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WASTEWATER CALCULATION PACKAGE

Project:	Proposed Ambulance Station
Address:	69 Old Port Wakefield Road, Two Wells SA 5501
Job No:	BC2501066
Revision:	B
By:	AB

bentleyconsulting.net.au
admin@bentleyconsulting.net.au
36 Leader St, Wayville SA 5034

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ENGINEERING CALCULATION PACKAGE

Project:	Proposed Ambulance Station
Address:	69 Old Port Wakefield Road, Two Wells SA 5501
Job No:	BC2501066
Revision:	B

APPROVAL REGISTER

Revision	Date	Issue	Engineer	Checked
B	20/08/2025	For Approval	AB	JP

Design Information

Bentley Consulting have been engaged to provide wastewater engineering for the proposed development located at the above mentioned address

Reference Documents

AS1547-2012 - On-site domestic wastewater management

On-site Wastewater Systems Code - 2013 SA Health

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Appendix A

Wastewater Engineer Certification

bentleyconsulting.net.au
admin@bentleyconsulting.net.au
36 Leader St, Wayville SA 5034

Wednesday, 20 August 2025

Alex Cooper
Secon Consulting Engineers
456 Pulteney Street,
Adelaide SA 5000

Dear Alex,

Re:	Project:	Proposed Ambulance Station
	Project Address:	69 Old Port Wakefield Road, Two Wells SA 5501
	Project Number:	BC2501066
	Design Package Reference:	BC2501066-WW-Report[B]

Please find attached drawings and associated calculations in relation to the proposed on-site wastewater design located at the above-mentioned address.

The wastewater design was completed in accordance with requirements outlined in the Australian Standard AS1547-2012, On-site domestic wastewater management.

In reference to the South Australian Public Health (wastewater) Regulations 2013, by definition, the design was carried out by a professional engineer.

Should you wish to discuss any of these matters further please do not hesitate to contact the undersigned.

Yours faithfully,

SCOTT BENTLEY
DIRECTOR | SENIOR ENGINEER
BEng (Hons) MIEAust CPEng NER

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Appendix B

Wastewater Design

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36 Leader St, Wayville SA 5034

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ENGINEERING CALCULATION PACKAGE

Site Location:	69 Old Port Wakefield Road, Two Wells SA 5501
Land Use:	Ambulance Station
Distance to watercourse:	Greater than 10m
Distance to Wells/ Dams/ Bores:	Greater than 10m
Flooding Region:	Flooding not anticipated in 1 in 10 year event
Site Topography:	Approximately 1 in 50 (2.0%) *See attached locality plan from Naturemaps (Department for Environment & Water).
Depth to Refusal:	1.0 m (B2)
Depth to Water Table:	> 4.0 m

Wastewater Loading:

Proposed wastewater design accommodates proposed ambulance station and existing CFS shed.

This design accommodates twelve people per shift, with one shift per day, inclusive of both the proposed ambulance station and existing CFS shed.

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Wastewater Loading:

As per the SA Health On-site Wastewater Systems Code

Staff Ablutions, Work Place Installations (e.g. factories, commercial office) (With toilet & shower)

Sludge Scum Rate (S*)	25 *L/p/y*	
Daily Flow Rate (DF*)	40 *L/p/d*	
BOD(5) Loading	25 *g/p/d*	
Number of People Per Shift	12 *persons*	**1 shift per day*

Non-Standard Fixtures

As per Table 5-6, Table 5-7 of SA Health Code

Spa Bath:	N/A
Food Waste Disposal:	N/A

Load Increases

Sludge Scum Rate (S*)	0	*% increase*
Daily Flow Rate (DF*)	0	*L increase*
BOD(5) Loading	40	*% increase*

Total Loads

Sludge Scum Rate (S*)	300	*L/y*
Daily Flow Rate (DF*)	480	*L/d*
BOD(5) Loading	420	*g/d*

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ENGINEERING CALCULATION PACKAGE

Septic Tank Design (Primary System)

Minimum capacity = (P1 x S x Y) + (P2 x DF)

where:

P1 =	12	persons using system
S =	25	L/y (Sludge/Scum Rate)
Y =	4	years (Desludging frequency)
P2 =	12	persons using system
DF =	40	L/d (Daily Flow Rate)

Minimum Effective Capacity = 1680 L

Holding Tank Design

Based on a DF of 40L/p/d:

Holding Tank Volumes (L)						
Frequency of pump out (Days)	Persons (#)					
	8	9	10	11	12	13
15	4800	5400	6000	6600	7200	7800
30	9600	10800	12000	13200	14400	15600
60	19200	21600	24000	26400	28800	31200
90	28800	32400	36000	39600	43200	46800
120	38400	43200	48000	52800	57600	62400
150	48000	54000	60000	66000	72000	78000
180	57600	64800	72000	79200	86400	93600

Minimum holding tank volume of 4 x DF (1920 L). 7,200 L recommended based on 12 people and a 15 day pumpout frequency. Size to be confirmed based on client's requirements.

Holding tank to be installed in accordance with SA health code & AS3500.2.

Nature Maps - 69 Old Port Wakefield Road, Two Wells SA 5501

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Appendix C

Wastewater Design Drawings

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36 Leader St, Wayville SA 5034

PROPOSED AMBULANCE STATION - WASTEWATER DRAWINGS

69 OLD PORT WAKEFIELD ROAD, TWO WELLS SA 5501

SHEET NO.	DRAWING TITLE	REVISION
WW-0000	DRAWING LIST & LOCALITY PLAN	A
WW-0100	WASTEWATER KEY PLAN	A
WW-0101	WASTEWATER PLAN	A

LOCALITY PLAN

NOT TO SCALE

RGB
THIS DRAWING INCLUDES COLOURED INFORMATION

ISSUE FOR APPROVAL

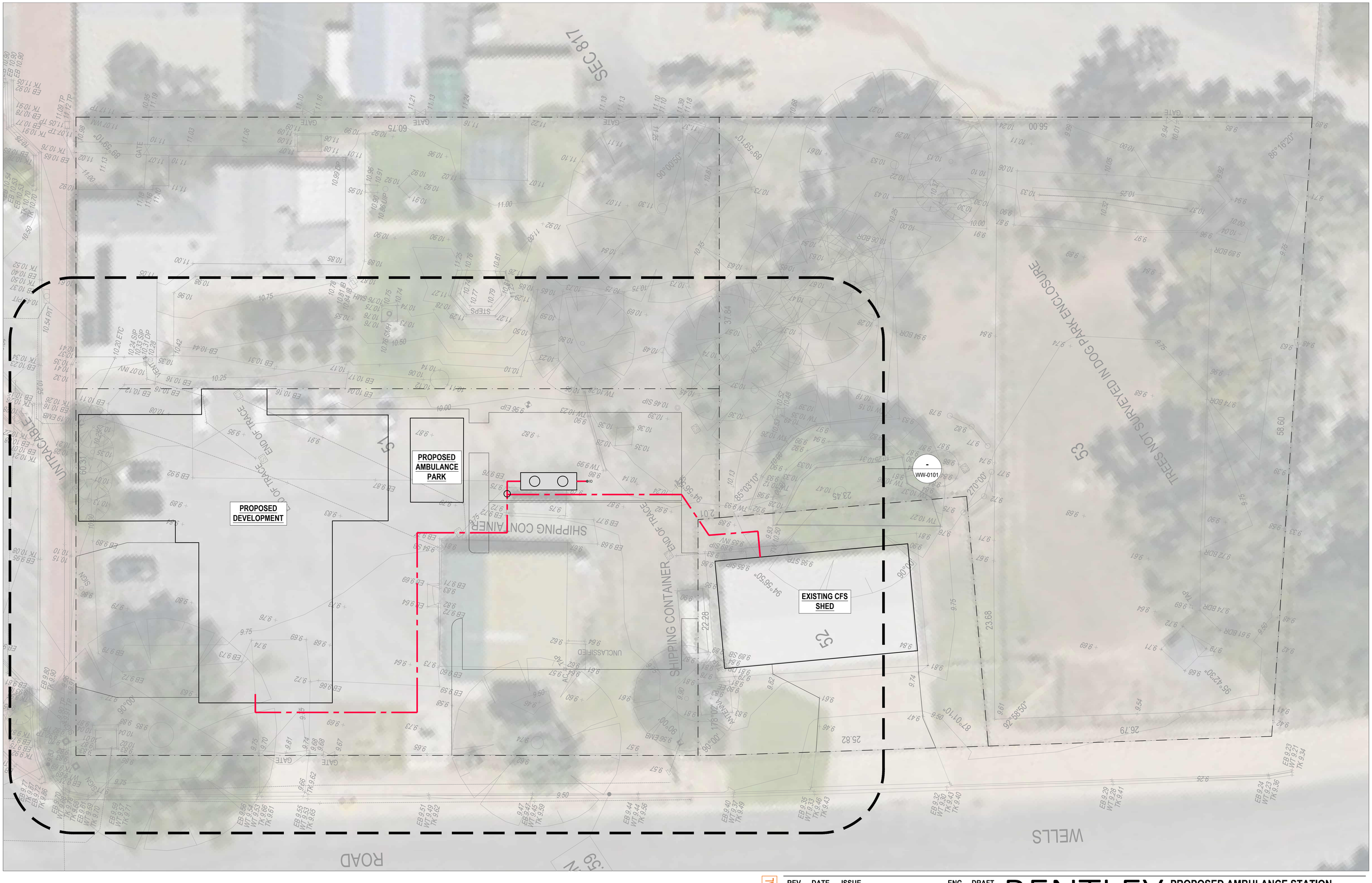
REV	DATE	ISSUE	ENG	DRAFT
A	19.08.25	FOR APPROVAL	AB	AB

