



Ros Tomlinson

## Effluent Disposal Feasibility Report

Proposed Development

74 Longleat Lane, Kurmond

SY160307

May 2017

PLANNING  
PROJECT MANAGEMENT  
ENGINEERING  
CERTIFICATION

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# 1 Introduction

Barker Ryan Stewart has been engaged to investigate the Effluent Disposal requirements of a proposed subdivision of Lot 3 DP 747089, being 74 Longleat Lane, Kurmond. The proposal involves the creation of one lot on a parcel of land located in the south western corner of the property as is shown on the proposed subdivision plan in Appendix A.

The site currently has a total site area of 3.095 hectares and is proposed to be subdivided into two lots with areas of 2.58 hectares (Lot 12 which will contain the existing residence) and 0.515 hectares (Lot 11 which has an existing building located on it. This building has been used as a studio and it is proposed to utilise this as the main residence on the lot.

The land generally slopes to the south of the site and has a depression that passes from the existing large dam into a smaller dam and to the southern boundary. The large dam is located up above the existing studio and the small dam is located on the proposed Lot 11. The studio has its own effluent disposal system which is separate to the main residence.

The OSSM system is to be installed in accordance with:

- Treat effluent on-site using a certified method in accordance with Environmental Health Protection Guidelines (DLG 1998) and AS/NZS 1547:2012 (SAI & NZS 2012).
- Comply with the requirements/objectives of the Environmental Health Protection Guidelines (DLG 1998).
- Hawkesbury Council Development Control Plan.

## 2 Site Assessment

### 2.1 Existing System and Development

There are two existing dwellings on the site, comprising of the main house and a secondary one bedroom dwelling that had been used as an artist's studio for many years. It is this studio and the parcel of land surrounding it that is proposed to be subdivided.

The effluent disposal system servicing the main premises is located at the rear of the dwelling and the associated landscaped surrounds. It services the three bedroom dwelling and is comprised of a septic tank with an infiltration trench located a short distance below it.

The studio is also serviced by septic and absorption trench system, with the septic being positioned immediately at the rear of the studio and the trench just below it.

A visual inspection of the existing absorption trenches has shown that they appear to be functioning well and have been maintained in a satisfactory manner. Approximate locations of the septic tanks (shown as red dots) and absorption trenches (as pink) are shown in figure 2.1 below.



Source SixMaps Spatial Information Exchange

**Figure 2.1 Location of Existing Septic Tanks Absorption Trenches**

## 2.2 Proposed System and Development

There are to be no improvements or alterations to the existing main residence, with the second lot being located some 40 plus away from the septic and absorption trench that serve the residence.

There are also no plans for the upgrading or altering of the existing studio and effluent disposal system located on the proposed lot within this application. The current owners of the property do however expect that once the created lot and studio are sold then the dwelling will be either added to or knocked down and a new dwelling erected. It is expected that at this time a new effluent disposal system will be required to be installed to suit the new larger dwelling. Based on this assumption, this report has undertaken a site assessment for such a proposal to show that the proposed lot could cater for it.

## 2.3 Site Assessment Factors

A Site assessment rating for the on-site system has been undertaken in accordance with Table 4 of the OSMSH and is shown below in Table 3.1. According to Bannerman and Hazelton and publication Soil landscapes of the Penrith 1:100000 sheet, the soil landscape of the area is that of the Luddenham (Lu) soil type.

**Table 3.1 – Site Assessment – Rating for On-Site Systems**

Site Feature	Limitation	Rating	Comments
Flood Potential	Above 1 in 100 year flood	Minor	
Exposure	Exposure – High sun and wind exposure.	Minor	
Slope %	Absorption system	Minor	
Landform	Hill Crest, convex side slopes and plains	Minor	
Run On and U/S Seepage	Minimal catchment located above	Minor	
Erosion Potential	No visible signs of erosion	Minor	
Site Drainage	No visible sign of surface dampness	Minor	
Fill	No Fill	Minor	
Buffer Distance	Refer section 3.3	Minor	
Land Area	Refer section 3.3	Minor	
Rock Outcrops	No rock outcrops / floaters are visible	Minor	
Geology	Land appears homogeneous	Minor	

A Soil assessment rating for on-site systems in accordance with Table 6 of the OSMSH document has been undertaken in Table 3.2 below. There are no major limitations that have been encountered in either the site assessment or the soil assessment.

The following information was found to occur within the effluent disposal area.

- Soil classification –clay loam to sandy clay loam
- DIR from limiting lower profile – 15
- pH – 6.5
- Permeability is high across all soil layers
- Depth to bedrock 1.0m plus
- Phosphorus absorption index assumed high absorbance of phosphorus
- No water table was sighted.

