infrastructure & development consulting

Vacy Village South – Stage 5

Flood Evacuation Response

March 2026

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Client	Cornish Group	**Revision**	A
Author	J. Laokittichai	**Reviewed**	A Hilly

1 Introduction

Infrastructure & Development Consulting (IDC) has prepared this letter to support the Development Application for Vacy Village Stage 5. This letter outlines the proposed flood evacuation response for the site and demonstrates that the development is consistent with the adopted regional flood management arrangements for the Paterson River catchment.

2 Site Description

Vacy Village South – Stage 5 is located at 598 Gresford Road, Vacy, within the Dungog Shire Local Government Area in the Hunter Region of NSW. The site forms part of the broader Vacy Village South subdivision and is located to the south of the previously proposed Stage 4 development area.

The land is legally described as Lot 123 DP1063557 and is zoned R5 Large Lot Residential under the Dungog Local Environmental Plan. Surrounding land includes rural residential development, agricultural land and areas of environmental protection.

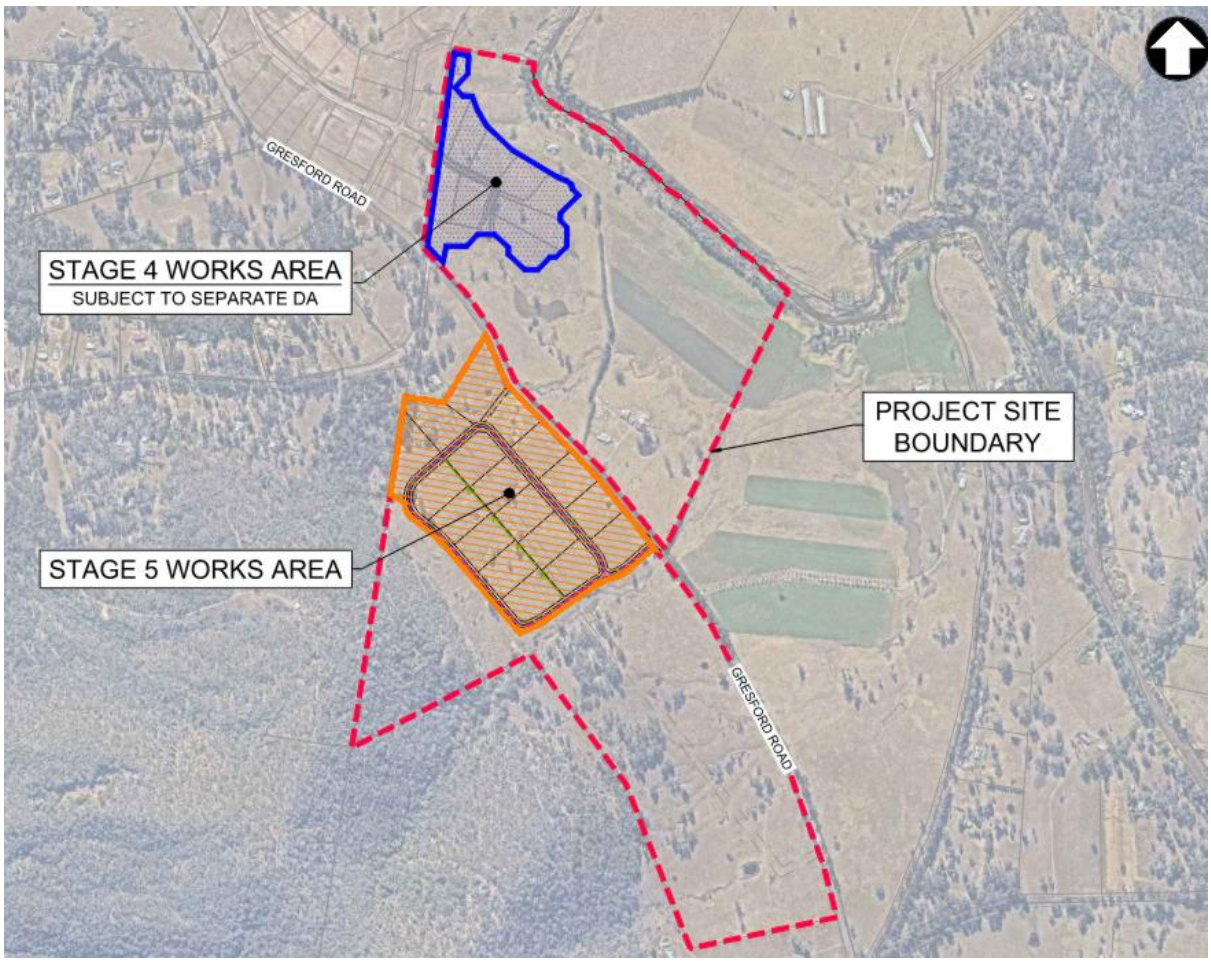
The proposed Stage 5 development comprises:

- Creation of 18 rural residential lots
- An internal looped road network
- Connection to the existing Gresford Road
- Stormwater management infrastructure including table drains, culverts and level spreaders.

Each lot is intended to accommodate a single rural residential dwelling consistent with the surrounding development pattern.

Vehicular access to the subdivision is provided via Gresford Road, which connects to the local road network and provides access toward the Vacy township and surrounding areas.

Figure 1 - Site Location



Source: Nearmap Imaging 2024

Figure 2 - Proposed Development

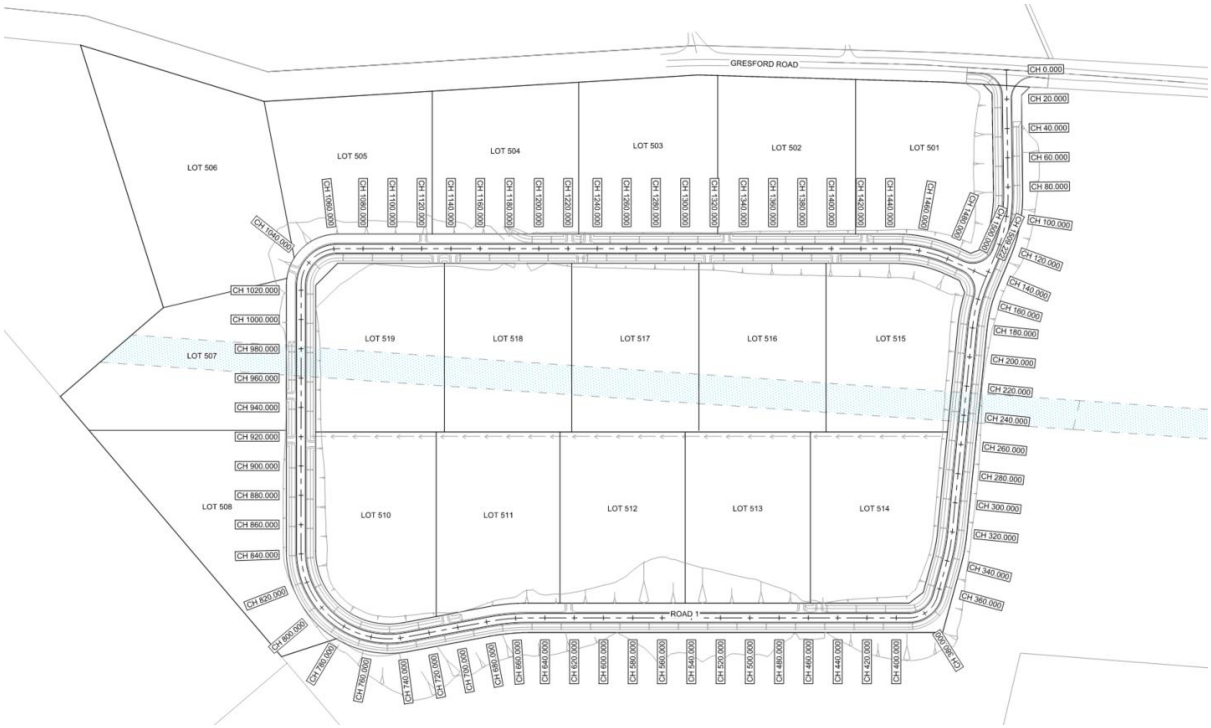
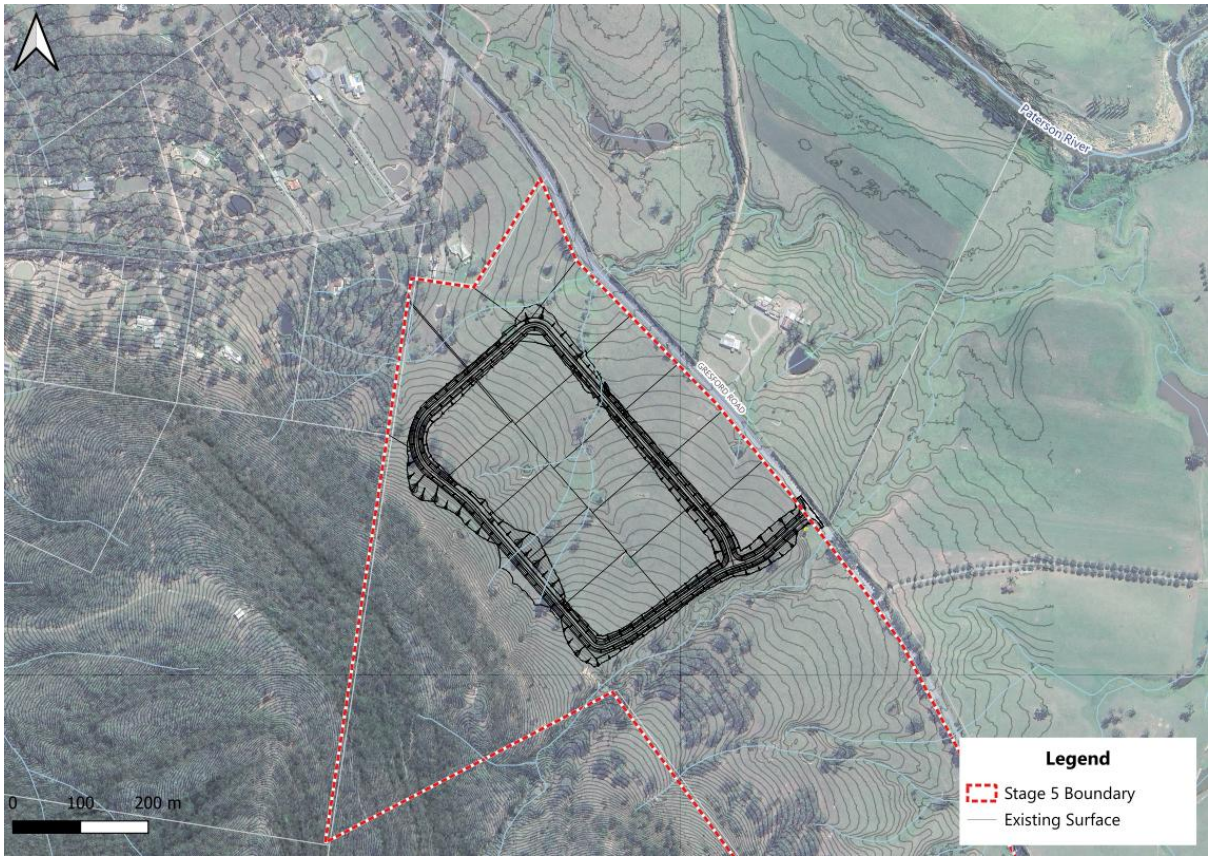


Figure 3 – Site Topography



3 Flood Evacuation Strategy

3.1 Existing Catchment Flood Conditions

Based on Council's *Paterson River Flood Study* (by WMA Water, March 2017), the Stage 5 site has been identified as being part of the Paterson River catchment, which covers an area of approximately 1,200km^2 and lies within Maitland City Council, Port Stephens Council, and Dungog Shire Council. The area of interest for this study includes the floodplain from Vacy (near the confluence of the Paterson and Allyn Rivers) to the confluence with the Hunter River at Hinton. This portion of the Paterson River catchment has an area of approximately 105km^2.

The main tributary of the Paterson River is the Allyn River. Both of these rivers originate as mountainous streams in the Barrington Tops National Park and traverse through the Paterson and Allyn River Valleys.