BENTLEY CONSULTING
36 Leader Street, Wayville SA 5034
Email: admin@bentleyconsulting.net.au
Phone: 08 7081 4120

PROPOSED AMBULANCE STATION
69 OLD PORT WAKEFIELD ROAD, TWO WELLS SA 5501

DRAWING LIST & LOCALITY PLAN

SHEET SIZE	JOB NO.	SHEET NO.	REV
A1	BC2501066	DR-WW-0000	A



RGB
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BENTLEY CONSULTING
36 Leader Street, Wayville SA 5034
Email: admin@bentleyconsulting.net.au
Phone: 08 7081 4120

PROPOSED AMBULANCE STATION
69 OLD PORT WAKEFIELD ROAD, TWO WELLS SA 5501

WASTEWATER KEY PLAN

SHEET SIZE	JOB NO.	SHEET NO.	REV
A1	BC2501066	DR-WW-0100	A

ACCESS MODIFIABLE VOLUME TANK:

ACCESS TANKS TRAFFICABLE DN1600 9,700 L MODIFIABLE VOLUME TANK TO BE CONFIGURED AS FOLLOWS:

SEPTIC CHAMBER = 2,500 L
HOLDING CHAMBER = 7,200 L

CLASS D LID TO BE PROVIDED. TANK TO BE CONFIRMED TRAFFICABLE BY MANUFACTURER AND SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS SPECIFICATIONS.

HOLDING TANK ALARM:

AN AUDIBLE AND VISUAL ALARM WITH MUTING FACILITIES FOR THE AUDIBLE COMPONENT SHALL BE PROVIDED AND BE LOCATED IN A CONSPICIOUS POSITION TO WARN THAT THE HOLDING TANK REQUIRES PUMPING OUT WITHIN 24 HOURS.

IMPORTANT NOTE:

THIS DESIGN ASSUMES SPECIFIC LOADING PARAMETERS AS DENOTED IN THE WASTEWATER MANAGEMENT REPORT. REFER TO REPORT FOR ADDITIONAL DETAILS.

CFS SHED:

CFS SHED ON ADJACENT PROPERTY WILL UTILISE SEPTIC/ HOLDING TANK UNTIL FUTURE CWMS INFRASTRUCTURE/ CONNECTION IS AVAILABLE. ADDITIONAL LOADING FROM CFS SHED HAS BEEN CONSIDERED WITHIN THE LOADING RATE CALCULATIONS FOR THIS DESIGN. PERMISSION IS TO BE SOUGHT FROM BOTH PARTIES AND COUNCIL PRIOR TO CONSTRUCTION.

SITE BOUNDARY

ACCESS TANKS TRAFFICABLE DN1600 9,700 L MODIFIABLE VOLUME TANK WITH RISER TO SUIT COVER LEVEL. TANK TO BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS REQUIREMENTS.

GRAVITY OUTLET PROVISION TO BE PROVIDED TO ACCOMMODATE FUTURE CWMS CONNECTION.

PROVIDE CONNECTION TO CFS SHED SEWER RUN.

SEWER RUNS SHOWN ARE INDICATIVE ONLY. REFER TO HYDRAULIC SERVICES LAYOUTS BY SECON CONSULTING ENGINEERS. PLUMBER TO ENSURE ADEQUATE FALL CAN BE ACHIEVED PRIOR TO CONSTRUCTION.

EXTENT OF DESIGN, REFER TO HYDRAULIC SERVICES LAYOUT BY SECON CONSULTING ENGINEERS.

PROPOSED AMBULANCE PARK

PROPOSED DEVELOPMENT

EXISTING CFS SHED

WASTEWATER DESIGN - GENERAL NOTES

W1 THESE DRAWINGS SHALL BE READ IN CONJUNCTION WITH ALL CONSULTANT DRAWINGS, THE SPECIFICATION AND WITH SUCH OTHER WRITTEN INSTRUCTIONS ISSUED DURING THE COURSE OF THE CONTRACT. ANY DISCREPANCY SHALL BE REFERRED TO BC BEFORE PROCEEDING WITH THE WORK.

W2 THESE DRAWINGS SHALL NOT BE SCALED. DIMENSION AND SETOUT SHALL BE STRICTLY IN ACCORDANCE WITH THE ARCHITECTURAL DOCUMENTS. DRAWINGS ISSUED IN ELECTRONIC FORMAT MUST NOT BE USED FOR DIMENSIONAL SETOUT. ALL DIMENSIONS SHOWN SHALL BE VERIFIED BY THE BUILDER ON SITE. ALL DIMENSIONS SHOWN ARE IN MILLIMETERS AND LEVELS IN METERS UNLESS NOTED OTHERWISE (U.N.O).

W3 ALL MATERIALS AND WORKMANSHIP MUST BE IN ACCORDANCE WITH THE CURRENT AND RELEVANT AUSTRALIAN CODES, STANDARDS AND THE BY-LAWS AND ORDINANCES OF THE RELEVANT BUILDING AUTHORITIES UNLESS VARIED BY THE PROJECT SPECIFICATION.

W4 CONSTRUCTION SHALL NOT COMMENCE UNTIL BUILDING APPROVAL HAS BEEN RECEIVED FROM THE RELEVANT AUTHORITIES.

W5 IF THE BUILDER ENCOUNTERS A WATER TABLE OR ROCK DURING CONSTRUCTION, CONSTRUCTION IS TO BE IMMEDIATELY CEASED AND THE ENGINEER IS TO BE NOTIFIED.

W6 MINIMUM FALL TO ALL 100DIA DRAINS SHALL BE 1.65%.

W7 TRENCH BACKFILL TO 98% COMPACTION

W8 ALL BUILDING SEWER DRAIN CONNECTIONS TO BE 100DIA.

W9 BUILDER TO ENSURE ALL SETBACK DISTANCES ARE OBTAINED AS PER SA HEALTH'S ONSITE WASTEWATER SYSTEM CODE (2013) AND AS1547-2012

LEGEND

SYMBOL	DENOTES
	Ø100 uPVC SEWER PIPE @ MIN 1.65%
	Ø100 uPVC EFFLUENT PIPE @ MIN 1.00%

TYPICAL SET-BACKS

ITEM	SET-BACK FROM	MINIMUM DIMENSION (M)
SEPTIC TANK	BOUNDARIES	2.5
SEPTIC TANK	BUILDINGS	2.5

RGB
THIS DRAWING INCLUDES COLOURED INFORMATION

SCALE BAR 1:100 (A1) - SCALE BAR 1:200 (A3)
0 1 2 3 4 5 6 7 8 9 10m

ISSUE FOR APPROVAL

REV	DATE	ISSUE	ENG	DRAFT
A	19.08.25	FOR APPROVAL	AB	AB

BENTLEY CONSULTING
36 Leader Street, Wayville SA 5034
Email: admin@bentleyconsulting.net.au
Phone: 08 7081 4120

PROPOSED AMBULANCE STATION
69 OLD PORT WAKEFIELD ROAD, TWO WELLS SA 5501

WASTEWATER PLAN

SHEET SIZE	JOB NO.	SHEET NO.	REV
A1	BC2501066-DR-WW-0101		A

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Appendix D

Geotechnical Report

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Two Wells SAAS Ambulance Station

Geotechnical Investigation Draft Report

Grieve Gillett Architects

21 January 2025
Ref: 241697R002RevA

tonkin

Building exceptional
outcomes together

Document History and Status

Rev	Description	Author	Reviewed	Approved	Date
A	Draft Report	LA	JNB	JNB	21/01/2025

Contents

Project: Two Wells SAAS Ambulance Station | Geotechnical Investigation Draft Report
Client: Grieve Gillett Architects
Ref: 241697R002RevA

Tables

Figures

Appendices

1 Introduction

South Australia Ambulance Services (SAAS) are establishing an ambulance station at Two Wells, SA. Tonkin has been engaged by Grieve Gillett Architects to undertake the design of the proposed new ambulance station. As part of this design, a geotechnical investigation was conducted by Tonkin to understand the geotechnical properties of the site. Environmental testing was also conducted by Tonkin in conjunction with the geotechnical investigations.

1.1 Proposed Construction

The proposed construction of new ambulance station will consist of:

- 3 Bay Garage
- Training Room
- 10 External Car parks
- Entry and Exiting Crossovers
- Kitchen, Offices, Crew Room, Changeroom, Storeroom, Toilets and Sleep Rooms

1.2 Scope of Works

The scope of work was developed to confirm the ground profile and soil properties for the design of proposed ambulance station at Two Wells. Prior to commencing fieldwork, a desktop review was carried out to understand the regional geotechnical conditions. The fieldwork took place on the 8th of January 2025, involving the following scope of site investigation works:

- Five boreholes drilled using a 4WD-mounted Rockmaster Drill rig employing push tube methodology. Three boreholes were drilled to a target depth of 4.0 meters below ground level (mBGL) and two boreholes were drilled to a target depth of 1.5 mBGL. The locations were adjusted based on the presence of existing underground services.
- Dynamic Cone Penetrometer (DCP) tests were undertaken at all borehole locations to a target depth of 1.5 mBGL or refusal in accordance with AS 1289.6.3.2.
- The soil profile at each borehole location was logged by a Tonkin Geotechnical Engineer in accordance with AS 1726 Geotechnical site investigations.
- Soil samples were collected and submitted to a NATA accredited testing laboratory for a range of geotechnical testing.

