

**Client :** NZTA - Waka Kotahi  
**Project :** Northland Corridor  
**Location :** Alternative to the Brynderwyn Hills

**Project No. :** 1-C2466.16  
**Bore :** BH2B\_1104  
**Test section :** 31.5-32

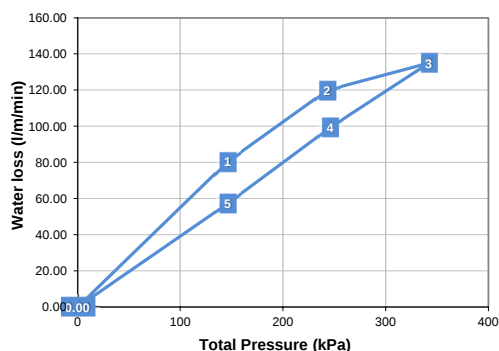
**Test Details**

Date: 27/08/25 Bottom of packer (m): 31.50 Height of pressure gauge above ground (m): 0.5  
 Bore diameter (mm): 96 Bore depth (m): 32.00 Vertical Depth to groundwater (m): 4.2  
 Bore inclination (deg): 90 Section length (m): 0.50 (or depth to base of packer)

Hg = gauge pressure, Hl = head loss in rods and packer, Hw = (gauge height + groundwater depth)x 9.81, Total = Hg+Hw-Hl

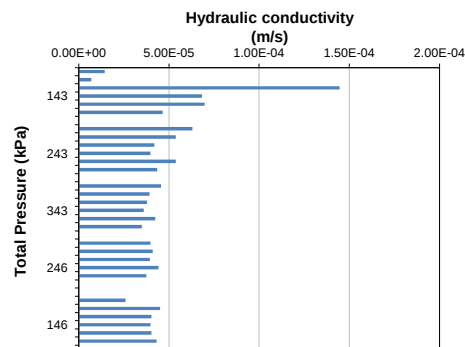
| PRESSURE |       |       | Test<br>Duration | FLOW RATES          |                   |                   |                 |               |                      |         |                              | Water<br>Loss | Lugeons | Approx<br>Permeability |
|----------|-------|-------|------------------|---------------------|-------------------|-------------------|-----------------|---------------|----------------------|---------|------------------------------|---------------|---------|------------------------|
| Hg       | HI    | Total |                  | Initial<br>(litres) | Flowmeter         |                   | Initial<br>(mm) | Drum readings |                      | Leakage | Assigned<br>Flow<br>(litres) |               |         |                        |
| (kPa)    | (kPa) | (kPa) | (min)            |                     | Final<br>(litres) | Total<br>(litres) |                 | Final<br>(mm) | Equivalent<br>litres |         |                              | (litres)      |         |                        |
| 100      | 0     | 146   | 2                | 288100.0            | 288121.0          | 21.0              |                 |               |                      |         | 21.0                         | 21.0          | 143.7   | 1.4E-05                |
| 100      | 0     | 146   | 2                | 288121.0            | 288131.0          | 10.0              |                 |               |                      |         | 10.0                         | 10.0          | 68.4    | 6.8E-06                |
| 100      | 21    | 125   | 2                | 288131.0            | 288312.0          | 181.0             |                 |               |                      |         | 181.0                        | 181.0         | 1446.8  | 1.4E-04                |
| 100      | 0     | 146   | 2                | 288312.0            | 288412.0          | 100.0             |                 |               |                      |         | 100.0                        | 100.0         | 684.4   | 6.8E-05                |
| 100      | 0     | 146   | 2                | 288412.0            | 288514.0          | 102.0             |                 |               |                      |         | 102.0                        | 102.0         | 698.1   | 7.0E-05                |
| 100      | 0     | 146   | 2                | 288514.0            | 288582.0          | 68.0              |                 |               |                      |         | 68.0                         | 68.0          | 465.4   | 4.7E-05                |
|          |       |       |                  |                     |                   |                   |                 |               |                      |         |                              |               |         |                        |
| 200      | 10    | 236   | 2                | 288582.0            | 288731.0          | 149.0             |                 |               |                      |         | 149.0                        | 149.0         | 631.1   | 6.3E-05                |
| 200      | 3     | 243   | 2                | 288731.0            | 288862.0          | 131.0             |                 |               |                      |         | 131.0                        | 131.0         | 538.9   | 5.4E-05                |
| 200      | 0     | 246   | 2                | 288862.0            | 288965.0          | 103.0             |                 |               |                      |         | 103.0                        | 103.0         | 418.5   | 4.2E-05                |
| 200      | 0     | 246   | 2                | 288965.0            | 289063.0          | 98.0              |                 |               |                      |         | 98.0                         | 98.0          | 398.2   | 4.0E-05                |
| 200      | 3     | 243   | 2                | 289063.0            | 289194.0          | 131.0             |                 |               |                      |         | 131.0                        | 131.0         | 538.9   | 5.4E-05                |
| 200      | 0     | 246   | 2                | 289194.0            | 289301.0          | 107.0             |                 |               |                      |         | 107.0                        | 107.0         | 434.8   | 4.3E-05                |
|          |       |       |                  |                     |                   |                   |                 |               |                      |         |                              |               |         |                        |
| 300      | 11    | 335   | 2                | 289301.0            | 289454.0          | 153.0             |                 |               |                      |         | 153.0                        | 153.0         | 456.6   | 4.6E-05                |
| 300      | 4     | 342   | 2                | 289454.0            | 289588.0          | 134.0             |                 |               |                      |         | 134.0                        | 134.0         | 391.7   | 3.9E-05                |
| 300      | 3     | 343   | 2                | 289588.0            | 289718.0          | 130.0             |                 |               |                      |         | 130.0                        | 130.0         | 378.9   | 3.8E-05                |
| 300      | 0     | 346   | 2                | 289718.0            | 289843.0          | 125.0             |                 |               |                      |         | 125.0                        | 125.0         | 361.2   | 3.6E-05                |
| 300      | 0     | 346   | 2                | 289843.0            | 289990.0          | 147.0             |                 |               |                      |         | 147.0                        | 147.0         | 424.7   | 4.2E-05                |
| 300      | 0     | 346   | 2                | 289990.0            | 290111.0          | 121.0             |                 |               |                      |         | 121.0                        | 121.0         | 349.6   | 3.5E-05                |
|          |       |       |                  |                     |                   |                   |                 |               |                      |         |                              |               |         |                        |
| 200      | 0     | 246   | 2                | 290214.0            | 290312.0          | 98.0              |                 |               |                      |         | 98.0                         | 98.0          | 398.2   | 4.0E-05                |
| 200      | 0     | 246   | 2                | 290312.0            | 290413.0          | 101.0             |                 |               |                      |         | 101.0                        | 101.0         | 410.4   | 4.1E-05                |
| 200      | 0     | 246   | 2                | 290413.0            | 290510.0          | 97.0              |                 |               |                      |         | 97.0                         | 97.0          | 394.1   | 3.9E-05                |
| 200      | 0     | 246   | 2                | 290510.0            | 290619.0          | 109.0             |                 |               |                      |         | 109.0                        | 109.0         | 442.9   | 4.4E-05                |
| 200      | 0     | 246   | 2                | 290619.0            | 290711.0          | 92.0              |                 |               |                      |         | 92.0                         | 92.0          | 373.8   | 3.7E-05                |
|          |       |       |                  |                     |                   |                   |                 |               |                      |         |                              |               |         |                        |
|          |       |       |                  |                     |                   |                   |                 |               |                      |         |                              |               |         |                        |
| 100      | 0     | 146   | 2                | 290711.0            | 290749.0          | 38.0              |                 |               |                      |         | 38.0                         | 38.0          | 260.1   | 2.6E-05                |
| 100      | 0     | 146   | 2                | 290749.0            | 290815.0          | 66.0              |                 |               |                      |         | 66.0                         | 66.0          | 451.7   | 4.5E-05                |
| 100      | 0     | 146   | 2                | 290815.0            | 290874.0          | 59.0              |                 |               |                      |         | 59.0                         | 59.0          | 403.8   | 4.0E-05                |
| 100      | 0     | 146   | 2                | 290874.0            | 290932.0          | 58.0              |                 |               |                      |         | 58.0                         | 58.0          | 397.0   | 4.0E-05                |
| 100      | 0     | 146   | 2                | 290932.0            | 290991.0          | 59.0              |                 |               |                      |         | 59.0                         | 59.0          | 403.8   | 4.0E-05                |
| 100      | 0     | 146   | 2                | 290991.0            | 291054.0          | 63.0              |                 |               |                      |         | 63.0                         | 63.0          | 431.2   | 4.3E-05                |
|          |       |       |                  |                     |                   |                   |                 |               |                      |         |                              |               |         |                        |

