Southern Link Inland Port

Groundwater Assessment

Prepared for:
Southern Link Property Limited

Date:
16 February 2026

Prepared by:
Stantec New Zealand

Project/File:
310206525

Stantec New Zealand

Revision Schedule

Revision No.	Date	Description	Prepared by	Quality Reviewer	Independent Reviewer	Project Manager Final Approval
DRAFT	19-12-2025	IN PROGRESS	E. Charlesworth	M. Scaife	V. Dally	
1	03-02-2026	For client use	E. Charlesworth	M. Scaife	V. Dally	
2	16-02-2025	For client use	E. Charlesworth	M. Scaife	V. Dally	Sarah Lloyd

Disclaimer

The conclusions in the report are Stantec's professional opinion, as of the time of the report, and concerning the scope described in the report. The opinions in the document are based on conditions and information existing at the time the document was published and do not take into account any subsequent changes. The report relates solely to the specific project for which Stantec was retained and the stated purpose for which the report was prepared. The report is not to be used or relied on for any variation or extension of the project, or for any other project or purpose, and any unauthorised use or reliance is at the recipient's own risk.

Stantec has assumed all information received from the client and third parties in the preparation of the report to be correct. While Stantec has exercised a customary level of judgment or due diligence in the use of such information, Stantec assumes no responsibility for the consequences of any error or omission contained therein.

This report is intended solely for use by the client in accordance with Stantec's contract with the client. While the report may be provided to applicable authorities having jurisdiction and others for whom the client is responsible, Stantec does not warrant the services to any third party. The report may not be relied upon by any other party without the express written consent of Stantec, which may be withheld at Stantec's discretion.

Prepared by: ______________________
Signature

Evelyn Charlesworth
Printed Name

Reviewed by: ______________________
Signature

Vanessa Dally
Printed Name

Approved by: ______________________
Signature

Sarah Lloyd
Printed Name

Table of Contents

List of Tables

List of Figures

List of Appendices

Executive Summary

Stantec New Zealand (Stantec) has been engaged by Southern Link Property Limited (SLPL) to undertake a hydrogeological assessment to support the substantive application for the Southern Link Inland Port (SLIP, also referred to as the Site) under the Fast-track Approvals Act 2024. The purpose of this assessment is to characterise the existing groundwater environment at the proposed approximately 40-hectare Site on the Taieri Plains near Mosgiel and evaluate potential hydrogeological effects arising from construction and operation of the SLIP.

Hydrogeological Setting and Site Conditions

The Site is underlain by Pleistocene and Holocene river deposits comprising gravel, sand, silt, and clay. Groundwater on the Lower Taieri Plains flows westward, with the site located in a recharge zone where rainfall, foothill runoff, and Silver Stream contribute to groundwater recharge. Silver Stream, located along the southern site boundary, is a losing stream and hydraulically connected to the aquifer.

Onsite groundwater monitoring undertaken by Stantec indicates groundwater depths of approximately 7.5 - 9m below ground level, with a negative vertical hydraulic gradient confirmed through nested piezometers. These findings align with long-term regional monitoring records and show seasonal fluctuations of only 1 - 2 m. Groundwater levels are therefore well below the expected 3 m excavation depth required for bulk earthworks, and groundwater interception during construction is unlikely.

Groundwater quality information was reviewed with reference to long-term monitoring data from the nearby North Taieri closed landfill, located approximately 600 m north-east of the Site. Across more than 20 years of monitoring, most analytes have remained stable and within New Zealand Drinking Water Standards guideline values, with only isolated historical exceedances. Overall, current groundwater quality in the area is considered good, and no evidence suggests landfill-related impacts at the SLIP site.

Assessment of Potential Effects

The proposed Site is not expected to adversely affect groundwater levels, groundwater quality, or groundwater users. Key findings include:

- **Groundwater Levels:** Excavations are not expected to encounter groundwater, and no dewatering is anticipated. Site development (e.g., buildings, pavement) will reduce local recharge but only at a minor scale, with negligible effect on regional groundwater levels.
- **Groundwater Quality:** No contaminants will be discharged to groundwater as part of site construction or operation. Standard erosion and sediment controls will manage risks during earthworks. Minimal impacts on groundwater quality are expected.
- **Stormwater Basin:** The proposed unlined stormwater attenuation pond may allow limited seepage. Calculations indicate seepage volumes would be modest and groundwater levels are unlikely to reach the pond base except during extreme recharge events, in which case no adverse effect is expected due to the basin already containing water.
- **Surface Water Depletion:** As no groundwater abstraction is proposed, there is no risk of drawdown effects on Silver Stream or other surface water bodies.
- **Effects on Groundwater Users:** With no abstraction or expected impacts on groundwater quality , no effects on existing or future groundwater users are anticipated.

Recommendations

- Continue short-term groundwater level monitoring to strengthen the baseline dataset prior to and during construction.

Overall Conclusion

The hydrogeological assessment concludes that the proposed SLIP will have **negligible effects** on groundwater levels, groundwater flow patterns, groundwater quality, or groundwater users. No significant hydrogeological constraints are identified.

1 Introduction

1.1 Scope

This hydrogeological study and assessment has been undertaken to gather, collate, and assess existing knowledge of the expected hydrogeological conditions relevant to the proposed Southern Link Inland Port (SLIP) site located at 270 – 292 Dukes Road North, Mosgiel (the Site). The intent of this report is to document the desktop / field investigation findings and provide a preliminary assessment of potential groundwater impacts at the SLIP Site.

1.2 Contract Details

Stantec has been commissioned by Southern Link Property Limited (SLPL) to support a substantive application for the SLIP under the Fast-track Approvals Act 2024. The contract works have been undertaken to advance the design, construction and operation of the SLIP, with the intent to facilitate the granting of all necessary approvals.

1.3 Code of Conduct

The Independent Reviewer of this report is Vanessa Dally. Vanessa is a Senior Principal Hydrogeologist with 21 years' experience. Vanessa has undertaken numerous hydrogeological and water supply investigations in both Australia and New Zealand ranging from groundwater exploration within remote arid locations to dewatering investigations within low lying coastal areas under development. Vanessa also has experience in contaminated land, carrying out investigations of soil and groundwater, including site remediation, as well as other fields of environmental science and geology. Vanessa's experience includes water quality monitoring, groundwater contaminant transport modelling, contaminated groundwater remediation, pump and step test analysis, regional groundwater modelling, dewatering investigations, and supervision of drilling and groundwater bore installation. She is member of the New Zealand Hydrological Society and WasteMINZ.

Vanessa has read the Code of Conduct for expert witnesses contained in the Environment Court Practice Note 2023. This report has been prepared in compliance with that Code, as if it was expert evidence presented in proceedings before the Environment Court. Unless stated otherwise, this report is within Vanessa's area of expertise, and she have not omitted to consider material facts known to her that might alter or detract from the opinions expressed in this report.

1.4 Project Overview

SLPL seeks to establish an Inland Port / Logistics Hub on an approximately 40-hectare site on the Taieri Plains near Mosgiel to enable freight transfer between trains and trucks. The SLIP Site location is shown in outlined yellow with ancillary activities within the KiwiRail roading corridor marked blue in Figure 1-1. The ancillary activities within the KiwiRail do not impact on the content of this report and are therefore not discussed further. This SLIP will deliver significant infrastructure to support regional economic growth, improve freight logistics, and enhance resilience to environmental risks. The development will occur as described in the Project Description of SLPL's Substantive Fast-track Application which should be referred to for a complete description of the SLIP development. In summary, the SLIP will include:

- A new rail siding off the Taieri Branch Line to enable loading, unloading and operation of a rail freight shuttle service to Port Chalmers and the wider rail network;

- Approximately 155,000 m^2 of high stud warehousing (chilled and ambient) and associated yard and canopy areas;
- Two road exchange areas for the loading and unloading of container trucks;
- A container depot facility enabling the inspection, cleaning, upgrading and repair of containers including for food grade repacking;
- Approximately 9 ha of container terminal for storage and movement of empty and full containers including refrigerated containers;
- Approximately 1000 m^2 of onsite offices ancillary to the Inland Port;
- Road widening and construction of a new intersection onto Dukes Road North;
- 24/7 operation with flood and road lighting for nighttime operation;
- Ancillary activities to support the above including vehicle parking, truck waiting areas, onsite road network, three waters and power infrastructure, flood mitigation, landscaping, security measures, acoustic barriers and lighting; and
- Ongoing management and monitoring activities including ensuring establishment of landscaping, stream health monitoring, wildlife management and effects management.

Construction of the SLIP is anticipated to be undertaken in three stages however the timing of the delivery of each stage, and discrete works within each stage, may change in response to demand for logistics capacity at the SLIP. Each stage of works will involve site clearance, earthworks, construction of buildings, hardstanding and access, installation of infrastructure, landscaping and works and management activities necessary to manage environmental effects during construction including erosion and sediment controls and construction management activities:

- Stage 1 is estimated to be completed 1 to 3 years following approval of the Project and will include clearance of the southern area of the site and construction of the ‘Stage 1’ container storage concrete pad, rail siding, container service area, warehouses, internal roading, parking and loading, road widening and construction of the new intersection on Dukes Road North, stormwater attenuation pond, Silver Stream stormwater outlets, servicing infrastructure, flood management measures, landscaping, acoustic barriers and eastern bund, and lighting.
- Stage 2 is estimated to be completed 3 to 5 years following approval of the Project and will include clearance of the northern area of the site and construction of the ‘Stage 2’ container storage concrete pad, warehouses, ancillary offices, internal roading, parking and loading, emergency egress onto Dukes Road North, expansion of the stormwater attenuation pond, landscaping, extension of the servicing infrastructure and lighting.
- Stage 3 is estimated to be completed 5 to 10 years following approval of the Project and will include clearance of the eastern area of the site, including the eastern acoustic bund, and construction of the ‘Stage 3’ warehouses, internal roading, parking and loading, landscaping, extension of the servicing infrastructure and lighting.

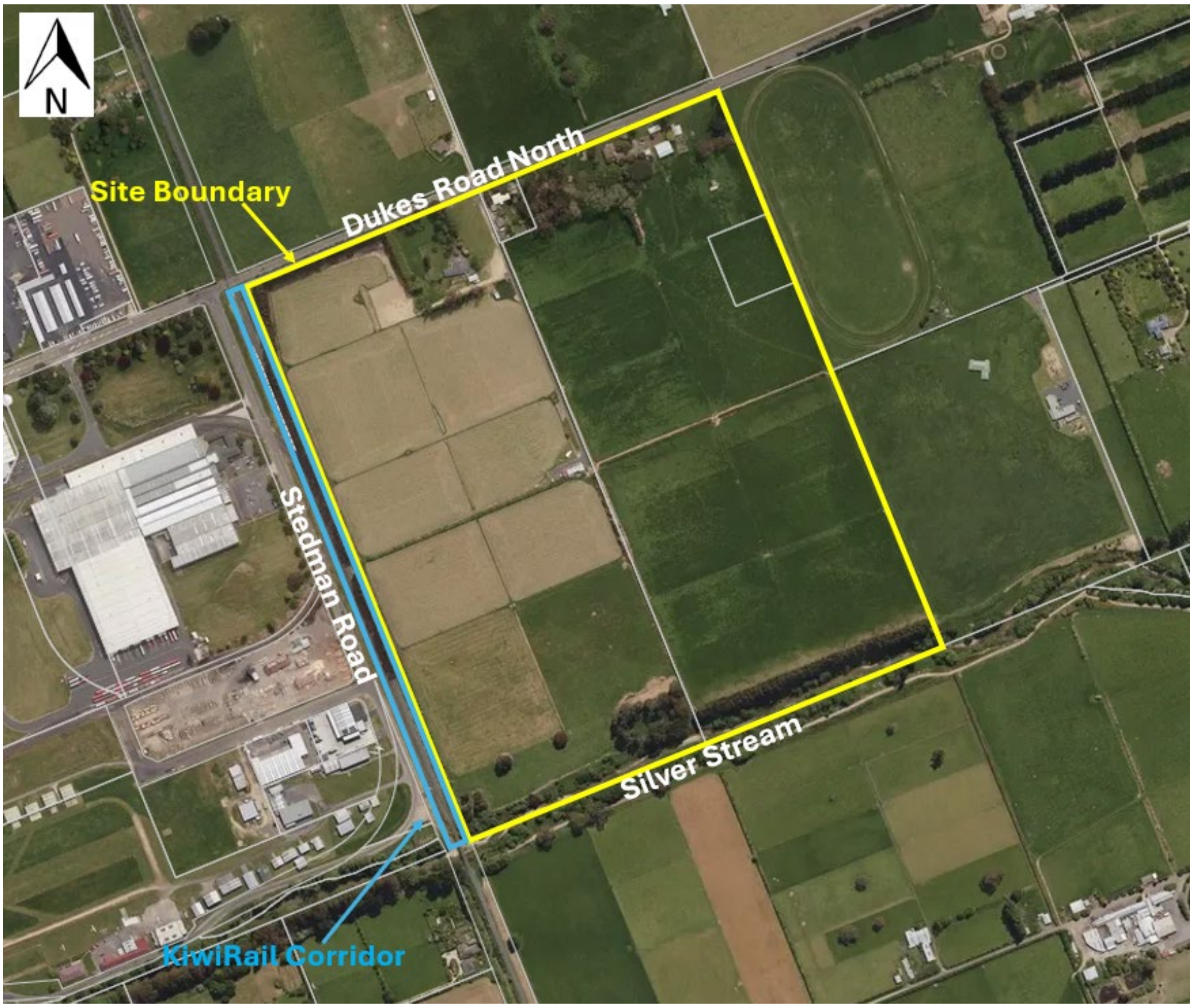


Figure 1-1 Site Overview

2 Site Description

The Site is located on the Taieri Plains near Mosgiel, Dunedin. Figure 2-1 shows the proposed Site boundaries and the location of Silver Stream, a prominent surface water body located to the southeast of the Site.

