



## Supplementary submission

in response to

Senate Standing Committee on Environment and Communications inquiry into rehabilitation of mining and resources projects as it relates to Commonwealth responsibilities; varied terms of reference regarding the rehabilitation of power station ash dams

prepared by

Environmental Justice Australia

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## **About Environmental Justice Australia**

Environmental Justice Australia (formerly the Environment Defenders Office, Victoria) is a not-for-profit public interest legal practice. We are independent of government and corporate funding. Our legal team combines technical expertise and a practical understanding of the legal system to protect our environment.

We act as advisers and legal representatives to community-based environment groups, regional and state environmental organisations, and larger environmental NGOs, representing them in court when needed. We also provide strategic and legal support to their campaigns to address climate change, protect nature and defend the rights of communities to a healthy environment.

We also pursue new and innovative solutions to fill the gaps and fix the failures in our legal system to clear a path for a more just and sustainable world.

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## 1. Introduction

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While attention is often paid to mine rehabilitation and the environmental and health impacts of burning coal for energy, little attention is paid to the legacy contamination risks posed by ash waste. Ash ponds, herein referred to as "ash dumps", are a neglected aspect of the coal combustion process. Ash dumps contain the waste ash (also known as fly ash or coal ash) from the coal combustion process. This waste is delivered to a storage facility, usually by pipe, to an open-ground pit nearby the coal-fired power station that produced the waste. In the case of the Latrobe Valley power stations, these pits are inside worked-out sections of the brown coal mines. It is estimated that Australia produces 13 million tonnes of ash waste annually from coal combustion.<sup>1</sup>

There are many examples of contamination risks presented by ash dumps in Australia. These include the events of early 2017 when ash dust from the Northern power station site blew over Port Augusta, SA, causing significant health issues for the community. Similar 'ash pollution events' have been experienced by communities elsewhere in Australia. During summer 2016, residents in Wangi Wangi, Lake Macquarie, complained to the NSW Environment Protection Authority when the 200 hectare ash dump at the Eraring power station dried out and ash blew over their homes. OriginEnergy received a \$15,000 fine for the incident – which continued over several days – but this penalty did nothing to prevent this re-occurring or remedy long-term risks.

As discussed below, significant environmental impacts are already occurring as a result of poor state regulation and paucity of rehabilitation requirements for ash dumps, including either non-existent or opaque financial assurance or bond requirements to protect the taxpayer from footing the bill for cleaning up contamination and rehabilitating ash dumps.

## 2. Health risks and impacts

Coal ash contains the same toxic substances contained in the coal burnt in power stations, including arsenic, lead, mercury, cadmium, chromium and selenium. Globally, coal ash is recognised and managed as a toxic health hazard. It is considered to present a "grave" health risk.<sup>2</sup>

The heavy metals in fly ash are extremely toxic to human organ systems. The US EPA found that living next to a coal ash disposal site can increase the risk of cancers, as well as other complications.<sup>3</sup> This is especially true if the disposal site is a wet ash pond and it is unlined, and the local drinking water is sourced from wells.<sup>4</sup>

The heavy metals contained in fly ash can lead to poisoning, increased rates of cancer, heart damage, lung disease, respiratory problems, birth defects, development issues in children, kidney disease

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<sup>1</sup> Ash Development Association Australia (2015) *Coal Combustion Products: Factbook*, Australian Ebook Publisher.

<sup>2</sup> Gottlieb, B., Gilbert, S., Evans, L. (2010). *Coal Ash: The toxic threat to our health and environment*. Commissioned by Physicians for Social Responsibility and EarthJustice. The United States of America. Available at: <http://www.psr.org/assets/pdfs/coal-ash.pdf>.

<sup>3</sup> Gottlieb, B., Gilbert, S., Evans, L. (2010). *Coal Ash: The toxic threat to our health and environment*. Commissioned by Physicians for Social Responsibility and EarthJustice. The United States of America. Available at: <http://www.psr.org/assets/pdfs/coal-ash.pdf>.

