DOYLE SOIL CONSULTING

SITE AND SOIL EVALUATION REPORT

ONSITE WASTEWATER ASSESSMENT

Lot 3/22 Corbys Road

Kettering

June 2024

Doyle Soil Consulting: 6/76 Auburn Rd Kingston Beach 7050 – 0488 080 455 – robyn@doylesoilconsulting.com.au

SITE INFORMATION

Client: Lachlan Spencer and Samantha Owen

Address: Lot 3/ 22 Corby's Road, Kettering (CT 182800/3)

Site Area: Approximately 2650 m^2

Date of inspection: 09/08/2023

Building type: New house

Services: Tank water supply and onsite wastewater

Planning Overlays: Biodiversity protection, Landslide Hazard (low), Bushfire Prone

Mapped Geology - Mineral Resources Tasmania 1:25 000 Southeast sheet:
Jd = Jurassic dolerite

Soil Depth at LAA: 0.55 – 0.75 m

Subsoil Drainage: Imperfectly drained

Drainage lines / water courses: None

Vegetation: pasture, few trees

Rainfall in previous 7 days: None

Slope at LAA: Approximately 9° to the east

SITE ASSESSMENT AND SAMPLE TESTING

Site and soil assessment in accordance with AS1547-2012 *Onsite domestic wastewater assessment and design*.

Emerson Dispersion test on subsoils.

Test holes were dug using a Christie Post Driver Soil Sampling Kit, comprising CHPD78 Christie Post Driver with Soil Sampling Tube (50 mm OD x 1600/2100 mm).

SITE AND SOIL COMMENTS

The natural soil profiles are formed from clayey colluvium derived Cretaceous syenite. The profiles are shallow, with refusal occurring at approximately 0.55 to 0.75 at the proposed land application area (LAA). Refusal was on variably weathered syenite bedrock. The field textures of the soil profile are dominated by silty clays, which are weakly structured, with mild dispersion characteristics.

The site is subject to significant surface and subsurface water run-on. The, mostly, very shallow and poorly draining soils appear to remain waterlogged for long periods. At time of visit, much of the site was very moist-to-saturated – improved site drainage will be key for sustainability of the onsite wastewater management system (OWMS).

Site constraints (to be addressed by suitably designed OWMS):

- Shallow soil profiles – bedrock at 0.55 – 0.75 m
- Medium clay (Cat. 6) subsoils
- Maximum estimated linear loading rate (LLR) of approx. 22 L/m/day (estimated using *Table 2.2 of Designing and Installing, Sydney Catchment Authority Current Recommended Practice)*
- Significant rock-breaking is required for the installation of the treatment unit

Site strengths: (to be exploited by suitably designed OWMS):

- Sufficient site area and soil depth available (with 2° and land application via sub-surface irrigation).

The site and soil constraints may be addressed by the use of an accredited aerated wastewater treatment system (AWTS), to achieve secondary treatment (with chlorination), and land application by subsurface irrigation. A long and narrow LAA should be constructed across the slope to minimise the LLR for the shallow clay soils.

Subsurface cut-off (ag-style) drains are required across the upslope boundary to direct all run-on water into the existing stormwater infrastructure to the north and east. The drain base should be on the bedrock and maintain sufficient fall to protect the LAA from additional water.

SOIL PROFILES – Test Hole 1

Depth (m)	Horizon	Description and field texture grade	Soil Cat.
0 – 0.2	A1	Dark greyish brown (10 YR 4/2), **Silty Clay Loam**, structureless - massive moist soft consistency	**4**
0.2 – 0.5	$B2_g$	Greyish brown (10YR 5/2), with common fine brownish yellow (10YR 6/6) and greenish grey (5G 6/1) mottles, **Silty Medium Clay**, structureless - massive, moist soft consistency.	**6**
0.5 – 0.55	R_w	Fragmented slightly weathered syenite bedrock. Refusal.	**3**

SOIL PROFILES – Test Hole 2

Depth (m)	Horizon	Description and field texture grade	Soil Cat.
0 – 0.1	A1	Dark greyish brown (10 YR 4/2), **Silty Clay Loam**, structureless - massive moist soft consistency	**4**
0.1 – 0.7	$B2_g$	Grey (10YR 5/1) with common yellowish brown (10YR 5/6) mottles, **Silty Light Clay**, structureless - massive, moist, soft consistency	**5**
0.55 – 0.75	R_w	Greyish brown 2.5YR 5/2 **Silty Medium Clay**, structureless - massive, moist soft consistency, common gravels.	**6**

SOIL PROFILES – Test Hole 3

Depth (m)	Horizon	Description and field texture grade	Soil Cat.
0 – 1	A1	Dark greyish brown 10 YR 4/2, **Silty Clay Loam**, structureless - massive, moist soft consistency	**4**
0.1 – 0.4	$B2_{1g}$	Grey (10YR 5/1) with common yellowish brown (10YR 5/6) mottles, **Silty Light Clay**, structureless - massive, moist, soft consistency	**5**
0.4 – 0.7	$B2_2$	Greyish brown 2.5YR 5/2 **Silty Medium Clay**, structureless - massive, moist soft consistency, common gravels.	**6**
0.7 – 1.1	C_w	Pale olive 5YR 6/4, **Gritty Clay Loam** with common fine gravels, structureless - single grain, slightly moist, loose consistency. Refusal on syenite bedrock.	**4**

SOIL PROFILES – Test Hole 4

Depth (m)	Horizon	Description and field texture grade	Soil Category
0 – 0.15	A1	Dark greyish brown (10 YR 4/2), **Silty Clay Loam**, massive, moist soft consistency	**4**
0.15 – 0.5	B2	Greyish brown (2.5YR 5/2), **Silty Medium Clay**, massive, moist, soft consistency, common gravels. Refusal.	**6**
0.5 – 0.55	R_w	Fragmented slightly weathered syenite bedrock. Refusal.	**3**

EMERSON AGGREGATE DISPERSION TEST

Soils with an excess of exchangeable sodium ions on the cation exchange complex (clays), can cause clay dispersion. Under some circumstances the presence of dispersive soils can also lead to significant erosion, and in particular tunnels leading to eventual gully erosion. Dispersive clay subsoil materials can also cause sealing of the soil surface – if left out in wet weather, they then dry and set very hard in dry weather. Based upon field survey of the property and the surrounding area, no erosion was identified at the site.

