

# ESA 17 - DAIRIES AND OTHER MILK HANDLING OPERATIONS

This advice is provided and maintained by the BSIF and is intended for guidance only. The information is provided in good faith, based upon the best information currently available, but is to be relied on at the user's own risk.

Please remember that you have the responsibility to stay up to date on compliance matters and we recommend that you regularly check and review that what you do is in compliance with current legislation. If you cause pollution or allow it to occur,

you may be committing a criminal offence.

Following this advice will help you manage your environmental responsibilities, prevent pollution and comply with the law. BSIF

provide a series of advice documents which we believe you will find useful. These can be downloaded at [www.bsif.co.uk/resources](http://www.bsif.co.uk/resources).

The advice is based on available information and legislation and its' interpretation by BSIF. BSIF will not accept any direct or indirect liability deriving from following advice or guidance. Visit [www.GOV.UK](http://www.GOV.UK) for access to UK Government legislation and guidance. Sodium hydroxide (caustic soda), disinfectants, acids and cleaning agents all have the potential to cause serious

## 1. INTRODUCTION

These guidelines focus on pollution risks which are specific to the dairy industry. They are not intended for small scale, farm based operations, although much of the content will be relevant. It is recommended that drainage systems be identified as either surface water or foul and be marked accordingly as blue to surface and red to foul. This will provide immediate identification of any risk to the environment from a spillage occurring at a site.

If penstocks or other mitigation measures are in place, these need to be tested regularly and all staff aware of how to operate them in an emergency.

If a potential or actual spill is suspected then a call to the Environment Agencies hotline 0800 80 70 60 should be made as soon as possible to ensure that measures can be put in place to prevent widespread pollution of surface and groundwaters. Any pollution prevention materials on site should be deployed as soon as possible to mitigate any further environmental damage and contain the spill at source.

A spill to the foul sewer system should be reported to the local sewage undertaker as soon as possible.

## 2. POLLUTING POTENTIAL OF DAIRY OPERATIONS

### A. MILK AND MILK PRODUCTS

It is not often recognised that milk can have a significant polluting effect on water if allowed to reach rivers or streams. It can be as much as 400 times more polluting than untreated domestic sewage. Naturally occurring bacteria break down milk entering a watercourse, using up oxygen in the water more quickly than it can be replaced. As a result of falling oxygen levels, fish and other creatures can suffocate. The high fat content of milk and its products can also cause physical problems within drainage systems. Solidified fat can cause blockages, resulting in overflows from the system and possible pollution of watercourses.

### B. CHEMICALS AND CLEANERS

Sodium hydroxide (caustic soda), disinfectants, acids and cleaning agents all have the potential to cause serious pollution and to impair effluent treatment. In addition, cooling and refrigeration systems often contain ammonia or biocides which can be damaging to the water environment.

### C. FRUIT JUICES

Fruit juices, particularly when handled as concentrates, may have the same de-oxygenating effect on a watercourse as milk. In addition they are often highly acidic and may also contain preservatives.

### 3. SITE DRAINAGE

#### A. SURFACE WATER DRAINAGE

It should be remembered that surface water drainage discharges to a watercourse, which may be remote from the site, or to water contained in underground strata (groundwater) via a soakaway. Surface water should therefore be clean and uncontaminated. The spillage of milk products in yard areas connected to the surface water drain will result in pollution. Devices used to measure pH, turbidity or conductivity can be used to continuously monitor the quality of surface water in the system and trigger alarms. However, these are not a substitute for sound practices which will avoid spillages in the first place and should not be relied upon as the sole means of preventing pollution.

#### B. TRADE EFFLUENT DISCHARGES TO THE FOUL SEWER

Discharges of waste water should pass to the public foul sewer if available, or be treated, subject to the agreement of the sewerage undertaker. In most cases, a trade effluent consent will be required. Sewerage undertakers will normally wish to minimise the amount of rainwater entering the foul sewer and it may be necessary to provide a roof for loading bays, cleaning areas and waste compactors. Due to the high organic content of dairy effluents, discharges to sewer must be carefully controlled to prevent overloading of the sewage treatment plant. Trade effluent staff from the local sewerage undertaker should be able to give further, site-specific, advice.

