Oil clean-up products and their application in England and Wales

This guidance describes the oil clean-up product types available in England and Wales and identifies which ones are suitable for use in:

Spillages to:

- inland waters
- coastal waters
- yard surfaces, roadways and forecourts
- unmade ground/groundwater
- rocky shores.

Routine oil clean-up from:

- boat bilges
- bund walls and oil separators
- vehicles and machinery
- harbour walls.

When applying this guidance, operators should use our preferred option in the first instance.

Environment Agency preferred option for oil spills to surface water and groundwater

We prefer the use of mechanical recovery and/or sorbents to remove oil from surface waters. These methods for removing oil don't add to the water pollution and are designed to remove the oil from the water. These products should be used first.

You should only consider alternative techniques if you need to remove further oil. These alternatives often require the introduction of further products to the water environment, some of which are pollutants in their own right.

When oil has entered groundwater, the best option will depend on site conditions, such as soil type. You must contact us for our advice.

This guidance will help Environment Officers, Operations Delivery staff and oil clean-up contractors to assess whether or not a proposed product is acceptable in a given situation and what other control mechanisms may be needed. This will prevent the application of a product that may actually worsen the pollution and cause toxic chemicals to enter the environment.

It will help businesses to:

- select the right product type when they're carrying out routine cleaning operations;
- adopt good practice;
- satisfy the requirements of their own environmental management system.

Product manufacturers should use this guidance to market their products for the most suitable applications.

Section 1 describes each of the six product types being marketed in England and Wales and explains the potential environmental impacts of each one.

Section 2 examines each of the situations listed above and considers which of the clean-up product types are appropriate for use. It also summarises the permitting requirements and legal frameworks that apply to each product type in each situation.

It doesn't give detailed advice on how to store and dispose of waste oils, nor does it identify individual named products and assess their suitability.

Section 1, Oil clean-up products – a summary of their characteristics

The description of oil clean-up product categories below will help you select the appropriate product for your situation. Manufacturers may use these words or categories differently. Check the Material Safety Data Sheet of the product you're considering to make sure it only contains the constituents you'd expect. For example, a product marketed as a bioremediation product may contain organic solvents, or a product marketed as a sorbent may contain surfactants.

1. **Mechanical oil removal techniques** – mechanical equipment such as oil skimmers aren't described in this guidance but they're a valuable tool in oil clean-up. Mechanical skimmers can be used where sorbents would be overwhelmed by the volume of oil; they can recover a high proportion of the spilt oil. Containment booms or floating booms can prevent the oil from spreading to other areas. They can also act as a barrier to protect unpolluted areas from approaching spills.

2. **Sorbents** – adsorbents and absorbents exist on the UK market. They draw the oil off the surface and retain it so it can be physically removed. They work by mechanical or chemical means, such as adhesion and capillary action. Some allow the oil to be recovered out of the sorbents after use. Some 'lock' the oil into their chemical composition so that it can't leach out. Both types have their strengths and you should identify the best product to use depending on the situation.

   For spillages of petrol, true absorbents may be preferred because they draw the petrol into their chemical composition and prevent the continued release of petrol vapour; this may reduce the fire and explosion risk.

   Sorbents are made of different materials such as polyethylene, clay, organic matter or recycled products. They can be applied manually or mechanically, and can come as loose product or in sheets, booms, pads pillows. The recovery of loose sorbent can be difficult as it spreads itself across the water body – it may be best to contain it using booms.

   They remove the free oil and typically leave only an oily sheen on water.

   Sorbents can't take up dissolved hydrocarbons and some of them won't work if the hydrocarbons are oxidised and weathered. They're affected by the temperature and the viscosity of the oil. They must be either in direct contact with, or close to, the oil for it to be taken up. They can't draw spilled oil out of contaminated land although there are techniques where contaminated soils can be agitated with sorbents to separate the oil from the soil.

   Sorbents are inert and don't add anything to the water body – they simply remove the oil. They're simple, quick and easy to use.