The subsoil was tested for dispersion using the Emerson Aggregate Test (EAT). Photos of test results are available on request. Testing resulted in class 2(2), indicating clays with moderate dispersion characteristics. Exposure to rainfall may therefore, lead to spontaneous clay dispersion.

To minimise the likelihood of this, we recommend coverage of exposed subsoil with topsoil or regular treatment with gypsum at 0.5 Kg/m^2 along with minimising subsoil disturbance whenever possible.

TH #	Depth (m)	Visual sign	Class
2	0.1 - 0.55	Some dispersion (obvious milkiness < 50% of aggregate affected)	2(2)

WASTEWATER LAND APPLICATION AREA SETBACKS (per E23.10.1 Interim Planning Scheme 2015)

Required setback from foundations: 4.25 m

Required setback from downslope surface water: 100 m

Required setback from downslope boundary: 10.5 m

Required setback from upslope and side boundaries: 1.5 m

Required vertical setback to bedrock: 0.5 m below the LAA (Table R1 of AS1547-2012)

WASTEWATER CLASSIFICATION AND DESIGN

According to AS1547-2012, the soil is **category 6** (Medium Clay).

Secondary treatment is required.

Wastewater loading: 6 persons @ 120 L/day (tank) - 720 L/day.

Design Irrigation Rate (DIR): 1.6 mm/day for LAA.

Total minimum Land Application Area required: 448 m^2

Effluent Disposal System Specifications:

Using a DIR of 1.6 mm/day, a **minimum irrigation area of 448 m^2** is required. This should be installed as subsurface irrigation under lawn (or mulch with landscaped gardens).

Due to the dynamic head requirements (Appendix 2) of the proposed design, the LAA should be **split into two zones** - equally sized and sequentially dosed.

Use **dimensions 32.0 m x 6.0 m for each area**. Dripper-line laterals to be installed 1.0 m apart and along the contour – see Spec Sheet. The system will have a total **14 runs of dripper line (laterals), each 32 m long (total 448 m irrigation line).**

Use purple **Netafim Unibioline (internal diameter = 16 mm, dripper flow rate = 2.3 L/hr, dripper spacing = 0.3 m, pressure compensating drippers)**.

A **disk filter (130 micron / 120 mesh)** is required on the distribution main of the AWTS and should be covered by a lilac-coloured valve box. An indexing valve is required. A **2-Zone 1" Fimco/Netafim indexing valve** is recommended, due its relatively low minimum operation pressure (7 m head / 0.4 bar / 5.7 psi). Both are to be housed in lilac-coloured valve boxes, installed flush with the ground – see Site Plan.

The minimum irrigation pump capacity for the proposed design is **33 L/min @ 18.7 m head**. A high head sump pump is required. If the minimum pump capacity is not achievable with the standard pump of the AWTS unit (check pump curve data), suitable alternatives include **Zenox ZHS-070-1A** or **Reefe RHV220** (or make/model with similar capacity). See Appendix 2 for hydraulic design calculations and minimum pump capacity requirements.

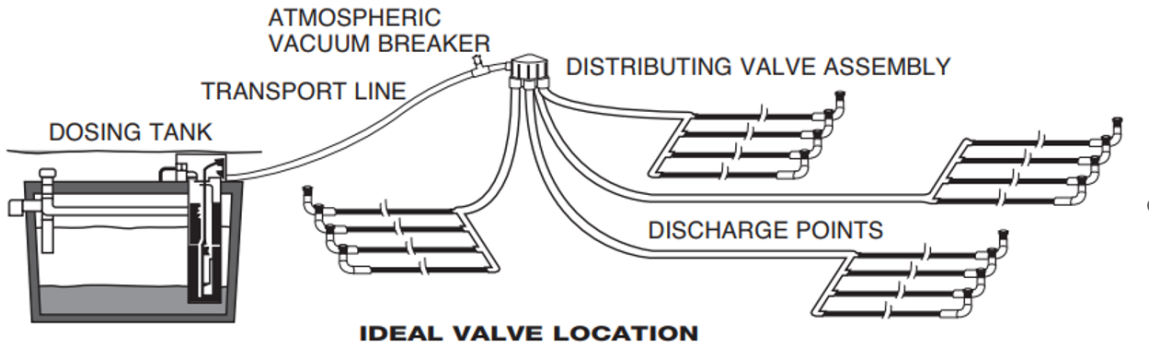
Construction / Installation

Subsurface cut-off (ag-style) drains are required across the entire upslope boundary to direct all run-on water into the existing stormwater infrastructure to the north and east. The drain base should be on the bedrock and maintain sufficient fall.

NOTE: The local topsoils are thin horizons of clay loam, with underlying medium clay. The site is, therefore, **not suitable** for irrigation lines installed using a tractor mounted rig or lines in shallow, back-filled, trenches. To avoid compaction, the LAA is not to have vehicles or heavy machinery traffic during wet conditions - soil smearing/compaction will reduce permeability and may cause failure of the land application area.

