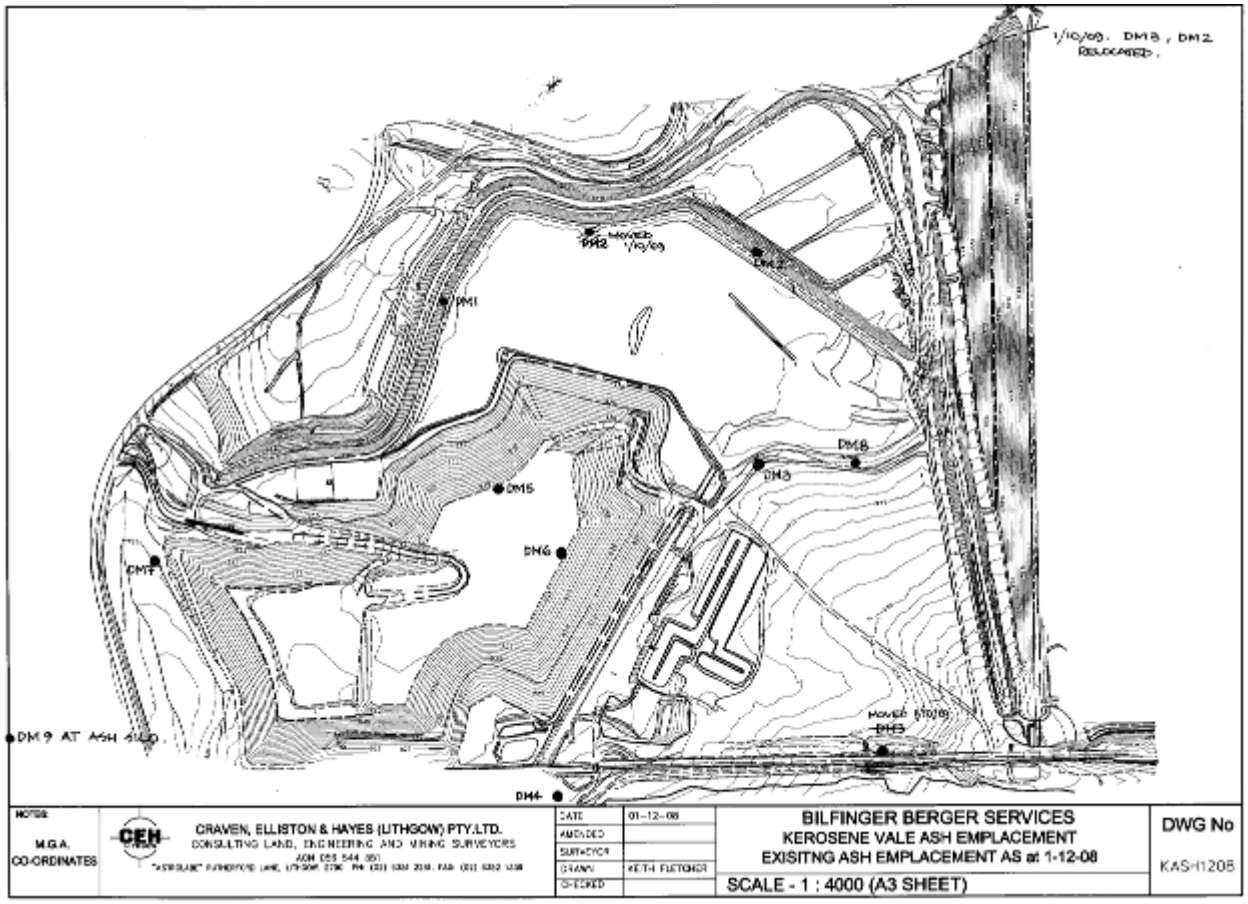

Figure 6-6 Location of dust monitors within the KVAR ash placement area

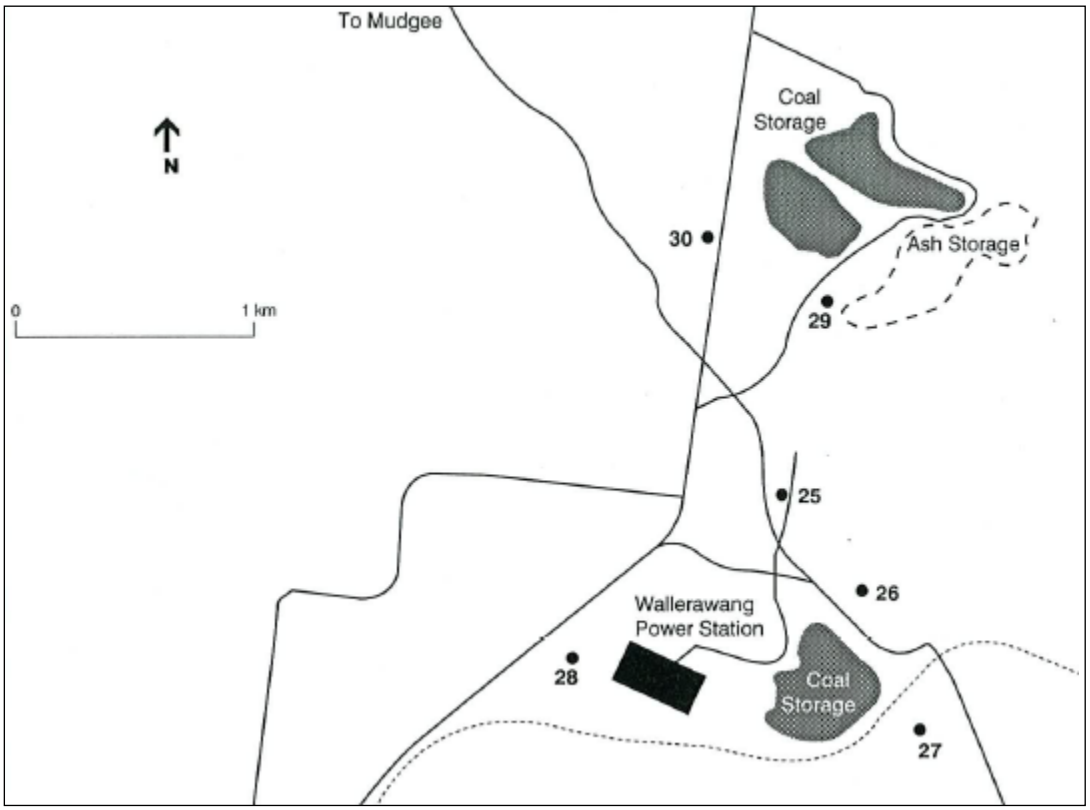

Figure 6-7 Location of dust monitors outside the KVAR ash placement area

6.2 Environmental Monitoring- Operation Environmental Management Plan (OEMP)

The project's approved OEMP incorporates seven topic specific management sub-plans covering the following:

- Ash Delivery and Placement
- Operational Noise and Vibration
- Surface Water Quality
- Groundwater Management
- Air Quality
- Landscape and Revegetation
- Waste Management

The OEMP also covers inspections and audits.

Each topic-specific management sub-plan consists of overarching target(s) and a series of management and mitigation measures. In reviewing the environmental performance of the project an assessment of all relevant documentation and several site visits were undertaken to determine whether the overarching target(s) were being met and whether the management and mitigation measures were being implemented.

6.2.1 Ash Delivery and Placement

Based on the information reviewed and the site observations made, the operations of the Stage 2 Kerosene Vale Ash Repository are meeting the following targets of the Ash Delivery and Placement Sub Plan of the OEMP:

- Compliance with the normal hours of operation condition for at least 98% of the year and its stretch target of 100% of the year- operation records show the Stretch Target has been achieved, i.e. 100% within normal hours;
- Reduction in the number of days operating under emergency conditions (less than 5 days/year and its stretch target of 0 days/year)- Stretch Target of 100% also achieved; and
- Compliance with the ash placement and compaction procedures- target of 92% dry density ratio exceeded, with testing undertaken on 22/3/2011 showing an average of 95.2% for 2010/11.

Delta Electricity has developed an extensive ash reuse strategy, comprising three separate volumes:

- Stage 1 – Ash Strategy Report (DMC, September 2010)
- Stage 2 – Quarry and Natural Aggregates Review (DMC, September 2010)
- Stage 3 and Stage 4 – Report Evaluation of Laboratory Results for Future Strategic Positioning (DMC, June 2011).

These reports include investigating markets for ash related products, such as aggregates (for use in road bases and construction materials), agriculture, and cement products. A trial project using fly ash as a road base in Wallerawang is set to be delivered in late 2011 in

conjunction with the Roads and Traffic Authority (RTA) NSW (Pers. Comm, Flood, 2011). Though at this point in time, it is not possible to determine whether or not Delta is on track to achieve an ash re-use target of 20% or its stretch target of 40% by 2013, the quantity of ash reused from April 2010 – April 2011 is outlined below (Table 6-4). These numbers indicate a reuse target of 20% of ash intended for KVAR is not likely to be reached by 2013.

Table 6-4 Quantities of ash reused April 1010 – April 2011

Date	To Repository (Tonnes)	Re-used (Tonnes)	%
Apr 10	28,555	0	0%
May 10	35,306	0	0%
Jun 10	37,228	0	0%
Jul 10	27,680	0	0%
Aug 10	25,104	0	0%
Sept 10	35,366	908	3%
Oct 10	54,668	0	0%
Nov 10	53,018	0	0%
Dec 10	45,340	0	0%
Jan 11	57,041	660.16	1%
Feb 11	47,438	687.67	1%
Mar 11	62,567	949.16	2%
Apr 11	42,263	611.48	1%
TOTAL	551,574	3816.47	1%

However, Delta Electricity honours existing contracts with Fly Ash Australia and Alchemy Industries for ash reuse, and Conneq has performed some ash reuse by reclamation from the Mt Piper repository through Mountain Industries, which delivers ash to Kandos Cement (Pers. Comm, Lowry, 2011). In addition to this, Conneq is an active member of the Ash Development Association Australia, which is designed to govern and submit exemptions for ash reuse in various applications. The Association exists as an avenue for investigation into new and innovative options for beneficial ash reuse and operates primarily as a forum for discussion.

With regard to the management and mitigation measures specified for Ash Delivery and Placement in the approved OEMP, this AEMR found the majority of the OEMP requirements were complied with. However, two Partial Compliances were identified. The first Partial Compliance relates to the requirement for Delta to undertake a review of the logistical arrangements for ash haulage and placement to determine the feasibility of reducing hours of operation. The review was to be undertaken and lodged with the Director-General DP&I following the commencement of operations. Clause 2.3.1 of the OEMP states a number of conditions under which operations can occur outside normal hours. In consideration of these conditions, feasibility studies were undertaken and it was determined logistic hours cannot be reduced. This is due to the fact that there is insufficient storage capacity at the Wallerawang Power Station for any additional ash to be stored outside the hours of 22:00 and 07:00 daily, before being transported to KVAR (Pers.Comm. Conneq, 2011).

The second Partial Compliance refers to the requirement for Delta to prepare a long term ash management strategy and submit it to the Director-General DP&I within six months of the commencement of operations. Delta Electricity has developed an extensive Ash Reuse Strategy, comprising three separate volumes as outlined above. This has been found to be a

partial compliance for the 2010-11 project year as the strategy was not submitted to the Department of Planning and Infrastructure until September 2011, though the first two stages of the report were completed in September 2010.

6.2.2 Operational Noise and Vibration

Based on the findings of the Stage 2 Kerosene Vale Ash Repository Operational Noise Review (dated September 2009) the operations of the Stage 2 Kerosene Vale Ash Repository were found to meet the OEMP target of achieving compliance with the noise criterion of L_{Aeq} of 40dB(A) at the nearest most affected receiver during normal operations.

This AEMR covers the second year of ash placement operations (April 2010 to March/April 2011). During this period there have been no emergency operations as defined in the Project Approval's associated Conditions of Approval. As such, the operations of the Stage 2 Kerosene Vale Ash Repository were found to meet the OEMP target of achieving a significant reduction in the number of noise-related complaints during emergency operations (less than 5 per year, stretch target = zero). No noise complaints were recorded for the period of April 2010 – April 2011.

With respect to the management and mitigation measures specified in the approved OEMP, the majority of the OEMP requirements were found to be complied with.

However, one Non-compliance was identified. This Non-compliance relates to the need for ongoing operational noise monitoring to be undertaken in accordance with OEMP requirements (Section 5.2 Environmental Monitoring Program & Section 6.4 Noise and Vibrations Management Plan).

6.2.3 Surface Water Quality

6.2.3.1 *Background*

The Aurecon (2010) report titled "KVAD Stage II Water Quality Assessment October 2007 to March 2010" indicates that the preliminary assessment of the effects of Stage 2 placement showed that rainwater had infiltrated the Stage 2A dry ash, and had leached some trace metals and elements from the flyash into surface waters. However, this groundwater was effectively held above the Kerosene Vale Ash Dam clay capping due to its relatively low permeability, which effectively limited the movement of the groundwater off-site. Assessments of effects of this water on receiving water quality, including selenium, indicate there has been no significant impact, or simply that the effects were undetectable against the highly modified catchment conditions. Based on this assessment it appears that the water quality within Sawyers Swamp Creek is not significantly impacted by Stage 2 operations (Aurecon, 2010).

6.2.3.2 *Targets*

The Surface water quality sub-plan as outlined in the OEMP is comprised of the following

- Targets:
  - The water quality within Sawyer's Swamp Creek is not impacted by Stage 2 operations

  - Zero environmental incidents that relate to pollution of waters at Sawyers Swamp Creek

- Indicators:
  - The surface water monitoring results and the assessment of water quality in accordance with ANZECC guidelines
  - No visual evidence of erosion and sedimentation impacts on Sawyers Swamp Creek following significant rain events
  - Records of trend analysis, management procedures and observations for each of the nominated monitoring locations.

6.2.3.3 *Current Status*

Based on the information reviewed and the site observations made, the operations of the Stage 2 Kerosene Vale Ash Repository are meeting the target of zero environmental incidents that relate to pollution of waters at Sawyers Swamp Creek.

6.2.3.4 *Compliance Assessment*

The 1st Annual AEMR for Kerosene Vale Stage 2 operations (Parsons Brinkerhoff, 2010) reported two Non-compliances for the April 2009 – April 2010 twelvemonth.

The first Non-compliance related to the 25ML Storage Pond not being established at KVAR. This Non-compliance was found to be incorrect as the redundant return water canal at Kerosene Vale is being used for this purpose, and has been since commencement of operations. The capacity of the return water canal was found to be adequate, in addition to which its use removed the necessity for the placement of an additional holding pond.

The second Non-compliance mentioned was that two surface water monitoring sites had not been established for Sawyer's Swamp Creek. Routine sampling of surface waters for Kerosene Vale have been collected since commencement of operations at a minimum of four surface water monitoring points in the Sawyer's Swamp Creek system, as part of the surface water monitoring program (detailed in Table 6-2 and Figure 6-2). Since project commencement, a total of 18 surface water locations have been regularly monitored.

6.2.4 Groundwater Management

Dry ash placement management has mainly involved limiting rainfall infiltration and reducing seepage from the ash dam into the local groundwater (Aurecon, 2010). The effectiveness of these activities has been demonstrated by improved water quality in the local groundwater during the Stage 1 placement from 2003 to 2006, before the toe drains (of the Kerosene Vale Ash Dam) became blocked. Examination of the processes determining groundwater quality showed that the improved water quality was due to reduced seepage from Kerosene Vale Ash Dam relative to background groundwater flows, as discussed above (Section 6.1.2.2).

The current, Stage 2A, water quality in receiving waters and changes from pre-Stage 1 to the initial Stage 2A placement were examined in terms of the likely effects of the groundwater beneath Stage 2 and seepage from the SSCAD on water quality in Sawyers Swamp Creek. These effects were put into the context of poor water quality in the area, which is unrelated to the placement of dry ash from Wallerawang Power Station (Aurecon, 2010). From this, the

following conclusions were drawn on the overall effects of the groundwater beneath Stage 2 and the SSCAD seepage on receiving water quality:

- Insignificant or undetectable effects on surface or groundwater quality, including selenium, in receiving waters due to
  - Limited rainfall infiltration into the groundwater due to the dry ash itself and compaction by machinery;
  - Placement of the dry ash on the clay capping of the KVAD and its limited permeability;
  - The highly mineralised nature of the catchment; and
  - Attenuation of selenium in ash leachate by uptake by local soils or mine spoil.

The report from which the above observations were sourced (Aurecon, 2010) provides a number of recommendations with respect to managing Delta Electricity's groundwater resources, though the assessments made by Aurecon within this report indicate that the quality of groundwater beneath KVAR are not being impacted by ash placement operations.

Conneq Industrial Infrastructure and the Nalco laboratory have indicated that groundwater monitoring is undertaken at 18 different sites on and surrounding Kerosene Vale (Figure 6-2).

For the 2010-11 reporting period, all of the OEMP requirements with respect to groundwater quality were found to be complied with. The 1st Annual AEMR conducted (PB, 2010) found a non-conformance with the requirement to construct two (2) additional groundwater monitoring bores- one (1) down-gradient of the repository to the north and one (1) up-gradient. Information provided by Conneq, site inspections and water monitoring results from previous years indicate that there are a total of thirteen (13) groundwater bores that are regularly sampled.

6.2.5 Air Quality

Based on the MES Report (Draft, June 2010) titled "Kerosene Vale Ash Repository Stage 2 – Air Quality Review – April 2009 – March 2010", the dust gauge data from the first year of KVAR Stage 2 operations do not indicate that KVAR Stage 2 operations have resulted in dust deposition above the OEMP levels that trigger the requirement to implement additional control measures. A comparison (undertaken by MES) of dust data from the first year of operation of KVAR Stage 2 with data collected in previous years showed no indication of an increase in dust deposition levels, most importantly at Gauge 29, the closest to KVAR Stage 2.

No complaints were received in regard to Kerosene Vale Stage 2 operations within the reporting period. The 1st AEMR completed by Parsons Brinckerhoff (2010) returned one non-compliance with Air Quality criterion, in that two additional dust gauges as required by the OEMP had not been installed on site. Records for KVAR indicate that in February 2009, eight dust monitors were installed on and around the repository, with an additional monitor located at the silo (Figure 6-4). Monthly data collection commenced in March 2009, with results reported as a rolling site average (g m-2) unless otherwise stated.

Having reviewed all available information/data and from site inspections, the requirements of the OEMP were found to be complied with for 2010-11.

6.2.6 Landscape and Revegetation

Landscaping and revegetation at the Kerosene Vale Ash Repository to date has been limited to the permanent capping of Stage 1. As operations are still continuing for Stage 2, no revegetation works have commenced. Once the Stage 2 area of the repository reaches the design RL of 940 mAHD extensive rehabilitation works will commence.

Interim landscaping and revegetation activities have included a series of trials to determine best practice techniques for rehabilitating the whole site upon its completion. These trials have included different seed dispersal techniques (by hand and by hydro-cannon) and site preparation including planting seedlings by hand and using plastic tree guards. The greatest problems identified as hindering the success of these trials have been the presence of pest vertebrates (i.e. rabbits and kangaroos) and the shallow soil profile.

To this end, Conneq have increased the capping depth to a minimum of 1m for all permanent capping

Based on the information reviewed and the site observations made, the interim landscaping/revegetation activities undertaken are considered to be in line with the relevant OEMP target, given the project's progress to date.

The majority of the OEMP requirements with respect to landscaping/revegetation were found to be not applicable given, as ash has yet to reach the design RL (940 mAHD) as aforementioned.

No non-conformances were identified.

6.2.7 Waste Management

Based on the Monthly Client Reports and information reviewed (including discussion with site security and the Security Manager) and site observations made, the operations of the Stage 2 Kerosene Vale Ash Repository have met the OEMP targets for waste management for the 2010-11 year.

The majority of the OEMP requirements with respect to waste management were found to be complied with.

No non-conformances were identified.

6.2.8 Inspections and Audits

The project OEMP provides guidance on inspections and audits to be undertaken during the operation of the Stage 2 Kerosene Vale Ash Repository. The specific sections of the OEMP that deal with inspections and audits are:

- Section 3.7.1 Environmental Inspections
- Section 3.8 Environmental Audits

Inspections and reviews currently undertaken by Delta include the following:

- Daily Inspection undertaken by the Delta's Contract Administrator. This daily inspection covers the following aspects of operations:
  - Weather conditions
  - People and Safety
  - Dust Suppression

  - Compaction
  - Surface Water Run-off
  - Corrective Actions

- Monthly review of the project's overall progress and performance based on the Monthly Client Service Report prepared by Conneq Industrial Infrastructure. The Monthly Client Service reports include a section addressing environmental matters which covers the following aspects of operations:
  - Ash placement
  - Hours of operation
  - Ash reuse
  - Noise
  - Sawyers Swamp Creek
  - Groundwater levels
  - Dust
  - Ash moisture
  - Field compaction and Compaction
  - Daily checklist (as performed by Delta's Contract Administrator)
  - Surface water management
  - Wind – dust suppression
  - Site areas
  - Site water usage
  - Catchment water quality (within ash placement area only)
  - Surface water, ash conditioning water and sprinkler water quality (pH and EC)
  - Revegetation
  - Stack stability
  - Survey
  - Site management

These reports are submitted to and reviewed by Delta monthly, with all areas discussed in detail during regular client/contractor meetings.

6.3 Environmental Assessment Impacts and Performance Predictions

Chapter 16 of the Environmental Assessment (Justification and Residual Risk) made the following assessment

Against the benefit of ongoing electricity production the following key potential environmental impacts have been identified in association with the proposal:

- Noise impacts on the local community
- Aquatic ecology impacts associated with the realignment of Sawyers Swamp Creek
- Water quality impacts
- Dust and air emission impacts.

The EA and design process has identified proposed mitigation and management measures to mitigate these impacts.

6.3.1 Noise Impacts

Based on the site observations made and the information reviewed the potential noise impacts from the operation of the Kerosene Vale Stage 2 Ash Repository have been effectively mitigated and managed.

No noise related complaints were received regarding KVAR Stage 2 throughout the 2010-11project year.

6.3.2 Aquatic Ecology Impacts

As previously noted, Delta Electricity have advised that there are no longer any plans to realign Sawyers Swamp Creek. As such the anticipated aquatic ecological impacts associated with the creek re-alignment will not eventuate.

6.3.3 Water Quality Impacts

Based on the site observations made and the information reviewed the potential surface and groundwater impacts from the operation of the Kerosene Vale Stage 2 Ash Repository have been effectively mitigated and managed.

6.3.4 Dust and Air Impacts

Based on the site observations made and the information reviewed the potential dust/air impacts from the operation of the Kerosene Vale Stage 2 Ash Repository have been effectively mitigated and managed.

