

Queensland firefighting foam survey—results summary

August 2017

This information sheet provides a summary of the results of a voluntary survey conducted in 2017 by the Department of Environmental and Heritage Protection (the department) of select industry and commercial operators. The aim of the survey was to gain a further understanding of firefighting foam use in Queensland as a result of growing concerns regarding per- and poly-fluoroalkyl substances (PFAS).

Key information

In July 2016, the Queensland Environment and Heritage Protection effected the Operational Policy – Environmental Management of Firefighting Foam. A voluntary survey was undertaken in early 2017 to determine the status of firefighting foam stocks in Queensland. The survey was sent to 992 recipients and a total of 468 responses were received.

Summary of results:

- **Total volume of firefighting foam reported** – approximately 425 tonnes
- **Industries most likely to use and store foam** involve bulk fuel and chemical storage
- **Most common type of foam reported** – Aqueous Film Forming Foam (AFFF & AR variants)
- **Twenty nine per cent (29%) of sites identified that transition to a policy compliant foam is required**
- **Twenty three per cent (23%) are unsure of whether transition is required**

The information provided will be used to help inform future decisions on implementing the policy and any further preventative action that can be taken.

Introduction

In Australia and overseas, a number of contaminated sites are being identified as a result of the historic and current use of firefighting foams that contain fluorinated organic compounds including perfluorooctane sulfonic acid (PFOS) and perfluorooctanoic acid (PFOA). These chemicals are known for their persistence in the environment, mobility and tendency to bioaccumulate, and are recognised today to present a threat to human health and environmental values.

In response to this, the department introduced an Operational Policy in July 2016 which effectively prohibited the use of certain high risk foams containing fluorinated organic compounds and set expectations when dealing with both persistent and non-persistent foams and their wastes. In particular, foam users are encouraged to transition to fluorine free alternatives where possible.

A copy of the [Operational Policy – Environmental Management of Firefighting Foam](#) is available on the Queensland Government website.

Between February and May 2017, 992 commercial and industrial operators were invited to participate in a voluntary survey to help determine the status of firefighting foam stocks in Queensland.

Survey objectives

The survey was designed to assist in achieving the following objectives:

1. **Identify current stocks** of firefighting foam and the operator's **status of transition** to a policy compliant foam in accordance with the Operational Policy.
2. Confirm the status of **disposal plans** for non-compliant foams at each site as per the Operational Policy.
3. **Catalogue site details** and any other available relevant information such as type of foam, quantity, and whether the products have been or are being replaced with fluorine free products.

Survey participants

The survey recipients were selected based on the fire risks associated with the activity they are conducting and likelihood of releasing firefighting foam to the environment. These typically involve activities that store large quantities of flammable or combustible liquids, or those where there may be a large quantity of foam being released to the environment over time, such as is with heavy machinery containing built in extinguishing systems that are required to perform regular system checks.

The following groups were invited to participate in the survey:

- Prescribed Environmentally Relevant Activity (ERA) operators licenced under the Qld *Environmental Protection Act 1994* (EP Act) – selected activities based on fire hazard
- Mining ERA operators licenced under the EP Act
- Petroleum and gas ERA operators holders licensed under the EP Act
- Sites storing flammable and combustible Dangerous Goods over manifest quantities
- Major Hazard Facilities

Federally operated activities were not included in the survey.

Results

The results of the survey indicate the scale of firefighting foam use in Queensland, both in terms of the volumes of substances and the geographic spread of sites where they are used. The response to the survey from participants was overall positive.

Foam use

Approximately fifty six per cent (56%) of responses indicated that firefighting foam either is, or was, used at some point on the relevant site. Figure 1 on Page 4 shows the reported status of firefighting foam use at the sites surveyed.

The results indicated that firefighting foams are common at sites handling large quantities of flammable & combustible liquids. Figure 2 on Page 4 provides a summary of the most common industry/activities reported as using foams.

Foam volume and type

The total volume of firefighting foam reported was approximately 425t. Of this, two per cent (2%) was reported as fluorine free (note that some fluorinated foams are permitted to be used in accordance with certain requirements). A breakdown of the types of foams used is provided in Figure 3 on Page 4. The most common was Aqueous Film Forming Foam in both number of sites where it was used and volume (approximately 220t).