<sup>4</sup> Gottlieb, B., Gilbert, S., Evans, L. (2010). *Coal Ash: The toxic threat to our health and environment*. Commissioned by Physicians for Social Responsibility and EarthJustice. The United States of America. Available at: <http://www.psr.org/assets/pdfs/coal-ash.pdf>.

cognitive deficits and behavioural problems.<sup>5</sup> The likelihood of being affected by these chemicals is greatly increased by prolonged exposure and increased concentration levels.<sup>6</sup>

This waste contains a toxic mixture of heavy metals and other substances that are known to have harmful impacts on health, groundwater, land and air. Quite often this ash is mixed with saline waste water, creating a toxic sludge that sits in an exposed pit, simultaneously evaporating into the air and, if not adequately monitored and managed, leaching into the land and water tables.

On their website, Delta Electricity describe coal ash as "relatively inert". This description is both inaccurate and deceptive.

### **3. Ash dump regulation is different throughout Australia; financial mechanisms are opaque or are not required**

Ash dump regulation differs by jurisdiction. A lack of clear regulation ensuring the safe and responsible disposal and management of coal ash creates conditions for unscrupulous and hazardous practices. It is unclear whether, or how much, is required of ash pond operators to ensure financial resources are available to rehabilitate ash dumps when a power station closes. The Victorian EPA licensing system requires a financial assurance to be held by operators for landfill, which includes ash dumps. However in NSW and QLD, there are no financial assurances imposed on these States' respective environmental protection bodies.

This is alarming given the health risks posed by human and environmental exposure to ash wastes. Ash dumps present a significant toxic legacy and can contaminate land and water tables for extended periods of time, making ongoing monitoring of these sites over decades necessary to ensure environmental and health protection. The companies that have operated power stations can wind up to avoid responsibility for monitoring, leaving the financial obligation on State governments and ultimately the taxpayer.

#### *Victoria*

Ash ponds are classified as landfill and are scheduled premises under the *Environment Protection (Scheduled Premises) Regulations 2017* (Vic). The EPA states that there is no formal documents obliging or guiding best practise pollution prevention for groundwater contamination from ash ponds, but considers that the best practise for landfills receiving municipal waste largely applies to preventing this type of pollution.<sup>7</sup>

Financial assurances ("FA") for landfill, including ash dumps, are required in power station licences in Victoria. The calculation of FAs for ash dumps is determined in consultation between the power station operators and the Victoria EPA. We have been informed that this determination is complicated by the fact that the power station operators that are required to hold FAs for ash dumps

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<sup>5</sup> Gottlieb, B., Gilbert, S., Evans, L. (2010). *Coal Ash: The toxic threat to our health and environment*. Commissioned by Physicians for Social Responsibility and EarthJustice. The United States of America. Available at: <http://www.psr.org/assets/pdfs/coal-ash.pdf>.

<sup>6</sup> Gottlieb, B., Gilbert, S., Evans, L. (2010). *Coal Ash: The toxic threat to our health and environment*. Commissioned by Physicians for Social Responsibility and EarthJustice. The United States of America. Available at: <http://www.psr.org/assets/pdfs/coal-ash.pdf>.

<sup>7</sup> Victoria EPA, Publication 841, *Groundwater Attenuation Zones*, April 2002, p. 4 (<http://www.epa.vic.gov.au/~media/Publications/841.pdf>).

are also required to pay a bond for mine rehabilitation, and the EPA does not want to "double-dip" on requiring rehabilitation bonds where these are already imposed by the mining regulator.

The FA determination process otherwise lacks transparency. The amount of these financial assurances is unknown, and when we have attempted to find out from the EPA how much these FAs are, we have been told that this information is confidential. We cannot determine the adequacy of the FAs held in Victoria. Nor is it clear whether or not FAs have been finalised in Victoria for Loy Yang, Yallourn or Hazelwood.