**Notes** Laminar flow behaviour  
 K estimated from average of all steps, excluding excessive flow stages  
 Minimum K estimated from minimum of all stages  
 Maximum K estimated from maximum of all stages



| Averages |                |                    |                                  |
|----------|----------------|--------------------|----------------------------------|
| Stage    | Pressure (kPa) | Water loss (l/min) | Hydraulic conductivity - K (m/s) |
| 1        | 146            | 80.33              | 5.8E-05                          |
| 2        | 243            | 119.83             | 4.9E-05                          |
| 3        | 342            | 135.00             | 3.9E-05                          |
| 4        | 246            | 99.40              | 4.0E-05                          |
| 5        | 146            | 57.17              | 3.9E-05                          |

Calculated: LS  
 Checked:  
 Date: 15/01/26



**Client :** NZTA - Waka Kotahi  
**Project :** Northland Corridor  
**Location :** Alternative to the Brynderwyn Hills

**Project No. :** 1-C2466.16  
**Bore :** BH2B\_1109  
**Test section :** 25-28.2

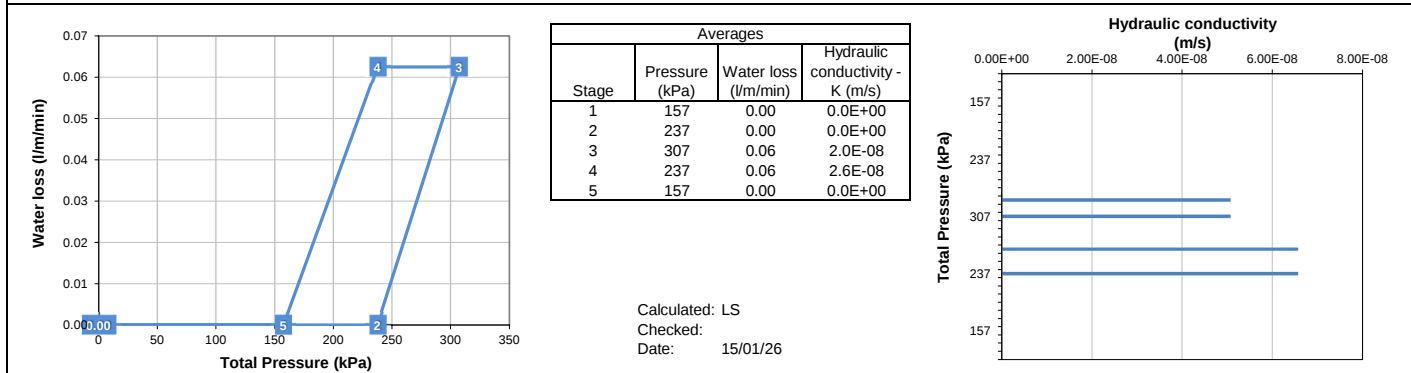
**Test Details**

Date: 17/09/25 Bottom of packer (m): 25.00 Height of pressure gauge above ground (m): 0.8  
 Bore diameter (mm): 96 Bore depth (m): 28.20 Vertical Depth to groundwater (m): 7.1  
 Bore inclination (deg): 90 Section length (m): 3.20 (or depth to base of packer)

$H_g$  = gauge pressure,  $H_l$  = head loss in rods and packer,  $H_w$  = (gauge height + groundwater depth) x 9.81, Total =  $H_g + H_w - H_l$

| PRESSURE |       |       | Test<br>Duration | FLOW RATES |           |       |         |               |       |         |                  | Water<br>Loss | Lugeons  | Approx<br>Permeability |
|----------|-------|-------|------------------|------------|-----------|-------|---------|---------------|-------|---------|------------------|---------------|----------|------------------------|
| Hg       | HI    | Total |                  | Initial    | Flowmeter |       | Initial | Drum readings |       | Leakage | Assigned<br>Flow |               |          |                        |
| (kPa)    | (kPa) | (kPa) | (min)            | (litres)   | Final     | Total |         | (mm)          | Final |         |                  | Equivalent    | (litres) | (litres)               |
| 80       | 0     | 157   | 2                | 1029.0     | 1029.0    | 0.0   |         |               |       |         | 0.0              | 0.0           | 0.0      | 0.0E+00                |
| 80       | 0     | 157   | 2                | 1029.0     | 1029.0    | 0.0   |         |               |       |         | 0.0              | 0.0           | 0.0      | 0.0E+00                |
| 80       | 0     | 157   | 2                | 1029.0     | 1029.0    | 0.0   |         |               |       |         | 0.0              | 0.0           | 0.0      | 0.0E+00                |
| 80       | 0     | 157   | 2                | 1029.0     | 1029.0    | 0.0   |         |               |       |         | 0.0              | 0.0           | 0.0      | 0.0E+00                |
| 80       | 0     | 157   | 2                | 1029.0     | 1029.0    | 0.0   |         |               |       |         | 0.0              | 0.0           | 0.0      | 0.0E+00                |
|          |       |       |                  |            |           |       |         |               |       |         |                  |               |          |                        |
|          |       |       |                  |            |           |       |         |               |       |         |                  |               |          |                        |
| 160      | 0     | 237   | 2                | 1031.0     | 1031.0    | 0.0   |         |               |       |         | 0.0              | 0.0           | 0.0      | 0.0E+00                |
| 160      | 0     | 237   | 2                | 1031.0     | 1031.0    | 0.0   |         |               |       |         | 0.0              | 0.0           | 0.0      | 0.0E+00                |
| 160      | 0     | 237   | 2                | 1031.0     | 1031.0    | 0.0   |         |               |       |         | 0.0              | 0.0           | 0.0      | 0.0E+00                |
| 160      | 0     | 237   | 2                | 1031.0     | 1031.0    | 0.0   |         |               |       |         | 0.0              | 0.0           | 0.0      | 0.0E+00                |
| 160      | 0     | 237   | 2                | 1031.0     | 1031.0    | 0.0   |         |               |       |         | 0.0              | 0.0           | 0.0      | 0.0E+00                |
|          |       |       |                  |            |           |       |         |               |       |         |                  |               |          |                        |
|          |       |       |                  |            |           |       |         |               |       |         |                  |               |          |                        |
| 230      | 0     | 307   | 2                | 1032.0     | 1032.0    | 0.0   |         |               |       |         | 0.0              | 0.0           | 0.0      | 0.0E+00                |
| 230      | 0     | 307   | 2                | 1032.0     | 1033.0    | 1.0   |         |               |       |         | 1.0              | 0.2           | 0.5      | 5.1E-08                |
| 230      | 0     | 307   | 2                | 1033.0     | 1033.0    | 0.0   |         |               |       |         | 0.0              | 0.0           | 0.0      | 0.0E+00                |
| 230      | 0     | 307   | 2                | 1033.0     | 1034.0    | 1.0   |         |               |       |         | 1.0              | 0.2           | 0.5      | 5.1E-08                |
| 230      | 0     | 307   | 2                | 1034.0     | 1034.0    | 0.0   |         |               |       |         | 0.0              | 0.0           | 0.0      | 0.0E+00                |
|          |       |       |                  |            |           |       |         |               |       |         |                  |               |          |                        |
|          |       |       |                  |            |           |       |         |               |       |         |                  |               |          |                        |
| 160      | 0     | 237   | 2                | 1034.0     | 1035.0    | 1.0   |         |               |       |         | 1.0              | 0.2           | 0.7      | 6.6E-08                |
| 160      | 0     | 237   | 2                | 1035.0     | 1035.0    | 0.0   |         |               |       |         | 0.0              | 0.0           | 0.0      | 0.0E+00                |
| 160      | 0     | 237   | 2                | 1035.0     | 1035.0    | 0.0   |         |               |       |         | 0.0              | 0.0           | 0.0      | 0.0E+00                |
| 160      | 0     | 237   | 2                | 1035.0     | 1036.0    | 1.0   |         |               |       |         | 1.0              | 0.2           | 0.7      | 6.6E-08                |
| 160      | 0     | 237   | 2                | 1036.0     | 1036.0    | 0.0   |         |               |       |         | 0.0              | 0.0           | 0.0      | 0.0E+00                |
|          |       |       |                  |            |           |       |         |               |       |         |                  |               |          |                        |
|          |       |       |                  |            |           |       |         |               |       |         |                  |               |          |                        |
| 80       | 0     | 157   | 2                | 1035.0     | 1035.0    | 0.0   |         |               |       |         | 0.0              | 0.0           | 0.0      | 0.0E+00                |
| 80       | 0     | 157   | 2                | 1035.0     | 1035.0    | 0.0   |         |               |       |         | 0.0              | 0.0           | 0.0      | 0.0E+00                |
| 80       | 0     | 157   | 2                | 1035.0     | 1035.0    | 0.0   |         |               |       |         | 0.0              | 0.0           | 0.0      | 0.0E+00                |
| 80       | 0     | 157   | 2                | 1035.0     | 1035.0    | 0.0   |         |               |       |         | 0.0              | 0.0           | 0.0      | 0.0E+00                |
| 80       | 0     | 157   | 2                | 1035.0     | 1035.0    | 0.0   |         |               |       |         | 0.0              | 0.0           | 0.0      | 0.0E+00                |
|          |       |       |                  |            |           |       |         |               |       |         |                  |               |          |                        |
|          |       |       |                  |            |           |       |         |               |       |         |                  |               |          |                        |

