Dear [redacted]

This technical note provides a response to your email dated 2nd October 2025 regarding emissions to air from the Angus Fire treatment train involving surface activated foam fractionation.

The schematic diagram below provides an overview of the treatment train and the functions of the various tanks in the overall sequence.

Tank 1 receives influent directly from Angus Stormwater containment tanks A1, A2, A3, A4 & A5. There is no processing of the stormwater within this tank. This tank 'breathes' to atmosphere but there is no forced ventilation.

Primary SAFF Vessels

There are four primary vessels included in the treatment train (SV1-10, SV1-20, SV1-30 and SV1-40). These are the vessels that treat the storm water using surface activated foam fractionation. The SAFF vessels are independent to each other and the stormwater is treated in batches.

The circulation through each primary vessel is generated using inductors. These inductors create a negative pressure which in turn creates an air bubble structure that PFAS will concentrate on and rise to the top of the column due to their dual hydrophilic (water-loving) and hydrophobic (water-repelling) nature, which causes them to accumulate at the air-water interface within the bubble structure. This is the foam fractionation process. This is important to note as air flow through the primary vessels is passive (i.e. there is no forced or positive air pressure generated e.g. via a compressor).

The concentrated PFAS within the bubble structure is transferred to Tank 3 (Foam storage tank) with the associated air flow also accompanying it into Tank 3.

Secondary/Tertiary SAFF Vessels

The secondary and tertiary tanks (SV3-10 and SV3-20) are involved in concentrating the PFAS attached to the bubble structure received from the primary vessels. Similarly to the primary tanks, there is no forced ventilation through the system and any air flow will vent back into Tank 3.

Tank 2

Tank 2 only receives treated water, post foam fractionisation., with the majority received from the primary vessels being discharged directly to storage. The system is designed to hold back a quantity of treated water, which is then used to feed the secondary and tertiary tanks which require their water levels to be 'topped up'. Tank 2 which only ever receives post foam franctionised treated water then vents to atmosphere, and therefore there is no risk of aerosols containing PFAS to be generated.

Tank 3

Tank 3 is for used to store foam containing concentrated PFAS that has been successfully removed from the SAFF Primary process.

Tank 3A

This tank provides additional capacity tank to support Tank 3.

Tank 4

This tank contains used to store foam containing concentrated PFAS that has been processed from the secondary SAFF tanks.

Tank 5

This tank contains PFAS Hyper Concentrate, processed from tertiary processing.

Tanks 3, 3A, 4 and 5 contain the PFAS separated during the SAFF process. As with Tanks 1 and 2, there are no treatment processes within these tanks; they are used for storage purposes only.

Emissions to Air

Tank 3A receives displaced air from Tanks 3, 4 and 5 (and indirectly from the primary, secondary and tertiary SAFF vessels). Tank 3A contains a sprinkler head that is designed to knock down any residual foam in the system and avoid the generation of aerosols. Where a passive emission of air is required from the system, then Tank 3A then vents to atmosphere via a Vapour Carbon Vessel which will effectively mitigate any potential releases of PFAS species to atmosphere.

For a system of this size, a Carbon Vapour Vessel of 2.75 litres is considered appropriate for the purposes of abatement. However, in order to support the precautionary approach that has been employed throughout the design of the treatment train, the unit has been upgraded to a 400 litre Vapour Carbon Vessel. The maintenance routine change out of the Vapour Carbon Vessel for Tank 3A is scheduled on an annual basis, which is more frequent than recommended by the manufacturer.

Release of direct air emissions to atmosphere should be minimal. Air flows within the system are passive and driven by the filling of tanks and making it difficult to provide a quantitative estimate of internal flow rates, as they will be variable and very low, expected to be below $2m^3$/hr (using the flow rate of the stormwater feed into the treatment plant).

