

What issues have emerged from the Buncefield depot fire which generated around 30m litres of contaminated runoff?

Aidan Turnbull sought the opinions of Gary McDowall, Franz Kitzwögerer and Colin Chiverton about possible fire service solutions.



# Pollution containment and cleanup

**T**he major fire at the Buncefield fuel storage site, which burned for three days from the 11th to the 13th December 2005, is known to have produced approximately 30 million litres of contaminated firewater. One of those concerned about the fate of the runoff is Gary McDowall of Foamclean Limited.

“All of this firewater contains fluorosurfactant and many other contaminants, and will require treatment,” he says.

Gary’s company, Foamclean Limited, provides products and services designed to resolve issues with the disposal of firefighting foam. Using a patented and tested system, Foamclean Limited removes the chemicals from the solution that make a fire fighting foam an effective extinguishing agent. The process employed removes the environmentally damaging fluorosurfactants and other agents, rendering the treated solution harmless and clean.

Foamclean Limited uses the ‘Perfluoro Filtration Extraction Cleaning and Treatment’ process known as perFECTTM. This is a patented process for cleaning fluorinated solutions, such as AFFF foam. The process works by passing the solution through a carefully-designed carbon matrix in

such a way that it extracts the fluorosurfactants, rendering the treated foam solution free of any contaminants known to have a detrimental impact on the environment.

## Should we depend on foam agents?

“Safe disposal of firefighting foam and, in some cases, foam concentrates has never raised more questions than it does currently,” reports Gary. From the well-documented withdrawal by 3M from fluorosurfactant manufacture using perfluorooctanyl sulphonate (PFOS) chemistry in May 2000 to the present day, dealing with foam as a waste product has become a fundamental environmental issue.

There are those who would argue that there should be a reduction in our dependency on foam products because of their potential detrimental impact on the environment, comments Gary.

“Foam manufacturers have developed fluorosurfactant free foams (FSFF) that have no long-term detrimental environmental impact. There are numerous areas of application for this type of product, in particular with the UK fire & rescue services. However, the main issues relate to foams containing fluorosurfactants.”

*30 million litres of contaminated wastewater was left behind after the Buncefield fire.*

## PRODUCT PROFILE

### CONTAINING WASTE RUNOFF



How do you ensure that contaminated material is collected for proper off-site disposal? UK-based Professional Protection Systems, known for supplying bespoke decontamination solutions to emergency services in 60 countries has developed a range of waste water bladder tanks with capacities from 100 to 6,000 litres which can be filled via a range of wastewater pumps, including units with floor level suction that will remove wastewater and solids up to 6mm in diameter down to a 1mm depth. To further reduce the spread of contaminant PPS have developed raised plastic flooring (made from recycled product) to keep contaminant from legs and feet, or boots, and the company also offers a decon basin or boot bath with a disposable liner, the contents of which can then be pumped into a bladder. More information? Visit: [www.ppsgb.com](http://www.ppsgb.com)

*Left behind in the firewater is a dirty mixture of water, PFOS, polyaromatic hydrocarbons and MTBE. No-one knows what will happen to it.*

The UK Ground Water Regulations 1998 describe specific groups of substances which fall into two lists, List I and List II. Those detailed in List I include organohalogen compounds and should be prevented from entering groundwater. All Aqueous Film Forming Foam (AFFF) formulations contain fluorosurfactants which are organohalogens and fall within List I of the Regulations.

Gary concludes: "Any substance that is found to be persistent, bioaccumulative or toxic (PBT) must be prevented from entering groundwater. All fluorosurfactants are known to be environmentally very persistent (vP) with a halflife of the order of a decade or more. Some fluorosurfactant breakdown products, for example, PFOS, also bioaccumulate and are toxic. The lithium salt of PFOS is even an insecticide."

#### Should brigades use safer foams?

Franz Kitzwögerer of BIOVERSAL looks to the example of Austria's fire services as the way forward. He comments: "In Austria more than half the fire brigades have opted to use alternative firefighting foam extinguishing agents rather than create problems for the local environment. These products do not carry any hazardous markings for transport and the products do not carry any hazardous labelling whatsoever."

"BIOVERSAL QF corresponds with the highest standards in the world against fires and fulfils not only the EN-standards but also international standards, i.e. ICAO, GOST etc."

BIOVERSAL works like this - the product encapsulates particles of the hydrocarbon when foaming which means there is a high portion of water which cools in a very effective and efficient way, making three-dimensional fires easier to control.

"Next, BIOVERSAL QF prepares the hydrocarbons for a rapid biological breakdown during the extinguishing process. This so far, has been



unequaled anywhere in the world," says Mr Kitzwögerer.

The BIOVERSAL range of products contain special natural substances which can fight fires and oil pollution but are completely harmless to the environment. These organisms are based on highly-degradable surfactants. They stimulate the micro-organisms to multiply substantially, thus bringing about a rapid biological degradation process.

In September 2002, approximately 5,000 litres of commercial heating oil spilled into Lake Goldegg in Austria, affecting tourism, drinking water quality and some commercial operations supplying mud packs to health farms. This whole area is very environmentally sensitive and BIOVERSAL was the only product that met the criteria for use in such an important area. In April 2003 - after treatment - the water was passed as fit for drinking by the local authority in Salzburg. This was an incredible achievement considering the previous level of contamination.

#### UK Environment Agency's view

Colin Chiverton, head of the team dealing with the foam at Buncefield for the Environment Agency commented:

"All the contaminated firewater has now been removed from the Buncefield site and is being securely stored at a number of sites around the country. It is the oil company's responsibility to come forward with options for the safe disposal of the firewater."

"We worked closely with the fire services from the earliest stages of the incident to plan a response that would minimise the environmental impact and risks to underground and surface waters drawn for public supply. This covered arrangements for sourcing water, for containing firewater, and the use of foam. Measures were put in place to contain foam on site as well as contaminated firewater."

"We aim to protect the environment and human health from exposure to PFOS. We will use our available powers to prevent, and where this is not possible, to minimise the emissions of PFOS to the environment, however the use of such 'PFOS foams' is not currently illegal. Defra did bring forward proposals to phase out the use of PFOS in firefighting foams but the European Commission proposed a Directive on PFOS last December."

"This does not restrict the use of PFOS in firefighting foam and discussions on this will now need to be pursued at EU level."



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