New South Wales Concrete by-product Recycling and Disposal Industry Guidelines

CEMENT CONCRETE
& AGGREGATES AUSTRALIA

Cement Concrete & Aggregates Australia (CCAA) is the peak industry body for the heavy construction materials industry in Australia, including the extractive, cement and pre-mixed concrete industries.

The industry produces some 150 million tonnes of aggregates, 9 million tonnes of cement and 24 million cubic metres of pre-mixed concrete per year. The industry is committed to ensuring that these operations are sustainable and environmentally responsible.

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Acknowledged nationally and internationally as Australia's foremost cement, concrete and aggregate information body, CCAA takes a leading role in education and training, research and development, technical information and advisory services and is a significant contributor to the preparation of Codes and Standards affecting building and building materials.

CCAA aims to protect and extend the uses of cement, concrete and aggregate by advancing knowledge, skill and professionalism in Australian concrete construction and by promoting awareness of products, their energy-efficiency properties and uses, and of the contribution the industry makes towards a better environment.
CCAA is a not-for-profit organisation.

Section 1
Objective

New South Wales has over 300 operational concrete batching plants that generate a number of concrete by-products and wastes. NSW legislation and regulations require that all operators must minimise the amount of new resources used in the production process, ensure that as much material as possible is re-used or recycled and that any waste that cannot be re-used is disposed of in the correct manner.

The *Protection of the Environment Operations Act 1997* and the *Protection of the Environment (Waste) Regulation 2005* regulate the management, storing, transporting, processing, recycling and disposal of waste in NSW.

Typically many concrete by-products can be re-used in the concrete batching process without breaching any of the environmental regulations.

The waste can also be re-used onto land if it is subject to a general or specific exemption. If there is no exemption then the waste must be disposed of at a licenced facility.

CCAA has developed this document to provide our Members with guidance on the regulatory requirements for managing the four main concrete by-products, specifically:

- Hardened Returned Concrete
- Wash Water
- Liquid Wash Out / Slurry
- Solid Wash Out.

Section 2

How to Deal with Different types of Concrete by-products

2.1 Hardened Returned Concrete

2.1.1 Definition

Hardened Returned Concrete is concrete that has been returned to a concrete plant and has been cured or hardened. Hardened Returned Concrete has the same properties as normal concrete and is generally free of contaminants, such as cementitious materials, steel reinforcement, wood, paper, plastic, and brick. Once hardened, this concrete can be handled and stored with little risk of contaminated water runoff.

2.1.2 General Exemptions

Hardened Returned Concrete can be crushed, at facilities that have the appropriate licenses, to form recovered aggregates. In this manner it can be re-used in the concrete batching process, or applied to the land as engineering fill or as a road base.

Recovered aggregates are subject to a general exemption issued by the New South Wales Environment Protection Authority (EPA). Fine materials recovered from the batching process are also subject to a general exemption.
These exemptions are available at:

http://www.epa.nsw.gov.au/waste/generalrre.htm

Under these exemptions recovered aggregates and fines can be applied to land for road making activities, building, landscaping and construction works, without the need to acquire an environment protection licence.

Hardened Returned Concrete cannot be utilised for the following applications:

- Dams
- Mine, quarry and sand dredge rehabilitations
- Back fill for voids
- Utilised in reshaping land for agricultural purposes.

This material can be applied to road construction on private land if the following conditions are met:

- The relevant waste is applied to land to the minimum extent necessary for the construction of a road.
- Development consent for the development has been granted under the relevant Environmental Planning Instrument.
- It is to provide access (temporary or permanent) to a development approved by a local government.
- The works undertaken are either exempt or are a complying development.

The material being applied to the land must be sampled and tested, as detailed in the general exemptions, to ensure that it will pose minimal risk of harm to the environment.

2.1.3 Specific Exemptions

If the land application for the Hardened Returned Concrete does not match that stipulated in the general exemption then

the operator may apply for a specific exemption. In doing so the operator must consult with the EPA and prove that the reuse is bona fide recycling and not disposal and that the proposed re-use will not harm the environment. More information on the specific resource recovery exemptions are available at:

http://www.epa.nsw.gov.au/waste/RREapplications.htm

2.1.4 Disposal

Hardened Returned Concrete has been pre-classified as General Solid Waste (nonputrescible) under the EPA's waste Classification Guidelines, which is available at:

http://www.epa.nsw.gov.au/resources/waste/091216classifywaste.pdf

Hardened Returned Concrete does not require a licensed transporter and does not need to be tracked. However, if it is to be disposed of it does need to be transported to a licensed facility, although this will attract the waste and environment levy on each tonne of disposed material.

