Environmental Impact Assessment Report

Volume 3 – Appendices

Prepared by: AWN Consulting, November 2025

Prepared for: Beauparc Limited

AWN Consulting Ltd, The Tecpro Building, IDA Business & Technology Park, Clonshaugh, Dublin 17, D17 XD90

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Appendix 2.1
Planning Reference, Applicant and Location

AWN Consulting Ltd, The Tecpro Building, IDA Business & Technology Park, Clonshaugh, Dublin 17, D17 XD90

APPENDIX 2.1

Planning Reference, Applicant & Location	Development Description	Decision & Decision Date
Ref: 2460842 Applicant: Polarisgate Ltd Location: Curraghtown, Brownstown, Navan, Co. Meath	The development will consist of a 10 year planning permission for 180 Megawatt gas fired peaking power plant on a site comprising 7.87 ha. The electricity generating station will comprise • 3 no. open cycle gas turbines (OCGT) generators each consisting of an air intake filter system, exhaust stack (30m high), fin fan coolers, start transformer, power control centre, fire extinguishing cabinet; and waste process water tank. • Liquid fuel storage (secondary fuel) supply which includes; three bunded fuel storage tanks each with 1,950m3 capacity (15m diameter x 11m high). • unloading area, fuel polishing and transfer system building and fuel pipework. • Three generators and step up transformers with a single storey communication building (6.7m high). • An administration and maintenance building with an area of 800m² (9.6m high) with car parking. • Containerised power control centre (25m by 20m x 4m high). • Fire water tank of 500m3 and pumphouse. • Containerised water treatment unit (12m long x 3m wide x 3m high) with 10m3 with purified water storage tank (2.75m high and 2.27m diameter). • Lube oil and chemical storage, Emergency generator, Air compressor building (8m long x 4m wide x 4m high) and auxiliary unit transformers. • Natural gas supply which includes; Gas Networks Ireland (GNI) above ground installation (AGI), natural gas receiving facility (5m high) including pressure and temperature control, natural gas filter and natural gas pipework. • Temporary construction compound. • All associated ancillary development, including upgrades to site access from the L-10132, upgrades to existing site access road, new site access road, site works and services including underground pipework and cabling, drainage infrastructure, emergency backup generator, fire detection and protection system, fencing, gates, internal roadways, lighting all other ancillary site works. It should be noted in respect of this planning application that permission is sought for a period of 40 years. The application relates to development for the purposes of an activity requiring a license from the Environmental Protection Agency under the Industrial Emissions Directive 2012/18/EU. It also relates to a Lower Tier COMAH establishment and therefore falls under the requirements of the Control of Major Accident Hazard (COMAH) Regulations, 2015. The Planning Application will be accompanied by a Natura Impact Statement (NIS).	Decision: Applied, FI requested 05/12/2024 Grant date: T.B.C
Ref: HA17.318573 (ABP) Applicant: Niamh O'Neill Location: Slane, County Meath	Proposed N2 Slane Bypass to the east of Slane village comprising 3.5km of dual carriageway including a new bridge crossing of the River Boyne, along with N51 road realignments, and traffic management and public realm enhancements within Slane village.	Decision status: Live case

Ref: 23576 Applicant: Highfield Solar Limited, Location: Towlands of Rathdrinagh, Sicily, Thomastown, Rahill, Drumman & Knockcommon, near the town of Duleek, Co Meath	A ten year permission and 35 year operation life for a solar farm described herein. The total site area for the proposed development is 188.9 hectares consisting of the following: solar photovoltaic panels on ground mounted steel frames and associated hard standing, inverter/transformer stations, underground power and communication cables and ducts, boundary security fence, CCTV cameras, upgraded internal access tracks, new internal access tracks, 2 no. new site entrances along the L5608 local road, underground electrical and communications cabling for approximately 700m along the L5608 local road and all associated services and development works including drainage infrastructure, temporary construction compound and landscaing. As part of a separate Strategic Infrastructure Development (SID) application for consent, consent will be sought for the provision of a 110kV onsite electrical substation and associated works from An Bord Pleanala. This planning application is accompanied by a Natura Impact Statement.	Decision: Conditional Grant date: 14/11/2024
Ref: 2460587 Applicant: Balrath GB FC Football Club Location: BALRATH PARK FOOTBALL GROUND, FLEMINGTON, BALRATH, NAVAN, CO. MEATH, C15V62W	New upgraded synthetic grass pitch, with boundary fence around perimeter of pitch 4 No. of 12metre high floodlight poles with a max 250 lux lighting and associated site works Upgraded & extended parking area with associated site works.	Decision: Conditional Grant date: 14/11/2024
Ref: 2460413 Applicant: Aisling Tully Location: Rathdrinagh, Beauparc, Navan, Co. Meath	The development will consist of a new two-storey style dwelling with a single storey projection to the rear, detached domestic garage, domestic wastewater disposal system, domestic site entrance and all associated site works. Significant further information/revised plans submitted on this application.	Decision: Conditional Grant date: 14/11/2024
Ref: 2470 Applicant: David Byrne Location: The Cottage, Thurstianstown, Beauparc, Navan, Co Meath C15 F3CH	To construct a single storey extension to the side and rear of existing dwelling house, new wastewater treatment system and percolation area and all associated site development works. Significant further information/revised plans submitted on this application.	Decision: Conditional Grant date: 09/10/2024
Ref: 24270 Applicant: Peter Hickey Location: Flemingstown, Kentstown, Co. Meath	The development will consist of the following: 1. Construction of a new detached, 2-storey dwelling. 2. Construction of a new garage. 3. New proprietary wastewater treatment system & percolation area. 4. New entrance to site. 5. All associated site works.	Decision: Conditional Grant date: 19/09/2024
Ref: 231057 Applicant: William Clarke Location: Curraghtown, Brownstown, Navan, Co. Meath	The permission for retention of extensions to the front and rear, retention of attic storage area, retention of 3no. Velux windows to front elevation, retention of alterations to all elevations, retention of garage and permission to construct a single storey extension to the rear and replace existing septic tank with a new wastewater treatment system and percolation area and all associated site development works.	Decision: Conditional Grant date: 29/02/2024

Ref: 22780 Applicant: Emerald Tower Limited Location: Veldonstown, Kentstown , Navan, Co. Meath	The development will consist of erecting a 27m high lattice telecommunications structure together with antennas, dishes and associated telecommunications equipment all enclosed by security fencing and extend existing access track. Significant further information/revised plans submitted on this application.	Decision: Conditional Grant date: 30/01/2024
Ref: 2360331 Applicant: Mary Joyce Location: Newtown, Beaupark, Navan, Co. Meath, C15 N2C2	1) construct a single storey domestic extension to the northern gable side of existing dwelling house, and 2) all associated site services.	Decision: Conditional Grant date: 25/01/2024
Ref: 2360296 Applicant: EirGrid plc Location: Townlands of Cardrath, Broomfield, Balrenny, Higginstown (Slane Electoral Division), Coalpits, Mooretown (Slane Electoral Division), Cashel, Crewbane, Ro, [The works in County Meath will take place between Structure 82 in the townland of Cardrath and the end mast located at the 220 kV Woodland Substation (Structure 207) in the townland of Woodland.]	EirGrid PLC, with the consent and approval of the Electricity Supply Board (ESB), intends to apply to Meath County Council for permission for works associated with the proposed uprate of the existing Louth – Woodland 220 kV overhead powerline (OHL) between the existing Louth 220 kV substation in the townland of Monavallet, County Louth and the existing Woodland 220 kV substation in the townland of Woodland, County Meath. The Louth – Woodland 220 kV OHL is approximately 61.5 km long and comprises 207 no. steel lattice tower structures. The existing circuit is located within the functional area of Louth County Council and Meath County Council. Approximately 38.5 km of the existing OHL circuit is located within the functional area of Meath County Council and approximately 23 km is within the functional area of Louth County Council. A separate planning application is being lodged with Louth County Council. The Proposed Development within the functional area of Meath County Council is located in the townlands of Cardrath, Broomfield, Balrenny, Higginstown (Slane Electoral Division), Coalpits, Mooretown (Slane Electoral Division), Cashel, Crewbane, Rossnaree, Fennor (Painestown Electoral Division), Newtown (Painestown Electoral Division), Rathdrinagh, Thurstianstown, Painestown (Painestown Electoral Division), Knockharley, Veldonstown, Kentstown, Danestown, Proudstown (Skreen Electoral Division), Macetown (Skreen Electoral Division), Painestown (Macetown Electoral Division), Frankstown, Riggins (Kilbrew Electoral Division), Reask (Kilbrew Electoral Division), Hallstown, Cabinhill, Flemingtown (Ratoath Electoral Division), Twentypark, Lagore Little, Brownstown (Ratoath Electoral Division), Bradystown, Curkeen, Commons (Ratoath Electoral Division), Gormanstown, Wilkinstown (Dunshaughlin Electoral Division), Powderlough, Raynestown, Derrockstown, Mill Land (Dunshaughlin Electoral Division), Parsonstown, Rathregan, Portan (Dunshaughlin Electoral Division), and Woodland. Five (5) temporary construction compounds and associated access routes are located in the townlands of Knockmooney, Slane, Rath, Flemingstown and Tuiterath. The Proposed Development works within the functional area of County Meath will comprise: ? the replacement ("restringing") of the existing overhead line circuit conductor with a new higher capacity conductor; ? the strengthening of up to 25 no. tower foundations; ? the replacement of hardware and fittings, such as insulators, insulator ha.	Decision: Conditional Grant date: 17/11/2023

Ref: 23714 Applicant: Donal Connell Location: Rathdrinagh, Beauparc, Navan, Co. Meath	The construction of a single-story detached dwelling & single-storey domestic garage to the rear, with a proposed Secondary Treatment System and soil polishing filter also modifications to the existing site entrance onto the public road and all associated site works and landscaping.	Decision: Conditional Grant date: 17/10/2023
Ref: 23458 Applicant: EirGrid PLC Location: Causetown, Platin, Co. Meath	The proposed development will consist of an uprate of the existing Gorman to Platin 110 kV Overhead line (OHL) (19.76 km long and comprising 109no. supporting structures between the existing Gorman substation in the townland of Causetown, Co. Meath and the existing Platin 110kV substation in the townland of Platin, Co. Meath). The proposed project is located within the townlands of Graigs, Ardmulchan, Dollardstown, Dunmoe, Carranstown, Platin, Haystown and Carnuff, Stackallan, Harmanstown, Causetown, Garballagh, Commons, Downestown, Gillinstown, Longford, Rathdrinagh, Painestown, Thurstianstown, Knockcommon, Drumman, Laugher, Newtown and Platin.The proposed uprate project will comprise: • the replacement ("restringing") of the existing OHL circuit conductor wires with a new higher capacity conductor including installation of a new fibre communication connection; • the replacement of 42no. existing polesets - any replacement structures will be constructed at, or immediately adjacent to the existing structures they will replace, will be along the same alignment as existing, and will be of a similar height and appearance; • the replacement of steel members at 8no. steel angle masts; • replacement of hardware and fittings at all structure locations; • replacement and relocation of fibre communication structures; • all associated site development works; • Earthwire to be replaced between Angle Mast 94 and End Mast 108; • Tower painting at 10no. steel Angle/End masts; • foundation strengthening works at 4no. Angle Masts; • Anti-climbing guards to be installed at lno. location; • all associated works within the existing Gorman substation and Platin 110 kV substation to accommodate the uprated 110 kV overhead line including alterations to existing apparatus; • all associated temporary site development works to gain access to the existing structures including clearance of vegetation, disassembly and reassembly of gate posts/ piers and removal and reinstatement of existing fencing; and • other temporary associated and ancillary site development works required for the purpose of the uprate of the existing circuit, including construction compounds, silt traps, silt fences, stone tracks, ground protection mats, infrastructure crossing support systems and temporary watercourse crossings	Decision: Conditional Grant date: 20/06/2023
Ref: 22537 Applicant: Clement Booth Location: Painestown, Beauparc, Navan, Co. Meath	The development will consist of; (1) the restoration of lands for the purposes of agricultural gain through importing and depositing of inert material comprising natural minerals of clay, silt, sand, gravel or stone and (2) all ancillary site development works. Natura impact statement (nis) will be submitted to the planning authority with the application. Significant further information/revised plans submitted on this application.	Decision: Conditional Decision date: 25/05/2023

Ref: 221203 Applicant: Kentstown Village Park Committee Location: Kentstown Village Park, Navan Road, Kentstown, Co Meath C15 EHT2	Erection of a single storey, modular, multi-functional community facility with associated site works. Significant further information/revised plans submitted on this application.	Decision: Grant date: 28/03/2023
Ref: 22451 Applicant: Garranvale Limited Location: Veldonstown Road, Kentstown, Co. Meath	The construction of 53 no. two storey houses, consisting of 17 no. 4 bed units, 34 no. 3 bed units, and 2 no. 2 bed units, together with all associated and ancillary works including works to the Veldonstown Road, boundary treatments, internal roadways and services, on an overall site area of 1.7ha as the second phase of a permitted residential development at Veldonstown Road, Kentstown, Co. Meath. The proposed development comprises 32 no. Type A (118 sqm, two-storey, three-bedroom, semi-detached houses); 1 no. Type B1 (118.2 sqm, two storey, three-bedroom, detached house); 1 no. type B2 (118.2 sqm, two-storey, three-bedroom, detached house; 2 no. Type C (85.6 sqm, two-storey, two-bedroom, terraced houses); 10 no. Type D1 (137.4 sqm, two-storey, four-bedroom, detached and semi-detached houses); 2 no. Type D2 (137.4 sqm, two-storey, four-bedroom, semi-detached houses); 2 no. Type D3 (137.4 sqm, two-storey, four-bedroom, semi-detached houses); and 3 no. Type D4 (138 sqm, two-storey, four -bedroom, semi-detached and detached houses designed for universal access). It is proposed to provide 109 no. car parking spaces comprising 106 no. allocated spaces and 3 no. visitor spaces. It is proposed to widen the Veldonstown Road to 5.5 metres and to provide footpaths along the full extent of the site frontage on the Veldonstown Road. Significant further information/revised plans submitted on this application.	Decision: Conditional Grant date: 16/12/2022
Ref: 2460284 Applicant: Garranvale Limited Location: Veldonstown Road, Kentstown, Co. Meath	The proposed development is for a residential scheme of 38 no. two storey houses, and for permission for amendments to the permission granted under Meath County Council Reg. Ref. 22/451 to accommodate a temporary wastewater treatment plant, on an overall site of 3.83 ha at Veldonstown Road, Kentstown, County Meath. The proposed development comprises the construction of 38 no. residential dwellings comprising: 4 no. 2 Bedroom Houses, 30 no. 3 Bedroom Houses and 4 no. 4 Bedroom Houses; 0.64 ha of centrally located public open space; vehicular access from the Veldonstown Road (L10133); 80 no. car parking spaces; and all enabling and site development works, levels, landscaping, boundary treatments, lighting, water and utility services and connections, waste management and all ancillary development and works above and below ground. The proposed development also includes for amendments to the permission granted under Meath County Council Reg. Ref. 22/451 to accommodate a temporary wastewater treatment plant on the site of 3 no. permitted house units (Nos. 84, 85 and 86) to service the permitted and proposed development. The 3 no. permitted units under Reg. Ref. 22/451 will be constructed following decommissioning and removal of the proposed temporary wastewater treatment plant. The proposed development also includes for the	Decision: Conditional Grant date: 05/09/2024

	amendment of site levels and finished floor levels permitted under Meath County Council Reg. Ref. 22/451 by up to a maximum of 2.05m to accommodate the servicing of the site by the temporary wastewater treatment plant. Significant further information/revised plans submitted on this application	
Ref: 22691 Applicant: David Matthews Location: Flemingstown, Kentstown, Co. Meath	Construction of a single storey style dwelling with detached domestic garage, install a proprietary sewage treatment system and form new entrance to public road.	Decision: Conditional Grant date: 17/11/2022
Ref: PA17.307433 (ABP) Applicant: Indaver Ireland Limited Location: Carranstown, Duleek, County Meath	Increase in annual total waste for treatment from currently permitted 235,000 tonnes to 250,000 tonnes, increase in annual amount of hazardous waste from currently permitted 10,000 tonnes to 25,000 tonnes, development of a aqueous waste tank farm, hydrogen generation unit, bottom ash storage building, development of a single storage warehouse, new concrete yard, weather canopy, demolition and rebuilding of an existing single storey modular office and ancillary site works.	Decision: Conditional Grant date: 30/03/2022
Ref: 211347 Applicant: Mark Clerkin Location: Flemingstown, Balrath, Co Meath C15 RF38	Full planning permission to convert existing bungalow attic to habitable bedroom space and all associated site development works and services.	Decision: Conditional Grant date: 12/01/2022
Ref: LB201327 Applicant: Litchford Ltd Location: Downestown, Duleek, Co. Meath	Development will consist of the importation of 230,000 m3 (345,000 tonnes) of Article 27 (as defined by European communities (Waste Directive) Regulations 2011) uncontaminated soil and stone as a non-waste by product over a five year period to improve 12 hectares of agricultural lands where: The further use of the stone is certain and will be used to recontour and improve the agricultural lands; The soil and stone can be used directly without further processing. The soil and stone will be an integral part of a production process i.e. soil will be excavated, moved to facilitate site development in accordance with Article 27 by a material producer or with the expressed written consent of a material producer and will be notifiable to the EPA as a by - product prior to its use on lands. The proposed further use of the soil and stone fulfils all relevant product, environmental and health protection requirements for the specific use and will not lead to overall adverse environmental or human health impacts. An Environmental Impact Assessment Report and a screening report for Appropriate Assessment accompanies the application.	Decision: Conditional Grant date: 18/05/2021
Ref: 21795 Applicant: Knockharley Cricket Club, c/o Duncan Grehan Location: Veldonstown, Brownstown, Navan, Co Meath	The development will consist of refurbishment works to the practice area within the grounds of Knockharley Cricket Club to include replacement of the existing laid out artificial surface & surrounding netted cage comprising total area of 30 meters length x 8 meters width x 3.5 meters height.	Decision: Conditional Grant date: 05/08/2021

Appendix 5.1

NRA/TII Criteria for Rating the Magnitude and Significance of Soils and Geological Impacts at EIA Stage National Roads Authority

AWN Consulting Ltd, The Tecpro Building, IDA Business & Technology Park, Clonshaugh, Dublin 17, D17 XD90

Table 1 Criteria for rating site Attributes – Estimation of Importance of Soil and Geology Attributes (NRA)

Importance	Criteria	Typical Examples
Very High	Attribute has a high quality, significance or value on a regional or national scale Degree or extent of soil contamination is significant on a national or regional scale Volume of peat and/or soft organic soil underlying route is significant on a national or regional scale*	Geological feature rare on a regional or national scale (NHA) Large existing quarry or pit Proven economically extractable mineral resource
High	Attribute has a high quality, significance or value on a local scale. Degree or extent of soil contamination is significant on a local scale. Volume of peat and/or soft organic soil underlying route is significant on a local scale. *	Contaminated soil on site with previous heavy industrial usage Large recent landfill site for mixed wastes Geological feature of high value on a local scale (County Geological Site) Well drained and/or high fertility soils Moderately sized existing quarry or pit Marginally economic extractable mineral resource
Medium	Attribute has a medium quality, significance or value on a local scale Degree or extent of soil contamination is moderate on a local scale Volume of peat and/or soft organic soil underlying route is moderate on a local scale*	Contaminated soil on site with previous light industrial usage Small recent landfill site for mixed wastes Moderately drained and/or moderate fertility soils Small existing quarry or pit Sub-economic extractable mineral resource
Low	Attribute has a low quality, significance or value on a local scale Degree or extent of soil contamination is minor on a local scale. Volume of peat and/or soft organic soil underlying route is small on a local scale*	Large historical and/or recent site for construction and demolition wastes. Small historical and/or recent landfill site for construction and demolition wastes. Poorly drained and/or low fertility soils. Uneconomically extractable mineral resource.

** relative to the total volume of inert soil disposed of and/or recovered*
Source: Box 4.1: 'Guidelines on Procedures for Assessment and Treatment of Geology for National Road Schemes' by the National Roads Authority (NRA, 2009)

Table 2 Criteria for Rating Impact Significance at EIA Stage - Estimation Of Magnitude of Impact on Soil / Geology Attribute (NRA)

Magnitude of Impact	Criteria	Typical Examples
Large Adverse	Results in loss of attribute	Loss of high proportion of future quarry or pit reserves Irreversible loss of high proportion of local high fertility soils Removal of entirety of geological heritage feature Requirement to excavate / remediate entire waste site Requirement to excavate and replace high proportion of peat, organic soils and/or soft mineral soils beneath alignment
Moderate Adverse	Results in impact on integrity of attribute or loss of part of attribute	Loss of moderate proportion of future quarry or pit reserves Removal of part of geological heritage feature Irreversible loss of moderate proportion of local high fertility soils Requirement to excavate / remediate significant proportion of waste site Requirement to excavate and replace moderate proportion of peat, organic soils and/or soft mineral soils benath alignment
Small Adverse	Results in minor impact on integrity of attribute or loss of small part of attribute	Loss of small proportion of future quarry or pit reserves Removal of small part of geological heritage feature Irreversible loss of small proportion of local high fertility soils and/or high proportion of local low fertility soils Requirement to excavate / remediate small proportion of waste site Requirement to excavate and replace small proportion of peat, organic soils and/or soft mineral soils beneath alignment
Negligible	Results in an impact on attribute but of insufficient magnitude to affect either use or integrity	No measurable changes in attributes
Minor Beneficial	Results in minor improvement of attribute quality	Minor enhancement of geological heritage feature
Moderate Beneficial	Results in moderate improvement of attribute quality	Moderate enhancement of geological heritage feature
Major Beneficial	Results in major improvement of attribute quality	Major enhancement of geological heritage feature

Source: Box 5.1: 'Guidelines on Procedures for Assessment and Treatment of Geology, for National Road Schemes' by the National Roads Authority (NRA, 2009)

Table 3 Rating of Significant Environmental Impacts at EIA Stage (NRA)

Importance of Attribute	Magnitude of Importance			
	Negligible	Small Adverse	Moderate Adverse	Large Adverse
Extremely High	Imperceptible	Significant	Profound	Profound
Very High	Imperceptible	Significant/moderate	Profound/Significant	Profound
High	Imperceptible	Moderate/Slight	Significant/moderate	Profound/Significant
Medium	Imperceptible	Slight	Moderate	Significant
Low	Imperceptible	Imperceptible	Slight	Slight/Moderate

Source: Box 5.4: Guidelines on Procedures for Assessment and Treatment of Geology for National Road Schemes' by the National Roads Authority (NRA, 2009)

Appendix 5.2
Laboratory Testing

AWN Consulting Ltd, The Tecpro Building, IDA Business & Technology Park, Clonshaugh, Dublin 17, D17 XD90

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Ireland

Attention :	Iain Williams
Date :	1st August, 2025
Your reference :	247501.0517
Our reference :	Test Report 25/12215 Batch 1
Location :	Knockharley
Date samples received :	25th July, 2025
Status :	Final Report
Issue :	202508011151

Six samples were received for analysis on 25th July, 2025 of which six were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

The greenhouse gas emissions generated (in Carbon – Co2e) to obtain the results in this report are estimated as:

Scope 1&2 emissions - 6.299 kg of CO2

Scope 1&2&3 emissions - 14.886 kg of CO2

Authorised By:

Bruce Leslie
Project Manager

Please include all sections of this report if it is reproduced

Client Name: AWN Consulting
Reference: 247501.0517
Location: Knockharley
Contact: Iain Williams
EMT Job No: 25/12215

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
$H=H_2SO_4$, Z=ZnAc, N=NaOH, $HN=HN0_3$

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	1-11	12-22	23-33	34-44	45-55	56-66					LOD/LOR	Units	Method No.
Sample ID	105S	105S (B)	108S	108S (B)	107S	107S (B)							
Depth													
COC No / misc													
Containers	V H HN N P G	V H HN N P G	V H HN N P G	V H HN N P G	V H HN N P G	V H HN N P G							
Sample Date	22/07/2025	22/07/2025	23/07/2025	23/07/2025	23/07/2025	23/07/2025							
Sample Type	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water							
Batch Number	1	1	1	1	1	1							
Date of Receipt	25/07/2025	25/07/2025	25/07/2025	25/07/2025	25/07/2025	25/07/2025							
PAH MS													
Naphthalene #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1					<0.1	ug/l	TM4/PM30
Acenaphthylene #	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005					<0.005	ug/l	TM4/PM30
Acenaphthene #	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005					<0.005	ug/l	TM4/PM30
Fluorene #	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005					<0.005	ug/l	TM4/PM30
Phenanthrene #	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005					<0.005	ug/l	TM4/PM30
Anthracene #	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005					<0.005	ug/l	TM4/PM30
Fluoranthene #	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005					<0.005	ug/l	TM4/PM30
Pyrene #	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005					<0.005	ug/l	TM4/PM30
Benzo(a)anthracene #	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005					<0.005	ug/l	TM4/PM30
Chrysene #	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005					<0.005	ug/l	TM4/PM30
Benzo(bk)fluoranthene #	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008					<0.008	ug/l	TM4/PM30
Benzo(a)pyrene #	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005					<0.005	ug/l	TM4/PM30
Indeno(123cd)pyrene #	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005					<0.005	ug/l	TM4/PM30
Dibenzo(ah)anthracene #	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005					<0.005	ug/l	TM4/PM30
Benzo(ghi)perylene #	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005					<0.005	ug/l	TM4/PM30
PAH 16 Total #	<0.173	<0.173	<0.173	<0.173	<0.173	<0.173					<0.173	ug/l	TM4/PM30
Benzo(b)fluoranthene	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008					<0.008	ug/l	TM4/PM30
Benzo(k)fluoranthene	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008					<0.008	ug/l	TM4/PM30
PAH Surrogate % Recovery	83	80	85	83	86	83					<0	%	TM4/PM30
MTBE #	<5	<5	<5	<5	<5	<5					<5	ug/l	TM36/PM12
Benzene #	<5	<5	<5	<5	<5	<5					<5	ug/l	TM36/PM12
Toluene #	<5	<5	<5	<5	<5	<5					<5	ug/l	TM36/PM12
Ethylbenzene #	<5	<5	<5	<5	<5	<5					<5	ug/l	TM36/PM12
m/p-Xylene #	<5	<5	<5	<5	<5	<5					<5	ug/l	TM36/PM12
o-Xylene #	<5	<5	<5	<5	<5	<5					<5	ug/l	TM36/PM12
TPH CWG													
Aliphatics													
>C5-C6 (HS_1D_AL) #	<10	<10	<10	<10	<10	<10					<10	ug/l	TM36/PM12
>C6-C8 (HS_1D_AL) #	<10	<10	<10	<10	<10	<10					<10	ug/l	TM36/PM12
>C8-C10 (HS_1D_AL) #	<10	<10	<10	<10	<10	<10					<10	ug/l	TM36/PM12
>C10-C12 (EH_CU_1D_AL) #	<5	<5	<5	<5	<5	<5					<5	ug/l	TM5/PM16/PM30
>C12-C16 (EH_CU_1D_AL) #	<10	<10	<10	<10	<10	<10					<10	ug/l	TM5/PM16/PM30
>C16-C21 (EH_CU_1D_AL) #	<10	<10	<10	<10	<10	<10					<10	ug/l	TM5/PM16/PM30
>C21-C35 (EH_CU_1D_AL) #	<10	<10	<10	<10	<10	<10					<10	ug/l	TM5/PM16/PM30
>C35-C44 (EH_CU_1D_AL)	<10	<10	<10	<10	<10	<10					<10	ug/l	TM5/PM16/PM30
Total aliphatics C5-44 (EH_CU+HS_1D_AL)	<10	<10	<10	<10	<10	<10					<10	ug/l	TM5/TM36/PM12/PM16/PM30

Element Materials Technology

Client Name: AWN Consulting
Reference: 247501.0517
Location: Knockharley
Contact: Iain Williams
EMT Job No: 25/12215

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
$H=H_2SO_4$, Z=ZnAc, N=NaOH, $HN=HN0_3$

EMT Sample No.	1-11	12-22	23-33	34-44	45-55	56-66							
Sample ID	105S	105S (B)	108S	108S (B)	107S	107S (B)							
Depth													
COC No / misc													
Containers	V H HN N P G	V H HN N P G	V H HN N P G	V H HN N P G	V H HN N P G	V H HN N P G							
Sample Date	22/07/2025	22/07/2025	23/07/2025	23/07/2025	23/07/2025	23/07/2025							
Sample Type	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water							
Batch Number	1	1	1	1	1	1							
Date of Receipt	25/07/2025	25/07/2025	25/07/2025	25/07/2025	25/07/2025	25/07/2025							
TPH CWG													
Aromatics													
>C5-EC7 (HS_1D_AR)#	<10	<10	<10	<10	<10	<10					<10	ug/l	TM36/PM12
>EC7-EC8 (HS_1D_AR)#	<10	<10	<10	<10	<10	<10					<10	ug/l	TM36/PM12
>EC8-EC10 (HS_1D_AR)#	<10	<10	<10	<10	<10	<10					<10	ug/l	TM36/PM12
>EC10-EC12 (EH_CU_1D_AR)#	<5	<5	<5	<5	<5	<5					<5	ug/l	TM5/PM16/PM30
>EC12-EC16 (EH_CU_1D_AR)#	<10	<10	<10	<10	<10	<10					<10	ug/l	TM5/PM16/PM30
>EC16-EC21 (EH_CU_1D_AR)#	<10	<10	<10	<10	<10	<10					<10	ug/l	TM5/PM16/PM30
>EC21-EC35 (EH_CU_1D_AR)#	<10	<10	<10	<10	<10	<10					<10	ug/l	TM5/PM16/PM30
>EC35-EC44 (EH_CU_1D_AR)	<10	<10	<10	<10	<10	<10					<10	ug/l	TM5/PM16/PM30
Total aromatics C5-44 (EH_CU+HS_1D_AR)	<10	<10	<10	<10	<10	<10					<10	ug/l	TM5/TM36/PM12/PM16/PM30
Total aliphatics and aromatics(C5-44) (EH_CU+HS_1D_Total)	<10	<10	<10	<10	<10	<10					<10	ug/l	TM5/TM36/PM12/PM16/PM30

Please see attached notes for all abbreviations and acronyms

Please include all sections of this report if it is reproduced
All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name: AWN Consulting
Reference: 247501.0517
Location: Knockharley
Contact: Iain Williams

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason
No deviating sample report results for job 25/12215						

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.
It is a requirement under ISO 17025 that we inform clients if samples are deviating i.e. outside what is expected. A deviating sample indicates that the sample 'may' be compromised but not necessarily will be compromised. The result is still accredited and our analytical reports will still show accreditation on the relevant analytes.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 25/12215

SOILS and ASH

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary. Asbestos samples are retained for 6 months.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C. Ash samples are dried at 35°C ±5°C.

Where Mineral Oil is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil is quoted, this refers to Total Aliphatics C10-C40.

STACK EMISSIONS

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation for Dioxins and Furans and Dioxin like PCBs has been performed on XAD-2 Resin, only samples which use this resin will be within our MCERTS scope.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a requirement of our Accreditation Body for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.
Laboratory records are kept for a period of no less than 6 years.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

Customer Provided Information

Sample ID and depth is information provided by the customer.

Age of Diesel

The age of release estimation is based on the nC17/pristane ratio only as prescribed by Christensen and Larsen (1993) and Kaplan, Galperin, Alimi et al., (1996).
Age estimation should be treated with caution as it can be influenced by site specific factors of which the laboratory are not aware.

Tentatively Identified Compounds (TICs)

Where Tentatively Identified Compounds (TICs) are reported, up to 10 Tentatively Identified Compounds will be listed where there is found to be a greater than 80% match with the NIST library. The reported concentration is determined semi-quantitively, with a matrix specific limit of detection. Note, other compounds may be present but are not reported.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above quantitative calibration range. The result should be considered the minimum value and is indicative only. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 25/12215

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM16/PM30	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE/Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM16/PM30	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE/Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM5/TM36	please refer to TM5 and TM36 for method details	PM12/PM16/PM30	please refer to PM16/PM30 and PM12 for method details				
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes			

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F: +44 (0) 1244 833781
W: www.element.com

AWN Consulting
Tecpro Building
Clonshaugh Business & Technology Park
Dublin
Dublin 17
Ireland

Attention :	Iain Williams
Date :	4th August, 2025
Your reference :	Knockharley Landfill
Our reference :	Test Report 25/12316 Batch 1
Location :	Knockharley
Date samples received :	28th July, 2025
Status :	Final Report
Issue :	202508041502

Four samples were received for analysis on 28th July, 2025 of which four were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

The greenhouse gas emissions generated (in Carbon – Co2e) to obtain the results in this report are estimated as:

Scope 1&2 emissions - 4.054 kg of CO2

Scope 1&2&3 emissions - 9.582 kg of CO2

Authorised By:



Sean Anglish
Project Coordinator

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: AWN Consulting
Reference: Knockharley Landfill
Location: Knockharley
Contact: Iain Williams
EMT Job No: 25/12316

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
$H=H_2SO_4$, Z=ZnAc, N=NaOH, $HN=HN0_3$

EMT Sample No.	1-11	12-22	23-33	34-44							LOD/LOR	Units	Method No.
Sample ID	BH106S	BH106S (B)	BH104S	BH104S (B)									
Depth													
COC No / misc													
Containers	V H HN N P G	V H HN N P G	V H HN N P G	V H HN N P G									
Sample Date	24/07/2025 12:00	24/07/2025 12:00	25/07/2025 11:00	25/07/2025 11:00									
Sample Type	Ground Water	Ground Water	Ground Water	Ground Water									
Batch Number	1	1	1	1									
Date of Receipt	28/07/2025	28/07/2025	28/07/2025	28/07/2025									
PAH MS													
Naphthalene #	<0.1	<0.1	<0.1	<0.1							<0.1	ug/l	TM4/PM30
Acenaphthylene #	<0.005	<0.005	<0.005	<0.005							<0.005	ug/l	TM4/PM30
Acenaphthene #	<0.005	<0.005	<0.005	<0.005							<0.005	ug/l	TM4/PM30
Fluorene #	<0.005	<0.005	<0.005	<0.005							<0.005	ug/l	TM4/PM30
Phenanthrene #	<0.005	<0.005	<0.005	0.009							<0.005	ug/l	TM4/PM30
Anthracene #	<0.005	<0.005	<0.005	<0.005							<0.005	ug/l	TM4/PM30
Fluoranthene #	<0.005	<0.005	<0.005	<0.005							<0.005	ug/l	TM4/PM30
Pyrene #	<0.005	<0.005	<0.005	<0.005							<0.005	ug/l	TM4/PM30
Benzo(a)anthracene #	<0.005	<0.005	<0.005	<0.005							<0.005	ug/l	TM4/PM30
Chrysene #	<0.005	<0.005	<0.005	<0.005							<0.005	ug/l	TM4/PM30
Benzo(bk)fluoranthene #	<0.008	<0.008	<0.008	<0.008							<0.008	ug/l	TM4/PM30
Benzo(a)pyrene #	<0.005	<0.005	<0.005	<0.005							<0.005	ug/l	TM4/PM30
Indeno(123cd)pyrene #	<0.005	<0.005	<0.005	<0.005							<0.005	ug/l	TM4/PM30
Dibenzo(ah)anthracene #	<0.005	<0.005	<0.005	<0.005							<0.005	ug/l	TM4/PM30
Benzo(ghi)perylene #	<0.005	<0.005	<0.005	<0.005							<0.005	ug/l	TM4/PM30
PAH 16 Total #	<0.173	<0.173	<0.173	<0.173							<0.173	ug/l	TM4/PM30
Benzo(b)fluoranthene	<0.008	<0.008	<0.008	<0.008							<0.008	ug/l	TM4/PM30
Benzo(k)fluoranthene	<0.008	<0.008	<0.008	<0.008							<0.008	ug/l	TM4/PM30
PAH Surrogate % Recovery	68 SV	85	79	83							<0	%	TM4/PM30
MTBE #	<5	<5	<5	<5							<5	ug/l	TM36/PM12
Benzene #	<5	<5	<5	<5							<5	ug/l	TM36/PM12
Toluene #	<5	<5	<5	<5							<5	ug/l	TM36/PM12
Ethylbenzene #	<5	<5	<5	<5							<5	ug/l	TM36/PM12
m/p-Xylene #	<5	<5	<5	<5							<5	ug/l	TM36/PM12
o-Xylene #	<5	<5	<5	<5							<5	ug/l	TM36/PM12
TPH CWG													
Aliphatics													
>C5-C6 (HS_1D_AL) #	<10	<10	<10	<10							<10	ug/l	TM36/PM12
>C6-C8 (HS_1D_AL) #	<10	<10	<10	<10							<10	ug/l	TM36/PM12
>C8-C10 (HS_1D_AL) #	<10	<10	<10	<10							<10	ug/l	TM36/PM12
>C10-C12 (EH_CU_1D_AL) #	<5	<5	<5	<5							<5	ug/l	TM5/PM16/PM30
>C12-C16 (EH_CU_1D_AL) #	<10	<10	<10	<10							<10	ug/l	TM5/PM16/PM30
>C16-C21 (EH_CU_1D_AL) #	<10	<10	<10	<10							<10	ug/l	TM5/PM16/PM30
>C21-C35 (EH_CU_1D_AL) #	<10	<10	<10	<10							<10	ug/l	TM5/PM16/PM30
>C35-C44 (EH_CU_1D_AL)	<10	<10	<10	<10							<10	ug/l	TM5/PM16/PM30
Total aliphatics C5-44 (EH_CU+HS_1D_AL)	<10	<10	<10	<10							<10	ug/l	TM5/TM36/PM12/PM16/PM30

Please see attached notes for all abbreviations and acronyms

Element Materials Technology

Client Name: AWN Consulting
Reference: Knockharley Landfill
Location: Knockharley
Contact: Iain Williams
EMT Job No: 25/12316

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
$H=H_2SO_4$, Z=ZnAc, N=NaOH, HN=$HN0_3$

EMT Sample No.	1-11	12-22	23-33	34-44							LOD/LOR	Units	Method No.
Sample ID	BH106S	BH106S (B)	BH104S	BH104S (B)									
Depth													
COC No / misc													
Containers	V H HN N P G	V H HN N P G	V H HN N P G	V H HN N P G									
Sample Date	24/07/2025 12:00	24/07/2025 12:00	25/07/2025 11:00	25/07/2025 11:00									
Sample Type	Ground Water	Ground Water	Ground Water	Ground Water									
Batch Number	1	1	1	1									
Date of Receipt	28/07/2025	28/07/2025	28/07/2025	28/07/2025									
TPH CWG													
Aromatics													
>C5-EC7 (HS_1D_AR)#	<10	<10	<10	<10							<10	ug/l	TM36/PM12
>EC7-EC8 (HS_1D_AR)#	<10	<10	<10	<10							<10	ug/l	TM36/PM12
>EC8-EC10 (HS_1D_AR)#	<10	<10	<10	<10							<10	ug/l	TM36/PM12
>EC10-EC12 (EH_CU_1D_AR)#	<5	<5	<5	<5							<5	ug/l	TM5/PM16/PM30
>EC12-EC16 (EH_CU_1D_AR)#	<10	<10	<10	<10							<10	ug/l	TM5/PM16/PM30
>EC16-EC21 (EH_CU_1D_AR)#	<10	<10	<10	<10							<10	ug/l	TM5/PM16/PM30
>EC21-EC35 (EH_CU_1D_AR)#	<10	<10	<10	<10							<10	ug/l	TM5/PM16/PM30
>EC35-EC44 (EH_CU_1D_AR)	<10	<10	<10	<10							<10	ug/l	TM5/PM16/PM30
Total aromatics C5-44 (EH_CU+HS_1D_AR)	<10	<10	<10	<10							<10	ug/l	TM5/TM36/PM12/PM16/PM30
Total aliphatics and aromatics(C5-44) (EH_CU+HS_1D_Total)	<10	<10	<10	<10							<10	ug/l	TM5/TM36/PM12/PM16/PM30

Please see attached notes for all abbreviations and acronyms

Client Name: AWN Consulting
Reference: Knockharley Landfill
Location: Knockharley
Contact: Iain Williams

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason
No deviating sample report results for job 25/12316						

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.
It is a requirement under ISO 17025 that we inform clients if samples are deviating i.e. outside what is expected. A deviating sample indicates that the sample 'may' be compromised but not necessarily will be compromised. The result is still accredited and our analytical reports will still show accreditation on the relevant analytes.

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NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 25/12316

SOILS and ASH

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

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It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary. Asbestos samples are retained for 6 months.

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Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C. Ash samples are dried at 35°C ±5°C.

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The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

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ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

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Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

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Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a requirement of our Accreditation Body for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
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REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

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Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

Customer Provided Information

Sample ID and depth is information provided by the customer.

Age of Diesel

The age of release estimation is based on the nC17/pristane ratio only as prescribed by Christensen and Larsen (1993) and Kaplan, Galperin, Alimi et al., (1996).
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#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
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M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above quantitative calibration range. The result should be considered the minimum value and is indicative only. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 25/12316

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM16/PM30	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE/Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM16/PM30	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE/Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM5/TM36	please refer to TM5 and TM36 for method details	PM12/PM16/PM30	please refer to PM16/PM30 and PM12 for method details				
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes			

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W: www.element.com

AWN Consulting
Tecpro Building
Clonshaugh Business & Technology Park
Dublin
Dublin 17
Ireland

Attention :	Iain Williams
Date :	4th August, 2025
Your reference :	Knockharley Landfill
Our reference :	Test Report 25/12381 Batch 1
Location :	Knockharley
Date samples received :	29th July, 2025
Status :	Final Report
Issue :	202508041549

Four samples were received for analysis on 29th July, 2025 of which four were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

The greenhouse gas emissions generated (in Carbon – Co2e) to obtain the results in this report are estimated as:

Scope 1&2 emissions - 4.054 kg of CO2

Scope 1&2&3 emissions - 9.582 kg of CO2

Authorised By:



Sean Anglish
Project Coordinator

Please include all sections of this report if it is reproduced

Client Name: AWN Consulting
Reference: Knockharley Landfill
Location: Knockharley
Contact: Iain Williams
EMT Job No: 25/12381

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
H=H_2SO_4, Z=ZnAc, N=NaOH, HN=$HN0_3$

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	1-11	12-22	23-33	34-44							LOD/LOR	Units	Method No.
Sample ID	BH101S	BH102S	BH101S (B)	BH102S (B)									
Depth													
COC No / misc													
Containers	V H HN N P G	V H HN N P G	V H HN N P G	V H HN N P G									
Sample Date	28/07/2025 14:00	28/07/2025 09:00	28/07/2025 14:00	28/07/2025 09:00									
Sample Type	Ground Water	Ground Water	Ground Water	Ground Water									
Batch Number	1	1	1	1									
Date of Receipt	29/07/2025	29/07/2025	29/07/2025	29/07/2025									
PAH MS													
Naphthalene #	<0.1	<0.1	<0.1	<0.1							<0.1	ug/l	TM4/PM30
Acenaphthylene #	<0.005	<0.005	<0.005	<0.005							<0.005	ug/l	TM4/PM30
Acenaphthene #	<0.005	<0.005	<0.005	<0.005							<0.005	ug/l	TM4/PM30
Fluorene #	<0.005	<0.005	<0.005	<0.005							<0.005	ug/l	TM4/PM30
Phenanthrene #	<0.005	<0.005	<0.005	<0.005							<0.005	ug/l	TM4/PM30
Anthracene #	<0.005	<0.005	<0.005	<0.005							<0.005	ug/l	TM4/PM30
Fluoranthene #	<0.005	<0.005	<0.005	<0.005							<0.005	ug/l	TM4/PM30
Pyrene #	<0.005	<0.005	<0.005	<0.005							<0.005	ug/l	TM4/PM30
Benzo(a)anthracene #	<0.005	<0.005	<0.005	<0.005							<0.005	ug/l	TM4/PM30
Chrysene #	<0.005	<0.005	<0.005	<0.005							<0.005	ug/l	TM4/PM30
Benzo(bk)fluoranthene #	<0.008	<0.008	<0.008	<0.008							<0.008	ug/l	TM4/PM30
Benzo(a)pyrene #	<0.005	<0.005	<0.005	<0.005							<0.005	ug/l	TM4/PM30
Indeno(123cd)pyrene #	<0.005	<0.005	<0.005	<0.005							<0.005	ug/l	TM4/PM30
Dibenzo(ah)anthracene #	<0.005	<0.005	<0.005	<0.005							<0.005	ug/l	TM4/PM30
Benzo(ghi)perylene #	<0.005	<0.005	<0.005	<0.005							<0.005	ug/l	TM4/PM30
PAH 16 Total #	<0.173	<0.173	<0.173	<0.173							<0.173	ug/l	TM4/PM30
Benzo(b)fluoranthene	<0.008	<0.008	<0.008	<0.008							<0.008	ug/l	TM4/PM30
Benzo(k)fluoranthene	<0.008	<0.008	<0.008	<0.008							<0.008	ug/l	TM4/PM30
PAH Surrogate % Recovery	72	80	70	75							<0	%	TM4/PM30
MTBE #	<5	<5	<5	<5							<5	ug/l	TM36/PM12
Benzene #	<5	<5	<5	<5							<5	ug/l	TM36/PM12
Toluene #	<5	<5	<5	<5							<5	ug/l	TM36/PM12
Ethylbenzene #	<5	<5	<5	<5							<5	ug/l	TM36/PM12
m/p-Xylene #	<5	<5	<5	<5							<5	ug/l	TM36/PM12
o-Xylene #	<5	<5	<5	<5							<5	ug/l	TM36/PM12
TPH CWG													
Aliphatics													
>C5-C6 (HS_1D_AL) #	<10	<10	<10	<10							<10	ug/l	TM36/PM12
>C6-C8 (HS_1D_AL) #	<10	<10	<10	<10							<10	ug/l	TM36/PM12
>C8-C10 (HS_1D_AL) #	<10	<10	<10	<10							<10	ug/l	TM36/PM12
>C10-C12 (EH_CU_1D_AL) #	<5	<5	<5	<5							<5	ug/l	TM5/PM16/PM30
>C12-C16 (EH_CU_1D_AL) #	<10	<10	<10	<10							<10	ug/l	TM5/PM16/PM30
>C16-C21 (EH_CU_1D_AL) #	<10	<10	<10	<10							<10	ug/l	TM5/PM16/PM30
>C21-C35 (EH_CU_1D_AL) #	<10	<10	<10	<10							<10	ug/l	TM5/PM16/PM30
>C35-C44 (EH_CU_1D_AL)	<10	<10	<10	<10							<10	ug/l	TM5/PM16/PM30
Total aliphatics C5-44 (EH_CU+HS_1D_AL)	<10	<10	<10	<10							<10	ug/l	TM5/TM36/PM12/PM16/PM30

Element Materials Technology

Client Name: AWN Consulting
Reference: Knockharley Landfill
Location: Knockharley
Contact: Iain Williams
EMT Job No: 25/12381

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
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Sample Type	Ground Water	Ground Water	Ground Water	Ground Water									
Batch Number	1	1	1	1									
Date of Receipt	29/07/2025	29/07/2025	29/07/2025	29/07/2025									
TPH CWG													
Aromatics													
>C5-EC7 (HS_1D_AR)#	<10	<10	<10	<10							<10	ug/l	TM36/PM12
>EC7-EC8 (HS_1D_AR)#	<10	<10	<10	<10							<10	ug/l	TM36/PM12
>EC8-EC10 (HS_1D_AR)#	<10	<10	<10	<10							<10	ug/l	TM36/PM12
>EC10-EC12 (EH_CU_1D_AR)#	<5	<5	<5	<5							<5	ug/l	TM5/PM16/PM30
>EC12-EC16 (EH_CU_1D_AR)#	<10	<10	<10	<10							<10	ug/l	TM5/PM16/PM30
>EC16-EC21 (EH_CU_1D_AR)#	<10	<10	<10	<10							<10	ug/l	TM5/PM16/PM30
>EC21-EC35 (EH_CU_1D_AR)#	<10	<10	<10	<10							<10	ug/l	TM5/PM16/PM30
>EC35-EC44 (EH_CU_1D_AR)	<10	<10	<10	<10							<10	ug/l	TM5/PM16/PM30
Total aromatics C5-44 (EH_CU+HS_1D_AR)	<10	<10	<10	<10							<10	ug/l	TM5/TM36/PM12/PM16/PM30
Total aliphatics and aromatics(C5-44) (EH_CU+HS_1D_Total)	<10	<10	<10	<10							<10	ug/l	TM5/TM36/PM12/PM16/PM30

Please see attached notes for all abbreviations and acronyms

Element Materials Technology

Notification of Deviating Samples

Client Name: AWN Consulting
Reference: Knockharley Landfill
Location: Knockharley
Contact: Iain Williams

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason
No deviating sample report results for job 25/12381						

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.
It is a requirement under ISO 17025 that we inform clients if samples are deviating i.e. outside what is expected. A deviating sample indicates that the sample 'may' be compromised but not necessarily will be compromised. The result is still accredited and our analytical reports will still show accreditation on the relevant analytes.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 25/12381

SOILS and ASH

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NFD	No Fibres Detected
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HWOL ACRONYMS AND OPERATORS USED

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CU	Clean-up - e.g. by florisil, silica gel.
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Total	Aliphatics & Aromatics.
AL	Aliphatics only.
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#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 25/12381

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM16/PM30	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE/Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM16/PM30	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE/Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM5/TM36	please refer to TM5 and TM36 for method details	PM12/PM16/PM30	please refer to PM16/PM30 and PM12 for method details				
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes			

Appendix 5.3
Ground Investigation Report

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Ground Investigations Ireland

Project West Knockharley Landfill

Beauparc

Factual Ground Investigation Report

September 2025

Directors:
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C	Final	J Cashen	B Sexton	C Finnerty	Dublin	26 September 2025

Ground Investigations Ireland Ltd. present the results of the fieldworks and laboratory testing in accordance with the specification and related documents provided by or on behalf of the client The possibility of variation in the ground and/or groundwater conditions between or below exploratory locations or due to the investigation techniques employed must be taken into account when this report and the appendices inform designs or decisions where such variation may be considered relevant. Ground and/or groundwater conditions may vary due to seasonal, man-made or other activities not apparent during the fieldworks and no responsibility can be taken for such variation. The data presented and the recommendations included in this report and associated appendices are intended for the use of the client and the client's geotechnical representative only and any duty of care to others is excluded unless approved in writing.

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1.0 Preamble

On the instructions of WSP, a site investigation was carried out by Ground Investigations Ireland Ltd. (GII) between May and July 2025 at the site of the proposed new landfill cell in Knockharley Landfill, Navan, County Meath.

2.0 Overview

2.1. Background

It is proposed to increase the existing landfill capacity by constructing additional cells for landfilling. At the time of the site investigation the site was brownfield and occupied reworked soil deposits assumed to be derived from the development of previous landfill cells. The site is situated in Knockharley Landfill which is located approximately 10km to the east of Navan town.

2.2. Purpose and Scope

The purpose of the site investigation was to investigate subsurface conditions utilising a variety of investigative methods in accordance with the project specification. The scope of the work undertaken for this project included the following:

- Visit project site to observe existing conditions
- Completion of eight (8 No.) rotary core *Geobore S* boreholes to a maximum depth of 29.50m BGL in the proposed new cell
- Completion of four (4 No.) rotary core *DTH Symmetrix* boreholes to a maximum depth of 14.00m BGL in the proposed new cell
- Completion of thirty-one (31 No.) rotary core *DTH Symmetrix* boreholes to a maximum depth of 14.00m BGL around an existing cell
- Installation and development of twelve (12 No.) groundwater monitoring wells in the new cell
- Installation of thirty-one (31 No.) gas monitoring wells in the existing cell
- Completion of six (6 No.) falling head permeability tests
- Installation of eleven (11 No.) water level data loggers
- Environmental and geotechnical laboratory testing
- Factual Report

3.0 Subsurface Exploration

3.1. General

During the ground investigation a programme of intrusive investigation specified by the Consulting Engineer was undertaken to determine the sub surface conditions at the proposed site. Regular sampling and in-situ testing were undertaken in the exploratory holes to facilitate the geotechnical descriptions and to enable laboratory testing to be carried out on the soil samples recovered during excavation and drilling.
The procedures used in this site investigation are in accordance with Eurocode 7 Part 2: Ground Investigation and testing (ISEN 1997 – 2:2007) and B.S. 5930:2015+A1:2020.

3.2. Rotary Boreholes

The rotary coring was carried out by a track mounted T44 Beretta rig at the locations shown on the location plan in Appendix 1. The rotary boreholes were completed from the ground surface.
The T44 Beretta is equipped with rubber tracks which allow for short travel on pavement surfaces avoiding any damage to the surface. The T44 Beretta utilises a triple tube core barrel system operated using a wireline drilling process. The outer barrel is rotated by the drill rods and at its lower end, carries the coring bit. The inner barrel is mounted on a swivel so that it does not rotate during the process. The third barrel or liner is placed within the second one to retain the core intact and to preserve as much as possible the fabric of the drilling stratum. The core is cut by the coring bit and passes to the inner liner. The core is brought up to the surface within the inner barrel on a small diameter wire rope or line attached to the “overshoot” recovery tool which is then placed into a core box in order of recovery. A drilling fluid, typically air mist or water flush is passed from the surface through hollow drill rods to the drill bit and is used to cool the drill bit. Temporary casing is used in some situations to support unstable ground or to seal off fissures or voids. It should be noted that the rotary coring can only achieve limited recovery in overburden, particularly granular or weakly cemented strata due to the flushing medium washing away the cohesive fraction during coring. The recovery achieved, where required is noted on the borehole logs and core photographs are provided to allow assessment of the core recovered. The rotary geobore S borehole logs are provided in Appendix 2 of this report. Air drilling in the form of down-the-hole (DTH) Symmetrix drilling was utilised at BH101T, BH106T, BH107T, BH108T. The DTH borehole logs are included in Appendices 3 and 4 of this report.

3.3. Falling Head Permeability Testing

Falling head permeability testing were carried out in five of the standpipes as requested to determine the permeability of the overburden. The initial water level was recorded and a data logger installed. The standpipe was filled with clean potable water from IBC to ground level and the drop-in water level was recorded at regular intervals manually (dipmeter) and automatically (data logger). The recorded test data can be used to calculate the permeability value based on the methods outlined in B.S. 5930:2015 and IS EN ISO 22282-2:2012. The manual and automatic water measurements are provided in Appendix 5 and Appendix 6 of this report, respectively.

3.4. Surveying

The exploratory hole locations have been recorded using a KQGeo M8 GNSS System which records the coordinates and elevation of the locations to Irish Transverse Mercator (ITM) as required by the project specification. The coordinates and elevations are provided on the exploratory hole logs in the appendices of this Report.

3.5. Groundwater/Gas Monitoring Installations

Groundwater/Gas monitoring installations were installed upon the completion of the boreholes to enable sampling and the determination of the equilibrium groundwater level. The typical groundwater monitoring installation consists of a 50mm uPVC/HDPE slotted pipe with a pea gravel response zone and bentonite seal installed to the Engineers specification. Where required the standpipe is sealed with a gas tap and finished with a durable steel cover fixed in place with a concrete surround. The installation details are provided on the exploratory hole logs in the appendices of this Report. Each well was purged a minimum of three times and until the water parameters stabilised. Five of the wells were air lifted using a compressor and the addition of potable water. The groundwater monitoring and sampling data is included in Appendices 7, 8 and 9 of this report.

3.6. Laboratory Testing

Samples were selected from the exploratory holes for a range of environmental and geotechnical testing to assist in the classification of soils and to provide information for the proposed design.
Environmental soil testing as required by the specification, including the Rilta Suite, major Anions and Cations, heavy metals, VOCs and SVOCs testing was carried out by Element Materials Technology Laboratory (EMTL) in the United Kingdom (UK). The Rilta suite testing includes both Solid Waste and Leachate Waste Acceptance Criteria. Groundwater testing was also completed by EMTL and included parameters the following parameters:

- Major Anions Ca, Mg, Na, K
- Major cations Sulphate, Chloride, Fluoride, Total alkalinity
- Orthophosphate
- Ammoniacal Nitrogen as N
- Total Oxidised Nitrogen (as N)
- Total cyanide
- Total organic carbon
- COD
- BOD5
- TSS
- VOCs
- SVOCs
- TPHCWG C44 with Chromatogram ID

- Speciated chlorinated Phenols
- Speciated PAHs (17)
- Combined pesticides suite
- Acid pesticides
- Total and faecal coliforms
- Dissolved methane

Geotechnical testing consisting of moisture content, Atterberg limits, Particle Size Distribution (PSD) wet sieve and hydrometer tests were completed by Professional Soils Laboratory (PSL) in the UK. Specialist shear strength and permeability testing consisting of quick undrained, consolidated undrained triaxial, and permeability in a triaxial cell tests were also completed by PSL on undisturbed samples.
The results of the laboratory testing are included in Appendix 10 of this Report.

4.0 Ground Conditions

4.1. General

The ground conditions encountered during the investigation are summarised below with reference to in-situ and laboratory test results. The full details of the strata encountered during the ground investigation are provided in the exploratory hole logs included in the appendices of this report.

The sequence of strata encountered was variable across the site but generally comprised;

- Made Ground
- Cohesive Deposits
- Granular Deposits
- Bedrock

MADE GROUND: Made Ground deposits were encountered from ground level at BH105S and extended to a depth 8.00m BGL. These deposits were described generally as *brown slightly sandy gravelly Clay with low cobble and boulder content.*

COHESIVE DEPOSITS: Cohesive deposits were encountered from ground level at most locations and beneath the made ground at BH105S and were described typically as *brown slightly sandy gravelly CLAY with low cobble and boulder content* overlying a *grey / dark grey slightly sandy gravelly CLAY with low cobble and boulder content*. The secondary sand and gravel constituents varied across the site and with depth, with granular lenses occasionally present in the glacial till matrix. These deposits had low (<5%), medium (5%-20%) or high (20%-50%) cobble and boulder content, where noted on the exploratory hole logs.

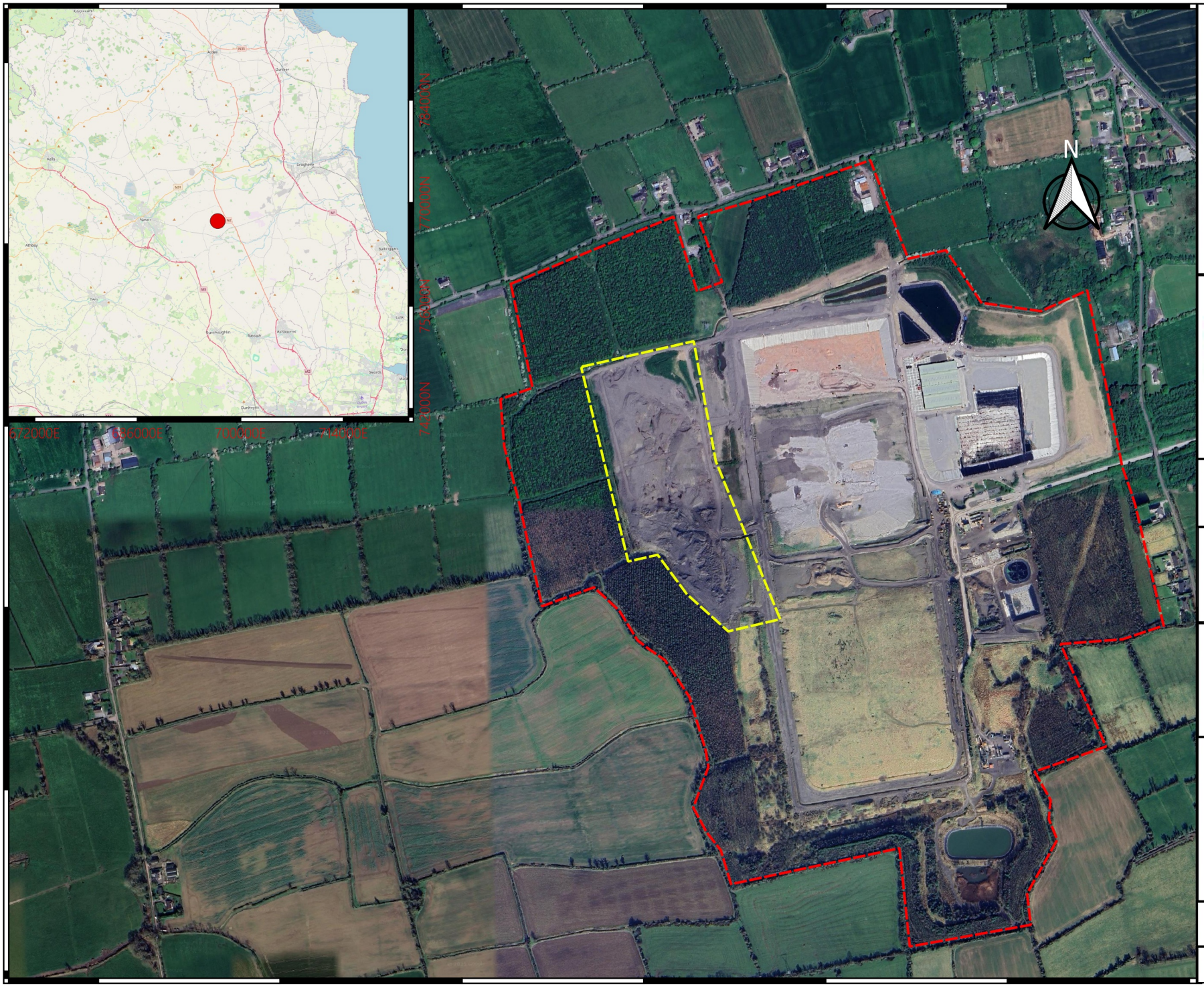
GRANULAR DEPOSITS: Granular deposits were noted within the cohesive deposits at BH102S and were typically described as SAND and GRAVEL on the logs. This was due to the poor recovery of the material in the Geobore S liners.

BEDROCK: The rotary core boreholes recovered *very weak to weak thinly to medium bedded grey fine to medium grained SANDSTONE with interbeds of Siltstone.* This is typical of the Balrickard Formation, which is noted on Geological Survey Ireland's (GSI) geological mapping of the site. The degree of weathering ranged from slightly to highly weathered. The depth to rock varies from 14.30m BGL in BH106S to a maximum of 28.00m BGL in BH105S.

4.2. Groundwater

Groundwater strikes are included on the DTH borehole logs where they were noted but are not included in the Geobore S borehole logs. This is because water strikes cannot be accurately identified during rotary Geobore S drilling as water is added as part of the drilling process. Groundwater levels would be expected to vary with the time of year, rainfall, nearby construction, and other factors. For this reason, standpipes were installed in all boreholes to allow the equilibrium groundwater level to be determined. The groundwater monitoring is included in Appendices 7 and 8 of this Report.

APPENDIX 1 - Figures



Client:

wsp

Project Code:
14656-04-25

Project Title:
Project West Knockharley Landfill

Drawing Title:
Figure 1 Site Location

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0 32 64 96 128 160 m

Drawn By:	Date:
JC	16-09-2025



Indicative Cell Boundary

DTH Symmetrix Rotary

Geobore S Rotary

Client:

wsp

Project Code:

14656-04-25

Project Title:

Project West Knockharley Landfill

Drawing Title:

Figure 2 - New Cell Site Investigation Points

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0 20 40 60 80 100 m

Drawn By:	Date:
JC	16-09-2025



Whole Site Indicative Boundary

Gas Well

Client:

wsp

Project Code:
14656-04-25

Project Title:
Project West Knockharley Landfill

Drawing Title:
Figure 3 - Gas Well Site Investigation Points

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0 30 60 90 120 150 m

Drawn By:	Date:
JC	16-09-2025

APPENDIX 2 – Geobore S Rotary Borehole Records

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Site Project West Knockharley Landfill			**Borehole Number** BH101S
Machine : Beretta T44 **Flush :** Water + Polymer Mix **Core Dia :** 102 mm **Method :** Rotary Cored (Geobore S)	**Casing Diameter** 146mm cased to 23.50m **Location** 696740.6 E 767642.6 N	**Ground Level (mOD)** 63.59 **Dates** 15/05/2025-19/05/2025	**Client** Beauparc **Engineer** WSP / AWN	**Job Number** 14656-04-25 **Sheet** 1/3

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.00-2.50	24				C		(2.50)	Recovery consists of brown slightly sandy slightly gravelly Clay with low cobble content. Drillers notes boulder CLAY			
2.50 2.50-2.95 2.50-4.00	77				2,4/4,5,6,6 SPT(C) N=21 C	61.09	2.50 (1.50)	Stiff dark grey slightly sandy gravelly CLAY with medium cobble and low boulder content			
4.00 4.00-4.45 4.00-5.50	93				9,9/13,11,11,13 SPT(C) N=48 C	59.59	4.00 (2.70)	Very stiff dark grey slightly sandy gravelly CLAY with medium cobble and low boulder content			
5.50 5.50-5.95 5.50-7.00	100				10,10/11,12,12,12 SPT(C) N=47 C	56.89	6.70	Very stiff dark brownish grey slightly sandy gravelly CLAY with medium cobble and low boulder content			
7.00 7.00-7.45 7.00-8.50 7.00-8.50 7.80-8.20	97				9,11/11,9,10,11 SPT(C) N=41 B C U						
8.50 8.50-8.95 8.50-10.00 8.50-10.00 9.10-9.50	100				12,12/12,13,13,16 SPT(C) N=54 B C U						
10.00											

Remarks
Borehole complete at 23.50m BGL
50mm plain standpipe from 23.50m to 21.50m BGL and 3.50m BGL to GL. 50mm slotted standpipe from 21.50m to 3.50m BGL.
Bentoninte seal from 23.50m to 21.50m BGL and 3.50m to 1.00m BGL. Sand pack from 21.50m to 21.20m BGL and 4.00m to 3.50m BGL. Gravel pack from 21.20m to 4.00mBGL and 1.00m BGL up.
Finished with a raised cover and concrete cap.

Scale (approx)	Logged By
1:50	JK

Figure No. 14656-04-25.BH101S

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Site Project West Knockharley Landfill			**Borehole Number** BH101S
Machine : Beretta T44 **Flush :** Water + Polymer Mix **Core Dia :** 102 mm **Method :** Rotary Cored (Geobore S)	**Casing Diameter** 146mm cased to 23.50m **Location** 696740.6 E 767642.6 N	**Ground Level (mOD)** 63.59 **Dates** 15/05/2025-19/05/2025	**Client** Beauparc **Engineer** WSP / AWN	**Job Number** 14656-04-25 **Sheet** 2/3

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
10.00-10.45 10.00-11.50 10.00-12.00	100				11,12/13,13,16,24 SPT(C) N=66 C ES						
11.50 11.50-11.95 11.50-13.00 12.00-14.00	87				1,7/10,13,17,32 SPT(C) N=72 C ES		(12.30)	(11.30m to 11.35m BGL) Sand lens			
13.00 13.00-13.45 13.00-14.50 14.00-16.00	93				6,10/12,14,19,30 SPT(C) N=75 C ES						
14.50 14.50-16.00	100				C						
16.00 16.00-17.50 16.00-18.00	100				C ES						
17.50 17.50-19.00 18.00-19.00	100				C ES						
19.00 19.00-20.50 19.00-21.00	93				C ES	44.59	19.00	Very stiff dark grey slightly sandy gravelly CLAY with high cobble and low boulder content (19.50m to 19.65m BGL) Gravel lens - Clay washed out by drilling rig			

Remarks

Scale (approx)	Logged By
1:50	JK

Figure No. 14656-04-25.BH101S

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Site Project West Knockharley Landfill			**Borehole Number** BH101S
Machine : Beretta T44 **Flush :** Water + Polymer Mix **Core Dia :** 102 mm **Method :** Rotary Cored (Geobore S)	**Casing Diameter** 146mm cased to 23.50m	**Ground Level (mOD)** 63.59	**Client** Beauparc	**Job Number** 14656-04-25
	Location 696740.6 E 767642.6 N	**Dates** 15/05/2025-19/05/2025	**Engineer** WSP / AWN	**Sheet** 3/3

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
							(2.20)				
20.50 20.50-22.00	93				C	42.39	21.20	Dark grey clayey angular to subangular fine to coarse GRAVEL (possible weathered bedrock) (20.50m to 22.00m BGL) Possible drilling grease noted in recovered liner			
							(0.80)				
22.00 22.00-23.50	93	26	0	NI	C	41.59	22.00	Weak to moderately weak medium bedded grey fine to medium grained SANDSTONE with interbeds of Siltstone. Slightly to moderately weathered (22.00m to 23.50m BGL) Mostly non intact			
							(1.50)				
23.50						40.09	23.50	Complete at 23.50m			

Remarks

Scale (approx)	Logged By
1:50	JK

Figure No. 14656-04-25.BH101S

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Site Project West Knockharley Landfill			**Borehole Number** BH102S
Machine : Beretta T44 **Flush :** Water + Polymer Mix **Core Dia :** 102 mm **Method :** Rotary Cored (Geobore S)	**Casing Diameter** 146mm cased to 28.00m **Location** 696778.6 E 767507.3 N	**Ground Level (mOD)** 64.91 **Dates** 20/05/2025-23/05/2025	**Client** Beauparc **Engineer** WSP / AWN	**Job Number** 14656-04-25 **Sheet** 1/3

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.00-2.50	28				C		(2.50)	Recovery consists of brown slightly sandy slightly gravelly Clay. Driller notes brown CLAY onto SAND and GRAVEL.			
2.50 2.50-2.95 2.50-4.00	23				2,3/6,9,9,10 SPT(C) N=34 C	62.41	2.50 (2.00)	Recovery consists of grey slightly clayey slightly sandy fine to coarse Gravel with low cobble content. Driller notes clayey SAND and GRAVEL (Dense)			
4.00 4.00-4.45 4.00-5.50					6,20/22,22,15,20 SPT(C) N=79 C						
4.50-11.50	100				ES	60.41 60.11 59.71	4.50 (0.30) 4.80 (0.40) 5.20	Very stiff dark brownish grey slightly sandy gravelly CLAY with low cobble content Very stiff grey slightly sandy gravelly CLAY with low cobble and boulder content Very stiff dark brownish grey slightly sandy gravelly CLAY with low cobble and boulder content			
5.50 5.50-5.95 5.50-7.00	100				6,10/11,10,12,13 SPT(C) N=46 C						
7.00 7.00-7.45 7.00-8.50	67				5,6/22,10,9,10 SPT(C) N=51 C			(7.35m to 7.50m BGL) Dark brownish grey slightly clayey gravelly medium to coarse Sand lens			
8.50 8.50-8.95 8.50-10.00					4,5/2,7,8,10 SPT(C) N=27 C						
9.20-10.20	97				B		(7.90)				
10.00											

Remarks
Borehole complete at 28.00m BGL
50mm plain standpipe from 28.00m to 27.00m BGL and 6.00m BGL to GL. 50mm slotted standpipe from 27.00m to 6.00m BGL.
Bentoninte seal from 28.00m to 27.00m BGL and 5.80m to 1.00m BGL. Sand pack from 27.00m to 26.70m BGL and 6.10m to 5.80m BGL. Gravel pack from 26.70m to 6.10mBGL and 1.00m BGL up.
Finished with a raised cover and concrete cap.

Scale (approx)	Logged By
1:50	JK

Figure No. 14656-04-25.BH102S

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Site Project West Knockharley Landfill			**Borehole Number** BH102S
Machine : Beretta T44 **Flush :** Water + Polymer Mix **Core Dia :** 102 mm **Method :** Rotary Cored (Geobore S)	**Casing Diameter** 146mm cased to 28.00m	**Ground Level (mOD)** 64.91	**Client** Beauparc	**Job Number** 14656-04-25
	Location 696778.6 E 767507.3 N	**Dates** 20/05/2025-23/05/2025	**Engineer** WSP / AWN	**Sheet** 2/3

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
10.00-10.45 10.00-11.50					6,6/7,10,12,14 SPT(C) N=43 C						
10.70-11.80	80				B						
11.50 11.50-13.00 11.50-13.10 11.80-12.20	93				C ES U						
13.00 13.00-14.50 13.10-14.50	83				C ES	51.81	13.10 (1.40)	Very stiff dark grey slightly sandy gravelly CLAY with low cobble content			
14.50 14.50-16.00	40				C	50.41	14.50 (1.90)	Recovery consists of grey slightly clayey slightly sandy subangular to subrounded medium to coarse Gravel with low cobble and boulder content. Driller notes SAND and GRAVEL.			
16.00 16.00-17.50 16.40-18.40	87				C ES	48.51	16.40	Very stiff dark grey slightly sandy gravelly CLAY with medium cobble and low boulder content			
17.50 17.50-19.00 18.40-19.80	87				C ES		(3.40)				
19.00 19.00-20.50 19.80-20.50	100				C ES	45.11	19.80	Very stiff grey slightly sandy gravelly silty CLAY			

Remarks

Scale (approx)	Logged By
1:50	JK

Figure No. 14656-04-25.BH102S

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Site Project West Knockharley Landfill			**Borehole Number** BH102S
Machine : Beretta T44 **Flush :** Water + Polymer Mix **Core Dia :** 102 mm **Method :** Rotary Cored (Geobore S)	**Casing Diameter** 146mm cased to 28.00m	**Ground Level (mOD)** 64.91	**Client** Beauparc	**Job Number** 14656-04-25
	Location 696778.6 E 767507.3 N	**Dates** 20/05/2025-23/05/2025	**Engineer** WSP / AWN	**Sheet** 3/3

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
							(0.70)	with low cobble and boulder content			
20.50 20.50-22.50	93				ES	44.41	20.50	Very stiff dark grey slightly sandy gravelly CLAY with medium cobble ad boulder content			
22.00	90						(3.00)				
23.50	93					41.41	23.50	Very stiff grey silty gravelly CLAY with medium cobble and low boulder content (23.50m to 23.60m BGL) Dark grey slightly clayey fine to coarse Sand lens			
25.00	80						(3.50)				
27.00	100	100	0	NI		37.91	27.00	Weak to moderately weak medium bedded grey fine to medium grained SANDSTONE with interbeds of Siltstone. Slightly to moderately weathered (27.00m to 28.00m BGL) Mostly non intact			
28.00						36.91	(1.00) 28.00	Complete at 28.00m			

Remarks

Scale (approx)	Logged By
1:50	JK

Figure No. 14656-04-25.BH102S

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Site Project West Knockharley Landfill			**Borehole Number** BH103T
Machine : Beretta T44 **Flush :** Water + Polymer Mix **Core Dia :** 102 mm **Method :** Rotary Cored (Geobore S)	**Casing Diameter** 146mm to 19.00m **Location** 696821.8 E 767297 N	**Ground Level (mOD)** 68.72 **Dates** 11/05/2025-12/05/2025	**Client** Beauparc **Engineer** WSP / AWN	**Job Number** 14656-04-25 **Sheet** 1/2

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.00-1.50	97				C	68.07	(0.65) 0.65	Soft to firm brown slightly sandy slightly gravelly CLAY			
1.50 1.50-2.50	50				C	67.22	(0.85) 1.50	Soft to firm brown slightly sandy gravelly CLAY with low cobble content			
2.50 2.50-2.95 2.50-4.00	40				2,4/4,5,6,6 SPT(C) N=21 C	66.22	(1.00) 2.50	Recovery consists of dark grey slightly sandy gravelly CLAY. Driller Notes: Boulder Clay (Stiff)			
4.00 4.00-4.45 4.00-5.50	100				9,9/13,11,11,13 SPT(C) N=48 C	64.72	(1.50) 4.00	Recovery consists of dark brownish grey slightly sandy gravelly CLAY with loose gravels. Driller Notes: Boulder Clay (Stiff)			
5.50 5.50-5.95 5.50-7.00	97				10,10/11,12,12,12 SPT(C) N=47 C			Very stiff dark brownish grey slightly sandy gravelly CLAY with medium cobble and low boulder content			
7.00 7.00-7.45 7.00-8.50 7.00-8.50	97				9,11/11,9,10,11 SPT(C) N=41 B C						
8.50 8.50-8.95 8.50-10.00 8.50-10.00	100				12,12/12,13,13,12 SPT(C) N=50 B C						
9.60-10.00					U						
10.00											

Remarks
Borehole complete at 19.00m BGL
50mm plain standpipe from 15.00m BGL to GL. 50mm slotted standpipe from 19.00m to 15.00m BGL.
Bentoninte seal from 14.40m to 11.50m BGL and 5.00m to 3.50m BGL. Sand pack from 14.90m to 14.40m BGL and 5.30m to 5.00m BGL. Gravel pack from 19.00m to 14.90m BGL and 11.50m to 5.30m BGL, and 3.50m BGL up.
Finished with a raised cover and concrete cap.

Scale (approx)	Logged By
1:50	JK

Figure No. 14656-04-25.BH101

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Site Project West Knockharley Landfill			**Borehole Number** BH103T
Machine : Beretta T44 **Flush :** Water + Polymer Mix **Core Dia :** 102 mm **Method :** Rotary Cored (Geobore S)	**Casing Diameter** 146mm to 19.00m **Location** 696821.8 E 767297 N	**Ground Level (mOD)** 68.72 **Dates** 11/05/2025-12/05/2025	**Client** Beauparc **Engineer** WSP / AWN	**Job Number** 14656-04-25 **Sheet** 2/2

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
10.00-10.45 10.00-11.50	100				11,12/13,13,16,8 SPT(C) N=50 C						
11.50 11.50-11.95 11.50-13.00	100				1,7/10,13,17,10 SPT(C) N=50 C		(15.00)				
13.00 13.00-13.45 13.00-14.50	100				6,10/12,14,19,5 SPT(C) N=50 C						
14.50 14.50-16.00	100				C						
15.50-17.50					ES						
16.00 16.00-17.50	100				C						
17.50 17.50-19.00 17.50-19.00	100				C ES						
19.00						49.72	19.00	Complete at 19.00m			

Remarks

Scale (approx)	Logged By
1:50	JK

Figure No. 14656-04-25.BH101

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Site Project West Knockharley Landfill			**Borehole Number** BH104S
Machine : Beretta T44 **Flush :** Water + Polymer Mix **Core Dia :** 102 mm **Method :** Rotary Cored (Geobore S)	**Casing Diameter** 146mm cased to 20.50m	**Ground Level (mOD)** 62.64	**Client** Beauparc	**Job Number** 14656-04-25
	Location 696834.6 E 767676 N	**Dates** 26/05/2025-29/05/2025	**Engineer** WSP / AWN	**Sheet** 1/3

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.00-1.50	73				C	62.24	(0.40) 0.40	Soft grey slightly sandy gravelly CLAY with low cobble content			
							(1.10)	Soft brown slightly sandy gravelly CLAY with low cobble content			
1.50 1.50-1.95 1.50-2.50	80				11,10/11,12,13,13 SPT(C) N=49 C	61.14	1.50	Stiff brown slightly sandy gravelly CLAY with high cobble and boulder content.			
							(1.00)				
2.50 2.50-2.95 2.50-4.00	80				10,9/10,9,6,8 SPT(C) N=33 C	60.14	2.50	Stiff dark brownish grey slightly sandy gravelly CLAY with low cobble and boulder content			
							(1.50)				
4.00 4.00-4.45 4.00-5.50	90				11,11/12,12,14,13 SPT(C) N=51 C	58.64	4.00	Very stiff dark brownish grey slightly sandy gravelly CLAY with low cobble and boulder content			
5.50 5.50-5.95 5.50-7.00	100				8,12/13,13,16,15 SPT(C) N=57 C						
6.00-7.50					B						
7.00 7.00-7.29 7.00-7.40 7.00-8.50 7.50-9.00	100				9,16/22,28 SPT(C) 50/140 U C B		(7.50)				
8.50 8.50-8.79 8.50-10.00	100				11,15/30,20 SPT(C) 50/140 C						
9.80-11.80					ES						
10.00											

Remarks
Borehole complete at 20.50m BGL
50mm plain standpipe from 19.60m to 27.60m BGL and 2.60m BGL to GL. 50mm slotted standpipe from 17.60m to 2.60m BGL.
Gravel backfill from 20.80m to 19.60m BGL. Bentoninte seal from 19.60m to 17.8.00m BGL and 2.40m to 0.90m BGL. Sand pack from 17.80m to 17.40m BGL and 2.70m to 2.40m BGL. Gravel pack from 17.40m to 2.70mBGL and 0.90m to 0.60m BGL.
Finished with a raised cover and concrete cap.

Scale (approx)	Logged By
1:50	JK

Figure No. 14656-04-25.BH104S

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Site Project West Knockharley Landfill			**Borehole Number** BH104S
Machine : Beretta T44 **Flush :** Water + Polymer Mix **Core Dia :** 102 mm **Method :** Rotary Cored (Geobore S)	**Casing Diameter** 146mm cased to 20.50m **Location** 696834.6 E 767676 N	**Ground Level (mOD)** 62.64 **Dates** 26/05/2025-29/05/2025	**Client** Beauparc **Engineer** WSP / AWN	**Job Number** 14656-04-25 **Sheet** 2/3

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
10.00-10.29 10.00-11.50	100				9,20/34,16 SPT(C) 50/140 C						
11.50 11.50-13.00 11.80-13.80	60				C ES	51.14	11.50 (1.50)	Recovery consists of dark brownish grey slighlty sandy gravelly Clay with loose gravels and cobbles. Driller notes boulder clay with a sand and gravel bed.			
13.00 13.00-14.50 13.80-19.80	100				C ES	49.64	13.00 (1.80)	Very stiff dark brownish grey slightly sandy gravelly CLAY with low cobble and boulder content			
14.50 14.50-16.00	83				C	47.84	14.80 (1.20)	Grey BOULDERS with some clay			
16.00 16.00-17.50 16.00-18.00	77				C ES	46.64	16.00 (2.30)	Very stiff grey slightly sandy slightly gravelly silty CLAY with low cobble and boulder content			
17.50 17.50-19.00 18.30	100	0	0	NI	C	44.34	18.30 (1.00)	Very weak thinly to medium bedded fine to medium grained SANDSTONE with interbeds of Siltstone. Slightly weathered to highly weathered. (18.30m to 19.30m BGL) Mostly non-intact			
19.00 19.30 19.70	100	85	70	13		43.34	19.30	Very weak to moderately weak thinly to medium bedded grey fine to medium grained SANDSTONE with interbeds of Siltstone. Slightly to moderately weathered with yellow staining			

Remarks

Scale (approx)	Logged By
1:50	JK

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Site Project West Knockharley Landfill			**Borehole Number** BH104S
Machine : Beretta T44 **Flush :** Water + Polymer Mix **Core Dia :** 102 mm **Method :** Rotary Cored (Geobore S)	**Casing Diameter** 146mm cased to 20.50m	**Ground Level (mOD)** 62.64	**Client** Beauparc	**Job Number** 14656-04-25
	Location 696834.6 E 767676 N	**Dates** 26/05/2025-29/05/2025	**Engineer** WSP / AWN	**Sheet** 3/3

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
				4			(1.20)	(19.30m to 20.50m BGL) 1 No. Fracture set. F1: 10-30 degrees medium spaced undulating rough			
20.50						42.14	20.50	Complete at 20.50m			

Remarks

Scale (approx)	Logged By
1:50	JK

Figure No. 14656-04-25.BH104S

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Site Project West Knockharley Landfill			**Borehole Number** BH105S
Machine : Beretta T44 **Flush :** Water + Polymer Mix **Core Dia :** 102 mm **Method :** Rotary Cored (Geobore S)	**Casing Diameter** 146mm cased to 29.50m **Location** 696966.8 E 767223.4 N	**Ground Level (mOD)** 71.63 **Dates** 09/06/2025-10/06/2025	**Client** Beauparc **Engineer** WSP / AWN	**Job Number** 14656-04-25 **Sheet** 1/3

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.00-2.50	42				C		(2.50)	Recovery consists of brownish grey slightly sandy slightly gravelly Clay. Driller notes boulder Clay (MADE GROUND)			
2.50 2.50-2.95 2.50-4.00	33				8,8/9,11,11,14 SPT(C) N=45 C	69.13	2.50 (1.50)	Recovery consists of brownish grey slightly sandy slightly gravelly Clay. Driller notes boulder Clay (MADE GROUND)			
4.00 4.00-4.45 4.00-5.50	53				9,10/9,12,13,13 SPT(C) N=47 C	67.63	4.00 (1.90)	MADE GROUND: greyish brown slightly sandy gravelly Clay with low cobble content			
5.50 5.50-5.95 5.50-7.00	67				7,8/11,12,14,15 SPT(C) N=52 C	65.73	5.90 (2.10)	MADE GROUND: brown slightly sandy slightly gravelly Clay with low cobble content			
7.00 7.00-7.32 7.00-8.50	100				10,13/18,25,7 SPT(C) 50/170 C	63.63	8.00 (0.50)	Very stiff dark brownish grey slightly sandy slightly gravelly CLAY			
8.50 8.50-8.72 8.50-10.00	37				12,28/50 SPT(C) 50/70 C	63.13	8.50 (1.50)	Recovery consists of dark brownish grey slightly sandy slightly gravelly Clay. Driller notes boulder CLAY. (Very Stiff)			
10.00											

Remarks
Borehole complete at 29.50m BGL
50mm plain standpipe from 29.50m to 27.80m BGL and 11.80m BGL to GL. 50mm slotted standpipe from 27.80m to 11.80m BGL.
Finished with a raised cover and concrete cap.
Bentoninte seal from 29.50m to 28.00m BGL and 11.50m to 9.50m BGL. Sand pack from 28.00m to 27.70m BGL and 11.80m to 11.50m BGL.
Gravel pack from 27.70m to 11.80mBGL and 9.50m BGL to GL.