Within the Paterson Valley, flooding is influenced by two (2) primary mechanisms:

- Paterson River flooding, which results from sustained rainfall across the Paterson and Allyn River catchments; and
- Hunter River backwater influence, which may elevate water levels in the lower reaches of the Paterson River during coincident regional flooding events.

These mechanisms can occur independently or concurrently, with the latter having significant effect on flood levels within the lower reaches of the Paterson River and floodplains.

At Vacy, flooding is characterised as large-scale riverine inundation associated with long duration storm events, rather than rapid-onset flash flooding. The adopted Paterson River Flood Study (WMA, 2017) identifies;

- the 36-hour duration as critical for the 1% AEP event; and
- the 72-hour duration as critical for the PMF event.

This confirms that flooding at Vacy is associated with long-duration riverine behaviour and gradual flood rise.

3.2 Site Flood Conditions

Flood maps, obtained from Council's *Paterson River Flood Study,* for the 1% AEP and PMF flood events were geospatially assessed against the adopted WMA flood mapping to determine the extent of flooding for the proposed Stage 5 site (See Figure 4 and Figure 5 below).

Figure 4 – 1% AEP Flooding Extent

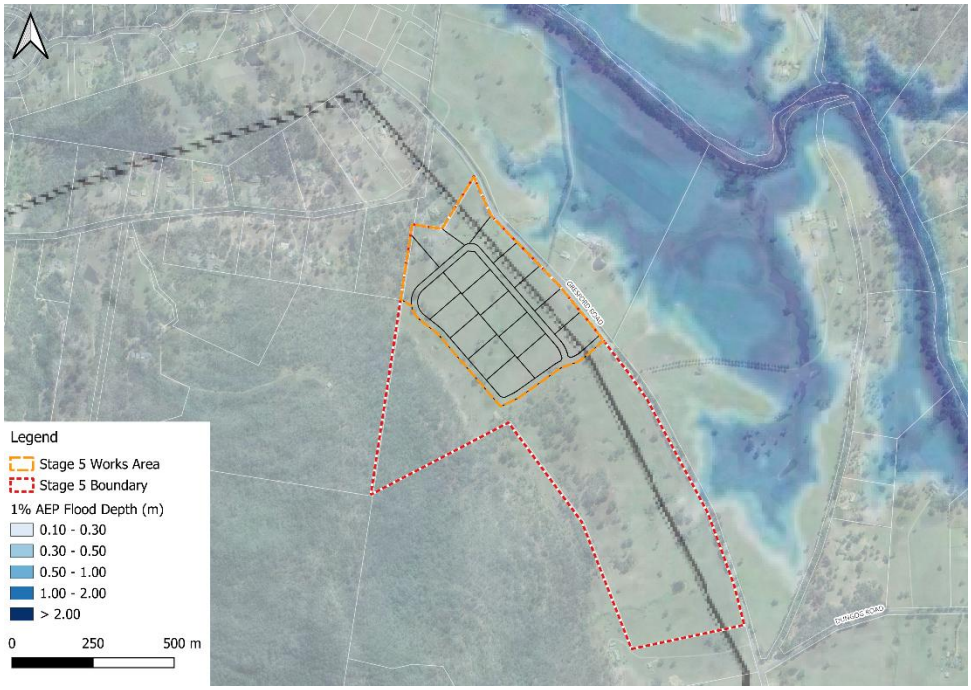
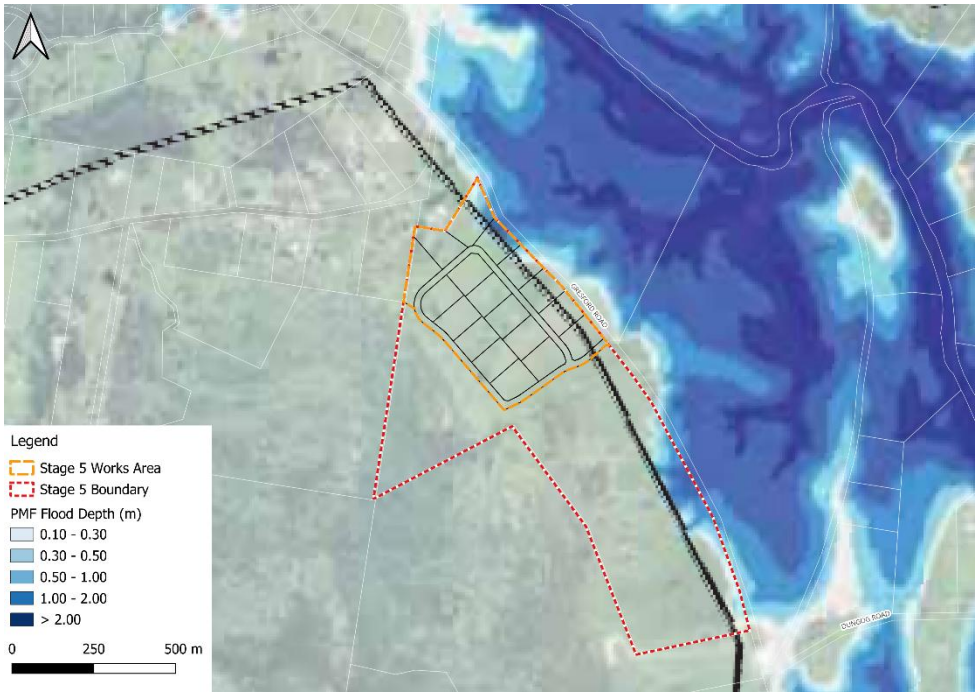


