Temora Hospital Redevelopment

Flooding Assessment

Health Infrastructure (NSW Government Health Infrastructure)

June 19, 2024

→ **The Power of Commitment**

Project name	Temora Hospital Redevelopment						
Document title	Temora Hospital Redevelopment | Flooding Assessment						
Project number	12600017						
File name	12600017-REP_Temora Hospital Redevelopment Flooding Assessment.docx						
Status Code	Revision	Author	Reviewer		Approved for issue		
			Name	Signature	Name	Signature	Date
S4	0	R Berg	S Douglas	iConnect	T Little		11/4/24
S4	1	R Berg	T Little	iConnect	T Little		19/06/24
[Status code]							
[Status code]							
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1. Introduction

1.1 Purpose of this Report

The purpose of this report is to present a Flood Impact Assessment for the Temora Hospital Redevelopment at Lot 2, DP 572392, to be included as part of the State Significant Development Application assessment.

– A review the flooding requirements and controls of the Temora Shire Council LEP (2010) and DCP (2012).
– A review of the Temora Flood Study (2019) prepared by Water Modelling Solutions, in the vicinity of the proposed site. The flood study flood mapping will be overlaid on publicly available LiDAR data obtained from the ICSM Elvis LiDAR portal.
– A review the 1 in 100 AEP and the PMF flood data presented in the Temora Flood Study (2019). Flooding data will be assessed in the context of any LEP and DCP controls.
– Compilation of this flooding assessment report.

1.2 Project Description

The NSW Government has committed $80 million to the Temora Health Service redevelopment, which will provide a high-quality contemporary health facility and ensure health care services are carefully planned to meet community needs now and into the future. The project is currently in the planning stage, with master planning currently underway.

The works will involve the complete demolition of the Heritage buildings with the new build consisting of Emergency/ Inpatient Unit (IPU)/ Maternity/ Medical Imaging/ front of House (FOH)/ back of house (BOH)/ Admin/ Perioperative/ Ambulatory care/ Plant spaces.

1.3 Scope and limitations

This report: has been prepared by GHD for Health Infrastructure (NSW Government Health Infrastructure) and may only be used and relied on by Health Infrastructure (NSW Government Health Infrastructure) for the purpose agreed between GHD and Health Infrastructure (NSW Government Health Infrastructure) as set out in section 1.1 of this report. GHD otherwise disclaims responsibility to any person other than Health Infrastructure (NSW Government Health Infrastructure) arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

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1.4 Site location

The Temora Hospital is located at the corner of Gloucester Street and Loftus Street, within the township of Temora (refer to Figure 1.1).

Figure 1.1 Temora Hospital

The location of the hospital within the wider Temora Township is displayed in Figure 1.2.

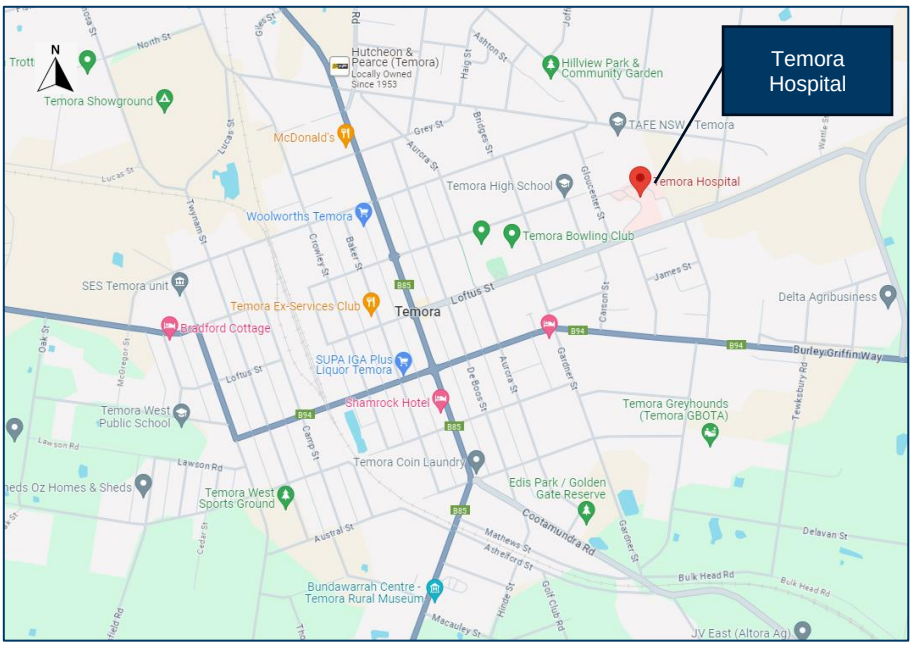

Figure 1.2 Temora hospital – local context (Source: Google Maps modified by GHD)