   When sorbents are removed from the water, they're hazardous waste and must be removed to a licensed waste treatment facility. Whilst awaiting disposal you must place contaminated sorbents in a liquid-tight bund. They are commonly landfilled, processed or incinerated. Sometimes the oil can be recovered from the sorbent so the sorbent can be reused.

   Sorbents are most appropriate on small and medium scale spills as the contaminated sorbents quickly create hazardous waste which can become a problem on a large scale. For large spills we recommend that you use an alternative oil removal method, for example oil skimmers, before applying any sorbents.

3. **Bioremediation Agents** – these contain dormant spores of micro-organisms in liquid or powder, sometimes with 'filler' such as bran. The micro-organisms break the oil down into carbon dioxide and water.

   They're applied with a spray or by manual application to the spill. They can be tilled into soils or mixed in a sparge tank for pumping into a water body.

   The activity of the micro-organisms within the bioremediation agent depends on:
   - temperature
   - pH
   - oxygen levels
   - the type of oil spilled.

   Details of the oil type are important and you may need to carry out tests to see if the micro-organisms can break the oil down. The agents also need some nutrients to support the process. The breakdown process will be quicker if you can find micro-organisms that have been exposed to the same oil before so they're already acclimatised.

   One side effect of the breakdown process is a high Biochemical Oxygen Demand (BOD) because the breakdown process uses oxygen in the surrounding water. You should only use these products where oxygen levels in the water are continually refreshed, such as a river, or in a body of water large enough to cope with the expected oxygen depletion, so that the reduced oxygen levels don't affect or kill other organisms in the water.

   Don't use bioremediation agents where there will be a discharge to a sewage treatment facility; they can harm the micororganic activity essential for sewage treatment.

   Bioremediation agents aren't usually a 'first-aid' treatment. They're often better suited to the treatment of spilled oil where it has already been contained.

   The agents are sometimes considered to be a waste management tool, where they can be used to treat low level oily waste in a controlled and contained environment such as a bund wall or oil separator. Treated oily water must still be discharged to the foul sewer, with prior permission from the sewer provider, and can't go into a water body or be discharged to ground/groundwater via an infiltration system (soakaway).

   When treating oil spills to ground, the components of the oil become more soluble; they break down and the resultant leachate needs to be controlled appropriately.

   Some oils are particularly difficult to treat so you need to know the type of oil spilled.

   Ask the manufacturer whether the product you're considering is a simple mixture of micro-organisms and sometimes an inert carrier, or whether any other chemicals are included in the composition.

   Some bioremediation agents need to be applied to the spill together with nutrients such as Nitrates and Phosphates (which can cause pollution themselves) to provide a balanced food source for the micro-organisms. These nutrients are sometimes included in proprietary products.

   Some bioremediation agents may contain: alcohol ethoxylate, urea, lauryl phosphate, surfactants, castor oil, propan-2-ol, sodium hydroxide, sodium metasilicate. **None** of these chemicals are acceptable for discharge into surface waters or groundwater without appropriate permissions.

   Remember, although a product may break down the hydrocarbon element of fuel oils to water and carbon dioxide, fuel oils contain other additives, many of which can't be broken down and will cause pollution.

   Carefully consider any claims that an oil spill can be rendered 'harmless' by applying a clean-up product.

4. **Dispersants** – these reduce the surface tension of oil allowing wave action to create smaller droplets which are dispersed further into the body of water accelerating natural breakdown.

   Dispersants are applied by a spray and can be applied from a boat, plane or from a knapsack.

   Waste disposal isn't a problem as dispersants simply spread the oil out over a greater volume where it can naturally degrade without creating any waste product.

   They're not normally appropriate for use on inland waters as they disperse the oil into the water body rather than removing it. They also rely on powerful wave motion which rarely happens on inland waters.

5. **Surface Cleaners** – these chemically break down the oil allowing it to be removed from the surface. The resultant mixture of oil constituents and surface cleaner is a pollutant. Some of these cleaners are oxidising agents.

