Greg Alderson & Associates

Chartered Professional Engineers and Scientists

On-Site Wastewater Management Assessment

Proposed whisky storage shed
Lot 5 DP 594645, 80 St Helena Road, McLeods Shoot

For: Cape Byron Distillery
Report No: 16098_ww whisky shed.doc
Date: 5th November 2019

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Document Information

Project name	Proposed whisky storage shed
Reference	16098_ww whisky shed.doc
Revision summary	

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1.0 INTRODUCTION

Greg Alderson and Associates have been commissioned by Cape Byron Distillery to provide an On-Site Wastewater Management Report for a proposed whisky storage shed at Lot 5 DP 594645, 80 St Helena Road, McLeods Shoot. The shed is proposed to include one toilet and sink, as such a Section 68 application is required to the installation of an On-Site Sewage Management System (OSMS). The following report provides information for the site investigation and the proposed OSMS.

1.1 Proposed On-Site Wastewater Management System

The design of the OSMS is based on a whisky storage shed with one toilet & sink. Wastewater generated from this shed will be very low and sporadic however wastewater does need to treated and disposed of in accordance with Council's wastewater strategy (2004). The following will be used for the design of the OSMS:

- The design is for 2 people using 10L each/day through the facilities (conservative hydraulic loading).
- **3/4.5L dual flush toilet** to be installed.
- Total land area of 37.15ha.
- **Septic tank** for collection and primary treatment of all wastewater flow.
- Install an **outlet effluent** filter on the septic tank.
- An **Evapotranspiration/ Absorption Bed (ETA)** Disposal Area, see attached plan.

2.0 SITE DESCRIPTION

Staff of this office investigated the subject property and the proposed wastewater management system location. The site is accessed by driveway from St Helena Road.

The property is shown within its immediate locality on **Exhibit No. 1**.

2.1 Land Area

The approximate land area of the allotment is 37.15ha. Due to the location of the shed being in between drainage lines and adjacent to a property boundary, land area is limited. Land area is a limitation that is addressed by the design of the OSMS's described in this report, and is addressed further in Section 2.6.

The disposal area is shown on **Exhibit No. 2**.

2.2 Vegetation

The area containing the proposed shed and OSMS was under macadamia plantation prior to the site investigation by staff of this office. At the time of inspection, the macadamia trees had been removed and the stumps grinded. Therefore, at the time of investigation the soil was bare in the location of the proposed OSMS. It is proposed that the OSMS area will be grassed in its final state.

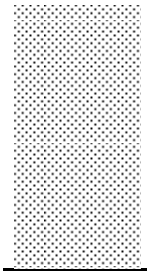
2.3 Slope

The topography of the property is undulating and steep throughout. In the location of the proposed OSMS, the slope falls gently to the south at approximately 9%. This area is considered appropriate for ETA bed disposal.

2.4 Soil

Soil of the site consists of friable brownish red clay loam krasnozem soils continuing to the extent of the borehole, being 800 mm depth. Rock floaters or fragments were not observed within the soil profile. Table 1 below presents a borelog of the soil at the site.

Table 1. Borelog of soil excavated at the site.

SOIL ASSESSMENT							
Horizon	**Depth (mm)**	**Texture**	**Structure**	**Colour**	**Coarse Fragments**	**Soil pH**	**Dispersive Class**
	0 800	Clay loam	Friable throughout	Brownish/Red throughout	None observed	6 (Morand, 1994)	Not tested although Morand (1994) suggest low to very low dispersive characteristics in this soil landscape.

The Soil Conservation Service 1:100,000 Soil Landscape Map (1994) presented the soils as an erosional Bangalow Soil Landscape. Morand (1994, p82). A broad description of the soil landscape is provided below.

Soil Landscape:	Erosional Bangalow Landscape.
Soils:	Moderately deep to deep (100->200 cm), well drained Krasnozems and brownish red Krasnozems.
Geology:	Lamington Volcanics: Lismore Basalts – Tertiary basalt with bole and minor agglomerate.
Limitations:	strongly acid, moderately erodible soils with high aluminium toxicity potential. Localised stony, shallow and waterlogged soils. Mass movement hazard (slumping).

All of the limitations as outlined in Morand (1994) were not evident in the site assessment. The site is not considered to be subject to mass movement in the vicinity of the proposed on-site wastewater management system. Amelioration of the pH through the addition of lime can improve the conditions for plant growth.

Table 2 provides an assessment for the proposed disposal system in accordance with the *Environment and Health Protection Guideline On-site Sewage Management for Single Households* (EPA et al, 1998) for the proposed OSMS.

Table 2: Soil Assessment for Wastewater Disposal in accordance to EHPG

SOIL FEATURE	COMMENT	LIMITATION RATING		
		Minor	Moderate	Major
DEPTH OF SOIL	Soil depth is estimated to be 3m in depth	✓		
DEPTH TO HIGH EPISODIC/ SEASONAL WATERTABLE	The water table was not intersected during borehole tests and no springs or other water discharges were observed. An allowance of 3 m to the watertable was used in order to size the disposal area based of phosphorous movements	✓		
SOIL PERMEABILITY	The sites soils were clay loams which have a high permeability.	✓		
COARSE FRAGMENTS	There were no rock fragments or floaters detected in the borehole.	✓		
pH	Soil pH is generally acidic (6), and will require lime to be incorporated into the disposal area.	✓ with addition of lime		
ELECTRICAL CONDUCTIVITY (dS/m)	Morand (1994) states that the Bangalow soil landscape has a very low electrical conductivity, there was no evidence of vegetation being affected by salt	✓		
PHOSPHOROUS SORPTION (kg/ha)	Morand (1994) states that the Bangalow soil landscape has a moderate to high phosphorous sorption rate of greater than 600mg/kg which is equivalent to greater than 10000kg/ha/year. A conservative 10000kg/ha/year was used for the design of the disposal area	✓		
MODIFIED EMERSON AGGREGATE TEST	Morand (1994) states that the Bangalow soil landscape has a low dispersive percentage, there were no signs of dispersiveness when soil at site was examined	✓		

Overall the EHPG (1998) would class the soil as being a minor limitation for disposal of wastewater.