Scale (approx)	Logged By
1:50	JK

Figure No. 14656-04-25.BH105S

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Site Project West Knockharley Landfill			**Borehole Number** BH105S
Machine : Beretta T44 **Flush :** Water + Polymer Mix **Core Dia :** 102 mm **Method :** Rotary Cored (Geobore S)	**Casing Diameter** 146mm cased to 29.50m	**Ground Level (mOD)** 71.63	**Client** Beauparc	**Job Number** 14656-04-25
	Location 696966.8 E 767223.4 N	**Dates** 09/06/2025-10/06/2025	**Engineer** WSP / AWN	**Sheet** 2/3

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
10.00-10.25 10.00-11.50	100				13,17/25,25 SPT(C) 50/100 C	61.63	10.00 (0.85)	Very stiff dark brown slightly sandy slightly gravelly CLAY with low cobble content			
11.50 11.50-13.00 12.00-13.50	97				C B	60.78	10.85	Very stiff dark brown slightly sandy gravelly CLAY with medium cobble and boulder content			
13.00 13.00-14.50 13.50-14.00 13.50-15.00	97				C U B						
14.50 14.50-16.00	100				C						
16.00 16.00-17.50	90				C		(10.65)				
17.50 17.50-19.00	100				C						
19.00 19.00-20.50	100				C						

Remarks

Scale (approx)	Logged By
1:50	JK

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Site Project West Knockharley Landfill			**Borehole Number** BH105S
Machine : Beretta T44 **Flush :** Water + Polymer Mix **Core Dia :** 102 mm **Method :** Rotary Cored (Geobore S)	**Casing Diameter** 146mm cased to 29.50m **Location** 696966.8 E 767223.4 N	**Ground Level (mOD)** 71.63 **Dates** 09/06/2025-10/06/2025	**Client** Beauparc **Engineer** WSP / AWN	**Job Number** 14656-04-25 **Sheet** 3/3

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
20.50 20.50-22.00	97				C	50.13	21.50	Very stiff brown slightly sandy gravelly CLAY with medium cobble and boulder content			
22.00 22.00-23.50	100				C		(3.50)				
23.50 23.50-25.00 24.00-25.00	100				C ES	46.63	25.00	Very stiff grey slightly sandy gravelly silty CLAY with medium cobble and boulder content			
25.00 25.00-26.50 25.00-27.00	97				C ES		(3.00)				
26.50 26.50-28.00 27.00-28.00	100				C ES	43.63	28.00	Very weak to moderately weak thinly to medium bedded grey fine to medium grained SANDSTONE with interbeds of Siltstone. Slightly to moderately weathered (28.00m to 29.50m BGL) 2 No. Fracture sets. F1: 0-40 degree fractures closely spaced planar rough. F2: 70-90 degree fractures medium spaced undulating rough			
28.00 28.00-29.50	100	20	0	27	C		(1.50)				
29.50						42.13	29.50	Complete at 29.50m			

Remarks

Scale (approx)	Logged By
1:50	JK

Figure No. 14656-04-25.BH105S

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Site Project West Knockharley Landfill			**Borehole Number** BH106S
Machine : Beretta T44 **Flush :** Water + Polymer Mix **Core Dia :** 102 mm **Method :** Rotary Cored (Geobore S)	**Casing Diameter** 146mm cased to 16.00m **Location** 696941.4 E 767697.9 N	**Ground Level (mOD)** 61.72 **Dates** 03/06/2025	**Client** Beauparc **Engineer** WSP / AWN	**Job Number** 14656-04-25 **Sheet** 1/2

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.00-1.50	100				C	61.22	(0.50) 0.50	Soft grey slightly sandy gravelly CLAY with low cobble content			
						60.72	(0.50) 1.00	Soft Light brown slightly sandy gravelly CLAY with low cobble content			
1.50 1.50-1.95 1.50-2.50	80				6,6/7,9,12,12 SPT(C) N=40 C	59.22	(1.50) 2.50	Soft to firm brown slightly sandy gravelly CLAY with low cobble content			
2.50 2.50-2.95 2.50-4.00	90				8,10/12,13,12,14 SPT(C) N=51 C			Very stiff dark brownish grey slightly sandy gravelly CLAY with low cobble and boulder content			
4.00 4.00-4.33 4.00-5.50	100				10,12/15,28,7 SPT(C) 50/180 C						
5.50 5.50-5.81 5.50-7.00	87				12,12/16,33,1 SPT(C) 50/160 C						
6.00-7.50					B						
7.00 7.00-7.33 7.00-8.50	100				13,14/17,25,8 SPT(C) 50/180 C						
7.50-7.90					U						
8.00-10.00					ES		(11.80)				
8.50 8.50-8.82 8.50-10.00	100				11,13/16,28,6 SPT(C) 50/170 C						
10.00											

Remarks
Borehole complete at 16.00m BGL
50mm plain standpipe from 16.00m to 14.00m BGL and 3.00m BGL to GL. 50mm slotted standpipe from 14.00m to 3.00m BGL.
Finished with a raised cover and concrete cap.
Bentoninte seal from 16.00m to 14.30m BGL and 2.50m to 1.00m BGL. Sand pack from 14.30m to 14.00m BGL and 3.00m to 2.50m BGL. Gravel pack from 14.00m to 3.00mBGL and 1.00m BGL up.

Scale (approx)	Logged By
1:50	JK

Figure No. 14656-04-25.BH106S

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Site Project West Knockharley Landfill			**Borehole Number** BH106S
Machine : Beretta T44 **Flush :** Water + Polymer Mix **Core Dia :** 102 mm **Method :** Rotary Cored (Geobore S)	**Casing Diameter** 146mm cased to 16.00m **Location** 696941.4 E 767697.9 N	**Ground Level (mOD)** 61.72 **Dates** 03/06/2025	**Client** Beauparc **Engineer** WSP / AWN	**Job Number** 14656-04-25 **Sheet** 2/2

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
10.00-10.31 10.00-11.50 10.00-12.00	100				14,16/18,31,1 SPT(C) 50/160 C ES						
11.50 11.50-13.00					C						
12.00-14.00 12.00-14.00	100				B ES						
13.00 13.00-14.50	100	0	0		C						
						47.42	14.30	Very weak to weak thinly to medium bedded grey fine to medium grained SANDSTONE with interbeds of Siltstone. Slightly to highly weathered (14.30m to 16.00m BGL) Non intact with clay infill (<0.05m) at 14.75m and 14.95m BGL			
14.50 14.50-16.00	87	20	0	NI	C		(1.70)	(15.60m to 15.70m BGL) Clay infill. Stiff gravelly silty Clay			
16.00						45.72	16.00	Complete at 16.00m			

Remarks

Scale (approx)	Logged By
1:50	JK

Figure No. 14656-04-25.BH106S

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Site Project West Knockharley Landfill			**Borehole Number** BH107S
Machine : Beretta T44 **Flush :** Water + Polymer Mix **Core Dia :** 102 mm **Method :** Rotary Cored (Geobore S)	**Casing Diameter** 146mm cased to 19.00m **Location** 696970.8 E 767522.4 N	**Ground Level (mOD)** 63.54 **Dates** 04/06/2025	**Client** Beauparc **Engineer** WSP / AWN	**Job Number** 14656-04-25 **Sheet** 1/2

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.00-2.50	87				C		(2.50)	Recovery consists of brown sandy gravelly CLAY with medium cobble content. Driller notes boulder CLAY.			
1.50 1.50-1.95	80				4,6/6,9,9,10 SPT(C) N=34						
2.50 2.50-2.95 2.50-4.00	80				3,5/5,6,7,9 SPT(C) N=27 C	61.04	2.50	Stiff dark brownish grey slightly sandy gravelly CLAY with low cobble and boulder content			
4.00 4.00-4.35 4.00-5.50	100				7,9/12,23,15 SPT(C) 50/200 C	59.54	(1.50) 4.00	Very stiff dark brownish grey slightly sandy gravelly CLAY with low cobble and boulder content			
5.50 5.50-5.85 5.50-7.00	100				10,12/17,28,5 SPT(C) 50/200 C						
6.50-9.50					B						
7.00 7.00-7.35 7.00-8.50	100				11,13/19,25,6 SPT(C) 50/200 C						
8.10-8.50					U						
8.50 8.50-8.80 8.50-10.00	100				12,14/21,33 SPT(C) 54/150 C						
9.50-11.50					ES						
10.00											

Remarks
Borehole complete at 19.00m BGL
50mm plain standpipe from 19.00m to 17.80m BGL and 3.80m BGL to GL. 50mm slotted standpipe from 17.80m to 3.80m BGL.
Bentoninte seal from 19.00m to 18.00m BGL and 3.30m to 1.00m BGL. Sand pack from 17.80m to 18.00m BGL and 3.80m to 3.30m BGL. Gravel pack from 17.80m to 3.80mBGL and 1.00m BGL up.
Finished with a raised cover and concrete cap.

Scale (approx)	Logged By
1:50	JK

Figure No. 14656-04-25.BH107S

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Site Project West Knockharley Landfill			**Borehole Number** BH107S
Machine : Beretta T44 **Flush :** Water + Polymer Mix **Core Dia :** 102 mm **Method :** Rotary Cored (Geobore S)	**Casing Diameter** 146mm cased to 19.00m **Location** 696970.8 E 767522.4 N	**Ground Level (mOD)** 63.54 **Dates** 04/06/2025	**Client** Beauparc **Engineer** WSP / AWN	**Job Number** 14656-04-25 **Sheet** 2/2

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
10.00-10.35 10.00-11.50	100				10,13/17,29,4 SPT(C) 50/200 C		(13.00)				
11.50 11.50-13.00 11.50-13.50	100				C ES						
13.00 13.00-14.50 13.50-15.50	100				C ES						
14.50 14.50-16.00 15.50-17.00	100				C ES						
16.00 16.00-17.50 17.00-18.30	80				C ES	46.54	17.00	Very stiff grey slightly sandy gravelly silty CLAY with low cobble content (17.00m to 18.30m BGL) Non intact			
17.50 17.50-19.00					C		(1.30)				
18.30	100	47	0	NI		45.24	18.30 (0.70)	Very weak thinly to medium bedded dark grey to grey fine grained SANDSTONE with interbeds of Siltstone. Slightly to highly weathered			
19.00						44.54	19.00	Complete at 19.00m			

Remarks

Scale (approx)	Logged By
1:50	JK

Figure No. 14656-04-25.BH107S

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Site Project West Knockharley Landfill			**Borehole Number** BH108S
Machine : Beretta T44 **Flush :** Water + Polymer Mix **Core Dia :** 102 mm **Method :** Rotary Cored (Geobore S)	**Casing Diameter** 146mm cased to 20.50m	**Ground Level (mOD)** 63.10	**Client** Beauparc	**Job Number** 14656-04-25
	Location 697076.7 E 767194.3 N	**Dates** 05/06/2025-06/06/2025	**Engineer** WSP / AWN	**Sheet** 1/3

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.00-2.50	87				C		(1.00)	Brown slightly sandy slightly gravelly CLAY with low cobble content			
						62.10	1.00				
							(0.50)	Stiff brown slightly sandy slightly gravelly CLAY with low cobble content			
1.50 1.50-1.95	80				7,8/8,12,14,17 SPT(C) N=51	61.60	1.50	Very stiff brown sandy gravelly CLAY			
							(1.00)				
2.50 2.50-2.95 2.50-4.00	80				6,9/10,14,14,15 SPT(C) N=53 C	60.60	2.50	Very stiff dark brownish grey slightly sandy gravelly CLAY with low cobble and boulder content			
							(3.00)				
4.00 4.00-4.45 4.00-5.50	100				6,8/11,11,14,17 SPT(C) N=53 C						
5.50 5.50-5.85 5.50-7.00	100				8,10/12,21,17 SPT(C) 50/200 C	57.60	5.50	Recvoery consists of loose gravels onto dark gery slighlty sandy gravelly CLAY. Driller notes boulder CLAY (Very Stiff)			
							(1.50)				
6.50-9.50					B						
7.00 7.00-7.35 7.00-8.50	100				11,13/15,27,8 SPT(C) 50/200 C	56.10	7.00	Very stiff dark brownish grey slightly sandy gravelly CLAY with low cobble and boulder content			
8.10-8.50					U						
8.50 8.50-8.85 8.50-10.00	100				12,14/17,30,3 SPT(C) 50/200 C						
9.50-11.50					ES						
10.00											

Remarks
Borehole complete at 20.50m BGL
Gravel backfill from 20.50m to 19.50m BGL. 50mm plain standpipe from 19.50m to 17.80m BGL and 2.80m BGL to GL. 50mm slotted standpipe from 17.80m to 2.80m BGL.
Bentoninte seal from 19.50m to 18.00m BGL and 2.50m to 1.00m BGL. Sand pack from 18.00m to 17.70m BGL and 2.70m to 2.50m BGL. Gravel pack from 17.70m to 2.70mBGL and 1.00m BGL up.
Finished with a raised cover and concrete cap.

Scale (approx)	Logged By
1:50	JK

Figure No. 14656-04-25.BH107S

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Site Project West Knockharley Landfill			**Borehole Number** BH108S
Machine : Beretta T44 **Flush :** Water + Polymer Mix **Core Dia :** 102 mm **Method :** Rotary Cored (Geobore S)	**Casing Diameter** 146mm cased to 20.50m **Location** 697076.7 E 767194.3 N	**Ground Level (mOD)** 63.10 **Dates** 05/06/2025-06/06/2025	**Client** Beauparc **Engineer** WSP / AWN	**Job Number** 14656-04-25 **Sheet** 2/3

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
10.00-10.35 10.00-11.50	100				10,13/15,28,7 SPT(C) 50/200 C						
11.50 11.50-13.00 11.50-13.50	100				C ES		(10.00)				
13.00 13.00-14.50 13.50-15.50	100				C ES						
14.50 14.50-16.00 15.50-17.00	100				C ES						
16.00 16.00-17.50 17.00-18.30	80				C ES	46.10	17.00	Very stiff grey slightly sandy gravelly silty CLAY with low cobble content (18.30m to 19.00m BGL) Mostly Non intact			
17.50 17.50-19.00					C		(1.30)				
18.30	100	47	0			44.80	18.30	Weak to moderately weak medium bedded grey fine to medium grained SANDSTONE with interbeds of Siltstone. Slightly to moderately weathered			
19.00 19.00-20.50	100	100	100	NI	C		(2.20)				

Remarks

Scale (approx)	Logged By
1:50	JK

Figure No. 14656-04-25.BH107S

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Site Project West Knockharley Landfill			**Borehole Number** BH108S
Machine : Beretta T44 **Flush :** Water + Polymer Mix **Core Dia :** 102 mm **Method :** Rotary Cored (Geobore S)	**Casing Diameter** 146mm cased to 20.50m	**Ground Level (mOD)** 63.10	**Client** Beauparc	**Job Number** 14656-04-25
	Location 697076.7 E 767194.3 N	**Dates** 05/06/2025-06/06/2025	**Engineer** WSP / AWN	**Sheet** 3/3

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
20.50						42.60	20.50	Complete at 20.50m			

Remarks

Scale (approx)	Logged By
1:50	JK

Figure No. 14656-04-25.BH107S

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Project West Knockharley Landfill
– Rotary Core Photographs

BH101S



BH101S



Project West Knockharley Landfill
– Rotary Core Photographs

BH101S



BH101S



Project West Knockharley Landfill
– Rotary Core Photographs

BH101S



BH101S



Project West Knockharley Landfill
– Rotary Core Photographs

BH102S



BH102S



Project West Knockharley Landfill
– Rotary Core Photographs

BH102S



BH102S



Project West Knockharley Landfill
– Rotary Core Photographs

BH102S



BH102S



BH102S



Project West Knockharley Landfill
– Rotary Core Photographs

BH103T



BH103T



Project West Knockharley Landfill
– Rotary Core Photographs

BH103T



BH103T



Project West Knockharley Landfill
– Rotary Core Photographs

BH103T



Project West Knockharley Landfill
– Rotary Core Photographs

BH104S



BH104S



Project West Knockharley Landfill
– Rotary Core Photographs

BH104S



BH104S



Project West Knockharley Landfill
– Rotary Core Photographs

BH104S



Project West Knockharley Landfill
– Rotary Core Photographs

BH105S



BH105S



Project West Knockharley Landfill
– Rotary Core Photographs

BH105S



BH105S



Project West Knockharley Landfill
– Rotary Core Photographs

BH105S



BH105S



Project West Knockharley Landfill
– Rotary Core Photographs

BH105S



BH106S



Project West Knockharley Landfill
– Rotary Core Photographs

BH106S



BH106S



Project West Knockharley Landfill
– Rotary Core Photographs

BH106S



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BH107S



BH107S



Project West Knockharley Landfill
– Rotary Core Photographs

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BH107S



Project West Knockharley Landfill
– Rotary Core Photographs

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Project West Knockharley Landfill
– Rotary Core Photographs

BH108S



BH108S



Project West Knockharley Landfill
– Rotary Core Photographs

BH108S



APPENDIX 3 – DTH Symmetrix Rotary Borehole Records – New Cell

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Site Project West Knockharley Landfill			**Borehole Number** BH101T
Machine : Beretta T44 **Flush :** Air **Core Dia:** 146 mm **Method :** DTH Symmetrix	**Casing Diameter** 146mm cased to 14.00m	**Ground Level (mOD)** 63.71	**Client** Beauparc	**Job Number** 14656-04-25
	Location 696739 E 767647.2 N	**Dates** 17/07/2025	**Engineer** WSP / AWN	**Sheet** 1/2

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
							(14.00)	SYMMETRIX: Driller notes boulder Clay.			

Remarks
DTH Symmetrix from 0.00m to 14.00m BGL
50mm slotted standpipe with pea gravel surround installed from 14.00m BGL to 10.00m BGL. 50mm plain standpipe with bentonite seal installed from 10.00m BGL to GL. Finished with raised cover.

Scale (approx)	Logged By
1:50	JK

Figure No. 14656-04-25.BH101T

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Site Project West Knockharley Landfill			**Borehole Number** BH101T
Machine : Beretta T44 **Flush :** Air **Core Dia :** 146 mm **Method :** DTH Symmetrix	**Casing Diameter** 146mm cased to 14.00m	**Ground Level (mOD)** 63.71	**Client** Beauparc	**Job Number** 14656-04-25
	Location 696739 E 767647.2 N	**Dates** 17/07/2025	**Engineer** WSP / AWN	**Sheet** 2/2

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
						49.71	14.00	Complete at 14.00m			

Remarks

Scale (approx)	Logged By
1:50	JK

Figure No. 14656-04-25.BH101T

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Site Project West Knockharley Landfill			**Borehole Number** BH106T
Machine : Beretta T44 **Flush :** Air **Core Dia:** 146 mm **Method :** DTH Symmetrix	**Casing Diameter** 146mm cased to 11.00m	**Ground Level (mOD)** 61.73	**Client** Beauparc	**Job Number** 14656-04-25
	Location 696936.7 E 767694.9 N	**Dates** 16/07/2025	**Engineer** WSP / AWN	**Sheet** 1/2

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
							(11.00)	SYMMETRIX: Driller notes boulder Clay.			

Remarks
DTH Symmetrix from 0.00m to 11.00m BGL
50mm slotted standpipe with pea gravel surround installed from 11.00m BGL to 8.00m BGL. 50mm plain standpipe with bentonite seal installed from 8.00m BGL to GL. Finished with raised cover.

Scale (approx)	Logged By
1:50	JK

Figure No. 14656-04-25.BH106T

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Site Project West Knockharley Landfill			**Borehole Number** BH106T
Machine : Beretta T44 **Flush :** Air **Core Dia :** 146 mm **Method :** DTH Symmetrix	**Casing Diameter** 146mm cased to 11.00m	**Ground Level (mOD)** 61.73	**Client** Beauparc	**Job Number** 14656-04-25
	Location 696936.7 E 767694.9 N	**Dates** 16/07/2025	**Engineer** WSP / AWN	**Sheet** 2/2

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
						50.73	11.00	Complete at 11.00m			

Remarks

Scale (approx)	Logged By
1:50	JK

Figure No. 14656-04-25.BH106T

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Site Project West Knockharley Landfill			**Borehole Number** BH107T
Machine : Beretta T44 **Flush :** Air **Core Dia:** 146 mm **Method :** DTH Symmetrix	**Casing Diameter** 146mm cased to 14.00m	**Ground Level (mOD)** 63.83	**Client** Beauparc	**Job Number** 14656-04-25
	Location 696971.6 E 767515.4 N	**Dates** 13/07/2025-16/07/2025	**Engineer** WSP / AWN	**Sheet** 1/2

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
							(14.00)	SYMMETRIX: Driller notes boulder Clay.			

Remarks
DTH Symmetrix from 0.00m to 14.00m BGL
50mm slotted standpipe with pea gravel surround installed from 14.00m BGL to 10.00m BGL. 50mm plain standpipe with bentonite seal installed from 10.00m BGL to GL. Finished with raised cover.

Scale (approx)	Logged By
1:50	JK

Figure No. 14656-04-25.BH107T

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Site Project West Knockharley Landfill			**Borehole Number** BH107T
Machine : Beretta T44 **Flush :** Air **Core Dia:** 146 mm **Method :** DTH Symmetrix	**Casing Diameter** 146mm cased to 14.00m	**Ground Level (mOD)** 63.83	**Client** Beauparc	**Job Number** 14656-04-25
	Location 696971.6 E 767515.4 N	**Dates** 13/07/2025-16/07/2025	**Engineer** WSP / AWN	**Sheet** 2/2

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
						49.83	14.00	Complete at 14.00m			

Remarks

Scale (approx)	Logged By
1:50	JK

Figure No. 14656-04-25.BH107T

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Site Project West Knockharley Landfill			**Borehole Number** BH108T
Machine : Beretta T44 **Flush :** Air **Core Dia:** 146 mm **Method :** DTH Symmetrix	**Casing Diameter** 146mm cased to 13.50m	**Ground Level (mOD)** 63.11	**Client** Beauparc	**Job Number** 14656-04-25
	Location 697081.6 E 767194.8 N	**Dates** 13/07/2025	**Engineer** WSP / AWN	**Sheet** 1/2

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
							(13.50)	SYMMETRIX: Driller notes boulder Clay.			

Remarks
DTH Symmetrix from 0.00m to 13.50m BGL
50mm slotted standpipe with pea gravel surround installed from 13.50m BGL to 9.50m BGL. 50mm plain standpipe with bentonite seal installed from 9.50m BGL to GL. Finished with raised cover.

Scale (approx)	Logged By
1:50	JK

Figure No. 14656-04-25.BH108T

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Site Project West Knockharley Landfill			**Borehole Number** BH108T
Machine : Beretta T44 **Flush :** Air **Core Dia :** 146 mm **Method :** DTH Symmetrix	**Casing Diameter** 146mm cased to 13.50m	**Ground Level (mOD)** 63.11	**Client** Beauparc	**Job Number** 14656-04-25
	Location 697081.6 E 767194.8 N	**Dates** 13/07/2025	**Engineer** WSP / AWN	**Sheet** 2/2

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
						49.61	13.50	Complete at 13.50m			

Remarks

Scale (approx)	Logged By
1:50	JK

Figure No. 14656-04-25.BH108T

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APPENDIX 4 – DTH Symmetrix Rotary Borehole Records – Existing Cell

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Site Project West Knockharley Landfill			**Borehole Number** LG29
Machine : Beretta T44 **Flush :** Air **Core Dia :** 146 mm **Method :** DTH Symmetrix	**Casing Diameter** 146mm cased to 14.00m	**Ground Level (mOD)**	**Client** Beauparc	**Job Number** 14656-04-25
	Location 697037.4 E 767534.1 N	**Dates** 19/06/2025	**Engineer** WSP / AWN	**Sheet** 1/2

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
							(14.00)	SYMMETRIX: Driller notes boulder Clay.			

Remarks
DTH Symmetrix from 0.00m to 14.00m BGL
Bentonite plug installed from 14.00m to 13.50m BGL. 50mm slotted standpipe with pea gravel surround installed from 13.50m BGL to 1.50m BGL. 50mm plain standpipe with bentonite seal installed from 1.50m BGL to GL. Finished with raised cover, concrete base and gas tap.

Scale (approx)	Logged By
1:50	JK

Figure No. 14656-04-25.LG29

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Site Project West Knockharley Landfill			**Borehole Number** LG29
Machine : Beretta T44 **Flush :** Air **Core Dia:** 146 mm **Method :** DTH Symmetrix	**Casing Diameter** 146mm cased to 14.00m	**Ground Level (mOD)**	**Client** Beauparc	**Job Number** 14656-04-25
	Location 697037.4 E 767534.1 N	**Dates** 19/06/2025	**Engineer** WSP / AWN	**Sheet** 2/2

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
							14.00	Complete at 14.00m			

Remarks

Scale (approx)	Logged By
1:50	JK

Figure No. 14656-04-25.LG29

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Site Project West Knockharley Landfill			**Borehole Number** LG30
Machine : Beretta T44 **Flush :** Air **Core Dia :** 146 mm **Method :** DTH Symmetrix	**Casing Diameter** 146mm cased to 10.50m	**Ground Level (mOD)**	**Client** Beauparc	**Job Number** 14656-04-25
	Location 697016.1 E 767579.3 N	**Dates** 13/06/2025	**Engineer** WSP / AWN	**Sheet** 1/2

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
							(10.50)	SYMMETRIX: Driller notes boulder Clay.			

Remarks
DTH Symmetrix from 0.00m to 10.50m BGL
Bentonite plug installed from 10.50m to 10.00m BGL. 50mm slotted standpipe with pea gravel surround installed from 10.00m BGL to 1.50m BGL. 50mm plain standpipe with bentonite seal installed from 1.50m BGL to GL. Finished with raised cover, concrete base and gas tap.

Scale (approx)	Logged By
1:50	JK

Figure No. 14656-04-25.LG30

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Site Project West Knockharley Landfill			**Borehole Number** LG30
Machine : Beretta T44 **Flush :** Air **Core Dia:** 146 mm **Method :** DTH Symmetrix	**Casing Diameter** 146mm cased to 10.50m	**Ground Level (mOD)**	**Client** Beauparc	**Job Number** 14656-04-25
	Location 697016.1 E 767579.3 N	**Dates** 13/06/2025	**Engineer** WSP / AWN	**Sheet** 2/2

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
							10.50	Complete at 10.50m			

Remarks

Scale (approx)	Logged By
1:50	JK

Figure No. 14656-04-25.LG30

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Site Project West Knockharley Landfill			**Borehole Number** LG31
Machine : Beretta T44 **Flush :** Air **Core Dia:** 146 mm **Method :** DTH Symmetrix	**Casing Diameter** 146mm cased to 10.50m	**Ground Level (mOD)**	**Client** Beauparc	**Job Number** 14656-04-25
	Location 697014.5 E 767629.3 N	**Dates** 13/06/2025	**Engineer** WSP / AWN	**Sheet** 1/2

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
							(10.50)	SYMMETRIX: Driller notes boulder Clay.			

Remarks
DTH Symmetrix from 0.00m to 10.50m BGL
Bentonite plug installed from 10.50m to 10.00m BGL. 50mm slotted standpipe with pea gravel surround installed from 10.00m BGL to 1.50m BGL. 50mm plain standpipe with bentonite seal installed from 1.50m BGL to GL. Finished with raised cover, concrete base and gas tap.

Scale (approx)	Logged By
1:50	JK

Figure No. 14656-04-25.LG31

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Site Project West Knockharley Landfill			**Borehole Number** LG31
Machine : Beretta T44 **Flush :** Air **Core Dia:** 146 mm **Method :** DTH Symmetrix	**Casing Diameter** 146mm cased to 10.50m	**Ground Level (mOD)**	**Client** Beauparc	**Job Number** 14656-04-25
	Location 697014.5 E 767629.3 N	**Dates** 13/06/2025	**Engineer** WSP / AWN	**Sheet** 2/2

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
							10.50	Complete at 10.50m			

Remarks

Scale (approx)	Logged By
1:50	JK

Figure No. 14656-04-25.LG31

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Site Project West Knockharley Landfill			**Borehole Number** LG32
Machine : Beretta T44 **Flush :** Air **Core Dia :** 146 mm **Method :** DTH Symmetrix	**Casing Diameter** 146mm cased to 11.50m	**Ground Level (mOD)**	**Client** Beauparc	**Job Number** 14656-04-25
	Location 697010.1 E 767679.3 N	**Dates** 13/06/2025	**Engineer** WSP / AWN	**Sheet** 1/2

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
							(11.50)	SYMMETRIX: Driller notes boulder Clay.			

Remarks
DTH Symmetrix from 0.00m to 11.50m BGL
Bentonite plug installed from 11.50m to 11.00m BGL. 50mm slotted standpipe with pea gravel surround installed from 11.00m BGL to 1.50m BGL. 50mm plain standpipe with bentonite seal installed from 1.50m BGL to GL. Finished with raised cover, concrete base and gas tap.

Scale (approx)	Logged By
1:50	JK

Figure No. 14656-04-25.LG32

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Site Project West Knockharley Landfill			**Borehole Number** LG32
Machine : Beretta T44 **Flush :** Air **Core Dia :** 146 mm **Method :** DTH Symmetrix	**Casing Diameter** 146mm cased to 11.50m	**Ground Level (mOD)**	**Client** Beauparc	**Job Number** 14656-04-25
	Location 697010.1 E 767679.3 N	**Dates** 13/06/2025	**Engineer** WSP / AWN	**Sheet** 2/2

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
							11.50	Complete at 11.50m			

Remarks

Scale (approx)	Logged By
1:50	JK

Figure No. 14656-04-25.LG32

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Site Project West Knockharley Landfill			**Borehole Number** LG33
Machine : Beretta T44 **Flush :** Air **Core Dia :** 146 mm **Method :** DTH Symmetrix	**Casing Diameter** 146mm cased to 9.50m	**Ground Level (mOD)**	**Client** Beauparc	**Job Number** 14656-04-25
	Location 696996.8 E 767727.8 N	**Dates** 23/06/2025	**Engineer** WSP / AWN	**Sheet** 1/1

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
							(9.50)	SYMMETRIX: Driller notes boulder Clay.			
							9.50	Complete at 9.50m			

Remarks
DTH Symmetrix from 0.00m to 9.50m BGL
Bentonite plug installed from 9.50m to 9.00m BGL. 50mm slotted standpipe with pea gravel surround installed from 9.00m BGL to 1.50m BGL. 50mm plain standpipe with bentonite seal installed from 1.50m BGL to GL. Finished with raised cover, concrete base and gas tap.

Scale (approx)	Logged By
1:50	JK

Figure No. 14656-04-25.LG33

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Site Project West Knockharley Landfill			**Borehole Number** LG34
Machine : Beretta T44 **Flush :** Air **Core Dia :** 146 mm **Method :** DTH Symmetrix	**Casing Diameter** 146mm cased to 10.00m	**Ground Level (mOD)**	**Client** Beauparc	**Job Number** 14656-04-25
	Location 697035.4 E 767759.9 N	**Dates** 23/06/2025	**Engineer** WSP / AWN	**Sheet** 1/1

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
							(10.00)	SYMMETRIX: Driller notes boulder Clay.			
							10.00				

Remarks
DTH Symmetrix from 0.00m to 10.00m BGL
Bentonite plug installed from 10.00m to 9.50m BGL. 50mm slotted standpipe with pea gravel surround installed from 9.50m BGL to 1.50m BGL. 50mm plain standpipe with bentonite seal installed from 1.50m BGL to GL. Finished with raised cover, concrete base and gas tap.

Scale (approx)	Logged By
1:50	JK

Figure No. 14656-04-25.LG34

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Site Project West Knockharley Landfill			**Borehole Number** LG35
Machine : Beretta T44 **Flush :** Air **Core Dia :** 146 mm **Method :** DTH Symmetrix	**Casing Diameter** 146mm cased to 9.00m	**Ground Level (mOD)**	**Client** Beauparc	**Job Number** 14656-04-25
	Location 697085.5 E 767763.2 N	**Dates** 24/06/2025	**Engineer** WSP / AWN	**Sheet** 1/1

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
							(9.00)	SYMMETRIX: Driller notes boulder Clay.			
							9.00	Complete at 9.00m			

Remarks
DTH Symmetrix from 0.00m to 9.00m BGL
Bentonite plug installed from 9.00m to 8.50m BGL. 50mm slotted standpipe with pea gravel surround installed from 8.50m BGL to 1.50m BGL. 50mm plain standpipe with bentonite seal installed from 1.50m BGL to GL. Finished with raised cover, concrete base and gas tap.

Scale (approx)	Logged By
1:50	JK

Figure No. 14656-04-25.LG35

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Site Project West Knockharley Landfill			**Borehole Number** LG36
Machine : Beretta T44 **Flush :** Air **Core Dia :** 146 mm **Method :** DTH Symmetrix	**Casing Diameter** 146mm cased to 9.50m	**Ground Level (mOD)**	**Client** Beauparc	**Job Number** 14656-04-25
	Location 697134.8 E 767772.8 N	**Dates** 24/06/2025	**Engineer** WSP / AWN	**Sheet** 1/1

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
							(9.50)	SYMMETRIX: Driller notes boulder Clay.			
							9.50	Complete at 9.50m			

Remarks
DTH Symmetrix from 0.00m to 9.50m BGL
Bentonite plug installed from 9.50m to 9.00m BGL. 50mm slotted standpipe with pea gravel surround installed from 9.00m BGL to 1.50m BGL. 50mm plain standpipe with bentonite seal installed from 1.50m BGL to GL. Finished with raised cover, concrete base and gas tap.

Scale (approx)	Logged By
1:50	JK

Figure No. 14656-04-25.LG36

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Site Project West Knockharley Landfill			**Borehole Number** LG37
Machine : Beretta T44 **Flush :** Air **Core Dia :** 146 mm **Method :** DTH Symmetrix	**Casing Diameter** 146mm cased to 9.00m	**Ground Level (mOD)**	**Client** Beauparc	**Job Number** 14656-04-25
	Location 697184.6 E 767779.1 N	**Dates** 24/06/2025	**Engineer** WSP / AWN	**Sheet** 1/1

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
							(9.00)	SYMMETRIX: Driller notes boulder Clay.			
							9.00	Complete at 9.00m			

Remarks
DTH Symmetrix from 0.00m to 9.00m BGL
Bentonite plug installed from 9.00m to 8.50m BGL. 50mm slotted standpipe with pea gravel surround installed from 8.50m BGL to 1.50m BGL. 50mm plain standpipe with bentonite seal installed from 1.50m BGL to GL. Finished with raised cover, concrete base and gas tap.

Scale (approx)	Logged By
1:50	JK

Figure No. 14656-04-25.LG37

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Site Project West Knockharley Landfill			**Borehole Number** LG38
Machine : Beretta T44 **Flush :** Air **Core Dia:** 146 mm **Method :** DTH Symmetrix	**Casing Diameter** 146mm cased to 8.00m	**Ground Level (mOD)**	**Client** Beauparc	**Job Number** 14656-04-25
	Location 697233.8 E 767787.5 N	**Dates** 25/06/2025	**Engineer** WSP / AWN	**Sheet** 1/1

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
							(8.00)	SYMMETRIX: Driller notes boulder Clay.			
							8.00	Complete at 8.00m			

Remarks
DTH Symmetrix from 0.00m to 8.00m BGL
Bentonite plug installed from 8.00m to 7.50m BGL. 50mm slotted standpipe with pea gravel surround installed from 7.50m BGL to 1.50m BGL. 50mm plain standpipe with bentonite seal installed from 1.50m BGL to GL. Finished with raised cover, concrete base and gas tap.

Scale (approx)	Logged By
1:50	JK

Figure No. 14656-04-25.LG38

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Site Project West Knockharley Landfill			**Borehole Number** LG39
Machine : Beretta T44 **Flush :** Air **Core Dia:** 146 mm **Method :** DTH Symmetrix	**Casing Diameter** 146mm cased to 8.50m	**Ground Level (mOD)**	**Client** Beauparc	**Job Number** 14656-04-25
	Location 697283.3 E 767794.6 N	**Dates** 25/06/2025	**Engineer** WSP / AWN	**Sheet** 1/1

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
							(8.50)	SYMMETRIX: Driller notes boulder Clay.			
							8.50	Complete at 8.50m			

Remarks
DTH Symmetrix from 0.00m to 8.50m BGL
Bentonite plug installed from 8.50m to 8.00m BGL. 50mm slotted standpipe with pea gravel surround installed from 8.00m BGL to 1.50m BGL. 50mm plain standpipe with bentonite seal installed from 1.50m BGL to GL. Finished with raised cover, concrete base and gas tap.

Scale (approx)	Logged By
1:50	JK

Figure No. 14656-04-25.LG39

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Site Project West Knockharley Landfill			**Borehole Number** LG40
Machine : Beretta T44 **Flush :** Air **Core Dia:** 146 mm **Method :** DTH Symmetrix	**Casing Diameter** 146mm cased to 8.00m	**Ground Level (mOD)**	**Client** Beauparc	**Job Number** 14656-04-25
	Location 697322.8 E 767825.3 N	**Dates** 25/06/2025	**Engineer** WSP / AWN	**Sheet** 1/1

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
							(8.00)	SYMMETRIX: Driller notes boulder Clay.			
							8.00	Complete at 8.00m			

Remarks
DTH Symmetrix from 0.00m to 8.00m BGL
Bentonite plug installed from 8.00m to 7.50m BGL. 50mm slotted standpipe with pea gravel surround installed from 7.50m BGL to 1.50m BGL. 50mm plain standpipe with bentonite seal installed from 1.50m BGL to GL. Finished with raised cover, concrete base and gas tap.

Scale (approx)	Logged By
1:50	JK

Figure No. 14656-04-25.LG40

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Site Project West Knockharley Landfill			**Borehole Number** LG41
Machine : Beretta T44 **Flush :** Air **Core Dia:** 146 mm **Method :** DTH Symmetrix	**Casing Diameter** 146mm cased to 8.50m	**Ground Level (mOD)**	**Client** Beauparc	**Job Number** 14656-04-25
	Location 697362.1 E 767854.4 N	**Dates** 26/06/2025	**Engineer** WSP / AWN	**Sheet** 1/1

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
							(8.50)	SYMMETRIX: Driller notes boulder Clay.			
							8.50	Complete at 8.50m			

Remarks
DTH Symmetrix from 0.00m to 8.50m BGL
Bentonite plug installed from 8.50m to 8.00m BGL. 50mm slotted standpipe with pea gravel surround installed from 8.00m BGL to 1.50m BGL. 50mm plain standpipe with bentonite seal installed from 1.50m BGL to GL. Finished with raised cover, concrete base and gas tap.

Scale (approx)	Logged By
1:50	JK

Figure No. 14656-04-25.LG41

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Site Project West Knockharley Landfill			**Borehole Number** LG42
Machine : Beretta T44 **Flush :** Air **Core Dia:** 146 mm **Method :** DTH Symmetrix	**Casing Diameter** 146mm cased to 8.00m	**Ground Level (mOD)**	**Client** Beauparc	**Job Number** 14656-04-25
	Location 697411.9 E 767854.4 N	**Dates** 26/06/2025	**Engineer** WSP / AWN	**Sheet** 1/1

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
							(8.00)	SYMMETRIX: Driller notes boulder Clay.			
							8.00	Complete at 8.00m			

Remarks
DTH Symmetrix from 0.00m to 8.00m BGL
Bentonite plug installed from 8.00m to 7.50m BGL. 50mm slotted standpipe with pea gravel surround installed from 7.50m BGL to 1.50m BGL. 50mm plain standpipe with bentonite seal installed from 1.50m BGL to GL. Finished with raised cover, concrete base and gas tap.

Scale (approx)	Logged By
1:50	JK

Figure No. 14656-04-25.LG42

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Site Project West Knockharley Landfill			**Borehole Number** LG43
Machine : Beretta T44 **Flush :** Air **Core Dia :** 146 mm **Method :** DTH Symmetrix	**Casing Diameter** 146mm cased to 8.00m	**Ground Level (mOD)**	**Client** Beauparc	**Job Number** 14656-04-25
	Location 697449.3 E 767825.8 N	**Dates** 26/06/2025	**Engineer** WSP / AWN	**Sheet** 1/1

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
							(8.00)	SYMMETRIX: Driller notes boulder Clay.			
							8.00	Complete at 8.00m			

Remarks
DTH Symmetrix from 0.00m to 8.00m BGL
Bentonite plug installed from 8.00m to 7.50m BGL. 50mm slotted standpipe with pea gravel surround installed from 7.50m BGL to 1.50m BGL. 50mm plain standpipe with bentonite seal installed from 1.50m BGL to GL. Finished with raised cover, concrete base and gas tap.

Scale (approx)	Logged By
1:50	JK

Figure No. 14656-04-25.LG43

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Site Project West Knockharley Landfill			**Borehole Number** LG44
Machine : Beretta T44 **Flush :** Air **Core Dia:** 146 mm **Method :** DTH Symmetrix	**Casing Diameter** 146mm cased to 8.00m	**Ground Level (mOD)**	**Client** Beauparc	**Job Number** 14656-04-25
	Location 697481.6 E 767788.1 N	**Dates** 27/06/2025	**Engineer** WSP / AWN	**Sheet** 1/1

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
							(8.00)	SYMMETRIX: Driller notes boulder Clay.			
							8.00	Complete at 8.00m			

Remarks
DTH Symmetrix from 0.00m to 8.00m BGL
Bentonite plug installed from 8.00m to 7.50m BGL. 50mm slotted standpipe with pea gravel surround installed from 7.50m BGL to 1.50m BGL. 50mm plain standpipe with bentonite seal installed from 1.50m BGL to GL. Finished with raised cover, concrete base and gas tap.

Scale (approx)	Logged By
1:50	JK

Figure No. 14656-04-25.LG44

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Site Project West Knockharley Landfill			**Borehole Number** LG45
Machine : Beretta T44 **Flush :** Air **Core Dia:** 146 mm **Method :** DTH Symmetrix	**Casing Diameter** 146mm cased to 8.00m	**Ground Level (mOD)**	**Client** Beauparc	**Job Number** 14656-04-25
	Location 697530.6 E 767767.8 N	**Dates** 27/06/2025	**Engineer** WSP / AWN	**Sheet** 1/1

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
							(8.00)	SYMMETRIX: Driller notes boulder Clay.			
							8.00	Complete at 8.00m			

Remarks
DTH Symmetrix from 0.00m to 8.00m BGL
Bentonite plug installed from 8.00m to 7.50m BGL. 50mm slotted standpipe with pea gravel surround installed from 7.50m BGL to 1.50m BGL. 50mm plain standpipe with bentonite seal installed from 1.50m BGL to GL. Finished with raised cover, concrete base and gas tap.

Scale (approx)	Logged By
1:50	JK

Figure No. 14656-04-25.LG45

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Site Project West Knockharley Landfill			**Borehole Number** LG46
Machine : Beretta T44 **Flush :** Air **Core Dia :** 146 mm **Method :** DTH Symmetrix	**Casing Diameter** 146mm cased to 7.00m	**Ground Level (mOD)**	**Client** Beauparc	**Job Number** 14656-04-25
	Location 697580.3 E 767761.8 N	**Dates** 30/06/2025	**Engineer** WSP / AWN	**Sheet** 1/1

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
							(7.00)	SYMMETRIX: Driller notes boulder Clay.			
							7.00	Complete at 7.00m			

Remarks
DTH Symmetrix from 0.00m to 7.00m BGL
Bentonite plug installed from 7.00m to 6.50m BGL. 50mm slotted standpipe with pea gravel surround installed from 6.50m BGL to 1.50m BGL. 50mm plain standpipe with bentonite seal installed from 1.50m BGL to GL. Finished with raised cover, concrete base and gas tap.

Scale (approx)	Logged By
1:50	JK

Figure No. 14656-04-25.LG46

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Site Project West Knockharley Landfill			**Borehole Number** LG47
Machine : Beretta T44 **Flush :** Air **Core Dia :** 146 mm **Method :** DTH Symmetrix	**Casing Diameter** 146mm cased to 7.00m	**Ground Level (mOD)**	**Client** Beauparc	**Job Number** 14656-04-25
	Location 697631.9 E 767766.8 N	**Dates** 30/06/2025	**Engineer** WSP / AWN	**Sheet** 1/1

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
							(7.00)	SYMMETRIX: Driller notes boulder Clay.			
							7.00	Complete at 7.00m			

Remarks
DTH Symmetrix from 0.00m to 7.00m BGL
Bentonite plug installed from 7.00m to 6.50m BGL. 50mm slotted standpipe with pea gravel surround installed from 6.50m BGL to 1.50m BGL. 50mm plain standpipe with bentonite seal installed from 1.50m BGL to GL. Finished with raised cover, concrete base and gas tap.

Scale (approx)	Logged By
1:50	JK

Figure No. 14656-04-25.LG47

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Site Project West Knockharley Landfill			**Borehole Number** LG48
Machine : Beretta T44 **Flush :** Air **Core Dia :** 146 mm **Method :** DTH Symmetrix	**Casing Diameter** 146mm cased to 6.50m	**Ground Level (mOD)**	**Client** Beauparc	**Job Number** 14656-04-25
	Location 697674.9 E 767791 N	**Dates** 30/06/2025	**Engineer** WSP / AWN	**Sheet** 1/1

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
							(6.50)	SYMMETRIX: Driller notes boulder Clay.			
							6.50	Complete at 6.50m			

Remarks
DTH Symmetrix from 0.00m to 6.50m BGL
Bentonite plug installed from 6.50m to 6.00m BGL. 50mm slotted standpipe with pea gravel surround installed from 6.00m BGL to 1.50m BGL. 50mm plain standpipe with bentonite seal installed from 1.50m BGL to GL. Finished with raised cover, concrete base and gas tap.

Scale (approx)	Logged By
1:50	JK

Figure No. 14656-04-25.LG48

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Site Project West Knockharley Landfill			**Borehole Number** LG49
Machine : Beretta T44 **Flush :** Air **Core Dia :** 146 mm **Method :** DTH Symmetrix	**Casing Diameter** 146mm cased to 7.00m	**Ground Level (mOD)**	**Client** Beauparc	**Job Number** 14656-04-25
	Location 697693.5 E 767750 N	**Dates** 30/06/2025	**Engineer** WSP / AWN	**Sheet** 1/1

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
							(7.00)	SYMMETRIX: Driller notes boulder Clay.			
							7.00	Complete at 7.00m			

Remarks
DTH Symmetrix from 0.00m to 7.00m BGL
Bentonite plug installed from 7.00m to 6.50m BGL. 50mm slotted standpipe with pea gravel surround installed from 6.50m BGL to 1.50m BGL. 50mm plain standpipe with bentonite seal installed from 1.50m BGL to GL. Finished with raised cover, concrete base and gas tap.

Scale (approx)	Logged By
1:50	JK

Figure No. 14656-04-25.LG49

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Site Project West Knockharley Landfill			**Borehole Number** LG56
Machine : Beretta T44 **Flush :** Air **Core Dia :** 146 mm **Method :** DTH Symmetrix	**Casing Diameter** 146mm cased to 11.50m	**Ground Level (mOD)**	**Client** Beauparc	**Job Number** 14656-04-25
	Location 697491 E 767440.8 N	**Dates** 03/07/2025	**Engineer** WSP / AWN	**Sheet** 1/2

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
							(11.50)	SYMMETRIX: Driller notes boulder Clay.			

Remarks
DTH Symmetrix from 0.00m to 11.50m BGL
Bentonite plug installed from 11.50m to 11.00m BGL. 50mm slotted standpipe with pea gravel surround installed from 11.00m BGL to 1.50m BGL. 50mm plain standpipe with bentonite seal installed from 1.50m BGL to GL. Finished with raised cover, concrete base and gas tap.

Scale (approx)	Logged By
1:50	JK

Figure No. 14656-04-25.LG56

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Site Project West Knockharley Landfill			**Borehole Number** LG56
Machine : Beretta T44 **Flush :** Air **Core Dia :** 146 mm **Method :** DTH Symmetrix	**Casing Diameter** 146mm cased to 11.50m	**Ground Level (mOD)**	**Client** Beauparc	**Job Number** 14656-04-25
	Location 697491 E 767440.8 N	**Dates** 03/07/2025	**Engineer** WSP / AWN	**Sheet** 2/2

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
							11.50	Complete at 11.50m			

Remarks

Scale (approx)	Logged By
1:50	JK

Figure No. 14656-04-25.LG56

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Site Project West Knockharley Landfill			**Borehole Number** LG57
Machine : Beretta T44 **Flush :** Air **Core Dia:** 146 mm **Method :** DTH Symmetrix	**Casing Diameter** 146mm cased to 11.00m	**Ground Level (mOD)**	**Client** Beauparc	**Job Number** 14656-04-25
	Location 697557.8 E 767456.3 N	**Dates** 03/07/2025	**Engineer** WSP / AWN	**Sheet** 1/2

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
							(11.00)	SYMMETRIX: Driller notes boulder Clay.			

Remarks
DTH Symmetrix from 0.00m to 11.00m BGL
Bentonite plug installed from 11.00m to 10.50m BGL. 50mm slotted standpipe with pea gravel surround installed from 10.50m BGL to 1.50m BGL. 50mm plain standpipe with bentonite seal installed from 1.50m BGL to GL. Finished with raised cover, concrete base and gas tap.

Scale (approx)	Logged By
1:50	JK

Figure No. 14656-04-25.LG57

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Site Project West Knockharley Landfill			**Borehole Number** LG57
Machine : Beretta T44 **Flush :** Air **Core Dia:** 146 mm **Method :** DTH Symmetrix	**Casing Diameter** 146mm cased to 11.00m	**Ground Level (mOD)**	**Client** Beauparc	**Job Number** 14656-04-25
	Location 697557.8 E 767456.3 N	**Dates** 03/07/2025	**Engineer** WSP / AWN	**Sheet** 2/2

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
							11.00	Complete at 11.00m			

Remarks

Scale (approx)	Logged By
1:50	JK

Figure No. 14656-04-25.LG57

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Site Project West Knockharley Landfill			**Borehole Number** LG58
Machine : Beretta T44 **Flush :** Air **Core Dia:** 146 mm **Method :** DTH Symmetrix	**Casing Diameter** 146mm cased to 11.00m	**Ground Level (mOD)**	**Client** Beauparc	**Job Number** 14656-04-25
	Location 697616.6 E 767444.1 N	**Dates** 02/07/2025	**Engineer** WSP / AWN	**Sheet** 1/2

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
							(11.00)	SYMMETRIX: Driller notes boulder Clay.			

Remarks
DTH Symmetrix from 0.00m to 11.00m BGL
Bentonite plug installed from 11.00m to 10.50m BGL. 50mm slotted standpipe with pea gravel surround installed from 10.50m BGL to 1.50m BGL. 50mm plain standpipe with bentonite seal installed from 1.50m BGL to GL. Finished with raised cover, concrete base and gas tap.

Scale (approx)	Logged By
1:50	JK

Figure No. 14656-04-25.LG58

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Site Project West Knockharley Landfill			**Borehole Number** LG58
Machine : Beretta T44 **Flush :** Air **Core Dia:** 146 mm **Method :** DTH Symmetrix	**Casing Diameter** 146mm cased to 11.00m	**Ground Level (mOD)**	**Client** Beauparc	**Job Number** 14656-04-25
	Location 697616.6 E 767444.1 N	**Dates** 02/07/2025	**Engineer** WSP / AWN	**Sheet** 2/2

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
							11.00	Complete at 11.00m			

Remarks

Scale (approx)	Logged By
1:50	JK

Figure No. 14656-04-25.LG58

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Site Project West Knockharley Landfill			**Borehole Number** LG59
Machine : Beretta T44 **Flush :** Air **Core Dia :** 146 mm **Method :** DTH Symmetrix	**Casing Diameter** 146mm cased to 10.50m	**Ground Level (mOD)**	**Client** Beauparc	**Job Number** 14656-04-25
	Location 697664.5 E 767458.6 N	**Dates** 02/07/2025	**Engineer** WSP / AWN	**Sheet** 1/2

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
							(10.50)	SYMMETRIX: Driller notes boulder Clay.			

Remarks
DTH Symmetrix from 0.00m to 10.50m BGL
Bentonite plug installed from 10.50m to 10.00m BGL. 50mm slotted standpipe with pea gravel surround installed from 10.00m BGL to 1.50m BGL. 50mm plain standpipe with bentonite seal installed from 1.50m BGL to GL. Finished with raised cover, concrete base and gas tap.

Scale (approx)	Logged By
1:50	JK

Figure No. 14656-04-25.LG59

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Site Project West Knockharley Landfill			**Borehole Number** LG59
Machine : Beretta T44 **Flush :** Air **Core Dia:** 146 mm **Method :** DTH Symmetrix	**Casing Diameter** 146mm cased to 10.50m	**Ground Level (mOD)**	**Client** Beauparc	**Job Number** 14656-04-25
	Location 697664.5 E 767458.6 N	**Dates** 02/07/2025	**Engineer** WSP / AWN	**Sheet** 2/2

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
							10.50	Complete at 10.50m			

Remarks

Scale (approx)	Logged By
1:50	JK

Figure No. 14656-04-25.LG59

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Site Project West Knockharley Landfill			**Borehole Number** LG60
Machine : Beretta T44 **Flush :** Air **Core Dia :** 146 mm **Method :** DTH Symmetrix	**Casing Diameter** 146mm cased to 10.00m	**Ground Level (mOD)**	**Client** Beauparc	**Job Number** 14656-04-25
	Location 697711.4 E 767476.1 N	**Dates** 02/07/2025	**Engineer** WSP / AWN	**Sheet** 1/1

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
							(10.00)	SYMMETRIX: Driller notes boulder Clay.			
							10.00				

Remarks
DTH Symmetrix from 0.00m to 10.00m BGL
Bentonite plug installed from 10.00m to 9.50m BGL. 50mm slotted standpipe with pea gravel surround installed from 9.50m BGL to 1.50m BGL. 50mm plain standpipe with bentonite seal installed from 1.50m BGL to GL. Finished with raised cover and concrete base.

Scale (approx)	Logged By
1:50	JK

Figure No. 14656-04-25.LG60

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Site Project West Knockharley Landfill			**Borehole Number** LG61
Machine : Beretta T44 **Flush :** Air **Core Dia:** 146 mm **Method :** DTH Symmetrix	**Casing Diameter** 146mm cased to 11.50m	**Ground Level (mOD)**	**Client** Beauparc	**Job Number** 14656-04-25
	Location 697744.3 E 767504.9 N	**Dates** 02/07/2025	**Engineer** WSP / AWN	**Sheet** 1/1

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
							(9.00)	SYMMETRIX: Driller notes boulder Clay.			
							9.00	Complete at 9.00m			

Remarks
DTH Symmetrix from 0.00m to 9.00m BGL
Bentonite plug installed from 9.00m to 8.50m BGL. 50mm slotted standpipe with pea gravel surround installed from 8.50m BGL to 1.50m BGL. 50mm plain standpipe with bentonite seal installed from 1.50m BGL to GL. Finished with raised cover and concrete base.

Scale (approx)	Logged By
1:50	JK

Figure No. 14656-04-25.LG61

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Site Project West Knockharley Landfill			**Borehole Number** LG62
Machine : Beretta T44 **Flush :** Air **Core Dia :** 146 mm **Method :** DTH Symmetrix	**Casing Diameter** 146mm cased to 9.00m	**Ground Level (mOD)**	**Client** Beauparc	**Job Number** 14656-04-25
	Location 697734.8 E 767554.3 N	**Dates** 01/07/2025	**Engineer** WSP / AWN	**Sheet** 1/1

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
							(9.00)	SYMMETRIX: Driller notes boulder Clay.			
							9.00	Complete at 9.00m			

Remarks
DTH Symmetrix from 0.00m to 9.00m BGL
Bentonite plug installed from 9.00m to 8.50m BGL. 50mm slotted standpipe with pea gravel surround installed from 8.50m BGL to 1.50m BGL. 50mm plain standpipe with bentonite seal installed from 1.50m BGL to GL. Finished with raised cover, concrete base and gas tap.

Scale (approx)	Logged By
1:50	JK

Figure No. 14656-04-25.LG62

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Site Project West Knockharley Landfill			**Borehole Number** LG63
Machine : Beretta T44 **Flush :** Air **Core Dia :** 146 mm **Method :** DTH Symmetrix	**Casing Diameter** 146mm cased to 9.00m	**Ground Level (mOD)**	**Client** Beauparc	**Job Number** 14656-04-25
	Location 697724.6 E 767603.2 N	**Dates** 01/07/2025	**Engineer** WSP / AWN	**Sheet** 1/1

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
							(9.00)	SYMMETRIX: Driller notes boulder Clay.			
							9.00	Complete at 9.00m			

Remarks
DTH Symmetrix from 0.00m to 9.00m BGL
Bentonite plug installed from 9.00m to 8.50m BGL. 50mm slotted standpipe with pea gravel surround installed from 8.50m BGL to 1.50m BGL. 50mm plain standpipe with bentonite seal installed from 1.50m BGL to GL. Finished with raised cover, concrete base and gas tap.

Scale (approx)	Logged By
1:50	JK

Figure No. 14656-04-25.LG63

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Site Project West Knockharley Landfill			**Borehole Number** LG64
Machine : Beretta T44 **Flush :** Air **Core Dia:** 146 mm **Method :** DTH Symmetrix	**Casing Diameter** 146mm cased to 6.00m	**Ground Level (mOD)**	**Client** Beauparc	**Job Number** 14656-04-25
	Location 697714.6 E 767652.1 N	**Dates** 01/07/2025	**Engineer** WSP / AWN	**Sheet** 1/1

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
							(6.00)	SYMMETRIX: Driller notes boulder Clay.			
							6.00	Complete at 6.00m			

Remarks
DTH Symmetrix from 0.00m to 6.00m BGL
Bentonite plug installed from 6.00m to 5.50m BGL. 50mm slotted standpipe with pea gravel surround installed from 5.50m BGL to 1.50m BGL. 50mm plain standpipe with bentonite seal installed from 1.50m BGL to GL. Finished with raised cover, concrete base and gas tap.

Scale (approx)	Logged By
1:50	JK

Figure No. 14656-04-25.LG64

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Site Project West Knockharley Landfill			**Borehole Number** LG65
Machine : Beretta T44 **Flush :** Air **Core Dia:** 146 mm **Method :** DTH Symmetrix	**Casing Diameter** 146mm cased to 7.50m	**Ground Level (mOD)**	**Client** Beauparc	**Job Number** 14656-04-25
	Location 697704 E 767700.9 N	**Dates** 01/07/2025	**Engineer** WSP / AWN	**Sheet** 1/1

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
							(7.50)	SYMMETRIX: Driller notes boulder Clay.			
							7.50	Complete at 7.50m			

Remarks
DTH Symmetrix from 0.00m to 7.50m BGL
Bentonite plug installed from 7.50m to 7.00m BGL. 50mm slotted standpipe with pea gravel surround installed from 7.00m BGL to 1.50m BGL. 50mm plain standpipe with bentonite seal installed from 1.50m BGL to GL. Finished with raised cover, concrete base and gas tap.

Scale (approx)	Logged By
1:50	JK

Figure No. 14656-04-25.LG65

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APPENDIX 5 - Falling Head Permeability Testing – Manual Measurements

Borehole Identification	BH101T	
Data Logger Out	27/06/2025 08:44	
Recording Started	27/06/2025 08:54	
Data Logger In	27/06/2025 08:58	
Water Start Time	27/06/2025 09:04	
Water Full Time	27/06/2025 09:04	
Water Level (Below Yellow Casing)	1.62	m
Distance from Yellow Casing to Top of Standpipe	0.05	m

GROUND INVESTIGATIONS IRELAND
Geotechnical & Environmental

Depth (metres below Top of Yellow Casing)	Time	Depth (metres below top of standpipe)
0.29	27/06/2025 09:05	0.24
0.30	27/06/2025 09:06	0.25
0.31	27/06/2025 09:06	0.26
0.32	27/06/2025 09:06	0.27
0.33	27/06/2025 09:07	0.28
0.34	27/06/2025 09:07	0.29
0.35	27/06/2025 09:07	0.30
0.36	27/06/2025 09:08	0.31
0.37	27/06/2025 09:08	0.32
0.38	27/06/2025 09:09	0.33
0.39	27/06/2025 09:09	0.34
0.40	27/06/2025 09:09	0.35
0.41	27/06/2025 09:10	0.36
0.42	27/06/2025 09:10	0.37
0.43	27/06/2025 09:11	0.38
0.44	27/06/2025 09:11	0.39
0.45	27/06/2025 09:11	0.40
0.46	27/06/2025 09:12	0.41
0.47	27/06/2025 09:12	0.42
0.48	27/06/2025 09:13	0.43
0.49	27/06/2025 09:13	0.44
0.50	27/06/2025 09:14	0.45
0.51	27/06/2025 09:14	0.46
0.52	27/06/2025 09:15	0.47
0.53	27/06/2025 09:15	0.48
0.54	27/06/2025 09:16	0.49
0.55	27/06/2025 09:16	0.50
0.56	27/06/2025 09:17	0.51
0.57	27/06/2025 09:17	0.52
0.58	27/06/2025 09:18	0.53
0.59	27/06/2025 09:18	0.54
0.60	27/06/2025 09:19	0.55
0.61	27/06/2025 09:19	0.56
0.62	27/06/2025 09:20	0.57
0.63	27/06/2025 09:20	0.58
0.64	27/06/2025 09:21	0.59

Depth (metres below Top of Yellow Casing)	Time	Depth (metres below top of standpipe)
0.65	27/06/2025 09:22	0.60
0.66	27/06/2025 09:22	0.61
0.67	27/06/2025 09:23	0.62
0.68	27/06/2025 09:23	0.63
0.69	27/06/2025 09:24	0.64
0.70	27/06/2025 09:25	0.65
0.71	27/06/2025 09:25	0.66
0.72	27/06/2025 09:26	0.67
0.73	27/06/2025 09:26	0.68
0.74	27/06/2025 09:27	0.69
0.75	27/06/2025 09:28	0.70
0.76	27/06/2025 09:28	0.71
0.77	27/06/2025 09:29	0.72
0.78	27/06/2025 09:30	0.73
0.79	27/06/2025 09:30	0.74
0.80	27/06/2025 09:31	0.75
0.81	27/06/2025 09:32	0.76
0.82	27/06/2025 09:33	0.77
0.83	27/06/2025 09:33	0.78
0.84	27/06/2025 09:34	0.79
0.85	27/06/2025 09:35	0.80
0.86	27/06/2025 09:36	0.81
0.87	27/06/2025 09:36	0.82
0.88	27/06/2025 09:37	0.83
0.89	27/06/2025 09:38	0.84
0.90	27/06/2025 09:39	0.85
0.91	27/06/2025 09:39	0.86
0.92	27/06/2025 09:40	0.87
0.93	27/06/2025 09:41	0.88
0.94	27/06/2025 09:42	0.89
0.95	27/06/2025 09:43	0.90
0.96	27/06/2025 09:45	0.91
0.97	27/06/2025 09:46	0.92
0.98	27/06/2025 09:47	0.93
0.99	27/06/2025 09:48	0.94
1.00	27/06/2025 09:49	0.95
1.01	27/06/2025 09:50	0.96
1.02	27/06/2025 09:51	0.97
1.03	27/06/2025 09:52	0.98
1.04	27/06/2025 09:53	0.99
1.05	27/06/2025 09:54	1.00
1.06	27/06/2025 09:55	1.01
1.07	27/06/2025 09:56	1.02
1.08	27/06/2025 09:57	1.03
1.09	27/06/2025 09:59	1.04
1.10	27/06/2025 10:00	1.05

Falling Head Tests
Manual Measurements

Depth (metres below Top of Yellow Casing)	Time	Depth (metres below top of standpipe)
1.11	27/06/2025 10:01	1.06
1.12	27/06/2025 10:02	1.07
1.13	27/06/2025 10:03	1.08
1.16	27/06/2025 10:09	1.11
1.19	27/06/2025 10:14	1.14
1.22	27/06/2025 10:19	1.17
1.25	27/06/2025 10:24	1.20
1.28	27/06/2025 10:29	1.23
1.30	27/06/2025 10:34	1.25
1.33	27/06/2025 10:39	1.28
1.37	27/06/2025 10:49	1.32
1.40	27/06/2025 10:59	1.35
1.58	27/06/2025 13:06	1.53

Borehole Identification	BH103T	
Data Logger Out	30/06/2025 11:56	
Recording Started	30/06/2025 12:02	
Data Logger In	30/06/2025 12:07	
Water Start Time	30/06/2025 12:09	
Water Full Time	30/06/2025 12:09	
Water Level (Below Yellow Casing)	1.16	m
Distance from Yellow Casing to Top of Standpipe	0.06	m

GROUND INVESTIGATIONS IRELAND
Geotechnical & Environmental

Depth (metres below Top of Yellow Casing)	Time	Depth (metres below top of standpipe)
0.16	30/06/2025 12:12	0.10
0.17	30/06/2025 12:13	0.11
0.18	30/06/2025 12:14	0.12
0.19	30/06/2025 12:15	0.13
0.20	30/06/2025 12:15	0.14
0.21	30/06/2025 12:16	0.15
0.22	30/06/2025 12:17	0.16
0.23	30/06/2025 12:18	0.17
0.24	30/06/2025 12:19	0.18
0.25	30/06/2025 12:20	0.19
0.26	30/06/2025 12:21	0.20
0.27	30/06/2025 12:21	0.21
0.28	30/06/2025 12:23	0.22
0.29	30/06/2025 12:24	0.23
0.30	30/06/2025 12:25	0.24
0.32	30/06/2025 12:27	0.26
0.35	30/06/2025 12:31	0.29
0.40	30/06/2025 12:38	0.34
0.45	30/06/2025 12:45	0.39
0.50	30/06/2025 12:57	0.44
0.55	30/06/2025 13:08	0.49
0.60	30/06/2025 13:24	0.54
0.65	30/06/2025 13:38	0.59
0.70	30/06/2025 13:57	0.64
0.75	30/06/2025 14:21	0.69
1.17	01/07/2025 08:30	1.11

Borehole Identification	BH106T	
Data Logger Out	30/06/2025 10:30	
Recording Started	30/06/2025 10:35	
Data Logger In	30/06/2025 10:37	
Water Start Time	30/06/2025 10:38	
Water Full Time	30/06/2025 10:38	
Water Level (Below Yellow Casing)	3.65	m
Distance from Yellow Casing to Top of Standpipe	0.04	m

GROUND INVESTIGATIONS IRELAND
Geotechnical & Environmental

Depth (metres below Top of Yellow Casing)	Time	Depth (metres below top of standpipe)
0.62	30/06/2025 10:39	0.58
0.69	30/06/2025 10:39	0.65
0.75	30/06/2025 10:39	0.71
0.80	30/06/2025 10:41	0.76
0.85	30/06/2025 10:42	0.81
0.90	30/06/2025 10:46	0.86
0.95	30/06/2025 10:51	0.91
1.00	30/06/2025 10:58	0.96
1.05	30/06/2025 11:07	1.01
1.10	30/06/2025 11:16	1.06
1.15	30/06/2025 11:25	1.11
1.20	30/06/2025 11:39	1.16
1.54	30/06/2025 14:37	1.50
1.78	01/07/2025 09:21	1.74

Borehole Identification	BH107T	
Data Logger Out	27/06/2025 11:10	
Recording Started	27/06/2025 11:15	
Data Logger In	27/06/2025 11:18	
Water Start Time	27/06/2025 11:22	
Water Full Time	27/06/2025 11:23	
Water Level (Below Yellow Casing)	13.38	m
Distance from Yellow Casing to Top of Standpipe	0.15	m

GROUND INVESTIGATIONS IRELAND
Geotechnical & Environmental

Depth (metres below Top of Yellow Casing)	Time	Depth (metres below top of standpipe)
11.45	27/06/2025 11:24	11.30
11.34	27/06/2025 11:34	11.19
11.33	27/06/2025 11:37	11.18
11.32	27/06/2025 11:43	11.17
11.31	27/06/2025 12:00	11.16
11.30	27/06/2025 12:13	11.15
11.29	27/06/2025 12:42	11.14
11.28	27/06/2025 13:20	11.13
10.77	30/06/2025 08:25	10.62

Borehole Identification	BH107T	
Data Logger Out	30/06/2025 09:19	
Recording Started	30/06/2025 09:29	
Data Logger In	30/06/2025 09:30	
Water Start Time	30/06/2025 09:34	
Water Full Time	30/06/2025 09:35	
Water Level (Below Yellow Casing)	10.77	m
Distance from Yellow Casing to Top of Standpipe	0.15	m

GROUND INVESTIGATIONS IRELAND
Geotechnical & Environmental

Depth (metres below Top of Yellow Casing)	Time	Depth (metres below top of standpipe)
0.26	30/06/2025 09:36	0.11
0.27	30/06/2025 09:36	0.12
0.28	30/06/2025 09:36	0.13
0.29	30/06/2025 09:36	0.14
0.30	30/06/2025 09:37	0.15
0.36	30/06/2025 09:38	0.21
0.37	30/06/2025 09:38	0.22
0.38	30/06/2025 09:38	0.23
0.39	30/06/2025 09:38	0.24
0.40	30/06/2025 09:38	0.25
0.41	30/06/2025 09:38	0.26
0.42	30/06/2025 09:39	0.27
0.43	30/06/2025 09:39	0.28
0.44	30/06/2025 09:39	0.29
0.45	30/06/2025 09:39	0.30
0.46	30/06/2025 09:39	0.31
0.47	30/06/2025 09:39	0.32
0.48	30/06/2025 09:40	0.33
0.49	30/06/2025 09:40	0.34
0.50	30/06/2025 09:40	0.35
0.51	30/06/2025 09:40	0.36
0.52	30/06/2025 09:40	0.37
0.53	30/06/2025 09:40	0.38
0.54	30/06/2025 09:41	0.39
0.55	30/06/2025 09:41	0.40
0.56	30/06/2025 09:41	0.41
0.57	30/06/2025 09:41	0.42
0.58	30/06/2025 09:41	0.43
0.59	30/06/2025 09:41	0.44
0.60	30/06/2025 09:42	0.45
0.65	30/06/2025 09:42	0.50
0.70	30/06/2025 09:43	0.55
0.75	30/06/2025 09:44	0.60
0.80	30/06/2025 09:45	0.65
0.85	30/06/2025 09:46	0.70
0.90	30/06/2025 09:47	0.75

Falling Head Tests
Manual Measurements

Depth (metres below Top of Yellow Casing)	Time	Depth (metres below top of standpipe)
0.95	30/06/2025 09:47	0.80
1.00	30/06/2025 09:48	0.85
1.05	30/06/2025 09:49	0.90
1.10	30/06/2025 09:57	0.95
1.12	30/06/2025 10:17	0.97
1.19	30/06/2025 11:45	1.04
1.27	30/06/2025 14:34	1.12
1.50	01/07/2025 09:05	1.35

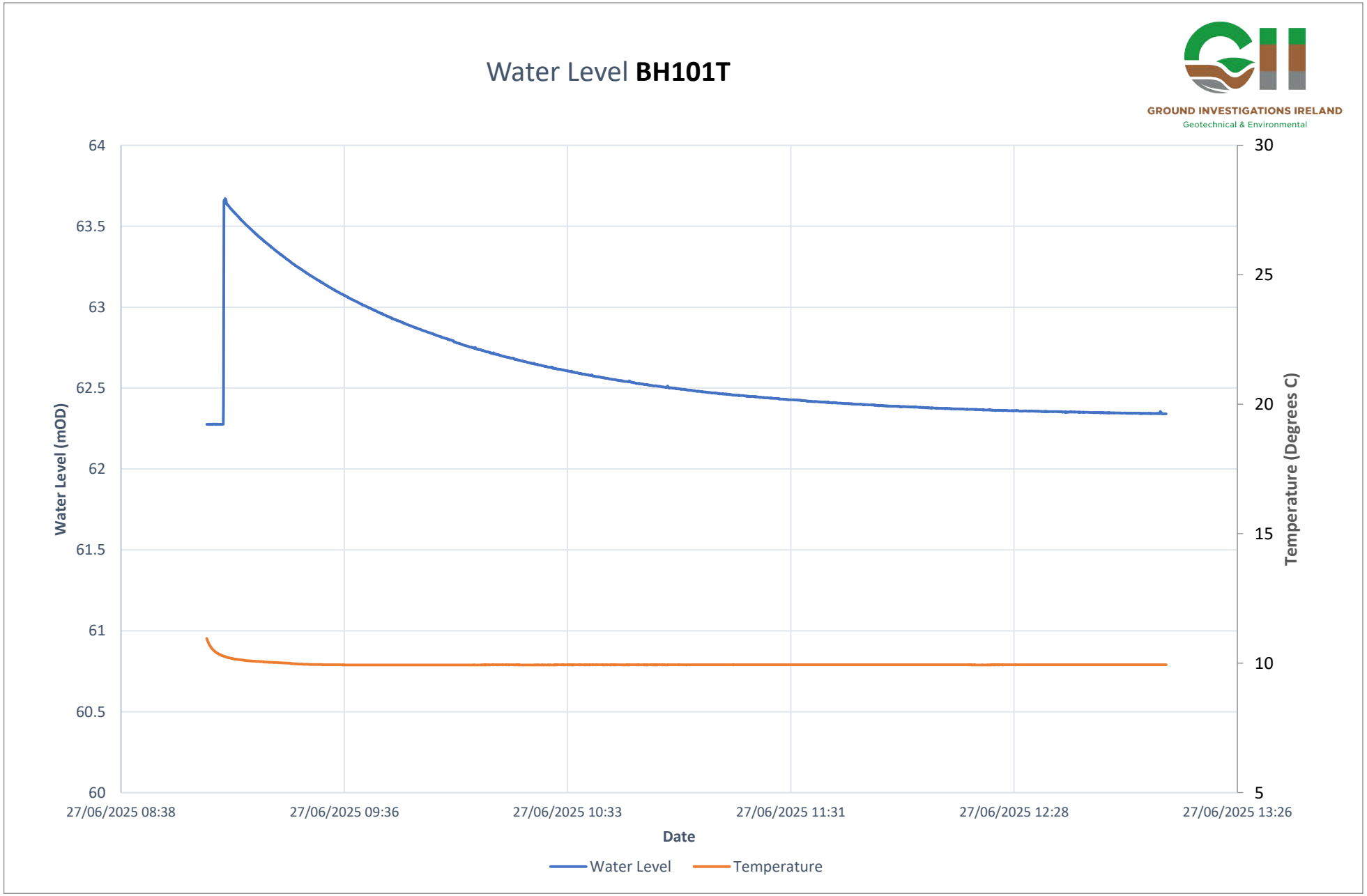
Borehole Identification	BH108T	
Data Logger Out	26/06/2025 13:14	
Recording Started	26/06/2025 13:46	
Data Logger In	26/06/2025 13:48	
Water Start Time	26/06/2025 13:49	
Water Full Time	26/06/2025 13:49	
Water Level (Below Yellow Casing)	6.51	m
Distance from Yellow Casing to Top of Standpipe	0.175	m

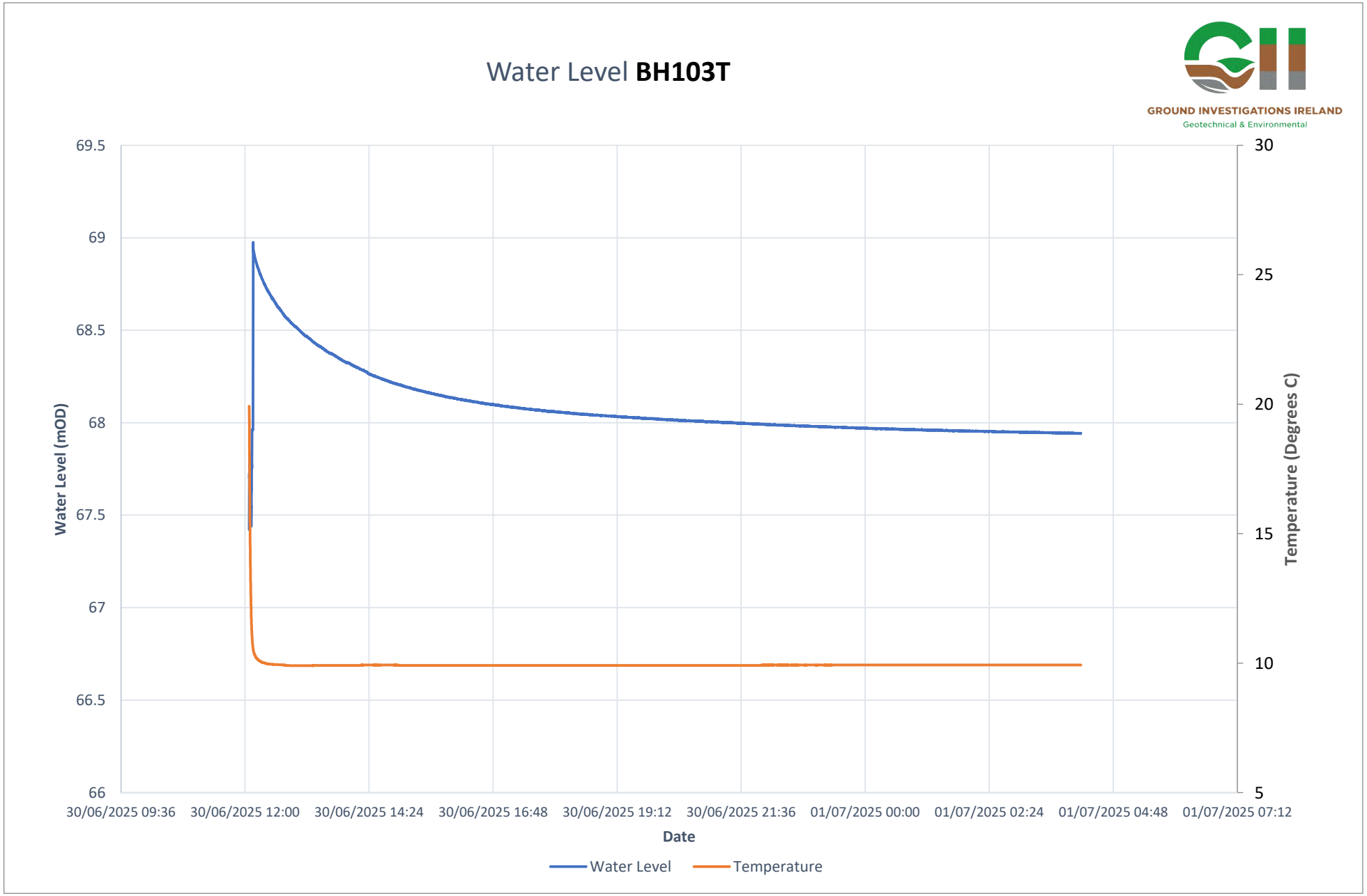
GROUND INVESTIGATIONS IRELAND
Geotechnical & Environmental

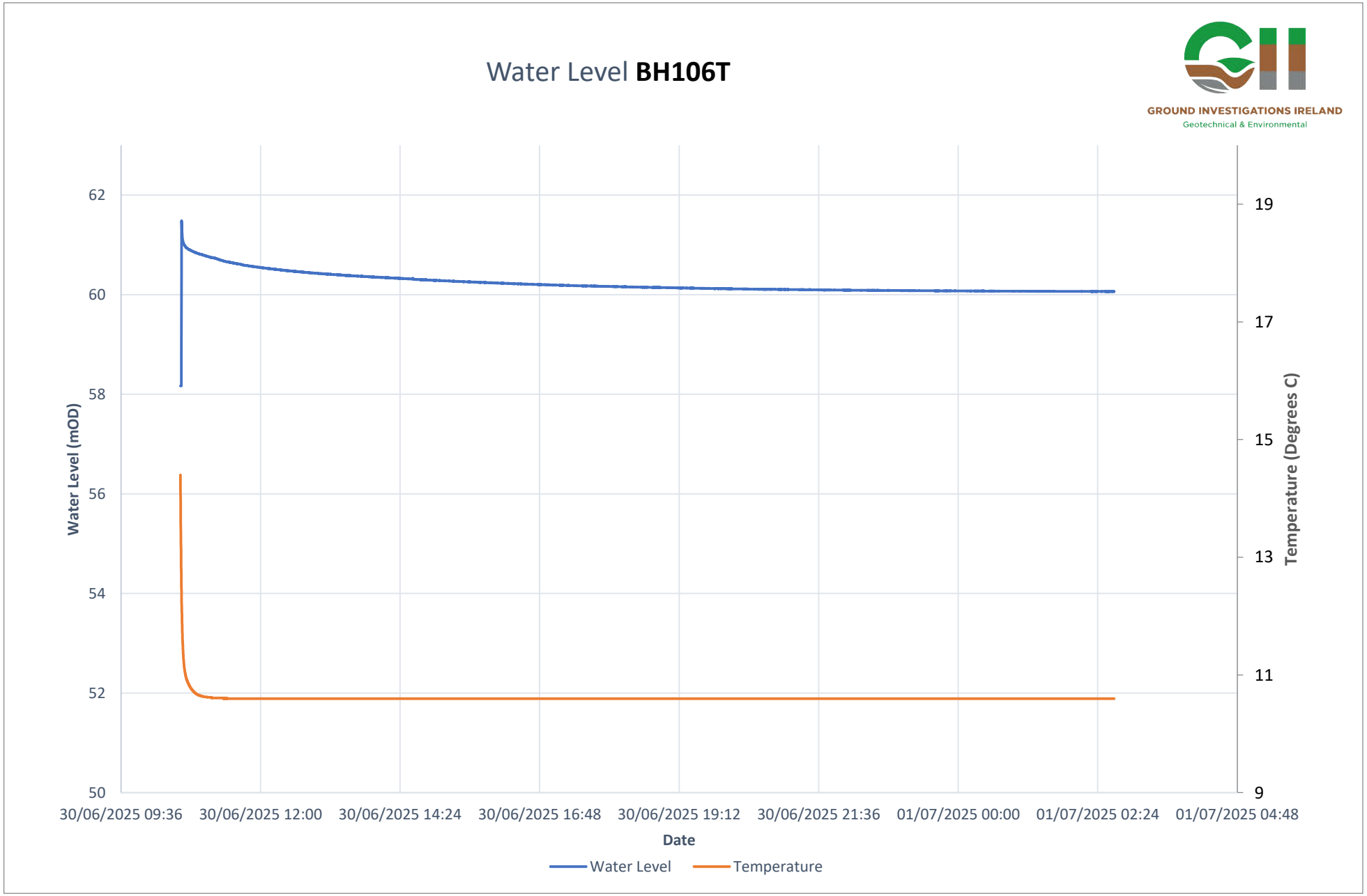
Depth (metres below Top of Yellow Casing)	Time	Depth (metres below top of standpipe)
3.46	26/06/2025 13:50	3.29
3.47	26/06/2025 13:52	3.30
3.48	26/06/2025 13:54	3.31
3.49	26/06/2025 13:56	3.32
3.50	26/06/2025 13:58	3.33
3.51	26/06/2025 14:00	3.34
3.52	26/06/2025 14:02	3.35
3.53	26/06/2025 14:04	3.36
3.54	26/06/2025 14:06	3.37
3.55	26/06/2025 14:07	3.38
3.56	26/06/2025 14:09	3.39
3.57	26/06/2025 14:11	3.40
3.58	26/06/2025 14:13	3.41
3.59	26/06/2025 14:15	3.42
3.60	26/06/2025 14:17	3.43
3.61	26/06/2025 14:19	3.44
3.62	26/06/2025 14:21	3.45
3.63	26/06/2025 14:23	3.46
3.64	26/06/2025 14:25	3.47
3.65	26/06/2025 14:27	3.48
3.66	26/06/2025 14:28	3.49
3.67	26/06/2025 14:31	3.50
3.68	26/06/2025 14:33	3.51
3.69	26/06/2025 14:35	3.52
3.70	26/06/2025 14:37	3.53
3.71	26/06/2025 14:39	3.54
3.72	26/06/2025 14:41	3.55
3.73	26/06/2025 14:43	3.56
3.74	26/06/2025 14:45	3.57
3.75	26/06/2025 14:47	3.58
3.76	26/06/2025 14:50	3.59
3.77	26/06/2025 14:51	3.60
3.78	26/06/2025 14:54	3.61
3.79	26/06/2025 14:56	3.62
3.80	26/06/2025 14:58	3.63

