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1. Introduction

The Mt Piper Ash Placement project involves the construction and operation of new ash placement areas at the Lamberts South and Lamberts North sites to cater for the ash generated from the existing Mt Piper Power Station and the proposed Mt Piper Power Station Extension. The project was approved under Part 3A of the EP&A Act by the NSW Minister for Planning and Infrastructure on 16 February 2012, Project Approval 09_0186.

Condition of Approval D1 requires Delta Electricity to prepare a long-term ash management strategy for investigation and assessment of alternative ash management measures with a goal of 40% re-use of ash by 31 December 2020. The report is to be submitted to the Director-General six months prior to the commencement of operations which are scheduled for 31 January 2013.

This report addresses this condition of approval and outlines the approach for ash management, not just for Mt Piper power station, but for Wallerawang also which is in the Western district. In Delta’s 2010/11 Sustainability Report (available at [www.de.com.au](http://www.de.com.au)) ash re-use is included in the Sustainability Scorecard setting a target of 50% increase in 2010 utilisation levels by 2015. The report also noted that with 311,003 tonnes utilised, there was a 10% increase in ash utilisation from the previous year.

For Mt Piper, the utilisation rate in 2011 was 23% or 226,000 tonnes. To have complied with the condition of approval in 2011, over 392,000 tonnes would need to have been utilised. This document outlines a strategy to achieve this increased level. The strategy is focussed on a number of areas:

a. Regulatory issues
b. Traditional markets
c. New markets and new technology
d. Management opportunities

2. Regulatory Issues

The Protection of the Environment Operations (Waste) Regulation 2005 makes requirements relating to non-licensed landfill sites, non-licensed waste activities and non-licensed waste transporting. The EPA issues general exemptions for commonly recovered, high volume and well characterised waste materials. One such exemption is the Coal Ash Exemption 2011. This exemption applies for all applications of ash re-use with the exception of bound use in cement and concrete products.

The exemption sets out the requirement for utilisation of ash as outlined below.

This Notice of Exemption is subject to the following conditions:

7.1. The chemical concentration or other attribute of the coal ash listed in Column 1 of Table 2 must not exceed any of the following:
7.1.1. the absolute maximum concentration or other value listed in Column 4 of Table 2,
7.1.2. for characterisation or once-off tests, the maximum average (based on the arithmetic mean) concentration or other value listed in Column 2 of Table 2, and
7.1.3. for routine tests, the maximum average (based on the arithmetic mean) concentration or other value listed in Column 3 of Table 2.

7.2. The coal ash can only be applied to land as an engineered fill, stabiliser, filter or drainage material or as a sand substitute as follows:
Due to the chemical properties of the Mt Piper and Wallerawang coal, ash produced from Mt Piper and Wallerawang does not comply with the exemption due to it having a low pH. In conjunction with the Ash Development Association of Australia (ADAA), Delta has been working to revise the Coal Ash Exemption 2011 such that prescribed uses of low pH ash are possible. The strategy adopted by Delta and the ADAA is to demonstrate that the ash has a low buffering capacity and when blended with other compliant materials, the pH of the blended product will comply with regulatory requirements.

To this end, expert representations have been made and scientific reports commissioned in the last 2 years to demonstrate the safe utilisation of coal ash. The last submission by the ADAA on this matter to the NSW Office of Environment and Heritage (OEH) was on 23 May 2012. It is anticipated a revised Coal Ash Exemption will be issued in 2012 permitting the limited use of low pH coal ash in applications outside of cementitious uses.

Discussions with NSW OEH have been constructive but it is noted that failure to achieve changes to existing regulations and exemptions will severely limit Delta’s ability to utilise ash as the cementitious uses are currently close to market saturation.

3. Traditional Ash Markets

Fly ash has been used as a supplementary cementitious material (SCM) due to its pozzolanic properties for over 30 years in NSW. The amount and quality of ash that can be used as an SCM is set out in Australian Standards for cement and concrete. The Australian cement market has an annual volume of 2 to 3 million tonnes, of which ash can comprise a maximum 30%.

As fly ash is cheaper than cement, its use has been largely optimised by industry making it difficult to sell further volumes into this market. However, opportunities may exist to export fly ash to other markets where there is little availability of fly ash. While the transport logistics make this difficult, the value of ash is higher due to the lack of alternatives. Increasing focus on reducing carbon footprints will increase the demand for ash as an SCM helping to overcome the cost of transporting the material. It is intended to investigate opportunities for fly ash sales overseas.

Other traditional markets for ash include as a material for stabilisation activities. This can be in mines or land developments and is subject to fluctuating demand levels and proximity of the fly ash source to the market. The installation in early 2012 of a loading point for run of station ash at Mt Piper power station will facilitate additional fly ash sales as previously the Fly Ash Australia loading point was a potential barrier to additional ash sales. Already sales...
of ash have been made to Weston Matrix for a local road project that has obtained a specific exemption from the waste regulations.


Much of Delta’s focus in recent years has been developing new markets for ash as an aggregate rather than as an SCM. The aggregate market in Australia is estimated to be 8 to 9 million tonnes with very little by way of ash penetration. The main hurdles to the use of ash in the aggregates markets include:

- Access to markets as it is hard to compete against quarries built close to demand. The closure of the Penrith Lakes scheme in NSW is seen as an opportunity for increased ash sales as sand is being transported further and further away.
- Acceptance of ash as an aggregate. Delta has a program underway that has resulted in the characterisation of ash as an aggregate rather than as an SCM. Refer to June 2011 DMC Report “Evaluation of Laboratory Results for KoAgg from Delta Power Stations - Future Strategic Positioning” attached. The next step in the strategy is to gain market and regulatory acceptance of ash as an aggregate product rather than a waste stream.
- Agglomeration of ash to increase value as an aggregate. Ash is a very fine dust to a large extent which limits its use as an aggregate. Delta has commissioned a study into new technologies available to agglomerate ash and improve its usefulness as an aggregate to enable access to new ash markets. The report, titled “Review of patents relevant to Agglomeration of fly ash to produce aggregates” is attached. The next stage of the strategy is to conduct selective testing of agglomeration technologies that have been identified to determine how suitable they are.

5. Ash Management Opportunities

In power generation, ash utilisation has traditionally been left to the markets to manage the fly ash facilities for off-site utilisation. This has traditionally favoured cement companies who can afford to install facilities to classify and load fly ash into trucks and limits access to aggregate markets that are dependent on local road building projects which last for months rather than years. Delta has taken steps to permit the loading of run of station ash at Mt Piper power station and conditioned ash is available at Wallerawang. These arrangements enable increased access to aggregate markets while maintaining existing commitments. When current contracts expire at Mt Piper and Wallerawang, new contract structures will be reviewed with a view to further expanding ash sales.