We have been informed by the Victoria EPA that an "adequate" FA is held for the Anglesea power station, but have not been provided with a figure.

#### NSW

Under the *Protection of the Environment Operations Act 1997*, the NSW EPA can impose financial assurances on a pollution licence to ensure adequate funds are available for carrying out works or programs that are required under a licence, such a rehabilitation plan. The EPA can also impose a condition that power stations hold insurance cover for payment of costs incurred in clean-up actions or for compensation of damages resulting from pollution caused in connection with a power station, such as an ash dump. None of the NSW power station licences contain financial assurances of are required to hold insurance cover on their pollution licences.

It appears that the practice in NSW is to require an operator to submit a remediation plan when a power station is decommissioned, to be approved by the NSW EPA, who may impose a financial assurance on the subsequent pollution licence for the rehabilitation phase, including the rehabilitation of ash dumps. Ultimately, however, the power to impose financial assurances is discretionary and something that the EPA does not impose on pollution licences for power stations that should include ash dumps.

#### Queensland

Under the *Environmental Protection Act 1994*, the Queensland Department of Environment and Heritage Protection ("EHP") can impose a financial assurance on a power station environmental licence to ensure compliance with licence conditions and to cover potential rehabilitation costs that arise as a result of electricity production. However, EHP will only impose such a condition it is satisfied this condition is justified in light of the degree of environmental harm, the likelihood that the rehabilitation work will be necessary, and the environmental record of the environmental authority.

Power station operators in Queensland have to apply to EHP to surrender their licence. These applications must contain a rehabilitation report if the power station is required to rehabilitate any aspect of its activities. Both environmental authorities for Stanwell and Gladstone power stations contain conditions for ash dump rehabilitation. The Gladstone power station is also subject to the Gladstone Power Station Agreement Act 1993 which contains additional rehabilitation requirements and the preparation of a separate Ash Management Agreement.

However, financial assurances are not imposed on Stanwell and Gladstone power stations. There are no legal obligations in place that at least these two power stations must hold a financial assurance for rehabilitation, including rehabilitation of ash dumps.

Throughout Victoria, NSW and Queensland, ash dump regulation is inconsistent and lacks transparency regarding financial mechanisms.

## 4. Ash dump management is inadequate

The poor and unregulated disposal of ash waste and management of coal ash dams during the operating life of power stations gives little hope for rigorous pollution control during the decommissioning and rehabilitation of closed power stations. We have summarized the issue we are aware of regarding the disposal and management of ash dumps in Victorian and South Australia. These issues highlight the necessity of federal best-practice regulations to create nationally consistent approach to management and rehabilitation.

### *Port Augusta*

After the Northern power station closed in 2016, remediation works were commenced to cap the ash dump. In January 2017, the temporary dust suppression measures that covered the ash dump failed and strong winds carried a thick plume of ash dust to nearby residents at Port Augusta. For several days, people reported breathing difficulties, coughing, and significant decreased in asthma incidents including the hospitalisation of children with asthma. The local community expressed high levels of anger and frustration at the delays in fixing the problems. Remediation of the ash dump has begun but is still not complete, and dust from dirt that covers the ash dump regularly flies over the Port Augusta community and causes respiratory complaints.<sup>8</sup>

The experience of the Port Augusta community highlights the problem that can occur when power stations close without adequate legal requirements in place to ensure sites are properly remediated immediately upon closure.

