Government of Western Australia
Department of Water and Environmental Regulation

Guideline

Port Authority bulk handling trials

Category 58 and 58A
(Replaces: Industry Regulation Fact Sheet)

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Enquiries

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This document is available on the Department website. For those with special needs, it can be made available in alternative formats such as audio, large print or Braille.

Acknowledgement

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- Departments of Health; Mines, Industry Regulation and Safety; and Transport
- Fremantle Port Authority
- Kimberly Ports Authority
- Mid West Ports Authority
- Pilbara Ports Authority
- Southern Ports Authority

This Guideline was developed by the Department's dedicated Ports team that fall within the Industry Regulation (Resource Industries) Branch, and in consultation with the Port Authorities and government agencies listed above.

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1 Purpose

To provide guidance for premises where the licence holder is a Port Authority (as defined in the *Port Authorities Act 1999*), as regulated under Part V of the *Environmental Protection Act 1986* (henceforth referred to as 'the Act'). For this guidance to apply, the Port Authority must be licensed to undertake Category 58 and / or 58A activities at the premises as listed in Schedule 1 of the Environmental Protection Regulations 1987.

To explain how the Department of Water and Environmental Regulation (DWER) will administer the 'trial conditions' within Port Authorities' licences that relate to trialling the handling of bulk granular materials using open loading and unloading systems.

Table 1: Category 58 and 58A - Bulk material loading and unloading

Description of category	Production or design capacity
Category 58	
Bulk material loading or unloading: premises on which clinker, coal, ore, ore concentrate or any other bulk granular material (other than salt) is loaded onto or unloaded from vessels by an open materials loading system.	100 tonnes or more per day
Category 58A	
Bulk material loading or unloading: premises on which salt is loaded onto or unloaded from vessels by an open materials loading system.	100 tonnes or more per day

1.1 Purpose of trial conditions

The trial conditions are intended to provide operational flexibility for ports and minimise impacts to economic growth where it can be demonstrated that any risk to public health, amenity and the environment is minimised to an acceptable level.

To assist in minimising this risk, the trial conditions are intended to be conservative. Actual or ongoing Category 58 (or 58A) activities, assessed through a licence amendment after a trial, may be conditioned less conservatively depending on the results of the trial.

By requiring notification prior to the commencement of the trial, and specified monitoring for potential emissions during the trial, the Department will obtain sufficient information to adequately assess the appropriateness of the trial and the potential for ongoing activities under the licence.

At any point in the trial period, the CEO, or their delegate, may cease a trial in the event that the risk is considered to be unacceptable to public health, amenity or the

environment; or in the event that modifications during the trial (including changes to the product specifications, materials handling or controls described through 'Notification of a trial') result in an unacceptable impact to public health, amenity or the environment.

2 What is a trial?

A trial is a defined test period during which the Port Authority receives and stores, loads and / or unloads a new bulk granular material, not specified in Schedule 2 of the current licence for that premises.

The trial provides for the collection of monitoring data and the optimisation of handling processes, including variables such as loader head type, conveyor speed and loading rate, moisture content, and other factors which allow for the selection of optimum or new and innovative methods to minimise emissions and discharges.

Port Authorities will note that salt and other evaporites may not be handled through a premises that does not have licence for Category 58A. Depending on the method of production, this may include products such as gypsum and potash – depending on the method of production.

3 Assessing risk to human health

Risk to human health refers only to the health of the general public.

Occupational Safety and Health risk analysis may be accepted as supporting information to help inform the assessment of risk to public health.

Occupational Safety and Health is legislated by other statutes and is not included in the assessment of impacts under the *Environmental Protection Act 1986*.

4 Interpreting the trial conditions

4.1 Notification of a trial

This condition is required to ensure sufficient notice and information is provided to the Department by the licence holder at least 30 days before commencement of a trial.

The Department encourages licence holders to refer to Appendix A – Minimum trial notification information required as a guide for the minimum information required for the notification.

- Noting this minimum requirement in advance of undertaking a trial risk assessment will ensure adequate information is available to inform the assessment of relevant risks.

The commencement of a trial is the point at which the premises receives the new material on the site.

- This means that a Port Authority may store a new product at an offsite bunker or depot, to facilitate commencement of stockpiling and storage before the trial period.