A plan showing the borehole locations is shown in Figure 1.1.

tonkin

Job Number: 241697.
Filename: 241697.qgz
Revision: RevA
Date: 2025-01-10 11:00
Drawn: Laki Abesekara.

Data Acknowledgement:
MetroMap, 2024

Grieve Gillett Architects

TWO WELLS SAAS AMBULANCE STATION
GEOTECHNICAL INVESTIGATION
BOREHOLE LOCATION PLAN

Figure 1.1

1.3 Desktop Review

The desktop review included accessing publicly available information from the South Australian Resources Information Gateway (SARIG)[1] and the Geoscience Australia's Stratigraphic Database[2].

1.3.1 Regional Geology

Our review of information available from the South Australian Resources Information gateway (SARIG) indicates that the investigated site is underlain by:

• Unit Qp\ca - Pleistocene calcrete – Pleistocene aged Undifferentiated Pleistocene calcrete.

Regional geology mapping from SARIG for the site is shown in Figure 1.2 below.

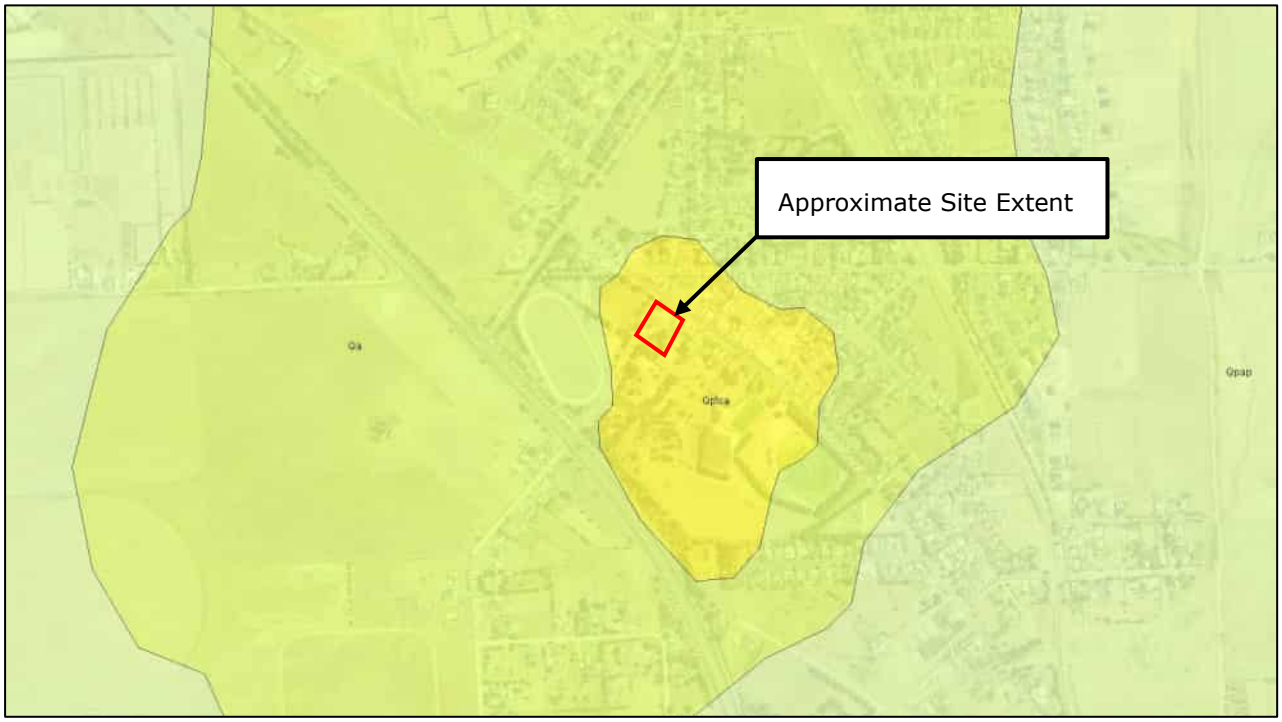

Figure 1.2 Regional Geology (SARIG, 2025)

1.3.2 Groundwater

According to groundwater information available through SARIG, shallow groundwater is expected to be encountered between 2 to 5 mBGL. A search on WaterConnect[3] shows 22 registered wells within 1km from the vicinity and 12 of them have Static Water Levels (SWL) ranging from 1.2 m to 8 m. A summary of these wells is provided in the Ground WaterConnect report in Appendix A.

[1] Department for Energy and Mining (2025). South Australian Resources Information Gateway (SARIG), Government of South Australia, Accessed 09 January 2025, https://map.sarig.sa.gov.au/

[2] Geoscience Australia and Australian Stratigraphy Commission (2017). Australian Stratigraphic Units Database, Commonwealth of Australia, Accessed 09 January 2025, https://asud.ga.gov.au/

[3] Department of Environment and Water (2025). *Groundwater Data Default,* accessed 09 January 2025, https://www.waterconnect.sa.gov.au/Systems/GD/Pages/Default.aspx

2 Site Conditions

2.1 Site Description

The site currently consists of a small shed and a sealed car park. The site slopes slightly towards the southwest, and medium to large trees are present on-site.

2.2 Geotechnical Investigation

2.2.1 Boreholes

Five boreholes (BH01 to BH05) were drilled using dynamic push tube methodology. Two boreholes (BH01 and BH03) were drilled to a depth of 4.0 mBGL and two boreholes (BH04 and BH05) were drilled to a depth of 1.5 mBGL. One borehole (BH02) was terminated at 1.0 mBGL due to push tube and solid auger refusal encountered within a calcrete layer. Borehole locations were selected away from existing services and placed at the proposed development site. The boreholes were drilled using a 4WD-mounted drill rig operated by Lab and Field.

A Geotechnical Engineer from Tonkin supervised the investigation full time. The recovered samples were logged in accordance with AS 1726 Geotechnical site investigations. Pocket Penetrometer tests were undertaken on competent cohesive soil samples recovered. The location of each borehole and the final depth is shown in Table 2.1.

Table 2.1 Summary of Borehole Locations

Borehole	Easting	Northing	Elevation (mAHD)	Depth (m)
BH01	271950.1	6169213.3	11.7	4.0*
BH02	271959.8	6169231.3	12.3	1.0R
BH03	271970.6	6169213.1	11.9	4.0*
BH04	271958.3	6169195.0	11.9	1.5*
BH05	271940.0	6169185.4	12.5	1.5*

Note: * = Extent of testing R = Refusal encountered

2.2.2 Stratigraphy

The subsurface conditions encountered during the investigation were in general agreement with the anticipated conditions following the desktop study.

A summary of the soils encountered and the depths in each borehole are presented in Table 2.2. Reference should be made to the individual borehole logs and core photographs presented in Appendix B.

Table 2.2 Soil Stratigraphy

Unit ID	Description	Depth to Underside of Unit (m)				
		BH01	BH02	BH03	BH04	BH05
1a	FILL. Asphalt/ Sandy Gravel, fine to coarse grained gravel, grey brown, fine to coarse grained sand	0.45	0.4	0.3	0.3	-
1b	TOPSOIL. Silty Sand, brown, fine to medium grained.	-	-	-	-	0.2
2	CALCRETE. recovered as Calcareous Sandy/Clayey Gravel and Gravelly Sand, pale grey brown, fine to coarse grained, with low plasticity silt.	1.1	1.0[R]	1.1	1.0	1.1
3	Calcareous Sandy CLAY. low to medium plasticity, pale reddish brown, fine to coarse grained sand, with or trace fine to coarse grained gravel.	2.0		1.4	1.3	1.5[*]
4	CLAY. medium to high plasticity, red brown, trace fine to medium grained sand.	4.0[*]		4.0[*]	1.5[*]	

Note: * = Extent of testing R = Refusal encountered,

2.2.3 Groundwater

No free groundwater was observed in any of boreholes.

2.3 In Situ Testing

2.3.1 Dynamic Cone Penetrometer (DCP) Testing

At all boreholes DCP testing was proposed to to a target depth of 1.5 mBGL in accordance with the methodology outlined in AS 1289.6.3.2. Refusal was encountered at all boreholes prior to reaching the target depth due to the presence of the calcrete. DCP test logs can be found in Appendix B.

2.4 Laboratory Testing

Three samples, including two bulk samples, were collected from three boreholes during the investigations. The samples were submitted to the NATA-accredited laboratory, Lab & Field. At the time of reporting, the lab results were not available but will be presented in the final report.

3 Design Recommendations

3.1 Footing Design

3.1.1 Site Classification

3.1.1.1 Estimated Characteristic Surface Movement

The site has been classified in accordance with AS 2870 Residential Slabs and Footings. The estimated characteristic soil surface movement (ys) was calculated to be in between 40 to 45 mm. In accordance with Section 2 of AS 2870, the site has been classified as **Class H1-D/P** due to the presence of calcareous soils and trees in the vicinity of the proposed construction.

Due to the presence of calcareous soils, design of the footings shall consider the requirements of AS 2870 and the recommendations of Special provisions for the design of residential slabs and footings and structural design of small structures, South Australian Conditions. In accordance with these recommendations, footings shall be designed to Class **H2-D** at a minimum.

All site classifications are based on current site conditions. They do not consider factors that produce abnormal moisture conditions such as:

- Future tree planting/removal
- Excessive or irregular watering adjacent to the structures
- Failure to provide and/or maintain adequate site drainage
- Irregular climatic effects including prolonged droughts and wet periods prior to construction

The classification of the site has not considered the effects of future site works (cut and fill), which may require site re-classification.

