



Llywodraeth Cymru  
Welsh Government

Groundwater protection  
codes for Wales

# Solvents

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## 1. Introduction

Groundwater lies below the surface of the ground. If you carelessly use or release solvents on your site they could pollute groundwater. Most solvents are **hazardous substances**<sup>1</sup>. Even in small quantities they cause pollution and can seriously impact the quality of groundwater and contaminate drinking water sources such as boreholes, wells, springs and streams making them unfit for drinking water or other uses such as food production.

You should read and follow this code if you:

- own or work at a site where solvents are used or stored
- deliver solvents to such a site
- are involved in decommissioning such a site

By following this code of practice you can reduce the risk of causing groundwater pollution.

You could be imprisoned and subject to an unlimited fine if you:

- discharge solvents directly to groundwater
- dispose of solvents on land without a permit from Natural Resources Wales

By using this code you will be able to show that you have taken steps to avoid pollution and are complying with your legal requirements under the Environmental Permitting (England and Wales) Regulations, 2016. You must also follow applicable guidance and laws like the health and safety regulations.

Natural Resources Wales would look at whether you followed or are likely to follow the code when deciding whether to serve a notice on you under the Environmental Permitting (England and Wales) Regulations, 2016. Such notices can include the requirement for you to get a permit, or to stop your use or storage of solvents on site. Failure to comply with a notice is also a criminal offence.

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<sup>1</sup> <https://naturalresources.wales/media/680314/updated-list-of-hazardous-substances.pdf>

## 2. Types of solvent

A solvent is any substance that's designed to act on another substance as either a:

- dissolver
- disperser
- degreaser
- viscosity adjuster
- surface tension adjuster
- preserver
- plasticiser

## 3. Develop an environmental management system

You need to show that you operate your facility in an environmentally responsible manner by developing operational control procedures in an environmental management system (EMS). Your EMS should show the facility's operation control procedures by establishing what measures you are going to have to protect the environment, and how you'll carry them out.

Your EMS should include:

- details of staff training and emergency response procedures
- plans for upgrading the facility's engineering requirements
- how you'll carry out checks and deal with problems
- controls such as leak detection, storage, deliveries, dispensing and inspection regimes
- how you'll carry out a management review of your environmental systems / procedures and implement any improvements necessary

You should keep up-to-date records of staff training.

## Accreditation of your EMS

The two main EMS certification schemes are **ISO 14001**<sup>2</sup> and the **Eco-Management and Audit Scheme (EMAS)**<sup>3</sup>. You can also use **BS 8555:2003**<sup>4</sup> – this isn't a certifiable standard but guidance for implementing an EMS on a phase-by-phase basis.

## 4. Risk assessment

A risk assessment is part of an environmental management system (EMS) for an operational facility. The preparation of an environmental risk assessment is important to ensure the risks to groundwater and appropriate protection measures are properly identified.

Your risk assessment needs to cover these areas:

- physical, chemical and biological properties of any material that could cause pollution
- how materials are stored or transported and the condition of storage containers
- possible effects of accidents, flooding, vandalism and failure of containment
- surface water drains and foul sewers that flow off your site
- any sustainable drainage systems you have on your site
- areas of unsurfaced ground (that represent potential pollutant pathways to underlying groundwater)
- operations and layout of your site
- risks posed to people and the environment and the extent of the possible damage they could cause
- local landscape and different weather conditions and the flood risk that could be reasonably expected at and around your site

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<sup>2</sup> <http://www.bsigroup.com/en-GB/iso-14001-environmental-management>

<sup>3</sup> [http://ec.europa.eu/environment/emas/index\\_en.htm](http://ec.europa.eu/environment/emas/index_en.htm)

<sup>4</sup> <http://shop.bsigroup.com/ProductDetail/?pid=00000000030077920>

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Read the [groundwater risk assessment guidance](#)<sup>5</sup> for detailed information on carrying out a risk assessment. The guidance is for permit applications, but you can use the principles it outlines.

You should use your risk assessment findings to create a risk management action plan for the facility. This will set out the engineering and operational control measures needed to protect groundwater. Use your risk assessment findings when designing new solvent use or storage facilities, or updating existing ones.

## 5. Prevent groundwater pollution

You must prevent groundwater pollution when:

- delivering and transporting solvents
- storing solvents (either as unused product or waste) using solvents
- disposing of solvents decommissioning solvent sites

You should also make sure that your EMS covers training staff in handling solvents.