2.4.1 Improvements to Soil

Increased acidity affects cation exchange capacity and can lead to deficiencies in calcium and magnesium while mobilising aluminium, which is toxic to plant growth. Lime can be added to the soil profile when preparing the area for disposal to increase the pH to a range between 6.5 – 8.5, which will enable plants to take up nutrients, which will be within the wastewater.

Gypsum will be added to the soil at construction and on an annual basis at the rate of 0.5 tonne/hectare to prevent the soil from degrading from sodium application, which is contained in the wastewater.

2.5 Environment and Health Risk Assessment

The following (Table 3) is an environment and health risk assessment in accordance with the policy for *Design Guidelines for On-Site Sewage Management Systems* Byron Shire Council (December, 2004).

Table 3: Environment and Health Risk Assessment for Proposed Disposal Area

SITE FEATURE	LIMITATION NONE	LIMITATION MAJOR	REASONING
FLOOD POTENTIAL	✓		The land of the proposed disposal areas is not subject to 1 in100 yr. flooding
SOIL TYPE	✓		Clay loams which have adequate permeability
EXPOSURE	✓		Exposure to sun and wind is acceptable.
SLOPE %	✓		9%.
LANDFORM	✓		Proposed disposal area is not within a gully and is located on a gentle foot slope of a minor ridge.
EROSION POTENTIAL	✓		No signs of erosion present in disposal areas.
SUBSOIL DRAINAGE	✓		No visible signs of subsoil dampness in the proposed disposal area.
SURFACE DRAINAGE	✓		Catch drains can be installed and storm water runoff can be diverted from the disposal area.
LAND FILLING	✓		No fill observed in the proposed disposal area.
LAND AVAILABLE FOR APPLICATION AREA		✓	There is excess area available for installing the OSMS however setbacks to drainage lines are encroched.
ROCKS AND ROCK OUTCROPS	✓		None observed in disposal area. Only some small fragments.
TREATMENT SYSTEM	✓		Septic tank (primary Treatment)
BUFFERS		✓	The proposed disposal area is located approximately 37m from a drainage line that has permanent flow.

2.6 Site Constraints and Proposed Best Practice

Tables 2 & 3 presented site constraints that may occur following the BSC Design Guidelines for On-Site Sewage Management Policy (2004) and the Environment and Health Protection Guideline On-site Sewage Management for Single Households (1998). It can be seen that the site is generally not restrictive to wastewater treatment and disposal however setbacks to drainage lines are an issue to be addressed.

A setback distance of 37m is proposed between the proposed OSMS and a creek. Further to this a 25m setback distance is proposed to an intermittent drainage line. Generally, such reduced setback distances would require the OSMS to include secondary treatment to limit the chance of nutrients entering the water course.

The main reason no secondary treatment is proposed is that the nutrient loading will be very low coming from the whisky shed. As the loading will be from sporadic toilet use from distillery staff when they are checking or storing whisky in the shed it is anticipated that the wastewater loading will realistically be less than 50L/week. The fertilizing of the macadamia trees that where cleared to allow for the construction of the shed would have generated significantly higher nutrient levels than the nutrients that will pass through the single toilet in the shed.

Regarding pathogens, Council's policy is that a 100m buffer is required between permeant water bodies and wastewater disposal areas. However, a scientific approach can be used to determine if the actual separation distance proposed is sufficient and will not lead to pathogen contamination of the water in the creek from the proposed OSMS. The 'Estimate of the Setback Distance' from the following equation as sourced from Cromer *et al* (2001) is used to determine if the proposed encroachment is suitable and will not cause a risk of pathogen contamination to the creek water.

Calculation of setback distance

This distance represents the distance effluent travels down into and across the water table before its viral count is reduced to the level recommended by the World Health Organisation (WHO).

The calculation to determine this distance is seen below.

Dg = (t – dv.(P/K)) / (P/(K.i))

Where:

Dg = required setback distance
t = time (days) for viral die off to occur in soil
dv = distance wastewater travels to reach groundwater
P = Effective porosity of soil
K = Saturated hydraulic conductivity (permeability) of soil
i = groundwater gradient

The equation values of this site are as follows and have been taken from the Appendix A of Ballina Shire Council's on-site sewage management guidelines (2017) when appropriate for this site, or from assumed site-specific values:

t = 25.1 days (magnitude of 3 (wastewater will sit in septic for over 40 days were most viruses will die) and temperature of 14°C)
dv = 3 m (conservative value)
P = 0.4 (clay)
K = 0.5 m/day (used highest indicative permeability rate for strongly structed light clay from Table L1 in AS/NZS 1547:2012)
i = 0.09 (represents 9% measured average slope between OSMS and creek)

According to the bore setback distance equation the setback distance required is **2.55 m**.

It is considered that the proposed OSMS does not pose a risk to the surrounding drainage lines. Viral die off to an acceptable level will occur prior to the wastewater released by the proposed OSMS reaching any drainage line.

3.0 DESIGN OF ON-SITE WASTEWATER MANAGEMENT SYSTEM

It is proposed that a septic tank will be used for primary treatment of all wastewater produced within the whisky shed amenities. In addition to this, an outlet filter will be installed on the outlet of the septic tank and then the wastewater will flow under gravity to an evapotranspiration/absorption bed for disposal. As stated, this is considered suitable in this scenario due to the lack of site constraints, suitable soil and actual low hydraulic loading generated from the whisky shed amenities.