- In this case, there is a risk that the Department may require the Port Authority to cease the trial via notification from the CEO, or their delegate.

The information must be sufficient to demonstrate that all risks from the trial to public health, amenity and the environment have been identified, assessed and controlled to an acceptable level.

The Department expects Port Authority-led assessments of risk to human health and the environment to be consistent with the Department Regulatory Framework.

The notification of a trial will be published on the Department website.

- Commercially sensitive information (as defined in the *Freedom of Information Act 1992* must be identified to the Department as part of the notification process.

4.2 CEO notification to cease a trial

This condition is required to ensure the CEO, or their delegate, is able to cease a trial in the event that it is:

- having, or might have, an unacceptable impact on public health, amenity or the environment; or
- different in any manner from that described (including product specifications, materials handling or controls) through the Notification of a trial, when that difference is resulting in, or is likely to result in, an unacceptable impact on public health, amenity or the environment.

4.3 Trial restrictions

This condition is required to ensure the trial is limited by time and scale to remove the ability for the licence holder to continue the trial as ‘normal’ operations.

While all trials will be limited to 12 months, the trial Conditions within individual Port Authority licences may vary on a case by case basis depending on existing authorised throughputs.

Determination of duration / extent of the trial will be based on a:

- percentage of throughputs currently authorised through the existing licence; and / or
- maximum tonnage; and / or
- maximum number of shipments; and
- level of handling activity that will provide sufficient information to effectively assess risks from ongoing activities to human health, amenity and the environment.

The restriction of certain hazardous bulk granular materials from trial conditions is considered necessary as higher risk materials require a detailed assessment through a works approval or licence amendment application prior to receipt at the premises and shipment of these materials commencing.

Hazardous materials are considered those that:

- contain asbestos in concentrations ≥0.01% w/w for non-friable asbestos or 0.01% w/w for fibrous asbestos;
- contain respirable silica ≥1% w/w;
- exceed the radiation transport limit of 10 Bq/g for Uranium-238 and Thorium-232 combined;
- exceed Rubidium-87 concentrations of 30 Bq/g; and/or
- are a waste or waste-derived by-product (except Clean fill).

A trial does allow for the installation of mobile or prefabricated equipment to facilitate enhanced or innovative handling methods; and hence a better human health and environmental outcome. However, where such installation is likely to cause emissions that result in an unacceptable risk to human health, amenity or the environment, a works approval would be required in accordance with s53(1)(b) of the Act.

NOTE: Trials do not extend to situations where construction of new handling equipment, or any other significant works are required. In these cases, a works approval is required.

4.4 Reporting

This condition is required to ensure that trial monitoring data is provided to the Department and is sufficient to inform the risk assessment for any:

- decision relating to terminating the trial;
- subsequent licence amendment application; or
- requirement to amend the trial.

NOTE: The minimum reporting requirements under this condition do not prevent Port Authorities from presenting findings earlier to the Department.

4.5 Ongoing shipments

In the event that a licence amendment is sought to allow for ongoing shipment of the trial material, the Department will endeavour to assess the application within three months.

Where the Department cannot complete a thorough risk assessment before expiry of the trial, a short-term amendment notice to extend the trial may be issued while the thorough assessment is conducted.

- This is dependent on circumstances, and Port Authorities will endeavour to facilitate risk assessments within the three month period as far as practicable.

5 Reading the products table

The purpose of the products table in Appendix B – Products table is to categorise, describe and provide examples of the different types of bulk materials that Port Authorities may handle as part of a trial.

It is not a definitive list of all products that Port Authorities may wish to trial. If the proposed trial product is not on the list, this does not necessarily eliminate the products from a trial.

The list also provides an indication of the hazards from certain material types to be considered in a risk assessment.

- Particulate matter 10 micron in diameter or finer (PM_{10}) and suspended solids have not been added to the list of hazards.
- Consideration of these hazards are expected in risk assessments for the trial of *all* bulk materials.

A list of suggested indicators is also provided for each example material, which can be monitored during a trial to identify the ability for the example material to enter the environment as a result of the trial.

