REF: 4001WW

VERSION [1.1]

NOVEMBER 6, 2020

SOIL AND SITE ASSESSMENT FOR ONSITE WASTEWATER DISPOSAL

64 CLARKE ROAD, LONDONDERRY, NSW

LGA: Penrith

Lot 2 DP 512998

CLIENT: Mathew Teuma

HARRIS ENVIRONMENTAL CONSULTING
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VERSION CONTROL

Title	Soil and Site Assessment for Onsite Wastewater Disposal			
Site address	64 Clarke Road, Londonderry, NSW			
Description	Two proposed dwellings			
Date Created	26/10/2020			
Version Number	**Modified By**	**Modifications Made**	**Date Modified**	**Status**
[1.0]	P.S.	Issue for client review	28/10/2020	Complete
[1.1]	P.S.	Issue for client review (new site plan)	6/11/2020	Complete

Limitations

The findings and recommendations in this report are based on the objectives and scope of work outlined above. Harris Environmental Consulting Pty performed the services in a manner consistent with the normal level of care and expertise exercised by members of the environmental assessment profession. The report and conclusions are based on the information obtained at the time of the assessment. Changes to the site conditions may occur subsequent to the investigation described herein, through natural processes or through the intentional or accidental addition of contaminants, and these conditions may change with space and time. The results of this assessment are based upon site assessment conducted by HEC personnel and information provided by the client and site management. All conclusions regarding the property are the professional opinions of the HEC personnel involved with the project, subject to the qualifications made above. While normal assessments of data reliability have been made, HEC assumes no responsibility or liability for errors in any data obtained from regulatory agencies, information from sources outside of HEC, or developments resulting from situations outside the scope of this project.

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1. INTRODUCTION

This Site and Soil Assessment for On-site Wastewater Management was prepared by Harris Environmental Consulting at the request of Mathew Teuma. It relates to the construction of two proposed dwellings on Lot 2 DP 512998 at 64 Clarke Road, Londonderry, NSW. Each proposed dwelling will have a separate wastewater treatment and disposal area.

Fieldwork was undertaken by a representative of Harris Environmental Consulting (HEC) on 21th October 2020. This plan is based on the primary investigation of the soils, topography and hydrology of the site observed on the day of inspection. Soil samples and photos of the site were taken for further analysis. This assessment was undertaken for a proposal to use an Aerated Wastewater Treatment System and subsurface irrigation for treated wastewater disposal for each dwelling.

2. ASSESSMENT CRITERIA

Harris Environmental Consulting prepared this report in accordance with:

- Penrith City Council's On-site Sewage Management and Greywater Reuse Policy
- Australian Standard AS/NZS 3500 Plumbing and Drainage 2018
- Environment and Health Protection Guidelines (1998) On-site Sewage Management; for Single Households (Department of Local Government)
- AS/NZ 1547:2012 On-site wastewater management (Standards Australia, 2012)

FIGURE 1 LOCATION OF PROPERTY

Source: SixMaps

3. SITE INFORMATION

Owner & contact details:	Maureen Teuma 0414933327 Matt Teuma 0417463726	
Project manager:	Joseph Mammone Nominated Architect. Registration No.9450 A 26A Oaklands Circuit, Gregory Hills NSW 2557 M 0420 945 363 E joseph@jmammonearchitecture.com.au	
Size of property:	Approx 2ha	
Site address:	64 Clarke Road, Londonderry, NSW	
Legal title:	Lot 2 DP 512998	
Local Government:	Penrith Council	
Water supply:	Town	
Wastewater design load and daily wastewater (L/day); *Assume two persons for a master bedroom, two persons for a guest room and one person per additional bedroom*	No. of bedrooms in proposed new dwelling	3-bedroom dwelling (2 x master + 1 bedroom)
	Design wastewater load	5 persons x 150L/day = **750L/day**
	No. of bedrooms in project home to replace the existing house	4 bedrooms + study (2 x master + 2 bedrooms + 1 x study)
	Design wastewater load	7 persons x 150L/day = **1050L/day**
PCC method of calculating irrigation area *Assume clay soils, reticulated water supply*	3-bedroom dwelling	**556m^2**
	5-bedroom dwelling	**833m^2**
Proposed wastewater treatment for each dwelling:	AWTS	
Proposed wastewater disposal for each dwelling:	Subsurface irrigation	
Date site assessed:	October 21, 2020	
Date report prepared:	November 6, 2020	
Report prepared by	Pichamon Sarakan B.Env Engineering (UOW)	
Site assessor:	 Sean Harris	Msc Env Science (UOW), Grad dip Nat Res (UNE), BscAppSc, Agriculture (HAC)

4. SITE ASSESSMENT

Climate - rainfall	Richmond - UWS Hawkesbury Rainfall Station (median annual 792.2mm)
Climate - evaporation	Badgerys Creek (median 1557mm)
Flood potential	Proposed wastewater treatment system must be above 1 in 100 year flood level and wastewater disposal area must be above 1 in 20 year flood level. These flood contours were not available for the preparation of this assessment.
Frost potential	Not known to be subject to frosts, minor limitation
Exposure	Northern aspect; minor limitation
Slope	1-2%, minor limitation
Landform	Uniform slope, minor limitation
Run-on and seepage	Minor upslope stormwater runon; minor limitation
Erosion potential	Minor erosion potential
Site drainage	Moderate to well drained soil profile; minor limitation
Evidence of fill	No evidence of fill; minor limitation
Domestic groundwater use	No groundwater bores within 100m
Surface rock	No surface rock; minor limitation
Area available for effluent disposal	Area available for effluent disposal within designated Effluent Management Area (EMA), minor limitation