3.1 Predicted Hydraulic Loading

The predicted hydraulic loads are based on each person generating 10L (two toilet uses) of water a day in the toilet and sink amenities which are to be water efficient (3/4.5L dual flush cistern and an aerator on the sink tap). Below is the theoretical peak hydraulic loading from the whisky shed amenities

2 staff x 10L/day each is **20 L/day**.

This is considered conservative as the whisky shed will be used solely for storing maturing whisky, and may only have staff utilizing the amenities one day per week during routine checking of the whisky or when delivering a batch of whisky for storage.

3.2 Predicted Nutrient Loading

The predicted nutrient loads are based on the BSC Policy (December, 2004) with no secondary treatment. Nutrients were not found to be a critical factor for the sizing of the OSMS due to the size of the subject property.

3.3 Disposal Area Required

This section investigates the disposal area required based on the predicted hydraulic loading from the use of the whisky shed facilities, and environmental factors which influence the area design. In order to ascertain the size of the disposal area, the model within the Byron Shire Council Design Guidelines for On-site Sewage Management for Single Households was used with the following parameters.

- 2 people;
- Land area of 371500m^2;
- 120L/person/day for water conserving devices and first principles (considered conservative based on the likely intermittent use of the whisky storage shed wastewater facilities);
- Clay loam – strong structure;
- Primary treatment via septic tank;
- Evapotranspiration/absorption bed for land application;
- 0% nitrogen reduction as no secondary treatment;
- No phosphorus reduction calculated;
- Ground water/bedrock depth of 3m.

The disposal area required for the hydraulic and nutrient loadings is as follows:

Area Required for	Hydraulics:	10 m^2 **(capped at 30m^2)**
	Nitrogen:	0 m^2
	Phosphorus:	21 m^2

The required hydraulic disposal area of 30m^2, which requires one ETA bed of 11m long x 2.0m wide to achieve this area.

4.0 DETAILS OF ON-SITE WASTEWATER MANAGEMENT SYSTEM

4.1 Septic Tank

A minimum of 1500L of septic tank capacity is required in accordance with table J3 *Blackwater septic tank operational capacities* of AS/NZS 1547-2012. It is unlikely that a 1500L septic tank will be available so a larger septic tank will be suitable. Furthermore, an outlet filter is to be installed in the septic tank to further increase primary treatment.

4.2 Evapotranspiration/ Absorption Bed

The primary treated wastewater from the septic tank will gravity flow for disposal via an ETA bed. Council's design modelling requires **one** ETA bed of **2.0 m** in width, **11.0 m** in length and **0.45 m** in depth.

It is proposed that the disposal field will be located in an area where there will be mown grass. Due to the slope in the area the disposal fields will not be mounded, but will have a final surface level matching the existing slope (some settling will occur), and water will shed off this slope.

4.2.1 Construction of ETA Bed

The ETA bed will be constructed in accordance with AS1547:2012 with the construction described as follows:

- Construction of the bed will involve the excavation of the natural soil to a depth of 450mm (on lower slope). Soil will be scarified and sand placed on this interface for a covering of about 50mm thick. Aggregate of 6-25mm diameter is placed on this to a depth of 200mm;
- Two slotted distribution pipes (PVC not ag pipe) 100 mm in diameter are placed on this layer, at 0.5m from the sides of the bed;
- Topsoil consisting of sandy loam is to cover the aggregate to a depth of 200mm, and the final finish is a mound appearance however at this site due to the slope the finish will match the natural land surface;
- Geotextile fabric is to be placed between the aggregate and the topsoil;
- An inspection point of (being slotted and capped PVC pipe) will be installed in the bed;
- A small catch drain shall be installed upslope of the disposal area to redirect overland flow away from the disposal area.

Exhibit No. 3 shows a typical cross section of the disposal bed. The proposed layout is presented in **Exhibit No. 2.**

5.0 MAINTENANCE PLANS

The following is a maintenance check list to be undertaken by the client.

5.1 Septic Systems & Effluent Filter

The septic tank should be regularly checked and is to be pumped every 3 to 5 years or as required, with wastes being removed by a licensed septic pumping company. The effluent filter should also be cleaned out at this time.

5.2 Evapotranspiration Absorption Field

The disposal system is designed in a manner that will allow the system to be maintained and repaired quickly if part of the system happens to fail.

- Bleach, bleach-based products, whiteners, nappy soakers and spot removers shall not be disposed of into the on-site system. They shall be disposed of on a disused area of a garden, well away from the disposal area.
- Hygiene products, condoms, tampons, sanitary napkins, disposable nappies and cotton buds shall not be disposed of via the on-site disposal system. They should be disposed of into garbage bins in sealed plastic bags.
- Only the recommended amounts of disinfectants should be used. Biodegradable products for septic systems are recommended. Runoff diversion banks to be inspected annually and maintenance as required undertaken to ensure that surface runoff is diverted around each of the disposal areas;
- No vehicular, stock or regular pedestrian access should be made across the disposal field.
- Vegetation will be harvested frequently up to 2 times a year can be undertaken, this will encourage regrowth and in turn will increase uptake of nutrients and water;
- Plant clippings shall be removed from the site to decrease amount of nutrients returning to the wastewater system;
- Effluent from disposal system should not be discharged to the stormwater system or over the ground;
- The effluent distribution pipes are to be inspected for blockage etc. when the aggregate is cleaned and flush cleaned or replaced as required.

Some signs of the disposal system failure are listed below, if any of these occur contact the plumber who installed the system and arrange for immediate pump out of the septic tank to relieve the need for effluent disposal to the disposal area.

