

INDUSTRY ENVIRONMENTAL GUIDE FOR  
**CONCRETE  
BATCHING**

## **Acknowledgments**

Brisbane City Council would like to acknowledge the New South Wales Office of Environment and Heritage for their technical assistance in the development of this guide.

## **Please note**

This guide provides information relevant at the time of publication. While reasonable efforts have been made to ensure the contents are factually correct, Brisbane City Council does not accept responsibility for the accuracy or completeness of the contents and is not liable for any loss or damage that may occur directly or indirectly through the use of, or reliance on, the contents of this guide.

# Contents

<b>1</b>	About this guide .....	1-1
<b>2</b>	Priority actions for concrete batching .....	2-1
<b>3</b>	Cement and fly ash handling .....	3-1
<b>4</b>	Sand and aggregate handling .....	4-1
<b>5</b>	Batching, slumping and delivery .....	5-1
<b>6</b>	Water management .....	6-1
<b>7</b>	Storage of chemicals .....	7-1
<b>8</b>	Waste management, resource recovery and resource efficiency .....	8-1
<b>9</b>	Noise management .....	9-1
<b>10</b>	Environmental management systems .....	10-1
<b>11</b>	Useful tools .....	11-1
	Self-assessment checklist for concrete batching plants .....	11-1
	Daily and weekly checklists .....	11-4
	Useful contacts .....	11-5
	<b>Appendix 1</b> – Definitions .....	A1-1
	<b>Appendix 2</b> – Guidelines for a Transitional Environmental Program (TEP) .....	A2-1
	<b>References</b> .....	12

---

## Abbreviations

### DEHP

Department of Environment and Heritage Protection

### EMS

Environmental management system

### FFDC

Fabric filter dust collector

### NPI

National Pollutant Inventory

### QUU

Queensland Urban Utilities

### SDS

Safety data sheet/s

### TEP

Transitional Environmental Program

### VOCs

Volatile organic compounds

### WH&S

Workplace health and safety

### WMP

Waste management plan

# 1 About this guide

This guide is part of a series prepared by Brisbane City Council. Similar guides for other business sectors are available from Council's website [www.brisbane.qld.gov.au](http://www.brisbane.qld.gov.au) or by calling Council's Contact Centre on (07) 3403 8888.

## What is the purpose of this guide?

This industry environmental guide is not a statutory document and is not law. Instead, it offers advice to assist the concrete batching industry in Brisbane to:

- meet the requirements of the *Brisbane City Plan 2014* (City Plan) when building, upgrading, extending or altering a concrete batching plant
- meet the requirements of *Environmental Protection Act 1994*, administered by Brisbane City Council, when operating a concrete batching plant.

Concrete is the mainstay of Brisbane's construction industry. Concrete underpins the city's economic prosperity and continued growth. While concrete can be durable and sustainable, its production, if managed poorly, can damage creeks, rivers and ultimately, Moreton Bay, and affect surrounding communities.

Each section of this guide addresses a separate aspect of the concrete production process, from handling cement and fly ash to batching and dealing with waste. Sample checklists and contact lists at the end of the guide can be picked up and used immediately or tailored to suit individual businesses.

Businesses using this guide can be confident they are doing what is required to protect the environment and prevent an environmental incident.

## Who are the intended users of this guide?

- Businesses and individuals involved in building, upgrading, extending, altering or operating a concrete batching plant in Brisbane.
- Brisbane City Council officers involved in assessing development applications and conditioning development approvals under City Plan.
- Brisbane City Council officers involved in investigating environmental nuisance and minor water offences under the *Environmental Protection Act 1994*.



## What are the business benefits?

Good environmental management practices do more than preserve the natural environment – they can save businesses money. Minimising waste, increasing resource efficiency and recovery and adopting cleaner production methods have been shown to reduce operating costs.

Businesses with high environmental standards enjoy:

- an enhanced reputation
- the opportunity to be a supplier of choice to corporate and government clients who may consider the environmental performance of suppliers and products as part of green procurement policies
- a high level of employee satisfaction, retention and productivity.

Other benefits of a high level of environmental management include:

- reduced loss of materials
- reduced waste disposal costs
- reduced water and electricity costs
- a level playing field for pollution control across the industry, providing fairer competition for all companies in the market
- lower spill clean-up costs
- fewer disruptions to business operations
- reduced costs associated with complaints from the community
- reduced potential for litigation arising from pollution incidents.





## Building, upgrading, extending or altering a concrete batching plant

Building, upgrading, extending or altering a concrete batching plant may trigger the need for a development approval from Brisbane City Council under City Plan. Call Council's Contact Centre on (07) 3403 8888 for advice on whether a proposed development requires approval.

City Plan regulates development in the city. It requires industrial development to comply with performance-based assessment criteria contained in its 'codes'. One of the main codes that new concrete batching plant development must comply with is the Industry Code.

Overlays, also contained in City Plan (e.g. Flood Overlay) or neighbourhood plans, which direct development in local communities, may add additional requirements depending on the development's location.

The Industry Code includes assessment criteria for:

- air quality
- surface water and groundwater
- storing chemicals and fuels (technological hazards)
- noise.

An Air Quality Impact Report, prepared in accordance with the *Air Quality Planning Scheme Policy*, can assist in demonstrating achievement of the relevant criteria of the Industry Code. Alternatively, implementing the air quality and dust management standards contained in the *Concrete Batching Plants Planning Scheme Policy* may be used in lieu of an Air Quality Impact Report to demonstrate compliance.

The Industry Code also requires new concrete batching plant developments to be designed and constructed to prevent the emission of contaminants to surface water or groundwater. New developments can demonstrate compliance with this requirement by implementing the surface and groundwater protection standards contained in the *Concrete Batching Plants Planning Scheme Policy*.

The *Concrete Batching Plants Planning Scheme Policy* is optional, not mandatory. It provides one way of complying with required performance outcomes without the need for a technical report. Alternative approaches can be used where it is demonstrated they comply with the performance outcomes of the Industry Code.

Read the sections on **Cement and fly ash handling, Sand and aggregates handling and Batching, slumping and delivery** contained in this guide for information on how to apply the *Concrete Batching Plants Planning Scheme Policy* and the Industry Code. Additional relevant advice for new development can be found in the sections on **Storage of chemicals** and **Noise management**.



## Operating a concrete batching plant

Operators of concrete batching plants must comply with the *Environmental Protection Act 1994* (the Act). This law places a general environmental duty on individuals and companies to protect the environment and to take all reasonable and practical measures to prevent or minimise environmental harm and nuisance. Council regulates environmental nuisance and minor water offences from Brisbane businesses not licenced by the Queensland Government.

The Minister for Environment and Heritage Protection (DEHP) has approved an environmental code of practice for concrete batching to provide guidance to operators to help them comply with the *Environmental Protection Act 1994* by meeting their general environmental duty.

This guide does not replace the environmental code of practice but contains additional advice from Brisbane City Council on reasonable and practical pollution control measures for development applications and that operation can take to prevent or minimise environmental nuisance and minor water offences under the Act. Council officers will reference these measures when investigating environmental nuisance and minor water offences under the Act.

Environmental nuisance includes an unreasonable interference or likely interference with an environmental value caused by aerosols, fumes, light, noise, odour, particles or smoke. The environmental nuisance provisions of the Act can be viewed at the Queensland legislation website [www.legislation.qld.gov.au](http://www.legislation.qld.gov.au)

Minor water offences include unlawfully depositing a prescribed water contaminant in a waterway, roadside gutter or a stormwater drain or in a place and in a way so that the

contaminant could be reasonably expected to wash, blow or fall into a waterway, roadside gutter or stormwater drain.

Prescribed water contaminants include chemicals, sediment, cement, concrete, acids, alkalis, building materials, oil, petrol, radiator and engine coolant and paint. A complete list is contained in Schedule 9 of the *Environmental Protection Regulation 2008*, which can be viewed at [www.legislation.qld.gov.au](http://www.legislation.qld.gov.au)

---

If a business's infrastructure is not sufficient to prevent or minimise water pollution or environmental nuisance, well-developed and documented environmental protection practices and procedures can help it demonstrate compliance with the general environmental duty. If practices and procedures cannot adequately demonstrate compliance with the general environmental duty of the Act, the facilities may need upgrading.

---





## Penalties for environmental offences

Environmental offences can lead to fines of up to \$500,000 and ruin a business' reputation.<sup>1</sup>

Everyone involved in the business is responsible for adhering to environmental laws, from managers through to supervisors and subcontractors. Managers and directors can be directly prosecuted for an offence and even face jail. Lack of knowledge is no defence – they must either demonstrate due diligence was exercised to prevent the offence or that they could not influence the conduct of their company.

In court, the prosecutor may not have to prove that an individual or organisation intended to cause the environmental nuisance or harm. Even accidents caused by negligence can result in fines and prosecution.

Penalties include:

- on-the-spot fines of more than \$1000 for an individual or several thousand dollars for a company for minor noise, air or water breaches of the Act
- up to \$70,000 or more for individuals found guilty of causing environmental harm and \$250,000 or more for companies guilty of the same offence
- up to \$500,000 and/or up to five years' jail for the most serious offences such as wilful breaches of the law that harm or are likely to harm the environment.

<sup>1</sup> ABC News, 'Concrete plant fined over stormwater pollution', 23 November 2010, [www.abc.net.au/news/2010-11-23/concrete-plant-fined-over-stormwater-pollution/2347094](http://www.abc.net.au/news/2010-11-23/concrete-plant-fined-over-stormwater-pollution/2347094)

## Other issues to consider

### Reporting incidents that may harm the environment

If a pollution incident occurs and it causes or threatens harm to the environment, by law the appropriate regulatory authority must be notified as soon as the incident is made known. This duty to notify pollution incidents extends to employers, the person carrying out the activity, employees, occupiers, contractors and agents.

For more information call Brisbane City Council on (07) 3403 8888 or visit [www.brisbane.qld.gov.au](http://www.brisbane.qld.gov.au)

### Reporting land contamination

The Department of Environment and Heritage Protection must be notified if a business causes land contamination. This duty to notify falls on the owner of the property and on the person whose activities have caused the contamination.

For more information call the Department of Environment and Heritage Protection on 1300 130 372 or refer to [www.ehp.qld.gov.au](http://www.ehp.qld.gov.au)

### Notifiable activities

Some industrial activities that have the potential to contaminate land are defined as notifiable activities under the *Environmental Protection Act 1994*. The owner or the occupier of the notifiable activity must notify the Department of Environment and Heritage Protection of the location. The Department records notifiable activities on the Queensland Environmental Management Register.

For more information call the Department of Environment and Heritage Protection on 1300 130 372 or refer to [www.ehp.qld.gov.au](http://www.ehp.qld.gov.au)

## National Pollutant Inventory (NPI)

The *National Environment Protection (National Pollution Inventory) Measure 1998* requires certain industries to report their emissions via the National Pollutant Inventory (NPI).

For more information call the Department of Environment and Heritage Protection on 1300 130 372 or refer to [www.ehp.qld.gov.au](http://www.ehp.qld.gov.au)

## Regulated wastes

Some wastes removed from a business such as oil, chemicals or contaminated water are defined as regulated waste under the *Environmental Protection Act 1994*. Regulated waste must be removed by a licensed waste transporter and records of removal kept on site.