3.1.1.2 Earthquake Classification

AS 1170.4 Earthquake Actions in Australia details the requirements for consideration of the effects of earthquakes on proposed structures. The design is influenced by several factors, namely:

- Structure importance level, based on risk and consequence of failure (both in terms of risk to life and social/economic risk).
- The Hazard Factor, which varies for geographical location.
- The site Soil Sub-Class, based on the subsoil strength and thickness.

Based on the results of geotechnical investigations and the values in AS 1170.4 Table 3.3, the Soil Sub-Class for the site is defined as Class Ce – Shallow soil site.

3.1.2 Allowable Vertical Bearing Pressure

Based on our inspection, investigation, and test results, the minimum allowable bearing pressure to be used in shallow footing design is 100 kPa, on account of the dense to very dense calcrete layer encountered throughout the site. Footings shall not be found within fill or topsoil encountered during the investigation.

It is recommended that a qualified geotechnical engineer inspect the site during construction to confirm the above recommendations.

3.2 Pavement Design

At the time of reporting, the lab results were not available to present the design CBR value of the subgrade, but this will be provided in the final report.

4 Geotechnical Risks and Considerations

4.1 Presence of Fill

Fill was encountered in four boreholes (BH01 to BH04) to depths ranging between 0.3 to 0.45 mBGL. These boreholes were drilled in the existing car park, and the fill appears to consist of pavement materials. As no documentation of the construction of the fill is available, this fill must be treated as uncontrolled fill. Topsoil was encountered in one borehole (BH05) up to 0.2 mBGL. Topsoil and uncontrolled fill shall be removed prior to construction.

The recommendations herein have been made based upon the conditions encountered at the locations of the boreholes, and lesser or greater depths of fill may be present in other locations. Should conditions that differ from those detailed in this report be encountered during construction, advice should be sought from a suitably qualified and experienced geotechnical practitioner to establish suitable design parameters.

4.2 Collapsible Soils

Calcareous soils were encountered in all boreholes. These soils may be susceptible to a loss of strength upon wetting and are potentially collapsible. The design of structures shall consider the recommendations made in 'Special provisions for the design of residential slabs and footings and structural design of small structures, South Australian Conditions' when designing any footings for structures at the site. Design of structures and pavements shall also consider diverting surface water away from structures and pavements to prevent subgrade soils being exposed to excessive moisture.

Construction must endeavour to prevent adverse moisture conditions occurring below pavements or structures to minimise the risk of soil collapse. Construction involving excavation should endeavour to leave excavations open for as short a time period as possible and surface water flows should be directed away from open excavations to minimise the possibility of adverse moisture conditions. If construction occurs during inclement weather, additional water control measures or shoring should be considered to avoid excessive wetting of calcareous soils.

Additionally, non-calcareous soils on site are considered to be highly reactive in accordance with AS 2870. Excessive wetting of soils immediately adjacent to construction should be avoided to prevent accentuation of reactive shrink swell movements.

4.3 Excavatability

Indurated soils (Calcrete) were encountered at shallow depths at all borehole locations. In borehole BH02, Calcrete could not be drilled by the solid auger. Excavation with conventional earthmoving machinery is expected to be feasible within this harder indurated material, however buckets with rock teeth, and excavators with higher capacities may be required for excavation in these areas.

We expect the non-indurated soils encountered during the investigation to be readily excavated with conventional earthmoving machinery such as excavators, loaders and similar.

4.4 Excavation Stability

Batter slopes in the topsoil and fill materials should not exceed 1 vertical to 3 horizontal. These materials may be dry and flowable when unconfined and may not remain stable even at the recommended slope. Flatter batters or shoring may be required to ensure excavation stability in these materials. Formal management of excavations in these conditions will be required during construction, with the management probably involving stability assessment or the design of appropriate shoring by a suitably qualified geotechnical engineer.

Excavations within the stiff to very stiff clays are likely to experience stability of near vertical faces in the short term (nominally one day work), provided that excavations are not affected by adverse soil moisture conditions or loading at the crest.

As identified in Section 4.2, collapsible soils have been identified on site. Construction should endeavour to prevent water ingress into excavations to prevent collapse of collapsible soils. Should construction occur during wet weather, excavations in calcareous soils must be battered or supported by shoring or other support methodology designed by a qualified geotechnical engineer.

This advice shall consider the minimum benching requirements as required by the relevant occupational health and safety regulations.

4.5 Subgrade Preparation

At the site of proposed pavement construction, strip and grub to remove topsoil and uncontrolled fill and excavate as required to the excavation depth.

The subgrade of any pavement construction should be proof rolled and compaction tested in accordance with AS 3798 to identify any areas of loose compaction. While subgrade soils were recovered with stiff to hard consistency during investigations, calcareous soils may soften significantly when exposed to increased moisture. Care shall be taken during construction to avoid over wetting the subgrade (e.g. undertake compaction at or just below OMC).

4.6 Reuse of Excavated Materials

Non-calcareous soils encountered may be suitable for reuse as engineered fill provided that they are compliant with the project specification. Calcareous soils should not be reused as engineered fill.

5 Limitations

5.1 Scope

This report has been prepared in accordance with the scope of services agreed between Tonkin Consulting and the Client. In some circumstances, the scope of services may have been limited by a range of factors such as time, budget, access, site disturbance or other constraints.

5.2 Reliance on Data

In preparing the report Tonkin Consulting has relied upon data, surveys and other information provided by other sources. Unless otherwise stated in the report, Tonkin Consulting has not verified the accuracy or completeness of that data. To the extent that the statements, facts, opinions, information, conclusions and/or recommendations in the report are based in whole or in part on the data, those conclusions are contingent on the accuracy and completeness of the data. Tonkin Consulting will not be liable in relation to incorrect conclusions should any data, information or condition be incorrect or have been concealed, withheld, misrepresented or otherwise not fully disclosed to Tonkin Consulting.

5.3 Geotechnical Investigation

Geotechnical engineering is based extensively on judgment and opinion. It is far less exact than other engineering disciplines. Geotechnical engineering reports are prepared to meet specific needs and individual situations. A report prepared for one purpose may not be adequate or suitable for others.

This report was prepared for the Client and for the purposes indicated by the Client or its representative. Use by any other person, or by the Client for a different purpose, might result in problems. This report should not be used by anyone, including the Client, for other than its intended purpose without seeking additional geotechnical advice.

5.4 Project-Specific Factors

This report is based on investigations designed to address project-specific factors. Unless further geotechnical advice is obtained, this report cannot be used when the nature of the proposed development is changed, or the size, configuration, location, or orientation of any development component is amended.

This report applies only to the site investigated and not to adjoining sites.

5.5 Limitations of Investigations

This report is based on data collected at specific locations using specific investigation techniques. Only a finite amount of information has been collected to meet the specific financial and technical requirements of our Proposal and the Brief, and this report does not purport to completely describe all the site characteristics and properties. The nature and continuity of the ground between test locations has been inferred using experience and judgement. Actual conditions could vary from the assumed model, as no subsurface exploration programme, no matter how extensive, can reveal all subsurface details and conditions.

The borehole logs are the subjective interpretation of subsurface conditions at particular locations, made by trained personnel. The interpretation maybe limited by the method of investigation and may not always be definitive. Observations of a test pit or excavation allows a greater area of the subsurface conditions to be inspected than borehole locations although such methods are limited by depth and site disturbance restrictions. In borehole investigations, the actual interface between materials maybe more gradual or abrupt than the report indicates.

5.6 Time Dependency

Subsurface conditions are subject to change over time by natural forces and man-made influences. A geotechnical report is based on the conditions that existing at the time of the subsurface investigations. A geotechnical engineer's advice should be sought as to whether the report's conclusions remain valid.

5.7 Involvement during design and construction

A geotechnical engineer should be retained to work with other appropriate design professionals to explain the relevant geotechnical finding and review the adequacy of their plans and specifications relative to geotechnical issues.

Issues relevant to construction works should be assessed by contractors who can make their own interpretation of the factual data provided. They should perform any additional tests as necessary for their own purposes.

5.8 Whole report

This report is intended to be read as a whole. Parts of the report should not be separated out and used without reference to the whole of the report.

In particular borehole and excavation logs should not be redrawn or used in isolation from the report.

5.9 Report for the Benefit of the Client

This report has been prepared for the benefit of the Client and no other party. Tonkin Consulting assumes no responsibility and will not be liable to any other person or organisation for or in relation to any matter dealt with or conclusions expressed in the report, or for any loss or damage suffered by any other person or organisation arising from matters dealt with or conclusions expressed in the report (including, without limitation, matters arising from any negligent act or omission of Tonkin Consulting or for any loss or damage suffered by any other party relying upon the matters dealt with or conclusions expressed in this report. Other parties should not rely on the report or the accuracy or completeness of any conclusion and should make their own enquiries and obtain independent advice in relation to such matters.

5.10 Other Limitations

Tonkin Consulting will not be liable to update or revise the report to take into account any events or emergent circumstances or facts occurring or becoming apparent after the date of the report.

