



STA NSW Mona Vale Bus Depot

Flood Report for Total Liquids Pump and
Treatment Installation

Prepared for
State Transit Authority NSW

Client representative
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Date
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Rev 00



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Revision History

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A	Draft preliminary report	M. Jacobs	A. Al Sadiq	M. Jacobs	22/05/2020
00	Final report	M. Jacobs	A. Al Sadiq	M. Jacobs	17/07/2020

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Executive Summary

This Flood Management Report has been prepared to support the Development Application for the installation of a Total Liquids Pump and Treatment facility (the Installation) in the existing bus depot at 58 Darley Street, Mona Vale. It has been prepared in accordance with the Guidelines for Preparing a Flood Management Report by the Northern Beaches Council.

The site is affected by medium and low risk flood precincts and has a flood life hazard category of H3.

The Installation comprises underground chambers, over-ground pipes and electrical and mechanical equipment. The construction of the Installation results in no appreciable loss in flood storage volume or flood conveyance.

Management measures are proposed to mitigate the impacts of flooding on the operation of the Installation, which include the placement of mechanical and electrical plant above the level of the probable maximum flood.

Information on flooding at the site was acquired from Council's on-line mapping, and no further flood modelling was carried out for this assessment.

1. Context

State Transit has appointed pitt&sherry to develop a Flood Management Report for its proposed Total Liquids Pump and Treat Installation (the Installation).

The Installation is located near the end wall of the Mona Vale Workshop Garage. It includes a wastewater treatment system to separate and collect diesel product and to treat recovered groundwaters from a network of onsite and offsite groundwater recovery wells. To comply with Council's development requirements, the proposed system will be elevated above the Flood Planning Level.

State Transit is preparing a Development Application to the Northern Beaches Council (Council) for a Category 1 Project. This Flood Management Report has been prepared as part of the supporting documentation.

The Bus Depot and Installation is superimposed on Council's on-line flood map (accessed 03-04-2020) and aerial photography in Figure 1.