- The table is not prescriptive, and more appropriate indicators for monitoring may be proposed depending on the circumstances of the trial.
- Indicators for monitoring, such as iron for iron ore handling trials, may not be appropriate where nearby roads are made with iron ore / iron-rich materials.
    - These sources may interfere with determining the level of contribution of detected iron from the trial, thereby limiting the value of monitoring.

Toxicological / ecotoxicological hazards refer to the product / material itself, as well as the risk from emissions after handling controls are considered.

- Generally speaking, products higher up in the table are expected to carry lower risk to public health, amenity and the environment compared with products further down the table.
    - Although this is not always the case as with the example of nut coke, which is a chemically treated material that does not necessarily present as great a risk to public health or the marine environment as some raw materials.

Some port premises do not have appropriate infrastructure to handle some materials.

- In these instances, a trial may not be appropriate, or a works approval may be required to build necessary materials handling infrastructure.

NOTE: The slurrying of a material for the purpose of transport to the premises (via pipe) is not considered to be a form of processing for the purpose of the products table.

6 Self-assessment decision making flowchart

The purpose of Appendix C – Self-assessment decision making flowchart - is to enable Port Authorities to undertake a preliminary risk assessment, or self-assessment, of the appropriateness of their proposed trial, in accordance with the trial conditions.

By following the logical flow paths to conclusions, Port Authorities can determine the appropriate level of handling method for their trial material.

The flow chart considers risks to public health and the environment, and allows for the development of new and innovative handling methods that could reduce risks to acceptable levels, where existing methods do not.

6.1 Separation distances

The minimum separation distance to sensitive receptors stated in the flow chart should be measured from the emission source, not the premises boundary.

The determination of the 500m distance to be used as a trigger for increased risk is based on Department knowledge and understanding of the risks associated with historical Category 58 and 58A activities at existing ports in Western Australia and their distance to sensitive receptors.

- This distance is the measurement from the source of potential emissions to the nearest residential receptor.
    - For example, Berth 5 at the Port of Bunbury is located within 500m of a residential receptor while Berth 8, located across the Bunbury Inner Harbour, is not and activities at this location present a lower risk to the nearest residential receptors.

Through an application for a licence amendment following a trial, a risk assessment may indicate that a lesser distance is acceptable from the source of potential emissions.

6.2 Radiation transport limits

The Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) have set an exemption limit for the transport of all bulk materials and large items that is '*designed so that quantities of naturally occurring material that present a very low radiation hazard do not have to be transported as a radioactive material.'* (ARPANSA, 2008).

- For uranium-238 and thorium-238, following advice from the Department of Mines, Industry Regulation and Safety (DMIRS), the Department has interpreted this to equate to a combined radioactivity of 10 Bq/g.
- Further advice from DMIRS notes that, unlike uranium-238 and thorium-232, rubidium-87 (which is commonly found in spodumene products) does not emit gamma rays as it decays.
    - As a beta emitter, the primary source of exposure to humans is expected to arise from the inhalation pathway.
    - Regulation 5(1)(a) of the Radiation Safety (General) Regulations (1983) stipulates criteria below which materials are deemed as not being radioactive substances.
    - Based on criteria set in these regulations the Department has conservatively restricted any product containing rubidium-87 with a radioactivity > 30 Bq/g for the protection of human health.

6.3 Asbestos ≥0.01% for non-friable and fibrous asbestos

This figure is based on the presence or absence of asbestiform fibres in bulk materials in accordance with AS 4964 (2004), and is expected to result in the (Department of Health) asbestos air-quality limit of 0.01 fibres per millilitre (f/ml) being met at the nearest receptor.

6.4 Respirable silica

Safe Work Australia (SWA) recommends the occupational exposure standard of 0.1 mg/m^3 time weighted average for respirable silica in ambient air.

When determining the standards for many other hazards in the *Workplace Exposure Standards for Airborne Contaminants (2013)*, SWA provide a value based on the assumption that, within the inhalable dust, there is no asbestos and less than 1 per cent respirable crystalline silica, as determined through a laboratory analysis of the product.

The Department considers respirable crystalline silica to be the fraction of crystalline silica dust that is 10 micron in diameter or smaller (PM_{10}). This is based on advice from the Department of Health.

6.5 Fines content >3% of total product (w/w)

The fines fraction trigger level is based on existing Department knowledge and understanding of the behaviour of bulk materials with a higher fraction of fines, and their potential for dust generation without additional handling or product controls applied.