Appendix A – Registered Ground Water wells

WaterConnect

Groundwater Data Report

Government of South Australia
Department for Environment and Water

Circle Centre -34.593611,138.513472, Radius 1km

Unit No	Date	Max Depth (m)	Latest Depth (m)	Status	Cased To (m)	SWL (m)	SWL Date	Yield (L/sec)	Yield Date	TDS (mg/L)	TDS Date	Aquifer	Purpose	Obs No	Permit No	SWL Status	Salinity Status
6628-549	01/01/1962	42.67	42.67	ABD													
6628-550	24/01/1949	24.38	24.38	NL	24.38	5.49	24/01/1949	0.38	24/01/1949	2285	24/01/1949	Qpah					
6628-585	20/01/1949	4.57	0	BKF		3.05	20/01/1949	0.13	20/01/1949	3099	20/01/1949	Qpah	STK				
6628-586	01/01/1920	60.96	60.96	ABD	60.96	6.1	13/03/1967	0.63	21/03/1962	2970	21/03/1962	Tomw(T1)	IRR	PTG041			
6628-587	09/10/1959	60.96	0	BKF				0.63	01/01/1963	4585	30/10/1964	Tomw(T1)	IRR		66172		
6628-588	01/10/1959	60.96	60.96	BLK		7.97	25/09/1998	13.89	16/04/1974	2870	09/10/1959	Tomw(T1)	OBS	PTG067		H	N
6628-593	21/01/1949	29.26	29.26	ABD	29.26	2.74	21/01/1949	1.26	21/01/1949	3582	26/08/1949	Qpah	IRR				
6628-594	21/01/1949	3.05		NL	3.05	1.22	21/01/1949	0.13	21/01/1949	3584	21/01/1949	Qpah	IRR				
6628-595	12/02/1968	19.51	19.51	OPR				0.25	12/02/1968	7515	12/02/1968	Qpah	IRR				
6628-761		38	38	OPR				0.19	29/03/1967	4500	06/03/1969	Qpah	DOM				
6628-763				NL													
6628-853	30/05/1967	36.58	0	BKF		8.23	30/05/1967	6.32	30/05/1967	7445	01/06/2002	Qpah(Q4)	DOM		502102		
6628-854				NL		0	21/01/1949			2258	21/01/1949	Tomw(T1)	IRR				
6628-855				NL						2230	08/04/1958						
6628-856				NL		0	31/01/1949			2744	31/01/1949	Tomw(T1)	STK				
6628-8789	05/11/1982	6	6	OPR								Qpah					
6628-12162	14/01/1983	27.5	27.5	OPR	27.5			1	14/01/1983	4117	14/01/1983	Qpah(Q3)	IND		92448		
6628-27409		7.5	7.5		4.5	5.1	27/05/2014					Qpah	INV		232435		
6628-27410	27/05/2014	12	12		6	6.66	27/05/2014					Qpah	INV		232436		
6628-33058	08/05/2024	10.5	10.5		6.5	5.6	08/05/2024						INV		501279		
6628-33059	07/05/2024	11	11		7	5.8	07/05/2024						INV		501278		
6628-33060	08/05/2024	8	8		5	3.2	08/05/2024								501280		

22 records

Appendix B – Borehole Logs & Core Photographs

ENGINEERING BOREHOLE LOG

Borehole No: **BH01**

Client:	Grieve Gillett Architects	**Total Depth (mBGL):**	4	**Commenced:**	08/01/2025
Project:	Two Wells Ambulance Station	**Elevation (mAHD):**	11.71	**Completed:**	08/01/2025
Project No:	241697	**Easting:**	271950.19	**Logged By:**	LA
Contractor:	Lab + Field	**Northing:**	6169213.33	**Checked By:**	JNB
Equipment:	Rockmaster	**Coordinates:**	54		

Method	Elevation (m)	Water	Depth (m)	Graphic Log	Group Symbol	Material Description	Moisture	Consistency/ Density	Sample Interval	Samples	DCP (0 5 10 15 20 25)	Field Tests	Comments / Observations
SA	11.71					ASPHALT.							
					F	FILL. Sandy GRAVEL. pale brown, fine to coarse sized, fine to coarse grained sand, trace low plasticity silt.	D	D		0.05 - 0.2 m ENV QC1			
PT			0.50		GC	Calcareous Clayey GRAVEL. low to medium plasticity clay, pale grey brown, fine to coarse sized, with fine to coarse grained sand.		D-VD		0.5 - 0.6 m ENV			Calcrete Layer
	10.71		1										
			1.50		CL-CI	Calcareous Sandy CLAY. low to medium plasticity, pale reddish brown, fine to coarse grained sand, with fine to coarse sized gravel, inorganic.	M-D	VSt		1.1 - 1.2 m ENV		1.5, PP 600	
					CL-CI	Calcareous Sandy CLAY. low to medium plasticity, pale reddish brown, fine to coarse grained sand, trace fine to coarse sized gravel.	w < PL			1.7 - 1.8 m ENV			
	9.71		2							2 - 2.1 m ENV			
			2.50		CI-CH	_ CLAY. medium to high plasticity, red brown, trace fine to medium grained sand, inorganic.							
	8.71		3									3, PP 600	
			3.50		CI-CH	_ CLAY. medium to high plasticity, red brown mottled pale grey, with fine to medium grained sand, inorganic.							with calcareous pockets
	7.71												
						BH01 Target Depth Reached at 4m (Target Depth Reached)							
	6.71												

Photo description	BH01		
Client	Grieve Gillett Architects		
Location	120 Port Wakefield Hwy, Two Wells SA 5501, Australia		
Project name	Two Wells Ambulance Station		
Project No	241697	**Scale**	Not to Scale
BH No	BH01	**BH Depth**	CorePhoto

ENGINEERING BOREHOLE LOG

Borehole No: **BH02**

Client:	Grieve Gillett Architects	**Total Depth (mBGL):**	1	**Commenced:**	08/01/2025
Project:	Two Wells Ambulance Station	**Elevation (mAHD):**	12.33	**Completed:**	08/01/2025
Project No:	241697	**Easting:**	271959.81	**Logged By:**	LA
Contractor:	Lab + Field	**Northing:**	6169231.33	**Checked By:**	JNB
Equipment:	Rockmaster	**Coordinates:**	54		

Method	Elevation (m)	Water	Depth (m)	Graphic Log	Group Symbol	Material Description	Moisture	Consistency/ Density	Sample Interval	Samples	DCP (0 5 10 15 20 25)	Field Tests	Comments / Observations
SA	12.33					ASPHALT.							
					GW	FILL. Sandy GRAVEL. grey brown, fine to coarse sized, fine to coarse grained sand.	D	VD		0.1 - 0.2 m ENV			
										0.3 - 0.4 m ENV			
			0.50		GW	Calcareous Sandy GRAVEL. pale grey brown, fine to coarse sized, fine to coarse grained sand.		D-VD		0.5 - 0.6 m ENV			Calcrete layer_ @1.0 both push tube and auger refusal
	11.33									0.9 - 1 m ENV			
						BH02 refusal Encountered at 1m (Push tube and Auger Refusal)							
	10.33												
	9.33												
	8.33												
	7.33												

tonkin

Photo description	BH02		
Client	Grieve Gillett Architects		
Location	120 Port Wakefield Hwy, Two Wells SA 5501, Australia		
Project name	Two Wells Ambulance Station		
Project No	241697	**Scale**	Not to Scale
BH No	BH02	**BH Depth**	CorePhoto

ENGINEERING BOREHOLE LOG

Borehole No: **BH03**

Client:	Grieve Gillett Architects	**Total Depth (mBGL):**	4	**Commenced:**	08/01/2025
Project:	Two Wells Ambulance Station	**Elevation (mAHD):**	11.91	**Completed:**	08/01/2025
Project No:	241697	**Easting:**	271970.59	**Logged By:**	LA
Contractor:	Lab + Field	**Northing:**	6169213.15	**Checked By:**	JNB
Equipment:	Rockmaster	**Coordinates:**	54		

Method	Elevation (m)	Depth (m)	Group Symbol	Material Description	Moisture	Consistency/ Density	Sample Interval	Samples	DCP (0 5 10 15 20 25)	Field Tests	Comments / Observations
SA	11.91		F	FILL. Sandy GRAVEL. grey brown, fine to coarse sized, fine to coarse grained sand, trace low plasticity silt.	D	D-VD		0 - 0.2 m ENV QC2			
		0.50	GW	Calcareous Sandy GRAVEL. pale grey brown, fine to coarse sized, fine to coarse grained sand, with low plasticity silt.		VD		0.3 - 0.4 m ENV			Calcrete layer
	10.91	1									
PT			CL-CI	Calcareous Sandy CLAY. low to medium plasticity, pale reddish brown, fine to coarse grained sand, trace fine to medium sized gravel.	w < PL	VSt		1.1 - 1.2 m ENV	8 8 6 5		
		1.50						1.4 - 1.5 m E...			
			CI-CH	_ CLAY. medium to high plasticity, red brown, trace fine to medium grained sand, inorganic.				1.5 - 1.9 m GEO PI+ PSD		1.8, PP 600	
	9.91	2									
		2.50									
	8.91	3								3, PP 600	
		3.50									
	7.91			**BH03 Target Depth Reached at 4m (Target Depth Reached)**							
	6.91										

Photo description	BH03		
Client	Grieve Gillett Architects		
Location	120 Port Wakefield Hwy, Two Wells SA 5501, Australia		
Project name	Two Wells Ambulance Station		
Project No	241697	**Scale**	Not to Scale
BH No	BH03	**BH Depth**	CorePhoto

ENGINEERING BOREHOLE LOG

Borehole No: **BH04**

Client:	Grieve Gillett Architects	**Total Depth (mBGL):**	1.5	**Commenced:**	08/01/2025
Project:	Two Wells Ambulance Station	**Elevation (mAHD):**	11.86	**Completed:**	08/01/2025
Project No:	241697	**Easting:**	271958.29	**Logged By:**	LA
Contractor:	Lab + Field	**Northing:**	6169195.03	**Checked By:**	JNB
Equipment:	Rockmaster	**Coordinates:**	54		