- Surface ponding and run-off of treated wastewater;
- degradation of soil structure - eg. sheet and rill erosion, surface crusts, or hard surfaces are evident;
- poor vegetation growth;
- unusual odours.

6.0 CONCLUSION

A wastewater management system has been designed for a proposed whisky storage shed at Lot 5 DP 594645, 80 St Helena Road, McLeods Shoot. It is determined that that on-site wastewater management can be achieved at the subject site conforming to the environmental and health objectives of BSC Policy (December, 2004), provided the following is undertaken:

- Provide a minimum 1500L **septic tank** volume for wastewater collection and primary treatment to treat all wastewater generated from the proposed whisky shed amenities, and install an **effluent filter**;
- Full water saving fixtures are to be installed;
- Wastewater will gravity flow from the septic tank to **one** evapotranspiration/absorption bed of **11m** x **2.0 m** x **0.45 m** which will achieve the requirement for the hydraulic and nutrient loads;
- A catch drain is to be installed upslope of the disposal area to direct stormwater around the disposal area;
- A maintenance program listed in Section 5.0 will be undertaken by the householder.

7.0 REFERENCES

Australian Standard AS 1547 - 2012 *On-Site Domestic-Wastewater Management.*

Byron Shire Council (December, 2004). *Design Guidelines for On-site Sewage Management for Single Households.* Protecting the Environment and Health of Byron Shire. Technical Guidelines for System Designers.

Cromer W C, Gardner E A & Beavers P D. (2001) An Improved Viral Die-Off Method for Estimating Setback Distances. *Proceedings of On-site '01 Conference: Advancing On-site Wastewater Systems*. Armidale: Lanfax Laboratories.

Environment Protection Authority, Dept. of Local Government, Department of Land & Water Conservation and NSW Department of Health (Feb 1998). *Environment and Health Protection Guidelines - On-Site Sewage Management Systems for Single Households*.

Morand, D.T. (1994). *Soil Landscapes of the Lismore-Ballina 1:100,000 Sheet* Report, Soil Conservation Service of NSW, Sydney.