The handling of bulk materials containing more than 3% of total particles, 10 microns or finer, has not typically resulted in exceedances of national air quality standards for PM_{10} where that material has been handled using Minimum Handling Method 3, or better.

6.6 Dust extinction moisture (DEM) level

It is acknowledged that a DEM level cannot be determined for all products.

Some products cannot be wet as they may be hydrophobic, set hard if wet, or cannot achieve DEM for some other reason. In these cases, other controls will be necessary.

6.7 Covered conveyors

The reference to covered conveyors in Minimum Handling Method 3 and 4 does not specifically mean fully enclosed, but rather that the conveyors be designed to remove the pathway to the receptor.

- For example: When considering discharges to the marine environment, a spill tray removes the pathway and it could be considered closed or covered.
- It is acknowledged that some covered conveyors have gaps to allow for venting and moving transfers.

6.8 Stormwater / wash water treatment 'required standard'

Refers to the treatment of stormwater or wash water to any standard required and described under the relevant licence or works approval for that premises.

Given the intent of the trial conditions is to take a conservative approach to assessing risks associated with proposed trials, if no required standards are stated in the relevant licence or works approval, then answer 'No' to the statement in the self-assessment flow chart (Appendix C): *Premises captures and treats stormwater or wash water to 'required standard' prior to discharge to the marine, estuarine or riverine environment or other discharge containment facility*.

6.9 Non-suitable products

Products that are not suitable for a trial may be considered under an amendment.

More information

For further information, please contact the Senior Manager Resource Industries on 6364 7000, or email at info@dwer.wa.gov.au.

This document is available in alternative formats and languages on request.

Related documents

Document Title
Port Authorities Act 1999
Environmental Protection Act 1986
Environmental Protection Regulations 1987
Freedom of Information Act 1992
Radiation Safety (General) Regulations 1983
National Environment Protection (1999) (Assessment of Site Contamination) Measure, Schedule B1;
Australian Standard 4964 (2004) Method for the qualitative identification of asbestos in bulk samples; and
Department of Health (2009) Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia.

Legislation

This document is provided for guidance only. It should not be relied upon to address every aspect of the relevant legislation.

Please refer to the Parliamentary Counsel's Office (PCO) for copies of the relevant legislation, available electronically from the PCO website at www.legislation.wa.gov.au.

Custodian

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Review

The application of this guideline will be continuously evaluated, and reviewed no later than 5 years from the date of issue or sooner as required.

References

ARPANSA (2008) Safety Guide: Management of Naturally Occurring Radioactive Material (NORM). Radiation Protection Series No. 15.

Radiation Safety (General) Regulations (1983)

National Environment Protection (1999) (Assessment of Site Contamination) Measure, Schedule B1;

Australian Standard 4964 (2004) Method for the qualitative identification of asbestos in bulk samples; and

Department of Health (2009) Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia.

Safe Work Australia (2013) Workplace Exposure Standards for Airborne Contaminants.

Appendix A – Minimum trial notification information required

Description of proposed trial	Human health hazards associated with the trial material	Environmental hazards associated with the trial material	Key human health and environmental risks associated with handling the trial material	Describe any potential amenity impacts associated with handling the trial material	Description of all sensitive receptors, including location and distance from source of hazard	Description of receptor pathways	Description of appropriate handling methods and controls on hazard source for mitigating (and/or minimising) risks to receptors – as determined by self-assessment framework provided by DWER	Description of proposed monitoring for trial period	Description of proposed contingency measures/management actions in the event of unexpected / unplanned incident resulting from trial
Product X, which is a physically treated raw material. The product has been crushed and screened using a dry process. *Product X will be handled [describe the storage and handling methods used].* *The Trial is expected to commence on [X DATE], at a rate of [X shipments and tonnages per month] and be completed [provide duration/tonnages of trial].*	*Brief description of toxicological risks – refer Appendix X: MSDS; and* *Laboratory data on chemical and geochemical composition* *Brief description of Product X's respirable fraction – refer to Appendix X: Particle size distribution analysis* *Leachate testing if applicable e.g. where the product presents a toxicological risk.* *Other reports as required.* *Confirmation of presence of asbestos, respirable silica or radiological content.*	*[Brief description of ecotoxicological risks] – refer to Appendix X: Leachate test (if applicable)* *Other reports as required.*	*Reference to relevant health standard/s specific to each hazard and to be used for comparison with monitoring data.*	*This could include an assessment of odour and noise impacts as well as dust deposition that has a nuisance effect.*	*Loading infrastructure – Approximately xx m from nearest residential/industrial receptor* *Product storage – Approximately xx m from nearest residential/industrial receptor*	*Description of site stormwater infrastructure and pathways to the marine environment.* *Description of specific wind arcs that may place receptors downwind of each source.*	*[Brief description of anticipated moisture content Appendix X: Dust Extinction Moisture level; or* *Affidavit from laboratory – DEM cannot be determined* *Describe other controls in place/ planned for the trial.*	*Monitoring parameters, locations (and as presented in an attached map), frequency, averaging periods and any meteorological monitoring to be undertaken.*	*Any proposed measures that will be implemented in specific weather or ambient air quality conditions as determined at ambient or boundary monitors.*