Figure 5 - PMF Flooding Extent



During the 1% AEP flood event, lots are primarily flood free with limited affectation of the proposed development impacted upon by the major storm event. Any local affectation is generally shallow overland flow path rather than flooding from a defined watercourse and the development site does not occupy land affected by mainstream flooding. As such, the development does not alter flood behaviour, flood storage, conveyance or the function of existing evacuation routes. The Patterson River Flood Study identifies the 36-hour duration as the

critical 1% AEP event for the riverine flood regime, which does not impact the proposed works site south of Gresford Road.

Based on the available flood mapping, the site is partially affected under PMF conditions, with estimated flood depths of approximately 0–2 m along the northern fringe of the site adjacent to Gresford Road. The adopted Paterson River Flood Study (WMA, 2017) identifies the PMF event as a long-duration regional flood, with a critical storm duration of approximately 72 hours.

It is noted that the adopted flood mapping is derived from a regional hydraulic model with defined computational boundaries. In the vicinity of the Stage 5 development, the model extent generally follows the Paterson River floodplain and does not extend significantly west beyond the primary riverine inundation area. Consequently, the mapped PMF extents near the site represent the interaction between the riverine floodplain and the edge of the model domain.

While this introduces some uncertainty in the precise representation of PMF flood depths immediately adjacent to the western edge of the mapped area, the dominant flooding mechanism in this locality remains long-duration riverine flooding associated with the Paterson River system. Shorter duration local runoff events would be expected to generate significantly lower flood levels than the regional riverine PMF conditions represented in the mapping.

Accordingly, the adopted mapping should be interpreted as representing a conservative upper bound of regional flood behaviour, rather than a direct indication of localised catchment flooding at the site. In this context, and noting that the potential evacuation route via Gresford Road follows rising terrain away from the floodplain, evacuation of the site remains achievable when undertaken in accordance with the existing NSW SES flood response arrangements (as explored in the evacuation discussion below in Section 3.5).

3.3 Isolation Risk

Given the large catchment scale and extended storm durations associated with Paterson River flooding, warning lead times are typically substantial and are based on Bureau of Meteorology forecasting and monitoring of river gauges.

Flood rise within the Patterson River at Vacy is gradual relative to flash-flood dominated catchments, meaning evacuation is generally precautionary rather than reactive.

Based on the adopted flood mapping:

- The site is not subject to early isolation in the 1% AEP event.
- The primary evacuation route remains accessible.
- The development does not create additional evacuation bottlenecks or constrained egress points.

As such, isolation risk at the site is manageable through compliance with existing regional evacuation arrangements.