**Table 3.2 – Soil Assessment – Rating for On-Site Systems**

Soil Feature	Limitation	Rating	Comments
Depth to Bedrock	>1.5m plus	Minor	
Depth to watertable	No visible water table	N/A	
Soil Permeability	Sandy Clay Loam	minor	
Course Fragment	2-10	Minor	
pH	>6	Moderate	
Electrical Conductivity	<4	Minor	
Sodicity	Low (assumed)	Minor	
Phosphorous Sorption	High (assumed)	Minor	
Emerson Aggregate Test	Class 1 (assumed)	moderate	

The site is considered to be suitable for onsite disposal of the effluent generated from the facility by means of an absorption trench after treatment from the existing septic system or by a drip irrigation system located subsurface.

### 3 Possible Effluent Disposal System Design

#### 3.1 Septic System

Should the studio be replaced with a new dwelling, the new residence will typically comprise of three bedrooms with a population equivalent of 4 persons which equates to a design flow of 1000 L/day. It is assumed that an aerated wastewater treatment system will be installed as per AS/NZS 1547:2012.

#### 3.2 Buffer Distances

The allowable buffer distances provided for an absorption system are listed below together with the provided distances.

- 12 metres if area up-gradient and 6 metres if area down-gradient of property boundary – 12m, achieved.
- 6 metres if area up-gradient and 3 metres if area down-gradient of swimming pools, driveways and buildings, 6m up-gradient and 3 metres down-gradient.
- 40 metres to a farm dam, intermittent waterway and drainage channel.

These distances can all be readily achieved.

#### 3.3 Design Calculations

##### 3.3.1 Introduction

The following design calculations are based on Appendix L of AS/NZS 1547:2012 and Councils On Site Sewage Management Policy and have been included to demonstrate the feasibility of providing an absorption trench.

In accordance with the OSMSH guidelines calculations for the irrigation area were undertaken with consideration given to the nutrient loading capacity, phosphorous loading capacity and hydraulic loading capacity for the site.

##### 3.3.2 Wastewater Flows

It is assumed that the proposed dwellings could contain three bedrooms and is capable of accommodating four people.

The daily flow rate per person has been determined using Appendix H of AS/NZS 1547:2000. This was found to be 150 Litres/Person/day.

Therefore the daily design wastewater flows are:

$$Q_{\text{wastewater}} = 150 \times EP = 150 \times 4 = 600 \text{ Litres/day}$$

##### 3.3.3 Sizing the absorption Trench

$$L = Q_{\text{wastewater}} / (\text{DLR} \times W)$$

L = length in m

Q = design daily flow in L/day

DLR = design loading rate in mm/d



W = width in m

$$L = 600 / (10 \times 4) = 15\text{m}$$

This value is conservative and based on the worst soil conditions. An area of 15m by 4m wide can easily be accommodated on the proposed lot together with a new larger residence.

## 4 Summary

This report has considered the suitability of the onsite sewerage management systems that service the existing residences on 74 Longleat Lane, Kurmond. It has found that the existing effluent systems that service the dwellings are of adequate size and appear to be functioning in an adequate manner.

An assessment of the site was also undertaken in accordance with the requirements of AS/NZS 1547:2000 – On-site domestic wastewater management. As a result of this assessment the new lot has been found to be suitable to support the installation of a conventional absorption trench, without having detrimental impact on the environment. Should a new system be required due to alterations or renewal of the existing studio, it will need to be installed, operated and maintained in accordance with the manufacturer's instructions and the Council conditions of approval and can only be approved under a separate application to council.

## 5 References

NSW Department of Local Government, NSW Environment Protection Authority, NSW Health Department, NSW Department of Land & Water Conservation and the NSW Department of Urban Affairs and Planning, 1988. Environment & Health Protection Guidelines, On Site Sewage Management for Single Households.

Standards Australia/Standards New Zealand (2000) 1547:2000. On site Domestic Wastewater Management.

Bannerman, SM & Hazelton PA (1990), *Soil Landscapes of the Penrith 1:100,000 Sheet*, Soil Conservation Service of NSW, Sydney

Hawkesbury Council (June 2004), Development Control Plan Chapter 7.

The Department of Primary Industries (1968), <http://allwaterdata.water.nsw.gov.au/water.stm>