Method	Elevation (m)	Water	Depth (m)	Graphic Log	Group Symbol	Material Description	Moisture	Consistency/ Density	Sample Interval	Samples	DCP (0 5 10 15 20 25)	Field Tests	Comments / Observations
SA	11.86				F	FILL. Sandy GRAVEL. grey brown, fine to coarse sized, fine to coarse grained sand, with low plasticity silt.	D	D		0.1 - 0.2 m ENV			
PT					SW	Calcareous Gravelly SAND. pale grey brown, fine to coarse grained, fine to coarse sized gravel, with low plasticity silt.		D-VD		0.3 - 0.4 m ENV	11 11		Calcrete layer
			0.50							0.5 - 1 m BULK CBR+PI+PSD			
	10.86		1		CL-CI	Calcareous Sandy CLAY. low to medium plasticity, pale reddish grey brown, fine to coarse grained sand, trace fine to coarse sized gravel, inorganic.	w < PL	VSt		1 - 1.1 m ENV			
					CI-CH	_ CLAY. medium to high plasticity, red brown, trace fine to medium grained sand, inorganic.				1.3 - 1.4 m ENV		1.3, PP 600	
						BH04 Target Depth Reached at 1.5m (Target Depth Reached)							

Photo description	BH04		
Client	Grieve Gillett Architects		
Location	120 Port Wakefield Hwy, Two Wells SA 5501, Australia		
Project name	Two Wells Ambulance Station		
Project No	241697	**Scale**	Not to Scale
BH No	BH04	**BH Depth**	CorePhoto

ENGINEERING BOREHOLE LOG

Borehole No: **BH05**

Client:	Grieve Gillett Architects	**Total Depth (mBGL):**	1.5	**Commenced:**	08/01/2025
Project:	Two Wells Ambulance Station	**Elevation (mAHD):**	12.49	**Completed:**	08/01/2025
Project No:	241697	**Easting:**	271940.08	**Logged By:**	LA
Contractor:	Lab + Field	**Northing:**	6169185.40	**Checked By:**	JNB
Equipment:	Rockmaster	**Coordinates:**	54		

Method	Elevation (m)	Water	Depth (m)	Graphic Log	Group Symbol	Material Description	Moisture	Consistency/ Density	Sample Interval	Samples	DCP (0 5 10 15 20 25)	Field Tests	Comments / Observations
PT	12.49				TS	Topsoil. Silty SAND. brown, fine to medium grained.	D	MD		0 - 0.1 m ENV	3, 4		
			0.50		GW	Calcareous Sandy GRAVEL. pale grey brown, fine to coarse sized, fine to coarse grained sand, with low plasticity silt.		D-VD		0.2 - 0.4 m ENV QC3 0.3 - 0.8 m BULK CBR	17, 13		Calcrete Layer
	11.49		1		CL-CI	Calcareous Sandy CLAY, low to medium plasticity, pale grey brown, fine to coarse grained sand, trace fine to medium sized gravel, inorganic.	w < PL	St-VSt		0.8 - 0.9 m ENV 1.2 - 1.4 m ENV			
						BH05 Target Depth Reached at 1.5m (Target Depth Reached)							

Photo description	BH05		
Client	Grieve Gillett Architects		
Location	120 Port Wakefield Hwy, Two Wells SA 5501, Australia		
Project name	Two Wells Ambulance Station		
Project No	241697	**Scale**	Not to Scale
BH No	BH05	**BH Depth**	CorePhoto

BENTLEY
CONSULTING

Appendix E

SA Health Approved Products

Approved Wastewater Products in South Australia

Septic Tanks, Biological Filters, Holding Tanks & Pump Sumps

	Model	Capacity (L/EP)	Description	DHW Approval No. & expiry	AS/NZS 1546.1:2008 Certification No. & expiry
A&A Worm Farm Waste Systems Pty Ltd Hastings, VIC enquiries@wormfarm.com.au	PT3000L G PT3000L P	10EP	Wet composting all-waste system with polypropylene shell, internal decomposition chamber with media utilising worms and invertebrates. Treated effluent must be disposed of via subsurface means (not including irrigation). Servicing required 6 months after commissioning, and every two years thereafter for life of system by a service agent accredited by A&A Worm Farm Waste Systems.	WWP-20131 4 June 2026	332 4 June 2026
	CT3200L G CT3200L P	21EP	Wet composting all-waste system with concrete shell, internal decomposition chamber with media utilising worms and invertebrates. Treated effluent must be disposed of via subsurface means (not including irrigation). Servicing required 6 months after commissioning, and every two years thereafter for life of system by a service agent accredited by A&A Worm Farm Waste Systems.	WWP-20054/1 4 June 2026	
	CT3600L G CT3600L P	24EP			
	CT5000L G CT5000L P	30EP			
Access Septic Products Pty Ltd Lonsdale, SA admin@accessseptic.com.au	Access Septic 35	3,500L	Tank, fibreglass, horizontal orientation. Can be configured as a holding tank or a septic tank with baffle.	WWP-20041/2 17 November 2025	582 17 November 2025
	Access Septic 40	4,000L			
	Access Septic 50	5,000L			
	Access All In One 42	3,300L	Septic tank with baffle and 900L built-in pump sump, fibreglass, horizontal orientation.		
	Access All In One 50	4,100L			

Manufacturer	Model	Capacity (L/EP)	Description	DHW Approval No. & expiry	AS/NZS 1546.1:2008 Certification No. & expiry
Access Septic Products Pty Ltd Lonsdale, SA admin@accessseptic.com.au	Modifiable Volume Tanks DN1600	5,800 – 25,200L	Tank, glass-reinforced plastic, horizontal orientation. Can be configured as a holding tank/pump sump, septic tank, septic tank with pump chamber, Anaerobic Baffled Reactor (ABR) or ABR with pump chamber. ABR to be sized either in accordance with conventional septic tank sizing calculation, or using P2 x 3DF (whichever is greater). Approved tank volumes: 5,800L, 6,800L, 7,800L, 8,700L, 9,700L, 10,600L, 11,600L, 12,600L, 13,600L, 14,600L, 15,600L, 16,500L, 17,500L, 18,400L, 19,400L, 20,400L, 21,300L, 22,300L, 23,200L, 24,200L and 25,200L.	WWP-20052 17 November 2025	582 17 November 2025
	Modifiable Volume Tanks DN2400	16,900 – 82,000L	Tank, glass-reinforced plastic, horizontal orientation. Can be configured as a holding tank/pump sump, septic tank, septic tank with pump chamber, Anaerobic Baffled Reactor (ABR) or ABR with pump chamber. ABR to be sized either in accordance with conventional septic tank sizing calculation, or using P2 x 3DF (whichever is greater). Approved tank volumes: 16,900L, 21,100L, 25,500L, 29,800L, 34,100L, 38,400L, 42,700L, 47,000L, 51,400L, 55,700L, 60,000L, 64,800L, 69,100L, 73,400L, 77,700L and 82,000L.	WWP-20052-1 8 October 2025	7328-4202-01 8 October 2025
	Access 88	8,875L	Tank, fibreglass, vertical orientation. Can be configured as a holding tank or septic tank with baffle.	WWP-20071 9 September 2025	629 9 September 2025
Arris Pty Ltd Urrbrae, SA info@arris.com.au	RhizoVault Anaerobic Baffled Reactor (ABR)	5,800 - 13,600L 16,900 - 60,000L	Tank, Glass-reinforced plastic, horizontal orientation, containing baffles that create between 3 and 6 chambers. An internal pump chamber can also be incorporated within the tank. Sized either in accordance with conventional septic tank sizing calculation, or using P2 x 3DF (whichever is greater).	WWP-20125 8 October 2025	TBD

Manufacturer	Model	Capacity (L/EP)	Description	DHW Approval No. & expiry	AS/NZS 1546.1:2008 Certification No. & expiry
Arris Pty Ltd Urrbrae, SA info@arris.com.au	Rhizopod®	N/A	Recirculating effluent evapotranspiration system consisting of a concrete vessels with plants. Used in conjunction with an on-site wastewater system and a balance tank sized to hold a minimum 4 days hydraulic flow. Rhizopod® setbacks to buildings to be determined by a structural engineer.	WWP-20111 13 October 2025	SMK1659 13 October 2025
Aquatec Fluid Systems Pty Ltd Shepparton, VIC info@aquatecenviro.com	Simplex	600L	Packaged pressure sewer pump unit, polyethylene, vertical orientation.	WWP-20097/A 28 September 2026	BMP 657673 28 September 2026
	Enviroplex	900L			
	Simplex	1,100L			
	Duplex	1,500L			
	Enduraplex	950L	Packaged pump sump, polyethylene, vertical orientation.	WWP-20164 12 December 2027	SMK41326 12 December 2027
BioCycle Sheidow Park, SA sales@biocycle.com.au	Septic Tank	3,000L	Septic tank with baffle, concrete, horizontal orientation.	WWP-20166 9 August 2029	SMKB20210 9 August 2029
		3,250L			
		4,250L			
		8,000L	Septic tank with baffle, concrete, vertical orientation.		
Coerco Pty Ltd Dalwallinu, WA info@coerco.com.au	VUT600	600L	Pump sump, polyethylene, vertical orientation.	WWP-20170 2 November 2029	SMK40330 2 November 2029
	VUT900	900L			
	VUT1200	1,200L			
	SEP-1450	1,450L	Tank, polyethylene, vertical orientation. Can be configured as a septic tank with baffle or holding tank.	WWP-20171 2 November 2029	
	SEP-2200	2,200L			
	SEP-3200 NEP-3200	3,200L			
	SEP-4000 NEP-4000	4,000L			
	SEP-11000	11,000L	Tank, polyethylene, horizontal orientation. Can be configured as a septic tank with baffle or holding tank.	WWP-20172 2 November 2029	
	SEP-15000	15,000L			
	SEP-19000	19,000L			
	SEP-23000	23,000L			