   They're applied as powder or by liquid spreading. They're often delivered as a concentrate and diluted on site before use. They're normally a mixture of organic solvents and surfactants.

   Surface cleaners can be used to clean up, after the gross product has been removed, from an inland spill to an impermeable surface (such as a yard or roadway). But they can't then be washed down the drain as both the surface cleaner and the residual oil components are pollutants.

   They can also be used to clean harbour walls. The oil can be collected in the harbour for removal and disposal. To achieve this, the product thins the oil down so it comes away from the wall. This oily wash water is polluting; collect it in an isolated section of the harbour and remove it for disposal unless you've previously agreed with the Marine Management Organisation and ourselves that it can enter water in the harbour.

   Surface cleaners can be used to clean the inside of oil tanks but don't discharge the resultant liquid waste from this process to an oil separator connected to a surface water system as the surface cleaning chemicals may interfere with the operation of the separator. Similarly, the resultant liquid wastes shouldn't be discharged to ground via an infiltration system without appropriate permission from us.

   If you plan to apply the cleaners directly to ground that's been contaminated by an oil spill, you must have permission from us before you use them.

   They shouldn't be applied to inland waters or groundwater as they're pollutants in their own right.

   Remember, although a product may break down the hydrocarbon element of fuel oils to water and carbon dioxide, fuel oils contain other additives, many of which can't be broken down and will pollute.

   You must carefully consider any claims that an oil spill can be rendered 'harmless' by applying a 'clean up' product.

6. Miscellaneous products

New products come onto the market which don't fit into any of the above categories. If you think one of them is most appropriate for your situation, seek advice from our Pollution Prevention Operational Technical Services team before you proceed.

These products include:

- sinking agents which take the oil down to the bottom of the waterbody where it's broken down by natural processes; this is unlikely to be acceptable in inland waters as the oil would still pollute the water whether it were at the top or the bottom.
- polymerisation products which polymerise the oil and transform it into a rubber type compound that can be removed from the water; introducing these polymers into surface waters or groundwater would introduce a pollutant and may need a permit.

Section 2 Technical assessment of oil clean-up products

Which ones are appropriate in which situation?

Possible emergencies

The situations identified in the green boxes below may be classed as emergencies. Clean-up activities carried out in these situations may benefit from a defence against prosecution under the Environmental Permitting Regulations 2010. But don't take such a defence for granted; if any clean up activity actually causes or worsens pollution of the environment, you may be prosecuted. Agree clean-up activities with us **before they take place**.

Defence relating to emergency actions may not apply to other legislation so seek advice. Each situation will be assessed separately. You can't assume that applying a product at one incident makes it automatically suitable for applying at other incidents.

The Environmental Damage (Prevention and Remediation) Regulations 2009 place a legal responsibility on the site operator to report some oil spills that constitute environmental damage to us; failure to do so may be a criminal offence.

You can report any pollution incident to us free, 24 hours a day on **0800 80 70 60**.

Remember to start your clean up with the preferred option if possible:

Environment Agency preferred option for oil spills to surface water and groundwater

We prefer the use of mechanical recovery and/or sorbents to remove oil from surface waters. These methods for removing oil don't add to the water pollution and are designed to remove the oil from the water. These products should be used first.

You should only consider alternative techniques if you need to remove further oil. These alternatives often require the introduction of further products to the water environment, some of which are pollutants in their own right.

When oil has entered groundwater, the best option will depend on site conditions, such as soil type. You must contact us for our advice.

Location	Activity/Clean-up	Options	Permitting requirements and legal frameworks
Marine	**Oil spill to water on the sea, estuaries and tidal waters up to the Fresh Water Limit**	• Mechanical recovery • Dispersants • Sorbents • Bioremediation	Products must have approval from the Marine Management Organisation for use in marine environment including tidal waters up to the Tidal Extent. This doesn't apply to mechanical skimmers. Containment booms may be used to contain the oil in one place to facilitate recovery.
		• Surface cleaners	The use of surface cleaners isn't appropriate.