## 6. Buy, deliver and transport solvents

When buying solvents you should:

- only buy as much as you need
- keep records of what you buy (how much, when and from whom)
- get an up-to-date product safety data sheet (SDS) from the supplier for each solvent you buy
- make sure staff are familiar with the site risk assessment

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<sup>5</sup> <https://www.gov.uk/guidance/groundwater-risk-assessment-for-your-environmental-permit>

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Make sure that deliveries are made in undamaged, **clearly labelled containers**<sup>6</sup> and that delivery areas are:

- large enough for any vehicles and handling equipment
- free of any obstacles or sources of ignition, e.g. heaters, lighting, naked flames, electrical equipment, smokers' materials (cigarettes, matches etc), and anything else that can get very hot or cause sparks
- have impermeable surfaces and, where appropriate, bunding (a type of engineered secondary containment system with walls and floors impermeable to the material stored) in line with your EMS and the risk assessment, to contain any spills

When transporting solvents around a site you should:

- use suitable, secure containers and other equipment (e.g. forklifts and trolleys)
- keep transportation routes clear of any sources of ignition or obstacles (e.g. drains, sumps and soakaways)
- follow the Dangerous Substance and Explosive Atmosphere Regulations (DSEAR) if the solvents are highly flammable
- use the shortest practical dispensing hose if you're using a tanker

You should also:

- make sure staff are trained in **manual and equipment handling**<sup>7</sup>
- make sure any contractors are supervised by trained staff
- assess the risk of fires from flammable liquids or their vapours under the DSEAR Regulations

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<sup>6</sup> <http://www.hse.gov.uk/chemical-classification/labelling-packaging/hazard-symbols-hazard-pictograms.htm>

<sup>7</sup> <http://www.hse.gov.uk/msd/manualhandling.htm>

## 7. Store solvents and prevent spills and leaks

Storing solvents incorrectly can lead to groundwater pollution. Make sure that storage areas are:

- inspected regularly for spills and leaks
- secure against the risk of spills or vandalism
- above ground storage
- protected from weather conditions that could negatively affect them, e.g. freezing conditions that could crack containers or heat that could cause fires
- protected by **secondary containment**<sup>8</sup>
- well-lit to avoid spills and make it easier to detect leaks

You should also:

- make sure inspections are documented and made against a checklist of relevant items
- keep an inventory of all solvents, chemicals and products stored and used on the site

You may need to use a leak detection system for your storage area. Your EMS and risk assessment should identify the requirement for an appropriate leak detection system.

### Where to store solvents

You can store solvents in appropriately sized and designed:

- cans
- drums
- intermediate bulk containers (IBCs)
- above ground storage tanks

Drums with large lids and rim clamps (e.g. 205 litre open top drums) can leak and cause spills, so you should only use these for storing viscous solvents that don't flow easily (e.g. paraffin waxes).

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<sup>8</sup> [http://www.ciria.org/Resources/Free\\_publications/c736.aspx](http://www.ciria.org/Resources/Free_publications/c736.aspx)



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You can use traditional metal drums with small bungs, provided they:

- have no holes, dents or leaks
- have no visible signs of rust or metal fatigue
- are clearly marked using **hazard pictograms**<sup>9</sup>
- haven't been used before for different types of solvent or other chemicals

You should avoid storing solvents in underground tanks as these are more likely to cause groundwater pollution. If you plan to use underground tanks, you must consult Natural Resources Wales first.

You should also be familiar with the position statements with regard to underground storage (Section D) for **groundwater protection**<sup>10</sup>

### **Prevent spills and leaks**

To prevent spills and leaks you should follow any recommendations from suppliers and:

- keep floors, containers and bund clean and dry
- make sure valves are kept shut
- only store as many solvents as you need
- place drip trays beneath taps and valves in the storage area
- secure the storage area (including taps and valves) against unauthorised access and vandalism
- **make sure spill kits and emergency equipment are available for staff and in good working order**

You should make sure that both containers and secondary containment are:

- chemically resistant to the solvents stored in them
- clearly labelled with warning signs

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<sup>9</sup> <http://www.hse.gov.uk/chemical-classification/labelling-packaging/hazard-symbols-hazard-pictograms.htm>

<sup>10</sup> [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/598778/LIT\\_7660.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/598778/LIT_7660.pdf)

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- strong enough that they're unlikely to burst or leak – you should remove any damaged or unsuitable containers immediately

You should have spare containers and hand transfer pumps available for transferring solvents from damaged containers. Use overdrums to encase damaged containers.