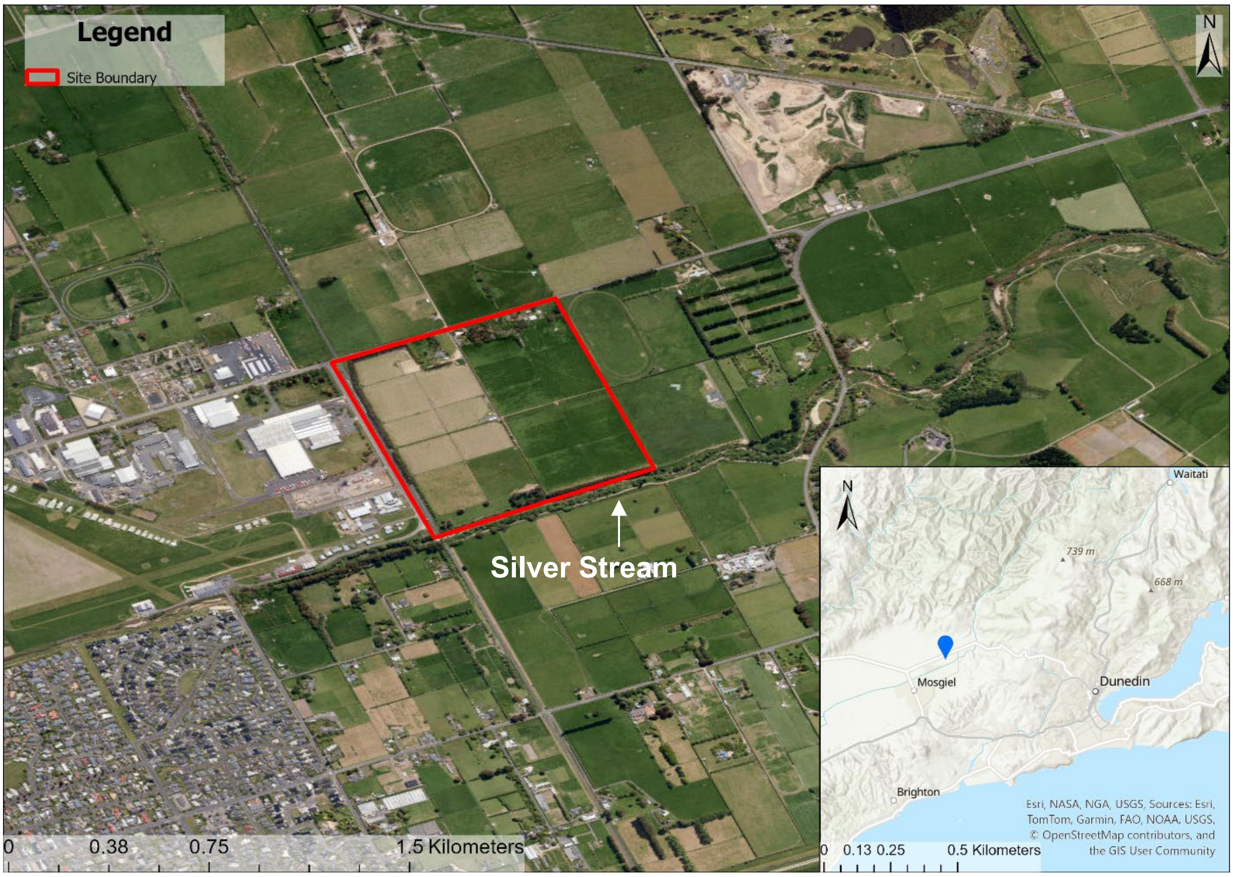


Figure 2-1 Site Location

2.1 Regional Geology

The regional geology of the area is described in the Institute of Geological and Nuclear Science (GNS) 1:250,000 scale geological map (Geological and Nuclear Science, 2025). The majority of the Site is underlain by Late Pleistocene River Deposits (OIS2). These are described as “poorly consolidated, slightly weathered sandy quartz, schist, or volcaniclastic-derived gravel and sand”. The south-eastern corner of the Site is underlain by Holocene River Deposits (OIS1), described as “poorly consolidated often poorly sorted fine to bouldery gravel with sand and mud”. The regional geology, as mapped by GNS, is shown in Figure 2-2.

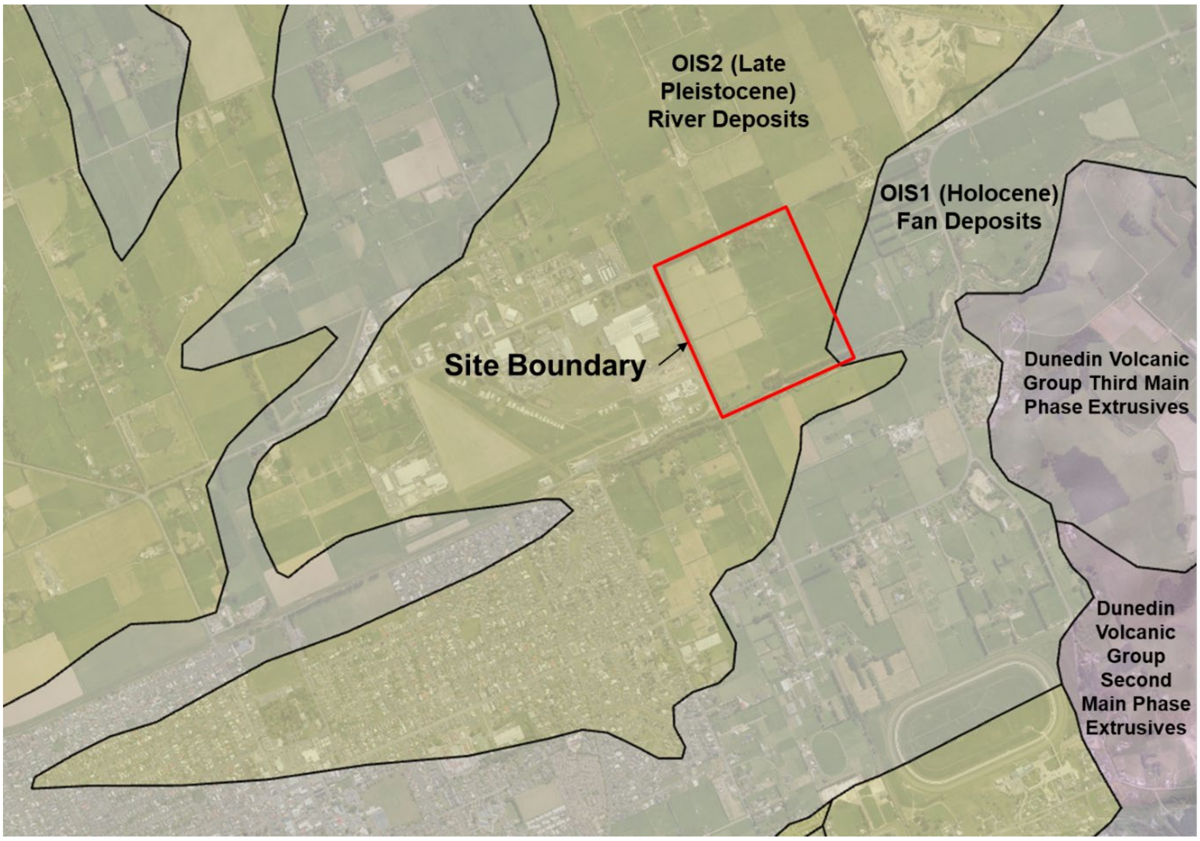


Figure 2-2 Mapped regional geology (Geological and Nuclear Science, 2025)

A groundwater study of the Lower Taieri Plains describes the underlying site geology as the "Dukes Formation" overlain by the "Wingatui Formation" (Irricon Consultants & ROYD Consulting, 1994). Whilst these naming conventions are no longer used, they describe the same river deposits mapped by GNS. A schematic block diagram of the regional geology underlying the site, as also provided in the 1994 groundwater study (Irricon Consultants & ROYD Consulting, 1994) is shown below in Figure 2-3.

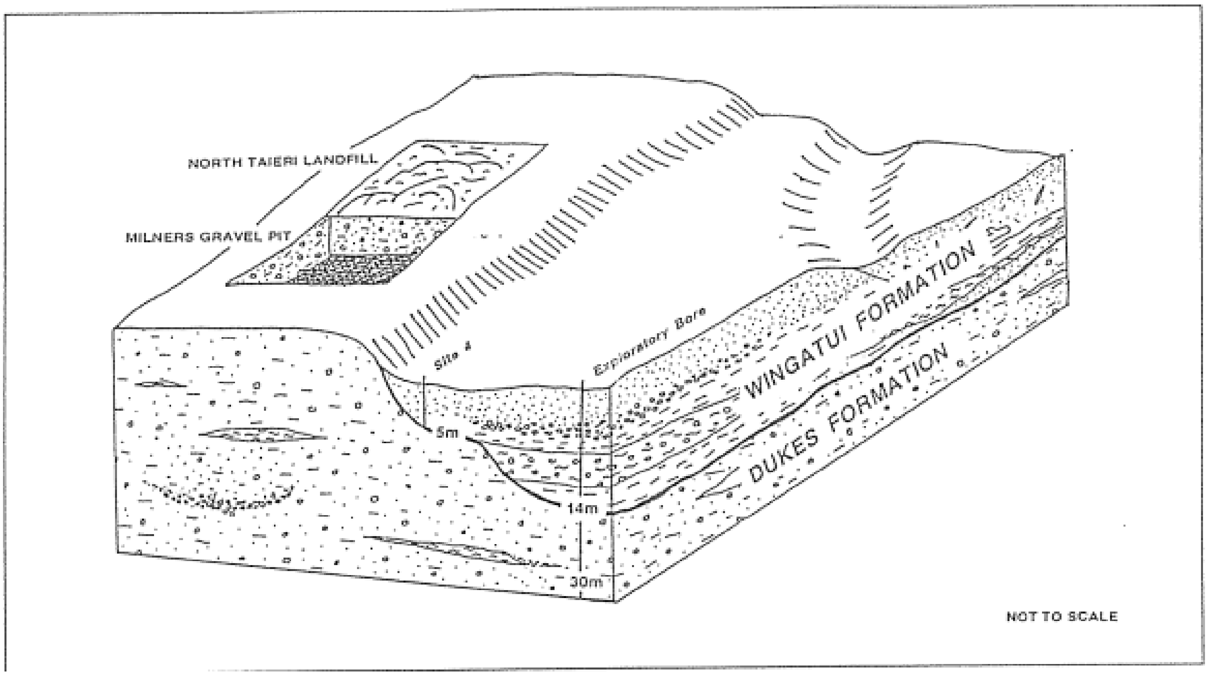


Figure 2-3 Schematic block diagram of the Lower Taieri Plains regional geology (Irricon Consultants & ROYD Consulting, 1994)

2.2 Topography and Hydrology

Based on the New Zealand LiDAR 1 m DEM (Land Information New Zealand , 2025), the site topography is generally flat, with an elevation of between approximately 29 – 25 m amsl. There is a gradual slope (3 – 5 m fall) to the south and west across the site.

Silver Stream runs along the southeastern site boundary (as shown in Figure 2-1), with its flow direction towards the southwest. The bed of Silver Stream is a low point along the Site, at approximately 20 m amsl, based on the LiDAR 1 m DEM. Silver Stream is one of the main rivers on the Taieri Plains. Based on the available data and a review of the literature, Silver Stream is hydraulically connected to the local groundwater system (Dunedin City Council, 2008; Irricon Consultants & ROYD Consulting, 1994; Irricon Consulting, 2005; Otago Regional Council, 2010). At and near the Site, Silver Stream acts as a recharge feature to the groundwater system and therefore is classified as a losing stream. This is discussed in further detail in Section 4.

3 Site Investigations

3.1 Stantec New Zealand

Stantec New Zealand (Stantec) completed a desktop investigation to identify existing onsite bores that were suitable for groundwater level monitoring at the Site (and wider local area including the Closed Taieri Landfill). The desktop review was followed by a site walkover to locate the various onsite bores identified. The objective of the groundwater monitoring was to:

- Characterise groundwater levels below the Site including likely groundwater fluctuations
- Estimate groundwater flow directions
- Understand the interaction between Silver Stream and the groundwater system
- Determine if there is a negative or positive vertical hydraulic gradient.

To achieve the monitoring objectives groundwater level loggers were installed in three pre-existing boreholes across the site. The locations of these are provided in Figure 3-1, and the installation drawings are provided in Appendix A. Loggers were installed in the well labelled “Not Specified” (referred to as IP-S2 in the drawings), I44/035 shallow well (IP-P5b) and I44/035 deep well (IP-P5).

The two bores closest to the Silver Stream are screened at various depths. The difference in water levels indicated by each bore provided information on the vertical gradient and the groundwater interaction with the Silver Stream. All three bores provided data to understand depth to groundwater, groundwater flow directions, and groundwater level fluctuations. The groundwater monitoring data is discussed in Section 4.1.

SLPL provided Stantec with information from a test pit (TP) investigation program that was undertaken at the Site in August 2024. This is described in detail in the Geotechnical Desktop Study (Stantec New Zealand, 2025).

Figure 3-1 Onsite boreholes with groundwater level monitoring loggers installed by Stantec

3.2 Previous Investigations

3.2.1 Wells Aotearoa New Zealand Database

Borehole logs and recorded groundwater levels from nearby boreholes documented on the Wells Aotearoa New Zealand database were also analysed. The location of these is shown colour coded blue and red on Figure 3-2. These records were used to provide an understanding of the recorded lithology and groundwater levels across the wider local area. The wells within the immediate local context (colour coded in blue on Figure 3-2) were preferentially used to develop the Site conceptual model.

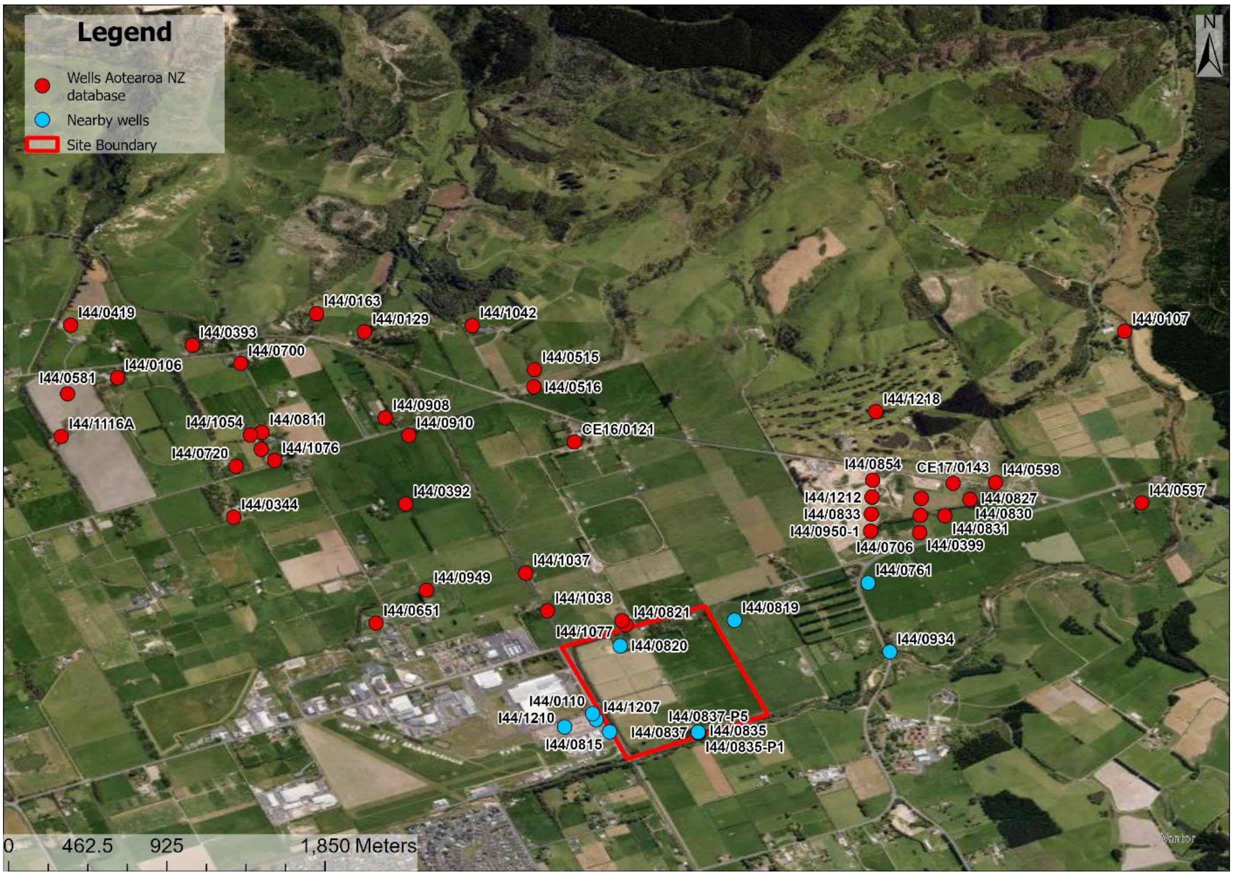


Figure 3-2 Nearby borehole records from Wells Aotearoa New Zealand database

3.2.2 North Taieri Closed Landfill Assessment

The North Taieri closed landfill is located approximately 600 m northeast of the proposed site (at its closest point). The former landfill is located between a working quarry to the west and a private closed landfill to the east. The North Taieri closed landfill ceased operations in 1992 due to concerns that the landfill leachate may be contaminating groundwater. Annual environmental monitoring and reporting is required to fulfil the consent conditions of the landfill (Dunedin City Council, 2024).The 2024 annual monitoring report (full reference below) was reviewed, and relevant data was analysed.