FIGURE 2 PROPOSED DEVELOPMENT

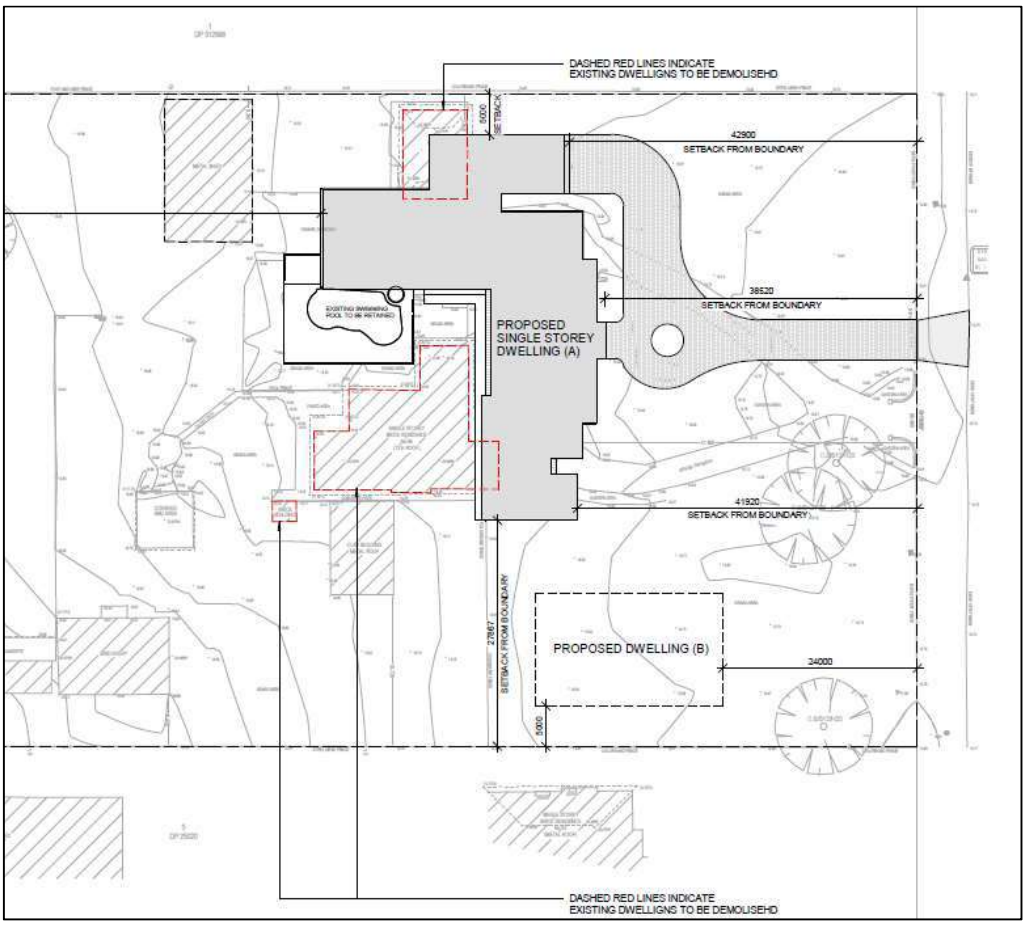
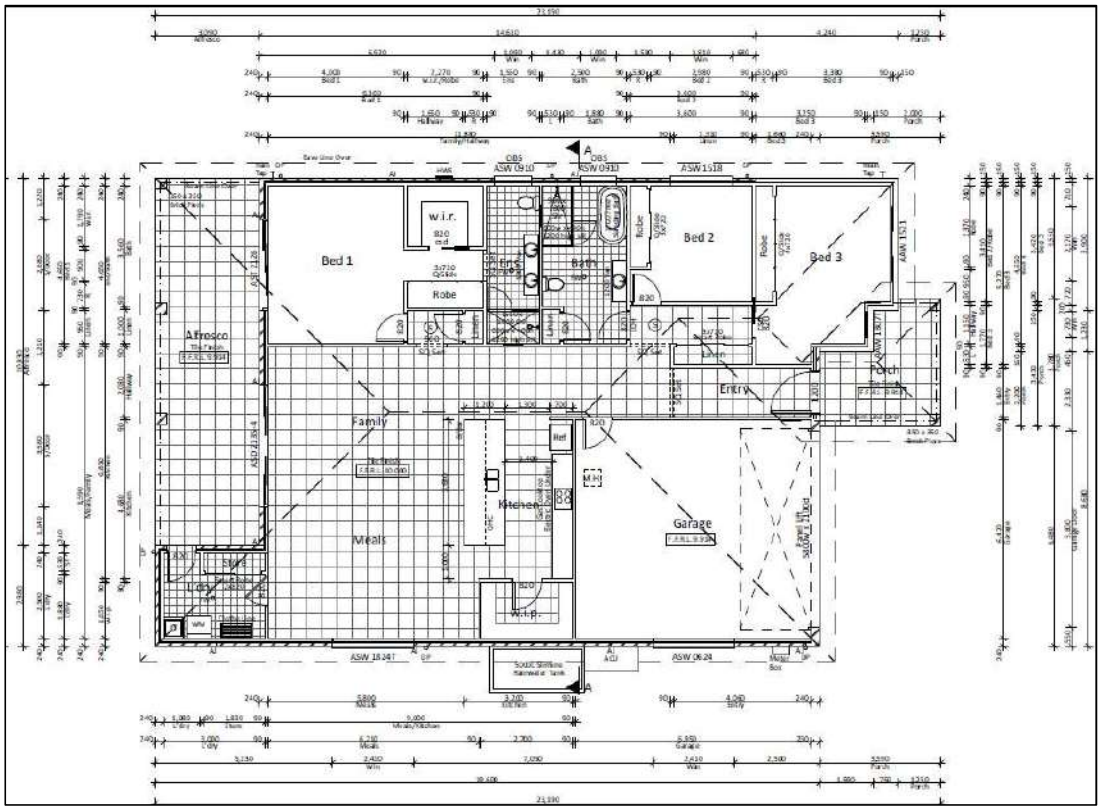