### *Bayswater*

In December 2015 the pipeline that carries fly ash slurry from the Bayswater Power Station to Ravensworth mining complex failed, causing fly ash to discharge into Bayswater Creek.<sup>9</sup> Though the discharge was reported as a small amount, with minimal environmental harm, the plant owner AGL was issued with a fine of \$15,000, as this was the third environmental infraction in 2016.<sup>10</sup>

### *Tarong and Tarong North*

To dispose of coal ash from Stanwell's Tarong and Tarong North power stations near Nanango, the Queensland Government contracted a firm called Coal Reuse. That firm entered into various contracts for reuse. When these contracts fell through and Coal Reuse remained obliged to take the coal ash, the company stored at least 1400 tonnes of hazardous ash in industrial sheds on a property at Gympie and the Brisbane suburb of Pinkenba "for months".<sup>11</sup>

### *Yallourn*

Consecutive environmental audits for Yallourn's ash dumps identified problems with the ash dumps including groundwater contamination. These contaminants could be impacting on the Latrobe River, an import source for the Ramsar-listed Gippsland Lakes. In February 2015, a rupture in an ash disposal pipeline led to 8.6 megalites of ash liquid being dumped into the Morwell River. The

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<sup>8</sup> <http://www.abc.net.au/7.30/after-closure-of-port-augusta-power-station./9664926>.

<sup>9</sup> EPA NSW. (2016, March 31). 'EPA fines AGL Macquarie \$15,000 for fly ash spill', *epa.nsw.gov.au*. Available at: <http://www.epa.nsw.gov.au/epamedia/EPAMedia16033101.htm>.

<sup>10</sup> EPA NSW. (2016, March 31). 'EPA fines AGL Macquarie \$15,000 for fly ash spill', *epa.nsw.gov.au*. Available at: <http://www.epa.nsw.gov.au/epamedia/EPAMedia16033101.htm>.

<sup>11</sup> ABC News, 1,400 tonnes of hazardous ash stored illegally in Brisbane and Gympie' <http://www.abc.net.au/news/2016-07-26/toxic-ash-illegally-stored-tarong-power-station-gympie-brisbane/7656260>.

Victorian EPA investigation found that the Energy Australia was in breach of its licence and was subsequently fined a paltry \$7584.

#### *Loy Yang*

Loy Yang A has had clean-up notices issued for groundwater contamination from its ash ponds since 2001 in relation to groundwaters affected by the operation of the Loy Yang Ash Pond. Under these clean-up notices the EPA designated the contaminated groundwater a groundwater attenuation zone ("GAZ") pursuant to Victorian environmental protection policies. The EPA has waived groundwater quality objectives in Loy Yang's licence for the GAZ for sulfate, aluminium, total dissolved solids and chloride. As far as we are aware, there is no actual clean-up required of Loy Yang to prevent further contamination or clean the source of the contamination. Other than implementing a groundwater monitoring program, as far as we are aware, there is no requirement by the EPA that the power station actually clean-up the contaminated groundwater or address the contamination at its source to prevent further contamination.

#### *Hazelwood*

In October 2015 it was reported to the Victorian EPA that a maximum of 40,000 litres of ash slurry had spilled from the Hazelwood ashing system into another mine catchment, showing issues with ash management.<sup>12</sup>

Former Hazelwood mine and power station workers have expressed to us their concerns that the ash dump inside the Hazelwood mine was never adequately constructed and has caused ash dump leachate to contaminate the aquifer underneath the mine. Concerns have also been expressed as to the ability of the landfill to hold ash leachate after it was watered down during fire-fighting operations during the Hazelwood mine fire. The landfill would have been constructed for a particular viscosity and density of material, which would have changed when water during the fire-fighting operations altered the viscosity. Given the ash dump is inside the mine, and the mine-owner, Engie, wants to fill the mine with water to rehabilitate it, there is a real risk that toxic material from the ash dump could contaminate either surface or groundwater after rehabilitation is completed.

#### *EnergyBrix/Morwell Power Station*

In 2014 the EnergyBrix power station ceased operations after its owner went into administration. After the power station closed it was abandoned, and no remediation of the site was undertaken. In 2017 the EPA issued clean-up notices to EnergyBrix, citing serious contamination issues at the site, including the contamination of land and water from the ash dump. It is unclear whether the operator was required to provide a financial assurance and if they did so before the company went into administration. Nor is it clear whether the company will have the funds to pay for the remediation and rehabilitation of the site. Meanwhile, toxic contaminants continue to leach onto land and groundwater, and it is looking increasingly likely that the taxpayer, via the Victorian EPA, will need to contribute to the clean-up of the site, including the ash dumps.