Twenty eight per cent (28%) of these sites reported they need to transition their foams in order to achieve compliance with the Policy. Fourteen per cent (14%) confirmed that they had a current waste disposal plan to do so.

Distribution across Queensland

Survey responses indicate that majority of firefighting foam use occurs near major cities, as shown in Figure 4 on Page 5. This was anticipated as the majority of industry activities are located near major cities. Sites identified further to the west are typically associated with mining, petroleum and gas activities. The number of sites identified within particular local government areas has been provided in Table 1.

Waste Management practices

The majority of responses stated that they either have withdrawn foams containing fluorinated organic compounds or have employed management practices for the collection of any related wastes generated. Forty one per cent (41%) indicated that there are no management practices in place for collecting firefighting foam wastes. This has been identified as a common issue where the delivery system is either through using hand held extinguishers or another portable system.

Table 1 – Number of reported sites in Queensland with existing firefighting foam stocks

Local Government Area	Number of sites
Balonne Shire	1
Banana Shire	5
Barcaldine Regional	1
Blackall Tambo Regional	1
Boulia Shire	1
Brisbane City	43
Bundaberg Regional	5
Burdekin Shire	6
Cairns Regional	4
Cassowary Coast Regional	2
Central Highlands Regional	3
Cloncurry Shire	3
Gladstone Regional	8
Gold Coast City	7
Gympie Regional	2
Hinchinbrook Shire	3
Ipswich City	11
Isaac Regional	4
Livingstone Shire	1
Lockyer Valley Regional	1
Logan City	3
Mackay Regional	6
Maranoa Regional	1
Mareeba Shire	2
Mckinlay Shire	2
Moreton Bay Regional	13
Mount Isa City	4
North Burnett Regional	1
Quilpie Shire	1
Rockhampton Regional	5
Scenic Rim Regional	1
South Burnett Regional	5
Southern Downs Regional	1
Sunshine Coast Regional	1
Toowoomba Regional	5
Townsville City	7
Western Downs Regional	6
Whitsunday Regional	1

Survey limitations

The results of this survey indicate trends that may be seen in the commercial and industrial sectors. It is important to remember that conclusions drawn aren't representative of the groups surveyed.

The survey specifically targeted state regulated sites and sites handling dangerous goods which were likely to store higher volumes of firefighting foam. Sites outside of state jurisdiction, or sites that do not hold licenses for environmentally relevant activities or reportable quantities of dangerous goods were not captured within the scope of the survey.

In March 2017, Queensland was impacted by TC Debbie. This impeded the ability of some companies to respond.

The results drawn from the survey were interpreted as an indication of the broader picture of firefighting foam use in Queensland. The reported volumes and locations of firefighting foams do not represent all materials in Queensland.

Next steps

The results of the survey will be used in developing a state wide inventory of firefighting foam stocks and will inform further action to be taken to ensure compliance with the Policy, such as education initiatives and targeted compliance programs.

Of particular note, identification of persistent foams requiring transition to Policy compliant foams was found to be low. This could be attributed to the lack of reliable information available about the formulation and environmental impacts of each firefighting foam brand which presents a significant barrier for firefighting foam users to be compliant with the Policy.

The Department will continue to provide information and engage with industry, as previously demonstrated at the Queensland PFAS Seminar held in February 2017. Future industry engagement and information sharing will include a focus towards clarifying how an operator can identify a prohibited firefighting foam and manage their use of firefighting foams accordingly.

Further information for firefighting foam users

- **PFOS legacy foams must be removed from service as soon as possible.**
- **Long-chain legacy fluorinated foams ($\geq C7$) must be removed as soon as practicable.**
- **Persistent foams (i.e. those containing any persistent compounds such as fluorinated organics) include all those called Aqueous Film Forming Foam (AFFF), Fluoro-protein (FP), Film Forming Fluoro-protein (FFFP) and their alcohol resistant (AR) variants.**
- **Foams described as 'C6-based' are unlikely to comply with the Policy and probably contain significant concentrations of PFOA, PFOA precursors or higher homologues.**
- **If you have having trouble identifying the composition of a firefighting foam, first speak with the manufacturer. Sampling and analysis may need to be undertaken in accordance with the firefighting foam Policy.**
- **Fluorinated organic foams must not be discharged directly to the environment.**
- **All fluorinated organic waste (including waste foam concentrate) must be disposed of by high-temperature destruction.**

Further information on PFAS and site investigations currently being undertaken in Queensland where PFAS foam has been used in fire training activities, as well as information for residents who are concerned that they located in a contaminated area is available on the [Queensland Government website](#).

