Submission

PFAS Sub-committee of the Joint Committee on Foreign Affairs, Defence and Trader – Ongoing Scrutiny of PFAS Remediation

Queensland Department of Environment and Science

1. Queensland Firefighting Foam Policy

On 7 July 2016, in the absence of Australian ratification of the Stockholm convention, the Department of Environment and Science (DES) introduced the *Environmental Management of Firefighting Foam* Operational Policy and provided a 3 year transition period for firefighting foam users to comply with the policy. As of 7 July 2019, all persons in Queensland are expected to have fully complied with the policy.

The development of Queensland's Policy commenced in 2013 in consultation with a wide diversity of experts in PFAS behaviour and effects, as well as firefighters and firefighting foam experts. Implementation in July 2016 commenced with a strong emphasis on partnering with industry stakeholders to achieve practical and effective outcomes with the phase-out of persistent firefighting foams.

The *Environmental Protection Act 1994* (Qld) (the Act) requires all persons undertaking any activity that impacts or has the potential to impact the environment in Queensland to take all reasonable and practical measures to prevent such harm from occurring (the *General Environmental Duty*, s.319). While compliance with the policy is not a legislative requirement, it clearly articulates expectations for meeting General Environmental Duty requirements. The Act enables the issuance of statutory notices to secure compliance with the General Environmental Duty in circumstances where it is not being met.

The policy's objective is to prevent short-term and long-term environmental harm taking into account the precautionary principle as set out in the Intergovernmental Agreement on the Environment and best practice environmental management. It sets out the environmental management standards to be met by foam users for both Class A foams used for solid combustible fires and Class B foams used for flammable liquid fires in recognition that all firefighting foams pose a range of hazards to the environment, and applies to anyone who handles, transports, disposes, stores, uses, or releases firefighting foams in Queensland.

The Queensland Policy has been regarded internationally as a benchmark for best practice, guiding transition to sustainable firefighting foam alternatives. Queensland's work has been frequently referenced by other regulatory agencies, industry groups and the foam industry, notably:

- The LASTFIRE group who represent the world's major oil companies, with Queensland contributing to guidelines and presenting by invitation to LASTFIRE foam summits, foam demonstrations and conferences (Budapest 2017, Dallas 2019 and Rotterdam TBA ~Sep 2020).
- The Stockholm Convention POP Review Committee and Conference of the Parties - submissions and presentations to member states as part of the PFAS Expert Panel by invitation of the International POPs Elimination Network (Rome 2018, Geneva 2019, Rome 2019).
- Stockholm Convention Proposals for restrictions on PFAS and adopted resolutions of the Conference of the Parties.
- Reebok International Firefighting Foam Summit, Manchester 2013, by invitation for presentations and discussion panels on Queensland's review of PFAS risks and the early development of the foam Policy.
- International publications on PFAS, management of firefighting and standards relevant to assessing risk.

- Firefighting foam manufacturers seeking to assess their products' environmental acceptability.
- End-users and the waste industry for adoption of standards for decontamination and waste disposal of facilities in transition.

A DES run Firefighting Foam End Users seminar run in Brisbane in February 2017 attracted international presenters with strong representation of industry and regulatory attendees from across Australian and New Zealand jurisdictions.

1.1 Transition of firefighting foam

The primary outcome of the policy is to ensure biodegradable fluorine free alternatives are used where available (subject to meeting public and workplace health and safety requirements), replacing the highly persistent PFAS chemicals. All PFOS and long-chain fluorinated foams were to be taken out of service by the end of the transition period on 7 July 2019.

The following specific requirements are stated in the policy:

- **PFOS fluorinated foams** (primarily manufactured by 3M prior to 2003 when they were discontinued) are to be removed from service *as soon as possible*.
- **Long-chain fluorinated foams** (those containing PFAS that do not meet C6 purity requirements stipulated in the policy) are to be removed from service *as soon as practicable*.
- **C6-pure fluorinated foams** (confirmed to meet C6 purity requirements in the policy) are only to be used subject to full containment. All concentrates, foam solution, produced foam, firewater, wastewater, runoff, contaminated soils and other associated materials/wastes must be disposed at licenced facilities. These requirements apply to spills or releases produced during accidental spills and the testing and maintenance of fixed or mobile equipment.