## **5. Rehabilitation**

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<sup>12</sup> EPA Victoria A. (2015, October 15). 'EPA investigates spill from GDF Suez site', [epa.vic.gov.au](http://www.epa.vic.gov.au/about-us/news-centre/news-and-updates/news/2015/october/15/epa-investigates-spill-from-gdf-suez-site). Available at: <http://www.epa.vic.gov.au/about-us/news-centre/news-and-updates/news/2015/october/15/epa-investigates-spill-from-gdf-suez-site>.

Capping of ash dumps during rehabilitation with a glue-like substance to suppress dust is considered standard industry practice, according to the Environment Manager of the Hazelwood Closure Project. This type of capping has occurred at the Hazelwood ash dumps, where it will remain for 12 months before other rehabilitation measures are undertaken.

A 'surfactant' or veneer was applied to the Northern power station ash dump near Port Augusta. Heavy rains washed this coating from the surface of the ash dump, followed by hot, dry, windy conditions. As a consequence, the Port Augusta community was exposed to weeks of wind-blown coal ash. It is important to note that from an international perspective, the use of surfactants to suppress dust is not considered best practice. Companies get away with this sub-standard management practice because there are no state or national regulations for best practice management.

EJA's observation of 'rehabilitation' of coal ash dumps at Australian power stations reveals a variety of practices – all of them inadequate. It appears that the rehabilitation of the Munmorah/Vales Point ash dump involves 40-50cm of fill. At Port Augusta, locals report that fill is limited to 10-15cm. In Victoria, it is 30cm of fill. Covering a massive volume of toxic coal ash with shallow fill presents several risks:

Fill can wash away or blow away, re-exposing the toxic ash to the elements. Fill only conceals the problem. Toxic substances contained in coal ash are still able to wash into surface water, contaminating nearby land and waterways such as Lake Macquarie, and seeping into ground water.

Near some of Australia's largest coal ash dumps, urban populations are growing rapidly. What future land use options will be condoned on 'rehabilitated' areas? The NSW Central Coast is a case in point. This is one of the fastest growing urban populations in NSW, with growing competition for vacant land. Our dialogue with the Lake Macquarie and Central Coast local government authorities confirmed that neither council had considered this question, nor ruled out future residential development over coal ash dumps.

Shallow fill provides limited opportunity for plants to grow. This is evident at the Vales Point ash dump where even the parts of the ash dump that were covered in fill 10-20 years ago now have only limited vegetation. Coal ash provides no nutrients for trees, or soil structure for root growth.

These risks warrant careful consideration and strong regulation to avoid future health impacts.

## **6. Australia needs national best practice ash dump management and rehabilitation regulations**

As an example of best practice national regulations, we refer the Committee to the United States Environment Protection Agency's approach to ash dump management and rehabilitation.

In 2015 the United States Environment Protection Agency published *Hazardous and Solid Waste Management System - Disposal of Coal Combustion Residuals From Electric Utilities* (the "CCR Rule") under the *Resource Conservation and Recovery Act* to address the need for consistent



compliance of ash dump management.<sup>13</sup> In the CCR Rule, coal-combustion residuals ("CCR") includes fly ash, bottom ash, boiler slag and flue gas desulfurisation materials.<sup>14</sup>

Prior to the CCR Rule being enforced, ash dump management under state regulatory programs which were supposed to fill other federal regulatory gaps, was found by the US EPA to be insufficient in their ability to fill these gaps to protect land, water, and communities living near ash dumps. These insufficiencies are exemplified by the 2008 Tennessee Valley Authority's Kingston Fossil Plant coal ash dike in Tennessee failed, spilling some 4.2 million m<sup>3</sup> of ash slurry which inundated homes and waterways causing considerable contamination to people and the environment.