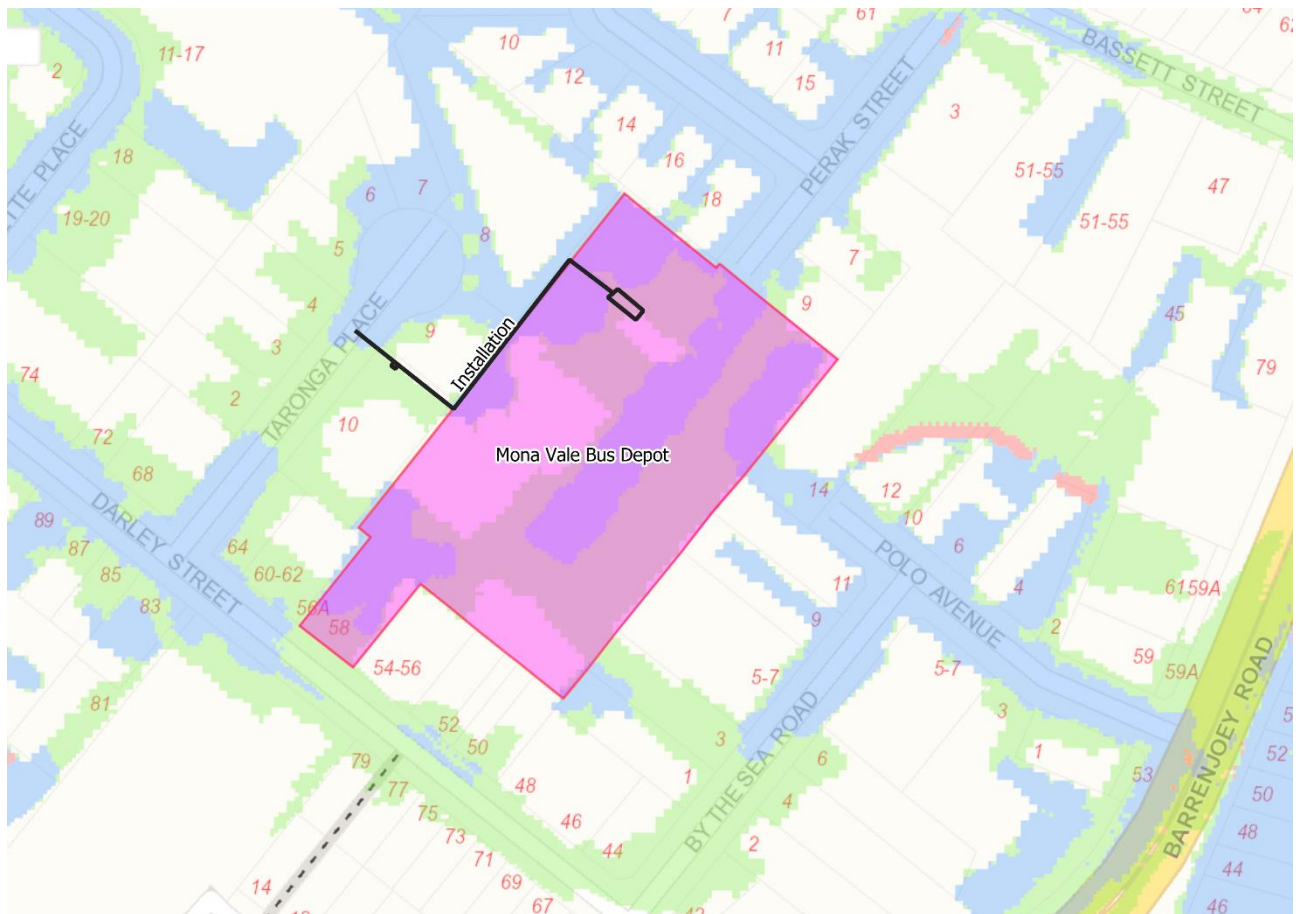


Figure 1: Site Plan superimposed on Council's Flood Map

2. Flood levels at Bus Depot

Flood levels at the Mona Vale Bus Depot were provided by Council as part of a previous Development Application, as described in the report Flood Management Report for Proposed Bus Port at 58 Darley Street, Mona Vale, pitt&sherry, 25 May 2018, ref SY17071B001 Rep 31P Rev00. These flood levels are reproduced in Table 1.

Table 1: Council's Flood Levels at Mona Vale Bus Depot

Description	Level (m AHD)
Lowest ground level (approx.)	2.60
1%AEP	2.84
Flood planning level (FPL)	3.14
Probable maximum flood (PMF)	3.76
Flood life hazard category	H3 Unsafe for vehicles, children and the elderly

3. Design of Installation

3.1 Concept design

The concept design of the Installation is illustrated in the sketches included in STA's emails to pitt&sherry of 02-04-2020 and 15-07-2020, which are reproduced in Figure 2, Figure 3 and Figure 4. These figures were used to develop the site plan in Figure 1 and elsewhere in this report.