Along with the annual monitoring report, a range of historical environmental assessments have been submitted as part of the original Assessment of Environmental Effects (AEE) for the closure of the landfill. These reports have been reviewed as part of this hydrogeological assessment, given the proximity of the proposed site to the North Taieri closed landfill (location of which is shown in Figure 4-6). These are provided below.

- Annual Monitoring Report 2024: Community and Closed Landfills, Dunedin City Council, September 2024.
  - Summarises the wider site setting and provides a groundwater quality assessment of the groundwater quality monitoring record.
- Lower Taieri Groundwater Preliminary Study, Irricon Consultants & ROYD Consulting, July 1994.
  - Groundwater study of the wider Lower Taieri Plains, investigating the hydrogeological system, aquifer yields, groundwater quality, and usage of the aquifer.
- Lower Taieri Groundwater Allocation Study, Otago Regional Council, August 2010.

  - Characterises the hydrogeological setting of the Lower Taieri Plains and management of the groundwater system. Includes numerical modelling of the groundwater system for groundwater allocation and resource allocation recommendations.
- North Taieri Closed Landfill: Aquifer Contamination Risk Assessment, Irricon Consulting, June 2005.
  - Assesses the risk of the closed landfill to the East Taieri aquifer system through groundwater modelling and leachate / discharge monitoring.
- North Taieri Closed Landfill – DCC Response to Section 92 Request, Dunedin City Council, May 2008.
  - Response to further information request regarding the landfill closure, including monitoring results and groundwater leachate modelling.

4 Hydrogeological Setting

The groundwater flow direction across the Taieri Plains is westward, based on groundwater contours diagrams and groundwater level measurements (Irricon Consultants & ROYD Consulting, 1994; Irricon Consulting, 2005; Otago Regional Council, 2010). Groundwater contours provided in the Lower Taieri Groundwater Allocation Study (Otago Regional Council, 2010) are shown in Figure 4-1, with the site location identified.

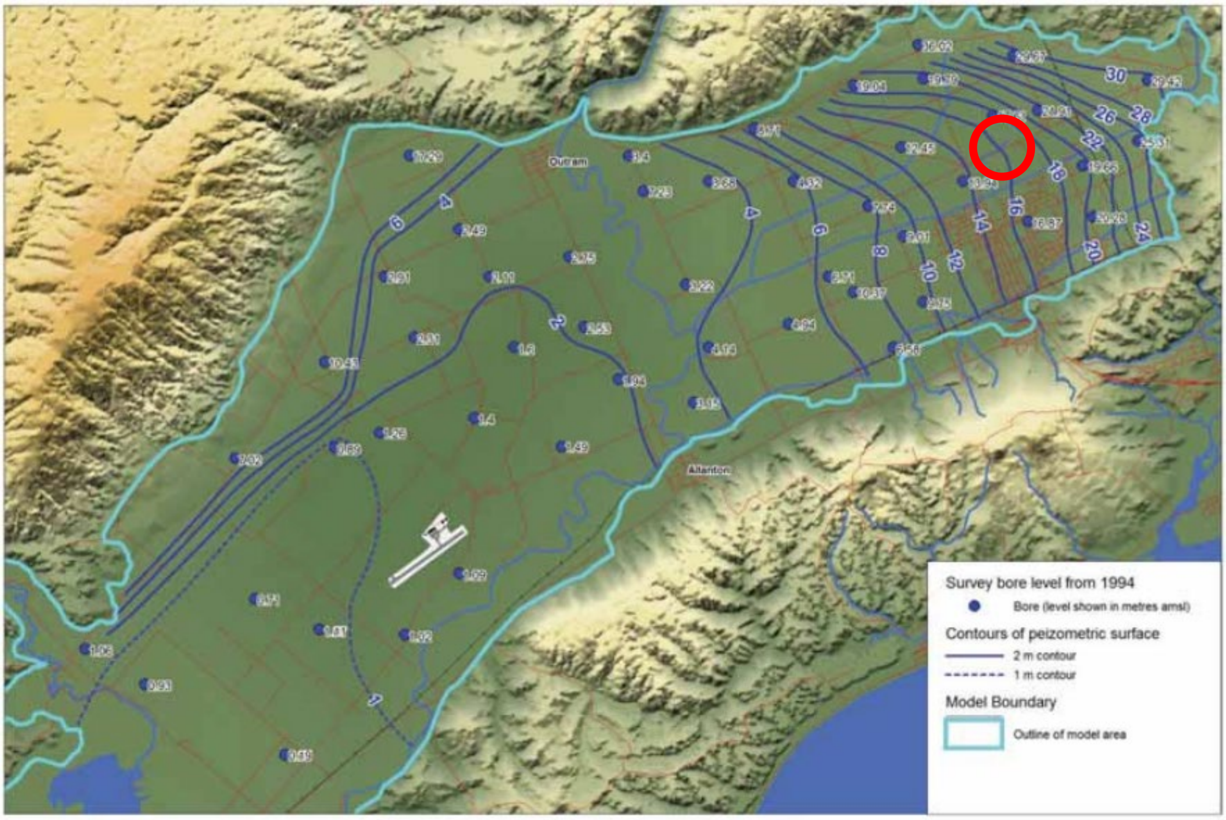


Figure 4-1 Groundwater contours across the Lower Taieri Plains, sourced from (Otago Regional Council, 2010). Approximate site location outlined in red.

The East Taieri aquifer is semi-confined, containing areas of water-bearing units intersected by aquitards. Within the vicinity of the proposed Site, the aquifer is considered unconfined (Dunedin City Council, 2008). As discussed in Section 2.1, is it comprised of river deposits, including gravels, sands, silts and clays.

In the vicinity of the Site the aquifer system is in a recharge zone. This means that the aquifer is being recharged through rainfall, foothill runoff, and through surface water features (i.e., the Silver Stream), resulting in a negative vertical hydraulic gradient, which is demonstrated by lower groundwater levels with depth (see Figure 4-2). This has been observed in the nested piezometers set up on site (IP-P5 and IP-P5b) and has been acknowledged throughout the various hydrogeological assessments carried out within the area (Irricon Consulting, 2005; Irricon Consultants & ROYD Consulting, 1994; Dunedin City Council, 2008). This is discussed in more detail in Section 4.2, alongside the site conceptual model.

The groundwater table within the Site ranges from 6 – 9 m bgl, with seasonal fluctuations of 1 – 2 m - i.e. the groundwater level is typically deeper in summer and shallower in winter (Dunedin City Council, 2008). Groundwater level monitoring data from the onsite loggers is provided and discussed in Section 4.1.

4.1 Measured Groundwater Levels

Three groundwater level loggers have been installed on the Site. Two and a half months of groundwater level data (mid-November to end of January) has been collected, downloaded, and processed at the time of writing (Figure 4-2).

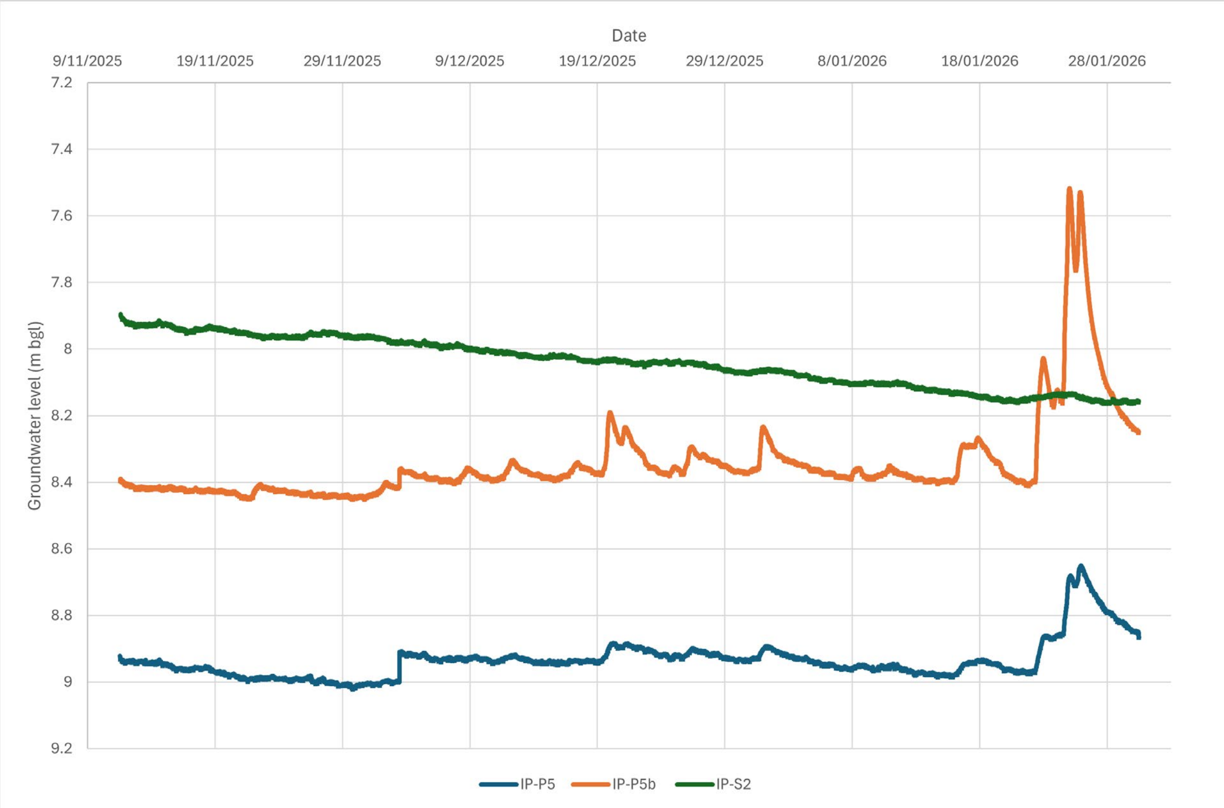


Figure 4-2 Onsite groundwater level monitoring data

The monitoring data shows that groundwater levels are between approximately 7.5 – 9 m bgl across the site. IP-P5 and IP-P5b are nested piezometers, installed in the same location but at different depths. IP-P5 is 16 m deep and IP-P5b is 9 m deep. The groundwater level data for these nested piezometers demonstrates the negative vertical hydraulic gradient discussed in Section 4, with the deeper well (IP-P5) showing a deeper average groundwater level of ~ 9 m bgl compared to the shallower well (IP-P5b) which shows a shallower average groundwater level of 8.3 m bgl. Monitoring of the groundwater levels should continue to better understand the seasonal variation of the groundwater table. However, data shows that the groundwater levels across the Site are relatively deep (i.e. not within 2 m of the surface, and likely at least 5 m below site) and therefore are not expected to be encountered during the proposed excavation works, unless the detailed design process determines deep excavations are required.

Historical monitoring data from borehole I44/0835, I44/0836 and I44/0837 (locations shown in Figure 3-1) was provided by Otago Regional Council. This is shown below in Figure 4-3. This data also displays the negative vertical hydraulic gradient, as I44/0838 is the deepest well and shows the deepest water level.

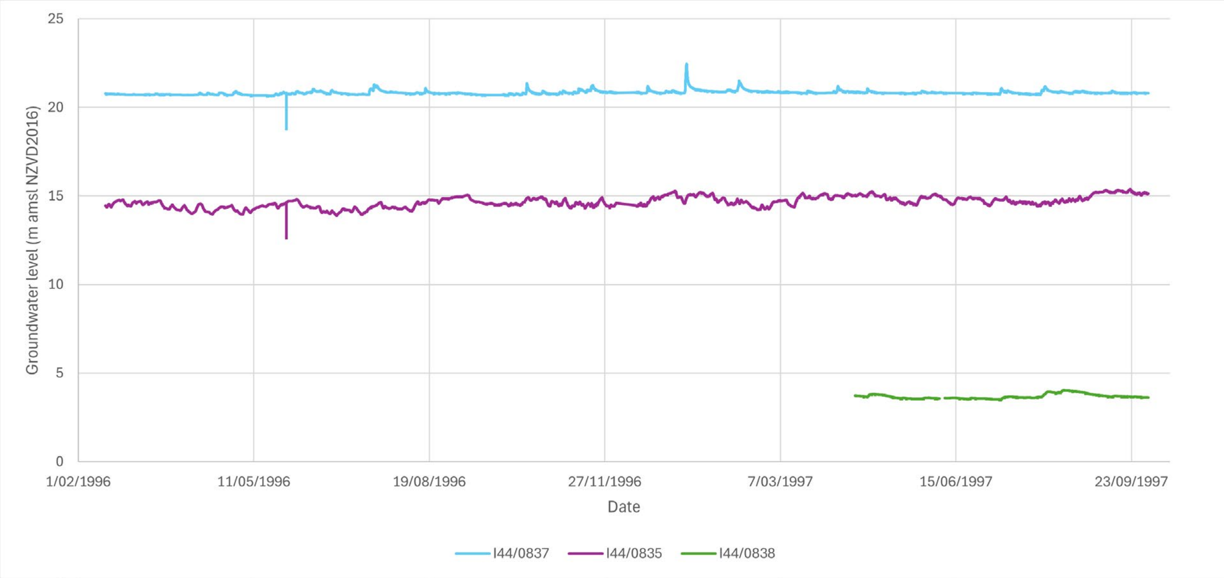


Figure 4-3 Historical groundwater elevation data from onsite monitoring boreholes

The groundwater level data was plotted against rainfall data from the Dunedin International Airport (located approximately 15 km away from the site) to better understand the recharge response to rainfall (Figure 4-4). Rainfall data from the Dunedin International Airport will likely be representative of the rainfall at the Site. Based on the data, groundwater level response to rainfall is relatively muted; the rainfall data from 1997 shows that 36 mm of rain caused a 1.5 m rise in groundwater levels in I44/0837. This would suggest that annual high recharge events are unlikely to bring groundwater levels to within 5 m of the ground surface. Furthermore, even if decadal recharge events do increase groundwater levels to above 5 m bgl, groundwater levels are unlikely to remain there for long periods, reducing to greater depths within hours or days of the event culminating.