**Notes** Test pressure in Psi converted to kPa for analysis  
 Negative flow during last stage as a result of overpressure of impermeable formation during testing, and no non-return valve - shown as no flow  
 Essentially impermeable; very little flow during high pressure stages



**Client :** NZTA - Waka Kotahi  
**Project :** Northland Corridor  
**Location :** Alternative to the Brynderwyn Hills

**Project No. :** 1-C2466.16  
**Bore :** BH2B\_1117  
**Test section :** 18.6-21.75

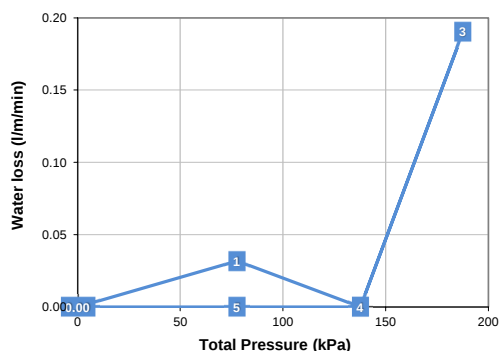
**Test Details**

Date: 9/09/25 Bottom of packer (m): 18.60 Height of pressure gauge above ground (m): 0.6  
 Bore diameter (mm): 96 Bore depth (m): 21.75 Vertical Depth to groundwater (m): 1.2  
 Bore inclination (deg): 90 Section length (m): 3.15 (or depth to base of packer)

$H_g$  = gauge pressure,  $H_I$  = head loss in rods and packer,  $H_w$  = (gauge height + groundwater depth) x 9.81, Total =  $H_g + H_w - H_I$

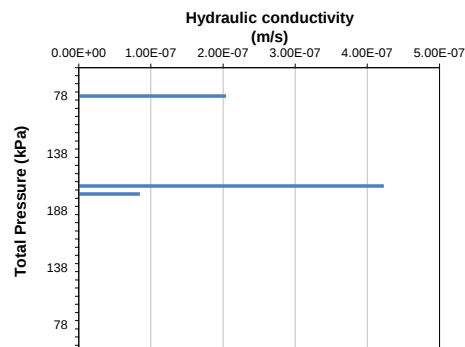
| PRESSURE |          |             | Test Duration (min) | FLOW RATES       |                          |                |              |                          |                   | Leakage (litres) | Assigned Flow (litres) | Water Loss (l/m/min) | Lugeons (l/m/min at 1000 kPa) | Approx Permeability (m/sec) |
|----------|----------|-------------|---------------------|------------------|--------------------------|----------------|--------------|--------------------------|-------------------|------------------|------------------------|----------------------|-------------------------------|-----------------------------|
| Hg (kPa) | HI (kPa) | Total (kPa) |                     | Initial (litres) | Flowmeter Final (litres) | Total (litres) | Initial (mm) | Drum readings Final (mm) | Equivalent litres |                  |                        |                      |                               |                             |
| 60       | 0        | 78          | 2                   | 291423.0         | 291423.0                 | 0.0            |              |                          |                   |                  | 0.0                    | 0.0                  | 0.0                           | 0.0E+00                     |
| 60       | 0        | 78          | 2                   | 291423.0         | 291423.0                 | 0.0            |              |                          |                   |                  | 0.0                    | 0.0                  | 0.0                           | 0.0E+00                     |
| 60       | 0        | 78          | 2                   | 291423.0         | 291423.0                 | 0.0            |              |                          |                   |                  | 0.0                    | 0.0                  | 0.0                           | 0.0E+00                     |
| 60       | 0        | 78          | 2                   | 291423.0         | 291424.0                 | 1.0            |              |                          |                   |                  | 1.0                    | 0.2                  | 2.0                           | 2.0E-07                     |
| 60       | 0        | 78          | 2                   | 291424.0         | 291424.0                 | 0.0            |              |                          |                   |                  | 0.0                    | 0.0                  | 0.0                           | 0.0E+00                     |
|          |          |             |                     |                  |                          |                |              |                          |                   |                  |                        |                      |                               |                             |
|          |          |             |                     |                  |                          |                |              |                          |                   |                  |                        |                      |                               |                             |
| 120      | 0        | 138         | 2                   | 291424.0         | 291424.0                 | 0.0            |              |                          |                   |                  | 0.0                    | 0.0                  | 0.0                           | 0.0E+00                     |
| 120      | 0        | 138         | 2                   | 291424.0         | 291424.0                 | 0.0            |              |                          |                   |                  | 0.0                    | 0.0                  | 0.0                           | 0.0E+00                     |
| 120      | 0        | 138         | 2                   | 291424.0         | 291424.0                 | 0.0            |              |                          |                   |                  | 0.0                    | 0.0                  | 0.0                           | 0.0E+00                     |
| 120      | 0        | 138         | 2                   | 291424.0         | 291424.0                 | 0.0            |              |                          |                   |                  | 0.0                    | 0.0                  | 0.0                           | 0.0E+00                     |
| 120      | 0        | 138         | 2                   | 291424.0         | 291424.0                 | 0.0            |              |                          |                   |                  | 0.0                    | 0.0                  | 0.0                           | 0.0E+00                     |
|          |          |             |                     |                  |                          |                |              |                          |                   |                  |                        |                      |                               |                             |
|          |          |             |                     |                  |                          |                |              |                          |                   |                  |                        |                      |                               |                             |
| 170      | 0        | 188         | 2                   | 291426.0         | 291431.0                 | 5.0            |              |                          |                   |                  | 5.0                    | 0.8                  | 4.2                           | 4.2E-07                     |
| 170      | 0        | 188         | 2                   | 291431.0         | 291432.0                 | 1.0            |              |                          |                   |                  | 1.0                    | 0.2                  | 0.8                           | 8.5E-08                     |
| 170      | 0        | 188         | 2                   | 291432.0         | 291432.0                 | 0.0            |              |                          |                   |                  | 0.0                    | 0.0                  | 0.0                           | 0.0E+00                     |
| 170      | 0        | 188         | 2                   | 291432.0         | 291432.0                 | 0.0            |              |                          |                   |                  | 0.0                    | 0.0                  | 0.0                           | 0.0E+00                     |
| 170      | 0        | 188         | 2                   | 291432.0         | 291432.0                 | 0.0            |              |                          |                   |                  | 0.0                    | 0.0                  | 0.0                           | 0.0E+00                     |
|          |          |             |                     |                  |                          |                |              |                          |                   |                  |                        |                      |                               |                             |
|          |          |             |                     |                  |                          |                |              |                          |                   |                  |                        |                      |                               |                             |
| 120      | 0        | 138         | 2                   | 291432.0         | 291432.0                 | 0.0            |              |                          |                   |                  | 0.0                    | 0.0                  | 0.0                           | 0.0E+00                     |
| 120      | 0        | 138         | 2                   | 291432.0         | 291432.0                 | 0.0            |              |                          |                   |                  | 0.0                    | 0.0                  | 0.0                           | 0.0E+00                     |
| 120      | 0        | 138         | 2                   | 291432.0         | 291432.0                 | 0.0            |              |                          |                   |                  | 0.0                    | 0.0                  | 0.0                           | 0.0E+00                     |
| 120      | 0        | 138         | 2                   | 291432.0         | 291432.0                 | 0.0            |              |                          |                   |                  | 0.0                    | 0.0                  | 0.0                           | 0.0E+00                     |
| 120      | 0        | 138         | 2                   | 291432.0         | 291432.0                 | 0.0            |              |                          |                   |                  | 0.0                    | 0.0                  | 0.0                           | 0.0E+00                     |
|          |          |             |                     |                  |                          |                |              |                          |                   |                  |                        |                      |                               |                             |
|          |          |             |                     |                  |                          |                |              |                          |                   |                  |                        |                      |                               |                             |
| 60       | 0        | 78          | 2                   | 291432.0         | 291432.0                 | 0.0            |              |                          |                   |                  | 0.0                    | 0.0                  | 0.0                           | 0.0E+00                     |
| 60       | 0        | 78          | 2                   | 291432.0         | 291432.0                 | 0.0            |              |                          |                   |                  | 0.0                    | 0.0                  | 0.0                           | 0.0E+00                     |
| 60       | 0        | 78          | 2                   | 291432.0         | 291432.0                 | 0.0            |              |                          |                   |                  | 0.0                    | 0.0                  | 0.0                           | 0.0E+00                     |
| 60       | 0        | 78          | 2                   | 291432.0         | 291432.0                 | 0.0            |              |                          |                   |                  | 0.0                    | 0.0                  | 0.0                           | 0.0E+00                     |
|          |          |             |                     |                  |                          |                |              |                          |                   |                  |                        |                      |                               |                             |
|          |          |             |                     |                  |                          |                |              |                          |                   |                  |                        |                      |                               |                             |
|          |          |             |                     |                  |                          |                |              |                          |                   |                  |                        |                      |                               |                             |
|          |          |             |                     |                  |                          |                |              |                          |                   |                  |                        |                      |                               |                             |
|          |          |             |                     |                  |                          |                |              |                          |                   |                  |                        |                      |                               |                             |

