WGA

TECHNICAL MEMORANDUM

PROJECT NO.: WGA241087

DOCUMENT NO.: WGA241087-MM-HG-0011_B

DATE: 29 JANUARY 2026

ATTENTION	Expert Consenting Panel - Ashbourne
SUBJECT	Response to Minute 11 (Point 13) and Minute 13
AUTHOR	Clare Houlbrooke

1. INTRODUCTION

This memorandum provides a response to Minute 11 (Point 13) and Minute 13, the Ashbourne Development.

Minute 11 (Point 13)

The panel have requested a response to a question from Waikato Regional Council on the cumulative effects of the development in terms of the wastewater discharge, in particular the loads of nutrients discharged in comparison with current land use.

In terms of nitrogen loading, WGA understand from Innoflow, the wastewater system designers, that the expected concentrations are below TN 60 g/m^3 (per comms, B. Hawthon, 23 January 2026). This maximum concentration has been used to calculate the nitrogen load over the full Retirement Village development area.

The calculations provided below result in a TN load of **82 kg/ha/year,** which is less than the farming permitted baseline of 150 kg/ha/year.

WGA understands that phosphorus is generally absorbed onto clay soils and is not a significant issue in shallow groundwater in this region. The proposed wastewater application represents a phosphorus load of 16 kg/ha/year based on an upper concentration of 12 g/m^3 in applied wastewater (per comms, B. Hawthon, 23 January 2026).

Therefore, WGA concludes that the proposed nutrient loading results in an improvement in terms of the cumulative effects on shallow groundwater compared with current land use.

Table 1: Calculated TN Load for Ashbourne RV

| DESCRIPTION	VALUE	UNIT
Wastewater average daily volume	75.58	m3/day
Concentration TN	60	g/m3
TN load per day	4,535	g/day
	4.53	kg/day
TN load per year	1,655	kg/year
Retirement Village area	201,437	m2
	20.14	ha
Proposed TN Load	**82**	**kg/ha/year**

Minute 13

The WGA memo dated 18 November 2025 provides the infiltration rates derived from the modelling in Table C1 for Basin A (labelled "Model Output").

In addition, there are model image files that were generated but not included in the November memo and two of these images are included below in Figure 1 and Figure 2 for further information on the results.