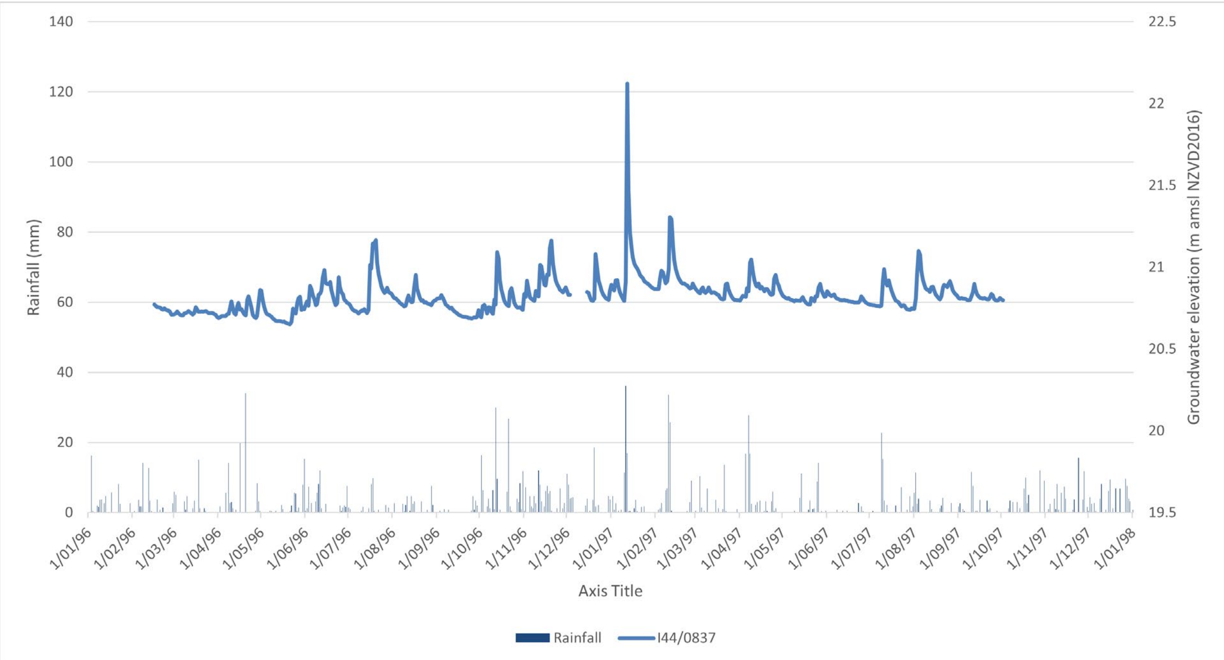


Figure 4-4 Historic rainfall data and groundwater level data to demonstrate the groundwater response to rainfall

4.2 Site Conceptual Model

A conceptual model of the site and the underlying groundwater system is shown in Figure 4-5. This presents a best guess estimate of the geological sequence under the proposed Site and the likely water table based on the borehole logs analysed and the onsite groundwater level monitoring data.

As shown below and discussed previously, the groundwater system displays a negative vertical hydraulic gradient. This means that the groundwater is flowing downwards, and the groundwater level / pressure at depth is lower than the level / pressure nearer the surface. Groundwater will move downwards through the aquifer. As a result, the groundwater system is recharged through surface water; at the Site, this means Silver Stream recharges the groundwater system and is a losing stream (i.e. loses water to the groundwater system and therefore recharges the groundwater system). This regime is observed within the groundwater levels in the nested piezometers installed onsite as well as described within previous reporting and assessments. For example, it was noted by Irricon Consultants & ROYD Consulting (1994) that three nested monitoring piezometers installed in the Lower Taieri Plains showed a drop in groundwater level with increasing depth, showing flow down the profile.

A downwards hydraulic gradient is a sign of hydraulic recharge as opposed to hydraulic discharge. This means it is less likely for artesian (or spring) conditions to occur onsite, reducing the risk of groundwater levels being close to the surface or upwelling during construction / operation.

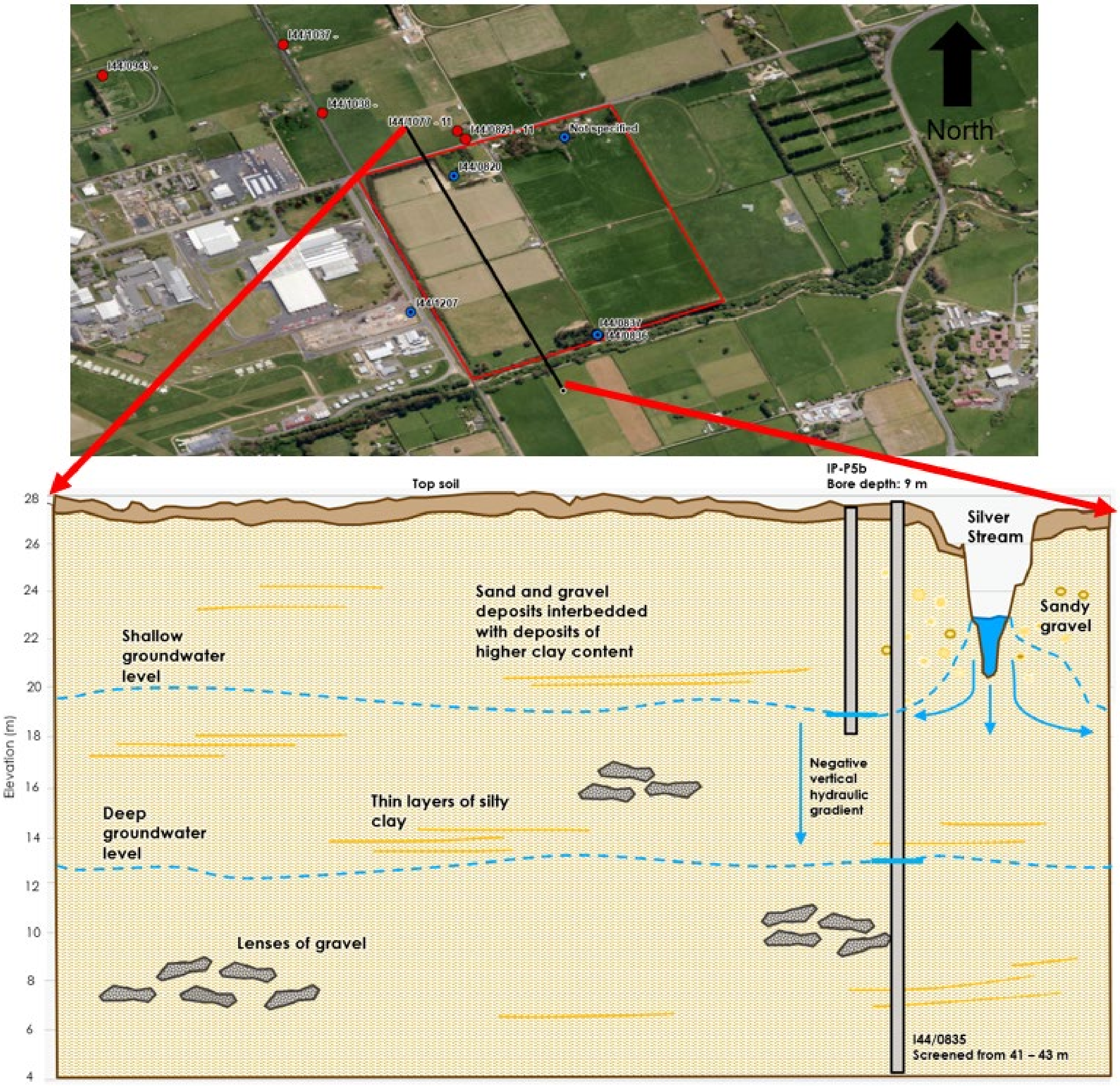


Figure 4-5   Site conceptual diagram

4.3 Aquifer Parameters

Hydraulic conductivity is a parameter of porous materials which measures the ease with which water can move through the pore spaces or fractures within the material. The horizontal hydraulic conductivity refers to the ability of water to move horizontally through a porous material, whereas the vertical hydraulic conductivity refers to the ability of water to move vertically through a porous material. Hydraulic conductivity varies with direction depending on the way the material has been formed or deposited (Woessner & Poeter, 2020).

Groundwater modelling for the Lower Taieri Plains has been carried out to understand the potential impact of leachate from the North Taieri closed landfill on the aquifer (see Section 3.2.2 for further detail). This requires estimates of aquifer parameters for the Lower Taieri Plains. Pumping tests undertaken in East Taieri estimate the hydraulic conductivity to be between 18 – 22 m/day (Irricon Consulting, 2005). These hydraulic conductivity values indicate that the aquifer system is mainly comprised of sandy gravel, with thinner layers of silt / clay. It is also worth noting that pumping tests often target the potential water-bearing units of an aquifer, and as a result tend to be biased towards the higher yielding units with higher hydraulic conductivities.

It was also noted that the responses during testing completed by others indicated that the vertical hydraulic conductivity of the system is lower than the horizontal hydraulic conductivity. The vertical hydraulic conductivity determined by others was assumed to be 0.25 of the horizontal hydraulic conductivity, for modelling purposes (Irricon Consulting, 2005). Vertical hydraulic conductivity is typically much less than horizontal hydraulic conductivity, and ratios of 0.10 – 0.50 are typically chosen for groundwater modelling. Therefore, we agree with assuming the vertical hydraulic conductivity is 0.25 of the horizontal hydraulic conductivity for groundwater modelling.

4.4 Groundwater Quality

As previously mentioned, the North Taieri closed landfill is approximately 600 m northeast of the site, as indicated on Figure 4-6. The landfill site is upgradient of the site, assuming a westward groundwater flow (as shown in Figure 4-1)

Groundwater quality monitoring is required as part of the consent conditions for the North Taieri closed landfill. 30 sampling points are monitored on a six-monthly basis in October and April each year; this includes two surface water sampling locations and nested piezometers. The sampling locations are provided in Figure 4-6, as per the 2024 Annual Monitoring Report for the North Taieri closed landfill (Dunedin City Council, 2024).

The sampling locations include 6 wells either within the site boundary or directly adjacent. These wells are Donnelly p1, Donnelly p3, Donnelly p4, Donnelly p5, Morris and Anderton Dukes Road (which is immediately opposite the site boundary) as shown on Figure 4-6. Only the results for Donnelly p1 and Morris were presented in the 2024 annual monitoring report (Dunedin City Council, 2024). The depth of the Morris well is approximately 10 m. The depth of the Donnelly P1 well is unknown, but on the Wells Aotearoa New Zealand Database it is indicated as being shallow.

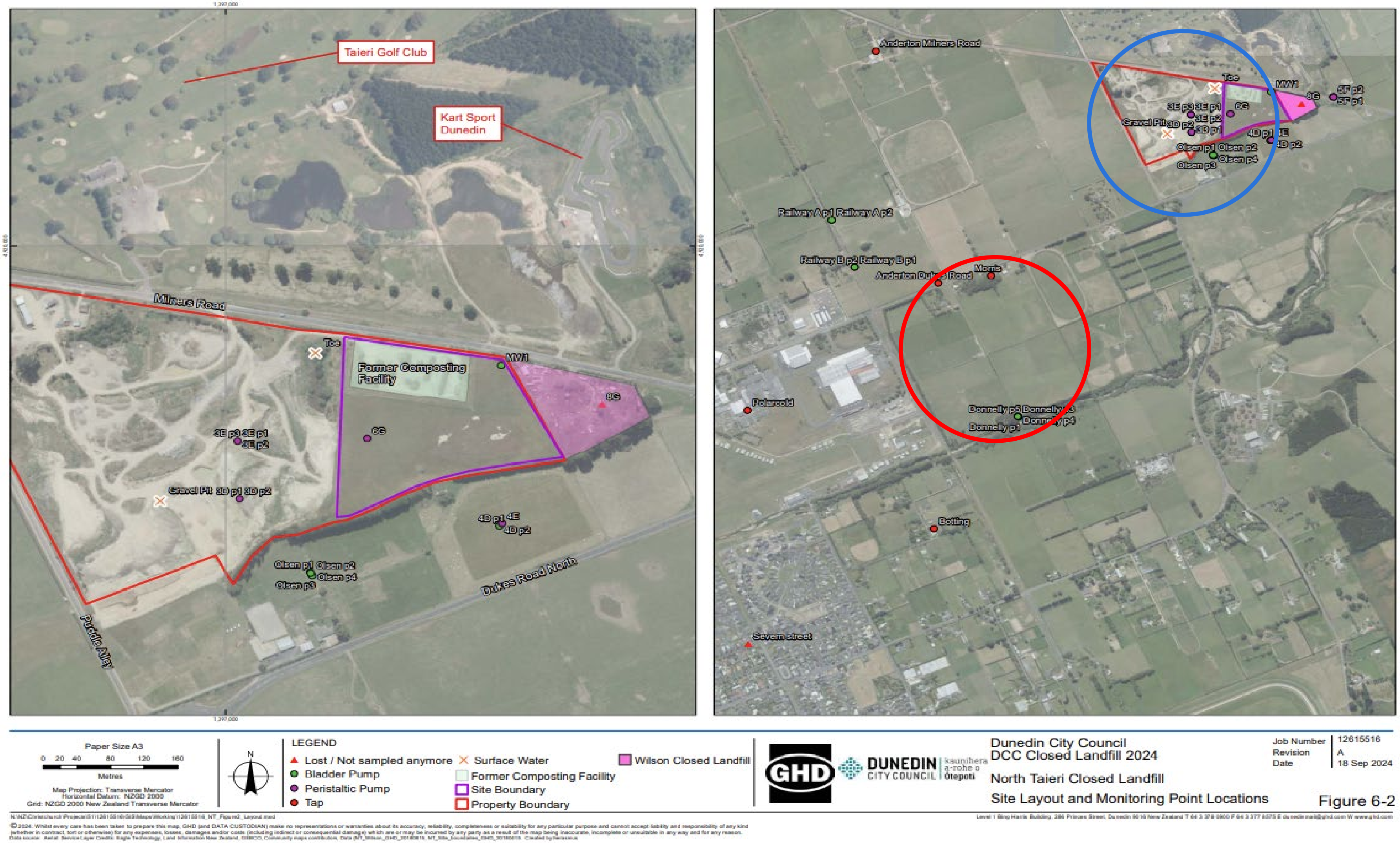


Figure 4-6 Location of groundwater quality monitoring sites, as per the North Taieri closed landfill Annual Monitoring Report (Dunedin City Council, 2024). The proposed site is circled in red, with the landfill site shown in blue.