FIGURE 3 FLOOR PLAN OF PROPOSED DWELLINGS



5. SOIL ASSESSMENT

Method:	Hand augur/crowbar/shovel		
Depth to bedrock (m):	1000mm to restrictive layer; minor limitation		
Depth to high soil watertable:	No groundwater or subsoil mottling encountered at a depth of 1000mm; minor limitation		
Coarse (%):	0-5% coarse fragments in subsoil, minor limitation		
pH (soil/water):	pH 5.5-6; minor limitation		
Electrical conductivity:	<4dSm, minor limitation		
Salinity hazard:	Moderate salinity; moderate limitation		
Domestic groundwater use:	The Department of Primary Industries Office of Water search of groundwater bores found there are **no known groundwater bores** within 100m of the proposed effluent management area		
Native vegetation and environmentally sensitive vegetation	No native vegetation or environmentally sensitive vegetation within 1m of the proposed EMA.		
Geological unit: Soil landscape:	Sedimentary rocks (undifferentiated consolidated Cenozoic sedimentary rocks; sandstone, limestone, conglomerate, siltstone, duricrust; commonly ferruginised or silicified; may be poorly consolidated, highly weathered, and dissected by present day drainage). Berkshire Park Soil Landscape CSIRO classification - Yellow duplex		
Surface rock:	No surface rock in proposed effluent management area		
Bulk density:	Permeable, well-drained soil profile in Layer 1 & 2, hard setting compacted subsoil as Layer 3		
Soil profile, from two similar soil profiles in EMA:	Layer 1		DIR
	Texture Colour Depth Structure Coarse frag.	Fine sandy loam Grey 0-300mm Apedal NA	NA
	Layer 2		DIR
	Texture Colour Depth Structure Coarse frag.	Sandy clay loam Grey 300-500mm Weakly 0-5%	NA
	Layer 3		DIR
	Texture Colour Depth Structure Coarse frag.	Light/medium sandy clay Tan 500-1000mm Massive 0-5%	NA

6. SUMMARY OF SOIL AND SITE CONSTRAINTS

There are no major soil or site constraints that would limit the installation of a new Aerated Wastewater Treatment System (AWTS) for wastewater treatment and subsurface irrigation area for treated wastewater disposal for each dwelling.

The site constraints that were considered include native trees and a dam in the rear of the property.

It is proposed subsurface irrigation will be installed at the north and southeast of the proposed dwellings, in a location that is compliant with the buffers and setback distances required by Penrith City Council. This includes locating the proposed irrigation area more than 6m from downslope boundary lines/driveways/dwellings/buildings, 3m from upslope boundary lines/driveways/dwellings/buildings**. The existing driveway will be removed and returned to grassland. This will require deep ripping of soil after the road is removed, adding approx. 150mm of topsoil and and laying turf.**

Photo 1 On-site soil assessment profile

Photo 2 Looking west across proposed irrigation on the western side of the driveway

Photo 3 Proposed irrigation on the western side of the driveway (looking towards the existing garage)

Photo 6 Driveway to be decommissioned and returned to grassland

Photo 7 Native trees (1m around dripline)

7. PROPOSED METHOD OF WASTEWATER TREATMENT

7.1 WASTEWATER TREATMENT SYSTEM

The design wastewater load for the 3-bedroom dwelling is 750L/d and for the 4-bedroom dwelling + study is 1050L/day. A domestic AWTS is required for each dwelling.

Council will require the domestic AWTS manufacturer's specifications of the Sewage Management Facility. (Information on proposed AWTS can be obtained from the manufacturer or NSW Heath Register of Accredited Sewage Management Systems at http://www.health.nsw.gov.au/publichealth/environment/water/waste_water.asp).

The AWTS manufacturer will provide the necessary plans and specifications including NSW Health Accreditation, tank dimensions and capacity, operation and maintenance details, plus Licensed Plumber's name, address, phone number and license number.

The AWTS will be installed and maintained in accordance with Section 5 of the guidelines 'On-site Sewage Management for Single Households' (Department of Local Government, 1998) and AS/NZS 1547-2012 'On-site Domestic Wastewater Management' (Standards Australia, 2012);

Upon approval from **Penrith Council,** the owner is to enter into a servicing contract with an approved servicing agent for the life of the system. Copies of the written service reports should be lodged with **Penrith Council** following each quarterly service

7.2 LOCATION OF PROPOSED AWTS

The location of the AWTS should be decided in conjunction with the licensed plumber in consultation with the property owner. The AWTS must be positioned on a stable, level base and be downslope of the building so there is sufficient fall from drainage outlets in the dwelling. The location of AWTS must be

- The exact location of the AWTS is to be decided by the installer in consultation with the property owner.
- It is to be at least 1.5m from any building.
- A power supply (and telephone line if telemetry or an automated monitoring/ alarm is fitted), will be required to deliver power to the treatment unit.
- Shall be located above the 1% AEP (1:100) flood contour.

AWTS installation must comply with the manufacturer's recommendations, AS/NZS 3500.2:2018 Plumbing and Drainage Part 2 Sanitary Plumbing and Drainage' and Council requirements.