#### C. DISCHARGES TO CONTROLLED WATERS

Where no public foul sewer is available, the site will require effluent treatment facilities designed to deal with the anticipated strength, nature and volume of waste water generated from all site operations. Treatment plants must be closely monitored by a suitably qualified person and it is essential that maintenance is carried out regularly. Alarms should be provided to alert staff to plant failures.

The treatment required may include fat removal, flow and load balancing, biological treatment and pH correction. An Agency consent is required for any discharge of trade effluent into a controlled water (which includes all watercourses, lakes, lochs, coastal waters and groundwaters) and may also be required for discharges into or onto land. Such consents set out the quality and quantity of effluent that may be discharged. They are not granted automatically, and early consultation with the local regulator is advised before any discharge is considered.

In some situations, an alternative to on site treatment may be to drain designated areas to a sealed tank for off site disposal by a licensed waste disposal contractor.

#### D. DRAINAGE SYSTEMS

A high proportion of water pollution incidents from dairies occur as a result of problems with the site drainage system. These arise as a result of damage to the fabric of the drains, blockage due to fat accumulation or solid debris, wrong connections and failure of pumping systems. It is therefore vital that there is a clear management responsibility for site drainage and that adequate, up-to-date records are maintained. A regular programme of inspection and maintenance should be undertaken.

Daily visual inspection of surface water drains at key points is a simple way to assess their condition and quickly identify faults. Cleaning materials used in dairies are highly corrosive and drains must be constructed using suitably resistant materials. Waste-water drainage systems should be equipped with appropriately designed grease traps and gratings to prevent sewer blockages. It is particularly important that these are regularly inspected, emptied and maintained, with cleaning taking place in an area draining to the foul sewer.

Gullies, grids and manhole covers should be identified as foul or surface systems using colour coded arrows indicating the direction of flow. Use blue for surface water, red for foul drains and ensure these are understood by staff.

Care should be taken to ensure that all drainage from welfare facilities such as toilets, sinks, showers and canteens is correctly connected into the site's foul drainage system. Such connections may require approval from the sewerage undertaker.

## E. PRE-TREATMENT, FLOW AND LOAD BALANCING

Pre-treatment and flow and load balancing may be required whether foul drainage passes to on site treatment facilities or the public foul sewer. Sudden changes in volume and composition can affect the efficiency of a treatment plant and are likely to have a detrimental effect on the quality of effluent discharged. Pre-treatment will reduce the strength of the effluent passed forward for treatment and online balancing tanks will deal with normal daily fluctuations. An off-line tank may be used as a holding or dump tank in emergencies. pH, conductivity or turbidity measuring devices in the drainage system can be used to automatically divert effluent to such a tank.

## F. DISCHARGES FROM PLANT ROOMS, AIR CONDITIONING AND HEATING SYSTEMS AND CHILLERS

Under no circumstances should chemically treated water or condensate from any refrigeration, air conditioning or heating system be discharged into the surface water system. Particular care should be taken that discharges at roof level do not enter the surface water system via down pipes. Such waste waters should be discharged to the foul drainage system or collected and disposed of by a registered waste disposal contractor. Internal floor drainage systems for associated plant, chemical storage or dosing areas must not be connected to surface water drains.

## 4. CLEANING ACTIVITIES

Large volumes of polluted water are produced in cleaning operations in dairies. All cleaning agents are potentially polluting and cleaning effluents must not be allowed to enter surface water drainage systems or soakaways. This is also the case for effluent arising from the use of pressure or steam cleaners. In certain environmentally sensitive areas, phosphate free detergents should be used.

### A. PROCESS AREA CLEANING

Waste waters from cleaning activities are polluting and must be discharged to the site's foul drainage system at a designated location. Ensure all staff and contractors working on site are aware of the disposal facilities for wash waters, and that surface water gullies should not be used for the disposal of wastes, by using clear signs.