The monitoring results have been compared by others to the New Zealand Drinking Water Standards (DWSNZ) 2005 Guideline Values (GV) or Maximum Acceptable Value (MAV), this comparison has been reproduced here. The DWSNZ were updated in 2022, however it is assumed that the 2005 guidelines values were used to ensure consistent comparison values were used throughout the monitoring period. The groundwater monitoring results for groundwater bores Donnelly p1 and Morris is summarised below in Table 4-1.

Table 4-1 Summary of groundwater quality results, as reported in the North Taieri closed landfill 2024 Annual Monitoring Report (Dunedin City Council, 2024)

Contaminants Monitored	Monitoring period	Comparison to DWSNZ and trend
Zinc	2001 – 2024	All sampled values are below the DWSNZ GV. There has been a decreasing trend in the Donnelly p1 well since 2013. There has been a slight increasing trend in the Morris well since 2016.
Lead	2004 – 2024	Samples from Donnelly p1 were above DWSNZ MAV from 2012 – 2016, and in 2023. There is no clear trend in the data. One sample from Morris in 2006 was above the DWSNZ MAV, but since then all samples have remained below the MAV. There is no clear trend.
Sodium	2001 – 2024	All sampled values are below the DWSNZ GV. The sampled values have remained consistent and stable across the entire monitoring period.
Boron	2001 – 2024	All sampled values are below the DWSNZ MAV. The sampled values have remained mostly stable across the entire monitoring period.
Nickel	2009 – 2024	All sampled values are below the DWSNZ MAV. The sampled values have remained mostly stable across the entire monitoring period.
Copper	2009 – 2024	All sampled values are below the DWSNZ MAV. The sampled values have remained mostly stable across the entire monitoring period, although the 2015 sampled value for the Donnelly p1 well was at the GV.
Nitrate (as NO3-N)	2001 – 2024	One sampled value for Morris in 2006 was above the DWSNZ MAV. All other values have been below the DWSNZ MAV and have remained fairly consistent throughout the monitoring period.
COD	2001 – 2024	There is no comparable standard value for COD. The values have remained fairly consistent across the monitoring period, around 40 mg/L.
Chloride	1996 – 2024 (Morris) 2001 – 2024 (Donnelly p1)	All sampled values are below the DWSNZ GV. The sampled values have remained consistent and stable across the entire monitoring period.
Ammoniacal Nitrogen	1996 – 2024 (Morris) 2001 – 2024 (Donnelly p1)	One sampled value for Morris in 2017 was above the DWSNZ GV. All other values are below the DWSNZ GV and have remained fairly consistent throughout the monitoring period.
Cadmium	2009 – 2024	One sampled value for Morris in 2011 was above the DWSNZ MAV. All other values are below the DWSNZ GV and have remained fairly consistent throughout the monitoring period.

Contaminants Monitored	Monitoring period	Comparison to DWSNZ and trend
Chromium (III + VI)	2007 – 2024 (Morris) 2009 – 2024 (Donnelly p1)	All values are below the DWSNZ MAV. There is no discernible trend within the data.
EC	1996 – 2024 (Morris) 2000 – 2024 (Donnelly p1)	There is no comparable standard value for EC. All value range between 100 – 400 µS/cm.
pH	1996 – 2024 (Morris) 2008 – 2024 (Donnelly p1)	The pH guideline range is 7.0 – 8.5. Most of the values sit just below this range, at around 6.5 – 7.0. Monitoring in 2010 showed results with a pH of 9.5 – 10 in both wells, but this result has not been observed since.

Overall, the groundwater sampling shows that the sampled parameters are within the comparable guideline values, with many of the parameters remaining consistent and stable over the monitored time period. This data provides a useful set of baseline groundwater quality data, which can be used to compare with groundwater quality during and after construction to determine any changes. This also suggests that any groundwater quality impacts from the nearby landfill site are not likely to be an issue at the Site.

5 Groundwater Impacts Assessment

5.1 Groundwater Levels and Flow Patterns

The proposed excavation depth for the construction of the hard stand areas is approximately 3 m. The earthworks diagrams are provided in Appendix B. The onsite groundwater level monitoring data shows that groundwater levels are 7.5 – 9 m bgl. Whilst seasonal variation of 1 – 2 m has been reported (Dunedin City Council, 2008), it is not expected that the proposed excavation will intersect groundwater levels. As a result, it is not expected that dewatering during construction will be required.

Groundwater flow has been identified as westward across the site (Figure 4-1). A negative vertical hydraulic gradient has been assumed at the site, based on onsite groundwater level monitoring data and previous investigations. This means that the groundwater system is recharged by the Silver Stream, as well as rainfall, and that the downwards movement of groundwater persists. The installation of building foundations, roading and hardstand areas will reduce the recharge to the aquifer via rainfall due to the impervious nature of these surfaces. However, it is not expected that the proposed Inland Port will impact the groundwater flow patterns significantly.

Annual average rainfall was calculated using a 30-year rainfall monitoring dataset from the Dunedin International Airport monitoring site. A high-level estimate of annual recharge to the site was done using the Rushton recharge model. This soil moisture model incorporates rainfall, evapotranspiration, soil characteristics and runoff to determine recharge to groundwater. Soil characteristics for the site were based on the soil mapping provided by S-Map (Manaaki Whenua - Landcare Research, 2026). It is estimated that approximately 13.5% of average rainfall ends up as average annual recharge to the site. Based on the average annual recharge to the site and the site area, the development will divert approximately 38,000 m^3/year of groundwater recharge. Most of the diverted recharge will end up in surface water features via runoff (i.e. Silver Stream) or migrate to the groundwater system at other locations. The reduced recharge below the hardstand areas will result in a minor, localised reduction in groundwater levels.

The deeper groundwater levels observed on site mean that the excavation and site development should not interfere with or intersect the groundwater table, and therefore the impact of the proposed development on the groundwater levels and flow patterns is expected to be negligible.

5.2 Groundwater Quality

Groundwater quality data from onsite, as part of the North Taieri closed landfill monitoring requirements, has been analysed (Section 4.4). The groundwater quality across the site is good, with very few exceedances of the DWSNZ guideline values over the 20-year monitoring period (Section 4.4). The proposed site development is not expected to impact the groundwater quality across the site, as no discharge is occurring. During the development of the site and earthworks, an Earthworks Management Plan is required to outline how soil and earth materials will be managed onsite.

The impact of the proposed development on the groundwater quality at the site is expected to be negligible.

5.3 Stormwater Basin

Stormwater is expected to be managed through a network of drainage infrastructure installed on the proposed site, including a stormwater attenuation pond (Stantec New Zealand, 2025). The depth of the stormwater attenuation pond is 4.4 m bgl at its deepest point. The current phase of design suggests that the stormwater attenuation pond will not be lined. However, this will be assessed and confirmed during the detail design phase of the project. If the stormwater basin is not lined, some seepage will occur.

An estimate of seepage from an unlined stormwater attenuation pond has been calculated using the Massmann equation (Massmann, 2003). The following assumptions were made:

- The area of the stormwater attenuation pond is 115 m x 115 m, as per the current earthwork's drawings.
- The groundwater level is modelled to be at the base of the stormwater attenuation pond.
- The depth of the stormwater in the attenuation pond is assumed to be 4 m.
- A hydraulic conductivity of 20 m/d has been assumed (Section 4.3).
- A clogging factor of 0.5.

An estimate of seepage during a full discharge event has been calculated as 2000 m^3/day. See Appendix C for the full calculation including inputs.

It is not expected that the groundwater levels will intercept the base of the stormwater attenuation pond. The data from the current groundwater level loggers installed on site show groundwater levels being at least 2 m from the base of the proposed stormwater attenuation pond (Figure 4-2). The elevation of the base of the stormwater attenuation pond is expected to be 22.5 m amsl. One historical reading shows the groundwater level as reaching 22 m amsl (Well I44/0837 in Figure 4-3), however this was approximately 30 years ago. Therefore, it is not expected that the groundwater levels will reach the base of the stormwater attenuation pond. It is possible that if an extreme (i.e. decadal) recharge event occurred, groundwater levels would intercept the base of the stormwater attenuation pond. However, in this scenario the stormwater attenuation pond would already contain water, and therefore there would be no increased impact of seepage into the groundwater system due to higher groundwater levels.

Given the depth of the groundwater levels and the depth of the stormwater attenuation pond, it is not expected that groundwater will contribute to the flooding risk.

5.4 Surface Water Depletion

Surface water depletion occurs when groundwater abstraction causes drawdown within a surface water body due to the surface-groundwater connectivity. As previously discussed, Silver Stream (the nearest surface water body) is a losing stream, where it recharges the groundwater system. This is opposed to a gaining stream, which is fed by groundwater and therefore at a greater risk to surface water depletion. No groundwater abstraction is proposed to occur on the Site and dewatering will not be required. Therefore, there is no expected surface water depletion due to the proposed SLIP.

5.5 Effects on Current and Future Groundwater Users

There will be no drawdown impacts on nearby groundwater users from groundwater abstraction/dewatering. If the stormwater pond is unlined, there are anticipated discharges from the stormwater retention basin, although the seepage volumes are expected to be similar to stormwater infiltration currently occurring on site. Change of land use may result in slightly elevated heavy metals and petroleum hydrocarbon concentrations within stormwater runoff. However, impacts to groundwater users is not expected given depth to groundwater and natural attenuation process.

Therefore, impacts on down-gradient users are not expected.

6 Recommendations

The recommendations are as follows:

- **Groundwater levels**
  - Groundwater levels onsite should continue to be monitored with the installed level loggers to establish a baseline set of groundwater level data prior to and during construction.

7 Conclusion

This hydrogeological study has collated and assessed existing knowledge on the expected hydrogeological conditions at the SLIP site. The outcome of the desktop review and field investigation findings shows that the expected impacts on the hydrogeological system as a result of the SLIP are negligible.

8 References

Dunedin City Council. (2008). *Dunedin City Council, North Taieri Closed Landfill - DCC response to Section 92 Request.*

Dunedin City Council. (2024). *Annual Monitoring Report 2024.* Dunedin: Dunedin City Council.

Geological and Nuclear Science. (2025, December). *Geoscience webmap*. Retrieved from GNS Science Te Pu Ao: https://www.gns.cri.nz/data-and-resources/geoscience-webmap/

Irricon Consultants & ROYD Consulting. (1994). *Lower Taieri Groundwater Preliminary Study.*

Irricon Consulting. (2005). *North Taieri Closed Landfill: Aquifer Contamination Risk Assessment.*

Land Information New Zealand . (2025, December). *New Zealand LiDAR 1 m DEM*. Retrieved from https://data.linz.govt.nz/layer/121859-new-zealand-lidar-1m-dem/

Manaaki Whenua - Landcare Research. (2026, January 23). *S-Map Online*. Retrieved from Manaaki Whenua Landcare Research: https://smap.landcareresearch.co.nz/maps-and-tools/app

Massmann, J. (2003, October). A design manual for sizing infiltration ponds. Prepared for Washington State Transport Commission.

Mitchell Daysh. (2025). *Southern Link Property Limited Southern Link Insland Port Project Description.*

Otago Regional Council. (2010). *Lower Taieri Groundwater Allocation Study .*

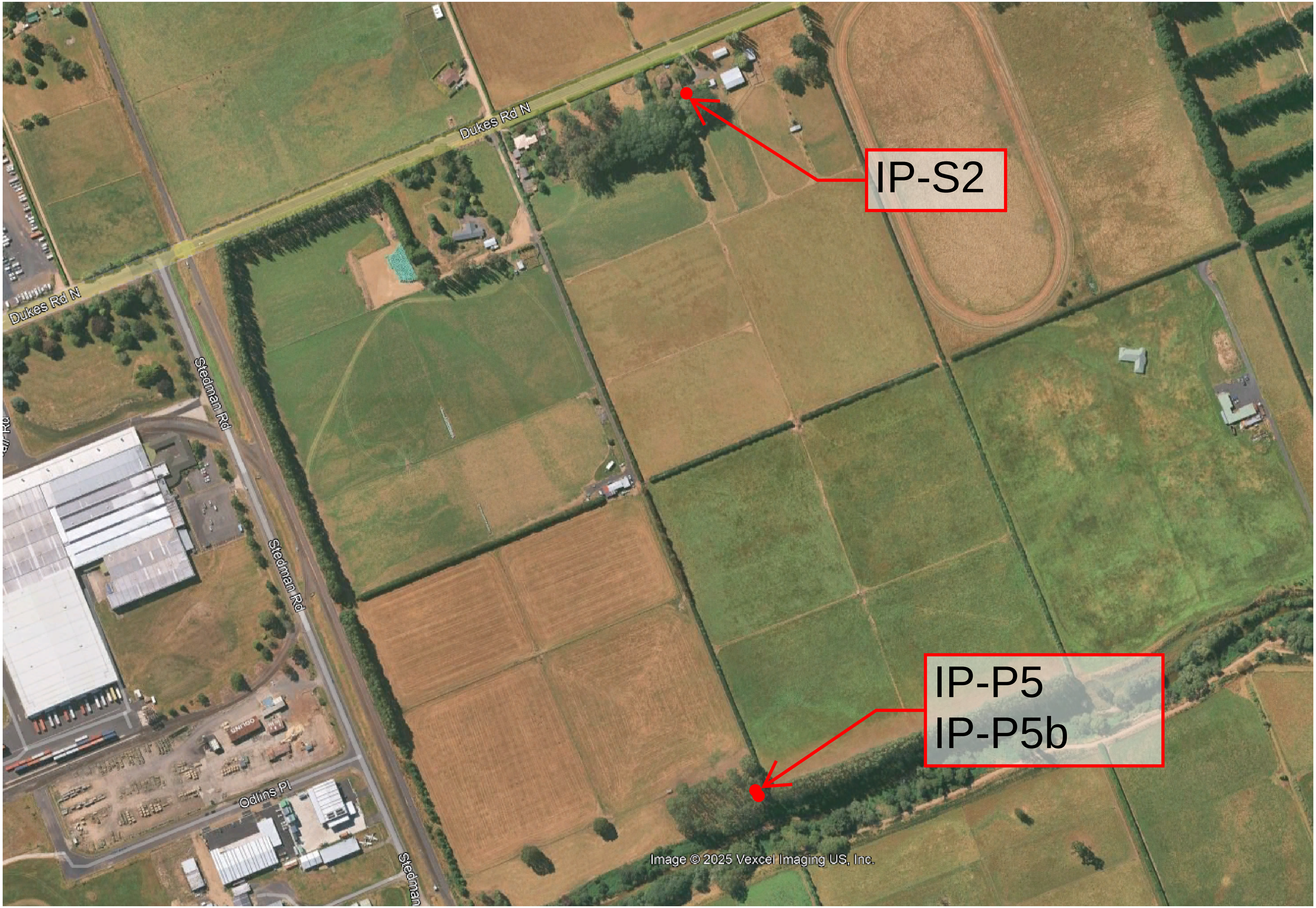
Stantec New Zealand. (2025). *Geotechnical Desktop Study and Appraisal: Southern Logistics Park.*

Stantec New Zealand. (2025). *Southern Link Inland Port Stormwater Assessment.* Stantec New Zealand.