End of Report

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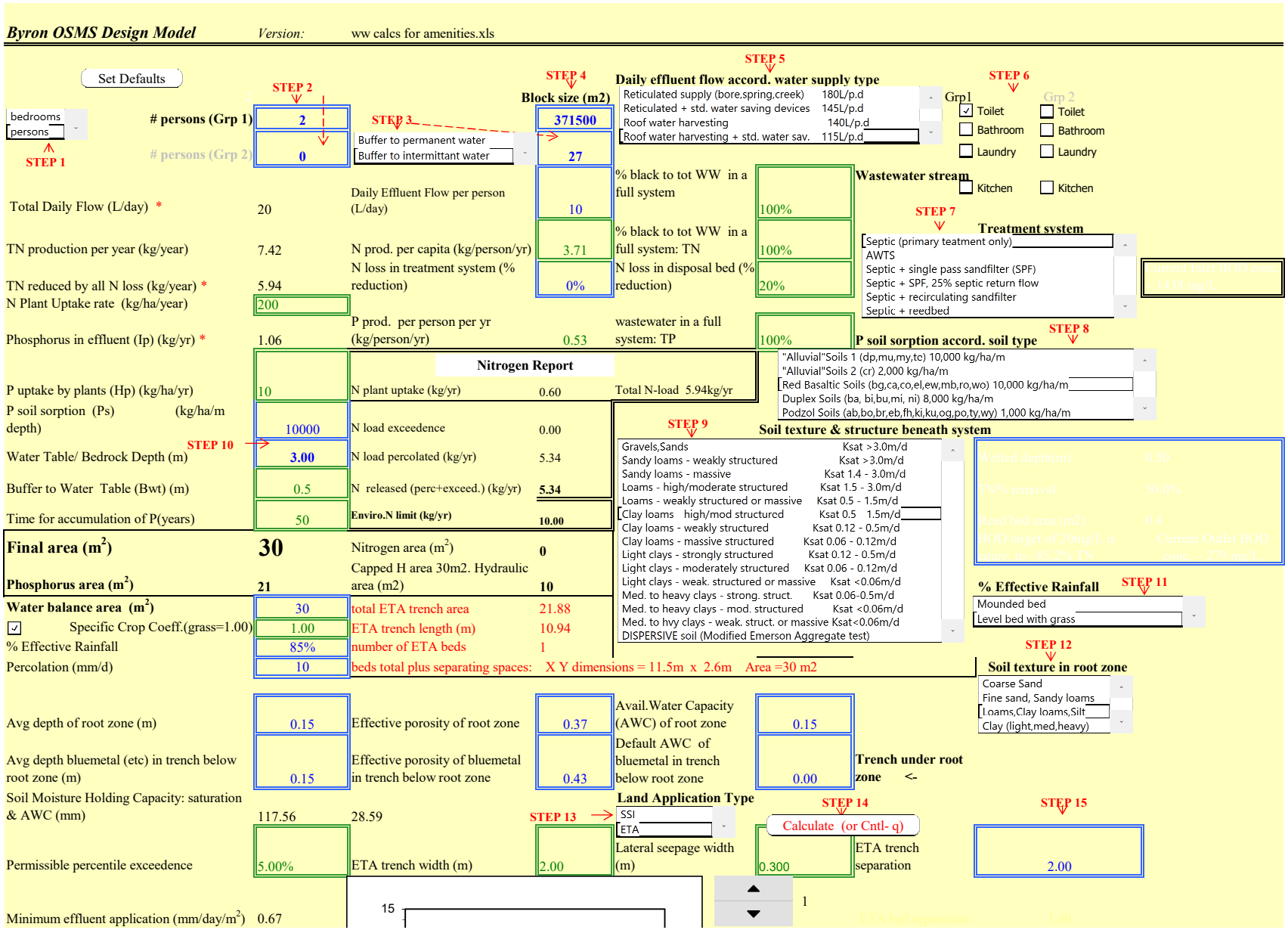