**Notes**  
 Test pressure in Psi converted to kPa for analysis  
 Gauge pressure fluctuates by up to 5 Psi during test  
 No flow - essentially impermeable



| Averages |                |                    |                                  |
|----------|----------------|--------------------|----------------------------------|
| Stage    | Pressure (kPa) | Water loss (l/min) | Hydraulic conductivity - K (m/s) |
| 1        | 78             | 0.03               | 4.1E-08                          |
| 2        | 138            | 0.00               | 0.0E+00                          |
| 3        | 188            | 0.19               | 1.0E-07                          |
| 4        | 138            | 0.00               | 0.0E+00                          |
| 5        | 78             | 0.00               | 0.0E+00                          |

Calculated: LS  
 Checked:  
 Date: 15/01/26



**Client :** NZTA - Waka Kotahi  
**Project :** Northland Corridor  
**Location :** Alternative to the Brynderwyn Hills

**Project No. :** 1-C2466.16  
**Bore :** BH2B\_1144  
**Test section :** 40.5-53

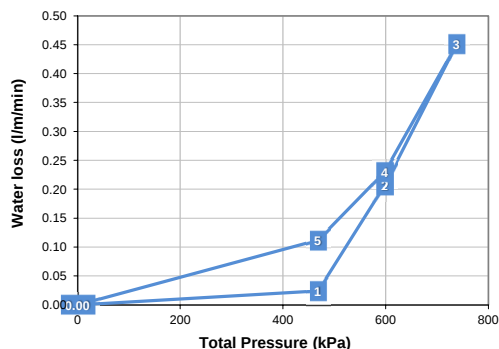
**Test Details**

Date: 28/08/25 Bottom of packer (m): 40.50 Height of pressure gauge above ground (m): 0.8  
 Bore diameter (mm): 96 Bore depth (m): 53.00 Vertical Depth to groundwater (m): 18.4  
 Bore inclination (deg): 90 Section length (m): 12.50 (or depth to base of packer)

Hg = gauge pressure, Hl = head loss in rods and packer, Hw = (gauge height + groundwater depth)x 9.81, Total = Hg+Hw-Hl

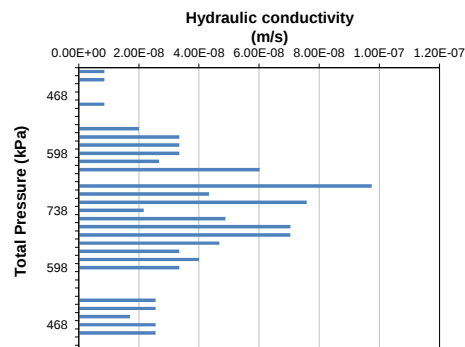
| PRESSURE |          |             | Test Duration (min) | FLOW RATES       |                |                |              |            |                   | Leakage (litres) | Assigned Flow (litres) | Water Loss (l/m/min) | Lugeons (l/m/min at 1000 kPa) | Approx Permeability (m/sec) |
|----------|----------|-------------|---------------------|------------------|----------------|----------------|--------------|------------|-------------------|------------------|------------------------|----------------------|-------------------------------|-----------------------------|
| Hg (kPa) | Hl (kPa) | Total (kPa) |                     | Initial (litres) | Final (litres) | Total (litres) | Initial (mm) | Final (mm) | Equivalent litres |                  |                        |                      |                               |                             |
| 280      | 0        | 468         | 2                   | 467.0            | 468.0          | 1.0            |              |            |                   |                  | 1.0                    | 0.0                  | 0.1                           | 8.5E-09                     |
| 280      | 0        | 468         | 2                   | 468.0            | 469.0          | 1.0            |              |            |                   |                  | 1.0                    | 0.0                  | 0.1                           | 8.5E-09                     |
| 280      | 0        | 468         | 2                   | 469.0            | 469.0          | 0.0            |              |            |                   |                  | 0.0                    | 0.0                  | 0.0                           | 0.0E+00                     |
| 280      | 0        | 468         | 2                   | 469.0            | 469.0          | 0.0            |              |            |                   |                  | 0.0                    | 0.0                  | 0.0                           | 0.0E+00                     |
| 280      | 0        | 468         | 2                   | 469.0            | 470.0          | 1.0            |              |            |                   |                  | 1.0                    | 0.0                  | 0.1                           | 8.5E-09                     |
|          |          |             |                     |                  |                |                |              |            |                   |                  |                        |                      |                               |                             |
|          |          |             |                     |                  |                |                |              |            |                   |                  |                        |                      |                               |                             |
| 410      | 0        | 598         | 2                   | 473.0            | 476.0          | 3.0            |              |            |                   |                  | 3.0                    | 0.1                  | 0.2                           | 2.0E-08                     |
| 410      | 0        | 598         | 2                   | 476.0            | 481.0          | 5.0            |              |            |                   |                  | 5.0                    | 0.2                  | 0.3                           | 3.3E-08                     |
| 410      | 0        | 598         | 2                   | 481.0            | 486.0          | 5.0            |              |            |                   |                  | 5.0                    | 0.2                  | 0.3                           | 3.3E-08                     |
| 410      | 0        | 598         | 2                   | 486.0            | 491.0          | 5.0            |              |            |                   |                  | 5.0                    | 0.2                  | 0.3                           | 3.3E-08                     |
| 410      | 0        | 598         | 2                   | 491.0            | 495.0          | 4.0            |              |            |                   |                  | 4.0                    | 0.2                  | 0.3                           | 2.7E-08                     |
| 410      | 0        | 598         | 2                   | 495.0            | 504.0          | 9.0            |              |            |                   |                  | 9.0                    | 0.4                  | 0.6                           | 6.0E-08                     |
|          |          |             |                     |                  |                |                |              |            |                   |                  |                        |                      |                               |                             |
|          |          |             |                     |                  |                |                |              |            |                   |                  |                        |                      |                               |                             |
| 550      | 0        | 738         | 2                   | 511.0            | 529.0          | 18.0           |              |            |                   |                  | 18.0                   | 0.7                  | 1.0                           | 9.8E-08                     |
| 550      | 0        | 738         | 2                   | 529.0            | 537.0          | 8.0            |              |            |                   |                  | 8.0                    | 0.3                  | 0.4                           | 4.3E-08                     |
| 550      | 0        | 738         | 2                   | 537.0            | 551.0          | 14.0           |              |            |                   |                  | 14.0                   | 0.6                  | 0.8                           | 7.6E-08                     |
| 550      | 0        | 738         | 2                   | 551.0            | 555.0          | 4.0            |              |            |                   |                  | 4.0                    | 0.2                  | 0.2                           | 2.2E-08                     |
| 550      | 0        | 738         | 2                   | 555.0            | 564.0          | 9.0            |              |            |                   |                  | 9.0                    | 0.4                  | 0.5                           | 4.9E-08                     |
| 550      | 0        | 738         | 2                   | 564.0            | 577.0          | 13.0           |              |            |                   |                  | 13.0                   | 0.5                  | 0.7                           | 7.0E-08                     |
| 550      | 0        | 738         | 2                   | 577.0            | 590.0          | 13.0           |              |            |                   |                  | 13.0                   | 0.5                  | 0.7                           | 7.0E-08                     |
| 410      | 0        | 598         | 2                   | 722.0            | 729.0          | 7.0            |              |            |                   |                  | 7.0                    | 0.3                  | 0.5                           | 4.7E-08                     |
| 410      | 0        | 598         | 2                   | 729.0            | 734.0          | 5.0            |              |            |                   |                  | 5.0                    | 0.2                  | 0.3                           | 3.3E-08                     |
| 410      | 0        | 598         | 2                   | 734.0            | 740.0          | 6.0            |              |            |                   |                  | 6.0                    | 0.2                  | 0.4                           | 4.0E-08                     |
| 410      | 0        | 598         | 2                   | 740.0            | 745.0          | 5.0            |              |            |                   |                  | 5.0                    | 0.2                  | 0.3                           | 3.3E-08                     |
|          |          |             |                     |                  |                |                |              |            |                   |                  |                        |                      |                               |                             |
|          |          |             |                     |                  |                |                |              |            |                   |                  |                        |                      |                               |                             |
| 280      | 0        | 468         | 2                   | 744.0            | 747.0          | 3.0            |              |            |                   |                  | 3.0                    | 0.1                  | 0.3                           | 2.6E-08                     |
| 280      | 0        | 468         | 2                   | 747.0            | 750.0          | 3.0            |              |            |                   |                  | 3.0                    | 0.1                  | 0.3                           | 2.6E-08                     |
| 280      | 0        | 468         | 2                   | 750.0            | 752.0          | 2.0            |              |            |                   |                  | 2.0                    | 0.1                  | 0.2                           | 1.7E-08                     |
| 280      | 0        | 468         | 2                   | 752.0            | 755.0          | 3.0            |              |            |                   |                  | 3.0                    | 0.1                  | 0.3                           | 2.6E-08                     |
| 280      | 0        | 468         | 2                   | 755.0            | 758.0          | 3.0            |              |            |                   |                  | 3.0                    | 0.1                  | 0.3                           | 2.6E-08                     |
|          |          |             |                     |                  |                |                |              |            |                   |                  |                        |                      |                               |                             |
|          |          |             |                     |                  |                |                |              |            |                   |                  |                        |                      |                               |                             |