To find a facility that is licensed to receive hardened returned concrete visit the EPA's website at:

http://www.epa.nsw.gov.au/prpoeoapp/

On the website click on the "Licences" option and under the dropdown menu entitled "Fee-Based Activity" select the filter entitled "Waste disposal by application to land" and press the search button.

This will provide you with a list of the Licensed Facilities that have an Environmental Protection Licence to receive hardened returned concrete.

2.2 Concrete Wash Water

2.2.1 Definition

Concrete Wash Water has a high pH of near 12, which makes it highly alkaline, and it also has a high content of suspended solids. Concrete Wash Water is generated from the washing of trucks, pumps, mixers and chutes, the cleaning out of an agitator bowl and the hosing down of the batch plant yard.

2.2.2 Re-use and Recycle

Concrete Wash Water is generally stored on-site at a concrete batch plant in settling ponds and tanks and is recycled into the concrete batching system. This process is advisable as it also reduces the requirement for clean mains water in the concrete batching process.

To assist with water management at a concrete batching plant CCAA has developed the *First Flush and Water Management Systems: Guide and Principles*, which is available by contacting your local CCAA office.

2.3 Liquid Wash Out/ Slurry

2.3.1 Definition

Liquid Wash Out is an unavoidable by-product of the concrete batching. The wash out slurry sinks to the bottom of settling ponds and tanks in concrete plants and is extremely difficult to pump and transfer. It is an alkaline material that is very difficult to re-use in the concrete batching process as it is not a consistent product and its re-use presents a number of technical and concrete performance issues.

Liquid Wash Out is classified as a liquid waste material. As such this waste must be transported by licensed contractors in specially designed "sucker-trucks" and disposed of at licensed facilities, attracting the waste and environment levy.

2.3.2 Re-use and Recycle

Liquid Wash Out can be stored in settling ponds, which are agitated to keep the material in a state of suspension. The Liquid Washout or Slurry is as such maintained in a liquid state. The water can then be pumped out and recycled back into the batching process, while leaving the majority of the alkaline cementitious material in the settling pond.

2.3.3 Disposal

If Liquid Wash Out cannot be kept in a state of suspension the material will collect at the bottom of the settling pond, requiring it to be pumped out and disposed of at a licensed facility.

It should be noted that there are only a few licensed facilities in NSW that are able to accept Liquid Wash Out waste.

To find a facility that is licensed to receive Liquid Wash Out visit the EPA's website at:

http://www.epa.nsw.gov.au/prpoeoapp/

This website will allow you to identify Licensed Facilities that have an Environmental Protection Licence to receive Liquid Waste by filtering for "Non-thermal treatment of hazardous and other waste" under the drop down list entitled "Fee-Based Activity".

The EPL for the proposed facility will also need to be reviewed to determine if this facility can receive liquid waste. This is most easily achieved by directly contacting the waste facility and confirming their ability to accept Liquid Wash Out waste or concrete slurry.

There is also a requirement for the load of Liquid Wash Out waste or concrete slurry to be tracked by the transporter and also for the transport to be licensed to transport liquid wastes.

2.3.4 Transform

The final option for dealing with Liquid Wash Out is to change it from a liquid waste to a solid waste. This is advisable as it increases the ease of handling the waste, increases the number of disposal sites licensed to accept the waste and also decreases transport costs and disposal fees.

One mechanism for transforming the waste from a liquid to a solid is to pump the slurry into dewatering tubes or geofabric bags. The synthetic dewatering tubes hold and contain the fine grains and material within the waste, while allowing the water to pass through its high-flow pores.

The water released from the tubes can be captured in the batch plant's settling ponds and re-used in the concrete batching process.

When the fine grains and material within the geofabric have sufficiently dried it can be removed from the tube and processed as a Solid Wash Out.

2.4 Solid Wash Out

2.4.1 Definition

Solid Wash Out has the consistency of clay and is returned concrete that has been washed out and dried. It is a mixture of aggregates and sand from the original concrete, and contains hydrated lime and other cementitious materials that cause alkalinity.