Manufacturer	Model	Capacity (L/EP)	Description	DHW Approval No. & expiry	AS/NZS 1546.1:2008 Certification No. & expiry
Coerco Pty Ltd Dalwallinu, WA info@coerco.com.au	SEP-27000	27,000L	Tank, polyethylene, horizontal orientation. Can be configured as a septic tank with baffle or holding tank.	WWP-20172 2 November 2029	SMK40330 2 November 2029
	SEP-31000	31,000L			
Department for Environment and Water (DEW) Adelaide, SA	National Parks and Wildlife Service (NPWS) Waterless Holding Tank Toilet System	850L	Waterless public toilet system composed of a toilet pedestal, subsurface polyethylene holding tank, and vent with wind-driven turbine ventilator, designed for use in national parks. Toilet block building will require footings to be engineered to cater for holding tank located within building foundation footprint. Not designed to accept plumbing fixture waste.	WWP-20086/1 23 August 2028	SMKB20032 23 September 2028 SMK40227 20 January 2029
		1,050L			
		1,460L			
Enviro One Services Cleveland, QLD	E/One Grinder Pump Station Model 2010iW	600/650L	Packaged grinder pump station, polyethylene, vertical orientation. Can be fitted with a proprietary “Model CM9125” extension collar.	WWP-20025/A 11 May 2028	SMKB20051 11 May 2028
	E/One Grinder Pump Station Model 2013iW	850/900L	Packaged grinder pump station, polyethylene, vertical orientation.		
	E/One Grinder Pump Station Model 2014iW	1,290/ 1,500L	Packaged grinder pump station, polyethylene, vertical orientation. Can be fitted with a proprietary “Model CM9125” extension collar.		
Everhard Industries Geebung, QLD info@everhard.com.au	Septic Tank/Holding Tank	3,000L	Tank, Polypropylene, vertical orientation. Can be configured as a septic tank with baffle or holding tank. Can be fitted with a proprietary riser.	WWP-20142 2 June 2028	SMK01950 2 June 2028
		4,000L	Tank, Polypropylene, vertical orientation. Can be configured as a septic tank with baffle or holding tank.		
	Pump Well	250L or 450L	Pump sump, polyethylene, spherical orientation. Can be fitted with a proprietary riser.		

Manufacturer	Model	Capacity (L/EP)	Description	DHW Approval No. & expiry	AS/NZS 1546.1:2008 Certification No. & expiry
Global Water Tonsley, SA sales@globalwatergroup.com.au	DAP07	650L	DrainAce packaged pump station, polyethylene, vertical orientation.	WWP-20110/1 28 September 2025	BMP 690194 28 September 2025
	DAP10	1,000L			
	DAP14	1,450L			
	DAP11A	1,200L			BMP 728571 4 November 2025
	DAP16A	1,600L			
	DAP20A	2,000L			
	DAP30	3,000L			
	DAP50	5,000L			
	DAC54	5,400L			SMK1659 13 October 2025
	DAC98	9,800L			
	DAC136	13,640L			
	DAC226	22,600L			
Global Rotomoulding Helidon Spa, QLD info@globalwater.com.au	GR-SP2500	2,500L	Septic tank (with or without baffle), polyethylene, spherical orientation.	WWP-20175 20 April 2030	SMK40297 20 April 2030
	GR-SP3000	3,000L			
	GR-SP4500	4,500L	Septic tank (with or without baffle), polyethylene, spherical orientation. Can be installed with a 300mm riser.		
	GR-SP5000	5,000L			
	GR-SP6000	6,000L			
	GR-2RBDT570	570L	Holding tank/pump sump, polyethylene, horizontal orientation. Can be used as a dosing chamber in the Surge-Flow100 reed bed container (used by the Reed-ePod).	WWP-20176 20 April 2030	
	GR-POC550	550L	Holding tank/pump sump, polyethylene, vertical orientation.		
	GR-POC1000	1,000L			
Gough Plastics Bohle, QLD sales@gough.com.au	Hybrid Toilet System	6EP	Public toilet primary-treatment system consisting of a proprietary low/no flush toilet pedestal, waste collection/treatment tank(s), vent with wind-driven or powered turbine, and effluent disposal system in accordance with the Code. Can accept hand basin waste.	WWP-20141 23 April 2028	SMKB21477 23 April 2028
		10EP			
		25EP			

Manufacturer	Model	Capacity (L/EP)	Description	DHW Approval No. & expiry	AS/NZS 1546.1:2008 Certification No. & expiry
Gough Plastics Bohle, QLD sales@gough.com.au	Hybrid Toilet System	50EP	Public toilet primary-treatment system consisting of a proprietary low/no flush toilet pedestal, waste collection/treatment tank(s), vent with wind-driven or powered turbine, and effluent disposal system in accordance with the Code. Can accept hand basin waste.	WWP-20141 23 April 2028	SMKB21477 23 April 2028
		75EP			
		100EP			
		150EP			
GRAF Australia Pty Ltd Henderson, WA info@grafaustralia.com.au	Carat	2,700L	Septic tank (with or without baffle), pump sump or holding tank, polypropylene, horizontal orientation. Can be fitted with proprietary risers. Can be made trafficable for class B and D vehicle loads.	WWP-20159 26 April 2029	5669-3054-02 26 April 2029
		3,750L			
		4,800L			
		6,500L			
	Carat XL	8,500L	Septic tank (without baffle), pump sump or holding tank, polyethylene, horizontal orientation. Can be fitted with proprietary risers. Can be made trafficable for class B and D vehicle loads.	WWP-20155 26 April 2029	
		10,000L			
	Carat XXL	16,000L	Septic tank (without baffle), holding tank or pump sump, polyethylene, horizontal orientation. Can be fitted with proprietary risers. Can be made trafficable for class B and D vehicle loads. Septic tank (without baffle), holding tank or pump sump, polyethylene, horizontal orientation. Can be fitted with proprietary risers. Can be made trafficable for class B and D vehicle loads.	WWP-20167/1 26 April 2029	
		22,000L			
		26,000L			
		28,000L			
		32,000L			
		36,000L			
		38,000L			
		42,000L			
		46,000L			
		48,000L			
		52,000L			
	Sapphire	600L	Pump sump/holding tank, polyethylene, vertical orientation. Can be fitted with proprietary risers. Can be made trafficable for class B and D vehicle loads.	WWP-20160 26 April 2029	
		900L			
		1,200L			
		1,500L			
	Platin/ Garantia Li-Lo	1,500L	Pump sump/holding tank, polyethylene, horizontal orientation. Can be fitted with proprietary risers. Can be made trafficable for class B vehicle loads.	WWP-20087/1 26 April 2029	
		3,000L			
		5,000L			

Manufacturer	Model	Capacity (L/EP)	Description	DHW Approval No. & expiry	AS/NZS 1546.1:2008 Certification No. & expiry
GRAF Australia Pty Ltd Henderson, WA info@grafaustralia.com.au	SuperCompact	2,000L 3,000L 4,000L 5,000L 8,000L 10,000L	Pump sump/holding tank, polyethylene, horizontal orientation. Can be fitted with proprietary risers. Can be made trafficable for class B and D vehicle loads.	WWP-20155 26 April 2029	5669-3054-02 26 April 2029
Hengshui Aoliancle Trading Heibi, China *Distributed by* Ecoflo Wastewater Management Virginia, QLD info@ecoflo.com.au	Nature Clean SMC Horizontal Septic Tank	2,500L (working capacity 2,300L)	Dual baffle 2,500L glass fibre reinforced plastic horizontal septic tank.	WWP-20104 3 October 2026	669 3 October 2026
Plastek Industries Pty Ltd Delacombe, VIC info@plastekind.com.au	Septic Tank	1,800L 3,300L 5,000L	Septic tank with baffle, concrete, horizontal orientation.	WWP-20119 9 November 2026	SMK41214 9 November 2026
	Pump Well/ Holding Well	2,200L 3,600L 5,500L	Holding tank/pump sump, concrete, vertical orientation.		
Polymaster Swan Hill, VIC sales@polymaster.com.au	Pump Well	700L 1,000L 1,300L	Pump sump, polyethylene, vertical orientation. Can be fitted with a proprietary riser	WWP-20153 30 May 2026	BMP 650823 30 May 2026
	ST3100 ST4550	3,100L 4,550L	Septic tank without baffle, polyethylene, horizontal orientation. Can be fitted with a proprietary riser.	WWP-20139 30 May 2026	
	CW3300 CW5000	3,300L 5,000L	Holding tank, polyethylene, horizontal orientation. Can be fitted with a proprietary riser.		