**Notes** Test pressure in Psi converted to kPa for analysis  
 Additional stage added - no flow at low pressure. Middle stages used for analysis. Packer failed at 8 mins, stage 410 kPa - re-seal established; flow after 8 mins used  
 Dilation - K estimated from average of stages 1, 2, 4 and 5  
 Minimum K estimated from stage 1 (lowest K)  
 Maximum K estimated from stage 5



| Averages |                |                    |                                  |
|----------|----------------|--------------------|----------------------------------|
| Stage    | Pressure (kPa) | Water loss (l/min) | Hydraulic conductivity - K (m/s) |
| 1        | 468            | 0.02               | 5.1E-09                          |
| 2        | 598            | 0.21               | 3.5E-08                          |
| 3        | 738            | 0.45               | 6.1E-08                          |
| 4        | 598            | 0.23               | 3.8E-08                          |
| 5        | 468            | 0.11               | 2.4E-08                          |

Calculated: LS  
 Checked:  
 Date: 15/01/26



**Client :** NZTA - Waka Kotahi  
**Project :** Northland Corridor  
**Location :** Alternative to the Brynderwyn Hills

|                       |            |
|-----------------------|------------|
| <b>Project No. :</b>  | 1-C2466.16 |
| <b>Bore :</b>         | BH2B_1144  |
| <b>Test section :</b> | 69.5-75.2  |

### Test Details

|                         |         |                       |       |                                            |      |
|-------------------------|---------|-----------------------|-------|--------------------------------------------|------|
| Date:                   | 3/09/25 | Bottom of packer (m): | 69.50 | Height of pressure gauge above ground (m): | 0.8  |
| Bore diameter (mm):     | 96      | Bore depth (m):       | 75.20 | Vertical Depth to groundwater (m):         | 15.5 |
| Bore inclination (deg): | 90      | Section length (m):   | 5.70  | (or depth to base of packer)               |      |

*Hg* = gauge pressure, *Hl* = head loss in rods and packer, *Hw* = (gauge height + groundwater depth) x 9.81, Total = *Hg*+*Hw*-*Hl*