To prepare the LAA site, the natural surface should be scarified prior to laying down the irrigation pipe. **Then, cover with a minimum of 150 mm mulch (settled depth) and plants at 1 per 5m^2** (further details below).

The indexing valve should be installed at the highest point in the distribution system, with a vacuum breaker placed before the sequencing valve (as shown in the below diagram).



Credit: K-Rain Manufacturing Corp. USA

Subsoils were tested for reactivity and the site is classified as **Class M**. All plumbing fixtures and fittings should be installed as per *Appendix G AS/NZS 3500.2.2021*.

Additional Details

When subjected to the maximum design hydraulic load of 720 L/day, the pump will run for a maximum of 22 minutes per day (Appendix 2).

The specified LAA design results in a linear loading rate (LLR) of up to 14 L/m/day. This is below the estimated maximum rate (22 L/m/day) for the soil/site (per Table 2.2 of *Designing and Installing, Sydney Catchment Authority Current Recommended Practice*).

All forms of livestock and vehicular traffic should be excluded from the finished LAA (fence-off necessary).

Healthy plants are required for effective evapotranspiration. If the system is consistently underloaded (i.e., by low occupation), supplementary watering may be required – maintain green grass cover. The area should be mowed to encourage growth and nutrient removal. Clippings to be removed – see Loading Certificate.

Compliance with E23.10.1 of the *Interim Planning Scheme 2015* is shown in the attached table for acceptable criteria. It is recommended that during construction Doyle Soil Consulting be notified of any major variation to the soil conditions or loading rate as predicted in this report.

Robyn Doyle
B.Agr.Sc.
Soil Scientist and
Wastewater Designer
Licence no. CC7149

Rowan Mason
B.Agr.Sc.(hons)
Soil Scientist

APPENDIX 1 – TRENCH™

Doyle Soil Consulting

Land suitability and system sizing for on-site wastewater management

Trench 3.0 (Australian Institute of Environmental Health)

Assessment Report

OWMS design for new 4 bedrooom dwelling

Assessment for	Lachlan Spencer and Samantha Owen	Assess. Date	24-Jun-24
	15 Floreate Drive, Junortoun, VIC	Ref. No.	
Assessed site(s)	Lot 3 - 22 Corbys Road Kettering	Site(s) inspected	9-Aug-23
Local authority	Kingborough Council	Assessed by	R Doyle

This report summarises wastewater volumes, climatic inputs for the site, soil characteristics and sustem sizing and design issues. Site Capability and Environmental sensitivity issues are reported separately, where 'Alert' columns flag factors with high (A) or very high (AA) limitations which probably require special consideration for system design(s). Blank spaces on this page indicate data have not been entered into TRENCH.

Wastewater Characteristics

Wastewater volume (L/day) used for this assessment = 720 (using the 'No. of bedrooms in a dwelling' method)
Septic tank wastewater volume (L/day) = 240
Sullage volume (L/day) = 480
Total nitrogen (kg/year) generated by wastewater = 5.3
Total phosphorus (kg/year) generated by wastewater = 1.3

Climatic assumptions for site (Evapotranspiration calculated using the crop factor method)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Mean rainfall (mm)	52	48	53	53	58	58	65	76	67	72	66	66
Adopted rainfall (R, mm)	52	48	53	53	58	58	65	76	67	72	66	66
Retained rain (Rr, mm)	41	38	42	42	46	47	52	60	54	58	53	53
Max. daily temp. (deg. C)	22	21	20	18	15	13	13	13	15	17	18	20
Evapotrans (ET, mm)	156	123	104	70	47	31	35	50	74	102	118	149
Evapotr. less rain (mm)	**115**	**85**	**62**	**27**	**1**	**-15**	**-17**	**-11**	**21**	**44**	**65**	**96**

Annual evapotranspiration less retained rain (mm) = 473

Soil characterisitics

Texture = Medium Clay Category = 6 Thick. (m) = 0.5
Adopted permeability (m/day) = 0.06 Adopted LTAR (L/sq m/day) = 2 Min depth (m) to water = 3

Proposed disposal and treatment methods

Proportion of wastewater to be retained on site:	All wastewater will be disposed of on the site
The preferred method of on-site primary treatment:	In a package treatment plant
The preferred method of on-site secondary treatment:	Above-ground
The preferred type of in-ground secondary treatment:	None
The preferred type of above-ground secondary treatment:	Trickle irrigation
Site modifications or specific designs:	Not needed

Suggested dimensions for on-site secondary treatment system

Total length (m) =	70
Width (m) =	6
Depth (m) =	0.5
Total disposal area (sq m) required =	550
comprising a Primary Area (sq m) of:	552
and a Secondary (backup) Area (sq m) of:	

Sufficient area is available on site

To enter comments, click on the line below 'Comments'. (This yellow-shaded box and the buttons on this page will not be printed.)

Comments

The calculated DIR for the category 6 soil on a 9 degree slope is 1.6 mm/day. An irrigation area of approximately 450 sq m is required. The system should therefore have the capacity to cope with predicted climatic and loading events.

Doyle Soil Consulting

Land suitability and system sizing for on-site wastewater management

Trench 3.0 (Australian Institute of Environmental Health)

Site Capability Report

OWMS design for new 4 bedrooom dwelling

Assessment for	Lachlan Spencer and Samantha Owen	Assess. Date	24-Jun-24
	15 Floreate Drive, Junortoun, VIC	Ref. No.	
Assessed site(s)	Lot 3 - 22 Corbys Road Kettering	Site(s) inspected	9-Aug-23
Local authority	Kingborough Council	Assessed by	R Doyle

This report summarises data relating to the physical capability of the assessed site(s) to accept wastewater. Environmental sensitivity and system design issues are reported separately. The 'Alert' column flags factors with high (A) or very high (AA) site limitations which probably require special consideration in site acceptability or for system design(s). Blank spaces indicate data have not been entered into TRENCH.