7. Conclusions

The majority of Conditions of Approval and environmental requirements of the Operation Environmental Management Plan (OEMP) were found to be either complied with or no longer applicable to operations at Kerosene Vale Ash Repository Stage 2. This relates to specific areas of environmental concern, including potential impacts on local ground and surface water by ash emplacement activities, potential impacts on the community by operational and traffic related noise disturbances and lighting emissions, impacts on air quality through dust and other airborne irritants or particulates, and potential impacts on the general environment through wastes generated. This also relates to potential anthropological impacts, for example potential impacts on items or areas of either Aboriginal or non-indigenous heritage if they are discovered within the project area. One Non-compliance and four Partial-compliances were found in the process of cross checking the Conditions of approval and the requirements of the OEMP with operations at KVAR Stage 2 from April 2010 to March/April 2011.

The Non-compliance found related to the lack of ongoing noise monitoring at the site. CoA 3.3 requested that the Proponent, Delta Electricity, prepare and implement an Operational Noise Monitoring Program. However, since the completion of the Operational Noise Review (PB, 2009) no further noise monitoring has been undertaken at Kerosene Vale.

The preparation of a Noise Monitoring Program to assess compliance against the criteria outlined in CoA 2.15 was conducted as part of the Operation Environmental Management Plan (OEMP) (PB, 2008) for the project. Section 5.2 of the OEMP 'Environmental monitoring program' provides a detailed table outlining the recommendations for noise monitoring at a minimum of 3 most affected locations on a 6 monthly basis.

In addition to this, a Repository Operational Noise Review was conducted in 2009 to identify any areas of particular concern. According to this Review, operations at KVAR were not anticipated to exceed the allowable noise limits, except under worst case meteorological and operational conditions (PB, 2009). However, as no noise monitoring has been conducted it is difficult to ascertain whether this has been the case. According to the monitoring recommendations outlined in the OEMP, since the initial Noise Review a total of 3 ongoing operational noise monitoring events should have taken place by the completion of this reporting period (March/Aprill 2011).

The four Partial-compliances found with the project relate to the requirements of the Proponent, Delta Electricity, to review its logistical arrangements with a view to reducing hours of operation; correspond with the Director-General if any non-compliances were found in the initial Operational Noise Review; the implementation of noise mitigation measures at the private residences of local landholders if written requests are issued; and to acquire the land of any noise affected landholders if written request is made.

Condition of Approval 2.9 is a partial compliance as the Proponent, Delta Electricity, has complied with the first requirement of the CoA but not the second. A review of logistical arrangements has been conducted by principal contractors Conneq, but the report has not been formalised or submitted to the Director-General. The review indicated that the capacity for overnight storage at Wallerawang Power Station meant the hours of operation could not be reduced without overloading the available space. As such Conneq have suggested the use of an additional ash haulage truck, that meets the operation and noise requirements for the project, to work at a half time capacity if the need arises. The findings of the review were discussed and reviewed by the nominated Environmental Representative for the project and deemed to be reasonable and feasible.

Conditions of Approval 2.18, 2.19 and 2.20 are partial compliances for the following reasons:

- No non-compliances with operational noise criteria were discovered in the Operational Noise Review;
- No landholders have made written requests (or any other type of request) for Delta Electricity to implement additional noise mitigation measures at their properties; and
- No landholders have made written requests (or any other type of request) for Delta Electricity to acquire their land.

However, as no ongoing operational noise monitoring has occurred, it is difficult to determine whether any exceedences have occurred, regardless of the fact no formal complaints or written requests have been made.

In conclusion, given the above results, a number of direct actions are required to ensure ongoing compliance with the project approvals and the OEMP. These primarily include the immediate implementation of an attended noise monitoring event and successive monitoring events every 6 months; and the formalisation and submission of the review of logistical arrangements for ash handling and transport for KVAR to determine if the hours of operation can in fact be reduced. With regard to ongoing operational noise monitoring, it is feasible that if after two successive noise monitoring events (one twelve month period) no operational noise exceedences are determined, the Proponent may submit to the Director-General a proposal to discontinue noise monitoring, except where required under changed or exceptional circumstances (i.e. construction, rock breaking or other activities need to occur).

8. Recommendations

In light of the Conclusions as discussed above, the Environment Team- Western as independent of the operations of KVAR Stage 2 make the following recommendations:

1. That an attended noise monitoring event is conducted as soon as is practicable, and organise for consecutive six-monthly noise monitoring events thereafter;
2. Review the results of this noise monitoring after an initial 12 month period and if considered reasonable, seek an exemption from continued noise monitoring from the Director-General, particularly if the record of no noise related complaints continues; and
3. Formalise and submit a review of the logistical arrangements for ash haulage to KVAR Stage 2 to the Director-General.

The above recommendations would ensure complete compliance with the Conditions of Approval for the project, as well as the requirements as outlined in the Operation Environmental Management Plan, with the exception of those relating to the realignment of Sawyers Swamp Creek, as in the light of the adjusted ash placement strategy these are no longer applicable.

With regard to the AEMR for 2011-12 a particular focus will need to be on the Conditions of Approval that relate to Construction activities, as the development for KVAR Stage 2B will be instigated in late 2011, if the safe placement of ash is to be continued.

9. References

- Harris, S (2009) *Stage 2 Kerosene Vale Ash Repository operational noise review*. September 2009. Parsons Brinckerhoff Australia Pty Ltd, Ernst and Young Centre, Level 27/680 George St, Sydney 2000.
- Aiken, J (2010) *Repository Site Management Plan (RMP) for Ash Placement Area, Wallerawang Power Station*. September 2010. Conneq Industrial Infrastructure Pty Ltd, Mt Piper Power Station, Boulder Rd, Portland NSW 2847.
- Budd, K; Abdelmaseih, M; & Walker, s (2008). *Kerosene Vale- Stage 2 Ash Repository Operation Environmental Management Plan*. Parsons Brinckerhoff Australia Pty Ltd, Ernst and Young Centre, Level 27/680 George St, Sydney 2000.
- Little, S. G. (1984). *Heavy Metals in Water in and around NSW Power Stations*. Electricity Commission of NSW Research and Investigation Section.
- Burrows, D. (2001). *Wallerawang Ash Management Proposed Dry Ash Handling Facility*. Hyder Consulting (Australia) Pty Ltd.
- EC of NSW (1989). *Mount Piper Ash Storage Environmental Impact Statement*. Electricity Commissions of NSW Research and Investigation Section.

Appendix A-

Detailed review checklist and Recommendations for Conditions of Approval

9.1.1 Administrative Conditions

9.1.1.1 *Terms of Approval*

Minister's Condition of Approval 1.1

The proponent shall carry out the project generally in accordance with the:

- ***a) Major Project Application 07_0005;***
- ***b)* Kerosene Vale – Stage 2 Ash Repository Area *(two volumes)* – Environmental Assessment*, prepared by Parsons Brinckerhoff and dated 1 April 2008;***
- ***c)* Kerosene Vale – Stage 2 Ash Repository Area – Submissions Report*, prepared by Parsons Brinckerhoff and dated 30 May 2008; and***
- ***d)* The conditions of this approval.**

Compliance Assessment Observations and Comments

Based on the review undertaken, the Kerosene Vale Stage 2 operations have generally been carried out in accordance to the above requirements.

However, one minor non-compliance was identified, with respect to the Conditions of Approval and the OEMP, with recommendations for improvements made at the bottom of each assessment within this Appendix.

Compliance Assessment Finding

Compliance.

Minister's Condition of Approval 1.2

In the event of an inconsistency between:

- ***a) The conditions of this approval and any document listed from condition 1.1a) – 1.1c) inclusive the conditions of this approval shall prevail to the extent of the inconsistency; and***
- ***b) Any of the documents listed from the condition 1.1a) – 1.1c) inclusive, the most recent document shall prevail to the extent of the inconsistency.***

Compliance Assessment Observations and Comments

Throughout implementation of the project, and during the course of the review of operations in preparing this AEMR, no inconsistencies were observed between the documents listed above.

Compliance Assessment Finding

Compliance.

Minister's Condition of Approval 1.3

The proponent shall comply with the reasonable requirements of the Director-General arising from the Department's assessment of: ***a) Any reports, plans or correspondence that are submitted in accordance with this approval; and*** ***b) The implementation of any actions or measures contained in these reports, plans or correspondence.***
Compliance Assessment Observations and Comments Delta Electricity has not received any requests from the Director-General of the Department of Planning and Infrastructure in the 2010-11 reporting period.
Compliance Assessment Finding Not Applicable.

9.1.1.2 *Limits of Approval*

Minister's Condition of Approval 1.4
This approval shall lapse five years after the date on which it is granted, unless the works that are the subject of this approval are physically commenced on or before that time.
Compliance Assessment Observations and Comments The Project Approval for Kerosene Vale Ash Repository Stage 2 is dated 26 November 2008. This approval will lapse on 26 November 2013. This indicates that the Project Approval is still valid, as works at KVAR were commenced in April, 2009.
Compliance Assessment Finding Compliance.

9.1.1.3 *Statutory Requirements*

Minister's Condition of Approval 1.5
The Proponent shall ensure that all licences, permits and approvals are obtained as required by law and maintained as required with respect to the project. No condition of this approval removes the obligation for the Proponent to obtain, renew or comply with such licences, permits or approvals.

Compliance Assessment Observations and Comments

The Kerosene Vale Ash Repository Stage 2 project is within the jurisdiction of Environment Protection Licence (EPL) 766, as allocated to the Wallerawang Power Station.

As discussed in section 4 of this AEMR, the sections of the licence that are relevant to KVAR operations are:

- L1- Pollution of Waters
- L5 Waste
- L6 Noise Limits
- Hours of Operation

Based on the observations and discussion of section 4, the project is generally complying with the requirements of Delta Electricity's EPL 766.

Compliance Assessment Finding

Compliance.

9.1.2 Specific Environmental Conditions

9.1.2.1 *Ash Management*

Minister's Condition of Approval 2.1
The Proponent shall prepare a long-term ash-management strategy including a program for investigation and assessment of alternative ash management measures with a goal of 40% reuse of ash by 31 December 2012. The report shall be submitted to the Director-General within six months of the commencement of operations. The Proponent shall report on the status and outcomes of its investigations to the Director-General every two years from the commencement of the operation of the project, unless otherwise agreed by the Director-General.
Compliance Assessment Observations and Comments Following the first AEMR, Delta Electricity commissioned the report *Fly Ash: Strategy Development for Aggregates and Other Bulk Use Applications* (DMC, 2010). The report was developed in four (4) stages: • Stage 1: Initial Strategy Development for the Bulk Use of Ash: Coarse and Fine Aggregate Applications; • Stage 2: Natural Aggregate Resources in NSW Regions Served by Delta Power Stations; and • Evaluation of Laboratory Results for KoAgg from Delta Power Stations- Future Strategic Positioning. Report on Results from the Laboratory Test Program (Stage 3) and Strategic Summary Position Development (Stage 4). These reports were completed in September 2010, September 2010 and June 2011, respectively, and submitted to DP&I in September 2011. This satisfies the above biennial reporting requirement. Ash reuse progress will be tracked in Delta Electricity's Annual Sustainability Report.
Compliance Assessment Finding **Compliance.**

Minister's Condition of Approval 2.2
To facilitate assessment of the viability of coal resources in the project area and provide a finite opportunity for their extraction, the Proponent shall undertake revised staging of ash placement activities as described in the document referred to in condition 1.1c) of this approval
Compliance Assessment Observations and Comments The Asset Manager – External Plant advised that Centennial Coal declined to extract the coal resources in the project area following the completion of their studies (Parsons Brinkerhoff, 2010). It was decided that ash will not be placed over the coal resource in the project area (i.e. Area 2, pine plantation area- refer Figure 6-2) for another 2 years, which is finite opportunity. As outlined in this report, the pine plantation area now constitutes Stage 2B of Kerosene Vale Ash Repository.

Compliance Assessment Finding
Compliance.

9.1.2.2 *Noise Impacts*

Minister's Condition of Approval 2.3
Construction activities associated with the project shall only be undertaken during the following hours: ***a) 7:00 am to 6:00 pm, Mondays to Fridays, inclusive;*** ***b) 8:00 am to 1:00 pm on Saturdays; and*** ***c) At no time on Sundays or public holidays.***
Compliance Assessment Observations and Comments Ash placement within KVAR Stage 2A has not required construction activities to date. This is because Stage 2A placement is an extension from Stage 1 and has utilised existing facilities. In accordance with CoA 6.2 the Proponent must prepare and implement a Construction Environmental Management Plan (CEMP) prior to the commencement of construction works. A CEMP has been prepared for the construction works associated with the development of Stage 2B in preparation for ash placement, including Section 2.2 Construction Noise Management Plan and 2.2.3 Noise Monitoring Program. This was submitted to DP&I in August 2011. No specific construction works have been carried out on the site additional to this.
Compliance Assessment Finding Not applicable.

Minister's Condition of Approval 2.4
Activities resulting in impulsive or tonal noise emission (such as rock breaking or rock hammering) shall be limited to 8:00 am to 12:00 pm, Monday to Saturday and 2:00 pm to 5:00 pm Monday to Friday. The Proponent shall not undertake such activities for more than three continuous hours and must provide a minimum one-hour respite period.
Compliance Assessment Observations and Comments Not applicable, as the requirement for rock breaking or hammering as not arisen, given no construction works have commenced on site. Refer to CoA 2.3 for further detail.
Compliance Assessment Finding Not Applicable.

Minister's Condition of Approval 2.5

Construction outside the hours stipulated in condition 2.3 of this approval is permitted in the following circumstances: ***a) Where construction works do not cause audible noise at any sensitive receiver; or*** ***b) For the delivery of materials required outside these hours by the Police or other authorities for safety reasons; or*** ***c) Where it is required in an emergency to avoid the loss of lives, property and/or to prevent environmental harm.***
Compliance Assessment Observations and Comments Not applicable, as no construction works have commenced on site. Refer to CoA 2.3 for further detail.
Compliance Assessment Finding Not Applicable.

Minister's Condition of Approval 2.6
The hours of construction activities specified under condition 2.3 of this approval may be varied with the prior written approval of the Director-General. Any request to alter the hours of construction specified under condition 2.3 shall be: ***a) Considered on a case-by-case basis;*** ***b) Accompanied by details of the nature and need for activities to be conducted during the varied construction hours; and*** ***c) Accompanied by any information necessary for the Director-General to reasonably determine that activities undertaken during the varied construction hours will not adversely impact on the acoustic amenity of sensitive receivers in the vicinity of the site.***
Compliance Assessment Observations and Comments Not applicable, as no construction works have commenced on site. Refer to CoA 2.3 for further detail.
Compliance Assessment Finding Not Applicable.

Minister's Condition of Approval 2.7

The construction noise objective for the proponent is to manage noise from construction activities (as measured by $L_{A10\ (15minute)}$ descriptor) so as not to exceed the background L_{A90} noise level by more than 10dB(A) at any sensitive receiver. ***Any activities that have the potential for noise emissions that exceed the objective must be identified and managed in accordance with the Construction Noise Management Plan (as referred under condition 6.3B) of this approval). The Proponent shall implement all reasonable and feasible noise mitigation measures with the aim of achieving the construction noise objective.***
Compliance Assessment Observations and Comments Not applicable- refer to observations made above for CoA 2.3.
Compliance Assessment Finding Not Applicable.

Minister's Condition of Approval 2.8
Operational activities associated with the project shall only be undertaken from 7:00am to 10:00pm Monday to Sunday.
Compliance Assessment Observations and Comments Conneq have advised that no operational activities have taken place outside the hours designated above.
Compliance Assessment Finding Compliance.

Minister's Condition of Approval 2.9
Within six months of commencement of operation of the project the Proponent shall prepare and submit to the Director-General a review of the logistical arrangements for ash haulage and placement to determine the feasibility of reducing the hours of operation. If, as a result of the review, it is determined that ash haulage and placement times can commence later and/or finish earlier, the Proponent shall aim to observe the reduced hours whenever possible.
Compliance Assessment Observations and Comments Ash placement commenced at KVAR in April 2009, and since this time a review of the logistical arrangements for ash haulage has been undertaken. However, this review has not yet been submitted to the Department of Planning. It was determined that the limited storage capacity at Wallerawang Power Station for overnight storage of ash before placement meant the hours of operation could not be reduced (Lowry, Pers. Comm, 2011).
Compliance Assessment Finding Partial compliance. This is the same compliance finding as in the previous AEMR (2010).

Recommendation

Conneq Industrial Infrastructure finalise the report reviewing the logistical arrangements for ash haulage in consultation with Delta Electricity and submit to Department of Planning as soon as possible.

Minister's Condition of Approval 2.10

Operations outside the hours stipulated in condition 2.8 of this approval are only permitted in the following emergency situations:

- ***a) Where it is required to avoid the loss of live, property and/or to prevent environmental harm; or***
- ***b) Breakdown of plant and/or equipment at the repository or the Wallerawang Power Station with the effect of limiting or preventing ash storage at the power station outside the operating hours defined in condition 2.8; or***
- ***c) A breakdown of an ash haulage truck(s) preventing haulage during the operating hours stipulated in condition 2.8 combined with insufficient storage capacity at the Wallerawang Power Station to store ash outside of the project operating hours; or***
- ***d) In the event that the National Electricity Market Management Company (NEMMCO), or a person authorised by NEMMCO, directs the Proponent (as a licensee) under the National Electricity Rules to maintain, increase or be available to increase power generation for system security and there is insufficient ash storage capacity at the Wallerawang Power Station to allow for the ash to be stored.***

In the event of conditions 2.10b) or 2.10c) arising, the Proponent is to take all reasonable and feasible measures to repair the breakdown in the shortest time possible.

Compliance Assessment Observations and Comments

Conneq have advised that no operational activities have taken place outside the hours, as outlined in CoA 2.8. This includes the fact that no emergency situations have occurred to trigger the necessity for out of hours operations.

There have been no complaints or instances associated with out of hours operations at KVAR, and no After Hours Haulage scenarios listed in Delta Electricity's notification log.

Therefore this condition (CoA 2.10) is not applicable as no trigger events have occurred to warrant out of hours operations.

Compliance Assessment Finding

Not Applicable.

Minister's Conditions of Approval 2.11, 2.12, 2.13 and 2.14

2.11- In the event that an emergency situation as referred to under condition 2.10b) or 2.10c) occurs more than once in any two month period, the Proponent shall prepare and submit to the Director-General for approval a report including, but not limited to:

- ***a) The dates and a description of the emergency situations;***
- ***b) An assessment of all reasonable and feasible mitigation measure to avoid recurrence of the emergency situations;***
- ***c) Identification of a preferred mitigation measure(s); and***
- ***d) Timing and responsibility for implementation of the mitigation measure (s).***

The report is to be submitted to the Director-General within 60 days of the second exceedence occurring. The Proponent shall implement all reasonable and feasible mitigation measures in accordance with the requirements of the Director-General.

2.12- The Proponent shall notify the DECC prior to undertaking any emergency ash haulage or placement operations outside of the hours of operation stipulated in condition 2.8 of this approval and keep a log of such operations.

2.13- The Proponent shall notify the Director-General in writing within seven days of undertaking any emergency ash haulage or placement operations outside of the hours of operation stipulated in condition 2.8 of this approval.

2.14- The Proponent shall notify nearby sensitive receivers (as defined in the Operational Noise Management Plan required under condition 6.5a) of this approval) prior to 8.00pm where it is known that emergency ash haulage or placement operations will be required outside of the hours of operation stipulated in condition 2.8 of this approval.

Compliance Assessment Observations and Comments

None of the above are applicable- refer to the observations made against CoA 2.10.

Compliance Assessment Finding

Not Applicable.

Minister's Condition of Approval 2.15

The cumulative operational noise from the ash placement area and ash haulage activity shall not exceed an $L_{Aeq\ (15\ minute)}$ of 40 dB(A) at the nearest most affected sensitive receiver during normal operating hours as defined in condition 2.8 of this approval.

This noise criterion applies under the following meteorological conditions:

- ***a) Wind speeds up to 3m/s at 10 metres above ground; and/or***
- ***b) Temperature inversion conditions of up to 3^0C/100m and source to receiver gradient winds of up to 2m/s at 10m above ground level.***

This criterion does not apply where the Proponent and the affected landowner have reached a negotiated agreement in regard to noise, and a copy of the agreement has been forwarded to the Director-General and the DECC.

Compliance Assessment Observations and Comments

The Operational Noise Review indicated Delta Electricity's compliance with this condition. Specifically,

measured noise levels during May and August 2009 indicated Stage 2 operations are generally compliant with the operational noise criteria (PB, 2009). During neutral meteorological conditions full compliance with the operational noise criteria has been determined during the day time and evening periods at all receiver locations, and compliance with the operational noise goal is achieved at all receivers during neutral and potential prevailing noise enhancing meteorological conditions where peak day time and evening period fly ash truck movements do not exceed five (5) trucks per fifteen (15) minute period (PB, 2009).

Delta Electricity has not entered into any agreements regarding noise from KVAR with any potentially affected landholders, nor had any noise related complaints regarding the KVAR Stage 2 project.

Compliance Assessment Finding

Compliance.

Minister's Condition of Approval 2.16

The Proponent shall implement measures to ensure noise attenuation of trucks. These measures may include, but are not limited to, installation of residential class mufflers, engine shrouds, body dampening, speed limiting, fitting of rubber stoppers to tail gates, limiting the use of compression breaking, and ensuring trucks operate in a one-way system at the ash repository where feasible.

Compliance Assessment Observations and Comments

As identified in the first AEMR (PB, 2010), with commencement of Stage 2 operations, Conneq (then Bilfinger Berger Services) engaged a new fleet of Mercedes-Benz Actros trucks, which are compliant with the noise emission standards outlined above (CoA 2.15). No compression braking is used on the repository, trucks are well maintained with engines enclosed, mufflers in place, and proceed in a unidirectional format according to enforced speed limits.

With the additional production of ash observed in the months toward the end of the reporting period (March/April 2011) a third truck has regularly been engaged for ash haulage. This truck is also compliant with the above standards, and is of European make (Volvo).

Conneq is currently seeking to purchase a new Scania truck, in anticipation that continued high levels of ash will be produced.

Ash haulage operations comply with all noise emission requirements on the haul road.

Compliance Assessment Finding

Compliance.

Minister's Condition of Approval 2.17

The Proponent shall liaise with the owner/operator of Angus Place Coal Mine with the aim of preparing a protocol which provides for a co-operative approach for the management and mitigation of noise impacts associated with coal and ash truck movements along the private haul road.

Compliance Assessment Observations and Comments

Delta Electricity regularly liaises with Centennial Coal through monthly fuel supply meetings. The protocol developed between Delta and Centennial includes the restriction of movement of trucks along the haul road between 6pm and 7am daily- trucks are diverted from the haul road passage during these hours as necessary. Centennial Coal reports to Delta with any instances that may impact on background noise caused by truck movement through the monthly meetings, and are bound by their Environment Protection Licence 467. Information provided to Delta by Centennial regarding potential Angus Place noise impacts associated with coal and ash truck movements underneath this licence included hours of operation, noise level limits and pollutants.

NB: no noise complaints were received throughout the reporting period.