| PRESSURE |       |       | Test Duration | FLOW RATES       |           |                |                |               |              |            | Water Loss        | Lugeons  | Approx Permeability |         |
|----------|-------|-------|---------------|------------------|-----------|----------------|----------------|---------------|--------------|------------|-------------------|----------|---------------------|---------|
| Hg       | HI    | Total |               | Initial (litres) | Flowmeter |                | Total (litres) | Drum readings |              |            |                   |          |                     | Leakage |
| (kPa)    | (kPa) | (kPa) | (min)         |                  |           | Final (litres) |                |               | Initial (mm) | Final (mm) | Equivalent litres | (litres) |                     |         |
| 330      | 0     | 490   | 1             | 985.0            | 985.0     | 0.0            |                |               |              |            | 0.0               | 0.0      | 0.0                 | 0.0E+00 |
| 330      | 0     | 490   | 1             | 985.0            | 986.0     | 1.0            |                |               |              |            | 1.0               | 0.2      | 0.4                 | 3.6E-08 |
| 330      | 0     | 490   | 1             | 986.0            | 986.0     | 0.0            |                |               |              |            | 0.0               | 0.0      | 0.0                 | 0.0E+00 |
| 330      | 0     | 490   | 1             | 986.0            | 986.0     | 0.0            |                |               |              |            | 0.0               | 0.0      | 0.0                 | 0.0E+00 |
| 330      | 0     | 490   | 1             | 986.0            | 986.0     | 0.0            |                |               |              |            | 0.0               | 0.0      | 0.0                 | 0.0E+00 |
| 330      | 0     | 490   | 1             | 986.0            | 986.0     | 0.0            |                |               |              |            | 0.0               | 0.0      | 0.0                 | 0.0E+00 |
| 330      | 0     | 490   | 1             | 986.0            | 986.0     | 0.0            |                |               |              |            | 0.0               | 0.0      | 0.0                 | 0.0E+00 |
| 330      | 0     | 490   | 1             | 986.0            | 986.0     | 0.0            |                |               |              |            | 0.0               | 0.0      | 0.0                 | 0.0E+00 |
| 660      | 0     | 820   | 1             | 988.0            | 988.0     | 0.0            |                |               |              |            | 0.0               | 0.0      | 0.0                 | 0.0E+00 |
| 660      | 0     | 820   | 1             | 988.0            | 988.5     | 0.5            |                |               |              |            | 0.5               | 0.1      | 0.1                 | 1.1E-08 |
| 660      | 0     | 820   | 1             | 988.5            | 989.0     | 0.5            |                |               |              |            | 0.5               | 0.1      | 0.1                 | 1.1E-08 |
| 660      | 0     | 820   | 1             | 989.0            | 989.0     | 0.0            |                |               |              |            | 0.0               | 0.0      | 0.0                 | 0.0E+00 |
| 660      | 0     | 820   | 1             | 989.0            | 989.5     | 0.5            |                |               |              |            | 0.5               | 0.1      | 0.1                 | 1.1E-08 |
| 660      | 0     | 820   | 1             | 989.5            | 989.5     | 0.0            |                |               |              |            | 0.0               | 0.0      | 0.0                 | 0.0E+00 |
| 660      | 0     | 820   | 1             | 989.5            | 990.0     | 0.5            |                |               |              |            | 0.5               | 0.1      | 0.1                 | 1.1E-08 |
| 990      | 0     | 1150  | 1             | 992.0            | 993.0     | 1.0            |                |               |              |            | 1.0               | 0.2      | 0.2                 | 1.5E-08 |
| 990      | 0     | 1150  | 1             | 993.0            | 993.5     | 0.5            |                |               |              |            | 0.5               | 0.1      | 0.1                 | 7.6E-09 |
| 990      | 0     | 1150  | 1             | 993.5            | 994.5     | 1.0            |                |               |              |            | 1.0               | 0.2      | 0.2                 | 1.5E-08 |
| 990      | 0     | 1150  | 1             | 994.5            | 995.0     | 0.5            |                |               |              |            | 0.5               | 0.1      | 0.1                 | 7.6E-09 |
| 990      | 0     | 1150  | 1             | 995.0            | 996.0     | 1.0            |                |               |              |            | 1.0               | 0.2      | 0.2                 | 1.5E-08 |
| 990      | 0     | 1150  | 1             | 996.0            | 997.0     | 1.0            |                |               |              |            | 1.0               | 0.2      | 0.2                 | 1.5E-08 |
| 990      | 0     | 1150  | 1             | 997.0            | 997.5     | 0.5            |                |               |              |            | 0.5               | 0.1      | 0.1                 | 7.6E-09 |
| 660      | 0     | 820   | 1             | 999.5            | 1000.0    | 0.5            |                |               |              |            | 0.5               | 0.1      | 0.1                 | 1.1E-08 |
| 660      | 0     | 820   | 1             | 1000.0           | 1000.0    | 0.0            |                |               |              |            | 0.0               | 0.0      | 0.0                 | 0.0E+00 |
| 660      | 0     | 820   | 1             | 1000.0           | 1000.0    | 0.0            |                |               |              |            | 0.0               | 0.0      | 0.0                 | 0.0E+00 |
| 660      | 0     | 820   | 1             | 1000.0           | 1000.5    | 0.5            |                |               |              |            | 0.5               | 0.1      | 0.1                 | 1.1E-08 |
| 660      | 0     | 820   | 1             | 1000.5           | 1000.5    | 0.0            |                |               |              |            | 0.0               | 0.0      | 0.0                 | 0.0E+00 |
| 660      | 0     | 820   | 1             | 1000.5           | 1000.5    | 0.0            |                |               |              |            | 0.0               | 0.0      | 0.0                 | 0.0E+00 |
| 660      | 0     | 820   | 1             | 1000.5           | 1001.0    | 0.5            |                |               |              |            | 0.5               | 0.1      | 0.1                 | 1.1E-08 |
| 330      | 0     | 490   | 1             | 1002.0           | 1002.0    | 0.0            |                |               |              |            | 0.0               | 0.0      | 0.0                 | 0.0E+00 |
| 330      | 0     | 490   | 1             | 1002.0           | 1002.0    | 0.0            |                |               |              |            | 0.0               | 0.0      | 0.0                 | 0.0E+00 |
| 330      | 0     | 490   | 1             | 1002.0           | 1002.0    | 0.0            |                |               |              |            | 0.0               | 0.0      | 0.0                 | 0.0E+00 |
|          |       |       |               |                  |           |                |                |               |              |            |                   |          |                     |         |
|          |       |       |               |                  |           |                |                |               |              |            |                   |          |                     |         |
|          |       |       |               |                  |           |                |                |               |              |            |                   |          |                     |         |
|          |       |       |               |                  |           |                |                |               |              |            |                   |          |                     |         |

## Notes

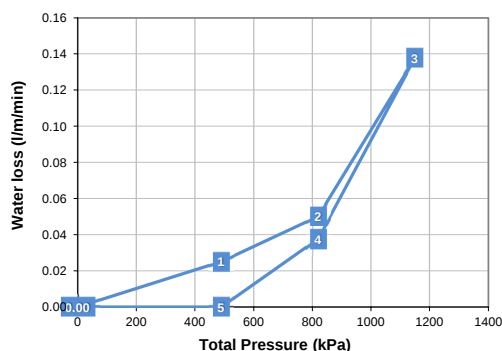
Test pressure in Psi converted to kPa for analysis

Negative flow during last step as a result of overpressure of impermeable formation during testing, and no non-return valve - shown as no flow

Dilation - K estimated from average of stage 1, 2 and 4 (lower pressure, excluding no flow)

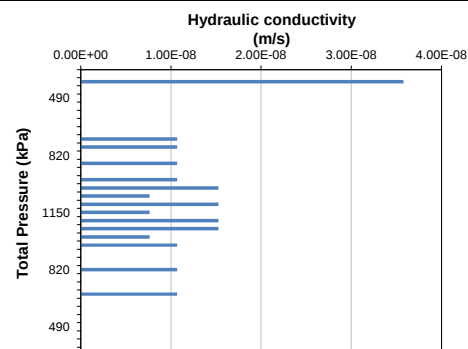
Minimum K estimated from stage 1 (lowest K)

Maximum K estimated from stages 2 and 4



| Averages |                |                      |                                  |
|----------|----------------|----------------------|----------------------------------|
| Stage    | Pressure (kPa) | Water loss (l/m/min) | Hydraulic conductivity - K (m/s) |
| 1        | 490            | 0.03                 | 5.1E-09                          |
| 2        | 820            | 0.05                 | 6.1E-09                          |
| 3        | 1150           | 0.14                 | 1.2E-08                          |
| 4        | 820            | 0.04                 | 4.6E-09                          |
| 5        | 490            | 0.00                 | 0.0E+00                          |

Calculated: LS  
Checked:  
Date: 15/01/26



**Client :** NZTA - Waka Kotahi

**Project No. :** 1-C2466.16

**Project :** Northland Corridor

**Bore :** BH2B\_1157

**Location :** Alternative to the Brynderwyn Hills

**Test section :** 80-84

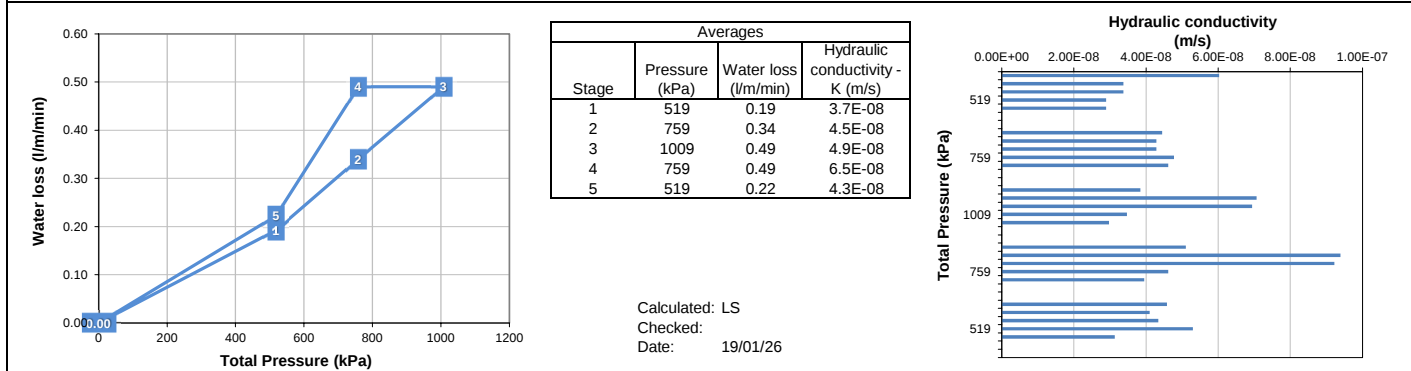
**Test Details**

Date: 5/11/25 Bottom of packer (m): 80.00 Height of pressure gauge above ground (m): 1.0  
 Bore diameter (mm): 96 Bore depth (m): 84.00 Vertical Depth to groundwater (m): 27.4  
 Bore inclination (deg): 90 Section length (m): 4.00 (or depth to base of packer)