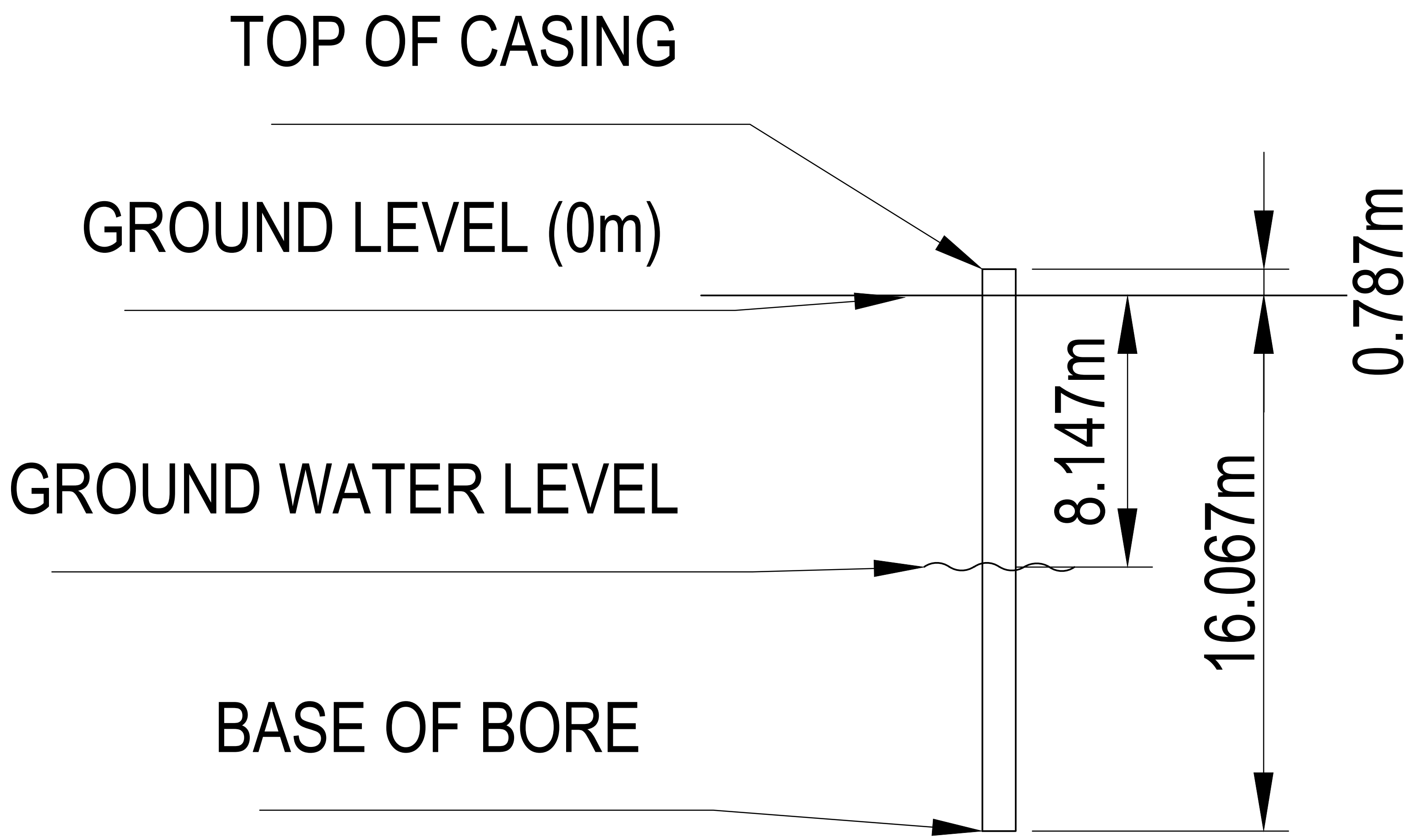
Woessner, W. W., & Poeter, E. P. (2020). *Hydrogeologic Properties of Earth Materials and Principles of Groundwater Flow.* Ontario, Canada: The Groundwater Project.

Appendices

Appendix A Onsite Monitoring Boreholes

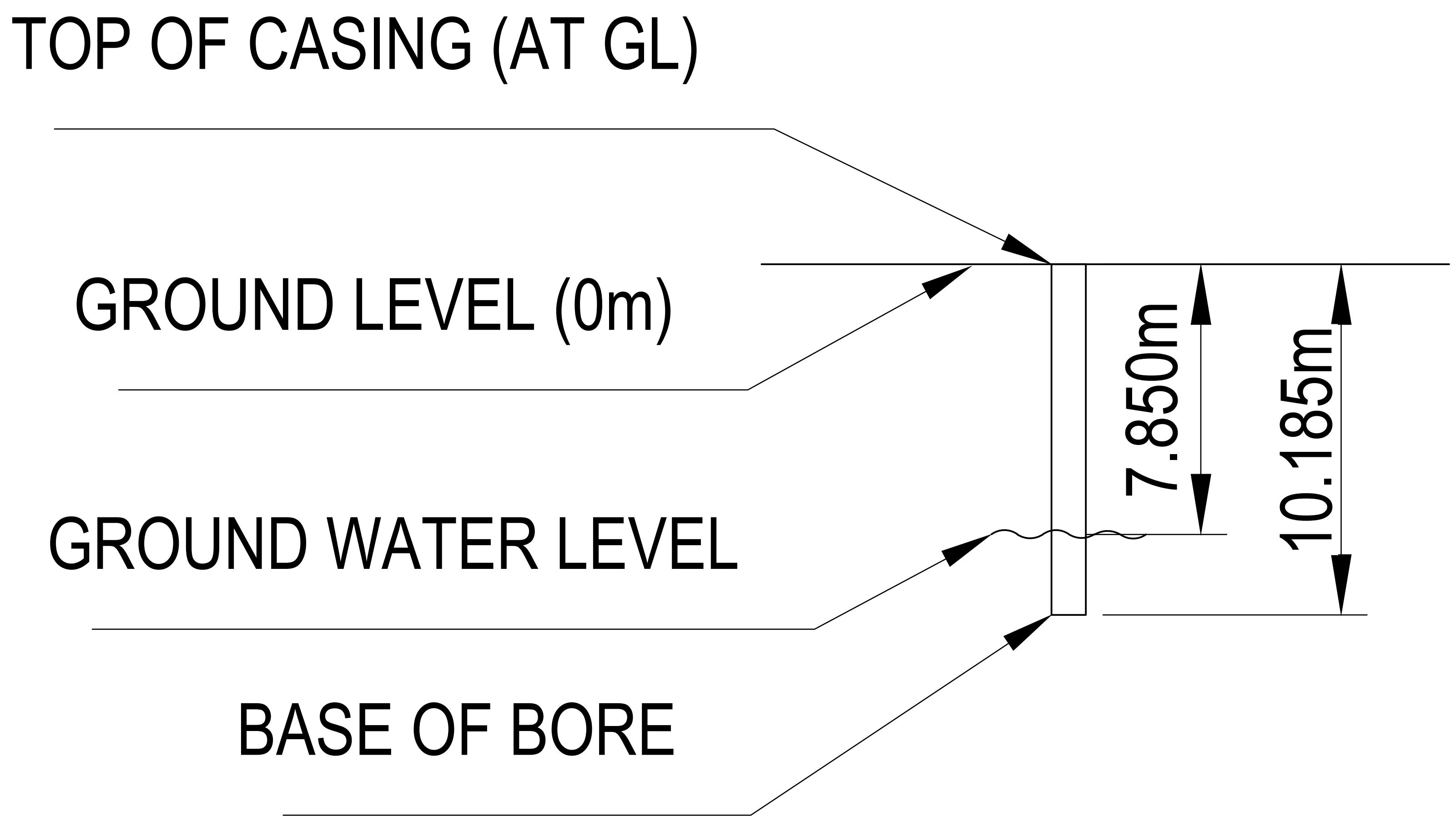

IP-S2
IP-P5
IP-P5b
Dukes Rd N
Dukes Rd N
Stedman Rd
Stedman Rd
Odlins Pl
Image © 2025 Vexcel Imaging US, Inc.

IP-P5



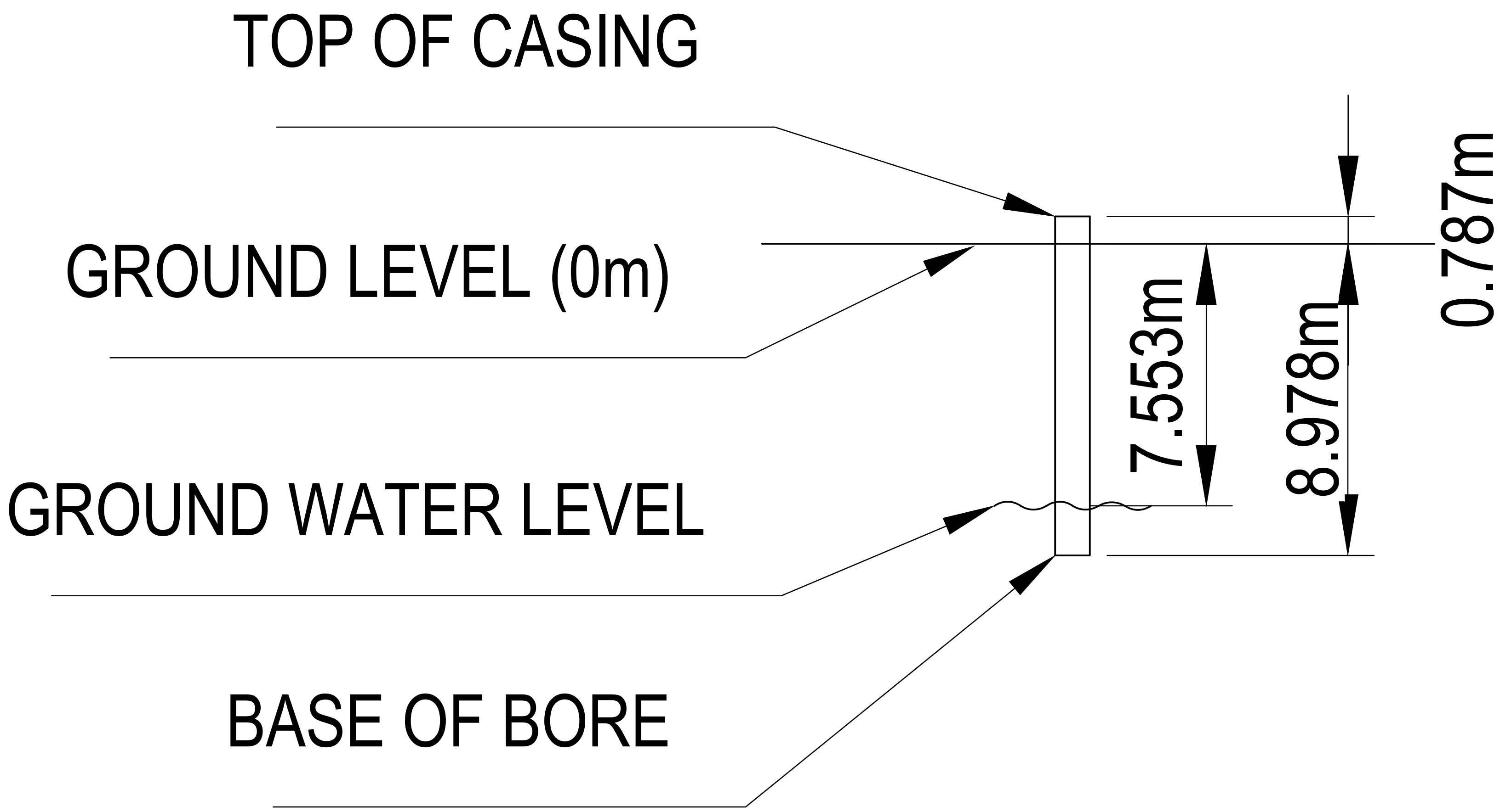
C:/Users/rorange/OneDrive - Stantec/My Resources/Inland Port/Bore Sketch.dwg SCALE = 1:200.0

IP-S2



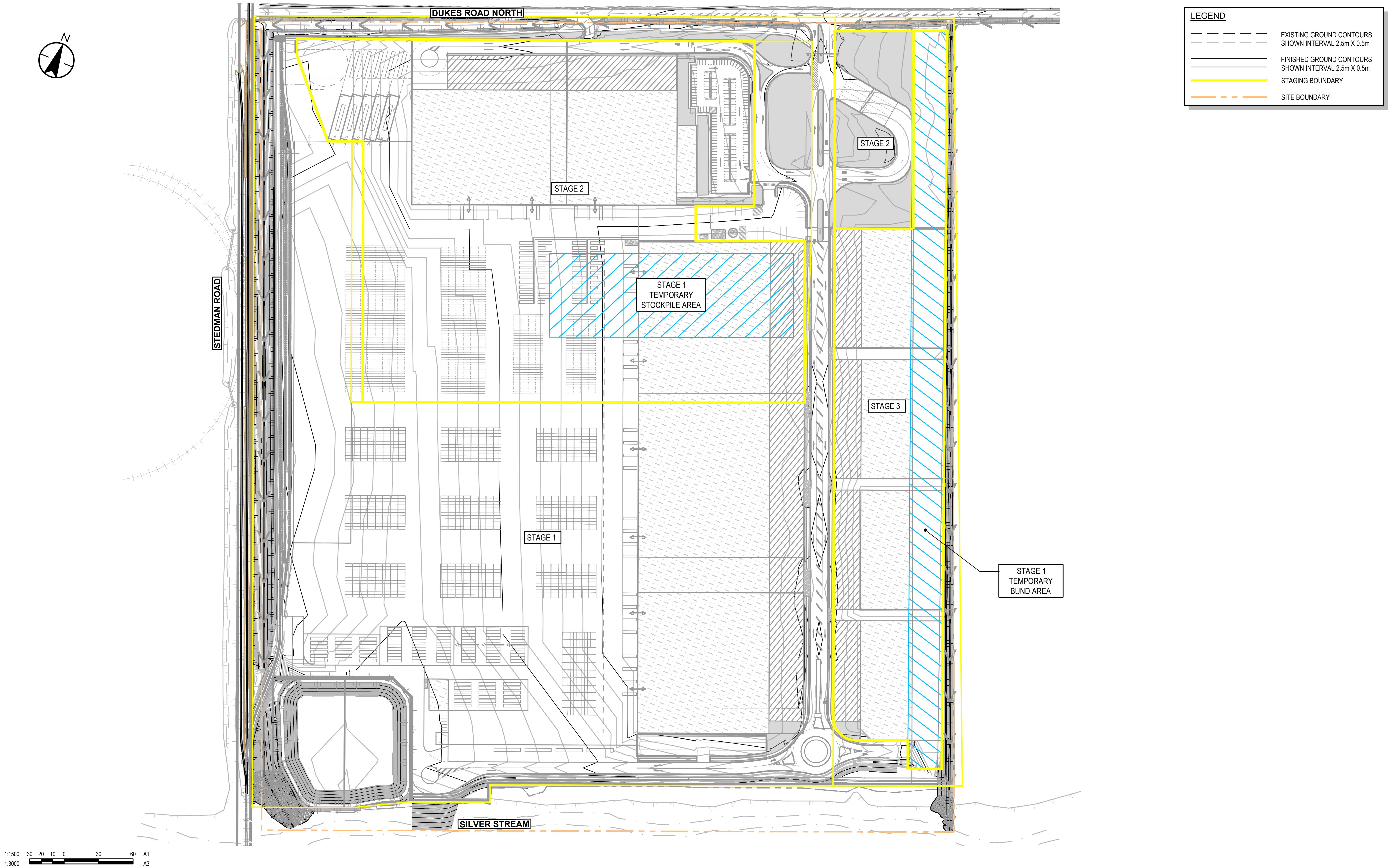
C:/Users/rorange/OneDrive - Stantec/My Resources/Inland Port/Bore Sketch.dwg SCALE = 1:200.0

IP-P5b



C:/Users/rorange/OneDrive - Stantec/My Resources/Inland Port/Bore Sketch.dwg SCALE = 1:200.0

Appendix B Earthworks Diagrams



Rev	Issued/Revision	By	Appd	YYYY.MM.DD
C	ISSUED FOR CONSENT	BG	SL	26.02.20
B	ISSUED FOR CONCEPT DESIGN	BG	SL	26.02.05
A	ISSUED FOR CONCEPT DESIGN	MS	FZ	25.12.19

Issue Status

A1

AUTHORISED FOR CONSENT

This document is suitable only for the purpose noted above. Use of this document for any other purpose is not permitted.