2. Relevant Flood Planning Matters

2.1 Acts

2.1.1 Water Management Act 2000

The Water Management Act 2000, (WM Act) is administered by regulators including WaterNSW and Department of Industry: Water to manage water resources. The aim of the WM Act is to ensure that water resources are conserved and properly managed for sustainable use benefiting both present and future generations. It is also intended to provide formal means for the protection and enhancement of the environmental qualities of waterways and their in-stream uses as well as to provide for protection of catchment conditions.

Principles of the WM Act relating to drainage and floodplain management include the need to manage flood risk and avoid or minimise land degradation including soil erosion, compaction, geomorphic instability, and waterlogging.

2.1.2 Protection of the Environment Operations Act 1997

The Protection of the Environment Operations (POEO) Act 1997, is administered by the NSW Environment Protection Authority (EPA) and is implemented throughout NSW to protect, restore, and enhance the quality of the environment. The aim of the POEO Act is to reduce risks to human health, provide increased opportunities for public involvement and participation in environment protection, rationalise, simplify and strengthen the regulatory framework for environment protection and improve the efficiency of administration of environment protection legislation.

To ensure that potential impacts on stormwater are managed in accordance with the objectives of the POEO Act, mitigation measures would need to be implemented during the construction and operational phases.

2.2 Policies, guidelines, and standards

2.2.1 NSW Flood Risk Management Manual

The NSW Flood Risk Management Manual and NSW Flood Prone Land Policy (NSW Government, 2023) relates to the management of flood-prone land within NSW. It provides guidelines in relation to the management of flood liable lands, including any development that has the potential to influence flooding, particularly in relation to increasing the flood risk to people and infrastructure. Activities of the project which have the potential to increase flood risk would be subject to consideration under the Manual.

The primary object of the NSW Flood Prone Land Policy is to reduce the impact of flooding and flood liability on individual owners and occupiers of flood prone property, and to reduce private and public losses resulting from floods. At the same time the policy recognises that benefits flowing from the use, occupation, and development of flood prone land. The policy promotes the use of a merit approach which balances social, economic, environmental and flood risk parameters to determine whether development or use of the floodplains is appropriate and sustainable.

2.2.2 Australian Rainfall and Runoff (2019)

Australian Rainfall and Runoff (ARR, 2019) is the primary technical publication for stormwater and flood estimates and design considerations and provides updates to the previous version of Australian Rainfall and Runoff (Engineers Australia, 1987). The technical analysis and development of the hydrologic and hydraulic models, including the management of stormwater and flooding at the site would need to consider this guideline.

2.3 Temora Shire Council

2.3.1 Temora Shire Council Local Environmental Plan (TSC LEP 2010)

The Temora Shire Council Environmental Plan 2012 (TSC LEP 2010) applies to land within the Temora Shire Council local government area and identifies planning provisions relevant to flooding. Amongst others, key matters noted in the TSC LEP 2010 flooding sections are that development consent must not be granted to development on land to which the flood planning clause applies unless the consent authority is satisfied that the development

a. Is compatible with the flood function and behaviour on the land, and
b. Will not adversely affect flood behaviour in a way that results in detrimental increases in the potential flood affectation of other development or properties, and
c. Will not adversely affect the safe occupation and efficient evacuation of people or exceed the capacity of existing evacuation routes for the surrounding area in the event of a flood, and
d. Incorporates appropriate measures to manage risk to life in the event of a flood, and
e. Will not adversely affect the environment or cause avoidable erosion, siltation, destruction of riparian vegetation or a reduction in the stability of riverbanks or watercourses.

The TSC LEP 2010 provides four flood planning maps, which show flood planning areas. The Temora Hospital Redevelopment is not located in any flood planning areas on these maps. Special flood considerations are not adopted by Temora Shire Council.

2.3.2 Temora Shire Council Development Control Plan (TSC DCP 2012)

The TSC DCP 2012 Flood Prone Land provides controls to:

– provide development standards on land that is identified or is likely to be liable to flooding
– reduce private and public losses resulting from flooding
– minimise the risk to life and property during periods of flooding

TSC DCP 2012 Flood Prone Land notes that short-term flooding can occur in two locations in Temora town and in the village of Springdale. In the localities affected, water depths are typically insufficient to cause serious property damage, and flood waters disperse rapidly. The identified locations do not include the location of the Temora Hospital Redevelopment.