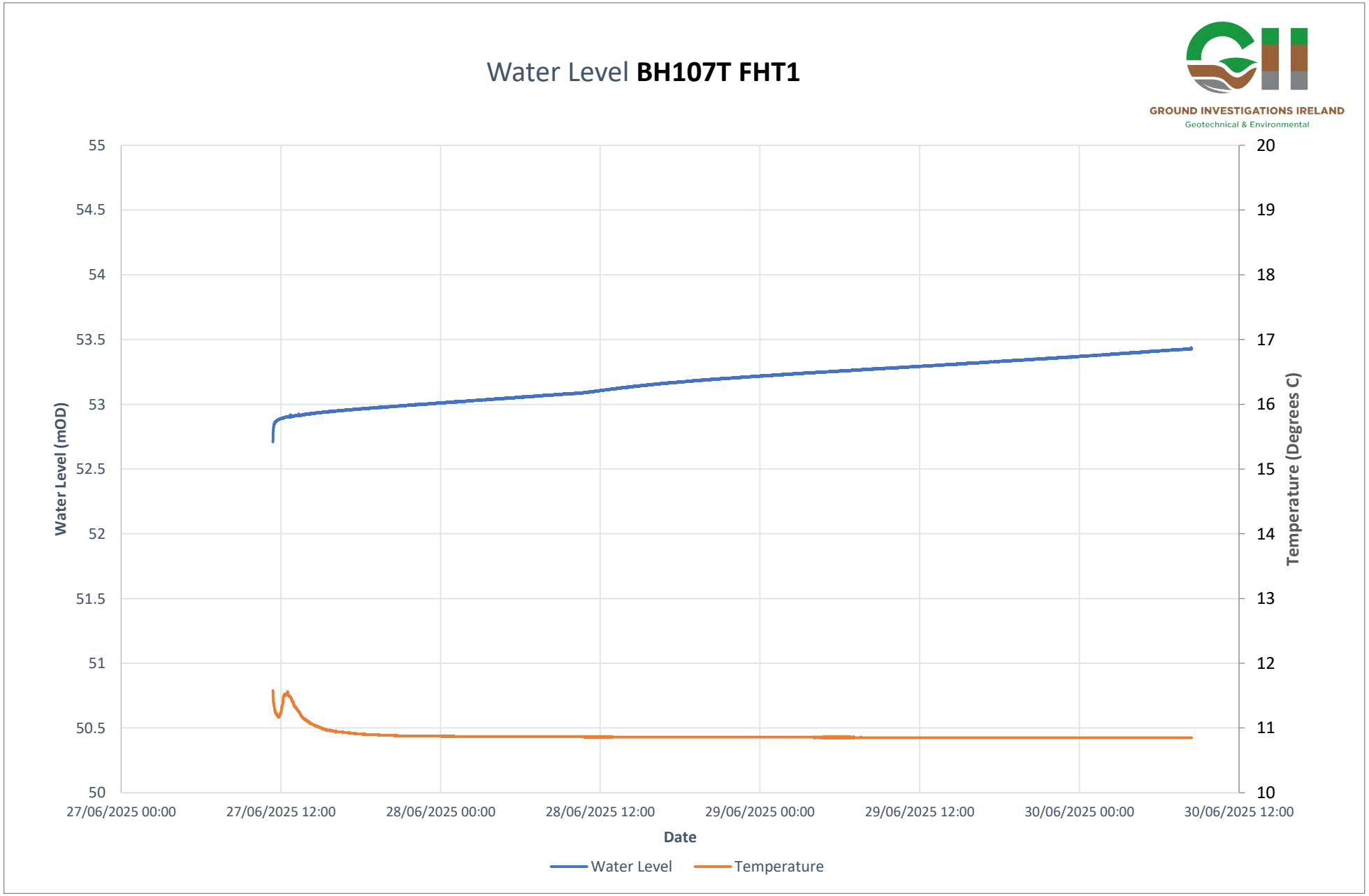
Depth (metres below Top of Yellow Casing)	Time	Depth (metres below top of standpipe)
3.81	26/06/2025 15:00	3.64
3.82	26/06/2025 15:02	3.65
3.83	26/06/2025 15:04	3.66
3.84	26/06/2025 15:06	3.67
3.85	26/06/2025 15:09	3.68
3.86	26/06/2025 15:11	3.69
3.87	26/06/2025 15:13	3.70
3.88	26/06/2025 15:15	3.71
3.89	26/06/2025 15:17	3.72
3.90	26/06/2025 15:19	3.73
3.91	26/06/2025 15:22	3.74
3.93	26/06/2025 15:27	3.76
3.95	26/06/2025 15:32	3.78
3.99	26/06/2025 15:42	3.82
4.04	26/06/2025 15:52	3.87
6.32	27/06/2025 12:48	6.15

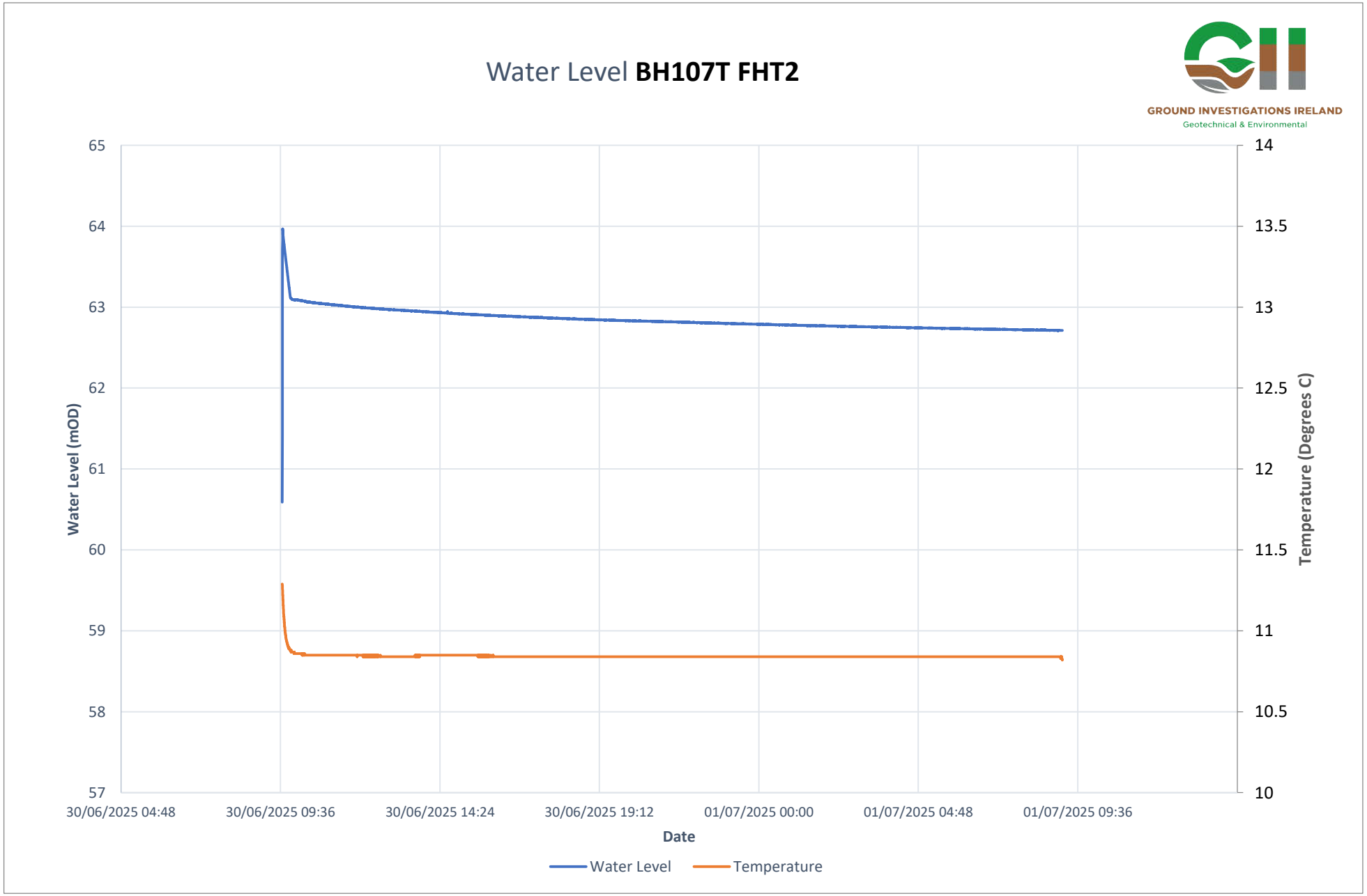
APPENDIX 6 – Falling Head Permeability Testing – Automatic Measurements

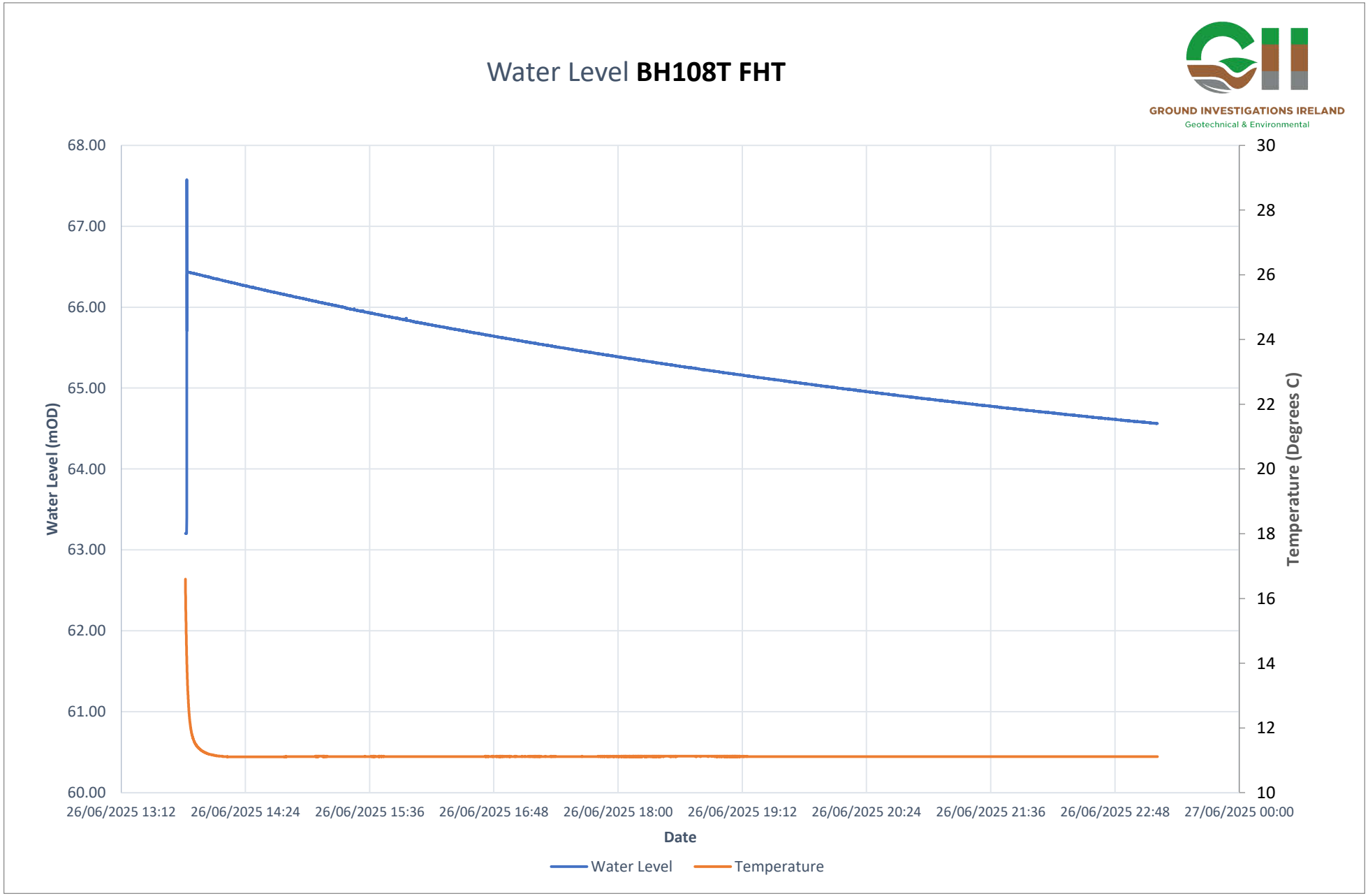

Water Level BH101T
GROUND INVESTIGATIONS IRELAND
Geotechnical & Environmental
Water Level (mOD)
64
63.5
63
62.5
62
61.5
61
60.5
60
Temperature (Degrees C)
30
25
20
15
10
5
27/06/2025 08:38
27/06/2025 09:36
27/06/2025 10:33
27/06/2025 11:31
27/06/2025 12:28
27/06/2025 13:26
Date
Water Level
Temperature


Water Level BH103T
GROUND INVESTIGATIONS IRELAND
Geotechnical & Environmental
Water Level (mOD)
69.5
69
68.5
68
67.5
67
66.5
66
Temperature (Degrees C)
30
25
20
15
10
5
30/06/2025 09:36
30/06/2025 12:00
30/06/2025 14:24
30/06/2025 16:48
30/06/2025 19:12
30/06/2025 21:36
01/07/2025 00:00
01/07/2025 02:24
01/07/2025 04:48
01/07/2025 07:12
Date
Water Level
Temperature


Water Level BH106T
GROUND INVESTIGATIONS IRELAND
Geotechnical & Environmental
Water Level (mOD)
62
60
58
56
54
52
50
Temperature (Degrees C)
19
17
15
13
11
9
30/06/2025 09:36
30/06/2025 12:00
30/06/2025 14:24
30/06/2025 16:48
30/06/2025 19:12
30/06/2025 21:36
01/07/2025 00:00
01/07/2025 02:24
01/07/2025 04:48
Date
Water Level
Temperature


Water Level BH107T FHT1
GROUND INVESTIGATIONS IRELAND
Geotechnical & Environmental
Water Level (mOD)
Temperature (Degrees C)
55
54.5
54
53.5
53
52.5
52
51.5
51
50.5
50
20
19
18
17
16
15
14
13
12
11
10
27/06/2025 00:00
27/06/2025 12:00
28/06/2025 00:00
28/06/2025 12:00
29/06/2025 00:00
29/06/2025 12:00
30/06/2025 00:00
30/06/2025 12:00
Date
Water Level
Temperature


Water Level BH107T FHT2
GROUND INVESTIGATIONS IRELAND
Geotechnical & Environmental
Water Level (mOD)
Temperature (Degrees C)
65
64
63
62
61
60
59
58
57
14
13.5
13
12.5
12
11.5
11
10.5
10
30/06/2025 04:48
30/06/2025 09:36
30/06/2025 14:24
30/06/2025 19:12
01/07/2025 00:00
01/07/2025 04:48
01/07/2025 09:36
Date
Water Level
Temperature


Water Level BH108T FHT
GROUND INVESTIGATIONS IRELAND
Geotechnical & Environmental
Water Level (mOD)
68.00
67.00
66.00
65.00
64.00
63.00
62.00
61.00
60.00
Temperature (Degrees C)
30
28
26
24
22
20
18
16
14
12
10
26/06/2025 13:12
26/06/2025 14:24
26/06/2025 15:36
26/06/2025 16:48
26/06/2025 18:00
26/06/2025 19:12
26/06/2025 20:24
26/06/2025 21:36
26/06/2025 22:48
27/06/2025 00:00
Date
Water Level
Temperature

APPENDIX 7 – Groundwater Monitoring 1st Phase

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GROUND INVESTIGATIONS IRELAND
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Web: www.gii.ie

GROUNDWATER MONITORING

Project West Knockharley Landfill

BOREHOLE	DATE	TIME	GROUNDWATER (m BGL)	GROUNDWATER (m MOD)	Comments
BH101S	09/06/2025	12:54:00	0.00	63.59	Artesian
BH102S	09/06/2025	13:06:00	0.00	64.91	Artesian
BH104S	09/06/2025	12:50:00	0.00	62.64	Artesian
BH106S	09/06/2025	12:42:00	0.00	61.72	Artesian
BH107S	09/06/2025	12:36:00	0.87	62.67	
BH108S	09/06/2025	12:30:00	1.52	61.58	

GROUND INVESTIGATIONS IRELAND
Geotechnical & Environmental

Catherinestown House,
Hazelhatch Road,
Newcastle,
Co. Dublin.
D22 YD52

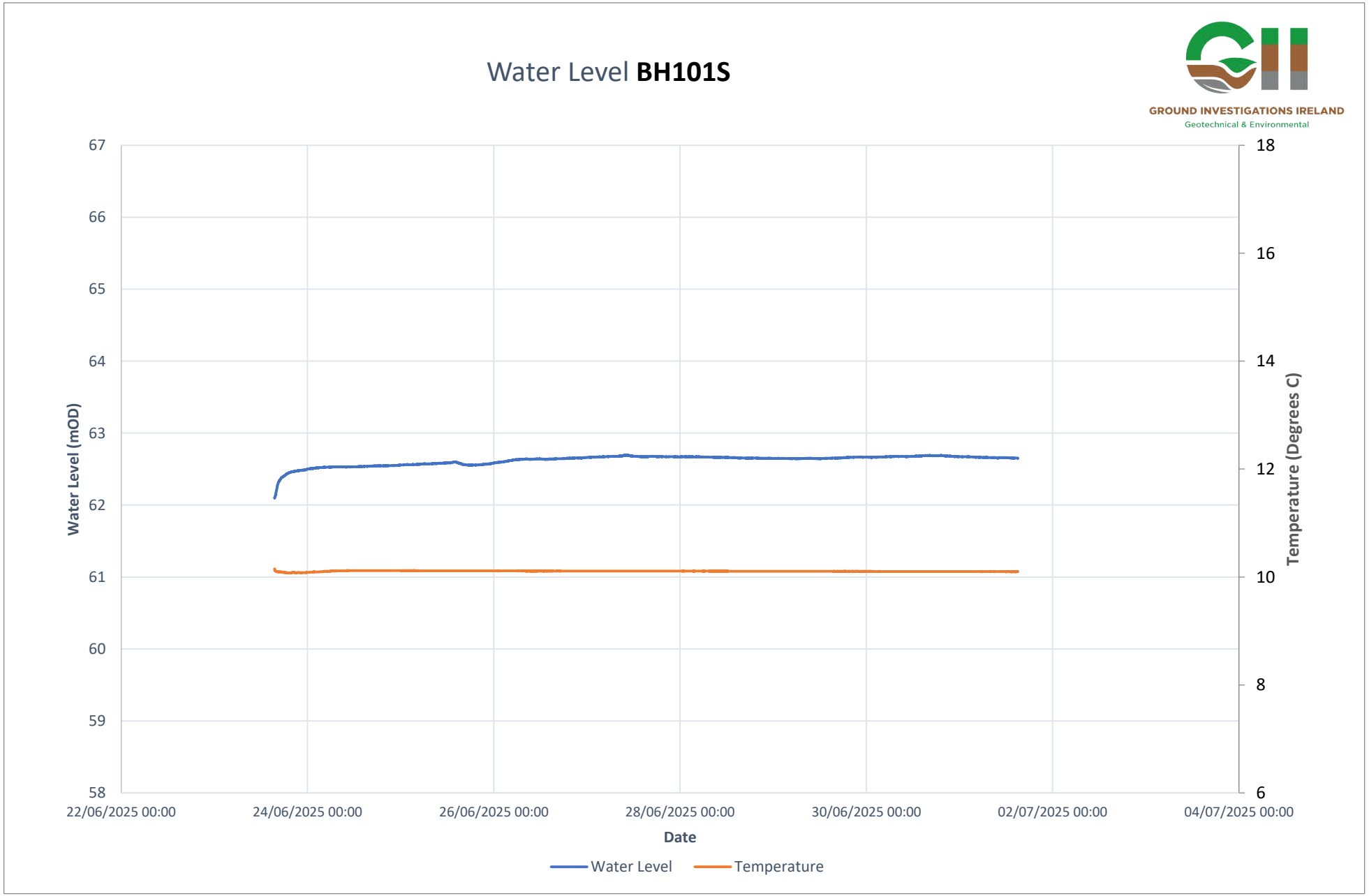
Tel: 01 601 5175 / 5176
Email: info@gii.ie
Web: www.gii.ie

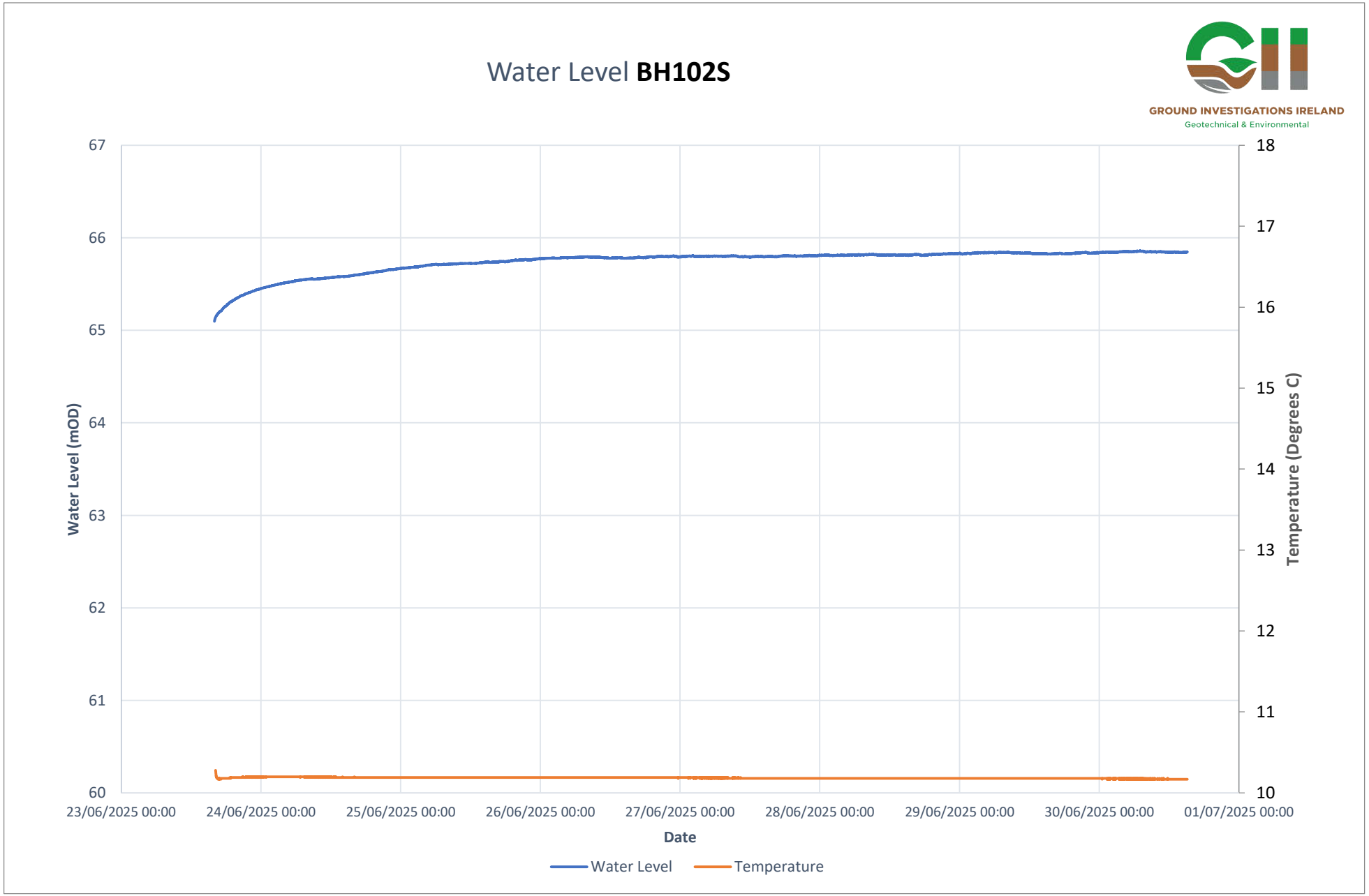
GROUNDWATER MONITORING

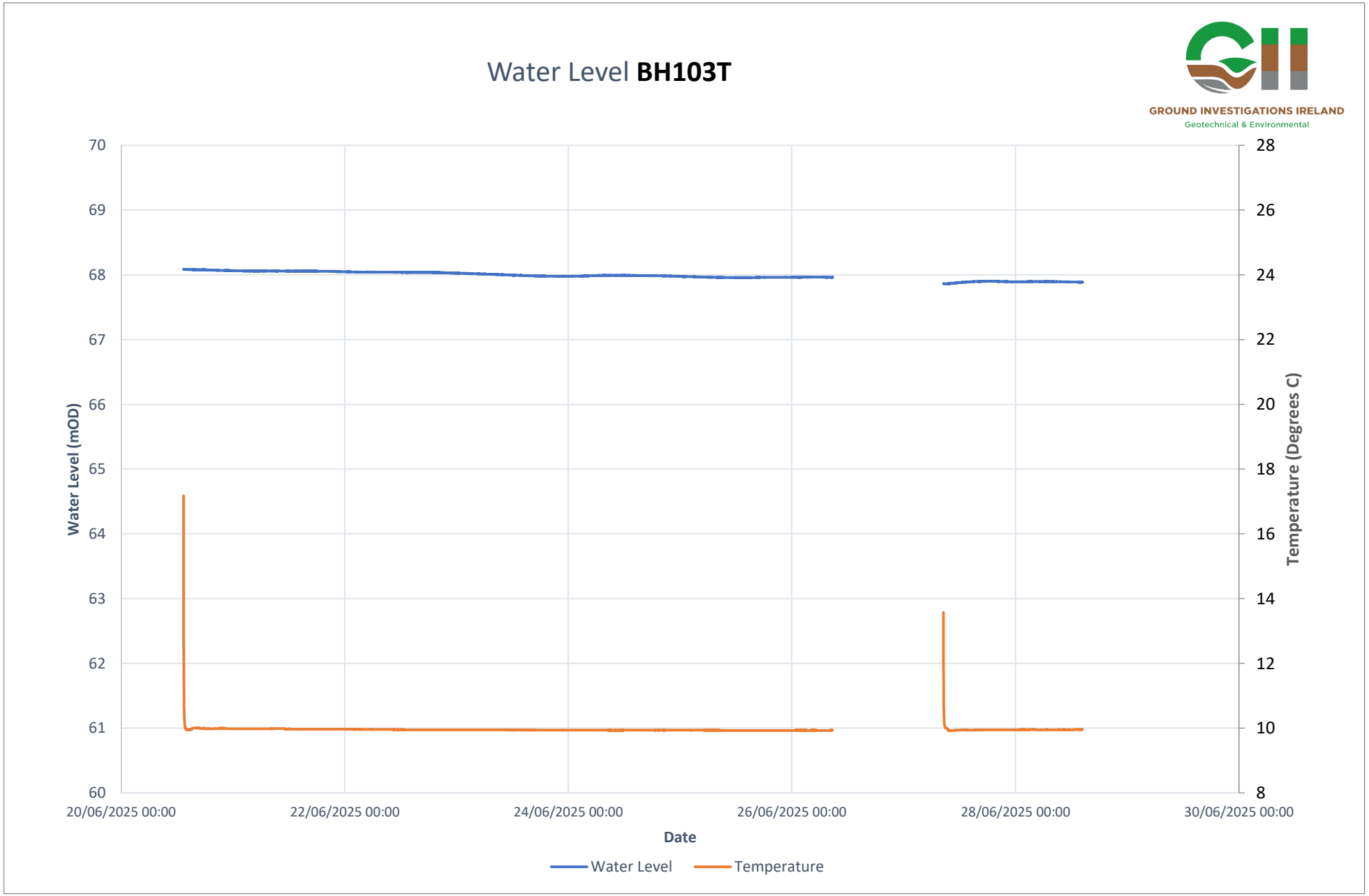
Project West Knockharley Landfill

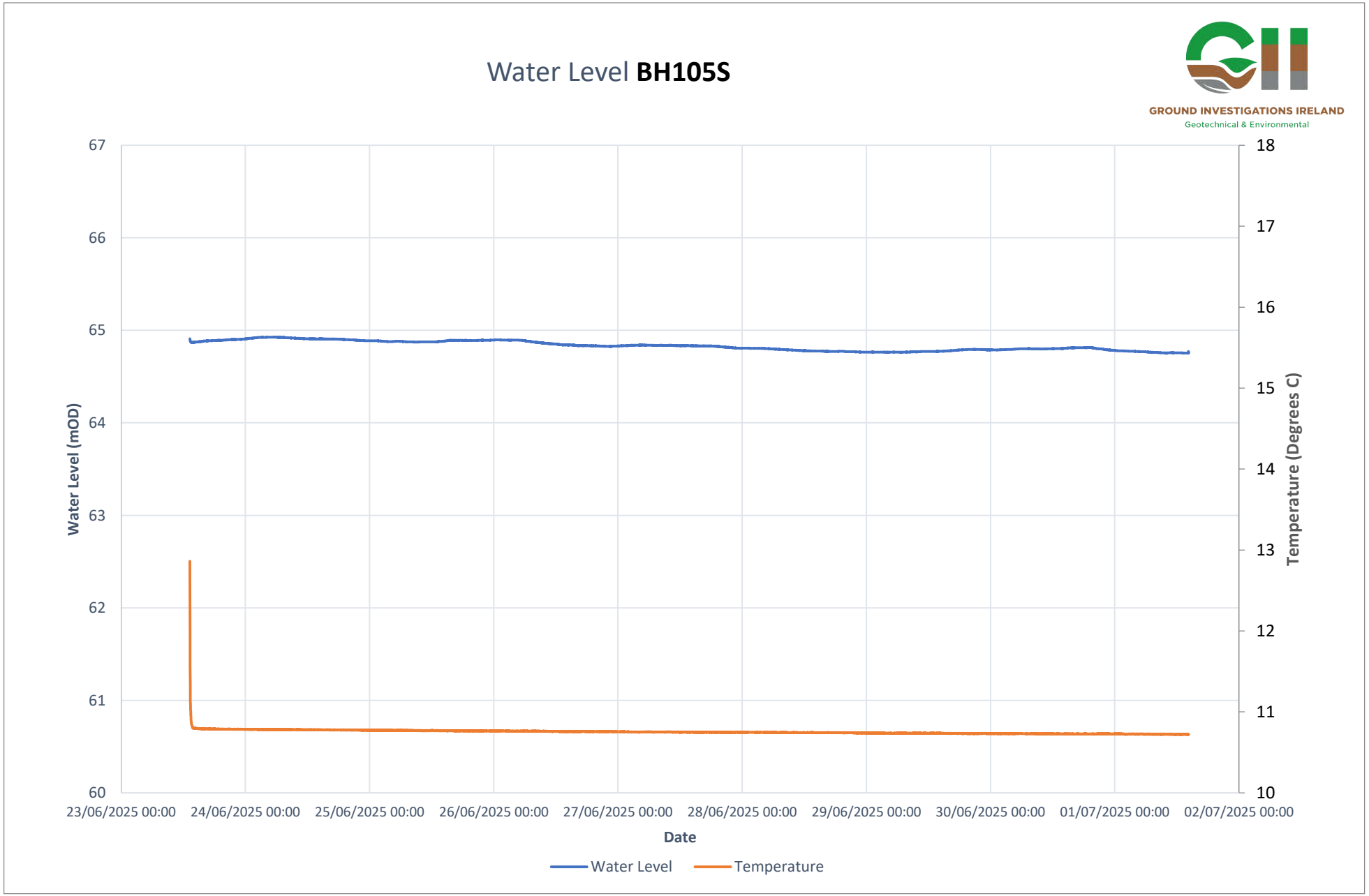
BOREHOLE	DATE	TIME	GROUNDWATER (m BSTP)	GROUNDWATER (m MOD)	Comments
BH101S	23/06/2025	15:14:00	1.65	62.10	Levellogger installed
BH102S	23/06/2025	15:38:00	0.00	65.10	Artesian. Levellogger installed
BH104S	23/06/2025	14:02:00	> -1.00	>63.835	Artesian.
BH105S	23/06/2025	13:17:00	6.92	64.91	Levellogger installed
BH106S	23/06/2025	14:38:00	0.00	>61.83	Artesian. Levellogger installed
BH107S	23/06/2025	12:28:00	0.87	62.80	Levellogger installed
BH108S	23/06/2025	12:53:00	1.52	61.68	Levellogger installed
BH101T	20/06/2025	15:37:00	5.10	58.80	Levellogger Installed
BH103T	20/06/2025	13:23:00	0.89	68.09	Levellogger Installed
BH106T	20/06/2025	15:13:00	9.40	52.62	Levellogger Installed
BH107T	20/06/2025	14:49:00	13.56	50.45	Levellogger Installed
BH108T	20/06/2025	13:57:00	9.60	53.61	Levellogger Installed

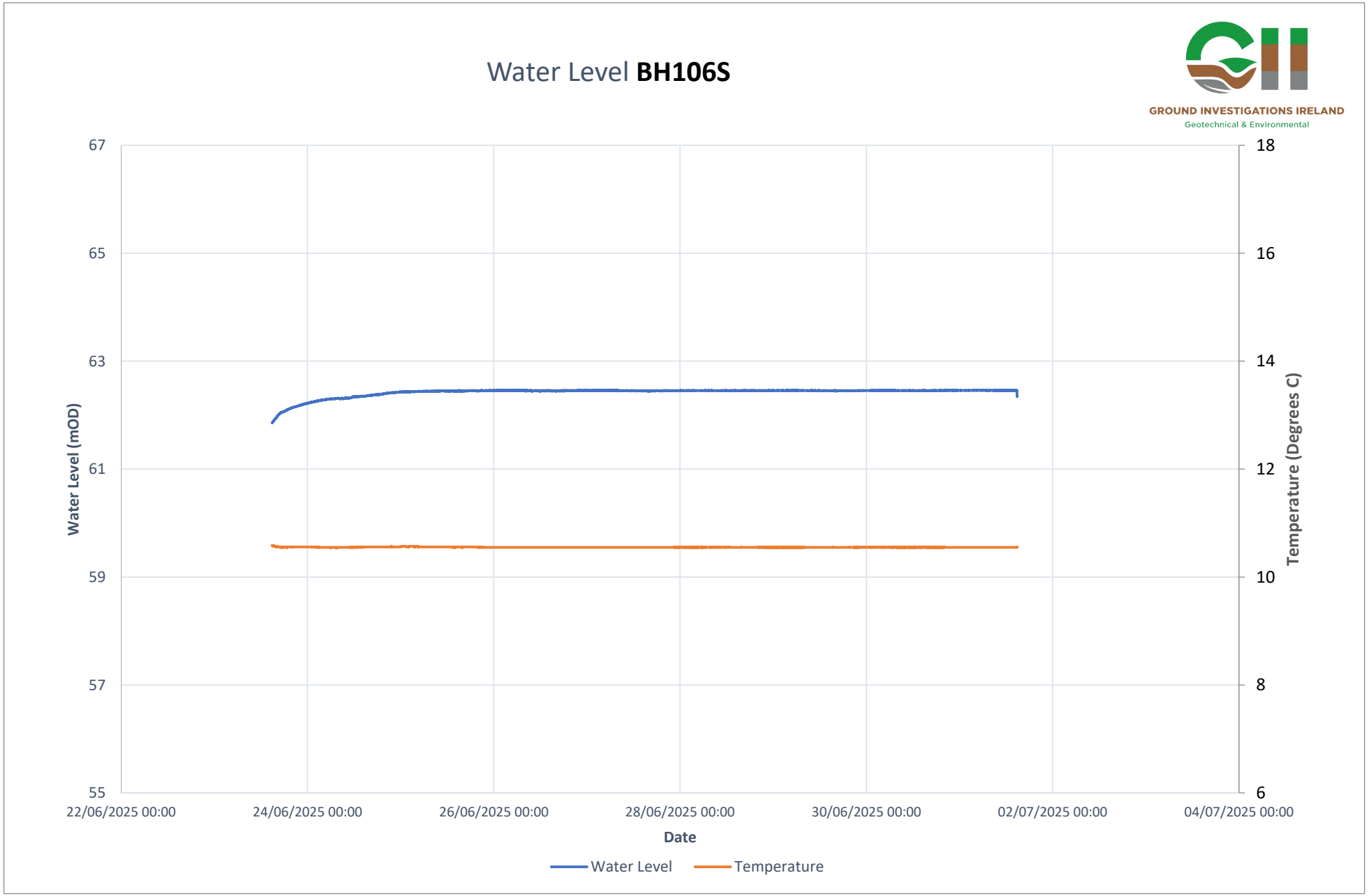
***BSTP - below standpipe**


Water Level BH101S
GROUND INVESTIGATIONS IRELAND
Geotechnical & Environmental
Water Level (mOD)
Temperature (Degrees C)
67
66
65
64
63
62
61
60
59
58
18
16
14
12
10
8
6
22/06/2025 00:00
24/06/2025 00:00
26/06/2025 00:00
28/06/2025 00:00
30/06/2025 00:00
02/07/2025 00:00
04/07/2025 00:00
Date
Water Level
Temperature

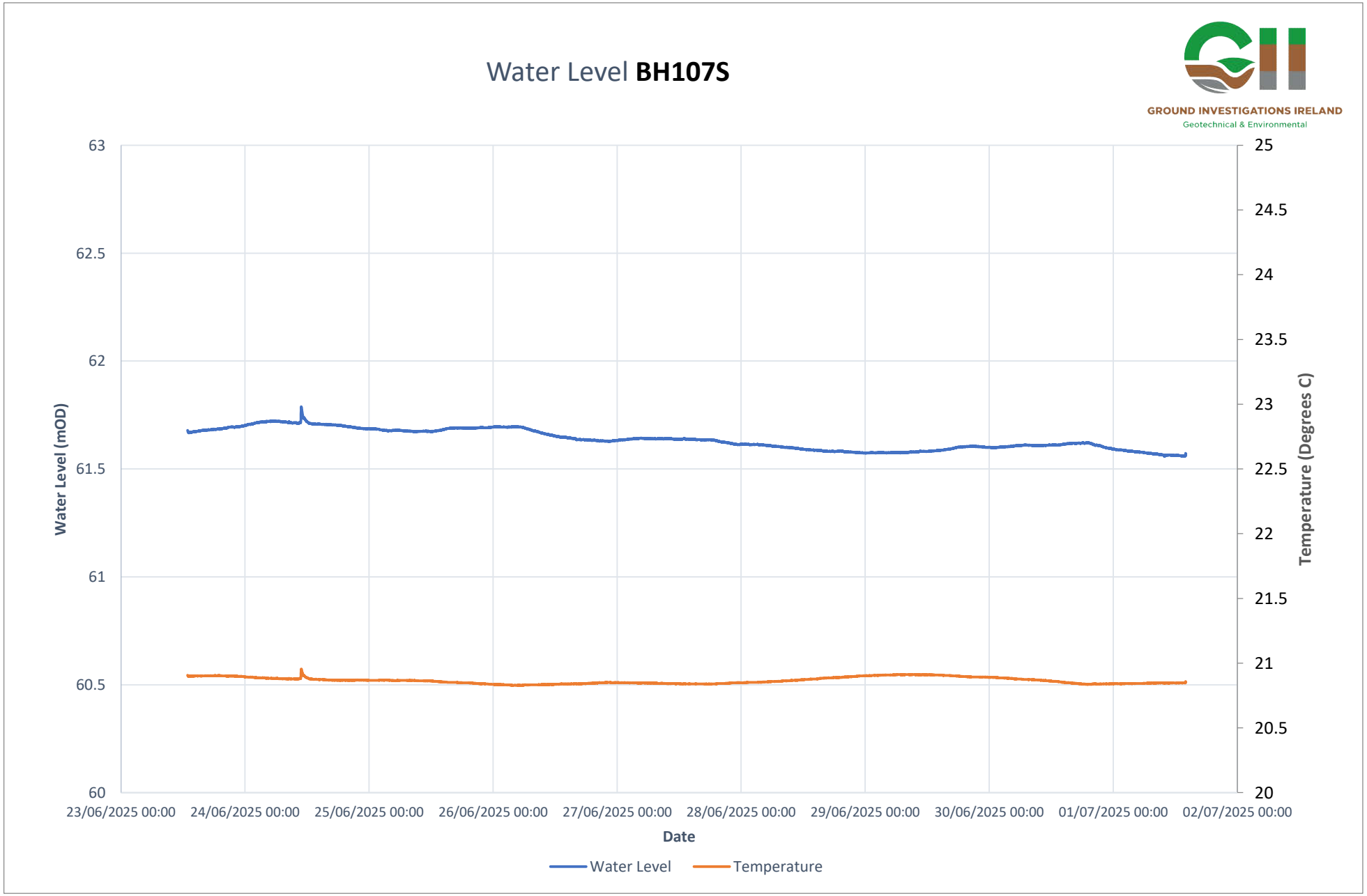

Water Level BH102S
GROUND INVESTIGATIONS IRELAND
Geotechnical & Environmental
Water Level (mOD)
Temperature (Degrees C)
67
66
65
64
63
62
61
60
18
17
16
15
14
13
12
11
10
23/06/2025 00:00
24/06/2025 00:00
25/06/2025 00:00
26/06/2025 00:00
27/06/2025 00:00
28/06/2025 00:00
29/06/2025 00:00
30/06/2025 00:00
01/07/2025 00:00
Date
Water Level
Temperature

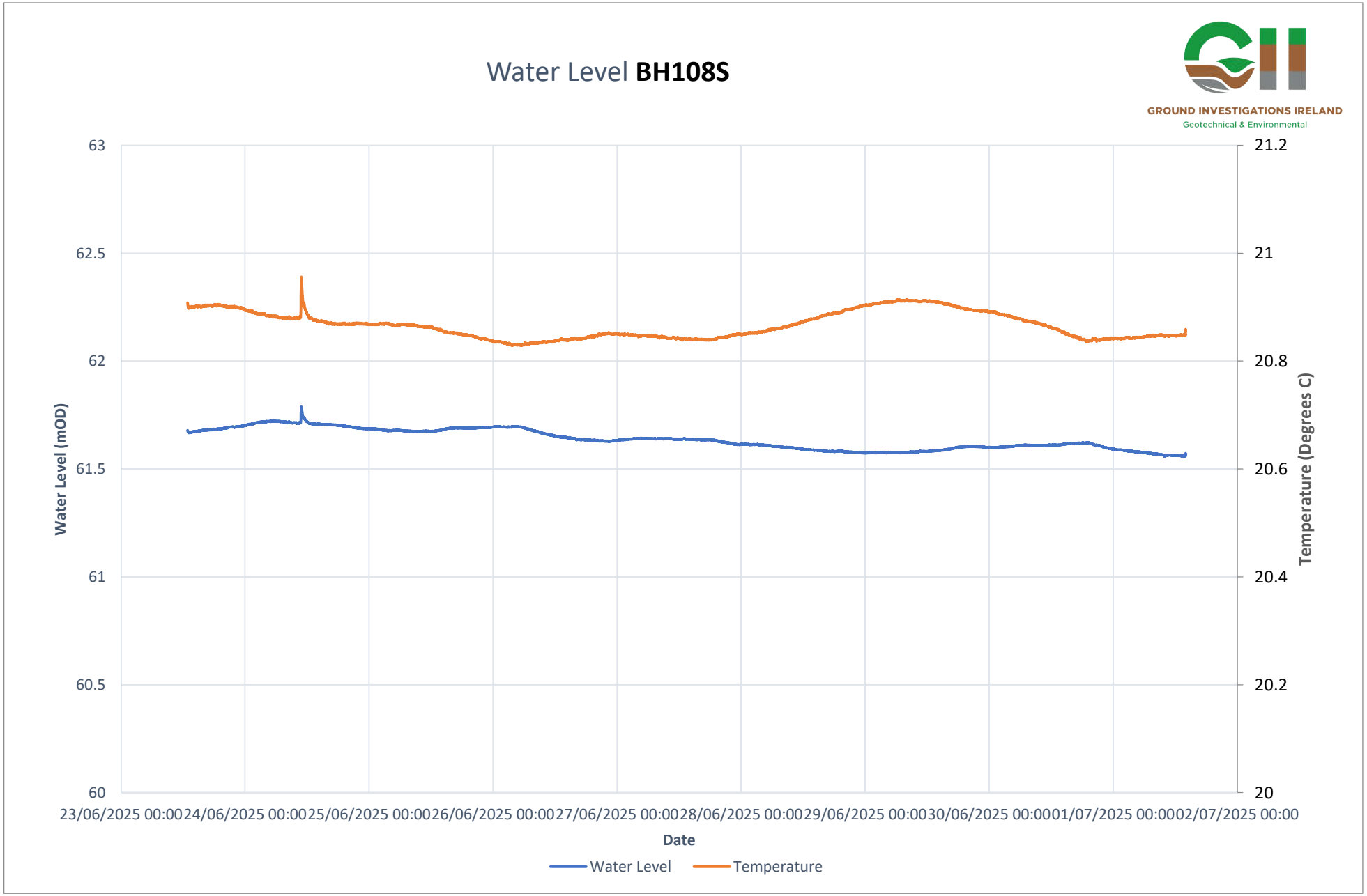

Water Level BH103T
GROUND INVESTIGATIONS IRELAND
Geotechnical & Environmental
Water Level (mOD)
Temperature (Degrees C)
70
69
68
67
66
65
64
63
62
61
60
28
26
24
22
20
18
16
14
12
10
8
20/06/2025 00:00
22/06/2025 00:00
24/06/2025 00:00
26/06/2025 00:00
28/06/2025 00:00
30/06/2025 00:00
Date
Water Level
Temperature

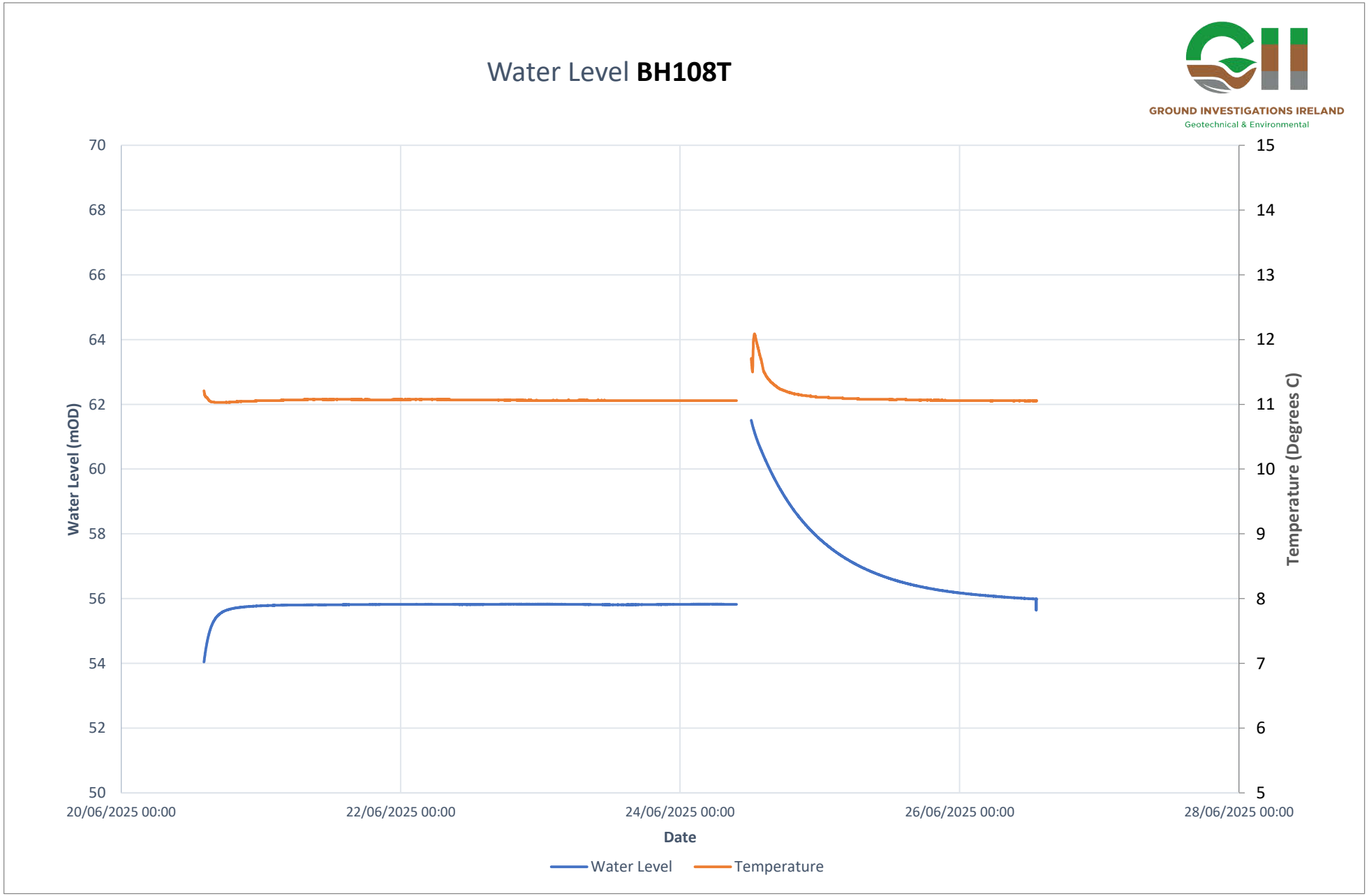

Water Level BH105S
GROUND INVESTIGATIONS IRELAND
Geotechnical & Environmental
Water Level (mOD)
Temperature (Degrees C)
67
66
65
64
63
62
61
60
18
17
16
15
14
13
12
11
10
23/06/2025 00:00
24/06/2025 00:00
25/06/2025 00:00
26/06/2025 00:00
27/06/2025 00:00
28/06/2025 00:00
29/06/2025 00:00
30/06/2025 00:00
01/07/2025 00:00
02/07/2025 00:00
Date
Water Level
Temperature


Water Level BH106S
GROUND INVESTIGATIONS IRELAND
Geotechnical & Environmental
Water Level (mOD)
Temperature (Degrees C)
67
65
63
61
59
57
55
18
16
14
12
10
8
6
22/06/2025 00:00
24/06/2025 00:00
26/06/2025 00:00
28/06/2025 00:00
30/06/2025 00:00
02/07/2025 00:00
04/07/2025 00:00
Date
Water Level
Temperature


Water Level BH106T
GROUND INVESTIGATIONS IRELAND
Geotechnical & Environmental
Water Level (mOD)
Temperature (Degrees C)
70
68
66
64
62
60
58
56
54
52
50
13
12
11
10
9
8
7
6
20/06/2025 00:00
22/06/2025 00:00
24/06/2025 00:00
26/06/2025 00:00
28/06/2025 00:00
30/06/2025 00:00
Date
Water Level
Temperature


Water Level BH107S
GROUND INVESTIGATIONS IRELAND
Geotechnical & Environmental
Water Level (mOD)
Temperature (Degrees C)
63
62.5
62
61.5
61
60.5
60
25
24.5
24
23.5
23
22.5
22
21.5
21
20.5
20
23/06/2025 00:00
24/06/2025 00:00
25/06/2025 00:00
26/06/2025 00:00
27/06/2025 00:00
28/06/2025 00:00
29/06/2025 00:00
30/06/2025 00:00
01/07/2025 00:00
02/07/2025 00:00
Date
Water Level
Temperature


Water Level BH108S
GROUND INVESTIGATIONS IRELAND
Geotechnical & Environmental
Water Level (mOD)
Temperature (Degrees C)
63
62.5
62
61.5
61
60.5
60
21.2
21
20.8
20.6
20.4
20.2
20
23/06/2025 00:00
24/06/2025 00:00
25/06/2025 00:00
26/06/2025 00:00
27/06/2025 00:00
28/06/2025 00:00
29/06/2025 00:00
30/06/2025 00:00
01/07/2025 00:00
02/07/2025 00:00
Date
Water Level
Temperature


Water Level BH108T
GROUND INVESTIGATIONS IRELAND
Geotechnical & Environmental
Water Level (mOD)
Temperature (Degrees C)
70
68
66
64
62
60
58
56
54
52
50
15
14
13
12
11
10
9
8
7
6
5
20/06/2025 00:00
22/06/2025 00:00
24/06/2025 00:00
26/06/2025 00:00
28/06/2025 00:00
Date
Water Level
Temperature

APPENDIX 8 – Groundwater Monitoring 2nd Phase

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GROUND INVESTIGATIONS IRELAND
Geotechnical & Environmental

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Web: www.gii.ie

GROUNDWATER MONITORING

Project West Knockharley Landfill

BOREHOLE	DATE	TIME	GROUNDWATER (m BSTP)	GROUNDWATER (m MOD)	Comments
BH101S	01/07/2025	15:14:00	0.87	62.88	Levellogger reinstalled
BH102S	01/07/2025	15:32:00	0.00	>66.10	Artesian. 1m length added. Levellogger reinstalled
BH104S	-	-	-	-	Artesian. 2m length added. No logger installed
BH105S	01/07/2025	14:25:00	7.07	64.76	Levellogger reinstalled
BH106S	01/07/2025	14:58:00	0.00	>62.83	Artesian. 1m length added. Levellogger reinstalled
BH107S	01/07/2025	14:44:00	1.15	62.52	Levellogger reinstalled
BH108S	01/07/2025	14:11:00	1.66	61.54	Levellogger reinstalled
BH101T	27/06/2025	13.18:00	1.62	62.28	Levellogger reinstalled
BH103T	01/07/2025	08:54:00	1.16	67.82	Levellogger reinstalled
BH106T	03/07/2025	09:07:00	1.24	60.78	Levellogger reinstalled
BH107T	03/07/2025	08:50:00	1.73	62.28	Levellogger reinstalled
BH108T	27/06/2025	13:00:00	6.32	56.89	Levellogger reinstalled

***BSTP - below standpipe**

GROUND INVESTIGATIONS IRELAND
Geotechnical & Environmental

Catherinestown House,
Hazelhatch Road,
Newcastle,
Co. Dublin.
D22 YD52

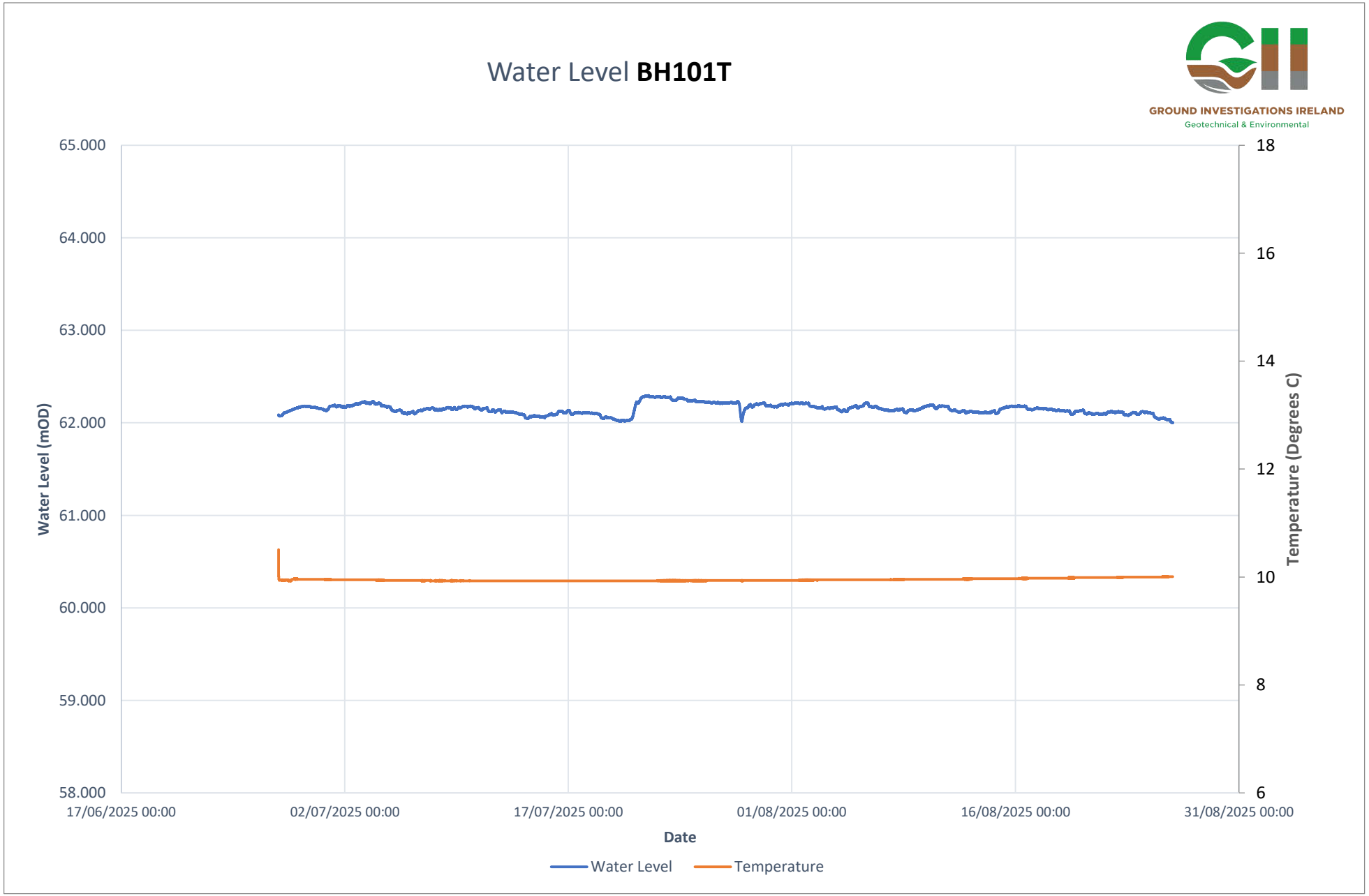
Tel: 01 601 5175 / 5176
Email: info@gii.ie
Web: www.gii.ie

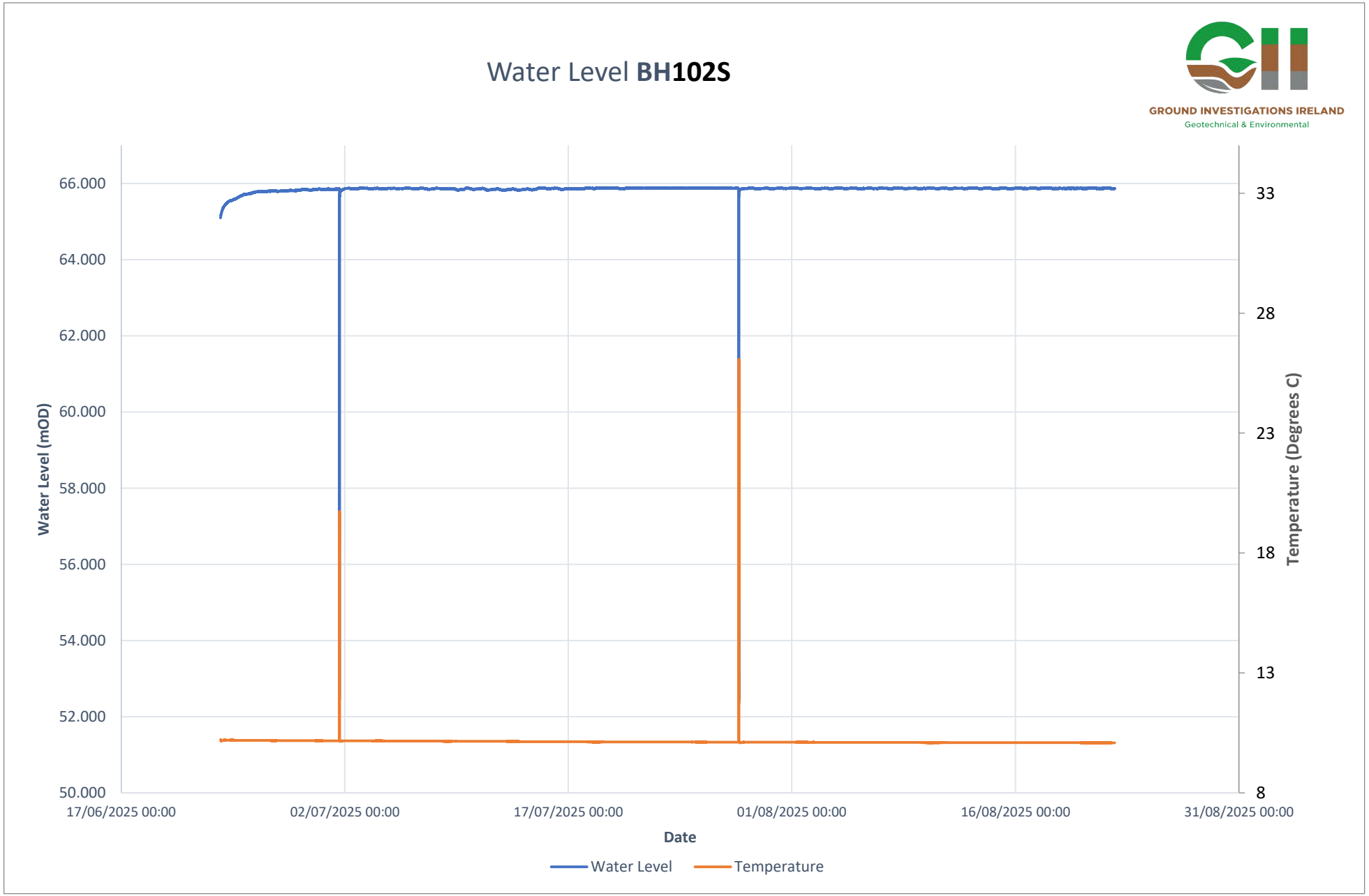
GROUNDWATER MONITORING

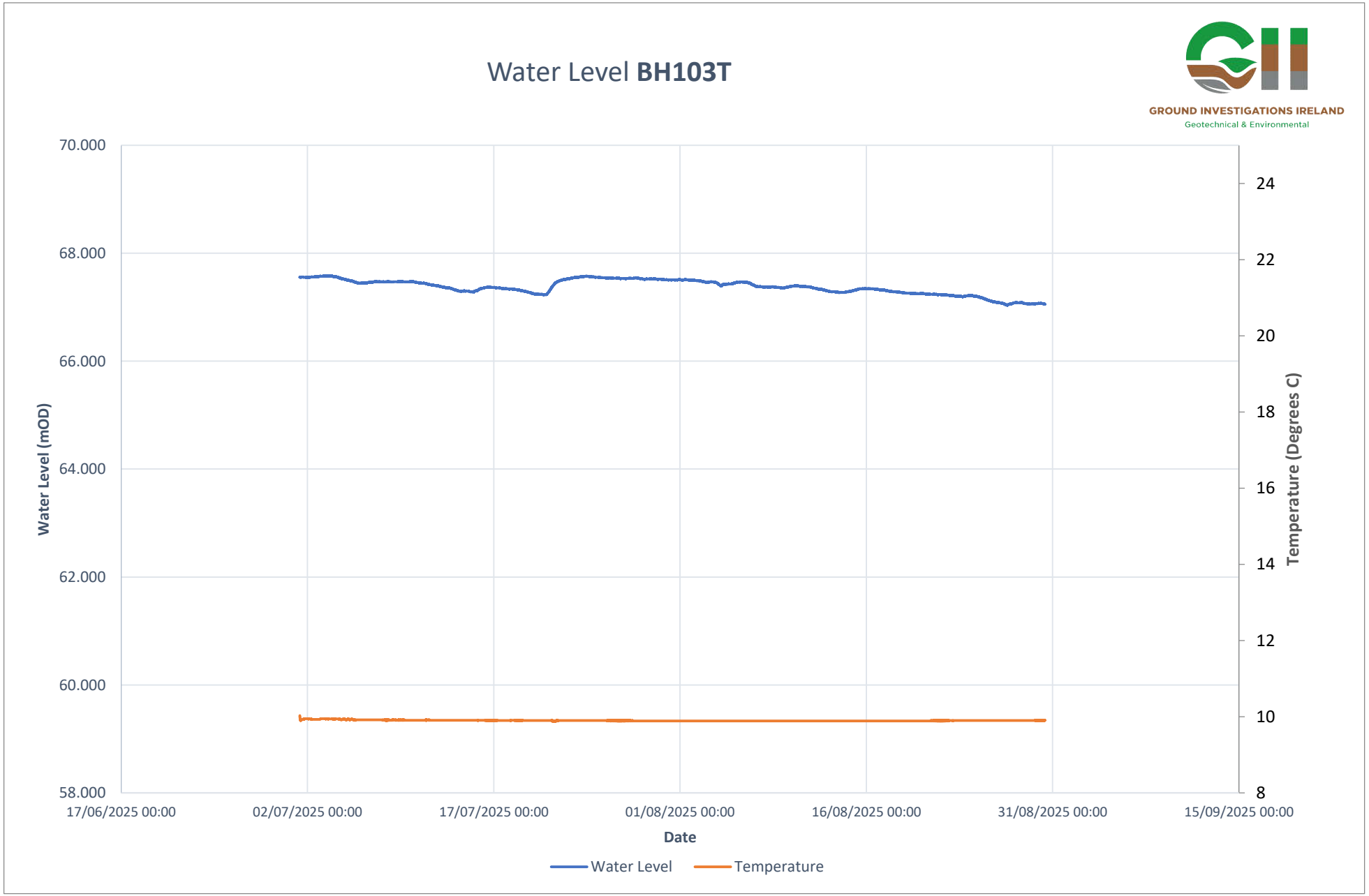
Project West Knockharley Landfill

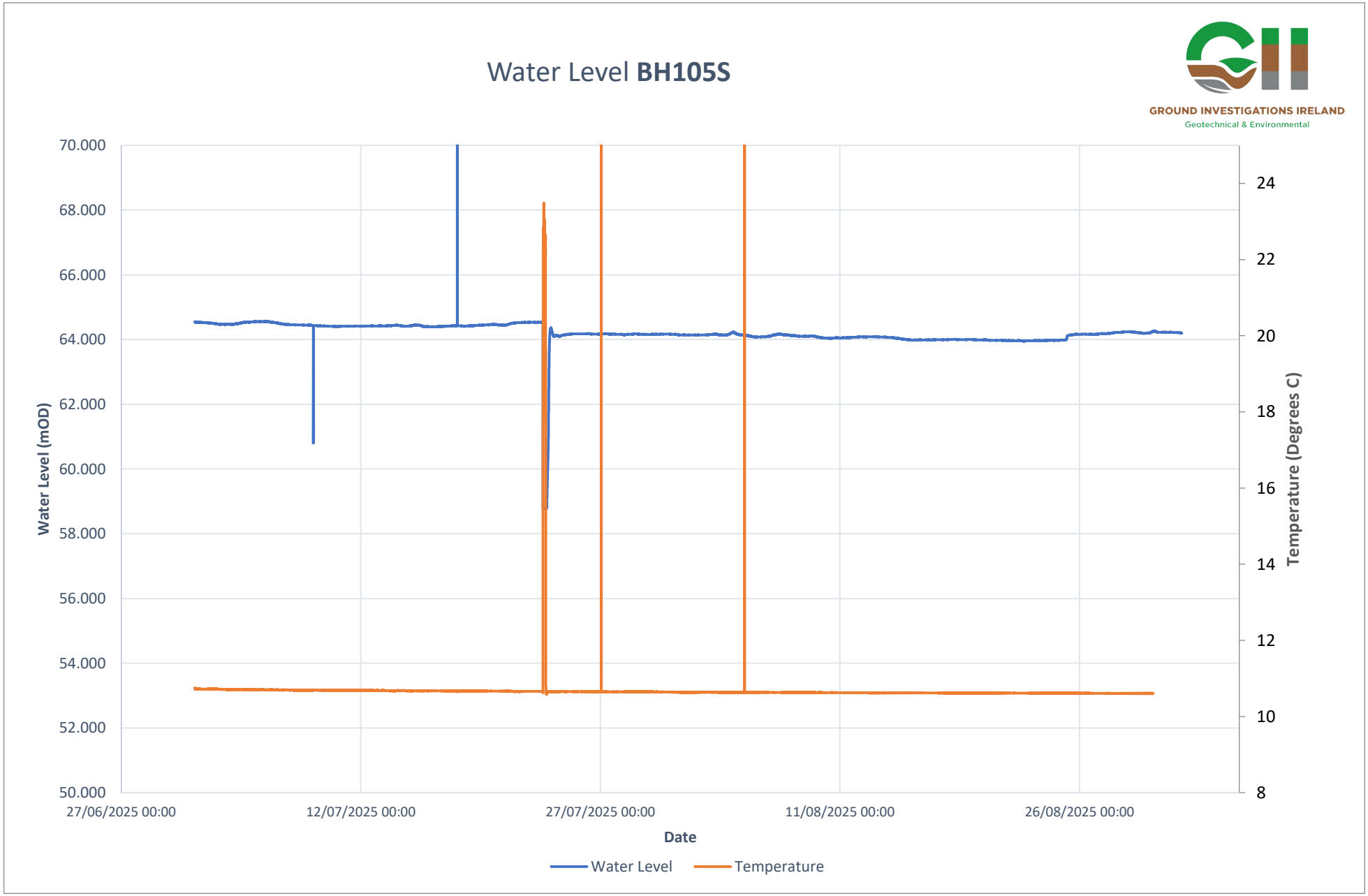
BOREHOLE	DATE	TIME	GROUNDWATER (m BSTP)	GROUNDWATER (m MOD)	Comments
BH101S	01/09/2025	12:20:00	0.88	62.87	Levellogger removed. Fault - unable to download data
BH102S	01/09/2025	12:43:00	0.00	>66.10	Artesian. 1m length added. Levellogger removed
BH104S	01/09/2025	-	-	-	Artesian. 2m length added.
BH105S	01/09/2025	09:56:00	7.71	64.12	Levellogger reinstalled
BH106S	01/09/2025	11:22:00	0.00	>62.83	Artesian. 1m length added. Levellogger removed
BH107S	01/09/2025	10:54:00	1.40	62.27	Levellogger reinstalled
BH108S	01/09/2025	09:40:00	1.84	61.36	Levellogger reinstalled
BH101T	01/09/2025	11:44:00	1.61	62.29	Levellogger reinstalled
BH103T	01/09/2025	10:21:00	1.66	67.32	Levellogger reinstalled
BH106T	01/09/2025	11:08:00	0.01	62.01	Levellogger reinstalled
BH107T	01/09/2025	10:40:00	1.76	62.25	Levellogger reinstalled
BH108T	01/09/2025	08:58:00	6.90	56.31	Levellogger reinstalled

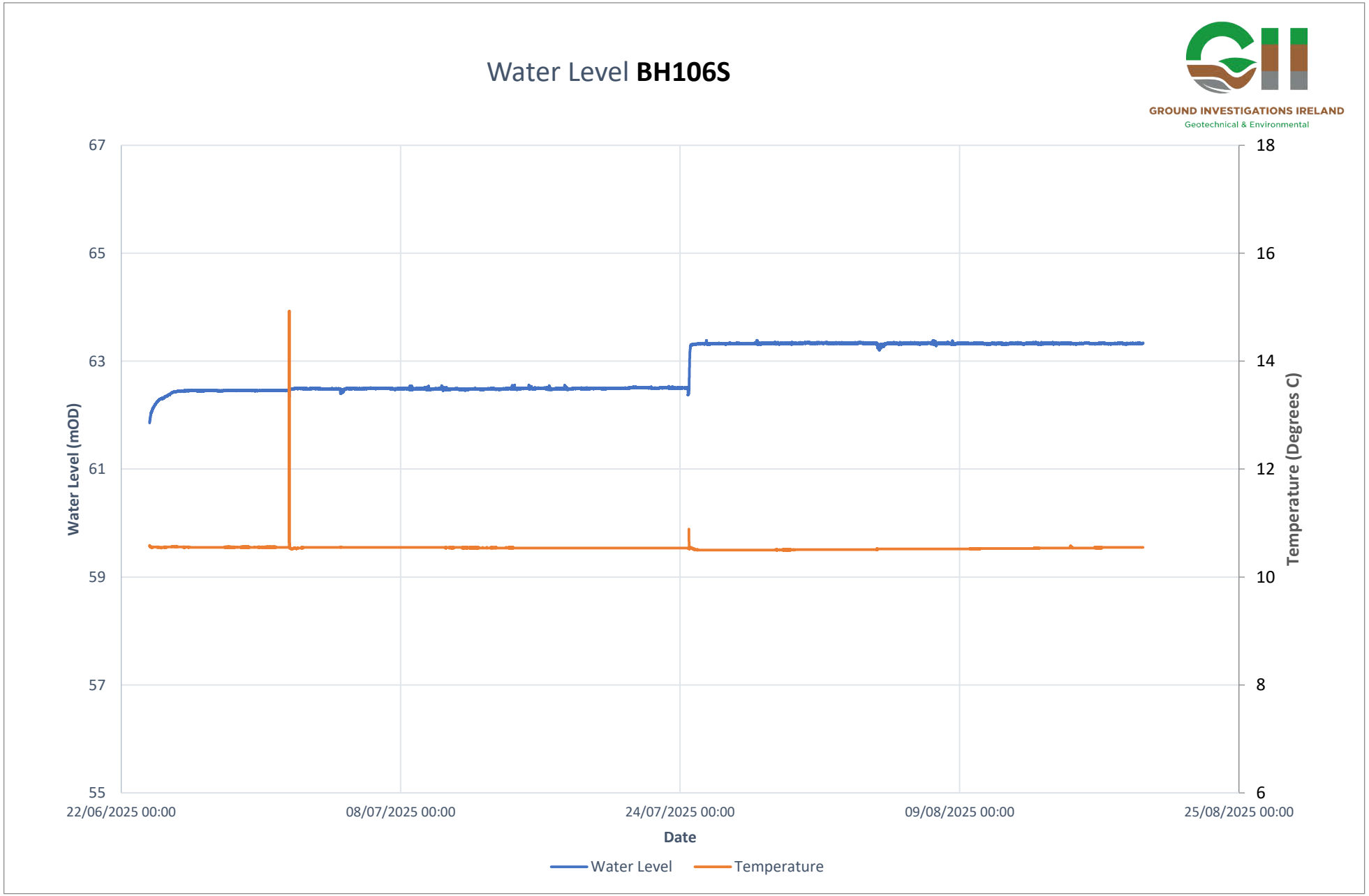
***BSTP - below standpipe**

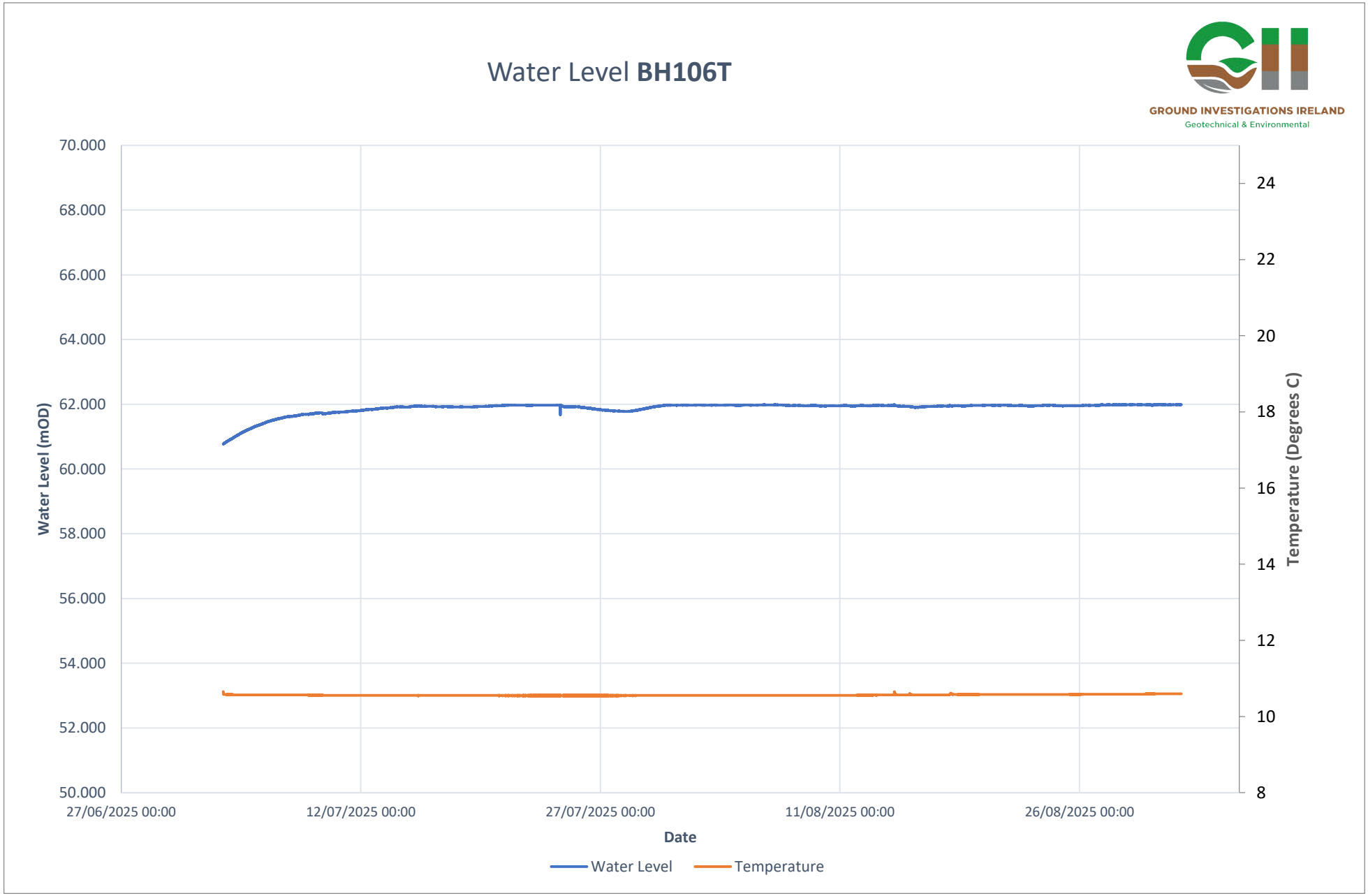

Water Level BH101T
GROUND INVESTIGATIONS IRELAND
Geotechnical & Environmental
65.000
64.000
63.000
62.000
61.000
60.000
59.000
58.000
Water Level (mOD)
18
16
14
12
10
8
6
Temperature (Degrees C)
17/06/2025 00:00
02/07/2025 00:00
17/07/2025 00:00
01/08/2025 00:00
16/08/2025 00:00
31/08/2025 00:00
Date
Water Level
Temperature

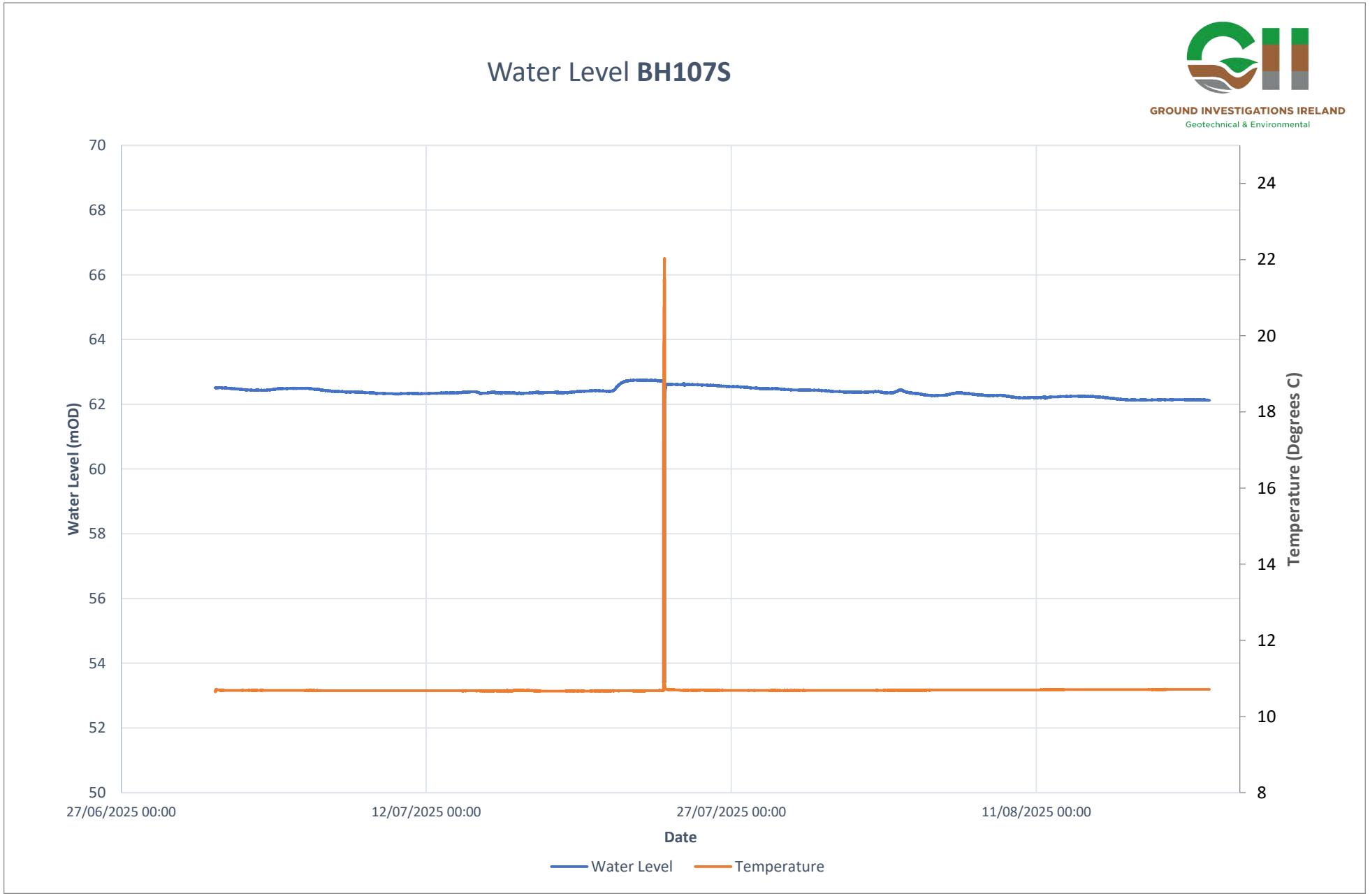

Water Level BH102S
GROUND INVESTIGATIONS IRELAND
Geotechnical & Environmental
66.000
64.000
62.000
60.000
58.000
56.000
54.000
52.000
50.000
Water Level (mOD)
33
28
23
18
13
8
Temperature (Degrees C)
17/06/2025 00:00
02/07/2025 00:00
17/07/2025 00:00
01/08/2025 00:00
16/08/2025 00:00
31/08/2025 00:00
Date
Water Level
Temperature

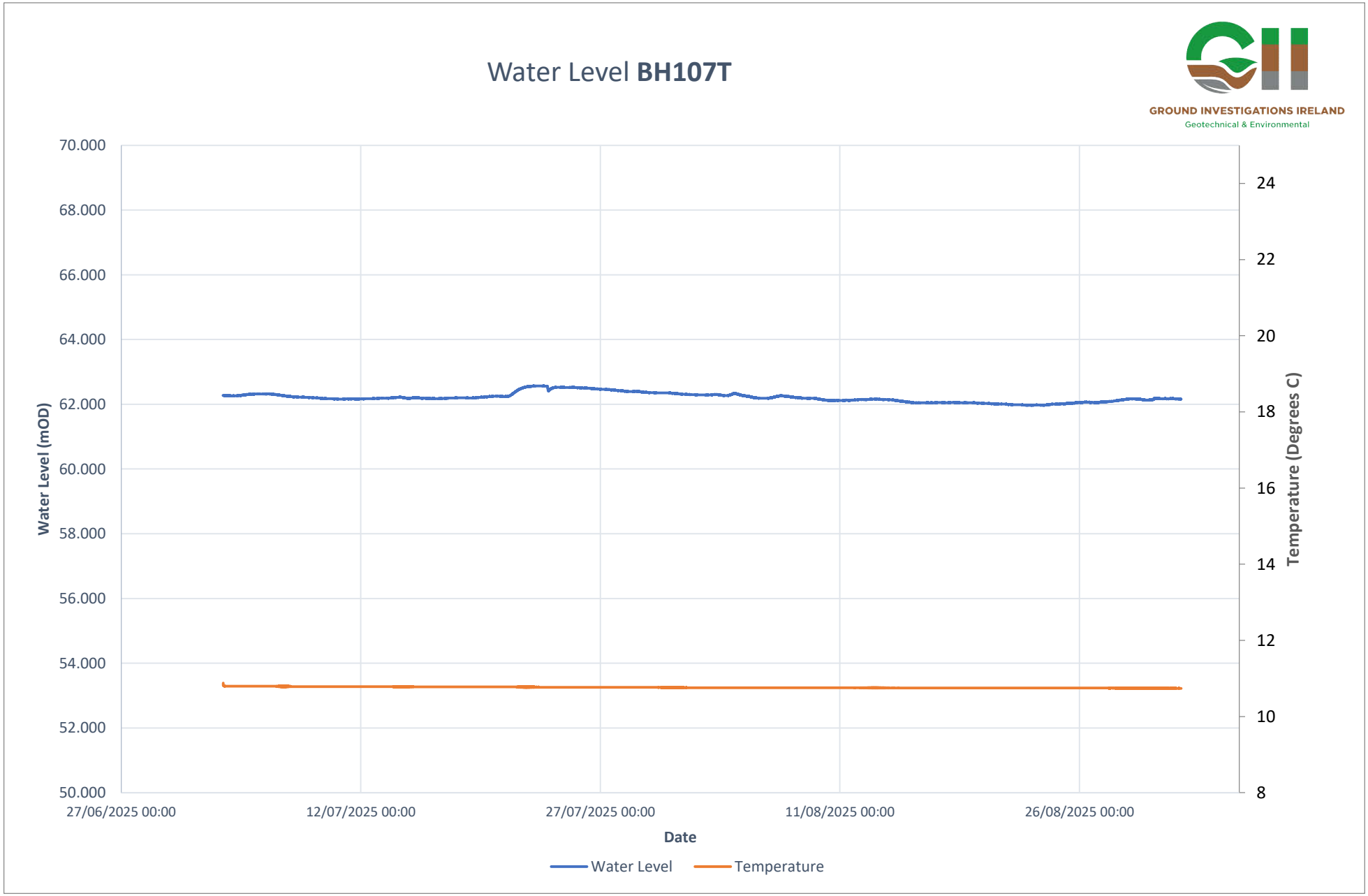

Water Level BH103T
GROUND INVESTIGATIONS IRELAND
Geotechnical & Environmental
70.000
68.000
66.000
64.000
62.000
60.000
58.000
Water Level (mOD)
24
22
20
18
16
14
12
10
8
Temperature (Degrees C)
17/06/2025 00:00
02/07/2025 00:00
17/07/2025 00:00
01/08/2025 00:00
16/08/2025 00:00
31/08/2025 00:00
15/09/2025 00:00
Date
Water Level
Temperature