For more information call the Department of Environment and Heritage Protection on 1300 130 372 or refer to [www.ehp.qld.gov.au](http://www.ehp.qld.gov.au)

## Trade waste

The release of waste by a business in Brisbane into the sewerage system may require a permit from Queensland Urban Utilities.

For more information call Queensland Urban Utilities on 13 26 57 or refer to [www.urbanutilities.com.au](http://www.urbanutilities.com.au)

# 2 Priority actions for concrete batching

This short summary outlines the most important actions businesses can take at each stage of the concrete production process to protect the environment and surrounding community. These are explored in greater detail within individual chapters.



## Cement and fly ash handling

- Keep cement and fly ash out of stormwater drains and waterways.
- Prevent storage silos from overflowing with an automatic shutdown switch.
- Use equipment such as a reverse pulse filter to control dust from storage silos.
- Install an emergency shutdown on storage silos to prevent spills.



## Sand and aggregate handling

- Dampen materials being delivered to control dust.
- Shield stockpiles from the wind or store them in bins.
- Enclose or cover conveyors and fit them with belt cleaners.
- Clean up spilt material immediately to prevent contamination of waterways.



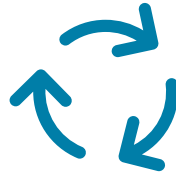
## Batching, slumping and delivery

- Roof and enclose truck loading bays.
- Install dust control equipment at loading bays.
- Use recycled water for slumping.
- Use wheel-wash facilities to stop the spread of waterway contaminants.



## Water management

- Minimise and recycle wastewater.
- Separate contaminated wastewater and clean stormwater.
- Design the 'first-flush' collection pit for contaminated water so it is large enough for the contaminated catchment area.
- Collect, treat and process wastewater onsite.



## Waste management, resource recovery and resource efficiency

- Reduce waste to maximise cost savings.
- Recycle returned concrete where possible.
- Prepare a waste management plan.
- Maximise aggregate reclamation where possible.



## Environmental management systems

- Develop an environmental policy to guide business operations.
- Create an environmental action plan outlining ways to manage risks.
- Conduct risk assessments of possible hazards.
- Document pollution prevention



## Storage of chemicals

- Order and store chemicals in the smallest quantities possible.
- Store chemicals (including admixtures) and fuel within a bunded, covered and signed area.
- Always clearly label all chemicals and keep safety data sheets.
- Prepare a spill response plan and keep clean-up equipment close to chemical and fuel storage areas.



## Noise management

- Limit noise at night and in the early morning.
- Use broadband reversing alarms on trucks and front-end loaders.
- Enclose stationary noise sources such as compressors, motors and pumps.
- Use acoustic screens or barriers around noise sources such as aggregate loading bins, truck loading bays or slumping stands.

# 3 Cement and fly ash handling

## Environmental impacts

Cement and fly ash needs to be kept out of stormwater drains, creeks and other waterways as they are prescribed water contaminants that can kill aquatic plants and animals, degrade Moreton Bay and impact on recreational boating, fishing and swimming.

Cement and fly ash contaminate waterways because they:

- have a high pH
- contain a range of toxic heavy metals
- create a fine, suffocating layer of sediment on the banks or beds of waterways
- increase the turbidity – or cloudiness – of waterways.

Increased turbidity reduces the light entering aquatic environments. This slows photosynthesis by plants and reduces the visibility of aquatic organisms. Turbidity can also clog fish gills, smother plants and bottom-feeding organisms and generally decrease the amenity of an area.

Concrete batching plants must be designed and operated to prevent cement and fly ash from being blown, swept, hosed or left to be washed by rain into gutters or the stormwater system.<sup>2</sup>

Wind-blown cement and fly ash can cause an environmental (dust) nuisance by affecting the health and well-being of residents and damaging property such as vehicles.

## Cement and fly ash delivery

Cement and fly ash needs to be stored in sealed, dust-tight silos. All hatches, inspection points and duct work should be dust-tight.

Cement and fly ash should be delivered in sealed vehicles equipped for pneumatic transfer to the storage silos.

The silo delivery pipes need to be made of material able to withstand the effects of cement and fly ash. The pipes should be clearly labelled with the silo identification and material stored inside the silo. Pipes should be kept locked (except when a delivery is in progress) to prevent the accidental spillage of cement or fly ash.

The silo delivery pipe should be fitted with a butterfly or pinch valve, or similar, that enables 'tight shut-off' to prevent cement or fly ash dust escaping. The valve should be made of wear-resistant materials and be able to withstand products delivered at a high velocity. The valve should be less than one metre above the fill point to minimise the spillage of cement or fly ash.<sup>3</sup>

Any cement or fly ash spills during delivery need to be cleaned up as soon as possible to minimise the risk of water contamination and dust emissions. This should be documented in spill clean-up procedures. Collecting and recycling the spilt cement and fly ash for re-use can reduce waste.

For more information refer to Cement Concrete & Aggregates Australia, *Guidelines for Delivery of Bulk Cementitious Products to Premixed Concrete Plants*, May 2007. [www.concrete.net.au](http://www.concrete.net.au)

<sup>2</sup> Section 440ZG *Environmental Protection Act 1994*.

<sup>3</sup> Environmental Protection Authority, *Environmental Guidelines for the Concrete Batching Industry*, State Government of Victoria, June 1998, p11.



It is important to provide spill clean-up equipment at all delivery points to enable the fast and effective clean-up of spilt cement or fly ash. The equipment needs to be accessible and unobstructed at all times.



Spill kit station.

## Silo overfill protection

Overfilling a cement or fly ash silo can release large volumes of dust into the air, which can affect properties significant distances from the site. Storage silos should be equipped with a high-level sensor alarm and an automatic delivery shut-down switch to prevent the silo from overfilling.

Ensure the high-level sensor alarm is set at a point that prevents the silo from overfilling. The following points should be considered when setting the alarm:

- silo profile
- maximum fill rate
- response time of the shut-down system
- volume of delivery vehicles.

An automatic shut-down switch is also required to minimise spillage and dust. It should be able to stop the flow of cement to the silo within 60 seconds of the high-level alarm's activation.

The silo over-fill protection system should incorporate a 30 minute reset time delay.

The high-level alarm should be audible or, in areas sensitive to noise, visual only.

There should be a circuit to test the operation of the alarm sensor within easy access to the delivery driver. The system should be tested before every delivery of cement or fly ash to the silo.

A relief valve for a cement or fly ash storage silo must be designed to automatically prevent the level of cement or fly ash in the silo rising above the high-level alarm fill point.

For more information refer to Cement Concrete & Aggregates Australia, *Guidelines for the Maintenance and Upkeep of Silo Over-pressurisation Systems*, June 2012.

[www.concrete.net.au](http://www.concrete.net.au)



## Silo dust control equipment

Cement storage silos need to be fitted with equipment to minimise dust emissions from the silo. A reverse pulse fabric filter dust collector (FFDC) or other dust control technology with an equivalent or better performance is recommended for storage silos.

Whichever technology is employed, it needs to be maintained in accordance with the manufacturer's instructions to ensure adequate and efficient performance. Maintenance procedures and schedules should be documented for the site.

Actions that can be taken to ensure the effective dust control performance of FFDCs are:

- The FFDC should be sized so that the dust collector bags are not subject to clogging. An appropriately sized multibag reverse pulse jet filter should be installed in the silo, fitted and used in accordance with the manufacturer's recommendations. The cloth area of the filter needs to be adequate for the displaced air volume.
- The FFDC should be completely protected from the weather.

- The FFDC should be made of a material that can withstand continuous exposure to cement.
- The filter elements should be cleaned automatically at the end of the silo filling cycle.
- A source of high-pressure air, free of moisture and oil, is required to operate the filters effectively.
- The FFDC should be able to withstand the maximum pressure differential that may be encountered. A differential pressure indicator should be fitted to an alarm to indicate bag filter pressure according to manufacturer's specifications.<sup>4</sup>
- Silos should be protected against internal pressures exceeding the design pressure. Positive relief valves or similar, set at appropriate pressures, should be installed. The relief valve should be ducted to a container on the ground that is able to collect dust particles.
- The exhaust air from the silo filters should be ducted to a dust collection container on the ground. Ensure the exhaust discharge points are visible and can be monitored by the driver during silo filling operations. If dust is discharged from the duct work, the driver must immediately stop filling the silo. This procedure should be documented for the site.
- Burst bag detectors are recommended to reduce dust emissions from silos. Burst bag detectors may be connected to an automatic silo overflow protection circuit to stop the flow of cement if a filter bag bursts.
- The FFDC should be visually inspected at least once a week and any necessary repairs carried out immediately. This procedure should be documented for the site.

## Cement and fly ash silo discharge

Cement and fly ash silo discharge points can release dust and should be controlled by an on/off valve, generally fitted above the weigh hopper. The control valve should be open air sprung to close on failure of air pressure or electric power.

The control valve should be fitted before (upstream of) any flexible joints in the pipe line and as close as possible to the silo outlet point at the base of the silo cone.

<sup>4</sup> Environmental Protection Authority, *Environmental Guidelines for the Concrete Batching Industry*, State Government of Victoria, June 1998, p11.



Silo delivery pipes.

This ensures that product can be stopped if a flexible joint fails. All flexible connections between the silo and the weigh hoppers should be sleeved in metal.

Any cement or fly ash spills during discharge need to be cleaned up as soon as possible to minimise the risk of water contamination and dust emissions. This should be documented in spill clean-up procedures.

It is important to provide spill clean-up equipment at all cement and fly ash discharge points to enable the fast and effective treatment of spilt cement or fly ash. The equipment needs to be accessible and unobstructed at all times.

### Silo discharge emergency shut down

The discharge point of cement or fly ash silos needs to be fitted with an emergency shut-down valve to stop the flow of cement if an emergency occurs, such as a breach in a flexible joint or failure of the discharge valve. The emergency shut-down valve should be similar in location and design to the silo discharge valve.

The plant operator should be able to shut down product discharge by using an override button located inside the control room. The two systems working in tandem provide extra security from accidental discharge. The emergency shut-down procedures should be documented.

### Cement and fly ash weigh hoppers

Cement and fly ash weigh hoppers need to be totally enclosed and fitted with a dedicated FFDC, or equivalent dust control device, to ensure dust cannot escape into the atmosphere.

The weigh hopper also needs to be protected against overfilling by installing an alarm probe at the top of the hopper to automatically shut down the product delivery system to the weigh hopper.

## Inspection and maintenance program

Concrete batching plants should have a documented inspection and maintenance program for cement and fly ash handling facilities. An inspection of all the dust-control components should be performed routinely, at least weekly. This will help identify and prevent any potential problems such as leaks or spills before they occur.

Using a checklist that includes suggested measures from this guide may be helpful in documenting inspection and maintenance procedures. This guide contains a sample checklist that can be used as the basis for a routine inspection program.

Documenting inspection and maintenance procedures for pollution control equipment, training staff in the procedures and undertaking a regular and effective site-specific inspection and reporting program can greatly assist a business in demonstrating compliance with the general environmental duty of the *Environmental Protection Act 1994*.



Weigh hoppers.

# 4 Sand and aggregates handling

## Environmental impacts

Sand and aggregates need to be kept out of stormwater drains, creeks and other waterways as they are prescribed water contaminants that can degrade or destroy aquatic habitats.

Concrete batching plants must be designed and operated to prevent dust and aggregates from being blown, swept, hosed or left to be washed by rain into gutters or the stormwater system.<sup>5</sup>

Sand, aggregates and dust particles harm aquatic life by increasing turbidity and creating a fine, suffocating layer of sediment on the banks or beds of waterways. If fine dust particles enter nearby homes or business they can cause an environmental (dust) nuisance and damage property.

