

# Chemical waste: appropriate measures for permitted facilities

From: **Environment Agency**  
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## Contents

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### Guidance for regulated facilities with an environmental permit to treat or transfer chemical waste.

This guidance explains the standards (appropriate measures) that are relevant to regulated facilities with an environmental permit to treat or transfer chemical waste. Chemical waste includes:

- hazardous chemical wastes (for example sulphuric acid or engine oil)
- wastes that contain, or are contaminated with, hazardous chemicals (for example contaminated soils)
- non-hazardous chemical wastes (for example non-hazardous sludges from physico-chemical treatment) that are treated chemically

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**[1. When appropriate measures apply \(/guidance/chemical-waste-appropriate-measures-for-permitted-facilities/1-when-appropriate-measures-apply\)](#)**

Assessing appropriate measures for your site, the measures that apply to different types of facilities and implementing measures at new and existing facilities.

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## **[2. General management appropriate measures \(/guidance/chemical-waste-appropriate-measures-for-permitted-facilities/2-general-management-appropriate-measures\)](#)**

These are the appropriate measures for the environmental management of a regulated facility with an environmental permit for treating or transferring chemical waste.

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## **[3. Waste pre-acceptance, acceptance and tracking appropriate measures \(/guidance/chemical-waste-appropriate-measures-for-permitted-facilities/3-waste-pre-acceptance-acceptance-and-tracking-appropriate-measures\)](#)**

These are the appropriate measures for waste pre-acceptance, acceptance and tracking at regulated facilities with an environmental permit for treating or transferring chemical waste. They do not apply when waste will be received directly from a householder.

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## **[4. Waste storage, segregation and handling appropriate measures \(/guidance/chemical-waste-appropriate-measures-for-permitted-facilities/4-waste-storage-segregation-and-handling-appropriate-measures\)](#)**

These are the appropriate measures for waste storage, segregation and handling at regulated facilities with an environmental permit for treating or transferring chemical waste.

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## **[5. Waste treatment appropriate measures \(/guidance/chemical-waste-appropriate-measures-for-permitted-facilities/5-waste-treatment-appropriate-measures\)](#)**

These are the appropriate measures for waste treatment at regulated facilities with an environmental permit for treating chemical waste.

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## **[6. Emissions control appropriate measures \(/guidance/chemical-waste-appropriate-measures-for-permitted-facilities/6-emissions-control-appropriate-measures\)](#)**

These are the appropriate measures for emissions control at regulated facilities with an environmental permit for treating or transferring chemical waste.

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## **[7. Emissions monitoring and limits appropriate measures \(/guidance/chemical-waste-appropriate-measures-for-permitted-facilities/7-emissions-monitoring-and-limits-appropriate-measures\)](#)**

These are the emissions limits and appropriate measures for monitoring emissions to air and water at regulated facilities with an environmental permit


for treating or transferring chemical waste.

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## [8. Process efficiency appropriate measures \(/guidance/chemical-waste-appropriate-measures-for-permitted-facilities/8-process-efficiency-appropriate-measures\)](/guidance/chemical-waste-appropriate-measures-for-permitted-facilities/8-process-efficiency-appropriate-measures)

These are the appropriate measures for process efficiency at regulated facilities with an environmental permit for treating or transferring chemical waste.

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# 1. When appropriate measures apply

Assessing appropriate measures for your site, the measures that apply to different types of facilities and implementing measures at new and existing facilities.

There is a lot of overlap between best available techniques (BAT) for waste installation facilities and necessary measures for waste operation facilities. The Environment Agency uses the term 'appropriate measures' to cover both sets of requirements.

Appropriate measures are the standards that operators should meet to comply with their environmental permit requirements. This guidance sets out what you must consider when you assess the appropriate measures for your site. It is not definitive and it does not replace your obligation to assess appropriate measures fully.

Some measures may not be suitable or relevant for your operation. Appropriate measures will depend on the:

- activities being carried out
- size and nature of the activities
- location of the site

For installations there are additional requirements for using energy and raw materials (including water) efficiently. These are called [process efficiency measures \(https://www.gov.uk/guidance/chemical-waste-appropriate-measures-for-permitted-facilities/8-process-efficiency-appropriate-measures\)](https://www.gov.uk/guidance/chemical-waste-appropriate-measures-for-permitted-facilities/8-process-efficiency-appropriate-measures).

Where a measure is not suitable, an operator can propose alternative measures that achieve the same level of environmental protection. Or they can provide an explanation of why the specific measure is not relevant.

In certain situations, you may need to provide a higher standard of environmental protection, for example:

- where there are local sensitive receptors
- if there is a risk that an operation may exceed an Environmental Quality Standard

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## **1.1. Measures that apply to different types of facilities**

This is how the standards in this technical guidance apply to different types of facilities that treat or transfer chemical waste.

The following sections apply to transfer stations:

- [General management](https://www.gov.uk/guidance/chemical-waste-appropriate-measures-for-permitted-facilities/2-general-management-appropriate-measures)  
(<https://www.gov.uk/guidance/chemical-waste-appropriate-measures-for-permitted-facilities/2-general-management-appropriate-measures>)
- [Waste pre-acceptance, acceptance and tracking](https://www.gov.uk/guidance/chemical-waste-appropriate-measures-for-permitted-facilities/3-waste-pre-acceptance-acceptance-and-tracking-appropriate-measures)  
(<https://www.gov.uk/guidance/chemical-waste-appropriate-measures-for-permitted-facilities/3-waste-pre-acceptance-acceptance-and-tracking-appropriate-measures>)
- [Waste storage, segregation and handling](https://www.gov.uk/guidance/chemical-waste-appropriate-measures-for-permitted-facilities/4-waste-storage-segregation-and-handling-appropriate-measures)  
(<https://www.gov.uk/guidance/chemical-waste-appropriate-measures-for-permitted-facilities/4-waste-storage-segregation-and-handling-appropriate-measures>)
- [Emissions control](https://www.gov.uk/guidance/chemical-waste-appropriate-measures-for-permitted-facilities/6-emissions-control-appropriate-measures)  
(<https://www.gov.uk/guidance/chemical-waste-appropriate-measures-for-permitted-facilities/6-emissions-control-appropriate-measures>)
- [Emissions monitoring and limits](https://www.gov.uk/guidance/chemical-waste-appropriate-measures-for-permitted-facilities/7-emissions-monitoring-and-limits-appropriate-measures)  
(<https://www.gov.uk/guidance/chemical-waste-appropriate-measures-for-permitted-facilities/7-emissions-monitoring-and-limits-appropriate-measures>)
- [Process efficiency](https://www.gov.uk/guidance/chemical-waste-appropriate-measures-for-permitted-facilities/8-process-efficiency-appropriate-measures)  
(<https://www.gov.uk/guidance/chemical-waste-appropriate-measures-for-permitted-facilities/8-process-efficiency-appropriate-measures>) (measures for using energy, raw materials and water apply to Industrial Emissions Directive (IED) installations only)

The following sections apply to treatment activities (treating chemical wastes by a method other than incineration):

- [General management](https://www.gov.uk/guidance/chemical-waste-appropriate-measures-for-permitted-facilities/2-general-management-appropriate-measures)  
(<https://www.gov.uk/guidance/chemical-waste-appropriate-measures-for-permitted-facilities/2-general-management-appropriate-measures>)
- [Waste pre-acceptance, acceptance and tracking](https://www.gov.uk/guidance/chemical-waste-appropriate-measures-for-permitted-facilities/3-waste-pre-acceptance-acceptance-and-tracking-appropriate-measures)  
(<https://www.gov.uk/guidance/chemical-waste-appropriate-measures-for-permitted-facilities/3-waste-pre-acceptance-acceptance-and-tracking-appropriate-measures>)
- [Waste storage, segregation and handling](https://www.gov.uk/guidance/chemical-waste-appropriate-measures-for-permitted-facilities/4-waste-storage-segregation-and-handling-appropriate-measures)  
(<https://www.gov.uk/guidance/chemical-waste-appropriate-measures-for-permitted-facilities/4-waste-storage-segregation-and-handling-appropriate-measures>)

[storage-segregation-and-handling-appropriate-measures](#))

- [Waste treatment](#)  
(<https://www.gov.uk/guidance/chemical-waste-appropriate-measures-for-permitted-facilities/5-waste-treatment-appropriate-measures>)
- [Emissions control](#)  
(<https://www.gov.uk/guidance/chemical-waste-appropriate-measures-for-permitted-facilities/6-emissions-control-appropriate-measures>)
- [Emissions monitoring and limits](#)  
(<https://www.gov.uk/guidance/chemical-waste-appropriate-measures-for-permitted-facilities/7-emissions-monitoring-and-limits-appropriate-measures>)
- [Process efficiency](#)  
(<https://www.gov.uk/guidance/chemical-waste-appropriate-measures-for-permitted-facilities/8-process-efficiency-appropriate-measures>) (measures for using energy, raw materials and water apply to IED installations only)

For waste incineration activities, the following sections apply in addition to the [incineration sector guidance](#)

(<https://www.gov.uk/government/publications/incineration-of-waste-epr501-additional-guidance>):

- [Waste pre-acceptance, acceptance and tracking](#)  
(<https://www.gov.uk/guidance/chemical-waste-appropriate-measures-for-permitted-facilities/3-waste-pre-acceptance-acceptance-and-tracking-appropriate-measures>)
- [Waste storage, segregation and handling](#)  
(<https://www.gov.uk/guidance/chemical-waste-appropriate-measures-for-permitted-facilities/4-waste-storage-segregation-and-handling-appropriate-measures>)

Other generic technical guidance also applies to chemical waste facilities, including [guidance on emissions, odour and noise](#)

(<https://www.gov.uk/guidance/control-and-monitor-emissions-for-your-environmental-permit>).

Specific technical guidance may also be appropriate. For example, there is additional

[technical guidance](#)

<https://www.gov.uk/government/collections/technical-guidance-for-regulated-industry-sectors-environmental-permitting>) for operators of sites that incinerate waste, and operators who store or treat healthcare wastes.

We consider the accident and fire prevention measures specified in this guidance are appropriate measures for managing the fire risks of chemical waste. If you have a permit to carry out an activity involving the storage of other non-hazardous combustible wastes, you may need an approved fire prevention plan that meets the requirements of our [fire prevention plan guidance](#) (<https://www.gov.uk/government/publications/fire-prevention-plans-environmental-permits>).

Combustion plant with a rated thermal input less than 50 megawatts must comply with the relevant requirements of the Medium Combustion Plant Directive and specified generator regulations. See [guidance on the requirements for medium combustion plant and specified generators](#) (<https://www.gov.uk/guidance/medium-combustion-plant-and-specified-generators-environmental-permits>).

If you operate an exempt site that transfers or treats chemical waste, you should also follow this guidance.

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## **1.2. Implementing appropriate measures at new and existing facilities**

The appropriate measures in this guidance apply to both new and existing facilities that treat or transfer chemical waste.

For new facilities the appropriate measures must be in place before operations start.

For existing facilities, if the cost of complying with the appropriate measures is disproportionate to the environmental benefit, immediate compliance may



not be reasonable. Through permit reviews, the Environment Agency will assess the current operating techniques of existing facilities against the relevant appropriate measures.

Where an operator is not using appropriate measures, we will expect them to provide improvement plans and timetables for implementing the relevant appropriate measures. We will review these proposals and set formal timescales for making the improvements needed. We will do this by varying the environmental permit to include improvement conditions.

Improvements at existing facilities are likely to fall into one of the following 2 categories.

### **1. Standard good practice requirements**

For example, these could be:

- updated management systems
- waste, water and energy efficiency measures
- measures to prevent fugitive or accidental emissions
- waste handling techniques
- appropriate monitoring equipment

Where these improvements are relatively low cost, operators should implement them as soon as possible and within 12 months.

### **2. Larger, more capital intensive improvements**

For example, these could be:

- installing significant abatement equipment
- the significant redesign of facility layout, including the design and installation of new buildings or treatment plant

Operators should complete these improvements as soon as practicable and within 3 years.


Local environmental impacts (for example, having sensitive receptors or an air quality management area close by) may mean an operator has to take

action more quickly than the timescales provided here.

By August 2022, unless we [approve a derogation \(https://www.gov.uk/guidance/best-available-techniques-environmental-permits#how-to-propose-an-alternative-technique\)](https://www.gov.uk/guidance/best-available-techniques-environmental-permits#how-to-propose-an-alternative-technique), existing installations must comply with relevant BAT associated emission levels (AELs). These are set out in the [waste treatment BAT conclusions \(https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L\\_.2018.208.01.0038.01.ENG&toc=OJ:L:2018:208:TOC\)](https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2018.208.01.0038.01.ENG&toc=OJ:L:2018:208:TOC).

New installations (including new or replacement plant at existing facilities) must comply with any relevant BAT AELs from when operations begin, unless we approve a derogation.

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## **2. General management appropriate measures**

These are the appropriate measures for the environmental management of a regulated facility with an environmental permit for treating or transferring chemical waste.

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### **2.1. Management system**

1. You must have and follow an up-to-date, [written management system](https://www.gov.uk/guidance/develop-a-management-system-environmental-permits) (<https://www.gov.uk/guidance/develop-a-management-system-environmental-permits>) that incorporates the following environmental performance features:

You have:

- management commitment, including from senior managers
- an environmental policy that is approved by senior managers and includes the continuous improvement of the facility's environmental performance

You plan and establish the resources, procedures, objectives and targets needed for environmental performance alongside your financial planning and investment.