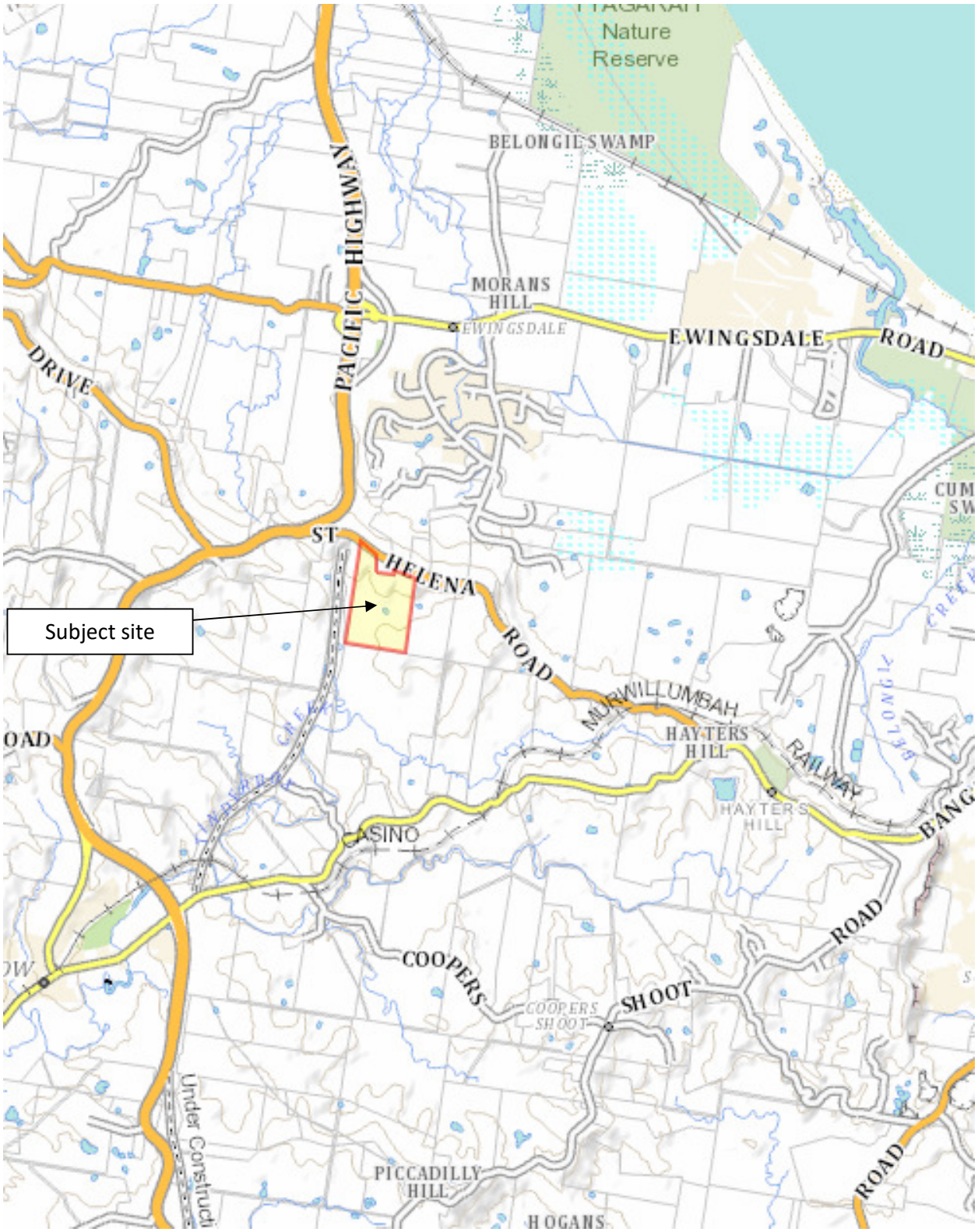
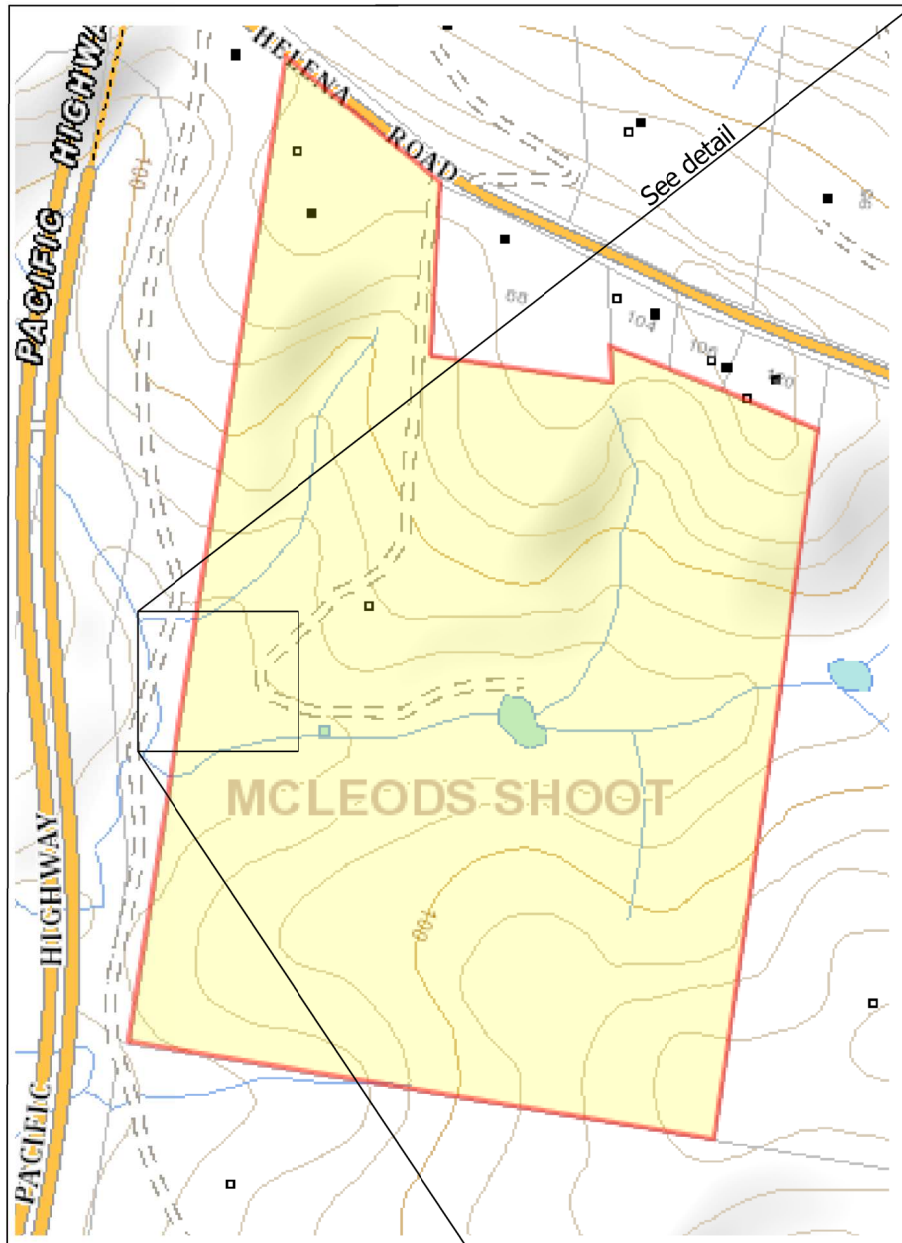
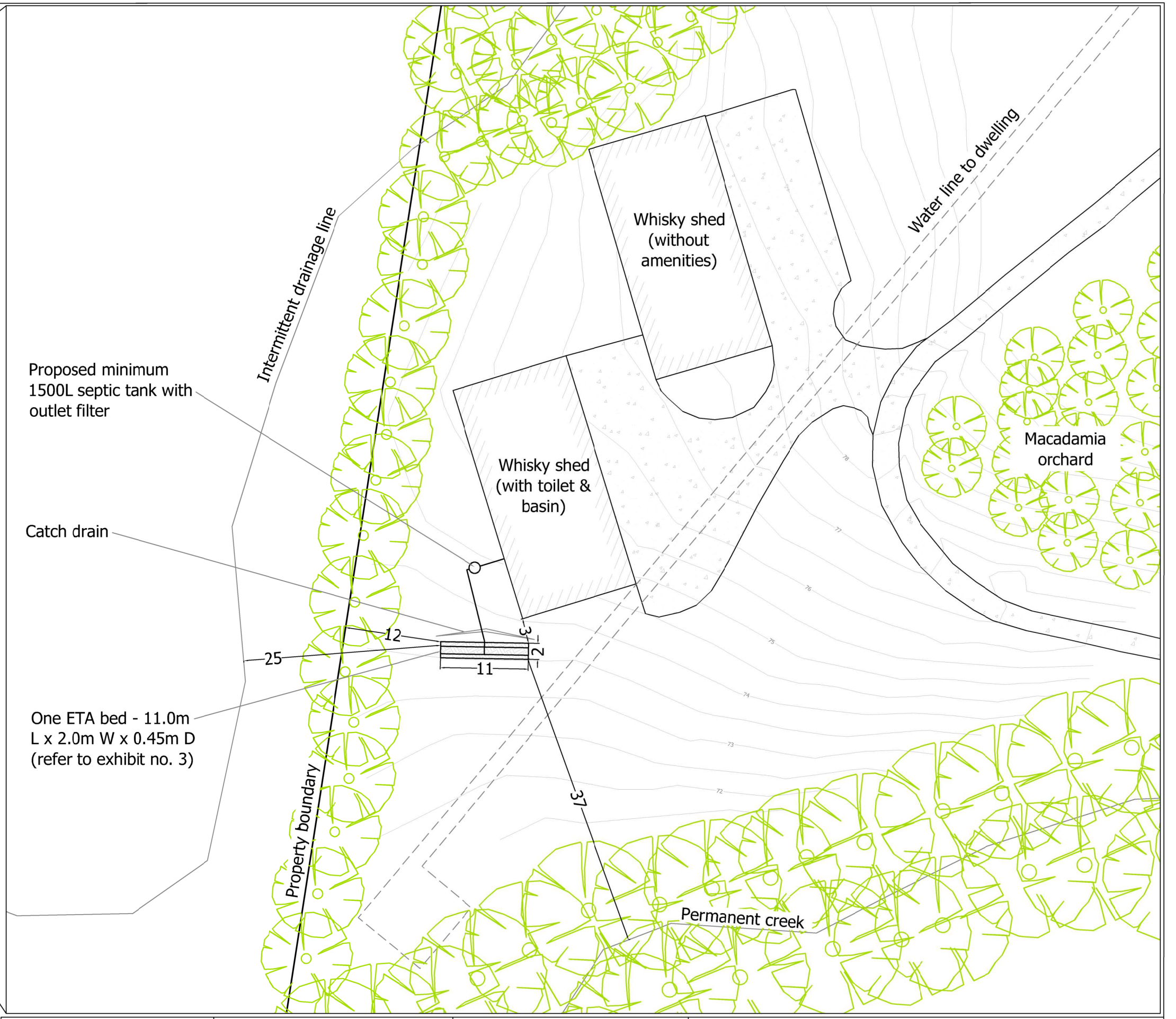