It is important to prevent or minimise dust emissions from sand and aggregate handling at all stages of the process from stockpiling to transferring raw materials.

## Dust emission sources

Potential sources of dust pollution include:

- delivery of raw materials in trucks, trailers and tankers
- storage of raw materials in bunkers and stockpiles
- transfer of raw materials by front-end loaders, conveyors, hoppers and agitators
- vehicular traffic within the facility.

The best way to avoid or minimise dust leaving concrete batching plants is through good design, maintenance and operating practices.

## Sand and aggregates stockpiles

Sand and aggregates should be delivered in a dampened state, using covered trucks. If the materials have dried out during transit they should be dampened again before being dumped into the storage bin to minimise dust emissions during loading.

Sand and aggregates should be stored in a bin (hopper or bunker) that shields the materials from winds. Storage bins can be above or below-ground.

Above-ground storage bins should enclose the stockpile on three sides and be roofed or have another means in place to reduce dust emissions.

The walls should extend 0.5 metre above the height of the maximum quantity of raw material kept on site and one metre beyond the front of the stockpile to minimise wind-blown dust.<sup>6</sup>

If the storage bin is not roofed it should be fitted with water sprays to keep the stored material damp at all times.



Aggregate bins.

<sup>5</sup> Section 440ZG *Environmental Protection Act 1994*.

<sup>6</sup> Environmental Protection Authority, *Environmental Guidelines for the Concrete Batching Industry*, State Government of Victoria, June 1998, p10.



The water content of the stockpile should be routinely monitored to ensure it is maintained in a damp condition. This should be documented in site maintenance procedures.

In-ground storage bunkers are an effective way to minimise dust emissions from bulk stored sand and aggregates. Where these are filled by drive-over deliveries, the bunker should be shielded on two sides by shrouds or walls that are at least 0.5 metres high, extend the entire length of the bunker, and are fitted with water sprayers to reduce dust emissions during loading.

It is still essential to ensure the raw materials are damp before they are loaded into the in-ground bunkers.

## Overhead bins

Overhead storage bins should be enclosed to minimise dust emissions.

The loading and dispatch points, including the swivel chute area, of overhead storage bins also need to be enclosed or fitted with water sprayers to minimise wind-blown dust.

Where water sprayers are used they should be able to be automatically activated before loading or dispatching sand or aggregates at the overhead storage bin.

Rubber curtain seals are one way of protecting the opening of the overhead bin from winds.

## Conveyer belt and raw material transfer

Above-ground conveyer belts used to transfer raw material should be covered or enclosed to ensure dust is not blown from the conveyer during transit.

Conveyer loading and discharge points should be fully enclosed. Double rubber curtain seals or the like are recommended for transfer point outlets to prevent dust emissions.

Conveyer belts should be fitted with belt cleaners on the return side of the belt. It is important that any raw material collected by the belt cleaners is contained in a way that prevents dust emissions.

## Aggregate weigh bins

Aggregate weigh bins or hoppers at plants where front-end loaders are used should be shrouded on three sides and roofed to minimise wind-blown dust during storage, loading and dispatch.

Keeping the raw materials damp is one way of minimising dust emissions where front-end loaders are used to transfer sand and aggregates.

## Cleaning up spilt material

It is important to clean up spilt sand and aggregates immediately to prevent it being washed into stormwater drains, being blown off-site or being tracked off-site by vehicle movement.

Clean-up equipment needs to be kept close to sand and aggregate storage and transfer areas and clean-up procedures need to be documented.

## Inspection and maintenance program

Concrete batching plants should have a documented inspection and maintenance program for sand and aggregate handling facilities. An inspection of all the dust control components should be performed routinely, at least weekly. This will help identify and prevent any potential problems, such as leaks or spills, before they occur.

Using a checklist that includes suggested measures from this guide may help in documenting inspection and maintenance procedures. This guide contains a sample checklist that can be used as the basis for a routine inspection program.

Documenting inspection and maintenance procedures for pollution control equipment, training staff in the procedures and undertaking a regular and effective site-specific inspection and reporting program can greatly assist in demonstrating compliance with the general environmental duty of the *Environmental Protection Act 1994*.

# 5 Batching, slumping and delivery

## Environmental impacts

Concrete and its constituents need to be kept out of stormwater drains, creeks and other waterways as they are prescribed water contaminants that can kill aquatic plants and animals, degrade Moreton Bay and impact on recreational boating, fishing and swimming.

Cement and other constituents of concrete contaminate waterways because they:

- have a high pH
- may contain a range of toxic heavy metals
- create a layer of sediment on the banks or beds of waterways
- increase the turbidity – or cloudiness – of waterways.

Increased turbidity reduces the light entering aquatic environments. This slows photosynthesis by plants and reduces the visibility of aquatic organisms.

Fine sediment can also clog fish gills, smother plants and bottom-feeding organisms and generally decrease the amenity of an area.

Concrete batching plants must be designed and operated to prevent cement, concrete, fly ash, sand and aggregates from being blown, swept, hosed or left to be washed by rain into gutters or the stormwater system.<sup>7</sup>



Slump stand.

<sup>7</sup> Section 440ZG Environmental Protection Act 1994.



Wind-blown cement and fly ash can also cause an environmental (dust) nuisance by affecting the health and well-being of residents and damaging property such as vehicles.

## Truck loading bay

The truck loading bay is a potential source of dust and water pollution.

Raw materials should be loaded into the truck agitators by either a telescopic chute (preferred) or a flexible sleeve to prevent spillage. Spillage can also be avoided by putting in place measures to ensure truck agitators are not overfilled.

The chute or sleeve needs to be long enough to enter agitator hatches. Where flexible sleeves are used they should be made of material capable of withstanding continuous exposure to concrete ingredients such as cement, fly ash and abrasive aggregates.

It is important to put measures in place to prevent dust particles being released from the loading point. Install water sprays in the perimeter of the load point and set them to start automatically whenever a batch is discharged. Alternatively, a mechanical dust extraction system can be fitted at the load point.

Dust emissions from loading trucks can also be minimised by roofing the loading bay and enclosing it on at least two sides. This will also prevent rainwater from washing spilt raw materials into the stormwater system.

Flexible doors fitted to the open sides of the loading bay are a good additional measure to control dust and water pollution. A drive-through type loading bay with flexible doors at the entrance and exit is recommended.

Spilt cement, fly ash, sand or aggregates in the loading bay needs to be cleaned up as soon

as possible to prevent it being tracked out on vehicle wheels and washed into the stormwater system or deposited on the roadway. This should be documented in spill clean-up procedures.

---

It is important to provide spill clean-up equipment at the loading bay to enable the fast and effective clean up of spilt cement, fly ash or other materials. The equipment should be accessible and unobstructed at all times.

---





Slump stand.

## Slumping

New slump stands and bays – and their wheel-wash facilities – should be connected to the water management system (see **Water management** section) to prevent contaminants such as spilt cement, aggregate or concrete slurry from entering stormwater drains.

It is important to design slump stands to avoid trucks driving through slurry water generated by wash-downs.

New batching plants should be designed to enable recycled water from the water management system to be used for slumping.



Wheel wash.

## Transport and delivery

New concrete batching plants need to have wheel-wash facilities to prevent contaminants from being tracked out of the site on truck tyres on to the street, where they can be washed into stormwater drains.

All trucks should be provided with spill kits to cover clean-up needs in transit. Spills during transit need to be cleaned up immediately to prevent contaminants entering stormwater drains or waterways.

Spills that enter a waterway need to be reported to Brisbane City Council on (07) 3403 8888.

Truck agitators and chutes should only be washed out at a dedicated facility at the delivery site or at a washout facility connected to the water management system at the concrete batching plant (see **Water management** section).

Educate drivers on their environmental responsibilities. Drivers should be aware of clean-up procedures after spills and washing procedures after deliveries. Training and procedures should be documented.

## Inspection and maintenance program

Concrete batching plants should have a documented inspection and maintenance program for batching and slumping facilities. An inspection of all the dust and water-pollution control components should be performed routinely, at least weekly. This will help identify and prevent any potential problems such as leaks or spills before they occur.

Using a checklist that includes the suggested measures from this guide may be helpful in documenting inspection and maintenance procedures. This guide contains a sample checklist that can be used as the basis for a routine inspection program.

Documenting inspection and maintenance procedures for pollution control equipment, training staff in the procedures and undertaking a regular and effective site-specific inspection and reporting program can greatly assist in demonstrating compliance with the general environmental duty of the *Environmental Protection Act 1994*.

# 6 Water management

## Environmental impacts

Wastewater from concrete batching plants may contain potential pollutants such as cement, sand and aggregates that can kill aquatic plants and animals, degrade Moreton Bay and impact on recreational boating, fishing and swimming.

These substances can harm the environment by:

- increasing soil and water pH
- increasing the turbidity – or cloudiness – of waterways
- acting as a transfer medium for heavy metals and hydrocarbons to waterways.

Increased turbidity reduces the light entering aquatic environments. This slows photosynthesis by plants and reduces the visibility of aquatic organisms. Fine sediment can also clog fish gills, smother plants and bottom-feeding organisms and generally decrease the amenity of an area.



## Water management principles

To avoid degrading local water quality, concrete batching plants should:

- minimise wastewater
- recycle wastewater that is generated.

New concrete batching plants can be designed to achieve these two principles by:

- minimising the area of the site that generates contaminated water
- providing separate, dedicated drainage systems for contaminated and clean stormwater and including a 'first-flush' system
- collecting contaminated stormwater and processing and recycling wastewater.

Reduce the risk of stormwater contamination by preventing and cleaning up any spillages or dust accumulation.

## Wastewater generation

Concrete batching plants produce wastewater from:

- contaminated stormwater runoff
- dust control sprinklers
- agitator washout stations
- agitator charging stations
- slumping stations
- truck wheel washes
- vehicle wash-down areas.
- truck washing area
- concrete batching area
- wheel wash area
- any other area that may generate stormwater contaminated with cement dust, fly ash, sand or aggregates.

New concrete batching plants should be designed to minimise the areas that are contaminated with cement dust, fly ash or other materials, as these areas have the potential to generate contaminated stormwater runoff when it rains.

Clean stormwater runoff, such as runoff from office buildings and staff car parks, should be separated from contaminated stormwater so it does not add to the volume of wastewater needing management. Separate drains should be provided for clean stormwater runoff.

All contaminated stormwater and process wastewater should be collected, retained onsite and treated or removed by an approved contractor. It should not be discharged off-site.

Areas that generate wastewater or contaminated stormwater need to have a concrete surface and be designed and graded so that all contaminated water runs to a collection and treatment system.

Specific areas that should be concrete paved and graded to the wastewater collection and treatment system include:

## Wastewater collection and treatment system

Concrete batching plants require a wastewater collection and treatment system to capture contaminated process water and stormwater. This prevents and minimises contaminated water entering off-site stormwater drains, creeks or other waterways.

Wastewater collection and treatment systems should incorporate the features below.

- The system should have a storage capacity sufficient to hold stormwater runoff from the contaminated operational areas of the site generated by 20 mm of rain over 24 hours.
- Contaminated water from the site should be diverted to a first-flush collection pit and then pumped to a storage tank for recycling.
- An outlet (overflow drain) one metre upstream of the collection pit should divert excess rainwater from the operational area when the pit fills due to heavy rain (e.g. more than 20 mm of rain over 24 hours).<sup>8</sup>
- Settlement ponds for wash-down water should contain a sloping sludge interceptor to separate water and sediments. The sloping surface enables easier removal of sludge and sediments.