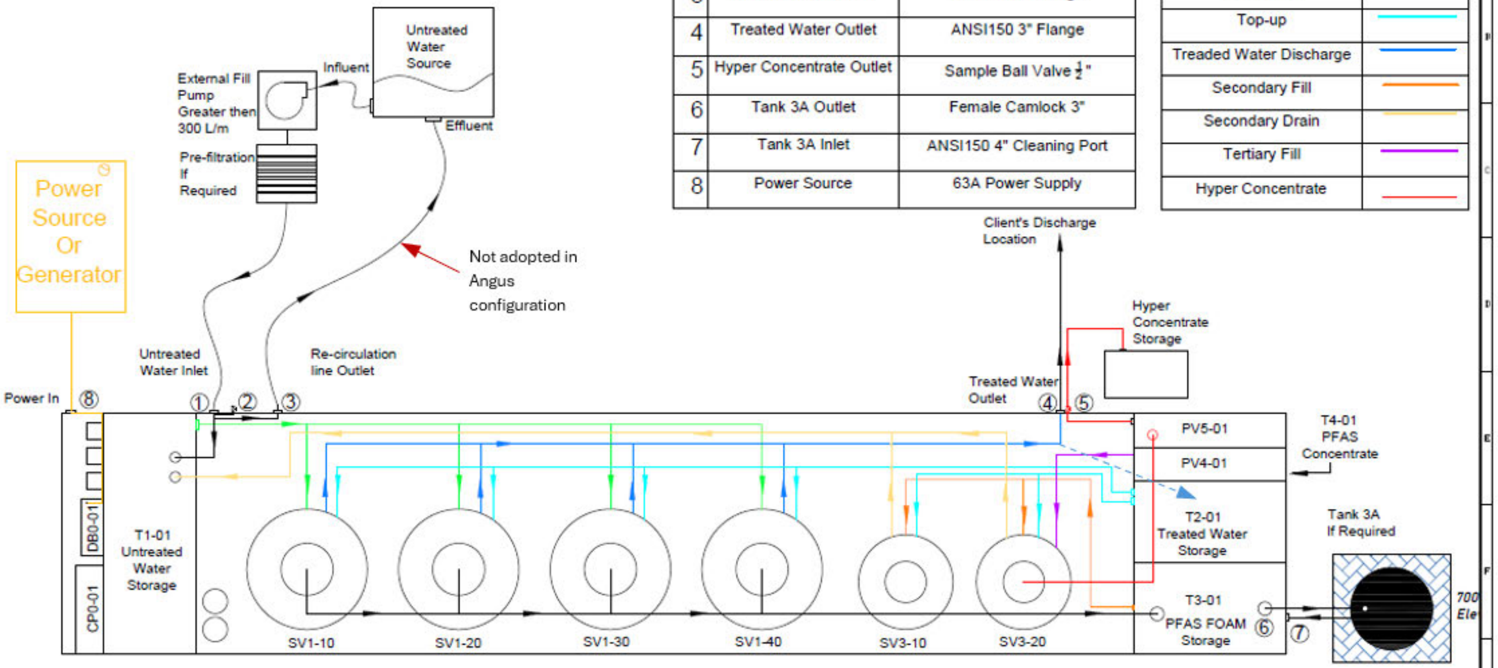
In summary, air flow through the treatment train is passive (no forced ventilation generated by compressors). Any over pressure situation would be released into Tank 3A which has a water sprinkler system installed to knock down any foam in the head space and a vapour carbon unit installed on the final release to capture any remaining contaminants, should any be present in the final release.

SAFF Connection Detials

1	Untreated Water Inlet	ANSI150 3" Flange
2	Untreated Water Sample	Sample Ball Valve $\frac{1}{2}$ "
3	Re-circulated Outlet	ANSI150 3" Flange
4	Treated Water Outlet	ANSI150 3" Flange
5	Hyper Concentrate Outlet	Sample Ball Valve $\frac{1}{2}$"
6	Tank 3A Outlet	Female Camlock 3"
7	Tank 3A Inlet	ANSI150 4" Cleaning Port
8	Power Source	63A Power Supply

Legend

External Piping and Hardware	black line
Cleaning solution	light orange line
Primary Fill	green line
Top-up	cyan line
Treaded Water Discharge	blue line
Secondary Fill	orange line
Secondary Drain	beige line
Tertiary Fill	purple line
Hyper Concentrate	red line



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STATUS CODE		EQUIPMENT TAG NO.	
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DOCUMENT ISSUE			
FOR INFORMATION	☐		
APPROVED FOR CONSTRUCTION	☐		
CERTIFIED FINAL	☐		
AS BUILT	☐		
COMMENT STATUS CODE			