2.4 SES

The Temora Shire Flood Emergency Sub Plan (SES 2023) is a sub plan of the Local Emergency Management Plan (EMPLAN). The purpose of this plan is to set out the multi-agency arrangements for the emergency management of flooding in the Temora Shire Local Government Area (LGA). The plan sets out the Temora Shire level emergency management arrangements for prevention, preparation, response and initial recovery for flooding in the Temora Shire LGA.

The EMPLAN describes the arrangements at local level to prevent, prepare for, respond to and recover from emergencies and also provides policy direction for the preparation of Sub Plans and Supporting Plans. The EMPLAN identifies the following Evacuation Centres:

– Temora Memorial Town Hall.
– Temora Recreation Centre.
– Temora Ex Services Memorial Club.

It is noted that all three locations are flood affected in a PMF flood.

3. Flood Information

3.1 Temora Flood Study (Water Modelling Solutions 2019)

Flood data at Temora was obtained from the Temora Flood Study (Water Modelling Solutions 2019). This study notes, amongst others:

- A predominant feature of the Temora stormwater network are the open channels through the town, known as the eastern drainage line and the western drainage line. These drainage lines generally convey stormwater from the south to the north via concrete-lined open channels. The vegetated channel downstream of the confluence of the eastern and western drainage lines continues to the north-west where it discharges into Lake Centenary. The catchment serviced by the eastern and western drainage line through town and down to Lake Centenary covers an area of approximately 24 km^2.
- Trigalong Creek runs from south to north and is located to the west of the town. The Trigalong Creek catchment down to Lake Centenary covers an area of approximately 153 km^2
- The Flood Study consisted of a data collection phase, hydrologic model development, hydraulic model development, historical flood simulation and design flood simulation. The hydrologic model development was carried out to calculate the runoff hydrographs as a function of the catchment conditions and the rainfall hyetographs. The hydrologic model developed for this study used the Watershed Bounded Network Model (WBNM) software. The hydraulic model development was undertaken to estimate the flood levels, depths, velocities and extents generated from the catchment conditions and the runoff hydrographs. The hydraulic model developed for this study used the TUFLOW software.
- Historical flood simulations were carried out to calibrate and validate the models' performance in representing flood behaviour in historical flood events. The models were calibrated to the March 2012 event and validated to the September 2016 event. Overall, the modelled flood extent for the 2012 and 2016 event corresponded relatively well to the photographic evidence.
- Following the historical flood simulations, the design flood simulations were carried out to determine the flood behaviour across the study area through a range of statistically-based rainfall events. These events ranged from the 0.2 EY event to the 0.2% AEP event and the PMF event.

Generally, the underlying flood mechanisms for the study area were found to be high-intensity, short-duration storm bursts following particularly wet periods that decrease the soil infiltration and decrease the dam capacities prior to the storm burst.

Referring to Figure 3.1 it is noted that the site of the Temora Hospital Redevelopment is located on high grounds in Temora. Typically elevations at the hospital site are 317 mAHD compared to 287m AHD in the lower laying areas of town. Figure 3.2 and Figure 3.3 show that the Temora Flood Study did not identify Lot 2, DP 572392 as flood prone land, since it is located above the Probable Maximum Flood (PMF) flood level. It is therefore considered that there is no flood risk associated with the Temora Hospital Redevelopment.