Location	Activity/Clean-up	Options	Permitting requirements and legal frameworks
Inland	**Oil spill to water on a river, lake, pond, canal or other inland water**	• Mechanical recovery • Sorbents	The oil may be sorbed or removed by mechanical means; when disposing of used sorbent or waste oil, the operator must comply with the Duty of Care and the Hazardous Waste Regulations. Containment booms may be used to contain the oil in one place to facilitate recovery.
		• Bioremediation	In limited circumstances, this may be considered when the opportunities to use mechanical recovery and sorbents have been exhausted and oil pollution persists in the water environment; you must agree this with the local Environment Officer who would have to be certain that there would be no adverse effects on the environment. Use the product on a small test area first to make sure it will actually break down the residual oil. These products will only be considered where there's a need to speed up the biodegradation of the oil (for example, a spillage in a high amenity area such as a canal). We would prefer to leave the oil residues to be broken down naturally without adding any further chemicals to the water environment. Some bioremediation products contain ingredients that are toxic in the aquatic environment; check the Material Safety Data Sheet before use.
		• Surface cleaners	Some of these products are directly toxic in their own right and their use in inland waters is unlikely to be acceptable.
		• Dispersants	The use of dispersants isn't appropriate.

Location	Activity/Clean-up	Options	Permitting requirements and legal frameworks
Inland	**Oil spill to impermeable yard area, roadway, forecourt or other impermeable surface**	• Sorbents • Mechanical Recovery	The oil may be sorbed and then swept up. When disposing of used sorbent or waste oil, you must comply with the Duty of Care and the Hazardous Waste Regulations.
		• Surface cleaners	These may be used but the resultant effluent mustn't be washed into surface water drains, surface waters or to groundwater – to do so could be a criminal offence. The site occupier MUST be certain that the effluent will be washed to foul sewer before using these products. You must get the consent of the sewer provider before any discharge if you don't already have an appropriate Trade Effluent consent. Alternatively, the mixture of surface cleaner and oily waste can be swept up, contained and removed off site as hazardous waste.
		• Bioremediation	These products digest or denature the hydrocarbons which can then be swept up and contained. This may reclassify the waste from hazardous to non-hazardous; this might result in cheaper treatment and/or disposal. For this to be allowed, you'd have to provide evidence of the chemical composition of the resultant waste material. It would also depend on the European Waste Code applied to this treated waste. **These products can't be applied to the spilled oil and then washed, with the digested oil, into a surface water drain, surface or groundwater** – to do so would be a criminal offence.
		• Dispersants	The use of dispersants isn't appropriate.

Location	Activity/Clean-up	Options	Permitting requirements and legal frameworks
Inland	**Oil spill to ground**	• Sorbents	Will only sorb the free oil that remains on the surface. You must comply with Duty of Care and the Hazardous Waste Regulations when disposing of used sorbent.
		• Mechanical removal of contaminated soil or water	The soils must be removed and disposed of in accordance with the Hazardous Waste Regulations. You may need to agree the clean-up criteria with the local authority and us. An environmental risk assessment will be needed. If a hole is excavated to allow the contaminated water to be removed by vacuum-tanker and then passed through an oil separator, the appropriate permits must be acquired before any abstraction/discharge takes place.

Location	Activity/Clean-up	Options	Permitting requirements and legal frameworks
Inland, cont.	**Oil spill to ground, cont.**	• Bioremediation	These products may be applied to, or mixed with, the contaminated soil to allow the micro-organisms to break down the hydrocarbon. An Environmental Permit may be required for this in-situ treatment and you may need to agree the clean-up criteria with the local authority and us depending on the volume of soil to be treated. If the product is to be applied in liquid form, that application itself may need to be authorised under the Environmental Permitting Regulations 2010**. These products must not be applied to the ground without prior approval of the Environment Agency.**
		• In-situ remediation using alternative method	Other remediation treatments for the contamination of soil and groundwater may be considered and these may require Environmental Permits and/or mobile plant licences, depending on the type of treatment selected. You may need to agree clean-up criteria with the local authority and us depending on the volume of soil and/or groundwater to be treated.
		• Surface cleaners	These products are unlikely to be acceptable because they contain pollutants; we would have to permit their application into or onto the ground under the Environmental Permitting Regulations 2010.
		• Dispersants	The use of dispersants isn't appropriate.