<sup>8</sup> Environmental Protection Authority, *Environmental Guidelines for the Concrete Batching Industry*, State Government of Victoria, June 1998, p8.

- Wastewater should be pumped from the settlement ponds to a recycling tank. The ponds should have a primary pump triggered by a float switch and a backup pump that automatically activates if the primary pump fails. The pump should be mounted on a permanent structure raised from the ground inside the pond so that it does not pump out settled sludge and sediments.
- Wastewater stored in the recycling tank needs to be reused at the earliest possible opportunity. Ideally, depending on production, the plant is able to use the full reserve storage capacity of the wastewater collection and treatment system within 72 hours of a downpour. This will

restore the system's storage capacity, making it ready to handle wastewater generated by any subsequent rain. It also prevents the risk of wastewater overflowing to off-site stormwater drains or waterways. If the water level exceeds the capacity of the recycling tank, the wastewater will need to be removed by a waste management contractor. The recycled water can be used for most operations onsite.

---

**Brisbane City Council must be notified if wastewater is discharged directly to off-site stormwater drains or waterways within 24 hours of the occurrence.**

---

## Inspection and maintenance program

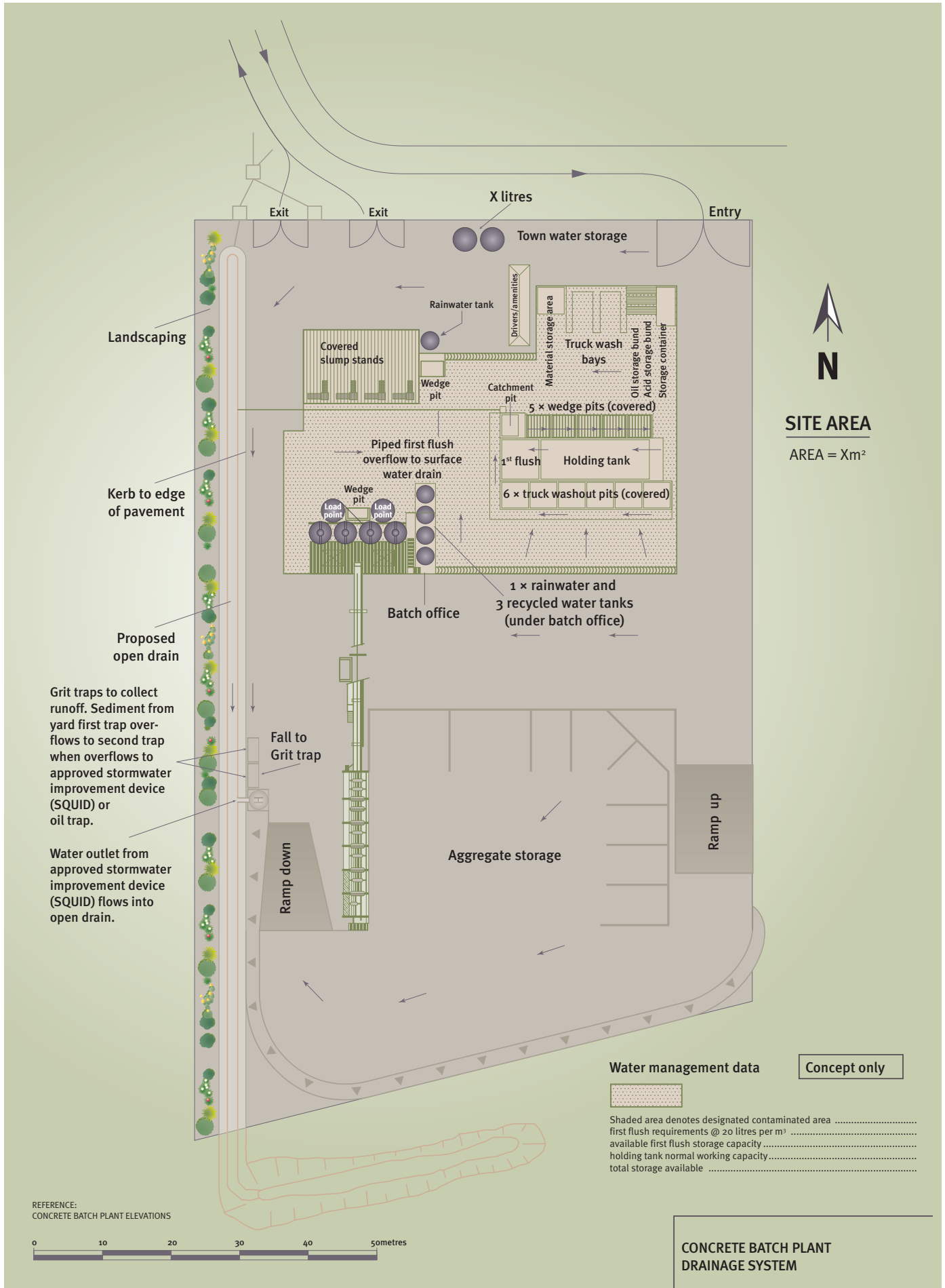
Concrete batching plants should have a documented inspection and maintenance program for their water collection and treatment system. An inspection of all the water pollution control components should be performed routinely, at least weekly. This will help identify and prevent any potential problems such as leaks or spills before they occur.

Using a checklist that includes the suggested measures from this guide may be helpful in documenting inspection and maintenance procedures. This guide contains a sample checklist that can be used as the basis for a routine inspection program.

Documenting inspection and maintenance procedures for pollution control equipment, training staff in the procedures and undertaking a regular and effective site-specific inspection and reporting program can greatly assist in demonstrating compliance with the general environmental duty of the *Environmental Protection Act 1994*.



# Diagrammatic example of a waste water collection and treatment system





# 7 Storage of chemicals

## Environmental impacts

Fuels and chemicals including concrete admixtures need to be kept out of stormwater drains, creeks and other waterways as they are prescribed water contaminants that are harmful to the natural environment and human health.

Contaminants that enter stormwater drains can pollute waterways, accumulate in the environment, kill aquatic life and degrade recreational swimming and fishing areas. These contaminants can be passed up the food chain to humans.

Chemicals and fuels also need to be prevented from soaking into the ground where they can accumulate in the soil and potentially seep into and degrade waterways or groundwater.

Concrete batching plants should be designed and operated to ensure chemicals and fuels are stored safely. This will contain leaks and spills and prevent these substances entering stormwater drains or waterways.

Fuels and some chemicals also pose fire and workplace health and safety risks. Fire prevention and worker safety are important considerations that need to be integrated into the storage, use and disposal of chemicals.

---

Workplace Health and Safety Queensland publish a range of useful guides to assist in addressing these issues. Go to [www.worksafe.qld.gov.au](http://www.worksafe.qld.gov.au)

---

Firewater contaminated with chemicals must be prevented from running into off-site stormwater drains or waterways. Polluted firewater can have acute and long-term impacts on natural habitats and can be very expensive to remediate.

## Storage quantities

Chemicals should be ordered in the smallest practical quantity for the application and within all regulated storage quantity limitations. Do not let surplus chemicals accumulate indefinitely. If there is no likelihood of their use, they should be scheduled for disposal.

---

This guide primarily focuses on ways to store and handle small quantities of chemicals. Storing larger quantities may require additional precautions in order to comply with the *Environmental Protection Act 1994* and the *Work Health and Safety Act 2011*. For example, chemicals may need to be stored in approved cabinets or package stores constructed in compliance with Australian Standards for specific classes of dangerous goods. Check the requirements at [www.worksafe.qld.gov.au](http://www.worksafe.qld.gov.au)

---





## Storage areas for chemicals

Chemicals, including waste chemicals, should be stored in a dedicated, bunded area or compound that is capable of retaining any spilt liquids.

These storage areas should be labelled with details of what can be stored in them. Fit relevant warning signs at access points to dedicated stores.

Structurally, a good chemical storage area should have:

- good ventilation, such as vents in the walls, ceiling, or open windows, to keep the store cool and prevent the build-up of fumes or gases that may affect the health of workers or cause a risk of explosion
- solid walls and roof to protect the contents of the store from wind and rain
- good lighting
- separate shelving or individual cabinets for storing items that should not be stored together
- security against unauthorised access.

The bunding should incorporate the design features listed below.

- It should be liquid-tight and chemically-resistant for the type of liquid contained (some chemicals can permeate concrete and brick and dissolve seals and joints). Bunding is commonly built from solid concrete or brick walls treated to be liquid-tight.
- While bunding can generally be constructed in position, commercial pallet bunding units can be used for minor chemical storage needs.
- Bunded areas need to be large enough to hold the contents of the largest container stored inside the bund plus 25% of its volume.
- Containers should be set back from the edge of the bund.
- Splash shields can be used to deflect any leaks. Where used they should be non-combustible, chemically resistant to the goods stored and positioned to prevent punctured container flow out of the bund.
- If workshop walls and floor are well sealed, the storage area can be bunded with a small concrete lip across all doorways. Ensure the bund is marked well so it does not become a trip hazard.
- All bunds need to be regularly maintained, checked for cracks and leaks, and kept free of unnecessary materials.
- Drain and pump-out valves need to be locked in the closed position.
- Outdoor bunded areas need to be roofed and isolated from stormwater runoff to prevent rain entering the area and causing pollutants to overflow or metal drums to rust.

## Handling of chemicals

Good chemical management and handling practices reduce the risk of a spill or contamination.

- Keep an up-to-date list of the types and volumes of chemicals being stored. All chemicals should be quickly identifiable.
- Ensure all containers of hazardous chemicals are clearly labelled with details of what they contain and any hazard they pose. Containers need to be properly labelled from the time they come onto the premises to when they are removed for disposal.

Labels on chemical products help to identify the product, its ingredients, and hazards or dangers. They also contain important health and safety information.

Most manufactured chemicals come labelled with details on:

- the name of the chemical
  - ingredients and their concentration (strength)
  - information about hazards associated with the chemical
  - emergency information (safety and environmental advice)
  - name of the manufacturer
  - date of manufacture.
- Make sure staff read the labels on all the chemical products they use and are adequately trained in their use.

### Safety data sheets (SDS)

A SDS is an information sheet about the safe handling, storage, transport and disposal of a material. Refer to a chemical's SDS to find out:

- the name of the chemical and its product code
- key ingredients
- physical description and properties
- hazard information
- how to store the chemical
- how to handle the chemical and what personal protective equipment may be required
- what to do in case of an emergency such as a spill.

The information on the SDS can save lives in an emergency. When chemicals are received, complete the following steps.

- Check that every chemical product purchased or used comes with an SDS. If the SDS is missing, source it from the supplier.
- Make the SDS register readily accessible and up-to-date.
- Train staff on the safe use of all chemicals and ensure they read the labels of all chemical products they use.

The Workplace Health and Safety Queensland website also has some useful publications on managing chemical hazards in the workplace. See [www.worksafe.qld.gov.au](http://www.worksafe.qld.gov.au)

## Segregation of chemicals

Chemicals belong to specific categories and must be stored, segregated or separated according to their compatibility. This ensures they cannot accidentally come into contact with each other and cause a reaction such as a fire, explosion or release of toxic or flammable gases or vapours. Always check the label or refer to the SDS to confirm which category a chemical belongs to and its compatibility. There are several common categories, outlined below.



