Fire Protection and Water Supply Plan

Addendum 1

Lot 1 DP 109606

Princes Highway, Frogs Hollow

30 April 2018

Prepared for:

Sport Aviation Flight College Australia Ltd

18 Elizabeth Parade, Tura Beach

NSW 2548

Prepared by:

Tasman Engineering Consultants

Project No. S-518

Structural, Civil, Geotechnical & Environmental Engineers

ABN 870 83 813 556

Office 1, Main Street Centre,
62 Main Street, Merimbula, NSW
Tel : (02) 6495-4776

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APPENDICIES

1.0 General

The purpose of this addendum to the Fire Protection and Water Supply Plan is to provide additional information requested by Bega Valley Shire Council (BVSC).

Specifically BVSC has requested the following in relation to fire and potable water supply:

- Information regarding systems for making potable water,
- Preliminary hydraulic assessment for a fire suppression system to insure compliance with NSRF condition 4 of RFS letter dated 11 Dec 2017.

2.0 Provision of Potable Water

In regard to providing systems for making potable water, two methods are proposed.

The first is to provide for a 15 l free standing water dispenser with a returnable 15 l bottle in each accommodation unit, office unit, and classroom unit, hangar and maintenance buildings as well as a number of dispensers in the dining area. Information regarding the proposed unit is included in **Appendix B**.

The second is to provide filtration and treatment of rainwater using an off the shelf treatment technology.

Multi stage cartage filtration followed by disinfection using a UV sterilization system can be customized to the required application. Typical systems include a pleated polyester canister filter followed by a carbon canister filter which removes organics, colour, taste and odour then a UV disinfection unit which destroys pathogens. Typical units produce up to 60 l/min. Multiple units may be used to provide additional volume or larger units may be custom designed. A system such as the FiltaTank rain water treatment system or an equivalent would be provided to treat rainwater for use in the Kitchen.

Information regarding The FiltaTank filtration and UV disinfection system is included in **Appendix B**.

3.0 Preliminary Hydraulic Assessment for Fire Suppression System

The fire suppression system is intended to be supplied by on site treated effluent which is stored in dedicated above ground tanks. RFS has indicated that the system must comply with:

1. NSW Rural Fire Service Planning for Bushfire Protection 2006, and
2. AS 2419.1-2005, Fire Hydrant Installations.

The Fire Protection and Water Supply Plan dated 25 October 2018 addresses the fundamental design parameters for compliance with both NSW RFS Planning for Bush Fire Protection, and AS 2419.1-2005 Fire Hydrant Installations and the recommendations outlined in the Fire Capability Assessment prepared for the site by GN Consulting.

The design parameters are summarized as follows:

- Two hydrants shall be provided to service each of the Maintenance Buildings as well as the Main Building and Parking Area.
- The Main Building and Workshop Buildings and Car Park also shall be protected by a fire hose reel system to serve all parts of the buildings.
- The pressure and flow requirements are specified as 10 l/s per hydrant at a dynamic pressure of 700 KPa.
- A dual pump set is required and would operate at the design flow of 20 l/s and design pressure of 700 kPa + head loss.
- A AS 2419 compliant booster assembly is required and can be supplied off the shelf.
- A 330 KL water supply is specified in three 110 KL tanks. An additional 150 Kl would be available from the stand alone fire water storage tanks at various locations around the site and would provide for the required 50% 24 hour refill volume specified in AS 2419.1-2005.
- Tanks shall have a tank gauge which is visible from the area of the booster assembly.
- The final design would also include an analysis of the piped distribution system to ensure that the pressure and flow requirements are achieved. This includes adjusting the pipe size to achieve the pressure and head loss within the required specification of 150 KPa maximum head loss and a maximum static pressure of 1300 KPa.
- Underground piping shall consist of PN 16 UPVC bell and spigot pipe.
- All above ground piping including hydrant stand pipes shall be steel.
- Trenching details and details of thrust blocks and pipe restraints would be shown in detail in the final design documentation.

Figure 1 shows the components of the fire supply system.

4.0 Water Supply

BVSC has provide further questions in regard to the provision of potable water as follows:

"*Should bore water not be a feasible option further estimates of water deficit should be provided based on rainfall range rather than the average or decile 5 rainfall statistics to allow an understanding of best case and worst case scenarios and likely additional movements for water carriage*".