Location	Activity/Clean-up	Options	Permitting requirements and legal frameworks
Beaches and Rocky Shores	**Oil spilled or washed up onto sand and rocks**	• Sorbents	The oil may be sorbed. When disposing of used sorbent you must comply with the Duty of Care and the Hazardous Waste Regulations. If loose sorbents are used below the Mean High Water Springs, they must be MMO approved.
		• Mechanical removal	The oil may be removed by diggers/spades and must be disposed of in accordance with the Hazardous Waste Regulations. Vacuum recovery systems can also be deployed to suck up liquid oil from rock pools, shorelines, rocks and sand. Pressure washers may also be used to remove oil from rocks and are especially useful on irregular surfaces. If using them with detergents, the comments relating to surface cleaners (below) will apply. Before work commences Natural England or Countryside Commissions Wales should be consulted to check for the presence of protected habitats or species.
		• Dispersants • Bioremediation • Surface cleaners	You must agree the use of the product with us, the Marine Management Organisation (MMO) and possibly the Local authority. To agree on a product quickly, they are likely to approve products that have been approved by MMO for marine use although they will also consider the impact of these products on non-marine flora and fauna. Many shorelines are Protected Habitats; for any product to be approved for use there, the agencies must be certain that it won't damage the environment. You must consider the direct toxicity of the clean-up product on the water environment. Don't apply products to shores and beaches without **prior** consultation with us and Natural England (NE)/Countryside Commission Wales (CCW). For spills below the Mean High Water Springs the MMO will consult NE/CCW as part of their approval process.

Routine Clean-Up activities

These activities do **not benefit from any defence against prosecution** under the Environmental Permitting Regulations 2010; any such activity must permitted before it takes place. These clean-up activities must be planned in advance so that they can be completed without causing harm to the environment and without breaching any legal controls on the activity or associated waste disposal. Guidance on many of these activities is in the Environment Agency's pollution prevention guidance notes which you can download from www.environment-agency.gov.uk/ppg.

Location	Activity/Clean up	Options	Permitting requirements and legal frameworks
Inland and coastal	**Oil spilt in boat bilges**	• Mechanical removal	Oil may be sucked out of bilges. You must comply with Duty of Care and the Hazardous Waste Regulations when disposing of waste oil.
		• Sorbents	Sorbents will take a proportion of the oil off the bilge water. The operator must comply with the Duty of Care and the Hazardous Waste Regulations when disposing of used sorbent.
		• Bioremediation • Surface cleaners	These products may break down the oil to innocuous products or emulsify the oil. **If these products do successfully break down the oil to innocuous constituents, the resultant liquid waste is still a pollutant and must not be discharged to the water environment.** It must be pumped to a wastewater storage/treatment vessel. Some of these products contain ingredients that are toxic in the aquatic environment; check the Material Safety Data Sheet before use. Remember, although a product may break down the hydrocarbon element of fuel oils to water and carbon dioxide, fuel oils contain other additives, many of which can't be broken down and will cause pollution.
		• Dispersants	Dispersants aren't appropriate.