Manufacturer	Model	Capacity (L/EP)	Description	DHW Approval No. & expiry	AS/NZS 1546.1:2008 Certification No. & expiry
Property Werx Pty Ltd Port Macquarie, NSW info@wormsmart.com.au	WormSmart AWSP1800PF	10EP	Wet composting all-waste system with decomposition chamber utilising worms and invertebrates. Treated effluent must be disposed of via subsurface means (not including dripper irrigation). System must be serviced every 6 months by service agent accredited by WormSmart.	WWP-20120 25 August 2026	339 25 August 2026
Quickmix Concrete Mount Gambier, SA admin@quickmix.com.au	Septic Tank	3,400L	Septic tank, concrete, horizontal orientation.	WWP-20154 18 December 2028	SMK1661 18 December 2028
	Septic Tank	6,000L	Septic tank, concrete, vertical orientation.		
	Collection Well	6,000L	Holding tank, concrete, horizontal orientation.		
RELN Pty Ltd Ingleburn, NSW sales@reln.com.au	450L/600L Pump Well	450L or 600L	Pump sump, polyethylene, vertical orientation. Capacity 450L or 600L depending on inlet drill location.	WWP-20183 19 July 2028	AMI 1651 19 July 2028
	1200L/1000L/ 900L Pump Well	900L or 1,000L	Pump sump, polyethylene, vertical orientation. 1,200L nominal capacity. Usable capacity of 900L or 1,000L depending on inlet drill location.		
RELN Pty Ltd Ingleburn, NSW sales@reln.com.au	3200L Septic Tank/Holding Tank	3,200L	Tank, polypropylene, vertical orientation. Can be configured as a holding tank or a septic tank with baffle. Can be fitted with a proprietary riser.	WWP-20183 19 July 2028	AMI 1651 19 July 2028
	4000L Septic Tank/Holding Tank	4,000L	Tank, polypropylene, vertical orientation. Can be configured as a holding tank or a septic tank with baffle.		
Ri-Industries Angle Park, SA sales@ri-industries.com.au	Pump Chamber	622L	Pump sump, concrete, vertical orientation. Can be fitted with proprietary “Type 34” riser.	WWP-20062/1 13 October 2025	SMK1659 13 October 2025
	Pump Chamber	1,100L	Pump sump, plastic fibre-reinforced concrete, vertical orientation.		
	Septic Tank	3,000L	Septic tank with baffle, poly fibre-reinforced concrete, horizontal orientation. Can be fitted with proprietary “Type 33” riser. A proprietary trafficable cover slab suitable for Class B vehicle loads can be installed.	WWP-20064/1 13 October 2025	

Manufacturer	Model	Capacity (L/EP)	Description	DHW Approval No. & expiry	AS/NZS 1546.1:2008 Certification No. & expiry
Ri-Industries Angle Park, SA sales@ri-industries.com.au	Septic Tank	1,620L	Septic tank with baffle, concrete, horizontal orientation. Can be fitted with proprietary "Type 33" riser.	WWP-20063/1 13 October 2025	SMK1659 13 October 2025
		3,000L 50mm wall			
		3,000L 60mm wall			
		3,250L			
	Septic Tank/Holding Tank	4,300L	Septic tank with baffle or holding tank, concrete, horizontal orientation. Can be fitted with proprietary "Type 33" riser.		
		5,000L			
	Septic Tank/Holding Tank	5,000L	Tank, concrete, vertical orientation. Can be configured as a holding tank or septic tank with baffle. Can be fitted with proprietary risers. Come in trafficable and non-trafficable versions.	WWP-20059/1 13 October 2025	
		8,000L			
		12,000L			
		20,000L			
	Ri-Scape 3300	3,300L	Combined septic tank with baffle and internal 900L pump chamber, concrete, horizontal orientation. Can be fitted with proprietary riser and cover slab with lockable poly resin access lid.	WWP-20061/1 13 October 2025	
	Ri-Scape 4000	4,000L			
Rotoplas Unanderra, NSW sales@rotoplas.com.au	VUT100	100L	Pump sump/holding tank, polyethylene, vertical orientation.	WWP-20137/1 4 November 2025	BMP 728571 4 November 2025
	VUT250	250L			
	VUT350	350L			
	VUT700	700L			
	VUT1200	1,200L			
	VUT1600	1,600L			
	VUT2000	2,000L			
	VUT3000	3,000L			
	VUT5000	5,000L			

Manufacturer	Model	Capacity (L/EP)	Description	DHW Approval No. & expiry	AS/NZS 1546.1:2008 Certification No. & expiry
SPE Polytech Ettalong, NSW *Distributed by* **Eco Building Supplies** Seaview Downs, SA admin@ecobuildingsupplies.com.au **Pump Stations Australia** Seacliff Park, SA office@pumpstationsaustralia.com.au	Pump Stations	1,050L 850mm diameter	Pump stations, polyethylene, vertical orientation.	WWP-20168 and WWP-20169 20 January 2029	SMK40227 20 January 2029
		1,050L 1,000mm diameter			
		1,460L			
		1,880L			
		3,150L			
		4,100L			
		6,100L			
		8,500L			
Suncoast Waste Water Management Kunda Park, QLD info@ozzikleen.com	PT 300	300L	Pump sump/holding tank, polyethylene, vertical orientation.	WWP-20146/1 23 September 2028	SMKB20032 23 September 2028
	PT 350	350L			
	PT 500	663L			
	PT 850	850L			
	PT 1000 (flat bottom)	1,208L			
	PT 1000 (hopper bottom)	1,225L			
	PS 1000	1,225L			
	PT 1500 (flat bottom)	1,735L			
	PT 1500 (hopper bottom)	1,640L			
	PS 1500	1,640L			

Manufacturer	Model	Capacity (L/EP)	Description	DHW Approval No. & expiry	AS/NZS 1546.1:2008 Certification No. & expiry
Suncoast Waste Water Management Kunda Park, QLD info@ozzikleen.com	PT 4000	4,150L	Pump sump/holding tank, polyethylene, vertical orientation. Comes in single turret and twin turret versions.	WWP-20146/1 23 September 2028	SMKB20032 23 September 2028
	PT 5300 (flat bottom)	5,350L	Pump sump/holding tank, polyethylene, vertical orientation.		
	PT 5300 (hopper bottom)	5,250L			
	RW 5300	5,300L			
	ST10	4,500L	Tank without baffle, polyethylene, vertical orientation. Can be configured as a septic tank without baffle, a holding tank or a pump sump.		
	ST10A	4,500L	Septic tank with baffle, polyethylene, vertical orientation.		
Sustainable Space Clare, SA essentialfx@gmail.com	Reed ePod Mk2	Variable	Biological outlet filter incorporating reed bed contained in a Global Rotomoulding polyethylene open-top trough. Installed after septic tank with outlet filter. Multiple units may be installed in series. Effluent disposal via primary-treated effluent disposal methods in Code or AS/NZS 1547.	WWP-20136 27 April 2028	N/A
Taylex Australia Pty Ltd Ormeau, QLD info@taylex.com.au	Maxi Tank	4,750L	Septic tank, concrete, vertical orientation. Contains five chambers and clarification TFS filter. Can be fitted with internal pump in final chamber (453L). Can be installed with 600mm, 800mm and 1,000mm risers.	WWP-20185 11 July 2030	7295-3039-01 11 July 2030
	Septic Tank	4,000L	Tank, concrete, vertical orientation. Can be configured as a septic tank with or without baffle, or holding tank, or pump chamber. Can be installed with 600mm, 800mm and 1,000mm risers. The 5,000L and 10,000L septic tanks can be made trafficable for class B and D vehicle loads.	WWP-20184 11 July 2030	7295-3039-01 11 July 2030
	Septic Tank	5,000L			
	Septic Tank	10,000L			
	22,500L, T44 Septic Tank	18,960L	Tank, concrete, vertical orientation. Can be configured as a septic tank without baffle and with inlet and outlet sweep tees, or holding tank, or pump chamber. Optional outlet filter. Can be fitted with a 150mm riser. Can be made trafficable for Class B and D vehicle loads.	WWP-20186 19 August 2030	7290-3039-01 19 August 2030

Manufacturer	Model	Capacity (L/EP)	Description	DHW Approval No. & expiry	AS/NZS 1546.1:2008 Certification No. & expiry
Taylex Australia Pty Ltd Ormeau, QLD info@taylex.com.au	10,000L Pump Station / Balance Tank / Invert Tank	6,000L 6,460L 7,250L 7,680L 8,500L 8,900L	Tank, concrete, vertical orientation. Can be configured as a holding tank or a pump sump. Variable capacity depending on inlet depth. Can be fitted with 600mm, 800mm and 1,000mm risers. Can be made trafficable for Class B and D vehicle loads.	WWP-20186 19 August 2030	7290-3039-01 19 August 2030

Note:

Where trafficability is not specified for products on this list, a bespoke trafficable lid designed by a wastewater water engineer may be used. Alternatively, a proprietary trafficable lid may also be used, if certified by a wastewater engineer. Trafficable lids must be designed and used so that the tank is not subject to any trafficable loads, and that these are diverted around the tank.

Manufacturer	Model	Capacity (L/EP)	Description	DHW Approval No. & expiry	AS/NZS 1546.1:2008 Certification No. & expiry
Taylex Australia Pty Ltd Ormeau, QLD info@taylex.com.au	10,000L Pump Station / Balance Tank / Invert Tank	6,000L 6,460L 7,250L 7,680L 8,500L 8,900L	Tank, concrete, vertical orientation. Can be configured as a holding tank or a pump sump. Variable capacity depending on inlet depth. Can be fitted with 600mm, 800mm and 1,000mm risers. Can be made trafficable for Class B and D vehicle loads.	WWP-20186 19 August 2030	7290-3039-01 19 August 2030

Note:

Where trafficability is not specified for products on this list, a bespoke trafficable lid designed by a wastewater water engineer may be used. Alternatively, a proprietary trafficable lid may also be used, if certified by a wastewater engineer. Trafficable lids must be designed and used so that the tank is not subject to any trafficable loads, and that these are diverted around the tank.

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