The best available and most reliable information regarding precipitation and evaporation is that obtained from the Bureau of Meteorology (BOM).

The October 25, 2017 fire protection and water supply plan Table 3 summarizes a water balance based on a revised consumption of 28,080 l/day and a roof area of 27,455. The figures for roof area and revised consumption remain reasonable assumptions.

The following tables summarize the water balance using a range of rainfall statistics beginning with the lowest rainfall on record which is a reasonable approximation of the worst case rainfall, through Decile 7 which is a reasonable best case scenario for precipitation. The rainfall statistics have been taken from published data for Bega BOM Station 069139 which have been compiled from 23 years of data from 1994 through 2018. Data for Decile 7 has been interpolated based on the published data for Decile 5 and 9.

The following tables include a nominated initial storage volume which is the volume required to initiate cumulative storage such that the resulting monthly storage remains positive. The nominated initial storage would be the volume of supplemental storage that would be required to be supplied from an offsite source.

Table 1- Frogshollow Airstrip Rainwater Balance

Consumption (l/day)	28080		Total water consumption less non potable and drinking water										
Roof Area (m2)	16700		Lowest rainfall on record Bega Station 069139										
Initial storage (m3)	9800												
Parameter	**Units**	**Jan.**	**Feb.**	**Mar.**	**Apr.**	**May**	**Jun.**	**Jul.**	**Aug.**	**Sept.**	**Oct.**	**Nov.**	**Dec.**
Days per Month	days	31	28	31	30	31	30	31	31	30	31	30	31
Precipitation	mm/month	10.6	0.2	0.2	0	6.6	0.4	1.4	1	6.2	0	0	3
Precipitation Input	m^3	177.02	3.34	3.34	0	110.22	6.68	23.38	16.7	103.54	0	0	50.1
Consumption Output	m^3	870.48	786.24	870.48	842.4	870.48	842.4	870.48	870.48	842.4	870.48	842.4	870.48
Deficit/surplus	m^3	-693.46	-782.9	-867.14	-842.4	-760.26	-835.72	-847.1	-853.78	-738.86	-870.48	-842.4	-820.4
Cumulative storage	m^3	9106.54	8323.64	7456.5	6614.1	5853.84	5018.12	4171.02	3317.24	2578.4	1707.9	865.5	45.12

Table 6- Frogshollow Airstrip Rainwater Balance

Consumption (l/day)	28080		Total water consumption less non potable and drinking water										
Roof Area (m2)	16700		Decile 5 Bega Station 069139										
Initial storage (m3)	3800												
Parameter	**Units**	**Jan.**	**Feb.**	**Mar.**	**Apr.**	**May**	**Jun.**	**Jul.**	**Aug.**	**Sept.**	**Oct.**	**Nov.**	**Dec.**
Days per Month	days	31	28	31	30	31	30	31	31	30	31	30	31
Precipitation	mm/month	38.8	47.6	35.6	25	21.2	39	18.2	18.4	26.6	30.6	57.1	35.8
Precipitation Input	m^3	647.96	794.92	594.52	417.5	354.04	651.3	303.94	307.28	444.22	511.02	953.57	597.86
Consumption Output	m^3	870.48	786.24	870.48	842.4	870.48	842.4	870.48	870.48	842.4	870.48	842.4	870.48
Deficit/surplus	m^3	-222.52	8.68	-275.96	-424.9	-516.44	-191.1	-566.54	-563.2	-398.18	-359.46	111.17	-272.6
Cumulative storage	m^3	3577.48	3586.16	3310.2	2885.3	2368.86	2177.76	1611.22	1048.02	649.84	290.38	401.55	128.93