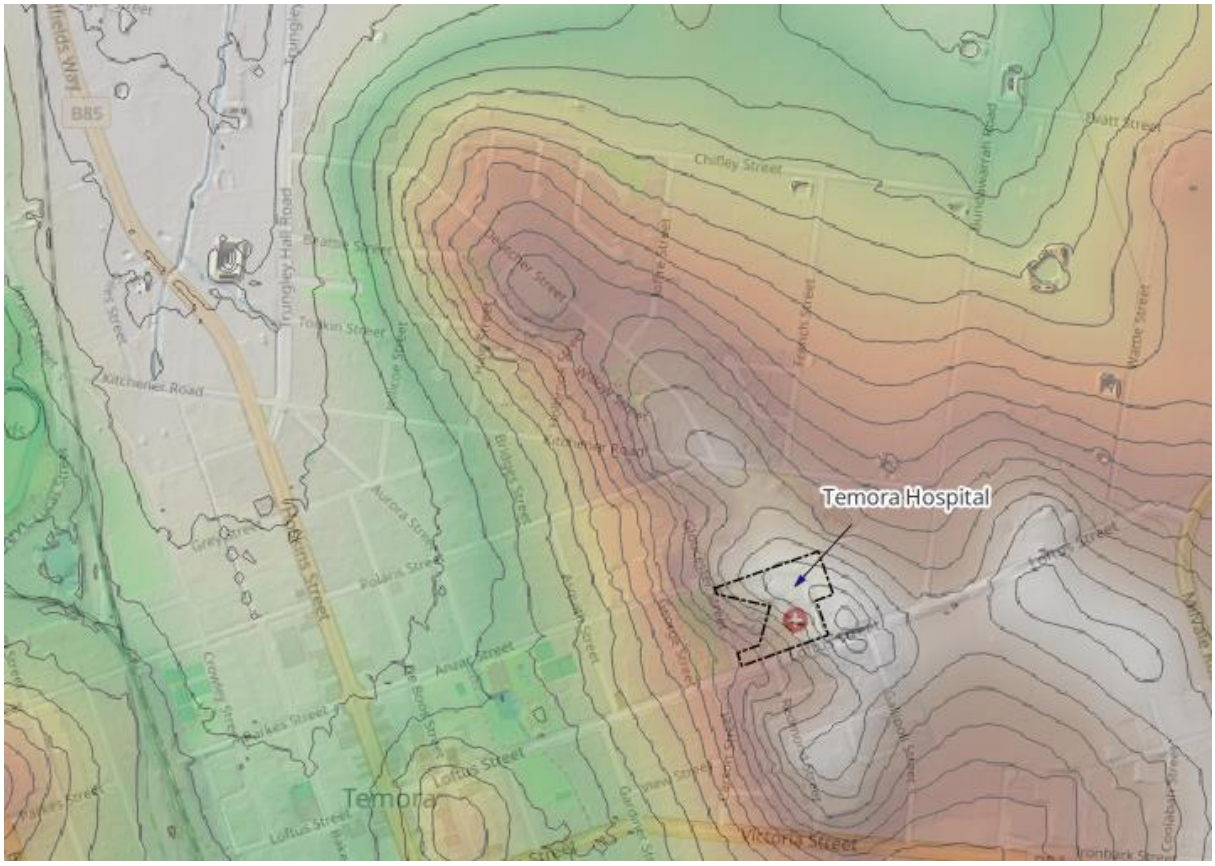

Figure 3.1 Topography