### Flammable chemicals

Chemicals such as petrol, ethanol, kerosene, turpentine and many solvents are highly flammable and need to be kept away from heat and substances that might cause them to ignite or explode. Flammable chemicals are best stored in a cupboard or cabinet that has been specially designed for them. See *Australian Standard AS1940: The storage and handling of flammable and combustible liquids* for specific storage and handling requirements.



### Oxidising substances

Oxidising chemicals quickly and easily react with other chemicals. They should only be stored with other oxidising chemicals. Examples are calcium hypochlorite (swimming pool chlorine), sodium peroxide and methyl ethyl ketone peroxides (MEKP). See *Australian Standard AS4326: The storage and handling of oxidising agents* for specific storage and handling requirements.



### Corrosive chemicals

Chemicals such as acids can corrode substances including inappropriate containers and temporary bunding. They can also react violently and explosively if they come into contact with other types of chemicals. See *Australian Standard AS3780: The storage and handling of corrosive substances* for specific storage and handling requirements.



### Toxic chemicals

Toxic chemicals are poisonous to people and ecosystems. Chemical fires involving toxic substances pose a particularly high risk. Toxic chemicals should be separated from other classes of fire-risk chemicals. See *Australian Standard AS4452: The storage and handling of toxic substances* for specific requirements.

## Good storage and handling practices

When dealing with hazardous materials, all activities, repairs, servicing etc. should be carried out under cover. Always wear the recommended protective gear such as gloves, eyewear and a mask when handling chemicals. Access to storage areas should be kept clear and stores need to be kept free of extraneous materials.

Containers need to be routinely inspected. If signs of a spill, leak or deterioration are observed, the suspect package needs to be examined and made safe.

Minimise the movement of chemicals as much as possible. Containers should be handled with care to minimise the risk of leaks. Examine chemical packaging immediately before handling. Look for leaking containers, loose lids and torn cartons. Do not transport open or leaking containers.

Care needs to be taken when decanting or transferring chemicals. Hand-pouring should be avoided. Dispensing pumps or self-closing metal taps should be used in order to reduce the hazards of splash, spillage or escape of vapours. Funnels can be used where hand-pouring is unavoidable.

## Emergency preparation and planning

Developing a chemical management/spill response plan reduces the risk of committing an environmental offence. It may also reduce liability if an offence does occur by providing evidence of responsible operational practices.

This document can be small and simple, and sit as part of workplace health and safety materials. All procedures should be documented, from the clean-up of leaks and spills to the disposal of waste materials.

Prepare and practise the spill clean-up plan. Staff should know what to do, where

to find emergency equipment and how to use it. Make sure staff members are aware of emergency telephone numbers to call in the case of a spill. A template of emergency contacts is included in this guide. Clear signs outlining spill clean-up procedures and emergency contact numbers should be prominently displayed onsite.

Keep spill response materials (for example, a spill kit) on hand at all times.

## Basic response to spills

1. Address the source of the spill immediately **ONLY** if safe to do so. For major spills, call the Queensland Fire and Rescue Service on 000.
2. Use the materials in the spill kit to contain the spill and control its flow. If necessary, stop the spill from entering drains and waterways by using a boom, plastic drain covers or otherwise block the stormwater drain inlets. Under no circumstances should the chemical spill be hosed down a drain or into a waterway.
3. If there is no fire hazard and the material is not particularly volatile or toxic, proceed with clean-up as directed in the SDS. It is important to clean up all spills quickly, even small ones, as they can easily flow or be washed into waterways or stormwater drains.
4. Any spilt or leaked liquids contained within a bunded area should be pumped or drained out by a licenced regulated waste transporter.
5. Store all waste generated from any spill clean-up in a sealed vessel (limiting emission of odorous or volatile compounds) and in a bunded, covered area.

The contents of the spill kit may include some or all of the following:

- booms to contain liquid
- material to block drains
- material to absorb spills
- broom
- shovel
- personal protective equipment such as a mask, chemically-resistant boots, gloves and a simple respirator.

6. All liquids that are regulated wastes must be removed from the site by a licensed regulated waste transporter. Regulated waste transport dockets must be maintained onsite. Contact a waste contractor who is licensed to dispose of the absorbents used in the spill clean-up, and any residual waste or chemicals contained in the response.
7. If a spill that causes or threatens harm to the environment occurs, notify Brisbane City Council or the Department of Environment and Heritage Protection as soon as possible. This is a legal requirement of the *Environmental Protection Act 1994*.

## Further information

Department of Environment and Heritage Protection Hotline – phone 1300 130 372 or visit [www.ehp.qld.gov.au](http://www.ehp.qld.gov.au)

Standards Australia – phone 131 242 or visit [www.standards.org.au](http://www.standards.org.au) for *Australian Standard AS1940–2004: The storage and handling of flammable and combustible liquids*

Yellow Pages – [www.yellowpages.com.au](http://www.yellowpages.com.au) look under ‘Chemical Spill Equipment’, ‘Waste Reduction and Disposal Services’ and ‘Environmental and Pollution Consultants’

Queensland Fire and Rescue Service [www.fire.qld.gov.au](http://www.fire.qld.gov.au)

Fire Protection Association Australia [www.fpaa.com.au](http://www.fpaa.com.au)

# 8 Waste management, resource recovery and resource efficiency

## Environmental impacts

The main solid waste generated by batching plants is concrete washout waste. If not carefully disposed of, waste concrete can block and contaminate stormwater drainage systems and damage roads, land and waterways.

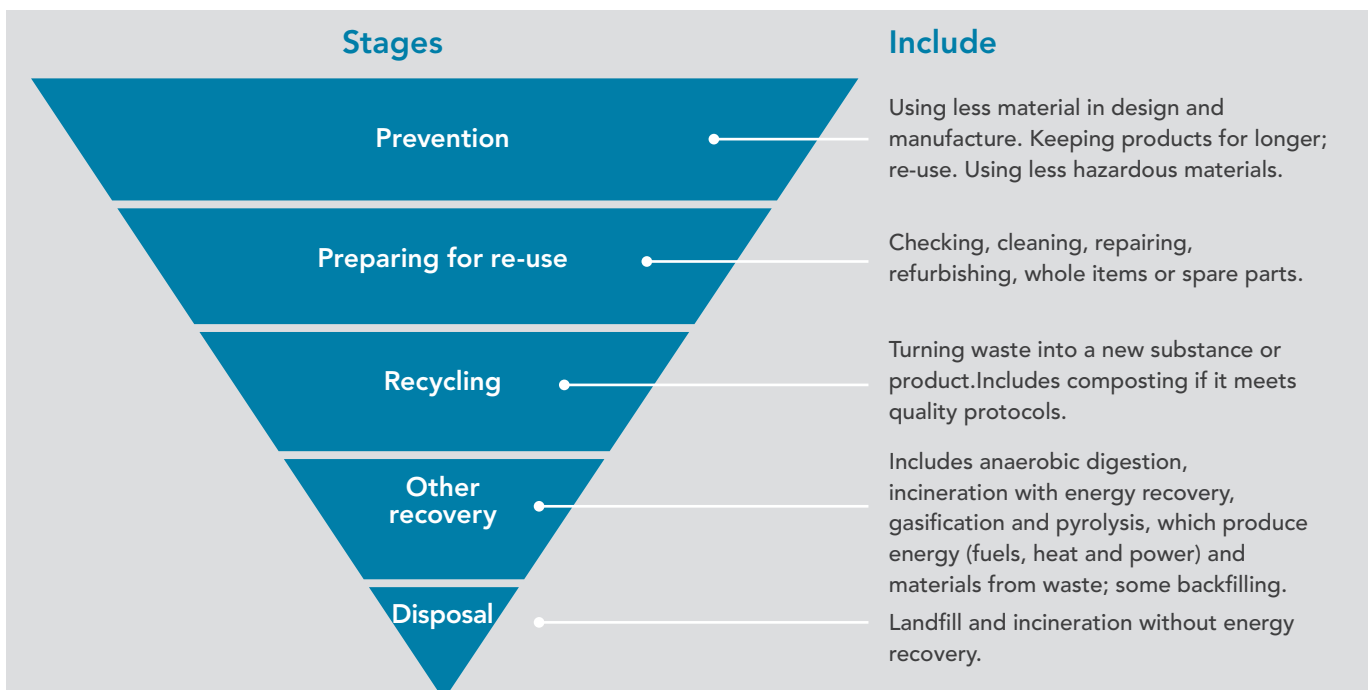
Poor waste management can also release liquid wastes to ground and surface waters. Contamination of local waterways can harm aquatic life and reduce recreational fishing, swimming and amenity values of waterways.

## Managing wastes

Waste disposal can be expensive. Poor waste management reduces the efficient use of material resources, further increasing costs. Businesses able to reduce their waste can enjoy considerable cost benefits.

The priority waste management activities are listed below.

1. Prevent or avoid the waste.
2. Reuse the waste.
3. Recycle the waste.
4. Dispose of the waste.



## Implementing waste minimisation

In the concrete batching industry, waste minimisation principles can be applied to water, cement, aggregate and all other inputs. Plants applying these principles have saved significant costs.

A useful starting point for a minimisation program is to prepare a Waste Management Plan (WMP). A WMP is a fundamental part of a company's approach to environmental management (see **Environmental management systems** section).

Begin preparing a WMP by undertaking a waste audit to:

- identify all waste streams
- quantify and characterise these waste streams
- establish how each waste stream is generated.

Next, conduct a waste assessment to identify ways to minimise each waste stream. A technical and economic feasibility analysis can help decide which option to adopt.

A WMP normally contains an implementation timetable outlining the methods selected, anticipated costs and likely environmental benefits. Periodic review will ensure the plan is being followed and help spot new opportunities.

## Dealing with specific waste streams

The best way to deal with waste concrete is to reduce the amount that is produced. Carefully matching orders to production helps minimise the need to return unused concrete to the batching plant.

It may be possible to use waste concrete for construction purposes at the batching plant. If not, dump it in a fully enclosed pit where it can dry.

It should then be reused or taken to a recycling facility or licensed landfill. Any reuse, such as road base or other beneficial use, must avoid situations where there can be significant runoff.

Concrete truck agitators and chutes must not be rinsed out near the stormwater system or roadways. It might be possible to add water and agitate the mixer during the return trip to the plant, making cleaning easier and enabling excess materials to be reused.

All concrete dispatched and returned should be carefully accounted for to ensure proper disposal of the waste product.

Consider how to reduce waste in the office. Establish a recycling program for aluminium cans, glass bottles, packaging materials, cardboard and office paper.

## Resource efficiency

Efficiency requires reducing the use of resources (raw materials, water and energy) and lowering the volume and toxicity of waste and other emissions. This efficiency is often referred to as lean manufacturing, cleaner production or resource efficiency. It involves finding ways to reduce costs and environmental impacts along the entire production or service delivery process, from the supply of raw materials to operations and distribution.

Identifying and implementing resource efficiency measures is possible for managers who know their business and are prepared to have a close, systematic look at inefficiencies. It offers opportunities to profit from:

- reducing the use of energy, water and raw materials
- avoiding waste, reusing and recycling materials
- minimising waste volumes and reducing its toxicity to lower the cost of treatment and disposal

- implementing process changes to increase production and reduce spoilage
- reducing the use of hazardous and dangerous materials to minimise dangerous goods storage and environmental liability risks
- providing a safe, clean and pleasant work environment that leads to increased productivity.

