WATER UK

Water UK Guidance document relating to the disposal of The contents of Fire Extinguishers to the Public Sewer

Contents

1 Background and Introduction

This Guidance Note is intended to give guidance and awareness on the environmental issues relating to foam based fire extinguishers and their disposal to public sewer from commercial, industrial and other non domestic premises.

It covers the applicable legislation, how to handle the extinguishers at the customer's site, and looks at the available options for collection and disposal at sites/ organisations undertaking small scale activity.

This guidance does not cover the disposal of other non foam based fire extinguishers (such as dry chemical/ powder based units)

Large scale and incidents/ events involving emergency provisions are set out in other guidance and reference documents e.g. **Protocol for the disposal of contaminated water and associated wastes at incidents** issued jointly by the UK Environment Agencies and Water UK (Dec 2011)

The key pollutants associated with the disposal of foam based fire extinguisher waste water to sewer include Perfluorooctane Sulfonate (PFOS) and Perfluoro Octanoic Acid (PFOA) which are members of a group of chemicals known as perfluorinated chemicals (PFCs).

Both PFOS and PFOA are very persistent in the environment. PFOS was widely used in the past in products to provide protective coatings to materials such as textiles and leather. It was also used in some fire fighting foams. However, most production of PFOS ceased in 2002. Manufacture and essentially all uses are now prohibited in the European Union.

PFOA is still manufactured and is used to produce other chemicals such as fluoropolymers, which are used in electronics and non-stick cookware for example.

2 Environmental Issues

2.1 General Pollution Prevention Advice

For any commercial / industrial or non domestic premises care should always be taken to adhere wherever reasonably practicable to the general principles of pollution prevention as set out in the Pollution Prevention Guidelines at the Environment Agency web site (see link at end of guidance note).

Pollution Prevention Guideline 1 specifically provides a general set of advice which should be considered by any relevant site operator in conjunction with this specific guidance for fire extinguishers.

All reasonable steps should be taken at all times to prevent contaminated waste causing pollution and to notify the appropriate Agencies immediately should any undue contamination occur (e.g. spillage or other uncontrolled release to the Environment).

2.2 Guidelines for PFOS and PFOA in drinking water?

The Health Protection Agency (HPA) advises that the maximum acceptable concentration of perfluorooctane sulfonate (PFOS) in drinking water is 0.3 microgrammes per litre (µg/l), and that the maximum acceptable concentration of perfluorooctanoic acid (PFOA) in drinking water is 10 microgrammes per litre (µg/l). This follows a request for advice from the Drinking Water Inspectorate for England and Wales (DWI).

The Groundwater Regulations are designed to prevent dangerous substances from causing direct or indirect pollution to groundwater (used as a source of drinking water).

Fire fighting foams must not be discharged to groundwater and need to be disposed of safely by incineration or via foul sewer to a waste water (sewage) treatment plant where deemed appropriate/ acceptable locally.

Foam extinguisher concentrates, and extinguisher foam charges must NOT be discharged onto car parks, hard standings, grass, waste land, streams, rainwater/storm drains or any other outdoor site.

2.3 Obtaining Consent for the disposal of this waste to public sewer

Under the Water Industry Act, 1991 any waste produced as a result of an industrial or commercial activity requiring disposal to the public sewerage system may require formal Consent from the relevant Sewerage Undertaker (your local water company)

In all instances, contact your local water company (sewerage undertaker) to discuss the need for Consent to Discharge.

The Sewerage Undertaker must consider the request, taking into account the polluting substance, the rate of discharge to the sewer, the presence of storm water overflows, the ability of the receiving treatment works to deal with the pollutants and the impact on the discharge permit and the impact that would follow if the discharge was not permitted.

Generally Consents/ Permits will be issued on a site by site basis and so should be sought in advance and applied for by either the site operator or the servicing agent. The named Consent holder becomes responsible for the discharges made at any given site.