Figure 2: Proposed transfer pipework layout

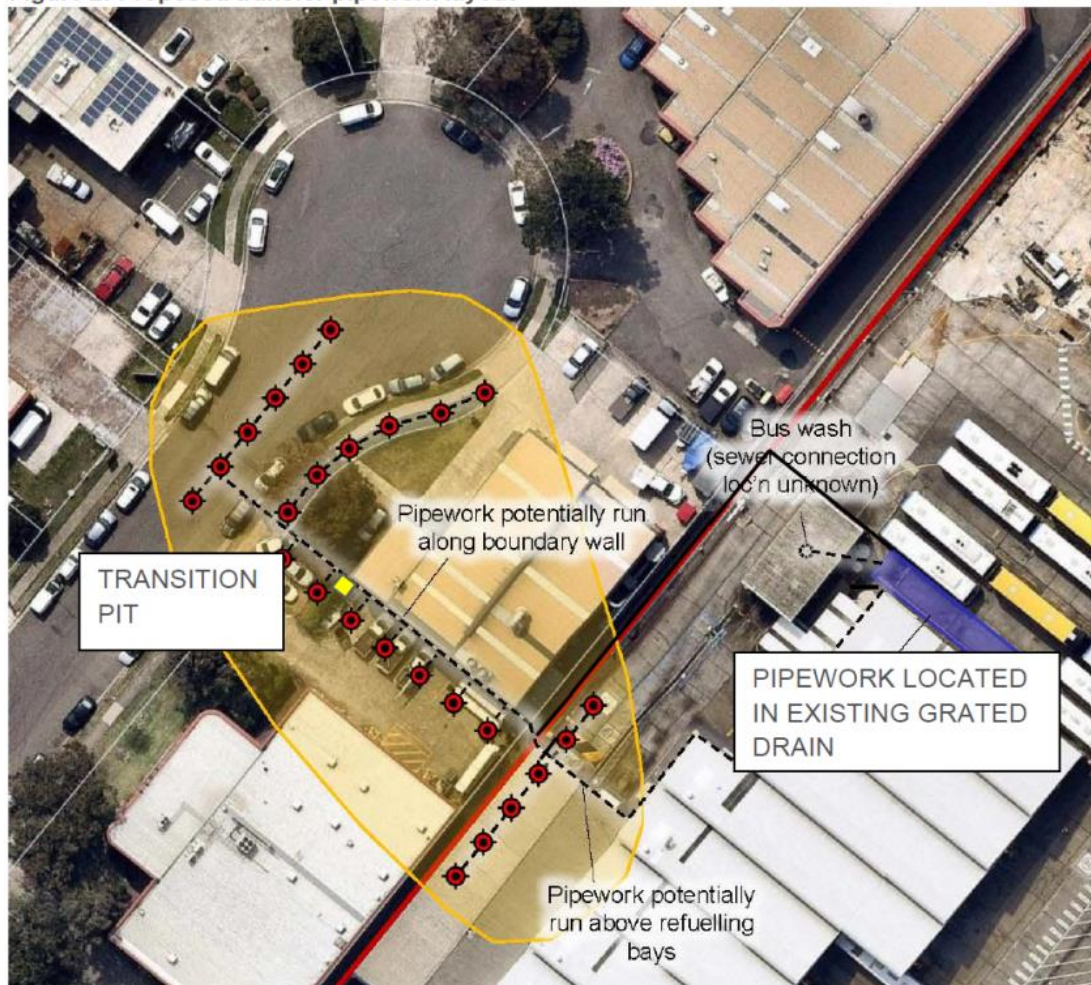


Figure 2: STA's Concept Site Plan showing connection to drainage in Taronga Place