Location	Activity/Clean up	Options	Permitting requirements and legal frameworks
Inland	**Oil collected in bund walls and oil separators**	• Mechanical removal	Oil may be sucked out of bunds and separators. You must comply with Duty of Care the Hazardous Waste Regulations when disposing of waste oil.
		• Sorbents	Sorbents will take a proportion of the oil off the bilge or separator water. You must comply with the Duty of Care and the Hazardous Waste Regulations when disposing of used sorbent
		• Bioremediation • Surface cleaners	These products may break down the oil to innocuous products. Don't introduce products to an oil separator that will emulsify the oil or alter its surface tension characteristics if that separator is connected to a surface water system; oily waste may wash through the separator and cause pollution. **If these products do successfully break down the hydrocarbon component of the oil to innocuous constituents, the resultant liquid waste is still a pollutant and must not be discharged to surface waters or groundwater.** Some of these products contain ingredients that are toxic in the aquatic environment; check the Material Safety Data Sheet before use.
		• Dispersants	Dispersants aren't appropriate.

Location	Activity/Clean up	Options	Permitting requirements and legal frameworks
Inland	**Removal of oil from vehicles/machinery**	• Conventional washing using detergents	This creates a trade effluent that can't be discharged to surface waters or groundwater. It must be discharged to foul sewer with the consent of the sewer provider or to a contained system. When the contained system is emptied, you must comply with the Duty of Care and the Hazardous Waste Regulations when disposing of waste oil, silt and effluent.
		• Bioremediation agents followed by washing	Bioremediation agents can be applied to oil on the machinery/ vehicle before conventional washing takes place to break down the oil. This may reduce the amount of free oil in the trade effluent but the disposal options remain the same as above.

Location	Activity/Clean up	Options	Permitting requirements and legal frameworks
Inland, cont.	**Removal of oil from vehicles/machinery cont.**	• Surface cleaners	Surface cleaners may be used directly on oily machinery to clean it – the degreasing activity will break down the oil and make it easier to remove. The resultant effluent may contain less free oil but it will be polluting and must be discharged to foul sewer with the consent of the sewer provider.
		• Mechanical recovery, sorbents and dispersants	The use of these products isn't appropriate.
	See PPG13 for guidance on vehicle washing and machinery washing		

Location	Activity/Clean up	• Options	Permitting requirements and legal frameworks
Coastal	**Removal of oil deposits from harbour walls**	• Mechanical removal	This may not be possible because of the nature of the surface. But any oily waste scraped off/scrubbed off must be disposed of in accordance with the Hazardous Waste Regulations. Alternatively, pressure washers can be used in conjunction with oil containment booms to wash down walls. The booms contain the oils which are then removed, often by skimmers. These must be used with cold water and no detergents if the removed oils are to be allowed to run into the water.
		• Dispersants • Surface cleaners	If the products will wash into the marine environment, the MMO must approve their use. This may be a routine operation to remove normal build up of oily residues on the harbour wall, but any activity that washes oily residues and clean-up chemicals into the water may cause pollution. You should seek our permission before any such activity. An environmental risk assessment will be needed which may conclude that the oil is best left where it is, if it can't be removed without polluting the water. Alternatively, the cleaning activity may have to take place in dry conditions when the cleaning effluent can be collected and removed without entering the water.

Location	Activity/Clean up	• Options	Permitting requirements and legal frameworks
Coastal, cont.	**Removal of oil deposits from harbour walls cont.**	• Bioremediation	Bioremediation agents may be applied to the oily residues to accelerate the biodegradation of the oil; you must seek our permission for this and the MMO's permission if the products will enter the marine environment. The oil shouldn't be actively washed into the harbour; it should be left in situ whilst the micro-organic activity takes place. Some bioremediation products contain ingredients that are toxic in the aquatic environment; check the Material Safety Data Sheet before use.
		• Sorbents	Sorbents may be used to sorb the oil as it's released from the harbour wall. The operator must comply with the Duty of Care and the Hazardous Waste Regulations when disposing of used sorbent. If loose sorbents are used below the Mean High Water Springs, they must be MMO approved.

We welcome any questions or comments about this guidance, or suggestions about how we could improve it, please email us at pollution.prevention@environment-agency.gov.uk, phone us on 08708 506 506 or write to us at:

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