Queensland's transition phase of the policy included a series of seminars, surveys and industry education activities to canvass firefighting activities and stocks along Queensland's east coast, and provide operators with the information needed to transition to sustainable alternatives. Information to date indicates that there has been a very high uptake and culture shift within industry.

For example, DES has been liaising with the Australian Institute of Petroleum and large petroleum product manufacturers and suppliers regarding their transition to fluorine free alternatives. Engagement with this industry has been very positive. These operators invested significantly in researching suitable alternatives and upgrading infrastructure to comply with the policy and achieve a positive environmental outcome.

Those who have not been able to comply with the policy requirements within the transition period for reasons beyond their control have voluntarily subjected themselves to statutory programs (Transitional Environmental Program under the *Environmental Protection Act 1994*). These enforceable programs detail when and how the operator will transition to compliance, including temporary mitigation measures that will be implemented. Contravention of these approvals carry significant penalties up to $834,062.50 for an individual, over $4.1 million for a corporation, or 5 years imprisonment.

Requirements of the policy have also been considered and incorporated in planning documents such as the 2020 Brisbane Airport Preliminary Draft Master Plan, prepared by the Brisbane Airport Corporation, despite the airport being a Commonwealth regulated site and subsequently free from an obligation to comply with Queensland's policy.

1.2 Firefighting foam selection

DES acknowledges that while firefighting foams present a range of hazards to the environment, they are an essential firefighting tool for protection of life and property with a prime consideration being safety and the protection of life.

The policy also recognises that a prime consideration when choosing and procuring firefighting foam is the effectiveness of the foam for the intended application in providing adequate levels of firefighting performance, safety and property protection. The alternatives available that meet the appropriate independently verified performance standards and approvals must then be compared in terms of a net environmental benefit analysis to select the optimal combination that also best addresses the relevant environmental protection standards and overall best practice.

The policy provides guidance on matters that are to be considered when selecting foam products to be used. All firefighting foams must be assessed for their suitability and potential to cause environmental harm prior to use or disposal.

1.3 Use of fluorine free (non-persistent) firefighting foam

When using fluorine free (or non-persistent) Class A and Class B foams, including for training purposes, the policy states that the potential for causing environmental harm and the need for management measures needs to be assessed. This is due to acute risks predominately associated with the high biochemical oxygen demand and subsequent oxygen depletion when released to waters. Guidance on management measures is provided in the policy.

1.4 Relevance to the Department of Defence

The Queensland Government has communicated the above expectations in the policy to the Department of Defence (Defence) in the course of commenting on draft investigation documents and PFAS Management Area Plans (PMAPs). Consideration of these expectations are particularly relevant for Defence operations moving forward.
For example, DES has raised the potential risks from continued use of fluorinated firefighting foams in operations being conducted at the Army Aviation Centre Oakey. Continued use of fluorinated firefighting foam, particularly PFOS and long chain PFAS foams, presents a risk of recontamination of remediated areas or release of additional contaminants.

Further information including a copy of the policy and associated explanatory notes is available on the Queensland Government website at https://www.qld.gov.au/environment/pollution/management/disasters/investigation-pfas/firefighting-foam.

2. Investigations and remediation

2.1 Queensland Government approach

The Queensland Government has adopted a proactive and risk-based approach to investigations. Subsequent remediation actions and measures to minimise migration of contaminants are to be undertaken in a timely manner and should be prioritised to address minimising or mitigating human health risks.

It is DES's view that the overall objective of any type of remediation and management plan in Queensland should be to achieve full compliance with Queensland's environmental legislation by implementing of specific, timely management actions consistent with best practice environmental management. This includes compliance with the following provisions of the *Environmental Protection Act 1994*:

- s.437 – A person must not unlawfully cause serious environmental harm.
- s.438 – A person must not unlawfully cause material environmental harm.

- s.440 – A person must not unlawfully cause environmental nuisance.
- s.440ZG – A person must not unlawfully deposit a prescribed water contaminant in waters; or in a roadside gutter or stormwater drainage; or at another place, and in a way, so that the contaminant could reasonably be expected to wash, blow, fall or otherwise move into waters, a roadside gutter or stormwater drainage.
  Note – PFAS are prescribed water contaminants under item 1 of schedule 10 of the Environmental Protection Regulation 2019 (Qld) being "a chemical, or chemical waste containing a chemical (legislation examples include PFAS).
- s.319 – A person must not carry out any activity that causes, or is likely to cause, environmental harm unless the person takes all reasonable and practicable measures to prevent or minimise the harm (the general environmental duty).