3.4 Council Flood Management Strategy

Dungog Shire Council currently have a flood warning system in place, primarily due to the high risk of flash flooding associated with the convergence of the Myall Creek and Williams River catchments east of the town centre. The warning system aims to provide guidance on the actions to adopt when triggers are activated and is dependent on forecasting from the Bureau of Meteorology (BOM) and the flood gauge installed near Hooke Street. Council's flood warning system is shown in Table 1 below:

Table 1 Dungog Shire Council Flood Warning System

Level	Monitor	Look For	Action	Flood Timeline
1 Forecast	Online BOM warnings	Williams River Flood Warning Upper Hunter Severe Weather Warning	Monitor conditions and be aware	1 – 3 days
2 Raining	River heights from BOM websites for NSW Mid North Coast rivers and Myall Creek	Levels above 0.3m for Myall Creek at Dungog	Use judgment and begin evacuation preparation	Hours
3 Level > 2m	Surroundings	Rising flood waters	Begin evacuation	1 hour or less
4 Siren	Siren	Loud 'WHOOP' for 5 minutes followed by 15 minutes silence	Evacuate immediately	Imminent

There is also a NSW SES *Dungog Shire Local Flood Emergency Sub Plan*, which sets out the arrangements for the emergency management of flooding in the Dungog Shire Council LGA. The plan notes that Vacy (location of the subject site) is affected by riverine flooding from Paterson River. The plan details that NSW SES flood information and warnings are delivered through various television and radio stations, newspapers, emails from multiple state and Council agencies, as well as through NSW social media forums.

The Stage 5 site is covered by the Vacy/Martins Creek response arrangements, with the general strategy including evacuation and registration of at-risk population. The strategy recommends self-evacuation to friends/family outside of the impact area and registration of affected community members at the identified Assembly Area. The Assembly Area (Temporary Evacuation Centre) is to be established in consultation with the Welfare Services Functional Area Coordinator and the NSW SES. Potential locations include:

- Martins Creek School of Arts (58 Grace Avenue, Martins Creek);
- Vacy Public School (Gresford Road, Vacy); and
- Vacy School of Arts (779 Gresford Road, Vacy).

Based on the adopted flood mapping, isolation of the site is limited to extreme PMF conditions and is not associated with early inundation of the evacuation route.

It should be noted that the arrangements within the sub plan do not require activation, as they are always active.

3.5 Proposed Flood Management Strategy – Stage 5

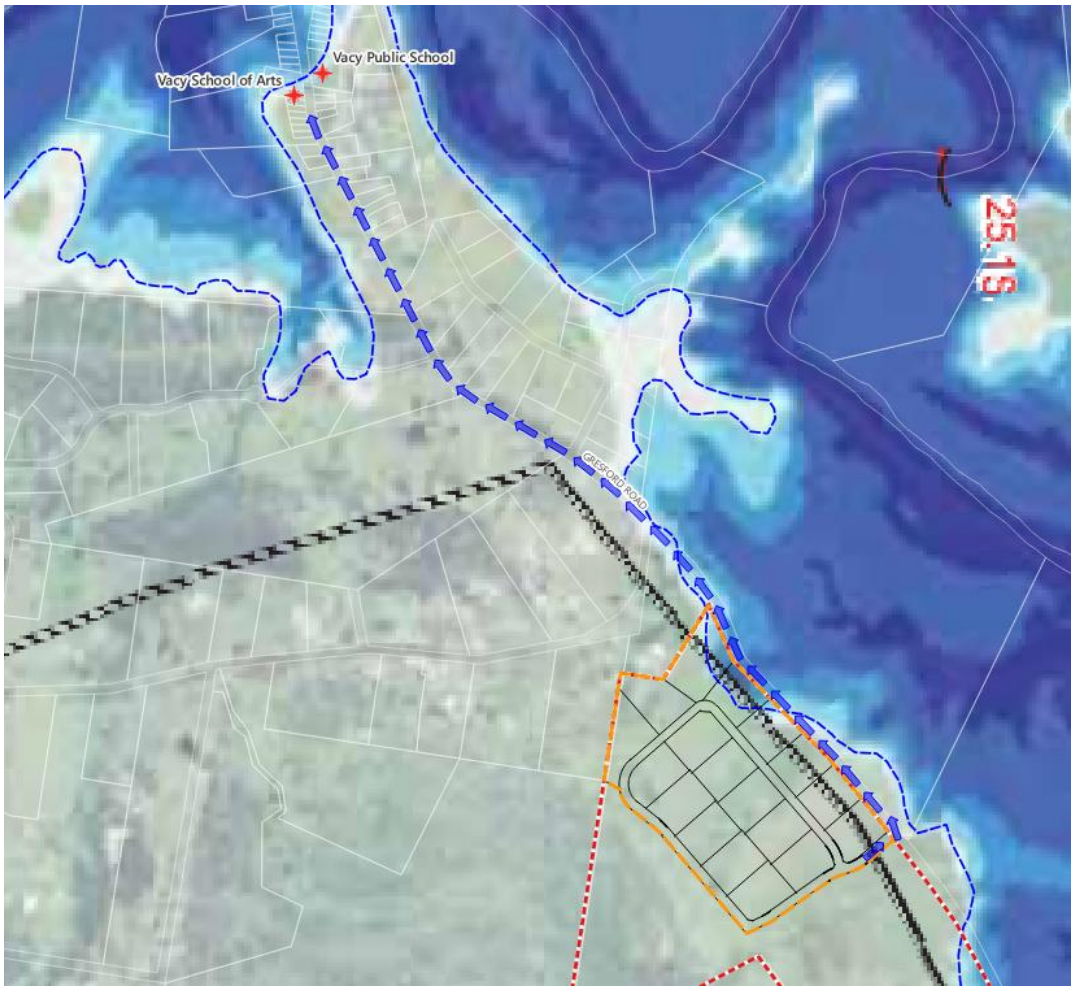
In accordance with the existing Flood Management Plans, it is proposed that the site remains consistent with the existing plans and evacuation of residents takes place via the road network which offers a constantly rising path of travel up and out of the flood plain to the existing evacuation centres.