7.3 INSTALLATION OF PIPES

The sewer pipes between the plumbing amenities, AWTS and irrigation area must conform with 'AS/NZS 3500(Set):2018 Plumbing and Drainage Set' specifying the nominal pipe sizes and respective minimum grades. Table 1 contains these specifications.

In addition, where a sewer carrying untreated wastewater to a treatment system is longer than 60 metres, the minimum grade should be doubled, and inspection ports should be installed at least every 30 metres or at an angle or change of grade.

The sewer pipes between the plumbing amenities, AWTS and irrigation area must be buried at a depth that provides protection against mechanical damage or deformation, in accordance with 'AS/NZS 3500.2:2018 Plumbing and Drainage Set'. Table 2 shows the minimum pipe depth for trafficable areas.

TABLE 1 Minimum pipe diameter and grade calculations

Nominal pipe size (DN)	Minimum grade %	Minimum grade ratio
65	2.5	1:40
80	1.65	1:60
100	1.65*	1:60
125	1.25	1:80
150	1.00	1:100
* Except for drains from septic tanks, sewage treatment plants and unvented discharge pipes from tundishes, which may have a minimum grade of 1%, Source: 'AS/NZS 3500.2:2018 Plumbing and drainage Part 2 Sanitary plumbing and drainage' Table 3.4.1. NB: pipe grades are expressed as a percentage of vertical to horizontal distances.		

TABLE 2 Minimum pipe depth for trafficable areas

Location	Minimum depth of cover (mm) for all materials other than cast iron
Where subject to vehicular traffic	500
Elsewhere	300
Source: 'AS/NZS 3500 (Parts 0-4):2018 Plumbing and drainage Set'. Table 3.7.2 Minimum Cover for Buried Pipes'	

7.4 SWIMMING POOL WASTEWATER

The existing swimming pool will be retained. The overflow from the pool runs to the rear of the property. The pool wastewater does not enter the grassed lawn that is to be used for wastewater disposal.

8. REQUIRED IRRIGATION AREA

In accordance with *Table 2 Sizing of Domestic Aerated Wastewater Treatment Systems Effluent Disposal Areas* of the Penrith City Council's On-Site Sewage Management Policy, (Appendix II) the required irrigation area for a dwelling on clay soil types with town water supply:

- A 3-bedroom house will require a 556m^2 irrigation area.
- A 5-bedroom house will require an 833m^2 irrigation area.

9. LOCATION AND METHOD OF IRRIGATION

- 833m^2 of subsurface irrigation is proposed for the proposed 5-bedroom dwelling and 556m^2 of subsurface irrigation is proposed for the proposed 3-bedroom dwelling.
- The installer is expected to make adjustments to the alignment of drip lines, location of distribution lines and water rotors to suit the site conditions.
- The installation and location of subsurface irrigation can be found in the Appendix.
- The Site Plans show the 833m^2 irrigation area is split into 4 x 209m^2 zones.
- The Site Plans show the 556m^2 irrigation area is in 4 x 139m^2 zones

10. SUMMARY

The purpose of this assessment is to assess whether on-site wastewater management can be undertaken on the subject lot to achieve the relevant assessment criteria. This assessment finds that on-site wastewater management can be undertaken for the proposed dwellings.

Following the soil and site assessment, the following is proposed:

Proposed 5-bedroom dwelling:

- Installation of an Aerated Wastewater Treatment (AWTS) for wastewater treatment; and

- Installation of 833m^2 subsurface irrigation for treated wastewater disposal, as shown on Site Plan.

Proposed 3-bedroom dwelling:

- Installation of an Aerated Wastewater Treatment (AWTS) for wastewater treatment; and

- Installation of 556m^2 subsurface irrigation for treated wastewater disposal, as shown on Site Plan.

11. REFERENCES

Department of Local Government (1998) *On-site Sewage Management for Single Households*. NSW Government.

Standards Australia (2012) Australian/New Zealand Standard 1547:2012 *On-site domestic wastewater management*. Standards Australia.

NSW Health Septic Tank Accreditation Guidelines (2001).

Hazelton, P.A and Murphy, B.W ed. (1992) *What Do All the Numbers Mean? A Guide for the Interpretation of Soil Test Results.* Department of Conservation and Land Management (incorporating the Soil Conservation Service of NSW), Sydney.

Penrith City Council Development Control Plan

APPENDIX I SUBSURFACE IRRIGATION

i) If wastewater is split into equal zones, each zone must receive an even proportion of wastewater, using a sequencing valve, such as a water rotor or similar.

ii) Immediately after the AWTS, a disc filter or a 100 to 150 micron filter is to be installed (ie, before the sequencing valve). The filter must be cleaned regularly (at least every 3 months).

iii) The distribution pipe from the AWTS to the water rotor shall consist of a 25mm uPVC or polythene pipe, buried 300mm underground. Where vehicles pass over the line, it should be 450mm for light traffic and 500mm for heavy traffic.

iv) Pressure compensating subsurface drip line is used with emitters and laterals at approximately 750mm spacing's (maximum of 1000mm) and buried to a depth of 100-150mm below finished ground level (in accordance with ASNZ1547:2012).

v) The drip line is to be impregnated with root inhibitor or include a tech filter that dispenses a root inhibitor (a chemical injector assembly or impregnated emitter tube) to protect drip line from root ingress.

vi) Air release valves should be located at the highest point and flush valves at the lowest point of each sub-surface zone and shall be contained within a durable protective housing with a lilac lid to indicate wastewater.

vii) Additional air/vacuum valves, pressure-reducing valves and non return / tube non-leakage valves are to be included into the design as needed. ie., where the effluent irrigation area is located above the treatment system or pump well, a non return valve.

viii) The system must have capacity to enable flushing to remove any suspended solids and organic growth that may accumulate.

ix) The effluent irrigation system should be tested to ensure there is uniform effluent delivery to all parts of the irrigation area.

x) The effluent management area must be fenced off from livestock and vehicles.

xi) The irrigation area should be vegetated with grass before commissioning. The grass within the irrigation should be mown on a regular basis and dispose of clippings outside the irrigation area.