You implement your environmental performance procedures, paying particular attention to:

- staff structure and relevant responsibilities
- staff recruitment, training, awareness and competence
- communication (for example, of performance measures and targets)
- employee involvement
- documentation
- effective process control
- maintenance programmes
- managing change
- emergency preparedness and response
- making sure you comply with environmental legislation

You check environmental performance and take corrective or preventative action, paying particular attention to:

- monitoring and measurement
- learning from incidents, near misses and mistakes, including those of other organisations
- records maintenance

- independent (where practicable) internal or external auditing of the management system to confirm it has been properly implemented and maintained

Senior managers review the management system to check it is still suitable, adequate and effective.

You review the development of cleaner technologies and their applicability to site operations.

When designing new plant, you make sure you assess the environmental impacts from the plant's operating life and eventual decommissioning.

You consider the [risks a changing climate](https://www.gov.uk/guidance/develop-a-management-system-environmental-permits#a-changing-climate) (<https://www.gov.uk/guidance/develop-a-management-system-environmental-permits#a-changing-climate>) poses to your operations. You have appropriate plans in place to assess and manage future risks.

You compare your site's performance against relevant sector guidance and standards on a regular basis, known as sectoral benchmarking.

You have and maintain the following documentation:

- inventory of emissions to air and water
- residues management plan
- accident management plan
- [site infrastructure plan](https://www.gov.uk/guidance/develop-a-management-system-environmental-permits#prepare-your-site-infrastructure-plan) (<https://www.gov.uk/guidance/develop-a-management-system-environmental-permits#prepare-your-site-infrastructure-plan>)
- [site condition report](https://www.gov.uk/government/publications/environmental-permitting-h5-site-condition-report) (<https://www.gov.uk/government/publications/environmental-permitting-h5-site-condition-report>)
- odour management plan, if required
- noise and vibration management plan, if required
- dust management plan, if required
- pest management plan, if required
- fire prevention plan, if required
- [climate change risk assessment](https://www.gov.uk/guidance/adapting-to-climate-) (<https://www.gov.uk/guidance/adapting-to-climate->

[change-risk-assessment-for-your-environmental-permit](#)), if required

Your management system can also include, for example, product or service quality, operational efficiency and [health and safety in the workplace](#) (<https://www.hse.gov.uk/pubns/books/hsg65.htm>).

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## 2.2. Staff competence

1. Your site must be operated at all times by an adequate number of staff with [appropriate qualifications and competence](#) (<https://www.gov.uk/guidance/develop-a-management-system-environmental-permits#managing-staff-competence-and-training-records>).
2. The design, installation and maintenance of infrastructure, plant and equipment must be carried out by competent people.
3. You must have appropriately qualified managers for your waste activity who are members of a government-approved [technical competency scheme](#) (<https://www.gov.uk/guidance/legal-operator-and-competence-requirements-environmental-permits#qualifications-required-by-waste-activity-managers>).
4. The person carrying out the technical appraisal of a waste's suitability for receipt at pre acceptance must have the minimum of a [Higher National Certificate](#) (<https://www.gov.uk/what-different-qualification-levels-mean/list-of-qualification-levels>) (HNC) in chemistry (or equivalent qualification). For the following wastes, technical appraisals must be carried out by a person who has had enough training to determine the suitability of the waste for the site:
  - asbestos
  - contaminated clothing and rags
  - 'articles', for example waste electronic equipment or batteries
  - contaminated wood

- solid non-hazardous waste other than 'mirror entries' (where waste may be allocated to a hazardous entry or to a non-hazardous entry according to the European List of Waste)

5. If you need to sample, check (other than visually), or test a hazardous waste when you accept it, acceptance must be supervised by someone with the minimum of an HNC in chemistry (or equivalent qualification). At sites where the waste needs only a visual check, the person who receives the waste must have had enough training to be able to identify and manage any non-conformances in the load received.

6. You must make sure that any required sample is representative of the waste and has been taken by someone technically competent to do so.

7. Any required analysis must be done by someone with the minimum of an HNC in chemistry (or equivalent qualification).

8. Non-supervisory staff must be reliable and technically skilled. Their skills may be based on experience and relevant training.

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## 2.3. Accident management plan

1. As part of your written management system you must have a [plan for dealing with any incidents or accidents](https://www.gov.uk/guidance/develop-a-management-system-environmental-permits#accident-prevention-and-management-plan) (<https://www.gov.uk/guidance/develop-a-management-system-environmental-permits#accident-prevention-and-management-plan>) that could result in pollution.

2. The accident management plan must identify and assess the risks the facility poses to human health and the environment.

3. Particular areas to consider may include:

- waste types
- vessels overfilling

- failure of plant and equipment (for example over-pressure of vessels and pipework, blocked drains)
- failure of containment (for example, bund failure, or drainage sumps overflowing)
- failure to contain firefighting water
- making the wrong connections in drains or other systems
- preventing incompatible substances coming into contact with each other
- unwanted reactions and runaway reactions
- checking the composition of an effluent before emission
- vandalism and arson
- extreme weather conditions, such as flooding or very high winds

4. You must [assess the risk of accidents and their consequences](https://www.gov.uk/guidance/risk-assessments-for-your-environmental-permit) (<https://www.gov.uk/guidance/risk-assessments-for-your-environmental-permit>). Risk is the combination of the likelihood that a hazard will occur, and the severity of the impact resulting from that hazard. Having identified the hazards, you can assess the risks by addressing 6 questions:

- how likely is it that the accident will happen?
- what may be emitted and how much?
- where will the emission go – what are the pathways and receptors?
- what are the consequences?
- what is the overall significance of the risk?
- what can you do to prevent or reduce the risk?

5. In particular, you must identify any fire risks, for example from:

- arson or vandalism
- self-combustion, for example due to chemical oxidation
- plant or equipment failure and electrical faults
- naked lights and discarded smoking materials
- hot works (for example welding or cutting), industrial heaters and hot exhausts
- reactions between incompatible materials



- neighbouring site activities
- sparks from loading buckets
- hot loads deposited at the site

6. The depth and type of accident risk assessment you do will depend on the characteristics of the plant and its location. The main factors to take into account are the:

- scale and nature of the accident hazard presented by the plant and its activities
- risks to areas of population and the environment (the receptors)
- nature of the plant and complexity of the activities, and how difficult it is to decide and justify adequate risk control techniques

7. Through your accident management plan, you must also identify the roles and responsibilities of the staff involved in managing accidents. You must give them clear guidance on how to manage each accident scenario, for example, whether to use containment or dispersion to extinguish fires, or let them burn.

8. You must appoint one facility employee as an emergency co-ordinator who will take lead responsibility for implementing the plan. You must train your employees so they can perform their duties effectively and safely and know how to respond to an emergency.

9. You must also:

- establish how you will communicate with relevant authorities, emergency services and neighbours (as appropriate) both before, during and after an accident
- have appropriate emergency procedures, including for safe plant shutdown and site evacuation
- have post-accident procedures that include making an assessment of the harm that may have been caused by an accident and the remediation actions you will take
- test the plan by carrying out emergency drills and exercises

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## 2.4. Accident prevention measures

You must take the following measures, where appropriate, to prevent events that may lead to an accident.

### Segregating waste

1. You must keep apart incompatible or segregated wastes and substances by their hazardous properties.
2. You must segregate incompatible waste types into bays or store them in dedicated buildings. The minimum requirement is to use a kerbed perimeter and separate drainage collection. You must also have measures in place to prevent containers falling over into other storage areas.

### Preventing accidental emissions

3. You must make sure you contain the following (where appropriate) and route to the effluent system (where necessary):

- process waters
- site drainage waters
- emergency firefighting water
- chemically contaminated waters
- spillages of chemicals

4. You must be able to contain surges and storm water flows. You must provide enough buffer storage capacity to make sure you can achieve this. You can define this capacity using a risk-based approach, for example, by taking into account the:

- nature of the pollutants
- effects of downstream waste water treatment
- sensitivity of the receiving environment

5. You can only discharge waste water from this buffer storage after you have taken appropriate measures, for example, to control, treat or reuse the water.

6. You must have spill contingency procedures to minimise the risk of an accidental emission of raw materials, products and waste materials, and to prevent their entry into water.

7. Your emergency firefighting water collection system must take account of additional firefighting water flows or firefighting foams. You may need emergency storage lagoons to prevent contaminated firefighting water reaching a receiving water body.

8. You must consider and, if appropriate, plan for the possibility that you need to contain or abate accidental emissions from:

- overflows
- vents
- safety relief valves
- bursting discs

If this is not advisable on safety grounds, you must focus on reducing the probability of the emission.

## **Security measures**

9. You must have security measures (and staff) in place to prevent:

- entry by intruders
- damage to equipment
- theft
- fly-tipping
- arson

10. Facilities must use an appropriate combination of the following measures:

- security guards
- total enclosure (usually with fences)
- controlled entry points

- adequate lighting
- warning signs
- 24-hour surveillance, such as CCTV

## **Fire prevention**

11. There are 3 fire prevention objectives. You must:

- minimise the likelihood of a fire happening
- aim for a fire to be extinguished within 4 hours
- minimise the spread of fire within the site and to neighbouring sites

12. You must have appropriate systems for fire prevention, detection and suppression or extinction.

13. You must have suitable procedures and provisions (such as fire resistant stores, automatic alarms and sprinklers) to store certain types of hazardous waste.

14. Your facility must have enough water supplies to extinguish fires. You must have an alternative type of fire protection system if you store or treat any water-reactive waste, for example dry powder extinguishers.

15. You must isolate drainage systems from flammable waste storage areas to prevent fire spreading along the drainage system by solvents or other flammable hydrocarbons.

16. You must regularly inspect and clean your site to prevent the build-up of loose combustible material (including waste and dust), particularly around treatment plant, equipment and other potential sources of ignition.

17. You should share and communicate accident management and fire prevention plans with your local fire and rescue service.

## **Other accident prevention measures**

18. You must assess areas of the site where explosive atmospheres could occur and, where

appropriate, classify them into hazardous zones in accordance with the [Dangerous Substances and Explosive Atmospheres Regulations](https://www.hse.gov.uk/fireandexplosion/dsear.htm) (<https://www.hse.gov.uk/fireandexplosion/dsear.htm>).

Plant and equipment used in these zones must be [ATEX compliant](https://www.hse.gov.uk/fireandexplosion/atex.htm) (<https://www.hse.gov.uk/fireandexplosion/atex.htm>).

19. You must maintain plant control in an emergency – use one or a combination of the following measures:

- alarms
- process trips and interlocks
- automatic systems based on microprocessor control and valve control
- tank level readings such as ultrasonic gauges, high level warnings, process interlocks and process parameters

20. You must:

- make sure all the measurement and control devices you would need in an emergency are easy to access and will operate in an emergency
- maintain the plant so it is in a good state through a preventive maintenance programme and a control and testing programme
- use techniques such as suitable barriers to prevent moving vehicles damaging equipment
- have procedures in place to avoid incidents due to poor communication between operating staff during shift changes and after maintenance or other engineering work

## **Record keeping and procedures**

21. You must:

- keep an up-to-date record of all accidents, incidents, near misses, changes to procedures, abnormal events, and the findings of maintenance inspections
- investigate accidents, incidents, near misses and abnormal events and record the steps you take to stop them reoccurring

- maintain an inventory of substances, which are present (or likely to be) and which could have environmental consequences if they escape – many apparently innocuous substances can damage the environment if they escape
  - have procedures for checking raw materials and wastes to make sure they are compatible with other substances they may accidentally come into contact with
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## **2.5. Contingency plan and procedures**

1. You must have and implement a contingency plan, which makes sure you:

- comply with all your permit conditions and operating procedures during maintenance or shutdown at your site, or elsewhere
- do not exceed storage limits in your permit and you continue to apply appropriate measures for storing and handling waste
- stop accepting waste unless you have a clearly defined method of recovery or disposal and enough permitted storage capacity

2. You should have contingency procedures to make sure that, as far as possible, you know in advance about any planned shutdowns at waste management facilities where you send waste.

3. You must make your customers aware of your contingency plan, and of the circumstances in which you would stop accepting waste from them.

4. You should consider whether the sites or companies you rely on in your contingency plan:

- can take the waste at short notice
- are authorised to do so in the quantities and types likely to be needed – in addition to carrying out their existing activities

5. You should not discount alternative disposal or recovery options on the basis of extra cost or geographical distance if doing so means you could exceed your permitted storage limits, or compromise your storage procedures.

6. You must not include unauthorised capacity in your contingency plan. If your contingency plan includes using temporary storage for additional waste on your site, you must make sure your site is authorised for this storage and you have the appropriate infrastructure in place.

### **Treatment sites only**

7. Your management procedures and contingency plan must:

- identify known or predictable malfunctions associated with your technology and the procedures, spare parts, tools and expertise needed to deal with them
- include a record of spare parts held, especially critical spares – or state where you can get them from and how long it would take
- have a defined procedure to identify, review and prioritise items of plant which need a preventative maintenance regime
- include all equipment or plant whose failure could directly or indirectly lead to an impact on the environment or human health
- identify 'non-productive' or redundant items such as tanks, pipework, retaining walls, bunds, mobile plant, reusable waste containers (for example wheeled carts), ducts, filters and security systems
- make sure you have the spare parts, tools, and competent staff needed before you start maintenance

8. If you produce an end-of-waste material at your facility, your contingency planning must consider issues with storage capacity for end-of-waste products and materials that fail the end-of-waste specification.