## Uncovering resource efficiency measures

The following five steps help identify the best ways of making a business more efficient.

### 1. Plan and organise

A team approach to resource efficiency produces the best outcomes. With management's support, an environment team should be established that includes staff from different areas of the business. Appoint a champion or team leader and consider inviting suppliers or customers to join the team occasionally. Ideally, the environmental champion will have the full support of management and other staff. If the business is too small for an environment team, just use one or two staff members.

Identify ways to integrate resource efficiency into business planning and staff responsibilities.

### 2. Assess and measure

The environment team needs to assess processes, material flows and costs within the business and identify internal barriers to more efficient practices.

The team should start by collecting baseline data on resource use and waste – what gets measured, what gets considered. The team should also complete an initial business and

process assessment, which could include brainstorming sessions, a facility walk-through or a more formal audit. It is wise to involve an outside person with technical expertise who can provide a fresh pair of eyes and ideas from other companies.

The initial assessment and data will provide a benchmark against which to measure ongoing improvement.

### 3. Identify opportunities and implement priority actions

The resource assessment will almost certainly identify immediate opportunities for cost savings. These should be implemented as quickly as possible. Small wins help maintain a team's enthusiasm. Other ideas might need further research and assessment, and take longer to implement.

The team should record ideas and options, and prepare a simple action plan outlining opportunities, issues requiring further investigation, priorities, timeframes and staff responsibility for actions.

### 4. Document results and evaluate success

Record any financial investment in resource efficiency projects and the time taken to recover these costs – this is known as the payback period. Set up simple spreadsheets or other tools to document project results in terms of their financial, environmental and other outcomes. Take the time to note qualitative results such as staff enthusiasm, improved working relationships with suppliers and comments from customers.

These records help to justify further resource efficiency projects.

### 5. Reward and revisit

Encourage and reward the environment team. Consider refreshing the group by alternating leaders and inviting new team members. Efficiency is a continuous process and the resource efficiency plan should be regularly revisited.

## Possible industry opportunities

Cost-effective resource efficiency opportunities can be found in several areas.

### Saving water, efficient use and recycling

- Install rainwater tanks where possible and use rainwater for washing vehicles. Rainwater can also be used to supply toilets and for other non-potable requirements.
- Check taps, toilets and showers for leaks and drips and repair them promptly. Ensure all taps are turned off when not in use.
- Fit water-minimising controls where possible. For example spray nozzles on hoses, AAA-rated low-flow taps or tap aerators, water-efficient showerheads that save energy by reducing hot water use, low-flush toilets and sensors for urinal flushing.
- Keep water supply equipment well maintained and check it periodically for leaks. Make sure staff are encouraged to report leaks and repair them promptly.
- Use water meter data to identify leaks.

### Reducing hazardous materials and waste

- Reduce the use of hazardous materials. Conduct an inventory of all chemicals used and assess if all are needed.
- Consider replacing some chemicals with less toxic alternatives.
- Organise the chemical storage area so that older chemicals are readily accessible and used before they become out-of-date.
- Isolate recyclable liquids for collection by a licensed regulated waste transporter.

### Working with suppliers, staff and customers

- Encourage suppliers to provide materials in bulk, collect empty containers and take packages back for reuse or recycling.
- Ask chemical suppliers for less toxic alternatives.
- Promote the benefits of being an environmentally responsible business to staff, suppliers and customers.
- Provide recycling bins that are easily accessible to staff and customers.
- Regularly communicate resource-saving successes to industry partners and associations, staff, customers and suppliers.

### Saving energy and technology upgrades

- Use sensor-activated lighting in buildings and areas where permanent lighting is not required.



---

## Disposing of waste chemicals

Disposing chemical waste is expensive so it makes good business sense to minimise the amount produced.

Businesses are responsible for disposing chemical waste in a way that does not cause environmental harm. Many waste chemicals such as fuels, oils, lubricants, paint residues, lead/acid batteries and used oil filters may even be classified as regulated waste under the *Environmental Protection Act 1994*. Specific regulatory requirements are placed on the management and disposal of regulated wastes. For a full list of regulated wastes, refer to *Schedule 7 of the Environmental Protection Regulation 2008*.

Adopting the following suggestions can lead to significant savings and reduced environmental risks.

1. Avoid the use of hazardous chemicals where possible.
  2. Substitute with safe or less harmful options wherever practicable.
  3. Minimise the storage and use of hazardous chemicals by ordering smaller quantities more frequently or by using them more efficiently and producing less waste.
  4. Reuse and recycle chemicals where safe to do so.
  5. Disposal is the last option and generally the most costly and wasteful in terms of resources.
- 

## Waste storage and disposal requirements

The storage of waste chemicals should be in accordance with the general storage requirements for chemicals.

All waste should be stored in properly labelled, suitable containers and kept closed (except when additional waste is being added). The label should contain the date, type of waste and any other relevant information required by the disposal company.

Do not mix wastes together except for compatible flammable solvents or other clearly compatible wastes. Different classes of waste should be segregated to avoid unwanted reactions with other hazardous chemicals. This practice also facilitates cost-effective disposal.

Only engage a licensed regulated waste transporter. Keep accurate records of all contracts and the receipts for all chemical pickups, transport and disposals from the business. Liability for contamination may be mitigated by accurate record keeping.

Investigate working with other companies in the area to share waste disposal costs. Communicate with other companies in the same industry to find out how they handle waste materials.

Select a key employee to manage the hazardous waste and make sure this person receives the support they need. A concrete batching plant may still be liable if someone outside of the plant improperly disposes of their chemicals.

- Do not pour hazardous waste on to the ground, into the sewer or into wheelie bins or bulk waste bins.
- Do not burn any waste onsite.
- Do not accept samples of chemicals that will not be used.
- Do not give away surplus chemicals unless they are going to someone who will actually use them.

## Further information

Department of Environment and Heritage Protection (DEHP) Hotline  
– phone 1300 130 372 or visit [www.ehp.qld.gov.au](http://www.ehp.qld.gov.au)

Look in the Yellow Pages under 'Recycling' or 'Waste Reduction and Disposal'  
– [www.yellowpages.com.au](http://www.yellowpages.com.au)

Comprehensive directory of recycling services for business  
– phone 1300 763 768 or visit [www.businessrecycling.com.au](http://www.businessrecycling.com.au)

Reverse Garbage  
– [www.reversegarbage.com.au](http://www.reversegarbage.com.au)  
– phone (07) 3891 9744 or email [info@reversegarbage.com.au](mailto:info@reversegarbage.com.au)

Cement, Concrete and Aggregates Australia (CCAA)  
– [www.concrete.net.au](http://www.concrete.net.au),  
Level 2, 485 Ipswich Road, Annerley  
Qld 4103, phone (07) 3227 5200.

# 9 Noise management

## Environmental impacts

Noise is a form of pollution and a common source of conflict between concrete batching plants and the local community. In simple terms, unwanted noise, particularly at night or the early morning, can cause annoyance and sleep disturbance.

People can become annoyed when noise affects their sleep or ability to study, relax or have a conversation. Good sleep is a prerequisite for good physical and mental functioning.

Noise control is a critical issue for concrete batching plants and needs to be managed as carefully as other environmental emissions.

## Noise criteria

Proposed concrete batching plant development needs to demonstrate that it can comply with the noise criteria contained in the Industry Code of City Plan. A noise impact assessment report, prepared in accordance with the *Noise Impact Assessment Planning Scheme Policy*, can assist in demonstrating achievement of these criteria.

Noise criteria in the code are planning and design criteria, they are not the operating criteria for a concrete batching plant.

The noise management requirements for a new concrete batching plant may be specified in a development permit issued by Brisbane City Council. The noise management requirements are generally based on the control measures recommended in the noise impact assessment report for the development.

A noise impact assessment report is not required where the development implements the acceptable outcomes for noise listed in the Industry Code of City Plan. Refer to the *Guideline for industrial development* for more information.

If noise is not authorised by a development permit, the environmental nuisance provisions of the *Environmental Protection Act 1994* apply. These provisions consider whether all reasonable and practical measures have been taken by the concrete batching plant to prevent or minimise any impact by noise on people's ability to sleep, study, learn, relax or have a conversation. It also considers the impact of the noise on the amenity of the community.

Where noise requires a detailed analysis or control, an acoustic consultant should be engaged to assess the concrete batching plant operations and recommend noise control measures.



## Noise sources at concrete batching plants

The main sources of noise from concrete batching plants are:

- compressors, motors and pumps
- aggregate delivery to bunkers and hoppers
- pneumatic valves on plant and machinery
- delivery truck, agitator truck and front-end loader engine noise
- vehicle air brakes
- reversing alarms on trucks and front-end loaders
- clanging and banging of steel parts on gates, storage hoppers, plant, agitator trucks and delivery vehicles
- alarms and sirens
- amplified telephones
- public address systems
- radios.

Trucks traveling to and from concrete batching plants at night or in the early morning are also a common source of noise complaints by surrounding communities.

## Noise control measures

Noises that cause the greatest annoyance are those that occur at night or the early morning (i.e. before 7am); short, sharp impact noises (such as banging steel or unloading items); or noise that is tonal (such as some alarms, sirens, compressors, motors or pumps).

All reasonable and practical measures need to be taken to prevent or minimise environmental (noise) nuisance. Measures to consider include:

- using visual alarms instead of audible alarms such as sirens, where safe
- using low-intrusion or broadband reversing alarms on trucks and front-end loaders
- enclosing stationary noise sources such as compressors, motors and pumps
- using acoustic screens and barriers around noise sources such as aggregate loading bins, truck loading bays or slumping stands (for a barrier or screen to be effective in reducing noise emissions it must be located as close as possible to the source)
- lining steel aggregate bins and hoppers with sound-absorbing material such as industrial rubber where appropriate on a site-specific basis to manage noise
- limiting non-essential activities such as deliveries to day-time business hours

- designing the flow of work to reduce the amount of reversing required by vehicles
- fitting silencing devices to all air-pressure operated equipment
- using alternative methods of notifying staff instead of public address systems
- selecting the lowest noise option available when buying equipment
- keeping plant and equipment well maintained.

It is usually necessary to undertake concrete batching during the night or early morning. As this is the time when the impact on residents is greatest and as many of the noise sources (e.g. mobile sources) cannot be enclosed, new concrete batching plant development will need to ensure that it is appropriately separated from sensitive uses such as residential areas.

---

Council's noise measuring and modelling indicates that, in Brisbane, noise impacts are very unlikely where there is at least 500 metres separating a concrete batching plant and a residential area. Depending on the specific site location, topography and existing noise sources (such as busy roads), separation distances between 250 and 500 metres may also be suitable. Establishing a good relationship with the local community through open and timely communication can help reduce the chance of conflicts over noise.

---



# 10 Environmental management systems

## Reducing environmental risks

An environmental management system (EMS) helps businesses examine their practices and find ways to manage environmental impacts. It is not prescriptive; rather, it encourages creative, tailored solutions.

Implementing an EMS is voluntary. It is often adopted by businesses to:

- prevent and minimise pollution
- comply with environmental laws
- demonstrate due diligence
- maximise the efficient use of resources
- reduce waste
- demonstrate a good corporate image
- build awareness of environmental responsibilities among employees
- gain a better understanding of the environmental impacts of business activities
- increase profit through more efficient operations.