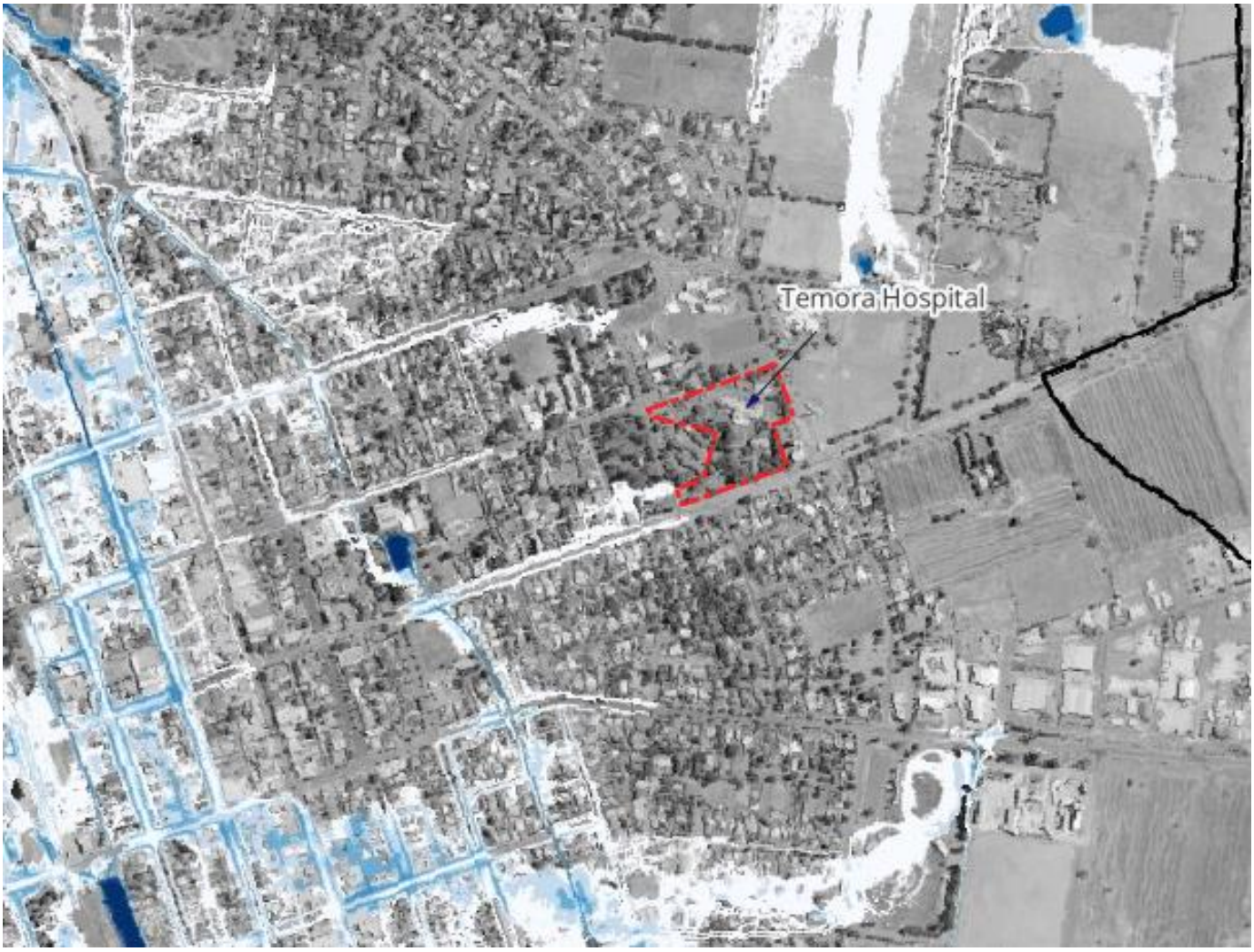

Figure 3.2 1% AEP Flood Depth (WMS 2019)