Alert	Factor	Units	Value	Confid level	Limitation Trench	Limitation Amended	Remarks
	Expected design area	sq m	1,000		Moderate		
A	Density of disposal systems	/sq km	40		High		
	Slope angle	degrees	9		Moderate		
	Slope form		Straight simple		Low		
A	Surface drainage		Poor		High		
	Flood potential		Site floods <1:100 yrs		Very low		
	Heavy rain events		Rare		Low		
	Aspect (Southern hemi.)		Faces E or W		Moderate		
	Frequency of strong winds		Common		Low		
	Wastewater volume	L/day	720		Moderate		
	SAR of septic tank effluent		1.0		Low		
	SAR of sullage		2.5		Moderate		
	Soil thickness	m	0.5		Moderate		
AA	Depth to bedrock	m	0.5		Very high		
	Surface rock outcrop	%	1		Moderate		
	Cobbles in soil	%	1		Very low		
	Soil pH		6.0		Low		
	Soil bulk density	gm/cub. cm	1.4		Very low		
A	Soil dispersion	Emerson No.	3		High		
	Adopted permeability	m/day	0.06		Low		
AA	Long Term Accept. Rate	L/day/sq m	2		Very high		

To enter comments, click on the line below 'Comments' . (This yellow-shaded box and the buttons on this page will not be printed.)

Comments

The site is limited by Cat 6 subsoils and bedrock at 0.5 m depth. With secondary treatment, chlorination and subsurface irrigation, the site is suitable for onsite wastewater disposal with a suffiecient area available. subsurface irrigation under specified lawns/pasture is recommended.

Doyle Soil Consulting

Land suitability and system sizing for on-site wastewater management

Trench 3.0 (Australian Institute of Environmental Health)

Environmental Sensitivity Report

OWMS design for new 4 bedrooom dwelling

Assessment for	Lachlan Spencer and Samantha Owen	Assess. Date	24-Jun-24
	15 Floreate Drive, Junortoun, VIC	Ref. No.	
Assessed site(s)	Lot 3 - 22 Corbys Road Kettering	Site(s) inspected	9-Aug-23
Local authority	Kingborough Council	Assessed by	R Doyle

This report summarises data relating to the environmental sensitivity of the assessed site(s) in relation to applied wastewater. Physical capability and system design issues are reported separately. The 'Alert' column flags factors with high (A) or very high (AA) limitations which probably require special consideration in site acceptability or for system design(s). Blank spaces indicate data have not been entered into TRENCH.

Alert	Factor	Units	Value	Confid level	Limitation Trench	Limitation Amended	Remarks
	Cation exchange capacity	mmol/100g	75		Moderate		
	Phos. adsorp. capacity	kg/cub m	0.7		Moderate		
	Annual rainfall excess	mm	-473		Very low		
	Min. depth to water table	m	3		Very low		
	Annual nutrient load	kg	6.6		Low		
	G'water environ. value	Agric non-sensit			Low		
	Min. separation dist. required	m	4		Very low		
	Risk to adjacent bores						Factor not assessed
	Surf. water env. value	Agric sensit/dom drink			Moderate		
	Dist. to nearest surface water	m	130		Moderate		
AA	Dist. to nearest other feature	m	10		Very high		
	Risk of slope instability	Very low			Very low		
	Distance to landslip	m	1000		Very low		

To enter comments, click on the line below 'Comments'. (This yellow-shaded box and the buttons on this page will not be printed.)

Comments

Generous setbacks to all downslope features are possible. A conservative DIR has been adopted and equally sized irrigation zones are to be sequentially dosed. There will be a low environmental risk due to the available area and the distance to both the dowslope boundary and surface water.

APPENDIX 2 – Hydraulic Design, System Componentry & Pump Requirements

System Sizing and Componentry: 2-Zone Subsurface Irrigation System			
Design Hydraulic Load (L/day)	Max. DIR (L/m^2/day)	LAA (m2)	
720	1.6	448	
Sequencing valve required?	Valve make/model	Number of zones	Area/zone (m^2)
yes	1" Fimco/Netafim indexing	2	224
Zone width (m) (downslope)	Spacing between upper and lower zones (m)	Number of laterals/zone	Lateral spacing (m)
6.0	1.0	7	1.0
Dripper spacing (m)	Total length irrigation pipe (m)	Number of drippers/zone	
0.3	448	871	
Dripper flow rate (L/hr)	Zone flow rate (L/hr)	Zone flow rate (L/min)	
2.3	2003	33	
Supply line material	Supply line internal dia. (mm)	Supply line length (m)	
Lilac LDPE	25.4	45.0	
Filter Type	Make/Model (or equivalent)	Filter grade	
Disk	Arkal 1" short	120 mesh/130 micron (RED)	

Dynamic Head Calculation	
Component	Approx. Head loss (m)
Supply line (friction @ flow rate)	2.3
Filter (friction @ flow rate)	0.5
Sequencing valve (friction @ flow rate)	0.8
Other Fittings (friction)	0.7
Approx. Elevation differential (from bottom of AWTS to highest point of LAA)	6.0
Dripper line operating head (min)	10.0
Total	**20.3**

Pump Requirements	
Min. pump capacity	Max. Pump time @ Design Hydraulic Load
33L/min @ 20.3 m Head	22 mins/day

Demonstration of wastewater system compliance to *2016 Directors Guidelines for On-site Wastewater Disposal*