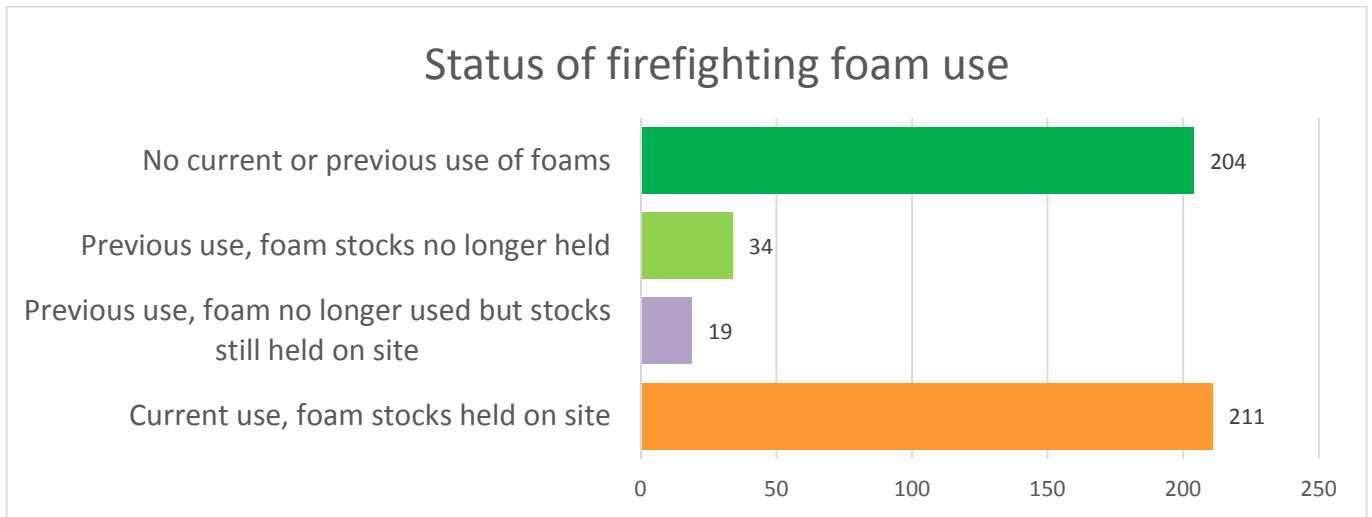


Figure 1 – Reported status of firefighting foam use by number of sites

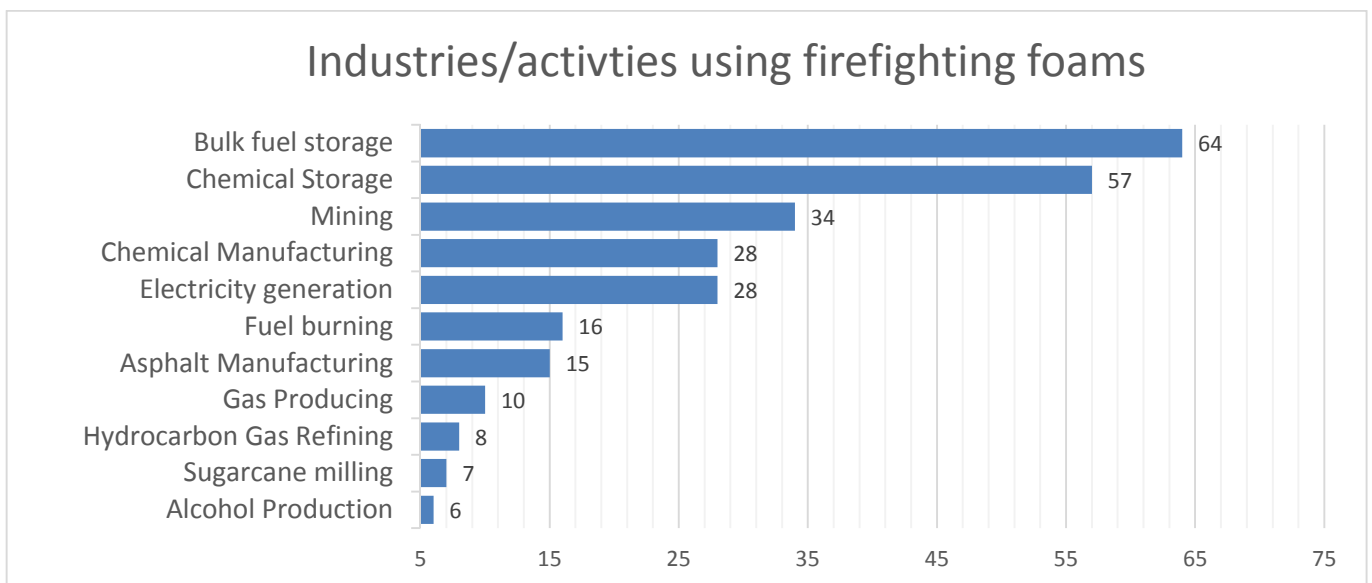


Figure 2 - Most common industry/activities