

WYNSAFE

Occupational Health Services
ABN 61 578 505 096

PO Box 2297
Werribee VIC 3030
Phone: (03) 9731 1167
Fax: (03) 8640 0822
Mobile: Not Relevant

Email: Not Relevant
Not Relevant
Not Relevant

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Not Relevant
Not Relevant

Country Fire Authority
PO Box 701
Mt Waverley VIC 3149

Re: SRS Proposal for Remediation of Sludge from Settling Pond at CFA Fiskville

Dear Not Relevant

In response to your request for an assessment of the need for, and timing of, the above remediation, I have provided the following report.

Introduction

In October – November 2005, CFA commissioned a report into the quality of water used for firefighting training at CFA Field Training Grounds⁽¹⁾. This report examined and assessed the potential impact on the health of personnel and the environment, and made recommendations for the ongoing management of the identified issues.

This report was followed up with a second report in October 2007⁽²⁾ which reviewed the original report recommendations and subsequent actions. It asserted that:

“Each training ground should document a “Management Plan” to address the issue of firefighting water.”

These Management Plans were subsequently documented and distributed to the training grounds in March 2008⁽³⁾.

Background

CFA Fiskville has a series of Dams on its premises as well as a “Pit”.

Water for the main fire fighting supply is pumped from the Pit, which is filled from the town water supply, to the main hydrants on the PAD. Water from Dam 2 can also be diverted into the pit. Water for the back up water supply is pumped from Dam 2.

Once used on the fireground, the water flows back into Dam 1 via a triple interceptor which is serviced every 12 months. Possible contaminants on the fireground are foam and hydrocarbons. Possible contaminants of Dam 1 are faecal matter from wildlife and contaminants from the fireground. Possible contaminants of Dam 2 are faecal matter from wildlife and contaminants from the fireground as Dam 1 and Dam 2 are connected via a channel containing 300mm of crushed scoria. There are also Dams 3 and 4 which can be used to top up the other Dams if needed, although at the time of writing this report (19/4/09) Dams 3 and 4 are both empty.

Dam 1 contains sludge contaminated with hydrocarbons and heavy metals from past practices, and firefighting foam from the flammable PAD. Options for the remediation or removal of this sludge were assessed by SRS Australia Pty Ltd and a proposal and cost estimate was provided to CFA on 17 March 2009.

Management Plan

The Management Plan – Firefighting Water for the CFA Training College requires that:

1. Each quarter one water sample is to be taken from each of the following:
 - i Dam 1 (inflow)
 - ii Dam 1 (effluent)
 - ii Dam 2
 - iii Dam 3

Water samples are to be tested for:

- i E.coli
- ii BOD
- iii Oil & Grease
- iv Total phosphate
- v Suspended Solids
- vi Total Nitrogen

2. In July and December, 3 water samples are to be taken from each of the following:

- i Dam 2
- ii Pit

Water samples are to be analysed for:

- i E.coli & Pseudomonas
- ii BOD
- iii pH & Suspended Solids

3. If water analysis results indicate that the water does not comply with the agreed standard then:

- I the storage location is to be immediately isolated and tagged out
- li another source of water should be used where practicable
- lii an investigation of the cause of contamination should be undertaken
- lv a course of action to rectify problem should be determined – i.e. take steps to correct any contamination, like flushing out storage areas, or treating with disinfectant products.
- ii. advice or assistance from a water treatment company may be required.

4. Acceptable test results must be obtained before any tagged out water source can be put back into service.

Water Quality Criteria

Recommended criteria for water quality parameters are:

- E coli <10 orgs per 100mL
- BOD <10 mg/l
- pH 6.0 – 9.0
- Suspended solids <5 mg/l
- Pseudomonas aeruginosa <10 orgs per 100mL

Note on E.coli

Since the release of the water management plans, it has been highlighted that the *E.coli* standard of 10 orgs per 100mL is difficult to achieve at some training grounds (i.e. Huntly, Fiskville). A review of this standard has been requested to determine if training grounds need to modify their training practices (in relation to water supply and/or treatment) or whether the standard can be reduced to 150 orgs per 100mL which has been recommended by Ecowise Environmental⁽⁴⁾.

The sticking point is that after consultation with EPA, DHS, MFESB etc, CFA decided to document an SOP for "Recycled Water - Use and Management of" which stipulates that only Class A water can be used for training purposes and that Class B and Class C must NOT be used. Class A limits E.coli to 10 orgs/100mL. Therefore the general feeling was that management plans had to be consistent with that SOP.