APPENDIX II SIZING EFFLUENT DISPOSAL AREAS

Sizing of AWTS Effluent Disposal Areas			
Suburb	**No. of Bedrooms**	**Surface and Sub-Surface Irrigation Areas (m^2)**	
		Reticulated Water	Tank Water
Sandy Soil Types ***Agnes Banks - east of Castlereagh Road. Castlereagh - north of Devlin Road and east of Castlereagh Road.***	**2**	584	467
	3	779	623
	4	973	778
	5	1168	934
	6	1326	1090
Clay Soil Types ***Most other areas***	**2**	417	334
	3	556	444
	4	695	556
	5	833	667
	6	972	778

Notes: *(1) The irrigation areas in Table 2 are calculated using conservative figures to enable the sustainable management of effluent. A property owner can provide a Wastewater Assessment Report to support a proposal for a smaller irrigation area.*

(2) The Effluent Disposal Area (EDA) is based on nutrient balances as they are considered to be the most limiting factors in these areas.

(3) Figures in Table 2 are based on:

- *150 litres per person/day or 120 litres per person/day for tank water supply*
- *One person per bedroom and two for a master bedroom*
- *TN output value of 25 mg/L and a Critical Loading Rate of 27 mg/m^2/day*
- *TP output value of 12 mg/L*
- *P sorption capacity - 600,000 mg/m^2/depth for clay soil types or 400,000 mg/m^2/depth for sandy soil types*
- *Design Irrigation rate of 15 mm/week for clay soil types or 35 mm/week for sandy soil types.*

(4) A Wastewater Assessment Report is required for applications with more than 6 bedrooms.

(5) Council assesses effluent loading based on two persons for a master bedroom, two persons for a guest room and one person per additional bedroom. A study or any other room that has the potential to be used as a bedroom will be considered as an additional bedroom.

APPENDIX III BUFFERS AND SETBACK DISTANCES

System	Buffer Distances
All OSSM systems (including tank)	• 250 metres to domestic groundwater well • 100 metres to permanent surface waters (e.g. rivers, creeks, streams, lakes etc) • 40 metres to other waters (e.g. dams, stormwater easements, overland flow paths, intermittent waterways and drainage areas etc) • 15 metres from an in-ground water tank • 1 metre from the drip line of native trees and shrubs • For tank – minimum 1.5 metres from dwelling
Surface spray irrigation	• 15 metres to dwellings • 6 metres if area up-slope and 3 metres if area down-slope of buildings, driveways and property boundaries • 3 metres to paths and walkways • 6 metres to swimming pools and recreational areas
Surface drip and trickle irrigation	• 6 metres if area up-slope and 3 metres if area down-slope of dwellings, swimming pools, property boundaries, driveways and buildings
Subsurface irrigation	• 6 metres if area up-slope and 3 metres if area down-slope of dwellings, swimming pools, property boundaries, driveways and buildings
Absorption system	• 12 metres if area up-slope and 6 metres if area down-slope of property boundaries and dwellings • 6 metres if area up-slope and 3 metres if area down-slope of swimming pools, driveways and buildings

Notes: (1) Additional buffer distances may be required as identified during Council's assessment of the development proposal.

SITE PLAN: KEY

- PROPERTY BOUNDARY
- 100mm PVC PIPE
- 25mm POLY PIPE
- PROPOSED EFFLUENT DISPOSAL AREA - FOR (A) DWELLING)
- PROPOSED EFFLUENT DISPOSAL AREA - FOR (B) DWELLING
- PROPOSED 5-BEDROOM DWELLING (A)
- PROPOSED 3-BEDROOM DWELLING (B)
- PROPOSED ACCESS
- EXISTING SHED
- DAM
- PROPOSED AWTS
- 1M BUFFER

423m²
139m²
220m²
DWELLING (A)
DWELLING (B)
613m²
58.2m
HARRIS
nearmap
0 10 20 30 40 50 100
scale: — 1: 800

Issue:	Description:	Date	Drawn	Approved
A	Issue for client review	28/10/20	PS	SH
B	Issue for client review	6/11/20	PS	SH

North

Client:
MATHEW TEUMA

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E: info@hec.eco
ABN: 541 287 40 549
Wastewater | Bushfire | Stormwater