Acceptable Solutions	**Performance Criteria**	**Compliance**
A1 Horizontal separation distance from a building to a land application area must comply with one of the following: a) be no less than 6m; or b) be no less than: i) 3m from an upslope building or level building; ii) If primary treated effluent to be no less than 4m plus 1m for every degree of average gradient from a downslope building; iii) If secondary treated effluent and subsurface application, no less than 2m plus 0.25m for every degree of average gradient from a downslope building	P1 The land application area is located so that a) the risk of wastewater reducing the bearing capacity of a building's foundations is acceptably low.; and b) is setback a sufficient distance from a downslope excavation around or under a building to prevent inadequately treated wastewater seeping out of that excavation	Complies with A1 (b) (iii) Land application area will be located with a minimum separation distance of 9 m from downslope building (4.25 m required)
A2 Horizontal separation distance from downslope surface water to a land application area must comply with (a) or (b) a) be no less than 100m; or b) be no less than the following: i) if primary treated effluent 15m plus 7m for every degree of average gradient to downslope surface water; or ii) if secondary treated effluent and subsurface application, 15m plus 2m for every degree of average gradient to down slope surface water.	P2 Horizontal separation distance from downslope surface water to a land application area must comply with all of the following: a) Setback must be consistent with AS/NZS 1547 Appendix R; b) A risk assessment in accordance with Appendix A of AS/NZS 1547 has been completed that demonstrates that the risk is acceptable.	Complies with A2 (b) (ii) Land application area will be located with a minimum separation distance of 33 m of downslope surface water (33 m required)

A3 Horizontal separation distance from a property boundary to a land application area must comply with either of the following: a) be no less than 40m from a property boundary; or b) be no less than: i) 1.5m from an upslope or level property boundary; and ii) If primary treated effluent 2m for every degree of average gradient from a downslope property boundary; or iii) If secondary treated effluent and subsurface application, 1.5m plus 1m for every degree of average gradient from a downslope property boundary.	P3 Horizontal separation distance from a property boundary to a land application area must comply with all of the following: a) Setback must be consistent with AS/NZS 1547 Appendix R; and b) A risk assessment in accordance with Appendix A of AS/NZS 1547 has been completed that demonstrates that the risk is acceptable.	Complies with A3 (b) (i) Land application area will be located with a minimum separation distance of 1.5m from an upslope or level property boundary Complies with A3 (b) (iii) Land application area will be located with a minimum separation distance of 43 m of downslope property boundary (10.5 m required)
A4 Horizontal separation distance from a downslope bore, well or similar water supply to a land application area must be no less than 50m and not be within the zone of influence of the bore whether up or down gradient.	P4 Horizontal separation distance from a downslope bore, well or similar water supply to a land application area must comply with all of the following: a) Setback must be consistent with AS/NZS 1547 Appendix R; and b) A risk assessment completed in accordance with Appendix A of AS/NZS 1547 demonstrates that the risk is acceptable	Complies with A4 No bore or well identified within 50m

A5 Vertical separation distance between groundwater and a land application area must be no less than: a) 1.5m if primary treated effluent; or b) 0.6m if secondary treated effluent	P5 Vertical separation distance between groundwater and a land application area must comply with the following: a) Setback must be consistent with AS/NZS 1547 Appendix R; and b) A risk assessment completed in accordance with appendix A of AS/NZS 1547 that demonstrates that the risk is acceptable	No groundwater encountered.
A6 Vertical separation distance between a limiting layer and a land application area must be no less than: a) 1.5m if primary treated effluent; or b) 0.5m if secondary treated effluent	P6 Vertical setback must be consistent with AS/NZS1547 Appendix R.	Complies with A6 (b)
A7 nil	P7 A wastewater treatment unit must be located a sufficient distance from buildings or neighbouring properties so that emissions (odour, noise or aerosols) from the unit do not create an environmental nuisance to the residents of those properties	Complies

CERTIFICATE OF THE RESPONSIBLE DESIGNER

Section 94
Section 106
Section 129
Section 155

Form **35**

To: Lachlan Spencer and Samantha Owen *Owner name*
15 Floreate Dr *Address*
Junortoun VIC 3551 *Suburb/postcode*

Designer details:

Name: Robyn Doyle
Category: Bldg srvcs dsgnr-hydraulic domestic
Business name: Doyle Soil Consulting
Phone No: 0488080455
Business address: 6/76 Auburn Rd
Kingston Beach 7050
Fax No:
Licence No: CC7418
Email address: robyn@doylesoilconsulting.com.au

Details of the proposed work:

Owner/Applicant Lachlan Spencer and Samantha Owen
Designer's project reference No. 2024-6
Address: 3/22 Corbys Road
Lot No: 3
Kettering 7155

Type of work: Building work ☐ Plumbing work ☒ *(X all applicable)*

Description of work:
Wastewater Design

(new building / alteration / addition / repair / removal / re-erection water / sewerage / stormwater / on-site wastewater management system / backflow prevention / other)

Description of the Design Work (Scope, limitations or exclusions): *(X all applicable certificates)*

Certificate Type:	Certificate	Responsible Practitioner
	☐ Building design	Architect or Building Services Designer
	☐ Structural design	Structural Engineer
	☐ Fire Safety design	Fire Engineer
	☐ Civil design	Civil Engineer
	☒ Hydraulic design	Building Services Designer
	☐ Fire service design	Building Services Designer
	☐ Electrical design	Building Services Designer
	☐ Mechanical design	Building Service Designer
	☐ Plumbing design	Plumber
	☐ Other (specify)	

Deemed-to-Satisfy: ☒ Performance Solution: ☐ (*X the appropriate box*)

Other details:

Design documents provided:

The following documents are provided with this Certificate –

Document description:

Drawing numbers:	Prepared by: Doyle Soil Consulting	Date: June 2024
Schedules:	Prepared by:	Date:
Specifications:	Prepared by: Doyle Soil Consulting	Date: June 2024
Computations:	Prepared by:	Date:
Performance solution proposals:	Prepared by:	Date:
Test reports:	Prepared by: Doyle Soil Consulting	Date: June 2024

Standards, codes or guidelines relied on in design process:

AS1547-2012 On site domestic wastewater management.