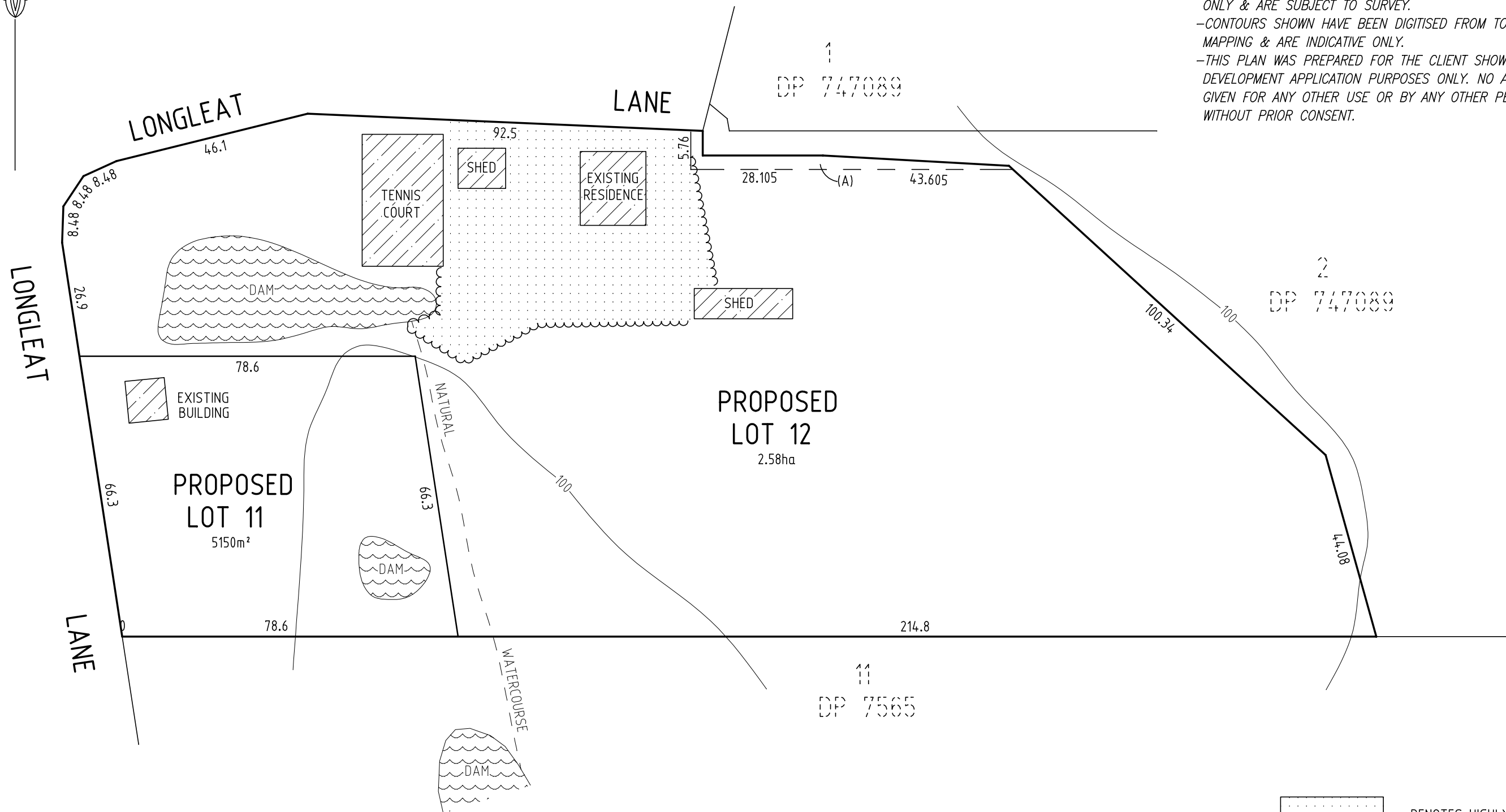
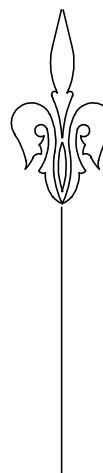
## **Appendix A: Proposed Subdivision and Site Plan**

**A3 ISSUED FOR CERTIFIER/COUNCIL APPROVAL**

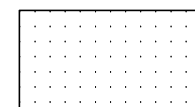
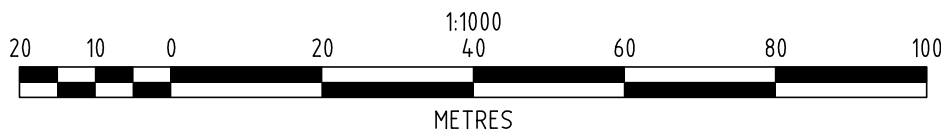
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(A) EASEMENT FOR SUPPLY OF ELECTRICITY VARIABLE WIDTH (DP 747089)



DENOTES HIGHLY VEGETATED AREA



F		0	5	10	15	20	25	MILLIMETRES AT A3	50	55	60	65	70	75
E	DESIGN BY	REDUCTION RATIO AT A3 1:1000												
D	SURVEY BY	CONTOUR INTERVAL												
C	CALCS BY	ORIGIN OF LEVELS TOPOGRAPHIC MAP												
B	DRAWN BY G.DOUGLAS	DATUM APPROXIMATE A.H.D.												
A	CHECKED BY A.EDWARDS													
Date	REVISION													



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DATE 7/5/2014  
 FILE No. 93428  
 COUNCIL REF

CLIENT NAME FALSON & ASSOCIATES  
 LOCALITY KURMOND LGA HAWKESBURY  
 PLAN No. 93428:DA:1 C.FILE: 93428DA1.DWG

**PLAN OF PROPOSED SUBDIVISION OF LOT 3 DP 747089 - LONGLEAT LANE, KURMOND**

SHEET No. 1 OF 1 SHEETS