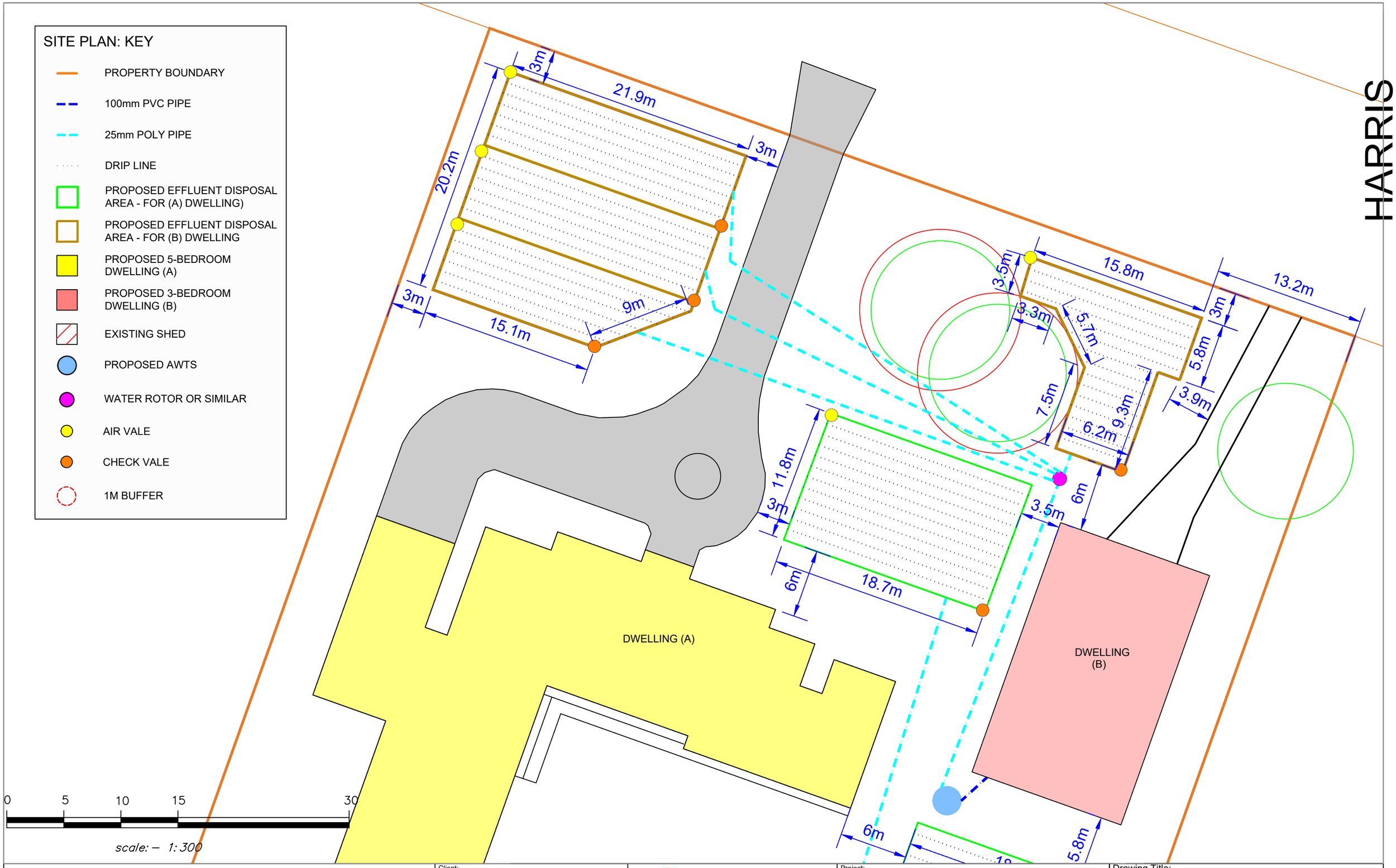
Project:
PROPOSED DWELLINGS
LOT: 2 DP: 512998
64 CLARKE ROAD, LONDONDERRY, NSW
LGA: PENRITH

Drawing Title:
WASTEWATER MANAGEMENT PLAN DETAILS SHEET No.1

Drawn:	Date:	Paper Size:	Q.A. Check:	Date:
PS	6/11/20	ISO Expand A3	Complete	6/11/20
Designed:	Our reference:	Scale:	Dwg. No.	Issue:
PS	4001WW	1:800	#1	B

SITE PLAN: KEY

- PROPERTY BOUNDARY
- 100mm PVC PIPE
- 25mm POLY PIPE
- DRIP LINE
- PROPOSED EFFLUENT DISPOSAL AREA - FOR (A) DWELLING)
- PROPOSED EFFLUENT DISPOSAL AREA - FOR (B) DWELLING
- PROPOSED 5-BEDROOM DWELLING (A)
- PROPOSED 3-BEDROOM DWELLING (B)
- EXISTING SHED
- PROPOSED AWTS
- WATER ROTOR OR SIMILAR
- AIR VALE
- CHECK VALE
- 1M BUFFER



Issue:	Description:	Date	Drawn	Approved
A	Issue for client review	28/10/20	PS	SH
B	Issue for client review	6/11/20	PS	SH