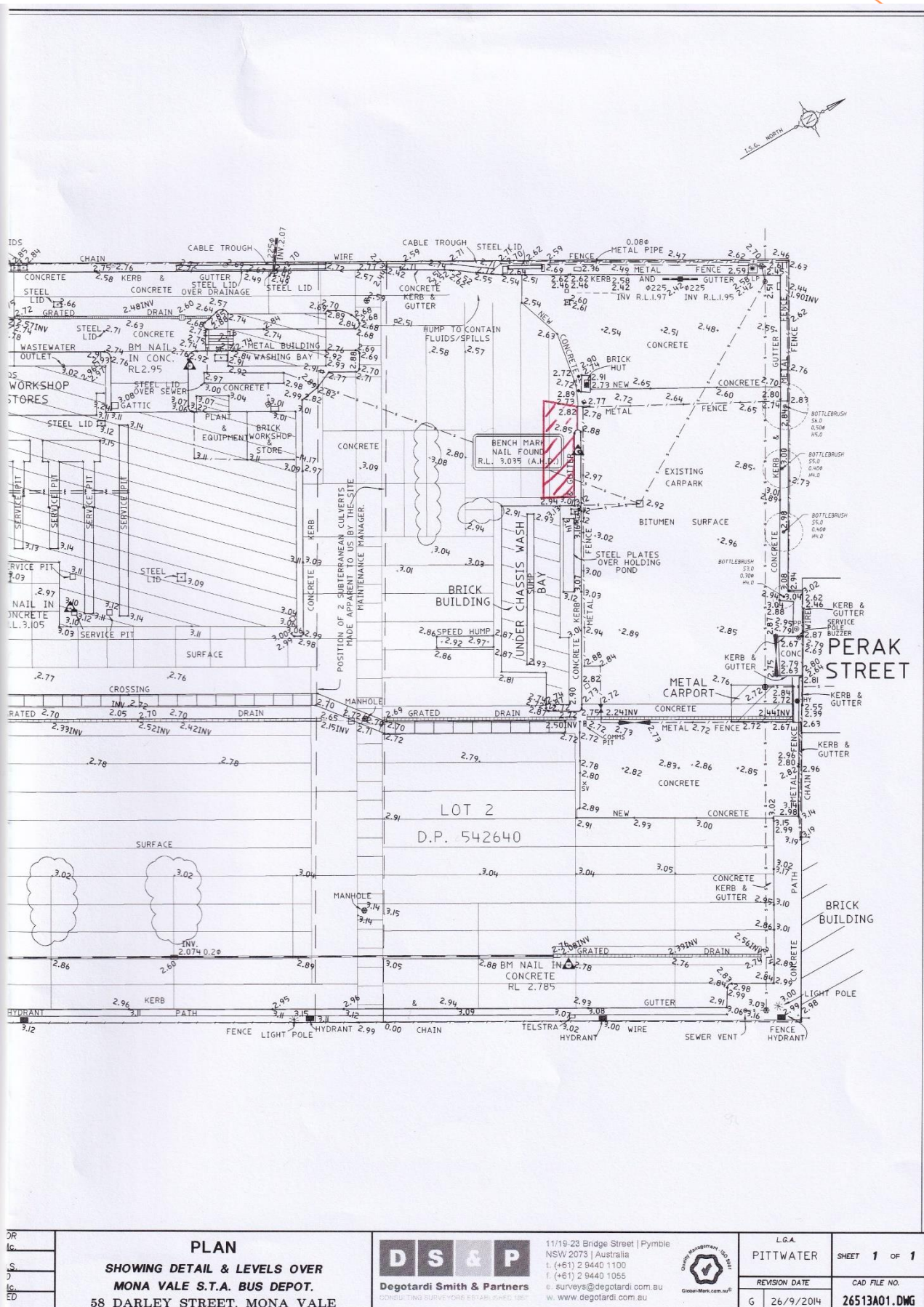


Figure 3: Location of pit within Bus Depot

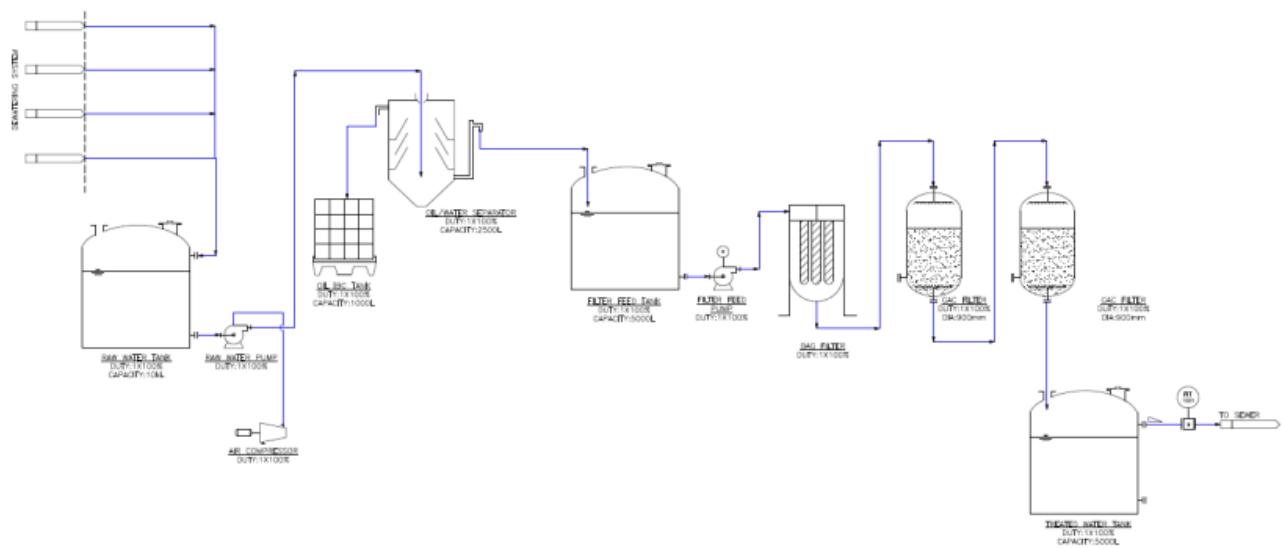


Figure 4: STA's Concept Operation Schematic

3.2 Operation of installation

The Installation has automated operation.