## 8. Use and disposal of solvents

### Use of solvents

Make sure that areas where solvents are used on site:

- are clearly designated with [proper signage](#)
- have impermeable flooring and chemically resistant to the solvents used
- are located away from soakaways, drinking water boreholes, sumps, surface water sources and surface water drains
- are inside properly bunded areas
- are free of traffic or any obstacles - this reduces the risk of accidental spills

### Disposal of solvents

Waste that contains solvents may be classed as controlled waste under the Hazardous Waste Regulations. This means that when disposing of them you must:

- check if your [waste is hazardous](#)<sup>11</sup>
- check if you need an [environmental permit](#)<sup>12</sup>
- make sure a [registered waste carrier](#)<sup>13</sup> removes it from your site

## 9. Train staff to handle solvents

You should ensure your staff are trained, and any visiting contractors are similarly trained, to handle solvents. Training should cover:

- how to supervise deliveries
- handling and transporting solvents

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<sup>11</sup> <https://naturalresources.wales/guidance-and-advice/environmental-topics/waste-management/how-to-classify-and-assess-waste/?lang=en>

<sup>12</sup> <https://naturalresources.wales/permits-and-permissions/?lang=en>

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- understanding the importance of protecting groundwater and **assessing the risks to groundwater**<sup>14</sup> at a site
- completing waste transfer and consignment notes
- dealing with incidents and emergencies, including reporting spills or other incidents and using spill kits and emergency equipment
- carrying out and documenting maintenance checks and repairs
- understanding environmental permitting and hazardous waste regulations

## 10. Site infrastructure

You should look after the infrastructure (e.g. pipework, secondary containment and drains) on your site to prevent groundwater pollution. Make sure any infrastructure is:

- suitable for the quantity of solvents you're using
- located and designed so that it won't cause groundwater pollution
- positioned so you can properly clean and maintain it
- **clearly signposted**

Get specific guidance from the supplier on how to look after your site infrastructure, but always:

- carry out an annual inspection of bunds, flooring, drainage, pipework, storage areas, secondary containment and signs
- carry out repairs promptly
- maintain and inspect the site in line with the EMS
- keep detailed written records of inspections, maintenance and repairs – you may also have permits that require you to do this

### Maintain and inspect pipework

Leaks from pipework carrying solvents can cause groundwater pollution. You should make sure pipework:

<sup>13</sup> <https://www.wastecarriersregistration.naturalresourceswales.gov.uk/en/registrations/search>

<sup>14</sup> <https://www.gov.uk/guidance/groundwater-risk-assessment-for-your-environmental-permit>

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- is resistant to any solvents it carries or comes into contact with
- is located above ground and is available for inspection and maintenance
- is on an impermeable surface away from surface water drains, soakaways, drinking water abstractions and sumps
- is located away from main roadways or is protected from impact damage
- has clear labelling stating its contents
- has the minimum number of connections to prevent the increase in potential for accidental leaks

These rules also apply to taps, valves and pumps. You should also place taps, valves and pumps over bunded areas if you're filling or transferring solvents between containers.

### **Secondary containment and bunds**

You should use secondary containment for any containers on your site that aren't integrally bunded, including double-skinned containers. Secondary containment can help to prevent:

- solvents leaking from containers
- spills from fires and explosions in storage areas

If you don't provide secondary containment on your site, you may have to explain why it isn't needed during an inspection from, for example, the Health and Safety Executive, a local authority or Natural Resources Wales.

Secondary containment could include:

- simple spill decks and containment platforms
- safety storage platforms with spill decks
- engineered solutions, such as bunds and prefabricated systems made from steel or plastic

The type of secondary containment you use will depend on:

- the type and quantity of solvents you're storing
- whether the storage area is inside or outside

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Make sure that secondary containment:

- is impermeable and chemically resistant to the solvents stored in it – some types of concrete are not resistant to all types of solvent
- has clear labelling stating its contents, if it's enclosed
- has no services such as pipes or ducts passing through it

Read more information about [secondary containment systems](#)<sup>15</sup> .

Make sure that bunds:

- could contain all the liquid stored in the container (or the largest container if there's more than one), plus an extra 10% capacity for rainfall and fire fighting water
- are designed to stay free of rainwater and for the safe removal of spills
- are free of surface water drains, soakaways, engineered sumps, separators, vegetation and combustible material
- are further than 10m from watercourses and further than 50m from a well, spring or borehole which is used for drinking water supply.

Remove any spills and rainwater that gathers from bunds as soon as possible. Do this using a pump over the bund wall or from a low point in the bund. Don't use valves or other arrangements that are inside the bund wall or pass through it.

You must [dispose of waste that contains solvents legally](#).