9. Your management system must include procedures for auditing your performance against all of these contingency measures and for reporting the audit results to the site manager.

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## **2.6. Plant decommissioning**

1. You must consider how you will decommission the plant at the design stage, and plan how you will minimise risks during decommissioning.

2. For existing plants where potential risks are identified, you must have a programme of design improvements. These design improvements need to make sure you:

- avoid using underground tanks and pipework – if it is not economically possible to replace them, you must protect them by secondary containment or a suitable monitoring programme
- drain and clean out vessels and pipework before dismantling
- use insulation which you can dismantle easily without dust or hazard
- use recyclable materials, taking into account operational or other environmental objectives

3. You must have and maintain a decommissioning plan to demonstrate that:

- plant will be decommissioned without causing pollution
- the site will be returned to a satisfactory condition

4. Your decommissioning plan should include details on:

- whether you will remove or flush out pipelines and vessels (where appropriate) and how you will empty them of any potentially harmful contents
- site plans showing the location of all underground pipes and vessels
- the method and resources needed to clear any on-site lagoons



- the method for closing any on-site landfills
- how asbestos or other potentially harmful materials will be removed, unless we have agreed it is reasonable to leave such liabilities to future owners
- methods for dismantling buildings and other structures, and for protecting surface water and groundwater during construction or demolition at your site
- any soil testing needed to check for pollution caused by site activities, and information on any remediation needed to return the site to a satisfactory state when you stop activities, as defined by the initial site condition report
- the measures proposed, once activities have definitively stopped, to avoid any pollution risk and to return the site of operation to a satisfactory state (including, where appropriate, measures relating to the design and construction of the plant)
- the clearing of deposited residues, waste and any contamination resulting from the waste treatment activities

5. You should make sure that equipment taken out of use is decontaminated and removed from the site.

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# Chemical waste: appropriate measures for permitted facilities

From: **Environment Agency**  
(/government/organisations/environment-  
agency)

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updates**

## Contents

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### **3. Waste pre-acceptance, acceptance and tracking appropriate measures**

These are the appropriate measures for waste pre-acceptance, acceptance and tracking at regulated facilities with an environmental permit for treating or transferring chemical waste. They do not apply when waste will be received directly from a householder.

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## 3.1. Waste pre-acceptance

1. You must implement waste pre-acceptance procedures so that you know enough about a waste (including its composition) before it arrives at your facility. You need to do this to assess and confirm the waste is technically and legally suitable for your facility. Your procedures must follow a risk-based approach, considering:

- the source and nature of the waste
- its hazardous properties
- potential risks to process safety, occupational safety and the environment (for example, from odour and other emissions)
- knowledge about the previous waste holder

2. When you receive a customer query, and before the waste arrives at your facility, you must obtain the following in writing or in an electronic form:

- details of the waste producer including their organisation name, address and contact details
- the source of the waste (the producer's business and the specific process that has created the waste)
- where the holder of the waste is not the producer, details of the waste holder including their organisation name, address and contact details
- information on the nature and variability of the waste production process and the waste

You must also obtain (in writing or electronic form) details about the waste including:

- a description
- the List of Waste code (European Waste Classification (EWC) code)
- its physical form
- its composition (based on safety data sheets, where appropriate, or representative samples and robust laboratory analysis)
- any hazardous properties
- any persistent organic pollutants (POPs) present

- the potential for self-heating, self-reactivity or reactivity to moisture or air
- any odour
- its age, that is when it first became waste
- the type of packaging
- an estimate of the quantity you expect to receive in each load and in a year

You must also obtain confirmation that the waste does not contain a radioactive source. If there is a risk of radioactive contamination you must obtain confirmation that the waste is not radioactive, unless your facility is permitted to accept such waste.

3. You must consider whether specific wastes, from among those you are permitted to receive, have properties that can pose unacceptable risks to the site or process, for example due to:

- a risk of explosion (for example, if ammunition or aerosol canisters are present, or mixing processes that could lead to explosion)
- corrosion caused by strong acids
- a risk of uncontrolled reactions (for example, if peroxides or strong oxidants are present, or polymerising components such as certain isocyanates)
- a risk of the evolution of gases (for example if cyanides, sulphides or dissolved gas are present)

You should establish a list of such wastes.

4. You can verify the pre-acceptance information by contacting or visiting the producer. Dealing with staff directly involved in waste production will help to fully characterise a waste.

5. You must obtain and analyse a representative sample of a waste if:

- the chemical composition or variability of the waste is unclear from the information supplied by the customer
- there are doubts about whether the sample analysed is representative of the waste

- you will treat the waste at your facility (this allows you to carry out tests to determine if the planned treatment will be safe and effective)

Where you rely on a customer sample you must record that you have done this and the reason why the customer sample is acceptable.

6. You may not need a representative sample where, for example, the waste is:

- asbestos
- a pure product chemical or aerosol where the chemical composition and hazardous properties are available in a REACH compliant safety data sheet
- packaged cosmetics and pharmaceuticals
- contaminated clothing, packaging or rags
- an 'article', for example batteries, lighting tubes, waste electrical or electronic equipment, end-of-life vehicles or parts of vehicles, metal waste and scrap metal
- solid non-hazardous waste (except for mirror entries when the waste composition is unknown)
- contaminated wood and roofing material
- produced in an emergency – you must not treat or offload such wastes until you have completed a full characterisation

6.1 You also may not need a representative sample if the waste is laboratory smalls in containers of less than 5 litres.

Laboratory smalls generally contain pure chemical elements and compounds from laboratories or arise when laboratory stores are cleared.

When drums are used for laboratory smalls, a list of the contents must be stored within the drum below the lid, or attached to the drum. Similarly for other types of packages containing laboratory smalls, a list of contents is appropriately stored within (or attached to) the packaging. Each packed drum (or other package) is then labelled with the hazard for carriage, for example under the International Carriage of Dangerous Goods by Road (ADR) treaty.

You should provide packaging guidance to your customer or their intermediary if the person packing the laboratory smalls does not work for you.

6.2 You also may not need a representative sample of waste oil for treatment. Pre acceptance sampling is not critical for a waste oil treatment plant, but it would be required if the waste will be treated at a mineral oil refinery. Typically waste oil comes from a large number of small volume sources, such as garages, but its composition is essentially fixed. Waste oil is any mineral-based or synthetic lubrication, or industrial oil which has become unfit for its original use. Waste oil includes:

- used combustion engine oils
- gearbox oils
- mineral lubricating oils
- oils for turbines
- hydraulic oils

Waste oil contaminated with more than 50 ppm of polychlorinated biphenyls (PCBs) is not included as a waste oil.

6.3 You should obtain a representative sample of the following types of waste oil, from:

- industrial sites that do not normally produce waste oil
- other sources where chemicals and potential contaminants may be handled, for example from chemical manufacturing

You should advise your customers that they must avoid contaminating waste oil. This is because during treatment low flashpoint solvents or petrol will cause handling difficulties, increase volatile organic compound (VOC) emissions and increase the risk of accidents.

Contamination with PCBs can transfer those PCBs either to the:

- product (which may cause dioxin formation if used in a subsequent combustion process)
- tank bottom oil sludges

- effluent

If you suspect that waste oil has become contaminated, for example by solvents, petrol or PCBs, you must identify the contamination.

6.4 If you do not take a pre-acceptance sample of any hazardous waste you must record the reason.

6.5 If the customer has a number of containers holding the same waste, you can apply 'the square root of (N) + 1' rule to sampling those containers. Producing a composite sample of this waste may be appropriate. If the waste is variable you will need a sample from each container.

7. After fully characterising a waste, you must technically assess the waste's suitability for treatment or storage to make sure you can meet permit conditions. You must also do this to meet any Control of Major Accident Hazards (COMAH) requirements, because wastes, raw materials and end-of-waste materials all contribute to COMAH limits. You must make sure that the waste complies with the site's treatment capabilities. In the case of water based liquid waste, you may perform laboratory scale tests to predict the treatment's performance, for example on breaking of emulsion or biodegradability.

8. You can use material flow analysis to help identify the flow and fate of the components in the waste. This analysis can be helpful in choosing the most appropriate forms of treatment for the waste, either directly at the site or at any subsequent treatment site.

9. You must keep pre-acceptance records for at least 3 years (in a computerised waste tracking system) following receipt of the waste. If an enquiry from a waste producer does not lead to the receipt of waste, you do not need to keep records.

10. You must reassess the information required at pre-acceptance if the:

- waste changes
- process giving rise to the waste changes

- waste received does not conform to the pre-acceptance information

In all cases, you must reassess the information required at pre-acceptance on an annual basis.

11. You must apply odour criteria to decide whether to accept wastes that are already releasing, or have the potential to release:

- mercaptans or other VOCs
- low molecular weight amines
- acrylates
- other similarly highly odorous materials

These substances are only suitable for acceptance under special handling requirements.

12. You must keep the roles and responsibilities of sales staff and technical staff separate. If sales staff are involved in waste enquiries then technical staff must do a final technical check before approval. You must keep this final technical check independent of commercial considerations, to make sure you:

- only accept wastes that are suitable for the site
- avoid accumulating waste
- have enough storage and treatment capacity

13. Fully characterising the waste's composition is an essential step in the pre-acceptance procedure because hazardous wastes can be very complex. You must be sure you know what is in the waste so that you can safely handle or treat it. You must select analytical tests based on knowing the process that generates the waste. You must characterise the waste's composition at the pre-acceptance stage. You need to do this to make sure you comply with regulatory requirements and to work out the most appropriate waste storage, transfer or treatment route.

14. For liquid waste, any or all of the following may be appropriate:

- measure the density of the sample
- measure the water content



- measure the ash content after calcination at 550°C
- test whether the stream might inhibit biological treatment
- test for cyanide, and if present determine the free and complexed cyanide levels
- test for POPs
- check the content of volatile and semi volatile substances
- check the mass balance of liquid waste

You can also measure the pH, redox potential and electrical conductivity of liquid wastes. For pastes and oils, perform these measurements on a water extract of crude sample using a ratio of 10 l/kg of dry matter. You should mix the water with the sample in a closed container to limit exchanges with the atmosphere.

You can also test for the 12 heavy metals (As, Ba, Cd, Cr, Cu, Hg, Mo, Ni, Pb, Sb, Se, Zn) and determine their levels individually and quantitatively. You may use any specific classical method of (partial) extraction of these metals. Where it is present, check specifically for chromium (VI). If the waste is saline (conductivity > 0.15 S/m), measure the chlorides and preferably all the halogens that are soluble in water to make sure you correctly speciate the metals.

You can also test for other metal content and other elements (for example silicon, sulphur and phosphorous).

15. If you suspect the analysis methods applied to a liquid sample will not extract and quantify the compounds present in any solid particles or in any separate phases, separate the sample into 2 fractions by a suitable method. For example, this could be by filtration, centrifugation or decantation. Then you can determine the mass of each fraction, and perform a comprehensive analysis of the separated liquid fraction and solid fraction, or of each phase.

16. For solid waste, any or all of the following may be appropriate:

- measure the bulk density of the sample, without pre-treatment of the sample
- measure the water content
- measure the ash content after calcination at 550°C
- test for cyanide, and if present determine the free and complexed cyanide levels
- test for POPs
- check the content of volatile and semi volatile substances
- check the mass balance of solid waste

You can also measure the pH, redox potential and electrical conductivity on a water extract of crude sample using a ratio of 10 l/kg of dry matter.

You can also test for the 12 heavy metals (As, Ba, Cd, Cr, Cu, Hg, Mo, Ni, Pb, Sb, Se, Zn) and determine their levels individually and quantitatively. You may use any specific classical method of (partial) extraction of these metals. Where it is present, check specifically for chromium (VI). If the waste is saline (conductivity > 0.15 S/m), measure the chlorides and preferably all the halogens to make sure you correctly speciate the metals.

You can also test for other metal content and other elements (for example silicon, sulphur and phosphorous).

17. When multiple immiscible phases or fractions are present in a waste, you can perform the analysis on each phase and combine them to provide the final result.

18. Analyses must be carried out by laboratories that have robust quality assurance procedures and use recognised test methods. The EN ISO 17025 accreditation represents best practice.

19. When you agree that you will accept waste from a customer, you should decide and record what parameters you will check at the acceptance stage. The checks could be visual (for example colour, phase, fuming), physical (for example pumpability, form), chemical (for example pH range, maximum acceptable metals content) or odour based

parameters. You should define the acceptable tolerance for each acceptance test result and record which of these criteria could lead to further testing, non-conformance or rejection. The person checking the waste for acceptance can also decide on their own additional parameters.

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## **3.2. Waste acceptance**

1. You must follow waste acceptance procedures to check that the characteristics of the waste you receive match your pre-acceptance information. This is to confirm that the waste is as expected and you can accept it. If it is not, you must confirm that you can accept it as a non-conforming waste, or you must reject it.