Material Type	Material Description	Examples	Key human health hazards (excluding PM_{10})	Key environmental hazards (excluding the potential for suspended materials)	Example indicator for monitoring during trial (excluding PM_{10})
Unmodified raw material	The material is in the state that it was extracted from the ground Can include very simple or minimal steps that do not increase the concentrations of hazardous substances within the material Washing or screening to separate the very small or very large fraction	Sand	Crystalline silica[1]; Radiological components[2]	N/A	N/A
		Washed sand			
		Screened sand			
		Clean fill[3]			
		Crystalline silica sand			
		Gravel (uncrushed)			
		Quarried Rock			
Physically treated raw material	The material has been physically processed to reduce the particle size or remove certain particle size fractions. Crushing; grinding; milling and physical (electrostatic or magnetic separation; wet or dry) separation.	Iron ore (haematite & magnetite)	Crystalline silica; Fibres	N/A	Ambient air quality monitoring: Iron
		Spodumene ore (no chemical flotation – Run of Mine)	Crystalline silica; Fibres; Mica; Radiological components	N/A	Ambient air quality monitoring: Lithium
		Bauxite	Crystalline silica; Mica; Radiological components	N/A	Ambient air quality and stormwater monitoring: Aluminium
		Gypsum	Crystalline silica; Radiological components	N/A	N/A
		Aggregate (eg. mixed; crushed gravel)	Crystalline silica	N/A	N/A
		Caesium ores	Radiological components	N/A	Ambient air quality monitoring: Caesium
		Quartz	Crystalline silica	N/A	N/A
		Coal	Radiological components	Ecotoxicity (bioavailability/ bioaccumulation)[4]	Stormwater monitoring: Trace elements[5]

[1] Silica can be an indicator of dust generation from the handling of sands, iron ore and spodumene etc. However, given the proximity of many ports' to sand beaches the determination of attribution may be difficult. The risk of silica dust can be determined through the analysis of particle size distribution and moisture content.

[2] Radiological components are not anticipated in most unmodified raw materials but may be present in materials such as granite.

[3] As defined by the Landfill Waste Classification and Waste Definitions 1996 *(as amended April 2018)*.

[4] Includes the bioavailability of metals within the product.

[5] Trace elements may include, but not be limited to, selenium, mercury, lead, cadmium, nickel, tin and arsenic. Trace elements will need to be determined through leach testing.