AS3500 (Parts 0-5)-2013 Plumbing and drainage set.

Any other relevant documentation:

Site and Soil Evaluation Report

Attribution as designer:

I, Robyn Doyle, am responsible for the design of that part of the work as described in this certificate.

The documentation relating to the design includes sufficient information for the assessment of the work in accordance with the *Building Act 2016* and sufficient detail for the builder or plumber to carry out the work in accordance with the documents and the Act.

This certificate confirms compliance and is evidence of suitability of this design with the requirements of the National Construction Code.

	Name: (print)	*Signed*	*Date*
Designer:	R Doyle		28/06/2024
Licence No:	CC7418		

Assessment of Certifiable Works: (TasWater)

Note: single residential dwellings and outbuildings on a lot with an existing sewer connection are not considered to increase demand and are not certifiable.

If you cannot check ALL of these boxes, LEAVE THIS SECTION BLANK.

TasWater must then be contacted to determine if the proposed works are Certifiable Works.

I confirm that the proposed works are not Certifiable Works, in accordance with the Guidelines for TasWater CCW Assessments, by virtue that all of the following are satisfied:

- [X] The works will not increase the demand for water supplied by TasWater
- [X] The works will not increase or decrease the amount of sewage or toxins that is to be removed by, or discharged into, TasWater's sewerage infrastructure
- [X] The works will not require a new connection, or a modification to an existing connection, to be made to TasWater's infrastructure
- [X] The works will not damage or interfere with TasWater's works
- [X] The works will not adversely affect TasWater's operations
- [X] The work are not within 2m of TasWater's infrastructure and are outside any TasWater easement
- [X] I have checked the LISTMap to confirm the location of TasWater infrastructure
- [X] If the property is connected to TasWater's water system, a water meter is in place, or has been applied for to TasWater.

Certification:

I, ……Robyn Doyle……being responsible for the proposed work, am satisfied that the works described above are not Certifiable Works, as defined within the *Water and Sewerage Industry Act 2008,* that I have answered the above questions with all due diligence and have read and understood the Guidelines for TasWater CCW Assessments.

Note: the Guidelines for TasWater Certification of Certifiable Works Assessments are available at: www.taswater.com.au

	Name: (print)	*Signed*	*Date*
Designer:	Robyn Doyle		28/06/2024

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AS1547:2012 – Loading Certificate – AWTS Design

This loading certificate is provided in accordance with Clause 7.4.2(d) of AS/NZS 1547:2012 and sets out the design criteria and the limitations associated with use of the system.

Site Address: Lot 3, 22 Corbys Rd, Kettering

System Capacity: 6 persons @ 120 L/person/day

Summary of Design Criteria

DIR: 1.6 mm/day.

Irrigation area: 448 m^2

Reserve area location /use: Assigned – 100 % available

Water saving features fitted: Standard fixtures

Allowable variation from design flows: 1 event @ 200 % daily loading per quarter

Typical loading change consequences: Expected to be minimal due to use of AWTS and large land area

Overloading consequences: Continued overloading may cause hydraulic failure of the irrigation area and require upgrading/extension of the area. Risk considered acceptable due to monitoring through quarterly maintenance reports.

Underloading consequences: Lower than expected flows will have minimal consequences on system operation unless the house has long periods of non-occupation. Under such circumstances additional maintenance of the system may be required. Long term under loading of the system may also result in vegetation die off in the irrigation areas and additional watering may be required. Risk considered acceptable due to monitoring through quarterly maintenance reports.

Lack of maintenance / monitoring consequences: Issues of underloading/overloading and condition of the irrigation area require monitoring and maintenance, if not completed system failure may result in unacceptable health and environmental risks. Monitoring and regulation by the permit authority required to ensure compliance.

Other considerations: Owners/occupiers must be made aware of the operational requirements and limitations of the system by the installer/maintenance contractor/leasing agent. A copy of the entire design report should be provided at change of ownership.

Two-zone Subsurface Irrigation System (schematic, not to scale)
Lot 3, 22 Corbys Road, Kettering