Coordinate System
NZGD North Taieri Circuit 2000
Datum
NZVD 2016

Colour Disclaimer

This drawing has been documented in colour. This drawing is required to be printed in colour. Failure to do so may result in loss of information. Black and white printing may be used if specific black and white documents have been obtained from Stantec.

Stantec

The Contractor shall verify and be responsible for all dimensions. DO NOT scale the drawing - any errors or omissions shall be reported to Stantec without delay.

Client/Project Logo

Southern Link LOGISTICS PARK

Client/Project
SOUTHERN LINK PROPERTY Ltd

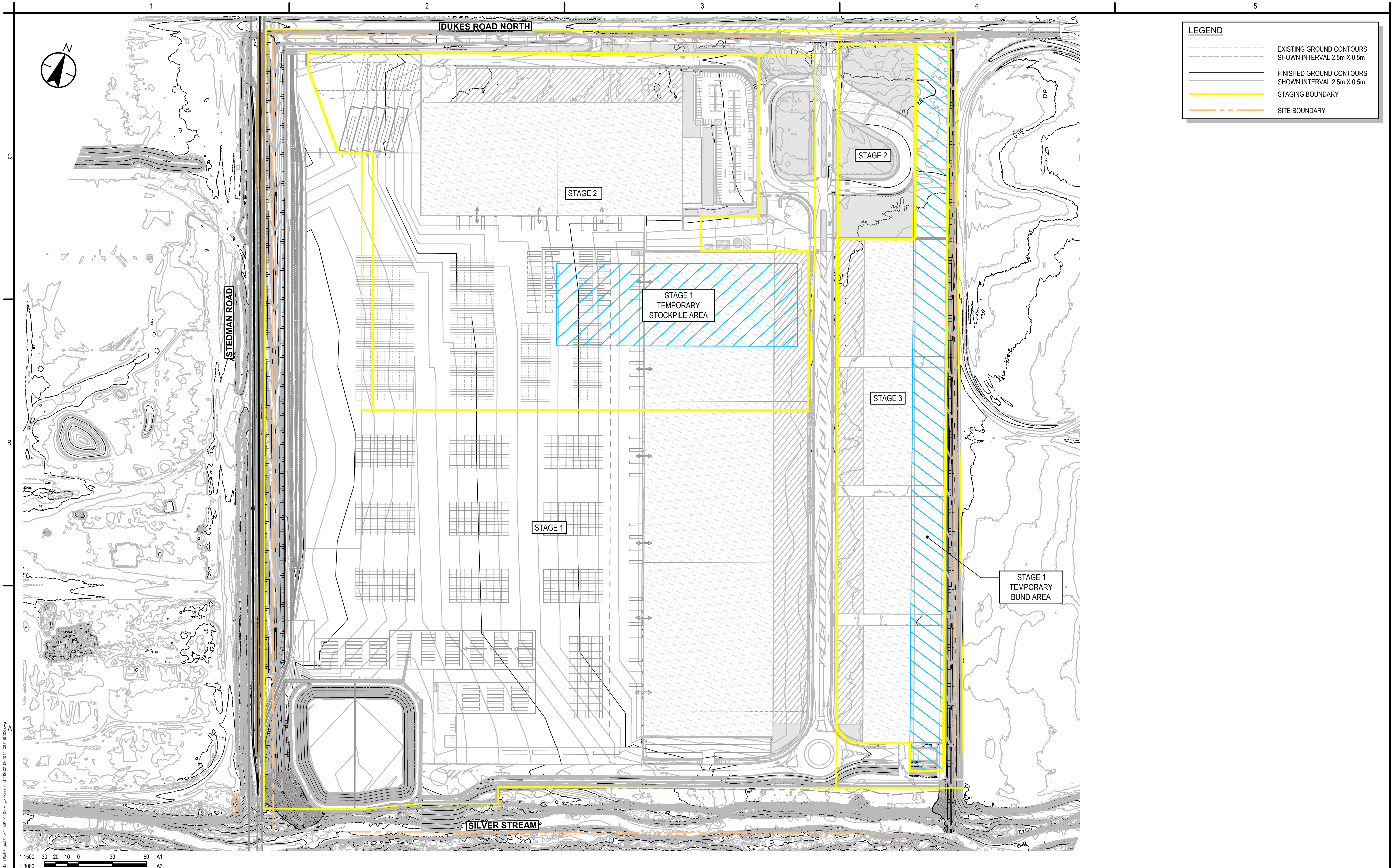
SOUTHERN LINK INLAND PORT
DEVELOPED CONCEPT DESIGN

Maninder Singh	Reuben Orange	Andrew Quigley	Sarah Lloyd	2026.02.20
Drawn	Designed	Reviewed	Approved	YYYY.MM.DD

Title
EARTHWORKS PLAN
FINISHED GROUND SURFACE

Project No. 310206525
Scale at A1 1:1500

Revision C
Drawing No. 310206525-STN-00-501-DR-CI-090001



	Issued/Revision	By	Appd	YYYY.MM.DD
C	ISSUED FOR CONSENT	BG	SL	26.02.20
B	ISSUED FOR CONCEPT DESIGN	BG	SL	26.02.05
A	ISSUED FOR CONCEPT DESIGN	MS	FZ	25.12.19

Issue Status

A1

AUTHORISED FOR CONSENT

This document is suitable only for the purpose noted above.
Use of this document for any other purpose is not permitted.

Coordinate System
NZGD North Taieri Circuit 2000
Datum
NZVD 2016

Colour Disclaimer

This drawing has been documented in colour. This drawing is required to be printed in colour. Failure to do so may result in loss of information. Black and white printing may be used if specific black and white documents have been obtained from Stantec.

Stantec

The Contractor shall verify and be responsible for all dimensions. DO NOT scale the drawing - any errors or omissions shall be reported to Stantec without delay.

Client/Project Logo

Southern Link LOGISTICS PARK

Client/Project
SOUTHERN LINK PROPERTY Ltd

SOUTHERN LINK INLAND PORT
DEVELOPED CONCEPT DESIGN

Maninder Singh	Reuben Orange	Andrew Quigley	Sarah Lloyd	2026.02.20
Drawn	Designed	Reviewed	Approved	YYYY.MM.DD

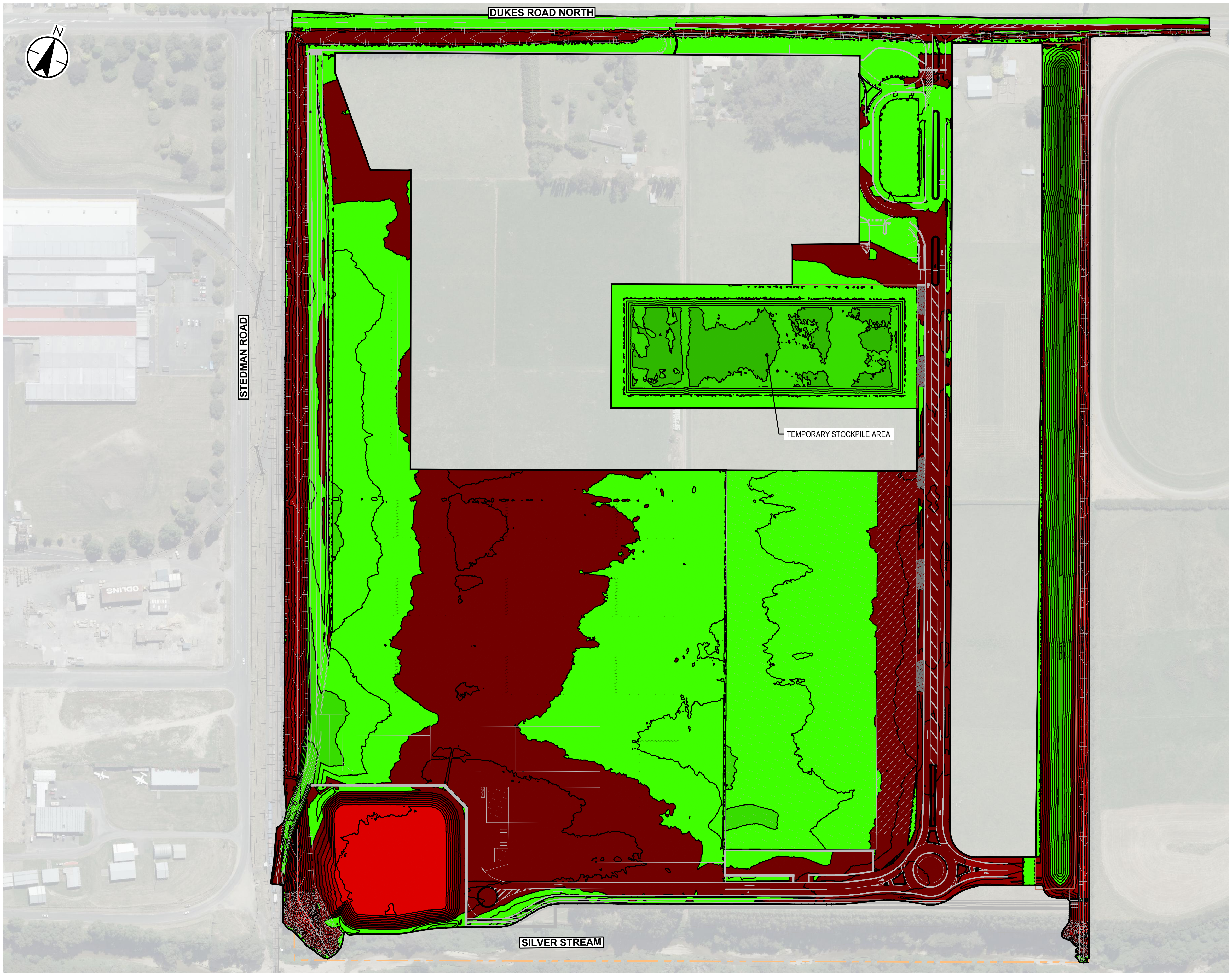
Title **EARTHWORKS PLAN SUBGRADE SURFACE**

Project No. 310206525

Scale at A1 1:1500

Revision C

Drawing No. **310206525-STN-00-501-DR-CI-090002**



1:1500 30 20 10 0 30 60 A1
1:3000 A3

CUT/FILL DEPTHS TABLE				
NUMBER	COLOUR	MINIMUM DEPTH	MAXIMUM DEPTH	RANGE VOLUME
1		-5.50	-5.00	0
2		-5.00	-4.50	5
3		-4.50	-4.00	1443
4		-4.00	-3.50	3442
5		-3.50	-3.00	3960
6		-3.00	-2.50	4679
7		-2.50	-2.00	5682
8		-2.00	-1.50	7634
9		-1.50	-1.00	10847
10		-1.00	-0.50	19032
11		-0.50	0.00	45342
12		0.00	0.50	50095
13		0.50	1.00	20224
14		1.00	1.50	12066
15		1.50	2.00	9784
16		2.00	2.50	3013
17		2.50	3.00	1854
18		3.00	3.50	1195
19		3.50	4.00	680
20		4.00	4.50	332
21		4.50	5.00	69
22		5.00	5.50	1

CUT/FILL REPORT - EARTHWORKS STAGE 1				
AREA (m^2)	CUT (m^3)	TOPSOIL STRIP (m^3)	FILL (m^3)	NET (m^3)
284,300	102,100	85,300 <CUT>	99,400	88,000 <CUT>

NOTE

1. DEPTHS ARE SHOWN FROM EXISTING STRIPPED SURFACE TO SUBGRADE SURFACE. (SURFACE STRIP DEPTH 300mm).

Rev	Issued/Revision	By	Appd	YYYY.MM.DD
C	ISSUED FOR CONSENT	BG	SL	26.02.20
B	ISSUED FOR CONCEPT DESIGN	BG	SL	26.02.05
A	ISSUED FOR CONCEPT DESIGN	MS	FZ	25.12.19

Issue Status
A1
AUTHORISED FOR CONSENT

This document is suitable only for the purpose noted above. Use of this document for any other purpose is not permitted.

Coordinate System
NZGD North Taieri Circuit 2000
Datum
NZVD 2016

Colour Disclaimer
This drawing has been documented in colour. This drawing is required to be printed in colour. Failure to do so may result in loss of information. Black and white printing may be used if specific black and white documents have been obtained from Stantec.

Stantec

The Contractor shall verify and be responsible for all dimensions. DO NOT scale the drawing - any errors or omissions shall be reported to Stantec without delay.

Client/Project Logo
Southern Link LOGISTICS PARK

Client/Project
SOUTHERN LINK PROPERTY Ltd
SOUTHERN LINK INLAND PORT
DEVELOPED CONCEPT DESIGN

Drawn	Designed	Reviewed	Approved	YYYY.MM.DD
Maninder Singh	Reuben Orange	Andrew Quigley	Sarah Lloyd	2026.02.20

Title EARTHWORKS PLAN
STAGE 1

Project No. 310206525
Scale at A1 1:1500
Revision C
Drawing No. 310206525-STN-00-501-DR-CI-090301

1:1500 30 20 10 0 30 60 A1
1:3000 A3

CUT/FILL DEPTHS TABLE				
NUMBER	COLOUR	MINIMUM DEPTH	MAXIMUM DEPTH	RANGE VOLUME
1		-2.50	-2.00	62
2		-2.00	-1.50	1661
3		-1.50	-1.00	6006
4		-1.00	-0.50	7624
5		-0.50	0.00	16461
6		0.00	0.50	20754
7		0.50	1.00	5375
8		1.00	1.50	583

CUT/FILL REPORT - EARTHWORKS STAGE 2				
AREA (m^2)	CUT (m^3)	TOPSOIL STRIP (m^3)	FILL (m^3)	NET (m^3)
128,300	31,900	32,000 <CUT>	26,800	37,100 <CUT>

NOTE

1. DEPTHS ARE SHOWN FROM EXISTING STRIPPED SURFACE TO SUBGRADE SURFACE. (SURFACE STRIP DEPTH 300mm).

Issued/Revision		By	Appd	YYYY.MM.DD
C	ISSUED FOR CONSENT	BG	SL	26.02.20
B	ISSUED FOR CONCEPT DESIGN	BG	SL	26.02.05
A	ISSUED FOR CONCEPT DESIGN	MS	FZ	25.12.19

Issue Status

A1

AUTHORISED FOR CONSENT

This document is suitable only for the purpose noted above. Use of this document for any other purpose is not permitted.