2. Your procedures should follow a risk-based approach, considering:

- the source, nature and age of the waste
- the waste's hazardous properties
- potential risks to process safety, occupational safety and the environment (for example, from odour and other emissions)
- potential for self-heating, self-reactivity or reactivity to moisture or air
- knowledge about the previous waste holder(s)

3. Other than in an emergency (for example, taking waste from an emergency incident clean-up), you must only receive pre-booked wastes onto site that have been adequately pre-accepted and are consistent with the pre-acceptance information.

4. All relevant storage areas (quarantine, reception and general) and treatment processes in your facility must have physical capacity for the waste you receive. You must not receive wastes if this capacity is not available. The amount of waste you receive must also comply with storage limits in your permit and the limits set under COMAH.

5. You must visually check wastes or their packaging and verify them against pre-acceptance information and transfer documentation before you accept them on site. The extent of the initial visual check is determined by the waste type and how it is packaged.

6. You must check and validate all transfer documentation and resolve discrepancies before you accept the waste. If you believe the incoming waste classification and description is incorrect or incomplete, then you must address this with the customer during waste acceptance. You must record any non-conformances. If you have assessed the waste as acceptable for on-site storage or treatment, you must document this.

7. You must have clear criteria for non-conforming wastes including rejection of such waste. You must also have a written procedure for recording, reporting and tracking non-conforming wastes, including notifying the relevant customer or waste producer, and the regulator.

8. You must weigh each load of waste on arrival to confirm the quantities against the accompanying paperwork, unless alternative reliable systems are available (for example, based upon density and volume). You must record the weight in the computerised waste tracking system.

9. The person carrying out waste acceptance checks must be trained to effectively identify and manage any non-conformances in the loads received, complying with this guidance and your permit conditions.

10. If there is a known risk of radioactive contamination, you must check the waste to determine that it does not include radioactive material, unless you are permitted to accept these materials.

11. You must minimise the manual handling of waste. You should use mechanical unloading technologies where it is possible, safe and practicable to do so.

12. Offloading, sampling, general storage, reception and quarantine areas must have an impermeable surface with self-contained drainage, to prevent any spillage entering the storage systems or escaping off site.

13. The designated sampling point or reception area must be close to the laboratory or checking area and needs to be visible.

### **Acceptance of containerised waste**

14. After you have completed the initial visual inspection and confirmatory checks, you must offload waste containers into a dedicated reception area to await detailed checks or sampling. Wastes that do not require further checking can go directly into the appropriate storage area. You must not unload wastes if you do not have enough space.

15. All waste containers must be fit for purpose, and, where appropriate, be:

- in sound condition
- undamaged
- not corroded, if metal
- have well-fitting lids
- suitable for the contents
- with caps, valves and bungs in place and secure

You must risk assess containers, particularly those made of plastic, if they have exceeded the manufacturer's use by date.

You must quarantine non-conforming containers and deal with them immediately and appropriately. You must record all non-conformances.

16. You must check, and where appropriate sample and analyse, the contents of all containers in the reception area within one working day of receipt. You must then transfer compliant containers to the relevant appropriate storage area on site.

17. You must move non-compliant containers to a dedicated quarantine area unless you can safely store the waste in a general storage area with other

compatible wastes whilst you investigate the non-conformance. You must label non-compliant containers to identify that they are quarantined. You must record the non-conformance and where the waste is stored. If you use a dedicated quarantine area, you must segregate or isolate incompatible wastes. You must contain and abate wastes which are quarantined due to odour.

18. Quarantine storage must be for a maximum of 5 working days. You must have written procedures for dealing with wastes you hold in quarantine, and a maximum storage volume. For some limited and specific cases (for example the detection of radioactivity), you can extend quarantine storage time if the Environment Agency agrees.

19. Where containers hold laboratory smalls, you must open each container held in reception within one working day of receipt to check that the contents remain undamaged and that the inventory is as expected. All of the contents in each drum must be compatible. Once checked the container can be moved to the appropriate storage area. Laboratory smalls that need to be sorted must be moved to a dedicated repackaging area and repackaged immediately.

20. You must make sure that all waste packages you receive are marked or labelled with:

- a description of the waste that also gives its chemical identity and composition
- a unique tracking system reference
- the date of arrival on site
- a hazard code or codes (using a product or transport symbol)

The unique reference must allow you to track the waste and easily identify the producer of the waste.

21. If waste containers are received shrink-wrapped on pallets, or you shrink-wrap containers, you can label the shrink wrap with all the relevant information. If a shrink wrapped load is split, you must make sure you mark or label each individual container with all the relevant information.

22. Where bar code systems are used for labelling, the hazardous property of the waste and the date of receipt of the container must be directly visible.

23. You should, wherever possible, keep wastes segregated in reception, to minimise the risk of incompatible materials reacting together.

### **Acceptance of bulk wastes**

24. Bulk loads (liquid or solid) can only be offloaded after they have been fully verified as compliant. You must not accept a non-compliant bulk load for interim storage except in an emergency. Verification testing should include:

- checking consistency with the pre-acceptance information
- compatibility with the receiving vessel contents
- where appropriate, checking treatability by using laboratory scale simulation

25. Deliveries in a tanker must be accompanied by a 'wash out' certificate or a declaration of the previous load so that contamination by this route can be checked.

26. Samples from tankers should wherever possible be taken representatively by taking a core sample from the top hatch and from a suitable gantry. You must sample from each compartment where the tanker is divided into multiple compartments. If you have to take a sample from the back valve, you must take precautions to avoid spillages.

### **Acceptance sampling**

27. You must representatively sample all wastes, bulk or containerised (including from every container) at the acceptance stage, and carry out verification and compliance testing. You must not just rely on the written information supplied. The requirement to sample does not apply to some wastes, for example:

- pure product chemicals
- asbestos

- contaminated clothing, packaging or rags
- 'articles'
- laboratory smalls
- packaged cosmetics and pharmaceuticals
- solid non-hazardous waste (except for mirror entries when the waste composition is unknown)
- contaminated wood and roofing material
- waste received directly from a householder
- green wastes and food wastes

Where a sample is not required, you must still visually check the waste is as expected and that no contrary materials are present. You must record the reason why you did not sample the waste in your computerised waste tracking system.

You must empty and repack containers of contaminated clothing, packaging or rags to check for items that should not be there.

You must obtain a representative sample and analyse waste oil, from:

- industrial sites that do not normally produce waste oil
- other sources where chemicals and potential contaminants may be handled, for example from chemical manufacturing

For other waste oil you must obtain a representative sample of the waste but you do not have to analyse it unless a problem is found at the treatment plant.

28. A representative sample is one that takes account of the full variation and any partitioning of the load so you can account for worst case scenarios.

29. You must take a sample from every container. You can make a composite sample if each of the containers making up the composite holds the same waste and the waste is known not to be variable. You must obtain a representative sample by taking a core sample down to the base of the container. You must make sure you replace lids, bungs and valves immediately after sampling.



30. On-site sampling must take place under the supervision of the site's qualified staff. Where a driver arrives at the site with a sample taken elsewhere, the sample:

- must be verified as representative, reliable and obtained by a person technically competent to take it
- is only acceptable if it was taken for specific health or safety purposes

31. Sampling must not increase the risk of incompatible substances coming into contact with one another, for example within a sump serving the sampling point, or due to contaminated sampling equipment.

32. You must have suitable absorbents and spill kit material available to deal with any spills.

33. You must keep a record of the sampling regime, process and justification in your computerised waste tracking system.

34. You should keep acceptance samples on site for at least 2 working days after you have:

- treated a waste and removed its treatment residues from the facility
- transferred a waste from your site

Where you are transferring waste oil from your site you must keep acceptance samples for at least 2 working days after the waste has been treated off site. You must analyse the waste oil sample if a problem is found at the off-site treatment plant. You only need to keep samples that you did not analyse at acceptance.

35. You must have a sampling and analysis procedure. You must design it based on the risk factors for the waste, for example:

- the type of waste (for example hazardous or non-hazardous)
- knowledge of the customer (for example waste producer)

- the impact of potential mixing or blending and the possibilities for subsequent treatment

36. You must check any relevant physico-chemical parameters using, for example, viscometry, infrared, chromatography and mass spectrometry.

37. Sampling procedures must be customised for:

- bulk liquid
- bulk solids
- large and small containers or vessels (the number of samples increases with the number of containers or vessels and the variability of the waste)
- laboratory smalls

38. You must determine and record the following information:

- the sampling regime for each load, together with your justification for selecting each option
- where and how the sample was taken
- the capacity of the sampled vessel (for samples from drums, an additional parameter would be the total number of drums)
- the number of samples and degree of consolidation
- the operating conditions at the time of sampling

39. Wherever possible you should sample waste in accordance with:

- [EN 14899 Characterization of waste. Sampling of waste materials. Framework for the preparation and application of a sampling plan](https://shop.bsigroup.com/ProductDetail/?pid=000000000030112012)  
(<https://shop.bsigroup.com/ProductDetail/?pid=000000000030112012>)
- [CEN/TR 15310-1 Characterization of waste. Sampling of waste materials. Guidance on the selection and application of criteria for sampling under various conditions](https://shop.bsigroup.com/ProductDetail/?pid=000000000030142196)  
(<https://shop.bsigroup.com/ProductDetail/?pid=000000000030142196>)
- [CEN/TR 15310-2 Characterization of waste. Sampling of waste materials. Guidance on sampling techniques](#)

<https://shop.bsigroup.com/ProductDetail?pid=000000000030058975>

- [CEN/TR 15310-3 Characterization of waste. Sampling of waste materials. Guidance on procedures for sub-sampling in the field](https://shop.bsigroup.com/ProductDetail?pid=000000000030058994)  
(<https://shop.bsigroup.com/ProductDetail?pid=000000000030058994>)
- [CEN/TR 15310-4 Characterization of waste. Sampling of waste materials. Guidance on procedures for sample packaging, storage, preservation, transport and delivery](https://shop.bsigroup.com/ProductDetail?pid=000000000030058997)  
(<https://shop.bsigroup.com/ProductDetail?pid=000000000030058997>)
- [CEN/TR 15310-5 Characterization of waste. Sampling of waste materials. Guidance on the process of defining the sampling plan](https://shop.bsigroup.com/ProductDetail?pid=000000000030078845)  
(<https://shop.bsigroup.com/ProductDetail?pid=000000000030078845>)

For more information see guidance on the [classification and assessment of waste WM3](https://www.gov.uk/government/publications/waste-classification-technical-guidance)  
(<https://www.gov.uk/government/publications/waste-classification-technical-guidance>).

## Testing and analysis

40. You must test each waste for acceptance according to the parameters decided at pre-acceptance, plus any appropriate additional checks. You should record the results of the tests in the computerised waste tracking system. You should note and investigate any discrepancies.

41. Analysis of waste must be carried out by a laboratory with suitably recognised test methods. Where the waste received is hazardous, the laboratory should be on site, or routinely available at another site capable of providing test results within one working day of receipt of the waste at your site.

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## 3.3. Waste tracking

1. You must use a computerised tracking system to hold up-to-date information about the available capacity of the waste quarantine, reception, general and bulk storage areas of your facility, including treatment residues and end-of-waste product materials.

2. Your waste tracking system must hold all the information generated during:

- pre-acceptance
- acceptance
- non-conformance or rejection
- storage
- repackaging
- treatment
- removal off site

This information must be easily accessible.

3. You must create records and update them to reflect deliveries, on-site treatment and despatches. Your tracking system will also operate as a waste inventory and stock control system. It must include this information as a minimum:

- the date the waste arrived on site
- the original producer's details
- the previous holder
- a unique reference number
- waste pre-acceptance and acceptance information
- any analysis results
- the package type and size
- the intended treatment or transfer route
- accurate records of the nature and quantity of wastes held on site, including all hazards – and identifying the primary hazards
- where the waste is located on site
- where the waste is in the designated treatment or transfer route
- the names of staff who have taken any decisions about accepting or rejecting waste streams and

who have decided on recovery or disposal options

- details that link each container accepted to its consignment or transfer note
- details of any non-conformances and rejections


4. The tracking system must be able to report:

- the total quantity of waste present on site at any one time
- a breakdown by type of the waste quantities you are storing pending treatment or transfer
- a breakdown of the waste quantities by hazardous property
- an indication of where a batch or consignment of waste is located on a site plan
- the quantity of waste on site compared with the limits authorised by your permit
- the length of time the waste has been on site
- the quantity of end-of-waste product materials on site at any one time, where applicable

5. You must store back-up copies of computer records off site. Records must be easily accessible in an emergency.

6. You must hold acceptance records for a minimum of 2 years after you have treated the waste or removed it off site. You may have to keep some records for longer if they are required for other purposes, for example, hazardous waste consignment notes.

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# Chemical waste: appropriate measures for permitted facilities

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## Contents

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### **4. Waste storage, segregation and handling appropriate measures**

These are the appropriate measures for waste storage, segregation and handling at regulated facilities with an environmental permit for treating or transferring chemical waste.

1. You must store waste in locations that minimise the handling of waste. Waste handling must be carried out by competent staff using appropriate equipment.

2. Where possible, you should locate storage areas away from watercourses and sensitive perimeters (for example, those close to public rights of way, housing or schools). You must store all waste within the secure area of your facility to prevent unauthorised access and vandalism.