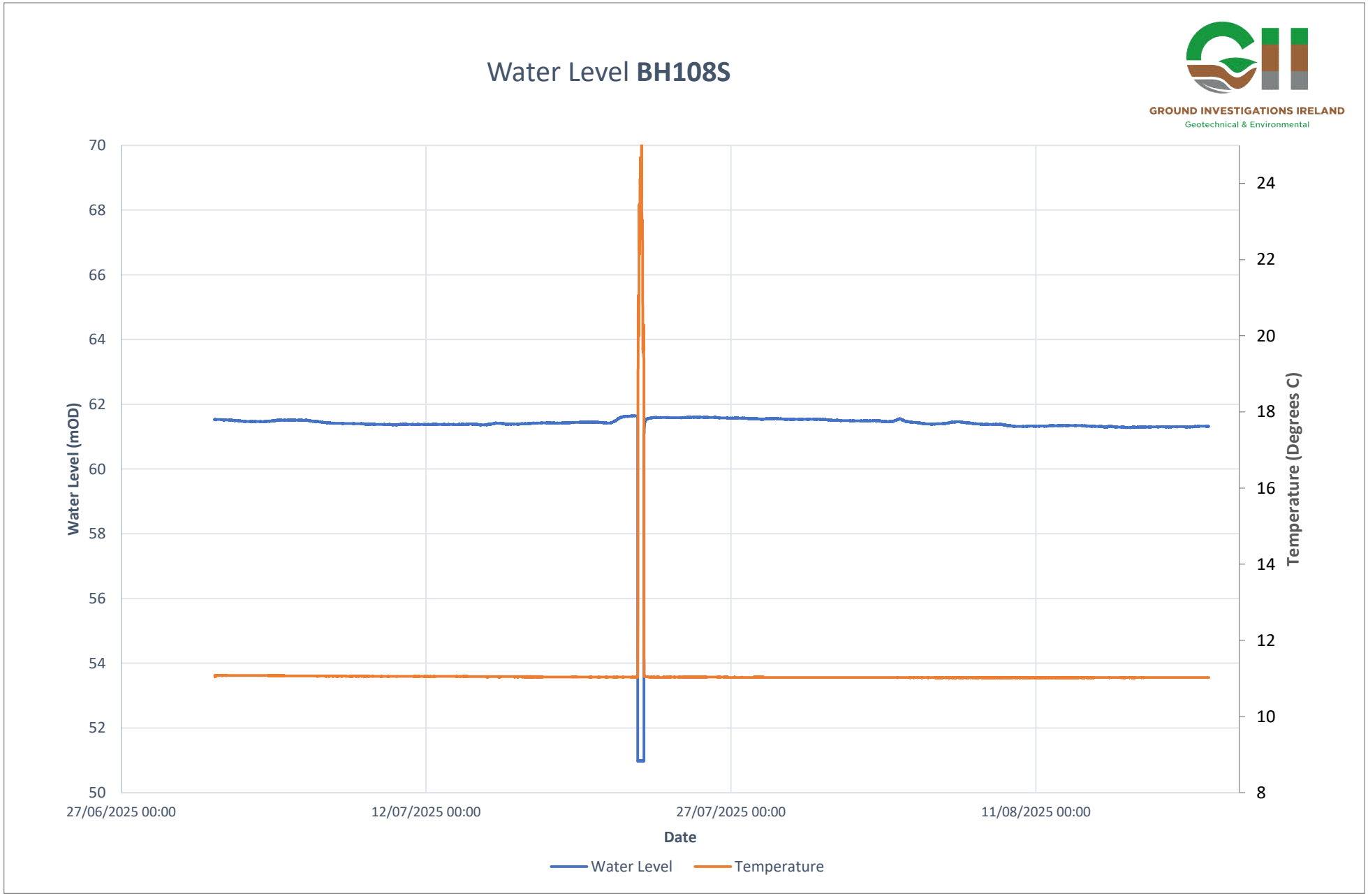

Water Level BH105S
GROUND INVESTIGATIONS IRELAND
Geotechnical & Environmental
70.000
68.000
66.000
64.000
62.000
60.000
58.000
56.000
54.000
52.000
50.000
Water Level (mOD)
24
22
20
18
16
14
12
10
8
Temperature (Degrees C)
27/06/2025 00:00
12/07/2025 00:00
27/07/2025 00:00
11/08/2025 00:00
26/08/2025 00:00
Date
Water Level
Temperature

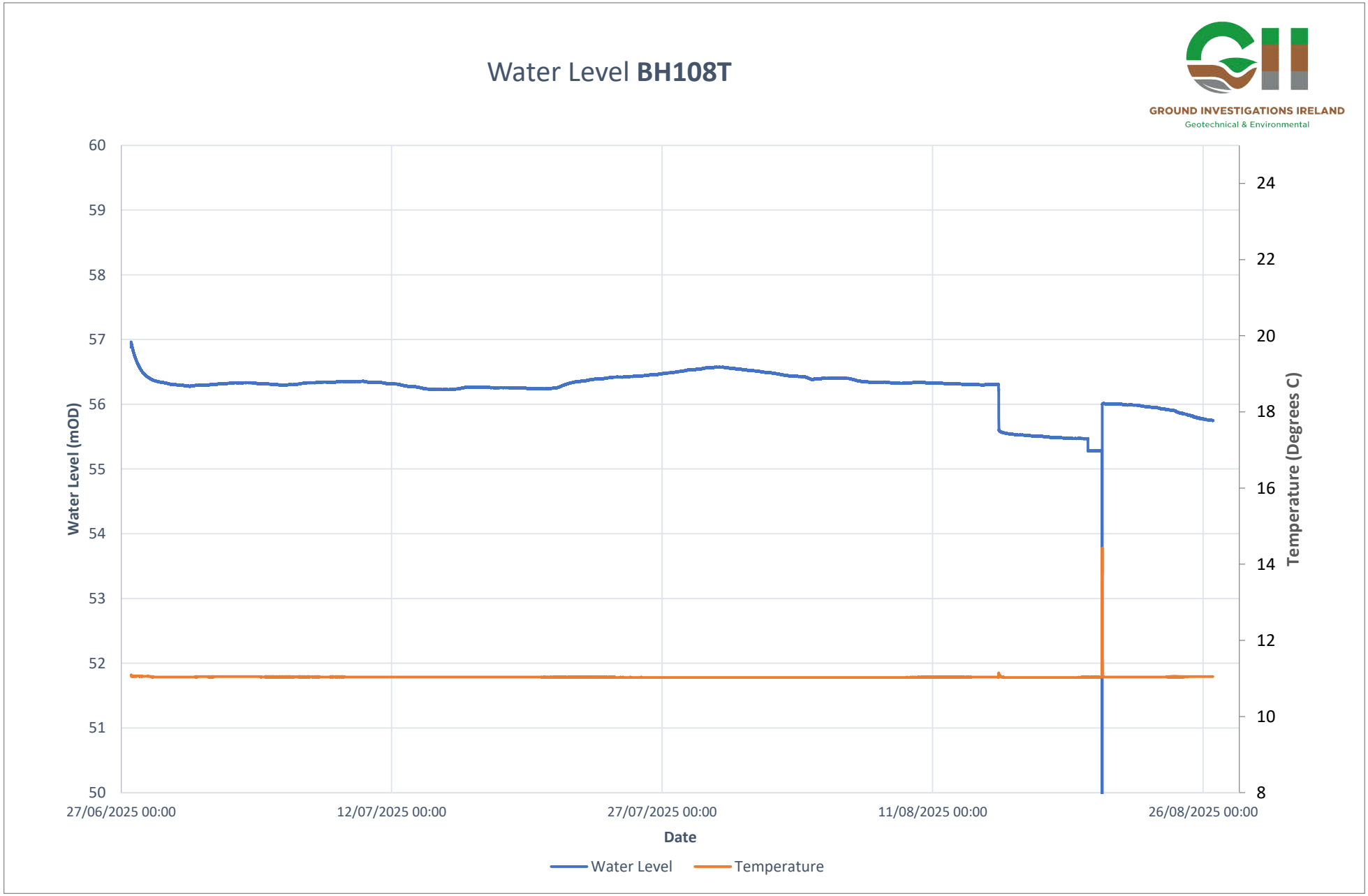

Water Level BH106S
GROUND INVESTIGATIONS IRELAND
Geotechnical & Environmental
Water Level (mOD)
Temperature (Degrees C)
67
65
63
61
59
57
55
18
16
14
12
10
8
6
22/06/2025 00:00
08/07/2025 00:00
24/07/2025 00:00
09/08/2025 00:00
25/08/2025 00:00
Date
Water Level
Temperature


Water Level BH106T
GROUND INVESTIGATIONS IRELAND
Geotechnical & Environmental
70.000
68.000
66.000
64.000
62.000
60.000
58.000
56.000
54.000
52.000
50.000
Water Level (mOD)
24
22
20
18
16
14
12
10
8
Temperature (Degrees C)
27/06/2025 00:00
12/07/2025 00:00
27/07/2025 00:00
11/08/2025 00:00
26/08/2025 00:00
Date
Water Level
Temperature


Water Level BH107S
GROUND INVESTIGATIONS IRELAND
Geotechnical & Environmental
Water Level (mOD)
Temperature (Degrees C)
70
68
66
64
62
60
58
56
54
52
50
24
22
20
18
16
14
12
10
8
27/06/2025 00:00
12/07/2025 00:00
27/07/2025 00:00
11/08/2025 00:00
Date
Water Level
Temperature


Water Level BH107T
GROUND INVESTIGATIONS IRELAND
Geotechnical & Environmental
70.000
68.000
66.000
64.000
62.000
60.000
58.000
56.000
54.000
52.000
50.000
Water Level (mOD)
24
22
20
18
16
14
12
10
8
Temperature (Degrees C)
27/06/2025 00:00
12/07/2025 00:00
27/07/2025 00:00
11/08/2025 00:00
26/08/2025 00:00
Date
Water Level
Temperature


Water Level BH108S
GROUND INVESTIGATIONS IRELAND
Geotechnical & Environmental
Water Level (mOD)
70
68
66
64
62
60
58
56
54
52
50
Temperature (Degrees C)
24
22
20
18
16
14
12
10
8
27/06/2025 00:00
12/07/2025 00:00
27/07/2025 00:00
11/08/2025 00:00
Date
Water Level
Temperature


Water Level BH108T
GROUND INVESTIGATIONS IRELAND
Geotechnical & Environmental
Water Level (mOD)
Temperature (Degrees C)
60
59
58
57
56
55
54
53
52
51
50
24
22
20
18
16
14
12
10
8
27/06/2025 00:00
12/07/2025 00:00
27/07/2025 00:00
11/08/2025 00:00
26/08/2025 00:00
Date
Water Level
Temperature

APPENDIX 9 – Groundwater Sampling Records

Ground Investigations Ireland Groundwater Monitoring Field Sheet

GROUND INVESTIGATIONS IRELAND
Geotechnical & Environmental

Project Number		14656-04-25				Sample Date		19/06/2025				
Client		WSP				Current Weather		Sunny/ Dry				
Site Name		Knockharley Landfill				Weather Prev 24 hours		Sunny/ Dry				
Sampler I.D.		Jason Kennedy				Sampling Method/Type		Pump				
Sample I.D.	BH104S	BH106S	BH107S									
Casing Diameter (mm)	146	146	146									
Standpipe Diameter (mm)	50	50	50									
Stick Up (mm)	220	170	120									
Cover Condition	Intact and functional.	Intact and functional.	Intact and functional.									
Standpipe Type uPVC etc.	uPVC	uPVC	uPVC									
Total Well Depth (m)	17.66	15.78	17.8									
Water Level (mBGL)	Artesian (flowing)	0	0.67									
Odour	NONE	NONE	NONE									
Time Purging Start	15:20	13:46	11:25									
Timer Purging End	15:32	14:35	12:13									
Purge Volume (litres)	35	92	101									
Sampling Time	15:32	14:40	12:15									
Litres Purged	35	92	101									
Ph (pH Units)	6.75	6.81	6.83									
EC (mS/cm)	0.68	0.63	0.75									
Temp (Degrees)	15.1	16.6	15.6									
ORP (mV)	123	130	150									
DO (mg/l)	2.5	1.3	3.2									
Colour	Slightly cloudy	Cloudy Brown	Slightly cloudy									
Odour	NONE	NONE	NONE									
Additional Comments	Purged x1 the volume of water due to well being artesian											

(Revision V2 September 2020)

Ground Investigations Ireland Groundwater Monitoring Field Sheet

GROUND INVESTIGATIONS IRELAND
Geotechnical & Environmental

Project Number	14656-04-25	Sample Date	23/06/2025	
Client	WSP	Current Weather	Overcast/ Dry	
Site Name	Knockharley Landfill	Weather Prev 24 hours	Rain	
Sampler I.D.	Jason Kennedy	Sampling Method/Type	Pump	

Sample I.D.	BH101S	BH102S										
Casing Diameter (mm)	146	146										
Standpipe Diameter (mm)	50	50										
Stick Up (mm)	140	180										
Cover Condition	One bolt broken but cover is intact and functional. Cover contains a lot of rust.	Intact and functional.										
Standpipe Type uPVC etc.	uPVC	uPVC										
Total Well Depth (m)	23	26.95										
Water Level (mBGL)	0.11	0.18										
Odour	NONE	NONE										
Time Purging Start	09:54	08:50										
Timer Purging End	10:16	09:12										
Purge Volume (litres)	135	158										
Sampling Time	10:16	09:12										
Litres Purged	135	158										
Ph (pH Units)	6.56	6.52										
EC (mS/cm)	0.74	0.69										
Temp (Degrees)	13	12.4										
ORP (mV)	85	81										
DO (mg/l)	1.3	1.9										
Colour	Cloudy Brown	Slightly Cloudy Brown										
Odour	NONE	NONE										
Additional Comments												

Ground Investigations Ireland Groundwater Monitoring Field Sheet

GROUND INVESTIGATIONS IRELAND
Geotechnical & Environmental

Project Number	14656-04-25	Sample Date	18/06/2025	
Client	WSP	Current Weather	Sunny/ Dry	
Site Name	Knockharley Landfill	Weather Prev 24 hours	Dry	
Sampler I.D.	Jason Kennedy and Jacob Grimes	Sampling Method/Type	Pump	

Sample I.D.	BH105S	BH108S										
Casing Diameter (mm)	146	146										
Standpipe Diameter (mm)	50	50										
Stick Up (mm)	190	60										
Cover Condition	Intact and functional	Intact and functional										
Standpipe Type uPVC etc.	uPVC	uPVC										
Total Well Depth (m)	29	20.5										
Water Level (mBGL)	6.82	1.3										
Odour	NONE	NONE										
Time Purging Start	11:27	13:32										
Timer Purging End	14:55	13:52										
Purge Volume (litres)	130	00:00										
Sampling Time	14:55	13:52										
Litres Purged	130	113										
Ph (pH Units)	6.7	6.71										
EC (mS/cm)	1.38	0.86										
Temp (Degrees)	15.5	14.8										
ORP (mV)	153	191										
DO (mg/l)	6	1.8										
Colour	Cloudy Brown	Clear										
Odour	NONE	NONE										
Additional Comments												

(Revision V2 September 2020)

APPENDIX 10 – Laboratory Testing

www.gii.ie

Element Materials Technology
Unit 3 Deeside Point
Zone 3
Deeside Industrial Park
Deeside
CH5 2UA

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F: +44 (0) 1244 833781
W: www.element.com

Ground Investigations Ireland
Catherinestown House
Hazelhatch Road
Newcastle
Co. Dublin
Ireland
D22 K5P8

Attention :	James Cashen
Date :	26th September, 2025
Your reference :	14656-04-25
Our reference :	Test Report 25/10047 Batch 1
Location :	Knockharley Landfill
Date samples received :	19th June, 2025
Status :	Final Report
Issue :	202509261155 (Supersedes 202507040915)

Two samples were received for analysis on 19th June, 2025 of which two were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

The greenhouse gas emissions generated (in Carbon – Co2e) to obtain the results in this report are estimated as:

Scope 1&2 emissions - 9.195 kg of CO2

Scope 1&2&3 emissions - 21.73 kg of CO2

Authorised By:

Phil Sommerton BSc
Senior Technical Account Manager

Please include all sections of this report if it is reproduced

Client Name: Ground Investigations Ireland
Reference: 14656-04-25
Location: Knockharley Landfill
Contact: James Cashen
EMT Job No: 25/10047

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
$H=H_2SO_4$, Z=ZnAc, N=NaOH, $HN=HN0_3$

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	1-7	8-14									LOD/LOR	Units	Method No.
Sample ID	BH105S	BH108S											
Depth													
COC No / misc													
Containers	V H HNUF P G	V H HN P G											
Sample Date	18/06/2025	18/06/2025											
Sample Type	Ground Water	Ground Water											
Batch Number	1	1											
Date of Receipt	19/06/2025	19/06/2025											
Dissolved Aluminium #	2.5	6.7									<1.5	ug/l	TM170/PM14
Dissolved Antimony #	<2	<2									<2	ug/l	TM170/PM14
Dissolved Arsenic #	1.4	6.5									<0.9	ug/l	TM170/PM14
Dissolved Barium #	85.6	130.7									<1.8	ug/l	TM170/PM14
Dissolved Beryllium #	<0.5	<0.5									<0.5	ug/l	TM170/PM14
Dissolved Boron #	33	27									<12	ug/l	TM170/PM14
Dissolved Cadmium #	0.15	0.04									<0.03	ug/l	TM170/PM14
Total Dissolved Chromium #	<0.2	0.2									<0.2	ug/l	TM170/PM14
Dissolved Cobalt #	2.5	0.9									<0.1	ug/l	TM170/PM14
Dissolved Copper #	1	<1									<1	ug/l	TM170/PM14
Total Dissolved Iron #	<4.7	97.0									<4.7	ug/l	TM170/PM14
Dissolved Lead #	<0.4	<0.4									<0.4	ug/l	TM170/PM14
Dissolved Manganese #	1020.5_{AA}	740.2_{AA}									<1.5	ug/l	TM170/PM14
Dissolved Mercury #	<0.5	<0.5									<0.5	ug/l	TM170/PM14
Dissolved Molybdenum #	5.7	7.5									<0.2	ug/l	TM170/PM14
Dissolved Nickel #	4.3	2.0									<0.2	ug/l	TM170/PM14
Dissolved Selenium #	2.4	<1.2									<1.2	ug/l	TM170/PM14
Dissolved Vanadium #	<0.6	<0.6									<0.6	ug/l	TM170/PM14
Dissolved Zinc #	5	4									<3	ug/l	TM170/PM14
Total Phosphorus	19	11									<5	ug/l	TM170/PM14
Dissolved Calcium #	369.3_{AB}	140.0									<0.2	mg/l	TM30/PM14
Dissolved Magnesium #	36.4	21.9									<0.1	mg/l	TM30/PM14
Dissolved Potassium #	4.0	3.6									<0.1	mg/l	TM30/PM14
Dissolved Sodium #	30.4	24.3									<0.1	mg/l	TM30/PM14
Dissolved Titanium	<5	<5									<5	ug/l	TM30/PM14
Methyl Tertiary Butyl Ether #	<0.1	<0.1									<0.1	ug/l	TM15/PM10
Benzene #	<0.5	<0.5									<0.5	ug/l	TM15/PM10
Toluene #	<5	<5									<5	ug/l	TM15/PM10
Ethylbenzene #	<1	<1									<1	ug/l	TM15/PM10
m/p-Xylene #	<2	<2									<2	ug/l	TM15/PM10
o-Xylene #	<1	<1									<1	ug/l	TM15/PM10
Surrogate Recovery Toluene D8	104	101									<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	107	101									<0	%	TM15/PM10
Total Phenols HPLC	<0.15	<0.15									<0.15	mg/l	TM26/PM0
Fluoride	<0.3	0.3									<0.3	mg/l	TM173/PM0
Sulphate as SO4 #	593.9	180.5									<0.5	mg/l	TM38/PM0
Chloride #	18.0	13.5									<0.3	mg/l	TM38/PM0
Ortho Phosphate as PO4 #	<0.06	<0.06									<0.06	mg/l	TM38/PM0
Nitrate as N #	0.06	<0.05									<0.05	mg/l	TM38/PM0

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 14656-04-25
Location: Knockharley Landfill
Contact: James Cashen
EMT Job No: 25/10047

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
$H=H_2SO_4$, Z=ZnAc, N=NaOH, HN=$HN0_3$

EMT Sample No.	1-7	8-14									LOD/LOR	Units	Method No.
Sample ID	BH105S	BH108S											
Depth													
COC No / misc													
Containers	V H HNUF P G	V H HN P G											
Sample Date	18/06/2025	18/06/2025											
Sample Type	Ground Water	Ground Water											
Batch Number	1	1											
Date of Receipt	19/06/2025	19/06/2025											
Total Cyanide #	<0.01	<0.01									<0.01	mg/l	TM89/PM0
Ammoniacal Nitrogen as N #	0.19	0.11									<0.03	mg/l	TM38/PM0
Total Alkalinity as CaCO3 #	298	276									<1	mg/l	TM75/PM0
COD (Settled) #	8	17									<7	mg/l	TM57/PM0
Free Ammonia as N	<0.006	<0.006									<0.006	mg/l	TM176/PM0
Total Organic Carbon #	<2	<2									<2	mg/l	TM60/PM0
Total Dissolved Solids #	1318	590									<35	mg/l	TM20/PM0
Total Nitrogen	0.8	1.4									<0.5	mg/l	TM38/TM125/PM0
Total Solids #	1486	668									<5	mg/l	TM20/PM0

Please see attached notes for all abbreviations and acronyms

Please include all sections of this report if it is reproduced
All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name: Ground Investigations Ireland
Reference: 14656-04-25
Location: Knockharley Landfill
Contact: James Cashen
EMT Job No: 25/10047

SVOC Report : **Liquid**

EMT Sample No.	1-7	8-14											
Sample ID	BH105S	BH108S											
Depth											Please see attached notes for all abbreviations and acronyms		
COC No / misc													
Containers	V H HNUF P G	V H HN P G											
Sample Date	18/06/2025	18/06/2025											
Sample Type	Ground Water	Ground Water											
Batch Number	1	1											
Date of Receipt	19/06/2025	19/06/2025											
SVOC MS											LOD/LOR	Units	Method No.
Phenols													
2-Chlorophenol #	<1	<1									<1	ug/l	TM16/PM30
2-Methylphenol #	<0.5	<0.5									<0.5	ug/l	TM16/PM30
2-Nitrophenol	<0.5	<0.5									<0.5	ug/l	TM16/PM30
2,4-Dichlorophenol #	<0.5	<0.5									<0.5	ug/l	TM16/PM30
2,4-Dimethylphenol	<1	<1									<1	ug/l	TM16/PM30
2,4,5-Trichlorophenol #	<0.5	<0.5									<0.5	ug/l	TM16/PM30
2,4,6-Trichlorophenol	<1	<1									<1	ug/l	TM16/PM30
4-Chloro-3-methylphenol #	<0.5	<0.5									<0.5	ug/l	TM16/PM30
4-Methylphenol	<1	<1									<1	ug/l	TM16/PM30
4-Nitrophenol	<10	<10									<10	ug/l	TM16/PM30
Pentachlorophenol	<1	<1									<1	ug/l	TM16/PM30
Phenol	<1	<1									<1	ug/l	TM16/PM30
PAHs													
2-Chloronaphthalene #	<1	<1									<1	ug/l	TM16/PM30
2-Methylnaphthalene #	<1	<1									<1	ug/l	TM16/PM30
Phthalates													
Bis(2-ethylhexyl) phthalate	<5	<5									<5	ug/l	TM16/PM30
Butylbenzyl phthalate	<1	<1									<1	ug/l	TM16/PM30
Di-n-butyl phthalate #	<1.5	<1.5									<1.5	ug/l	TM16/PM30
Di-n-Octyl phthalate	<1	<1									<1	ug/l	TM16/PM30
Diethyl phthalate #	<1	<1									<1	ug/l	TM16/PM30
Dimethyl phthalate	<1	<1									<1	ug/l	TM16/PM30
Other SVOCs													
1,2-Dichlorobenzene #	<1	<1									<1	ug/l	TM16/PM30
1,2,4-Trichlorobenzene #	<1	<1									<1	ug/l	TM16/PM30
1,3-Dichlorobenzene #	<1	<1									<1	ug/l	TM16/PM30
1,4-Dichlorobenzene #	<1	<1									<1	ug/l	TM16/PM30
2-Nitroaniline	<1	<1									<1	ug/l	TM16/PM30
2,4-Dinitrotoluene #	<0.5	<0.5									<0.5	ug/l	TM16/PM30
2,6-Dinitrotoluene	<1	<1									<1	ug/l	TM16/PM30
3-Nitroaniline	<1	<1									<1	ug/l	TM16/PM30
4-Bromophenylphenylether #	<1	<1									<1	ug/l	TM16/PM30
4-Chloroaniline	<1	<1									<1	ug/l	TM16/PM30
4-Chlorophenylphenylether #	<1	<1									<1	ug/l	TM16/PM30
4-Nitroaniline	<0.5	<0.5									<0.5	ug/l	TM16/PM30
Azobenzene #	<0.5	<0.5									<0.5	ug/l	TM16/PM30
Bis(2-chloroethoxy)methane #	<0.5	<0.5									<0.5	ug/l	TM16/PM30
Bis(2-chloroethyl)ether #	<1	<1									<1	ug/l	TM16/PM30
Carbazole #	<0.5	<0.5									<0.5	ug/l	TM16/PM30
Dibenzofuran #	<0.5	<0.5									<0.5	ug/l	TM16/PM30
Hexachlorobenzene #	<1	<1									<1	ug/l	TM16/PM30
Hexachlorobutadiene #	<1	<1									<1	ug/l	TM16/PM30
Hexachlorocyclopentadiene	<1	<1									<1	ug/l	TM16/PM30
Hexachloroethane #	<1	<1									<1	ug/l	TM16/PM30
Isophorone #	<0.5	<0.5									<0.5	ug/l	TM16/PM30
N-nitrosodi-n-propylamine #	<0.5	<0.5									<0.5	ug/l	TM16/PM30
Nitrobenzene #	<1	<1									<1	ug/l	TM16/PM30
Surrogate Recovery 2-Fluorobiphenyl	113	117									<0	%	TM16/PM30
Surrogate Recovery p-Terphenyl-d14	115	120									<0	%	TM16/PM30

Client Name: Ground Investigations Ireland
Reference: 14656-04-25
Location: Knockharley Landfill
Contact: James Cashen
EMT Job No: 25/10047

VOC Report : **Liquid**

EMT Sample No.	1-7	8-14									LOD/LOR	Units	Method No.
Sample ID	BH105S	BH108S											
Depth													
COC No / misc													
Containers	V H HNUF P G	V H HN P G											
Sample Date	18/06/2025	18/06/2025											
Sample Type	Ground Water	Ground Water											
Batch Number	1	1											
Date of Receipt	19/06/2025	19/06/2025											
VOC MS													
Dichlorodifluoromethane	<2	<2									<2	ug/l	TM15/PM10
Methyl Tertiary Butyl Ether #	<0.1	<0.1									<0.1	ug/l	TM15/PM10
Chloromethane #	<3	<3									<3	ug/l	TM15/PM10
Vinyl Chloride #	<0.1	<0.1									<0.1	ug/l	TM15/PM10
Bromomethane	<1	<1									<1	ug/l	TM15/PM10
Chloroethane #	<3	<3									<3	ug/l	TM15/PM10
Trichlorofluoromethane #	<3	<3									<3	ug/l	TM15/PM10
1,1-Dichloroethene (1,1 DCE) #	<3	<3									<3	ug/l	TM15/PM10
Dichloromethane (DCM) #	<3	<3									<3	ug/l	TM15/PM10
trans-1-2-Dichloroethene #	<3	<3									<3	ug/l	TM15/PM10
1,1-Dichloroethane #	<3	<3									<3	ug/l	TM15/PM10
cis-1-2-Dichloroethene #	<3	<3									<3	ug/l	TM15/PM10
2,2-Dichloropropane	<1	<1									<1	ug/l	TM15/PM10
Bromochloromethane #	<2	<2									<2	ug/l	TM15/PM10
Chloroform #	3	<2									<2	ug/l	TM15/PM10
1,1,1-Trichloroethane #	<2	<2									<2	ug/l	TM15/PM10
1,1-Dichloropropene #	<3	<3									<3	ug/l	TM15/PM10
Carbon tetrachloride #	<2	<2									<2	ug/l	TM15/PM10
1,2-Dichloroethane #	<2	<2									<2	ug/l	TM15/PM10
Benzene #	<0.5	<0.5									<0.5	ug/l	TM15/PM10
Trichloroethene (TCE) #	<3	<3									<3	ug/l	TM15/PM10
1,2-Dichloropropane #	<2	<2									<2	ug/l	TM15/PM10
Dibromomethane #	<3	<3									<3	ug/l	TM15/PM10
Bromodichloromethane #	<2	<2									<2	ug/l	TM15/PM10
cis-1-3-Dichloropropene	<2	<2									<2	ug/l	TM15/PM10
Toluene #	<5	<5									<5	ug/l	TM15/PM10
trans-1-3-Dichloropropene	<2	<2									<2	ug/l	TM15/PM10
1,1,2-Trichloroethane #	<2	<2									<2	ug/l	TM15/PM10
Tetrachloroethene (PCE) #	<3	<3									<3	ug/l	TM15/PM10
1,3-Dichloropropane #	<2	<2									<2	ug/l	TM15/PM10
Dibromochloromethane	<2	<2									<2	ug/l	TM15/PM10
1,2-Dibromoethane #	<2	<2									<2	ug/l	TM15/PM10
Chlorobenzene #	<2	<2									<2	ug/l	TM15/PM10
1,1,1,2-Tetrachloroethane #	<2	<2									<2	ug/l	TM15/PM10
Ethylbenzene #	<1	<1									<1	ug/l	TM15/PM10
m/p-Xylene #	<2	<2									<2	ug/l	TM15/PM10
o-Xylene #	<1	<1									<1	ug/l	TM15/PM10
Styrene	<2	<2									<2	ug/l	TM15/PM10
Bromoform	<2	<2									<2	ug/l	TM15/PM10
Isopropylbenzene #	<3	<3									<3	ug/l	TM15/PM10
1,1,2,2-Tetrachloroethane	<4	<4									<4	ug/l	TM15/PM10
Bromobenzene #	<2	<2									<2	ug/l	TM15/PM10
1,2,3-Trichloropropane #	<3	<3									<3	ug/l	TM15/PM10
Propylbenzene #	<3	<3									<3	ug/l	TM15/PM10
2-Chlorotoluene #	<3	<3									<3	ug/l	TM15/PM10
1,3,5-Trimethylbenzene #	<3	<3									<3	ug/l	TM15/PM10
4-Chlorotoluene #	<3	<3									<3	ug/l	TM15/PM10
tert-Butylbenzene #	<3	<3									<3	ug/l	TM15/PM10
1,2,4-Trimethylbenzene #	<3	<3									<3	ug/l	TM15/PM10
sec-Butylbenzene #	<3	<3									<3	ug/l	TM15/PM10
4-Isopropyltoluene #	<3	<3									<3	ug/l	TM15/PM10
1,3-Dichlorobenzene #	<3	<3									<3	ug/l	TM15/PM10
1,4-Dichlorobenzene #	<3	<3									<3	ug/l	TM15/PM10
n-Butylbenzene #	<3	<3									<3	ug/l	TM15/PM10
1,2-Dichlorobenzene #	<3	<3									<3	ug/l	TM15/PM10
1,2-Dibromo-3-chloropropane	<2	<2									<2	ug/l	TM15/PM10
1,2,4-Trichlorobenzene	<3	<3									<3	ug/l	TM15/PM10
Hexachlorobutadiene	<3	<3									<3	ug/l	TM15/PM10
Naphthalene	<2	<2									<2	ug/l	TM15/PM10
1,2,3-Trichlorobenzene	<3	<3									<3	ug/l	TM15/PM10
Surrogate Recovery Toluene D8	104	101									<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	107	101									<0	%	TM15/PM10

Please see attached notes for all abbreviations and acronyms

Please include all sections of this report if it is reproduced
All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name: Ground Investigations Ireland

Reference: 14656-04-25

Location: Knockharley Landfill

Contact: James Cashen

Matrix : Liquid

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason
25/10047	1	BH105S		1-7	Be MS	Sample holding time exceeded
25/10047	1	BH108S		8-14	Be MS	Sample holding time exceeded

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.

It is a requirement under ISO 17025 that we inform clients if samples are deviating i.e. outside what is expected. A deviating sample indicates that the sample 'may' be compromised but not necessarily will be compromised. The result is still accredited and our analytical reports will still show accreditation on the relevant analytes.

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NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 25/10047

SOILS and ASH

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary. Asbestos samples are retained for 6 months.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C. Ash samples are dried at 35°C ±5°C.

Where Mineral Oil is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil is quoted, this refers to Total Aliphatics C10-C40.

STACK EMISSIONS

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation for Dioxins and Furans and Dioxin like PCBs has been performed on XAD-2 Resin, only samples which use this resin will be within our MCERTS scope.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a requirement of our Accreditation Body for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.
Laboratory records are kept for a period of no less than 6 years.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

Customer Provided Information

Sample ID and depth is information provided by the customer.

Age of Diesel

The age of release estimation is based on the nC17/pristane ratio only as prescribed by Christensen and Larsen (1993) and Kaplan, Galperin, Alimi et al., (1996).
Age estimation should be treated with caution as it can be influenced by site specific factors of which the laboratory are not aware.

Tentatively Identified Compounds (TICs)

Where Tentatively Identified Compounds (TICs) are reported, up to 10 Tentatively Identified Compounds will be listed where there is found to be a greater than 80% match with the NIST library. The reported concentration is determined semi-quantitively, with a matrix specific limit of detection. Note, other compounds may be present but are not reported.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above quantitative calibration range. The result should be considered the minimum value and is indicative only. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range
AA	x5 Dilution
AB	x10 Dilution

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 25/10047

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM15	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.				
TM15	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes			
TM16	Modified USEPA 8270D v5:2014. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM16	Modified USEPA 8270D v5:2014. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM20	Modified BS 1377-3:1990/USEPA 160.1/3 (TDS/TS: 1971) Gravimetric determination of Total Dissolved Solids/Total Solids	PM0	No preparation is required.	Yes			
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM0	No preparation is required.				
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma-Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified				
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma-Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified	Yes			
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) - All anions comparable to BS ISO 15923-1: 2013I	PM0	No preparation is required.	Yes			
TM38/TM125	Total Nitogen/Organic Nitrogen by calculation	PM0	No preparation is required.				

EMT Job No: 25/10047

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM57	Modified US EPA Method 410.4. (Rev. 2.0 1993) Comparable with ISO 15705:2002. Chemical Oxygen Demand is determined by hot digestion with Potassium Dichromate and measured spectrophotometerically.	PM0	No preparation is required.	Yes			
TM60	TC/TOC analysis of Waters by High Temperature Combustion followed by NDIR detection. Based on the following modified standard methods: USEPA 9060A (2002), APHA SMEWW 5310B:1999 22nd Edition, ASTM D 7573, and USEPA 415.1.	PM0	No preparation is required.	Yes			
TM75	Modified US EPA method 310.1 (1978). Determination of Alkalinity by Metrohm automated titration analyser.	PM0	No preparation is required.	Yes			
TM89	Modified USEPA method OIA-1667 (1999). Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM0	No preparation is required.	Yes			
TM170	Determination of Trace Metals by ICP-MS (Inductively Coupled Plasma-Mass Spectrometry): Modified USEPA Method 200.8, Rev. 5.4, 1994; Modified EPA Method 6020A, Rev.1, Feb 2007; Modified BS EN ISO 17294-2:2016	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified				
TM170	Determination of Trace Metals by ICP-MS (Inductively Coupled Plasma-Mass Spectrometry): Modified USEPA Method 200.8, Rev. 5.4, 1994; Modified EPA Method 6020A, Rev.1, Feb 2007; Modified BS EN ISO 17294-2:2016	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified	Yes			
TM173	Analysis of fluoride by ISE (Ion Selective Electrode) using modified ISE method 9214 - 340.2 (EPA 1998)	PM0	No preparation is required.				
TM176	Free ammonia based on the pH and temperature dependent equilibrium calculated in accordance with NRA Water Quality Objectives 1994 using the ammoniacal nitrogen result.	PM0	No preparation is required.				

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Catherinestown House
Hazelhatch Road
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Ireland
D22 K5P8

Attention :	James Cashen
Date :	26th September, 2025
Your reference :	1456-04-25
Our reference :	Test Report 25/10236 Batch 1
Location :	Knockharley Landfil
Date samples received :	23rd June, 2025
Status :	Final Report
Issue :	202509261155 (Supersedes 202507081511)

Three samples were received for analysis on 23rd June, 2025 of which three were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

The greenhouse gas emissions generated (in Carbon – Co2e) to obtain the results in this report are estimated as:

Scope 1&2 emissions - 13.539 kg of CO2

Scope 1&2&3 emissions - 31.996 kg of CO2

Authorised By:

Phil Sommerton BSc
Senior Technical Account Manager

Please include all sections of this report if it is reproduced

Client Name: Ground Investigations Ireland
Reference: 1456-04-25
Location: Knockharley Landfil
Contact: James Cashen
EMT Job No: 25/10236

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
H=H_2SO_4, Z=ZnAc, N=NaOH, HN=$HN0_3$

EMT Sample No.	1-7	8-14	15-21								LOD/LOR	Units	Method No.
Sample ID	BH104S	BH106S	BH107S										
Depth													
COC No / misc													
Containers	V H HNUF P G	V H HNUF P G	V H HNUF P G										
Sample Date	19/06/2025	19/06/2025	19/06/2025										
Sample Type	Ground Water	Ground Water	Ground Water										
Batch Number	1	1	1										
Date of Receipt	23/06/2025	23/06/2025	23/06/2025										
Dissolved Aluminium #	4.7	9.3	8.3								<1.5	ug/l	TM170/PM14
Dissolved Antimony #	<2	<2	2								<2	ug/l	TM170/PM14
Dissolved Arsenic #	1.0	1.0	4.3								<0.9	ug/l	TM170/PM14
Dissolved Barium #	65.4	73.4	50.8								<1.8	ug/l	TM170/PM14
Dissolved Beryllium #	<0.5	<0.5	<0.5								<0.5	ug/l	TM170/PM14
Dissolved Boron #	41	80	38								<12	ug/l	TM170/PM14
Dissolved Cadmium #	0.03	<0.03	0.12								<0.03	ug/l	TM170/PM14
Total Dissolved Chromium #	<0.2	<0.2	<0.2								<0.2	ug/l	TM170/PM14
Dissolved Cobalt #	1.0	0.7	1.8								<0.1	ug/l	TM170/PM14
Dissolved Copper #	<1	<1	3								<1	ug/l	TM170/PM14
Total Dissolved Iron #	12.0	<4.7	<4.7								<4.7	ug/l	TM170/PM14
Dissolved Lead #	<0.4	<0.4	<0.4								<0.4	ug/l	TM170/PM14
Dissolved Manganese #	421.5	192.5	1448.5$_{AB}$								<1.5	ug/l	TM170/PM14
Dissolved Mercury #	<0.5	<0.5	<0.5								<0.5	ug/l	TM170/PM14
Dissolved Molybdenum #	3.6	18.3	13.5								<0.2	ug/l	TM170/PM14
Dissolved Nickel #	1.8	3.4	5.1								<0.2	ug/l	TM170/PM14
Dissolved Selenium #	<1.2	<1.2	<1.2								<1.2	ug/l	TM170/PM14
Dissolved Vanadium #	0.7	1.1	<0.6								<0.6	ug/l	TM170/PM14
Dissolved Zinc #	<3	3	<3								<3	ug/l	TM170/PM14
Total Phosphorus	514$_{AB}$	21290$_{AC}$	228								<5	ug/l	TM170/PM14
Dissolved Calcium #	90.5	67.5	97.3								<0.2	mg/l	TM30/PM14
Dissolved Magnesium #	21.2	17.8	15.3								<0.1	mg/l	TM30/PM14
Dissolved Potassium #	3.2	5.0	4.6								<0.1	mg/l	TM30/PM14
Dissolved Sodium #	29.0	52.0	44.7								<0.1	mg/l	TM30/PM14
Dissolved Titanium	<5	<5	<5								<5	ug/l	TM30/PM14
Methyl Tertiary Butyl Ether #	<0.1	<0.1	<0.1								<0.1	ug/l	TM15/PM10
Benzene #	<0.5	<0.5	<0.5								<0.5	ug/l	TM15/PM10
Toluene #	<5	<5	<5								<5	ug/l	TM15/PM10
Ethylbenzene #	<1	<1	<1								<1	ug/l	TM15/PM10
m/p-Xylene #	<2	<2	<2								<2	ug/l	TM15/PM10
o-Xylene #	<1	<1	<1								<1	ug/l	TM15/PM10
Surrogate Recovery Toluene D8	101	101	101								<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	102	99	100								<0	%	TM15/PM10
Total Phenols HPLC	<0.15	<0.15	<0.15								<0.15	mg/l	TM26/PM0
Fluoride	<0.3	<0.3	0.4								<0.3	mg/l	TM173/PM0
Sulphate as SO4 #	42.5	60.7	165.6								<0.5	mg/l	TM38/PM0
Chloride #	18.6	21.6	29.4								<0.3	mg/l	TM38/PM0
Ortho Phosphate as PO4 #	0.26	<0.06	0.07								<0.06	mg/l	TM38/PM0
Nitrate as N #	0.22	0.13	0.10								<0.05	mg/l	TM38/PM0

Please see attached notes for all abbreviations and acronyms

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 1456-04-25
Location: Knockharley Landfil
Contact: James Cashen
EMT Job No: 25/10236

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
H=H_2SO_4, Z=ZnAc, N=NaOH, HN=$HN0_3$

EMT Sample No.	1-7	8-14	15-21									
Sample ID	BH104S	BH106S	BH107S									
Depth										Please see attached notes for all abbreviations and acronyms		
COC No / misc												
Containers	V H HNUF P G	V H HNUF P G	V H HNUF P G									
Sample Date	19/06/2025	19/06/2025	19/06/2025									
Sample Type	Ground Water	Ground Water	Ground Water									
Batch Number	1	1	1							LOD/LOR	Units	Method No.
Date of Receipt	23/06/2025	23/06/2025	23/06/2025									
Total Cyanide #	<0.01	<0.01	<0.01							<0.01	mg/l	TM89/PM0
Ammoniacal Nitrogen as N #	0.22	0.47	0.13							<0.03	mg/l	TM38/PM0
Total Alkalinity as CaCO3 #	310	300	214							<1	mg/l	TM75/PM0
COD (Settled) #	<7	7	9							<7	mg/l	TM57/PM0
Free Ammonia as N	<0.006	0.009	<0.006							<0.006	mg/l	TM176/PM0
Total Organic Carbon #	<2	<2	<2							<2	mg/l	TM60/PM0
Total Dissolved Solids #	440	401	541							<35	mg/l	TM20/PM0
Total Nitrogen	1.6	50.4	0.8							<0.5	mg/l	TM38/TM125/PM0
Total Solids #	982	80573	854							<5	mg/l	TM20/PM0

Please include all sections of this report if it is reproduced
All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name: Ground Investigations Ireland
Reference: 1456-04-25
Location: Knockharley Landfil
Contact: James Cashen
EMT Job No: 25/10236

SVOC Report : **Liquid**

EMT Sample No.	1-7	8-14	15-21									
Sample ID	BH104S	BH106S	BH107S									
Depth										Please see attached notes for all abbreviations and acronyms		
COC No / misc												
Containers	V H HNUF P G	V H HNUF P G	V H HNUF P G									
Sample Date	19/06/2025	19/06/2025	19/06/2025									
Sample Type	Ground Water	Ground Water	Ground Water									
Batch Number	1	1	1									
Date of Receipt	23/06/2025	23/06/2025	23/06/2025									
SVOC MS										LOD/LOR	Units	Method No.
Phenols												
2-Chlorophenol #	<3 AA	<3 AA	<1							<1	ug/l	TM16/PM30
2-Methylphenol #	<1.5 AA	<1.5 AA	<0.5							<0.5	ug/l	TM16/PM30
2-Nitrophenol	<1.5 AA	<1.5 AA	<0.5							<0.5	ug/l	TM16/PM30
2,4-Dichlorophenol #	<1.5 AA	<1.5 AA	<0.5							<0.5	ug/l	TM16/PM30
2,4-Dimethylphenol	<3 AA	<3 AA	<1							<1	ug/l	TM16/PM30
2,4,5-Trichlorophenol #	<1.5 AA	<1.5 AA	<0.5							<0.5	ug/l	TM16/PM30
2,4,6-Trichlorophenol	<3 AA	<3 AA	<1							<1	ug/l	TM16/PM30
4-Chloro-3-methylphenol #	<1.5 AA	<1.5 AA	<0.5							<0.5	ug/l	TM16/PM30
4-Methylphenol	<3 AA	<3 AA	<1							<1	ug/l	TM16/PM30
4-Nitrophenol	<30 AA	<30 AA	<10							<10	ug/l	TM16/PM30
Pentachlorophenol	<3 AA	<3 AA	<1							<1	ug/l	TM16/PM30
Phenol	<3 AA	<3 AA	<1							<1	ug/l	TM16/PM30
PAHs												
2-Chloronaphthalene #	<3 AA	<3 AA	<1							<1	ug/l	TM16/PM30
2-Methylnaphthalene #	<3 AA	<3 AA	<1							<1	ug/l	TM16/PM30
Phthalates												
Bis(2-ethylhexyl) phthalate	<15 AA	<15 AA	<5							<5	ug/l	TM16/PM30
Butylbenzyl phthalate	<3 AA	<3 AA	<1							<1	ug/l	TM16/PM30
Di-n-butyl phthalate #	<4.5 AA	<4.5 AA	<1.5							<1.5	ug/l	TM16/PM30
Di-n-Octyl phthalate	<3 AA	<3 AA	<1							<1	ug/l	TM16/PM30
Diethyl phthalate #	<3 AA	<3 AA	<1							<1	ug/l	TM16/PM30
Dimethyl phthalate	<3 AA	<3 AA	<1							<1	ug/l	TM16/PM30
Other SVOCs												
1,2-Dichlorobenzene #	<3 AA	<3 AA	<1							<1	ug/l	TM16/PM30
1,2,4-Trichlorobenzene #	<3 AA	<3 AA	<1							<1	ug/l	TM16/PM30
1,3-Dichlorobenzene #	<3 AA	<3 AA	<1							<1	ug/l	TM16/PM30
1,4-Dichlorobenzene #	<3 AA	<3 AA	<1							<1	ug/l	TM16/PM30
2-Nitroaniline	<3 AA	<3 AA	<1							<1	ug/l	TM16/PM30
2,4-Dinitrotoluene #	<1.5 AA	<1.5 AA	<0.5							<0.5	ug/l	TM16/PM30
2,6-Dinitrotoluene	<3 AA	<3 AA	<1							<1	ug/l	TM16/PM30
3-Nitroaniline	<3 AA	<3 AA	<1							<1	ug/l	TM16/PM30
4-Bromophenylphenylether #	<3 AA	<3 AA	<1							<1	ug/l	TM16/PM30
4-Chloroaniline	<3 AA	<3 AA	<1							<1	ug/l	TM16/PM30
4-Chlorophenylphenylether #	<3 AA	<3 AA	<1							<1	ug/l	TM16/PM30
4-Nitroaniline	<1.5 AA	<1.5 AA	<0.5							<0.5	ug/l	TM16/PM30
Azobenzene #	<1.5 AA	<1.5 AA	<0.5							<0.5	ug/l	TM16/PM30
Bis(2-chloroethoxy)methane #	<1.5 AA	<1.5 AA	<0.5							<0.5	ug/l	TM16/PM30
Bis(2-chloroethyl)ether #	<3 AA	<3 AA	<1							<1	ug/l	TM16/PM30
Carbazole #	<1.5 AA	<1.5 AA	<0.5							<0.5	ug/l	TM16/PM30
Dibenzofuran #	<1.5 AA	<1.5 AA	<0.5							<0.5	ug/l	TM16/PM30
Hexachlorobenzene #	<3 AA	<3 AA	<1							<1	ug/l	TM16/PM30
Hexachlorobutadiene #	<3 AA	<3 AA	<1							<1	ug/l	TM16/PM30
Hexachlorocyclopentadiene	<3 AA	<3 AA	<1							<1	ug/l	TM16/PM30
Hexachloroethane #	<3 AA	<3 AA	<1							<1	ug/l	TM16/PM30
Isophorone #	<1.5 AA	<1.5 AA	<0.5							<0.5	ug/l	TM16/PM30
N-nitrosodi-n-propylamine #	<1.5 AA	<1.5 AA	<0.5							<0.5	ug/l	TM16/PM30
Nitrobenzene #	<3 AA	<3 AA	<1							<1	ug/l	TM16/PM30
Surrogate Recovery 2-Fluorobiphenyl	116 AA	99 AA	116							<0	%	TM16/PM30
Surrogate Recovery p-Terphenyl-d14	119 AA	109 AA	118							<0	%	TM16/PM30

Client Name: Ground Investigations Ireland
Reference: 1456-04-25
Location: Knockharley Landfil
Contact: James Cashen
EMT Job No: 25/10236

VOC Report : **Liquid**

EMT Sample No.	1-7	8-14	15-21									
Sample ID	BH104S	BH106S	BH107S									
Depth												
COC No / misc												
Containers	V H HNUF P G	V H HNUF P G	V H HNUF P G									
Sample Date	19/06/2025	19/06/2025	19/06/2025									
Sample Type	Ground Water	Ground Water	Ground Water									
Batch Number	1	1	1									
Date of Receipt	23/06/2025	23/06/2025	23/06/2025									

Please see attached notes for all abbreviations and acronyms

											LOD/LOR	Units	Method No.
VOC MS													
Dichlorodifluoromethane	<2	<2	<2								<2	ug/l	TM15/PM10
Methyl Tertiary Butyl Ether #	<0.1	<0.1	<0.1								<0.1	ug/l	TM15/PM10
Chloromethane #	<3	<3	<3								<3	ug/l	TM15/PM10
Vinyl Chloride #	<0.1	<0.1	<0.1								<0.1	ug/l	TM15/PM10
Bromomethane	<1	<1	<1								<1	ug/l	TM15/PM10
Chloroethane #	<3	<3	<3								<3	ug/l	TM15/PM10
Trichlorofluoromethane #	<3	<3	<3								<3	ug/l	TM15/PM10
1,1-Dichloroethene (1,1 DCE) #	<3	<3	<3								<3	ug/l	TM15/PM10
Dichloromethane (DCM) #	<3	<3	<3								<3	ug/l	TM15/PM10
trans-1-2-Dichloroethene #	<3	<3	<3								<3	ug/l	TM15/PM10
1,1-Dichloroethane #	<3	<3	<3								<3	ug/l	TM15/PM10
cis-1-2-Dichloroethene #	<3	<3	<3								<3	ug/l	TM15/PM10
2,2-Dichloropropane	<1	<1	<1								<1	ug/l	TM15/PM10
Bromochloromethane #	<2	<2	<2								<2	ug/l	TM15/PM10
Chloroform #	<2	<2	5								<2	ug/l	TM15/PM10
1,1,1-Trichloroethane #	<2	<2	<2								<2	ug/l	TM15/PM10
1,1-Dichloropropene #	<3	<3	<3								<3	ug/l	TM15/PM10
Carbon tetrachloride #	<2	<2	<2								<2	ug/l	TM15/PM10
1,2-Dichloroethane #	<2	<2	<2								<2	ug/l	TM15/PM10
Benzene #	<0.5	<0.5	<0.5								<0.5	ug/l	TM15/PM10
Trichloroethene (TCE) #	<3	<3	<3								<3	ug/l	TM15/PM10
1,2-Dichloropropane #	<2	<2	<2								<2	ug/l	TM15/PM10
Dibromomethane #	<3	<3	<3								<3	ug/l	TM15/PM10
Bromodichloromethane #	<2	<2	<2								<2	ug/l	TM15/PM10
cis-1-3-Dichloropropene	<2	<2	<2								<2	ug/l	TM15/PM10
Toluene #	<5	<5	<5								<5	ug/l	TM15/PM10
trans-1-3-Dichloropropene	<2	<2	<2								<2	ug/l	TM15/PM10
1,1,2-Trichloroethane #	<2	<2	<2								<2	ug/l	TM15/PM10
Tetrachloroethene (PCE) #	<3	<3	<3								<3	ug/l	TM15/PM10
1,3-Dichloropropane #	<2	<2	<2								<2	ug/l	TM15/PM10
Dibromochloromethane	<2	<2	<2								<2	ug/l	TM15/PM10
1,2-Dibromoethane #	<2	<2	<2								<2	ug/l	TM15/PM10
Chlorobenzene #	<2	<2	<2								<2	ug/l	TM15/PM10
1,1,1,2-Tetrachloroethane #	<2	<2	<2								<2	ug/l	TM15/PM10
Ethylbenzene #	<1	<1	<1								<1	ug/l	TM15/PM10
m/p-Xylene #	<2	<2	<2								<2	ug/l	TM15/PM10
o-Xylene #	<1	<1	<1								<1	ug/l	TM15/PM10
Styrene	<2	<2	<2								<2	ug/l	TM15/PM10
Bromoform	<2	<2	<2								<2	ug/l	TM15/PM10
Isopropylbenzene #	<3	<3	<3								<3	ug/l	TM15/PM10
1,1,2,2-Tetrachloroethane	<4	<4	<4								<4	ug/l	TM15/PM10
Bromobenzene #	<2	<2	<2								<2	ug/l	TM15/PM10
1,2,3-Trichloropropane #	<3	<3	<3								<3	ug/l	TM15/PM10
Propylbenzene #	<3	<3	<3								<3	ug/l	TM15/PM10
2-Chlorotoluene #	<3	<3	<3								<3	ug/l	TM15/PM10
1,3,5-Trimethylbenzene #	<3	<3	<3								<3	ug/l	TM15/PM10
4-Chlorotoluene #	<3	<3	<3								<3	ug/l	TM15/PM10
tert-Butylbenzene #	<3	<3	<3								<3	ug/l	TM15/PM10
1,2,4-Trimethylbenzene #	<3	<3	<3								<3	ug/l	TM15/PM10
sec-Butylbenzene #	<3	<3	<3								<3	ug/l	TM15/PM10
4-Isopropyltoluene #	<3	<3	<3								<3	ug/l	TM15/PM10
1,3-Dichlorobenzene #	<3	<3	<3								<3	ug/l	TM15/PM10
1,4-Dichlorobenzene #	<3	<3	<3								<3	ug/l	TM15/PM10
n-Butylbenzene #	<3	<3	<3								<3	ug/l	TM15/PM10
1,2-Dichlorobenzene #	<3	<3	<3								<3	ug/l	TM15/PM10
1,2-Dibromo-3-chloropropane	<2	<2	<2								<2	ug/l	TM15/PM10
1,2,4-Trichlorobenzene	<3	<3	<3								<3	ug/l	TM15/PM10
Hexachlorobutadiene	<3	<3	<3								<3	ug/l	TM15/PM10
Naphthalene	<2	<2	<2								<2	ug/l	TM15/PM10
1,2,3-Trichlorobenzene	<3	<3	<3								<3	ug/l	TM15/PM10
Surrogate Recovery Toluene D8	101	101	101								<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	102	99	100								<0	%	TM15/PM10

Please include all sections of this report if it is reproduced
All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name: Ground Investigations Ireland

Matrix : Liquid

Reference: 1456-04-25

Location: Knockharley Landfil

Contact: James Cashen

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason
25/10236	1	BH104S		1-7	Be MS	Sample holding time exceeded
25/10236	1	BH106S		8-14	Be MS	Sample holding time exceeded
25/10236	1	BH107S		15-21	Be MS	Sample holding time exceeded

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.

It is a requirement under ISO 17025 that we inform clients if samples are deviating i.e. outside what is expected. A deviating sample indicates that the sample 'may' be compromised but not necessarily will be compromised. The result is still accredited and our analytical reports will still show accreditation on the relevant analytes.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 25/10236

SOILS and ASH

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary. Asbestos samples are retained for 6 months.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C. Ash samples are dried at 35°C ±5°C.

Where Mineral Oil is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil is quoted, this refers to Total Aliphatics C10-C40.

STACK EMISSIONS

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation for Dioxins and Furans and Dioxin like PCBs has been performed on XAD-2 Resin, only samples which use this resin will be within our MCERTS scope.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a requirement of our Accreditation Body for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.
Laboratory records are kept for a period of no less than 6 years.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

Customer Provided Information

Sample ID and depth is information provided by the customer.

Age of Diesel

The age of release estimation is based on the nC17/pristane ratio only as prescribed by Christensen and Larsen (1993) and Kaplan, Galperin, Alimi et al., (1996).
Age estimation should be treated with caution as it can be influenced by site specific factors of which the laboratory are not aware.

Tentatively Identified Compounds (TICs)

Where Tentatively Identified Compounds (TICs) are reported, up to 10 Tentatively Identified Compounds will be listed where there is found to be a greater than 80% match with the NIST library. The reported concentration is determined semi-quantitively, with a matrix specific limit of detection. Note, other compounds may be present but are not reported.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above quantitative calibration range. The result should be considered the minimum value and is indicative only. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range
AA	x3 Dilution
AB	x5 Dilution
AC	x500 Dilution

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 25/10236

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM15	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.				
TM15	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes			
TM16	Modified USEPA 8270D v5:2014. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM16	Modified USEPA 8270D v5:2014. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM20	Modified BS 1377-3:1990/USEPA 160.1/3 (TDS/TS: 1971) Gravimetric determination of Total Dissolved Solids/Total Solids	PM0	No preparation is required.	Yes			
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM0	No preparation is required.				
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma-Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified				
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma-Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified	Yes			
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) - All anions comparable to BS ISO 15923-1: 2013I	PM0	No preparation is required.	Yes			
TM38/TM125	Total Nitogen/Organic Nitrogen by calculation	PM0	No preparation is required.				

EMT Job No: 25/10236

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM57	Modified US EPA Method 410.4. (Rev. 2.0 1993) Comparable with ISO 15705:2002. Chemical Oxygen Demand is determined by hot digestion with Potassium Dichromate and measured spectrophotometerically.	PM0	No preparation is required.	Yes			
TM60	TC/TOC analysis of Waters by High Temperature Combustion followed by NDIR detection. Based on the following modified standard methods: USEPA 9060A (2002), APHA SMEWW 5310B:1999 22nd Edition, ASTM D 7573, and USEPA 415.1.	PM0	No preparation is required.	Yes			
TM75	Modified US EPA method 310.1 (1978). Determination of Alkalinity by Metrohm automated titration analyser.	PM0	No preparation is required.	Yes			
TM89	Modified USEPA method OIA-1667 (1999). Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM0	No preparation is required.	Yes			
TM170	Determination of Trace Metals by ICP-MS (Inductively Coupled Plasma-Mass Spectrometry): Modified USEPA Method 200.8, Rev. 5.4, 1994; Modified EPA Method 6020A, Rev.1, Feb 2007; Modified BS EN ISO 17294-2:2016	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified				
TM170	Determination of Trace Metals by ICP-MS (Inductively Coupled Plasma-Mass Spectrometry): Modified USEPA Method 200.8, Rev. 5.4, 1994; Modified EPA Method 6020A, Rev.1, Feb 2007; Modified BS EN ISO 17294-2:2016	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified	Yes			
TM173	Analysis of fluoride by ISE (Ion Selective Electrode) using modified ISE method 9214 - 340.2 (EPA 1998)	PM0	No preparation is required.				
TM176	Free ammonia based on the pH and temperature dependent equilibrium calculated in accordance with NRA Water Quality Objectives 1994 using the ammoniacal nitrogen result.	PM0	No preparation is required.				

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Ground Investigations Ireland
Catherinestown House
Hazelhatch Road
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Co. Dublin
Ireland
D22 K5P8

Attention :	James Cashen
Date :	26th September, 2025
Your reference :	14656 - 04 - 25
Our reference :	Test Report 25/10319 Batch 1
Location :	Knockharley Landfill
Date samples received :	24th June, 2025
Status :	Final Report
Issue :	202509261201 (supersedes 202507071132)

Two samples were received for analysis on 24th June, 2025 of which two were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

The greenhouse gas emissions generated (in Carbon – Co2e) to obtain the results in this report are estimated as:

Scope 1&2 emissions - 8.688 kg of CO2

Scope 1&2&3 emissions - 20.532 kg of CO2

Authorised By:

Phil Sommerton BSc
Senior Technical Account Manager

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 14656 - 04 - 25
Location: Knockharley Landfill
Contact: James Cashen
EMT Job No: 25/10319

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
$H=H_2SO_4$, Z=ZnAc, N=NaOH, $HN=HN0_3$

EMT Sample No.	1-7	8-14									LOD/LOR	Units	Method No.
Sample ID	BH101S	BH102S											
Depth													
COC No / misc													
Containers	V H HNUF P G	V H HNUF P G											
Sample Date	23/06/2025	23/06/2025											
Sample Type	Ground Water	Ground Water											
Batch Number	1	1											
Date of Receipt	24/06/2025	24/06/2025											
Dissolved Aluminium #	15.0	3.9									<1.5	ug/l	TM170/PM14
Dissolved Antimony #	<2	<2									<2	ug/l	TM170/PM14
Dissolved Arsenic #	1.6	1.3									<0.9	ug/l	TM170/PM14
Dissolved Barium #	107.1	100.4									<1.8	ug/l	TM170/PM14
Dissolved Beryllium #	<0.5	<0.5									<0.5	ug/l	TM170/PM14
Dissolved Boron #	43	36									<12	ug/l	TM170/PM14
Dissolved Cadmium #	0.21	0.06									<0.03	ug/l	TM170/PM14
Total Dissolved Chromium #	<0.2	<0.2									<0.2	ug/l	TM170/PM14
Dissolved Cobalt #	1.1	0.9									<0.1	ug/l	TM170/PM14
Dissolved Copper #	<1	<1									<1	ug/l	TM170/PM14
Total Dissolved Iron #	11.9	<4.7									<4.7	ug/l	TM170/PM14
Dissolved Lead #	<0.4	<0.4									<0.4	ug/l	TM170/PM14
Dissolved Manganese #	571.5	900.7									<1.5	ug/l	TM170/PM14
Dissolved Mercury #	<0.5	<0.5									<0.5	ug/l	TM170/PM14
Dissolved Molybdenum #	10.1	5.1									<0.2	ug/l	TM170/PM14
Dissolved Nickel #	7.2	3.0									<0.2	ug/l	TM170/PM14
Dissolved Selenium #	<1.2	<1.2									<1.2	ug/l	TM170/PM14
Dissolved Vanadium #	0.8	<0.6									<0.6	ug/l	TM170/PM14
Dissolved Zinc #	<3	4									<3	ug/l	TM170/PM14
Total Phosphorus	6770$_{AA}$	185									<5	ug/l	TM170/PM14
Dissolved Calcium #	95.2	93.0									<0.2	mg/l	TM30/PM14
Dissolved Magnesium #	18.8	20.1									<0.1	mg/l	TM30/PM14
Dissolved Potassium #	4.1	3.3									<0.1	mg/l	TM30/PM14
Dissolved Sodium #	49.3	31.8									<0.1	mg/l	TM30/PM14
Dissolved Titanium	<5	<5									<5	ug/l	TM30/PM14
Methyl Tertiary Butyl Ether #	<0.1	<0.1									<0.1	ug/l	TM15/PM10
Benzene #	<0.5	<0.5									<0.5	ug/l	TM15/PM10
Toluene #	<5	<5									<5	ug/l	TM15/PM10
Ethylbenzene #	<1	<1									<1	ug/l	TM15/PM10
m/p-Xylene #	<2	<2									<2	ug/l	TM15/PM10
o-Xylene #	<1	<1									<1	ug/l	TM15/PM10
Surrogate Recovery Toluene D8	95	97									<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	104	102									<0	%	TM15/PM10
Total Phenols HPLC	<0.15	<0.15									<0.15	mg/l	TM26/PM0
Fluoride	<0.3	<0.3									<0.3	mg/l	TM173/PM0
Sulphate as SO4 #	67.4	35.3									<0.5	mg/l	TM38/PM0
Chloride #	23.4	17.9									<0.3	mg/l	TM38/PM0
Ortho Phosphate as PO4 #	<0.06	<0.06									<0.06	mg/l	TM38/PM0
Nitrate as N #	0.08	0.07									<0.05	mg/l	TM38/PM0

Please see attached notes for all abbreviations and acronyms

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 14656 - 04 - 25
Location: Knockharley Landfill
Contact: James Cashen
EMT Job No: 25/10319

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
$H=H_2SO_4$, Z=ZnAc, N=NaOH, $HN=HN0_3$

EMT Sample No.	1-7	8-14									LOD/LOR	Units	Method No.
Sample ID	BH101S	BH102S											
Depth													
COC No / misc													
Containers	V H HNUF P G	V H HNUF P G											
Sample Date	23/06/2025	23/06/2025											
Sample Type	Ground Water	Ground Water											
Batch Number	1	1											
Date of Receipt	24/06/2025	24/06/2025											
Total Cyanide #	<0.01	<0.01									<0.01	mg/l	TM89/PM0
Ammoniacal Nitrogen as N #	0.20	0.29									<0.03	mg/l	TM38/PM0
Total Alkalinity as CaCO3 #	1600	360									<1	mg/l	TM75/PM0
COD (Settled) #	<7	<7									<7	mg/l	TM57/PM0
Free Ammonia as N	<0.006	0.007									<0.006	mg/l	TM176/PM0
Total Organic Carbon #	<2	<2									<2	mg/l	TM60/PM0
Total Dissolved Solids #	495	457									<35	mg/l	TM20/PM0
Total Nitrogen	19.4	1.4									<0.5	mg/l	TM38/TM125/PM0
Total Solids #	21059	708									<5	mg/l	TM20/PM0

Please see attached notes for all abbreviations and acronyms

Client Name: Ground Investigations Ireland
Reference: 14656 - 04 - 25
Location: Knockharley Landfill
Contact: James Cashen
EMT Job No: 25/10319

SVOC Report : **Liquid**

EMT Sample No.	1-7	8-14											
Sample ID	BH101S	BH102S											
Depth													
COC No / misc													
Containers	V H HNUF P G	V H HNUF P G											
Sample Date	23/06/2025	23/06/2025											
Sample Type	Ground Water	Ground Water											
Batch Number	1	1											
Date of Receipt	24/06/2025	24/06/2025											

Please see attached notes for all abbreviations and acronyms

			LOD/LOR	Units	Method No.
SVOC MS					
Phenols					
2-Chlorophenol #	<1	<1	<1	ug/l	TM16/PM30
2-Methylphenol #	<0.5	<0.5	<0.5	ug/l	TM16/PM30
2-Nitrophenol	<0.5	<0.5	<0.5	ug/l	TM16/PM30
2,4-Dichlorophenol #	<0.5	<0.5	<0.5	ug/l	TM16/PM30
2,4-Dimethylphenol	<1	<1	<1	ug/l	TM16/PM30
2,4,5-Trichlorophenol #	<0.5	<0.5	<0.5	ug/l	TM16/PM30
2,4,6-Trichlorophenol	<1	<1	<1	ug/l	TM16/PM30
4-Chloro-3-methylphenol #	<0.5	<0.5	<0.5	ug/l	TM16/PM30
4-Methylphenol	<1	<1	<1	ug/l	TM16/PM30
4-Nitrophenol	<10	<10	<10	ug/l	TM16/PM30
Pentachlorophenol	<1	<1	<1	ug/l	TM16/PM30
Phenol	<1	<1	<1	ug/l	TM16/PM30
PAHs					
2-Chloronaphthalene #	<1	<1	<1	ug/l	TM16/PM30
2-Methylnaphthalene #	<1	<1	<1	ug/l	TM16/PM30
Phthalates					
Bis(2-ethylhexyl) phthalate	<5	<5	<5	ug/l	TM16/PM30
Butylbenzyl phthalate	<1	<1	<1	ug/l	TM16/PM30
Di-n-butyl phthalate #	<1.5	<1.5	<1.5	ug/l	TM16/PM30
Di-n-Octyl phthalate	<1	<1	<1	ug/l	TM16/PM30
Diethyl phthalate #	<1	<1	<1	ug/l	TM16/PM30
Dimethyl phthalate	<1	<1	<1	ug/l	TM16/PM30
Other SVOCs					
1,2-Dichlorobenzene #	<1	<1	<1	ug/l	TM16/PM30
1,2,4-Trichlorobenzene #	<1	<1	<1	ug/l	TM16/PM30
1,3-Dichlorobenzene #	<1	<1	<1	ug/l	TM16/PM30
1,4-Dichlorobenzene #	<1	<1	<1	ug/l	TM16/PM30
2-Nitroaniline	<1	<1	<1	ug/l	TM16/PM30
2,4-Dinitrotoluene #	<0.5	<0.5	<0.5	ug/l	TM16/PM30
2,6-Dinitrotoluene	<1	<1	<1	ug/l	TM16/PM30
3-Nitroaniline	<1	<1	<1	ug/l	TM16/PM30
4-Bromophenylphenylether #	<1	<1	<1	ug/l	TM16/PM30
4-Chloroaniline	<1	<1	<1	ug/l	TM16/PM30
4-Chlorophenylphenylether #	<1	<1	<1	ug/l	TM16/PM30
4-Nitroaniline	<0.5	<0.5	<0.5	ug/l	TM16/PM30
Azobenzene #	<0.5	<0.5	<0.5	ug/l	TM16/PM30
Bis(2-chloroethoxy)methane #	<0.5	<0.5	<0.5	ug/l	TM16/PM30
Bis(2-chloroethyl)ether #	<1	<1	<1	ug/l	TM16/PM30
Carbazole #	<0.5	<0.5	<0.5	ug/l	TM16/PM30
Dibenzofuran #	<0.5	<0.5	<0.5	ug/l	TM16/PM30
Hexachlorobenzene #	<1	<1	<1	ug/l	TM16/PM30
Hexachlorobutadiene #	<1	<1	<1	ug/l	TM16/PM30
Hexachlorocyclopentadiene	<1	<1	<1	ug/l	TM16/PM30
Hexachloroethane #	<1	<1	<1	ug/l	TM16/PM30
Isophorone #	<0.5	<0.5	<0.5	ug/l	TM16/PM30
N-nitrosodi-n-propylamine #	<0.5	<0.5	<0.5	ug/l	TM16/PM30
Nitrobenzene #	<1	<1	<1	ug/l	TM16/PM30
Surrogate Recovery 2-Fluorobiphenyl	109	99	<0	%	TM16/PM30
Surrogate Recovery p-Terphenyl-d14	115	120	<0	%	TM16/PM30

Client Name: Ground Investigations Ireland
Reference: 14656 - 04 - 25
Location: Knockharley Landfill
Contact: James Cashen
EMT Job No: 25/10319

VOC Report : **Liquid**

EMT Sample No.	1-7	8-14											
Sample ID	BH101S	BH102S											
Depth													
COC No / misc													
Containers	V H HNUF P G	V H HNUF P G											
Sample Date	23/06/2025	23/06/2025											
Sample Type	Ground Water	Ground Water											
Batch Number	1	1											
Date of Receipt	24/06/2025	24/06/2025											
VOC MS													
Dichlorodifluoromethane	<2	<2											
Methyl Tertiary Butyl Ether #	<0.1	<0.1											
Chloromethane #	<3	<3											
Vinyl Chloride #	<0.1	<0.1											
Bromomethane	<1	<1											
Chloroethane #	<3	<3											
Trichlorofluoromethane #	<3	<3											
1,1-Dichloroethene (1,1 DCE) #	<3	<3											
Dichloromethane (DCM) #	<3	<3											
trans-1-2-Dichloroethene #	<3	<3											
1,1-Dichloroethane #	<3	<3											
cis-1-2-Dichloroethene #	<3	<3											
2,2-Dichloropropane	<1	<1											
Bromochloromethane #	<2	<2											
Chloroform #	<2	<2											
1,1,1-Trichloroethane #	<2	<2											
1,1-Dichloropropene #	<3	<3											
Carbon tetrachloride #	<2	<2											
1,2-Dichloroethane #	<2	<2											
Benzene #	<0.5	<0.5											
Trichloroethene (TCE) #	<3	<3											
1,2-Dichloropropane #	<2	<2											
Dibromomethane #	<3	<3											
Bromodichloromethane #	<2	<2											
cis-1-3-Dichloropropene	<2	<2											
Toluene #	<5	<5											
trans-1-3-Dichloropropene	<2	<2											
1,1,2-Trichloroethane #	<2	<2											
Tetrachloroethene (PCE) #	<3	<3											
1,3-Dichloropropane #	<2	<2											
Dibromochloromethane	<2	<2											
1,2-Dibromoethane #	<2	<2											
Chlorobenzene #	<2	<2											
1,1,1,2-Tetrachloroethane #	<2	<2											
Ethylbenzene #	<1	<1											
m/p-Xylene #	<2	<2											
o-Xylene #	<1	<1											
Styrene	<2	<2											
Bromoform	<2	<2											
Isopropylbenzene #	<3	<3											
1,1,2,2-Tetrachloroethane	<4	<4											
Bromobenzene #	<2	<2											
1,2,3-Trichloropropane #	<3	<3											
Propylbenzene #	<3	<3											
2-Chlorotoluene #	<3	<3											
1,3,5-Trimethylbenzene #	<3	<3											
4-Chlorotoluene #	<3	<3											
tert-Butylbenzene #	<3	<3											
1,2,4-Trimethylbenzene #	<3	<3											
sec-Butylbenzene #	<3	<3											
4-Isopropyltoluene #	<3	<3											
1,3-Dichlorobenzene #	<3	<3											
1,4-Dichlorobenzene #	<3	<3											
n-Butylbenzene #	<3	<3											
1,2-Dichlorobenzene #	<3	<3											
1,2-Dibromo-3-chloropropane	<2	<2											
1,2,4-Trichlorobenzene	<3	<3											
Hexachlorobutadiene	<3	<3											
Naphthalene	<2	<2											
1,2,3-Trichlorobenzene	<3	<3											
Surrogate Recovery Toluene D8	95	97											
Surrogate Recovery 4-Bromofluorobenzene	104	102											

Please see attached notes for all abbreviations and acronyms

LOD/LOR	Units	Method No.
<2	ug/l	TM15/PM10
<0.1	ug/l	TM15/PM10
<3	ug/l	TM15/PM10
<0.1	ug/l	TM15/PM10
<1	ug/l	TM15/PM10
<3	ug/l	TM15/PM10
<3	ug/l	TM15/PM10
<3	ug/l	TM15/PM10
<3	ug/l	TM15/PM10
<3	ug/l	TM15/PM10
<3	ug/l	TM15/PM10
<3	ug/l	TM15/PM10
<3	ug/l	TM15/PM10
<3	ug/l	TM15/PM10
<1	ug/l	TM15/PM10
<2	ug/l	TM15/PM10
<2	ug/l	TM15/PM10
<2	ug/l	TM15/PM10
<3	ug/l	TM15/PM10
<2	ug/l	TM15/PM10
<2	ug/l	TM15/PM10
<0.5	ug/l	TM15/PM10
<3	ug/l	TM15/PM10
<2	ug/l	TM15/PM10
<3	ug/l	TM15/PM10
<2	ug/l	TM15/PM10
<2	ug/l	TM15/PM10
<5	ug/l	TM15/PM10
<2	ug/l	TM15/PM10
<2	ug/l	TM15/PM10
<3	ug/l	TM15/PM10
<2	ug/l	TM15/PM10
<2	ug/l	TM15/PM10
<2	ug/l	TM15/PM10
<2	ug/l	TM15/PM10
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<2	ug/l	TM15/PM10
<3	ug/l	TM15/PM10
<4	ug/l	TM15/PM10
<2	ug/l	TM15/PM10
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<3	ug/l	TM15/PM10
<3	ug/l	TM15/PM10
<3	ug/l	TM15/PM10
<3	ug/l	TM15/PM10
<3	ug/l	TM15/PM10
<3	ug/l	TM15/PM10
<3	ug/l	TM15/PM10
<3	ug/l	TM15/PM10
<3	ug/l	TM15/PM10
<2	ug/l	TM15/PM10
<3	ug/l	TM15/PM10
<3	ug/l	TM15/PM10
<2	ug/l	TM15/PM10
<3	ug/l	TM15/PM10
<0	%	TM15/PM10
<0	%	TM15/PM10

Element Materials Technology

Notification of Deviating Samples

Client Name: Ground Investigations Ireland
Reference: 14656 - 04 - 25
Location: Knockharley Landfill
Contact: James Cashen

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason
No deviating sample report results for job 25/10319						

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.
It is a requirement under ISO 17025 that we inform clients if samples are deviating i.e. outside what is expected. A deviating sample indicates that the sample 'may' be compromised but not necessarily will be compromised. The result is still accredited and our analytical reports will still show accreditation on the relevant analytes.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 25/10319

SOILS and ASH

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary. Asbestos samples are retained for 6 months.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C. Ash samples are dried at 35°C ±5°C.

Where Mineral Oil is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil is quoted, this refers to Total Aliphatics C10-C40.

STACK EMISSIONS

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation for Dioxins and Furans and Dioxin like PCBs has been performed on XAD-2 Resin, only samples which use this resin will be within our MCERTS scope.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a requirement of our Accreditation Body for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.
Laboratory records are kept for a period of no less than 6 years.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

Customer Provided Information

Sample ID and depth is information provided by the customer.

Age of Diesel

The age of release estimation is based on the nC17/pristane ratio only as prescribed by Christensen and Larsen (1993) and Kaplan, Galperin, Alimi et al., (1996).
Age estimation should be treated with caution as it can be influenced by site specific factors of which the laboratory are not aware.

Tentatively Identified Compounds (TICs)

Where Tentatively Identified Compounds (TICs) are reported, up to 10 Tentatively Identified Compounds will be listed where there is found to be a greater than 80% match with the NIST library. The reported concentration is determined semi-quantitively, with a matrix specific limit of detection. Note, other compounds may be present but are not reported.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above quantitative calibration range. The result should be considered the minimum value and is indicative only. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range
AA	x50 Dilution

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 25/10319

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM15	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.				
TM15	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes			
TM16	Modified USEPA 8270D v5:2014. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM16	Modified USEPA 8270D v5:2014. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM20	Modified BS 1377-3:1990/USEPA 160.1/3 (TDS/TS: 1971) Gravimetric determination of Total Dissolved Solids/Total Solids	PM0	No preparation is required.	Yes			
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM0	No preparation is required.				
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma-Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified				
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma-Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified	Yes			
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) - All anions comparable to BS ISO 15923-1: 2013I	PM0	No preparation is required.	Yes			
TM38/TM125	Total Nitogen/Organic Nitrogen by calculation	PM0	No preparation is required.				

EMT Job No: 25/10319

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM57	Modified US EPA Method 410.4. (Rev. 2.0 1993) Comparable with ISO 15705:2002. Chemical Oxygen Demand is determined by hot digestion with Potassium Dichromate and measured spectrophotometerically.	PM0	No preparation is required.	Yes			
TM60	TC/TOC analysis of Waters by High Temperature Combustion followed by NDIR detection. Based on the following modified standard methods: USEPA 9060A (2002), APHA SMEWW 5310B:1999 22nd Edition, ASTM D 7573, and USEPA 415.1.	PM0	No preparation is required.	Yes			
TM75	Modified US EPA method 310.1 (1978). Determination of Alkalinity by Metrohm automated titration analyser.	PM0	No preparation is required.	Yes			
TM89	Modified USEPA method OIA-1667 (1999). Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM0	No preparation is required.	Yes			
TM170	Determination of Trace Metals by ICP-MS (Inductively Coupled Plasma-Mass Spectrometry): Modified USEPA Method 200.8, Rev. 5.4, 1994; Modified EPA Method 6020A, Rev.1, Feb 2007; Modified BS EN ISO 17294-2:2016	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified				
TM170	Determination of Trace Metals by ICP-MS (Inductively Coupled Plasma-Mass Spectrometry): Modified USEPA Method 200.8, Rev. 5.4, 1994; Modified EPA Method 6020A, Rev.1, Feb 2007; Modified BS EN ISO 17294-2:2016	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified	Yes			
TM173	Analysis of fluoride by ISE (Ion Selective Electrode) using modified ISE method 9214 - 340.2 (EPA 1998)	PM0	No preparation is required.				
TM176	Free ammonia based on the pH and temperature dependent equilibrium calculated in accordance with NRA Water Quality Objectives 1994 using the ammoniacal nitrogen result.	PM0	No preparation is required.				

Please include all sections of this report if it is reproduced

LABORATORY REPORT

Contract Number: PSL25/5811

Report Date: 05 September 2025

Client's Reference: 14656-04-25

Client Name: Ground Investigations Ireland Ltd
Catherinestown House
Hazelhatch Road
Newcastle
Co Dublin
D22 YD52

For the attention of: James Cashen

Contract Title: Project West Knockharley Landfill

Date Received: 5/8/2025
Date Commenced: 5/8/2025
Date Completed: 5/9/2025

Notes: Opinions and Interpretations are outside the UKAS Accreditation

A copy of the Laboratory Schedule of accredited tests as issued by UKAS is attached to this report. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced other than in full, without the prior written approval of the laboratory.

Checked and Approved Signatories:

A Watkins (Managing Director)	R Berriman (Associate Director)	S Royle (Laboratory Manager)
L Knight (Assistant Laboratory Manager)	S Eyre (Senior Technician)	T Watkins (Senior Technician)

5 – 7 Hexthorpe Road,
Hexthorpe,
Doncaster,
DN4 0AR
Tel: 01302 768098
Email: rberriman@prosoils.co.uk
awatkins@prosoils.co.uk

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
BH101S		B	7.00	8.50	Brown slightly sandy gravelly CLAY.
BH101S		U	7.80	8.20	Brown slightly sandy gravelly CLAY.
BH101S		U	9.10	9.50	Brown slightly sandy gravelly CLAY.
BH102S		B	10.70	11.80	Brown slightly sandy gravelly CLAY.
BH102S		U	11.80	12.20	Brown slightly sandy gravelly CLAY.
BH102S		B	9.20	10.20	Brown slightly sandy gravelly CLAY.
BH103T		B	7.00	8.50	Brown slightly sandy gravelly CLAY.
BH103T		B	8.50	10.00	Brown slightly sandy gravelly CLAY.
BH103T		U	9.60	10.00	Brown slightly sandy gravelly CLAY.
BH104S		B	6.00	7.50	Brown slightly sandy gravelly CLAY.
BH104S		U	7.00	7.40	Brown slightly sandy gravelly CLAY.
BH104S		B	7.50	9.00	Brown slightly sandy gravelly CLAY.
BH105S		B	12.00	13.50	Brown slightly sandy gravelly CLAY.
BH105S		U	13.50	14.00	Brown slightly sandy gravelly CLAY.
BH106S		B	6.00	7.50	Brown slightly sandy gravelly CLAY.
BH106S		U	7.50	7.90	Brown slightly sandy gravelly CLAY.
BH107S		B	6.50	9.50	Brown slightly sandy gravelly CLAY.
BH107S		U	8.10	8.50	Brown slightly sandy gravelly CLAY.
BH108S		B	6.50	9.50	Brown slightly sandy gravelly CLAY.

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
BH108S		U	8.10	8.50	Brown slightly sandy gravelly CLAY.
BH101S		U	5.50	6.00	Very stiff brown slightly sandy gravelly CLAY.
BH102S		U	7.30	7.70	Brown slightly sandy gravelly CLAY.
BH102S		U	8.50	9.00	Hard brown slightly sandy gravelly CLAY.
BH103T		U	4.50	5.00	Brown slightly sandy gravelly CLAY.
BH104S		U	5.50	6.00	Hard brown slightly sandy gravelly CLAY.
BH105S		U	7.50	8.00	Brown slightly sandy gravelly CLAY.
BH106S		U	9.00	9.50	Very stiff brown slightly sandy gravelly CLAY.