4. Flood analysis

4.1 Analysis

The following flood analysis is based on information available from Council's flood mapping, which is based on previous flood modelling carried out by others. No further flood modelling has been carried out for this Flood Management Plan.

Relevant floor and flood levels are summarised in Table 1.

The site is not affected by estuarine flooding or other coastal issues.

Council's flood risk planning map indicates that the site is affected by medium and low risk flooding, as illustrated in Figure 5. The pattern of flooding suggested by the flood risk planning map is that stormwater runoff generally flows along low-lying land westwards through the site, from Barrenjoey Road towards Pittwater to the west and north.

It is expected that the urban stormwater drainage system provides the principle means for conveying stormwater runoff downstream, but overland flows will occur during more severe storm events along the network of roads in the urban footprint.

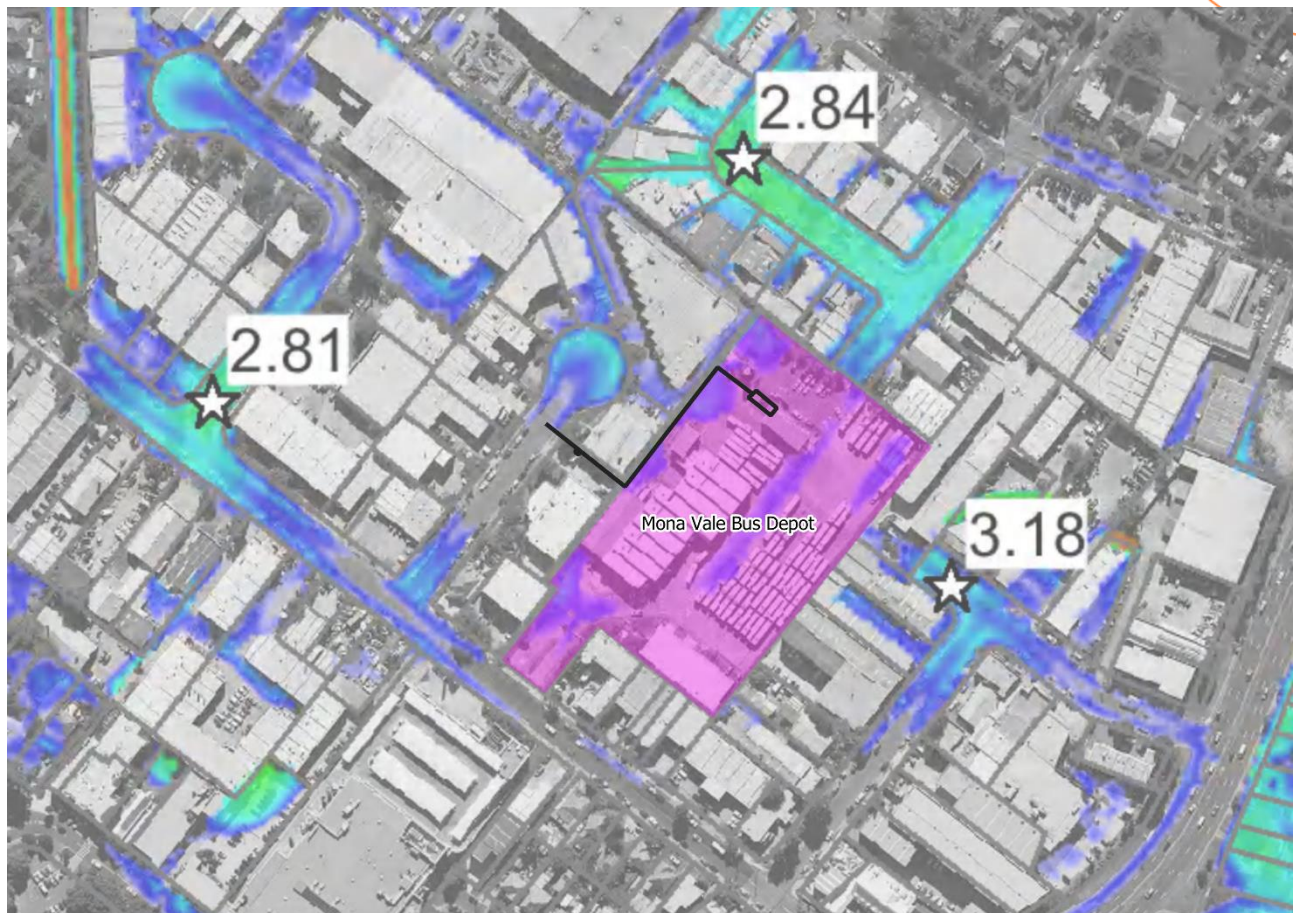


Figure 5: Site Plan superimposed on Council's 1%AEP Flood Map

4.2 Inferences

4.2.1 How the proposed development affects flooding

The Installation does not appreciably affect flood storage because it occupies no appreciable flood storage volume above existing ground levels.

The Installation does not appreciably affect flood conveyance because it presents no appreciable additional blockage to flood flows above existing ground levels. The pipe connection to Taronga Place will not affect underground pipe flows into Taronga Place because the pipes are sealed and are operated by the Installation Pumps.

4.2.2 How flooding affects the proposed development

The Installation will be affected by flooding in flood events less than the 1%AEP event. Council's modelling indicates that the depth of flooding during the 1%AEP and PMF events will be about 0.24m and 1.16, respectively. The Flood Planning Level (FPL) is 3.14 m AHD, which is about 0.54m above ground.

The Flood Life Hazard Category is estimated from Council's model results for flood depths and velocities¹. The category H3 is "Unsafe for vehicles, children and the elderly".

¹ knowledge.aidr.org.au/media/1891/guideline-7-3-technical-flood-risk-management.pdf

It is understood that “unsafe for vehicles” refers to vehicles crossing floodwaters, where they are at risk of being washed away and so present a risk to human life. The bus port will contain vehicles (parked busses), but it is unlikely that they would be manned at the time of flooding, and it is also unlikely that they would be washed into a creek. Site operations preclude the presence of children or the elderly, so the risk to human life arising from the movement of the vehicles by floodwaters is small.