The ultimate outcome of remediation should be to return land to a state where the relevant environmental values are protected or enhanced where reasonably achievable. Consideration must be given to environmental values and water quality objectives declared under the Environmental Protection Policy (Water and Wetland Biodiversity) 2019 (Qld) for Queensland waters.

2.2 Relevance to the Department of Defence

DES is aware of Defence having undertaken investigations at the following sites in Queensland:

- Army Aviation Centre Oakey
- RAAF Base Amberley
- RAAF Base Townsville
- Lavarack Barracks, Townsville
- HMAS Cairns and Former WW2 Fuel Installation, Hill
- Wide Bay Training Area
- RAAF Base Scherger

Most of these sites are either in the final stages of investigation or development of PMAPs and Ongoing Monitoring Plans (OMP).

Queensland's experience with Defence in recent years has generally been very positive. Defence has remained engaged with the Queensland Government while undertaking investigations and developing PMAPs and OMPs. These documents have been, or are currently being, developed for Army Aviation Centre Oakey, RAAF Base Townsville, RAAF Base Amberley and Lavarack Barracks.

2.2.1 Remediation and ongoing management

While the complexity of managing PFAS affected sites is noted, DES considers that there is room for improvement in the timeliness of remedial actions being undertaken at Defence sites and direction for meeting environmental obligations under Queensland legislation.

DES is of the understanding from Defence that PMAPs are high level documents that are not intended to define the specific remedial measures to be undertaken, noting that information gathered as part of the Detailed Site Investigations was not collected for this purpose and that further investigations are required at some sites in order to inform specific remedial actions. This approach presents a risk of delaying remedial actions.

In addition to being timely, identified actions should address all primary and secondary source areas sufficient to protect the environmental values of the area and meet the relevant requirements of the *Environmental Protection Act 1994*.

Remediation efforts should reflect the preferred hierarchy of treatment and remediation options in section 13 of the PFAS National Environmental Management Plan being:

1. Separation, treatment and destruction: on-site or off-site treatment of the contamination so that it is destroyed, removed or the associated risk is reduced to an acceptable level.
2. Onsite encapsulation in engineered facilities with/without immobilisation
3. Offsite removal to a specific landfill cell where leachate is captured, treated and the removed PFAS destroyed.

Defence is expected to take all reasonable and practicable actions to firstly remediate primary and secondary source areas and where not achievable, implement appropriate management actions.

2.2.2 Investigations

Effective remediation and management relies on sound and reliable detailed site investigations. DES commends the Defence in this regard with most investigations being undertaken to a high standard. Recently however DES considers that there has been a variation in the quality of investigations being undertaken at Defence sites. This has the potential to affect the appropriateness of remedial actions necessary to protect human and ecological receptors and meet Queensland's legislative environmental obligations.

The following main issues have been identified and discussed with Defence:

- **Multiple sources—**it is recognised that some sites are located in areas where there may be multiple sources of PFAS (including non-Defence sites) contributing to PFAS in the environment. In these circumstances, Defence is expected to fully investigate and understand their contribution and undertake all reasonable and practicable measures to minimise contributions from their site.
- **Biota sampling (aquatic ecosystems)—**a number of reports provided to DES have not recommended offsite biota sampling as a part of investigations. Consistent with the PFAS National Environmental Management Plan, it is preferred to directly measure aquatic biota in order to consider risks as a result of bioaccumulation where exposure pathways and sensitive receptors (ecological and/or human) exist.
- **No onsite source area—**it is noted that Defence sites can be large in size and identifying a specific source area may not be reasonably achievable. In these cases, a lack of ability to identify a specific source area should not be used as a reason to exclude human health or ecological risk assessments where onsite and offsite soil, groundwater, surface water or sediment sampling indicates PFAS is being released from the site into the environment. This is particularly relevant where there are potential human exposure pathways or sensitive ecological receptors such as wetlands of national significance. Further investigations and assessment is considered necessary to inform ongoing management measures (e.g. future monitoring, change in human behaviour to reduce exposure).