2.4 Transport of Fire Extinguishers

Environmental Protection (Duty of Care) Regulations cover the transport of fire extinguishers, please refer to the guidance as set out via the following link:-

http://www.hse.gov.uk/cdg/pdf/fire-ex.pdf

3 Foam Extinguishers

3.1 Chemical Composition

Aqueous film forming foams (AFFF) contained in fire extinguishers are water-based and frequently contain hydrocarbon based surfactant such as sodium alkyl sulfate, and fluorosurfactants such as fluorotelomers, perfluorooctanoic acid (PFOA), or perfluorooctanesulfonic acid (PFOS). They have the ability to spread over the surface of hydrocarbon-based liquids.

Perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA) are members of a chemical group known as perfluorinated chemicals (PFCs). PFCs are extremely heat stable and have a number of industrial uses. Given this stability, they are also environmentally resistant.

Perflourooctane Sulphonate (or PFOS) was used for many years in foam extinguishers. However, it has been proved to be toxic and a potential risk to aquatic wildlife, in addition to having a known carcinogenic content.

3.2 Annual Service

During the annual service the recommendations in the Fire Industry Association Guide to servicing and/ or the manufacturer's instructions should be followed.

When the extinguisher is emptied, the foam solution contents (media) should be stored in an appropriate secure container before returning to the extinguisher.

3.3 Bulk Collection

If the media requires replacing, the discarded media should be kept in a secure container until all the extinguishers have been serviced. The collected media should be disposed of via a licensed waste operator. As a guide volumes of waste over and above 250 litres would be deemed a 'bulk' waste and so should be taken off site for disposal via a licensed disposal route.

3.4 ''Single'' Discharge (low volume activity)

If during the service individual extinguishers are emptied, the media can be

discharged to the public foul water sewerage system subject to a formal Consent being made available to do so by the Water Company.

As a general guide no more than 20 individual units (based on a typical volume of 9 litres per unit) or a total of no more than 250 litres should be disposed of to sewer comprising of waste foam media and wash water only across the whole site in any given working day. In some circumstances, it may be possible to exceed these volumes. Advice should be sought from your local Water Company/ Sewerage Undertaker.

Steps should be taken to minimise foaming in the sewer or other sewerage asset such as a local pumping station. Discharges should therefore be made first to a holding vessel/ tank or other suitable container and then passed at a constant low level rate of no more than 0.5 to 1 litre per second discharge to the sewer (i.e. over as long a period as is reasonably practicable)

The spent media should ***never*** be discarded anywhere on site other than the foul water system.

Any Consent issued which permits the disposal of this waste to sewer will specify a maximum volume and maximum rate of discharge which is suitable for the local sewer/ treatment works.

3.5 5 year Discharge testing

Discharge testing residues/ runoff from the extinguisher(s) must not enter the groundwater system. Therefore the common historical practice of carrying out the discharge on the customer's site in areas where it could reach the ground water (e.g. car parks, grass, verges, ditches, bare soil, rainwater drains or wasteland) is not permitted and could result in legal proceedings by the Environment Agency.

It should be possible though to discharge small numbers of extinguisher contents in to the foul water system as described above in 3.4.

3.6 Use of Foul Water Sewer

Where it has been deemed appropriate to use the public sewer for disposal and the relevant Consent has been issued an appropriate access point should be used.

Avoid using toilet areas/ waste sinks wherever possible. Ideally, a fit for purpose discharge point where safe access can be made in order to obtain samples at any given time by the Sewerage Undertaker should be identified and provided (e.g. an identified foul water sewer manhole)

Care should be made to ensure discharges are not made to any drainage at any given site where effluent may pass into other onsite treatment/ process plant where this waste stream may detrimentally impact on its routine operation.

Care should also be made to avoid discharging any waste to private drainage systems and drains serving cess pools or septic tanks.

4 Handling of Extinguishers off site/ at a service depot

4.1. Collection

To transport any waste companies are required to hold a waste carriers licence. An item is defined as waste the moment the owner no longer requires or has possession of the item.

Under the **Environmental Protection (Duty of Care) Regulations** a duty of care note must be given to the client when you remove waste from their site.