## About environmental management systems

An EMS provides a structured approach to planning, implementing and routinely checking an organisation's environmental protection measures. It is a tool to manage impacts on the community and the environment.

An EMS integrates environmental management into a company's daily operations, long-term planning and other management systems. It does not have to be a large document and could be part of, or be linked to, existing workplace health and safety documentation.

Depending on the circumstances of the business, it may be beneficial to certify the EMS under *International Standard AS/NZS ISO 14001:2004 Environmental management systems – Requirements with guidance for use*. Even if the EMS is not certified, this standard provides good guidance.

## Key elements of an EMS

Developing an EMS involves documenting environmental risks and their potential impacts, identifying control measures and assigning management and staff responsibility. It also includes documenting procedures, training, waste disposal, maintenance, inspections and audits.

Documenting business policies and processes to prevent and minimise pollution offers several advantages such as those listed below.

- It ensures every person involved in a business understands the roles they play in preventing and minimising pollution.
- It acts as evidence of due diligence by the management team, which may be a defence in the event of an environmental pollution incident or an environmental nuisance (if an incident occurs onsite, providing documentation that shows responsible management and active measures to avoid such incidents could provide a defence).
- It demonstrates sound environmental management to customers.
- It offers a systematic method of improving and monitoring environmental performance.

Key elements of a successful EMS include:

- management commitment
- hazard identification and risk analysis
- monitoring and review
- community liaison.

EMS documents may include:

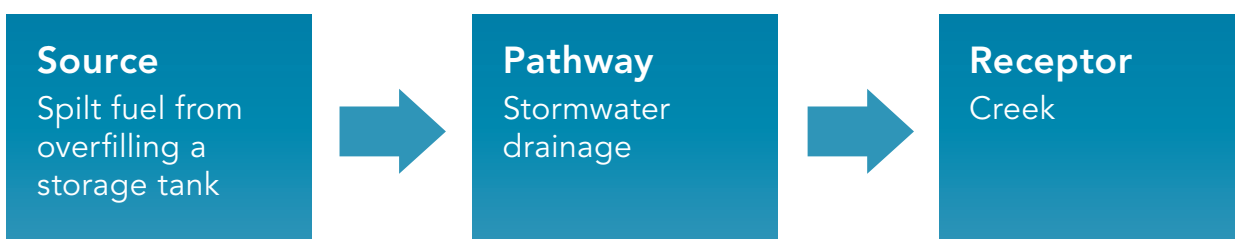
- environmental policy
- environmental action plan
- staff training records
- staff induction procedures
- standard operating procedures
- environmental incidents and complaints register
- waste disposal receipts
- maintenance and inspection schedules.

## Management commitment

A key component of an EMS is an environmental policy. This could be as simple as one paragraph or a one-page statement outlining the organisation's commitment to complying with environmental laws and implementing best practice environmental management. The policy should contain clear objectives detailing what it aims to achieve.

Management should evaluate and review the policy regularly (e.g. annually) and communicate it to all staff. Resourcing environmental commitments should also be considered. Staff should be given the time and resources needed to deliver the policy.

### Example of source-pathway-receptor



## Environmental action plan

Review the environmental risks, hazards and impacts of business operations and create an environmental action plan. This plan should include specific objectives and targets for managing each risk or hazard and for reducing identified impacts.

This plan can be small and simple, for example, a one-page table. It can also form part of, or be linked to, existing workplace health and safety documentation.

Use the tools in this guide to help identify environmental hazards and ways to reduce them. This guide also contains a checklist that can be used during environmental reviews.

## Hazard identification

To identify hazards that an environmental action plan should consider, assess the following:

- activities that generate or present a risk of emissions, including smoke, fumes, dust and odour
- activities that involve prescribed water contaminants and the risk of spills or leaks, including fuels, chemicals, dust and sediment
- activities that generate high noise levels
- plant, machines, equipment, tools or appliances
- chemical hazards such as storing and working with hazardous chemicals
- legal requirements.

Hazards can be identified by the following actions:

- conducting a walk-through site inspection
- listing all the tasks and work activities carried out
- looking at the ways different tasks or activities could interact and cause a hazard
- reviewing past incidents
- considering information from manufacturers or suppliers and relevant safety and storage instructions
- quantifying the amount of hazardous substances stored onsite
- talking to staff and other businesses.

All hazards need to be documented once identified.

For a hazard to pose a risk to the environment or human health, three components must be present: source, pathway and receptor.

The source is what generates the pollution (e.g. a machine). The pathway is the path or media that the pollution could travel through to access a receptor (e.g. air or stormwater system). The receptor is what could be potentially affected by the pollution (e.g. occupants of a house or waterway).

If one component is missing, the hazard is unlikely to become a risk. The hazard identification process should consider all possible sources, pathways and receptors. It is helpful to consider the hazard in relation to sensitive receptors such as stormwater drain inlets, creeks, houses, schools and neighbouring businesses, and work backwards.

A risk assessment can then be used to develop strategies that break the source-pathway-receptor link.

## Risk analysis

Risk analysis involves assessing the likelihood and consequence of harmful effects due to each hazard identified.

- Gather information about each hazard identified.
- Work out how likely it is that an incident will happen.
- Identify the consequences of an incident from each hazard. For example, if the incident could result in long-term environmental contamination, health impacts or annoyance to residents, degradation of waterways and other natural habitats, damage to property and the need to rehabilitate or decontaminate land or waterways.

- Take into account different situations or conditions that could increase the risk such as the effects of rainfall, floods or a change to a process, operating hours or storage volumes.

The following is a risk analysis matrix that can be used to assign a risk level (negligible, low, medium, high, very high or extreme) to a hazard based on its likelihood and consequence.

## Risk analysis matrix

Likelihood	Consequence				
	Insignificant	Minor	Moderate	Major	Catastrophic
Almost Certain	Low +	Medium +	High	Very High	Extreme
Likely	Low -	Medium -	Medium +	High	Very High
Possible	Negligible	Low +	Medium -	Medium +	High
Unlikely	Negligible	Low -	Low +	Medium -	Medium +
Rare	Negligible	Negligible	Negligible	Low -	Low +

Once a risk level has been assigned to each hazard, use the following matrix to prioritise and identify the level of action required for each hazard. For example, if a hazard is assigned a medium risk, consider additional control measures to reduce it as far as practicable. Then, reassess the risk level to see if it has been reduced.

## Risk level action matrix

Assessed Risk Level	Environmental Impact	Action
<input type="checkbox"/> Negligible	No impact on the environment.	Undertake the activity with the existing controls in place.
<input type="checkbox"/> Low	Environmental incident comprising of environmental nuisance, caused by off-site release or harmful onsite release with minor short-term and negligible cumulative environmental impacts.	Undertake the activity with the existing controls in place.
<input type="checkbox"/> Medium	Environmental incident comprising of material environmental harm. Environmental damage is managed with site resources and procedures.	Additional controls may be needed.
<input type="checkbox"/> High	<p>Environmental incident comprising of serious environmental harm.</p> <p>Environmental damage (major, short-term or cumulative) will require outside assistance.</p>	Controls will need to be in place before the activity is undertaken.
<input type="checkbox"/> Very High / Extreme	<p>Environmental incident comprising of serious environmental harm of an extensive area where the core environmental values or attributes are threatened.</p> <p>Long-term damage, requiring long-term recovery (years).</p> <p>Environmental damage (major, short-term or cumulative) will require outside assistance.</p>	<p>Consider alternatives to doing the activity.</p> <p>Significant control measures will need to be implemented to ensure compliance.</p>

The risk assessment should not be seen as a one-off process. Risks should be reassessed at regular intervals (e.g. annually) to take into account significant changes to the site infrastructure, plant, equipment, operations and newly identified issues.



## Pollution prevention procedures

Documenting procedures to prevent pollution is one way to demonstrate sound environmental management. Procedures suitable to include in an EMS include:

- undertaking activities and tasks that present a risk of environmental pollution or nuisance
- operating pollution control equipment
- inspecting and maintaining pollution control infrastructure and equipment
- cleaning up spills and responding to pollution incidents.

Procedures should clearly outline roles and responsibilities for undertaking environmental protection tasks. For example, a procedure for cleaning out silt traps should say who is responsible for making sure the silt traps are cleaned out (e.g. site manager). This provides clarity as to who needs to do what and when.

Systems should also be in place to routinely check that staff are following the procedures.

## Training and environmental incidents register

An EMS should include a training register documenting staff induction and training (i.e. who, what and when) and an environmental incidents register.

All staff should be trained to use pollution control equipment, undertake clean up and report incidents and undertake their duties in a way that prevents or minimises pollution impacts.

The environmental incidents register records incidents that occur, rectification actions to address the incident and steps to prevent future incidents.

## Monitoring and reviewing performance

Use the systems and documentation in the EMS to regularly monitor, review and report on the environmental performance of a business. Regular environmental audits of all activities onsite can help verify performance and identify areas for improvement.

Questions to ask during a review include the below.

- Are the pollution control measures effective in minimising the level of risk?
- Have there been any changes to the measures?
- Are further measures required?
- Are pollution control procedures and training adequate?

It is good practice to give staff the opportunity to easily communicate environmental impact and risk issues, as well as solutions, to senior management.

## Community liaison

Concrete batching plants should have systems to help maintain good community relationships and to respond to community complaints.

---

All complaints should be recorded in a register, which forms part of the EMS, and includes:

- the name and address of the complainant
- the time and date of the incident
- a clear statement about the problem or complaint
- details on the outcome of the resulting investigation and solutions to the problem
- name of the person dealing with the complaint.

---

Being a good neighbour is good for business.

# 11 Useful tools

## Self-assessment checklist for concrete batching plants

This checklist is a guide only. It can be expanded and tailored to suit individual businesses. Use it to evaluate environmental performance and identify areas for improvement.