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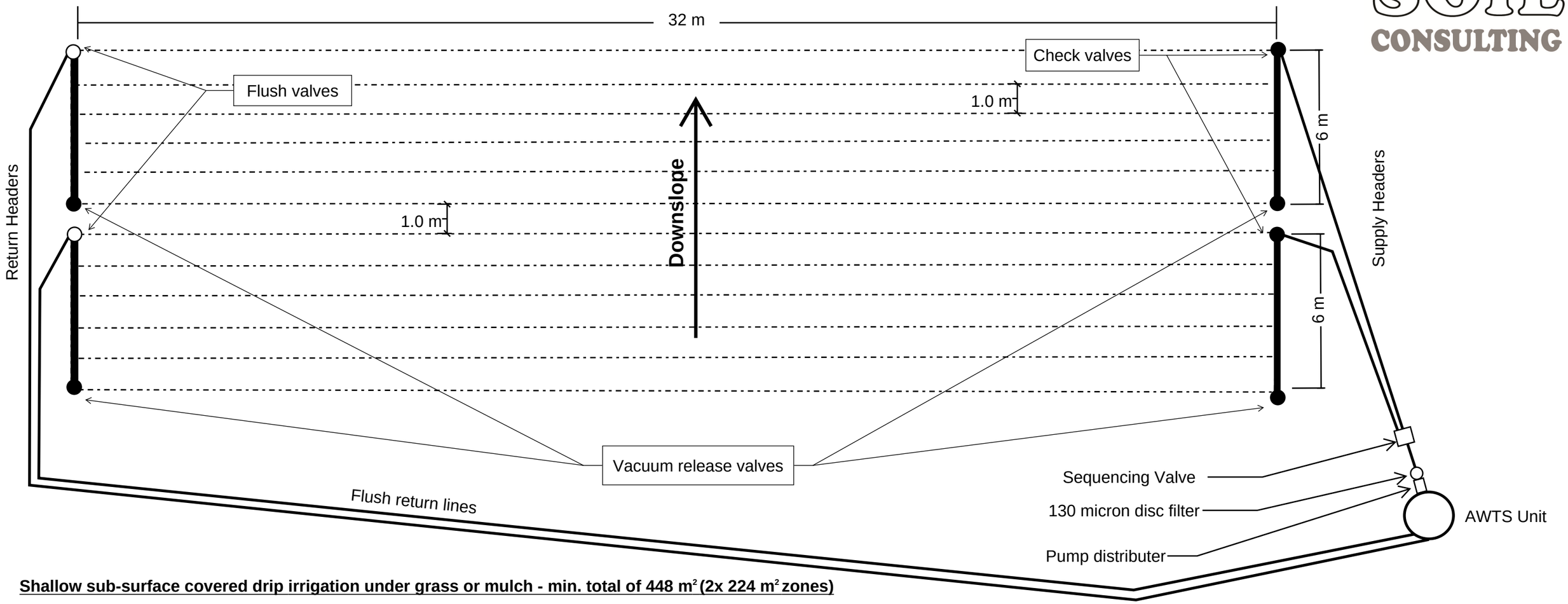

Shallow sub-surface covered drip irrigation under grass or mulch - min. total of 448 m² (2x 224 m² zones)

130 micron disc filter at pump discharge of AWTS unit.

Natural ground surface at land application area to be scarified prior to laying out irrigation system.

Dripper laterals to be laid along the contour (across slope) at 1000 mm spacing and covered to a min. depth of 150 mm good quality sandy loam topsoil or with mulch

Use Netafim Unibioline (16mm - 2.3 L/hr - 0.3m dripper spacing, pressure compensated, anti-siphon, non-leakage)

Supply and return manifolds (25-32 mm lilac LDPE) to be buried to a min. depth of 150 mm.

Install vacuum breakers at the highest points of each irrigation zone and flush valves at lowets points.

Valves and breakers to be in lilac coloured surface boxes, installed flush with the finished ground surface.

Manual or automatic flushing valve to be installed, discharging either back in o the AWTS pump-out chamber.

During system testing, a minimum pressure of 100kpa (i.e. 10m of head) should be provided at the high point, most distant from the AWTS discharge pump in each irrigation zone.

Condition and performance of the land application area to be monitored and reported on during quarterly inspections by maintenance contractor.

All onsite wastewater management systems are site-specific. Installer to refer DSC report and design spec sheets. Please contact the system designer with any questions or proposed changes to the system prior to proceeding with any changes.

Document Set ID: 4509862
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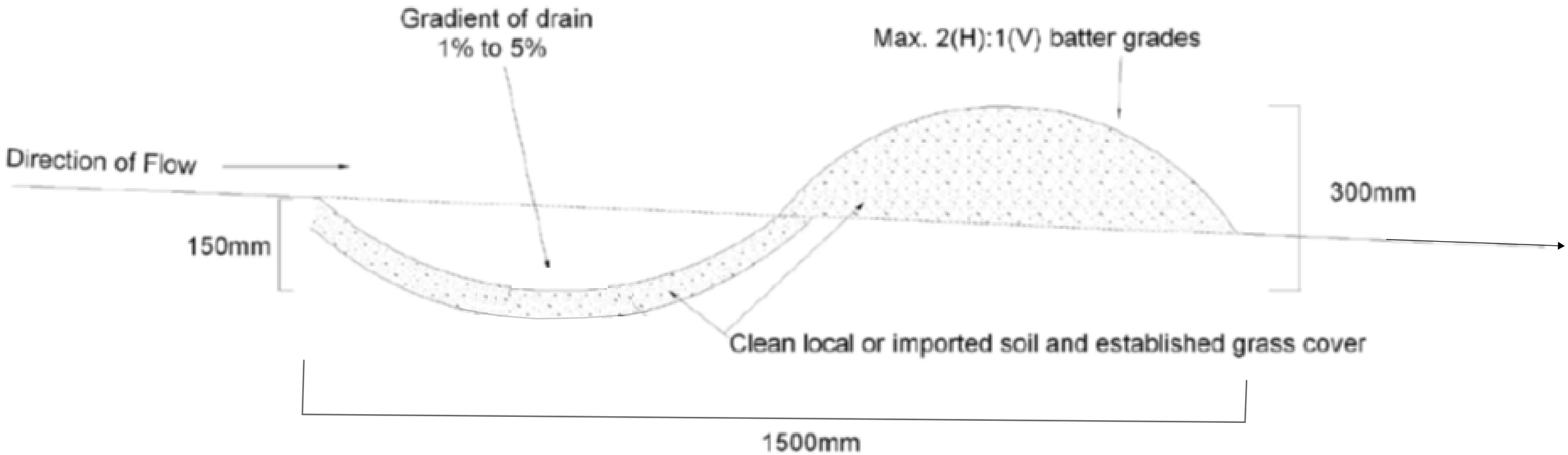
Cross Section: Upslope Diversion Drain



Reference: Design and Installation of On-site Wastewater Systems p179 -subsurface Effluent Irrigation -Sydney Catchment Authority -NSW Government.