Compliance Assessment Finding

Compliance.

Minister's Condition of Approval 2.18

Where noise monitoring (as required by conditions 3.2 or 3.3 of this approval) identifies any non-compliance with the operational noise criterion specified under condition 2.15 of this approval the Proponent shall prepare and submit to the Director-General for approval a report including, but not limited to:

a) An assessment of all reasonable and feasible physical and other mitigation measures for reducing noise at the source including, but not limited to –

i. Construction of a noise barrier along the haulage road

ii. Alternative ash haulage routes, and

iii. Alternative methods of ash conveyance to the repository; and

b) Identification of the preferred measure(s) for reducing noise at the source;

c) Feedback from directly affected property owners and the DECC on the proposed noise mitigation measures; and

d) Location, type, timing and responsibility for implementation of the noise mitigation measure(s).

The report is to be submitted to the Director-General within 60 days of undertaking the noise monitoring which has identified exceedences of the operational noise criterion specified under condition 2.15, unless otherwise agreed to by the Director-General. The Proponent shall implement all reasonable and feasible mitigation measures in accordance with the requirements of the Director-General.

Compliance Assessment Observations and Comments

An Operational Noise Review (PB, 2009) was prepared in accordance with CoA 3.2 of this approval. This Review returned the following findings-

1. Measured noise levels during May and August 2009 were generally compliant, with potential exceedences of up to 2.5dB(A) identified along Skelly Road
2. During neutral meteorological conditions full compliance with operational noise criteria was determined
3. Compliance with operational noise goals at all receivers is achieved during neutral and potential prevailing noise enhancing meteorological conditions where peak day time and evening period fly ash truck movements do not exceed 5 trucks per 15 minute period

This Operational Noise Review did not return any non-compliances with condition 2.15 as outlined above, and as such a report was not required to be submitted to the Director-General.

However, as outlined in section 6.1.1 Ongoing Noise Monitoring (CoA 3.3) no ongoing noise monitoring has occurred for the duration of the project.

Compliance Assessment Finding

Partial compliance.

This was found to be a Non-compliance in the previous AEMR (2010). In assessing this CoA it is believed that a finding of Partial compliance is more relevant, as no non-compliances were found in the Operational Noise Review requiring a report to the Director-General.

Recommendation

Delta Electricity implements a six-monthly attended noise monitoring program, to ensure ongoing compliance with operational noise criteria.

Minister's Condition of Approval 2.19

If, after the implementation of all reasonable and feasible source controls, as identified in the report required by condition 2.18, the noise generated by the project exceeds the criterion stipulated in condition 2.15 at:

- ***a) Any sensitive receiver in existence at the date of this approval; or***
- ***b) Any residential dwelling for which an approval has been sought or obtained under the* Environmental Planning and Assessment Act 1979 *no later than six months after the confirmation of operational noise levels;***

Upon receiving a written request from an affected landowner (unless that landowner has acquisition rights under condition 2.20 of this approval and has requested acquisition) the Proponent shall implement additional noise mitigation measures such as double glazing, insulation, air conditioning and or other building acoustic treatments at any residence on the land, in consultation with the landowner.

For the purpose of this condition and condition 2.20, confirmation of operational noise levels means:

- ***a) Completion of the operational noise review required under condition 3.2 this approval; and***
- ***b) Implementation of any source controls, as required under condition 2.18 of this approval, should the operational noise review indicate noise levels in excess of the operational noise criterion specified in condition 2.15; and***
- ***c) Monitoring of operational noise levels, as required under condition 3.3b) of this approval, following the implementation of any source controls.***

The additional mitigation measures must be reasonable and feasible. If within three months of receiving this request from the landowner the Proponent and landowner cannot agree on the measures to be implemented, or there is a dispute about the implementation of these measures, then either party may refer the matter to the Director-General for resolution, whose decision shall be final.

Compliance Assessment Observations and Comments

The Stage 2 Kerosene Vale Ash Repository Operational Noise Review determined upon completion that no additional noise control or mitigation measures were required (PB, 2010).

However, as aforementioned, since the review was completed no ongoing noise monitoring has been conducted by Delta Electricity (CoA 3.3); as such it is difficult to ascertain whether the project has achieved ongoing compliance with operational noise criteria. It should be noted that no complaints have been recorded for KVAR for the reporting period.

Compliance Assessment Finding

Partial compliance.

This is the same finding as in the previous AEMR (2010).

Recommendation

Delta Electricity implements a six monthly attended noise monitoring program, to ensure ongoing compliance with operational noise criteria.

Minister's Condition of Approval 2.20

If, after the implementation of all reasonable and feasible source controls, as identified in the report required by condition 2.18, the noise generated by the project exceeds the criterion stipulated in condition 2.15 by more than 5dB(A):

- ***a) At a sensitive receiver in existence at the date of this approval; or***
- ***b) At any residential dwelling for which an approval has been sought or obtained under the* Environmental Planning and Assessment Act 1979 *prior to the landholder receiving written notification that they are entitled to land acquisition rights, as per condition 2.25 of this approval; or***
- ***c) Over 25% or more of the area of a vacant allotment in existence at the date of this approval, and where a dwelling is permissible under the* Environmental Planning and Assessment Act 1979 *at that date, with the exception of land that is currently used for industrial or mining purposes;***

The Proponent shall, upon receiving a written request for acquisition from the landowner, acquire the land in accordance with the procedures in conditions 2.22 to 2.24 of this approval.

Any landowner that has agreed to, or property that has been the subject of, the application of additional noise mitigation measures under condition 2.19 of this approval waives the right to land acquisition.

Compliance Assessment Observations and Comments

Delta Electricity has received no written or verbal requests from landowners to acquire their land.

Compliance Assessment Finding

Compliance.

Minister's Condition of Approval 2.21

The land acquisition rights under condition 2.20 of this approval do not apply to landowners who have sought approval to subdivide their land after the date of this approval, unless the subdivision is created pursuant to condition 2.24 of this approval.

Compliance Assessment Observations and Comments

Not applicable. No landholders have applied for approval to subdivide their land according to the land acquisition rights listed under condition 2.20 of the Minister's Conditions of Approval.

Compliance Assessment Finding

Not Applicable.

Minister's Condition of Approval 2.22

Within three months of receiving a written request from a landowner with acquisition rights under condition 2.20 of this approval, the Proponent shall make a binding written offer to the landowner based on:

- ***a) The current market value of the landowner's interest in the property at the date of this written request, as if the property were unaffected by the project which is the subject of the project application, having regard to the:***
  - ***i. Existing and permissible use of the land, in accordance with the applicable planning instruments at the date of the written request; and***
  - ***ii. Presence of improvements on the property and/or any approved building or structure which has been physically commenced at the date of the landowner's written request, and is due to be completed subsequent to that date, but excluding any improvements that have resulted from the implementation of condition 2.19 of this approval;***
- ***b) The reasonable costs associated with:***
  - ***i. Relocating within the Lithgow local government area, or to any other local government area determined by the Director-General;***
  - ***ii. Obtaining legal advice and expert advice for determining the acquisition price of the land, and the terms upon which it is required; and***
- ***c) Reasonable compensation for any disturbance caused by the land acquisition process.***

However, if at the end of this period, the Proponent and landowner cannot agree on the acquisition price of the land, and/or the terms upon which the land is to be acquired, then either party may refer the matter to the Director-General for resolution.

Upon receiving such a request, the Director-General shall request the President of the NSW Division of the Australian Property Institute to appoint a qualified independent valuer or Fellow of the Institute, to consider submissions from both parties, and determine a fair and reasonable acquisition price for the land, and/or terms upon which the land is to be acquired.

Within 14 days of receiving an independent valuer's determinations, the Proponent shall make a written offer to purchase the land at a price not less than the independent valuer's determination.

If the landowner refuses to accept this offer within six months of the date of the Proponent's offer, the Proponent's obligations to acquire the land shall cease, unless otherwise agreed by the Director-General.

Compliance Assessment Observations and Comments

Not applicable. No landholders have applied for approval to subdivide their land according to the land acquisition rights listed under condition 2.20 of the Minister's Conditions of Approval.

Compliance Assessment Finding

Not Applicable.

Minister's Conditions of Approval 2.23, 2.24 and 2.25

2.23- The Proponent shall bear the costs of any valuation or survey assessment requested by the independent valuer or the Director-General and the costs of determination referred to above. ***2.24- If the Proponent and landowner agree that only part of the land shall be acquired, then the Proponent shall pay all reasonable costs associated with obtaining Council approval for any plan of subdivision (where permissible), and registration of the plan at the Office of the Registrar-General.*** ***2.25- The Proponent shall provide written notice to all landowners that are entitled to rights under conditions 2.19 and 2.20 within 21 days of determining the landholdings were additional noise mitigation measures or land acquisition apply. For the purpose of condition 2.20b), this condition only applies where operational noise levels have been confirmed in accordance with the definition in condition 2.19.***
Compliance Assessment Observations and Comments Not applicable. No landholders have applied for approval to subdivide their land according to the land acquisition rights listed under condition 2.20 of the Minister's Conditions of Approval.
Compliance Assessment Finding Not Applicable.

9.1.2.3 *Sawyers Swamp Creek Realignment*

NB: Delta Electricity decided upon commencement of the Project that the realignment of Sawyers Swamp Creek was not necessary. Therefore, the Conditions of Approval relating to Sawyers Swamp Creek realignment are Not Applicable. This refers to Conditions of Approval 2.26 (a – m), 2.27, 2.28 and 2.29.

9.1.2.4 *Surface Water Quality*

Minister's Condition of Approval 2.30
The Proponent shall take all reasonable and feasible measures to prevent discharge of sediments and pollutants from the construction and operation of the project entering waterways. ***Note: Section 120 of the* Protection of the Environment Operations Act 1997 *prohibits the pollution of water except where expressly provided by an Environmental Protection Licence.***
Compliance Assessment Observations and Comments As discussed in section 6.1.2.1 no surface waters from Kerosene Vale Stage 2 Ash Repository are allowed to enter the Sawyers Swamp Creek catchment. This is achieved through a series of collection ponds on site, with water reticulated around KVAR for the treatment of ash and dust suppression, as outlined in section 6.1.5.2
Compliance Assessment Finding Compliance.

Minister's Condition of Approval 2.31

Earthworks not associated with the realignment of Sawyer Swamp Creek shall not be undertaken within 50m of the creek where reasonable and feasible.
Compliance Assessment Observations and Comments
A minimum buffer zone of 50m has been maintained along the riparian area of Sawyers Swamp Creek for all operations. Construction works associated with the development of the Stage 2B area have been submitted to the DP&I in the form of a Construction Environment Management Plan (CEMP) as required under CoA 6.2, as of August 2011. As stated in section 2.28 of the CoA document the minimum width of any realignment for the creek riparian area was 20 m (on both sides). In addition, the DP&I has further defined a working setback from the creek of 50 m where reasonable and feasible. Consequently, planning for Stage 2B ash placement has included the 50 m setback.
Compliance Assessment Finding
Compliance.

Minister's Condition of Approval 2.32
All equipment, machinery and vehicles associated with the construction and operation of the project shall be operated and maintained in a manner that minimises the potential for oil and grease spills/leaks.
Compliance Assessment Observations and Comments
Conneq, as the principal contractor for Delta Electricity- Western ash placement and management supply Delta with Monthly Client Service Reports detailing site safety, ash placement, operations, environmental and maintenance aspects of site management. These maintenance records are provided monthly, and include General Operations (truck maintenance and hours, ash analyses, sensor repairs, vent lines, line trips etc.), Projects (unit outages, silo repairs and maintenance, valve repairs and maintenance etc.), Incidents/Near Misses, Training and Safety. Monthly Client Service Reports can be viewed upon request.
Compliance Assessment Finding
Compliance.-

9.1.2.5 *Air Quality Impacts*

Minister's Condition of Approval 2.33
The Proponent shall construct and operate the project in a manner that minimises dust impacts generated by construction works and operational activities, including wind-blown and traffic generated dust, on the receiving environment. All activities on the site shall be undertaken with the objective of preventing visible emissions of dust from the site. Should such visible dust emissions occur at any time, the Proponent shall identify and implement all practicable dust mitigation measures, including cessation of relevant works, as appropriate, such that emissions of visible dust cease.

Compliance Assessment Observations and Comments

As outlined in section 6.1.5 (Air Monitoring), dust management within the site is included in the responsibilities of all operations, including:

- Wash-down of security roadways, haul road and vehicle access roads;
- Use of perimeter sprays at the ash placement area;
- Mobile sprinkler system;
- Ash placement operations;
- Final capping of ash; and
- General maintenance of the ash placement area (Conneq, 2009).

Compliance Assessment Finding

Compliance.

Minister's Condition of Approval 2.34

The Proponent shall ensure that the load carrying compartment(s) of all ash haulage trucks are covered at all times except when loading or unloading ash material.

Compliance Assessment Observations and Comments

Ash haulage to KVAR has been observed, and both core trucks, and the additional truck that has been utilised since March 2011, were observed to be covered during transportation.

No issues with load coverings were recorded for the 2010-11 reporting period.

Compliance Assessment Finding

Compliance.

9.1.2.6 *Lighting Emissions*

Minister's Condition of Approval 2.35

The Proponent shall take all practicable measures to mitigate off-site lighting impacts from the project and ensure all external lighting associated with the project complies with **Australian Standard AS4282 1997 – Control of the Obtrusive Effects of Outdoor Lighting*.***

Compliance Assessment Observations and Comments

Conneq Industrial Infrastructure's Work Procedures Manual contains procedures that apply to all personnel and equipment operating at Kerosene Vale, including Lighting Towers – Outdoor Lighting.

This procedure covers Mobile Lighting Towers for ash placement team operations for KVAR and details the responsibilities, application and procedures for using outdoor lighting for the project, within the project area.

Use of lights at Kerosene Vale is to illuminate the tipping and turning area, lights must face south or east, operators must ensure the horizontal distance of the illuminated area is not less than 40m, and as access to the repository for ash transport is between 7am and 10pm lights must be extinguished by 10pm.

The lights used at KVAR are the HILITE 4000 hired from Coates Hire Operations Pty Ltd. The specification sheets for these lights form part of the Work Procedures Manual for lighting.

Compliance Assessment Finding

Compliance.

9.1.2.7 *Construction Traffic and Transport Impacts*

Minister's Condition of Approval 2.36

The Proponent shall ensure that construction vehicles associated with the project:

a) Minimise the use of local roads (though residential streets and town centres) to gain access to the site;

b) Adhere to any nominated haulage routes identified in the Construction Traffic Management Plan as referred to in condition 6.3a) of this approval; and

c) Adhere to a Construction Vehicle Code of Conduct prepared to manage driver behaviour along the local road network to address traffic impacts (and associated noise) along nominated haulage routes.

Compliance Assessment Observations and Comments

As outlined for CoA 2.3, ash placement within KVAR Stage 2A has not required construction activities to date. This is because Stage 2A placement is an extension from Stage 1 and has utilised existing facilities.

In accordance with CoA 6.2 the Proponent must prepare and implement a Construction Environmental Management Plan (CEMP) prior to the commencement of construction works. A CEMP has been prepared for the construction works associated with the development of Stage 2B in preparation for ash placement, and has been submitted to DP&I in August 2011.

No specific construction works have been carried out on the site additional to this.

Compliance Assessment Finding

Not applicable.

9.1.2.8 *Heritage Impacts*

Minister's Condition of Approval 2.37

The Proponent shall ensure that all construction personnel are educated on their obligations in

respect of the protection of Aboriginal and non-indigenous heritage sites and items.

Compliance Assessment Observations and Comments

All Conneq project personnel are required to undergo site inductions and environmental training, before being granted access to Delta properties.

The document "Environmental Management Controls for Cultural Heritage" (Reference BBS-WP-MP-WW-712.2.2) forms part of the Conneq Work Procedures Manual and applies to all personnel. The document details the following sequence of events (Flow Chart) where cultural heritage sites are concerned:

1. Advice of this procedure is included in a site induction;
2. [Heritage] sites may be characterised by rock fragments that are different to the natural material. Other indicators are mounds of shells and stones. Should earthworks uncover any other material which may be of Aboriginal (e.g. bones, stone axes, etc.) or early European origin, work in that area shall cease and the incident report to the Project Manager;
3. European sites may also be encountered and equally the same precautions shall be taken to ensure these sites or objects are not damaged;
4. The area will be clearly defined and isolated from other work areas. No artefacts or other potential heritage material shall be removed from the site;
5. The Project Manager will immediately notify the Client and the environmental Coordinator of the finding. The administrative authority must be notified on the finding as defined in the Emergency Response Plan;
6. All known significant sites are to be left undisturbed and where appropriate they shall be clearly identified by tagging and/or fencing. A site map shall also clearly identify areas to be protected. No access is permitted in these areas. It is the responsibility of the Project Manager to comply with the requirements of any archaeological study that may have been undertaken for the project;
7. Work will not re-commence in that area until approval has been granted by the administrative authority and the Client; and
8. All non-compliances will be immediately reported to the Project Manager.

No aboriginal or other cultural heritage sites have been identified at Kerosene Vale. All of Delta Electricity's cultural sites are listed in the Section 170 Heritage and Conservation Register.

Compliance Assessment Finding

Compliance.

Minister's Condition of Approval 2.38

If any previously unidentified heritage sites or items (Aboriginal and/or non-indigenous) are discovered during construction works or operational activities, all work likely to affect the heritage sites or item(s) is to cease immediately and the discovery of the objects shall be reported to DECC or the Department as relevant.

Compliance Assessment Observations and Comments

As outlined for CoA 2.37, Environmental Management Controls for Cultural Heritage are transcribed to all contractors and personnel before access to Delta Electricity property is granted.

Details of the information disseminated are listed above (Refer CoA 2.37).

Compliance with this Condition is not applicable, as no previously unidentified heritage sites or items have been discovered during Kerosene Vale Stage 2 operations.

Compliance Assessment Finding

Not applicable.

9.1.2.9 *Waste Management*

Minister's Condition of Approval 2.39

All waste materials shall be assessed, classified, managed and disposed of in accordance with* Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-liquid Wastes *(EPA, 1999).

Compliance Assessment Observations and Comments

Conneq provides 'Monthly Ash Placement Work Instructions' for Wallerawang Power Station to address all issues of routine site maintenance as part of a monthly work program.

The instructions include section 9.0 Waste Management state the following:

- Conneq are responsible for coordinating restricted wastes placed within the repository as outlined by the Environment Protection Licence 766 for Wallerawang Power Station and only EPL approved wastes can be kept within the premises.
- Types of wastes that Conneq has identified may be disposed of at the premises that are EPA approved include ash and biomass co-firing ash, and wastes that may be disposed of to the repository at the discretion of Delta include demineralisation and polisher plant effluents, chemical clean solutions and cooling tower sediments.
- Under Conneq's Monthly work instructions, the types of waste that are not enabled include mill pyrites, ion exchange resins, fabric filter bags, brine conditioned fly ash, settling pond sediments or oil and grit trip sediments. These wastes are allowed under EPL 766 section L5.2 and Section 55 of the *Protection of the Environment Operations Act 1997*.

Compliance Assessment Finding

Compliance.

Minister's Condition of Approval 2.40

All waste materials removed from the site shall only be directed to a waste management facility lawfully permitted to accept the materials.

Compliance Assessment Observations and Comments

Conneq utilises Delta's waste management facilities for wastes generated in the operation of the repository, including waste oils, general waste and materials for recycling. These are stored in intermediate storage facilities at Wallerawang Power Station and routinely removed by Delta Electricity's waste contractors.

As no construction activities have occurred on site to date, no waste materials associated with construction activities have been generated.

Compliance Assessment Finding

Compliance.

Minister's Condition of Approval 2.41

The Proponent shall not cause, permit or allow any waste generated outside the site to be received at the site for storage, treatment, processing, reprocessing, or disposal on the site, except as expressly permitted by a licence under the* Protection of the Environment Operations Act 1997*, if such a licence is required in relation to that waste.

Compliance Assessment Observations and Comments

No wastes generated outside the Kerosene Vale site are allowed to enter the area.

To prevent the unlawful access to the repository area, regular security patrols are conducted over the site during operational hours.

Both Conneq and Delta Electricity security personnel are required to report if they encounter any rubbish or wastes outside those that are allowed during routine operations.

Compliance Assessment Finding

Compliance.

9.1.3 Environmental Monitoring

9.1.3.1 *Construction Noise Monitoring*

Minister's Condition of Approval 3.1

The Proponent shall prepare and implement a Construction Noise Monitoring Program to confirm the predictions of the noise assessment detailed in the document referred to under condition 1.1b) of this approval and assess compliance against the construction noise criterion stipulated in condition 2.7 of this approval. The noise monitoring program shall be prepared in consultation with, and to the satisfaction of, the DECC. The monitoring program shall form part of the Construction Noise Management Plan referred to in condition 6.3b) of this approval and must include monitoring of the construction noise generated during:

- ***a) The realignment of Sawyers Swamp Creek;***
- ***b) Construction of the stabilisation berm;***
- ***c) Excavation of the former pine plantation area;***
- ***d) Relocation and construction of surface water management structures; and***
- ***e) Concurrent construction activities.***

The Proponent shall forward to the DECC and the Director-General a report containing the results of each noise assessment and describing any non-compliance within 14 days of conducting a noise assessment.

Compliance Assessment Observations and Comments

No construction activities have been required for Stage 2 operations at Kerosene Vale since the commencement of the project, As such, a Construction Noise Monitoring Program has not been required.

However, a Construction Environment Management Plan has been submitted to the DP&I for the proposed construction activities for KVAR Stage 2B. This included the necessary noise monitoring requirements.

Compliance Assessment Finding

Not applicable.

9.1.3.2 *Operational Noise Review*

Minister's Condition of Approval 3.2

Within 60 days of the commencement of operation of the project, unless otherwise agreed to by the Director-General, the Proponent shall submit for the approval of the Director-General an Operational Noise Review to confirm the operational noise impacts of the project. The Operational Noise Review must be prepared in consultation with, and to the satisfaction of, the DECC. The Review shall:

a) Identify the appropriate operational noise objectives and level for sensitive receivers;

b) Describe the methodologies for noise monitoring including the frequency of measurements and location of monitoring sites;

c) Document the operational noise levels at sensitive receivers as ascertained by the noise monitoring program;

d) Assess the noise performance of the project against the noise criterion specified in condition 2.15 of this approval and the predicted noise levels as detailed in the report referred to under condition 1.1b) of this approval; and

e) Provide details of any entries in the Complaints Register (as required under condition 5.4 of this approval) relating to noise impacts.

Where monitoring indicates noise levels in excess of the operational noise criterion specified in condition 2.15 of this approval, the Proponent shall prepare a report as required by condition 2.18 of this approval.

Compliance Assessment Observations and Comments

As outlined in the first AEMR for the KVAR project. A 60 day extension was granted to Parsons Brinckerhoff by the Department in 2009 for the completion of the Operational Noise Review due to meteorological conditions considered unsuitable for noise monitoring.