Table 7- Frogshollow Airstrip Rainwater Balance

Consumption (l/day)	28080		Total water consumption less non potable and drinking water										
Roof Area (m2)	16700		Decile 7 (Interpolated) Bega Station 069139										
Initial storage (m3)	0												
Parameter	**Units**	**Jan.**	**Feb.**	**Mar.**	**Apr.**	**May**	**Jun.**	**Jul.**	**Aug.**	**Sept.**	**Oct.**	**Nov.**	**Dec.**
Days per Month	days	31	28	31	30	31	30	31	31	30	31	30	31
Precipitation	mm/month	62.4	109	117	50	61	94.4	59.7	54.5	46	66.3	85	105
Precipitation Input	m^3	1041.25	1812.79	1950.56	833.33	1018.7	1576.48	996.99	910.15	768.2	1106.4	1414.5	1753.5
Consumption Output	m^3	870.48	786.24	870.48	842.4	870.48	842.4	870.48	870.48	842.4	870.48	842.4	870.48
Deficit/surplus	m^3	170.765	1026.55	1080.08	-9.07	148.22	734.08	126.51	39.67	-74.2	235.9	572.09	883.02
Cumulative storage	m^3	170.765	1197.31	2277.39	2268.3	2416.54	3150.62	3277.13	3316.8	3242.6	3478.5	4050.6	4933.6

From the above tables the initial storage required to offset a deficit decreases with an increase in rainfall. For the water balance using Decile 7 rainfall, which would be the reasonable best case scenario, no supplemental storage would be required.

5.0 Conclusion & Recommendations

Based on the above information potable water can be provide as bottled water or processed from rainwater using readily available off the shelf technology.

An AS 2419.1-2005 and RFS complaint fire suppression system can be provided for the site in a system based on dedicated tank water and a dedicated pump set. The recommendations for other components of the overall fire protection system which are addressed in the Fire Capability Assessment prepared by GN Consulting including portable fire extinguishers, hazard lighting, exit signs and emergency warning systems would be addressed in the final design documentation.

Additional water balance analysis shows that where a reduced rainfall is considered that supplemental water supply would be necessary. The need for supplemental water supply may be partially offset by further reductions in the use of rainwater or by increasing the roof catchment area. Generally though it is clear that under less than ideal conditions that supplemental water supply will be necessary to meet the demand. Provision of supplemental water would require an additional traffic load for deliveries and the potential traffic volumes to and from the facility are achievable within the context of the CHR/AUL intersection treatment proposed for the site.