ENVIRONMENTAL ISSUE/AREA	ACTION OR MEASURE	WHO IS RESPONSIBLE?	WHEN?
<b>1. COMPLIANCE</b>			
	Ensure copies of development approvals are on site and easily accessible.	Manager	Continual
	Develop daily, weekly and monthly checklists.	Manager	Annually
	Train staff to carry out daily and weekly checks on environmental compliance.	Manager	Continual
	Train staff, contractors and subcontractors on their environmental responsibilities. This includes spill prevention and what to do in case of a spill or contaminant release.	Manager	Annually

ENVIRONMENTAL ISSUE/AREA	ACTION OR MEASURE	WHO IS RESPONSIBLE?	WHEN?
<b>2. WATER AND AIR QUALITY MANAGEMENT</b>			
Plant	Check all dust collection equipment is operating correctly.	Foreman	Weekly
	Ensure silo and weigh hopper overflow protection is operating correctly.	Foreman	Daily
	Ensure emergency shut-down system operates from console and silo delivery points.	Foreman	Daily
	Ensure aggregates are damp at all times and wind shields are in place and offer adequate protection from the wind.	Foreman	Daily
	Ensure oils, fuel or chemicals are stored in a bunded area or placed on spill trays when in use.	Foreman	Continual
	Ensure level controls are working properly in water collection pits and recycling tank.	Foreman	Daily
	Ensure visual alarms on console to indicate when water is discharged off-site are installed and operating correctly.	Foreman	Weekly
	Check content of spill clean-up kits.	Foreman	Monthly
<b>3. SOLID AND LIQUID WASTE MANAGEMENT</b>			
Common to all areas	Ensure concrete wastes are returned to the plant unless diverted for approved beneficial use.	Manager	Continual
	Ensure waste concrete is reclaimed or recycled.	Manager	Continual
	Ensure recycling bins are clearly identified.	Manager	Annually
	Make sure waste collection points are clean and all bins have secure lids fitted.	Manager	Continual
	Make sure waste transporters are provided with information on the nature of hazardous wastes. Make sure waste goes to an appropriate and legal waste processing facility and that waste collection and tracking information is kept in the office.	Foreman	Annually

ENVIRONMENTAL ISSUE/AREA	ACTION OR MEASURE	WHO IS RESPONSIBLE?	WHEN?
<b>4. HAZARDOUS MATERIALS</b>			
Common to all areas	Store all chemicals, oils and batteries in a bunded and covered area.	Manager	Continual
	Provide training to all staff on: <ul style="list-style-type: none"> <li>the use of solvents and acids</li> <li>maintenance of bunded hazardous goods storage areas.</li> </ul>	Foreman	Annually and in new staff induction
	Ensure safety data sheets (SDS) are current and easily accessible to all staff.	Foreman	Annually
	Place spill clean-up kits in store and work areas, inspect regularly and keep stocked.	Foreman	Monthly
<b>5. RESOURCE EFFICIENCY</b>			
Reduce resource use	Access information on resource efficiency developed for the industry.	Manager	Annually
	Investigate ways to reduce waste.	Manager and all staff	Annually
	Educate clients about recycling wastes and demonstrate the systems in place.	Manager	Annually
	Investigate options for reducing energy and water use.	Manager	Annually
	Fit high energy-efficiency lighting to common areas. Fit motion sensors to lights in areas that do not need to be permanently lit.	Workshop Foreman	Annually
	Set quantified reduction targets for resource efficiency savings (e.g. raw materials, energy and water).	Manager (with all staff involved)	Annually

## Daily and weekly checklists

These checklists are guides only. They can be expanded and tailored to suit individual businesses.

Daily Checklist	TICK
All stormwater drains are clear from debris.	<input type="checkbox"/>
Car park and gardens are clean and free of rubbish.	<input type="checkbox"/>
Paved areas are clean and all drains and catchment pits are free of debris.	<input type="checkbox"/>
Taps are turned off and are not leaking.	<input type="checkbox"/>
Checks carried out by: <input type="text"/>	
Signed: <input type="text"/>	
Date: <input type="text"/>	

Weekly checklist	TICK
Daily checklists have all been completed and problems addressed.	<input type="checkbox"/>
Plant machinery is operating correctly and within specifications.	<input type="checkbox"/>
All bunds are clean and intact.	<input type="checkbox"/>
Hazardous material stores are clean and tidy.	<input type="checkbox"/>
Emergency spill kits are intact and re-stocked.	<input type="checkbox"/>
Water hoses and connections are not leaking.	<input type="checkbox"/>
Fuel storage tanks have been checked for leaks and integrity.	<input type="checkbox"/>
Lighting time switches are set correctly.	<input type="checkbox"/>
Checks carried out by: <input type="text"/>	
Signed: <input type="text"/>	
Date: <input type="text"/>	

## Useful contacts

This list is a sample only.

Organisation	Phone no.
Emergency services – Ambulance, Fire, Police	000
Brisbane City Council	(07) 3403 8888
Department of Environment and Heritage Protection (DEHP) hotline	1300 130 372
Workplace, Health and Safety Queensland (WH&S Queensland) Info Line	1300 369 915
Poisons Information Centre	13 11 26
Cement, Concrete and Aggregates Australia (CCAA)	(07) 3227 5200
Queensland Urban Utilities	13 26 57
Waste transporter	
General recyclers	

# Appendix 1

## Definitions

### **Bund**

An impervious embankment or wall of brick, stone, concrete, or other approved material that forms the perimeter, or part of the perimeter, of a compound (e.g. a bund may be used to contain spills from acids, fuels or admixtures).

### **Environmental harm**

As defined in the *Environmental Protection Act 1994* and includes an adverse effect (whether temporary or permanent, and of whatever magnitude, duration or frequency) on an environmental value and includes environmental nuisance.

### **Environmental nuisance**

As defined in the *Environmental Protection Act 1994* and includes any unreasonable interference or likely interference with an environmental value that is caused by noise, dust, odour, light, an unhealthy, offensive or unsightly condition because of contamination, or another way prescribed by regulation.

### **Environmental value**

As defined in the *Environmental Protection Act 1994* and includes a quality or physical characteristic of the environment that is conducive to ecological health or public amenity or safety; or another quality of the environment identified and declared to be of environmental value under an environmental protection policy or regulation.

### **General environmental duty**

As defined in the *Environmental Protection Act 1994*, i.e. a person must not carry out an activity that causes, or is likely to cause, environmental harm, unless the person takes all reasonable and practicable measures to prevent or minimise the harm.

### **Regulated liquid wastes**

Wastes that have been identified as unsafe for sewer disposal due to their chemical, biological or physical nature (e.g. flammable). These wastes are outlined in Schedule 7 of the *Environmental Protection Regulation 2008*. Regulated liquid wastes include:

- acids and acid solutions
- dyes
- mineral oils.

### **Regulated solid wastes**

Wastes that have been identified as unsafe for landfill disposal. These wastes are outlined in Schedule 7 of the *Environmental Protection Regulation 2008*.

Regulated solid wastes include:

- filter cake
- fly ash
- resins
- concrete wash out.

## **Regulatory authority**

Brisbane City Council and/or the Queensland Department of Environment and Heritage Protection.

## **Safety data sheets (SDS)**

Information sheets on products that manufacturers are required to provide. They outline the composition, applications and precautions that need to be taken in using such products.

## **Stormwater**

Rainfall that runs off hard surfaces such as roofs, roads and car parks, or off ground that has become saturated. Stormwater flows untreated to local creeks and eventually, in Brisbane, to the Brisbane River and Moreton Bay.

## **Trade waste**

Liquid wastes from any business, industry, trade or manufacturing process approved for sewer disposal, other than domestic sewage.

## **Transitional Environmental Program (TEP)**

A specific program that, when approved, achieves compliance with the *Environmental Protection Act 1994* for the matters dealt with by the program by:

- reducing environmental harm
- detailing the transition to an environmental standard.

## **VOCs (volatile organic compounds)**

Evaporated organic solvents (e.g. hydrocarbons, alcohols or unburnt liquid fuels) that are known (or suspected) to have environmental or health effects. Examples of chemicals that include VOCs include solvents, thinners, acrylic lacquers and fuels.

## **Water**

Includes all Queensland waters defined in the *Environmental Protection (Water) Policy 1997* and 'coastal waters' defined in the *Transport Operations (Marine Pollution) Act 1995*.



# Appendix 2

## Guidelines for a Transitional Environmental Program (TEP)

### Introduction

The *Environmental Protection Act 1994* (the Act) was developed to protect Queensland's environment while allowing for sustainable development.

As the Act encourages continual improvement of industrial activities, there might be instances where some activities may not be able to comply immediately with its requirements. There are allowances for businesses in this position to develop a Transitional Environmental Program (TEP). A TEP is an action plan that is negotiated between the operator of an activity and the administering authority, for example, the Department of Environment and Heritage Protection (DEHP) or Brisbane City Council. This action plan outlines how the operator of the activity intends to achieve compliance with the provisions of *the Act* and the timeframe in which compliance is to be achieved.

The TEP offers the operator of the activity some degree of short-term protection against fines or prosecution for non-compliance with the Act. Heavy penalties apply for non-compliance with the TEP.

The guidelines below have been developed to assist operators in the preparation of a draft TEP in accordance with the Act. The draft TEP must be submitted to the administering authority for review and approval.

While these guidelines provide a step-by-step process for developing a draft TEP, each activity is different and operators of activities are expected to develop site-specific management actions.

### Components of a TEP

The main elements that must be included in a TEP include:

- a statement on which activities or approval conditions (if applicable) are to be addressed under the TEP
- a statement of the objectives to be achieved and maintained under the TEP
- a statement on how the objectives are to be achieved and the proposed timetable for achieving the objectives
- a schedule of milestones and performance indicators at intervals of no longer than six months
- a schedule of monitoring and reporting compliance with the TEP.

### Submission of a TEP

Any operator can voluntarily submit a draft TEP at any time, provided the appropriate fee is paid at the time of the submission. Voluntary submission of a TEP can occur when an operator has identified a work process that does not comply with *the Act* or approval conditions (if applicable), or is concerned that the activity may not comply with an Environmental Protection Regulation.

Brisbane City Council can require the submission of a TEP where an inspection has identified a non-compliance issue.<sup>9</sup> The timeframe for submission of a draft TEP may depend on the severity of the non-compliance or the risk of environmental harm from the non-compliance.

<sup>9</sup> Section 330 *Environmental Protection Act 1994*.

All draft TEPs must be submitted in a form approved by Brisbane City Council or DEHP, together with the appropriate fee. Please check boxes below.

<input type="checkbox"/>	Identify activities that do not comply with <i>the Act</i>
<input type="checkbox"/>	Develop a statement of environmental objectives to be achieved and maintained under the TEP.
<input type="checkbox"/>	Detail how the environmental objectives will be achieved and a timetable for achievement of each of the objectives.
<input type="checkbox"/>	Detail appropriate milestones and performance indicators at intervals of no more than six months.
<input type="checkbox"/>	Detail appropriate monitoring and reporting of compliance with the TEP.

# References

*Australia Standard AS 1940: The storage and handling of flammable and combustible liquids.*

*Cement Concrete & Aggregates Australia, Guidelines for Delivery of Bulk Cementitious Products to Premixed Concrete Plants, May 2007.*

*Cement Concrete & Aggregates Australia, Guidelines for the Maintenance and Upkeep of Silo Over-pressurisation Systems, June 2012.*

*Environmental Protection Authority, Environmental Guidelines for the Concrete Batching Industry, State Government of Victoria, June 1998.*

*Healthy Waterways (partnership for the health of Moreton Bay and south-east Queensland waterways), [www.healthywaterways.org](http://www.healthywaterways.org)*

*ISO 14001, Environmental Management Systems – Specification with Guidance for Use.*

## Commonwealth legislation

*National Environmental Protection (National Pollution Inventory) Measure 1998.*

## Queensland State legislation

*Environmental Protection Act 1994*

*Environmental Protection Regulation 2008*

*Environmental Protection (Noise) Policy 2008*

*Environmental Protection (Air) Policy 2008*

*Environmental Protection (Water) Policy 2009*

*Environmental Protection (Waste Management) Policy 2000*

*Environmental Protection (Waste Management) Regulation 2000*

*Transport Operation (Marine Pollution) Act 1995*

*Sustainable Planning Act 2009*

*Work Health and Safety Act 2011*

## Brisbane City Council legislation

*Brisbane City Plan 2014*

*Concrete batching plants planning scheme policy 2014*

© Brisbane City Council 2014



**Brisbane City Council**  
**Information**  
GPO Box 1434  
Brisbane Qld 4001

Printed on recycled paper



CA15-743911-01-1172  
© Brisbane City Council 2015

For more information visit  
[www.brisbane.qld.gov.au](http://www.brisbane.qld.gov.au)  
or call (07) 3403 8888

 [Facebook.com/BrisbaneCityCouncil](https://www.facebook.com/BrisbaneCityCouncil)  
 [@brisbanecityqld](https://twitter.com/brisbanecityqld)