The Operational Noise Review (PB, 2009) was submitted to the Department of Planning on 16 September 2009, and the Department acknowledged its satisfaction that CoA 3.2 had been met on 18 September 2009.

Compliance Assessment Finding

Compliance.

9.1.3.3 *Ongoing Operational Noise Monitoring*

Minister's Condition of Approval 3.3

The Proponent shall prepare and implement an Operational Noise Monitoring Program to assess compliance against the operational noise criterion stipulated in condition 2.15 of this approval, throughout the life of the project. The noise monitoring program shall be prepared in consultation with, and to the satisfaction of, the DECC.

The noise monitoring program shall be prepared in accordance with the requirements of the* New South Wales Industrial Noise Policy *(EPA, 2000) and must include, but not be limited to:

a) Monitoring during ash placement in the far western area of the site adjacent to the haul road; and

b) Monitoring of the effectiveness of any noise mitigation measures implemented under condition 2.18 of this approval, against the noise criterion specified in condition 2.15 of this approval.

Noise from the project is to be measured at the most affected point on or within the residential boundary, or at the most affected point within 30 metres of a dwelling where the dwelling is more than 30 metres from the boundary, to determine compliance with the noise criterion stipulated in condition 2.15 of this approval. Where it can be demonstrated that direct measurement of noise from the project is impractical, the DECC may accept alternative means of determining compliance (see Chapter 11 of the* NSW Industrial Noise Policy*). The modification factors in Section 4 of the* NSW Industrial Noise Policy *shall also be applied to the measured noise levels where applicable.

The Proponent shall forward to the DECC and the Director-General a report containing the results of any non-compliance within 14 days of conducting a noise assessment.

Where monitoring indicates noise levels in excess of the operational noise criterion specified in condition 2.15 of this approval, the Proponent shall prepare a report as required by condition 2.18 of this approval.

The monitoring program shall form part of the Operational Noise Management Plan referred to in condition 6.5a) of this approval.

Compliance Assessment Observations and Comments

Since the completion of the Operational Noise Review (PB, 2009) no further noise monitoring has been undertaken at Kerosene Vale.

The preparation of a Noise Monitoring Program as referred to in CoA 3.3 to assess compliance against the criteria outlined in CoA 2.15 was conducted as part of the Operation Environmental Management Plan (OEMP) (PB, 2008) for the KVAR Stage 2 project. Section 5.2 ‘Environmental monitoring program’ provides a detailed table outlining the recommendations for noise monitoring at a minimum of 3 most affected locations on a 6 monthly basis.

According to the monitoring recommendations outlined in the OEMP, since the initial Noise Review a total of 3 ongoing operational noise monitoring events should have taken place by the completion of this reporting period (March/Aprill 2011).

Compliance Assessment Finding

Non-compliance.

This is the same compliance finding as for the first AEMR.

Recommendation
Delta Electricity should investigate a contract for ongoing noise monitoring as soon as possible.

9.1.3.4 *Groundwater Monitoring*

Minister's Condition of Approval 3.4
The Proponent shall prepare and implement a Groundwater Monitoring Program to monitor the impacts of ash placement activities on local groundwater quality and hydrology. The program shall be developed in consultation with, and to the satisfaction of, the SCA, and shall describe the location, frequency, rationale and procedures and protocols for collecting groundwater samples, as well as the parameters analysed and methods of analysis. The monitoring program shall be ongoing for the life of the project and include, but not be limited to: ***a) Monitoring at established bore sites (or replacement bore sites in the event that existing sites are damaged or lost) as described in the document referred to under condition 1.1b) of this approval; and*** ***b) A schedule for periodic monitoring of groundwater quality, depth and flow at all monitoring sites, at an initial frequency of no less than once every month for the first 12 months of operation.*** ***The monitoring program shall form part of the Groundwater Management Plan referred to in condition 6.5b) of this approval.***
Compliance Assessment Observations and Comments A Groundwater Monitoring Program in the form of the Groundwater quality sub-plan was developed as part of the OEMP (PB, 2008) and provided to Delta to determine the minimum monitoring requirements for groundwater following receipt of approval from the DP&I. The previous AEMR returned a compliance assessment of Partial compliance for this CoA, as it was determined that the two new groundwater bores that were to be installed down-gradient and to the north of the Stage 1 area had not been put in (Aurecon, 2010). In the 2010-11 reporting period a total of 13 groundwater bores are monitored by Conneq and Nalco, exceeding the minimum monitoring requirements. Results of groundwater monitoring are presented in Appendices B and C. Further detail is provided in section 6.1.2.2 of this AEMR.
Compliance Assessment Finding Compliance.

9.1.3.5 *Surface Water Quality Monitoring*

Minister's Condition of Approval 3.5

The Proponent is to implement a surface water quality monitoring program to monitor the impacts of the ash placement activities on, and the realignment of, Sawyers Swamp Creek. The Program shall be developed in consultation with and to the satisfaction of the DPI (Fisheries) and SCA, and shall describe the location, frequency, rationale and the procedures and protocols for collecting water samples as well as the parameters analysed and methods of analysis. The program shall include, but not necessarily be limited to:

a) Monitoring at the four existing water quality monitoring sites as described in the document referred to under 1.1b) of this approval;

b) Monitoring downstream of the realigned section of Sawyers Swamp Creek;

c) Monitoring at groundwater discharge points into Sawyers Swamp Creek;

d) Wet weather monitoring with a minimum of two events recorded within the first 12 months of both the operation of the project and post realignment of Sawyers Swamp Creek; and

e) A schedule for periodic monitoring of surface quality at all sites throughout the life of the project, at an initial frequency of no less than once every month for the first 12 months and must include, but not be limited to, dissolved oxygen, turbidity, total phosphorus and total nitrogen.

The monitoring program shall form part of the Surface Water Management Plan referred to in condition 6.5c) of this approval.

Compliance Assessment Observations and Comments

Nalco Site ID numbers 38, 39, 40 and 41 (Table 6-2, shaded cells) at Kerosene Vale have been sampled since January 2003, with sites 79, 80, 81, 83 and 84 commencing testing in January 2010. The remaining Nalco sites (86, 87 and 88) commenced sampling in May 2010.

The other sites (Table 6-2, unshaded cells) form part of the Conneq monthly water sampling routine for a combined total of 18 locations that are regularly monitored for the project, with tests performed including the following:

- pH;
- Alkalinity (CaCO3);
- Sulfate (SO4);
- Conductivity;
- Total Dissolved Solids; and
- Trace metals.

Refer to section 6.1.2.3 of this AEMR for further detail.

Compliance Assessment Finding

Compliance.

9.1.3.6 *Sawyers Swamp Creek Realignment Monitoring*

Conditions of Approval 3.6 and 3.7 relate to ecological monitoring in response to the realignment of Sawyers Swamp Creek. As Delta Electricity did not need to realign the creek, and has no future plans to do so, CoA's 3.6 and 3.7 are not applicable.

9.1.3.7 *Air Quality Monitoring*

Minister's Condition of Approval 3.8
The Proponent shall prepare an Air Quality Monitoring Program, in consultation with, and to the satisfaction of, the DECC. The Program shall include but not necessarily be limited to, monitoring for dust at the monitoring sites identified in the document referred to under condition 1.1b) of this approval. The air quality monitoring program shall be ongoing for the life of the project, including final rehabilitation and stabilisation of the site. ***The monitoring program shall form part of the Air Quality Management Plan referred to in condition 6.5d) of this approval.***
Compliance Assessment Observations and Comments The previous AEMR found a non-conformance with respect to the establishment of two (2) new dust deposition gauges as per the requirement as listed in the OEMP (PB, 2010). In February 2009, eight dust monitors were installed on and around KVAR, with an additional monitor located at the silo (Figure 6-4). Data collection commenced in March 2009, with results reported as a rolling site average (g m-2) unless otherwise stated. Dust monitoring results are recorded monthly with colour and textural observations. These results indicate that KVAR is managed effectively for dust and as such is in compliance with Conditions of Approval 2.33 and 3.8.
Compliance Assessment Finding Compliance.

9.1.4 Compliance Monitoring and Tracking

Minister's Condition of Approval 4.1
Prior to each of the events listed below, the Proponent shall certify in writing to the satisfaction of the Director-General that it has complied with all conditions of this approval applicable prior to that event: ***a) Commencement of any construction works on the land subject of this approval; and*** ***b) Commencement of operation of the project.***
Compliance Assessment Observations and Comments As no construction activities have been required for Kerosene Vale Stage 2 part a) of CoA 4.1 is not applicable for this AEMR. However, some construction works will be necessary to develop the Stage 2B area for continued ash placement. Accordingly, a Construction Environmental Management Plan has been submitted to the Department of Planning for approval. The Department of Planning indicated its satisfaction that Delta Electricity had met the relevant pre-operational requirements of this project before commencement in 2009. This included submission of a Pre-Operation Compliance Report, Compliance Tracking Program, and the Operation Environmental Management Plan.

Compliance Assessment Finding
a) Not applicable.
b) Compliance.

Minister's Condition of Approval 4.2
The Proponent shall develop and implement a Compliance Tracking Program for the project, prior to commencing operations, to track compliance with the requirements of this approval and shall include, but not necessarily be limited to:
a) Provisions for periodic review of the compliance status of the project against the requirements of this approval and the Statement of Commitments detailed in the document referred to in condition 1.1c) of this approval;
b) Provisions for periodic reporting of the compliance status to the Director-General;
c) A program for independent environmental auditing in accordance with* AS/NZ ISO 19011:2003 – Guidelines for Quality and/or Environmental Management Systems Auditing*;
d) Procedures for rectifying any non-compliance identified during environmental auditing or review of compliance;
e) Mechanisms for recording environmental incidents and actions taken in response to those incidents;
f) Provisions for reporting environmental incidents to the Director-General during construction and operation; and
g) Provisions for ensuring all employees, contractors and sub-contractors are aware of, and comply with, the conditions of this approval relevant to their respective activities.
The Compliance Tracking Program shall be implemented prior to operation of the project with a copy submitted to the Director-General for approval within four weeks of commencement of the project, unless otherwise agreed by the Director-General.

Compliance Assessment Observations and Comments

Environmental incidents that may occur in respect to Kerosene Vale Stage 2 operations are reported as according to the Operation Environmental Management Plan (OEMP) (PB, 2009) and are captured within Delta's Environmental Management System. Annual reporting requirements are also covered by the preparation of the Annual Environmental Management Report (AEMR), like this report.

Sections of the Minister approved OEMP that relate to this Condition include:

- Section 3.8 Environmental Audits (CoA 4.2c);
- Section 3.8 Environmental Audits and Section 3.8.1 Non-Compliances (CoA 4.2d);
- Section 3.9 Environmental Incidents Management (CoA 4.2e);
- Section 3.9 Environmental Incidents Management (CoA4.2f); and
- Section 3.5 Environmental Awareness Training and Site Inductions (4.2g).

Conneq have included the directive in the Repository Site Management Plan (RMP) (Conneq, 2010) that formal site management processes be documented monthly and weekly in line with the OEMP and the RMP. The Monthly Client Service Reports are also used as a method for recording any incidences.

A training plan as outlined in the RMP provides a base level of environmental awareness and induction training for Conneq personnel including the below. This covers CoA 4.2g above.

- Hours of operation
- Haul road speed restrictions and transport protocols
- Location of nearest sensitive receptors
- Erosion and sediment controls
- Dust suppression techniques
- Water quality protection
- Waste management
- Heritage issues and management
- Storage and handling of chemicals, fuels and oils
- Spill prevention and response
- Site hazards
- Emergency preparedness and response
- Community communication protocols and procedures
- Incident/non-compliance reporting requirements.

Compliance Assessment Finding

Complies.

Minister's Condition of Approval 4.3 and 4.4

CoA 4.3 – Nothing in this approval restricts the Proponent from utilising any existing compliance tracking programs administered by the Proponent to satisfy the requirements of condition 4.2. In doing so, the Proponent must demonstrate to the Director-General how these systems address the requirements and/or have been amended to comply with the requirements of the condition. ***CoA 4.4 – The Proponent shall meet the requirements of the Director-General in respect of the implementation of any measure necessary to ensure compliance with the conditions of this approval, and general consistency with the documents listed under condition 1.1 of this approval.***
Compliance Assessment Observations and Comments This project has an approved OEMP (approved by the DP&I in April, 2009), and falls under Delta Electricity's ISO14001 accreditation and Environmental Management System. The Director-General has not issued any requests to implement any additional measure to ensure compliance with the relevant Conditions of Approval for the Kerosene Vale Ash Repository Stage 2 project.
Compliance Assessment Finding Not applicable.

9.1.5 Community Information and Complaints Management

9.1.5.1 *Provision of Information*

Minister's Conditions of Approval 5.1 and 5.2
Prior to the commencement of the project, the Proponent shall establish and maintain a website for the provision of electronic information associated with the project. The Proponent shall, subject to confidentiality, publish and maintain up-to-date information on this website or dedicated pages including, but not necessarily limited to: ***a) The documents referred to under condition 1.1 of this approval;*** ***b) This project approval, Environment Protection Licence and any other relevant environmental approval, licence or permit required and obtained in relation to the project;*** ***c) All strategies, plans and program required under this project approval, or details of where this information can be viewed;*** ***d) Information on construction and operational progress;*** ***e) The outcomes of compliance tracking in accordance with the requirements of this project approval.*** ***5.2 – The Proponent shall make all documents required to be provided under condition 5.1 of this approval publicly available.***
Compliance Assessment Observations and Comments The link to the relevant web page for Kerosene Vale Ash Repository Stage 2 operational information is below. http://www.de.com.au/About-Us/Ash-management/Kerosene-Vale-Ash-Repository/default.aspx A link to the Department of Planning's project page is included on the website where the following documents can be accessed: • Major Project Application 07_0005 • Kerosene Vale – Stage 2 Ash Repository Area (two volumes) – Environmental Assessment prepared by Parsons Brinckerhoff and dated 1 April 2008. • Kerosene Vale – Stage 2 Ash Repository Area – Submissions Report prepared by Parsons Brinckerhoff and dated 30 May 2008. • Project Approval (Conditions of Approval) File S07/00001, dated 26 November 2008.
Compliance Assessment Finding Compliance.

9.1.5.2 *Complaints and Enquiries Procedure*

Minister's Condition of Approval 5.3

Prior to the commencement of the project, the Proponent shall ensure that the following are available for community complaints and enquiries during construction and operation:

- ***a) A 24 hour contact number(s) on which complaints and enquiries about construction and operational activities may be registered;***
- ***b) A postal address to which written complaints and enquiries may be sent; and***
- ***c) An email address to which electronic complaints and enquiries may be sent; and***
- ***d) An email address to which electronic complaints and enquiries may be transmitted.***

The telephone number, postal address and email address shall be published in a newspaper circulating in the local area prior to the commencement of the project. The above details shall also be provided on the website required by condition 5.1 of this approval.

Compliance Assessment Observations and Comments

The website:

http://www.de.com.au/About-Us/Ash-management/Kerosene-Vale-Ash-Repository/default.aspx

lists the following contact details for the project:

After hours complaints - call Wallerawang Power Station on 02 6352 8611

Postal address:

Western Environment Manager

Delta Electricity

PO Box Q863,

QVB NSW 1230

Compliance Assessment Finding

Compliance.

Minister's Condition of Approval 5.4

The Proponent shall record the details of all complaints received through the means listed under condition 5.3 of this approval in an up-to-date Complaints Register. The Register shall record, but not necessarily be limited to:

- ***a) The date and time of the complaint;***
- ***b) The means by which the complaint was made (e.g. telephone, email, mail, in person);***
- ***c) Any personal details of the complainant that were provided, or if no details were provided a note to that effect;***
- ***d) The nature of the complaint;***
- ***e) The time taken to respond to the complaint;***
- ***f) Any investigations and actions taken by the Proponent in relation to the complainant; and***
- ***g) If no action was taken by the Proponent in relation to the complaint, the reason(s) why no action was taken.***

The Complaints Register shall be made available for inspection by the Director-General upon request.
Compliance Assessment Observations and Comments Any complaints called in to Delta go via the switchboard (02 6352 8611) and are then redirected to the appropriate area of Delta Electricity operations. All complaints are recorded in the Ellipse system in the Incidents and Complaints register with all details captured including actions to be taken if necessary. If actions were necessary, a review of those actions is undertaken before the work order is closed. There have been no complaints received regarding Kerosene Vale Ash Repository for the reporting period.
Compliance Assessment Finding Compliance.

9.1.6 Environmental Management

9.1.6.1 *Environmental Representative*

Minister's Condition of Approval 6.1

Prior to the commencement of any construction or operational activities, or as otherwise agreed by the Director-General, the Proponent shall nominate for the approval of the Director-General a suitably qualified and experienced Environmental Representative(s) independent of the design, construction and operation personnel. The Proponent shall engage the Environmental Representative(s) during any construction activities, and throughout the life of the project, or as otherwise agreed by the Director-General. The Environmental Representative(s) shall:

a) Oversee the implementation of all environmental management plans and monitoring programs required under this approval, and advise the Proponent upon the achievements of these plans/programs;

b) Have responsibility for considering and advising the Proponent on matters specified in the conditions of this approval and the Statement of Commitments as referred to under condition 1.1c) of this approval;

c) Oversee the implementation of the environmental auditing of the project in accordance with the requirements of condition 4.2 of this approval and all relevant project Environmental Management System(s); and

d) Be given the authority and independence to recommend to the Proponent reasonable steps to be taken to avoid or minimise unintended or adverse environmental impacts, and, failing the effectiveness of such steps, to recommend to the Proponent that relevant activities are to be ceased as soon as reasonably practicable if there is a significant risk that an adverse impact on the environment will be likely to occur.

Compliance Assessment Observations and Comments

In March 2009 Delta Electricity nominated the Environment Manager- Western Nino Di Falco as the Environmental Representative prior to the commencement of operational activities. The Environmental Manager oversees the implementation of all operations at KVAR through the attendance at Monthly Client meetings with Conneq Industrial Infrastructure, regular liaison with the External Plant Manager Phil Day, and guides the project through site visits, sampling and other regulatory activities to ensure compliance with the environmental requirements of the Conditions of Approval and all relevant licences.

No construction activities have been required for Stage 2 operations at Kerosene Vale since the commencement of the project, As such, an independent Environmental Representative has not been nominated with regard to construction activities.

However, a Construction Environmental Management Plan has been submitted to the DP&I for the proposed construction activities for KVAR Stage 2B. For the purposes of this CEMP, the Environment Manager- Western will be nominated as the Environmental Representative for submission to the DP&I.

Compliance Assessment Finding

Complies.

9.1.6.2 *Construction Environmental Management*

Minister's Conditions of Approval 6.2 and 6.3
6.2 – Prior to the commencement of construction work, the Proponent shall prepare and implement a Construction Environmental Management Plan (CEMP). The CEMP shall outline the environmental management practices and procedures to be followed during construction. The CEMP shall be prepared in accordance with **Guideline for the Preparation of Environmental Management Plans** ***(DIPNR, 2004).*** ***The Construction Environmental Management Plan for the project (or any stage of the project) shall be submitted to the Director General for approval at least four weeks prior to the commencement of any construction work associated with the project (or stage as relevant), unless otherwise agreed by the Director-General. Construction shall not commence until written approval has been received from the Director-General.*** ***6.3 – As part of the Construction Environmental Management Plan for the project, the Proponent shall prepare and implement the following plans:*** ***a) A Construction Traffic Management Plan, prepared in consultation with the RTA, the relevant Council and emergency services to manage the construction traffic impacts of the project, including but not limited to:*** ***i. Identifying construction vehicle volumes (construction staff vehicles, heavy vehicles and oversized loads) and haulage routes;*** ***ii. Identifying any road closures and/or traffic detours during the haulage of oversized loads as agreed to by the relevant roads authority;*** ***iii. Detailing a Construction Vehicle Code of Conduct to set driver behaviour controls to minimise impacts on the land uses along haulage routes (including noise minimisation measures); and*** ***iv. Complying with the document*** **Procedures for Use in the Preparation of a Traffic Management Plan** ***(RTA, 2011).*** ***b) A Construction Noise Management Plan to detail how construction noise impacts would be minimised and managed. The Strategy shall be developed in consultation with, and to the satisfaction of, the DECC and shall include, but not necessarily be limited to:*** ***i. Details of construction activities and an indicative schedule for construction works;*** ***ii. Identification of construction activities that have the potential to generate noise impacts on sensitive receivers;*** ***iii. Procedures for assessing noise levels at sensitive receivers and compliance;*** ***iv. Details of the reasonable and feasible actions and measures to be implemented to minimise noise impacts and, if any noise exceedence is detected, how any non-compliance would be rectified; and*** ***v. Procedures for notifying sensitive receivers of construction activities that are likely to affect their noise amenity.*** ***c) An Erosion and Sediment Control Plan to detail measures to minimise erosion and the discharge of sediment and other pollutants to land and/or water during construction works. The Plan must include, but not necessarily be limited to:***

i. Identification of the construction activities that could cause soil erosion or discharge sediment or water pollutants from the site; *ii. A description of the management methods to minimise soil erosion or discharge of sediment or water pollutants from the site, including a strategy to minimise the area of bare surfaces, stabilise disturbed areas, and minimise bank erosion; and* ***Demonstration that the proposed erosion and sediment control measures will conform with, or exceed, the relevant requirements of* Managing Urban Stormwater: Soils and Construction *(Landcom, 2004).***
Compliance Assessment Observations and Comments No construction activities have been required for Stage 2 operations at Kerosene Vale since the commencement of the project, As such; a Construction Environmental Management Plan (CEMP) has not been required. However, a CEMP has been submitted to the DP&I (August, 2011) for the proposed construction activities for KVAR Stage 2B. It is anticipated that construction activities will commence in late 2011.
Compliance Assessment Finding Not applicable.

9.1.6.3 ***Operational Environmental Management***

Minister's Conditions of Approval 6.4 and 6.5
6.4 – The Proponent shall prepare and implement and Operation Environmental Management Plan to detail an environmental management framework, practices and procedures to be followed during operation of the project. The Plan shall be consistent with* Guideline for the Preparation of Environmental Management Plans *(DIPNR, 2004) and shall include, but not be limited to: ***a) Identification of all statutory and other obligations that the Proponent is required to fulfil in relation to operation of the project, including all approvals, licences and consultations;*** ***b) A description of the roles and responsibilities for all relevant employees (including contractors) involved in the operation of the project;*** ***c) Overall environmental policies and principles to be applied to the operation of the project*** ***d) Standards and performance measures to be applied to the project, and a means by which environmental performance can be periodically reviewed and improved, where appropriate;*** ***e) Management policies to ensure that environmental performance goals are met and to comply with the conditions of this approval;*** ***f) The additional plans listed under condition 6.5 of this approval; and*** ***g) The environmental monitoring requirements outlined under conditions 3.3 to 3.5 inclusive and 3.8 of this approval.*** ***The Plan shall be submitted for the approval of the Director-General no later than four weeks prior to the commencement of operation of the project, unless otherwise agreed by the Director-General. Operation shall not commence until written approval has been received from the Director-General.*** ***Nothing in this approval precludes the Proponent from incorporating the requirements of the***

Operational Environmental Management Plan into existing environmental management systems and plan administered by the Proponent.