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Project West Knockharley Landfill

Contract No:
PSL25/5811
Client Ref:
14656-04-25

SUMMARY OF SOIL CLASSIFICATION TESTS

BS 1377 - Part 2 : 2022 in accordance with BS EN ISO 17892 (as below)

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Water Content %	Linear Shrinkage	Particle Density Mg/m^3	Liquid Limit %	Plastic Limit %	Plasticity Index %	Passing 0.425mm %	Remarks
BH101S		B	7.00	8.50	10.2			34	17	17	34	Low Plasticity CIL
BH102S		B	10.70	11.80	7.2			31	16	15	40	Low Plasticity CIL
BH102S		B	9.20	10.20	8.9			35	18	17	37	Medium Plasticity CIM
BH103T		B	7.00	8.50	9.3			35	17	18	46	Medium Plasticity CIM
BH103T		B	8.50	10.00	7.5			34	18	16	37	Low Plasticity CIL
BH104S		B	6.00	7.50	8.4			33	17	16	41	Low Plasticity CIL
BH104S		B	7.50	9.00	9.4			34	16	18	47	Low Plasticity CIL
BH105S		B	12.00	13.50	8.5			32	16	16	42	Low Plasticity CIL
BH106S		B	6.00	7.50	7.8			31	15	16	38	Low Plasticity CIL
BH107S		B	6.50	9.50	7.2			32	16	16	43	Low Plasticity CIL
BH108S		B	6.50	9.50	9.3			32	17	15	45	Low Plasticity CIL

Water Content - BS 1377 - Part 2 : 2022 : Clause 4 in accordance with BS EN ISO 17892 - 1 : 2014 + A1 : 2022
Linear Shrinkage - BS 1377 - Part 2 : 2022 : Clause 7
Particle Density (Gas Jar method) - BS 1377 - Part 2 : 2022 : Clause 9
Liquid, Plastic Limit & Plasticity Index - BS 1377 - Part 2 : 2022 : Clause 5 & 6 in accordance with BS EN ISO 17892 - 12 : 2018 + A2 : 2022

SYMBOLS : NP = Non Plastic

UKAS TESTING 4043

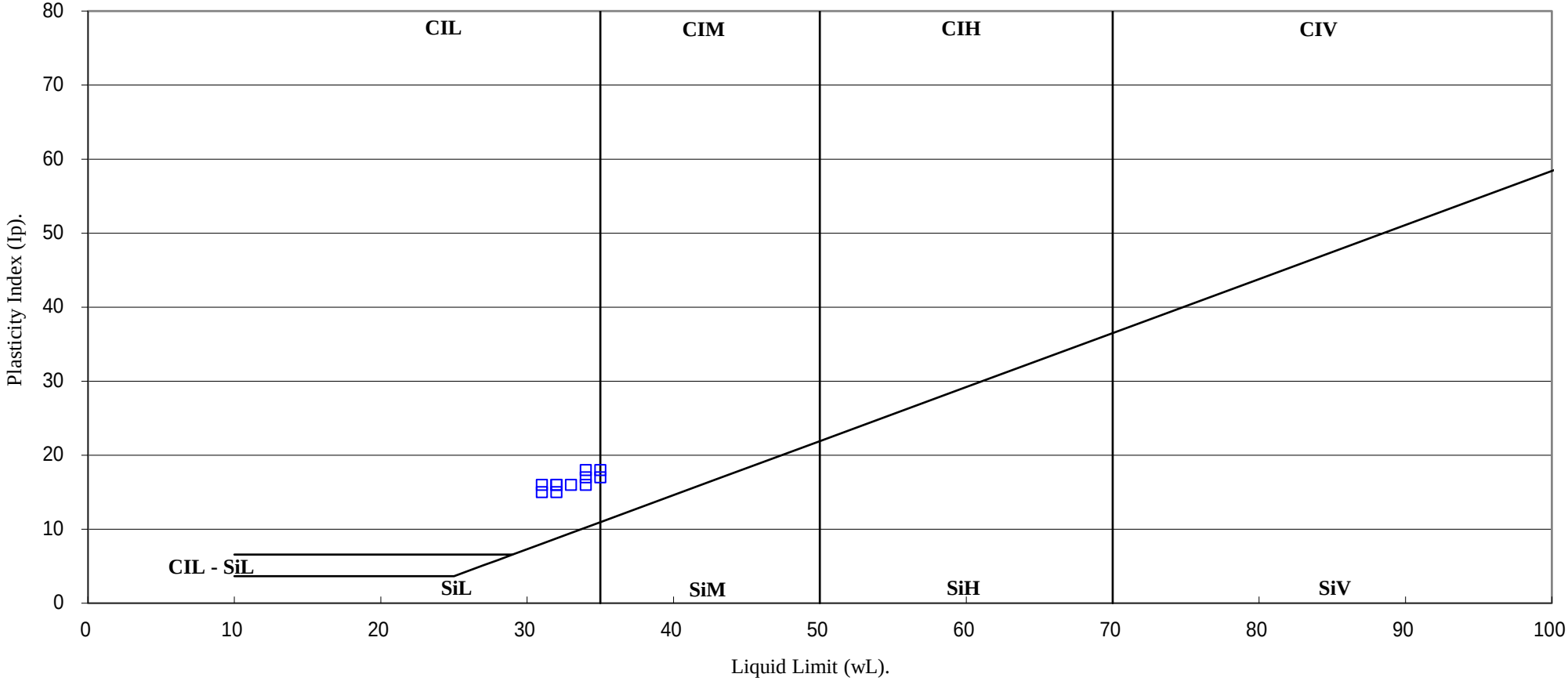
PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Project West Knockharley Landfill

Contract No:
PSL25/5811
Client Ref:
14656-04-25

PLASTICITY CHART

BS EN ISO 14688-2:2017 Clause 4.4



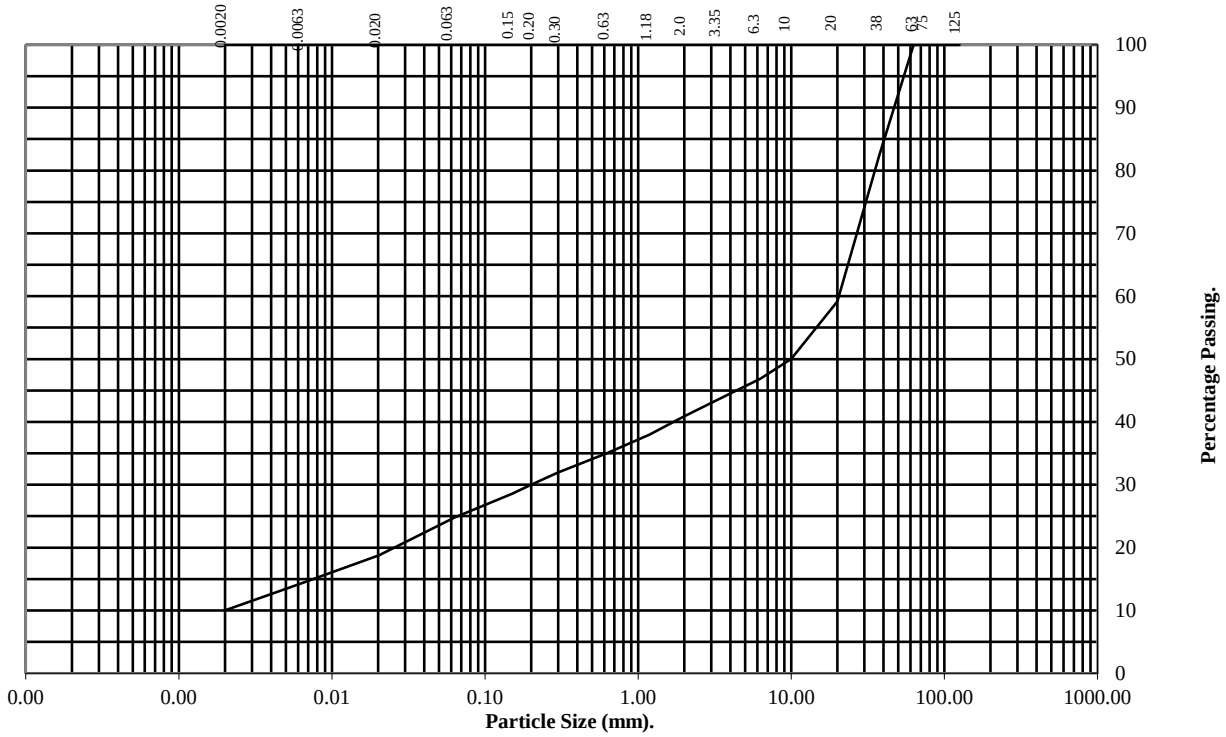
UKAS TESTING 4043 / PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY	**Project West Knockharley Landfill**	**Contract No:**
		PSL25/5811
		Client Ref:
		14656-04-25

PARTICLE SIZE DISTRIBUTION TEST

BS 1377 - Part 2 : 2022 : Clause 10 in accordance with BS EN ISO 17892 - 4 : 2016

Sieve Method, Clause 5.2 & Pipette Method, Clause 5.4

Hole Number:	**BH101S**	**Top Depth (m):**	**7.00**
Sample Number:		**Base Depth (m):**	**8.50**
Sample Type:	**B**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	82
20	59
10	50
6.3	47
3.35	44
2	41
1.18	38
0.63	35
0.3	32
0.2	30
0.15	29
0.063	25

Particle Diameter	Percentage Passing
0.020	19
0.0063	14
0.0020	10
Particle Density - 2.65 Mg/m3 assumed	

Soil Fraction	Total Percentage
Cobbles	0
Gravel	59
Sand	16
Silt	15
Clay	10

Remarks:

See Summary of Soil Descriptions

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Project West Knockharley Landfill

Contract No:
PSL25/5811
Client Ref:
14656-04-25

PARTICLE SIZE DISTRIBUTION TEST

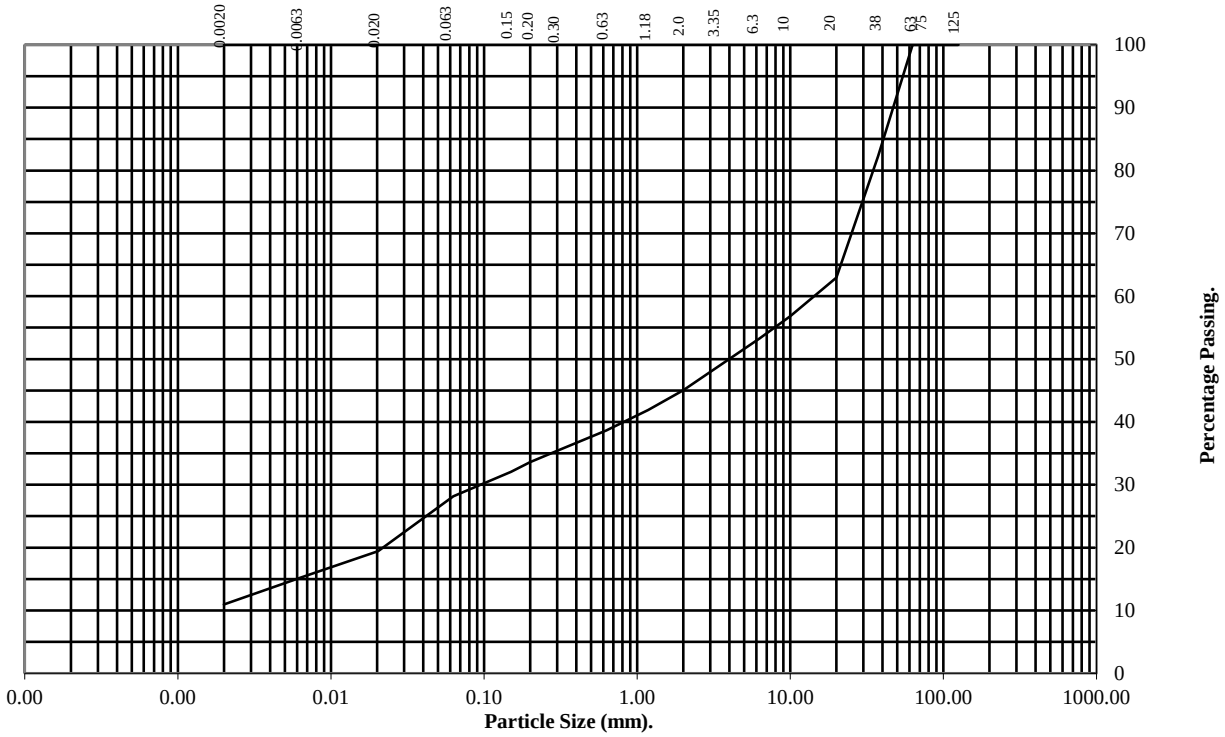
BS 1377 - Part 2 : 2022 : Clause 10 in accordance with BS EN ISO 17892 - 4 : 2016

Sieve Method, Clause 5.2 & Pipette Method, Clause 5.4

Hole Number: **BH102S** **Top Depth (m):** **9.20**

Sample Number: **Base Depth (m):** **10.20**

Sample Type: **B**



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	82
20	63
10	57
6.3	53
3.35	49
2	45
1.18	42
0.63	39
0.3	35
0.2	34
0.15	32
0.063	28

Particle Diameter	Percentage Passing
0.020	19
0.0063	15
0.0020	11
Particle Density - 2.65 Mg/m3 assumed	

Soil Fraction	Total Percentage
Cobbles	0
Gravel	55
Sand	17
Silt	17
Clay	11

Remarks:

See Summary of Soil Descriptions

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Project West Knockharley Landfill

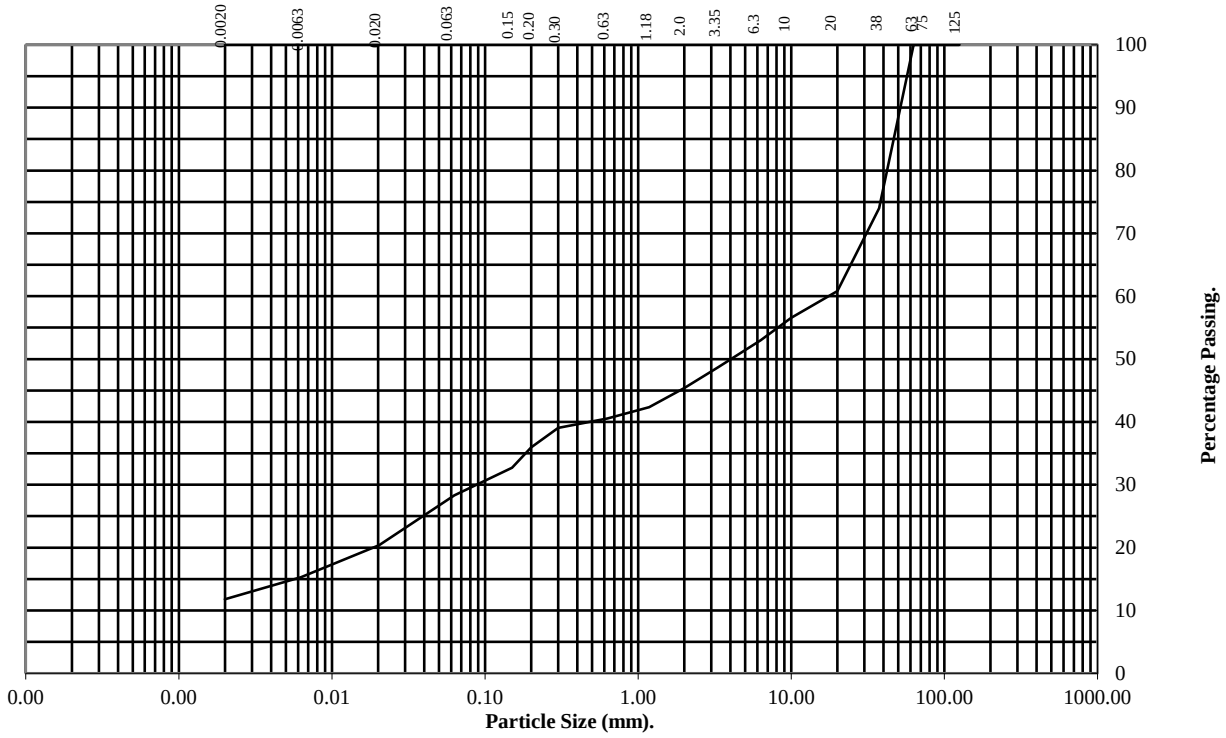
Contract No:
PSL25/5811
Client Ref:
14656-04-25

PARTICLE SIZE DISTRIBUTION TEST

BS 1377 - Part 2 : 2022 : Clause 10 in accordance with BS EN ISO 17892 - 4 : 2016

Sieve Method, Clause 5.2 & Pipette Method, Clause 5.4

Hole Number:	**BH102S**	**Top Depth (m):**	**10.70**
Sample Number:		**Base Depth (m):**	**11.80**
Sample Type:	**B**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	74
20	61
10	57
6.3	53
3.35	49
2	45
1.18	42
0.63	41
0.3	39
0.2	36
0.15	33
0.063	28

Particle Diameter	Percentage Passing
0.020	20
0.0063	15
0.0020	12
Particle Density - 2.65 Mg/m3 assumed	

Soil Fraction	Total Percentage
Cobbles	0
Gravel	55
Sand	17
Silt	16
Clay	12

Remarks:

See Summary of Soil Descriptions

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Project West Knockharley Landfill

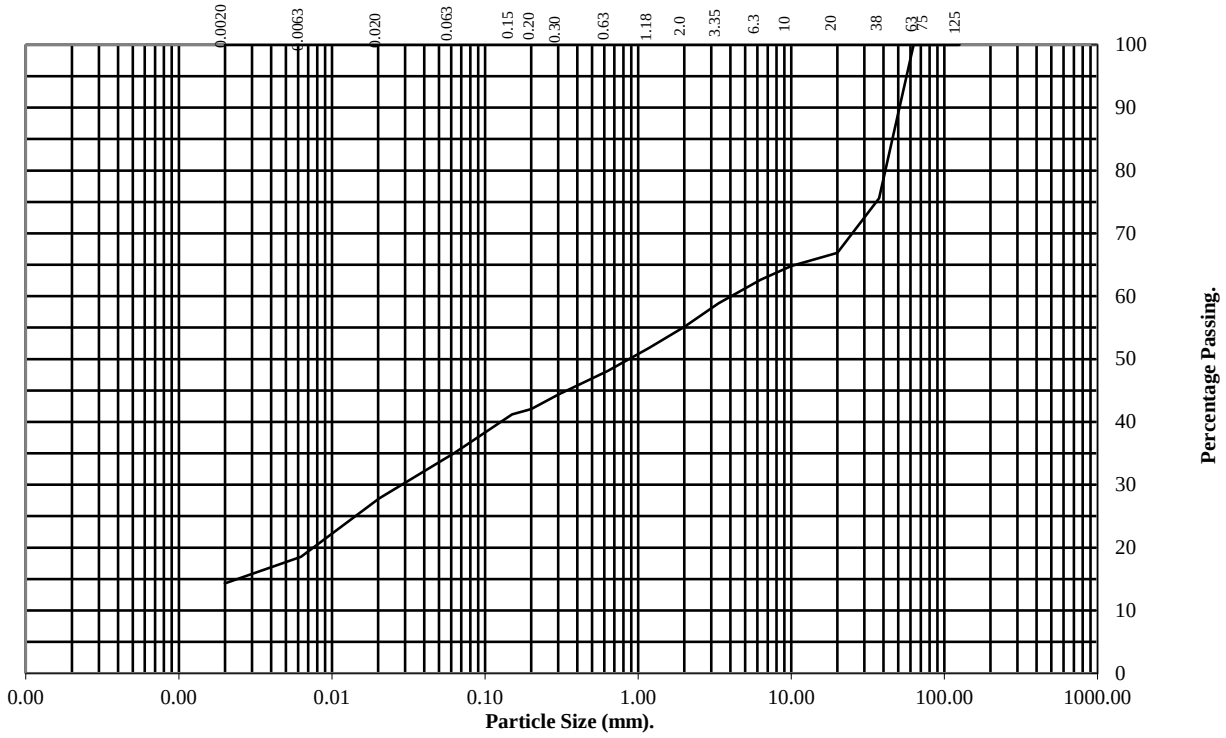
Contract No:
PSL25/5811
Client Ref:
14656-04-25

PARTICLE SIZE DISTRIBUTION TEST

BS 1377 - Part 2 : 2022 : Clause 10 in accordance with BS EN ISO 17892 - 4 : 2016

Sieve Method, Clause 5.2 & Pipette Method, Clause 5.4

Hole Number:	**BH103T**	**Top Depth (m):**	**7.00**
Sample Number:		**Base Depth (m):**	**8.50**
Sample Type:	**B**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	76
20	67
10	65
6.3	63
3.35	59
2	55
1.18	52
0.63	48
0.3	44
0.2	42
0.15	41
0.063	35

Particle Diameter	Percentage Passing
0.020	28
0.0063	19
0.0020	14
Particle Density - 2.65 Mg/m3 assumed	

Soil Fraction	Total Percentage
Cobbles	0
Gravel	45
Sand	20
Silt	21
Clay	14

Remarks:

See Summary of Soil Descriptions

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Project West Knockharley Landfill

Contract No:
PSL25/5811
Client Ref:
14656-04-25

PARTICLE SIZE DISTRIBUTION TEST

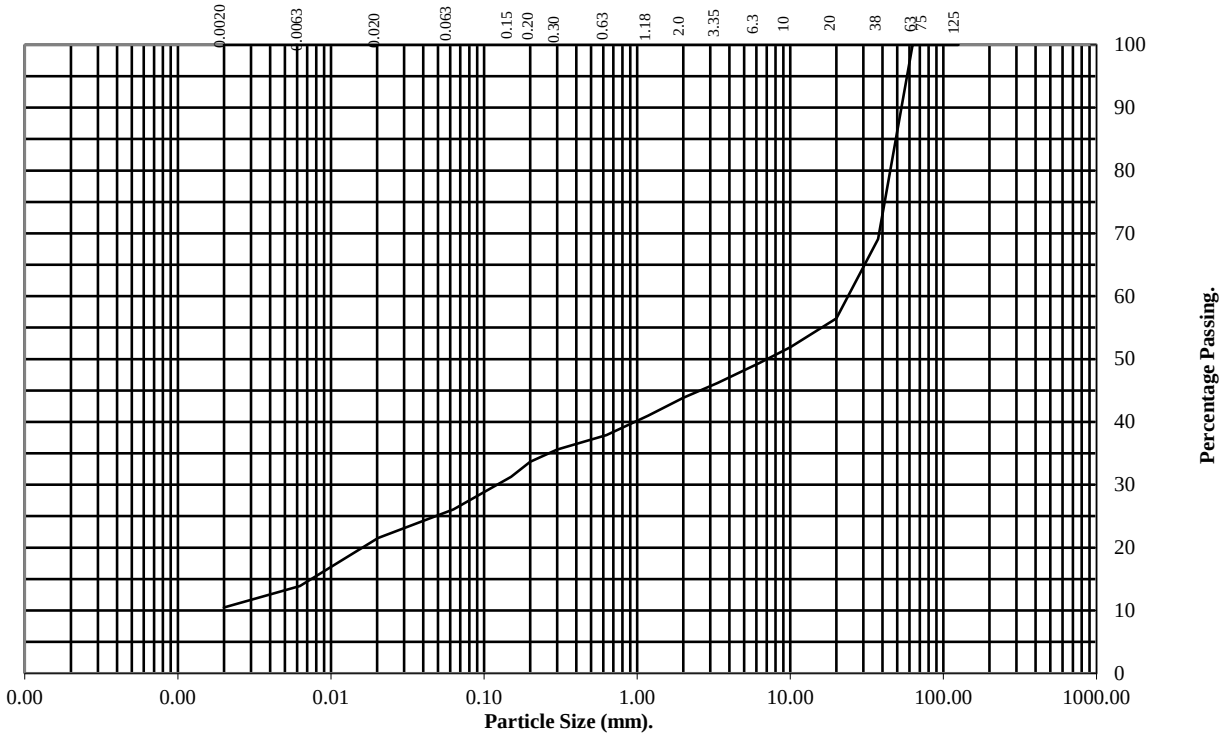
BS 1377 - Part 2 : 2022 : Clause 10 in accordance with BS EN ISO 17892 - 4 : 2016

Sieve Method, Clause 5.2 & Pipette Method, Clause 5.4

Hole Number: **BH103T** **Top Depth (m):** **8.50**

Sample Number: **Base Depth (m):** **10.00**

Sample Type: **B**



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	69
20	56
10	52
6.3	49
3.35	46
2	44
1.18	41
0.63	38
0.3	36
0.2	34
0.15	31
0.063	26

Particle Diameter	Percentage Passing
0.020	22
0.0063	14
0.0020	10
Particle Density - 2.65 Mg/m3 assumed	

Soil Fraction	Total Percentage
Cobbles	0
Gravel	56
Sand	18
Silt	16
Clay	10

Remarks:

See Summary of Soil Descriptions

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Project West Knockharley Landfill

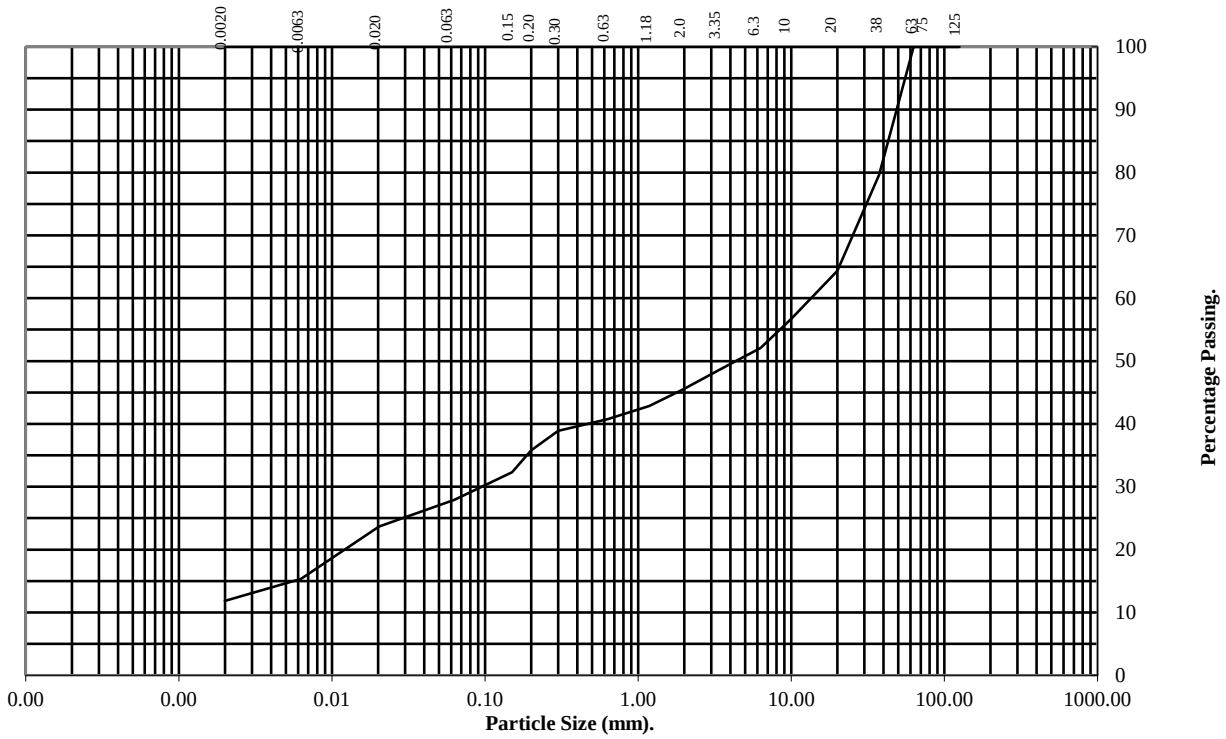
Contract No:
PSL25/5811
Client Ref:
14656-04-25

PARTICLE SIZE DISTRIBUTION TEST

BS 1377 - Part 2 : 2022 : Clause 10 in accordance with BS EN ISO 17892 - 4 : 2016

Sieve Method, Clause 5.2 & Pipette Method, Clause 5.4

Hole Number:	**BH104S**	**Top Depth (m):**	**6.00**
Sample Number:		**Base Depth (m):**	**7.50**
Sample Type:	**B**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	80
20	64
10	57
6.3	52
3.35	49
2	46
1.18	43
0.63	41
0.3	39
0.2	36
0.15	32
0.063	28

Particle Diameter	Percentage Passing
0.020	24
0.0063	15
0.0020	12
Particle Density - 2.65 Mg/m3 assumed	

Soil Fraction	Total Percentage
Cobbles	0
Gravel	54
Sand	18
Silt	16
Clay	12

Remarks:

See Summary of Soil Descriptions

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Project West Knockharley Landfill

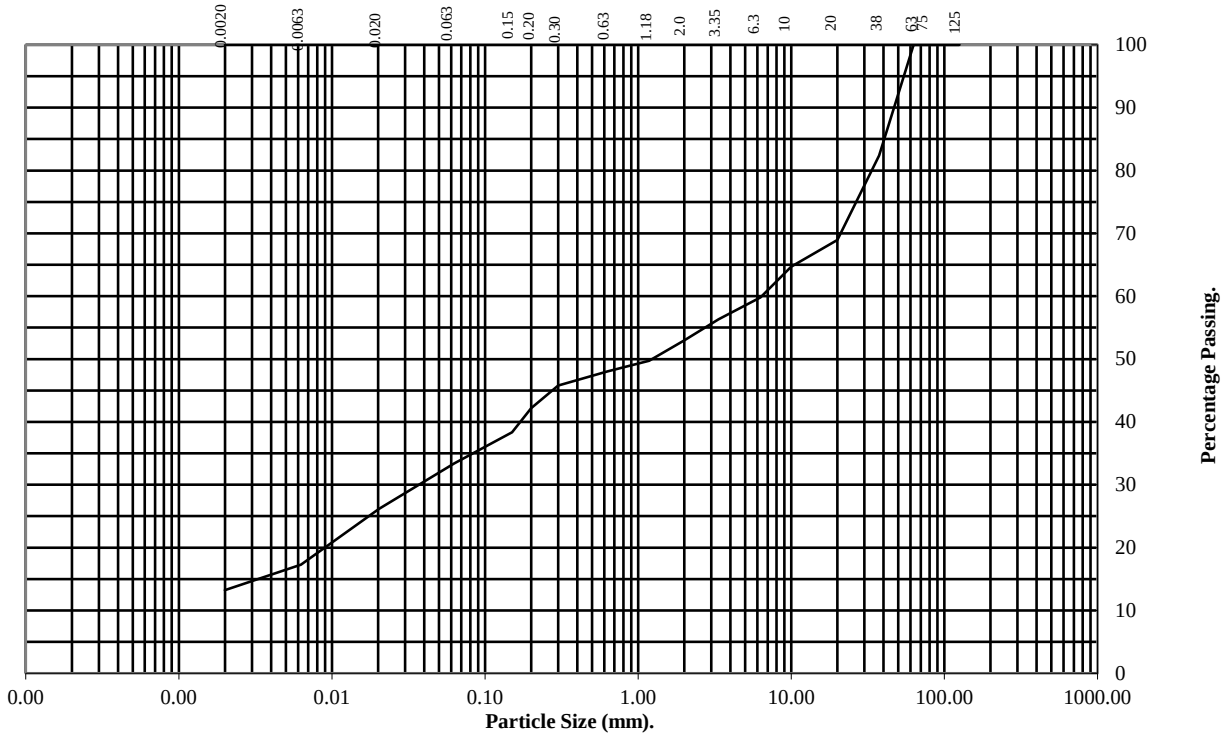
Contract No:
PSL25/5811
Client Ref:
14656-04-25

PARTICLE SIZE DISTRIBUTION TEST

BS 1377 - Part 2 : 2022 : Clause 10 in accordance with BS EN ISO 17892 - 4 : 2016

Sieve Method, Clause 5.2 & Pipette Method, Clause 5.4

Hole Number:	**BH104S**	**Top Depth (m):**	**7.50**
Sample Number:		**Base Depth (m):**	**9.00**
Sample Type:	**B**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	82
20	69
10	65
6.3	60
3.35	56
2	53
1.18	50
0.63	48
0.3	46
0.2	42
0.15	38
0.063	33

Particle Diameter	Percentage Passing
0.020	26
0.0063	17
0.0020	13
Particle Density - 2.65 Mg/m3 assumed	

Soil Fraction	Total Percentage
Cobbles	0
Gravel	47
Sand	20
Silt	20
Clay	13

Remarks:

See Summary of Soil Descriptions

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Project West Knockharley Landfill

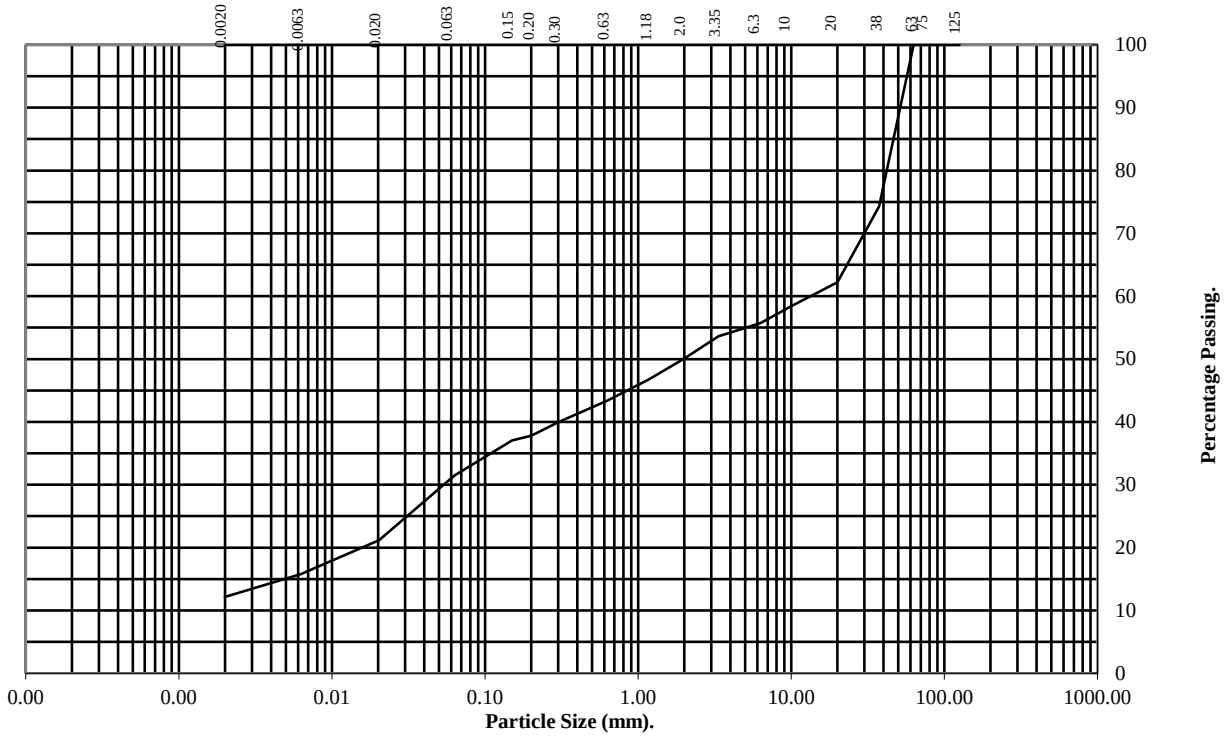
Contract No:
PSL25/5811
Client Ref:
14656-04-25

PARTICLE SIZE DISTRIBUTION TEST

BS 1377 - Part 2 : 2022 : Clause 10 in accordance with BS EN ISO 17892 - 4 : 2016

Sieve Method, Clause 5.2 & Pipette Method, Clause 5.4

Hole Number:	**BH105S**	**Top Depth (m):**	**12.00**
Sample Number:		**Base Depth (m):**	**13.50**
Sample Type:	**B**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	74
20	62
10	58
6.3	56
3.35	54
2	50
1.18	47
0.63	43
0.3	40
0.2	38
0.15	37
0.063	31

Particle Diameter	Percentage Passing
0.020	21
0.0063	16
0.0020	12
Particle Density - 2.65 Mg/m3 assumed	

Soil Fraction	Total Percentage
Cobbles	0
Gravel	50
Sand	19
Silt	19
Clay	12

Remarks:

See Summary of Soil Descriptions

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Project West Knockharley Landfill

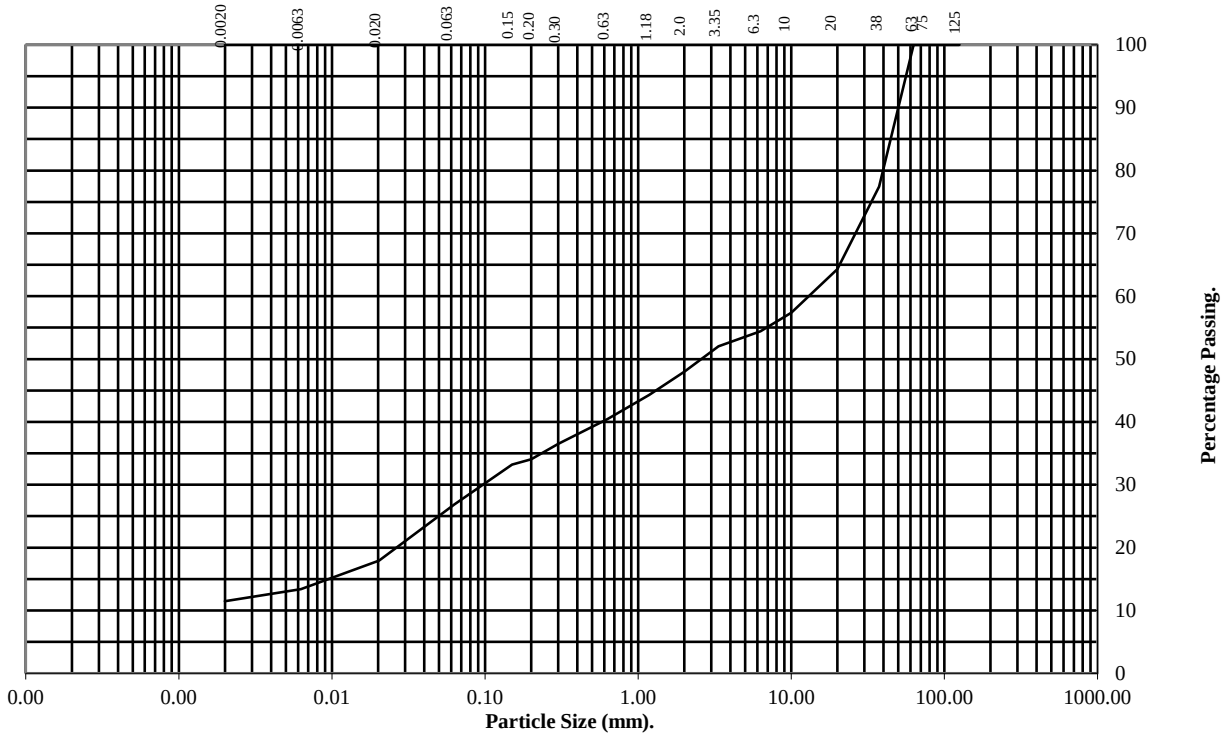
Contract No:
PSL25/5811
Client Ref:
14656-04-25

PARTICLE SIZE DISTRIBUTION TEST

BS 1377 - Part 2 : 2022 : Clause 10 in accordance with BS EN ISO 17892 - 4 : 2016

Sieve Method, Clause 5.2 & Pipette Method, Clause 5.4

Hole Number:	**BH106S**	**Top Depth (m):**	**6.00**
Sample Number:		**Base Depth (m):**	**7.50**
Sample Type:	**B**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	77
20	64
10	57
6.3	54
3.35	52
2	48
1.18	44
0.63	40
0.3	37
0.2	34
0.15	33
0.063	27

Particle Diameter	Percentage Passing
0.020	18
0.0063	13
0.0020	11
Particle Density - 2.65 Mg/m3 assumed	

Soil Fraction	Total Percentage
Cobbles	0
Gravel	52
Sand	21
Silt	16
Clay	11

Remarks:

See Summary of Soil Descriptions

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Project West Knockharley Landfill

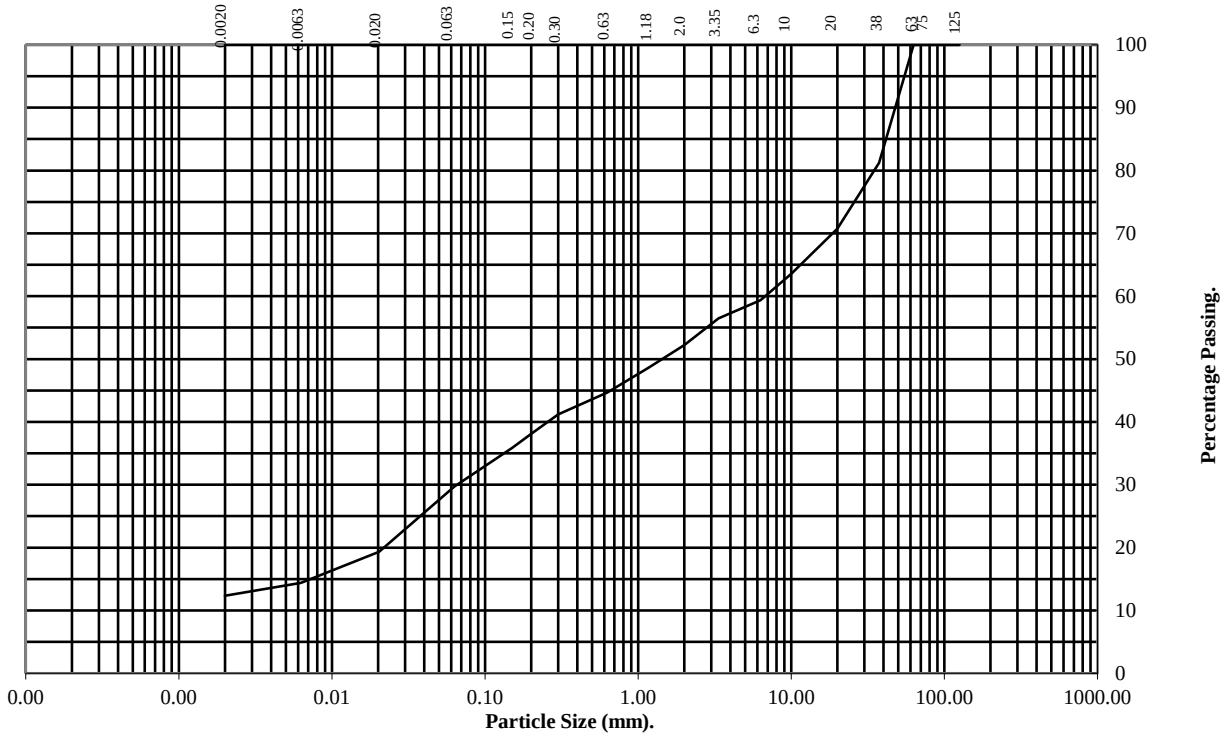
Contract No:
PSL25/5811
Client Ref:
14656-04-25

PARTICLE SIZE DISTRIBUTION TEST

BS 1377 - Part 2 : 2022 : Clause 10 in accordance with BS EN ISO 17892 - 4 : 2016

Sieve Method, Clause 5.2 & Pipette Method, Clause 5.4

Hole Number:	**BH107S**	**Top Depth (m):**	**6.50**
Sample Number:		**Base Depth (m):**	**9.50**
Sample Type:	**B**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	81
20	71
10	64
6.3	59
3.35	56
2	52
1.18	49
0.63	45
0.3	41
0.2	38
0.15	36
0.063	30

Particle Diameter	Percentage Passing
0.020	19
0.0063	14
0.0020	12
Particle Density - 2.65 Mg/m3 assumed	

Soil Fraction	Total Percentage
Cobbles	0
Gravel	48
Sand	22
Silt	18
Clay	12

Remarks:

See Summary of Soil Descriptions

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Project West Knockharley Landfill

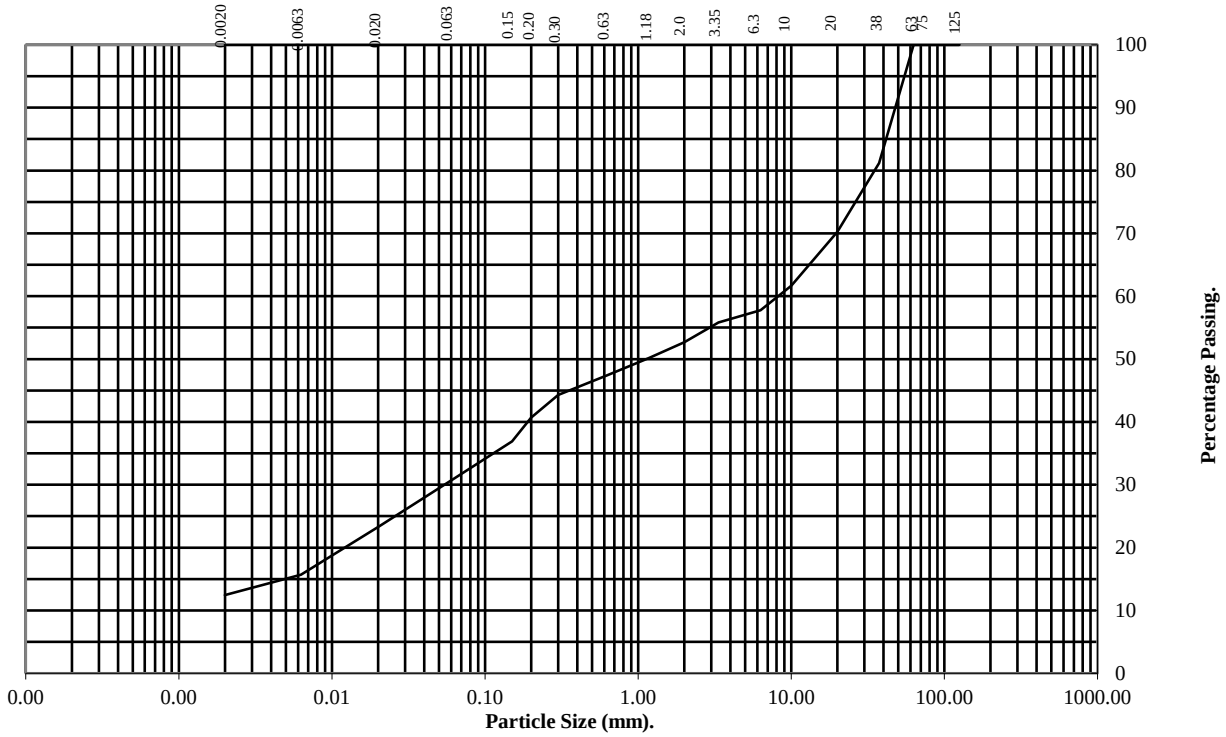
Contract No:
PSL25/5811
Client Ref:
14656-04-25

PARTICLE SIZE DISTRIBUTION TEST

BS 1377 - Part 2 : 2022 : Clause 10 in accordance with BS EN ISO 17892 - 4 : 2016

Sieve Method, Clause 5.2 & Pipette Method, Clause 5.4

Hole Number:	**BH108S**	**Top Depth (m):**	**6.50**
Sample Number:		**Base Depth (m):**	**9.50**
Sample Type:	**B**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	81
20	70
10	62
6.3	58
3.35	56
2	53
1.18	50
0.63	47
0.3	44
0.2	41
0.15	37
0.063	31

Particle Diameter	Percentage Passing
0.020	23
0.0063	16
0.0020	12
Particle Density - 2.65 Mg/m3 assumed	

Soil Fraction	Total Percentage
Cobbles	0
Gravel	47
Sand	22
Silt	19
Clay	12

Remarks:

See Summary of Soil Descriptions

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

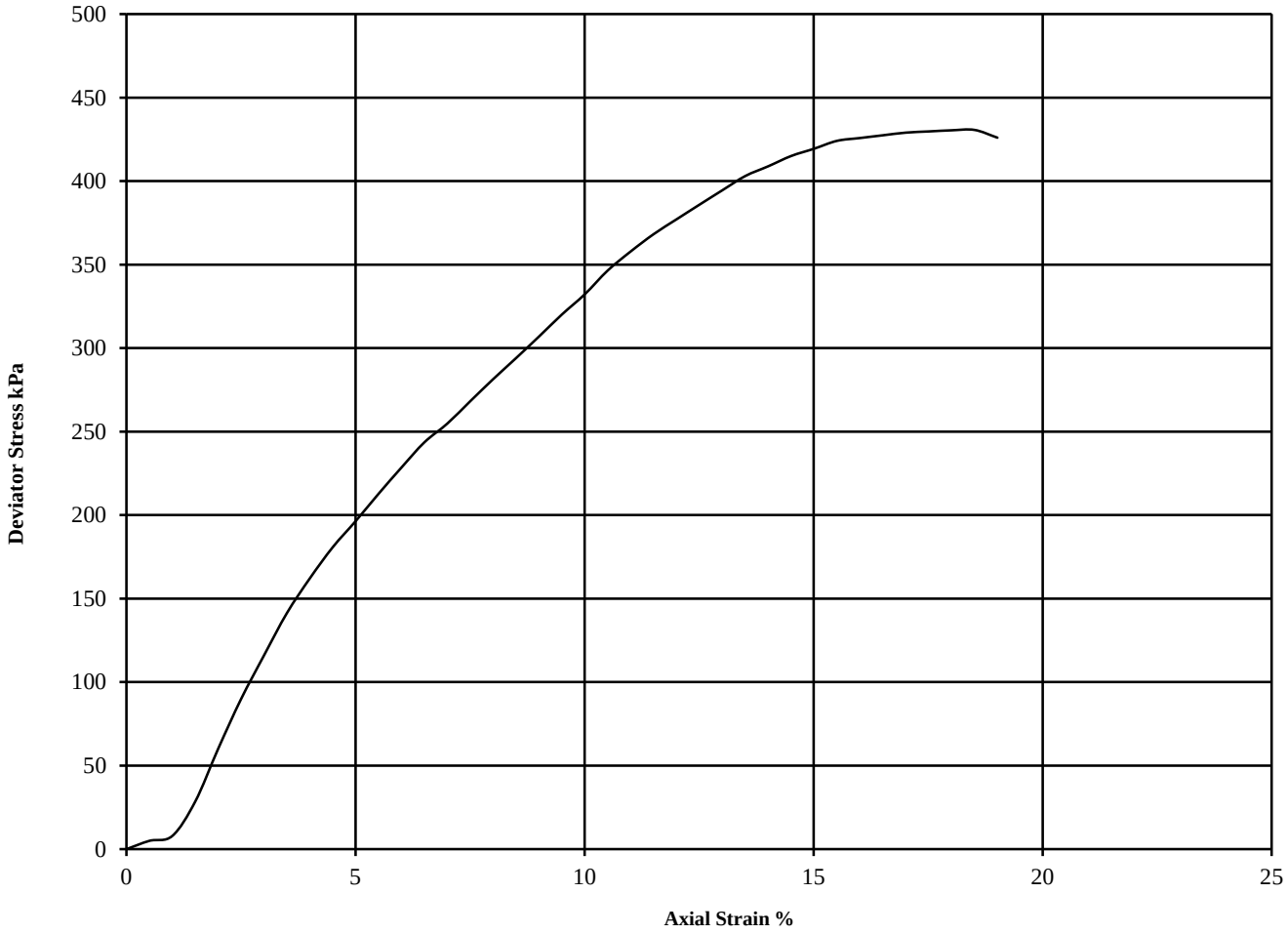
Project West Knockharley Landfill

Contract No:
PSL25/5811
Client Ref:
14656-04-25

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST

BS 1377 - Part 2 : 2022 : Clause 28 in accordance with BS EN ISO 17892 - 8 : 2018

Hole Number:	**BH101S**	**Top Depth (m):**	**5.50**
Sample Number		**Base Depth (m):**	**6.00**
Sample Type	**U**		



Diameter (mm):		102	Height (mm):		204	Test:	UU Single Stage		Remarks:
Specimen	Water Content (%)	Bulk Density (Mg/m3)	Dry Density (Mg/m3)	Cell Pressure (kPa)	Corr. Max. Deviator Stress (kPa)	Shear Strength Cu (kPa)	Failure Strain (%)		Undisturbed Sample Sample taken from top of tube Rate of strain = 0.9 %/min See summary of soil descriptions
1	9.1	2.33	2.14	120	431	215	18.0	Intermediate	

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

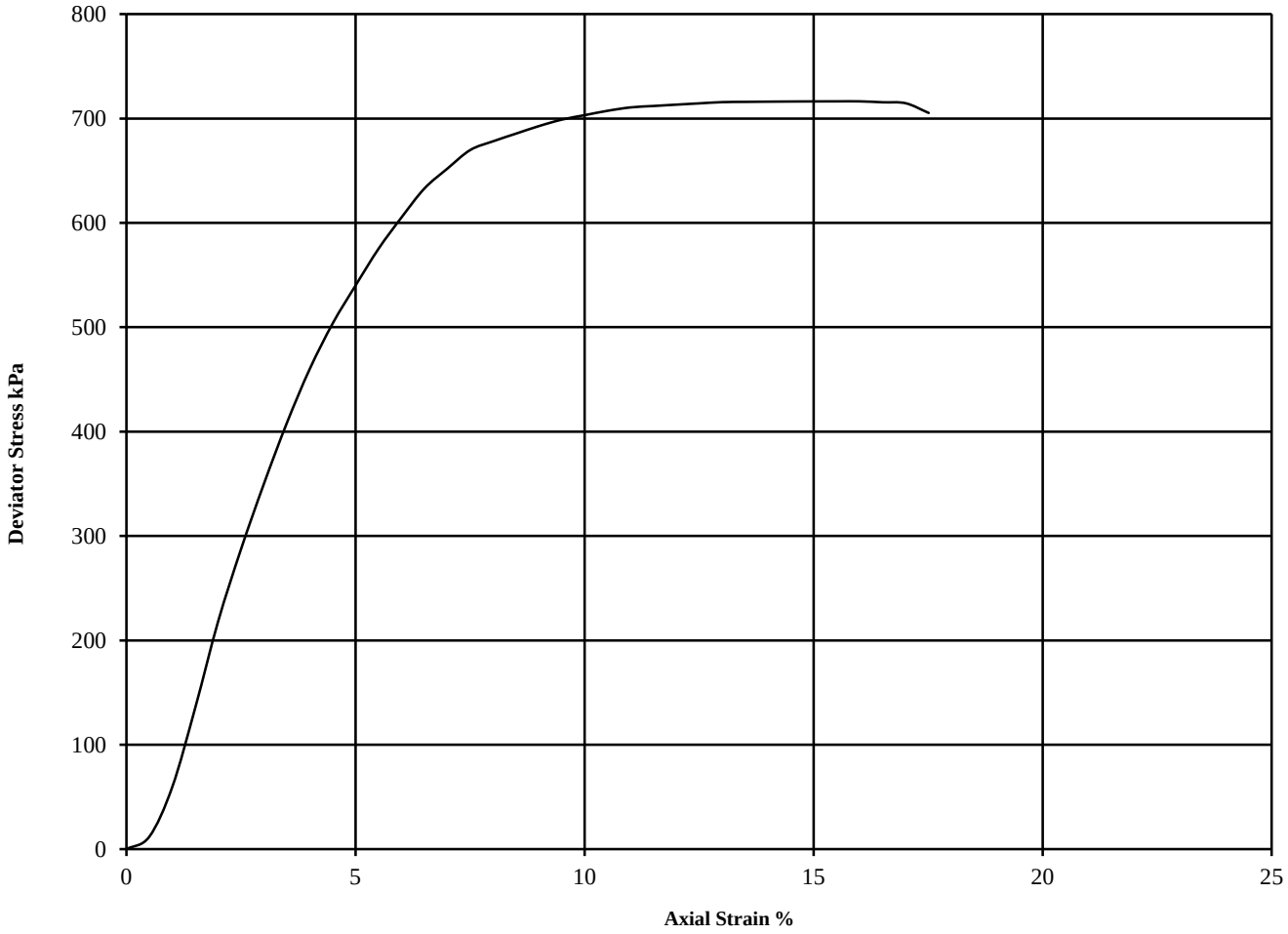
Project West Knockharley Landfill

Contract No:
PSL25/5811
Client Ref:
14656-04-25

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST

BS 1377 - Part 2 : 2022 : Clause 28 in accordance with BS EN ISO 17892 - 8 : 2018

Hole Number:	**BH102S**	**Top Depth (m):**	**8.50**
Sample Number		**Base Depth (m):**	**9.00**
Sample Type	**U**		



Diameter (mm):		102	Height (mm):		204	Test:	UU Single Stage		Remarks:
Specimen	Water Content (%)	Bulk Density (Mg/m3)	Dry Density (Mg/m3)	Cell Pressure (kPa)	Corr. Max. Deviator Stress (kPa)	Shear Strength Cu (kPa)	Failure Strain (%)		Undisturbed Sample Sample taken from top of tube Rate of strain = 0.9 %/min See summary of soil descriptions
1	6.8	2.31	2.16	175	716	358	15.0	Intermediate	

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

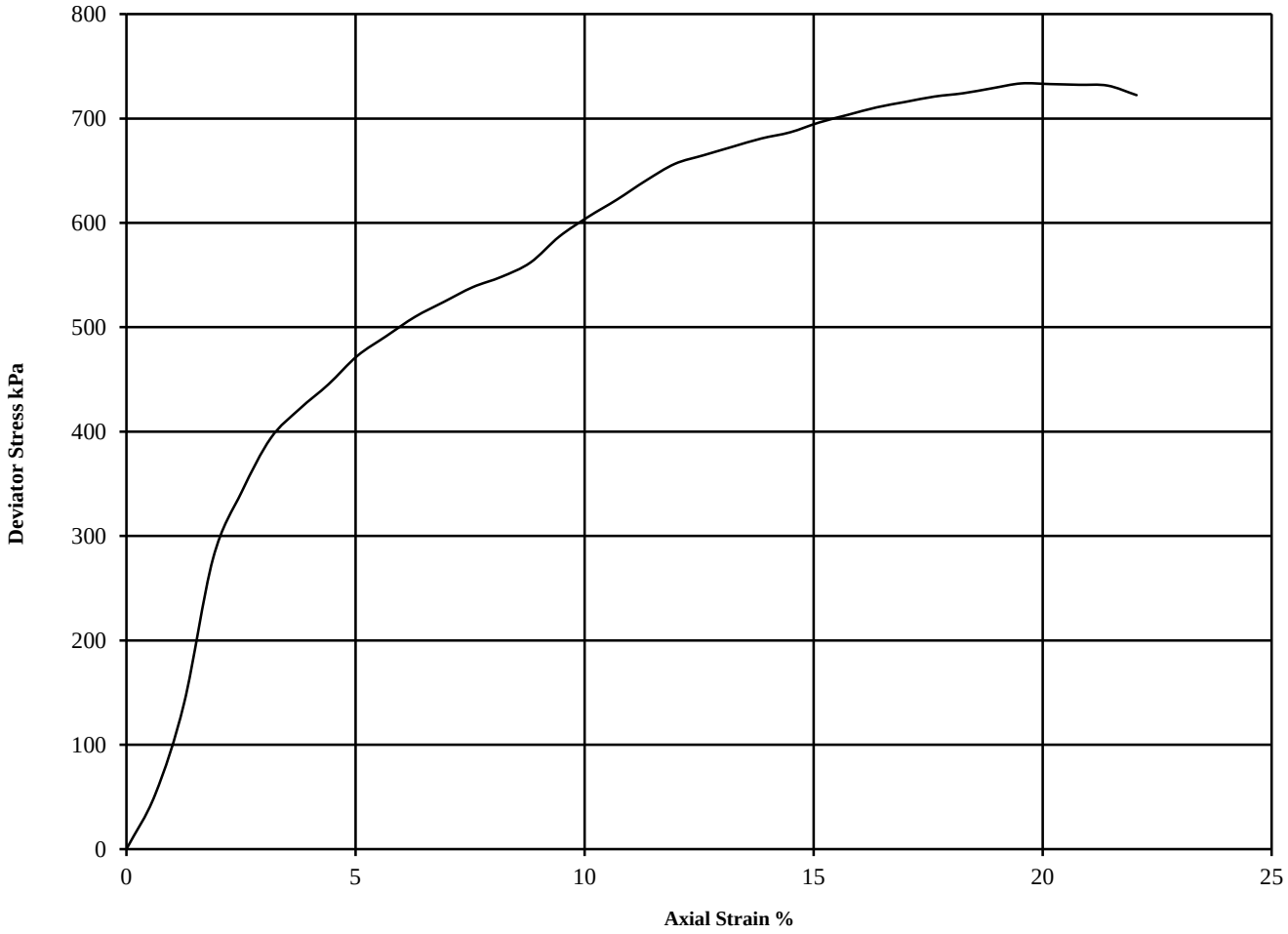
Project West Knockharley Landfill

Contract No:
PSL25/5811
Client Ref:
14656-04-25

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST

BS 1377 - Part 2 : 2022 : Clause 28 in accordance with BS EN ISO 17892 - 8 : 2018

Hole Number:	**BH104S**	**Top Depth (m):**	**5.50**
Sample Number		**Base Depth (m):**	**6.00**
Sample Type	**U**		



Diameter (mm):		102	Height (mm):		162	Test:	UU Single Stage		Remarks:
Specimen	Water Content (%)	Bulk Density (Mg/m3)	Dry Density (Mg/m3)	Cell Pressure (kPa)	Corr. Max. Deviator Stress (kPa)	Shear Strength Cu (kPa)	Failure Strain (%)		Undisturbed Sample Sample taken from top of tube Rate of strain = 1.2 %/min See summary of soil descriptions
1	6.5	2.35	2.21	120	734	367	18.9	Intermediate	

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

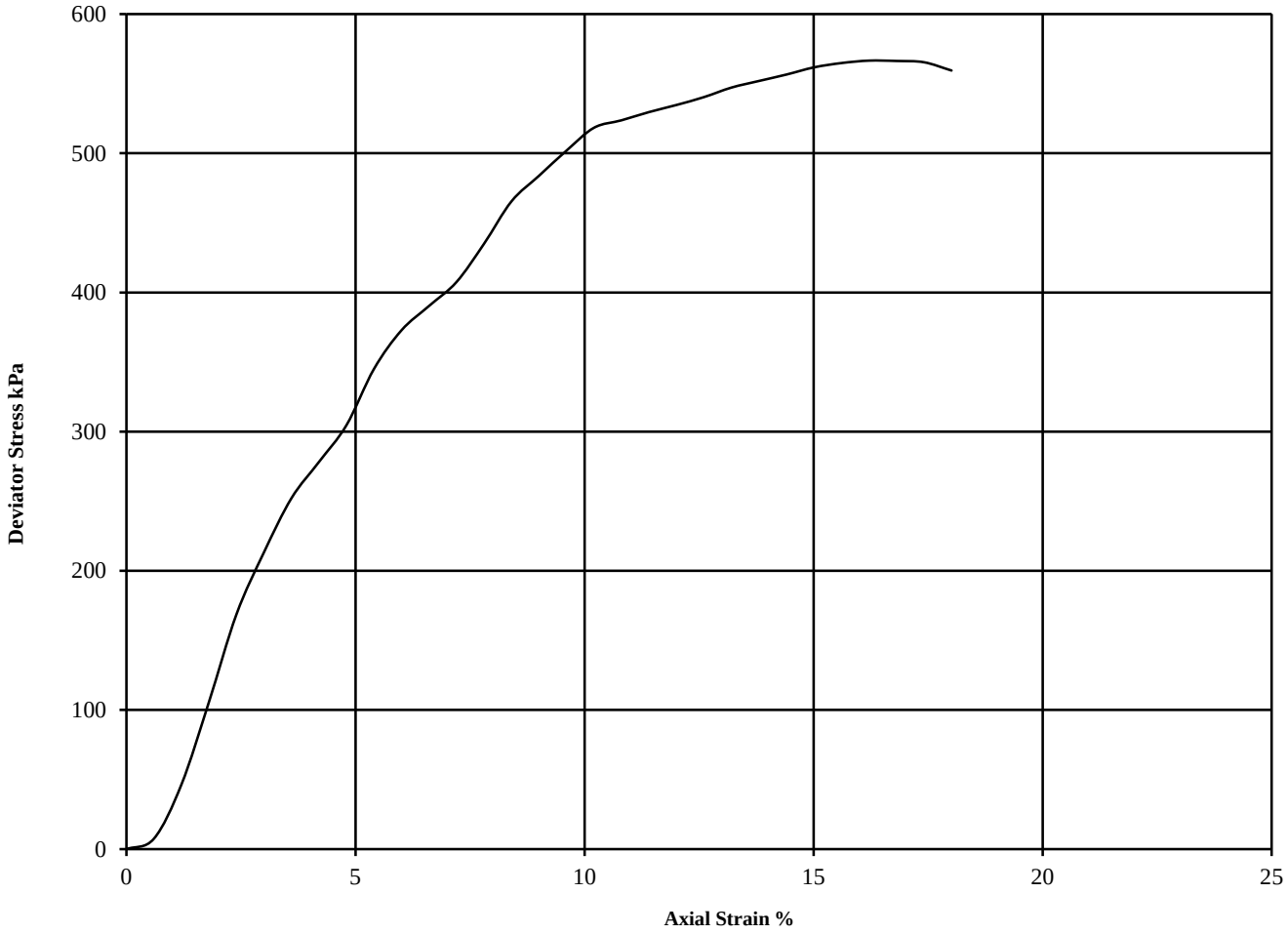
Project West Knockharley Landfill

Contract No:
PSL25/5811
Client Ref:
14656-04-25

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST

BS 1377 - Part 2 : 2022 : Clause 28 in accordance with BS EN ISO 17892 - 8 : 2018

Hole Number:	**BH106S**	**Top Depth (m):**	**9.00**
Sample Number		**Base Depth (m):**	**9.50**
Sample Type	**U**		



Diameter (mm):		102	Height (mm):		170	Test:	UU Single Stage		Remarks:
Specimen	Water Content (%)	Bulk Density (Mg/m3)	Dry Density (Mg/m3)	Cell Pressure (kPa)	Corr. Max. Deviator Stress (kPa)	Shear Strength Cu (kPa)	Failure Strain (%)		Undisturbed Sample Sample taken from top of tube Rate of strain = 1.1 %/min See summary of soil descriptions
1	8.0	2.33	2.16	180	567	283	15.6	Intermediate	

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Project West Knockharley Landfill

Contract No:
PSL25/5811
Client Ref:
14656-04-25

PERMEABILITY IN A TRIAXIAL CELL

BS 1377 - Part 2 : 2022 : Clause 23 in accordance with BS EN ISO 17892 - 11 : 2019

Hole Number: **BH101S** **Top Depth (m):** **7.80**

Sample Number: **Base Depth (m):** **8.20**

Sample Type: **U**

Description of Specimen
See summary of soil descriptions
Remarks
Undisturbed

Initial Specimen Conditions		
Height	mm	103.66
Diameter	mm	103.84
Area	mm^2	8468.75
Volume	cm^3	877.87
Mass	g	2087
Dry Mass	g	1936
Bulk Density	Mg/m^3	2.38
Dry Density	Mg/m^3	2.21
Water Content	%	7.8
Voids Ratio	-	0.201
Specific Gravity	Mg/m^3	2.65
(assumed/measured)	-	assumed

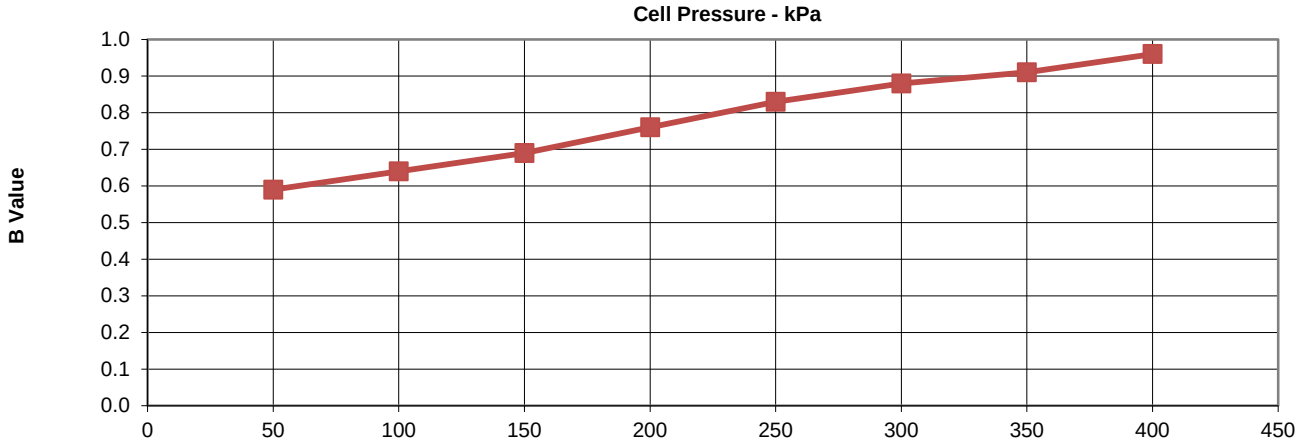
Final Specimen Conditions		
Water Content	%	8.0
Bulk Density	Mg/m^3	2.38
Dry Density	Mg/m^3	2.21

Test Setup		
Date Started		23/08/2025
Date Finished		28/08/2025
Top Drain Used		Y
Base Drain Used		Y
Method of Saturation		By back pressure
Direction Of Flow		Vertically Downwards
Saturation Time	Days	1
Consolidation Time	Days	1
Permeability Time	Days	1

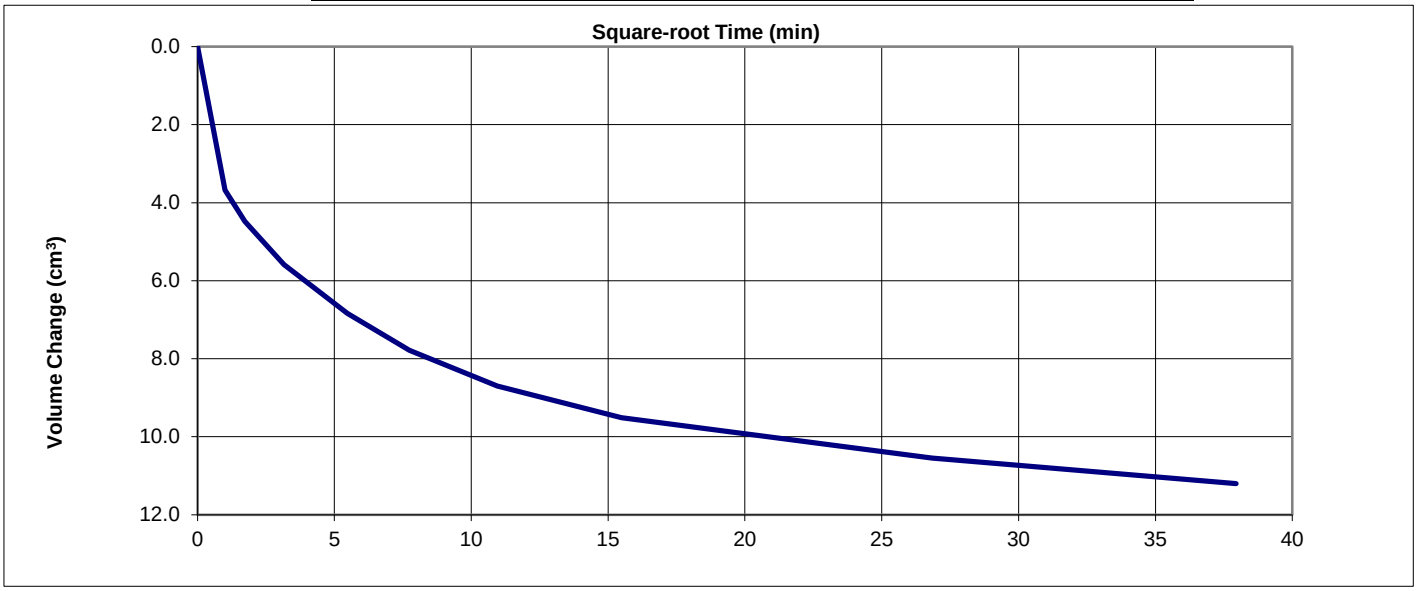
PERMEABILITY IN A TRIAXIAL CELL

BS 1377 - Part 2 : 2022 : Clause 23 in accordance with BS EN ISO 17892 - 11 : 2019

Specimen Details		
Hole Number:		BH101S
Sample Number:	m	
Sample Type:		U
Top Depth (m):		7.80
Base Depth (m):		8.20
Saturation		
Cell Pressure Incr.	kPa	50
Back Pressure Incr.	kPa	50
Differential Pressure	kPa	10
Final Cell Pressure	kPa	400
Final B Value	-	0.96



Consolidation		
Effective Pressure	kPa	100
Cell Pressure	kPa	450
Back Pressure	kPa	350
Final PWP	kPa	351
PWP dissipation	%	99



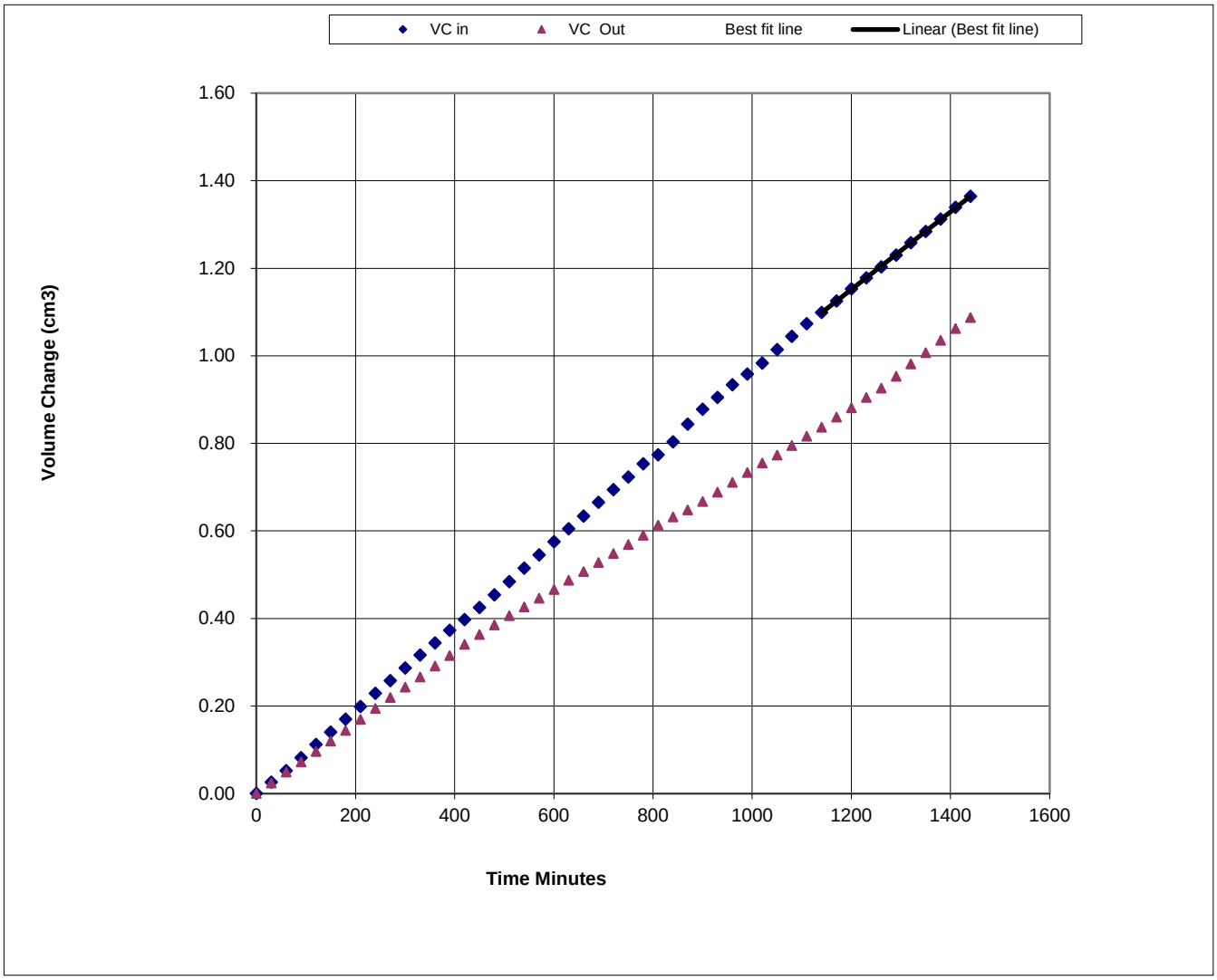
UKAS TESTING 4043 / PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY	**Project West Knockharley Landfill**	**Contract No.** PSL25/5811 **Client Ref** 14656-04-25

PERMEABILITY IN A TRIAXIAL CELL

BS 1377 - Part 2 : 2022 : Clause 23 in accordance with BS EN ISO 17892 - 11 : 2019

Specimen Details		
Hole Number:		BH101S
Sample Number:	m	
Sample Type:		U
Top Depth (m):		7.80
Base Depth (m):		8.20

Permeability Stage



Permeability Stage		
Cell Pressure	kPa	450
Mean Effective Stress	kPa	100
Back Pressure Diff.	kPa	20
Mean Rate of Flow	ml/min	0.0009
Average Temperature	'C	20
Vertical Permeability Kv	m/s	8.8E-11

PERMEABILITY IN A TRIAXIAL CELL

BS 1377 - Part 2 : 2022 : Clause 23 in accordance with BS EN ISO 17892 - 11 : 2019

Hole Number: **BH102S** **Top Depth (m):** **7.30**

Sample Number: **Base Depth (m):** **7.70**

Sample Type: **U**

Description of Specimen
See summary of soil descriptions
Remarks
Undisturbed

Initial Specimen Conditions		
Height	mm	101.70
Diameter	mm	101.85
Area	mm^2	8147.27
Volume	cm^3	828.58
Mass	g	1926
Dry Mass	g	1782
Bulk Density	Mg/m^3	2.32
Dry Density	Mg/m^3	2.15
Water Content	%	8.1
Voids Ratio	-	0.232
Specific Gravity	Mg/m^3	2.65
(assumed/measured)	-	assumed

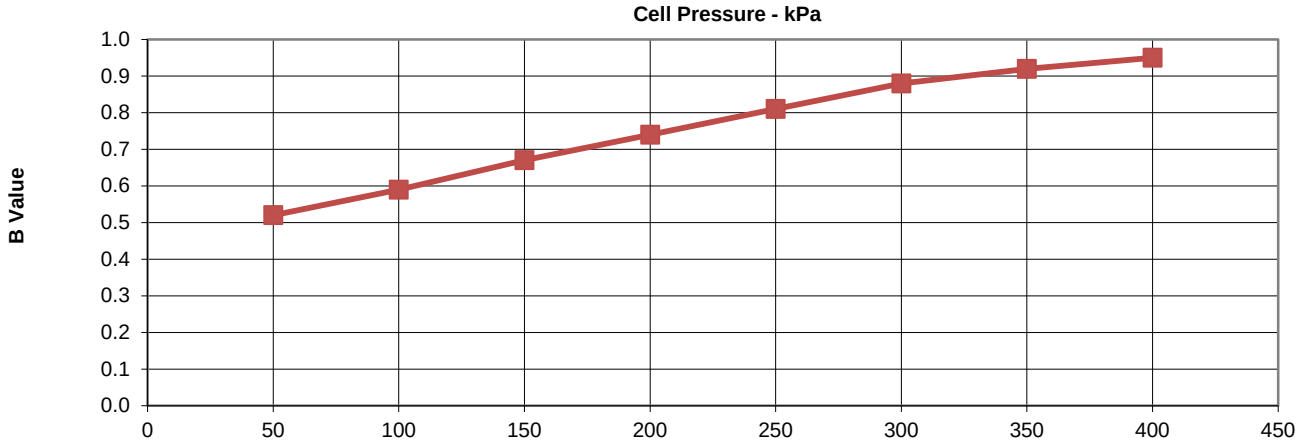
Final Specimen Conditions		
Water Content	%	8.4
Bulk Density	Mg/m^3	2.33
Dry Density	Mg/m^3	2.15

Test Setup		
Date Started		23/08/2025
Date Finished		28/08/2025
Top Drain Used		Y
Base Drain Used		Y
Method of Saturation		By back pressure
Direction Of Flow		Vertically Downwards
Saturation Time	Days	1
Consolidation Time	Days	1
Permeability Time	Days	1

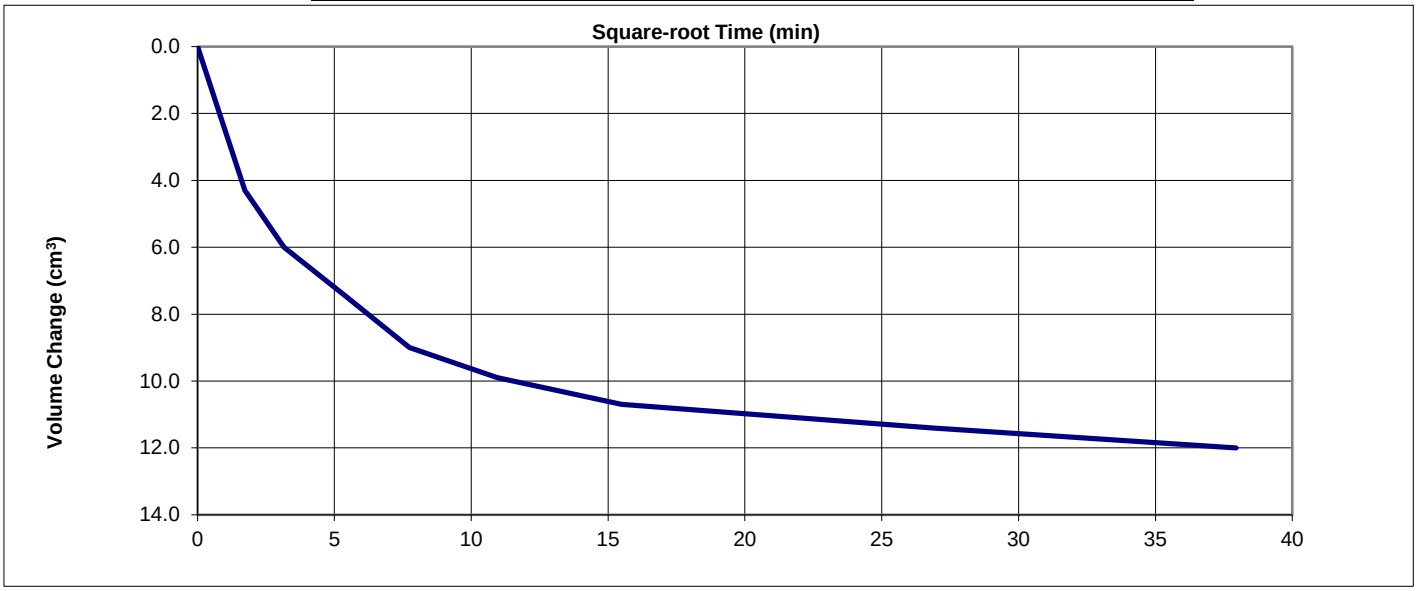
PERMEABILITY IN A TRIAXIAL CELL

BS 1377 - Part 2 : 2022 : Clause 23 in accordance with BS EN ISO 17892 - 11 : 2019

Specimen Details		
Hole Number:		BH102S
Sample Number:	m	
Sample Type:		U
Top Depth (m):		7.30
Base Depth (m):		7.70
Saturation		
Cell Pressure Incr.	kPa	50
Back Pressure Incr.	kPa	50
Differential Pressure	kPa	10
Final Cell Pressure	kPa	400
Final B Value	-	0.95



Consolidation		
Effective Pressure	kPa	100
Cell Pressure	kPa	450
Back Pressure	kPa	350
Final PWP	kPa	351
PWP dissipation	%	99



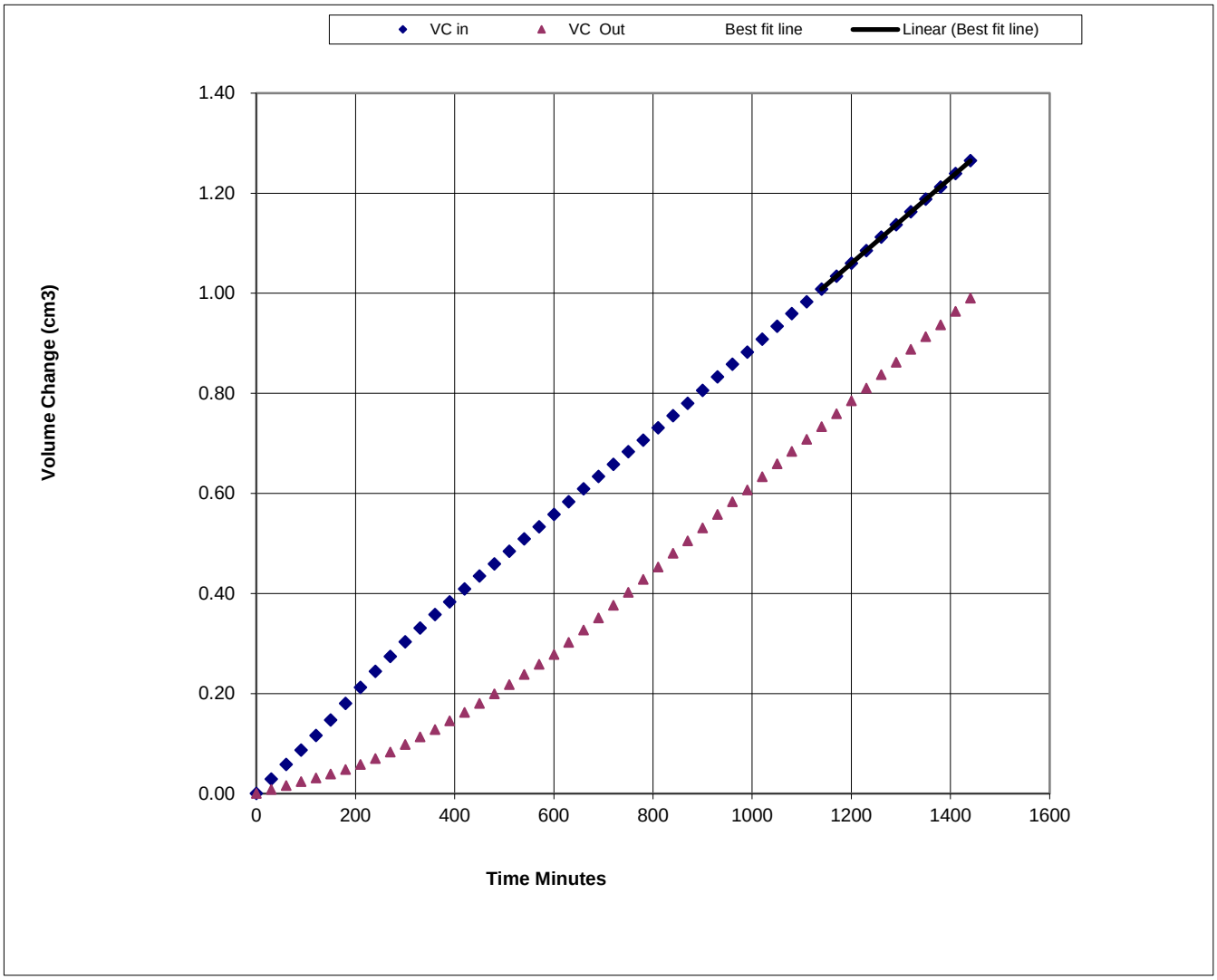
UKAS TESTING 4043 / PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY	**Project West Knockharley Landfill**	**Contract No.** PSL25/5811 **Client Ref** 14656-04-25

PERMEABILITY IN A TRIAXIAL CELL

BS 1377 - Part 2 : 2022 : Clause 23 in accordance with BS EN ISO 17892 - 11 : 2019

Specimen Details		
Hole Number:		BH102S
Sample Number:	m	
Sample Type:		U
Top Depth (m):		7.30
Base Depth (m):		7.70

Permeability Stage



Permeability Stage		
Cell Pressure	kPa	450
Mean Effective Stress	kPa	100
Back Pressure Diff.	kPa	20
Mean Rate of Flow	ml/min	0.0009
Average Temperature	'C	20
Vertical Permeability Kv	m/s	8.7E-11

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Project West Knockharley Landfill

Contract No.
PSL25/5811
Client Ref
14656-04-25

PERMEABILITY IN A TRIAXIAL CELL

BS 1377 - Part 2 : 2022 : Clause 23 in accordance with BS EN ISO 17892 - 11 : 2019

Hole Number:	**BH102S**	**Top Depth (m):**	**11.80**
Sample Number:		**Base Depth (m):**	**12.20**
Sample Type:	**U**		