Coordinate System
NZGD North Taieri Circuit 2000
Datum
NZVD 2016

Colour Disclaimer

This drawing has been documented in colour. This drawing is required to be printed in colour. Failure to do so may result in loss of information. Black and white printing may be used if specific black and white documents have been obtained from Stantec.

Stantec

The Contractor shall verify and be responsible for all dimensions. DO NOT scale the drawing - any errors or omissions shall be reported to Stantec without delay.

Client/Project Logo

Southern Link LOGISTICS PARK

Client/Project
SOUTHERN LINK PROPERTY Ltd
SOUTHERN LINK INLAND PORT
DEVELOPED CONCEPT DESIGN

Drawn	Designed	Reviewed	Approved	YYYY.MM.DD
Maninder Singh	Reuben Orange	Andrew Quigley	Sarah Lloyd	2026.02.20

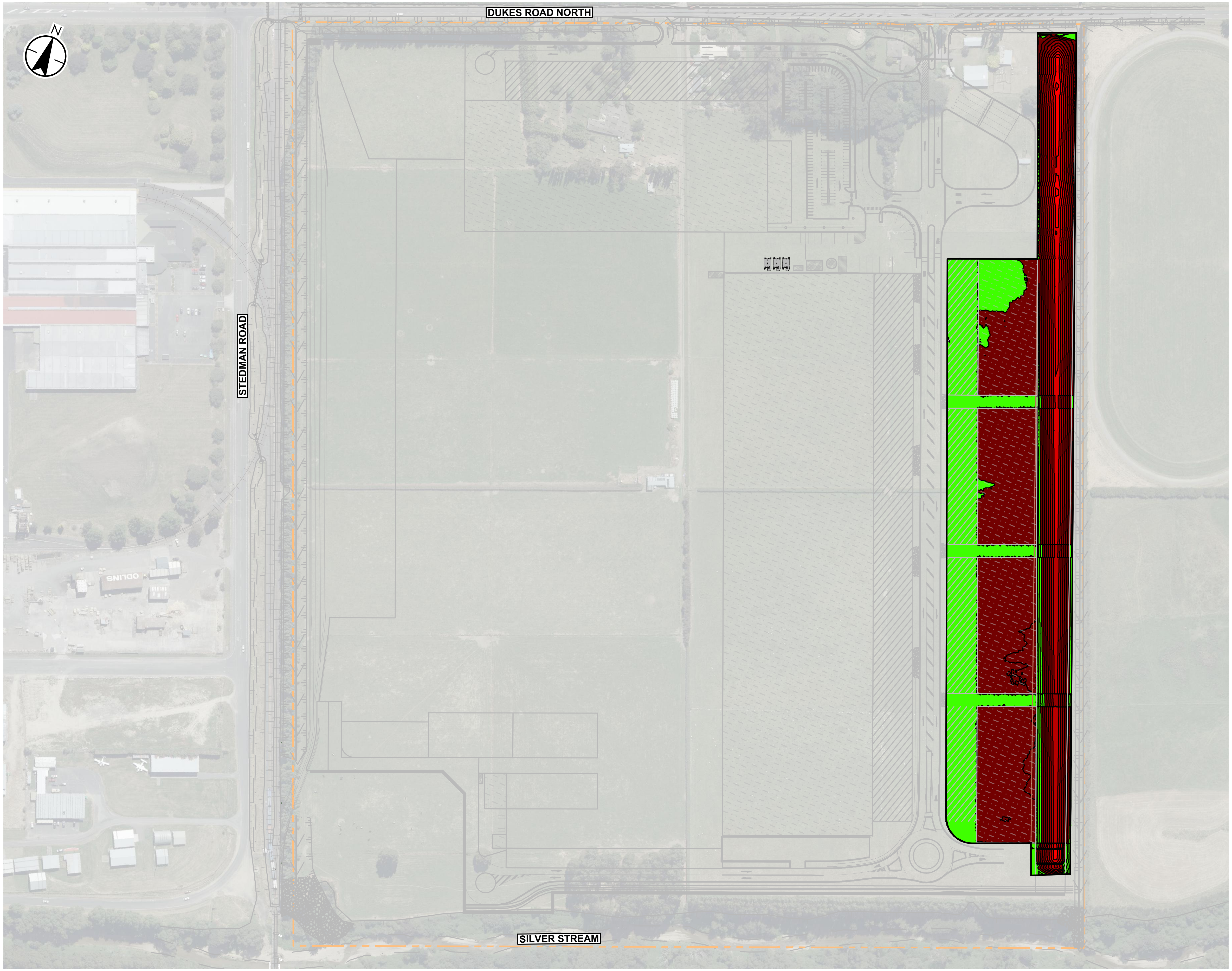
Title
EARTHWORKS PLAN
STAGE 2

Project No. 310206525

Scale at A1 1:1500

Revision C

Drawing No. 310206525-STN-00-501-DR-CI-090302



1:1500 30 20 10 0 30 60 A1
1:3000 A3

CUT/FILL DEPTHS TABLE				
NUMBER	COLOUR	MINIMUM DEPTH	MAXIMUM DEPTH	RANGE VOLUME
1		-5.50	-5.00	1
2		-5.00	-4.50	72
3		-4.50	-4.00	378
4		-4.00	-3.50	905
5		-3.50	-3.00	1694
6		-3.00	-2.50	2677
7		-2.50	-2.00	3616
8		-2.00	-1.50	4569
9		-1.50	-1.00	5541
10		-1.00	-0.50	8232
11		-0.50	0.00	12842
12		0.00	0.50	728
13		0.50	1.00	238
14		1.00	1.50	51
15		1.50	2.00	6
16		2.00	2.50	0

CUT/FILL REPORT - EARTHWORKS STAGE 3				
AREA (m^2)	CUT (m^3)	TOPSOIL STRIP (m^3)	FILL (m^3)	NET (m^3)
48,400	40,600	8,900 <CUT>	1,100	48,400 <CUT>

NOTE

1. DEPTHS ARE SHOWN FROM EXISTING STRIPPED SURFACE TO SUBGRADE SURFACE. (SURFACE STRIP DEPTH 300mm).

Issued/Revision		By	Appd	YYYY.MM.DD
C	ISSUED FOR CONSENT	BG	SL	26.02.20
B	ISSUED FOR CONCEPT DESIGN	BG	SL	26.02.05
A	ISSUED FOR CONCEPT DESIGN	MS	FZ	25.12.19

Issue Status
A1
AUTHORISED FOR CONSENT

This document is suitable only for the purpose noted above. Use of this document for any other purpose is not permitted.

Coordinate System
NZGD North Taieri Circuit 2000
Datum
NZVD 2016

Colour Disclaimer
This drawing has been documented in colour. This drawing is required to be printed in colour. Failure to do so may result in loss of information. Black and white printing may be used if specific black and white documents have been obtained from Stantec.

Stantec

Client/Project Logo
Southern Link LOGISTICS PARK

Client/Project
SOUTHERN LINK PROPERTY Ltd
SOUTHERN LINK INLAND PORT
DEVELOPED CONCEPT DESIGN

Drawn	Designed	Reviewed	Approved	YYYY.MM.DD
Maninder Singh	Reuben Orange	Andrew Quigley	Sarah Lloyd	2026.02.20

Title
EARTHWORKS PLAN
STAGE 3

Project No. 310206525
Scale at A1 1:1500
Revision C
Drawing No. 310206525-STN-00-501-DR-CI-090303

Appendix C Groundwater Seepage Calculations

Infiltration Loading Calculations and Discharge Areas

Based on Massmann (2003)

Clogging (m)	Water Depth in Cell, D_{cell} (m)	Depth to Water Table, D_{wt} (m)	Hydraulic Conductivity, K (m/d)	Total Base Area for One Cell Excluding Side Slopes, A_{cell} (m^2)	Hydraulic Gradient, i m/m	Cell Size Correction Factor, CF_{size} -	Infiltration Rate, f (m/d)	Total Number of Cells -	Total Length of Cell Bottom (m)	Length of Cell Bottom (m)	Width of Cell Bottom (m)	Cell Side Slopes (3:1 typical) -	Length of Cell Including Side Slope (m)	Width of Cell Including Side Slope (m)	Cell Dimension Correction Factor CF_{aspect} -	Clogging Correction Factor, $CF_{silt/bio}$ -	Adjusted Infiltration Rate, f_{corr} (m/d)	Loading Rate to One Cell (m^3/d)
	4	0.0	20	3,600	0.041	0.7	0.82	1	60	60	60	2	68	68	1.00	0.5	0.411	1,916

Stantec is a global leader in sustainable engineering, architecture, and environmental consulting. The diverse perspectives of our partners and interested parties drive us to think beyond what's previously been done on critical issues like climate change, digital transformation, and future-proofing our cities and infrastructure. We innovate at the intersection of community, creativity, and client relationships to advance communities everywhere, so that together we can redefine what's possible.

Stantec New Zealand
Level 10, Otago House, 477 Moray Place
Dunedin 9016
Mail to: PO Box 13052, Christchurch 8140
stantec.com

Vanessa Dally

Senior Principal Hydrogeologist

Stantec

Vanessa is an Environmental Scientist/Hydrogeologist with 20 years' experience in consultancy. She has carried out numerous hydrogeological and water supply investigations in both Australia and New Zealand ranging from groundwater exploration within remote arid locations to dewatering investigations within low lying coastal areas under development. Vanessa also has experience in contaminated land, carrying out investigations of soil and groundwater, including site remediation, as well as other fields of environmental science and geology. Vanessa's groundwater experience includes the following:

- water quality monitoring
- groundwater contaminant transport modelling
- contaminated groundwater remediation
- groundwater exploration for potable supply
- supervision of drilling and groundwater bore installation
- undertaking pump and step tests and analysis
- regional groundwater modelling
- dewatering investigations for both commercial development and mining projects.

EDUCATION AND TRAINING

BA/BSc conjoint, University of Auckland, 2003.

MSc Geology (Hons), University of Auckland, 2005

EIANZ (Professional Member)

New Zealand Hydrological Society (Member)

WasteMINZ (Member)

PROJECT EXPERIENCE

Levin Landfill Groundwater Investigation and Review of Resource Consent Conditions for Groundwater Quality | Horowhenua District Council | Hydrogeologist | 2005–2010, 2022-Present

Vanessa undertook a thorough groundwater investigation including monitoring of bores on Levin Landfill and private properties. A conceptual model of the groundwater regime was produced and groundwater quality data spanning numerous years was collected to delineate the leachate plume from the old unlined landfill and to monitor the new lined cell. The data was used to derive new trigger values for inclusion within the 2010 Revised Consent Conditions for the landfill. The project involved constant stakeholder consultation (including iwi, protest groups and adjacent landowners), which challenging at times, was finally resolved in 2010 with agreement on amended consent conditions. More recently Vanessa has provided technical advice as required.

Dewatering Reviews, Australia | Department of Climate Change, Energy, the Environment and Water, NSW Government | Reviewer | 2022-Present

Vanessa has been assisting with review of groundwater and dewatering management plans for significant state projects and commercial/residential developments in NSW. The reviews are to assess whether proposed development projects within NSW are likely to impact on groundwater resources.

Omarunui Landfill | Hastings District Council | Technical Lead | 2022-Present

Vanessa has provided technical inputs as required for resource consent compliance. Most recently Vanessa undertook site training with a local contractor for site specific sampling including infiltration testing.

Groundwater Permit Renewals, Kāpiti Coast | Kāpiti Coast District Council | Technical Lead | 2022-Present

Vanessa's role included supervision of bore installation, pumping tests and interpretation of results, preparation of assessment of environmental effects and application for resource consent for numerous council irrigation bores.

Eves Valley Landfill Hydrogeological Assessment | Nelson Tasman Regional Landfill | Hydrogeologist | 2025

Vanessa provided a hydrogeological assessment for Eves Valley Landfill to support variation of resource consent to dispose of Class 3 Managed Waste at the facility. The assessment involved a desktop review of existing environmental data for the site, updating the conceptual site model, and a hydrogeological Assessment of Environmental Effects (AEE) for the proposed consent variation.

Otaki Wastewater Treatment Plant - Assessment of Groundwater Quality | Kapiti Coast District Council | Technical Lead | 2024
Vanessa was responsible for assessment of water quality in relation to irrigation of treated wastewater and consent compliance. Transport and fate modelling was conducted for nutrients of concern and recommendations were made for improvement to water quality to assist council in meeting the compliance limits of the discharge consent.

Fielding Town Supply Hydrogeological Assessment of Effects | Manawatu District Council | Technical Lead | 2024
Vanessa carried out assessment of effects to support the resource consent application for bore takes for Fielding town supply.

Precinct 4 East Stormwater Detention Ponds, Feilding | Manawatu District Council | Hydrogeologist | 2024
Vanessa is assisting the Client with the hydrogeological aspects of the design for new stormwater detention ponds. The assessment includes numerical modelling to understand groundwater seepage rates.

Marton Dam Bore | Rangitikei District Council | Reviewer | 2024
Vanessa provided technical support and review for the bore siting, installation and assessment of environmental effects.

Te Puna Hāpori - Police Hub and Courthouse, Whanganui | NZ Police and Ministry of Justice | Technical Lead | 2022-2024
Vanessa was the technical lead for both the contaminated land and hydrogeological aspects of the project. The hydrogeological investigation included installation and testing of bores (permeability tests and water quality), and assessment of environmental effects and numerical modelling for dewatering management during development.

Balgownie Closed Landfill, Leachate System Assessment | Whanganui District Council | Hydrogeologist | 2019
Balgownie is a closed unlined landfill in a former swamp area near Whanganui River. After 40 years of operation a peripheral drainage system was constructed in the 1990s. Although the landfill has been closed since the early 2000s the effectiveness of this leachate system is still unknown. Vanessa's involvement in the project is assessing the groundwater regime and water chemistry to test the system's effectiveness and assist in improvements to design.

Houghton Bay Landfill Rehabilitation and Leachate Mitigation* | Wellington City Council | Hydrogeologist | 2015
This project involved a hydrogeological assessment to understand leachate transport and fate, and the quantity of leachate generated. This information was required to assess appropriate mitigation options for the closed landfill. Vanessa undertook the contaminated land and hydrological assessment for the project.

**Denotes projects completed with other firms*