6.5 – As part of the Operation Environmental Management Plan for the project, required under condition 6.4 of this approval, the Proponent shall prepare and implement the following Management Plans:

- ***a) An Operational Noise Management Plan to detail measures to mitigate and manage noise during operation of the project. The Plan shall be prepared in consultation with, and to the satisfaction of, the DECC and include, but not necessarily be limited to:***
  - ***i. Procedures to ensure that all reasonable and feasible noise mitigation measures are applied during operation of the project;***
  - ***ii. Identification of all relevant sensitive receivers and the applicable criteria at those receivers commensurate with the noise limit specified under condition 2.15 of this approval;***
  - ***iii. Identification of activities that will be carried out in relation to the project and the associated noise sources;***
  - ***iv. Noise monitoring procedures (as referred to in condition 3.3 of this approval) for periodic assessment of noise impacts at the relevant receivers against the noise limits specified under this approval and the predicted noise levels as detailed in the report referred to under condition 1.1b) of this approval;***
  - ***v. Details of all management methods and procedures that will be implemented to control individual and overall noise emissions from the site during operation;***
  - ***vi. Procedures and corrective actions to be undertaken if non-compliance against the operational noise criteria is detected; and***
  - ***vii. Provisions for periodic reporting of results to DECC.***
- ***b) A Groundwater Management Plan to detail measures to mitigate and manage groundwater impacts. The Plan shall be prepared in consultation with, and to the satisfaction of, the SCA and include, but not necessarily be limited to:***
  - ***i. Baseline data on groundwater quality, depth and flow in the project area;***
  - ***ii. Groundwater objectives and impact assessment criteria;***
  - ***iii. A program to monitor groundwater flows and groundwater quality in the project area as required by condition 3.4 of this approval;***
  - ***iv. A protocol for the investigation of identified exceedences of the groundwater impact assessment criteria;***
  - ***v. A response plan to address potential exceedences and groundwater impacts; and***
  - ***vi. Provisions for periodic reporting of results to the SCA.***
- ***c) A Surface Water Management Plan to outline measures that will be employed to manage water on the site, to minimise soil erosion and the discharge of sediments and other pollutants to land and/or waters throughout the life of the project. The Plan shall be based on best environmental practice and shall be prepared in consultation with, and to the satisfaction of, the SCA and DPI (Fisheries). The Plan shall include, but not necessarily be limited to:***
  - ***i. Baseline data on the water quality and flow in Sawyers Swamp Creek up to the***

date of this approval;

- ***ii. Water quality objectives and impact assessment criteria for Sawyers Swamp Creek;***
- ***iii. A program to monitor surface water quality in Sawyers Swamp Creek as referred to in condition 3.5 of this approval;***
- ***iv. A protocol for the investigation of identified exceedences in the impact assessment criteria;***
- ***v. A response plan to address potential adverse surface water quality exceedences;***
- ***vi. A site water management strategy identifying clean and dirty water areas for Stage A, B and C of the project and the associated water management measures including erosion and sediment controls and provisions for recycling/reuse of water and the procedures for decommissioning water management structures on the site; and***
- ***vii. Provisions for periodic reporting of results to the DPI (Fisheries) and the SCA.***

d) An Air Quality Management Plan to outline measures to minimise impacts from the project on local air quality. The Plan shall be prepared in consultation with, and to the satisfaction of, the DECC and include, but not necessarily be limited to:

- ***i. Baseline data on dust deposition levels;***
- ***ii. Air quality objectives and impact assessment criteria;***
- ***iii. An air quality monitoring program as referred to in condition 3.8 of this approval;***
- ***iv. An assessment of alternative methods of ash placement to minimise the exposure of active placement areas to prevailing winds;***
- ***v. Mitigation measures to be incorporated during emplacement activities and haulage of ash;***
- ***vi. An operating protocol for the repository irrigation system including activation rates, application rates and area of coverage;***
- ***vii. A protocol for the investigation of visible emissions from the repository area;***
- ***viii. A response plan to address visible emissions from the repository area; and***
- ***ix. Provisions for periodic reporting of results to the DECC.***

e) A Landscape/Revegetation Plan to outline measures to minimise the visual impacts of the repository and ensure the long-term stabilisation of the site and compatibility with the surrounding land fabric and land use. The Plan shall include, but not necessarily be limited to:

- ***i. Identification of design objectives and standards based on local environmental values, vistas, and land uses;***
- ***ii. A description of short- and long-term revegetation measures;***
- ***iii. A schedule of species to be used in revegetation;***
- ***iv. Timing and progressive implementation of revegetation works as placement areas are completed, including landscape plans; and***
- ***v. Procedures and methods to monitor and maintain revegetated areas during the***

establishment phase and long-term. ***Revegetation works must incorporate the use of local native species.***
Compliance Assessment Observations and Comments The Operation Environmental Management Plan was prepared by Parsons Brinckerhoff in 2009 including all of the required sections, and was submitted to the Department of Planning for approval. Approval was granted in April 2009, and operations at KVAR Stage 2 commenced in September 2009.
Compliance Assessment Finding Complies.

9.1.7 Environmental Reporting

9.1.7.1 *Environmental Incident Reporting*

Minister's Conditions of Approval 7.1 and 7.2
7.1 – The Proponent shall notify the Director-General of any environmental incident within 12 hours of becoming aware of the incident. The Proponent shall provide full written details of the incident to the Director-General within seven days of the date on which the incident occurred. ***7.2 – The Proponent shall meet the requirements of the Director-General to address the cause or impact of any environmental incident, as it related to this approval, reported in accordance with condition 7.1 of this approval, within such period as the Director-General may require.***
Compliance Assessment Observations and Comments No environmental incidents occurred within the April 2010- March/April 2011 reporting period requiring notification of the Director-General.
Compliance Assessment Finding Not applicable.

9.1.7.2 *Annual Performance Reporting*

Minister's Condition of Approval 7.3
The Proponent shall, throughout the life of the project, prepare and submit for the approval of the Director-General, an Annual Environmental Management Report (AEMR). The AEMR shall review the performance of the project against the Operation Environmental Management Plan (refer to condition 6.4 of this approval) and the conditions of this approval. The AEMR shall include, but not necessarily by limited to: ***a) Details of compliance with the conditions of this approval;*** ***b) A copy of the Complaints Register (refer to 5.4 of this approval) for the preceding twelve-month period (exclusive of personal details), and details of how these complaints were addressed and resolved;*** ***c) Identification of any circumstances in which the environmental impacts and performance of the project during the year have not been generally consistent with the environmental impacts and performance predicted in the documents listed under condition 1.1 of this approval, with details of additional mitigation measures applied to the project to address recurrence of these circumstances;*** ***d) Results of all environmental monitoring required under conditions 3.3 to 3.8 of this approval, including interpretations and discussion by a suitably qualified person; and*** ***e) A list of all occasions in the preceding twelve-month period when environmental goals/objectives/impact assessment criteria for the project have not been achieved, indicating the reason for failure to meet the criteria and the action taken to prevent recurrence of that type of failure.*** ***The Proponent shall submit a copy of the AEMR to the Director-General every year, with the first AEMR to be submitted no later than twelve months after the commencement of operation of the***

project. The Director-General may require the Proponent to address certain matters in relation to the environmental performance of the project in response to review of the Annual Environmental Report. Any action required to be undertaken shall be completed within such period as the Director-General may require. The Proponent shall make copies of each AEMR available for public inspection on request.
Compliance Assessment Observations and Comments This AEMR, of which this review checklist is a part, satisfies the requirements of Condition of Approval 7.3.
Compliance Assessment Finding Compliance.

Appendix B-

Nalco Water Sampling Data for KVAR 2010-11

Site ID	Source	Reported Origin	Sampling Code	Sample Number	Date Sampled	pH		Alkalinity, M (CaCO3)		Bore Water Level		Conduct-ivity		Total dissolved solids		Mercury (Hg) - Total		Chloride (Cl)		Fluoride (F)		Sulphate (SO4)	
32	WW	Groundwater Bore WGM1	D1	414250	18-Mar-10	5.8	pH Units	<20	mg/L			122	µS/cm	80	mg/L	<0.00005	mg/L	16	mg/L	<0.1	mg/L	11	mg/L
33	WW	Groundwater Bore WGM1	D2	414251	18-Mar-10	4.3	pH Units	<20	mg/L			409	µS/cm	250	mg/L	<0.00005	mg/L	41	mg/L	<0.1	mg/L	92	mg/L
34	WW	Groundwater Bore WGM1	D3	414252	18-Mar-10	6.2	pH Units	90	mg/L			771	µS/cm	460	mg/L	<0.00005	mg/L	95	mg/L	<0.1	mg/L	110	mg/L
35	WW	Groundwater Bore WGM1	D4	414253	18-Mar-10	5.4	pH Units	<20	mg/L			1454	µS/cm	1200	mg/L	<0.00005	mg/L	27	mg/L	<0.1	mg/L	610	mg/L
36	WW	Groundwater Bore WGM1	D5	414254	18-Mar-10	3.3	pH Units	<20	mg/L			2350	µS/cm	2000	mg/L	<0.00005	mg/L	20	mg/L	0.6	mg/L	1300	mg/L
37	WW	Groundwater Bore WGM1	D6	414255	18-Mar-10	3.1	pH Units	<20	mg/L			1137	µS/cm	610	mg/L	<0.00005	mg/L	35	mg/L	0.5	mg/L	340	mg/L
38	WW	Sawyers Swamp Creek Ash Dam	SSCAD	414256	18-Mar-10	6.5	pH Units	<20	mg/L			2121	µS/cm	1600	mg/L	<0.00005	mg/L	35	mg/L	2.2	mg/L	950	mg/L
39	WW	Dump Creek	DC	414257	17-Mar-10	3.2	pH Units	<20	mg/L			1389	µS/cm	920	mg/L	<0.00005	mg/L	19	mg/L	0.7	mg/L	560	mg/L
40	WW	Lidsdale Cut	WX5	414258	17-Mar-10	3.3	pH Units	<20	mg/L			2374	µS/cm	1900	mg/L	<0.00005	mg/L	25	mg/L	6.7	mg/L	1200	mg/L
41	WW	Sawyers Creek	WX7	414259	17-Mar-10	6.3	pH Units	<20	mg/L			1381	µS/cm	1000	mg/L	<0.00005	mg/L	20	mg/L	0.2	mg/L	560	mg/L
79	WW	Surface water SSC Ash Dam seepage point from V-notch	Seepage @ V-notch	414260	18-Mar-10	7.5	pH Units	80	mg/L			2016	µS/cm	1600	mg/L	<0.00005	mg/L	46	mg/L	1.5	mg/L	900	mg/L
80	WW	Surface water GW 10/GW 11 seepage 1 surface right		414261	18-Mar-10	3	pH Units	<20	mg/L			2879	µS/cm	2300	mg/L	<0.00005	mg/L	24	mg/L	1.2	mg/L	1300	mg/L
81	WW	Surface water GW 10/GW 11 seepage 2 surface left		414262	18-Mar-10	3	pH Units	<20	mg/L			2888	µS/cm	2400	mg/L	<0.00005	mg/L	26	mg/L	1.2	mg/L	1500	mg/L
82	WW	WX50. GW 10/GW 11 surface point 3 Pond	WX50	414263	17-Mar-10	3.1	pH Units	<20	mg/L			2748	µS/cm	2300	mg/L	<0.00005	mg/L	29	mg/L	1.2	mg/L	980	mg/L
83	WW	Sawyers Creek at D5	SSC @ D5	414264	17-Mar-10	7.8	pH Units	170	mg/L			1113	µS/cm	790	mg/L	<0.00005	mg/L	26	mg/L	0.7	mg/L	330	mg/L
84	WW	Upper Sawyers Creek at 850 m.	850m	414265	17-Mar-10	7.5	pH Units	160	mg/L			1188	µS/cm	860	mg/L	<0.00005	mg/L	29	mg/L	0.6	mg/L	390	mg/L
75	WW	Groundwater Bore GW10		414266	18-Mar-10	3.6	pH Units	<20	mg/L			985	µS/cm	850	mg/L	<0.00005	mg/L	8	mg/L	8	mg/L	400	mg/L
76	WW	Groundwater Bore GW11		414267	18-Mar-10	No Data Available																	
77	WW	Groundwater Bore A9		414268	18-Mar-10	6.8	pH Units	50	mg/L			748	µS/cm	520	mg/L	<0.00005	mg/L	19	mg/L	1	mg/L	250	mg/L
78	WW	Groundwater Bore A17		414269	18-Mar-10	3.7	pH Units	<20	mg/L			855	µS/cm	570	mg/L	<0.00005	mg/L	23	mg/L	<0.1	mg/L	310	mg/L
						4.9		110.0				1522.5		1168.9		<0.00005		29.6		1.9		636.5	
32	WW	Groundwater Bore WGM1	D1	415400	16-Apr-10	5.6	pH Units	<20	mg/L	3.6	m	118	µS/cm	110	mg/L	<0.00005	mg/L	18	mg/L	<0.1	mg/L	9	mg/L
33	WW	Groundwater Bore WGM1	D2	415401	16-Apr-10	4.4	pH Units	<20	mg/L	7.2	m	419	µS/cm	260	mg/L	<0.00005	mg/L	38	mg/L	<0.1	mg/L	120	mg/L
34	WW	Groundwater Bore WGM1	D3	415402	16-Apr-10	6.6	pH Units	90	mg/L	10	m	776	µS/cm	440	mg/L	<0.00005	mg/L	100	mg/L	<0.1	mg/L	120	mg/L
35	WW	Groundwater Bore WGM1	D4	415403	16-Apr-10	5.6	pH Units	<20	mg/L	1.2	m	1527	µS/cm	1200	mg/L	<0.00005	mg/L	34	mg/L	<0.1	mg/L	780	mg/L
36	WW	Groundwater Bore WGM1	D5	415404	16-Apr-10	No Data Available																	
37	WW	Groundwater Bore WGM1	D6	415405	16-Apr-10	3.1	pH Units	<20	mg/L	10.5	m	1055	µS/cm	520	mg/L	<0.00005	mg/L	34	mg/L	0.4	mg/L	350	mg/L
38	WW	Sawyers Swamp Creek Ash Dam		415406	15-Apr-10	4.5	pH Units	<20	mg/L			2247	µS/cm	1600	mg/L	<0.00005	mg/L	40	mg/L	2.5	mg/L	1000	mg/L
39	WW	Dump Creek		415407	15-Apr-10	3.3	pH Units	<20	mg/L			1428	µS/cm	890	mg/L	<0.00005	mg/L	19	mg/L	0.8	mg/L	610	mg/L
40	WW	Lidsdale Cut	WX5	415408	15-Apr-10	3.3	pH Units	<20	mg/L			2370	µS/cm	1800	mg/L	<0.00005	mg/L	28	mg/L	5.6	mg/L	1200	mg/L
41	WW	Sawyers Creek	WX7	415409	15-Apr-10	8.4	pH Units	420	mg/L			1100	µS/cm	670	mg/L	<0.00005	mg/L	10	mg/L	1.5	mg/L	150	mg/L
79	WW	Surface water SSC Ash Dam seepage point from V-notch		415410	15-Apr-10	7.8	pH Units	110	mg/L			2000	µS/cm	1500	mg/L	<0.00005	mg/L	48	mg/L	1.2	mg/L	890	mg/L
80	WW	Surface water GW 10/GW 11 seepage 1 surface right		415411	15-Apr-10	3.1	pH Units	<20	mg/L			2942	µS/cm	2100	mg/L	<0.00005	mg/L	29	mg/L	3.9	mg/L	1500	mg/L
81	WW	Surface water GW 10/GW 11 seepage 2 surface left		415412	15-Apr-10	3.1	pH Units	<20	mg/L			2960	µS/cm	2200	mg/L	<0.00005	mg/L	29	mg/L	3.9	mg/L	1500	mg/L

82	WW	WX50. GW 10/GW 11 surface point 3 Pond	WX50	415413	15-Apr-10	3.2	pH Units	<20	mg/L			2824	µS/cm	2100	mg/L	<0.00005	mg/L	33	mg/L	4.6	mg/L	1400	mg/L
83	WW	Sawyers Creek at D5		415414	15-Apr-10	8.5	pH Units	460	mg/L			1029	µS/cm	580	mg/L	<0.00005	mg/L	10	mg/L	0.8	mg/L	76	mg/L
84	WW	Upper Sawyers Creek at 850 m.		415415	15-Apr-10	8.5	pH Units	460	mg/L			1024	µS/cm	590	mg/L	<0.00005	mg/L	9	mg/L	1	mg/L	71	mg/L
75	WW	Groundwater Bore GW10		415416	16-Apr-10	3.6	pH Units	<20	mg/L	3.2	m	1078	µS/cm	800	mg/L	<0.00005	mg/L	9	mg/L	8	mg/L	490	mg/L
76	WW	Groundwater Bore GW11		415417	16-Apr-10	No Data Available																	
77	WW	Groundwater Bore A9		415418	16-Apr-10	6.8	pH Units	50	mg/L	2.1	m	784	µS/cm	480	mg/L	<0.00005	mg/L	20	mg/L	1.1	mg/L	270	mg/L
78	WW	Groundwater Bore A17		415419	16-Apr-10	5.9	pH Units	<20	mg/L	2.4	m	842	µS/cm	530	mg/L	<0.00005	mg/L	25	mg/L	<0.1	mg/L	330	mg/L
						5.3		265.0		5.0		1473.5		1020.6		<0.00005		29.6		2.7		603.7	
32	WW	Groundwater Bore WGM1	D1	416786	27-May-10	5.4	pH Units	<20	mg/L	4.2	m	119	µS/cm	66	mg/L	<0.00005	mg/L	20	mg/L	<0.1	mg/L	7	mg/L
33	WW	Groundwater Bore WGM1	D2	416787	27-May-10	4.7	pH Units	<20	mg/L	7.3	m	412	µS/cm	230	mg/L	<0.00005	mg/L	41	mg/L	<0.1	mg/L	110	mg/L
34	WW	Groundwater Bore WGM1	D3	416788	27-May-10	6.2	pH Units	110	mg/L	10	m	806	µS/cm	450	mg/L	<0.00005	mg/L	100	mg/L	<0.1	mg/L	130	mg/L
35	WW	Groundwater Bore WGM1	D4	416789	27-May-10	6.3	pH Units	70	mg/L	1.2	m	1502	µS/cm	1200	mg/L	<0.00005	mg/L	34	mg/L	<0.1	mg/L	770	mg/L
36	WW	Groundwater Bore WGM1	D5	416790	27-May-10	3.7	pH Units	<20	mg/L	8	m	583	µS/cm	390	mg/L	<0.00005	mg/L	4	mg/L	0.4	mg/L	250	mg/L
37	WW	Groundwater Bore WGM1	D6	416791	27-May-10	3.9	pH Units	<20	mg/L	10.5	m	784	µS/cm	510	mg/L	<0.00005	mg/L	24	mg/L	0.6	mg/L	330	mg/L
38	WW	Sawyers Swamp Creek Ash Dam		416792	26-May-10	5.5	pH Units	<20	mg/L			2130	µS/cm	1600	mg/L	<0.00005	mg/L	39	mg/L	2.3	mg/L	1100	mg/L
39	WW	Dump Creek		416793	26-May-10	3.3	pH Units	<20	mg/L			1258	µS/cm	690	mg/L	<0.00005	mg/L	22	mg/L	0.7	mg/L	530	mg/L
40	WW	Lidsdale Cut	WX5	416794	26-May-10	5.4	pH Units	<20	mg/L			603	µS/cm	300	mg/L	<0.00005	mg/L	13	mg/L	0.9	mg/L	250	mg/L
41	WW	Sawyers Creek	WX7	416795	26-May-10	6.7	pH Units	20	mg/L			1344	µS/cm	860	mg/L	<0.00005	mg/L	27	mg/L	1.7	mg/L	640	mg/L
79	WW	Surface water SSC Ash Dam seepage point from V-notch		416796	26-May-10			60	mg/L			1555	µS/cm	1100	mg/L	<0.00005	mg/L	40	mg/L	1.2	mg/L	720	mg/L
80	WW	Surface water GW 10/GW 11 seepage 1 surface right		416797	26-May-10	3.1	pH Units	<20	mg/L			2640	µS/cm	1900	mg/L	<0.00005	mg/L	30	mg/L	3.7	mg/L	1400	mg/L
81	WW	Surface water GW 10/GW 11 seepage 2 surface left		416798	26-May-10	3.1	pH Units	<20	mg/L			2685	µS/cm	1900	mg/L	<0.00005	mg/L	30	mg/L	3.8	mg/L	1400	mg/L
82	WW	WX50. GW 10/GW 11 surface point 3 Pond	WX50	416799	26-May-10	3.3	pH Units	<20	mg/L			2512	µS/cm	1900	mg/L	<0.00005	mg/L	33	mg/L	4.3	mg/L	1300	mg/L
83	WW	Sawyers Creek at D5		416800	26-May-10	7.9	pH Units	130	mg/L			870	µS/cm	560	mg/L	<0.00005	mg/L	33	mg/L	0.5	mg/L	250	mg/L
84	WW	Upper Sawyers Creek at 850 m.		416801	26-May-10	7.7	pH Units	130	mg/L			822	µS/cm	480	mg/L	<0.00005	mg/L	32	mg/L	0.5	mg/L	230	mg/L
86	WW	Surface water Northern wall collection pit		416802	26-May-10	5.3	pH Units	<20	mg/L			794	µS/cm	490	mg/L	<0.00005	mg/L	14	mg/L	0.2	mg/L	340	mg/L
87	WW	Surface water direct drain pit to creek		416803	26-May-10	4.9	pH Units	<20	mg/L			709	µS/cm	460	mg/L	<0.00005	mg/L	21	mg/L	0.7	mg/L	300	mg/L
88	WW	Dirty Surface water		416804	26-May-10	> 14	pH Units	<20	mg/L			3004	µS/cm	3200	mg/L	<0.00005	mg/L	51	mg/L	<0.1	mg/L	2200	mg/L
75	WW	Groundwater Bore GW10		416805	27-May-10	3.6	pH Units	<20	mg/L	3.1	m	1172	µS/cm	830	mg/L	<0.00005	mg/L	10	mg/L	6.3	mg/L	560	mg/L
76	WW	Groundwater Bore GW11		416806	27-May-10	No Data Available																	
77	WW	Groundwater Bore A9		416807	27-May-10	6.6	pH Units	50	mg/L	2.1	m	818	µS/cm	520	mg/L	<0.00005	mg/L	21	mg/L	0.8	mg/L	300	mg/L
78	WW	Groundwater Bore A17		416808	27-May-10	5.4	pH Units	<20	mg/L	2.3	m	826	µS/cm	520	mg/L	<0.00005	mg/L	24	mg/L	<0.1	mg/L	330	mg/L
85	WW	Groundwater Bore GW6		416809	27-May-10	No Data Available																	
						5.1		81.4		5.4		1270.4		916.2		<0.00005		30.1		1.8		611.2	
32	WW	Groundwater Bore WGM1	D1	417315	10-Jun-10	5.5	pH Units	<20	mg/L	4.3	m	113	µS/cm	98	mg/L	<0.00005	mg/L	19	mg/L	<0.1	mg/L	6	mg/L
33	WW	Groundwater Bore WGM1	D2	417316	10-Jun-10	4.9	pH Units	<20	mg/L	6.4	m	308	µS/cm	180	mg/L	<0.00005	mg/L	13	mg/L	<0.1	mg/L	110	mg/L
34	WW	Groundwater Bore WGM1	D3	417317	10-Jun-10	6.1	pH Units	80	mg/L	9.9	m	698	µS/cm	410	mg/L	<0.00005	mg/L	94	mg/L	<0.1	mg/L	120	mg/L
35	WW	Groundwater Bore WGM1	D4	417318	10-Jun-10	6.2	pH Units	80	mg/L	1.2	m	1419	µS/cm	1100	mg/L	<0.00005	mg/L	35	mg/L	<0.1	mg/L	750	mg/L