Description of Specimen
See summary of soil descriptions
Remarks
Undisturbed

Initial Specimen Conditions		
Height	mm	100.47
Diameter	mm	102.62
Area	mm^2	8270.92
Volume	cm^3	830.98
Mass	g	1906
Dry Mass	g	1747
Bulk Density	Mg/m^3	2.29
Dry Density	Mg/m^3	2.10
Water Content	%	9.1
Voids Ratio	-	0.260
Specific Gravity	Mg/m^3	2.65
(assumed/measured)	-	assumed

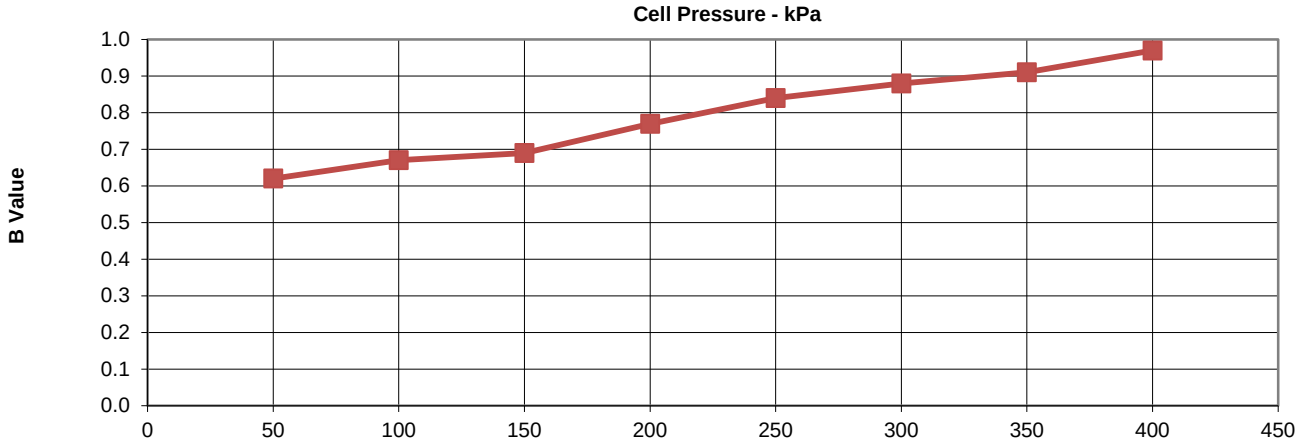
Final Specimen Conditions		
Water Content	%	9.4
Bulk Density	Mg/m^3	2.30
Dry Density	Mg/m^3	2.10

Test Setup		
Date Started		23/08/2025
Date Finished		28/08/2025
Top Drain Used		Y
Base Drain Used		Y
Method of Saturation		By back pressure
Direction Of Flow		Vertically Downwards
Saturation Time	Days	1
Consolidation Time	Days	1
Permeability Time	Days	1

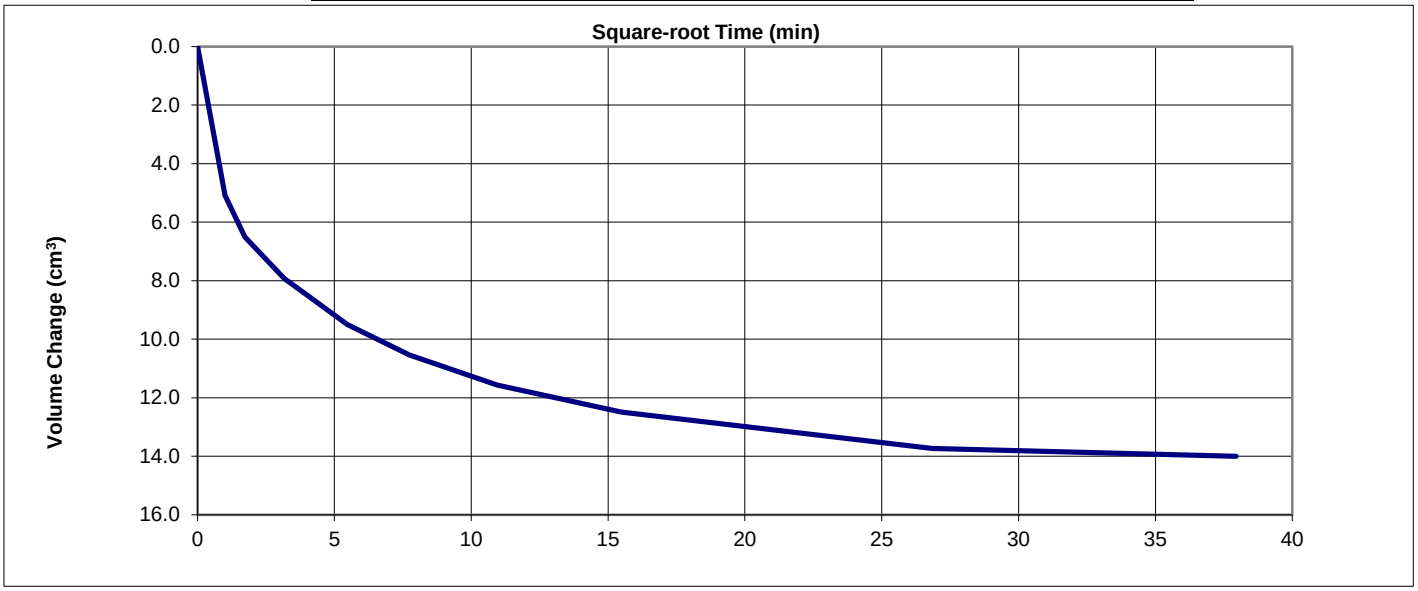
PERMEABILITY IN A TRIAXIAL CELL

BS 1377 - Part 2 : 2022 : Clause 23 in accordance with BS EN ISO 17892 - 11 : 2019

Specimen Details		
Hole Number:		BH102S
Sample Number:	m	
Sample Type:		U
Top Depth (m):		11.80
Base Depth (m):		12.20
Saturation		
Cell Pressure Incr.	kPa	50
Back Pressure Incr.	kPa	50
Differential Pressure	kPa	10
Final Cell Pressure	kPa	400
Final B Value	-	0.97



Consolidation		
Effective Pressure	kPa	100
Cell Pressure	kPa	450
Back Pressure	kPa	350
Final PWP	kPa	352
PWP dissipation	%	98



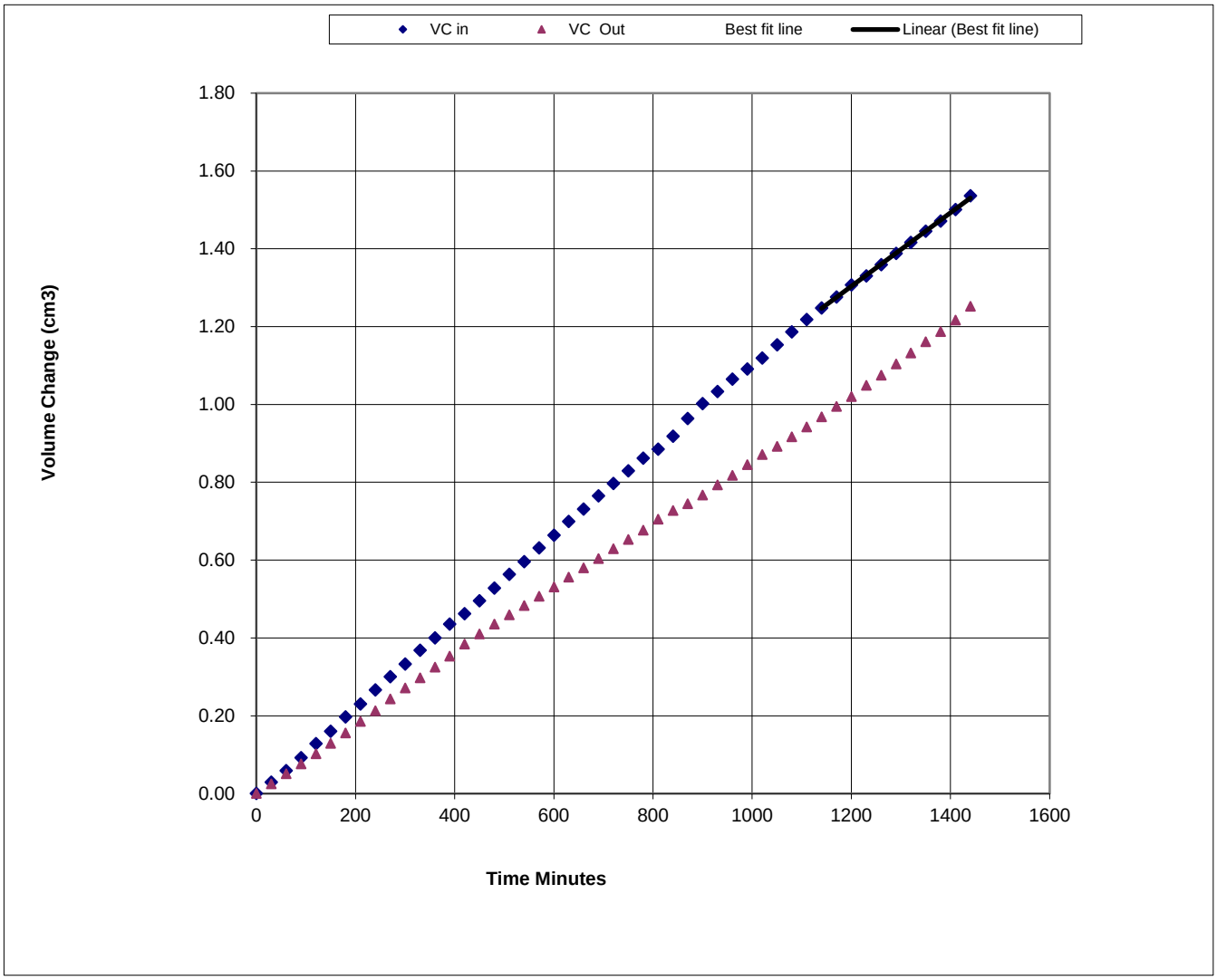
UKAS TESTING 4043 / PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY	**Project West Knockharley Landfill**	**Contract No.** PSL25/5811 **Client Ref** 14656-04-25

PERMEABILITY IN A TRIAXIAL CELL

BS 1377 - Part 2 : 2022 : Clause 23 in accordance with BS EN ISO 17892 - 11 : 2019

Specimen Details		
Hole Number:		BH102S
Sample Number:	m	
Sample Type:		U
Top Depth (m):		11.80
Base Depth (m):		12.20

Permeability Stage



Permeability Stage		
Cell Pressure	kPa	450
Mean Effective Stress	kPa	100
Back Pressure Diff.	kPa	20
Mean Rate of Flow	ml/min	0.0010
Average Temperature	'C	20
Vertical Permeability Kv	m/s	9.5E-11

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Project West Knockharley Landfill

Contract No.
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PERMEABILITY IN A TRIAXIAL CELL

BS 1377 - Part 2 : 2022 : Clause 23 in accordance with BS EN ISO 17892 - 11 : 2019

Hole Number: **BH103T** **Top Depth (m):** **9.60**

Sample Number: **Base Depth (m):** **10.00**

Sample Type: **U**

Description of Specimen
See summary of soil descriptions
Remarks
Undisturbed

Initial Specimen Conditions		
Height	mm	102.84
Diameter	mm	102.01
Area	mm^2	8172.88
Volume	cm^3	840.50
Mass	g	1996
Dry Mass	g	1846
Bulk Density	Mg/m^3	2.37
Dry Density	Mg/m^3	2.20
Water Content	%	8.1
Voids Ratio	-	0.207
Specific Gravity	Mg/m^3	2.65
(assumed/measured)	-	assumed

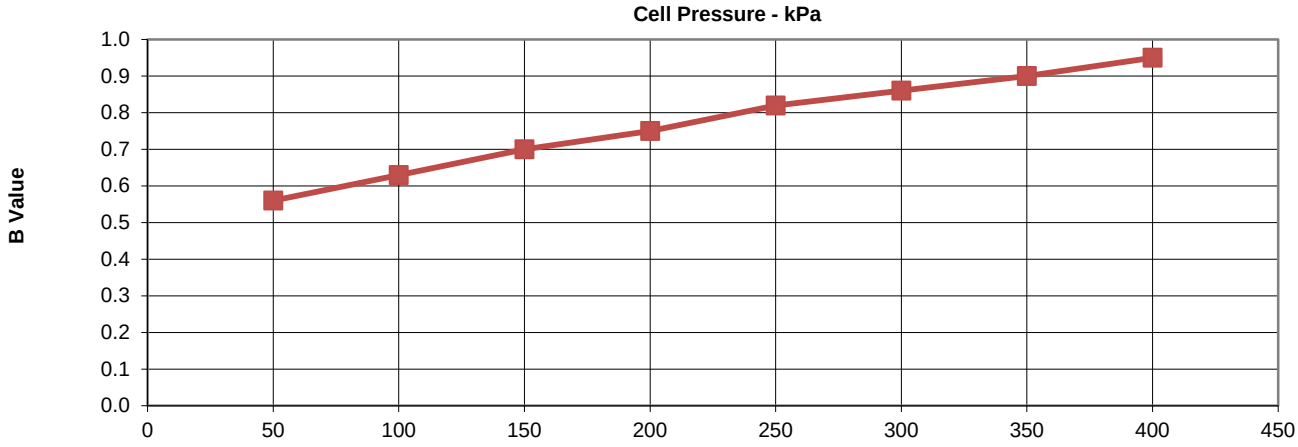
Final Specimen Conditions		
Water Content	%	8.4
Bulk Density	Mg/m^3	2.38
Dry Density	Mg/m^3	2.20

Test Setup		
Date Started		23/08/2025
Date Finished		28/08/2025
Top Drain Used		Y
Base Drain Used		Y
Method of Saturation		By back pressure
Direction Of Flow		Vertically Downwards
Saturation Time	Days	1
Consolidation Time	Days	1
Permeability Time	Days	1

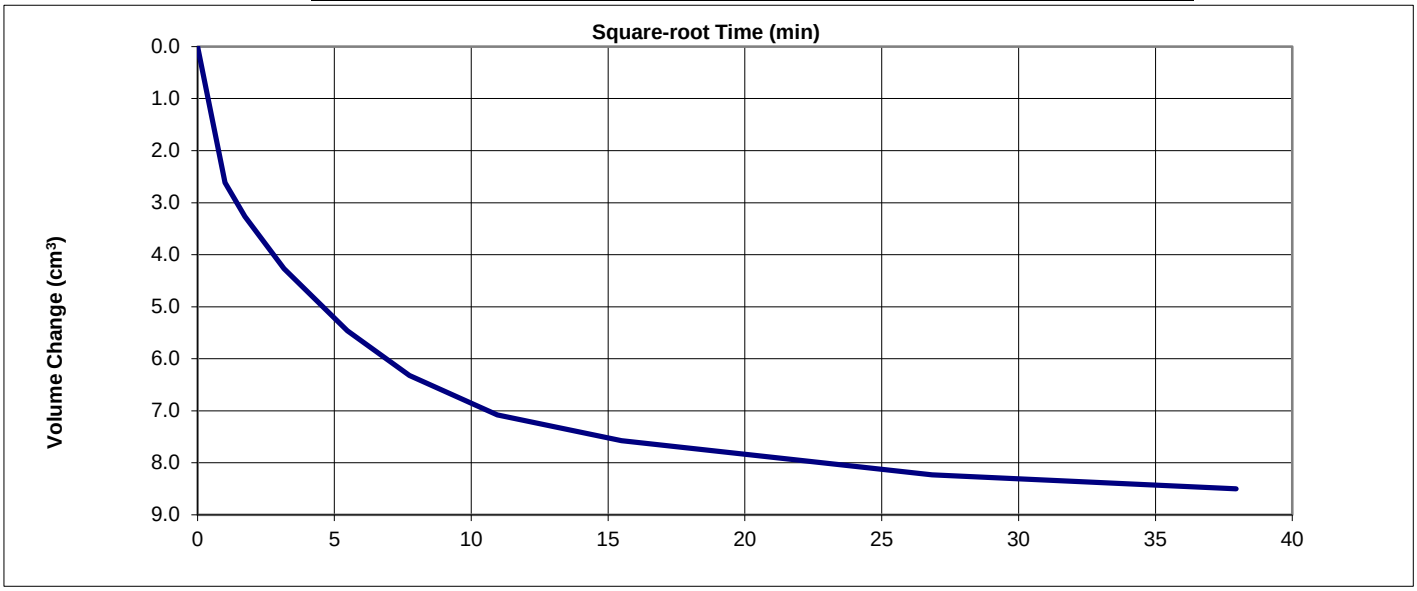
PERMEABILITY IN A TRIAXIAL CELL

BS 1377 - Part 2 : 2022 : Clause 23 in accordance with BS EN ISO 17892 - 11 : 2019

Specimen Details		
Hole Number:		BH103T
Sample Number:	m	
Sample Type:		U
Top Depth (m):		9.60
Base Depth (m):		10.00
Saturation		
Cell Pressure Incr.	kPa	50
Back Pressure Incr.	kPa	50
Differential Pressure	kPa	10
Final Cell Pressure	kPa	400
Final B Value	-	0.95



Consolidation		
Effective Pressure	kPa	100
Cell Pressure	kPa	450
Back Pressure	kPa	350
Final PWP	kPa	351
PWP dissipation	%	99



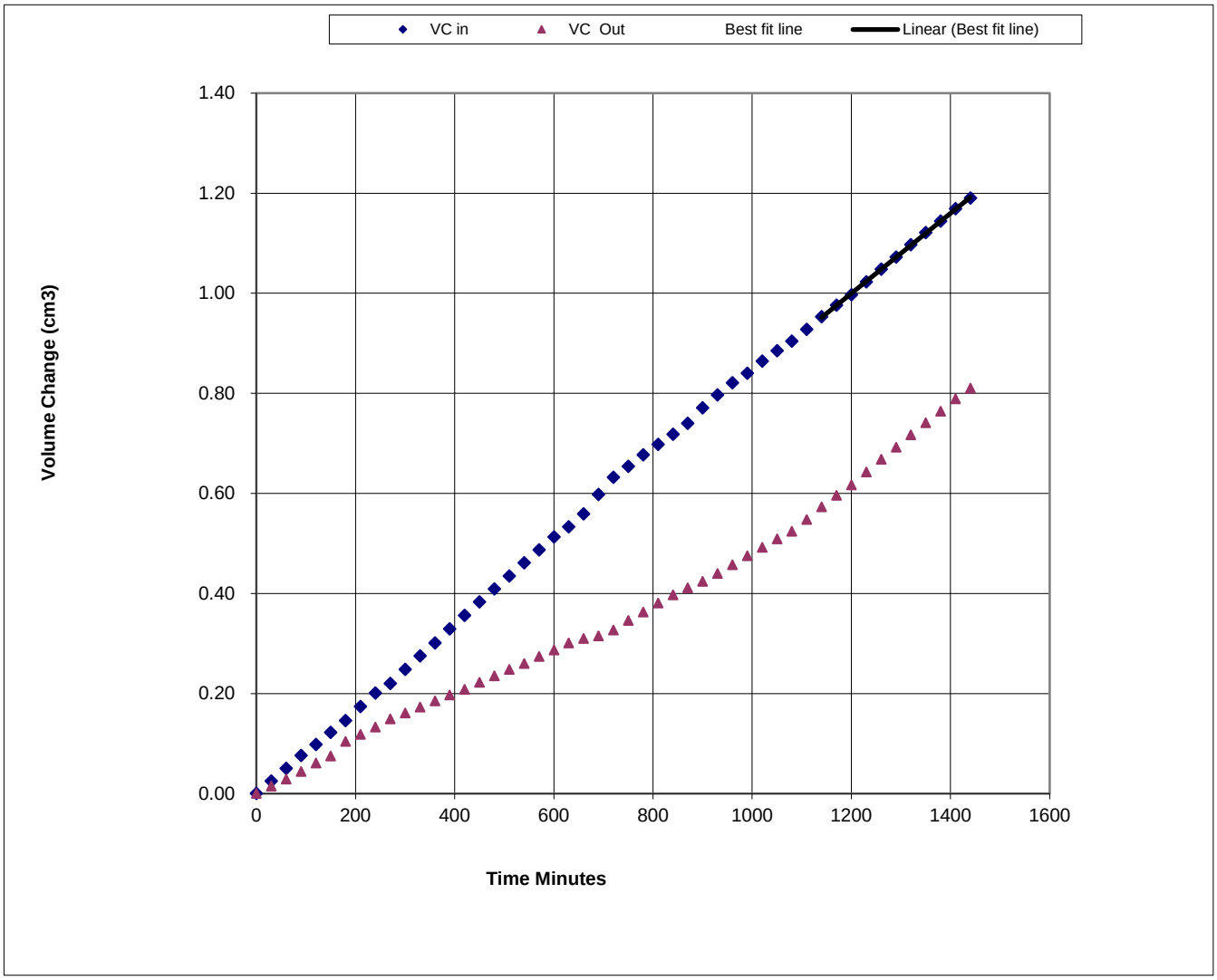
UKAS TESTING 4043 / PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY	**Project West Knockharley Landfill**	**Contract No.** PSL25/5811 **Client Ref** 14656-04-25

PERMEABILITY IN A TRIAXIAL CELL

BS 1377 - Part 2 : 2022 : Clause 23 in accordance with BS EN ISO 17892 - 11 : 2019

Specimen Details		
Hole Number:		BH103T
Sample Number:	m	
Sample Type:		U
Top Depth (m):		9.60
Base Depth (m):		10.00

Permeability Stage



Permeability Stage		
Cell Pressure	kPa	450
Mean Effective Stress	kPa	100
Back Pressure Diff.	kPa	20
Mean Rate of Flow	ml/min	0.0008
Average Temperature	'C	20
Vertical Permeability Kv	m/s	8.1E-11

PERMEABILITY IN A TRIAXIAL CELL

BS 1377 - Part 2 : 2022 : Clause 23 in accordance with BS EN ISO 17892 - 11 : 2019

Hole Number: **BH104S** **Top Depth (m):** **7.00**

Sample Number: **Base Depth (m):** **7.40**

Sample Type: **U**

Description of Specimen
See summary of soil descriptions
Remarks
Undisturbed

Initial Specimen Conditions		
Height	mm	102.28
Diameter	mm	102.21
Area	mm^2	8204.96
Volume	cm^3	839.20
Mass	g	2029
Dry Mass	g	1901
Bulk Density	Mg/m^3	2.42
Dry Density	Mg/m^3	2.27
Water Content	%	6.7
Voids Ratio	-	0.170
Specific Gravity	Mg/m^3	2.65
(assumed/measured)	-	assumed

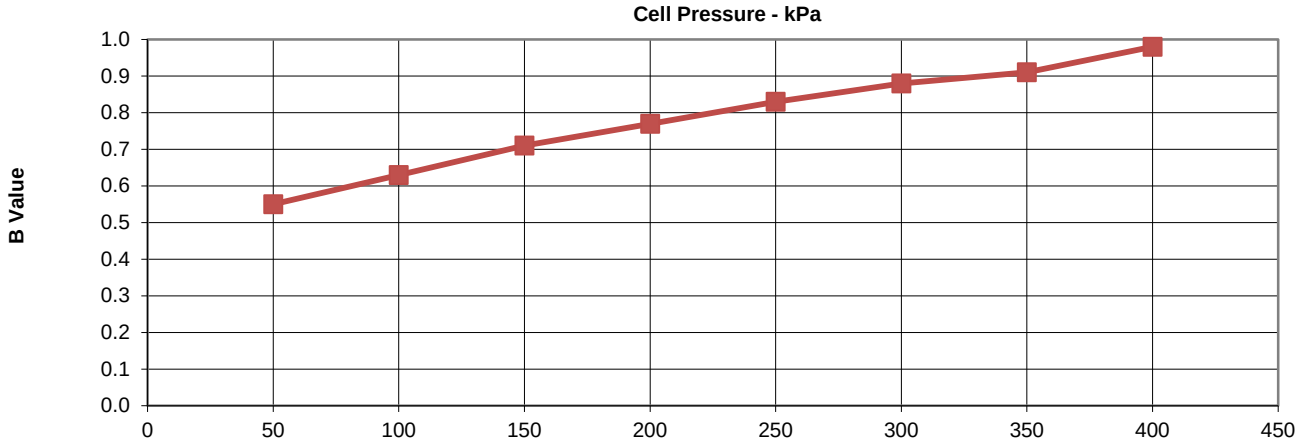
Final Specimen Conditions		
Water Content	%	6.8
Bulk Density	Mg/m^3	2.42
Dry Density	Mg/m^3	2.27

Test Setup		
Date Started		23/08/2025
Date Finished		28/08/2025
Top Drain Used		Y
Base Drain Used		Y
Method of Saturation		By back pressure
Direction Of Flow		Vertically Downwards
Saturation Time	Days	1
Consolidation Time	Days	1
Permeability Time	Days	1

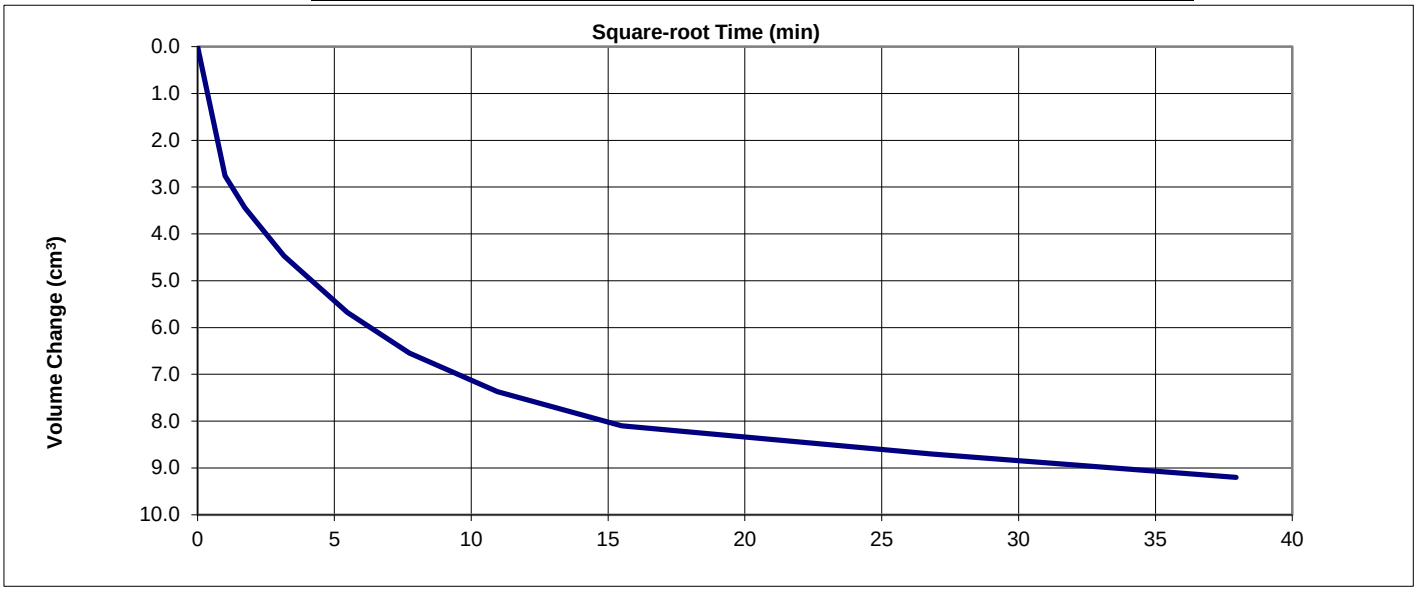
PERMEABILITY IN A TRIAXIAL CELL

BS 1377 - Part 2 : 2022 : Clause 23 in accordance with BS EN ISO 17892 - 11 : 2019

Specimen Details		
Hole Number:		BH104S
Sample Number:	m	
Sample Type:		U
Top Depth (m):		7.00
Base Depth (m):		7.40
Saturation		
Cell Pressure Incr.	kPa	50
Back Pressure Incr.	kPa	50
Differential Pressure	kPa	10
Final Cell Pressure	kPa	400
Final B Value	-	0.98



Consolidation		
Effective Pressure	kPa	100
Cell Pressure	kPa	450
Back Pressure	kPa	350
Final PWP	kPa	353
PWP dissipation	%	97



UKAS TESTING 4043

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Project West Knockharley Landfill

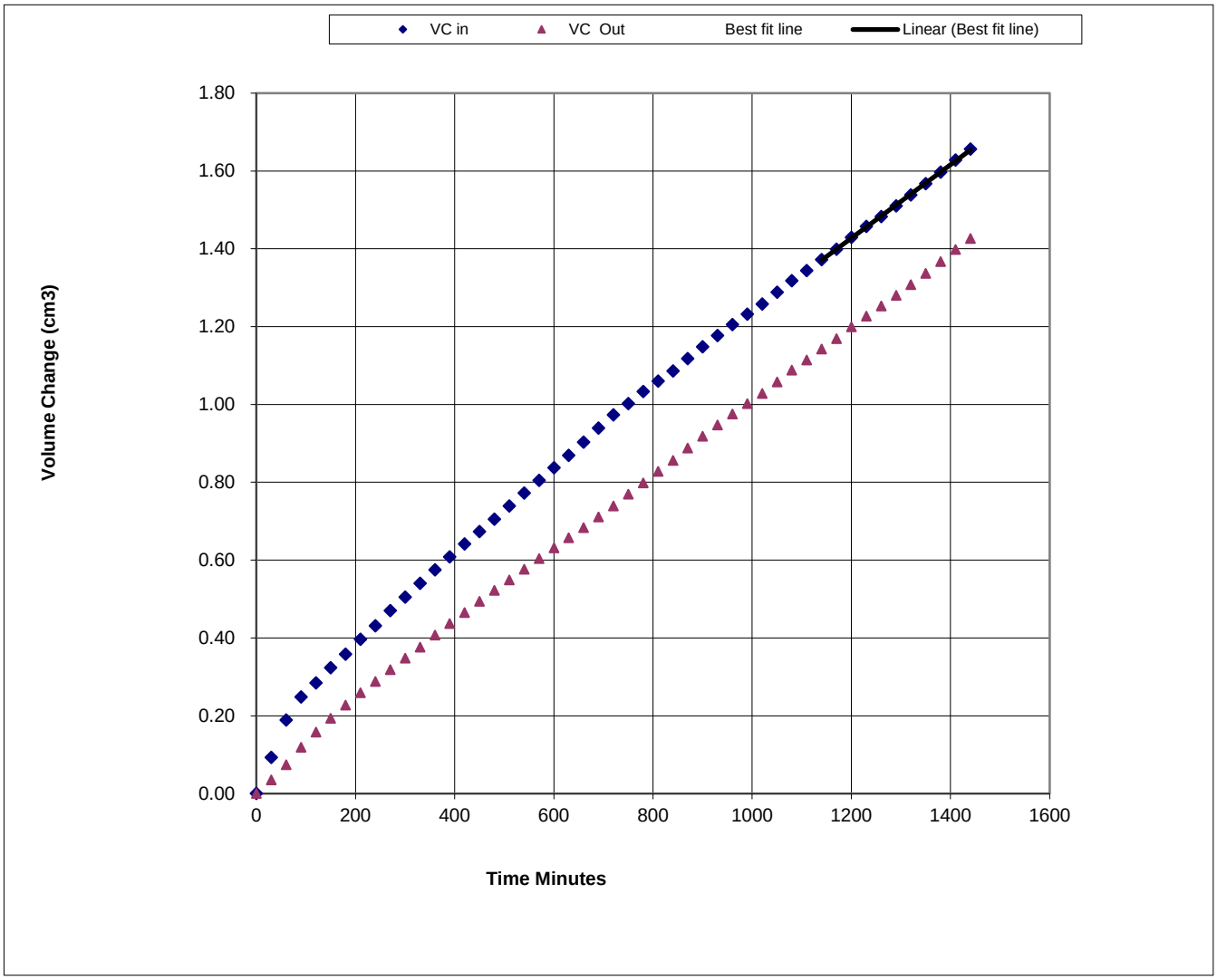
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PERMEABILITY IN A TRIAXIAL CELL

BS 1377 - Part 2 : 2022 : Clause 23 in accordance with BS EN ISO 17892 - 11 : 2019

Specimen Details		
Hole Number:		BH104S
Sample Number:	m	
Sample Type:		U
Top Depth (m):		7.00
Base Depth (m):		7.40

Permeability Stage



Permeability Stage		
Cell Pressure	kPa	450
Mean Effective Stress	kPa	100
Back Pressure Diff.	kPa	20
Mean Rate of Flow	ml/min	0.0009
Average Temperature	'C	20
Vertical Permeability Kv	m/s	9.6E-11

UKAS TESTING 4043

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PERMEABILITY IN A TRIAXIAL CELL

BS 1377 - Part 2 : 2022 : Clause 23 in accordance with BS EN ISO 17892 - 11 : 2019

Hole Number: **BH105S** **Top Depth (m):** **7.50**

Sample Number: **Base Depth (m):** **8.00**

Sample Type: **U**

Description of Specimen
See summary of soil descriptions
Remarks
Undisturbed

Initial Specimen Conditions		
Height	mm	105.19
Diameter	mm	102.58
Area	mm^2	8264.48
Volume	cm^3	869.34
Mass	g	2086
Dry Mass	g	1937
Bulk Density	Mg/m^3	2.40
Dry Density	Mg/m^3	2.23
Water Content	%	7.7
Voids Ratio	-	0.189
Specific Gravity	Mg/m^3	2.65
(assumed/measured)	-	assumed

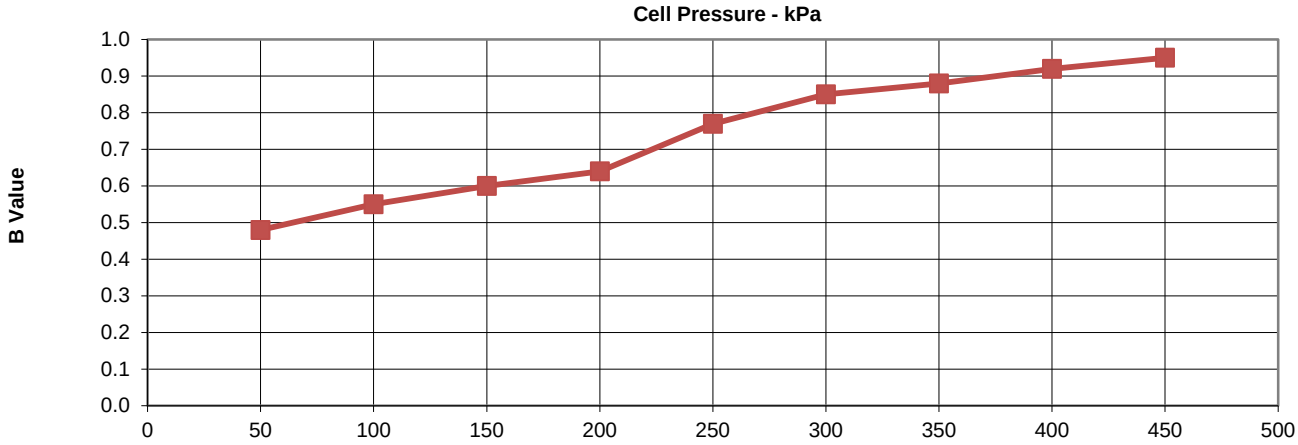
Final Specimen Conditions		
Water Content	%	8.0
Bulk Density	Mg/m^3	2.41
Dry Density	Mg/m^3	2.23

Test Setup		
Date Started		23/08/2025
Date Finished		28/08/2025
Top Drain Used		Y
Base Drain Used		Y
Method of Saturation		By back pressure
Direction Of Flow		Vertically Downwards
Saturation Time	Days	1
Consolidation Time	Days	1
Permeability Time	Days	1

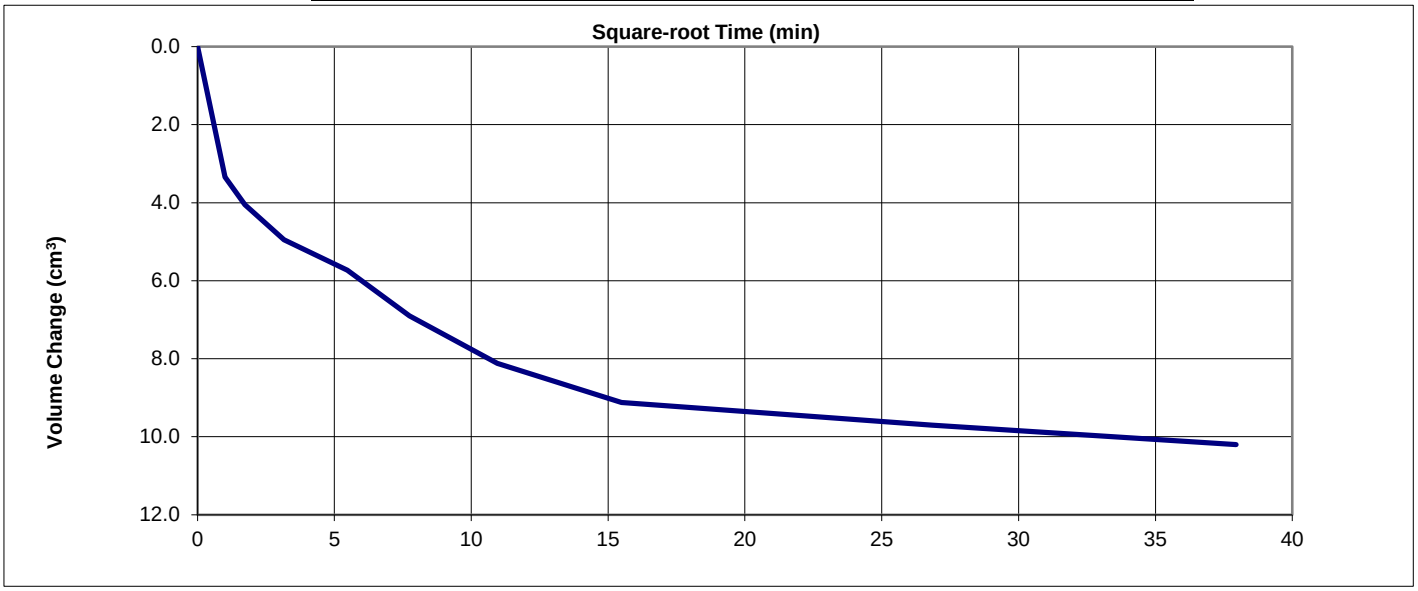
PERMEABILITY IN A TRIAXIAL CELL

BS 1377 - Part 2 : 2022 : Clause 23 in accordance with BS EN ISO 17892 - 11 : 2019

Specimen Details		
Hole Number:		BH105S
Sample Number:	m	
Sample Type:		U
Top Depth (m):		7.50
Base Depth (m):		8.00
Saturation		
Cell Pressure Incr.	kPa	50
Back Pressure Incr.	kPa	50
Differential Pressure	kPa	10
Final Cell Pressure	kPa	450
Final B Value	-	0.95



Consolidation		
Effective Pressure	kPa	100
Cell Pressure	kPa	500
Back Pressure	kPa	400
Final PWP	kPa	402
PWP dissipation	%	98



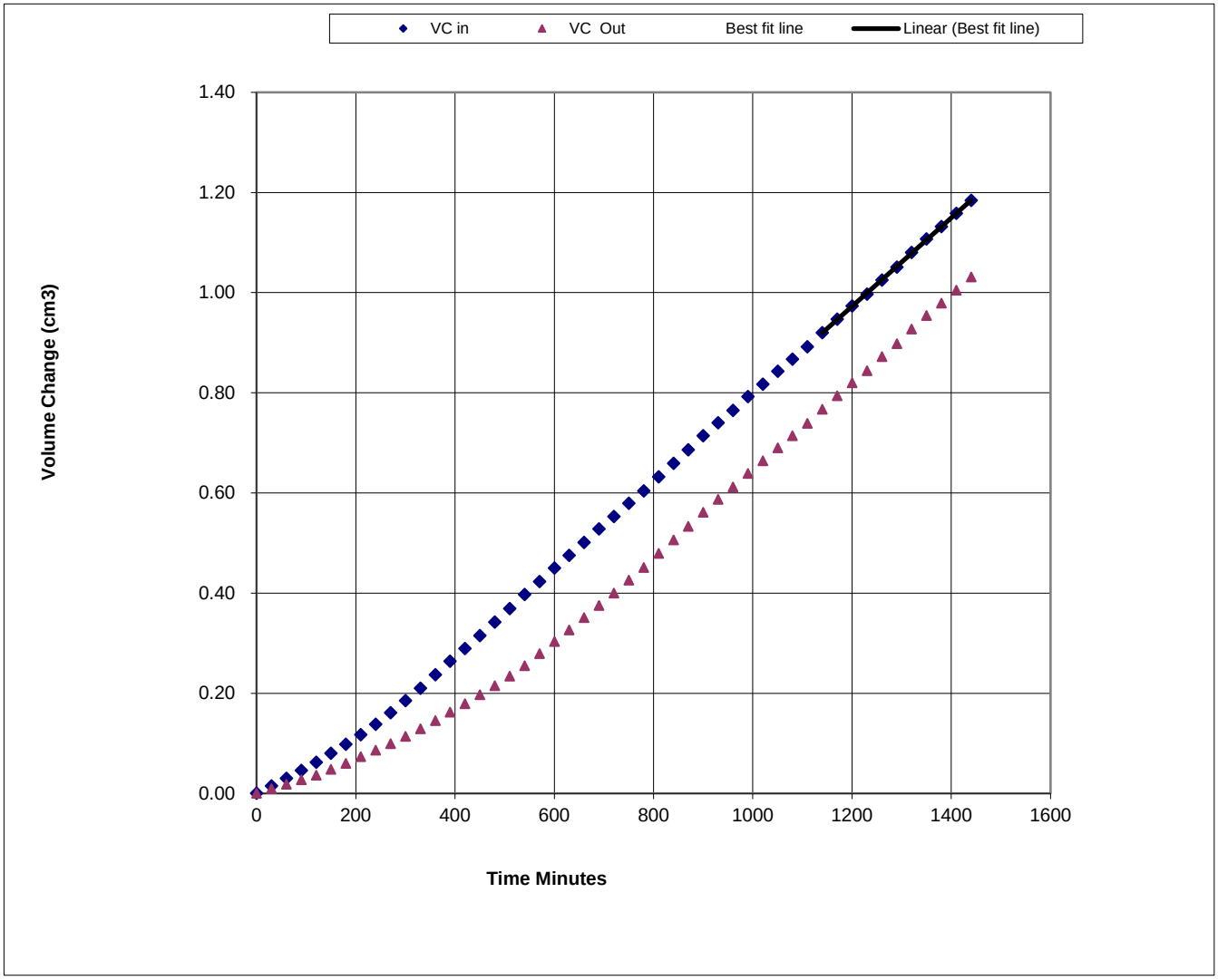
UKAS TESTING 4043 / PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY	**Project West Knockharley Landfill**	**Contract No.** PSL25/5811 **Client Ref** 14656-04-25

PERMEABILITY IN A TRIAXIAL CELL

BS 1377 - Part 2 : 2022 : Clause 23 in accordance with BS EN ISO 17892 - 11 : 2019

Specimen Details		
Hole Number:		BH105S
Sample Number:	m	
Sample Type:		U
Top Depth (m):		7.50
Base Depth (m):		8.00

Permeability Stage



Permeability Stage		
Cell Pressure	kPa	500
Mean Effective Stress	kPa	100
Back Pressure Diff.	kPa	20
Mean Rate of Flow	ml/min	0.0009
Average Temperature	'C	20
Vertical Permeability Kv	m/s	9.1E-11

PERMEABILITY IN A TRIAXIAL CELL

BS 1377 - Part 2 : 2022 : Clause 23 in accordance with BS EN ISO 17892 - 11 : 2019

Hole Number: **BH106S** **Top Depth (m):** **7.50**

Sample Number: **Base Depth (m):** **7.90**

Sample Type: **U**

Description of Specimen
See summary of soil descriptions
Remarks
Undisturbed

Initial Specimen Conditions		
Height	mm	101.34
Diameter	mm	102.83
Area	mm^2	8304.81
Volume	cm^3	841.61
Mass	g	2012
Dry Mass	g	1874
Bulk Density	Mg/m^3	2.39
Dry Density	Mg/m^3	2.23
Water Content	%	7.3
Voids Ratio	-	0.190
Specific Gravity	Mg/m^3	2.65
(assumed/measured)	-	assumed

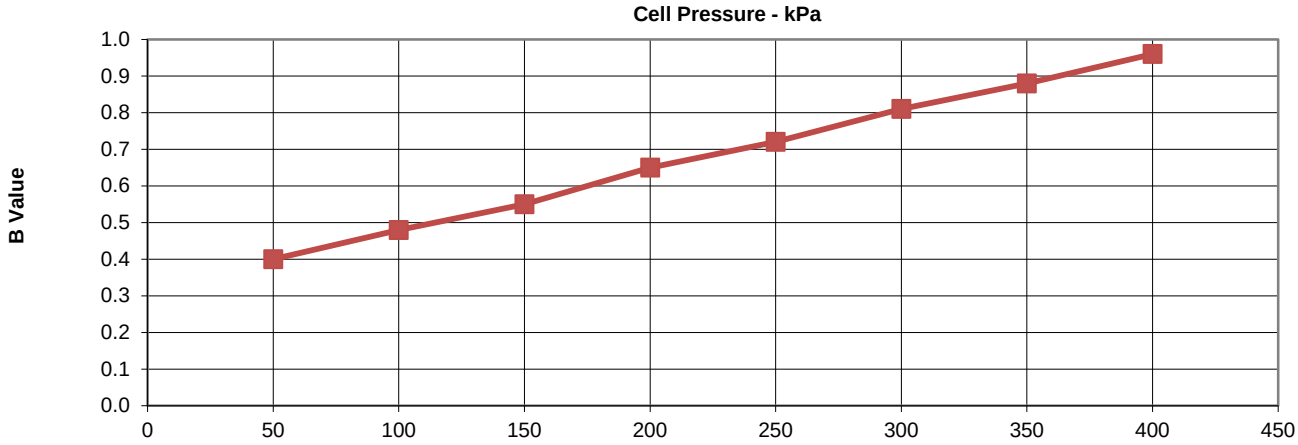
Final Specimen Conditions		
Water Content	%	7.2
Bulk Density	Mg/m^3	2.39
Dry Density	Mg/m^3	2.23

Test Setup		
Date Started		23/08/2025
Date Finished		28/08/2025
Top Drain Used		Y
Base Drain Used		Y
Method of Saturation		By back pressure
Direction Of Flow		Vertically Downwards
Saturation Time	Days	1
Consolidation Time	Days	1
Permeability Time	Days	1

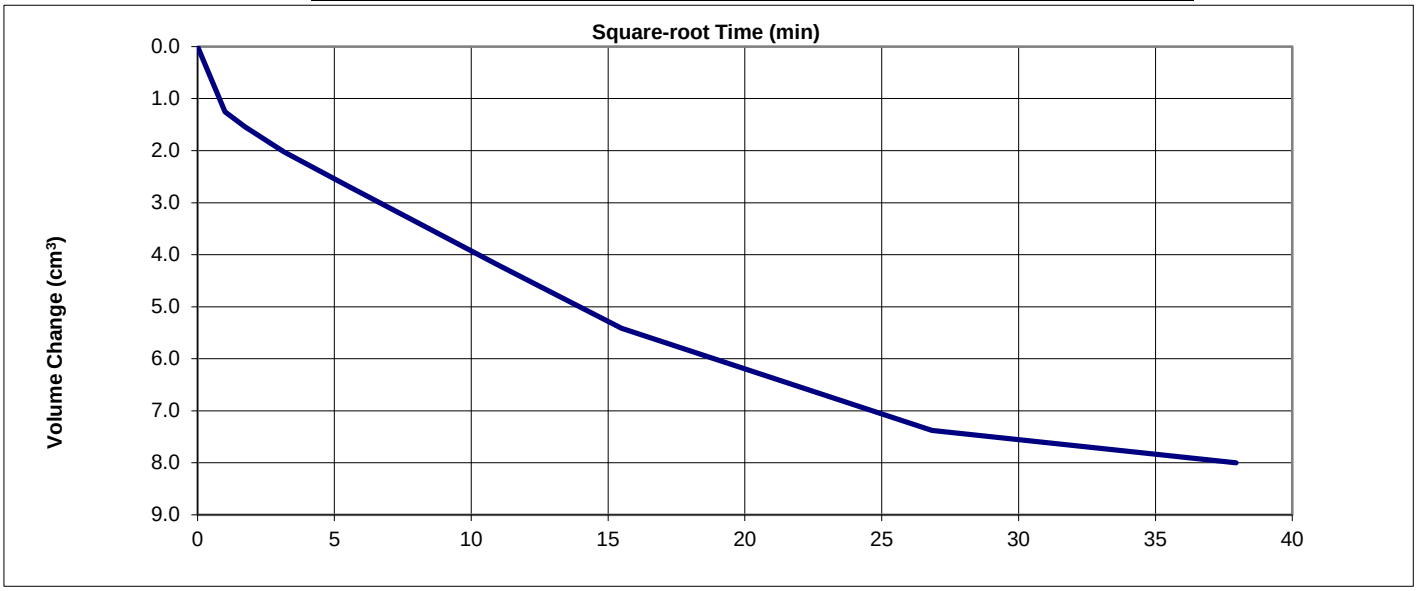
PERMEABILITY IN A TRIAXIAL CELL

BS 1377 - Part 2 : 2022 : Clause 23 in accordance with BS EN ISO 17892 - 11 : 2019

Specimen Details		
Hole Number:		BH106S
Sample Number:	m	
Sample Type:		U
Top Depth (m):		7.50
Base Depth (m):		7.90
Saturation		
Cell Pressure Incr.	kPa	50
Back Pressure Incr.	kPa	50
Differential Pressure	kPa	10
Final Cell Pressure	kPa	400
Final B Value	-	0.96



Consolidation		
Effective Pressure	kPa	100
Cell Pressure	kPa	450
Back Pressure	kPa	350
Final PWP	kPa	352
PWP dissipation	%	98



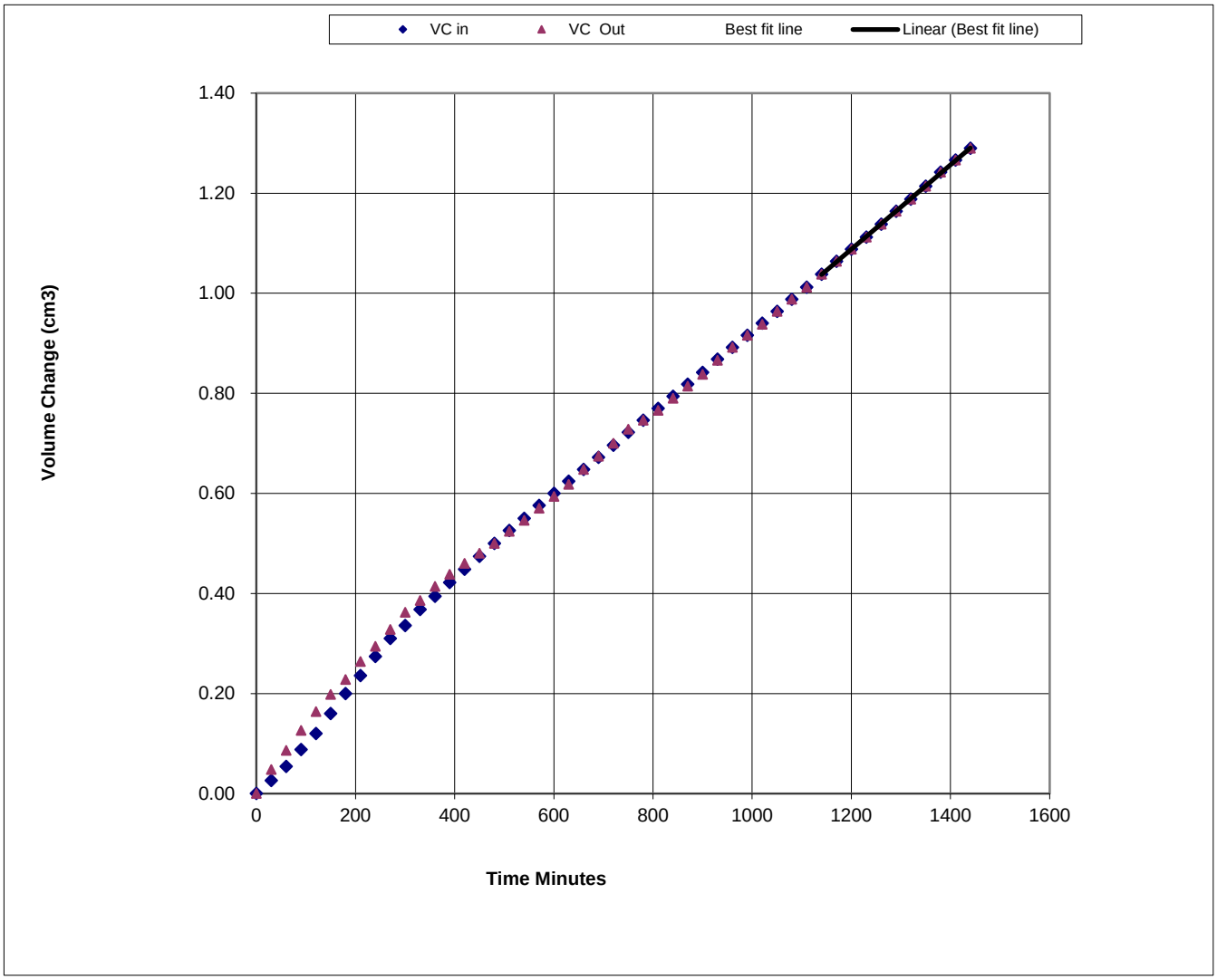
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PERMEABILITY IN A TRIAXIAL CELL

BS 1377 - Part 2 : 2022 : Clause 23 in accordance with BS EN ISO 17892 - 11 : 2019

Specimen Details		
Hole Number:		BH106S
Sample Number:	m	
Sample Type:		U
Top Depth (m):		7.50
Base Depth (m):		7.90

Permeability Stage



Permeability Stage		
Cell Pressure	kPa	450
Mean Effective Stress	kPa	100
Back Pressure Diff.	kPa	20
Mean Rate of Flow	ml/min	0.0008
Average Temperature	'C	20
Vertical Permeability Kv	m/s	8.4E-11

PERMEABILITY IN A TRIAXIAL CELL

BS 1377 - Part 2 : 2022 : Clause 23 in accordance with BS EN ISO 17892 - 11 : 2019

Hole Number: **BH107S** **Top Depth (m):** **8.10**

Sample Number: **Base Depth (m):** **8.50**

Sample Type: **U**

Description of Specimen
See summary of soil descriptions
Remarks
Undisturbed

Initial Specimen Conditions		
Height	mm	99.06
Diameter	mm	102.67
Area	mm^2	8278.98
Volume	cm^3	820.12
Mass	g	1901
Dry Mass	g	1737
Bulk Density	Mg/m^3	2.32
Dry Density	Mg/m^3	2.12
Water Content	%	9.4
Voids Ratio	-	0.251
Specific Gravity	Mg/m^3	2.65
(assumed/measured)	-	assumed

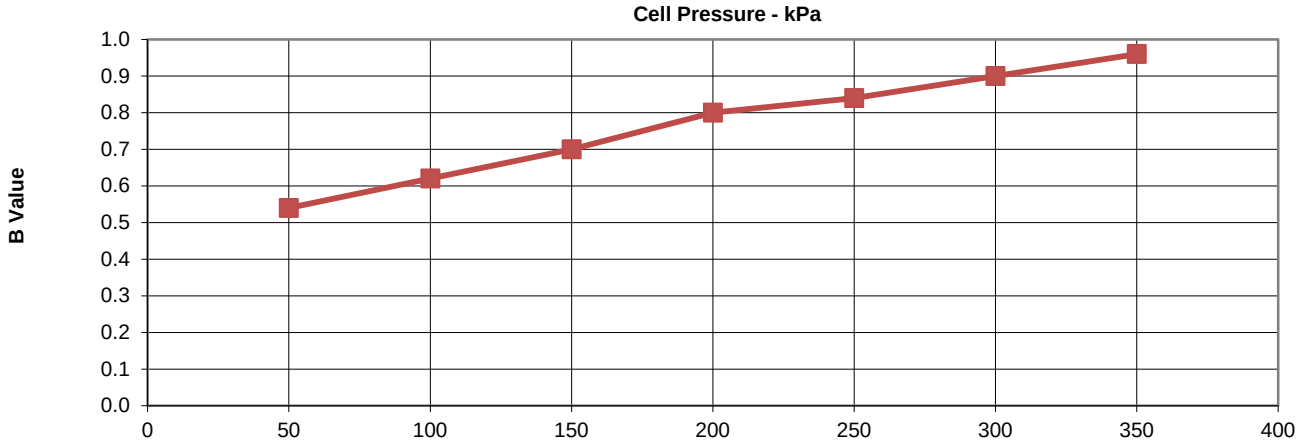
Final Specimen Conditions		
Water Content	%	9.4
Bulk Density	Mg/m^3	2.32
Dry Density	Mg/m^3	2.12

Test Setup		
Date Started		23/08/2025
Date Finished		28/08/2025
Top Drain Used		Y
Base Drain Used		Y
Method of Saturation		By back pressure
Direction Of Flow		Vertically Downwards
Saturation Time	Days	1
Consolidation Time	Days	1
Permeability Time	Days	1

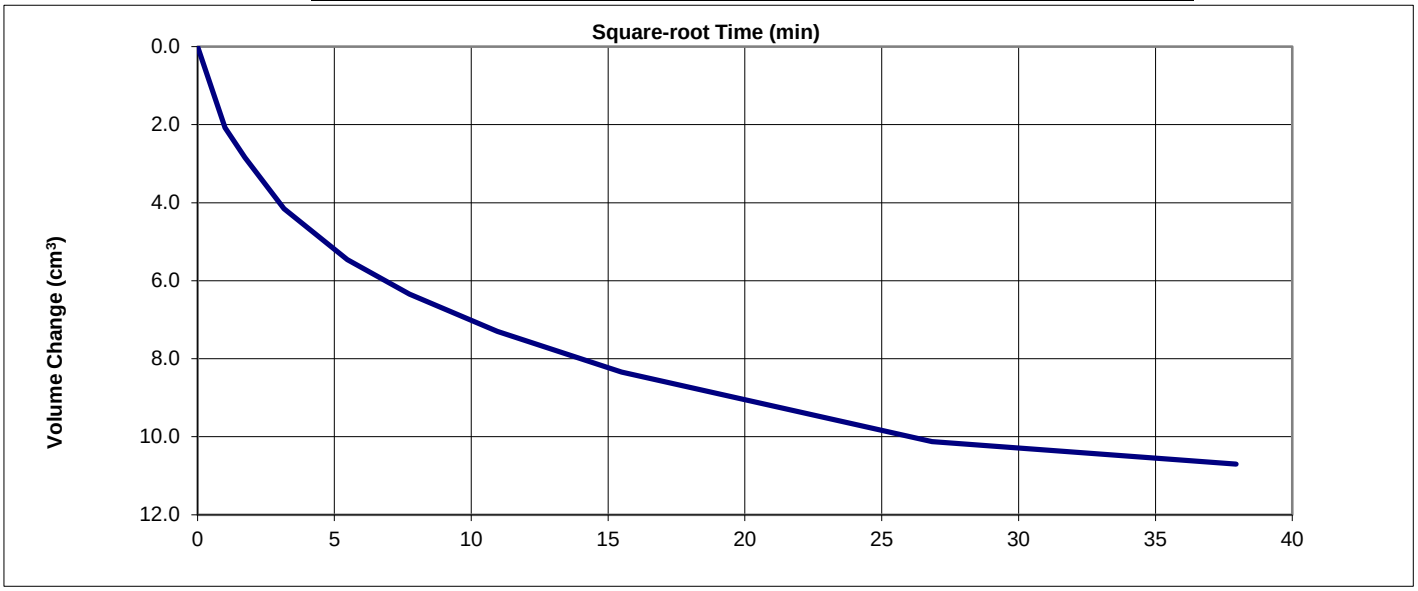
PERMEABILITY IN A TRIAXIAL CELL

BS 1377 - Part 2 : 2022 : Clause 23 in accordance with BS EN ISO 17892 - 11 : 2019

Specimen Details		
Hole Number:		BH107S
Sample Number:	m	
Sample Type:		U
Top Depth (m):		8.10
Base Depth (m):		8.50
Saturation		
Cell Pressure Incr.	kPa	50
Back Pressure Incr.	kPa	50
Differential Pressure	kPa	10
Final Cell Pressure	kPa	350
Final B Value	-	0.96



Consolidation		
Effective Pressure	kPa	100
Cell Pressure	kPa	400
Back Pressure	kPa	300
Final PWP	kPa	301
PWP dissipation	%	99



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Project West Knockharley Landfill

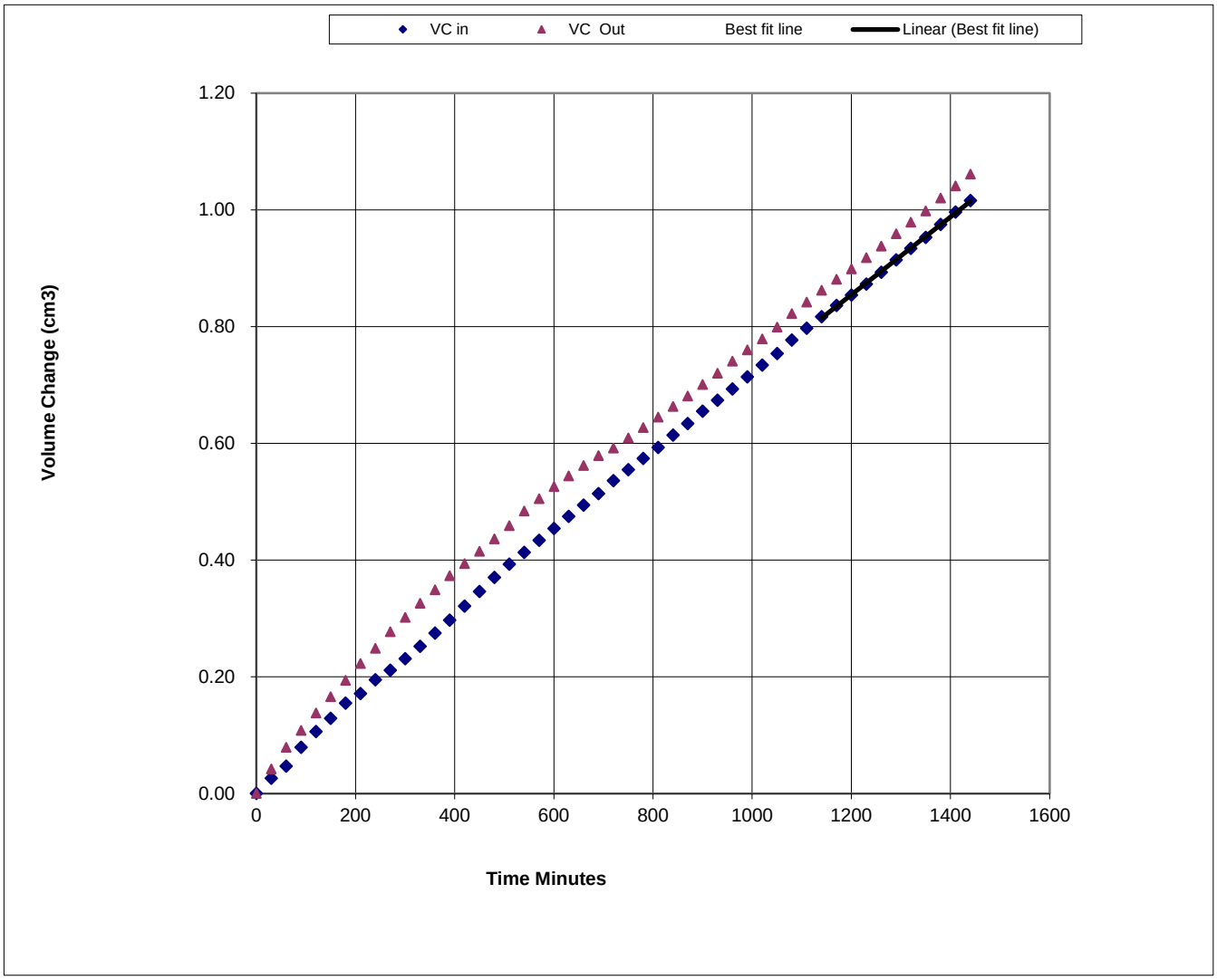
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Client Ref
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PERMEABILITY IN A TRIAXIAL CELL

BS 1377 - Part 2 : 2022 : Clause 23 in accordance with BS EN ISO 17892 - 11 : 2019

Specimen Details		
Hole Number:		BH107S
Sample Number:	m	
Sample Type:		U
Top Depth (m):		8.10
Base Depth (m):		8.50

Permeability Stage

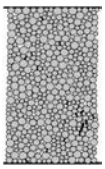


Permeability Stage		
Cell Pressure	kPa	400
Mean Effective Stress	kPa	100
Back Pressure Diff.	kPa	20
Mean Rate of Flow	ml/min	0.0007
Average Temperature	'C	20
Vertical Permeability Kv	m/s	6.5E-11

Effective Stress Triaxial Compression

Consolidated Undrained

Summary Report

Sample Details					
 *sketch showing specimen location in original sample*	Depth		9.10-9.50m U		
	Description		See summary of soil descriptions.		
	Type		Undisturbed, vertical orientation.		
	Initial Sample Length	L_0	(mm)	207.5	
	Initial Sample Diameter	D_0	(mm)	103.5	
	Initial Sample Weight	W_0	(gr)	4240.0	
	Initial Bulk Density	ρ_0	(Mg/m3)	2.43	
	Particle Density	ρ_s	(Mg/m3)	2.65	Assumed

Initial Conditions			Stage 1	2	3	4
Initial Cell Pressure	σ_{3i}	(kPa)	590	680	860	
Initial Back Pressure	U_{bi}	(kPa)	500	500	500	
Membrane Thickness	m_b	(mm)	0.400			
Displacement Input	L_{IP}	(mm)	CH 2			
Load Input	N_{IP}	(N)	CH 1			
Pore Water Pressure Input	u_{pwp}	(kPa)	CH 3			
Sample Volume	V	(cc)	CH 6			
Initial Moisture	ω_i	(%)	6.77			
Initial Dry Density	ρ_{di}	(Mg/m3)	2.27			
Initial Voids Ratio	e_i	.	0.165			
Initial Degree of Saturation	S_i	(%)	100			
B Value	B	.	0.96			

Final Conditions						
Final Moisture	ω_f	(%)	6.90			
Final Dry Density	ρ_{df}	(Mg/m3)	2.32			
Final Voids Ratio	e_f	.	0.141			
Final Degree of Saturation	S_f	(%)	100.0			
			Stage 1	2	3	4
Failure Criteria		.	Max. Dev.	Max. Dev.	Max. Dev.	
Strain At Failure	ε_f	(%)	2.57	3.96	14.24	
Stress At Failure	$(\sigma_1-\sigma_3)$	(kPa)	274.3	428.2	857.2	
Minor Stress At Failure	σ_3'	(kPa)	35.2	105.0	300.0	
Major Stress At Failure	σ_1'	(kPa)	309.5	533.2	1157.2	
Principal Stress Ratio At Failure	σ_1'/σ_3'		8.785	5.078	3.857	
PwP At Failure Criteria	u_f		555.1	575.4	560.0	

Notes



Plastic

Test Method	BS 1377-2: 2022 tested in accordance with BS EN ISO 17892-9.			Test Name	BH101S 9.10-9.50m U
				Test Date	28/08/2025
				Borehole	BH101S
Jobfile	Project West Knockharley Landfill			Sample	9.10-9.50m U
Client	Ground Investigations Ireland			Depth	9.10-9.50m U
Operator	David Burton	Checked	S.Royle	Approved	S.Royle

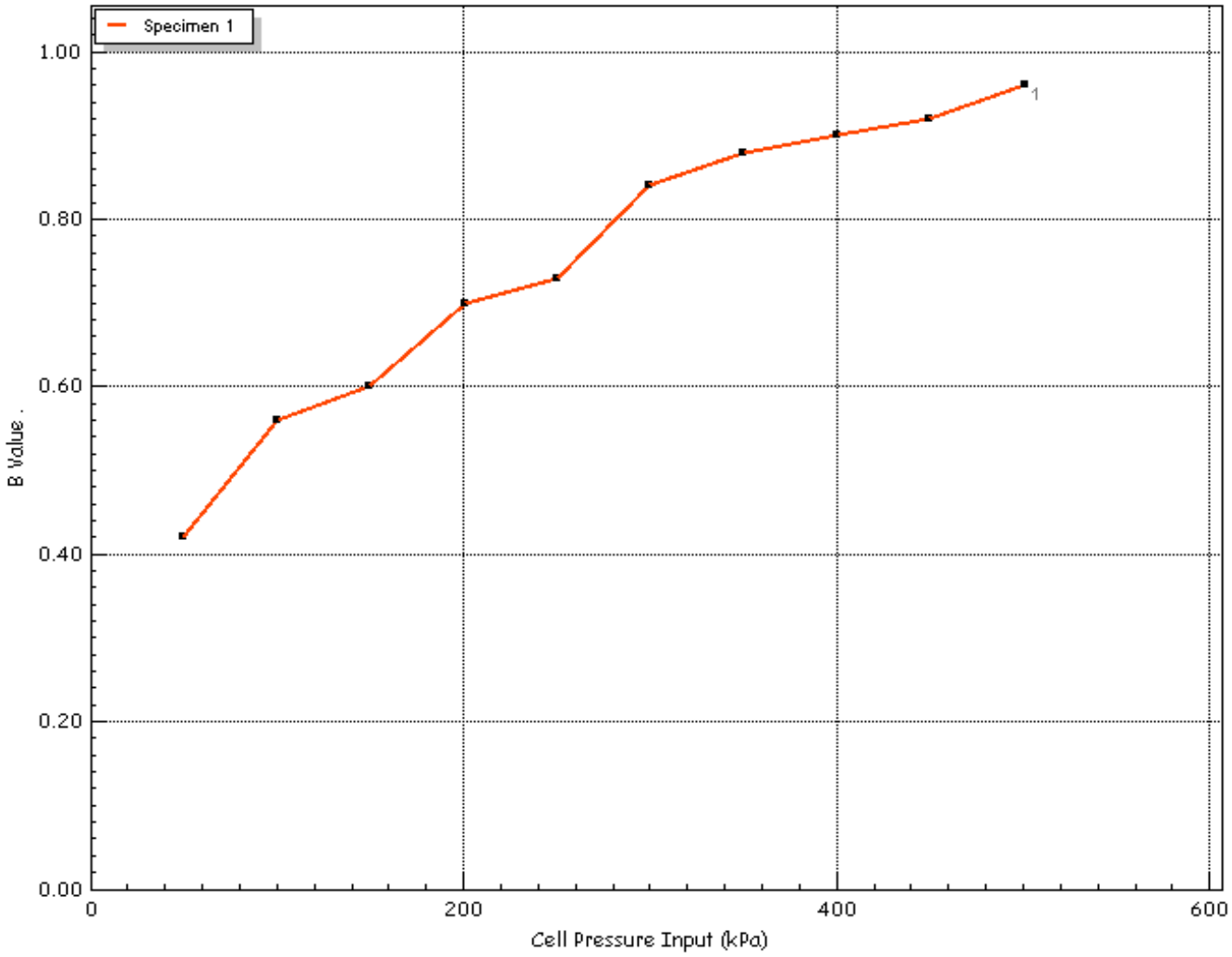
PSL Laboratory

Effective Stress Triaxial Compression

Consolidated Undrained

Saturation Plots

Saturation Method			Stepped
Cell Pressure Input	σ	(kPa)	500
Pore Water Pressure Input	u pwp	(kPa)	481
B Value	B	.	0.96



Test Method	BS 1377-2: 2022 tested in accordance with BS EN ISO 17892-9.			Test Name	BH101S 9.10-9.50m U
				Test Date	28/08/2025
				Borehole	BH101S
Jobfile	Project West Knockharley Landfill			Sample	9.10-9.50m U
Client	Ground Investigations Ireland			Depth	9.10-9.50m U
Operator	David Burton	Checked	S.Royle	Approved	S.Royle

PSL Laboratory

Effective Stress Triaxial Compression

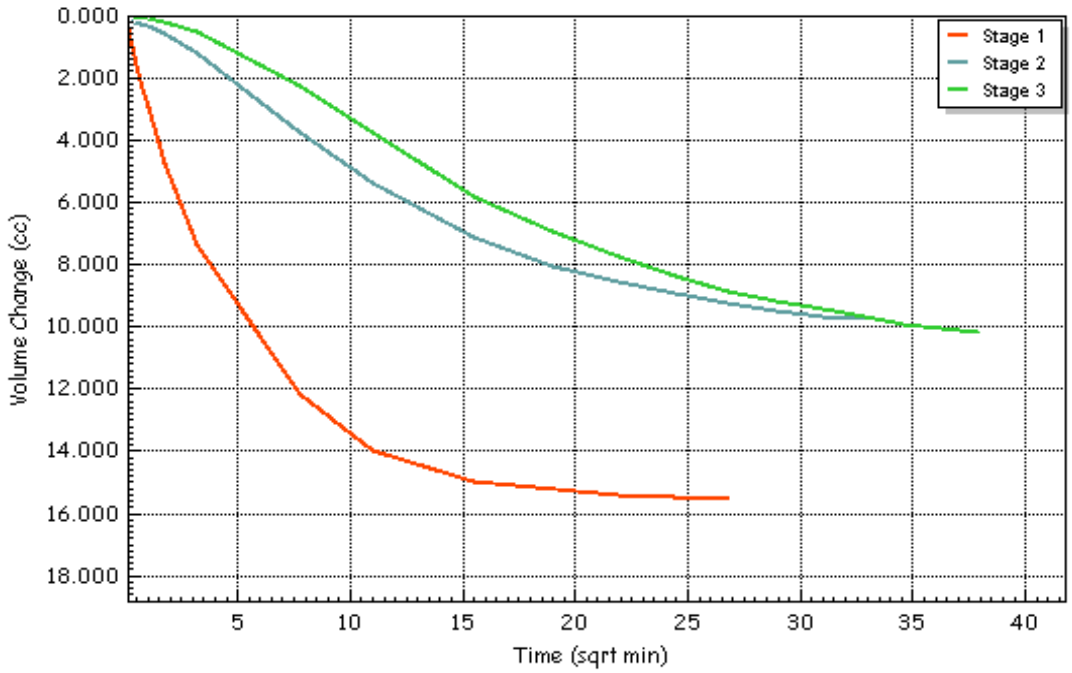
Consolidated Undrained

Consolidation Plots

Initial Conditions					
			Stage 1	2	3
Initial Cell Pressure	σ_3	(kPa)	590	680	860
Initial Back Pressure	u_{bi}	(kPa)	501	500	500
Pore Water Pressure Input	u_{pwp}	(kPa)	559	607	695
Drainage Method			Radial+One End		

Final Conditions					
			Stage 1	2	3
PWP Dissipation %	U%	(%)	100.00	100.00	100.00
Volumetric Strain	ε_v%	(%)	0.89	0.56	0.58
Corrected Length	L_c	(mm)	206.9	201.2	197.2
Corrected Area	A_c	(cm2)	83.63	85.51	86.73
Corrected Volume	V_c	(cc)	1730.241	1720.495	1710.310
t100	t_{100}	(min)	26.80	292.05	553.86
Consolidation	c_v	(m2/year)	0.082	0.008	0.004
Compressibility	m_v	(m2/MN)	0.151	0.052	0.030
Test Time	t_F	(h:m:s)	02:00:00	08:45:41	16:36:56
Estimated Strain to Failure	ε%	(%)	5.0	5.0	5.0
Shear Machine Speed	d_r	(mm/min)	0.08620	0.01914	0.00989

Notes



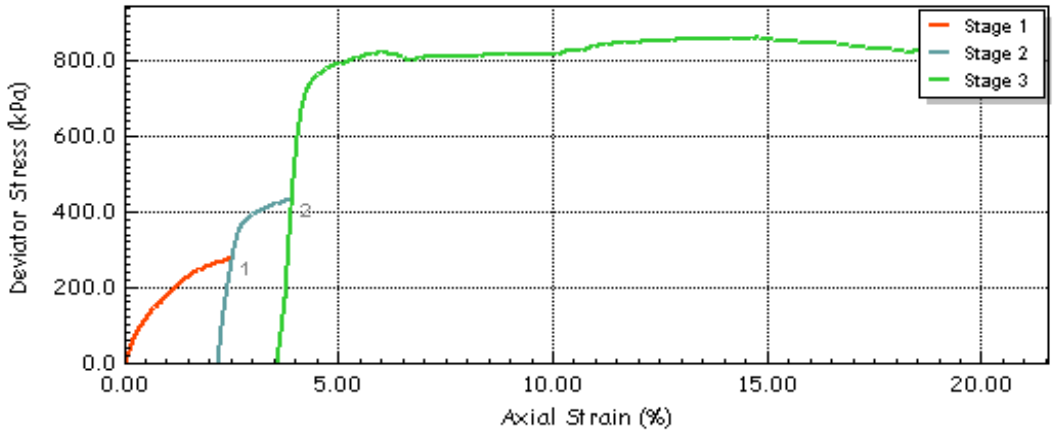
Test Method	BS 1377-2: 2022 tested in accordance with BS EN ISO 17892-9.		Test Name	BH101S 9.10-9.50m U	
			Test Date	28/08/2025	
			Borehole	BH101S	
Jobfile	Project West Knockharley Landfill		Sample	9.10-9.50m U	
Client	Ground Investigations Ireland		Depth	9.10-9.50m U	
Operator	David Burton	Checked S.Royle		Approved	S.Royle

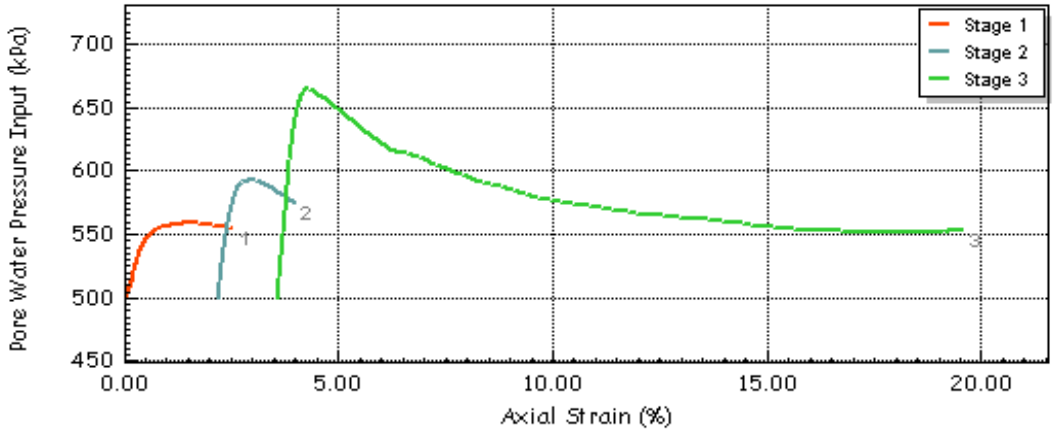
PSL Laboratory

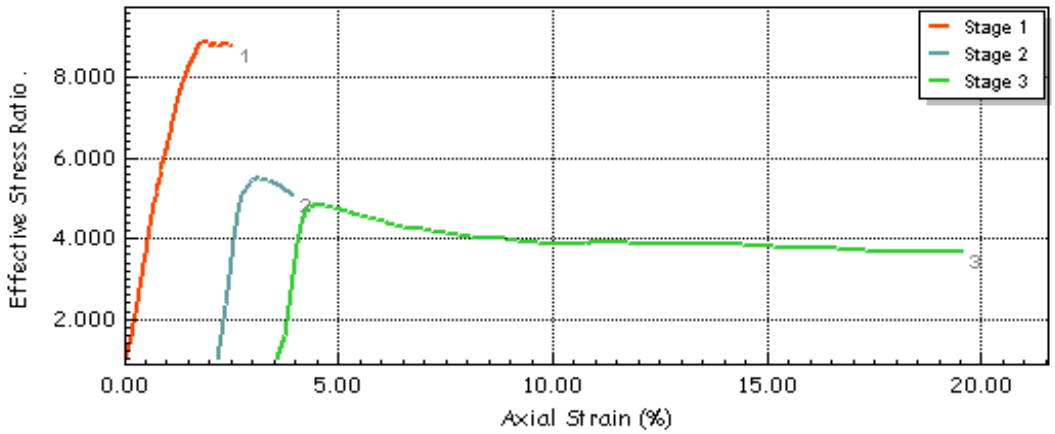
Effective Stress Triaxial Compression

Consolidated Undrained

Shear Stage Plots







Test Method	BS 1377-2: 2022 tested in accordance with BS EN ISO 17892-9.			Test Name	BH101S 9.10-9.50m U
				Test Date	28/08/2025
				Borehole	BH101S
Jobfile	Project West Knockharley Landfill			Sample	9.10-9.50m U
Client	Ground Investigations Ireland			Depth	9.10-9.50m U
Operator	David Burton	Checked	S.Royle	Approved	S.Royle

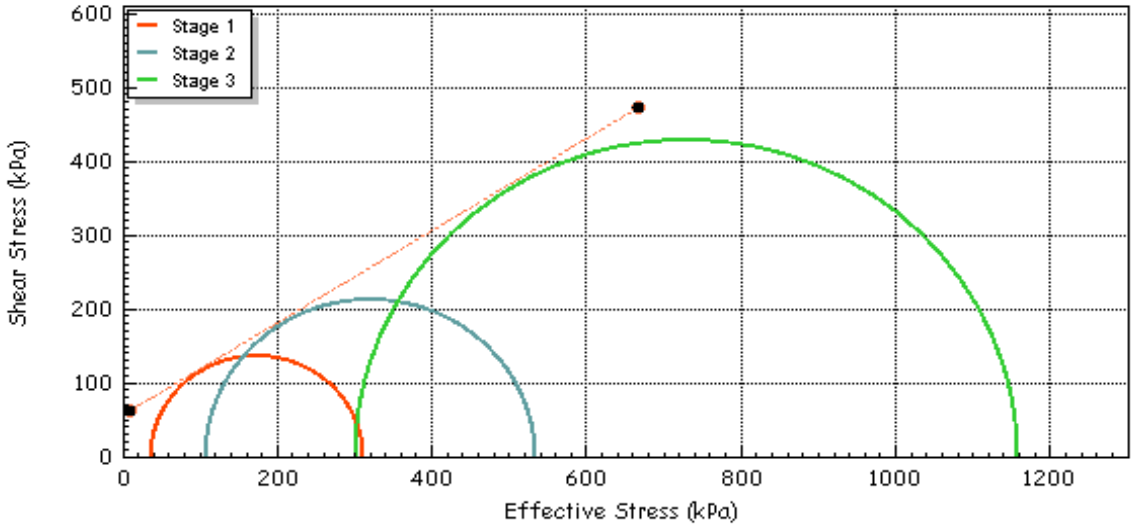
PSL Laboratory

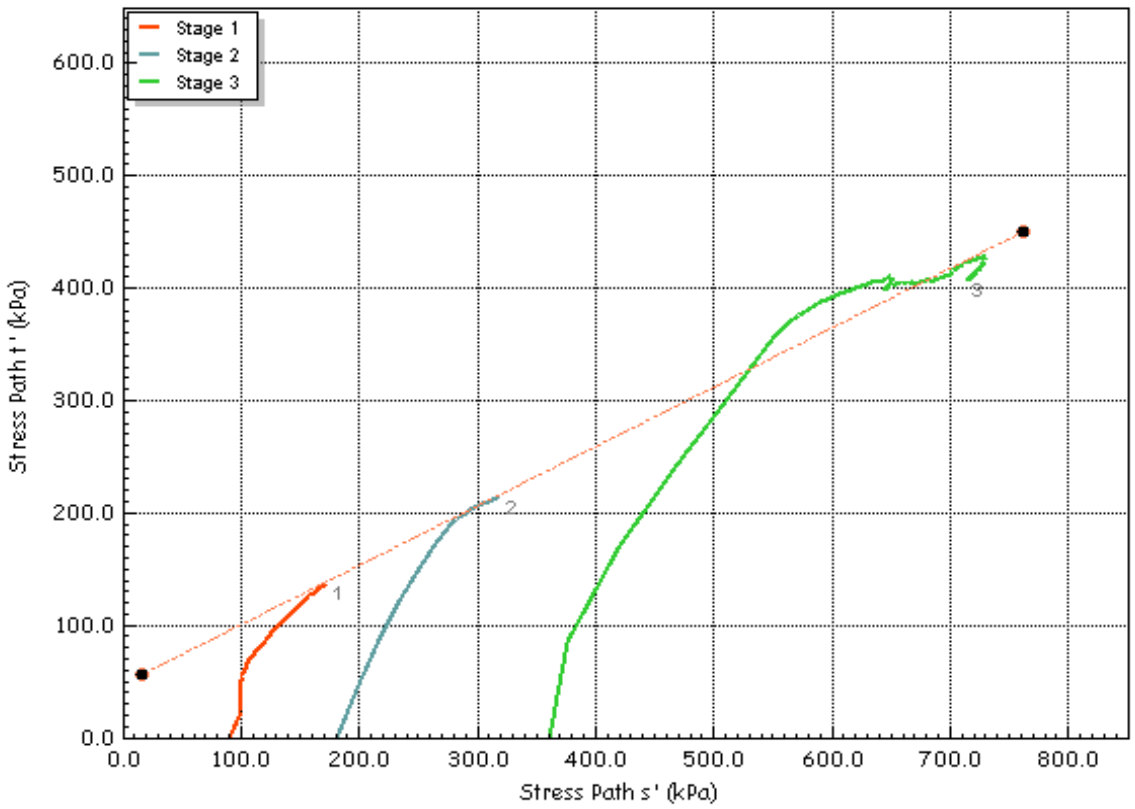
Effective Stress Triaxial Compression

Consolidated Undrained

Shear Stage Plots

Effective	c'	(kPa)	56.48	Effective Cohesion	c'	(kPa)	56.48
Effective Friction	ϕ'	(deg)	32.0	Effective Friction	ϕ'	(deg)	32.0