reported using firefighting foams by number of sites

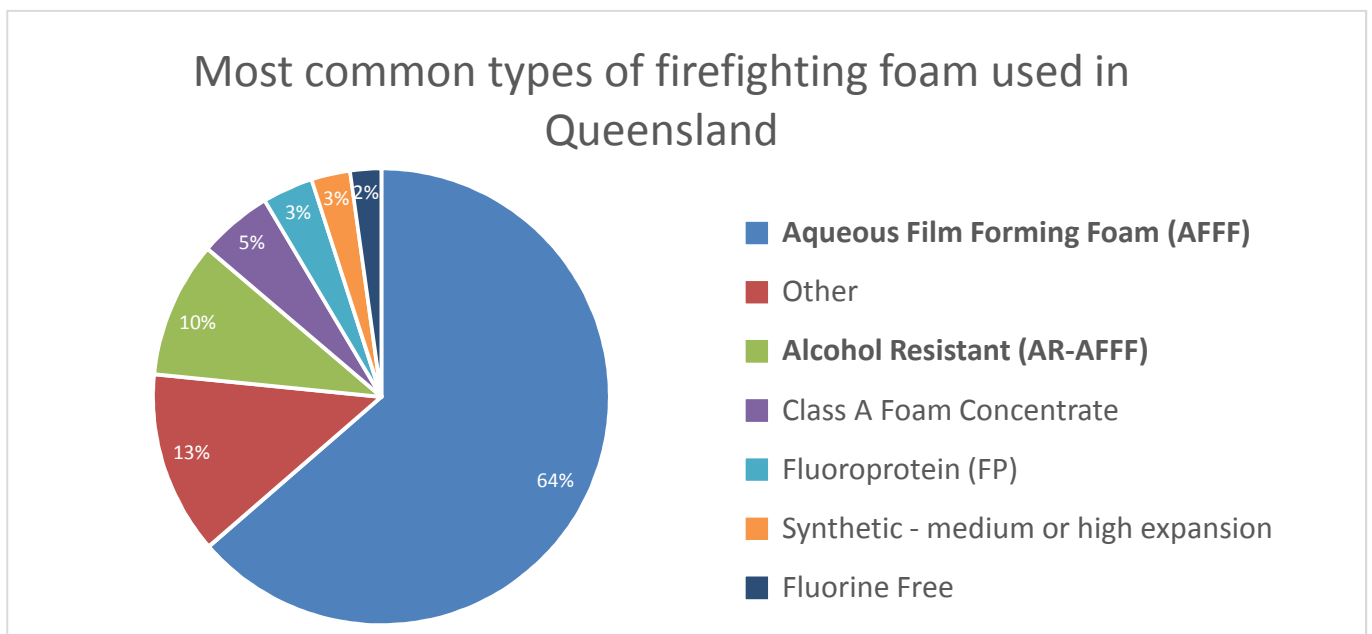


Figure 3 - Most common types of firefighting foam reported to be used by percentage of sites

