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EPA CE-18-0211

Ms Bonnie Allan
Committee Secretary
Senate Environment and Communications References Committee
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Parliament House
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By email: ec.sen@aph.gov.au

Dear Ms Allan

RE: Inquiry into the rehabilitation of mining and resources projects and power station ash dams as it relates to Commonwealth responsibilities

Thank you for your letter of 22 June 2018, offering the South Australian Environment Protection Authority (EPA) with an opportunity to respond to statements made by [REDACTED] submission to the above Inquiry.

I note that [REDACTED] submission is specific to the former power stations site in Port Augusta. Flinders Power is responsible for the decommissioning and rehabilitation of the site. The Flinders Power site is regulated by the EPA under the [Environment Protection Act 1993](#) for several activities of environmental significance. A copy of the current licence can be viewed on the EPA's website - [EPA13006](#).

I offer the following information in response to the specific issues raised by [REDACTED]. Please note that links to publicly-available reports and data have also been included to assist the committee in accessing additional information if required.

a. No comment.

b. National Pollutant Inventory reporting of chemicals in coal ash storage

The National Pollutant Inventory (NPI) provides the community, industry and government with information about substance emissions in Australia. This includes reports on stack emissions (not dust) and on transfers of reportable wastes to destinations such as tailings dams, landfills and recycling depots. During operation of the Port Augusta power stations the transfers of reportable waste to the ash dams and information about stack emissions were reported. NPI reports are available on the NPI website at www.npi.gov.au/npi-data/search-npi-data and can be searched by industry or location.

As the power station has ceased operations, it is no longer reporting stack emissions under the NPI Program. Flinders Power is, however, required to report any and all fugitive emissions from the site as part of the Closure Plan to the EPA. This information is publicly available on both the Flinders Power and EPA websites.

Topsoil application on the ash dam

The ash dam at the Flinders Power site has a total area of 273 hectares (2 730 000m²) comprised of the following:

- Ash Dam – 212 hectares
- Former Ash Dam – 36 hectares
- Polishing Pond – 25 hectares

Collectively the above ash storage facilities are referred to as the ash dam. An approved long-term management solution for the ash dam is to cap the area with soil and replant it with native vegetation.

The EPA requirements for the long-term management of the ash dam are to:

- have a long-term, stable separation layer between the ash and the final surface that protects human health and the environment
- minimise the generation of leachate to safeguard surface water and groundwater in accordance with the [Environment Protection \(Water Quality\) Policy 2015](#)
- provide land that is compatible with the intended use after closure.

Detailed plans for installing a soil separation layer to protect human health and the environment and to establish a self-sustaining vegetation system were developed by Flinders Power in early-2017 in conjunction with its vegetation experts Succession Ecology. These plans were reviewed by an independent third-party vegetation expert.

These plans were also assessed and approved by native vegetation specialists within the South Australian Department for Environment and Water to ensure a self-sustaining vegetation system would be achieved. In addition, the plans were endorsed by the independent site contamination auditor who is overseeing the site contamination assessment and remediation work across the whole site. Specialists, with relevant experience within the then Mining Regulation Division of the Department of State Development, also reviewed the plans.

The EPA understands that during operation, the ash was deposited in a warmish sea water slurry. As a result, it is likely that soluble substances no longer remain in the dam. Capping the dam will reduce the ongoing infiltration of water. Leachate is a specific matter that the site contamination auditor will be focussing on as part of his work in overseeing environmental assessments being undertaken as part of the Voluntary Site Contamination Assessment Proposal. At the conclusion of this process, the auditor will submit his findings to the EPA in the form of a site contamination audit report, which will be available from the EPA's Public Register.

Wastewater Treatment Plant

The EPA regulates two SA Water wastewater treatment plants. The Port Augusta East facility is located adjacent to the Flinders Power facility. This facility consists of a series of treatment lagoons, prior to discharge of water to the marine environment via Hospital Creek.