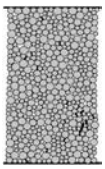


Test Method	BS 1377-2: 2022 tested in accordance with BS EN ISO 17892-9.			Test Name	BH101S 9.10-9.50m U
				Test Date	28/08/2025
				Borehole	BH101S
Jobfile	Project West Knockharley Landfill			Sample	9.10-9.50m U
Client	Ground Investigations Ireland			Depth	9.10-9.50m U
Operator	David Burton	Checked	S.Royle	Approved	S.Royle

Effective Stress Triaxial Compression

Consolidated Undrained

Summary Report

Sample Details					
	Depth		13.50-14.00m U		
	Description		See summary of soil descriptions.		
	Type		Undisturbed, vertical orientation.		
	Initial Sample Length	L_0	(mm)	207.5	
	Initial Sample Diameter	D_0	(mm)	104.0	
	Initial Sample Weight	W_0	(gr)	4063.0	
	Initial Bulk Density	ρ_0	(Mg/m3)	2.31	
sketch showing specimen location in original sample	Particle Density	ρ_s	(Mg/m3)	2.65	Assumed

Initial Conditions			Stage 1	2	3	4
Initial Cell Pressure	σ_{3i}	(kPa)	640	780	1060	
Initial Back Pressure	U_{bi}	(kPa)	500	500	500	
Membrane Thickness	m_b	(mm)	0.400			
Displacement Input	L_{IP}	(mm)	CH 2			
Load Input	N_{IP}	(N)	CH 1			
Pore Water Pressure Input	u_{pwp}	(kPa)	CH 3			
Sample Volume	V	(cc)	CH 6			
Initial Moisture	ω_i	(%)	7.92			
Initial Dry Density	ρ_{di}	(Mg/m3)	2.14			
Initial Voids Ratio	e_i	.	0.241			
Initial Degree of Saturation	S_i	(%)	87			
B Value	B	.	0.95			

Final Conditions						
Final Moisture	ω_f	(%)	7.14			
Final Dry Density	ρ_{df}	(Mg/m3)	2.22			
Final Voids Ratio	e_f	.	0.192			
Final Degree of Saturation	S_f	(%)	98.5			
			Stage 1	2	3	4
Failure Criteria		.	Max. Dev.	Max. Dev.	Max. Dev.	
Strain At Failure	ε_f	(%)	1.73	2.99	5.53	
Stress At Failure	$(\sigma_1-\sigma_3)$	(kPa)	252.6	443.5	801.7	
Minor Stress At Failure	σ_3'	(kPa)	40.9	128.0	313.0	
Major Stress At Failure	σ_1'	(kPa)	293.5	571.5	1114.7	
Principal Stress Ratio At Failure	σ_1'/σ_3'		7.178	4.465	3.561	
PwP At Failure Criteria	u_f		599.3	652.0	747.0	

Notes



Plastic

Test Method	BS 1377-2: 2022 tested in accordance with BS EN ISO 17892-9.		Test Name	BH105S 13.50-14.00m U	
			Test Date	28/08/2025	
			Borehole	BH105S	
Jobfile	Project West Knockharley Landfill		Sample	13.50-14.00m U	
Client	Ground Investigations Ireland		Depth	13.50-14.00m U	
Operator	David Burton	Checked	S.Royle	Approved	S.Royle

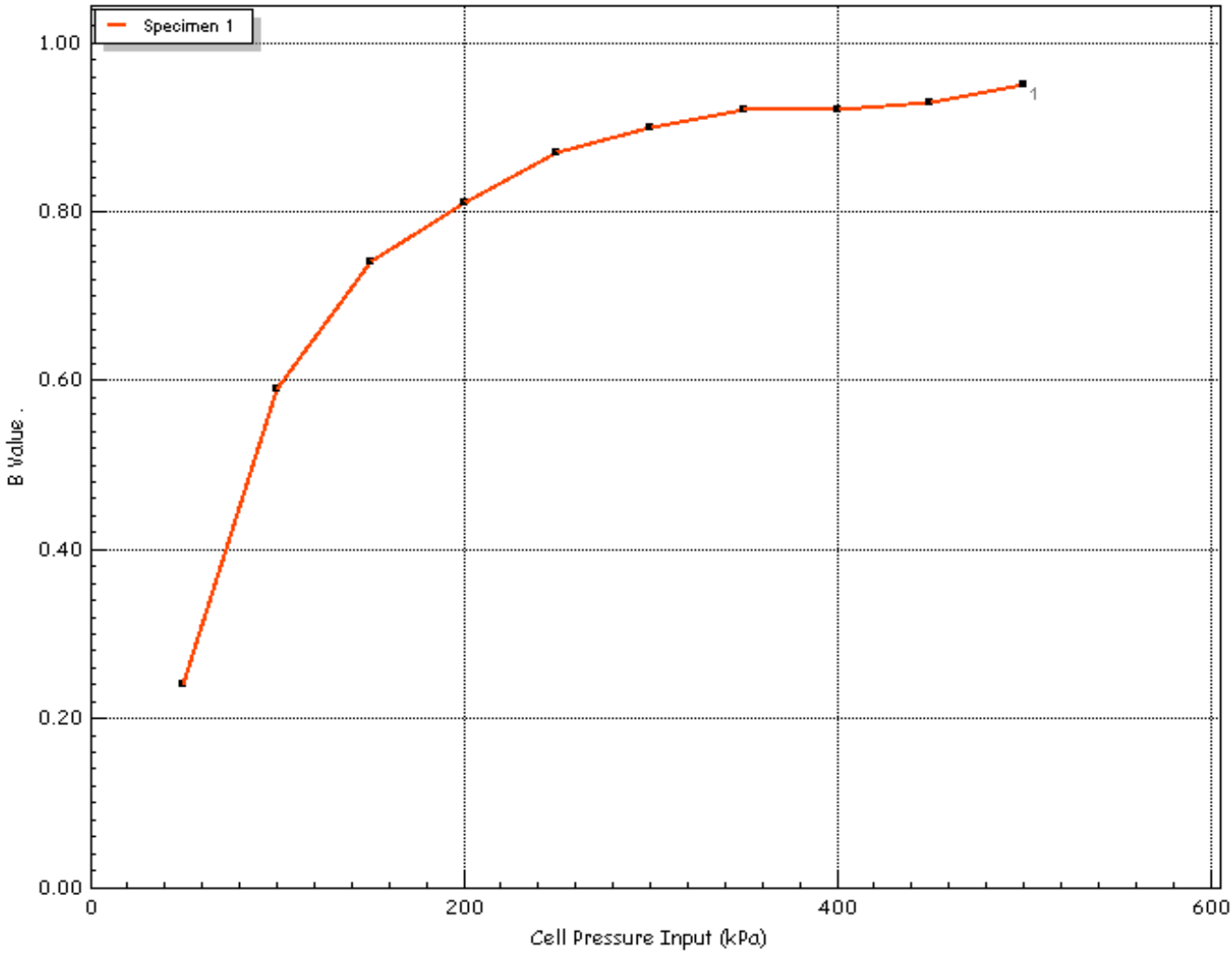
PSL Laboratory

Effective Stress Triaxial Compression

Consolidated Undrained

Saturation Plots

Saturation Method			Stepped
Cell Pressure Input	σ	(kPa)	500
Pore Water Pressure Input	u pwp	(kPa)	481
B Value	B	.	0.95



PSL PROFESSIONAL SOILS LABORATORY	Test Method	BS 1377-2: 2022 tested in accordance with BS EN ISO 17892-9.		Test Name	BH105S 13.50-14.00m U
				Test Date	28/08/2025
				Borehole	BH105S
	Jobfile	Project West Knockharley Landfill		Sample	13.50-14.00m U
	Client	Ground Investigations Ireland		Depth	13.50-14.00m U
	Operator	David Burton	Checked S.Royle	Approved	S.Royle

PSL Laboratory

Effective Stress Triaxial Compression

Consolidated Undrained

Consolidation Plots

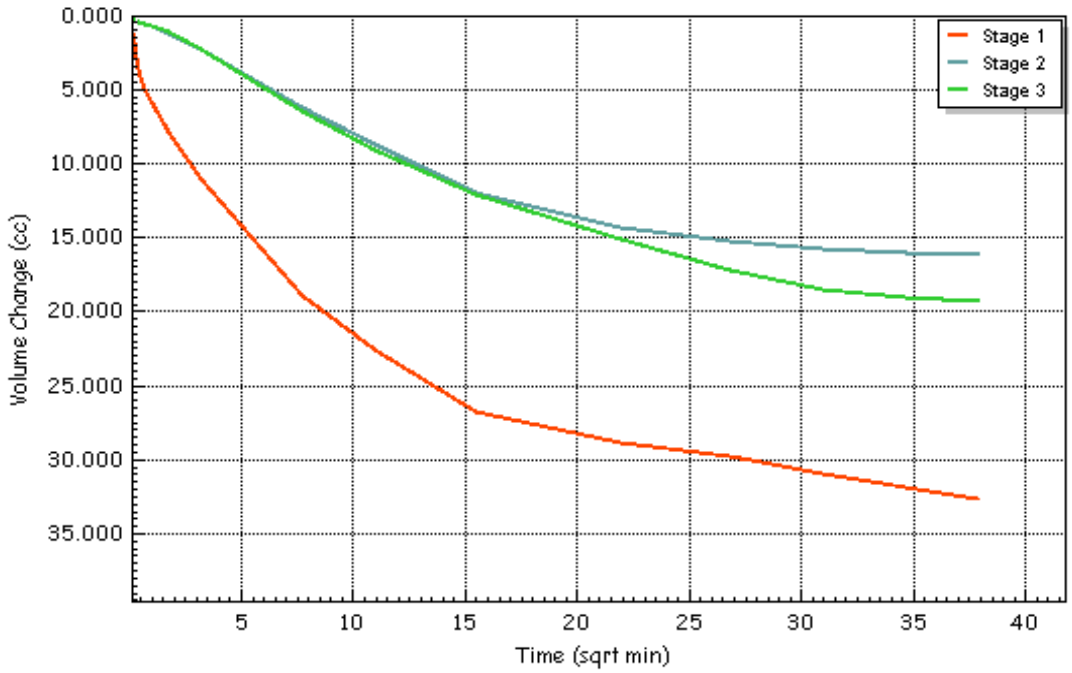
Initial Conditions

			Stage 1	2	3
Initial Cell Pressure	σ_3	(kPa)	640	780	1060
Initial Back Pressure	u_{bi}	(kPa)	500	502	499
Pore Water Pressure Input	u_{pwp}	(kPa)	615	715	936
Drainage Method			Radial+One End		

Final Conditions

			Stage 1	2	3
PWP Dissipation %	U%	(%)	100.00	100.00	100.00
Volumetric Strain	ε_v%	(%)	1.85	0.92	1.09
Corrected Length	L_C	(mm)	206.2	202.0	198.0
Corrected Area	A_C	(cm2)	83.90	84.84	85.58
Corrected Volume	V_C	(cc)	1730.025	1713.803	1694.556
t100	t_{100}	(min)	157.54	361.45	422.63
Consolidation	c_v	(m2/year)	0.014	0.006	0.005
Compressibility	m_v	(m2/MN)	0.161	0.043	0.025
Test Time	t_F	(h:m:s)	04:43:34	10:50:36	12:40:44
Estimated Strain to Failure	ε%	(%)	5.0	5.0	5.0
Shear Machine Speed	d_r	(mm/min)	0.03636	0.01552	0.01301

Notes



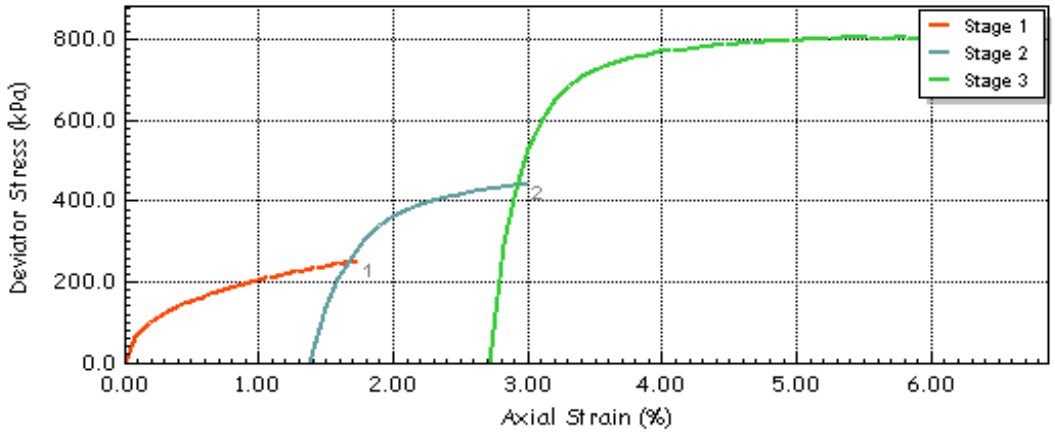
Test Method	BS 1377-2: 2022 tested in accordance with BS EN ISO 17892-9.			Test Name	BH105S 13.50-14.00m U
				Test Date	28/08/2025
				Borehole	BH105S
Jobfile	Project West Knockharley Landfill			Sample	13.50-14.00m U
Client	Ground Investigations Ireland			Depth	13.50-14.00m U
Operator	David Burton	Checked	S.Royle	Approved	S.Royle

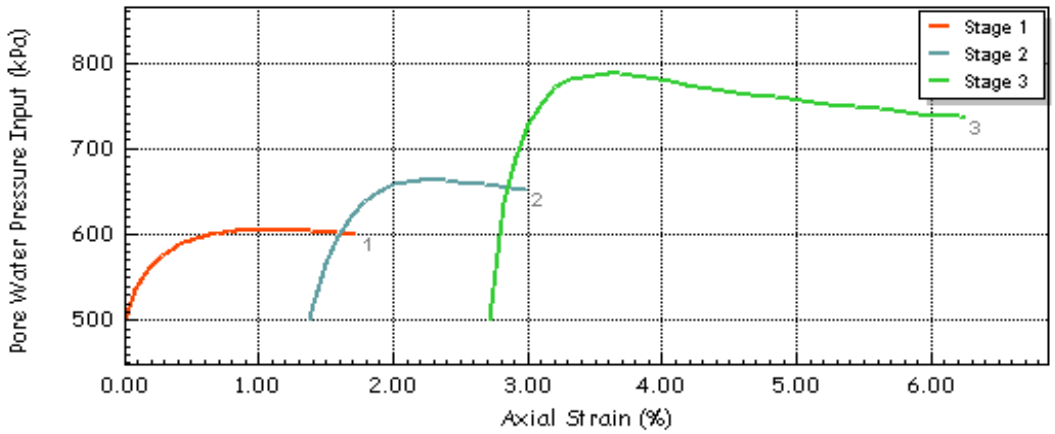
PSL Laboratory

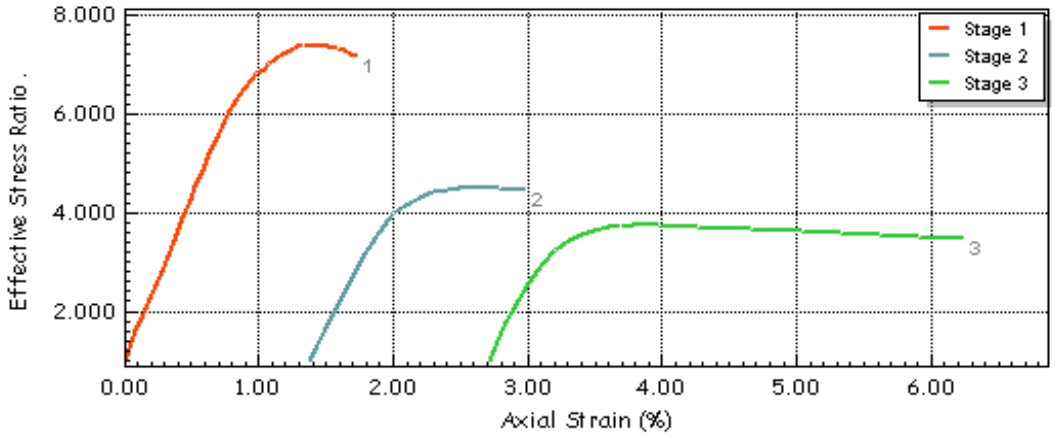
Effective Stress Triaxial Compression

Consolidated Undrained

Shear Stage Plots







Test Method	BS 1377-2: 2022 tested in accordance with BS EN ISO 17892-9.			Test Name	BH105S 13.50-14.00m U
				Test Date	28/08/2025
				Borehole	BH105S
Jobfile	Project West Knockharley Landfill			Sample	13.50-14.00m U
Client	Ground Investigations Ireland			Depth	13.50-14.00m U
Operator	David Burton	Checked	S.Royle	Approved	S.Royle

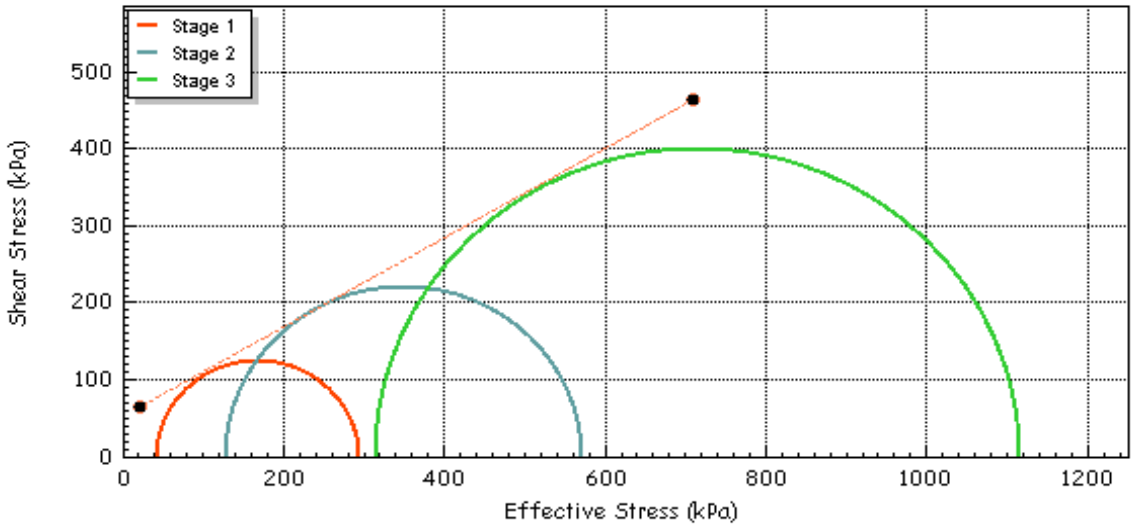
PSL Laboratory

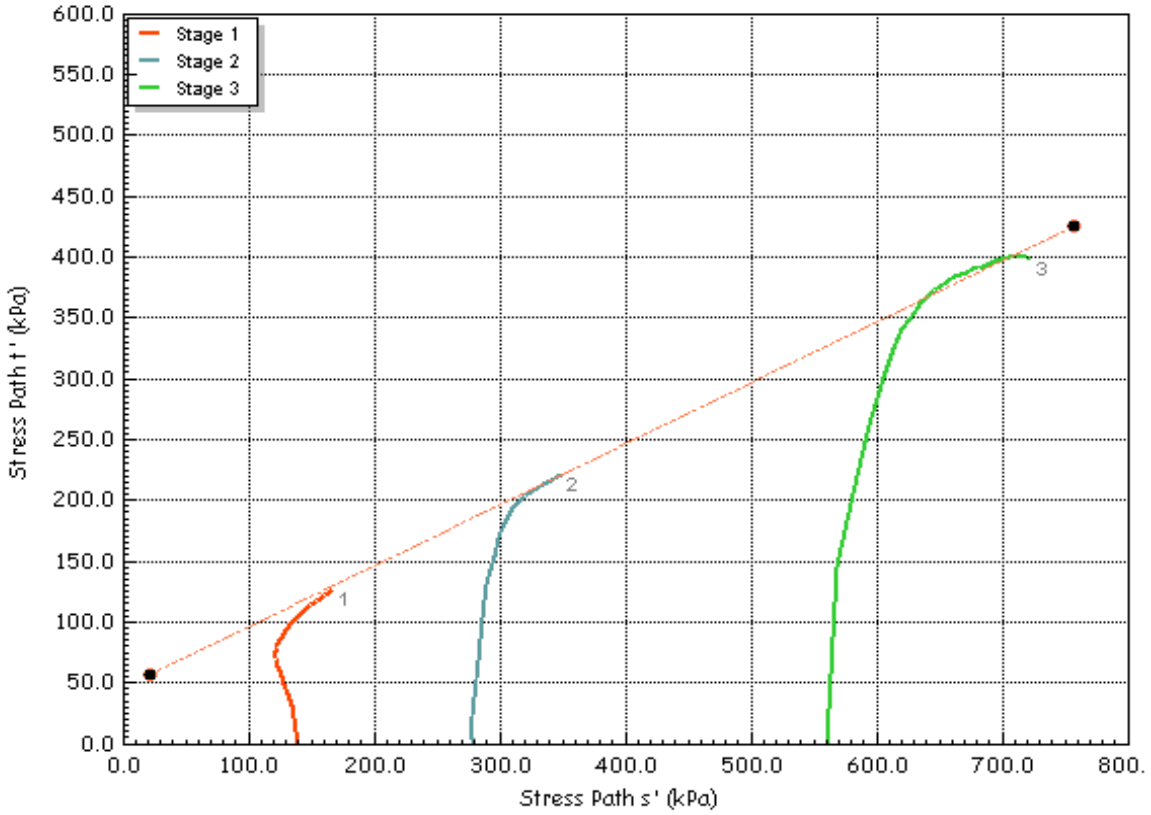
Effective Stress Triaxial Compression

Consolidated Undrained

Shear Stage Plots

Effective	c'	(kPa)	52.41	Effective Cohesion	c'	(kPa)	52.41
Effective Friction	ϕ'	(deg)	30.1	Effective Friction	ϕ'	(deg)	30.1



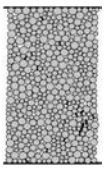


Test Method	BS 1377-2: 2022 tested in accordance with BS EN ISO 17892-9.			Test Name	BH105S 13.50-14.00m U
				Test Date	28/08/2025
				Borehole	BH105S
Jobfile	Project West Knockharley Landfill			Sample	13.50-14.00m U
Client	Ground Investigations Ireland			Depth	13.50-14.00m U
Operator	David Burton	Checked	S.Royle	Approved	S.Royle

Effective Stress Triaxial Compression

Consolidated Undrained

Summary Report

Sample Details					
 *sketch showing specimen location in original sample*	Depth		8.10-8.50m U		
	Description		See summary of soil descriptions.		
	Type		Undisturbed, vertical orientation.		
	Initial Sample Length	L_0	(mm)	209.0	
	Initial Sample Diameter	D_0	(mm)	104.0	
	Initial Sample Weight	W_0	(gr)	4083.0	
	Initial Bulk Density	ρ_0	(Mg/m3)	2.30	
	Particle Density	ρ_s	(Mg/m3)	2.65	Assumed

Initial Conditions			Stage 1	2	3	4
Initial Cell Pressure	σ_{3i}	(kPa)	530	610	770	
Initial Back Pressure	U_{bi}	(kPa)	450	450	450	
Membrane Thickness	m_b	(mm)	0.400			
Displacement Input	L_{IP}	(mm)	CH 2			
Load Input	N_{IP}	(N)	CH 1			
Pore Water Pressure Input	u_{pwp}	(kPa)	CH 3			
Sample Volume	V	(cc)	CH 6			
Initial Moisture	ω_i	(%)	10.4			
Initial Dry Density	ρ_{di}	(Mg/m3)	2.09			
Initial Voids Ratio	e_i	.	0.269			
Initial Degree of Saturation	S_i	(%)	100			
B Value	B	.	0.95			

Final Conditions						
Final Moisture	ω_f	(%)	8.87			
Final Dry Density	ρ_{df}	(Mg/m3)	2.16			
Final Voids Ratio	e_f	.	0.229			
Final Degree of Saturation	S_f	(%)	100.0			
			Stage 1	2	3	4
Failure Criteria		.	Max. Dev.	Max. Dev.	Max. Dev.	
Strain At Failure	ε_f	(%)	2.19	3.30	9.89	
Stress At Failure	$(\sigma_1-\sigma_3)$	(kPa)	198.7	351.8	835.0	
Minor Stress At Failure	σ_3'	(kPa)	35.6	82.8	272.0	
Major Stress At Failure	σ_1'	(kPa)	234.4	434.6	1107.0	
Principal Stress Ratio At Failure	σ_1'/σ_3'		6.575	5.248	4.070	
PwP At Failure Criteria	u_f		494.5	527.4	498.0	

Notes



Plastic

Test Method	BS 1377-2: 2022 tested in accordance with BS EN ISO 17892-9.			Test Name	BH108S 8.10-8.50m U
				Test Date	28/08/2025
				Borehole	BH108S
Jobfile	Project West Knockharley Landfill			Sample	8.10-8.50m U
Client	Ground Investigations Ireland			Depth	8.10-8.50m U
Operator	David Burton	Checked	S.Royle	Approved	S.Royle

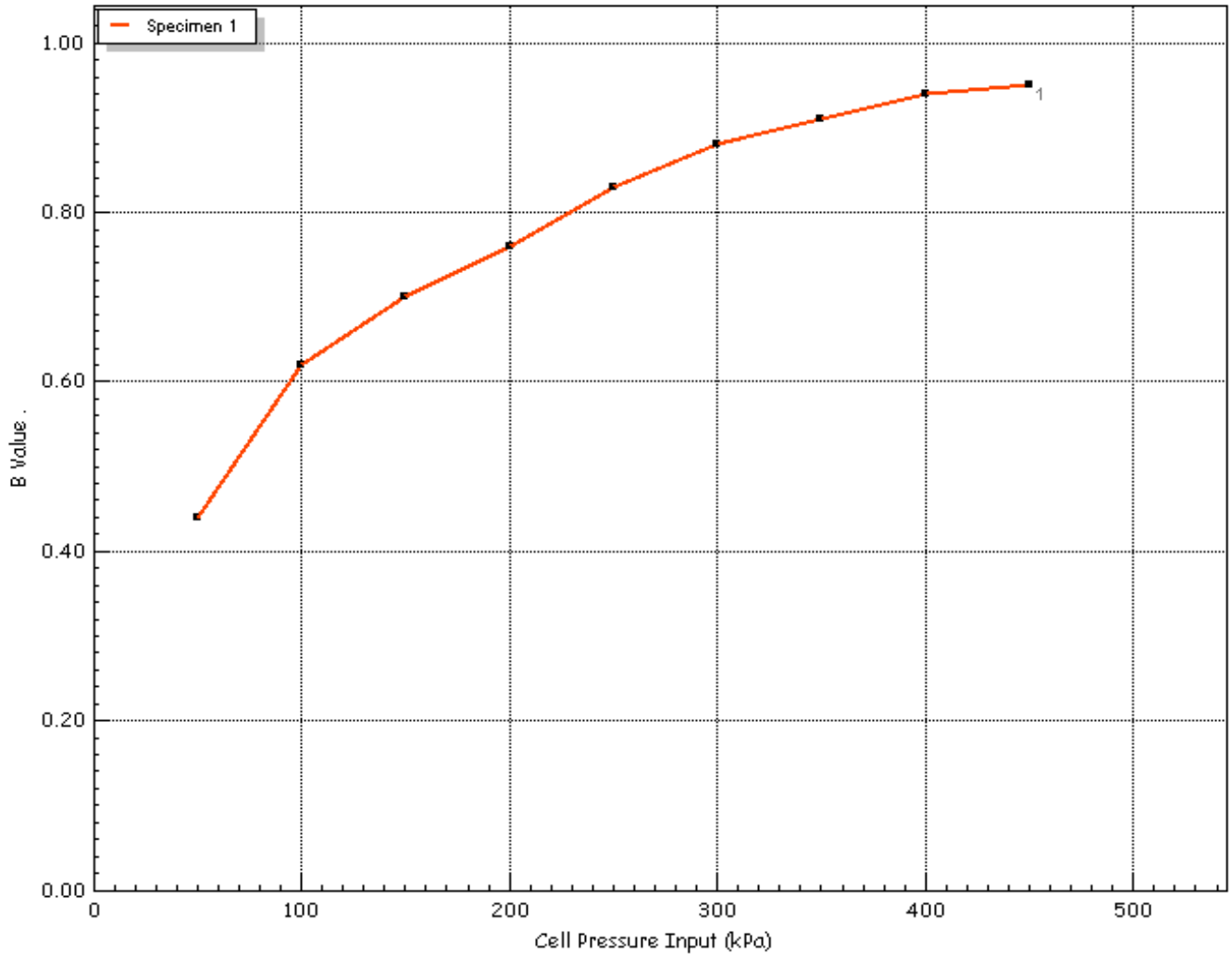
PSL Laboratory

Effective Stress Triaxial Compression

Consolidated Undrained

Saturation Plots

Saturation Method			Stepped
Cell Pressure Input	σ	(kPa)	450
Pore Water Pressure Input	u pwp	(kPa)	424
B Value	B	.	0.95



Test Method	BS 1377-2: 2022 tested in accordance with BS EN ISO 17892-9.			Test Name	BH108S 8.10-8.50m U
				Test Date	28/08/2025
				Borehole	BH108S
Jobfile	Project West Knockharley Landfill			Sample	8.10-8.50m U
Client	Ground Investigations Ireland			Depth	8.10-8.50m U
Operator	David Burton	Checked	S.Royle	Approved	S.Royle

PSL Laboratory

Effective Stress Triaxial Compression

Consolidated Undrained

Consolidation Plots

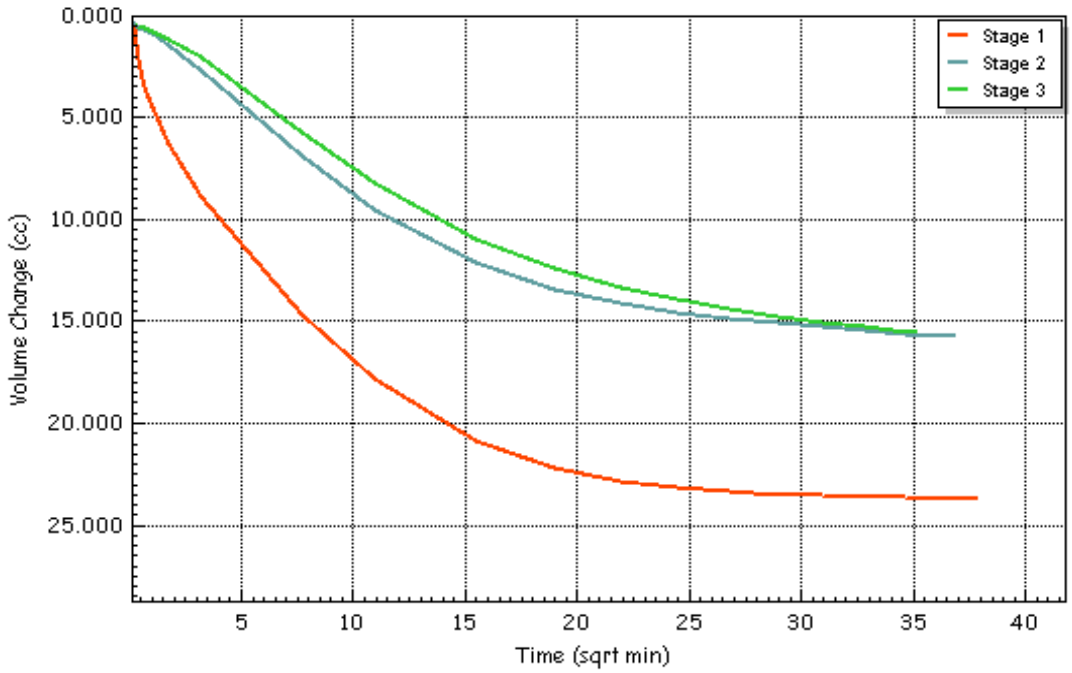
Initial Conditions

			Stage 1	2	3
Initial Cell Pressure	σ_3	(kPa)	530	610	770
Initial Back Pressure	u_{bi}	(kPa)	450	450	450
Pore Water Pressure Input	u_{pwp}	(kPa)	500	550	663
Drainage Method			Radial+One End		

Final Conditions

			Stage 1	2	3
PWP Dissipation %	U%	(%)	100.00	100.00	100.00
Volumetric Strain	ε_v%	(%)	1.34	0.89	0.88
Corrected Length	L_C	(mm)	208.1	202.9	199.0
Corrected Area	A_C	(cm2)	84.19	85.55	86.45
Corrected Volume	V_C	(cc)	1751.710	1735.941	1720.364
t100	t_{100}	(min)	70.90	272.90	388.75
Consolidation	c_v	(m2/year)	0.031	0.008	0.006
Compressibility	m_v	(m2/MN)	0.268	0.089	0.041
Test Time	t_F	(h:m:s)	02:07:37	08:11:13	11:39:45
Estimated Strain to Failure	ε%	(%)	5.0	5.0	5.0
Shear Machine Speed	d_r	(mm/min)	0.08152	0.02065	0.01422

Notes



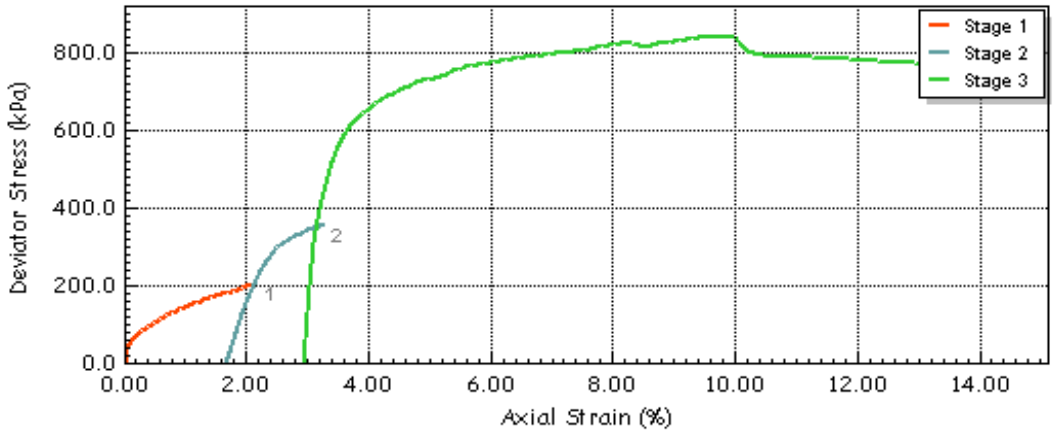
Test Method	BS 1377-2: 2022 tested in accordance with BS EN ISO 17892-9.			Test Name	BH108S 8.10-8.50m U
				Test Date	28/08/2025
				Borehole	BH108S
Jobfile	Project West Knockharley Landfill			Sample	8.10-8.50m U
Client	Ground Investigations Ireland			Depth	8.10-8.50m U
Operator	David Burton	Checked	S.Royle	Approved	S.Royle

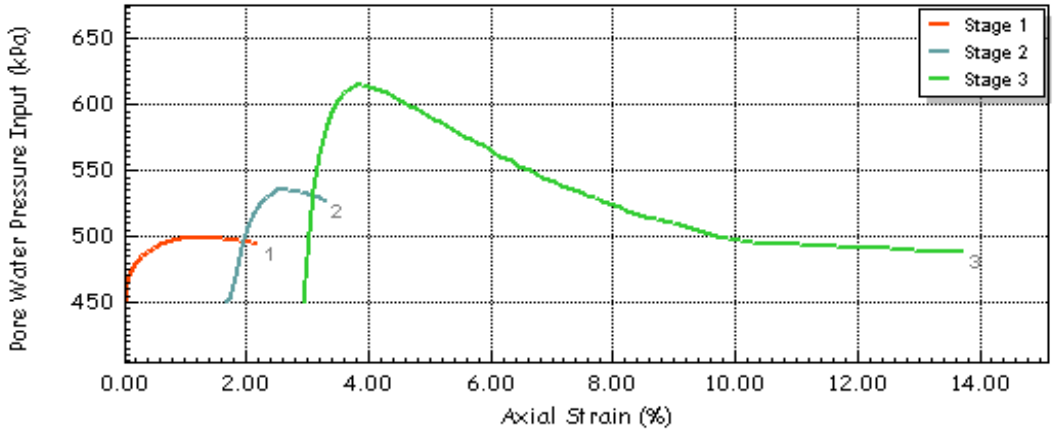
PSL Laboratory

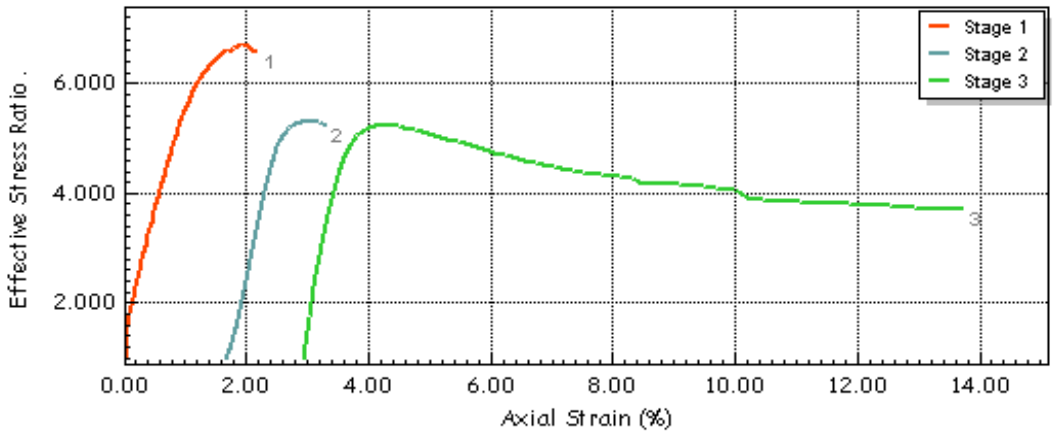
Effective Stress Triaxial Compression

Consolidated Undrained

Shear Stage Plots







PSL PROFESSIONAL SOILS LABORATORY	Test Method	BS 1377-2: 2022 tested in accordance with BS EN ISO 17892-9.		Test Name	BH108S 8.10-8.50m U
				Test Date	28/08/2025
UKAS TESTING 4043				Borehole	BH108S
	Jobfile	Project West Knockharley Landfill		Sample	8.10-8.50m U
	Client	Ground Investigations Ireland		Depth	8.10-8.50m U
	Operator	David Burton	Checked	S.Royle	Approved S.Royle

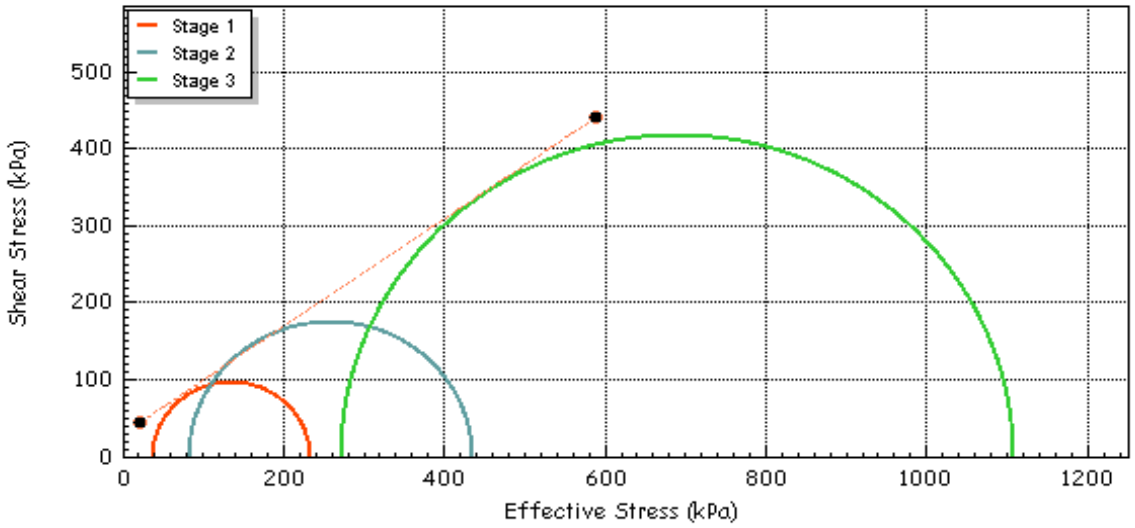
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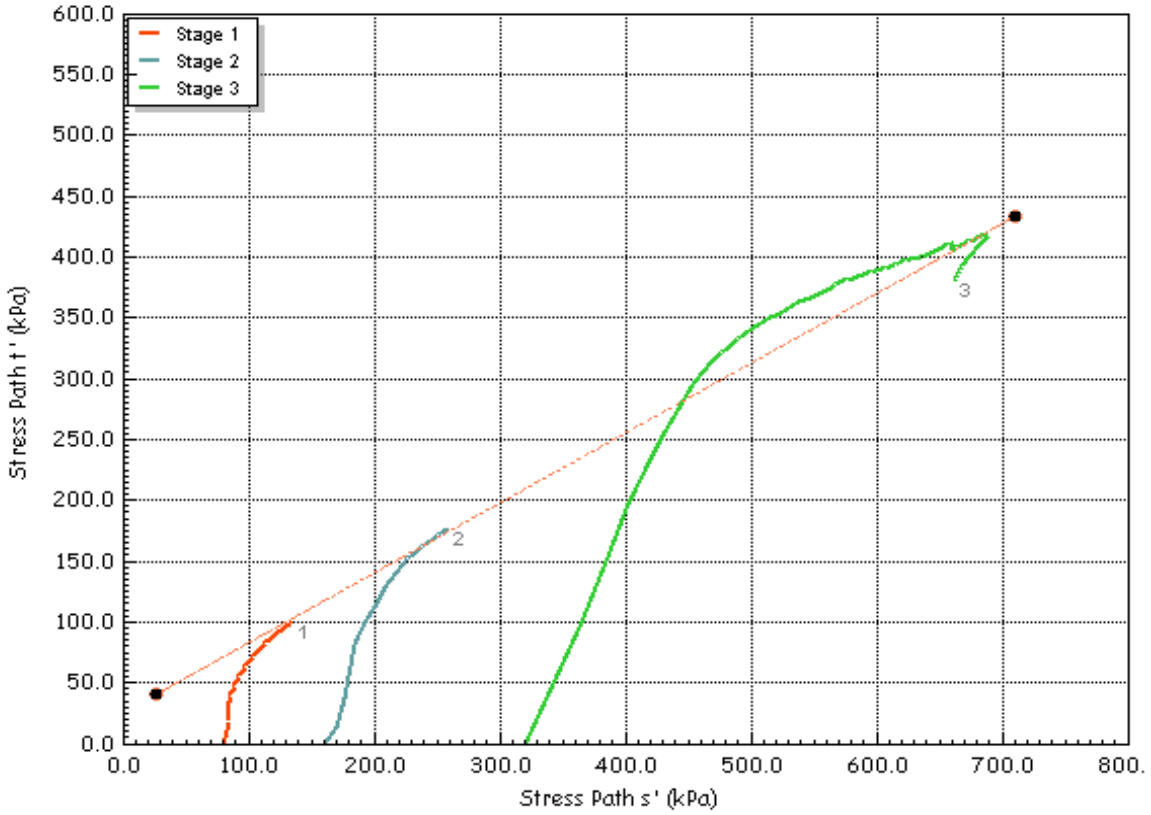
Effective Stress Triaxial Compression

Consolidated Undrained

Shear Stage Plots

Effective	c'	(kPa)	29.74	Effective Cohesion	c'	(kPa)	29.74
Effective Friction	ϕ'	(deg)	35.1	Effective Friction	ϕ'	(deg)	35.1





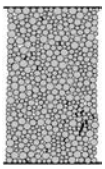
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				Test Date	28/08/2025
				Borehole	BH108S
Jobfile	Project West Knockharley Landfill			Sample	8.10-8.50m U
Client	Ground Investigations Ireland			Depth	8.10-8.50m U
Operator	David Burton	Checked	S.Royle	Approved	S.Royle

PSL Laboratory

Effective Stress Triaxial Compression

Consolidated Undrained

Summary Report

Sample Details					
 *sketch showing specimen location in original sample*	Depth		4.50-5.00m U		
	Description		See summary of soil descriptions.		
	Type		Undisturbed, vertical orientation.		
	Initial Sample Length	L_0	(mm)	200.0	
	Initial Sample Diameter	D_0	(mm)	102.0	
	Initial Sample Weight	W_0	(gr)	3580.0	
	Initial Bulk Density	ρ_0	(Mg/m3)	2.19	
	Particle Density	ρ_s	(Mg/m3)	2.65	Assumed

Initial Conditions			Stage 1	2	3	4
Initial Cell Pressure	σ_{3i}	(kPa)	850	900	1000	
Initial Back Pressure	U_{bi}	(kPa)	800	800	800	
Membrane Thickness	m_b	(mm)	0.400			
Displacement Input	L_{IP}	(mm)	CH 2			
Load Input	N_{IP}	(N)	CH 4			
Pore Water Pressure Input	u_{pwp}	(kPa)	CH 3			
Sample Volume	V	(cc)	CH 2			
Initial Moisture	ω_i	(%)	8.03			
Initial Dry Density	ρ_{di}	(Mg/m3)	2.03			
Initial Voids Ratio	e_i	.	0.307			
Initial Degree of Saturation	S_i	(%)	69			
B Value	B	.	0.96			

Final Conditions						
Final Moisture	ω_f	(%)	9.81			
Final Dry Density	ρ_{df}	(Mg/m3)	2.09			
Final Voids Ratio	e_f	.	0.267			
Final Degree of Saturation	S_f	(%)	97.3			
			Stage 1	2	3	4
Failure Criteria		.	Max. Dev.	Max. Dev.	Max. Dev.	
Strain At Failure	ε_f	(%)	5.22	9.95	20.00	
Stress At Failure	$(\sigma_1-\sigma_3)$	(kPa)	72.9	162.4	382.0	
Minor Stress At Failure	σ_3'	(kPa)	23.0	64.0	168.0	
Major Stress At Failure	σ_1'	(kPa)	95.9	226.4	550.0	
Principal Stress Ratio At Failure	σ_1'/σ_3'		4.170	3.537	3.274	
PwP At Failure Criteria	u_f		827.0	836.0	832.0	

Notes



Plastic

Test Method	BS 1377-2: 2022 tested in accordance with BS EN ISO 17892-9.		Test Name	BH103T 4.50-5.00m U	
			Test Date	27/08/2025	
			Borehole	BH103T	
Jobfile	Project West Knockharley Landfill		Sample	4.50-5.00m U	
Client	Ground Investigations Ireland		Depth	4.50-5.00m U	
Operator	David Burton	Checked	S.Royle	Approved	S.Royle

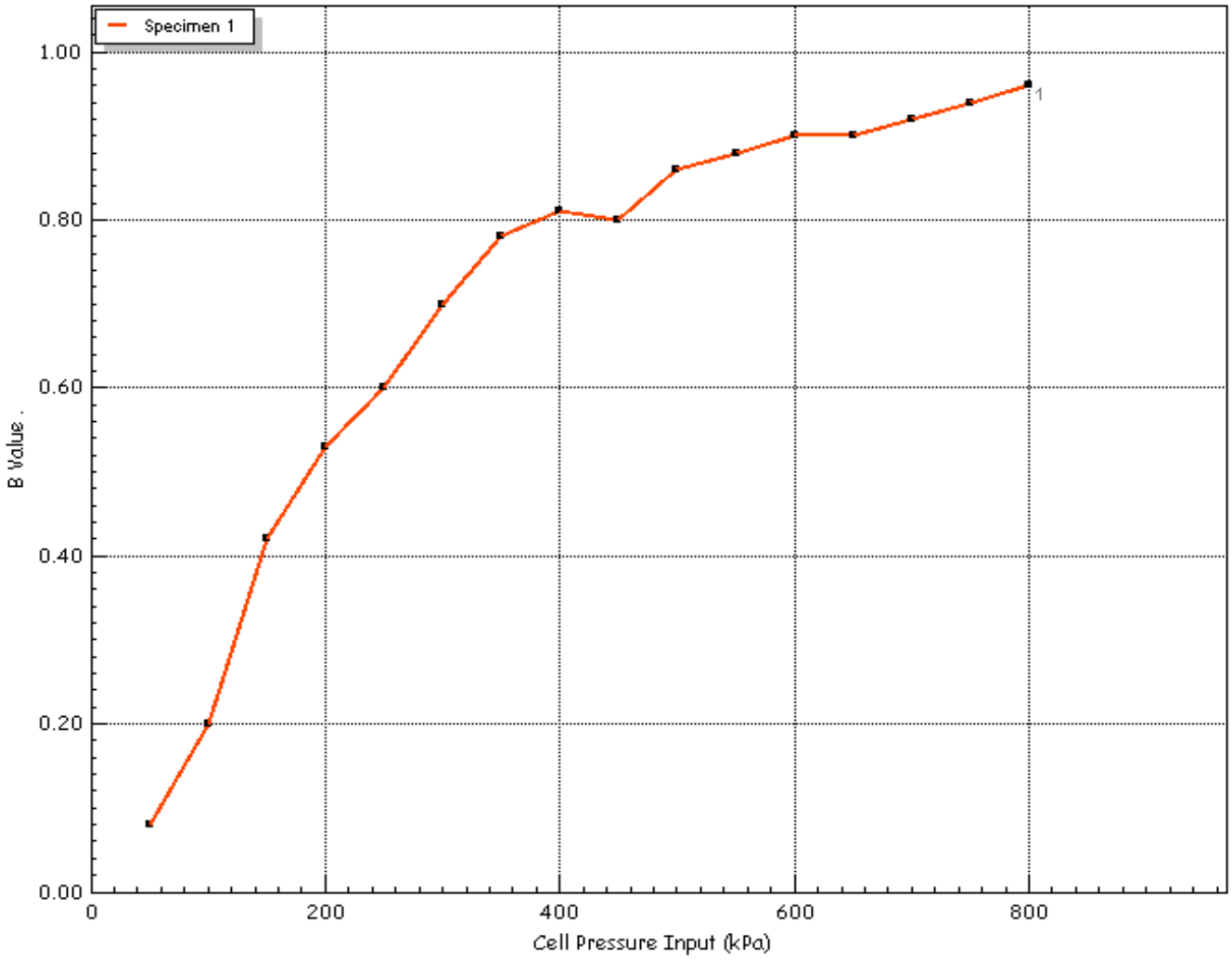
PSL Laboratory

Effective Stress Triaxial Compression

Consolidated Undrained

Saturation Plots

Saturation Method			Stepped
Cell Pressure Input	σ	(kPa)	800
Pore Water Pressure Input	u pwp	(kPa)	774
B Value	B	.	0.96



Test Method	BS 1377-2: 2022 tested in accordance with BS EN ISO 17892-9.			Test Name	BH103T 4.50-5.00m U
				Test Date	27/08/2025
				Borehole	BH103T
Jobfile	Project West Knockharley Landfill			Sample	4.50-5.00m U
Client	Ground Investigations Ireland			Depth	4.50-5.00m U
Operator	David Burton	Checked	S.Royle	Approved	S.Royle

PSL Laboratory

Effective Stress Triaxial Compression

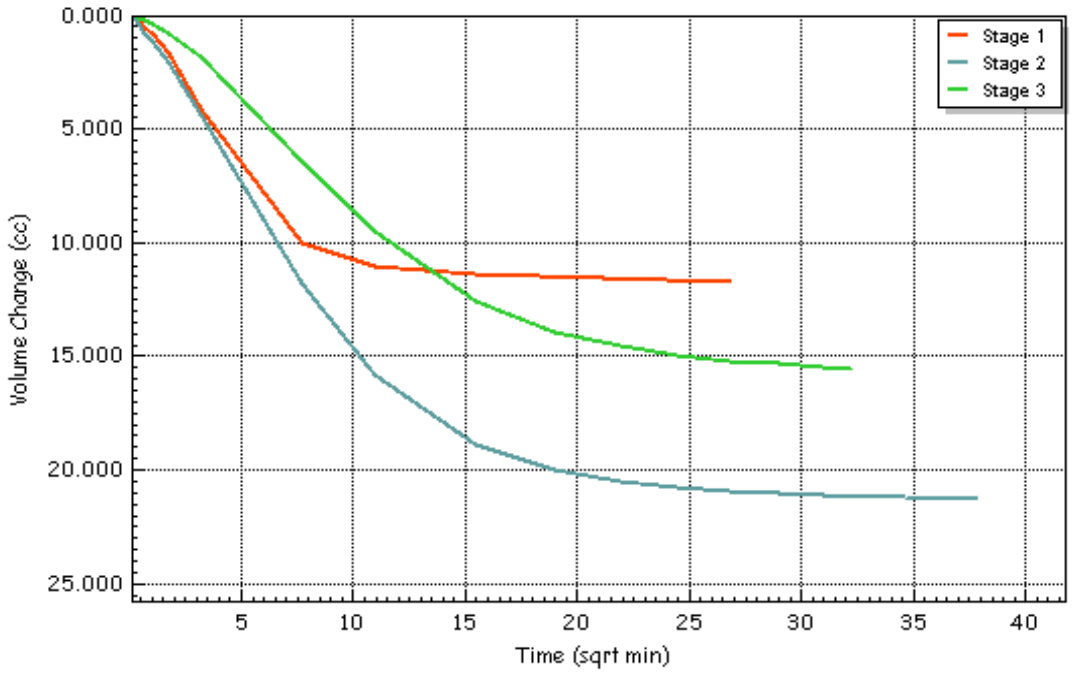
Consolidated Undrained

Consolidation Plots

Initial Conditions			Stage 1	2	3
Initial Cell Pressure	σ_3	(kPa)	850	900	1000
Initial Back Pressure	u_{bi}	(kPa)	800	801	801
Pore Water Pressure Input	u_{pwp}	(kPa)	817	847	918
Drainage Method			Radial+One End		

Final Conditions			Stage 1	2	3
PWP Dissipation %	U%	(%)	100.00	100.00	100.00
Volumetric Strain	ε_v%	(%)	0.72	1.30	0.95
Corrected Length	L_C	(mm)	199.5	188.3	178.3
Corrected Area	A_C	(cm2)	81.32	85.05	88.93
Corrected Volume	V_C	(cc)	1622.563	1601.281	1585.748
t100	t_{100}	(min)	60.57	190.85	283.07
Consolidation	c_v	(m2/year)	0.036	0.012	0.009
Compressibility	m_v	(m2/MN)	0.421	0.277	0.081
Test Time	t_F	(h:m:s)	02:00:00	05:43:31	08:29:31
Estimated Strain to Failure	ε%	(%)	5.0	5.0	5.0
Shear Machine Speed	d_r	(mm/min)	0.08313	0.02740	0.01750

Notes



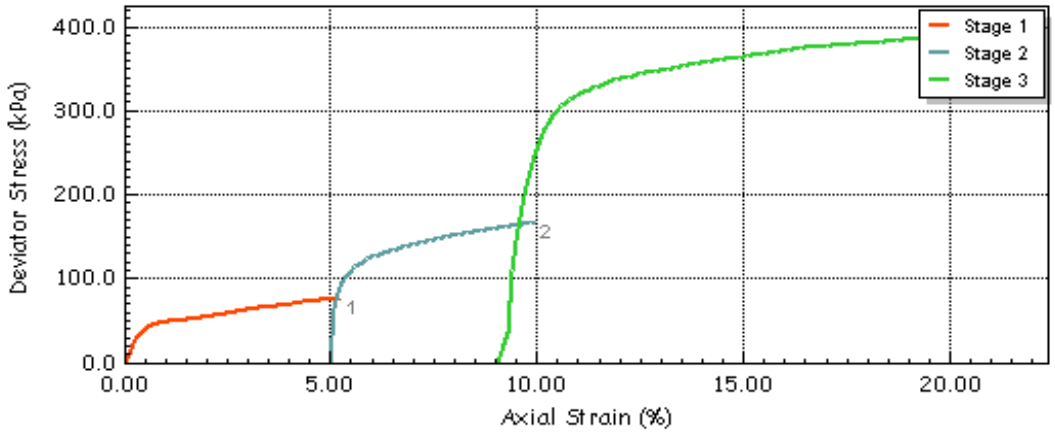
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			Test Date	27/08/2025	
			Borehole	BH103T	
Jobfile	Project West Knockharley Landfill		Sample	4.50-5.00m U	
Client	Ground Investigations Ireland		Depth	4.50-5.00m U	
Operator	David Burton	Checked S.Royle		Approved	S.Royle

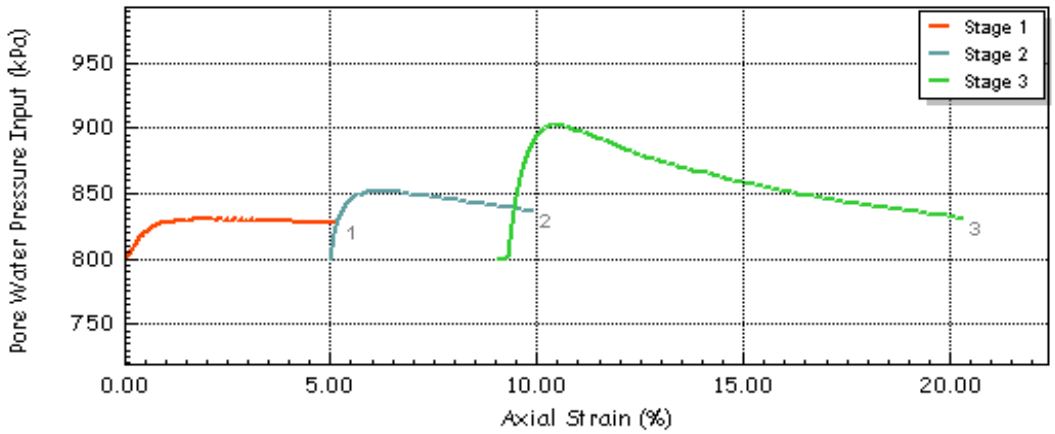
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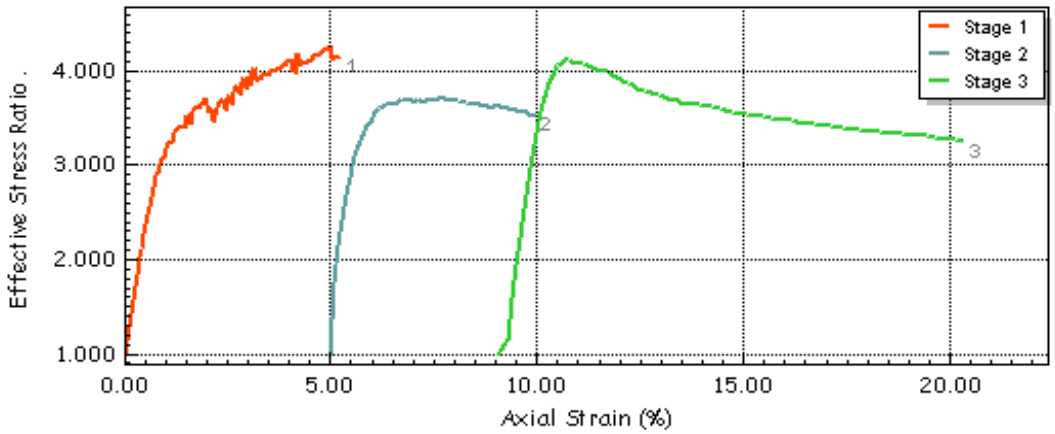
Effective Stress Triaxial Compression

Consolidated Undrained

Shear Stage Plots







Test Method	BS 1377-2: 2022 tested in accordance with BS EN ISO 17892-9.			Test Name	BH103T 4.50-5.00m U
				Test Date	27/08/2025
				Borehole	BH103T
Jobfile	Project West Knockharley Landfill			Sample	4.50-5.00m U
Client	Ground Investigations Ireland			Depth	4.50-5.00m U
Operator	David Burton	Checked	S.Royle	Approved	S.Royle

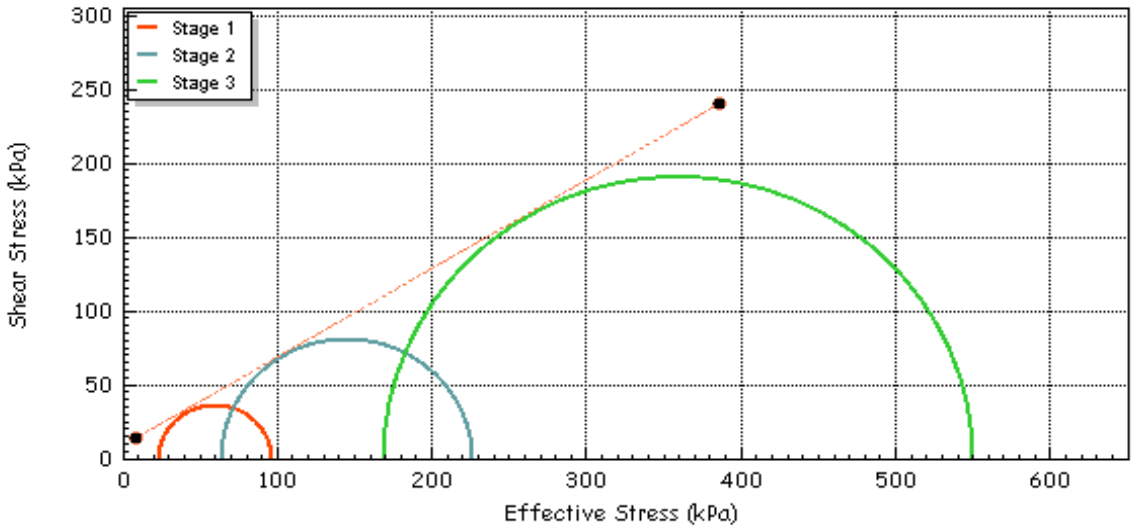
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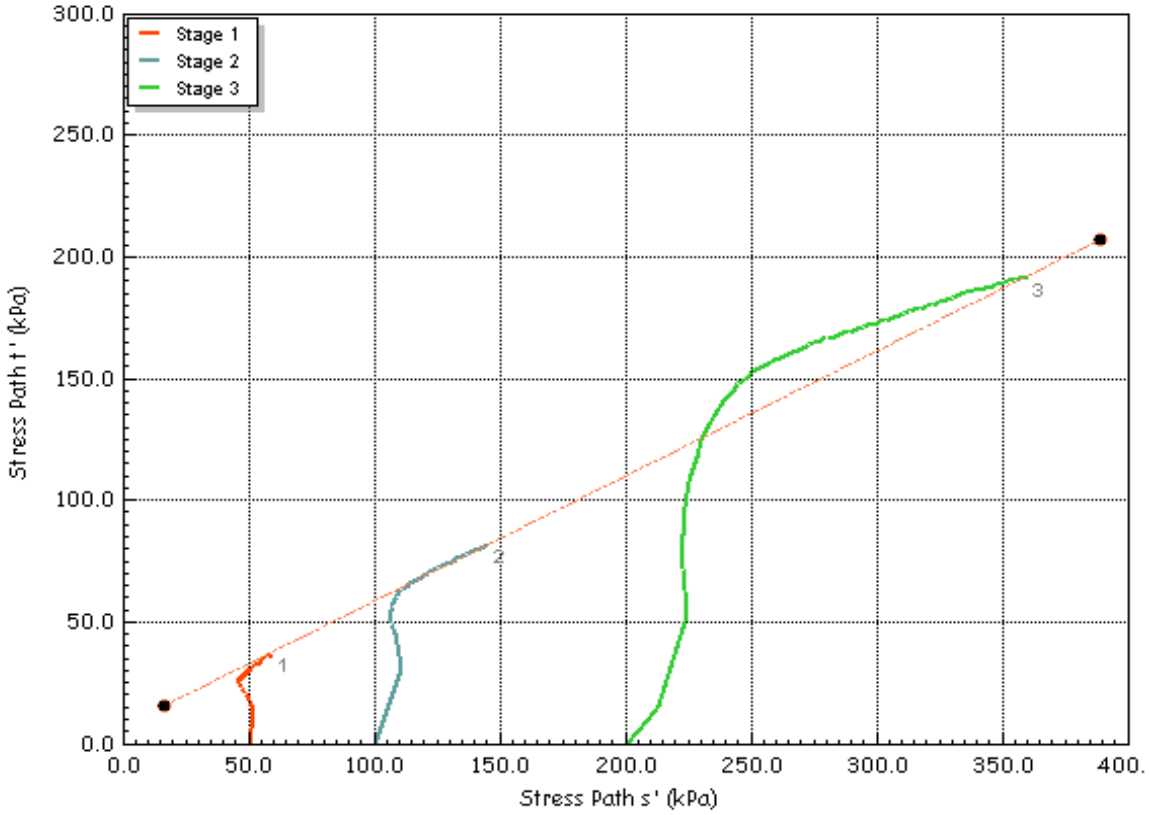
Effective Stress Triaxial Compression

Consolidated Undrained

Shear Stage Plots

Effective	c'	(kPa)	8.24	Effective Cohesion	c'	(kPa)	8.24
Effective Friction	ϕ'	(deg)	31.0	Effective Friction	ϕ'	(deg)	31.0





Test Method	BS 1377-2: 2022 tested in accordance with BS EN ISO 17892-9.		Test Name	BH103T 4.50-5.00m U	
			Test Date	27/08/2025	
			Borehole	BH103T	
Jobfile	Project West Knockharley Landfill		Sample	4.50-5.00m U	
Client	Ground Investigations Ireland		Depth		
Operator	David Burton	Checked S.Royle	Approved	S.Royle	

Appendix 6.1
Criteria for Rating the Magnitude and Significance of Geological and Hydrogeological Impacts at EIA Stage
National Roads Authority

AWN Consulting Ltd, The Tecpro Building, IDA Business & Technology Park, Clonshaugh, Dublin 17, D17 XD90

Impact Ratings and Assessment Criteria (Soils, Geology and Hydrogeology)

Table 1 Criteria for rating site Attributes – Estimation of Importance of Soil and Geology Attributes (NRA)

Importance	Criteria	Typical Examples
Very High	Attribute has a high quality, significance or value on a regional or national scale Degree or extent of soil contamination is significant on a national or regional scale Volume of peat and/or soft organic soil underlying route is significant on a national or regional scale*	Geological feature rare on a regional or national scale (NHA) Large existing quarry or pit Proven economically extractable mineral resource
High	Attribute has a high quality, significance or value on a local scale. Degree or extent of soil contamination is significant on a local scale. Volume of peat and/or soft organic soil underlying route is significant on a local scale. *	Contaminated soil on site with previous heavy industrial usage Large recent landfill site for mixed wastes Geological feature of high value on a local scale (County Geological Site) Well drained and/or high fertility soils Moderately sized existing quarry or pit Marginally economic extractable mineral resource
Medium	Attribute has a medium quality, significance or value on a local scale Degree or extent of soil contamination is moderate on a local scale Volume of peat and/or soft organic soil underlying route is moderate on a local scale*	Contaminated soil on site with previous light industrial usage Small recent landfill site for mixed wastes Moderately drained and/or moderate fertility soils Small existing quarry or pit Sub-economic extractable mineral resource

Importance	Criteria	Typical Examples
Low	Attribute has a low quality, significance or value on a local scale Degree or extent of soil contamination is minor on a local scale. Volume of peat and/or soft organic soil underlying route is small on a local scale*	Large historical and/or recent site for construction and demolition wastes. Small historical and/or recent landfill site for construction and demolition wastes. Poorly drained and/or low fertility soils. Uneconomically extractable mineral resource.

*** relative to the total volume of inert soil disposed of and/or recovered**

Source: Box 4.1: 'Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes' by the National Roads Authority (NRA, 2009)

Table 2 Criteria for Rating Impact Significance at EIA Stage - Estimation Of Magnitude of Impact on Soil / Geology Attribute (NRA)

Magnitude of Impact	Criteria	Typical Examples
Large Adverse	Results in loss of attribute	Loss of high proportion of future quarry or pit reserves Irreversible loss of high proportion of local high fertility soils Removal of entirety of geological heritage feature Requirement to excavate / remediate entire waste site Requirement to excavate and replace high proportion of peat, organic soils and/or soft mineral soils beneath alignment
Moderate Adverse	Results in impact on integrity of attribute or loss of part of attribute	Loss of moderate proportion of future quarry or pit reserves Removal of part of geological heritage feature Irreversible loss of moderate proportion of local high fertility soils Requirement to excavate / remediate significant proportion of waste site Requirement to excavate and replace moderate proportion of peat, organic

Magnitude of Impact	Criteria	Typical Examples
		soils and/or soft mineral soils benath alignment
Small Adverse	Results in minor impact on integrity of attribute or loss of small part of attribute	Loss of small proportion of future quarry or pit reserves Removal of small part of geological heritage feature Irreversible loss of small proportion of local high fertility soils and/or high proportion of local low fertility soils Requirement to excavate / remediate small proportion of waste site Requirement to excavate and replace small proportion of peat, organic soils and/or soft mineral soils beneath alignment
Negligible	Results in an impact on attribute but of insufficient magnitude to affect either use or integrity	No measurable changes in attributes
Minor Beneficial	Results in minor improvement of attribute quality	Minor enhancement of geological heritage feature
Moderate Beneficial	Results in moderate improvement of attribute quality	Moderate enhancement of geological heritage feature
Major Beneficial	Results in major improvement of attribute quality	Major enhancement of geological heritage feature

Source: Box 5.1: 'Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes' by the National Roads Authority (NRA, 2009)

Table 3 Criteria for rating Site Attributes - Estimation of Importance of Hydrogeology Attributes (NRA)

Magnitude of Impact	Criteria	Typical Examples
Extremely High	Attribute has a high quality or value on an international scale	Groundwater supports river, wetland or surface water body ecosystem protected by EU legislation e.g. SAC or SPA status

Magnitude of Impact	Criteria	Typical Examples
Very High	Attribute has a high quality or value on a regional or national scale	Regionally Important Aquifer with multiple well fields Groundwater supports river, wetland or surface water body ecosystem protected by national legislation – NHA status Regionally important potable water source supplying >2500 homes Inner source protection area for
High	Attribute has a high quality or value on a local scale	Regionally Important Aquifer Groundwater provides large proportion of baseflow to local rivers Locally important potable water source supplying >1000 homes Outer source protection area for regionally important water source Inner source protection area for locally important water source
Medium	Attribute has a medium quality or value on a local scale	Locally Important Aquifer Potable water source supplying >50 homes Outer source protection area for locally important water source
Low	Attribute has a low quality or value on a local scale	Poor Bedrock Aquifer Potable water source supplying <50 homes

Source: Box 4.3: 'Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes' by the National Roads Authority (NRA, 2009)

Table 4 Criteria for Rating Impact Significance at EIS Stage – Estimation of Magnitude of Impact on Hydrogeology Attribute (NRA)

Magnitude of Impact	Criteria	Typical Examples
Large Adverse	Results in loss of attribute and /or quality and integrity of attribute	Removal of large proportion of aquifer. Changes to aquifer or unsaturated zone resulting in extensive change to existing water supply springs and wells, river baseflow or ecosystems. Potential high risk of pollution to groundwater from routine run- off. [1] Calculated risk of serious pollution incident >2% annually. [2]
Moderate Adverse	Results in impact on integrity of attribute or loss of part of attribute	Removal of moderate proportion of aquifer. Changes to aquifer or unsaturated zone resulting in moderate change to existing water supply springs and wells, river baseflow or ecosystems. Potential medium risk of pollution to groundwater from routine run-off. [1] Calculated risk of serious pollution incident >1% annually. [2]
Small Adverse	Results in minor impact on integrity of attribute or loss of small part of attribute	Removal of small proportion of aquifer. Changes to aquifer or unsaturated zone resulting in minor change to water supply springs and wells, river baseflow or ecosystems. Potential low risk of pollution to groundwater from routine run- off. [1] Calculated risk of serious pollution incident >0.5% annually. [2]
Negligible	Results in an impact on attribute but of insufficient magnitude to affect either use or integrity	Calculated risk of serious pollution incident <0.5% annually. [2]

1 refer to Annex 1, Method C, Annex 1 of HA216/06

2 refer to Appendix B3 / Annex 1, Method D, Annex 1 of HA216/06

Source: Box 5.3: 'Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes' by the National Roads Authority (NRA, 2009)

Table 5 Rating of Significant Environmental Impacts at EIA Stage (NRA)

Importance of Attribute	Magnitude of Importance			
	Negligible	Small Adverse	Moderate Adverse	Large Adverse
Extremely High	Imperceptible	Significant	Profound	Profound
Very High	Imperceptible	Significant/moderate	Profound/Significant	Profound
High	Imperceptible	Moderate/Slight	Significant/moderate	Profound/Significant
Medium	Imperceptible	Slight	Moderate	Significant
Low	Imperceptible	Imperceptible	Slight	Slight/Moderate

Source: Box 5.4: 'Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes' by the National Roads Authority (NRA, 2009)

Appendix 6.2
Criteria for Rating the Magnitude and Significance of Impacts at EIA Stage National Roads Authority

AWN Consulting Ltd, The Tecpro Building, IDA Business & Technology Park, Clonshaugh, Dublin 17, D17 XD90

Table 1 Criteria for Rating Site Attributes – Estimation of Importance of Hydrological Attributes (NRA)

Importance	Criteria	Typical Examples
Extremely High	Attribute has a high quality or value on an international scale	River, wetland or surface water body ecosystem protected by EU legislation e.g. 'European sites' designated under the Habitats Regulations or 'Salmonid waters' designated pursuant to the European Communities (Quality of Salmonid Waters) Regulations, 1988.
Very High	Attribute has a high quality or value on a regional or national scale	River, wetland or surface water body ecosystem protected by national legislation – NHA status. Regionally important potable water source supplying >2500 homes. Quality Class A (Biotic Index Q4, Q5). Flood plain protecting more than 50 residential or commercial properties from flooding. Nationally important amenity site for wide range of leisure activities.
High	Attribute has a high quality or value on a local scale	Salmon fishery. Locally important potable water source supplying >1000 homes. Quality Class B (Biotic Index Q3-4). Flood plain protecting between 5 and 50 residential or commercial properties from flooding. Locally important amenity site for wide range of leisure activities.
Medium	Attribute has a medium quality or value on a local scale	Coarse fishery. Local potable water source supplying >50 homes. Quality Class C (Biotic Index Q3, Q2- 3). Flood plain protecting between 1 and 5 residential or commercial properties from flooding.

Importance	Criteria	Typical Examples
Low	Attribute has a low quality or value on a local scale	Locally important amenity site for small range of leisure activities. Local potable water source supplying <50 homes Quality Class D (Biotic Index Q2, Q1). Flood plain protecting 1 residential or commercial property from flooding. Amenity site used by small numbers of local people.

Table 2 Criteria for Rating Site Attributes – Estimation of Magnitude of Impact on Hydrological Attribute (NRA)

Magnitude of Impact	Criteria	Typical Examples
Large Adverse	Results in loss of attribute	Loss or extensive change to a waterbody or water dependent habitat. Increase in predicted peak flood level >100mm. Extensive loss of fishery. Calculated risk of serious pollution incident >2% annually. Extensive reduction in amenity value.
Moderate Adverse	Results in impact on integrity of attribute or loss of part of attribute	Increase in predicted peak flood level >50mm. Partial loss of fishery. Calculated risk of serious pollution incident >1% annually. Partial reduction in amenity value.
Small Adverse	Results in minor impact on integrity of attribute or loss of small part of attribute	Increase in predicted peak flood level >10mm. Minor loss of fishery. Calculated risk of serious pollution incident >0.5% annually.

Magnitude of Impact	Criteria	Typical Examples
		Slight reduction in amenity value.
Negligible	Results in an impact on attribute but of insufficient magnitude to affect either use or integrity	Negligible change in predicted peak flood level. Calculated risk of serious pollution incident <0.5% annually.
Minor Beneficial	Results in minor improvement of attribute quality	Reduction in predicted peak flood level >10mm. Calculated reduction in pollution risk of 50% or more where existing risk is <1% annually.
Moderate Beneficial	Results in moderate improvement of attribute quality	Reduction in predicted peak flood level >50mm. Calculated reduction in pollution risk of 50% or more where existing risk is >1% annually.
Major Beneficial	Results in major improvement of attribute quality	Reduction in predicted peak flood level >100mm

Appendix 6.3
Water Framework Directive Assessment

AWN Consulting Ltd, The Tecpro Building, IDA Business & Technology Park, Clonshaugh, Dublin 17, D17 XD90



Water Framework Directive Assessment

Project Title: Water Framework Directive Assessment for Knockharley Landfill Extension

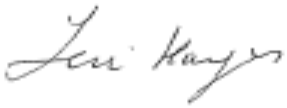
CLIENT	DOCUMENT REFERENCE	DATE
Beauparc	247501.0517	18/08/2025

AWN Consulting Ltd, The Tecpro Building, IDA Business & Technology Park, Clonshaugh, Dublin 17, D17 XD90

DOCUMENT CONTROL SHEET

Document Control Sheet	
Our Reference	247501.0517
Original Issue Date	18 August 2025
Client:	Beauparc
Client Address:	C/- Mitchell McDermott, 72 Leeson Street Upper, Rathmines, Dublin, D04 XD92, Ireland

Revision	Revision Date	Description

Details	Written by	Approved by
Signature		
Name	Rashaqat Ali Siddiqui	Teri Hayes
Title	Senior Hydrogeologist	Director (Water Services)
Date	18 August 2025	

Disclaimer
This report considers the specific instructions and requirements of our client. It is not intended for third-party use or reliance, and no responsibility is accepted for any third party. The provisions in this report apply solely to this project and should not be assumed applicable to other developments without review and modification.

ENVIRONMENT I.S. EN ISO 14001:2015 NSAI Certified | HEALTH & SAFETY I.S. ISO 45001:2018 NSAI Certified | QUALITY I.S. EN ISO 9001:2015 NSAI Certified

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1. INTRODUCTION

1.1 OBJECTIVE OF ASSESSMENT

AWN Consulting Limited (AWN) has prepared this Water Framework Directive (WFD) Screening Assessment to support the competent authority, in determining if there is a likelihood of significant effects on the Water Framework status of the receiving waterbodies as a result of the proposed phased extension of the existing landfill footprint through the construction of ten (10 no.) additional engineered landfill cells, including the 'Piggyback Cell'. A piggyback landfill cell is a waste cell built on top of a landfill to expand capacity vertically, reusing existing infrastructure and minimising land use. This extension will provide approximately 4.12 million m^3 for the continued disposal of non-hazardous waste and limited quantities of hazardous waste, thereby extending the operational lifespan of the licenced facility at Knockharley, Co. Meath.

This WFD Screening Assessment has been prepared in response to the requirements of the Water Framework Directive 2000/60/EC. This WFD compliance document should be read in conjunction with Chapter 6 of the Environmental Impact Assessment Report (EIAR).

The objective of the assessment is to address if the proposed development may compromise WFD status objectives including:

- Does the development cause deterioration of a water body from its current status or impede its potential for reaching "Good" status?
- Does the development impact on any water dependent protected areas, priority species, habitats etc.?
- Does the development support the achievement of water body objectives and programme of measures?

1.2 SITE SETTING AND HISTORY

The proposed development site is located within the townlands of Knockharley, Flemingstown and Tuitrath, Navan, Co. Meath and is operating as an active licensed landfill. The site is located c. 800m from the N2 National Primary Road and landfill facility has its own private entrance off the N2.

The site is surrounded at all sides by agricultural land which is the primary land use of the wider region. There are dispersed residential properties in the vicinity of the site, with the nearest residential houses located along the Knockharley road to the immediate north of the site and along the Rathdrinagh/Flemingstown road (L5056) to the east of the site.

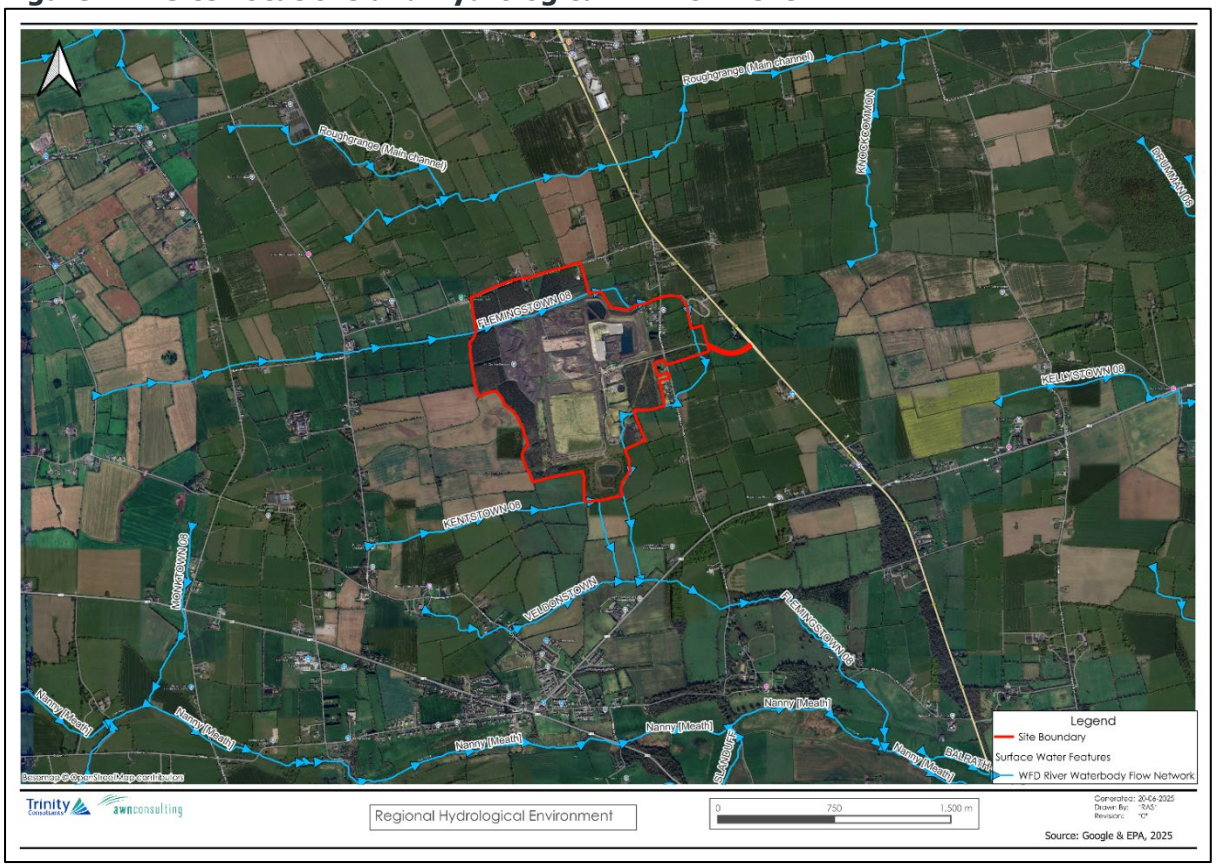
The Knockharley Stream (EPA Name: Flemingstown 08, EPA Code: 08F05) flows west to east through the northern portion of the site and then flows along the eastern boundary of the site where it the travels south /southeast away from the site and joins the Nanny River (EPA Name: Nanny (Meath), EPA Code: 08_757) c. 3km downstream. The Knockharley stream (Flemingstown Steam) traverses or runs along the boundary of the site for c.3km. A portion of the Knockharley Stream to the north of the landfill was diverted as part of the permitted ABP-303211-18 application.

The Kentstown Stream (EPA Name: Kentstown 08, EPA Code: 08K18) flow along the southern boundary of the site for c.90 m before turning south and joining the Knockharley Stream c. 550 m downstream as shown in Figure 1-1.

The site currently comprises a licenced landfill facility where waste disposal and recovery activities are undertaken with waste acceptance commencing in December 2004. A detailed description of the existing development is outlined in Section 2.2 in Chapter 2 – Description of the Proposed Development of this EIAR.

The site is currently a mix of, constructed landfill and associated facilities with some woodland and wet grassland. Prior to development as a landfill, the land was used for agriculture, and a network of field drains were installed to improve the land.

Figure 1-1. Site Locations and Hydrological Environment



1.3 EXPERIENCE OF AUTHORS

This report was prepared by Rashaqat Ali Siddiqui (BSc, MSc, MIT) and Teri Hayes ((BSc MSc PGeol EurGeol, Adv Dip in Environmental & Planning Law).

Rashaqat Ali Siddiqui (BSc, MSc, MIT). Ali is a hydrogeologist with over 7 years' experience in water resource management and impact assessment. He has a Masters in Hydrogeology and is a former Education Secretary of the Irish chapter for the Association of Hydrogeologists (IAH). Ali's specialist area of expertise is Water Resource Management, and Environmental Impact Assessment. His project experience includes contributions to a wide range of Site Investigation and Groundwater, Surface water and Soil Monitoring, Contaminated Land Assessment, Hydrological and Hydrogeological Risk Assessment, Environmental Impact Statements, and environmental reports for Industry, Transport, Infrastructure and residential developments.

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expertise is water resource management, eco-hydrogeology, hydrological assessment and environmental impact assessment.

1.4 LEGISLATION AND GUIDANCE

The Water Framework Directive (WFD) 2000/60/EC aims to protect and enhance the quality of the water environment (both surface water and groundwater) across all European Union member states. The WFD was transposed into Irish law by the European Communities (Water Policy) regulations 2003 (S.I. No 722 of 2003). The WFD requires that EU Member States achieve at least "Good" status for al water bodies by the year of 2027 at the latest. Additionally, where Member States assign "High" status objectives to water bodies, the "High" status must be achieved or maintained by 2027.