 $H_g = \text{gauge pressure, } H_l = \text{head loss in rods and packer, } H_w = (\text{gauge height} + \text{groundwater depth}) \times 9.81, \text{ Total} = H_g + H_w - H_l$ 

| PRESSURE        |                 |                    | Test<br>Duration | FLOW RATES              |                                |                       |                     |                                |                      |                         |                              | Water<br>Loss | Lugeons<br><br>(l/m/min at<br>1000 kPa) | Approx<br>Permeability |
|-----------------|-----------------|--------------------|------------------|-------------------------|--------------------------------|-----------------------|---------------------|--------------------------------|----------------------|-------------------------|------------------------------|---------------|-----------------------------------------|------------------------|
| Hg<br><br>(kPa) | HI<br><br>(kPa) | Total<br><br>(kPa) |                  | Initial<br><br>(litres) | Flowmeter<br>Final<br>(litres) | Total<br><br>(litres) | Initial<br><br>(mm) | Drum readings<br>Final<br>(mm) | Equivalent<br>litres | Leakage<br><br>(litres) | Assigned<br>Flow<br>(litres) |               |                                         |                        |
| 240             | 0               | 519                | 2                | 6169.7                  | 6172.2                         | 2.5                   |                     |                                |                      |                         | 2.5                          | 0.3           | 0.6                                     | 6.0E-08                |
| 240             | 0               | 519                | 2                | 6172.2                  | 6173.6                         | 1.4                   |                     |                                |                      |                         | 1.4                          | 0.2           | 0.3                                     | 3.4E-08                |
| 240             | 0               | 519                | 2                | 6173.6                  | 6175.0                         | 1.4                   |                     |                                |                      |                         | 1.4                          | 0.2           | 0.3                                     | 3.4E-08                |
| 240             | 0               | 519                | 2                | 6175.0                  | 6176.2                         | 1.2                   |                     |                                |                      |                         | 1.2                          | 0.1           | 0.3                                     | 2.9E-08                |
| 240             | 0               | 519                | 2                | 6176.2                  | 6177.4                         | 1.2                   |                     |                                |                      |                         | 1.2                          | 0.1           | 0.3                                     | 2.9E-08                |
|                 |                 |                    |                  |                         |                                |                       |                     |                                |                      |                         |                              |               |                                         |                        |
|                 |                 |                    |                  |                         |                                |                       |                     |                                |                      |                         |                              |               |                                         |                        |
| 480             | 0               | 759                | 2                | 6178.8                  | 6181.5                         | 2.7                   |                     |                                |                      |                         | 2.7                          | 0.3           | 0.4                                     | 4.4E-08                |
| 480             | 0               | 759                | 2                | 6181.5                  | 6184.1                         | 2.6                   |                     |                                |                      |                         | 2.6                          | 0.3           | 0.4                                     | 4.3E-08                |
| 480             | 0               | 759                | 2                | 6184.1                  | 6186.7                         | 2.6                   |                     |                                |                      |                         | 2.6                          | 0.3           | 0.4                                     | 4.3E-08                |
| 480             | 0               | 759                | 2                | 6186.7                  | 6189.6                         | 2.9                   |                     |                                |                      |                         | 2.9                          | 0.4           | 0.5                                     | 4.8E-08                |
| 480             | 0               | 759                | 2                | 6189.6                  | 6192.4                         | 2.8                   |                     |                                |                      |                         | 2.8                          | 0.3           | 0.5                                     | 4.6E-08                |
|                 |                 |                    |                  |                         |                                |                       |                     |                                |                      |                         |                              |               |                                         |                        |
|                 |                 |                    |                  |                         |                                |                       |                     |                                |                      |                         |                              |               |                                         |                        |
| 730             | 0               | 1009               | 2                | 6230.4                  | 6233.5                         | 3.1                   |                     |                                |                      |                         | 3.1                          | 0.4           | 0.4                                     | 3.8E-08                |
| 730             | 0               | 1009               | 2                | 6233.5                  | 6239.2                         | 5.7                   |                     |                                |                      |                         | 5.7                          | 0.7           | 0.7                                     | 7.1E-08                |
| 730             | 0               | 1009               | 2                | 6239.2                  | 6244.8                         | 5.6                   |                     |                                |                      |                         | 5.6                          | 0.7           | 0.7                                     | 6.9E-08                |
| 730             | 0               | 1009               | 2                | 6244.8                  | 6247.6                         | 2.8                   |                     |                                |                      |                         | 2.8                          | 0.4           | 0.3                                     | 3.5E-08                |
| 730             | 0               | 1009               | 2                | 6247.6                  | 6250.0                         | 2.4                   |                     |                                |                      |                         | 2.4                          | 0.3           | 0.3                                     | 3.0E-08                |
|                 |                 |                    |                  |                         |                                |                       |                     |                                |                      |                         |                              |               |                                         |                        |
|                 |                 |                    |                  |                         |                                |                       |                     |                                |                      |                         |                              |               |                                         |                        |
| 480             | 0               | 759                | 2                | 6230.4                  | 6233.5                         | 3.1                   |                     |                                |                      |                         | 3.1                          | 0.4           | 0.5                                     | 5.1E-08                |
| 480             | 0               | 759                | 2                | 6233.5                  | 6239.2                         | 5.7                   |                     |                                |                      |                         | 5.7                          | 0.7           | 0.9                                     | 9.4E-08                |
| 480             | 0               | 759                | 2                | 6239.2                  | 6244.8                         | 5.6                   |                     |                                |                      |                         | 5.6                          | 0.7           | 0.9                                     | 9.2E-08                |
| 480             | 0               | 759                | 2                | 6244.8                  | 6247.6                         | 2.8                   |                     |                                |                      |                         | 2.8                          | 0.4           | 0.5                                     | 4.6E-08                |
| 480             | 0               | 759                | 2                | 6247.6                  | 6250.0                         | 2.4                   |                     |                                |                      |                         | 2.4                          | 0.3           | 0.4                                     | 4.0E-08                |
|                 |                 |                    |                  |                         |                                |                       |                     |                                |                      |                         |                              |               |                                         |                        |
|                 |                 |                    |                  |                         |                                |                       |                     |                                |                      |                         |                              |               |                                         |                        |
| 240             | 0               | 519                | 2                | 6250.3                  | 6252.2                         | 1.9                   |                     |                                |                      |                         | 1.9                          | 0.2           | 0.5                                     | 4.6E-08                |
| 240             | 0               | 519                | 2                | 6252.2                  | 6253.9                         | 1.7                   |                     |                                |                      |                         | 1.7                          | 0.2           | 0.4                                     | 4.1E-08                |
| 240             | 0               | 519                | 2                | 6253.9                  | 6255.7                         | 1.8                   |                     |                                |                      |                         | 1.8                          | 0.2           | 0.4                                     | 4.3E-08                |
| 240             | 0               | 519                | 2                | 6255.7                  | 6257.9                         | 2.2                   |                     |                                |                      |                         | 2.2                          | 0.3           | 0.5                                     | 5.3E-08                |
| 240             | 0               | 519                | 2                | 6257.9                  | 6259.2                         | 1.3                   |                     |                                |                      |                         | 1.3                          | 0.2           | 0.3                                     | 3.1E-08                |
|                 |                 |                    |                  |                         |                                |                       |                     |                                |                      |                         |                              |               |                                         |                        |
|                 |                 |                    |                  |                         |                                |                       |                     |                                |                      |                         |                              |               |                                         |                        |

**Notes** Laminar flow behaviour  
 K estimated from average of all stages  
 Minimum K estimated from minimum of all stages  
 Maximum K estimated from maximum of all stages



Client : NZTA - Waka Kotahi  
 Project : Northland Corridor  
 Location : Alternative to the Brynderwyn Hills