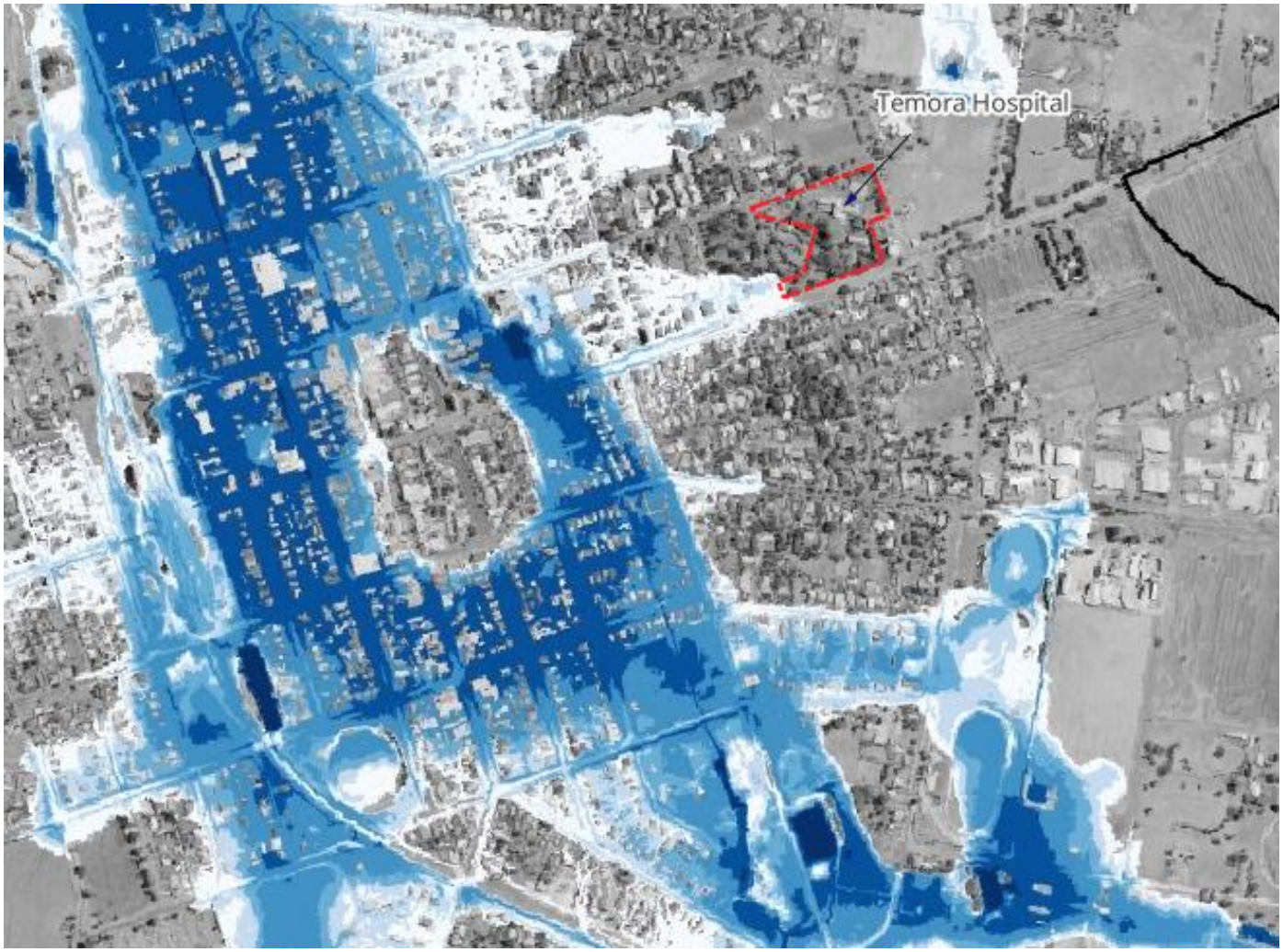

Figure 3.3 PMF Flood depths (WMS 2019)

3.2 Climate Change

Since the Lot 2, DP 572392 is not identified as flood prone land, and is located above the PMF, it is considered that there will be no risks associated with future climate and the flooding identified in Temora as part of the Temora Flood Study.

4. Assessment

4.1 Flood Impact on the Proposal

The TSC LEP 2010 provides four flood planning maps, which show flood planning areas. The Temora Hospital Redevelopment is not located in any flood planning areas on these maps. It is considered therefore that the flooding controls in the LEP and DCP do not apply.

The site of the Temora Hospital Redevelopment is located on high grounds in Temora. Typically elevations at the hospital site are 317 mAHD compared to 287m AHD in the lower laying areas of town. The Temora Flood Study (WMS 2019) did not identify Lot 2, DP 572392 as flood prone land, since it is located above the Probable Maximum Flood (PMF) flood level. It is therefore considered that there is no flood risk associated with the Temora Hospital Redevelopment.

4.2 Flood Impact due to the proposal

Given the location of the site it is considered that there is no flood impact associated with the proposal if the redevelopment results in a similar fraction of hardstand as currently exists at the site. However, if the proposal increases the fraction of impervious surfaces at the site, it is recommended that the increase in runoff be calculated and the impact be managed through the stormwater system at the site to minimize off site impacts.

5. Summary and Findings

The purpose of this report is to present a Flood Impact Assessment for the Temora Hospital Redevelopment at Lot 2, DP 572392, which is required to be included as part of the REF assessment. The assessment reviewed the Temora Shire Council LEP (2010) and DCP (2012) and flooding data provided by the Temora Flood Study (2019) prepared by Water Modelling Solutions.

The Temora Hospital Redevelopment is not located in any Temora flood planning areas and it is considered that the flooding controls in the LEP and DCP do not apply. The site of the Temora Hospital Redevelopment is located on high grounds in Temora and the Temora Flood Study (WMS 2019) did not identify Lot 2, DP 572392 as flood prone land, since it is located above the Probable Maximum Flood (PMF) flood level.

It is therefore considered that there is no flood risk associated with the Temora Hospital Redevelopment. Further, it is considered that there is no flood impact associated with the proposal if the redevelopment results in a similar fraction of hardstand as currently exists at the site. However, if the proposal increases the fraction of impervious surfaces at the site, it is recommended that the increase in runoff be calculated and the impact be managed through the stormwater system at the site to manage off site flood impacts.

6. References

– (NSW 2023), Flood Risk Management Manual, ISBN 978-1-923076-17-4, published by the NSW Government in June 2023.
– WMS 2019, Temora Flood Study, Water Modelling Solutions, prepared for Temora Shire Council, June 2019.
– TSC LEP 2010, Temora Shire Council Environmental Plan 2012, **https://www.temora.nsw.gov.au/Home**
– TSC DCP 2012, Temora Shire Council Development Control Plan 2012, **https://www.temora.nsw.gov.au/Home**.
– SES 2023, Temora Shire Flood Emergency Sub Plan (13 October 2023)