3. Where relevant, you must conform to [HSE standards \(https://www.hse.gov.uk/pubns/books/index-hsg-ref.htm\)](https://www.hse.gov.uk/pubns/books/index-hsg-ref.htm) and in particular to:

- [HSG51 Storage of flammable liquids in containers \(https://www.hse.gov.uk/pubns/books/hsg51.htm\)](https://www.hse.gov.uk/pubns/books/hsg51.htm)
- [HSG71 Chemical warehousing: storage of packaged dangerous substances \(https://www.hse.gov.uk/pubns/books/hsg71.htm\)](https://www.hse.gov.uk/pubns/books/hsg71.htm)
- [HSG76 Warehousing and storage: a guide to health and safety \(https://www.hse.gov.uk/pubns/books/hsg76.htm\)](https://www.hse.gov.uk/pubns/books/hsg76.htm)
- [HSG140 Safe use and handling of flammable liquids \(https://www.hse.gov.uk/pubns/books/hsg140.htm\)](https://www.hse.gov.uk/pubns/books/hsg140.htm)
- [HSG176 Storage of flammable liquids in tanks \(https://www.hse.gov.uk/pubns/books/hsg176.htm\)](https://www.hse.gov.uk/pubns/books/hsg176.htm)
- [CS21 Storage and handling of organic peroxides \(https://www.hse.gov.uk/pubns/books/cs21.htm\)](https://www.hse.gov.uk/pubns/books/cs21.htm)

4. You must clearly document the maximum storage capacity of your site and the designated storage areas. You must not exceed these maximum capacities. You should define capacity in terms of, for example, maximum tank or vessel capacities, tonnage and numbers of skips, pallets or containers. You must regularly monitor the quantity of stored waste on site and designated areas and check against the allowed maximum capacities.

5. You must clearly mark hazardous waste storage areas and provide signs showing the maximum quantity and hazardous properties of wastes that can be stored there.

6. Storage area drainage infrastructure must:

- contain all possible contaminated run-off



- prevent incompatible wastes coming into contact with each other
- make sure that fire cannot spread

7. Secondary and tertiary containment systems must conform to CIRIA guidance [C736 Containment systems for the prevention of pollution](https://www.ciria.org/ItemDetail?iProductCode=C736F&Category=FREEPUBS) (<https://www.ciria.org/ItemDetail?iProductCode=C736F&Category=FREEPUBS>).

8. You must store containerised wastes that are sensitive to air, light, heat, moisture or extreme ambient temperatures under cover protected from such ambient conditions. Covered areas must have good ventilation. This applies to any such container:

- held in general storage, reception storage (pending acceptance) or quarantine
- being emptied, repackaged or otherwise managed

For example, waste held in fibre or cardboard primary or secondary packaging should be stored under cover in a dry area and not exposed to rain or moisture. It must be kept off floors to prevent damage by damp.

9. You must store wastes in sealed metal containers under cover if they have the potential for self-heating or self-reactivity. You must monitor the containers for heat build-up. Such wastes include rags and filter materials contaminated with metal swarf, low boiling point oils or low flash point solvents.

10. Wherever practicable you should store all other wastes under cover. Covered areas must have good ventilation. This applies to any such container:

- held in general storage, reception storage (pending acceptance) or quarantine
- being emptied, repackaged or otherwise managed

Under cover storage provides better protection for containers than open air storage and minimises the generation of contaminated water. Covered storage also:

- lowers temperature fluctuations that can cause pressure build up in containers
- reduces the degradation of containers through weathering

11. You must not store hazardous waste in open-topped containers. Empty open-topped containers should be kept in a building or undercover to prevent rainwater ingress.

12. You must not store or hold wastes on site in vehicles or vehicle trailers unless you are receiving them or preparing them for imminent transfer (meaning that you will remove them from site within 24 hours, or 72 hours if over a weekend).

13. You should pay particular attention to avoid the build-up of static electricity when you are storing or handling flammable wastes and materials. You should use leak detection systems and alarms (for example VOC alarms) and automatic fire suppression equipment based on a recorded risk assessment.

14. You must provide adequate bunding of all storage areas, and containment and treatment of any water run-off.

15. You must not accumulate waste. You must treat wastes, or remove them from the site, as soon as possible. Generally you should do this within one month of receipt but all wastes must be removed within 6 months of receipt. This applies even when the waste might be used as a reactant. Where a shorter time period is given in a permit condition you must comply with the permit for that waste. Where a waste is stored for longer than allowed you must inform the Environment Agency.

16. All stored containers must keep the labelling they had at acceptance. If the label is damaged or no longer legible you should replace the label with that same information.

17. You must handle and store containers so that the label is easily visible and continues to be legible.

18. You should keep solid waste dry and avoid the dilution of hazardous waste.

19. You must keep clean rainwater and clean cooling water separate from wastes and waste waters.

20. You must keep incompatible wastes segregated so that they cannot come into contact with one another. You must store flammable wastes apart from other wastes to prevent fire spreading between them and other materials. You must use sealed drainage systems to prevent leaks and spillages contaminating other wastes.

21. There must be pedestrian and vehicular access (for example, forklift) at all times to the whole storage area so that you can retrieve containers without removing others that may be blocking access – other than removing those in the same row.

22. You must store all waste containers in a way that allows easy inspection. You must maintain safe access, with a gap of at least 0.7m between rows of bulk containers or palletised wastes.

23. You must move drums and other mobile containers between different locations (or loaded for removal off site) following written procedures. You must then amend your waste tracking system to record these changes.

24. You must stack bags and boxes of waste no more than 1m high on a pallet. You must not stack pallets more than 2 high.

25. You must stack containers specifically designed for stacking, and no more than 2.2m high on a pallet.

26. You must store all other containers on pallets. You must not stack these pallets more than 2 high, except for empty containers which can be stacked 3 high.

27. Stacked bags, boxes and containers must be stable. They must be secured with, for example, banding or shrink-wrap, if required. The packages

must not extend beyond (over-hang) the sides of the pallet. Any shrink-wrap used must be clear or transparent so that you can identify waste types, damaged containers, leaks or spillages and incorrectly stacked containers. You must be careful not to damage any packages during stacking.

28. All waste containers must remain fit for purpose. You must check any containers (and pallets they may be stored on) daily and record non-conformances. Non-compliant containers and pallets must be made safe. You must immediately and appropriately manage any unsound, poorly labelled or unlabelled containers (for example, by relabelling, over drumming and transferring the container's contents). You must risk assess, approve and record the use of containers, tanks and vessels:

- beyond their specified design life
- where you use them for a purpose, or substances, other than the ones they were designed for

29. You must not handle waste or its packaging in a way that might damage its integrity, unless it is appropriate to destroy a waste or its packaging, for example by shredding. You must not, for example, walk on or throw waste or waste packages.

30. You should, where applicable and based on a recorded risk assessment, make inert the atmosphere of tanks containing organic liquid waste with a flashpoint less than 21°C. This can be done, for example, by using nitrogen gas.

31. You must [store asbestos waste double bagged or wrapped, in sealed, closed and locked containers](https://www.hse.gov.uk/pubns/guidance/em9.pdf) (<https://www.hse.gov.uk/pubns/guidance/em9.pdf>). You must not store asbestos waste loose. You must not put asbestos wastes into bays or transfer it between different skips or containers. You must not use mechanical equipment, for example loading shovels, chutes and conveyors to move asbestos waste.

32. You must not stack wheeled containers on top of one another. Do not stack empty wheeled containers into one another more than 2.2m high.

33. All containers that need them should have a lid or bung, and the lid or bung must be closed except when the container is being sampled, having waste added into it or having waste removed from it.

34. You must not stack skips containing waste. Skips containing hazardous waste must be enclosed when not being loaded or unloaded. You should store loose bulk hazardous wastes under cover.

35. You can use racking systems to store waste but you must consider segregation, ability to inspect, separation and fire suppression measures. Racking systems must be designed and constructed in accordance with [HSG76 Warehousing and storage \(https://www.hse.gov.uk/pubns/books/hsg76.htm\)](https://www.hse.gov.uk/pubns/books/hsg76.htm).

36. You must:

- contain wash waters within an impermeable area and either discharge them to foul sewer or dispose of them appropriately off site.
- prevent run-off into external areas or to surface water drains

37. You must [manage waste in a way that prevents pests or vermin \(https://www.gov.uk/guidance/control-and-monitor-emissions-for-your-environmental-permit#pest-management-plan\)](https://www.gov.uk/guidance/control-and-monitor-emissions-for-your-environmental-permit#pest-management-plan). You must have specific measures and procedures in place to deal with wastes that are identified as causing pests or vermin.

38. You must inspect storage areas, containers and infrastructure daily. You must deal with any issues immediately. You must keep written records of the inspections. You must rectify and log any spillages of waste.

39. You must [train forklift drivers \(https://www.hse.gov.uk/workplacetransport/lift-trucks/lift-truck-training.htm\)](https://www.hse.gov.uk/workplacetransport/lift-trucks/lift-truck-training.htm) in the handling of palletised goods, to minimise forklift truck damage to the integrity of containers and infrastructure.

40. You must not carry out activities that represent a clear fire risk within any storage area. Examples include:

- grinding
  - welding or brazing of metalwork
  - smoking
  - parking normal road vehicles, except while unloading or loading
  - [recharging batteries](https://www.hse.gov.uk/pubns/indg139.pdf)  
(<https://www.hse.gov.uk/pubns/indg139.pdf>)
- 

## Bulk storage

41. Where relevant, bulk storage systems must conform to [CIRIA guidance](https://www.ciria.org/CIRIA/Bookshop/Bookshop/Books/Bookshop.aspx) (<https://www.ciria.org/CIRIA/Bookshop/Bookshop/Books/Bookshop.aspx>), and in particular to:

- [C535 Above ground proprietary prefabricated oil storage tank systems](https://www.ciria.org/ItemDetail?iProductCode=C535D&Category=DOWNLOAD&WebsiteKey=3f18c87a-d62b-4eca-8ef4-9b09309c1c91)  
(<https://www.ciria.org/ItemDetail?iProductCode=C535D&Category=DOWNLOAD&WebsiteKey=3f18c87a-d62b-4eca-8ef4-9b09309c1c91>)
- [C598 Chemical storage tank systems - good practice](https://www.ciria.org/ItemDetail?iProductCode=C598D&Category=DOWNLOAD&WebsiteKey=3f18c87a-d62b-4eca-8ef4-9b09309c1c91) (<https://www.ciria.org/ItemDetail?iProductCode=C598D&Category=DOWNLOAD&WebsiteKey=3f18c87a-d62b-4eca-8ef4-9b09309c1c91>)
- [C736 Containment systems for the prevention of pollution](https://www.ciria.org/ItemDetail?iProductCode=C736F&Category=FREEPUBS) (<https://www.ciria.org/ItemDetail?iProductCode=C736F&Category=FREEPUBS>)

42. You must use tanks and associated equipment that are suitably designed, constructed and maintained. You must do a risk assessment to validate the design and operation of bulk storage systems. Before you use new tanks and equipment you must check they are working correctly. You must periodically examine and test that your tanks meet the standards set out in EEMUA [Publication 231: The mechanical integrity of plant containing hazardous substances](https://www.eemua.org/Products/Publications/Digital/EE MUA-Publication-231.aspx) (<https://www.eemua.org/Products/Publications/Digital/EE MUA-Publication-231.aspx>).

43. You should vent bulk storage tanks and silos through suitable abatement.

44. You must locate bulk storage vessels on an impermeable surface which is resistant to the material being stored. The surface must have self-contained drainage to prevent any spillage entering the storage systems or escaping off site. Impermeable surfaces must have sealed construction joints.

45. You must provide bunds for all tanks containing liquids (whether waste or otherwise) which could be harmful to the environment if spilled. Bunds must meet the CIRIA [C535](https://www.ciria.org/ItemDetail?iProductCode=C535D&Category=DOWNLOAD&WebsiteKey=3f18c87a-d62b-4eca-8ef4-9b09309c1c91) (<https://www.ciria.org/ItemDetail?iProductCode=C535D&Category=DOWNLOAD&WebsiteKey=3f18c87a-d62b-4eca-8ef4-9b09309c1c91>) or [C736](https://www.ciria.org/ItemDetail?iProductCode=C736F&Category=FREEPUBS) (<https://www.ciria.org/ItemDetail?iProductCode=C736F&Category=FREEPUBS>) standard and:

- be impermeable, stable and resistant to the stored materials
- have no outlet (that is, no drains or taps), and drain to a blind collection point
- have pipework routed within bunded areas with no penetration of contained surfaces
- be designed to catch leaks from tanks or fittings
- have a capacity calculated following the relevant CIRIA guidance
- have regular visual inspections – you must pump out or remove any contents under manual control after you have checked for contamination
- be fitted with a high level probe and an alarm (as appropriate) if not frequently inspected
- have tanker connection points within the bund where possible – if not possible you must provide adequate containment for spillages or leakage
- have programmed engineering inspections (extending to water testing if structural integrity is in doubt)
- be emptied of rainwater regularly to maintain the containment capacity

46. You must control sludge build up and foam in tanks, for example by regularly sucking out the

sludge and using anti foaming agents.

47. You should equip storage and treatment tanks with an automatic level monitoring system and an associated alarm or trip system. These systems must be sufficiently robust (for example, be able to work if sludge and foam are present) and regularly maintained. You must fit tanks with suitable overflow protection.