## Drains

Drains can act as channels for groundwater pollution. Most sites will have 2 types of drain:

- surface water drains (including land and roof drains) – these discharge to local rivers, streams or soakaways, usually without treatment
- foul water drains (also known as trade effluent drains) – these carry contaminated water to sewage treatment works, storage lagoons or treatment systems

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<sup>15</sup> [http://www.ciria.org/Resources/Free\\_publications/c736.aspx](http://www.ciria.org/Resources/Free_publications/c736.aspx)

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Make sure that:

- surface water drains carry only uncontaminated water
- site effluent and contaminated surface waters are discharged to the foul drain drains are equipped with separators where necessary
- all drains are accessible for inspection and maintenance
- all drains are clearly marked on plans that are available to staff at all times

### **Keep a plan of the site's drains**

You should keep an up-to-date plan of drainage on your site. This should show:

- the layout of drains
- how to access them
- a plan ('schematic representation') of the site's drainage

You should mark:

- foul drains in red
- surface water drains in blue
- the direction of flow for both surface and foul drains (use the same colours to mark drain covers and manholes)

Your drain plan should also show:

- the general layout of buildings and roads on the site
- any separators, sumps and soakaways on or near the site
- offsite discharge points for surface water and trade effluent
- any watercourses, boreholes, wells or springs on or near the site
- any facilities for detecting pollution, such as inspection points (e.g. retention tanks, balancing tanks, fire water retention ponds)

Clearly mark the locations of:

- sprinkler control valves (if they're present) and mains water stopcocks
- places around the site suitable for portable emergency storage

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- points where you can use bungs and plugs
- process areas and any treatment areas on the site for trade or domestic sewage fire hydrants, fireboxes, cut-off valves and spill kits
- bunded areas, indicating their capacity and the types of product stored in them

## Signage

Signs and notices can help prevent solvent loss. You should use them to:

- identify delivery areas, transport routes and storage areas
- warn of hazardous materials or activities
- encourage good security and housekeeping, including cleaning and waste disposal
- provide clear instructions for the use of pipework, bunding and pouring areas
- identify emergency equipment and procedures

## Change or decommission a site

When changing or decommissioning a site, you should:

- make sure you don't release solvents to groundwater or surface water
- safely dispose of any equipment that contains solvents (e.g. pipes, drains, tanks and bunds)

Read the Association for Petroleum and Explosives Administration and Energy Industry's (APEA) **Blue Book**<sup>16</sup> to find out about the decommissioning and removal of any underground storage tanks.

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<sup>16</sup> <http://www.apea.org.uk/publication/blue-book-pdf>

## 11. Prepare for emergencies

If there's a risk that groundwater has been polluted you must contact **Natural Resources Wales**<sup>17</sup> to report an environmental incident. Call them on **0300 065 3000**

### Create an incident response plan

You should prepare a pollution incident response plan (PIRP) as part of your site's EMS, setting out what you'll do in an emergency.

You need to tailor your PIRP to your site, and at a minimum it should include:

- [emergency contact details](#)
- a product inventory, including a product safety data sheet (SDS)
- a site layout plan
- a plan of the drainage arrangements on the site
- details of the location of emergency response equipment
- your emergency procedure
- how you **report incidents**<sup>17</sup>

You should:

- make sure that both staff and contractors are aware of the procedures set out in the PIRP
- regularly test the effectiveness of your procedures
- keep copies of the PIRP on your site (and off the site for reference in the event of an incident)

You should also add a summary sheet to the PIRP that includes:

- your company name
- your address
- your main business activities

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<sup>17</sup> <https://naturalresources.wales/about-us/contact-us/report-an-incident/?lang=en>



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- a record of all the solvents on the site (including quantities) details of everyone who has a copy of the PIRP

### **Respond to an emergency**

You should make sure that your emergency response equipment:

- can deal with the maximum spill that's likely to occur
- is in good working order
- is clearly identified on the site plan (insert this into your PIRP)
- is clearly marked, with directions for its use clearly displayed

Make sure that staff are trained to use emergency response equipment.

You should also make spill kits available in areas where spills and leaks are likely to occur (e.g. storage, delivery and waste disposal areas). Spill kits should include:

- absorbent materials shovels
- drain bungs or covers

### **Carry out your emergency procedures**

Make sure that emergency procedures:

- are tailored to the needs of the site
- can deal with the worst case scenario

As part of your emergency procedure you should:

- tell staff about the incident
- evacuate the site safely
- tell your emergency contacts
- notify and evacuate any properties affected in the surrounding area

Your PIRP should set out how you'll:

- handle both small and large spills
- assess priorities in an emergency

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- make sure staff know their responsibilities in an emergency
- safely handle and dispose of any waste caused by the incident
- clean and decontaminate personal protective equipment
- dispose of fire-fighting water

### **Supply contact details**

Your emergency contact details will usually include:

- staff keyholders - include site, home and mobile numbers
- any sources of specialist advice
- emergency services
- specialist clean-up contractors
- the local water supply company
- the local sewerage undertaker