- c. The Port Augusta site is subject to the [Electricity Corporations \(Restructuring and Disposal\) Act 1999](#). This Act was created to enable the power stations' privatisation, and allowed for an Environment Compliance Agreement (ECA). The ECA included clauses which effectively acted as exemptions from some of the requirements of the [Environment Protection Act 1993](#) (EP Act) during power station operations. This Act also contained clauses relating to the closure and remediation of the site. Importantly, this effectively meant that remediation of the ash dam or clean-up of site contamination caused by disposal of ash into the ash dam was not required by Flinders Power whilst the power station was operational and the EPA was unable to require action by Flinders Power in this regard. This also prevented the EPA from using powers under the EP Act to establish financial assurance or a bond for environmental matters.

There are additional closure requirements at a whole of Government level and financial mechanisms have been made available. Specific details on funding arrangements is commercial in confidence. The South Australian Department of Treasury and Finance may be able to provide more information.

d. Air quality monitoring during operation

Weather conditions in summer can cause significant dust in the Upper Spencer Gulf region, from both natural and built areas. Industrial sites licensed by the EPA, including the site of the former power stations in Port Augusta, are required to take all reasonable and practicable steps to minimise dust impacts from their site on the community.

The EPA collected data from the monitoring of atmospheric particulate matter less than 10 micrometres (micron) in diameter (PM₁₀) from 1996 to 2007 on a one in six day cycle using high-volume air sample monitors, in compliance with the National Environment Protection (ambient Air Quality) Measure standard method.

EPA monitoring for particulate matter in Port Augusta ceased in May 2007 as the measured values (one day in six) were typically below the Australian standard.

A comparison of data in 2012-13 from the 'National Pollutant Inventory' (NPI) demonstrated that PM₁₀ emissions from the Augusta Power stations had continuously decreased since the EPA ceased monitoring in 2007. Reported PM₁₀ emissions in the period 2005-06 to 2012-13 had halved. Based on operations of the power station at that time, it was expected that reportable PM₁₀ emissions would remain at these lower levels on an on-going basis.

During operation, dust monitors were maintained by Flinders Power at Stirling North, Lea Memorial Oval, the Pigeon Club, the Tennis Club and the Port Augusta Hospital. Data from this monitoring network was available in the form of monthly reports on the EPA website.

The data gathered through both the EPA's own monitoring (up until 2007), and Flinders Power's on-going monitoring, provided the EPA with a significant understanding of PM₁₀ and total suspended particles (TSP) patterns in Port Augusta. The EPA's assessment of this data indicated that high particulate days often coincided with similar increased levels in other comparable regional centres such as Port Pirie and Whyalla. On these high particulate days, the data indicated that Flinders Power's operations during this time were not the demonstrated cause, rather, these were regional dust events.

Air Quality Monitoring during closure activity

The Flinders Power monitoring network has now been altered to focus on Lea Memorial Oval, Stirling North and on site monitoring to trigger responses to any dust from closure activity. In response to dust events coming from the site after operations ceased, in October 2016 the EPA required Flinders Power to install equipment to carry out continuous monitoring (daily instead of one day in six) of PM₁₀ at Lea Memorial Oval and Stirling North. This more intensive monitoring provides information on variations in dust throughout the day and picks up short-term 'spikes' in dust, unlike previous monitoring during operations which averaged the result across 24 hours.

This equipment constantly measures PM₁₀ and combines the continuous information to calculate the 24-hour average PM₁₀. The high-volume air sampler located at Lea Memorial Oval also records all solid and liquid particles in the atmosphere by TSP. Flinders Power is required to monitor TSP daily at this location.

Flinders Power was also directed to install three optical air quality monitoring sensors at the boundary of the ash dam. This was installed to provide data on the amount of dust arising from the ash dam itself or from earthmoving works that are extracting, transporting and spreading soil onto the ash dam as part of the long-term [Ash Dam Rehabilitation Plan](#).

If excessive dust is being generated due to higher wind conditions, the data from the optical sensors will trigger increased dust control measures, modifications to or the shutdown of construction activity, based on a Trigger Action Response Plan. The readings from the optical sensors are used to fine tune the Dust Management Plan and Trigger Action Response Plan, to better manage any dust generated by the construction activity that is an essential part of the ash dam rehabilitation process, as well as other closure activity.

In early 2017 the EPA re-established its own air quality monitoring network with the monitoring of atmospheric PM₁₀, TSP and particulate matter less than 2.5 micrometres in diameter (PM_{2.5}), to supplement and validate the monitoring required of Flinders Power. Monitoring of PM₁₀ and PM_{2.5} particles also provides information to assess against health-based criteria.