The following management measures are proposed to limit the effects of flooding on the proposed Installation:

- Mechanical and electrical plant, and switchgear will be elevated at least 0.54m above ground to raise it above the Flood Planning Level (3.14 m AHD). Mechanical and electrical plant and switchgear below this level will be designed to be operable under water.

4.3 Conclusions

The following are concluded:

- The proposed Installation will have no appreciable impact on flood storage, because it will occupy no appreciable flood storage volume
- The proposed Installation will have no appreciable impact on flood conveyance, because presents no appreciable, additional blockage to flood flows and creates no additional drainage paths; and
- Impacts of flooding on the proposed Installation can be managed by locating maintenance items and power outlets above an appropriate level.

5. Assessment of Impacts

Table 2: Compliance Table

Element	Compliance			Notes
	NA	Yes	No	
A Flood effects caused by development		✓		See Section 4.2.1.
B Drainage infrastructure and creek works	✓			The Installation does not affect either.
C Building components and structural details		✓		See Section 0.
D Storage of goods	✓			The installation does not include storage of goods.
E Flood emergency response	✓			The Installation has automated operation.
F Floor levels	✓			The Installation has no floors.
G Car parking	✓			The Installation has no car parking.
H Fencing	✓			The Installation will not change the fencing.
I Pools	✓			The Installation has no pools.



6. Key Points

The proposed Installation is adjunct to an existing use facility and supports the operation of that facility.

The proposed Installation will be affected by flooding, because parts of it are below the 1%AEP flood level.

The proposed Installation will not appreciably affect flood storage because it occupies no appreciable flood storage volume.

The form of the proposed Installation will not appreciably affected flood conveyance.

The operation of the proposed installation will reduce the potential impacts from flooding by requiring mechanical and electrical plant and switchgear to be located above the level of the Flood Planning Level 3.14 m AHD. Items below this level will be designed to be operable in a submerged state.



STA NSW Mona Vale Bus Depot

Flood Report for Total Liquids Pump and Treatment
Installation

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