36	WW	Groundwater Bore WGM1	D5	417319	10-Jun-10	4.2	pH Units	<20	mg/L	6.1	m	1167	µS/cm	1000	mg/L	0.00006	mg/L	10	mg/L	0.9	mg/L	680	mg/L
37	WW	Groundwater Bore WGM1	D6	417320	10-Jun-10	3.8	pH Units	<20	mg/L	10.2	m	789	µS/cm	540	mg/L	<0.00005	mg/L	25	mg/L	0.7	mg/L	350	mg/L
38	WW	Sawyers Swamp Creek Ash Dam		417321	9-Jun-10	5.9	pH Units	<20	mg/L			1978	µS/cm	1600	mg/L	<0.00005	mg/L	37	mg/L	2.2	mg/L	1100	mg/L
39	WW	Dump Creek		417322	9-Jun-10	3.4	pH Units	<20	mg/L			1252	µS/cm	850	mg/L	<0.00005	mg/L	21	mg/L	0.6	mg/L	580	mg/L
40	WW	Lidsdale Cut	WX5	417323	9-Jun-10	4	pH Units	<20	mg/L			1240	µS/cm	930	mg/L	<0.00005	mg/L	21	mg/L	2.4	mg/L	620	mg/L
41	WW	Sawyers Creek	WX7	417324	9-Jun-10	6.3	pH Units	<20	mg/L			1285	µS/cm	980	mg/L	<0.00005	mg/L	26	mg/L	0.4	mg/L	640	mg/L
79	WW	Surface water SSC Ash Dam seepage point from V-notch		417325	9-Jun-10	7.4	pH Units	80	mg/L			1831	µS/cm	1500	mg/L	<0.00005	mg/L	48	mg/L	1.3	mg/L	930	mg/L
80	WW	Surface water GW 10/GW 11 seepage 1 surface right		417326	9-Jun-10	3.1	pH Units	<20	mg/L			2543	µS/cm	2100	mg/L	<0.00005	mg/L	31	mg/L	3.5	mg/L	1400	mg/L
81	WW	Surface water GW 10/GW 11 seepage 2 surface left		417327	9-Jun-10	3.1	pH Units	<20	mg/L			2578	µS/cm	2100	mg/L	<0.00005	mg/L	31	mg/L	1.3	mg/L	1400	mg/L
82	WW	WX50. GW 10/GW 11 surface point 3 Pond	WX50	417328	9-Jun-10	3.4	pH Units	<20	mg/L			2407	µS/cm	2000	mg/L	<0.00005	mg/L	35	mg/L	1.4	mg/L	1400	mg/L
83	WW	Sawyers Creek at D5		417329	9-Jun-10	7.8	pH Units	120	mg/L			1007	µS/cm	700	mg/L	<0.00005	mg/L	33	mg/L	0.5	mg/L	360	mg/L
84	WW	Upper Sawyers Creek at 850 m.		417330	9-Jun-10	7.7	pH Units	120	mg/L			1031	µS/cm	720	mg/L	<0.00005	mg/L	33	mg/L	0.6	mg/L	380	mg/L
86	WW	Surface water Northern wall collection pit		417331	9-Jun-10	4.1	pH Units	<20	mg/L			664	µS/cm	450	mg/L	<0.00005	mg/L	25	mg/L	0.2	mg/L	250	mg/L
87	WW	Surface water direct drain pit to creek		417332	9-Jun-10	5.1	pH Units	<20	mg/L			749	µS/cm	570	mg/L	<0.00005	mg/L	22	mg/L	0.9	mg/L	310	mg/L
88	WW	Dirty Surface water		417333	9-Jun-10	4.1	pH Units	<20	mg/L			1482	µS/cm	1300	mg/L	<0.00005	mg/L	38	mg/L	5.8	mg/L	830	mg/L
75	WW	Groundwater Bore GW10		417334	10-Jun-10	No Data Available																	
76	WW	Groundwater Bore GW11		417335	10-Jun-10	7.1	pH Units	50	mg/L	2.2	m	355	µS/cm	250	mg/L	0.00013	mg/L	43	mg/L	0.3	mg/L	52	mg/L
77	WW	Groundwater Bore A9		417336	10-Jun-10	6.7	pH Units	60	mg/L	2	m	895	µS/cm	620	mg/L	<0.00005	mg/L	21	mg/L	1	mg/L	350	mg/L
78	WW	Groundwater Bore A17		417337	10-Jun-10	5.6	pH Units	<20	mg/L	2.3	m	785	µS/cm	540	mg/L	<0.00005	mg/L	23	mg/L	<0.1	mg/L	330	mg/L
85	WW	Groundwater Bore GW6		417338	9-Jun-10	No Data Available																	
						5.3		84.3		5.0		1208.0		933.5		0.0		31.1		1.4		588.5	
32	WW	Groundwater Bore WGM1	D1	418360	1-Jul-10	5.4	pH Units	20	mg/L	4.2	m	114	µS/cm	100	mg/L	<0.00005	mg/L	17	mg/L	<0.1	mg/L	6	mg/L
33	WW	Groundwater Bore WGM1	D2	418361	1-Jul-10	4.6	pH Units	<20	mg/L	6.8	m	315	µS/cm	210	mg/L	<0.00005	mg/L	17	mg/L	<0.1	mg/L	100	mg/L
34	WW	Groundwater Bore WGM1	D3	418362	1-Jul-10	5.9	pH Units	80	mg/L	9.9	m	644	µS/cm	390	mg/L	<0.00005	mg/L	81	mg/L	<0.1	mg/L	98	mg/L
35	WW	Groundwater Bore WGM1	D4	418363	1-Jul-10	6.1	pH Units	60	mg/L	1.1	m	1406	µS/cm	1200	mg/L	<0.00005	mg/L	34	mg/L	<0.1	mg/L	730	mg/L
36	WW	Groundwater Bore WGM1	D5	418364	1-Jul-10	4	pH Units	<20	mg/L	7	m	1356	µS/cm	1200	mg/L	<0.00005	mg/L	13	mg/L	0.5	mg/L	800	mg/L
37	WW	Groundwater Bore WGM1	D6	418365	1-Jul-10	3.7	pH Units	<20	mg/L	10.5	m	844	µS/cm	600	mg/L	<0.00005	mg/L	24	mg/L	0.7	mg/L	360	mg/L
38	WW	Sawyers Swamp Creek Ash Dam		418366	1-Jul-10	4.9	pH Units	<20	mg/L			2055	µS/cm	1600	mg/L	<0.00005	mg/L	35	mg/L	2.2	mg/L	1000	mg/L
39	WW	Dump Creek		418367	1-Jul-10	3.4	pH Units	<20	mg/L			1325	µS/cm	890	mg/L	<0.00005	mg/L	20	mg/L	0.7	mg/L	600	mg/L
40	WW	Lidsdale Cut	WX5	418368	1-Jul-10	5.1	pH Units	<20	mg/L			1039	µS/cm	740	mg/L	<0.00005	mg/L	17	mg/L	2	mg/L	490	mg/L
41	WW	Sawyers Creek	WX7	418369	1-Jul-10	4.1	pH Units	<20	mg/L			1458	µS/cm	1100	mg/L	<0.00005	mg/L	20	mg/L	0.7	mg/L	730	mg/L
79	WW	Surface water SSC Ash Dam seepage point from V-notch		418399	1-Jul-10	8	pH Units	90	mg/L			1681	µS/cm	1200	mg/L	<0.00005	mg/L	50	mg/L	1.2	mg/L	700	mg/L
80	WW	Surface water GW 10/GW 11 seepage 1 surface right		418400	1-Jul-10	3.2	pH Units	<20	mg/L			2780	µS/cm	2000	mg/L	<0.00005	mg/L	31	mg/L	3.7	mg/L	1400	mg/L
81	WW	Surface water GW 10/GW 11 seepage 2 surface left		418401	1-Jul-10	3.1	pH Units	<20	mg/L			2794	µS/cm	2100	mg/L	<0.00005	mg/L	30	mg/L	3.6	mg/L	1400	mg/L
82	WW	WX50. GW 10/GW 11 surface point 3 Pond	WX50	418402	1-Jul-10	3.2	pH Units	<20	mg/L			2701	µS/cm	2000	mg/L	<0.00005	mg/L	35	mg/L	4.4	mg/L	1400	mg/L
83	WW	Sawyers Creek at D5		418403	1-Jul-10	8.2	pH Units	120	mg/L			1031	µS/cm	640	mg/L	<0.00005	mg/L	33	mg/L	0.5	mg/L	330	mg/L

84	WW	Upper Sawyers Creek at 850 m.		418404	1-Jul-10	8.2	pH Units	120	mg/L			1007	µS/cm	600	mg/L	<0.00005	mg/L	32	mg/L	0.4	mg/L	320	mg/L
86	WW	Surface water Northern wall collection pit		418405	1-Jul-10	4.1	pH Units	<20	mg/L			695	µS/cm	440	mg/L	<0.00005	mg/L	22	mg/L	0.2	mg/L	250	mg/L
87	WW	Surface water direct drain pit to creek		418406	1-Jul-10	5	pH Units	<20	mg/L			793	µS/cm	520	mg/L	<0.00005	mg/L	22	mg/L	0.9	mg/L	310	mg/L
88	WW	Dirty Surface water		418407	1-Jul-10	4.2	pH Units	<20	mg/L			1888	µS/cm	1600	mg/L	<0.00005	mg/L	40	mg/L	15	mg/L	1100	mg/L
75	WW	Groundwater Bore GW10		418408	1-Jul-10	4	pH Units	<20	mg/L	3.3	m	1307	µS/cm	990	mg/L	0.00028	mg/L	11	mg/L	5.1	mg/L	660	mg/L
76	WW	Groundwater Bore GW11		418409	1-Jul-10					2.1	m												
77	WW	Groundwater Bore A9		418410	1-Jul-10	6.8	pH Units	30	mg/L	2.1	m	1115	µS/cm	770	mg/L	<0.00005	mg/L	20	mg/L	<0.1	mg/L	460	mg/L
78	WW	Groundwater Bore A17		418411	1-Jul-10	5.8	pH Units	<20	mg/L	2.2	m	820	µS/cm	540	mg/L	<0.00005	mg/L	22	mg/L	<0.1	mg/L	320	mg/L
85	WW	Groundwater Bore GW6		418412	1-Jul-10	No Data Available																	
						5.0		74.3		4.9		1325.8		974.1		0.0		28.5		2.6		616.5	
32	WW	Groundwater Bore WGM1	D1	420866	26-Aug-10	5.5	pH Units	<20	mg/L			110	µS/cm	120	mg/L	<0.00005	mg/L	18	mg/L	<0.1	mg/L	8	mg/L
33	WW	Groundwater Bore WGM1	D2	420867	26-Aug-10	5	pH Units	<20	mg/L			307	µS/cm	200	mg/L	<0.00005	mg/L	12	mg/L	<0.1	mg/L	110	mg/L
34	WW	Groundwater Bore WGM1	D3	420868	26-Aug-10	6.1	pH Units	50	mg/L			555	µS/cm	360	mg/L	<0.00005	mg/L	77	mg/L	<0.1	mg/L	79	mg/L
35	WW	Groundwater Bore WGM1	D4	420869	26-Aug-10	5.5	pH Units	20	mg/L			1397	µS/cm	1000	mg/L	<0.00005	mg/L	39	mg/L	<0.1	mg/L	680	mg/L
36	WW	Groundwater Bore WGM1	D5	420870	26-Aug-10	3.4	pH Units	<20	mg/L			1432	µS/cm	990	mg/L	<0.00005	mg/L	14	mg/L	0.4	mg/L	690	mg/L
37	WW	Groundwater Bore WGM1	D6	420871	26-Aug-10	3.3	pH Units	<20	mg/L			1176	µS/cm	660	mg/L	<0.00005	mg/L	47	mg/L	0.7	mg/L	430	mg/L
38	WW	Sawyers Swamp Creek Ash Dam		420872	25-Aug-10	4.6	pH Units	<20	mg/L			2109	µS/cm	1500	mg/L	<0.00005	mg/L	32	mg/L	2.4	mg/L	950	mg/L
39	WW	Dump Creek		420873	25-Aug-10	3.4	pH Units	<20	mg/L			1341	µS/cm	840	mg/L	<0.00005	mg/L	23	mg/L	0.6	mg/L	570	mg/L
40	WW	Lidsdale Cut	WX5	420874	25-Aug-10	5.1	pH Units	<20	mg/L			803	µS/cm	520	mg/L	<0.00005	mg/L	18	mg/L	1.5	mg/L	330	mg/L
41	WW	Sawyers Creek	WX7	420875	25-Aug-10	7.2	pH Units	40	mg/L			1140	µS/cm	760	mg/L	<0.00005	mg/L	21	mg/L	1.6	mg/L	470	mg/L
79	WW	Surface water SSC Ash Dam seepage point from V-notch		420876	25-Aug-10	7.7	pH Units	80	mg/L			860	µS/cm	530	mg/L	<0.00005	mg/L	46	mg/L	0.8	mg/L	250	mg/L
80	WW	Surface water GW 10/GW 11 seepage 1 surface right		420877	25-Aug-10	3.2	pH Units	<20	mg/L			2520	µS/cm	1900	mg/L	<0.00005	mg/L	30	mg/L	3.7	mg/L	1300	mg/L
81	WW	Surface water GW 10/GW 11 seepage 2 surface left		420878	25-Aug-10	2.6	pH Units	<20	mg/L			2365	µS/cm	1700	mg/L	<0.00005	mg/L	18	mg/L	<0.1	mg/L	1300	mg/L
82	WW	WX50. GW 10/GW 11 surface point 3 Pond	WX50	420879	25-Aug-10	3.2	pH Units	<20	mg/L			2508	µS/cm	1900	mg/L	<0.00005	mg/L	36	mg/L	4.3	mg/L	1200	mg/L
83	WW	Sawyers Creek at D5		420880	25-Aug-10	8.2	pH Units	180	mg/L			589	µS/cm	330	mg/L	<0.00005	mg/L	19	mg/L	0.6	mg/L	79	mg/L
84	WW	Upper Sawyers Creek at 850 m.		420881	25-Aug-10	8.1	pH Units	180	mg/L			560	µS/cm	310	mg/L	<0.00005	mg/L	20	mg/L	0.5	mg/L	79	mg/L
86	WW	Surface water Northern wall collection pit		420882	25-Aug-10	4.3	pH Units	<20	mg/L			579	µS/cm	370	mg/L	<0.00005	mg/L	19	mg/L	0.2	mg/L	220	mg/L
87	WW	Surface water direct drain pit to creek		420883	25-Aug-10	4.4	pH Units	<20	mg/L			822	µS/cm	540	mg/L	<0.00005	mg/L	24	mg/L	0.9	mg/L	340	mg/L
88	WW	Dirty Surface water		420884	25-Aug-10	4.1	pH Units	<20	mg/L			1905	µS/cm	1500	mg/L	<0.00005	mg/L	82	mg/L	13	mg/L	1000	mg/L
75	WW	Groundwater Bore GW10		420885	26-Aug-10	4	pH Units	<20	mg/L			1100	µS/cm	780	mg/L	<0.00005	mg/L	40	mg/L	4	mg/L	490	mg/L
76	WW	Groundwater Bore GW11		420886	26-Aug-10	7.4	pH Units	60	mg/L			268	µS/cm	160	mg/L	0.00008	mg/L	22	mg/L	0.3	mg/L	35	mg/L
77	WW	Groundwater Bore A9		420887	26-Aug-10	6.1	pH Units	30	mg/L			1223	µS/cm	870	mg/L	<0.00005	mg/L	21	mg/L	0.9	mg/L	560	mg/L
78	WW	Groundwater Bore A17		420888	26-Aug-10	5.2	pH Units	<20	mg/L			793	µS/cm	520	mg/L	<0.00005	mg/L	23	mg/L	<0.1	mg/L	330	mg/L
85	WW	Groundwater Bore GW6		420889	26-Aug-10	No Data Available																	
						5.1		80.0		N/A		1150.5		798.3		0.00008		30.5		2.1		500.0	
32	WW	Groundwater Bore WGM1	D1	422214	24-Sep-10	5.6	pH Units	<20	mg/L			202	µS/cm	200	mg/L	<0.00005	mg/L	21	mg/L	<0.1	mg/L	8	mg/L
33	WW	Groundwater Bore WGM1	D2	422215	24-Sep-10	5	pH Units	<20	mg/L			312	µS/cm	250	mg/L	<0.00005	mg/L	13	mg/L	<0.1	mg/L	110	mg/L
34	WW	Groundwater Bore WGM1	D3	422216	24-Sep-10	6	pH Units	50	mg/L			636	µS/cm	430	mg/L	<0.00005	mg/L	100	mg/L	<0.1	mg/L	84	mg/L
35	WW	Groundwater Bore WGM1	D4	422217	24-Sep-10	5.8	pH Units	30	mg/L			1418	µS/cm	1200	mg/L	<0.00005	mg/L	33	mg/L	<0.1	mg/L	710	mg/L

36	WW	Groundwater Bore WGM1	D5	422218	24-Sep-10	3.7	pH Units	<20	mg/L		1394	µS/cm	1200	mg/L	<0.00005	mg/L	15	mg/L	0.4	mg/L	740	mg/L
37	WW	Groundwater Bore WGM1	D6	422219	24-Sep-10	3.2	pH Units	<20	mg/L		1194	µS/cm	720	mg/L	<0.00005	mg/L	48	mg/L	0.6	mg/L	430	mg/L
38	WW	Sawyers Swamp Creek Ash Dam		422220	23-Sep-10	5.3	pH Units	<20	mg/L		1996	µS/cm	1500	mg/L	<0.00005	mg/L	31	mg/L	2.7	mg/L	940	mg/L
39	WW	Dump Creek		422221	23-Sep-10	3.4	pH Units	<20	mg/L		1400	µS/cm	960	mg/L	<0.00005	mg/L	21	mg/L	0.8	mg/L	630	mg/L
40	WW	Lidsdale Cut	WX5	422222	23-Sep-10	4.9	pH Units	<20	mg/L		951	µS/cm	660	mg/L	<0.00005	mg/L	22	mg/L	2.4	mg/L	420	mg/L
41	WW	Sawyers Creek	WX7	422223	23-Sep-10	8.2	pH Units	220	mg/L		838	µS/cm	510	mg/L	<0.00005	mg/L	12	mg/L	1.2	mg/L	180	mg/L
79	WW	Surface water SSC Ash Dam seepage point from V-notch		422224	23-Sep-10	8.2	pH Units	240	mg/L		979	µS/cm	610	mg/L	<0.00005	mg/L	45	mg/L	1.2	mg/L	190	mg/L
80	WW	Surface water GW 10/GW 11 seepage 1 surface right		422225	23-Sep-10	3.2	pH Units	<20	mg/L		2550	µS/cm	1900	mg/L	<0.00005	mg/L	30	mg/L	3.6	mg/L	1300	mg/L
81	WW	Surface water GW 10/GW 11 seepage 2 surface left		422226	23-Sep-10	2.7	pH Units	<20	mg/L		2071	µS/cm	1200	mg/L	<0.00005	mg/L	18	mg/L	<0.1	mg/L	1000	mg/L
82	WW	WX50. GW 10/GW 11 surface point 3 Pond	WX50	422227	23-Sep-10	3.2	pH Units	<20	mg/L		2470	µS/cm	1900	mg/L	<0.00005	mg/L	37	mg/L	4.5	mg/L	1300	mg/L
83	WW	Sawyers Creek at D5		422228	23-Sep-10	8.4	pH Units	270	mg/L		667	µS/cm	400	mg/L	<0.00005	mg/L	10	mg/L	0.7	mg/L	68	mg/L
84	WW	Upper Sawyers Creek at 850 m.		422229	23-Sep-10	8.3	pH Units	260	mg/L		656	µS/cm	390	mg/L	<0.00005	mg/L	10	mg/L	0.6	mg/L	68	mg/L
86	WW	Surface water Northern wall collection pit		422230	23-Sep-10	4.3	pH Units	<20	mg/L		636	µS/cm	420	mg/L	<0.00005	mg/L	20	mg/L	0.3	mg/L	240	mg/L
87	WW	Surface water direct drain pit to creek		422231	23-Sep-10	4	pH Units	<20	mg/L		858	µS/cm	550	mg/L	<0.00005	mg/L	22	mg/L	0.9	mg/L	350	mg/L
88	WW	Dirty Surface water		422232	23-Sep-10	No Data Available																
75	WW	Groundwater Bore GW10		422233	24-Sep-10	4.3	pH Units	<20	mg/L		1166	µS/cm	800	mg/L	<0.00005	mg/L	73	mg/L	3.4	mg/L	440	mg/L
76	WW	Groundwater Bore GW11		422234	24-Sep-10	No Data Available																
77	WW	Groundwater Bore A9		422235	24-Sep-10	6.2	pH Units	30	mg/L		1385	µS/cm	1000	mg/L	<0.00005	mg/L	21	mg/L	0.2	mg/L	670	mg/L
78	WW	Groundwater Bore A17		422236	24-Sep-10	5.9	pH Units	20	mg/L		800	µS/cm	540	mg/L	<0.00005	mg/L	21	mg/L	<0.1	mg/L	330	mg/L
85	WW	Groundwater Bore GW6		422237	24-Sep-10	6.9	pH Units	350	mg/L		3128	µS/cm	2000	mg/L	<0.00005	mg/L	680	mg/L	0.5	mg/L	390	mg/L
						5.3		163.3		N/A	1259.4		879.1		<0.00005		59.2		1.5		481.7	
32	WW	Groundwater Bore WGM1	D1	423740	28-Oct-10	5.9	pH Units	<20	mg/L		141	µS/cm	91	mg/L	<0.00005	mg/L	13	mg/L	<0.1	mg/L	14	mg/L
33	WW	Groundwater Bore WGM1	D2	423741	28-Oct-10	5.3	pH Units	<20	mg/L		312	µS/cm	210	mg/L	<0.00005	mg/L	13	mg/L	<0.1	mg/L	100	mg/L
34	WW	Groundwater Bore WGM1	D3	423742	28-Oct-10	6.1	pH Units	40	mg/L		747	µS/cm	460	mg/L	<0.00005	mg/L	130	mg/L	<0.1	mg/L	97	mg/L
35	WW	Groundwater Bore WGM1	D4	423743	28-Oct-10	5.9	pH Units	20	mg/L		1497	µS/cm	1200	mg/L	<0.00005	mg/L	30	mg/L	<0.1	mg/L	750	mg/L
36	WW	Groundwater Bore WGM1	D5	423744	28-Oct-10	3.4	pH Units	<20	mg/L		1505	µS/cm	1100	mg/L	<0.00005	mg/L	18	mg/L	0.3	mg/L	760	mg/L
37	WW	Groundwater Bore WGM1	D6	423745	28-Oct-10	3	pH Units	<20	mg/L		1239	µS/cm	700	mg/L	<0.00005	mg/L	46	mg/L	0.3	mg/L	440	mg/L
38	WW	Sawyers Swamp Creek Ash Dam		423746	27-Oct-10	5.2	pH Units	<20	mg/L		2026	µS/cm	1500	mg/L	<0.00005	mg/L	30	mg/L	2.3	mg/L	930	mg/L
39	WW	Dump Creek		423747	27-Oct-10	3.4	pH Units	<20	mg/L		1302	µS/cm	870	mg/L	<0.00005	mg/L	20	mg/L	0.5	mg/L	560	mg/L
40	WW	Lidsdale Cut	WX5	423748	27-Oct-10	4.7	pH Units	<20	mg/L		1119	µS/cm	820	mg/L	<0.00005	mg/L	27	mg/L	3.3	mg/L	500	mg/L
41	WW	Sawyers Creek	WX7	423749	27-Oct-10	7.6	pH Units	70	mg/L		662	µS/cm	430	mg/L	<0.00005	mg/L	15	mg/L	1.2	mg/L	210	mg/L
79	WW	Surface water SSC Ash Dam seepage point from V-notch		423750	27-Oct-10	7.7	pH Units	80	mg/L		818	µS/cm	560	mg/L	<0.00005	mg/L	38	mg/L	0.7	mg/L	250	mg/L
80	WW	Surface water GW 10/GW 11 seepage 1 surface right		423751	27-Oct-10	3.1	pH Units	<20	mg/L		2615	µS/cm	2000	mg/L	<0.00005	mg/L	30	mg/L	3.6	mg/L	620	mg/L
81	WW	Surface water GW 10/GW 11 seepage 2 surface left		423752	27-Oct-10	2.7	pH Units	<20	mg/L		1686	µS/cm	980	mg/L	<0.00005	mg/L	17	mg/L	0.5	mg/L	710	mg/L
82	WW	WX50. GW 10/GW 11 surface point 3 Pond	WX50	423753	27-Oct-10	3.2	pH Units	<20	mg/L		2493	µS/cm	1900	mg/L	<0.00005	mg/L	37	mg/L	4.4	mg/L	1300	mg/L
83	WW	Sawyers Creek at D5		423754	27-Oct-10	8	pH Units	120	mg/L		360	µS/cm	230	mg/L	<0.00005	mg/L	10	mg/L	0.4	mg/L	46	mg/L