The EPA consulted SA Health regarding its decision to install air quality monitoring to ensure that the data was collected in a manner that would enable future health assessment if required. SA Health's advice was also sought to ensure the positioning of the monitoring station would collect data that could accurately represent what the airborne dust was in terms of composition and particle size.

Current Flinders Power and EPA monitoring data is available in real-time via the internet.

Drying out of ash dam

While the power stations were operational, dust was controlled by the ongoing pumping of an ash and seawater slurry onto the ash dam. The slurry would spread across the ash dam, settle and compact to establish a crust on top of the ash. The crust was effective in sealing the surface.

At the cessation of power generation in May 2016, it was expected that a similar strategy would be successful in managing dust, prior to a long-term solution of capping with soil and revegetating, which had been proposed by Flinders Power to begin in 2017. As such, following closure, Flinders Power commenced new pumping arrangements to flood the surface of the ash dam with sea water to maintain the crust to manage dust emissions. This required different pumping arrangements as compared to when the stations were in operation.

Following reports of dust in July and August 2016, the EPA inspected the site and observed that the seawater pumping was forming channels on the dam, rather than spreading evenly across the surface as had occurred previously. After several attempts to alter the pumping, it was evident that this was not working effectively across the entire 212 hectare dam to suppress dust.

Given the dust events and the ineffectiveness of sea water flooding as a dust control measure, the EPA required Flinders Power to reassess its dust management strategy for the ash dam. On 26 August 2016 Flinders Power sought advice from the EPA on the trial of a new dust suppressant chemical, via aerial application, on a 15-hectare area of the ash dam. This trial proved successful and subsequently aerial spraying of the ash dam was undertaken. This was to be a temporary measure and Flinders Power proposed to the EPA to bring forward its long term plan for earthworks, topsoil and vegetation of the ash dam.

Dust Mitigation

As part of its assessment and licensing roles, the EPA has worked extensively and regularly with Flinders Power from 2015 to ensure adequate measures were in place. This has resulted in the development and implementation of the Closure and Post Closure Plan, [Dust Management Plan](#), [Ash Dam Rehabilitation Plan](#), and Flinders Power had entered into a [Voluntary Site Contamination Assessment Proposal](#). The EPA has required Flinders Power to ensure that each plan is targeted to minimise environmental harm, consider local conditions, and fulfil all the actions and milestones in its closure plan before it can surrender its license.

Several dust events have occurred at this site since closure, and rehabilitating the site by covering it with topsoil and native vegetation to provide a protective barrier between ash and the community is considered the most effective way to reduce dust in the longer term. In the event of dust coming from

the site, the EPA investigates actions undertaken by Flinders Power to determine whether all reasonable and practicable measures were employed to prevent this from occurring.

In relation to the most widely impacting dust event on 1 January 2017, a [detailed report](#) was prepared by the EPA. In response to immediate needs to protect the community following this event, the EPA issued Flinders Power with an [Environment Protection Order](#) requiring it to undertake a series of actions including a [Root Cause Analysis](#). The Order is available in the EPA Public Register. A full list of significant dust events from the site and regulatory responses is available from the EPA website, together with mineralogical reports of what was found in the dust and SA Health analyses. Dust management during demolition events is largely based on ensuring appropriate weather conditions are occurring for demolition to occur, as well as the use of water cannon. Flinders Power has held risk assessment and management meeting with all emergency services to plan each demolition event and notified the Port Augusta community.

The EPA has been present during all demolition events and monitored weather conditions and air quality closely. Levels of particulate matter (PM₁₀) have not exceeded health-based standards within residential areas following any demolition event.

The EPA is aware that video footage of demolition events is available via the Flinders Power YouTube channel.

EPA air quality monitoring equipment

The instrument used by the SA EPA for PM_{2.5} air quality monitoring is approved by US EPA (EQPM 1090-079) and Australian Standards (3580.9.8 and 3580.9.13) for monitoring particulate matters.

- e. The EPA and SA Health have been working closely together. SA Health scientists and public health experts ensured that any potential health impacts were identified. The EPA sent monitoring data and samples to an accredited laboratory and provided the results to SA Health. Samples of dust from the ash dam (November 2016) were analysed, to determine the elemental composition of the dust.