The **Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2009** (CDG Regs) and the European agreement ("Accord européen relatif au transport international des marchandises dangereuses par route", known as ADR) which together regulate the carriage of dangerous goods by road are highly prescriptive. The GB regulations were substantially restructured for 2009 with direct referencing to ADR for the main duties. Amendments to the regulations were made in 2011, mainly to reflect changes to the EU Transportable Pressure Equipment Directive

When transporting extinguishers from customers sites it is necessary to comply with the requirements of the ADR 2009 (see Fact File 23 in the Fire Industry Association web site).

The ADR states that UN No. 1044 fire extinguishers provided with protection against inadvertent discharge and secured packaged in strong outer packaging are exempt from the ADR requirements. This can be the original packages secured in the van or a secure lockable cage. If you transport extinguishers not secured as described above you will have to comply and this means drivers will have to be fully trained and certificated under ADR 2009.

Noting the transport issue above there are a number of options available for the collection of foam for disposal and the practicality of each should be considered before agreeing a procedure for collecting and disposing of foam.

- Keeping the media in the extinguisher and replacing the old extinguisher with a new extinguisher. The extinguishers are returned to the service depot for safe collection and disposal as a complete unit or the contents emptied into a secure container for storage/disposal

- Keeping the media in the extinguisher and replacing the old extinguisher with a new extinguisher. The old extinguishers are then left on the customer's site for collection by licensed waste disposal company.

- Collecting the foam in a secure container in the technician's vehicle before transferring to a larger container at the service depot,

4.2 Storage

Measures should be taken to ensure that any stored media cannot leak and reach groundwater or be released as an uncontrolled discharge to the sewer.

All media should be stored in sealed containers ideally within a bunded storage area away from drains.

5. Disposal of foam

5.1 Foul water sewage system

It is currently acceptable to dispose of foams (except PFOS based) via the foul water sewage system subject to a formal Consent being provided by the relevant Sewerage Undertaker. Always seek advice prior to any discharges being made.

Whenever you intend to dispose of any media via the foul sewage system this should always be to foul sewer and agreed with the site operator prior to any discharge taking place.

Formal records should always be kept by the Consent holder. These records should include the location, dates and time and amounts of waste media discharged and this information should be made available on request to the Sewerage Undertaker.

Discharges should not be made to sewer during or preceding expected periods of heavy rainfall at any given site. Sewer capacity is finite and when hydraulically loaded with rainwater this can create the conditions for sewer overflows to occur to the surface water system. Where required, a specific clause may be included in any Consent issued to prohibit this activity during these conditions.

5.2. High temp incineration

PFOS foams must be disposed of via high temperature incineration.

6. Recycling of components

Fire extinguisher parts and components should be recycled through registered facilities.

7 Useful Links / Further Information

7.1 Typical Example Effluent Quality Data

Parameter	Unit	Typical range/ concentration
pH	acidity	pH neutral c7.0
Suspended Solids	milligrammes per litre	20 to 300
C.O.D 1 hr (chemical oxygen demand)	milligrammes per litre	8000 to 13000
Total Phosphorus	milligrammes per litre	300-900
Ammonia	milligrammes per litre	300
Chromium	milligrammes per litre	<1
Copper	milligrammes per litre	<1
Lead	milligrammes per litre	<1
Nickel	milligrammes per litre	<1
Zinc	milligrammes per litre	<1
Ethanol, 2-butoxy-	milligrammes per litre	14
1-Octanol	milligrammes per litre	11
Ethanol, 2-(2-butoxyethoxy)-	milligrammes per litre	392
Didodecyl ether	milligrammes per litre	0.6
1-Nonene	milligrammes per litre	4
Nonyl Cyclopropane	milligrammes per litre	4

WEB SITE	LINK
Water UK web site	http://www.water.org.uk/
General Pollution Prevention Guidelines	http://www.environment-agency.gov.uk/business/topics/pollution/39083.aspx
Fire Industry Association web site	http://www.fia.uk.com/index.cfm
HSE guidance on transport of fire extinguishers HSE guidance on the carriage of dangerous goods regulations	http://www.hse.gov.uk/cdg/pdf/fire-ex.pdf http://www.hse.gov.uk/cdg/manual/

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