84	WW	Upper Sawyers Creek at 850 m.		423755	28-Oct-10	8.1	pH Units	220	mg/L			519	µS/cm	360	mg/L	<0.00005	mg/L	8	mg/L	0.5	mg/L	38	mg/L
86	WW	Surface water Northern wall collection pit		423756	28-Oct-10	4.5	pH Units	<20	mg/L			636	µS/cm	460	mg/L	<0.00005	mg/L	20	mg/L	0.4	mg/L	240	mg/L
87	WW	Surface water direct drain pit to creek		423757	27-Oct-10	3.8	pH Units	<20	mg/L			918	µS/cm	620	mg/L	<0.00005	mg/L	20	mg/L	0.8	mg/L	380	mg/L
88	WW	Dirty Surface water		423758	28-Oct-10	No Data Available																	
75	WW	Groundwater Bore GW10		423759	28-Oct-10	3.5	pH Units	<20	mg/L			1495	µS/cm	1100	mg/L	<0.00005	mg/L	51	mg/L	2.1	mg/L	670	mg/L
76	WW	Groundwater Bore GW11		423760	28-Oct-10	7.3	pH Units	80	mg/L			307	µS/cm	240	mg/L	<0.00005	mg/L	24	mg/L	0.3	mg/L	35	mg/L
77	WW	Groundwater Bore A9		423761	28-Oct-10	5.4	pH Units	<20	mg/L			1460	µS/cm	1200	mg/L	<0.00005	mg/L	21	mg/L	0.5	mg/L	730	mg/L
78	WW	Groundwater Bore A17		423762	28-Oct-10	5.3	pH Units	<20	mg/L			768	µS/cm	540	mg/L	<0.00005	mg/L	22	mg/L	<0.1	mg/L	310	mg/L
85	WW	Groundwater Bore GW6		423763	28-Oct-10	7.2	pH Units	410	mg/L			3608	µS/cm	2300	mg/L	0.00009	mg/L	760	mg/L	0.6	mg/L	460	mg/L
						5.2		130.0		N/A		1227.5		864.0		0.00009		60.9		1.3		441.3	
79	WW	Surface water SSC Ash Dam seepage point from V-notch		424653	19-Nov-10	7.7	pH Units	110	mg/L			1004	µS/cm	700	mg/L	<0.00005	mg/L	48	mg/L	0.9	mg/L	330	mg/L
80	WW	Surface water GW 10/GW 11 seepage 1 surface right		424654	18-Nov-10	3.1	pH Units	<20	mg/L			2583	µS/cm	1900	mg/L	<0.00005	mg/L	31	mg/L	3	mg/L	1400	mg/L
81	WW	Surface water GW 10/GW 11 seepage 2 surface left		424655	18-Nov-10	2.5	pH Units	<20	mg/L			2161	µS/cm	1200	mg/L	<0.00005	mg/L	18	mg/L	<0.1	mg/L	940	mg/L
82	WW	WX50. GW 10/GW 11 surface point 3 Pond	WX50	424656	18-Nov-10	3.2	pH Units	<20	mg/L			2464	µS/cm	1900	mg/L	<0.00005	mg/L	40	mg/L	3.6	mg/L	1300	mg/L
83	WW	Sawyers Creek at D5		424657	18-Nov-10	7.9	pH Units	90	mg/L			287	µS/cm	210	mg/L	<0.00005	mg/L	9	mg/L	0.3	mg/L	35	mg/L
84	WW	Upper Sawyers Creek at 850 m.		424658	23-Nov-10	No Data Available																	
86	WW	Surface water Northern wall collection pit		424659	19-Nov-10	4.2	pH Units	<20	mg/L			514	µS/cm	370	mg/L	<0.00005	mg/L	16	mg/L	0.3	mg/L	190	mg/L
87	WW	Surface water direct drain pit to creek		424660	18-Nov-10	3.5	pH Units	<20	mg/L			975	µS/cm	660	mg/L	<0.00005	mg/L	22	mg/L	0.6	mg/L	390	mg/L
88	WW	Dirty Surface water		424661	23-Nov-10	No Data Available																	
75	WW	Groundwater Bore GW10		424662	19-Nov-10	4	pH Units	<20	mg/L	3.1	m	1179	µS/cm	890	mg/L	<0.00005	mg/L	51	mg/L	4.7	mg/L	500	mg/L
76	WW	Groundwater Bore GW11		424663	19-Nov-10	7	pH Units	60	mg/L	1.8	m	212	µS/cm	190	mg/L	0.00006	mg/L	13	mg/L	0.2	mg/L	24	mg/L
77	WW	Groundwater Bore A9		424664	19-Nov-10	4.8	pH Units	<20	mg/L	2	m	1563	µS/cm	1200	mg/L	<0.00005	mg/L	22	mg/L	0.2	mg/L	810	mg/L
78	WW	Groundwater Bore A17		424665	19-Nov-10	4.1	pH Units	<20	mg/L	2.3	m	790	µS/cm	540	mg/L	<0.00005	mg/L	22	mg/L	<0.1	mg/L	320	mg/L
85	WW	Groundwater Bore GW6		424666	19-Nov-10	7	pH Units	390	mg/L	1.9	m	2890	µS/cm	1900	mg/L	0.00006	mg/L	570	mg/L	0.4	mg/L	360	mg/L
32	WW	Groundwater Bore WGM1	D1	424667	19-Nov-10	5.7	pH Units	<20	mg/L	1.9	m	175	µS/cm	110	mg/L	<0.00005	mg/L	18	mg/L	<0.1	mg/L	11	mg/L
33	WW	Groundwater Bore WGM1	D2	424668	19-Nov-10	5	pH Units	<20	mg/L	5	m	305	µS/cm	210	mg/L	<0.00005	mg/L	14	mg/L	<0.1	mg/L	110	mg/L
34	WW	Groundwater Bore WGM1	D3	424669	19-Nov-10	5.9	pH Units	40	mg/L	9.5	m	744	µS/cm	470	mg/L	<0.00005	mg/L	130	mg/L	<0.1	mg/L	110	mg/L
35	WW	Groundwater Bore WGM1	D4	424670	19-Nov-10	5.7	pH Units	20	mg/L	1.1	m	1482	µS/cm	1200	mg/L	<0.00005	mg/L	34	mg/L	<0.1	mg/L	770	mg/L
36	WW	Groundwater Bore WGM1	D5	424671	19-Nov-10	3.4	pH Units	<20	mg/L	3	m	1106	µS/cm	780	mg/L	<0.00005	mg/L	12	mg/L	0.5	mg/L	540	mg/L
37	WW	Groundwater Bore WGM1	D6	424672	19-Nov-10	3.1	pH Units	<20	mg/L	10.4	m	1231	µS/cm	710	mg/L	<0.00005	mg/L	50	mg/L	0.3	mg/L	470	mg/L
38	WW	Sawyers Swamp Creek Ash Dam		424673	19-Nov-10	5	pH Units	<20	mg/L			2023	µS/cm	1400	mg/L	<0.00005	mg/L	33	mg/L	2.5	mg/L	950	mg/L
39	WW	Dump Creek		424674	19-Nov-10	3.3	pH Units	<20	mg/L			1436	µS/cm	950	mg/L	<0.00005	mg/L	21	mg/L	0.7	mg/L	670	mg/L
40	WW	Lidsdale Cut	WX5	424675	18-Nov-10	4.7	pH Units	<20	mg/L			991	µS/cm	700	mg/L	<0.00005	mg/L	35	mg/L	3.1	mg/L	440	mg/L
41	WW	Sawyers Creek	WX7	424676	19-Nov-10	7.2	pH Units	70	mg/L			694	µS/cm	450	mg/L	<0.00005	mg/L	15	mg/L	1.8	mg/L	250	mg/L
						4.9		111.4		3.8		1218.6		847.3		<0.00005		55.6		1.4		496.4	

32	WW	Groundwater Bore WGM1	D1	425453	10-Dec-10	No Data Available																	
33	WW	Groundwater Bore WGM1	D2	425454	10-Dec-10	5.2	pH Units	<20	mg/L		309	µS/cm	230	mg/L	<0.00005	mg/L	14	mg/L	<0.1	mg/L	100	mg/L
34	WW	Groundwater Bore WGM1	D3	425455	10-Dec-10	5.8	pH Units	40	mg/L		660	µS/cm	430	mg/L	<0.00005	mg/L	110	mg/L	<0.1	mg/L	91	mg/L
35	WW	Groundwater Bore WGM1	D4	425456	10-Dec-10	6.2	pH Units	50	mg/L		686	µS/cm	500	mg/L	<0.00005	mg/L	20	mg/L	<0.1	mg/L	250	mg/L
36	WW	Groundwater Bore WGM1	D5	425457	10-Dec-10	3.8	pH Units	<20	mg/L		658	µS/cm	490	mg/L	<0.00005	mg/L	6	mg/L	0.7	mg/L	300	mg/L
37	WW	Groundwater Bore WGM1	D6	425458	10-Dec-10	3.3	pH Units	<20	mg/L		958	µS/cm	560	mg/L	<0.00005	mg/L	49	mg/L	0.3	mg/L	320	mg/L
38	WW	Sawyers Swamp Creek Ash Dam		425459	9-Dec-10	4.2	pH Units	<20	mg/L		2051	µS/cm	1500	mg/L	<0.00005	mg/L	32	mg/L	1.7	mg/L	940	mg/L
39	WW	Dump Creek		425460	9-Dec-10	4.2	pH Units	<20	mg/L		1134	µS/cm	830	mg/L	<0.00005	mg/L	20	mg/L	0.4	mg/L	530	mg/L
40	WW	Lidsdale Cut	WX5	425461	9-Dec-10	5.2	pH Units	<20	mg/L		519	µS/cm	370	mg/L	<0.00005	mg/L	12	mg/L	1.6	mg/L	220	mg/L
41	WW	Sawyers Creek	WX7	425462	9-Dec-10	7.3	pH Units	30	mg/L		336	µS/cm	240	mg/L	<0.00005	mg/L	13	mg/L	0.5	mg/L	99	mg/L
79	WW	Surface water SSC Ash Dam seepage point from V-notch		425463	9-Dec-10	7.4	pH Units	50	mg/L		1488	µS/cm	1100	mg/L	<0.00005	mg/L	44	mg/L	1.1	mg/L	640	mg/L
80	WW	Surface water GW 10/GW 11 seepage 1 surface right		425464	9-Dec-10	3.3	pH Units	<20	mg/L		2294	µS/cm	1800	mg/L	<0.00005	mg/L	27	mg/L	0.9	mg/L	1200	mg/L
81	WW	Surface water GW 10/GW 11 seepage 2 surface left		425465	9-Dec-10	2.6	pH Units	<20	mg/L		2161	µS/cm	1300	mg/L	<0.00005	mg/L	16	mg/L	<0.1	mg/L	1100	mg/L
82	WW	WX50. GW 10/GW 11 surface point 3 Pond	WX50	425466	9-Dec-10	3.3	pH Units	<20	mg/L		2287	µS/cm	1800	mg/L	<0.00005	mg/L	33	mg/L	1.1	mg/L	1200	mg/L
83	WW	Sawyers Creek at D5		425467	9-Dec-10	7.3	pH Units	30	mg/L		220	µS/cm	170	mg/L	<0.00005	mg/L	13	mg/L	0.2	mg/L	46	mg/L
84	WW	Upper Sawyers Creek at 850 m.		425468	9-Dec-10	No Data Available																
86	WW	Surface water Northern wall collection pit		425469	9-Dec-10	4.8	pH Units	<20	mg/L		167	µS/cm	170 ; 160	mg/L	<0.00005	mg/L	5	mg/L	<0.1	mg/L	60	mg/L
87	WW	Surface water direct drain pit to creek		425470	9-Dec-10	3.7	pH Units	<20	mg/L		983	µS/cm	690	mg/L	<0.00005	mg/L	24	mg/L	<0.1	mg/L	420	mg/L
88	WW	Dirty Surface water		425471	9-Dec-10	No Data Available																
75	WW	Groundwater Bore GW10		425472	10-Dec-10	6.4	pH Units	50	mg/L		1226	µS/cm	780	mg/L	<0.00005	mg/L	260	mg/L	0.4	mg/L	170	mg/L
76	WW	Groundwater Bore GW11		425473	10-Dec-10	7.2	pH Units	90	mg/L		259	µS/cm	220	mg/L	0.00006	mg/L	14	mg/L	0.2	mg/L	21	mg/L
77	WW	Groundwater Bore A9		425474	10-Dec-10	4.9	pH Units	<20	mg/L		1595	µS/cm	1300	mg/L	<0.00005	mg/L	22	mg/L	0.1	mg/L	840	mg/L
78	WW	Groundwater Bore A17		425475	10-Dec-10	4.3	pH Units	<20	mg/L		768	µS/cm	540	mg/L	<0.00005	mg/L	22	mg/L	<0.1	mg/L	310	mg/L
85	WW	Groundwater Bore GW6		425476	10-Dec-10	7.2	pH Units	270	mg/L		1711	µS/cm	1100	mg/L	0.00009	mg/L	300	mg/L	0.4	mg/L	200	mg/L
32	WW	Groundwater Bore WGM1	D1	426233	23-Dec-10										<0.00005	mg/L	19	mg/L	<0.1	mg/L	10	mg/L
						5.1		76.3		N/A	1070.0		797.5		0.0001		50.3		0.7		431.3	
38	WW	Sawyers Swamp Creek Ash Dam		426669	12-Jan-11	3.9	pH Units	<20	mg/L		2007	µS/cm	1400	mg/L	0.00007	mg/L	33	mg/L	1.3	mg/L	990	mg/L
79	WW	Surface water SSC Ash Dam seepage point from V-notch		426673	12-Jan-11	7.5	pH Units	90	mg/L		1840	µS/cm	1500	mg/L	<0.00005	mg/L	58	mg/L	1.3	mg/L	850	mg/L
41	WW	Sawyers Creek	WX7	426672	12-Jan-11	7.3	pH Units	60	mg/L		545	µS/cm	390	mg/L	<0.00005	mg/L	16	mg/L	1.2	mg/L	190	mg/L
39	WW	Dump Creek		426670	12-Jan-11	3.6	pH Units	<20	mg/L		1164	µS/cm	820	mg/L	<0.00005	mg/L	20	mg/L	0.8	mg/L	540	mg/L
32	WW	Groundwater Bore WGM1	D1	426663	13-Jan-11	5.8	pH Units	<20	mg/L	1.9	m	139	µS/cm	120	mg/L	<0.00005	mg/L	18	mg/L	<0.1	mg/L	15	mg/L
33	WW	Groundwater Bore WGM1	D2	426664	13-Jan-11	5	pH Units	<20	mg/L	5.2	m	298	µS/cm	230	mg/L	0.00008	mg/L	17	mg/L	<0.1	mg/L	98	mg/L
34	WW	Groundwater Bore WGM1	D3	426665	13-Jan-11	5.8	pH Units	50	mg/L	9.4	m	872	µS/cm	580	mg/L	<0.00005	mg/L	160	mg/L	<0.1	mg/L	130	mg/L
35	WW	Groundwater Bore WGM1	D4	426666	13-Jan-11	5.1	pH Units	<20	mg/L	1.1	m	1351	µS/cm	1200	mg/L	<0.00005	mg/L	35	mg/L	<0.1	mg/L	720	mg/L
85	WW	Groundwater Bore GW6		426686	13-Jan-11	7	pH Units	370	mg/L	1.9	m	2088	µS/cm	1400	mg/L	0.0001	mg/L	360	mg/L	0.6	mg/L	250	mg/L
78	WW	Groundwater Bore A17		426685	13-Jan-11	4	pH Units	<20	mg/L	2.2	m	771	µS/cm	560	mg/L	<0.00005	mg/L	20	mg/L	<0.1	mg/L	300	mg/L
77	WW	Groundwater Bore A9		426684	13-Jan-11	4.6	pH Units	<20	mg/L	2	m	1652	µS/cm	1300	mg/L	<0.00005	mg/L	21	mg/L	0.8	mg/L	900	mg/L
76	WW	Groundwater Bore GW11		426683	13-Jan-11	7.1	pH Units	90	mg/L	2.5	m	298	µS/cm	260	mg/L	0.00009	mg/L	20	mg/L	0.2	mg/L	27	mg/L