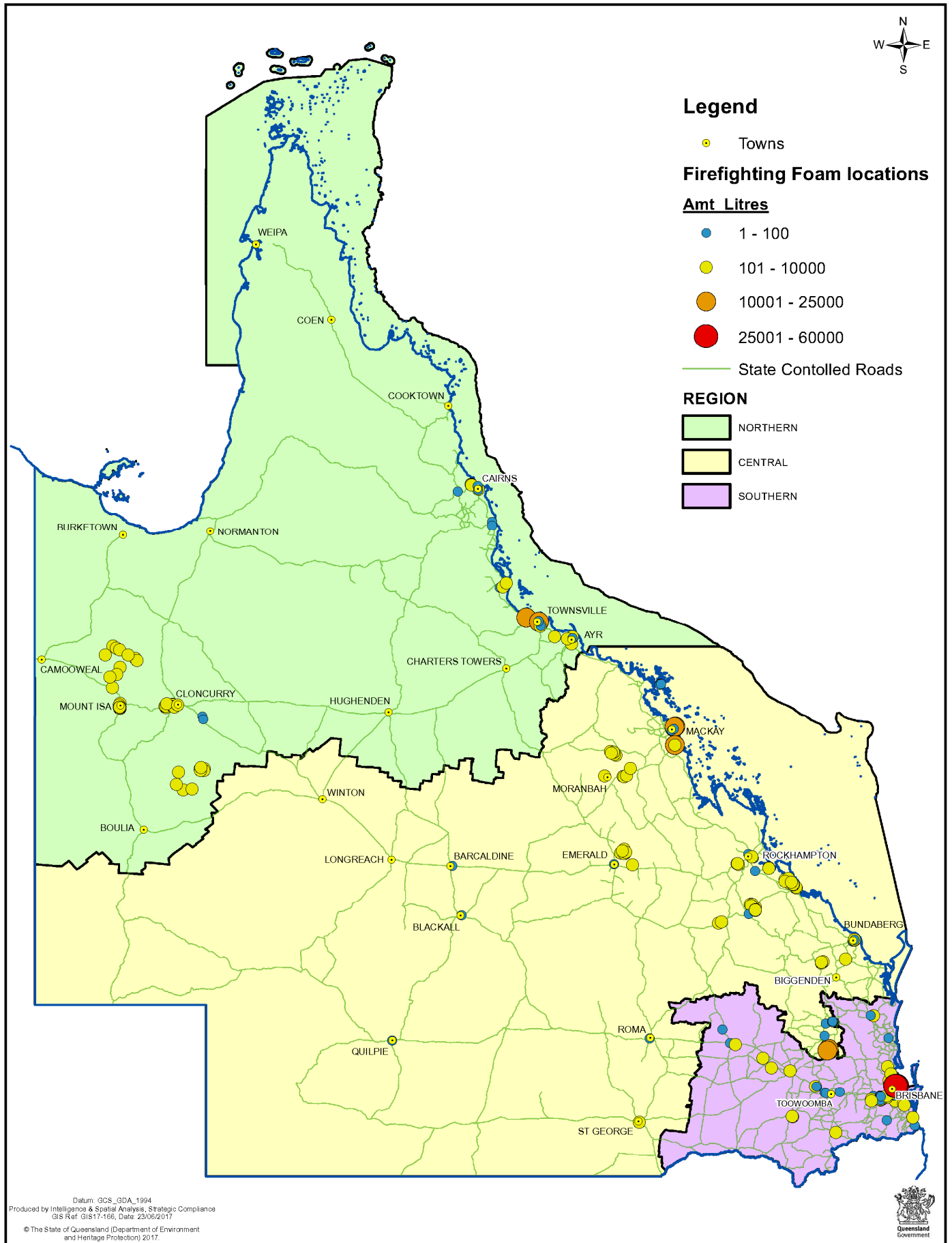


Figure 4 – Survey results of distribution of firefighting foam throughout Queensland