48. You must be able to close all connections to vessels, tanks and secondary containment via suitable valves. You must fit a valve close to the tank if you have bottom outlets, and have at least 2 isolation points in case of valve failure.

49. You must direct overflow pipes to a contained drainage system (for example the relevant secondary containment) or to another vessel where suitable control measures are in place.

50. Tanks, pipework and fittings must be examined by a competent person, following a written scheme. The scope and frequency of examination must also be determined by a competent person. You must work out how often to carry out these internal examinations using a risk assessment approach. This should be based on:

- tank service
- maintenance history
- known and potential damage mechanisms and their rates of attack

You should also do intermediate external examinations. You must act on the results of the examinations and do any necessary repairs to ensure the tanks remain fit for service. You must keep the results of examinations and repairs.

51. You must have systems in place to make sure that loading, unloading and storage are safe, considering any associated risks. This can include:

- having piping and instrumentation diagrams
- using ticketing systems
- using key locked coupling systems
- having colour coded points, fittings and hoses



- using specific coupling or hose sizes for certain waste transfers

52. As a general rule, you must not use open topped tanks, containers, vessels or pits to store or treat hazardous or liquid wastes.

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## **Transfer of waste into and from tankers**

53. All pipes, hoses, connections, couplings and transfer lines must be fit for purpose and resistant to the wastes being stored. You must use a suitable pipework coding system (for example, RAL European standard colour coding).

54. Site staff must supervise loading and unloading activities, either directly or via CCTV.

55. You must make sure that transfers into and from tankers only take place after you have completed any relevant verification and compatibility testing, and then only with the approval of an appropriate chemist or manager. The approver must specify:

- which batch or load of material is to be transferred
- the receiving storage vessel
- the equipment required, including spillage control and recovery equipment
- any special provisions relevant to that batch or load including minimising odour and other fugitive emissions

56. You must have in place systems to prevent 'tanker drive off' (a vehicle pulling away whilst still coupled).

57. You must make sure that the transfer of waste from tankers is only carried out by competent staff. You must give them enough time, so they are not under pressure to work more quickly than is deemed acceptable.

58. You must have measures in place to make sure that couplings are a correct fit. This will prevent couplings from loosening or becoming detached. You should provide, maintain and clean your own couplings and hoses to guarantee their integrity and fitness. You should also:

- make sure you take special care so that a coupling is able to withstand the maximum shut valve pressure of the transfer pump
- maintain a sound coupling at each end of the transfer hose, even when a gravity feed system is in place, and protect the transfer hose
- control potential leaks from coupling devices by using simple systems such as drip trays

59. You must make sure that transfers into and from tankers only take place in bunded areas designed to contain a worst case spillage. You must have emergency storage for leaking vehicles to minimise any acute incidents caused by a seal on a tanker failing.

60. You should have systems and procedures in place to make sure that wastes due to be transferred comply with the [carriage of dangerous goods \(https://www.hse.gov.uk/cdg/\)](https://www.hse.gov.uk/cdg/) when they are packaged and transported.

61. You must make sure that the transfer of waste from a tanker to a drum or vice versa is done in a dedicated area. A minimum of 2 trained and competent staff, working to formal written instructions, must perform the transfer. They must check any pipes and valves before and during the transfer. You must fit dip pipes with a shut-off valve to control the dispensing into containers and prevent overfilling.

62. You must make a record of any spillages. You must retain spillages within the bunded areas and collect them promptly using, for example, pumps or absorbents.

63. You must make sure that tankers are not used as blending or reaction vessels as this is not their designed purpose.

64. You must take operational and design precautions when mixing or blending wastes, depending on the composition and consistency of the wastes (for example when vacuuming dusty or powdery wastes).

65. Where you use rotary-type pumps, they must be equipped with a pressure control system and safety valve.

66. You must pump sludges. Do not pour them.

67. When loading and offloading odorous, flammable or volatile liquids between bulk storage tanks and tankers, you must use vapour balance lines to transfer the displaced vapours from the receiving vessel to the vessel you are pumping from.

68. You must follow safe operating procedures designed to reduce the risk of explosion and fugitive emissions when you transfer waste from powder tankers into silos. You must use trained and competent personnel.

69. You must carry out routine maintenance to prevent failure of the plant or equipment. This may include the failure of a pump seal or the blockage of a filter pot commonly used at transfer points.

70. You must continue using the waste tracking system that began at the pre-acceptance stage for the whole time waste is kept at the site.

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## **Aerosol storage**

71. You must store aerosol canisters under cover in secure, well-ventilated containers, and within caged storage areas. You must also store them in a well-ventilated place that is not subject to extreme temperatures or direct sunlight. You must not store canisters in open containers to prevent the risk of them spreading fires by 'missiling' or 'ejection'.

72. You must segregate aerosol canisters from other flammable wastes and potential sources of ignition. Preferably put them in a separate building, or use a fire resistant enclosure or fire wall. You must not hold any combustible material within the storage area, other than the canister's packaging, containers and the pallets on which they stand.

73. You must provide suitable containment measures (for example drip trays) for aerosol canisters held in containers which cannot collect and hold free liquids released from the canisters. Or you should transfer them to secure containers that are able to hold free liquid.

74. During storage, lids on containers holding aerosol canisters must remain securely closed at all times when not being filled, emptied or internally inspected. When not in use, the doors or hatches of cages must remain closed and locked.

75. You must not overfill containers used to store canisters. Overfilling can result in canisters being actuated and discharging their contents, either:

- under the weight of the canisters above them
- when the container lid is closed
- when containers are stacked

76. Cages used to store aerosol canister containers must be robust, fire resistant and of an appropriate mesh size (based upon the size of the canisters being stored). This is to constrain the canisters and prevent any ejection. Where the cage is not constructed with a mesh roof, the mesh wall panels must extend into the roof space of the storage area to make sure that the structure is completely enclosed.

77. You should store aluminium canisters separately from steel canisters (especially rusting canisters). This will:

- prevent thermite sparks during storage, handling and treatment
- allow the different metals to be more easily recovered

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## Sorting, repackaging and bulking

78. Sorting is the placing together of containers with other waste containers of the same type, without emptying the contents from the container. You must have a permit that specifically allows you to carry out storage activities (coded D15 or R13).

79. Repackaging is the removal of waste from a container, or into a container. This may involve bulking it with other wastes of the same type from other containers. You must have a permit that specifically allows you to carry out repackaging activities (coded D14 or R12).

80. Bulking of waste that is not regarded as repackaging includes:

- discharging from a tanker to bulk storage of wastes of the same type
- tank to tank transfer where both tanks contain wastes of the same type

These activities are storage (coded D15 or R13).

81. You must only bulk or repackage wastes together if they are materially the same. They must not react when they are bulked and they must not change the waste's composition.

82. If a waste is mixed with other similar wastes, where the resulting mixture does not have significantly different characteristics from the mixed wastes (for example blending compatible combustible or flammable wastes as a fuel), this activity is mixing or blending (coded D13 or R12). Any other mixing that changes a waste is treatment.

83. You must have a permit that specifically allows you to [mix hazardous waste](https://www.gov.uk/guidance/hazardous-waste-segregation-and-mixing) (<https://www.gov.uk/guidance/hazardous-waste-segregation-and-mixing>) with any:

- non-hazardous waste

- hazardous waste in a different category
- non-waste

84. You must not mix, bulk or repackage:

- wastes which could be recovered with other wastes if this means that the waste must now be sent for disposal or a lower form of recovery
- liquid wastes or infectious wastes with other wastes for the purpose of landfilling
- oils where this could affect their regeneration or recycling
- wastes containing Persistent Organic Pollutants (POPs) with another material solely to generate a mixture below the defined low POPs content
- waste to deliberately dilute it

85. You must transfer wastes from containers into other storage vessels using a dip pipe, not by pouring.

86. Repackaging or mixing must only take place in a dedicated area or store which has the plant and equipment needed to deal with the specific risks of that process. For example, this could include abatement or [local exhaust ventilation](https://www.hse.gov.uk/pubns/books/hsg258.htm) (<https://www.hse.gov.uk/pubns/books/hsg258.htm>).

87. Except for small packages with a volume less than 5 litres, or damaged containers, you must move containers using mechanical means. For example, use a forklift truck with a rotating drum handling fitting, or using pumps for liquids.

88. You must label containers of repackaged or mixed wastes so that you can identify their contents and origin through the tracking system. After repackaging, you must move the bulked materials and emptied containers to an appropriate segregated storage area.

89. You must have a risk assessment and carry out appropriate [compatibility testing](https://www.hse.gov.uk/chemicals/chemical-waste.htm) (<https://www.hse.gov.uk/chemicals/chemical-waste.htm>) to make sure that bulked wastes will not react with each other, or with the container into which they are being placed.

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## Laboratory smalls

90. Where possible, you should sort and segregate laboratory smalls at source so that you do not need to reopen or re-sort containers.

91. If you sort laboratory smalls for compatibility reasons you must carry this out in a dedicated area of a building, with self-contained drainage.

92. You must write and follow procedures for the segregation, sorting and repackaging of laboratory smalls.

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# Chemical waste: appropriate measures for permitted facilities

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## Contents

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## **5. Waste treatment appropriate measures**

These are the appropriate measures for waste treatment at regulated facilities with an environmental permit for treating chemical waste.

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### **5.1. General waste treatment**

1. Waste treatment must have a clear and defined benefit. You must fully understand, monitor and optimise the waste treatment process to make sure that you treat waste effectively and efficiently. You



must not treat waste to deliberately dilute it. The treated output material must meet your expectations and be suitable for its intended disposal or recovery route. You must identify and characterise emissions from the process, and take appropriate measures to control them at source.

2. You must have up-to-date written details of your treatment activities, and the abatement and control equipment you are using. This should include information about the characteristics of the waste you will treat and the waste treatment processes, including:

- simplified process flowsheets that show the origin of any emissions
- details of emission control and abatement techniques for emissions to air and water, including details of their performance
- diagrams of the main plant items where they have environmental relevance, for example, storage, tanks, treatment and abatement plant design
- details of chemical reactions and their reaction kinetics and energy balance
- details of physical treatment processes for example thermal desorption, distillation, phase separation, shredding, filtration, compaction, centrifuging, heating, cooling or washing
- details of biological treatment processes
- details of any effluent treatment
- a description of any flocculants or coagulants used
- an equipment inventory, detailing plant type and design parameters, for example, time, temperature, pressure
- waste types to be subjected to the process
- the control system philosophy and how the control system incorporates environmental monitoring information
- process flow diagrams (schematics)
- venting and emergency relief provisions
- a summary of operating and maintenance procedures
- process instrumentation diagrams

- monitoring points and monitoring schedules

3. You must have up-to-date written details of the measures you will take during abnormal operating conditions to make sure you continue to comply with your permit. Abnormal operating conditions include:

- unexpected releases
- start-up
- momentary stoppages
- shut-down

4. You should use material flow analysis for relevant contaminants in the waste to help identify their flow and fate. You should use the analysis to determine the appropriate treatment for the waste either directly at the site or at any subsequent treatment site.

Material flow analysis considers the contaminant quantity in the:

- waste input
- different waste treatment outputs
- waste treatment emissions

You should use the analysis and your knowledge of the fate of the contaminants to make sure you correctly treat and either destroy or remove them.

The use of material flow analysis is risk-based, considering:

- the hazardous properties of the waste
- the risks posed by the waste in terms of process safety
- occupational safety and environmental impact
- knowledge of the previous waste holder(s)

A treatment process may destroy certain substances in the waste. It could also put substances into the air, water or ground, or have residues which are sent for disposal. The weight of these outputs should be minimised. The treatment may produce residues for recovery or reuse and the weight of these substances should be maximised.

5. You must not proceed with the treatment if your risk assessment or material flow analysis indicates that losses from a process will cause:

- the breach of an environmental quality standard
- the breach of a benchmark
- a significant environmental impact

6. You must clearly define the objectives and reaction (chemical, physical or biological) processes for each treatment process. You must define the end point to the process so that you can monitor and control the reaction. You must define the suitable inputs to the process, and the design must take into account the likely variables expected within the waste stream. You must sample and analyse the waste to check that an adequate end point has been reached.

7. For each new reaction, you must assess the proposed mixes of wastes and reagents before treatment by carrying out a scale laboratory test mix of the wastes and reagents to be used. You must predetermine a batch 'recipe' for all reactions and mixes of wastes. You must also take into account the potential scale up effects, for example, the increased:

- heat of reaction with increased reaction mass relative to the reactor volume
- residence time within the reactor and modified reaction properties

Your treatment must comply with [HSG143 Designing and operating safe chemical reaction processes](https://www.hse.gov.uk/pubns/books/hsg143.htm) (<https://www.hse.gov.uk/pubns/books/hsg143.htm>).

8. The reactor vessel and plant must be specifically designed, commissioned and operated to be fit for purpose. The designs need to consider chemical process hazards and a hazard assessment of the chemical reactions. They also need to consider prevention and protective measures and process management, such as:

- working instructions
- staff training

- appropriate process control measures
- monitoring systems, alarms and interlocks
- plant maintenance
- checks
- audits
- emergency procedures

9. To track and control the process of change, you must have a written procedure for proposing, considering and approving changes to technical developments or procedural or quality changes.

10. Where an emission is expected, all treatment or reactor vessels must be enclosed. Only vent them to the atmosphere via an appropriate scrubbing and abatement system (subject to explosion relief).