### B. EQUIPMENT AND VEHICLE CLEANING

A designated and clearly marked washbay, discharging to the site foul drainage system, should be provided for the cleaning of dairy equipment and utensils. Similar facilities should be provided for any vehicle washing. Vehicle wash recycling systems are available.

### C. CLEANING OF LOADING AND PARKING AREAS

The cleaning of yard and parking areas is not encouraged by the Agencies. Cleaning should not be carried out unless the effluent generated can be contained by isolating the area from the surface water drainage system. Such waste waters must be discharged to the foul drainage system or collected for disposal by a licensed waste disposal contractor. Oil separators should be deployed, in these areas, further details of which are available in the ESA 3 "Use and Design of Oil Separators in Surface Water Drainage Systems.

### D. ROOF AREAS

Waste water produced when cleaning roofs should be collected for treatment. Care should be taken that it is not allowed to discharge to the surface water system via roofwater down pipes. Roofs in the proximity of spray driers must drain into the site's foul drainage system.

## 5. DELIVERY AND HANDLING OF MATERIALS

### A. LOADING AND UNLOADING AREAS

The risk of spillage and pollution is high in these areas and they should, therefore, be connected to the foul sewer and clearly marked. They should be isolated from the surface water system. This may be achieved using bunding in the form of “roll over” bunds, ramps or stepped access.

### B. DELIVERIES

All deliveries of milk, oil and potentially polluting materials such as chemicals and cleaners must be supervised by a responsible person. Tankers should discharge via a lockable fixed coupling within a bunded area. If a spillage does occur, it should be contained and reported immediately. Do not hose it down.

### C. PIPELINES

Where possible pipelines should be sited above ground and protected from collision damage. If a pipeline is to be installed underground, it should be placed in a leak-tight protective sleeve or duct and subject to regular inspection and testing. Pipeline ducts should not be connected to the surface water drainage system.

## 6. STORAGE AND PLANT FACILITIES

### A. ABOVE GROUND STORAGE

All above ground storage tanks, drums and containers, including those containing fruit juice, should be sited on an impermeable base within a bund. Particular care is needed for Intermediate Bulk Containers (IBCs) containing chemicals such as hypochlorite or acid. The bund should consist of a base and surrounding walls which must be constructed or lined with a material impermeable to the liquid stored and designed to contain a minimum of 110% of the tank capacity. Pipework should be constructed to pass over the bund rather than through it. Tanks should be clearly marked with their contents and volume. An eye glass or gauge should be fitted to indicate volume and prevent overfilling.

Detailed guidelines on oil storage are available (ESA 2 – Above Ground Oil Storage Tanks). Storage of potentially polluting liquids at or above roof level should be avoided.

### B. MILK SILOS

Milk silo areas should either be bunded as above or drained to the foul drainage system. The latter should only be adopted if holding or dump tanks are available to prevent overloading of downstream treatment facilities.

### C. BOILER HOUSE

Boiler house sumps should have high level alarms and should not be connected to the surface water system. Automatic pumps should not be used.

### D. REFRIGERATION AND AIR CONDITIONING PLANT

Refrigeration and air conditioning units often contain Chloroflourocarbons (CFC) which are an ozone depleting agent which must not be released to the atmosphere. Maintenance and repairs should be undertaken by a specialist contractor equipped to deal with these.

## 7. WASTE MANAGEMENT

Waste management is a complex area of legislation which the local regulators are responsible for implementing. The following areas are particularly relevant to the dairy industry.

### A. COMPACTORS

A number of serious incidents involving dairies have occurred as a result of dairy products such as milk and yogurt which have passed their "sell-by" date being put into compactors. A compactor is not suitable for disposal of food wastes or liquids, and any cartons should be fully drained before compaction. Even when used for solid refuse, compactors often leak polluting liquids. They should, therefore, be isolated from the surface water drainage system, using a spill tray, raised kerbs or "rollover" bunds, preferably covered, to avoid rainwater accumulation, and connected to the foul sewer if possible. Any leakage should be cleaned up straight away, using absorbent material. Compactors are exempt from the need for a waste management licence, but must be registered with the regulators.