SA Health has provided ongoing support to the EPA to address community concerns about the health impacts of dust since the first dust event and this support is ongoing. SA Health has provided the Port Augusta community with practical support in the following ways:

- Providing health advice to EPA staff to enable community announcements, and approving wording for use in EPA community updates.
- Attended the community information session in Port Augusta hosted by the EPA, so that people with health concerns could be referred directly to both senior SA Health staff based in Adelaide (Dr Monika Nitschke, Principal Scientific Officer and Dr Nicola Spurrier, Deputy Chief Medical Officer) and local hospital staff.
- Dr Nicola Spurrier briefed local hospital staff and designed a screening health assessment to allow nurses and local doctors to respond effectively to patients.
- Provided medical analyses of mineralogical reports of the air quality provided by EPA scientific staff ([January 2017](#) and [December 2016](#)).
- Set up a hotline for residents with health concerns or questions, which has been made available on every community update, fact sheet and on the EPA website. (For health related information and advice, please telephone: (08) 8226 7100).
- Created a fact sheet specifically for the Port Augusta community: [Dust and your health](#)
- During the period where there was most concern, set up a free clinic at the hospital for anyone concerned about respiratory issues.

Any dust is potentially harmful to health and dust generated by industry activity is treated seriously by the EPA. SA Health advised that “the ash dam airborne dust contains minimal toxic metals and substances” and “concentrations of the metallic fractions in the samples were mostly at the nanogram and microgram level. The levels for many metals are consistent with normal background levels elsewhere”.

“Concern is in the exposure to overall dust levels of particles sized smaller than 10 micrometres in diameter (PM₁₀). The particles are considered to reach into the respiratory system, where they can elicit cardiopulmonary health effects, so it is important to keep dust exposure to a minimum. This is relevant for short- and long-term exposure”.

f. Polluter pays

In South Australia, the *Environment Protection Act 1993* establishes a legislative framework for the management of site contamination. Since 1 July 2009, changes to the EP Act have required notification to the EPA of site contamination affecting groundwater. Responsibility for site contamination is assigned according to the ‘polluter pays’ principle – this means that the original polluter is liable for any clean-up and associated costs caused on and off the source site, regardless of when it was caused. Site contamination is often historical in nature, and the original polluter may no longer exist or be able to be identified. In these cases liability can pass to the current site owner. Under the EP Act, known or suspected groundwater contamination must be reported to the EPA.

The EPA can require assessment and if necessary remediation, which means to treat, contain, remove or manage the contamination. In most cases, the original polluter or past/current site owner must undertake or fund this work, including a communication and engagement program to keep affected communities informed.

Water quality monitoring

The EPA ceased routine water quality sampling in 2008 and this was replaced with a comprehensive ecological assessment program called the [Aquatic Ecosystem Condition Reports](#). The upper Spencer Gulf, including Port Augusta, is monitored as part of this program on a five-yearly rotating basis. The State of the Environment Report is a five-yearly report produced as a requirement of the *Environment Protection Act 1993* and reports on broad environmental trends.

g. No comment.

h. No comment.

i. and j.

While Flinders Power was scoping options for rehabilitation for the ash dam, the EPA also investigated options for ash dam remediation and rehabilitation within Australia and overseas. One option considered was the removal and disposal of the ash however, due to the volume of material on site requiring earthworks movement, it was determined to be unsuitable as it would likely result in considerable and prolonged dust, noise and amenity impacts on the local community. The timeframe for implementing this option would have likely been in the order of years, rather than months. The EPA also contacted the New South Wales EPA and the Queensland Department of Environment and Heritage to better understand how similar operations have been managed in their jurisdictions. Information obtained, along with consideration of the chemical composition, nature and size of the ash dam, as well as the location and local environment assisted all parties in their assessment of the final detailed design and rehabilitation plan for the Flinders Power ash dam.

Again I would like to thank you for providing the EPA with the opportunity to respond to this submission to the Inquiry, and wish you all the best with the Committee's work.

Yours sincerely



Tony Circelli

**CHIEF EXECUTIVE
ENVIRONMENT PROTECTION AUTHORITY**

Date: 6 July 2018