11. You must monitor the reaction to make sure it is under control and proceeding towards the anticipated result. Vessels used for treatment must be equipped appropriately, for example with high level, pH and temperature monitors. These monitors must be automatic and continuous, linked to a clear display in the control room or laboratory, and have an audible alarm. Your risk assessment may require you to link process monitors to cut-off devices.

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## **5.2. Aerosol canister treatment**

1. Any aerosol treatment process must be fit for purpose. It must be specifically designed to:

- treat canisters and recover their materials and residues
- manage potentially flammable substances
- prevent explosive atmospheres

2. You must design and operate the treatment process (for example, the waste feed rate, duration of treatment cycle and gas or liquid extraction) so that the canisters' residual contents are fully discharged and removed safely and efficiently.

3. You must locate the treatment plant in a designated covered area or ventilated building. This must:

- have impermeable surfaces and sealed drainage
- be located away from stored combustible materials, other sources of ignition and sensitive receptors

You must design the treatment area to avoid the potential build-up of flammable gases that are heavier than air, for example in sumps or similar sunken areas.

4. The treatment process must be:

- designed by a competent person
- carried out in an enclosed and sealed system, fitted with an appropriate gas extraction system
- provided with a means to contain or control an explosion
- strong enough to contain an explosion (typically up to 10 bar over-pressure), or have explosion relief directed to a safe space or explosion suppression fitted.

Design, operation and explosion relief provisions must satisfy the requirements of relevant health and safety legislation. The gas extraction system must be interlocked with plant operation, so that the plant cannot operate unless the system is working.

5. You must carry out the aerosol treatment process, including tipping and loading, within a controlled inert atmosphere. For example, you could use gas extraction and nitrogen gas injection to displace air from the plant and purge it before and after a treatment cycle. If the inerting system fails or high oxygen levels are detected, the treatment should stop automatically. Similarly, if you use ventilation to prevent an explosive atmosphere forming, the equipment should automatically stop operating when the lower explosion limit is approached.

6. You must make sure you have checked and sorted all canisters before feeding them into the treatment process. This makes sure you exclude

incompatible or untreatable wastes (for example, expanding foams).

7. You should process batches of aluminium and steel cans separately to make it easier to recycle the metals recovered from the treatment process and prevent thermite reactions.

8. You must keep waste sorting and storage distinct and separate from the treatment process.

9. For safety, and to prevent wastes accumulating on site, you must make sure you identify available and reliable recovery or disposal routes. You should have contracts in place to take:

- the residues or materials recovered from the treatment process
- any canisters you have accepted but cannot treat on site

10. You must make sure that as a minimum, all LPG piping systems comply with [UKLPG Code of Practice 22 \(https://www.liquidgasuk.org/shop/codes-of-practice/code-of-practice-22\)](https://www.liquidgasuk.org/shop/codes-of-practice/code-of-practice-22). They must be securely sealed and tested and have a procedure in place for regular inspection.

11. Containers and tanks holding liquids collected from the treatment process should be:

- compatible with the materials held
- fully earthed
- UN tested
- integrally sound
- designed and constructed to prevent the release of fugitive emissions to air (including odour) and ground, whilst allowing for emergency venting where necessary

12. You should store containers that cannot be enclosed (for example skips containing recovered metal which are open to allow ventilation and drying) in well-ventilated, covered storage areas. This will prevent:

- rainwater collecting (and becoming contaminated)

- the materials held corroding or deteriorating


13. You should not collect or hold flammable liquids in plastic drums or non-conductive plastic IBCs. Containers used to collect and hold flammable liquids from the treatment process should preferably be constructed from steel, or at least anti-static plastic. They should be designed so that they can be sealed for handling and storing. You must only use anti-static plastic containers to collect and hold flammable liquids if you are holding them separate from other wastes, within a self-contained bund.

14. You must collect, and allow to dry, any residues that remain on the recovered metals before they are stored or sent for recycling.

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### **5.3. Record keeping for all treatment residues**

1. You must record in the computerised waste tracking system:

- that a waste has been treated
  - what the treatment residues are and their weight
  - what end-of-waste products have been made and their weight
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# Chemical waste: appropriate measures for permitted facilities

From: **Environment Agency**  
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## Contents

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## **6. Emissions control appropriate measures**

These are the appropriate measures for emissions control at regulated facilities with an environmental permit for treating or transferring chemical waste.

You must [identify, characterise and control emissions](https://www.gov.uk/guidance/control-and-monitor-emissions-for-your-environmental-permit) (https://www.gov.uk/guidance/control-and-monitor-emissions-for-your-environmental-permit) from your activities that may cause pollution.

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### **6.1. Point source emissions to air**

1. You must contain storage tanks, silos and waste treatment plant (including shredders) to make sure you collect, extract and direct all process emissions to an appropriate abatement system for treatment before release.

2. You must identify the main chemical constituents of the site's point source emissions as part of the site's inventory of emissions to air.

3. You must assess the fate and impact of the substances emitted to air, following the Environment Agency's [risk assessment methodology \(https://www.gov.uk/guidance/risk-assessments-for-your-environmental-permit\)](https://www.gov.uk/guidance/risk-assessments-for-your-environmental-permit).

4. To reduce point source emissions to air (for example, dust, volatile organic compounds and odour) from the treatment of waste, you must use an appropriate combination of abatement techniques, including one or more of the following systems:

- adsorption (for example, activated carbon)
- biofiltration
- wet scrubbing
- fabric filters
- high efficiency particulate (HEPA) filtration
- condensation and cryogenic condensation
- cyclonic separation
- electrostatic precipitation
- thermal oxidation

5. You must assess and design vent and stack locations and heights to make sure dispersion capability is adequate. Where monitoring is required, including for odour, you must install suitable monitoring points.

6. Your procedures must make sure you correctly install, operate, monitor and maintain abatement equipment. For example, this includes monitoring and maintaining:

- appropriate flow and chemical concentration of scrubber liquor

- the handling and disposal or regeneration of spent scrubber or filter medium

7. You should design and operate abatement systems to minimise water vapour plumes.

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## 6.2. Fugitive emissions to air (including odour)

1. You must use appropriate measures to prevent emissions of [dust, mud and litter](https://www.gov.uk/guidance/control-and-monitor-emissions-for-your-environmental-permit#dust-mud-and-litter) (<https://www.gov.uk/guidance/control-and-monitor-emissions-for-your-environmental-permit#dust-mud-and-litter>) and [odour](https://www.gov.uk/guidance/control-and-monitor-emissions-for-your-environmental-permit#odour) (<https://www.gov.uk/guidance/control-and-monitor-emissions-for-your-environmental-permit#odour>).

2. You must design, operate and maintain storage and treatment plant in a way that prevents fugitive emissions to air, including dust, organic compounds and odour. Where that is not possible, you must minimise these emissions. Storage and treatment plant includes associated equipment and infrastructure such as:

- shredders
- conveyors
- skips or containers
- building fabric, including doors and windows
- pipework and ducting

3. To make sure fugitive emissions are collected and directed to appropriate abatement, your treatment plant must use high integrity components (for example, seals or gaskets). Your treatment plant must be fully enclosed, with air extraction systems located close to emission sources where possible.

4. You must use your waste pre-acceptance, waste acceptance and site inspection checks and procedures to identify and manage wastes that could cause, or are causing, fugitive emissions to

air. When you identify any of these wastes you must:

- take appropriate, risk assessed measures to prevent and control emissions
- prioritise their treatment or transfer

5. Where necessary, to prevent fugitive emissions to air from the storage and handling of wastes, you should use a combination of the following measures:

- store and handle such wastes within a building or enclosed equipment
- keep buildings and equipment under adequate negative pressure with an appropriate abated air circulation or extraction system
- where possible, locate air extraction points close to potential emissions sources
- use fully enclosed material transfer and storage systems and equipment, for example, conveyors, hoppers, containers, tanks and skips
- use fast-acting or 'airlock' doors that default closed
- keep building doors and windows shut to provide containment, other than when access is required
- minimising drop height
- use misting systems and wind barriers to prevent dust

6. You must set up a leak detection and repair programme and use it to promptly identify and mitigate any fugitive emissions from treatment plant and associated infrastructure (for example, pipework, conveyors, tanks).

7. You must regularly inspect and clean all waste storage and treatment areas, equipment (including conveyor belts) and containers. You must have an appropriate regular maintenance programme covering all buildings, plant and equipment. This must also include protective equipment such as air ventilation and extraction systems, curtains and fast-action doors used to prevent and contain fugitive releases.

8. Your inspection, maintenance and cleaning schedules must make sure that tanks and plant are regularly cleaned to avoid large-scale decontamination activities.

9. You must take measures to prevent the corrosion of plant and equipment (for example, conveyors or pipes). This includes selecting and using appropriate construction materials, lining or coating equipment with corrosion inhibitors and regularly inspecting and maintaining plant.

10. If you wash containers or tanks, you must design and operate the washing process and associated equipment in a way that prevents fugitive emissions to air. For example, you could do this activity in a contained or enclosed system.

11. You must fully enclose and contain pre- and post-treatment shredder plant to prevent emissions. You must design and operate the shredder plant using appropriate process interlocks. The plant should not operate unless it is enclosed and contained, for example, only working when the loading door on the hopper has been closed or sealed. Dust and microbial emissions from the shredder plant must be contained and extracted to an appropriate abatement system, for example HEPA air filtration.

12. Where a [dust management plan](https://www.gov.uk/guidance/control-and-monitor-emissions-for-your-environmental-permit#emissions-management-plan-for-dust) (<https://www.gov.uk/guidance/control-and-monitor-emissions-for-your-environmental-permit#emissions-management-plan-for-dust>) is required, you must develop and implement it following our guidance.

13. You must have procedures to minimise the amount of time odorous wastes spend in your storage and handling systems (for example, pipes, conveyors, hoppers, tanks). In particular, you must have provisions to manage waste during periods of peak volume.

14. You must have measures to contain, collect and treat odorous emissions, including using contained buildings and plant or equipment with appropriate air extraction and abatement. We do not consider masking agents to be appropriate measures for the treatment of odorous emissions.

15. You must monitor and maintain odour abatement systems to ensure optimum performance. For example, you should make sure that scrubber liquors are maintained at the correct pH and replenished or replaced at an appropriate frequency.

16. You must store contaminated waters that have potential for odours in covered or enclosed tanks or containers vented through suitable abatement.

17. Where odour pollution at sensitive receptors is expected, or has been substantiated, you must periodically monitor odour emissions using European (EN) standards, for example either:

- dynamic olfactometry according to EN 13725 to determine the odour concentration
- EN 16841-1 or -2 to determine the odour exposure

If you are using alternative methods for which no EN standards are available (for example, estimating odour impact), you should use ISO, national or other international standards to make sure you use data of an equivalent scientific quality. You must set out the monitoring frequency in the odour management plan.

18. Where odour pollution at sensitive receptors is expected, or has been substantiated, you must also set up, implement and regularly review an odour management plan. It must be part of your management system and include all of the following elements:

- actions and timelines to address any issues identified
- a procedure for odour monitoring
- a procedure for responding to odour incidents, for example, complaints
- an odour prevention and reduction programme designed to identify the source(s), characterise the contributions of the sources and prevent and reduce them

19. Where an [odour management plan](https://www.gov.uk/guidance/control-and-monitor-) (<https://www.gov.uk/guidance/control-and-monitor->

[emissions-for-your-environmental-permit#odour-management-plan](#)) is required, you must develop and implement it following our guidance.

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## 6.3. Emissions of noise and vibration

1. You should design the facility so that potential sources of noise (including building exits and entrances) are away from sensitive receptors and boundaries. You should locate buildings, walls, and embankments so they act as noise screens.

2. You must employ appropriate measures to control noise, for example, including:

- adequately maintaining plant or equipment parts which may become more noisy as they deteriorate – for example, bearings, air handling plant, building fabric, and specific noise attenuation kit associated with plant or machinery
- closing doors and windows of enclosed areas and buildings
- avoiding noisy activities at night or early in the morning
- minimising drop heights and the movement of waste and containers
- using broadband (white noise) reversing alarms and enforcing the on-site speed limit
- using low-noise equipment, for example, drive motors, fans, compressors and pumps
- adequately training and supervising staff
- where possible, providing additional noise and vibration control equipment for specific sources of noise – for example, noise reducers or attenuators, insulation, or sound-proof enclosures

3. Where noise or vibration pollution at sensitive receptors is expected, or has been substantiated, you must create, use and regularly review a noise and vibration management plan. This must be part of the environmental management system, and must include:

- actions and timelines to address any issues identified
- a procedure for noise and vibration monitoring
- a procedure for responding to identified noise and vibration events, for example, complaints

4. Your noise and vibration management plan should also include a noise and vibration reduction programme designed to:

- identify the sources of noise and vibration
- measure or estimate noise and vibration exposure
- characterise the contributions of the sources
- implement prevention and reduction measures

5. Where a [noise and vibration management plan](https://www.gov.uk/guidance/control-and-monitor-emissions-for-your-environmental-permit#noise-and-vibration-management-plan) (<https://www.gov.uk/guidance/control-and-monitor-emissions-for-your-environmental-permit#noise-and-vibration-management-plan>) is required, you must develop and implement it following our guidance.