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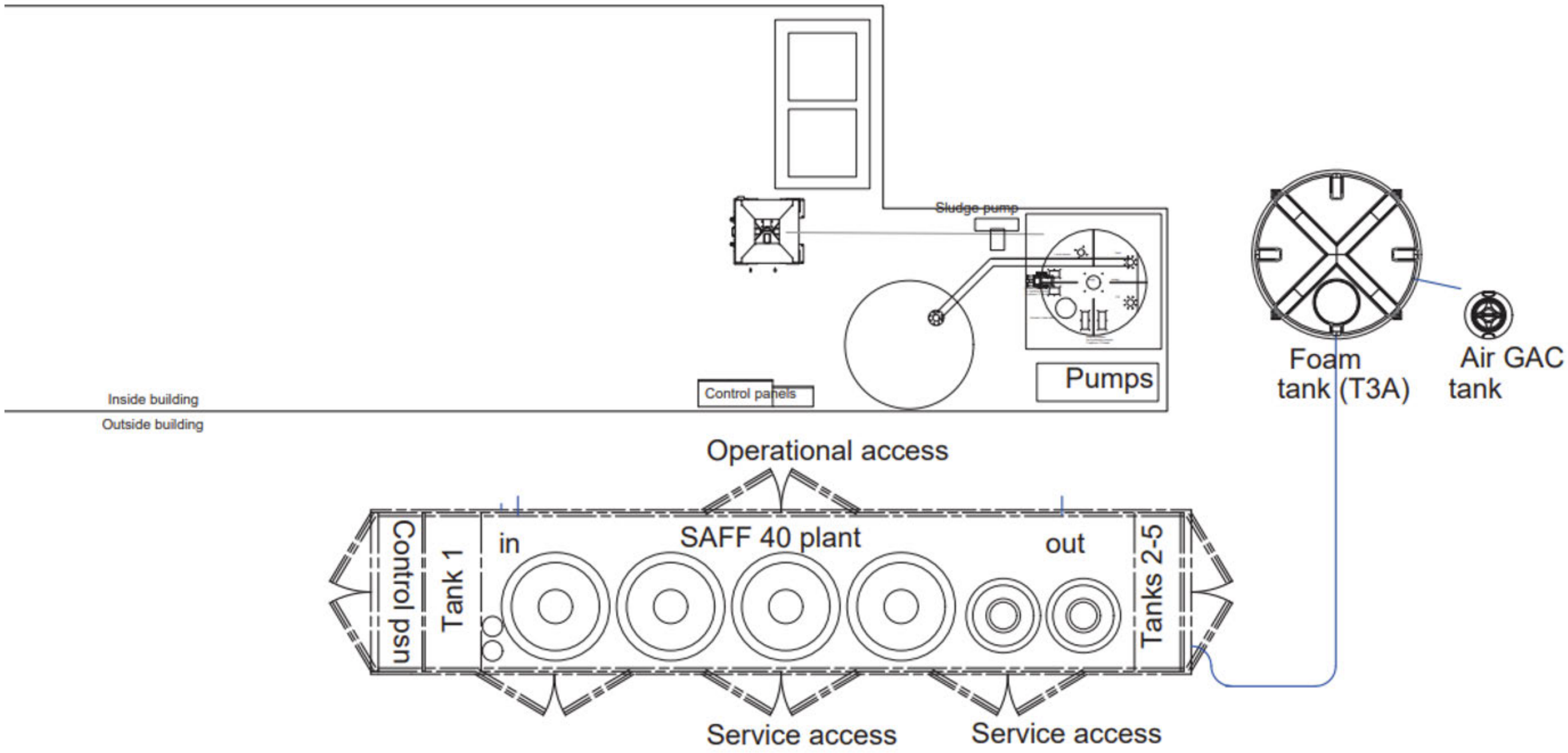

Sludge pump
Pumps
Control panels
Inside building
Outside building
Foam
tank (T3A)
Air GAC
tank
Operational access
Control psn
Tank 1
in
SAFF 40 plant
out
Tanks 2-5
Service access
Service access