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3/22 Corbys Rd, Kettering

Wastewater system: AWTS

Min. total subsurface irrigation area: 448 m²

- Installed as two equal sized and sequentially dosed zones.
- zone dimensions: 32.0 m x 6.0 m
- min. 1.0 m separation between zones
- irrigation laterals to follow contour at 1.0 m spacing.
- vacuum-breakers at highest points
- flush returns from lowest points to AWTS distribution chamber.

Sub-surface cut-off dranis - drain site long before constructing LAA. Vehicles and machinery not to drive on proposed LAA during wet soil conditions.

Scarify natural soil surface at LAA prior to laying down irrigation system and add a minimum of 150 mm mulch.

Plants at 1 per 5 m² Existing tree to remain

Dam to be decommissioned as part of site development. Suggest to locate AWTS unit in drained dam and back-fill around the unit to avoid excavating massive bedrock.

Min upslope/side foundations setback: 3 m
Min downslope boundary setback: 7.2 m
Min upslope and side boundaries setback: 1.5 m
Min downslope surface water setback: 35 m

Approximate test hole locations

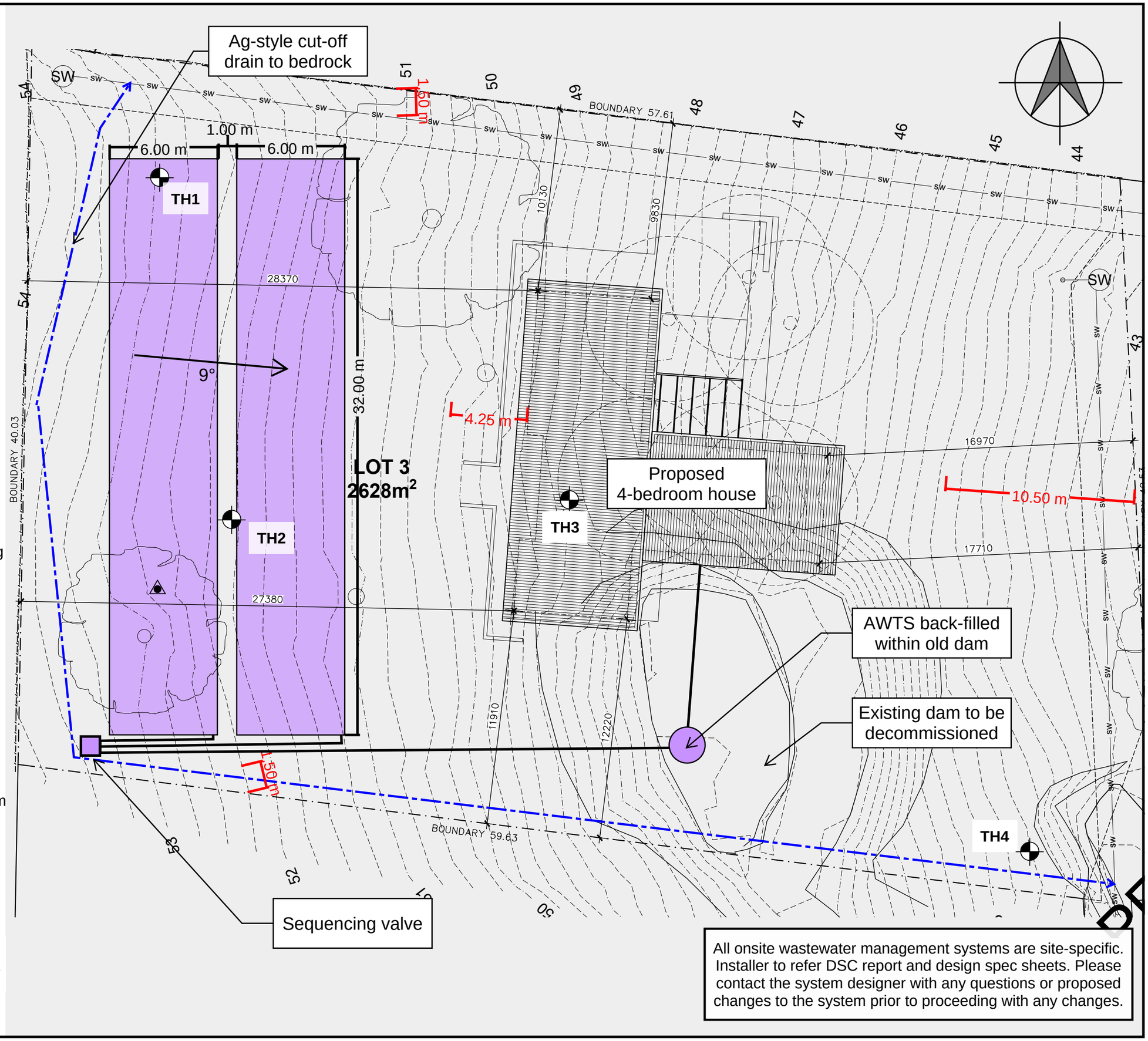
Refer to DSC report

Robyn Doyle
Building Services Designer
Hydraulic
CC7418

28/6/2024

Prepared by
Rowan Mason

21/6/24



All onsite wastewater management systems are site-specific. Installer to refer DSC report and design spec sheets. Please contact the system designer with any questions or proposed changes to the system prior to proceeding with any changes.