Byron OSMS Design Model
Version: ww calcs for amenities.xls
Set Defaults
STEP 1
bedrooms
persons
persons (Grp 1)
persons (Grp 2)
STEP 2
2
0
STEP 3
Buffer to permanent water
Buffer to intermittant water
STEP 4
Block size (m2)
371500
27
STEP 5
Daily effluent flow accord. water supply type
Reticulated supply (bore,spring,creek) 180L/p.d
Reticulated + std. water saving devices 145L/p.d
Roof water harvesting 140L/p.d
Roof water harvesting + std. water sav. 115L/p.d
STEP 6
Grp1
Grp 2
Toilet
Bathroom
Laundry
Kitchen
Wastewater stream
Total Daily Flow (L/day) *
20
Daily Effluent Flow per person (L/day)
10
% black to tot WW in a full system
100%
TN production per year (kg/year)
7.42
N prod. per capita (kg/person/yr)
3.71
% black to tot WW in a full system: TN
100%
STEP 7
Treatment system
Septic (primary teatment only)
AWTS
Septic + single pass sandfilter (SPF)
Septic + SPF, 25% septic return flow
Septic + recirculating sandfilter
Septic + reedbed
TN reduced by all N loss (kg/year) *
5.94
N loss in treatment system (% reduction)
0%
N loss in disposal bed (% reduction)
20%
N Plant Uptake rate (kg/ha/year)
200
Phosphorus in effluent (Ip) (kg/yr) *
1.06
P prod. per person per yr (kg/person/yr)
0.53
wastewater in a full system: TP
100%
STEP 8
P soil sorption accord. soil type
"Alluvial"Soils 1 (dp,mu,my,tc) 10,000 kg/ha/m
"Alluvial"Soils 2 (cr) 2,000 kg/ha/m
Red Basaltic Soils (bg,ca,co,el,ew,mb,ro,wo) 10,000 kg/ha/m
Duplex Soils (ba, bi,bu,mi, ni) 8,000 kg/ha/m
Podzol Soils (ab,bo,br,eb,fh,ki,ku,og,po,ty,wy) 1,000 kg/ha/m
Nitrogen Report
P uptake by plants (Hp) (kg/ha/yr)
10
N plant uptake (kg/yr)
0.60
Total N-load 5.94kg/yr
P soil sorption (Ps) (kg/ha/m depth)
10000
N load exceedence
0.00
STEP 9
Soil texture & structure beneath system
Gravels,Sands Ksat >3.0m/d
Sandy loams - weakly structured Ksat >3.0m/d
Sandy loams - massive Ksat 1.4 - 3.0m/d
Loams - high/moderate structured Ksat 1.5 - 3.0m/d
Loams - weakly structured or massive Ksat 0.5 - 1.5m/d
Clay loams high/mod structured Ksat 0.5 1.5m/d
Clay loams - weakly structured Ksat 0.12 - 0.5m/d
Clay loams - massive structured Ksat 0.06 - 0.12m/d
Light clays - strongly structured Ksat 0.12 - 0.5m/d
Light clays - moderately structured Ksat 0.06 - 0.12m/d
Light clays - weak. structured or massive Ksat <0.06m/d
Med. to heavy clays - strong. struct. Ksat 0.06-0.5m/d
Med. to heavy clays - mod. structured Ksat <0.06m/d
Med. to hvy clays - weak. struct. or massive Ksat<0.06m/d
DISPERSIVE soil (Modified Emerson Aggregate test)
STEP 10
Water Table/ Bedrock Depth (m)
3.00
N load percolated (kg/yr)
5.34
Buffer to Water Table (Bwt) (m)
0.5
N released (perc+exceed.) (kg/yr)
5.34
Time for accumulation of P(years)
50
Enviro.N limit (kg/yr)
10.00
Final area (m2)
30
Nitrogen area (m2)
0
Phosphorus area (m2)
21
Capped H area 30m2. Hydraulic area (m2)
10
Water balance area (m2)
30
total ETA trench area
21.88
Specific Crop Coeff.(grass=1.00)
1.00
ETA trench length (m)
10.94
% Effective Rainfall
85%
number of ETA beds
1
Percolation (mm/d)
10
beds total plus separating spaces: X Y dimensions = 11.5m x 2.6m Area =30 m2
% Effective Rainfall
STEP 11
Mounded bed
Level bed with grass
STEP 12
Soil texture in root zone
Coarse Sand
Fine sand, Sandy loams
Loams,Clay loams,Silt
Clay (light,med,heavy)
Avg depth of root zone (m)
0.15
Effective porosity of root zone
0.37
Avail.Water Capacity (AWC) of root zone
0.15
Avg depth bluemetal (etc) in trench below root zone (m)
0.15
Effective porosity of bluemetal in trench below root zone
0.43
Default AWC of bluemetal in trench below root zone
0.00
Trench under root zone <-
Soil Moisture Holding Capacity: saturation & AWC (mm)
117.56
28.59
Land Application Type
SSI
ETA
STEP 13
STEP 14
Calculate (or Cntl- q)
STEP 15
Permissible percentile exceedence
5.00%
ETA trench width (m)
2.00
Lateral seepage width (m)
0.300
ETA trench separation
2.00
Minimum effluent application (mm/day/m2)
0.67
15
1