Centres relevant to the proposed Stage 5 site include either the Vacy Public School, or the Vacy School of Arts, both located nearby on Gresford Road. Both of these evacuation centres are above the PMF and are only 2.0km to the northwest of the site, making them readily accessible in the event of an emergency.

The evacuation route increases from approximately RL 19.0m AHD in Gresford Road at the site frontage, to RL 29.5m AHD at the evacuation centres.

Refer to Figure 3 below which demonstrates the evacuation path out of the Stage 5 site area via the internal road networks and on to Gresford Road towards the school sites.

Figure 6 - PMF inundation and Evacuation Route



Because the proposed lots have evacuation access outside of the 1% AEP flood levels plus freeboard and has a constantly rising road available up and out of the development, the flood management strategy is entirely consistent with the local and regional plans.

In addition, Paterson River flooding is characterised by large catchment response and forecast-driven warning systems, rather than rapid onset flash flooding. The adopted Flood Study (WMA, 2017) identifies critical storm durations of approximately 36-hours for the 1% AEP event and 72-hours for the PMF event, confirming that flooding at Vacy is associated with long-duration riverine behaviour.

Accordingly, warning lead times provided through Bureau of Meteorology forecasts and NSW SES flood warnings significantly exceed the time required to evacuate the proposed development. Travel time from the site to the nominated evacuation centres on Gresford Road is minimal (approximately 1–2 minutes by vehicle), and the evacuation route follows continuously rising terrain outside the mapped 1% AEP extent. As such, the development does not rely on last-minute evacuation triggers and is consistent with established regional flood response arrangements.

4 Conclusions

Based on the adopted Paterson River Flood Study (WMA, 2017), the proposed Stage 5 development is located outside the 1% AEP flood extent and does not adversely impact flood storage, conveyance or flood behaviour. The site is not subject to early isolation during the 1% AEP event, and the proposed subdivision layout maintains existing overland flow paths.

While portions of the site are subject to inundation under extreme PMF conditions, the site access to Gresford Road remain outside the mapped PMF extents. The available evacuation route follows rising terrain from approximately RL 19.0m AHD at in Gresford Road to approximately RL 29.5m AHD at the nominated evacuation centres, remaining trafficable in the early phases of an extreme PMF event.

Given the scale of the large river catchment and the forecast-driven nature of Paterson River flooding, warning lead times are expected to significantly exceed the travel time required to evacuate the development. The proposed strategy is consistent with the NSW SES Dungog Shire Local Flood Emergency Sub Plan and does not introduce additional evacuation burden or unacceptable flood risk.

Accordingly, the proposed Stage 5 development is considered to achieve a safe and compliant flood evacuation outcome.