North

Client: MATHEW TEUMA

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Project: PROPOSED DWELLINGS

LOT: 2 DP: 512998
64 CLARKE ROAD, LONDONDERRY, NSW
LGA: PENRITH

Drawing Title: WASTEWATER MANAGEMENT PLAN DETAILS SHEET No.2

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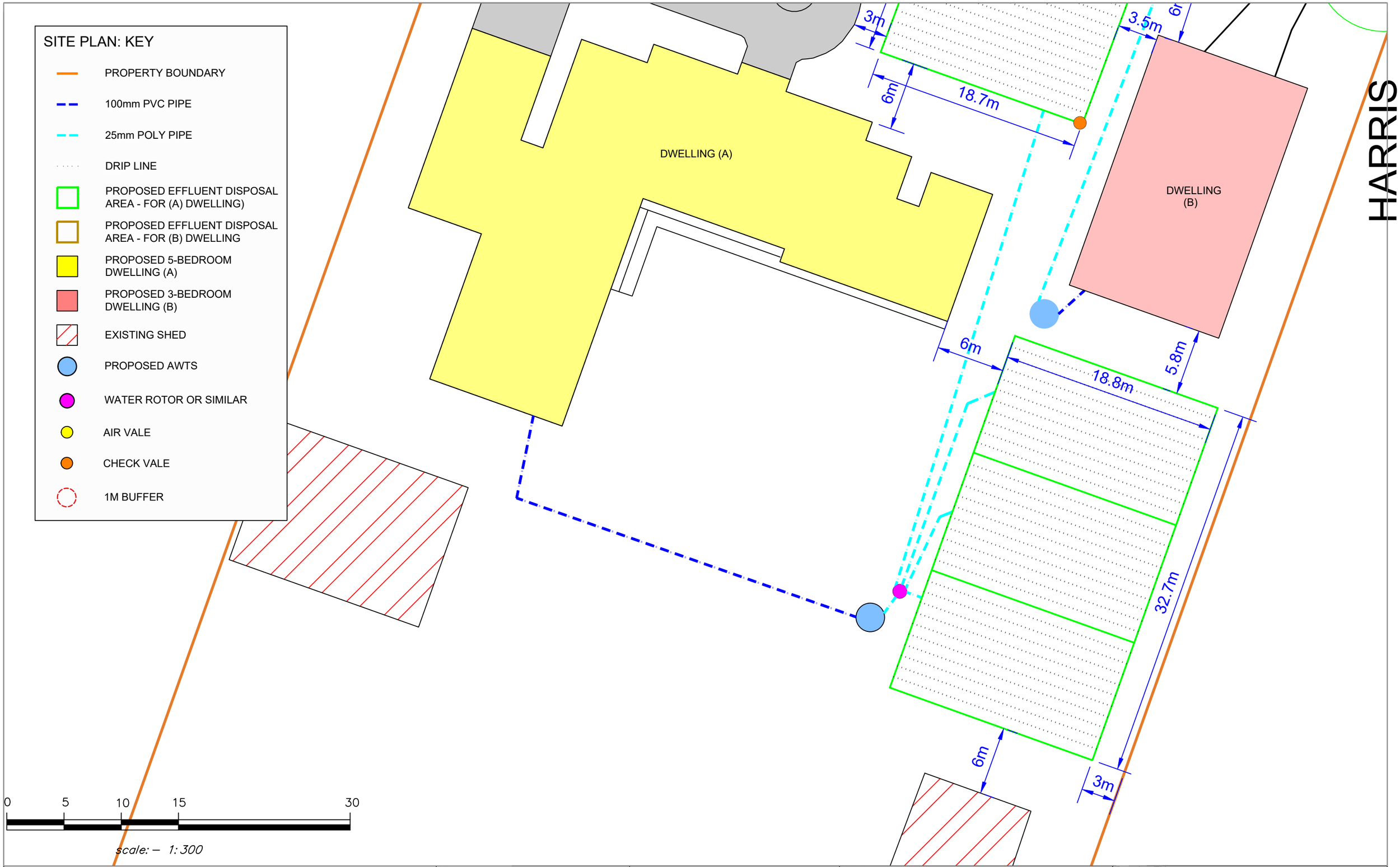
SITE PLAN: KEY

- PROPERTY BOUNDARY
- 100mm PVC PIPE
- 25mm POLY PIPE
- DRIP LINE
- PROPOSED EFFLUENT DISPOSAL AREA - FOR (A) DWELLING)
- PROPOSED EFFLUENT DISPOSAL AREA - FOR (B) DWELLING
- PROPOSED 5-BEDROOM DWELLING (A)
- PROPOSED 3-BEDROOM DWELLING (B)
- EXISTING SHED
- PROPOSED AWTS
- WATER ROTOR OR SIMILAR
- AIR VALE
- CHECK VALE
- 1M BUFFER



Issue:	Description:	Date	Drawn	Approved
A	Issue for client review	28/10/20	PS	SH
B	Issue for client review	6/11/20	PS	SH

North

Client: MATHEW TEUMA

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Project:
PROPOSED DWELLINGS

LOT: 2 DP: 512998
64 CLARKE ROAD, LONDONDERRY, NSW
LGA: PENRITH

Drawing Title:
WASTEWATER MANAGEMENT PLAN DETAILS SHEET No.3

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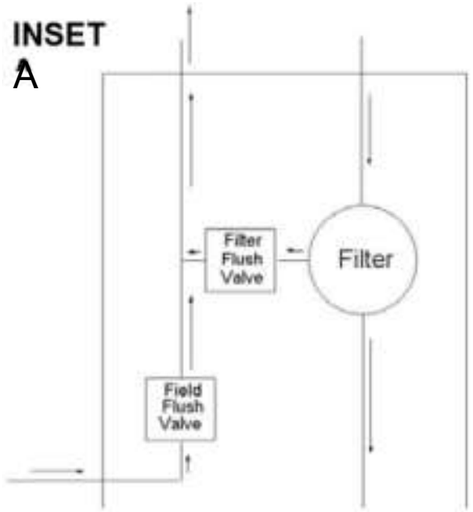