75	WW	Groundwater Bore GW10		426682	13-Jan-11	4.6	pH Units	<20	mg/L	3.1	m	1002	µS/cm	770	mg/L	<0.00005	mg/L	94	mg/L	2.6	mg/L	330	mg/L
88	WW	Dirty Surface water		426681	13-Jan-11	4.6	pH Units	<20	mg/L			563	µS/cm	410	mg/L	<0.00005	mg/L	26	mg/L	2.8	mg/L	210	mg/L
87	WW	Surface water direct drain pit to creek		426680	13-Jan-11	3.2	pH Units	<20	mg/L			1261	µS/cm	870	mg/L	<0.00005	mg/L	23	mg/L	0.9	mg/L	500	mg/L
86	WW	Surface water Northern wall collection pit		426679	13-Jan-11	4.4	pH Units	<20	mg/L			197	µS/cm	170	mg/L	<0.00005	mg/L	6	mg/L	<0.1	mg/L	69	mg/L
84	WW	Upper Sawyers Creek at 850 m.		426678	13-Jan-11	No Data Available																	
83	WW	Sawyers Creek at D5		426677	13-Jan-11	7.8	pH Units	80	mg/L			347	µS/cm	260	mg/L	<0.00005	mg/L	14	mg/L	0.4	mg/L	68	mg/L
82	WW	WX50. GW 10/GW 11 surface point 3 Pond	WX50	426676	13-Jan-11	3.2	pH Units	<20	mg/L			2371	µS/cm	2000	mg/L	<0.00005	mg/L	45	mg/L	5.2	mg/L	1200	mg/L
80	WW	Surface water GW 10/GW 11 seepage 1 surface right		426674	13-Jan-11	3.1	pH Units	<20	mg/L			2531	µS/cm	2000	mg/L	<0.00005	mg/L	32	mg/L	0.8	mg/L	1300	mg/L
40	WW	Lidsdale Cut	WX5	426671	13-Jan-11	4.6	pH Units	<20	mg/L			1011	µS/cm	800	mg/L	<0.00005	mg/L	28	mg/L	3.6	mg/L	480	mg/L
36	WW	Groundwater Bore WGM1	D5	426667	13-Jan-11	3.3	pH Units	<20	mg/L	2.9	m	1368	µS/cm	1000	mg/L	<0.00005	mg/L	18	mg/L	0.9	mg/L	680	mg/L
37	WW	Groundwater Bore WGM1	D6	426668	13-Jan-11	2.9	pH Units	<20	mg/L	10.3	m	1378	µS/cm	740	mg/L	0.00006	mg/L	55	mg/L	0.3	mg/L	490	mg/L
81	WW	Surface water GW 10/GW 11 seepage 2 surface left		426675	14-Jan-11	2.7	pH Units	<20	mg/L			1655	µS/cm	1000	mg/L	<0.00005	mg/L	18	mg/L	0.7	mg/L	670	mg/L
						4.8		123.3		3.9		1161.3		860.0		0.0		49.4		1.4		478.6	
81	WW	Surface water GW 10/GW 11 seepage 2 surface left		428129	24-Feb-11	2.8	pH Units	<20	mg/L			1502	µS/cm	870	mg/L	<0.00005	mg/L	20	mg/L	0.5	mg/L	570	mg/L
80	WW	Surface water GW 10/GW 11 seepage 1 surface right		428128	24-Feb-11	3	pH Units	<20	mg/L			2674	µS/cm	2100	mg/L	<0.00005	mg/L	32	mg/L	5	mg/L	1400	mg/L
79	WW	Surface water SSC Ash Dam seepage point from V-notch		428127	24-Feb-11	7.5	pH Units	90	mg/L			1900	µS/cm	1500	mg/L	<0.00005	mg/L	51	mg/L	1.4	mg/L	910	mg/L
41	WW	Sawyers Creek	WX7	428126	24-Feb-11	7.1	pH Units	50	mg/L			972	µS/cm	690	mg/L	<0.00005	mg/L	21	mg/L	2.1	mg/L	410	mg/L
40	WW	Lidsdale Cut	WX5	428125	24-Feb-11	3.5	pH Units	<20	mg/L			2211	µS/cm	1500	mg/L	<0.00005	mg/L	11	mg/L	13	mg/L	1200	mg/L
39	WW	Dump Creek		428124	24-Feb-11	3.4	pH Units	<20	mg/L			1390	µS/cm	970	mg/L	<0.00005	mg/L	20	mg/L	0.9	mg/L	650	mg/L
38	WW	Sawyers Swamp Creek Ash Dam		428123	24-Feb-11	5	pH Units	<20	mg/L			1745	µS/cm	1300	mg/L	<0.00005	mg/L	28	mg/L	1.4	mg/L	850	mg/L
82	WW	WX50. GW 10/GW 11 surface point 3 Pond	WX50	428130	24-Feb-11	3.4	pH Units	<20	mg/L			2271	µS/cm	1800	mg/L	<0.00005	mg/L	53	mg/L	6.5	mg/L	Over Range	mg/L
83	WW	Sawyers Creek at D5		428131	24-Feb-11	7.5	pH Units	110	mg/L			549	µS/cm	350	mg/L	<0.00005	mg/L	20	mg/L	0.5	mg/L	130	mg/L
84	WW	Upper Sawyers Creek at 850 m.		428132	24-Feb-11	No Data Available																	
86	WW	Surface water Northern wall collection pit		428133	24-Feb-11	4.1	pH Units	<20	mg/L			523	µS/cm	360	mg/L	<0.00005	mg/L	16	mg/L	0.3	mg/L	200	mg/L
87	WW	Surface water direct drain pit to creek		428134	24-Feb-11	3.5	pH Units	<20	mg/L			1286	µS/cm	940	mg/L	<0.00005	mg/L	21	mg/L	1.1	mg/L	580	mg/L
88	WW	Dirty Surface water		428135	24-Feb-11	No Data Available																	
75	WW	Groundwater Bore GW10		428136	25-Feb-11	3.9	pH Units	<20	mg/L			1155	µS/cm	880	mg/L	<0.00005	mg/L	57	mg/L	4.2	mg/L	470	mg/L
76	WW	Groundwater Bore GW11		428137	25-Feb-11	No Data Available																	
77	WW	Groundwater Bore A9		428138	25-Feb-11	5.3	pH Units	<20	mg/L			1678	µS/cm	1300	mg/L	<0.00005	mg/L	21	mg/L	0.8	mg/L	930	mg/L
78	WW	Groundwater Bore A17		428139	25-Feb-11	3.8	pH Units	<20	mg/L			800	µS/cm	560	mg/L	<0.00005	mg/L	19	mg/L	<0.1	mg/L	310	mg/L

85	WW	Groundwater Bore GW6		428140	25-Feb-11	No Data Available																	
32	WW	Groundwater Bore WGM1	D1	428117	25-Feb-11	5.5	pH Units	<20	mg/L			130	µS/cm	89	mg/L	0.00005	mg/L	17	mg/L	<0.1	mg/L	18	mg/L
33	WW	Groundwater Bore WGM1	D2	428118	25-Feb-11	4.6	pH Units	<20	mg/L			355	µS/cm	240	mg/L	<0.00005	mg/L	24	mg/L	<0.1	mg/L	120	mg/L
34	WW	Groundwater Bore WGM1	D3	428119	25-Feb-11	6	pH Units	50	mg/L			940	µS/cm	590	mg/L	<0.00005	mg/L	180	mg/L	<0.1	mg/L	150	mg/L
35	WW	Groundwater Bore WGM1	D4	428120	25-Feb-11	5.6	pH Units	<20	mg/L			1463	µS/cm	1100 ; 1300	mg/L	<0.00005	mg/L	31	mg/L	<0.1	mg/L	810	mg/L
36	WW	Groundwater Bore WGM1	D5	428121	25-Feb-11	3.2	pH Units	<20	mg/L			1823	µS/cm	1400	mg/L	<0.00005	mg/L	27	mg/L	1.1	mg/L	970	mg/L
37	WW	Groundwater Bore WGM1	D6	428122	25-Feb-11	2.9	pH Units	<20	mg/L			1433	µS/cm	800	mg/L	<0.00005	mg/L	54	mg/L	0.3	mg/L	530	mg/L
						4.6		75.0		N/A		1340.0		959.9		0.0		36.2		2.6		589.9	
32	WW	Groundwater Bore WGM1	D1	1596120	24-Mar-11	5.3	pH Units	<20	mg/L	5.6	m	110	µS/cm	130	mg/L	0.00006	mg/L	19	mg/L	<0.1	mg/L	9	mg/L
33	WW	Groundwater Bore WGM1	D2	1596122	24-Mar-11	4.7	pH Units	<20	mg/L	15	m	310	µS/cm	190	mg/L	<0.00005	mg/L	20	mg/L	<0.1	mg/L	92	mg/L
34	WW	Groundwater Bore WGM1	D3	1596126	24-Mar-11	5.7	pH Units	50	mg/L	14.1	m	870	µS/cm	500	mg/L	<0.00005	mg/L	150	mg/L	<0.1	mg/L	140	mg/L
35	WW	Groundwater Bore WGM1	D4	1596128	24-Mar-11	5.6	pH Units	26	mg/L	5.4	m	1500	µS/cm	1100	mg/L	<0.00005	mg/L	32	mg/L	<0.1	mg/L	790	mg/L
37	WW	Groundwater Bore WGM1	D6	1596136	24-Mar-11	3	pH Units	<20	mg/L	14.3	m	1300	µS/cm	700	mg/L	<0.00005	mg/L	40	mg/L	0.6	mg/L	480	mg/L
38	WW	Sawyers Swamp Ck Ash Dam		1596139	24-Mar-11	4.2	pH Units	<20	mg/L			1800	µS/cm	1200	mg/L	<0.00005	mg/L	27	mg/L	1.4	mg/L	850	mg/L
39	WW	Dump Creek		1596142	24-Mar-11	3.4	pH Units	<20	mg/L			1200	µS/cm	810	mg/L	<0.00005	mg/L	20	mg/L	0.5	mg/L	560	mg/L
40	WW	Lidsdale Cut	WX5	1596144	24-Mar-11	4.3	pH Units	<20	mg/L			1600	µS/cm	1200	mg/L	<0.00005	mg/L	40	mg/L	6.2	mg/L	800	mg/L
41	WW	Sawyers Ck	WX7	1596145	24-Mar-11	6.8	pH Units	30	mg/L			1000	µS/cm	710	mg/L	<0.00005	mg/L	25	mg/L	2	mg/L	440	mg/L
75	WW	Groundwater Bore GW10		1596196	24-Mar-11	3.4	pH Units	<20	mg/L	4.1	m	1400	µS/cm	1000	mg/L	<0.00005	mg/L	44	mg/L	5.4	mg/L	610	mg/L
76	WW	Groundwater Bore GW11		1596197	24-Mar-11	6.9	pH Units	63	mg/L	3.5	m	240	µS/cm	270	mg/L	<0.00005	mg/L	17	mg/L	0.3	mg/L	28	mg/L
77	WW	Groundwater Bore A9		1596198	24-Mar-11	5.7	pH Units	<20	mg/L	6.2	m	1800	µS/cm	1400	mg/L	<0.00005	mg/L	23	mg/L	0.8	mg/L	950	mg/L
78	WW	Groundwater Bore A17		1596199	24-Mar-11	4.1	pH Units	<20	mg/L	6.3	m	760	µS/cm	520	mg/L	<0.00005	mg/L	19	mg/L	<0.1	mg/L	300	mg/L
79	WW	Surface water SSC Ash Dam seepage point from V-notch		1596157	24-Mar-11	7.4	pH Units	86	mg/L			1900	µS/cm	1400	mg/L	<0.00005	mg/L	51	mg/L	1.3	mg/L	890	mg/L
80	WW	surface water GW 10/GW 11 seepage 1 surface right		1596158	24-Mar-11	3	pH Units	<20	mg/L			2700	µS/cm	2000	mg/L	<0.00005	mg/L	32	mg/L	4.6	mg/L	1400	mg/L
81	WW	surface water GW 10/GW 11 seepage 2 surface left		1596162	24-Mar-11	2.9	pH Units	<20	mg/L			1400	µS/cm	840	mg/L	<0.00005	mg/L	20	mg/L	0.5	mg/L	560	mg/L
82	WW	WX50. GW 10/GW 11 surface point 3 Pond	WX50	1596168	24-Mar-11	3.4	pH Units	<20	mg/L			2300	µS/cm	1700	mg/L	<0.00005	mg/L	55	mg/L	6	mg/L	1100	mg/L
83	WW	Sawyers Creek at D5		1596171	24-Mar-11	7.7	pH Units	120	mg/L			560	µS/cm	340	mg/L	<0.00005	mg/L	21	mg/L	0.4	mg/L	130	mg/L
84	WW	Upper Sawyers Creek at 850 m.		1596177	24-Mar-11																		
85	WW	Groundwater Bore GW6		1596200	24-Mar-11																		
86	WW	Surface water Northern wall collection pit		1596182	24-Mar-11	4	pH Units	<20	mg/L			590	µS/cm	390	mg/L	<0.00005	mg/L	17	mg/L	0.3	mg/L	230	mg/L
87	WW	Surface water direct drain pit to creek		1596186	24-Mar-11	3.1	pH Units	<20	mg/L			1600	µS/cm	1100	mg/L	<0.00005	mg/L	21	mg/L	1.1	mg/L	740	mg/L
88	WW	Dirty Surface water		1596187	24-Mar-11	4.8	pH Units	<20	mg/L			290	µS/cm	160	mg/L	<0.00005	mg/L	25	mg/L	0.2	mg/L	76	mg/L
						4.7		62.5		8.3		1201.4		841.0		0.00006		34.2		2.0		532.1	
32	WW	Groundwater Bore WGM1	D1	1617460	8-Apr-11	5.5	pH Units	<20	mg/L	3.4	m	120	µS/cm	140	mg/L	<0.00005	mg/L	19	mg/L	<0.1	mg/L	8	mg/L
33	WW	Groundwater Bore WGM1	D2	1617468	8-Apr-11	4.7	pH Units	<20	mg/L	7.6	m	320	µS/cm	200	mg/L	<0.00005	mg/L	32	mg/L	<0.1	mg/L	86	mg/L
34	WW	Groundwater Bore WGM1	D3	1617472	8-Apr-11	6	pH Units	68	mg/L	9.5	m	900	µS/cm	540	mg/L	<0.00005	mg/L	150	mg/L	0.1	mg/L	140	mg/L
35	WW	Groundwater Bore WGM1	D4	1617474	8-Apr-11	5.8	pH Units	25	mg/L	1.2	m	1500	µS/cm	1200	mg/L	<0.00005	mg/L	31	mg/L	<0.1	mg/L	<1	mg/L
37	WW	Groundwater Bore WGM1	D6	1617484	8-Apr-11	3.2	pH Units	<20	mg/L	10.6	m	1300	µS/cm	840	mg/L	<0.00005	mg/L	53	mg/L	0.2	mg/L	510	mg/L
38	WW	Sawyers Swamp Ck Ash Dam		1617488	8-Apr-11	5.1	pH Units	<20	mg/L			1700	µS/cm	1400	mg/L	<0.00005	mg/L	28	mg/L	1.6	mg/L	840	mg/L
39	WW	Dump Creek		1617495	8-Apr-11	3.2	pH Units	<20	mg/L			1400	µS/cm	970	mg/L	<0.00005	mg/L	20	mg/L	0.9	mg/L	650	mg/L
40	WW	Lidsdale Cut	WX5	1617496	8-Apr-11	3.4	pH Units	<20	mg/L			2200	µS/cm	1700	mg/L	<0.00005	mg/L	43	mg/L	8.4	mg/L	1200	mg/L
41	WW	Sawyers Ck	WX7	1617499	8-Apr-11	7.3	pH Units	65	mg/L			1100	µS/cm	800	mg/L	<0.00005	mg/L	24	mg/L	2.1	mg/L	470	mg/L
75	WW	Groundwater Bore GW10		1617581	8-Apr-11	3.2	pH Units	<20	mg/L	3.1	m	1600	µS/cm	1300	mg/L	<0.00005	mg/L	40	mg/L	6.4	mg/L	680	mg/L
76	WW	Groundwater Bore GW11		1617593	8-Apr-11																		
77	WW	Groundwater Bore A9		1617596	8-Apr-11	5.4	pH Units	<20	mg/L	2	m	1800	µS/cm	1600	mg/L	<0.00005	mg/L	24	mg/L	0.8	mg/L	970	mg/L

78	WW	Groundwater Bore A17		1617598	8-Apr-11	4.1	pH Units	<20	mg/L	2.1	m	750	µS/cm	580	mg/L	<0.00005	mg/L	19	mg/L	<0.1	mg/L	290	mg/L
79	WW	Surface water SSC Ash Dam seepage point from V-notch		1617549	8-Apr-11	7.5	pH Units	85	mg/L			1900	µS/cm	1500	mg/L	<0.00005	mg/L	50	mg/L	1.3	mg/L	900	mg/L
80	WW	surface water GW 10/GW 11 seepage 1 surface right		1617554	8-Apr-11	3	pH Units	<20	mg/L			2700	µS/cm	2200	mg/L	<0.00005	mg/L	33	mg/L	4.7	mg/L	1400	mg/L
81	WW	surface water GW 10/GW 11 seepage 2 surface left		1617567	8-Apr-11	2.9	pH Units	<20	mg/L			1500	µS/cm	920	mg/L	<0.00005	mg/L	19	mg/L	0.5	mg/L	570	mg/L
82	WW	WX50. GW 10/GW 11 surface point 3 Pond	WX50	1617573	8-Apr-11	3.4	pH Units	<20	mg/L			2200	µS/cm	1800	mg/L	<0.00005	mg/L	55	mg/L	6	mg/L	1100	mg/L
83	WW	Sawyers Creek at D5		1617574	8-Apr-11	8.1	pH Units	170	mg/L			720	µS/cm	500	mg/L	<0.00005	mg/L	20	mg/L	0.5	mg/L	160	mg/L
84	WW	Upper Sawyers Creek at 850 m.		1617575	8-Apr-11																		
85	WW	Groundwater Bore GW6		1617600	8-Apr-11																		
86	WW	Surface water Northern wall collection pit		1617576	8-Apr-11	3.9	pH Units	<20	mg/L			720	µS/cm	530	mg/L	<0.00005	mg/L	19	mg/L	0.4	mg/L	280	mg/L
87	WW	Surface water direct drain pit to creek		1617577	8-Apr-11	3	pH Units	<20	mg/L			1700	µS/cm	1100	mg/L	<0.00005	mg/L	21	mg/L	1	mg/L	690	mg/L
88	WW	Dirty Surface water		1617578	8-Apr-11																		
33	WW	POLISHER	D2	1642513	21-Apr-11	7.9	pH Units	340	mg/L			2800	µS/cm					770	mg/L	<1	mg/L	38	mg/L
						4.8		125.5		4.9		1446.5		1043.2		<0.00005		73.5		2.3		578.0	

Appendix C-

Conneq Water Monitoring Results and Interpretation

Appendix D-

2009-10 Audit Actions Table

Task	Issue	Responsibility	Complete	Status
1	(ref MCoA 2.1) Delta Electricity to formally advise Director-General DP&I as to the status of its long-term ash management strategy in accordance with the requirements of MCoA 2.1. At this point in time, it is not possible to determine whether or not Delta is on track to achieve an ash re-use target of 20% by 2013 or its stretch target of 40% by 2013.	Asset Manager Ext Plant Steve Marshall	✓	Completed as of 7th September 2011. Objective Reference B776202.
2	(ref MCoA 2.8) Time entries on BBS Daily Operational Timesheets should be in a standardised format eg 7.00am and 10.00pm or 0700 and 2200	Conneq Site Manager Brett Lowry	✓	Copy of Conneq KV Operational Timesheets sighted indicating hours are now recorded in 24hr time.
3	– (ref MCoA 2.9) A report (ie review of logistical arrangements for ash haulage and placement to determine the feasibility of reducing hours of operations) needs to be prepared and submitted to Director-General DP&I as it was not submitted by the required date of October 2009.	AM External Plant Steve Marshall and Conneq Bretty Lowry	✓	
4	(ref MCoA 3.3) Delta to make arrangements for ongoing operational noise monitoring as per the OEMP requirements and recommendations made in the Stage 2 Kerosene Vale Ash Repository Operational Noise Review. This recommendation has linkages to MCoAs 2.18, 2.19 and 2.20.	Environment Manager Nino	✓	Initial noise monitoring completed and determined no non-compliance with criterion.
5	(ref waste management) Delta to consider conducting security patrols of the Stage 2 KVAR outside of the normal operational hours to deter persons from illegally dumping waste at the Kerosene Vale Ash Repository area.	Security Manger Chan Sinnadurai	✓	Weekly patrol report from the Account Manager sighted, indicating outlying areas surrounding the Ash Dam are patrolled regularly between 18 and 22 times per week.
6	(ref environmental inspections) Consideration should be given to expanding the scope of the daily inspection performed by Delta's Contract Administration to address all of the specific potential impacts detailed in Table 4.8 of the OEMP.	AM External Plant Steve Marshall	✓	Review undertaken and incorporated into continuous improvement program. Document referenced for monthly Work Procedures Manual (Conneq) for repository operations staff.

7	– (ref: tracking of OEMP requirements) Delta to create an internal compliance tracking and reporting process for OEMP specifics in particular the following: • Environmental Inspection - Section 3.7.1 and Table 3-2. • Environmental Audits – Section 3.8 • Table 5-2 Environmental Monitoring Programs • Table 6-1 Environmental Targets and Performance Indicators • Environmental Management Sub-Plans (Section 6.2) This tracking and reporting should be performed at a frequency of monthly or every second month. This recommendation is to ensure the approved Operational Env Mgt Plan is implemented. It is noted that the Conneq Monthly Client Service Report will/may address some aspects of the above listed OEMP sections but they may not be responsible for others aspects which are Delta's responsibility.	Ext Plant/Env Mg (Phil Day & Nino Di Falco)	✓	All issues raised during Monthly Client meetings with Conneq are processed through Delta's internal Work Management System (Ellipse).
8	(ref MCoA 5.1) – The Delta Electricity website for the Kerosene Vale Stage 2 Ash Repository to provide a direct link to the DP&I project page http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=826 Or alternatively, provide downloadable versions of the following documents on the Delta Electricity web site: • Major Project Application 07_0005 • Kerosene Vale – Stage 2 Ash Repository Area (two volumes) – Environmental Assessment prepared by Parsons Brinckerhoff and dated 1 April 2008. • Kerosene Vale – Stage 2 Ash Repository Area – Submissions Report prepared by Parsons Brinckerhoff and dated 30 May 2008. • Project Approval (Conditions of Approval) File S07/00001, dated 26 November 2008.	PR Manager (Julia Harvey)	✓	Below is the location of the Kerosene Vale information: **http://www.de.com.au/About-Us/Ash-management/Kerosene-Vale-Ash-Repository/default.aspx** The link to the Department of Planning project page has been added.

9	Annual Environmental Management Report (April 2009 – April 2010) when completed and approved by the Director-General DP&I be provided on the Delta Electricity web site.	Env Mgr/PR Mgr Nino & Julia Harvey	✓	As above.
10	Delta Electricity website to provide a regular update on operational progress of KVAR Stage 2 and construction activities (if any).This recommendation has linkage to MCoA 5.2	ExtPlt/PR Mgr Phil Day & Julia Harvey	✓	Oct/Apr each year.
11	(ref: MCoA7.3d) – Delta Electricity to provide a copy of the Aurecon (2010) and Malfroy Environmental Services (2010) reports to DP&I as supporting documentation to the 2009-10 AEMR to comply with the requirement to provide “results of all environmental monitoring required under conditions 3.3 to 3.8 of this approval, including interpretations and discussion by a suitably qualified person”.	Environment Manager Nino	✗	Both reports in draft for final review

12	Delta Electricity has engaged a number of consultants to prepare specialist reports that have been sighted and reviewed in preparing this Annual Environmental Management Report. These reports provide a number of recommendations for Delta Electricity's consideration. To facilitate future Annual Environmental Management Reports, Delta Electricity should document those recommendations it adopts as well as documenting reasons for those recommendations not adopted. A number of the project's Conditions of Approval require the provision of periodic reporting of results to various government agencies, in particular: • Noise – Condition of Approval 6.5a (vii) – provisions for the periodic reporting of results to DECC. • Groundwater – Condition of Approval 6.5b (vi) – provisions for the periodic reporting of results to the SCA. • Surface Water – Condition of Approval 6.5c (viii) – provisions for the periodic reporting of results to the DPI (Fisheries) and the SCA. • Air – Condition of Approval 6.5d (ix) – provisions for the periodic reporting of results to the DECC. • In accordance MCoA 7.3d which states "results of all environmental monitoring required under conditions 3.3 to 3.8 of this approval, including interpretations and discussion by a suitably qualified person" must be included as part of the Annual Environmental Management Report. Given the above requirements, it is recommended that Delta Electricity forward the following reports to the nominated government agencies.	Environment Manager	✓ ✗ ✓	All report recommendations are raised as work order tasks and closed on completion. 3 noise monitoring events scheduled for late 2011 and 2012. Report to be sent to SCA and Fisheries.

13	Given that the Kerosene Vale Stage 2 Ash Repository has been in operation for at least one year, it provides Delta Electricity the opportunity to review and revise the project's approved OEMP against the following:§ Activities and management systems employed by the Contractor (Bilfinger Berger Services) and those of Delta Electricity.§ The findings and recommendations of specialist reports such as the Aurecon (2010) report titled "KVAD Stage II Water Quality Assessment October 2007 to March 2010" and Malfroy Environmental Strategies (2010) report titled "Kerosene Vale Ash Repository Stage 2 – Air Quality Review April 2009 – March 2010".§ Observations and recommendations provided in this Annual Environmental Management Report.It should be noted that any revision of the OEMP and its management sub plans will require consultation with the Department of Planning and other government agencies as detailed in the Project Approval.	Environment Manager		Complete review of OEMP to be undertaken after initial EMR report submitted.