### B. TREATMENT AND PRE -TREATMENT PLANTS

Adequate provision should be made for storage and handling of sludge produced from such plants. At times of adverse weather, discharge to land may be inappropriate and storage facilities should be sized to take this into account. The work of any contractors should be closely monitored, as you could be held responsible should they cause pollution. If sludge is to be spread beneficially on land, it may be exempt from waste management licencing. However, contractors should comply with relevant regulations and codes of practice. The formulation and implementation of Farm Waste Management Plans at farms used for spreading will minimise the risk of pollution. Contact your local agricultural advisor for advice on Management Plans.

Provide separators with sufficient access points to allow for the inspection and cleaning of all internal chambers. Keep access to the separator clear and do not use this area for storage.

If the separator is installed to retain flammable liquids, provide appropriate ventilation.

## B. LABELLING

Provide separators with a visible and durable label that can be read after installation and which contains the following information:

- manufacturer's reference number and year of manufacture
- oil storage capacity
- volume of separator
- bypass/full retention
- silt storage capacity
- unique identifier for the design of separator (name or number)
- oil level warning device details
- depth of oil storage
- class of separator
- closure device details
- nominal size

Mark the position of all separators clearly on all drainage plans and identify the separator on the ground by marking the manhole cover 'Separator'.

## 7. MAINTENANCE AND USE

To prevent pollution and minimise your costs, you need to manage your separator effectively. To make this easy, all parts of the separator that have to be regularly maintained must be accessible at all times.

Every six months, or in accordance with manufacturer's instructions, experienced personnel should:

- Physically inspect the integrity of the separator and all mechanical parts
- Assess the depth of accumulated oil and silt
- Service all electrical equipment such as alarms and separator management systems
- Check the condition of any coalescing device and replace it if necessary

Some heavily used or high-risk sites might require more frequent inspections.

Keep a detailed log of when the separator is inspected, maintained, emptied and serviced. Also record specific events relating to the separator system such as cleaning, repairs, accidents and incidents.

All sites should empty their separator as soon as a significant quantity of oil and/or silt has built up. The retained waste, including the silt, must be removed and the separator must be refilled with clean water before being put back in to service to prevent damage and to prevent oil passing through it. In addition to normal emptying of the separator, it will also need to be emptied right away if oil or silt levels exceed 90 per cent of the storage volume of the separator and the alarm is activated (see Section 5b). When the oil or silt reaches this level or after a spillage, employ a registered waste removal company to empty the separator (see Section 8 for information about waste management).

For all waste removal operations you must make sure that the waste removal company has experience in emptying separators and that they do not allow any of the contents to escape from the outlet during emptying.

Every five years it is recommended that separators be emptied and given a general inspection to test the integrity and performance of the system. The separator must be refilled with clean water following such an inspection.

Information on separator maintenance is in Part 2 of the European Standard.

## 8. WASTE MANAGEMENT

All waste must be handled, stored and disposed of correctly to avoid pollution. Waste oil is designated as hazardous/special waste and as a waste producer and holder, you are responsible for complying with the Hazardous Waste (England and Wales) (Amendment) Regulations 2016, the Special Waste Amendment (Scotland) Regulations 2004, or the Hazardous Waste (Amendment) Regulations (Northern Ireland) 2015.

You may need to register as a producer of hazardous/special waste, and you should refer to [www.gov.uk](http://www.gov.uk) for guidance. You must follow the Duty of Care Code of Practice which requires you to make sure that the waste oil:

- Does not escape from your control
- Is transferred only to a registered waste carrier to be sent for recycling or disposal at a suitably licensed facility
- Is accompanied by an appropriate transfer note with a full written description of the waste

## 9. EMERGENCIES

Draw up a Pollution Incident Response Plan (PIRP) that includes all oil separators. ESA21 INCIDENT RESPONSE PLANNING is worth consulting in relation to this.

Do not use a separator as the primary method of containing a large oil spill from above ground oil storage; this should be protected by a secondary containment system.

We recommend that all oil deliveries to the site be supervised.

Notify the local regulator immediately in the event of an emergency.