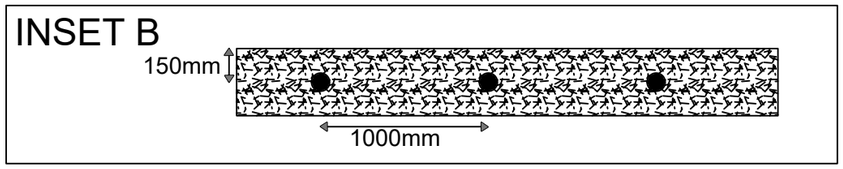

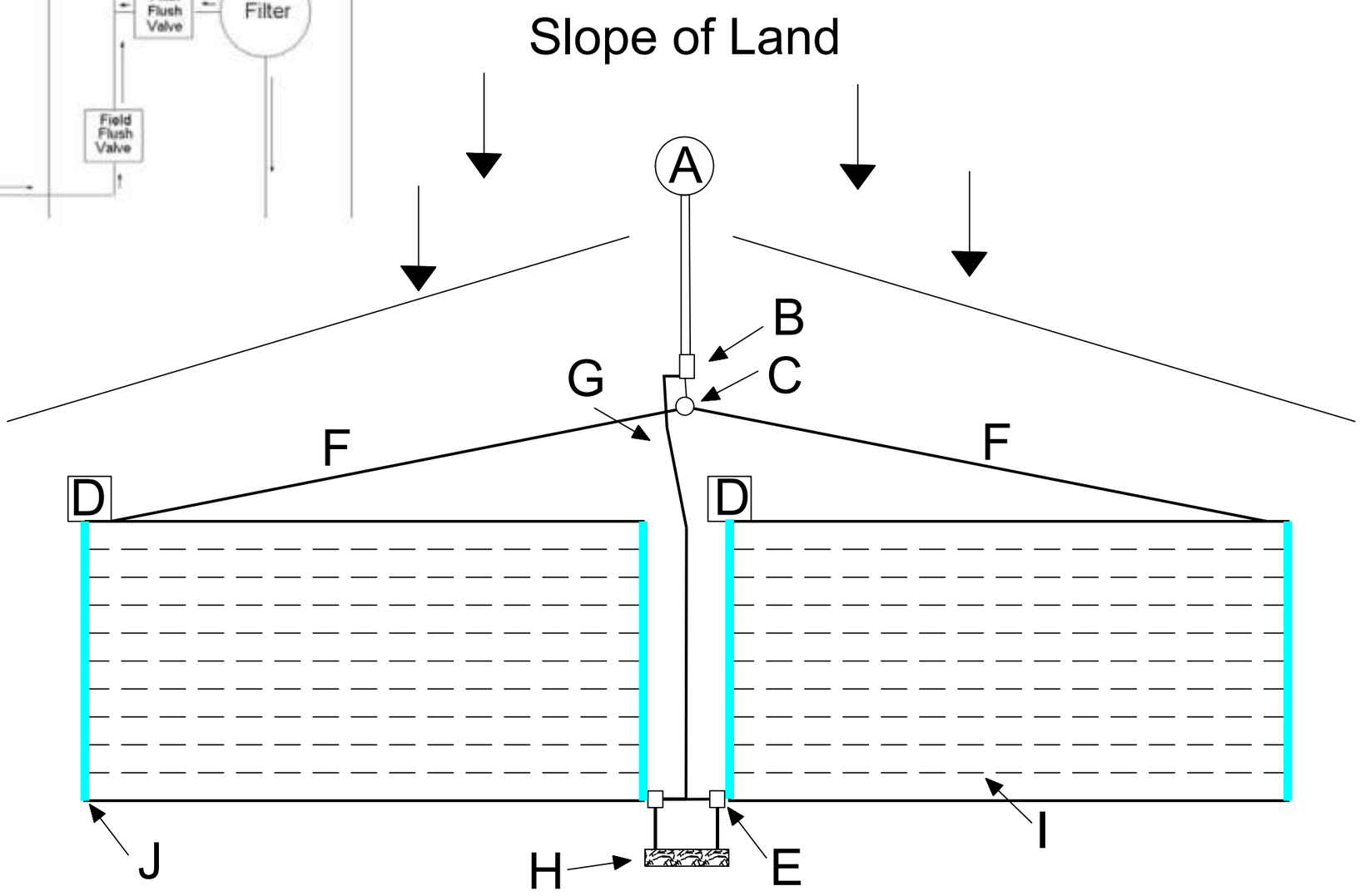

GENERAL DESIGN AND CONSTRUCTION

The irrigation area should be split into equal zones. Each zone is to receive an even proportion of wastewater, using a sequencing valve (C), such as a water rotor or similar.

A The irrigation pump must provide a minimum 20 m head and a flow rate that matches the design output of the selected dripline.

B Immediately after the AWTS, a disc filter or a 100 to 150 micron filter is to be installed (ie, before the sequencing valve).

C An automatic, hydraulically operated sequencing valve should be installed to deliver effluent evenly to the two areas.

D Air release valves must be installed at high points in each area. Additional air release valves may be required in undulating terrain.

E Check valves are required for each irrigation field to facilitate periodic flushing. It must be install at at the lowest point of each sub-surface zone and shall be contained within a durable protective housing with a lilac lid to indicate wastewater.

F Distribution pipes should be 25 mm uPVC or polyethylene pipe buried 300 mm below the ground surface.

G Flushing return manifold (See Inset A) should be 25 mm uPVC or polyethylene pipe buried 100-150 mm below the ground surface within the irrigation area. Outside this area, the pipe must be buried at a minimum of 300 mm depth.

H Where there are potential problems in returning irrigation field flush back to the treatment tank, a small (approximately 3 m x 0.6 m) absorption area sited below the effluent irrigation area can be used to accommodate the flushed effluent

I Pressure compensating subsurface drip line is used with emitters and laterals at approximately 800mm spacing's (min 600mm, maximum of 1000mm depending on soil type) and buried to a depth of 100mm below finished ground level (in accordance with ASNZ1547:2012).

J Distribution manifolds should be 25 mm uPVC or polyethylene pipe buried 300 mm below the ground surface.

Insert B: Cross-Section View

HARRIS

Issue:	Description:	Date	Drawn	Approved
A	HEC Standard Drawing		PS	SH

North

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Wastewater | Bushfire | Stormwater

Drawing Title:
SUBSURFACE IRRIGATION STANDARD DRAWING

Drawn:	Date:	Scale:	Q.A. Check: Date:	
PS		NTS		
Designed:	Our reference:		Dwg. No.	Issue:
PS				A