Material Type	Material Description	Examples	Key human health hazards (excluding PM_{10})	Key environmental hazards (excluding the potential for suspended materials)	Example indicator for monitoring during trial (excluding PM_{10})
		Mineral sands ore	Crystalline silica; Radiological components	N/A	N/A
		Titanium concentrates (Ilmenite leucoxene and rutile)	Crystalline silica; Radiological components	N/A	N/A
		Zircon	Crystalline silica; Radiological components	N/A	N/A
		Monazite (phosphate mineral)	Crystalline silica; Radiological components	N/A	N/A
		Manganese Ore	Lung, eye and skin irritant	Ecotoxicity	Manganese
		Chromite Ore	N/A	Ecotoxicity (bioavailability/ bioaccumulation); Groundwater contamination	Stormwater monitoring: Chromium as Cr(III) and Cr(VI)
		Cracker dust (crushed gravel)	Fibres; Lung, eye and skin irritant	N/A	N/A
		Granulated slag	N/A	N/A	Ambient air quality monitoring: Iron
		Garnet	Crystalline silica	N/A	N/A
		Talc	Crystalline silica	N/A	N/A
		Salt	N/A	N/A	N/A[6]
Manufactured products	Has been manufactured to a specified standard for use in a subsequent process, e.g. fertiliser manufacture MSDS available	Fertilisers including urea, phosphates, ammonium sulfate, soda ash	Odour; Lung, eye and skin irritant; Human toxicity	Eutrophication;	Stormwater monitoring: Ammonia; Total Nitrogen; Nitrates/nitrites; Total Phosphorous
		Separated alkali or alkaline earth metal salts including (but not limited to) potash and magnesium oxide	N/A	Eutrophication (N and P salts only)	Stormwater monitoring for N and P salts: Nitrates/nitrites; Phosphates
		Soya bean meal	N/A	N/A	N/A
Material Type	**Material Description**	**Examples**	**Key human health hazards (excluding PM_{10})**	**Key environmental hazards (excluding the potential for suspended materials)**	**Example indicator for monitoring during trial (excluding PM_{10})**
		Quick lime	Crystalline silica;	N/A	N/A

[6] Salt may also be attributed to natural causes such as sea spray, which is seasonally dependent, limiting the value of speciation monitoring for salt.

			Lung, eye and skin irritant		
		Cement clinker	Crystalline silica; Lung, eye and skin irritant	Crystalline silica; Lung, eye and skin irritant;	N/A
Chemically treated material	The composition of material that has been altered through chemical treatment (flotation, leaching, cyanidation, reaction). Involves the removal of unwanted components. May include addition of reagents.	Metal concentrates (including copper, iron, lead, nickel and zinc)	Human toxicity; Odour; Lung, eye and skin irritant	Ecotoxicity (bioavailability/ bioaccumulation); Groundwater contamination	Ambient air quality and stormwater monitoring: The predominant metal within the concentrates
		Spodumene concentrate (chemically treated) including lithium carbonate	Crystalline silica	Ecotoxicity (bioavailability/ bioaccumulation)	Ambient air quality monitoring: Lithium
		Mixed metal concentrates eg HPM	Crystalline silica; Human toxicity; Odour; Lung, eye and skin irritant	Ecotoxicity (bioavailability/ bioaccumulation); Groundwater contamination	Ambient air quality and stormwater monitoring: The predominant metals within the concentrates
		Synthetic rutile	N/A	N/A	N/A
		Alumina	Radiological components	N/A	Ambient air quality and stormwater monitoring: Aluminium
		Alumina hydrate	Radiological components	N/A	Ambient air quality and stormwater monitoring: Aluminium
		Petroleum coke	Odour; Lung, eye and skin irritant	Ecotoxicity (bioavailability/ bioaccumulation)	Stormwater monitoring: Trace elements[7]
		Sulfur	Lung, eye and skin irritant; Odour	Lung, eye and skin irritant; Odour	N/A[8]
		Magnesium Oxide	Lung, eye and skin irritant	N/A	N/A[9]

[7] Trace elements may include, but not be limited to, selenium, mercury, lead, cadmium, nickel, tin and arsenic. Trace elements will need to be determined through leach testing.