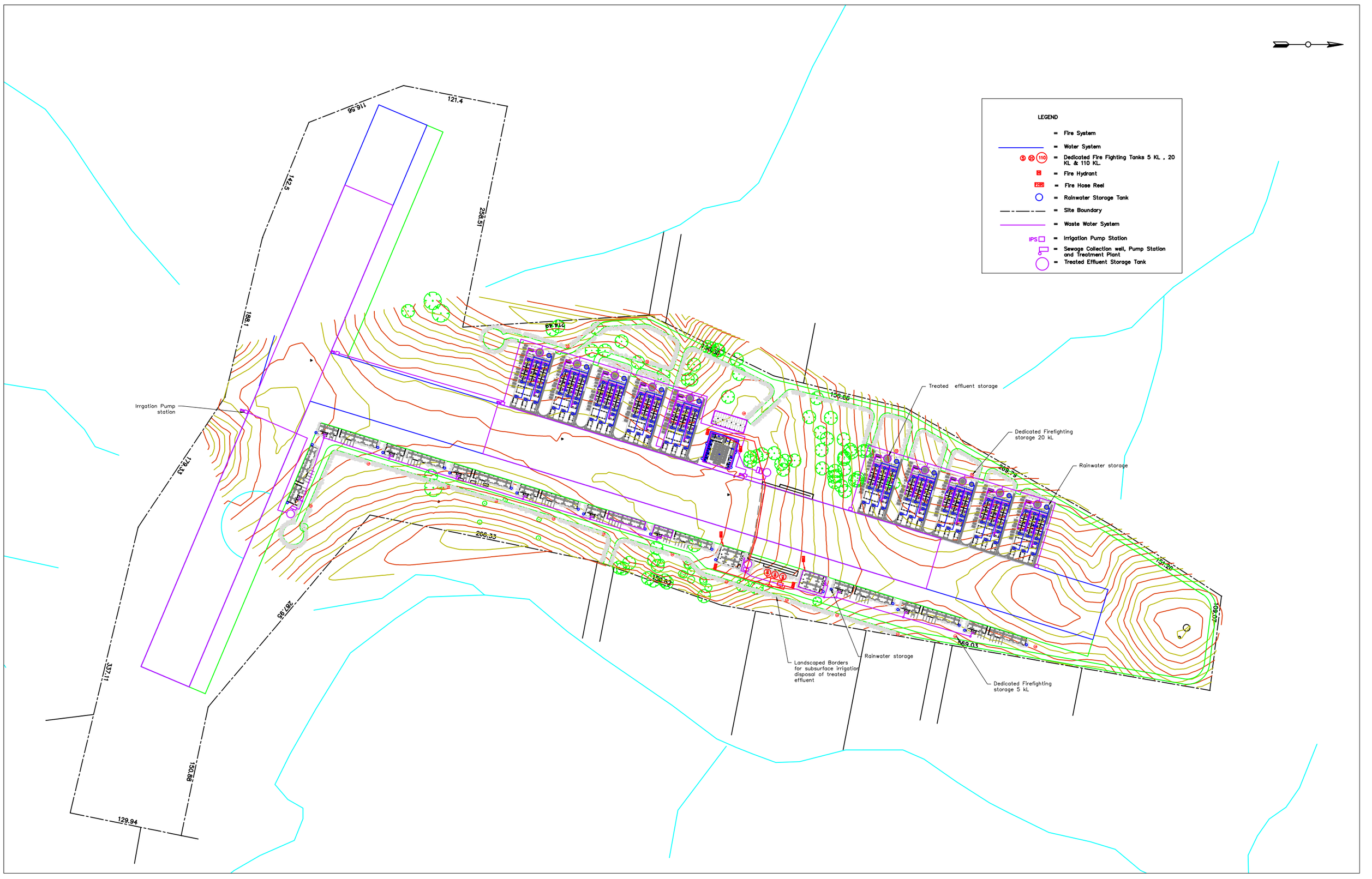
6.0 Report Limitations

This report is based on field observations and information provided in the development plan. The site has been evaluated using commonly accepted environmental engineering practices and standards. To the best of our knowledge these findings represent conditions at the times and places stated. The report should be read in its entirety. Figures and other attachments should not be separated from the report. The findings of this report should not be used to infer conditions for any other time or location except as specifically addressed in the report. Questions regarding this report, its findings or applicability to conditions not specifically addressed in the report should be directed to TEC. This report is intended to be used by the Client and their assigns. No part of this report may be used by any other party for any purpose without the express written permission of the Client and TEC.

Tasman Engineering Consultants

Austin F. Legler, CP. Eng.

Appendix A- Figures



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TASMAN ENGINEERING CONSULTANTS
STRUCTURAL, CIVIL AND GEOTECHNICAL ENGINEERS
OFFICE 1, MAIN STREET CENTRE,
62 MAIN ST , MERIMBULA NSW 2548
Tel: 02 64954776 Mob: 0488 490 243
Email: austin@tasmaneng.com.au

Scale	1:2000	Title	Frogs Hollow Figure 1- Fire Protection Water Supply
Drawn al	Date 14-4-2018		
Approved		Client	SAFCA
A.F.Legler B.S., M.A.S.C.E., M.I.E.(Aust.), C.P.Eng.		Size A1	Drg. No. S518
		Sheet of	Rev.

Appendix B- Water Supply and Treatment Equipment

15 LITRE - RETURNABLE

'Neverfail' Spring Water 15 Litre Returnable bottle is sourced from some of the finest natural springs in Australia, selected on the basis of mineral composition. It comes in a recyclable bottle and has a handle for easy lifting. Full water bottles are delivered direct to your door and the empty water

WATER COOLER TYPES

Water Cooler Types

We have a wide range of water coolers available for rent:

Freestanding Water Coolers

Rainwater Filter Systems with Ultraviolet Sterilisation

At The Tank Doctor we only sell the very best quality rainwater filter systems available on the market that include excellent warranty. Utilising Watermark approved, patented filter housings that are made in Italy and Viqua ultraviolet sterilisation systems made in Canada you are guaranteed the safety of your families health is in the very best hands. Rainwater filter systems are available in twin or triple 20" x 4.5" sizing and arrive fully assembled ready to go. We also offer complete installation service for the full range of all our water tank filters.

What makes Filtatank rainwater filtration systems the best choice?

- Designed and built in **Australia** from the highest quality components.
- Filtration systems arrive fully assembled ready to install.
- Kills 99.9% of bacteria and viruses through exposure to UV light.
- Super strong stainless steel fabrication.
- **Italian made** patented filter housings rated to 120psi. Watermark approved.
- High quality Viqua UV systems with **10-year** chamber warranty!
- U.V. digital day count down timer with warning alarm.