This material is typically taken out of washout pits, drained, dried, transported to quarries (refer to Section 4.4.3) or recycling centres and recovered for re-use.

2.4.2 Disposal

Solid Wash Out has been pre-classified as General Solid Waste (nonputrescible) under the EPA's Waste Classification Guidelines, which is available at:

http://www.epa.nsw.gov.au/resources/waste/091216classifywaste.pdf

Solid Wash Out does not require a licensed transporter and does not need to be tracked. However, if it is to be disposed of it does need to be transported to a licensed facility, although this will attract the waste and environment levy on each tonne of disposed material.

To find a facility that is licensed to receive Solid Wash Out visit the EPA's website at:

http://www.epa.nsw.gov.au/prpoeoapp/

On the website, click on the "Licences" option and under the dropdown menu entitled "Fee-Based Activity" select the filter entitled "Waste disposal by application to land" and press the search button.

This will provide you with a list of the Licensed Facilities that have an Environmental Protection Licence to receive solid wash out.

At the licensed facility Solid Wash Out is either re-processed into gravel and sand or is mixed with various other materials to become either road-base or another fill product. If re-used as fill or road-base the materials require an assessment against a resource recovery exemption.

2.4.3 Quarries

It is recommended that quarries accepting Solid Wash Out have the relevant approvals in their Environment Protection Licence (EPL) so that they may receive, store and process the Solid Wash Out. A site can apply to vary its EPL with the EPA. An EPL variation does not attract a financial cost and the forms are available on the EPA's website at:

http://www.epa.nsw.gov.au/licensing/licenceforms.htm

If your quarry is not licensed then the material must not be accepted by the quarry and must be transported to a licensed facility.

In the past, it has been a common practice to dispose of Solid Wash Out by returning the material to a quarry and mixing it in with a blast. This, however, is not an advisable technique for disposing of Solid Wash Out as the material has been processed and will impact on the extracted materials Virgin Excavated Natural Material (VENM) and Excavated Natural Material (ENM) classifications. If extracted materials cannot be classified as VENM or ENM then it greatly restricts where the material can be sold and how it can be utilised.

Section 3
Summary

The table below illustrates how each type of concrete by-products needs to be treated in NSW:

Summary of Concrete By-Product Recycling and Disposal in NSW

Type of Waste	EPA Classification	Recycling Options	Exemption for Land Application	Licenced Transporter & Tracking	Disposal at Licenced Facility
Hardened Returned Concrete	General Solid Waste (nonputrescible)	Concrete Batching Land Fill & Road-Base	√	x	√
Wash Water	Liquid Waste	Recycle into Concrete Batching Process			
Liquid Wash Out	Liquid Waste	Concrete Batching Keep Suspended Transform	x	√	√
Solid Wash Out	General Solid Waste (nonputrescible)	Concrete Batching Return to licenced quarry	√	x	√

Reference Material

The legislation and regulations administering waste in NSW are:

- Protection of the Environment Operations Act 1997
- Protection of the Environment Operations (Waste) Regulation 2005

There are a number of exemptions to the regulations that apply to the heavy construction materials industry, these are:

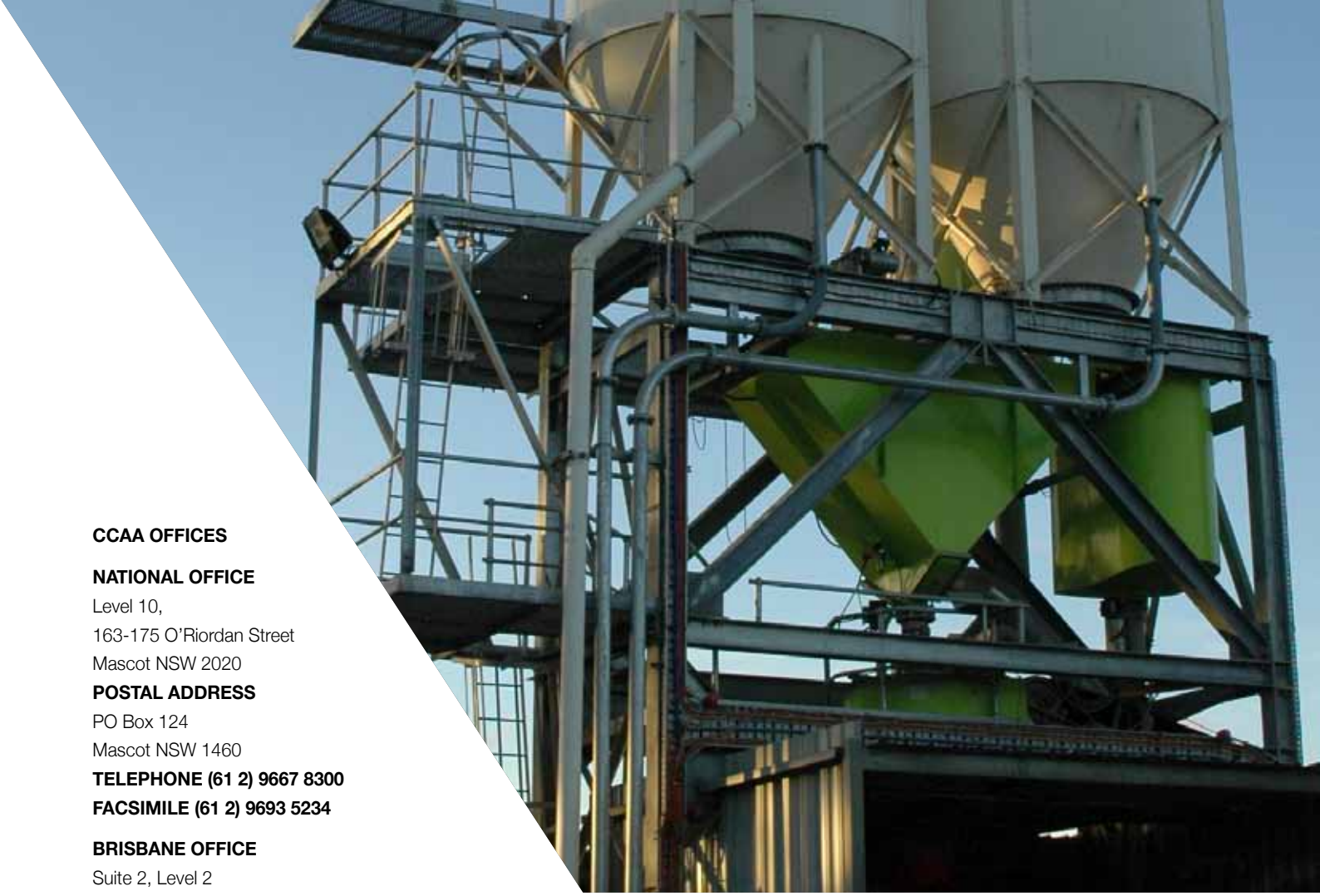
- Protection of the Environment Operations (Waste) Regulation 2005 – General Exemption Under Part 6, Clause 51 and 51A: The recovered aggregate exemption 2010
- Protection of the Environment Operations (Waste) Regulation 2005 – General Exemption Under Part 6, Clause 51 and 51A: The "batch process" recovered fines exemption September 2010
- Protection of the Environment Operations (Waste) Regulation 2005 – General Exemption Under Part 6, Clause 51 and 51A: The "continuous process" recovered fines exemption September 2010
- Protection of the Environment Operations (Waste) Regulation 2005 – General Exemption Under Part 6, Clause 51 and 51A: The excavated natural material exemption 2008
- Protection of the Environment Operations (Waste) Regulation 2005 – General Exemption Under Part 6, Clause 51 and 51A: The recovered glass sand exemption 2010
- Protection of the Environment Operations (Waste) Regulation 2005 – General Exemption Under Part 6, Clause 51 and 51A: The electric arc ladle furnace slag exemption 2011
- Protection of the Environment Operations (Waste) Regulation 2005 – General Exemption Under Part 6, Clause 51 and 51A: The steel furnace slag exemption 2010

The NSW Environment Protection Authority has also released a number of fact sheets and guides that impact on the industry, these are:

- EPA Fact Sheet: Resource recovery exemptions
- EPA Fact sheet: Virgin excavated natural material
- EPA Waste Classification Guidelines

The reference materials above can be accessed through the EPA's website, which is available at:

http://www.epa.nsw.gov.au/



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