Table C1: Groundwater Mounding Assessment Basin A

MODEL INPUT PARAMETER		VALUE	INFORMATION SOURCE	UNIT CONVERSION	
Length (m)		100	Maven basin design cross sections		
Width (m)		43.5			
Event Duration (days)		3	3-day 100-year ARI storm event duration.		
Initial Aquifer Saturated Thickness		8.55	Average aquifer thickness from CPT24-06 and SCPT24-04		
Aquifer Specific Yield (m³/m³)		0.22	Typical for aquifer type (Morris and Johnson 1967).		
Aquifer Gradient		-0.0022	Calculated from interpreted winter piezometric surface.		
Aquifer Dip Direction (degrees)	Cardinal	60°E			
	Moundsolv ()	30			
Rotation of the Infiltration Basin Length (degrees)	Cardinal	23.7°E	From Maven basin design plans		
	Moundsolv ()	36.3			
Hydraulic Conductivity (m/s)	CMW k (k^1)	6.27	Taken from CMW soakage tests (CIRIA 113 method), in pit, SOA24-23/24		
	Conservative k (k^2)	1.53	Calculated as the average of the last 4 values from CMW's soakage tests undertaken at SOA23 and SOA24 (CIRIA method.)		
Maximum Acceptable Groundwater Mounding Height (m)		6.0	Taken as the distance from the winter water table (derived from the piezometric surface) to the top of the basin specified in Maven basin design plans.		
Recharge Rate (Q) (m³/d)		2,145	Model Output		
Infiltration Rate (q) (m/d)		0.49	Model Output	mm/hr	20.5
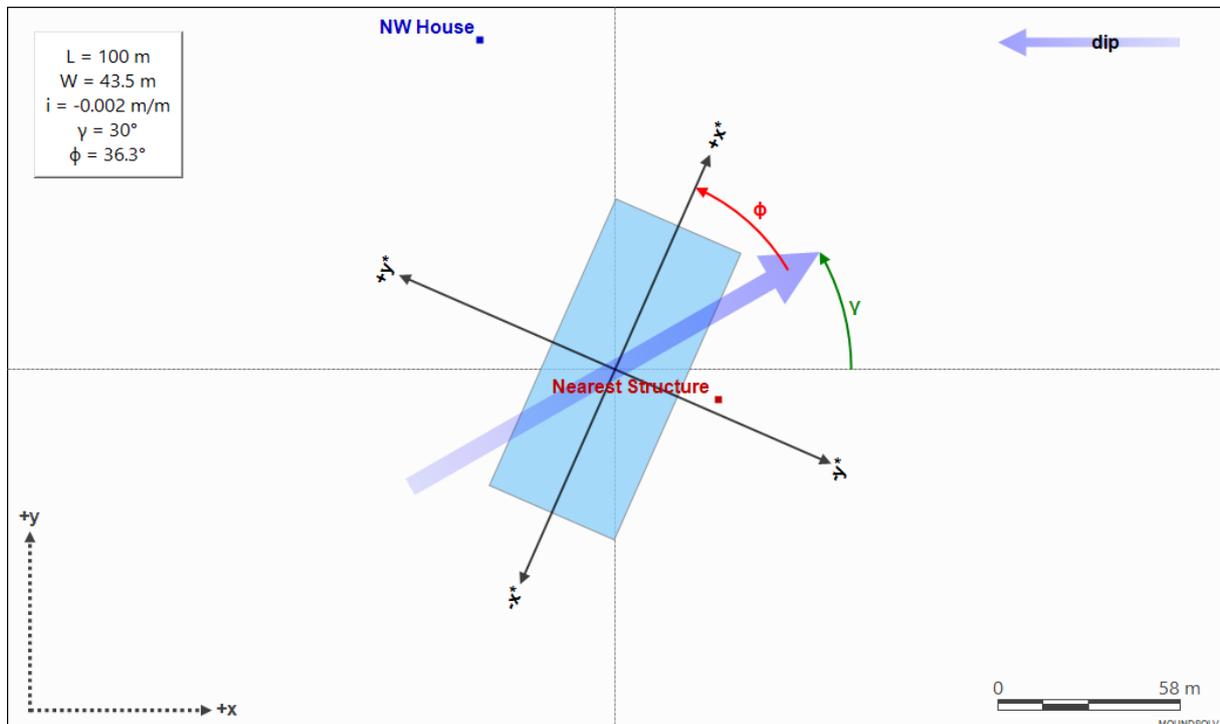
Figure 1: Basin A Moundsolv Map
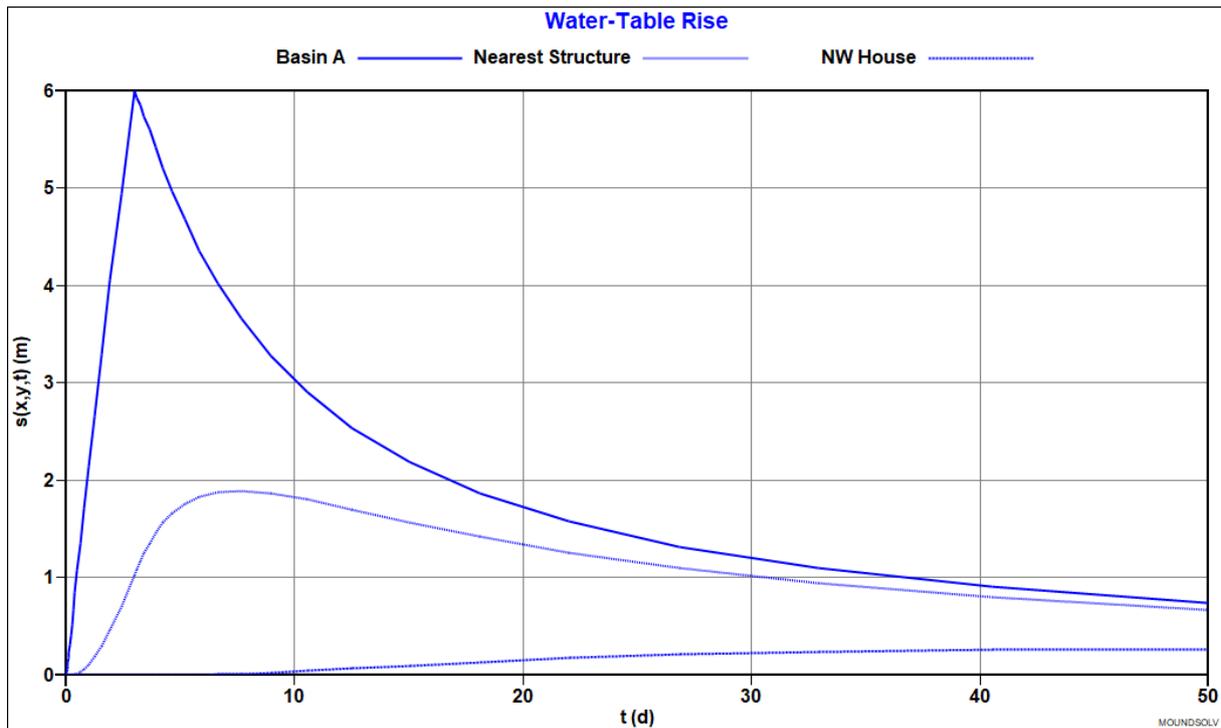
Figure 2: Basin A Moundsolv Projected Mounding (s) through Time (days) at the Basin and Nearby Structures.

Yours sincerely,

Clare Houlbrooke
Principal Hydrogeologist
WALLBRIDGE GILBERT AZTEC