CFA Management is considering a change of the E.coli standard from 10 orgs per 100mL to 150 orgs per 100mL based on recommendations from Ecowise Environmental, with the proviso that the Environment Protection Authority (EPA) and Department of Human Services (DHS) support such a change. If the change is supported by all parties, a submission would need to be made to CFA management to modify the SOP for "Recycled Water – Use and Management Of".

Discussion

The most important storages with regard to water quality are:

Dam 1

Is connected via a channel containing 300mm of crushed scoria to Dam 2 and therefore has a direct impact on the water quality of Dam 2. This Dam contains sludge contaminated with hydrocarbons and heavy metals from past practices, and firefighting foam from the flammable PAD, and is the Dam to which the SRS proposal relates.

Dam 2

Is used to supply water for the back-up line for firefighting and to top up the Main Pit which is supplied by town water and used for the main supply line for firefighting.

Analytical Results – Dam 1

Date	pH	BOD	Pseudomonas	E coli	SS
8/2/07	7.8	25	14000	1000	-
15/2/07	7.5	110	33000	440	-
12/3/08	-	250	-	410	2400
9/12/08	-	60	<10	120	340
9/4/09	7.7	81	15000	1200	120
Criteria	6.0 – 9.0	10	10	10*	5

Analytical Results – Dam 2

Date	pH	BOD	Pseudomonas	E coli	SS
15/2/07	8.4	10	<5	450	-
12/3/08	-	20	-	32	46
9/12/08	-	10	<5	13	13
9/4/09	8.5	17	<10	170	56
Criteria	6.0 – 9.0	10	10	10*	5

Note that the above analytical results are a composite of results provided by Ecowise Environmental and Central Highlands Water. It is not a comprehensive list but reflects the status of water quality over the past 2 years.

The samples analysed on 9/4/09 are highlighted in red as they reflect the current status of the water quality in each Dam. These samples were collected by Wynsafe on 8/4/09

* The criteria for E.coli is under review and the recommended level is 150 orgs/100mL.

The above results show that the current water quality for Dam 2, which is used for firefighting, does not comply with the criteria recommended in the Management Plan and required by the SOP for "Recycled Water – Use and Management Of". The most recent analyses of 9/4/09 show that BOD, E.coli and Suspended Solids were all above the recommended criteria.

The results fluctuate significantly and this may be due to prevailing conditions such as length of time since an input of water from the flammable PAD, a recent rain event, drought conditions, or the addition of Class A water which CFA Fiskville brings in to top up Dam 2 from time to time.

Conclusions and Recommendations

From previous analysis of the sludge, Dam 1 is known to be contaminated with heavy metals and petroleum hydrocarbons from past practices, and continues to be contaminated with firefighting foam and hydrocarbons from the flammable PAD. Until this Dam is cleaned up and a means of preventing further contamination is put in place, it is considered that Dam 2 will fail to meet the required water quality criteria as it is connected to Dam 1.

It should also be noted that the Management Plan has not been adhered to as training has continued even though the water quality is unacceptable.

It is recommended that:

- Discussions should be held with personnel at CFA Fiskville to review the use of water for training as it regularly fails to meet the recommended criteria.
- Funds should be sought from CFA to carry out a remediation of Dam 1 in the near future. Pressure to clean up this Dam will only increase with time from both an environmental and

health and safety perspective. It is considered that contaminants from this Dam are impacting on the water quality of Dam 2 which is used for firefighting training and does not meet the recommended criteria.

- Discussions should be held between SRS Australia and relevant CFA personnel to enable CFA to clarify and understand fully the scope of the proposal and its various options, and to determine whether the proposal will prevent or minimise any future contamination from the flammable PAD. These discussions should preferably be held on site.

Please contact me if you have any queries

Regards

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REFERENCES

1. Wynsafe Occupational Health Services, Report titled, "Assessment of Firefighting Water at CFA Field Training Grounds", October – November 2005.
2. Wynsafe Occupational Health Services, Report titled, "Management of the Quality of Firefighting Water at CFA Field Training Grounds", October 2007.
3. "Management Plan – Firefighting Water, CFA Training College Fiskville", March 2008.
4. Email from Ecowise Microbiologist Toni Gaal on 6 March 2008