The CCR Rule outlines national requirements that include the following:

1. Location restrictions. To ensure there is no reasonable probability of adverse effects on health or the environment from ash waste, the rule establishes five location restrictions as to where CCR can be placed: above "uppermost" aquifers, in wetlands, within fault areas, in seismic impact zones, and in unstable areas.
2. Liner design criteria. To help prevent contaminants in CCR from leaching from CCR units and contaminating groundwater. This includes requirements for new CCR facilities, and imposes a mandate that existing dumps must retrofit or close if they were not built with a composite (or alternative) liner and where concentrations of contaminants are "statistically above" groundwater protection standards established by the Rule.
3. Structural integrity requirements. Applies to new and existing surface impoundments, and lateral expansions, to prevent damages associated with structural failures. Owners and operators are required to regularly conduct a number of structural—integrity related assessments.
4. Operating criteria. Includes operating criteria for air criteria, run-on and run-off controls for CCR landfills, hydrologic and hydraulic capacity requirements for surface impoundments, and periodic assessment requirements.
5. Groundwater monitoring and corrective action. Requires groundwater monitoring system to detect contaminants, and, significantly, requires corrective actions to be taken where contaminants are found to be in exceedance of groundwater protection standards.
6. Closure and post-closure requirements. Requires all CCR facilities to close in accordance with specified standards and to monitor and maintain the facilities for a period of time after closure. These requirements are essential to ensure the long-term safety of close CCR facilities. Includes timeframes to initiate and complete closure requirements and the preparation of closure and post-closure care plans.
7. Administrative requirements, including the requirements that operators are to maintain a publicly accessible website for information about ash dumps.

Although some of these measures are required in individual State laws and regulations, the lack of a national approach means that ash dump management is inadequate and inconsistent and where one State or Territory's regulatory approach is weaker, an environmental justice issue for those communities that live near ash dumps or downstream from contaminated water.

In order to achieve a consistent approach to ash dump management and rehabilitation, we recommend that Australia adopt a national ash dump regulatory regime similar to that of the US CCR Rule, and implemented under a National Environment Protection Measure. These regulations should include provisions for monitoring and management of dump sites where a power station has been

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<sup>13</sup> *Hazardous and Solid Waste Material Management System – Disposal of Coal Combustion Residuals from Electric Utilities – Final Rule*, 40 CFR 257, 21303 (17 March 2015).

<https://www.federalregister.gov/documents/2015/04/17/2015-00257/hazardous-and-solid-waste-management-system-disposal-of-coal-combustion-residuals-from-electric>.

<sup>14</sup> We note that storage of flue gas desulfurisation materials are not applicable in Australia as no Australian coal-fired power generators have such pollution reduction technologies installed.

mothballed to avoid the types of legacy contamination issues identified above at the Morwell Power Station.

Moreover the management and rehabilitation of ash dumps is a matter of federal environmental significance because the legacy contamination issues presented by the transition from coal-fired power generation puts the environmental and communities at significant risk to exposure of toxic land and water, and during the initial rehabilitation periods as they currently stands, to toxic airborne dust.

**Recommendations:**

1. In our submission to this Inquiry we recommend that the Committee consider a National Mine Rehabilitation Commission. If such an incentive were initiated, this Commission might also include ash dump rehabilitation.
2. National assessment of adequacy of ash dump management as well as the contamination risks to air, land, surface water and groundwater from ash dump management.
3. Establish national best practice regulations for the construction, management and rehabilitation of ash dumps.
4. Ensure independent experts and stakeholders are meaningfully engaged in the development of these guidelines and in review processes for their implementation.
5. Implement enforcement mechanisms including independent experts under the NEPM for contaminated land to punish offenders for poor compliance with national standards.