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## 6.4. Point source emissions to water and sewer

1. You must identify the main chemical constituents of the site's point source emissions to water and sewer as part of the site's inventory of emissions.

2. You must assess the fate and impact of the substances emitted to water and sewer, following the Environment Agency's [risk assessment guidance](https://www.gov.uk/guidance/risk-assessments-for-your-environmental-permit) (<https://www.gov.uk/guidance/risk-assessments-for-your-environmental-permit>).

3. Discharges to water or sewer must comply with the conditions of an environmental permit or trade effluent consent. Relevant sources of waste water include:

- water or condensate collected from treatment processes
- waste compactor run-off



- vehicle washing
- vehicle oil and fuel leaks
- washing of containers
- spills and leaks in waste storage areas
- loading and unloading areas

4. To reduce emissions to water and sewer, if you need to treat waste water before discharge or disposal, you must use an appropriate combination of treatment techniques, including one or more of the following:

- preliminary or primary treatment – for example, equalisation, neutralisation or physical separation
- physico-chemical treatment – for example, adsorption, distillation or rectification, precipitation, chemical oxidation or reduction, evaporation, ion exchange, or stripping
- biological treatment – for example, activated sludge process or membrane bioreactor
- nitrogen removal – for example, nitrification and denitrification
- solids removal – for example, coagulation and flocculation, sedimentation, filtration or flotation

5. You must direct wash waters from cleaning containers to a foul sewer or sealed drainage system for on-site re-use or off-site disposal. You may need to pre-treat the waters to meet any limits on the effluent discharge consent. Discharges of wash waters to surface water or storm drains are not acceptable.

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## 6.5. Fugitive emissions to land and water

1. You must use appropriate measures to control potential fugitive emissions and make sure that they do not cause pollution. See the guidance on [emissions to water](https://www.gov.uk/guidance/control-and-monitor-emissions-for-your-environmental-permit#emissions-to-water) (<https://www.gov.uk/guidance/control-and-monitor-emissions-for-your-environmental-permit#emissions-to-water>) and [leaks from containers](#)

<https://www.gov.uk/guidance/control-and-monitor-emissions-for-your-environmental-permit#leaks-from-containers>).

2. You must have these in all operational areas of the facility:

- an impermeable surface
- spill containment kerbs
- sealed construction joints
- a sealed drainage system

3. You must have measures in place to prevent overflows and failures from tanks and vessels, including where relevant:

- overflow detectors and alarms
- directing over-flow pipes to a contained drainage system
- locating tanks and packaged liquids in suitable secondary containment (bunds)
- providing isolation mechanisms (for example, closing valves) for tanks, vessels and secondary containment

4. You must collect and treat separately each water stream generated at the facility, for example, surface run-off water or process water. Separation must be based on pollutant content and treatment required. In particular you must make sure you segregate uncontaminated water streams from those that require treatment.

5. You must use suitable drainage infrastructure to collect surface drainage from areas of the facility where you store, handle and treat waste. You must also collect wash waters and occasional spillages. Depending on the pollutant content, you must either recirculate what you have collected or send it for further treatment.

6. You must have design and maintenance provisions in place to detect and repair leaks. These must include regularly monitoring, inspecting and repairing equipment and minimising underground equipment and infrastructure.

7. You should provide appropriate buffer storage capacity at your facility to store waste waters, taking into account:

- potential abnormal operating scenarios and incidents
- the nature of any polluting substances and their impact on the downstream waste water treatment plant and receiving environment

8. You must have appropriate measures in place to monitor, treat and reuse water held in the buffer storage before discharging.

9. You must take measures to prevent emissions from washing and cleaning activities, including:

- directing liquid effluent and wash waters to foul sewer or collecting them in a sealed system for off-site disposal – you must not discharge them to surface or storm drains
- where possible, using biodegradable and non-corrosive washing and cleaning products
- storing all detergents, emulsifiers and other cleaning agents in suitable bunded or containment facilities, within a locked storage area, or in a building away from any surface water drains
- preparing cleaning solutions in contained areas of the site and never in areas that drain to the surface water system

10. Where relevant, you must have measures to prevent pollution from the on-site storage, handling and use of [oils and fuels](https://www.gov.uk/guidance/storing-oil-at-a-home-or-business) (<https://www.gov.uk/guidance/storing-oil-at-a-home-or-business>).

11. You must produce and implement a spillage response plan and train staff to follow and test it.

12. Your procedures and associated training must make sure you deal with spillages immediately.

13. You must keep spill kits at locations close to areas where a spillage could occur and make sure relevant staff know how to use them. Make sure kits are replenished after use.

14. You must stop spillages from entering drains, channels, gullies, watercourses and unmade ground. You must make proprietary sorbent materials, sand or drain mats available.

15. You must make sure your spillage response plan includes information about how to recover, handle and correctly dispose of waste produced from a spillage.

16. Container washing equipment must be contained and located in a designated area of the facility that has self-contained drainage. The equipment must be designed to collect and contain all wash waters, including any spray. Trained staff must operate, inspect and maintain it regularly.

17. For sub-surface structures, you must:

- establish and record the routing of all site drains and sub-surface pipework
- identify all sub-surface sumps and storage vessels
- engineer systems to minimise leakages from pipes and make sure they are detected quickly if they do occur, particularly where [hazardous substances](https://www.gov.uk/government/publications/values-for-groundwater-risk-assessments/hazardous-substances-to-groundwater-minimum-reporting-values#list-of-hazardous-substances) (<https://www.gov.uk/government/publications/values-for-groundwater-risk-assessments/hazardous-substances-to-groundwater-minimum-reporting-values#list-of-hazardous-substances>) are involved
- provide secondary containment or leakage detection for sub-surface pipework, sumps and storage vessels
- establish an inspection and maintenance programme for all sub-surface structures, for example, pressure tests, leak tests, material thickness checks or CCTV


18. For surfacing, you must design appropriate surfacing and containment or drainage facilities for all operational areas, taking into account:

- collection capacities
- surface thicknesses
- strength and reinforcement
- falls

- materials of construction
- permeability
- resistance to chemical attack
- inspection and maintenance procedures

19. You must have an inspection and maintenance programme for impermeable surfaces and containment facilities.

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## **7. Emissions monitoring and limits appropriate measures**

These are the emissions limits and appropriate measures for monitoring emissions to air and water at regulated facilities with an environmental permit for treating or transferring chemical waste.

We may set emission limits and monitoring requirements in your permit, based on your emissions inventory and [environmental risk](#)

[assessment \(https://www.gov.uk/guidance/risk-assessments-for-your-environmental-permit\)](https://www.gov.uk/guidance/risk-assessments-for-your-environmental-permit).

1. Where you are required to monitor emissions to comply with the requirements of your environmental permit, you must follow our [monitoring guidance \(https://www.gov.uk/guidance/control-and-monitor-emissions-for-your-environmental-permit#monitoring-your-emissions\)](https://www.gov.uk/guidance/control-and-monitor-emissions-for-your-environmental-permit#monitoring-your-emissions).

2. You must create and maintain an emissions inventory of point source emissions to air and water (including emissions to sewer) for your facility.

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## 7.1. Emissions to air

1. Your facility's emissions inventory must include information about the relevant characteristics of point source emissions to air, such as the:

- average values and variability of flow and temperature
- average concentration and load values of relevant substances and their variability
- flammability, lower and higher explosive limits and reactivity
- presence of other substances that may affect the waste gas treatment system or plant safety – for example, oxygen, nitrogen, water vapour, dust

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## 7.2. Emissions to water or sewer


1. Your facility's emissions inventory must include information about the relevant characteristics of point source emissions to water or sewer, such as:

- average values and variability of flow, pH, temperature, and conductivity
- average concentration and load values of relevant substances and their variability – for example, COD (chemical oxygen demand) and TOC (total organic carbon), nitrogen species,

phosphorus, metals, priority substances or micropollutants

- data on bio-eliminability – for example, BOD (biochemical oxygen demand), BOD to COD ratio, Zahn-Wellens test, biological inhibition potential, for example, inhibition of activated sludge

2. For relevant emissions to water or sewer identified by the emissions inventory, you must monitor key process parameters (for example, waste water flow, pH, temperature, conductivity, or BOD) at key locations. For example, these could either be at the:

- inlet or outlet (or both) of the pre-treatment
  - inlet to the final treatment
  - point where the emission leaves the facility boundary
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### **8. Process efficiency appropriate measures**

These are the appropriate measures for process efficiency at regulated facilities with an environmental permit for treating or transferring chemical waste.

1. For your facility, you must monitor and review the annual quantity of:

- water, energy and raw materials used
- residues and waste water produced

You must do this at least once a year.

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## **8.1. Energy efficiency (installations only)**

1. You must create and implement an energy efficiency plan at your facility. This must:

- define and calculate the specific energy consumption of the activity (or activities) you do and waste stream(s) you treat
- set annual key performance indicators – for example, specific energy consumption (expressed in kWh/tonne of waste processed)
- plan periodic improvement targets and related actions

2. You must regularly review and update your energy efficiency plan as part of your facility's management system.

3. You must have and maintain an energy balance record for your facility. This must provide a breakdown of your energy consumption and generation (including any energy or heat exported) by the type of source (electricity, gas, conventional liquid fuels, conventional solid fuels and waste). You should provide Sankey diagrams or energy balances to show how energy is used in your waste treatment processes.

4. You must regularly review and update your energy balance record as part of your facility's management system, alongside the energy efficiency plan.

5. You must have operating, maintenance and housekeeping measures in place in relevant areas, for example for:

- air conditioning, process refrigeration and cooling systems (leaks, seals, temperature control, evaporator or condenser maintenance)
- the operation of motors and drives
- compressed gas systems (leaks, procedures for use)

- steam distribution systems (leaks, traps, insulation)
- space heating and hot water systems
- lubrication to avoid high friction losses
- boiler operation and maintenance, for example, optimising excess air
- other maintenance relevant to the activities within the facility

6. You must have measures in place to avoid gross energy inefficiencies. These should include, for example:

- insulation
- containment methods (such as seals and self-closing doors)
- avoiding unnecessary discharge of heated water or air (for example, by fitting timers and sensors)

7. You should implement additional [energy efficiency measures](https://www.gov.uk/guidance/energy-efficiency-standards-for-industrial-plants-to-get-environmental-permits) (<https://www.gov.uk/guidance/energy-efficiency-standards-for-industrial-plants-to-get-environmental-permits>) at the facility as appropriate, following our guidance.

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## 8.2. Raw materials (installations only)

1. You must maintain a list of the raw materials used at your facility and their properties. This includes auxiliary materials and other substances that could have an environmental impact.
2. You must regularly review the availability of alternative raw materials and use any suitable ones that are less hazardous or polluting. This should include, where possible, substituting raw materials with waste or waste-derived products.
3. You must justify the continued use of any substance for which there is a less hazardous alternative.

4. You must have quality assurance procedures in place to control the content of raw materials.

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### **8.3. Water use (installations only)**

1. You must make sure you optimise water consumption to:

- reduce the volume of waste water you generate
- prevent or, where that is not practicable, reduce emissions to soil and water

2. Measures you must take include:

- implementing a water saving plan (involving establishing water efficiency objectives, flow diagrams and water mass balances)
- optimising the use of wash waters (for example, dry cleaning instead of hosing down and using trigger controls on all washing equipment)
- recirculating and reusing water streams within the plant or facility, if necessary after treatment
- reducing the use of water for vacuum generation (for example, using liquid ring pumps with high boiling point liquids), where relevant

3. You must review water use (a water efficiency audit) at least every 4 years.

4. You must also:

- produce flow diagrams and water mass balances for your activities
- establish water efficiency objectives and identify constraints on reducing water use beyond a certain level (usually this will be site specific)
- identify the opportunities for maximising reuse and minimising use of water
- have a timetabled improvement plan for implementing additional water reduction measures

5. To reduce water use and associated emissions to water, you should apply these general principles in

sequence:

- use water efficient techniques at source where possible
- reuse water within the process, by treating it first if necessary – if not practicable, use it in another part of the process or facility that has a lower water quality requirement
- if you cannot use uncontaminated roof and surface water in the process, you should keep it separate from other discharge streams – at least until after you have treated the contaminated streams in an effluent treatment system and have carried out final monitoring

6. You should establish the water quality requirements associated with each activity and identify whether you can substitute water from recycled sources. Where you can, include it in your improvement plan.

7. Where there is scope for reuse (possibly after some form of treatment) you should keep less contaminated water streams, such as cooling waters, separate from more contaminated streams.

8. You must minimise the volume of water you use for cleaning and washing down by:

- vacuuming, scraping or mopping in preference to hosing down
- reusing wash water (or recycled water) where practicable
- using trigger controls on all hoses, hand lances and washing equipment

9. You must directly measure fresh water consumption and record it regularly at every significant usage point, ideally on a daily basis.

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## **8.4. Waste minimisation, recovery and disposal**


1. You must have and implement a residues management plan that:

- minimises the generation of residues from waste treatment
- optimises the reuse, regeneration, recycling or energy recovery of residues, including packaging
- makes sure you properly dispose of residues where recovery is technically or economically impractical

2. Where you must dispose of waste, you must do a detailed assessment to identify the best environmental options for waste disposal.

3. You must regularly review options for recovering and disposing of waste produced at the facility. You must do this as part of your management system to make sure you are using the best environmental options and promoting the recovery of waste where technically and economically viable.

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