Project No. : 1-C2466.16  
 Bore : BH2B\_1157  
 Test section : 91-95

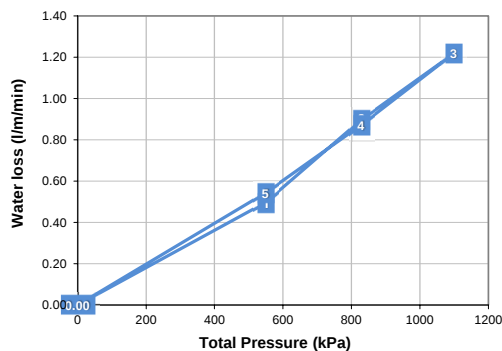
**Test Details**

Date: 5/11/25 Bottom of packer (m): 91.00 Height of pressure gauge above ground (m): 1.0  
 Bore diameter (mm): 96 Bore depth (m): 95.00 Vertical Depth to groundwater (m): 27.4  
 Bore inclination (deg): 90 Section length (m): 4.00 (or depth to base of packer)

Hg = gauge pressure, Hl = head loss in rods and packer, Hw = (gauge height + groundwater depth) x 9.81, Total = Hg+Hw-Hl

| PRESSURE |       |       | Test<br>Duration | FLOW RATES          |                   |                   |                 |               |            |          |                  | Water<br>Loss | Lugeons                  | Approx<br>Permeability |
|----------|-------|-------|------------------|---------------------|-------------------|-------------------|-----------------|---------------|------------|----------|------------------|---------------|--------------------------|------------------------|
| Hg       | HI    | Total |                  | Initial             | Flowmeter         | Total             | Initial         | Drum readings | Equivalent | Leakage  | Assigned         |               |                          |                        |
| (kPa)    | (kPa) | (kPa) | (min)            | Initial<br>(litres) | Final<br>(litres) | Total<br>(litres) | Initial<br>(mm) | Final<br>(mm) | litres     | (litres) | Flow<br>(litres) | (l/m/min)     | (l/m/min at<br>1000 kPa) | (m/sec)                |
| 270      | 0     | 549   | 2                | 5718.2              | 5722.2            | 4.0               |                 |               |            |          | 4.0              | 0.5           | 0.9                      | 9.1E-08                |
| 270      | 0     | 549   | 2                | 5722.2              | 5726.2            | 4.0               |                 |               |            |          | 4.0              | 0.5           | 0.9                      | 9.1E-08                |
| 270      | 0     | 549   | 2                | 5726.2              | 5730.2            | 4.0               |                 |               |            |          | 4.0              | 0.5           | 0.9                      | 9.1E-08                |
| 270      | 0     | 549   | 2                | 5730.2              | 5734.2            | 4.0               |                 |               |            |          | 4.0              | 0.5           | 0.9                      | 9.1E-08                |
| 270      | 0     | 549   | 2                | 5734.2              | 5738.0            | 3.8               |                 |               |            |          | 3.8              | 0.5           | 0.9                      | 8.7E-08                |
|          |       |       |                  |                     |                   |                   |                 |               |            |          |                  |               |                          |                        |
|          |       |       |                  |                     |                   |                   |                 |               |            |          |                  |               |                          |                        |
| 550      | 0     | 829   | 2                | 5747.0              | 5753.4            | 6.4               |                 |               |            |          | 6.4              | 0.8           | 1.0                      | 9.7E-08                |
| 550      | 0     | 829   | 2                | 5753.4              | 5761.0            | 7.6               |                 |               |            |          | 7.6              | 1.0           | 1.1                      | 1.1E-07                |
| 550      | 0     | 829   | 2                | 5761.0              | 5768.2            | 7.2               |                 |               |            |          | 7.2              | 0.9           | 1.1                      | 1.1E-07                |
| 550      | 0     | 829   | 2                | 5768.2              | 5776.0            | 7.8               |                 |               |            |          | 7.8              | 1.0           | 1.2                      | 1.2E-07                |
| 550      | 0     | 829   | 2                | 5776.0              | 5783.2            | 7.2               |                 |               |            |          | 7.2              | 0.9           | 1.1                      | 1.1E-07                |
| 550      | 0     | 829   | 2                | 5783.2              | 5790.0            | 6.8               |                 |               |            |          | 6.8              | 0.9           | 1.0                      | 1.0E-07                |
|          |       |       |                  |                     |                   |                   |                 |               |            |          |                  |               |                          |                        |
| 820      | 0     | 1099  | 2                | 5795.0              | 5805.0            | 10.0              |                 |               |            |          | 10.0             | 1.3           | 1.1                      | 1.1E-07                |
| 820      | 0     | 1099  | 2                | 5805.0              | 5814.4            | 9.4               |                 |               |            |          | 9.4              | 1.2           | 1.1                      | 1.1E-07                |
| 820      | 0     | 1099  | 2                | 5814.4              | 5824.2            | 9.8               |                 |               |            |          | 9.8              | 1.2           | 1.1                      | 1.1E-07                |
| 820      | 0     | 1099  | 2                | 5824.2              | 5833.8            | 9.6               |                 |               |            |          | 9.6              | 1.2           | 1.1                      | 1.1E-07                |
| 820      | 0     | 1099  | 2                | 5833.8              | 5844.2            | 10.4              |                 |               |            |          | 10.4             | 1.3           | 1.2                      | 1.2E-07                |
| 820      | 0     | 1099  | 2                | 5844.2              | 5853.4            | 9.2               |                 |               |            |          | 9.2              | 1.1           | 1.0                      | 1.0E-07                |
|          |       |       |                  |                     |                   |                   |                 |               |            |          |                  |               |                          |                        |
| 550      | 0     | 829   | 2                | 5855.8              | 5862.6            | 6.8               |                 |               |            |          | 6.8              | 0.9           | 1.0                      | 1.0E-07                |
| 550      | 0     | 829   | 2                | 5862.6              | 5869.6            | 7.0               |                 |               |            |          | 7.0              | 0.9           | 1.1                      | 1.1E-07                |
| 550      | 0     | 829   | 2                | 5869.6              | 5877.0            | 7.4               |                 |               |            |          | 7.4              | 0.9           | 1.1                      | 1.1E-07                |
| 550      | 0     | 829   | 2                | 5877.0              | 5884.0            | 7.0               |                 |               |            |          | 7.0              | 0.9           | 1.1                      | 1.1E-07                |
| 550      | 0     | 829   | 2                | 5884.0              | 5891.0            | 7.0               |                 |               |            |          | 7.0              | 0.9           | 1.1                      | 1.1E-07                |
| 550      | 0     | 829   | 2                | 5891.0              | 5897.6            | 6.6               |                 |               |            |          | 6.6              | 0.8           | 1.0                      | 1.0E-07                |
|          |       |       |                  |                     |                   |                   |                 |               |            |          |                  |               |                          |                        |
| 270      | 0     | 549   | 2                | 5899.0              | 5903.0            | 4.0               |                 |               |            |          | 4.0              | 0.5           | 0.9                      | 9.1E-08                |
| 270      | 0     | 549   | 2                | 5903.0              | 5908.1            | 5.1               |                 |               |            |          | 5.1              | 0.6           | 1.2                      | 1.2E-07                |
| 270      | 0     | 549   | 2                | 5908.1              | 5912.2            | 4.1               |                 |               |            |          | 4.1              | 0.5           | 0.9                      | 9.3E-08                |
| 270      | 0     | 549   | 2                | 5912.2              | 5916.4            | 4.2               |                 |               |            |          | 4.2              | 0.5           | 1.0                      | 9.6E-08                |
| 270      | 0     | 549   | 2                | 5916.4              | 5920.6            | 4.2               |                 |               |            |          | 4.2              | 0.5           | 1.0                      | 9.6E-08                |
| 270      | 0     | 549   | 2                | 5920.6              | 5925.0            | 4.4               |                 |               |            |          | 4.4              | 0.5           | 1.0                      | 1.0E-07                |
|          |       |       |                  |                     |                   |                   |                 |               |            |          |                  |               |                          |                        |

**Notes** Laminar flow behaviour  
 K estimated from average of all stages  
 Minimum K estimated from minimum of all stages  
 Maximum K estimated from maximum of all stages



| Averages |                |                    |                                  |
|----------|----------------|--------------------|----------------------------------|
| Stage    | Pressure (kPa) | Water loss (l/min) | Hydraulic conductivity - K (m/s) |
| 1        | 549            | 0.50               | 9.0E-08                          |
| 2        | 829            | 0.90               | 1.1E-07                          |
| 3        | 1099           | 1.22               | 1.1E-07                          |
| 4        | 829            | 0.87               | 1.1E-07                          |
| 5        | 549            | 0.54               | 9.9E-08                          |

Calculated: LS  
 Checked:  
 Date: 19/01/26