Source: NSW LPI Spatial Information Exchange (2019) Date 5/11/2019 Project No. 16098_ww whisky shed.doc Scale: NTS	**GREG ALDERSON AND ASSOCIATES** **ABN 58 594 160 789** 43 Main Street Clunes NSW 2480 Phone: (02) 6629 1552 Email: office@aldersonassociates.com.au	**Exhibit No. 1.** **SITE LOCATION** Lot 5 DP 594645, 80 St Helena Road, McLeods Shoot



Site Plan
1:6666



Wastewater Notes:

1. The system is designed to service the toilet amenities (1 x toilet & 1 x sink) within the whisky storage shed;
2. Connect wastewater to new 1500L (minimum) septic tank. The outlet of the new septic tank will be fitted with **effluent filter**;
3. Construct **one** evapotranspiration/absorption bed (ETA) for disposal of wastewater after the proposed septic tank;
4. The ETA bed is to be 11.0m x 2.0m x 0.45m and installed in accordance with AS 1547-2012 (see exhibit No. 3);
5. A catch drain is to be installed above the ETA bed to direct overland run-off around the disposal area;
6. Final location of septic tank to be determined onsite;
7. Vegetation is shown indicatively only.

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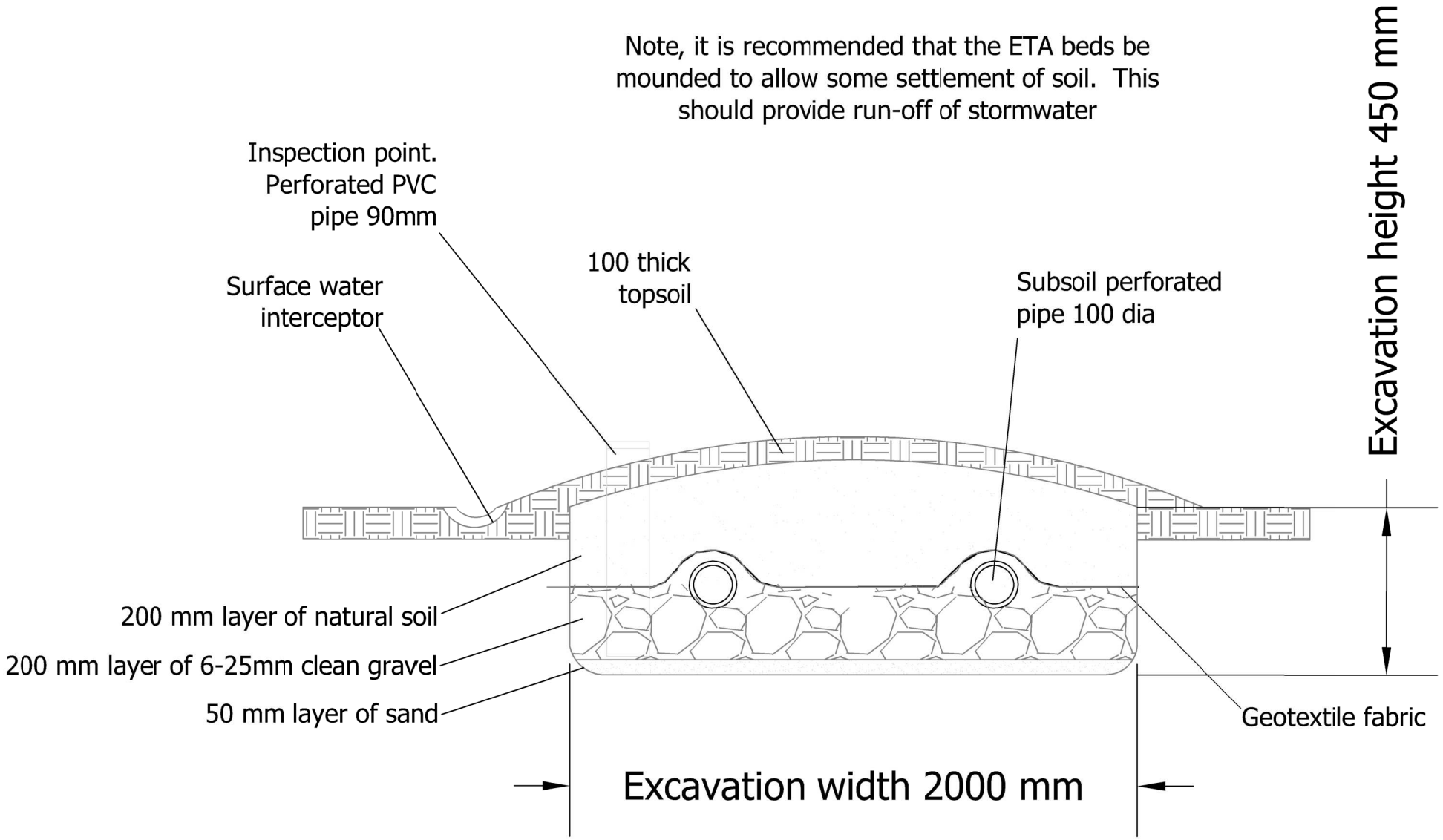
Client: Cape Byron Distillery

Site address: Lot 5 DP 594645, 80 Saint Helena Road, McLoeds Shoot

SITE LAYOUT AND PROPOSED OSMS LOCATION

Drawn:	Source:	EXHIBIT NO: 2	Date:
DB	Contours and shed locations from AGS Commercial Pty Ltd		5/11/19
Scale: 1:500	Original Size: A3	Project: Whisky Storage sheds	Revision: –
Job Number: 16098			

Note, it is recommended that the ETA beds be mounded to allow some settlement of soil. This should provide run-off of stormwater



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EVAPOTRANSPIRATION/ABSORPTION BED DETAIL

Drawn:	Source:	EXHIBIT NO:	Date:
DB	Greg Alderson & Associates, ASNZS 1547:2012	3	5/11/19

Scale:	Original Size:	Project:	Revision:
1:20	A4	Whisky Storage sheds	-

Job Number: 16098