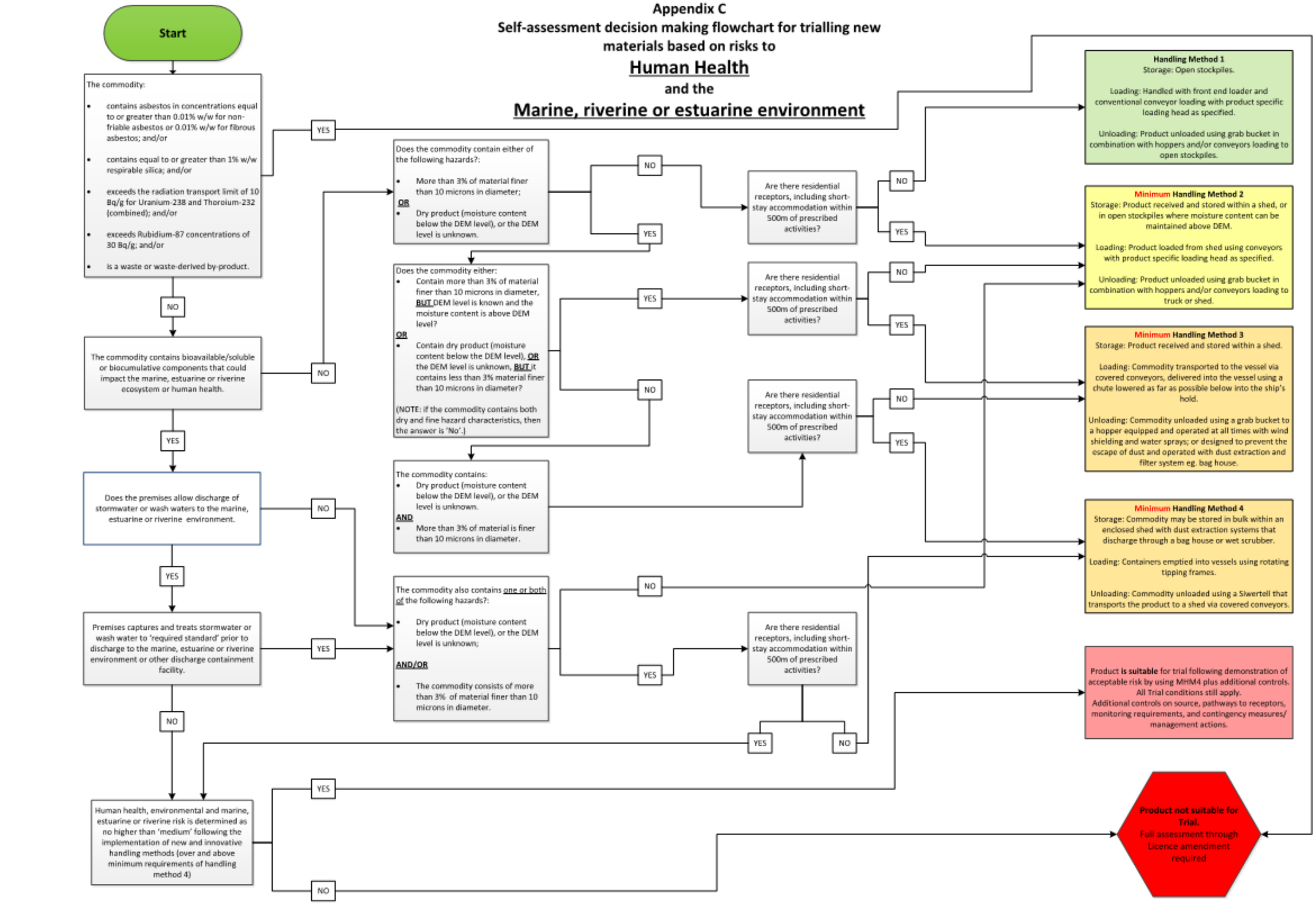
[8] Sulfur concentrations may also be attributed to natural causes such as sea spray, which is seasonally dependent, limiting the value of speciation monitoring for sulfur. In addition, the laboratory analysis of elemental sulfur is not NATA accredited and may be subject to large errors.

[9] Magnesium concentrations may also be attributed to natural causes such as sea spray, which is seasonally dependent, limiting the value of speciation monitoring for magnesium.

Material Type	Material Description	Examples	Key human health hazards (excluding PM_{10})	Key environmental hazards (excluding the potential for suspended materials)	Example indicator for monitoring during trial (excluding PM_{10})
		Magnesium Carbonate	N/A	N/A	As above
		Nut coke	N/A	N/A	N/A
Wastes and unmodified byproducts	Not suitable for trial requiring formal licence amendment process Harmful or hazardous constituents are concentrated in the waste stream There is little control over the composition of waste products	Tailings Red mud Iron oxide Flyash	Lung, eye and skin irritant; Human toxicity; Radiological components	Ecotoxicity (bioavailability/ bioaccumulation); Groundwater contamination; Odour	N/A

Note that:

- all non-prescribed products and grain have been excluded;
- all products not loaded or unloaded in ‘bulk’ (e.g. bagged or containerised products) have been excluded.


Appendix C
Self-assessment decision making flowchart for trialling new materials based on risks to
Human Health
and the
Marine, riverine or estuarine environment
Start
The commodity:
contains asbestos in concentrations equal to or greater than 0.01% w/w for non-friable asbestos or 0.01% w/w for fibrous asbestos; and/or
contains equal to or greater than 1% w/w respirable silica; and/or
exceeds the radiation transport limit of 10 Bq/g for Uranium-238 and Thorium-232 (combined); and/or
exceeds Rubidium-87 concentrations of 30 Bq/g; and/or
is a waste or waste-derived by-product.
YES
NO
The commodity contains bioavailable/soluble or biocumulative components that could impact the marine, estuarine or riverine ecosystem or human health.
YES
NO
Does the premises allow discharge of stormwater or wash waters to the marine, estuarine or riverine environment.
YES
NO
Premises captures and treats stormwater or wash water to 'required standard' prior to discharge to the marine, estuarine or riverine environment or other discharge containment facility.
YES
NO
Human health, environmental and marine, estuarine or riverine risk is determined as no higher than 'medium' following the implementation of new and innovative handling methods (over and above minimum requirements of handling method 4)
YES
NO
Does the commodity contain either of the following hazards?:
More than 3% of material finer than 10 microns in diameter;
OR
Dry product (moisture content below the DEM level), or the DEM level is unknown.
NO
YES
Does the commodity either:
Contain more than 3% of material finer than 10 microns in diameter, BUT DEM level is known and the moisture content is above DEM level?
OR
Contain dry product (moisture content below the DEM level), OR the DEM level is unknown, BUT it contains less than 3% material finer than 10 microns in diameter?
(NOTE: if the commodity contains both dry and fine hazard characteristics, then the answer is 'No'.)
YES
NO
The commodity contains:
Dry product (moisture content below the DEM level), or the DEM level is unknown.
AND
More than 3% of material is finer than 10 microns in diameter.
The commodity also contains one or both of the following hazards?:
Dry product (moisture content below the DEM level), or the DEM level is unknown;
AND/OR
The commodity consists of more than 3% of material finer than 10 microns in diameter.
NO
YES
Are there residential receptors, including short-stay accommodation within 500m of prescribed activities?
NO
YES
Are there residential receptors, including short-stay accommodation within 500m of prescribed activities?
NO
YES
Are there residential receptors, including short-stay accommodation within 500m of prescribed activities?
NO
YES
Are there residential receptors, including short-stay accommodation within 500m of prescribed activities?
YES
NO
Handling Method 1
Storage: Open stockpiles.
Loading: Handled with front end loader and conventional conveyor loading with product specific loading head as specified.
Unloading: Product unloaded using grab bucket in combination with hoppers and/or conveyors loading to open stockpiles.
Minimum Handling Method 2
Storage: Product received and stored within a shed, or in open stockpiles where moisture content can be maintained above DEM.
Loading: Product loaded from shed using conveyors with product specific loading head as specified.
Unloading: Product unloaded using grab bucket in combination with hoppers and/or conveyors loading to truck or shed.
Minimum Handling Method 3
Storage: Product received and stored within a shed.
Loading: Commodity transported to the vessel via covered conveyors, delivered into the vessel using a chute lowered as far as possible below into the ship's hold.
Unloading: Commodity unloaded using a grab bucket to a hopper equipped and operated at all times with wind shielding and water sprays; or designed to prevent the escape of dust and operated with dust extraction and filter system eg. bag house.
Minimum Handling Method 4
Storage: Commodity may be stored in bulk within an enclosed shed with dust extraction systems that discharge through a bag house or wet scrubber.
Loading: Containers emptied into vessels using rotating tipping frames.
Unloading: Commodity unloaded using a Shwertell that transports the product to a shed via covered conveyors.
Product is suitable for trial following demonstration of acceptable risk by using MHM4 plus additional controls. All Trial conditions still apply.
Additional controls on source, pathways to receptors, monitoring requirements, and contingency measures/ management actions.
Product not suitable for Trial.
Full assessment through Licence amendment required