The concept of 'deterioration of the status' of a body of surface water in Article 4(1)(a)(i) of Directive 2000/60 is interpreted as meaning that there is deterioration as soon as the status of at least one of the quality elements, within the meaning of Annex V to the directive, falls by one class, even if that fall does not result in a fall in classification of the body of the surface water as a whole. However, if the quality element concerned, within the meaning of that annex, is already in the lowest class, any deterioration of that element constitutes a 'deterioration of the status' of a body of surface water, within the meaning of Article 4(1)(a)(i).

As part of the WFD implementation process the EPA completes a risk assessment and the outcomes are implemented through River Basin Management Plans (RBMPs) in six-year cycles. Ireland is currently in WFD third cycle 2022-2027 i.e. Water Action Plan 2024 - A River Basin Management Plan for Ireland, (Department of Housing Local Government & Heritage, Sept 2024). Waterbodies are either "At Risk" or "Not at Risk" of meeting WFD environmental objectives. Where a waterbody is "At Risk", the EPA determines the significant pressures that are placing the water body at risk of meeting its status objective. This determination focuses the programme of Measures for the relevant subcatchment(s).

The primary aim of the RBMP is that water bodies identified as being 'At Risk' of not achieving their WFD environmental objectives need to have targeted measures implemented to achieve objectives under this Plan. The EPA determines the significant pressures that are placing the water body at risk of meeting its status objective. This determination focuses the programme of Measures for the relevant subcatchment(s).

As part of its role, the EPA and other stakeholders such as local authorities must consider whether proposals for new developments (other than where exemptions apply Article 4.4 - 4.7 of the WFD) have the potential to:

- Cause a deterioration of a water body from its current status or potential; and/ or
- Prevent future attainment of good status or potential where not already achieved.

As a result, new developments that have the potential to impact on current or predicted WFD status are required to assess their compliance against the WFD objectives of the potentially affected water bodies.

1.5 METHODOLOGY

This WFD assessment is based on desktop review of the Environmental Protection Agency (EPA) dataset which was obtained from the www.catchments.ie (accessed August 2025).
Other sources of information were also utilised to establish a baseline environment and are as follows.

The water bodies identified for this assessment are related to the vicinity of the proposed development and its direct or indirect hydrological or hydrogeological connection. From the aforementioned source of information, the WFD Status classification and Risk score were obtained for the identified water bodies.

Besides the status classification of water bodies, the WFD also requires that 'designated sites' meet their environmental requirements and conservation objectives. Designated sites are Natura 2000 sites (Special Areas of Conservation, SACs, with water-dependent habitats, and Special Protection Areas for species listed in the EU Habitats Directive); drinking water protected areas; bathing waters; shellfish waters; salmonid waters; and nutrient sensitive waters. Environmental requirements and conservation objectives for designated sites are stipulated in existing regulations or are being developed by the relevant public bodies (e.g., National Parks and Wildlife Service for SACs).

1.5.1 WFD Risk Status

The WFD Risk score is the risk for each waterbody of failing to meet their WFD objectives by 2027.

The three risk categories are:

- Waterbodies that are 'At Risk' of not meeting their Water Framework Directive objectives. For these waterbodies an evidence-based process was undertaken to identify the significant pressures; once a pressure is designated as 'significant', measures and accompanying resources are needed to mitigate the impact(s) from this pressure. These 'At Risk' waterbodies require not only implementation of the existing measures described in the various regulations, e.g., the Good Agricultural Practices Regulations, but also in many instances more targeted supplementary measures that may have to be taken by a variety of actors, in both the public and private sector.
- Waterbodies that are categorised as 'Review' either because additional information is needed to determine their status before resources and more targeted measures are initiated or the measures have been undertaken, e.g., a wastewater treatment plant upgrade, but the outcome hasn't yet been measured/monitored.
- Waterbodies that are 'Not at Risk' and therefore are meeting their Water Framework Directive objectives. These require maintenance of existing measures to protect the satisfactory status of the water bodies.

1.5.2 WFD Water Body Status

Surface water body status is classified by the EPA on the basis of chemical and ecological status or potential. This system is summarised in Appendix A Figure 1. Under the WFD, groundwater body status is classified on the basis of quantitative and chemical status. This system is summarised in Appendix A Figure 2.

1.5.3 Methodology for Determination of No Deterioration Assessment

Proposed developments that have the potential to impact on current or predicted WFD status are required to assess their compliance against the objectives defined for potentially affected water bodies.

1.5.3.1 Surface Water No Deterioration Assessment

Table 1-1 below presents the matrix used to assess the effect of the proposed development on surface water status or potential class. It ranges from a major beneficial effect (i.e., a positive change in overall WFD status) through no effect to deterioration in overall status class. The colour coding used in Table 1-1 is applied to the No Deterioration Assessment' spreadsheet provided in Appendix A of this report.

Table 1-1 Surface Water Assessment Matrix

Effect	Description/ Criteria	Outcome
Major Beneficial	Impacts that taken on their own or in combination with others have the potential to lead to the improvement in the ecological status or potential of a WFD quality element for the entire waterbody	Increase in status of one or more WFD element giving rise to a predicted rise in status class for that waterbody.
Minor/ localised beneficial	Impacts when taken on their own or in combination with others have the potential to lead to a minor localised or temporary improvement that does not affect the overall WFD status of the waterbody or any quality elements	Localised improvement, no change in status of WFD element
No Impact	No measurable change to any quality elements.	No change
Localised / temporary adverse effect	Impacts when taken on their own or in combination with others have the potential to lead to a minor localised or temporary deterioration that does not affect the overall WFD status of the waterbody or any quality elements. Consideration will be given to habitat creation measures.	Localised deterioration, no change in status of WFD element when balanced against mitigation measures embedded in the project.
Adverse effect on class of WFD element	Impacts when taken on their own or in combination with others have the potential to lead to the deterioration in the WFD status class of one or more biological quality elements, but not in the overall status of the waterbody. Consideration will be given to habitat creation measures.	Decrease in status of WFD element when balanced against positive measures embedded in the project.
Adverse effect on overall WFD class of waterbody	Impacts when taken on their own or in combination with others have the potential to lead to the deterioration in the ecological status or potential of a WFD quality element, which then lead to a deterioration of status/potential of waterbody.	Decrease in status of overall WFD waterbody status when balanced against positive measures embedded in the project.

1.5.3.2 Groundwater No Deterioration Assessment

Table 1.2 below presents the matrix used to assess the effect of the proposed development on groundwater status class. It ranges from a beneficial effect but no change in status to deterioration in overall status class. The colour coding used in Table 1-2 is applied to the final 'No Deterioration Assessment' spreadsheet in Appendix A of this report.

Table 1-2 Groundwater Assessment Matrix

Magnitude of Impact of the proposed development on WFD Element	Effect on WFD Element within the assessment boundary	Effect on Status of WFD element at the Groundwater Body Scale
Impacts lead to beneficial effect	Combined impacts have the potential to have a beneficial effect on the WFD element.	Improvement but no change to status of WFD element
No measurable change to groundwater levels or quality.	No measurable change to WFD elements.	No change and no deterioration in status of WFD element
Impacts when taken on their own have the potential to lead to a minor localised or temporary effect	Combined impacts have the potential to lead to a minor localised or temporary adverse effect on the WFD element.	Combined impacts have the potential to lead to a minor localised or temporary effect on the WFD element. No change to status of WFD element and no significant deterioration at groundwater body scale.
Impacts when taken on their own have the potential to lead to a widespread or prolonged effect.	Combined impacts have the potential to have an adverse effect on the WFD element.	Combined impacts have the potential to have an adverse effect on the WFD element, resulting in significant deterioration but no change in status class at groundwater body scale.
Impacts when taken on their own have the potential to lead to a significant effect.	Combined impacts in combination with others have the potential to have a significant adverse effect on the WFD element.	Combined impacts in combination with others have the potential to have an adverse effect on the WFD element AND change its status at the groundwater body scale

1.5.4 Assessment against Future Status Objectives

The assessment considers whether the proposed development has the potential to prevent the implementation or impact the effectiveness of the defined measures to achieve the objectives in the RBMP. The Water Action Plan 2024 has been reviewed in the context of ensuring mitigation measures comply with current and expected future measures required to be implemented for protection of water body status within the context of the proposed development.

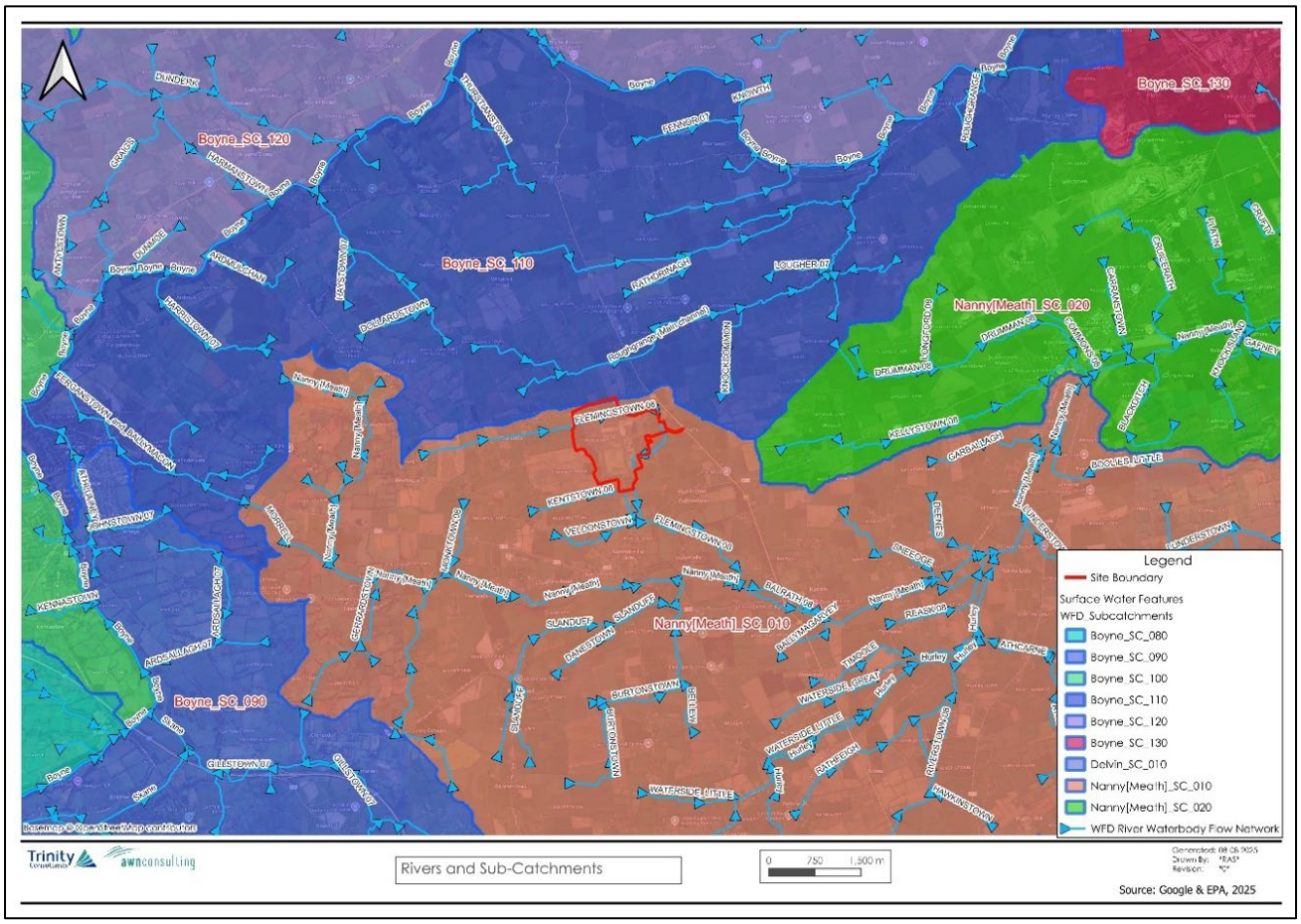
2. Water Body Identification

2.1 Surface Water Bodies

2.1.1 Regional Hydrological Environment

The proposed development site (is located in the Eastern River Basin District (IESE) (Hydrometric Area No. 08). The site lies within the Nanny-Delvin Catchment (Catchment ID: 08) and the Nanny [Meath]_SC_010 Sub-Catchment (Sub-Catchment ID: 08_4). Figure 2-1 presents the regional drainage sub catchments with the site identified with red boundary.

Figure 2-1. Hydrological Environment and River Sub-Catchments (EPA, 2025)



2.1.2 Local Hydrological Environment

Figure 2.2 presents the local hydrological environment on and around the site. The Knockharley stream stream transverses the northern section of the site, flowing in a easterly direction before turning south and transverses the south section of the site, passing through the Balrath Woods pNHA downstream of the landfill before discharging to Nanny [Meath]_SC_010 (European Code: IE_EA_08N010280) c.2.8km south of the site. The onsite attenuation pond discharges through a wetland to Flemingstown Stream.

A second tributary, the Kentstown Stream flows east along the southern licensed boundary before turning south and joining the Veldonstown Stream, just upstream of its confluence with the Flemingstown Stream

During the initial development of the landfill, the Fleminstown stream was realigned north of the existing landfill. The Flemingstown Stream originates from west of the site, near the Realtogue area c.2.5 km upstream of the site. The stream emerges from a 1.0 m diameter circular concrete culvert at the western boundary.

The current surface water infrastructure system (ref Figure 2-2) on the landfill site is split into two catchments, the northern catchment system, which includes a holding pond and the northern attenuation pond, and the southern catchment system which includes the southern attenuation pond and wetland. The proposed development will continue to drain to both these catchments for surface water management.

A system of leachate drains exists above the liner collecting leachate, which is pumped to a lined leachate lagoon, which is disposed of to a treatment facility off site. A network of foul drainage collects foul waste from the existing buildings and is treated in the biotreatment plant on site prior to discharge into the waste leachate lagoon.

Figure 2-2 Local Hydrological Environment

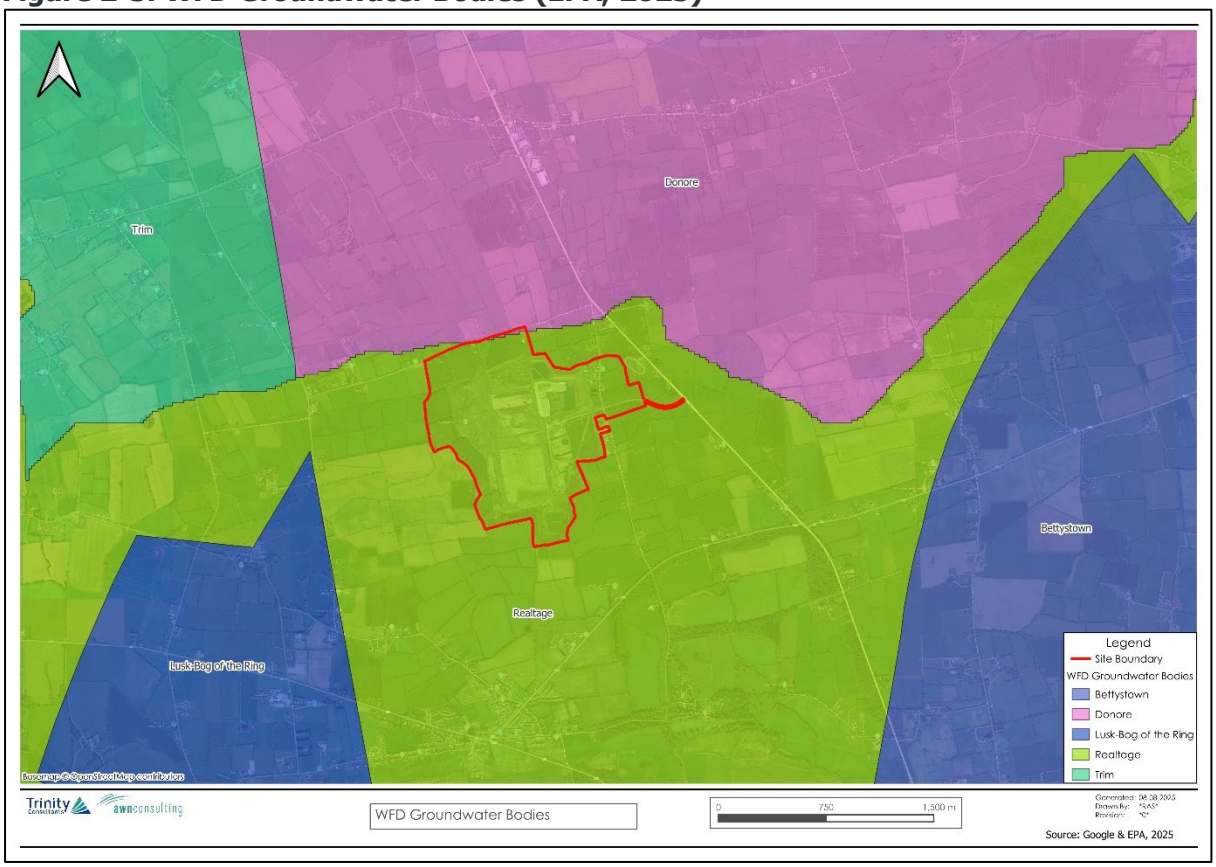


2.2 Groundwater Bodies

2.2.1 Regional Groundwater Bodies

The Groundwater Body (GWB) underlying the site is Realtage GWB (European Code: IE_EA_G_020). However, the site is also located on the boundary of Donore GWB (European Code: IE_EA_G_021). Refer to Figure 2-3 below which indicates the groundwater bodies in the region / context of the site.

Figure 2-3. WFD Groundwater Bodies (EPA, 2025)



2.2.2 Local Hydrogeology

The GSI has devised a system for classifying the bedrock aquifers in Ireland. The aquifer classification for bedrock depends on a number of parameters including, the area extent of the aquifer (km^2), well yield (m^3/d), specific capacity ($m^3/d/m$) and groundwater throughput (mm^3/d). There are three main classifications: regionally important, locally important and poor aquifers. Where an aquifer has been classified as regionally important, it is further subdivided according to the main groundwater flow regime within it. This sub-division includes regionally important fissured aquifers (Rf) and regionally important karstified aquifers (Rk). Locally important aquifers are sub-divided into those that are generally moderately productive (Lm) and those that are generally moderately productive only in local zones (Ll). Similarly, poor aquifers are classed as either generally unproductive except for local zones (Pl) or generally unproductive (Pu).

According to GSI (2025), it was identified that the site is underlain by Balrickard Formation which is described as coarse sandstone and shale rocks. No bedrock outcrops were identified within the site boundary.

The bedrock aquifer underlying the proposed development site, according to the GSI (www.gsi.ie/mapping) National Draft Bedrock Aquifer Map, is classified as a "*Poor Aquifer - Bedrock which is Generally Unproductive except for Local Zones*". The potential for vertical or horizontal migration within this type of aquifer is not significant and on local scale. The GSI map does not identify structural faults underneath the area of the subject site.

2.2.2.1 Soils and Subsoils

The Teagasc online mapping (2025) for the site indicates that the soils underlying the site and the surrounding area mainly comprise of poorly drained acidic mineral soils consisting of surface water gleys.

The northeastern section of the site is underlain with well drained mineral soils north of Flemingstown Stream. Pockets of alluvium have been identified within the site in the northern and southern part of the site.

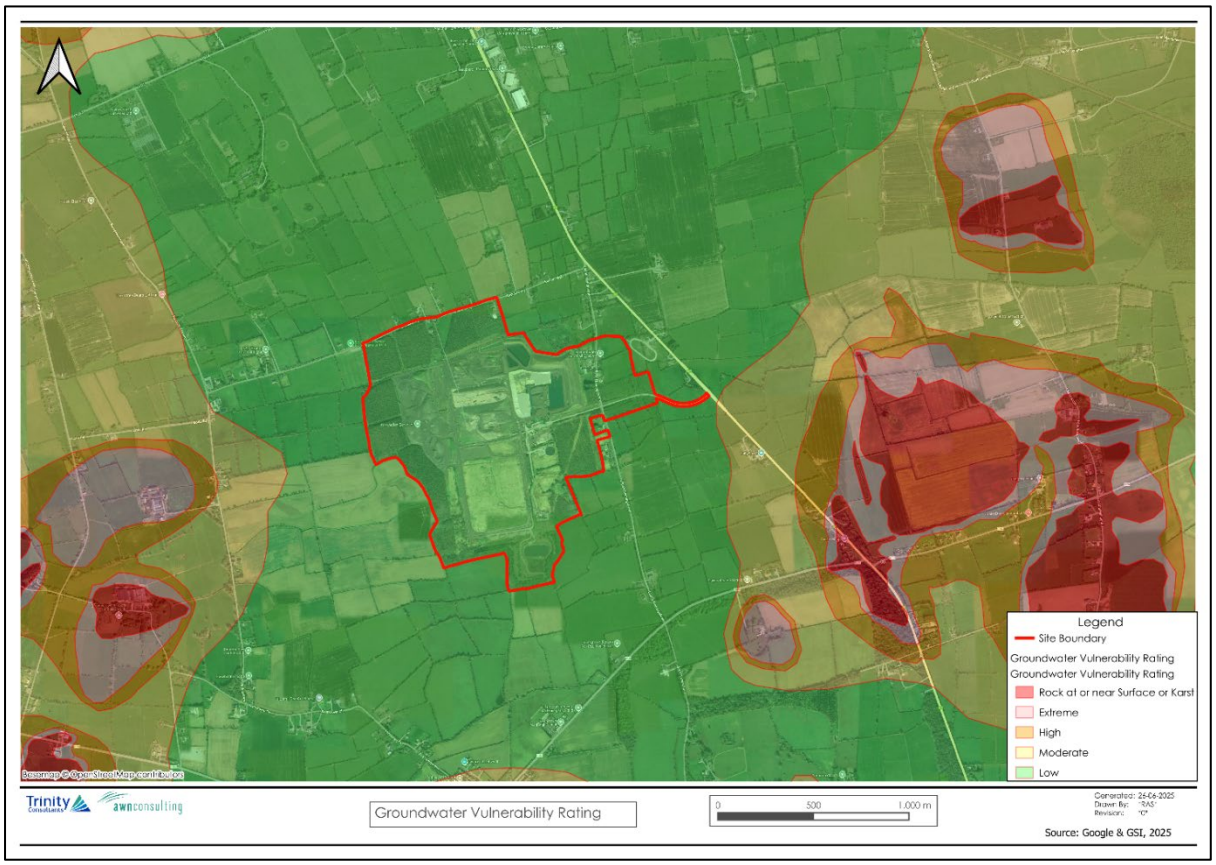
Based on a review of GSI online mapping, the site is predominantly underlain by tills from Namurian sandstone and shale in the north and central portion of the site while the southern portion is underlain by tills from Limestones. Alluvium was identified along the northern and southern section of site in the vicinity of the watercourses (GSI, 2025).

2.2.2.2 Aquifer Vulnerability

Groundwater vulnerability is an indication of how easily the aquifer can become contaminated by human activity. It is dependent on the thickness and permeability of the overlying soils and depth to the water table. For example, a bedrock aquifer with minimal thickness of overburden or with a thin layer of permeable overburden will be more vulnerable to contamination than a bedrock aquifer which has a thick layer of low permeability overburden. Extreme groundwater vulnerability is also associated with karst landforms as these are a direct pathway for water and contaminants to enter the aquifer from the surface.

The GSI presently classifies the groundwater vulnerability of the entire site as 'Low' vulnerability as shown in Figure 2-4. The GSI vulnerability classification is consistent with data obtained from the site investigations carried out by Ground Investigation Ireland (GII, 2025), at the proposed development site, where soft to stiff sandy gravelly glacial Clays with sand lenses were encountered. Bedrock was encountered at the site at depths ranging from 14.3m BGL at BH106S in the northeastern section of the proposed landfill extension, to 28m BGL at BH105S in the southern section of the proposed landfill extension.

Figure 2-4. Groundwater Vulnerability Rating (GSI, 2025)



2.2.3 Designated Sites

The NPWS (2025) on-line database have been reviewed to determine the location of areas of conservation within proximity to the proposed development site, and there are no Special Protected Areas (SPA) established under the EU Birds Directive (79/409/EEC), or Special Areas of Conservation (SAC) established under the Habitats Directive on or within the boundary of the proposed development site. Furthermore, there are no Natural Heritage Areas (NHA), or proposed Natural Heritage Areas (pNHA) established under the Wildlife Acts, 1976 and 2000 (as amended).

The European site in closest proximity of the site is as follows:

- The River Boyne and River Blackwater SAC (Site Code: 002299) and SPA (Site Code: 004232), located c. 4.5km north (linear distance).

However, the site has no hydrological pathway/connection to the River Boyne and River Blackwater.

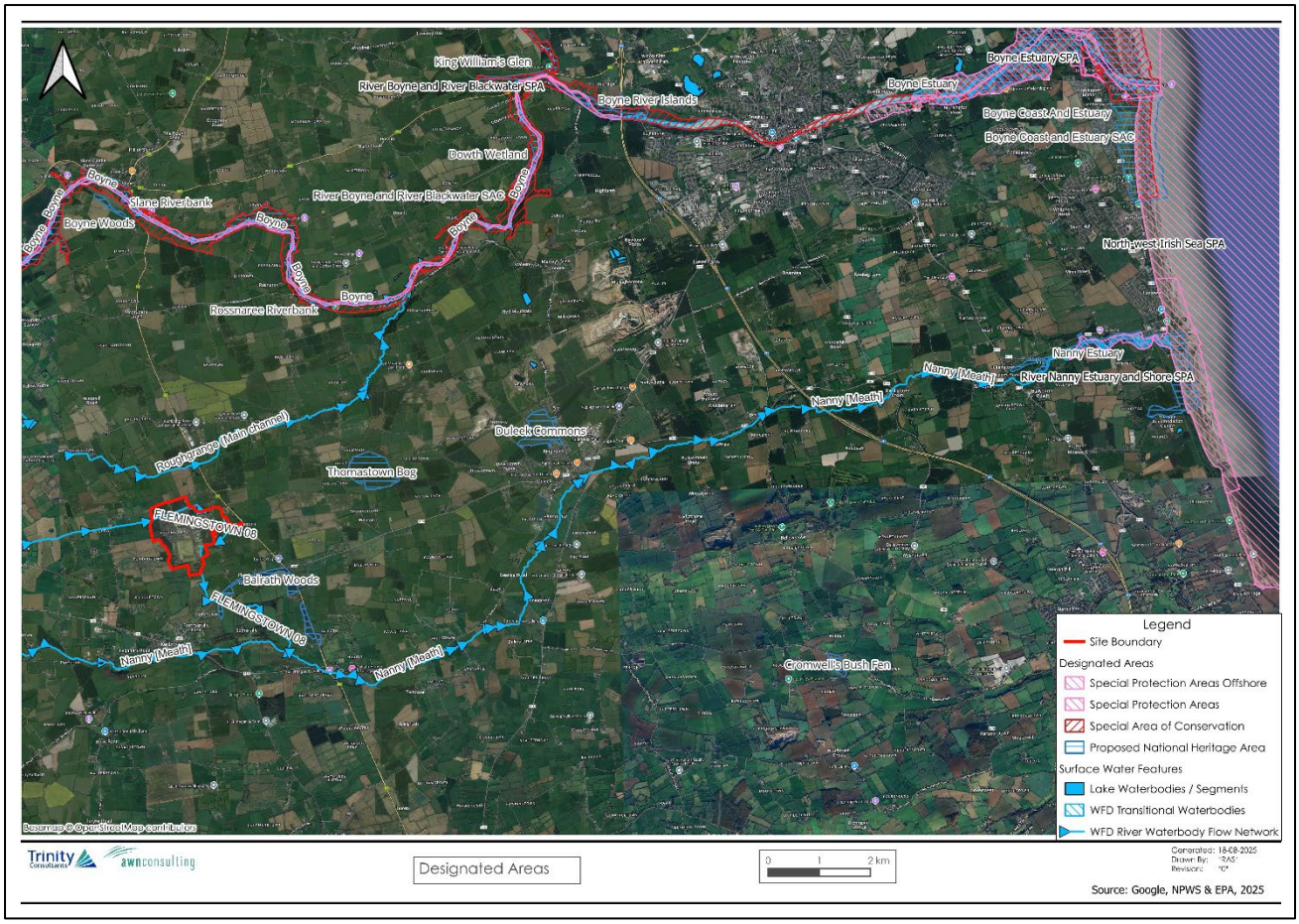
Other designated sites which have hydrological connectivity to the proposed site are as follows:

- Balrath Woods pNHA (Site Code: 001519) is located c. 550m south (linear distance) and c.800m downstream from the site. The pNHA has a direct hydrological connection to the Balrath Woods through Flemingstown Stream which transverses the pNHA before flowing in a south early direction and discharging to the River Nanny.

- The River Nanny Estuary and Shore SPA and North-west Irish Sea SPA lie approximately 22km and 27.8km downstream from the Proposed Development, respectively.

Refer to Figure 2-3 below for location of the River Boyne and River Blackwater SAC (Site Code: 002299) and SPA (Site Code: 004232) and the Balrath Woods pNHA (Site Code: 001519), River Nanny Estuary and Shore SPA (Site Code: 004158), North-west Irish Sea SPA (Site Code: 004236) and the hydrological connectivity in the context of the site. Further assessment is provided in the EIAR Chapter 7 Biodiversity.

Figure 2-3. Designated Sites (NPWS, 2025)



2.2.4 Bathing Waters and Recreational Waterbodies

A review of the Environmental Protection Agency's (EPA) online mapping that includes the Register of Protected Areas (RPA) under the Water Framework Directive (WFD) has shown that there are no Recreational Waters or Bathing Waterbodies located in the vicinity of the site. The nearest bathing waterbody is Laytown/Bettystown (BW ID: IEEABWC020_0000_0700) located c. 19km east of the site and has a hydrological connection through River Nanny and Nanny Estuary.

2.2.5 Surface Water Public Water Supplies

A review of the Environmental Protection Agency's (EPA) online mapping, which includes the Register of Protected Areas (RPA) established under the Water Framework Directive (WFD), indicates Nanny [Meath]_SC_010 and its two tributaries namely Flemingstown and Kentstown stream are not located within a designated Surface Water Drinking RPA. This classification of drinking water river lines has been delineated in accordance with the European Communities (Drinking Water) (No. 2) Regulations 2007 (SI No. 278/2007). This regulatory framework aims to ensure the protection of water resources utilised for human consumption, thus safeguarding public health and the environment.

2.2.6 Ground Water Public Water Supplies

There are no recorded Public Supply Source Protection Area or Group Scheme Preliminary Source Protection Areas in the vicinity of the proposed development site.

The nearest Group Scheme Preliminary Source Protection area is Drybridge, located c.12km north-east of the site. The nearest Public Supply Source Protection area is Slane PWS located c.4.6km north of the site.

Neither of these areas share a hydrological or hydrogeological connection to the site and are located within separate Sub-Catchments i.e. Boyne_SC_130 (Sub-Catchment ID: 07_17) and Boyne_SC_110 (Sub-Catchment ID: 07_1), respectively.

3. WFD STATUS

3.1 Waterbody Status

A summary of the WFD status and Risk for all relevant waterbodies is provided below in table 3-1

Table 3-1 WFD Waterbodies relevant to the Study Area

Type	WFD Classification	WFD Name/ID	WFD Status (2016-2021)	WFD Risk Score	Location
Surface Water Body	River Waterbody	Flemingstown (Meath)_10 (European Code: IE_EA_08F050930)	*'Poor'*	*'At Risk'*	Transverses through the site at multiple locations
	River Waterbody	Nanny [Meath]_SC_010 (European Code: IE_EA_08N010280)	*'Poor'*	*'At Risk'*	Located 2.8km south of the site.
Groundwater	Groundwater Body	Donore GWB (European Code: IE_SE_G_021)	*'Good'*	*'Not at Risk'*	Located adjacent to site
	Groundwater Body	Realtage GWB (European Code: IE_SE_G_020)	*'Good'*	*'Not at Risk'*	Underlying site

Note: Flemingstown stream, Kentstown Stream and Veldonstown Stream all belong to the River Nanny [Meath] WFD surface waterbody (European Code: IE_EA_08N010280)

3.1.1 Surface Waterbody Status

The proposed development site lies within the Nanny-Delvin Catchment (Catchment ID: 08) and the Nanny [Meath]_SC_010 Sub-Catchment (Sub-Catchment ID: 08_4).

This WFD Screening has identified 4 no. WFD surface water bodies and 2 no. groundwater body which need to be considered: Flemingstown (Meath)_10 (European Code: IE_EA_08F050930), Kentstown Stream, Veldonstown Stream and River Nanny (European Code: IE_EA_08N010280); and Realtage (European Code: IE_EA_G_020) and Donore (European Code: IE_EA_G_021) groundwater body. However, as stated above Flemingstown stream, Kentstown Stream and Veldonstown Stream all belong to the River Nanny [Meath] WFD surface waterbody (European Code: IE_EA_08N010280) and are assessed under one WFD waterbody i.e. River Nanny.

There is an existing *'direct'* hydrological connection/pathway through the site drainage and agreed discharge locations from the landfill site to the Fleminstown Stream (European Code: IE_EA_08F050930) and an *'Indirect'* pathway to the Kentstown Stream, Veldonstown Stream and River Nanny through site drainage and confluences of streams along with the Balrath Woods pNHA (Site Code: 001519). The Flemingstown(Meath)_10 (European Code: IE_EA_08F050930) stream transverses with the site in the northern section, flowing in an easterly direction before turning south, where it transverses with the south section of the site and passes through the Balrath Woods pNHA downstream of the landfill before discharging to River Nanny c.2.8km south of the site. The existing surface water pond discharges to the Flemingstown Stream south of the wetland. A second tributary, the Kentstown Stream flows east along the southern licensed boundary before turning south and joining the Veldonstown Stream, just upstream of its confluence with the Flemingstown Stream.

In relation to the proposed development site, the operational EPA quality monitoring station point in closest proximity to the site are 'as follows:

- Nanny (Meath)- East Bridge Kentstown (Station Code: RS08N010110), located c. 1.6km south (linear distance). However, this monitoring station is upstream of the discharge point of Flemingstown Stream. The most recent Q Value Score recorded at this station is in 2024 is 'Q3', which denotes a 'Poor' WFD status and moderately polluted pollution status and unsatisfactory conditions.

- Nanny (Meath)- Bridge Downstream of Nanny bridge (Station Code: RS08N010280), located c. 5.3 km south (linear distance) and c. 6.5km downstream of the site. The most recent Q Value Score recorded at this station is in 2024 is 'Q3-Q4', which denotes a 'Moderate' status and slightly polluted status and unsatisfactory conditions.

The Flemingstown Stream, the Kentstown stream and the Veldonstown Stream belong to the River Nanny [Meath] WFD surface waterbody (European Code: IE_EA_08N010280). The Nanny [Meath]_SC_010 WFD surface waterbody has a most recent WFD surface water status (WFD Period: 2016-2021) of '*Poor*' and its current WFD risk score (3rd risk cycle) of '*At risk*' of not achieving good status (EPA, 2025). This '*Poor*' status is related to its ecological status or potential, biological status or potential and supporting chemistry conditions. The most recent Sub-Catchment Assessment (May, 2024) carried out by the EPA on the Nanny-Delvin Catchment states the main pressure identified on the Nanny [Meath]_SC_010 WFD surface waterbody is from agriculture, hydromorphology, industry and urban waste water, likely attributing to the poor ecological and biological status or potential, particularly invertebrate status or potential.

Figure 3-1. Surface Water Quality for the River Nanny Surface Waterbody (Catchments.ie, 2025)

SW 2016-2021

Status	Assessment Technique	Status Confidence	Value
▼ Ecological Status or Potential	Monitoring	medium confidence	Poor
▼ Biological Status or Potential			Poor
Invertebrate Status or Potential			Poor
▼ Supporting Chemistry Conditions			Moderate
▼ General Conditions			Moderate
▼ Oxygenation Conditions			Pass
Dissolved Oxygen (% Sat)			Pass
Other determinand for oxygenation conditions			High
▼ Acidification Conditions			Pass
pH			Pass
▼ Nutrient Conditions			Moderate
▼ Nitrogen Conditions			Moderate
Nitrate			Moderate
Ammonium			Moderate
▼ Phosphorous Conditions			Moderate
Orthophosphate			Moderate

3.1.2 Ground Waterbody Status

The groundwater body in the region of the site (Realtage GWB - European Code: IE_EA_G_020) for which the site is located entirely within, has a WFD status of "*Good*" (WFD Period: 2016-2021) and a WFD risk score (3rd Cycle) of "*Not at Risk*" of not achieving good status, meaning it has achieved its objectives and the overall status is considered good. However, the site also lies on the boundary of Donore GWB (European Code: IE_EA_G_021) which also has been assigned a WFD status of "*Good*" (WFD Period: 2016-2021) and a WFD risk score (3rd Cycle) of "*Not at Risk*" of not achieving good status as presented in Figure 3-2 and 3-3.

This" Good'" status is related to the overall groundwater status i.e. quantitative groundwater status and chemical groundwater status.

Figure 3-2. Groundwater Quality for Realtage Groundwater Body (Catchments.ie, 2025)

GW 2016-2021

Status	Assessment Technique	Status Confidence	Value	
▼ Overall Groundwater Status			Good	
▼ Quantitative Groundwater Status			Good	
Saline (or Other) Intrusions Test			Good	
Impact of Groundwater on Surface Water Ecological/Quantitative Status Test			Good	
Groundwater Dependent Ecosystems (GWDTE) - Quantitative Assessment Test			Good	
Water Balance Test			Good	
▼ Chemical Groundwater Status			Good	
Saline (or Other) Intrusions Test			Good	
Impact of Groundwater on Surface Water Ecological/Chemical Status Test			Good	
Groundwater Dependent Ecosystems (GWDTE) - Chemical Assessment Test			Good	
Drinking Water Protected Area Test			Good	
General Chemical Assessment Test			Good	

Figure 3-3. Groundwater Quality for Donore Groundwater Body (Catchments.ie, 2025)

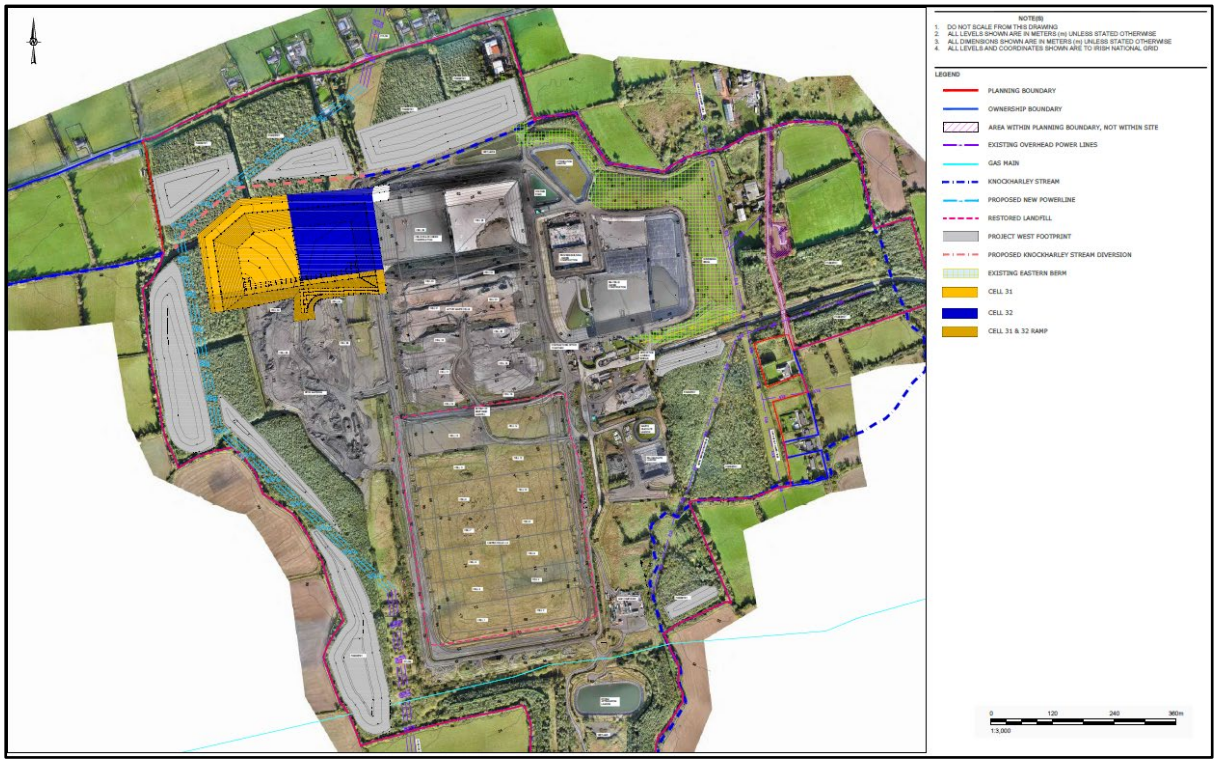
GW 2016-2021

Status	Assessment Technique	Status Confidence	Value	
▼ Overall Groundwater Status			Good	
▼ Quantitative Groundwater Status			Good	
Saline (or Other) Intrusions Test			Good	
Impact of Groundwater on Surface Water Ecological/Quantitative Status Test			Good	
Groundwater Dependent Ecosystems (GWDTE) - Quantitative Assessment Test			Good	
Water Balance Test			Good	
▼ Chemical Groundwater Status			Good	
Saline (or Other) Intrusions Test			Good	
Impact of Groundwater on Surface Water Ecological/Chemical Status Test			Good	
Groundwater Dependent Ecosystems (GWDTE) - Chemical Assessment Test			Good	
Drinking Water Protected Area Test			Good	
General Chemical Assessment Test			Good	

4. DESCRIPTION OF THE PROPOSED DEVELOPMENT

The purpose of this section is to provide an overview of the key relevant details of the proposed development which could have an impact on WFD compliance. For a more comprehensive understanding of the proposed development, please refer to Chapter 2 'Description of the Proposed Development' of the EIA Report. Chapter 2 provides a detailed overview of the lifecycle of the project, including reference to the architectural and civil engineering, drawings, plans, reports, and other relevant document in order to define the proposed development. The Proposed Development is anticipated to be completed (from construction to capping of final cells) with in c. a 21-year period. The Proposed Development will be constructed over seven phases. Each phase will overlap with waste cell filling taking place in tandem as the construction of cells are complete. Please refer to section 2.4.9 construction Phasing and Duration of Chapter 2.

Figure 4-1. Proposed Masterplan Layout - (WSP, 2025)



The elements of the development which would have potential impact are summarised in Sections 4.1(Construction) and 4.2 (Operation) and 4.3 (decommissioning) below.

4.1 Construction Phase

The activities required for the construction phase of the proposed development represents the greatest risk of potential impact on the hydrological and hydrogeological environment.

During construction of the development, the potential of impact on water body status is associated with the following sources:

- Accidental release of suspended solids (muddy water with increased turbidity (measure of the degree to which the water loses its transparency due to the presence of suspended particulates) – arising from excavation, stream works and ground disturbance;
- Accidental release of alkaline water from cement/concrete (increase turbidity and pH) works;

- Accidental release of hydrocarbons and other construction chemicals (ecotoxic) – accidental spillages from construction plant or onsite storage; and
- Accidental release of wastewater (nutrient and microbial rich) – arising from accidental discharge from on-site toilets and washrooms. Construction phase sewerage will be contained in a tank and taken by tanker off site for disposal at a licensed waste management facility.
- Direct physical damage during river alignment works which could lead to hydromorphological changes if incorrectly designed.

These are temporary short-lived events which could impact on status without mitigation measures being in place. The most likely impact would be to surface water body status as the groundwater bodies are naturally protected by overlying clays at this site. There is no long term dewatering or water abstractions required during construction so no likely impact on groundwater quantitative status.

4.2 Operational Phase

The proposed activities which could have an impact on water body status during operation can broadly be described as:

- Potential release of contaminated water during placement of waste within lined cells
- Potential release of leachate to storm sewer/ground
- Potential release of contaminants from a vehicle or foul sewer as described above

It is of note that the operation of the landfill will be undertaken in compliance with an amendment to the current EPA IED Licence (W0146-04), so design measures are currently in place to manage these risks.

The quantity of waste received at the facility will not change and will be as per the existing IED Licence (W0146-04), i.e. acceptance of up to 435,000 tonnes per annum of non-hazardous waste and up to 5,000 tonnes per annum of stable non-reactive hazardous waste. The non-hazardous waste accepted at the site comprises up to 150,000 tonnes of incinerator bottom ash (IBA), as well as household, commercial and industrial waste including residual fines, non-hazardous contaminated soils, construction and demolition (C&D) waste and baled recyclables.

Once a landfill cell is constructed, waste cell filling (operation) will be carried out in line with the IED Licence and permitted planning applications, including any conditions stipulated by the planning authority. Once a cell is at capacity, a permanent capping will be constructed over the cell. Pipework will be placed in the drainage stone layer above the HDPE barrier which has been designed to collect any leachate runoff from the landfill cells. As current, leachate will be pumped from the base of cells via a rising main and stored in leachate lagoons/tanks, prior to removal off-site for disposal at an authorised wastewater treatment plant. To manage the additional leachate generated by the proposed development, 2 no. containerised reverse osmosis plant units will be stationed on reinforced concrete bunded slabs (Plant Bund) and 12 no. additional storage tanks (6 no. per Reverse Osmosis plant unit) will be stationed on reinforced concrete bunded slabs.

The proposed surface water management infrastructure will connect to the existing infrastructure on site and continue to operate as current, including ongoing monitoring of discharge water quality and flow in line with the IED licence conditions. The capacity of the southern attenuation pond will be increased as part of the proposed development works for stormwater attenuation post closure, however this will not effect the operation of the onsite surface water system.

4.3 Decommissioning and Remediation Phase

Decommissioning and remediation will be carried out in accordance with the existing IED Licence (W0146-04), the CRAMP for the facility and the planning application's permitted by the planning authority, including planning conditions. As part of this phase, the following activities will be undertaken.

On completion of the deposit of waste at the facility, final capping shall be restored over the waste mass. Following completion of the final capping and establishment of interim restoration of the site, all structures, plant and equipment that are not required for restoration purposes will be decontaminated in accordance with recognised standard procedures and regulatory requirements and removed from the site.

During decommissioning of the development, the potential of contamination is associated with the following sources similar to the construction phase:

- Accidental release of suspended solids (muddy water with increased turbidity (measure of the degree to which the water loses its transparency due to the presence of suspended particulates) – arising from capping and ground disturbance;
- Accidental release of contaminated runoff containing hydrocarbons and other construction chemicals (ecotoxic) – accidental spillages from construction plant or onsite storage; and
- Accidental release of wastewater (nutrient and microbial rich) – arising from accidental discharge from on-site toilets and washrooms. Construction phase sewerage will be contained in a tank and taken by tanker off site for disposal at a licensed waste management facility.

Throughout the aftercare period, leachate within the landfill would be maintained at or below the levels required by the IED licence. It is planned that leachate would be treated on site to allow for use in the IBA Facility. This is expected to consume approximately 90% of the treated leachate. The remaining leachate will be tankered off site for disposal or recirculated. When agreed with the EPA as part of licence closure, the leachate management infrastructure is decommissioned, all buried pipework and cables will be grubbed up and removed from site.

Environmental monitoring will continue after the closure of the facility for surface and groundwater along with maintenance and inspection of drainage ditches to ensure that all discharges are adhering to the EPA Licence.

5. DESCRIPTION OF MITIGATION

This section outlines the mitigation measures in place to mitigate negative effects on surface water and groundwater quality and flow during construction, operation and decommissioning. Details of mitigation measures are provided in the Construction Environmental Management Plan (CEMP) and the EIAR, specifically chapter 2 and chapter 6.

Construction Phase

(i) As per the IED Licence (W146-04), the following design and mitigation measures will be in place to ensure surface water quality discharge meet licence limits with no resulting impacts on receiving water quality:

- Surface water management infrastructure is in place and maintained during construction works. As a minimum, the infrastructure is capable of the following:
  - Collection/diversion of any contaminated run-off arising within the installation. An actuated penstock is in place to prevent surface water discharging into the next pond, constructed wetland or receiving water in the event that monitoring should indicate contamination of the surface water;
  - the prevention of contaminated water and leachate discharges into surface water drains and courses; and
  - the collection/diversion of run off arising from capped and restored areas, incorporating adequately sized swales.
  - Discharge from attenuation ponds is further treated through constructed wetlands before discharge to streams.
  - The inlet to the northern surface water holding pond and southern attenuation pond includes Class I Full Oil Interceptor.

- The culvert and river diversion shall be constructed and operational prior to the commencement of construction works for the Proposed Landfill.

- All foul effluent generated from administration welfare facilities is collected onsite and passed through a Bio-Cycle treatment unit. Any effluent from this unit is discharged to the waste leachate lagoon and is tankered offsite for further treatment.

(ii) The proposed development works include a small diversion of the existing Flemingstown Stream. The diverted stream will be open stream with the exception of existing access road crossing which will require a culvert to allow the road to pass over. The design of the diversion aims to preserve the existing hydrological function of the stream and will not result in any significant changes to flow regime, connectivity, or water quality. The open channel sections will be designed to mimic natural conditions and will incorporate geomorphological features such as, pools and riffles where feasible, along with appropriate bed and bank materials to promote aquatic and riparian habitat.

(iii) The contractor will be obliged to operate in compliance with a Construction Environmental Management Plan which includes measures for management of runoff water quality, avoidance controls (e.g keeping machinery out of water courses, management of water from cement works areas, working only in appropriate weather conditions and suspending works in heavy rainfall conditions to avoid silty runoff, and emergency response measures for any localised spills, managing of soil stockpiles).

(iv) Sequencing of works will be undertaken to ensure that the proposed development is constructed in managed stages.

(v) The existing contractor compound which is on hardstand, will be used for refueling, storage of machinery and chemicals. This also included dedicated welfare facilities with off site disposal.

Operation Phase

The landfill will be required to operate in compliance with the existing licence and licence conditions for discharge to receiving waters. This will ensure protection of receiving water status.

- As current, there will be an engineered landfill liner and leachate collection system, an under cell drainage system and leachate recording and monitoring programme. The leachate collection rising main will discharge to the existing leachate lagoons or tanks on site. To manage the additional leachate generated by the proposed development, 2 no. containerised reverse osmosis plant units will be stationed on reinforced concrete bunded slabs (Plant Bund) and 12 no. additional storage tanks (6 no. per Reverse Osmosis plant unit) will be stationed on reinforced concrete bunded slabs.

- The existing surface water management infrastructure will be extended and maintained at the during Operation. The infrastructure is capable of the following:
  - Collection/diversion of any contaminated run-off arising within the installation. An actuated penstock is in place to prevent surface water discharging into the next pond, constructed wetland or receiving water in the event that monitoring should indicate contamination of the surface water;
  - the prevention of contaminated water and leachate discharges into surface water drains and courses; and
  - the collection/diversion of run off arising from capped and restored areas, incorporating adequately sized swales.
  - Discharge from attenuation ponds is further treated through constructed wetlands before discharge to streams.

  The inlet to the northern surface water holding pond and southern attenuation pond includes Class I Full Oil Interceptor.

- An Environmental Management System currently operates at the facility as required by the licence and includes measures for maintenance, inspections of containment etc, management of monitoring, reporting and spill response training and reporting.

Decommissioning Phase

This will be the same as the Construction Phase mitigation measures apart from:

- final remediation of leachate collection system once agreed with the EPA

- Rehabilitating had stand areas and promoting revegetation

6. NO DETERIORATION ASSESSMENT

During construction, operation and decommissioning there are design measures in place as this is an active operating licenced landfill site. In addition, further mitigation measures (as outlined in Section 5) will be implemented to ensure protection of the hydrological and hydrogeological environment.

Overall, with design and mitigation measures in place, there are no likely significant effects on surface water and groundwater as a result of the proposed development. There are no measurable changes to any quality elements and therefore there is no expected change to the WFD status. The WFD status classification or the ability to deliver the programme of measures will not be affected by the proposed development.

As outlined in section 2.2.3, the proposed development is hydrological linked with the following designated sites:

- Balrath Woods pNHA (Site Code: 001519) which is located c.800m downstream from the site.
- The River Nanny Estuary and Shore SPA and North-west Irish Sea SPA lie approximately 22km and 27.8km downstream from the Proposed Development, respectively.

With the design and mitigation measures in place and the distance to receptors (significant dilution/mixing and other attenuation mechanisms that will take place along the pathway), there is no potential for any change in water dependent habitat requirements as a result of the proposed development.

There are no source pathway linkages to Public Water Supplies.

7. CONCLUSIONS

Appendix A presents the methodology for the surface water and groundwater assessments to determine waterbody status.
Appendix B contains the background information and the WFD classification elements for surface water and groundwater body status. The colour coded system referred to in Appendix B – Table 1 and Table 2 are used to give a visual impression of the surface water and groundwater assessment, respectively

The proposed development site discharges to the Knockharley (Flemingstown) Stream and the Kentstown stream. Both belong to the River Nanny [Meath] WFD surface waterbody (European Code: IE_EA_08N010280). The Nanny [Meath]_SC_010 WFD surface waterbody has a most recent WFD surface water status (WFD Period: 2016-2021) of '*Poor*' and its current WFD risk score (3rd risk cycle) of '*At risk*' of not achieving good status. This '*Poor*' status is related to its ecological status or potential, biological status or potential and supporting chemistry conditions. The most recent Sub-Catchment Assessment (December 2018) carried out by the EPA on the Nanny [Meath]_SC_010 Sub-Catchment states the main pressure identified on the Nanny [Meath]_SC_010 WFD surface waterbody is from agriculture, hydromorphology, industry and urban waste water, likely contributing to the poor ecological and biological status or potential, particularly invertebrate status or potential.

The groundwater body in the region of the site (Realtage GWB - European Code: IE_EA_G_020) for which the site is located entirely within, has a WFD status of "*Good*" (WFD Period: 2016-2021) and a WFD risk score (3rd Cycle) of "*Not at Risk*" of not achieving good status, meaning it has achieved its objectives and the overall status is considered "*Good*". However, the site also lies on the boundary of Donore GWB (European Code: IE_EA_G_021) which also has been assigned a WFD status of "*Good*" (WFD Period: 2016-2021) and a WFD risk score (3rd Cycle) of "*Not at Risk*" of not achieving good status. The aquifer has low to moderate vulnerability as there is a high level of protection due to the thickness and nature of the low permeability soil present.

This WFD assessment shows that with design and mitigation measures in place, the proposed development will not cause any significant deterioration or change in water body status or prevent attainment, or potential to achieve, future good status or to meet the requirements and/or objectives in the Water Action Plan 2024 - A River Basin Management Plan for Ireland, (Department of Housing Local Government & Heritage, Sept 2024).

No further assessment of WFD is recommended given that no significant deterioration or change in water body status is expected based on the current understanding of the proposed development during construction and operation.

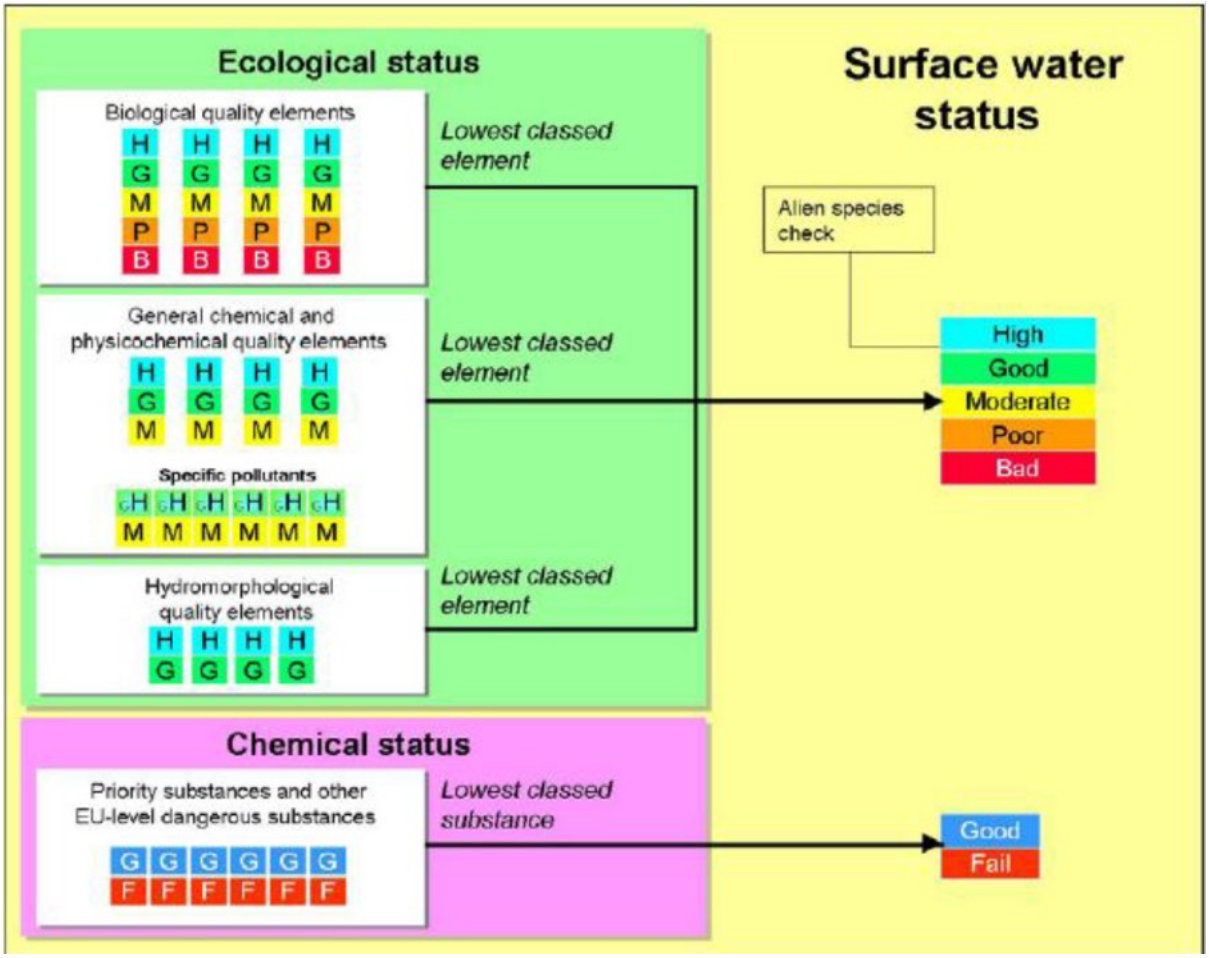
APPENDIX A

WATER FRAMEWORK DIRECTIVE ASSESSMENT MATRIX

1.1 Background to Surface Water Body Status & Groundwater Body Status

Under the WFD, surface water body status is classified on the basis of chemical and ecological status or potential. Ecological status is assigned to surface water bodies that are natural and considered by the EPA not to have been significantly modified for anthropogenic purposes (i.e., culverting). Ecological potential is assigned to artificial and man-made water bodies (such as canals), or natural water bodies that have undergone significant modification. The term 'ecological potential' is used as it may be impossible to achieve good ecological status because of modification for a specific use, such as navigation or flood protection. The ecological potential represents the degree to which the quality of the water body approaches the maximum it could achieve. The worst-case classification is assigned as the overall surface water body status, in a 'one-out all-out' system (i.e., by taking the worst case of all the combined risk outcomes). This system is summarised below in Figure 1.

Figure 1. WFD classification elements for surface water body status (Environmental Agency, 2015)



1.1.2 Chemical Status

Chemical status is defined by compliance with environmental standards for chemicals that are priority substances and/or priority hazardous substances, in accordance with the Environmental Quality

Standards Directive (2008/105/EC). This is assigned on a scale of good or fail. Surface water bodies are only monitored for priority substances where there are known discharges of these pollutants; otherwise, surface water bodies are reported as being at good chemical status.

1.1.3 Ecological Status

Ecological status or potential is defined by the overall health or condition of the watercourse. This is assigned on a scale of High, Good, Moderate, Poor or Bad, and on the basis of four classification elements or 'tests', as follows:

- **Biological:** This test is designed to assess the status indicated by a biological quality element such as the abundance of fish, invertebrates or algae and by the presence of invasive species. The biological quality elements can influence an overall water body status from Bad through to High.
- **Physico-chemical:** This test is designed to assess compliance with environmental standards for supporting physicochemical conditions, such as dissolved oxygen, phosphorus and ammonia. The physicochemical elements can only influence an overall water body status from Moderate through to High.
- **Specific pollutants:** This test is designed to assess compliance with environmental standards for concentrations of specific pollutants, such as zinc, cypermethrin or arsenic. As with the physico-chemical test, the specific pollutant assessment can only influence an overall water body status from Moderate through to High.
- **Hydromorphology:** For natural waterbodies, this test is undertaken when the biological and physicochemical tests indicate that a water body may be of High status. It specifically assesses elements such as water flow, sediment composition and movement, continuity, and structure of the habitat against reference or 'largely undisturbed' conditions. If the hydromorphological elements do not support High status, then the status of the water body is limited to Good overall status. For artificial or highly modified waterbodies, hydromorphological elements are assessed initially to determine which of the biological and physico-chemical elements should be used in the classification of ecological potential. In all cases, assessment of baseline hydromorphological conditions are an important factor in determining possible reasons for classifying biological and physicochemical elements of a water body as less than Good, and hence in determining what mitigation measures may be required to address these failing water bodies.

1.2 Background to Groundwater Body Status

Under the WFD, groundwater body status is classified on the basis of quantitative and chemical status. Status is assessed primarily using data collected from the EPA monitoring network; therefore, the scale of assessment means that groundwater status is mainly influenced by larger scale effects such as significant abstraction or widespread/ diffuse pollution. The worst-case classification is assigned as the overall groundwater body status, in a 'one-out all-out' system. This system is summarised in Figure 2 below.

1.2.1 Quantitative Status

Quantitative status is defined by the quantity of groundwater available as baseflow to watercourses and water-dependent ecosystems, and as 'resource' available for use as drinking water and other consumptive purposes. This is assigned on a scale of Good or Poor, and on the basis of four classification elements or 'tests' as follows:

- **Saline or other intrusions:** This test is designed to identify groundwater bodies where the intrusion of poor quality water, such as saline water or water of different chemical composition, as a result of groundwater abstraction is leading to sustained upward trends in pollutant concentrations or significant impact on one or more groundwater abstractions.
- **Surface water:** This test is designed to identify groundwater bodies where groundwater abstraction is leading to a significant diminution of the ecological status of associated surface water bodies.

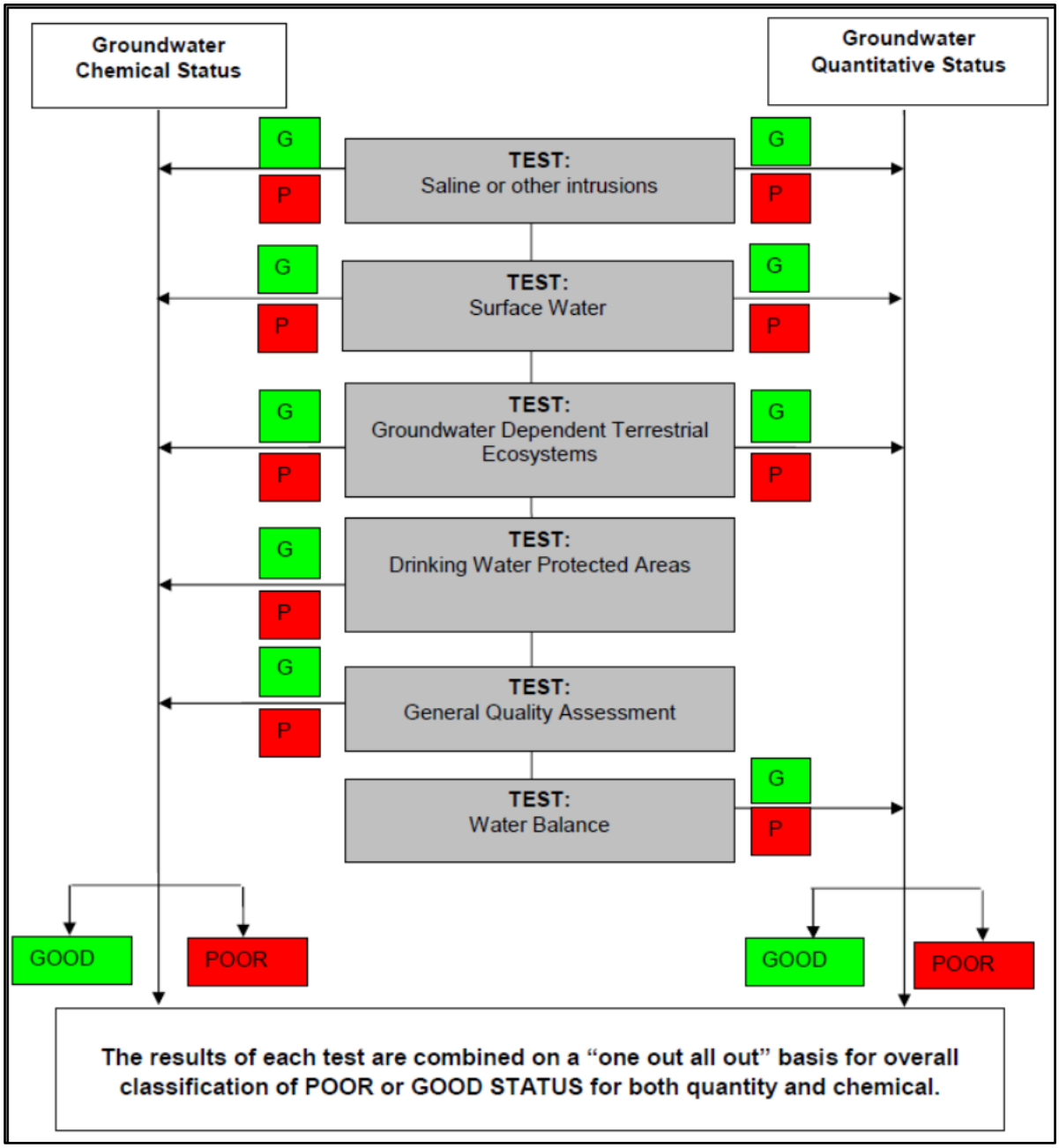
- **Groundwater Dependent Terrestrial Ecosystems (GWDTEs):** This test is designed to identify groundwater bodies where groundwater abstraction is leading to "significant damage" to associated GWDTEs (with respect to water quantity).
- **Water balance:** This test is designed to identify groundwater bodies where groundwater abstraction exceeds the "available groundwater resource", defined as the rate of overall recharge to the groundwater body itself, as well as the rate of flow required to meet the ecological needs of associated surface water bodies and GWDTEs.

1.2.2 Chemical Status

Chemical status is defined by the concentrations of a range of key pollutants, by the quality of groundwater feeding into watercourses and water-dependent ecosystems and by the quality of groundwater available for drinking water purposes. This is assigned on a scale of Good or Poor, and on the basis of five classification elements or 'tests' as follows:

- **Saline or other intrusions:** This test is designed to identify groundwater bodies where the intrusion of poor-quality water, such as saline water or water of different chemical composition, as a result of groundwater abstraction is leading to sustained upward trends in pollutant concentrations or significant impact on one or more groundwater abstractions.
- **Surface water:** This test is designed to identify groundwater bodies where groundwater abstraction is leading to a significant diminution of the chemical status of associated surface water bodies.
- **GWDTEs:** This test is designed to identify groundwater bodies where groundwater abstraction is leading to "significant damage" to associated GWDTE's (with respect to water quality).
- **Drinking Water Protected Areas (DrWPAs):** This test is designed to identify groundwater bodies failing to meet the DrWPA objectives defined in Article 7 of the WFD or at risk of failing in the future.
- **General quality assessment:** This test is designed to identify groundwater bodies where widespread deterioration in quality has or will compromise the strategic use of groundwater.

Figure 2. WFD classification elements for groundwater body status (Environmental Agency, 2015)



APPENDIX B.

Surface and Groundwater WFD Assessment

Appendix 6.4
Site Specific Flood Risk Assessment

AWN Consulting Ltd, The Tecpro Building, IDA Business & Technology Park, Clonshaugh, Dublin 17, D17 XD90



Site Specific Flood Risk Assessment

Project Ref: Knockharley Landfill Environmental Risk Assessment Report – Appendix 6.3

CLIENT	DOCUMENT REFERENCE	DATE
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AWN Consulting Ltd, The Tecpro Building, IDA Business & Technology Park, Clonshaugh, Dublin 17, D17 XD90

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Signature		
Name	Marcelo Allende	Teri Hayes
Title	Principal Hydrological Consultant	Director Water
Date	11 August 2025	

Disclaimer
This report considers the specific instructions and requirements of our client. It is not intended for third-party use or reliance, and no responsibility is accepted for any third party. The provisions in this report apply solely to this project and should not be assumed applicable to other developments without review and modification.

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1. INTRODUCTION

1.1 Background

AWN Consulting Ltd (AWN) has been appointed by Beauparc to undertake a Site Specific Flood Risk Assessment ("FRA") as part of the EIAR. The proposed development is located within the townlands of Knockharley, Flemingstown and Tuitrath, Navan, Co. Meath and part of the site is currently primarily in use as an active landfill (Industrial Emissions Directive (IED) Licence no. W0146-04). The site is located c. 800m from the N2 National Primary Road and landfill facility has its own private entrance off the N2.

The landfill was originally permitted in 2001 (Meath County Council (MCC) Reg. Ref. 01/5006) and most recently extended in size in 2021 (ABP-303211-18).

The proposed development primarily seeks to continue the existing landfill operations across an extended footprint within the site boundary. The proposed extension will add an additional 4.12 million m3 of additional void space for landfilling.

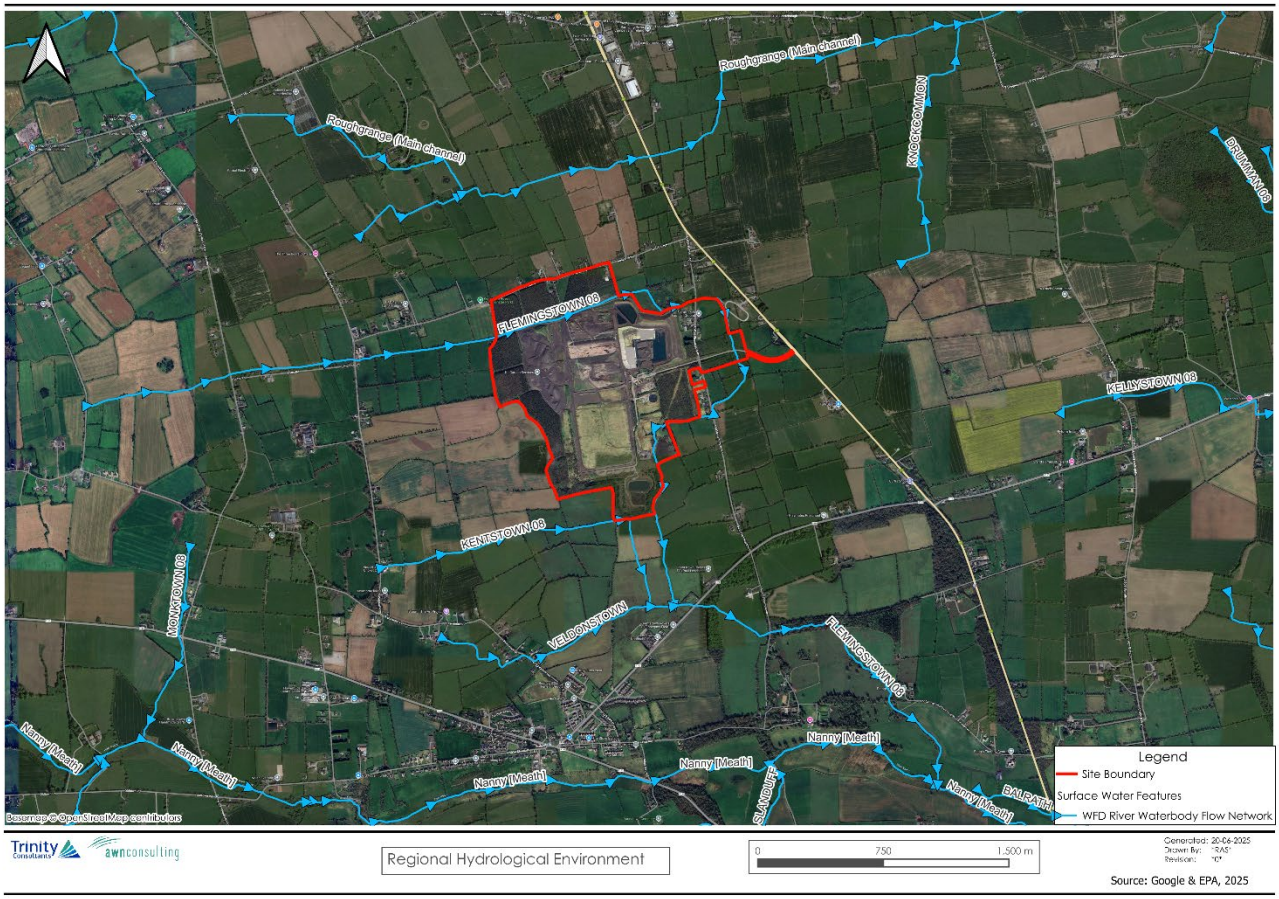
The site is surrounded at all sides by agricultural land which is the primary land use of the wider region. There are dispersed residential properties in the vicinity of the site, with the nearest residential houses located along the Knockharley road to the immediate north of the site and along the Rathdrinagh/Flemingstown road (L5056) to the east of the site.

The Knockharley Stream (EPA Name: Flemingstown 08, EPA Code: 08F05) flows west to east through the northern portion of the site and then flows along the eastern boundary of the site where it travels south /southeast away from the site and joins the Nanny River (EPA Name: Nanny (Meath), EPA Code: 08_757) c. 3km downstream. The Knockharley stream traverses or runs along the boundary of the site for c. 3km. A portion of the Knockharley Stream to the north of the landfill was diverted as part of the permitted ABP-303211-18 application.

The Kentstown Stream (EPA Name: Kentstown 08, EPA Code: 08K18) flows along the southern boundary of the site for c. 90 m before turning south and joining the Knockharley Stream c. 550 m downstream.

Refer to Figure 1-1 for the location of the proposed development and the hydrological environment.

Figure 1-1. Hydrological Environment



1.2 Planning Policy

The following planning policy documents are relevant to the assessment of the proposed development:

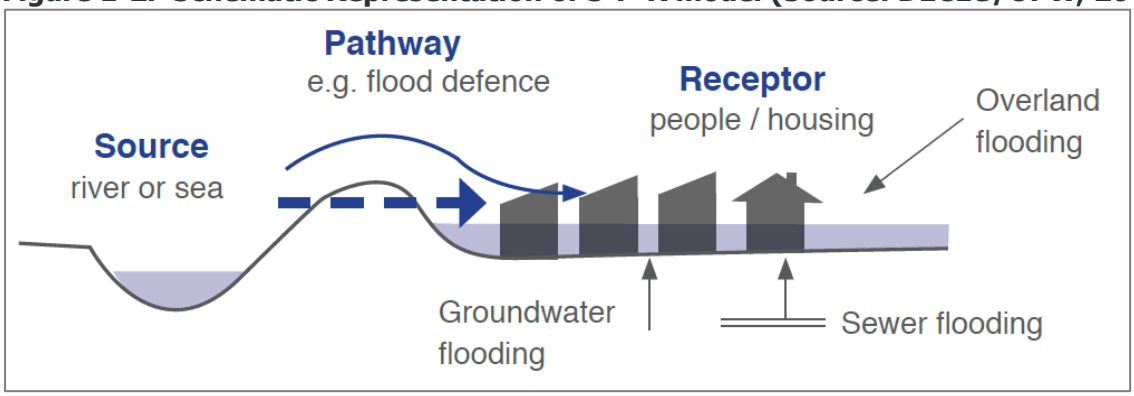
- The National Planning Guidelines published by the OPW and the Department of the Environment, Heritage and Local Government in November 2009 entitled 'The Planning System and Flood Risk Management Guidelines for Planning Authorities'.
- Meath County Development Plan 2021-2027.
- National Development Plan 2018-2027.
- National Development Plan Review 2025.

1.3 Relevant Guidelines and Flood Risk Management

As mentioned above, the relevant guidelines used by the Planning Authorities for Flood Assessment, 'The Planning System and Flood Risk Management', was published by the Department of Housing, Planning and Local Government (DECLG/OPW) in 2009. The purpose of the guidelines is to ensure that where relevant, flood risk is a key consideration in preparing development plans and assessing planning applications to avoid inappropriate development in areas at risk of flooding or increasing flood risk elsewhere as a result of development.

For carrying out a Site-specific Flood Risk Assessment (SSFRA), the OPW Guidelines recommend using Source-Path-Receptor (S-P-R) concept model to identify where the flood originates from, what the floodwaters path is and the areas in which assets and people might be affected by such flooding (Section 2.18 of the OPW Guidelines, 2009). Figure 1-2 below shows a schematic representation of S-P-R model.

Figure 1-2. Schematic Representation of S-P-R model (Source: DECLG/OPW, 2009)



A Flood Risk Assessment is undertaken over several stages with the need for progression to a more detailed stage dependent on the outcomes of the former stage. As per the relevant guidelines a tiered approach has been taken. The main aim of this assessment is to determine the risk of flooding to the site and the impact development will have on the floodplain, developments off site, upstream and downstream levels and any mitigation measures necessary.

This report follows the DECLG/OPW guidance for the staged approach to flood risk management as follows:

- Stage 1: Flood Risk Identification - to identify whether there may be any flooding or plan issues related to a plan area or proposed development site that may warrant further investigation.
- Stage 2: Initial Flood Risk Assessment - to confirm sources of flooding that may affect a plan area or proposed development site, to appraise the adequacy of existing information and to determine what surveys and modelling approach is appropriate to match the spatial resolution required and complexity of the flood risk issues. The extent of the risk of flooding should be assessed which may involve preparing indicative flood zone maps. Where existing river or coastal models exist, these should be used broadly to assess the extent of the risk of flooding and potential impact of a development on flooding elsewhere and of the scope of possible mitigation measures; and,
- Stage 3: Detailed Flood Risk Assessment - to assess flood risk issues in sufficient detail and to provide a quantitative appraisal of potential flood risk to a proposed or existing development, of its potential impact on flood risk elsewhere and of the effectiveness of any proposed mitigation measures. This will typically involve use of an existing or construction of a hydraulic model of the river or coastal cell across a wide enough area to appreciate the catchment wide impacts and hydrological processes involved.

As described in the FRM guidelines flood risk is a combination of the likelihood of flooding and the potential consequences arising. This is normally expressed in terms of the following relationship:

Flood Risk = Probability of Flooding x Consequences of Flooding

The likelihood of flooding is normally expressed as the percentage probability based on the average frequency measured or extrapolated from records over a large number of years. A 1% probability indicates the flood level that is expected to be reached on average once in 100 years, i.e. it has a 1% chance of occurring in any one year. Therefore:

- 100-year flood = 1% Annual Exceedance Probability (AEP).
- 1000-year flood = 0.1% AEP.

The purpose of this report is to carry out a Stage 1 Flood Risk Assessment for the site and the development proposals in accordance with the requirements outlined in "The Planning System and Flood Risk Management Guidelines for Planning Authorities". This report will make any recommendations for Stage 2 or Stage 3 FRA as necessary.

1.4 Flood Zones

According to the aforementioned guidelines: "*Flood zones are geographical areas within which the likelihood of flooding is in a particular range, and they are a key tool in flood risk management within the planning process as well as in flood warning and emergency planning*". The likelihood of a flood occurring is established through the identification of Flood Zones which indicate a high, moderate, or low risk of flooding from fluvial or tidal sources, as defined as follows (refer also to Figure 1-3 below):

- Flood Zone A - Where the probability of flooding is highest (greater than 1% AEP or 1 in 100 for river flooding and 0.5% AEP or 1 in 200 for coastal flooding) and where a wide range of receptors would be vulnerable.
- Flood Zone B - Where the probability of flooding is moderate (between 0.1% AEP or 1 in 1000 and 1% AEP or 1 in 100 for river flooding and between 0.1% AEP or 1 in 1000 year and 0.5% AEP or 1 in 200 for coastal flooding); and
- Flood Zone C - Where the probability of flooding is low (less than 0.1% AEP or 1 in 1000 for both river and coastal flooding).

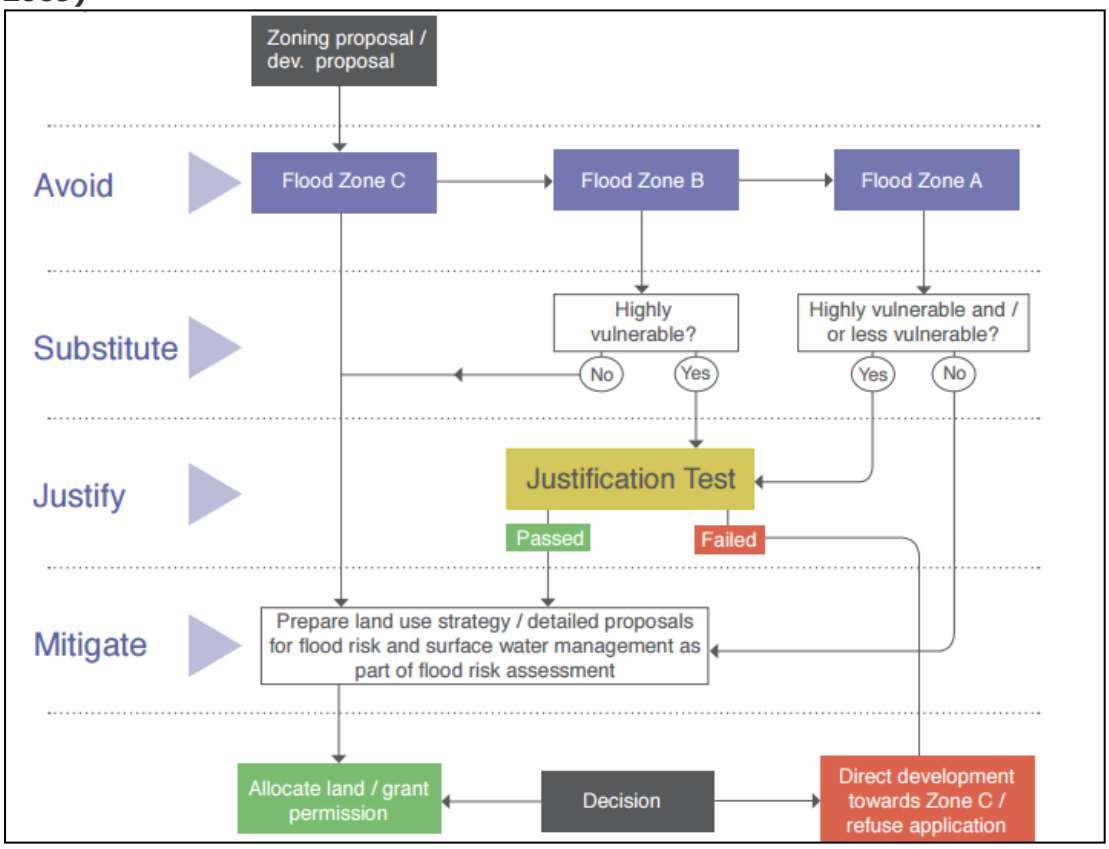
Figure 1-3. Indicative Flood Zone Map (Source: DECLG/OPW, 2009)



1.5 Sequential Approach and Justification Test

A sequential plan approach was undertaken for this risk assessment under the relevant guidance mentioned above. Specifically, a sequential approach is first and foremost directed towards land that is at low risk of flooding. The underpinning philosophy of the sequential approach is highlighted in the illustration below. It should be noted that the above guidance is applicable in the layout and design of the specific subject site at the development management stage (refer to Figure 1-4 below).

Figure 1-4. Sequential Approach Mechanism in the Planning Process (Source: DECLG/OPW, 2009)



According to the Guidelines, if a development falls in the justification test category, then the test must demonstrate that the development meets the following criteria:

1. The subject lands have been zoned or otherwise designated for the particular use or form of development in an operative development plan, which has been adopted or varied taking account of the Guidelines.
2. The proposal has been subject to an appropriate flood risk assessment that demonstrates:

    a. The development proposed will not increase flood risk elsewhere and, if practicable, will reduce overall flood risk.
    b. The development proposal includes measures to minimise flood risk to people, property, the economy, and the environment as far as reasonably possible.
    c. The development proposed includes measures to ensure that residual risks to the area and/or development can be managed to an acceptable level as regards the adequacy of existing flood protection measures or the design, implementation and funding of any future flood risk management measures and provisions for emergency services access; and
    d. The development proposed addresses the above in a manner that is also compatible with the achievement of wider planning objectives in relation to development of good urban design and vibrant and active streetscapes.

The acceptability or otherwise of levels of residual risk should be made with consideration of the type and foreseen use of the development and the local development context.

1.6 Classification of Vulnerability

As explained, the sequential approach presented above makes use of flood risk assessment and of prior identification of flood zones for river and coastal flooding and additionally, classification of the vulnerability to flooding of different types of development, as illustrated in Table 1-1 below.

Table 1-1. Classification of Vulnerability of Different Types of Development (Source: DECLG/OPW, 2009)

Vulnerability class	Land uses and types of development
Highly Vulnerable Development (including essential infrastructure)	Garda, ambulance and fire stations and command centres required to be operational during flooding. Hospitals. Emergency access and egress points. Schools. Dwelling houses, student halls of residence and hostels. Residential institutions such as residential care homes, children's homes and social services homes. Caravans and mobile home parks. Dwelling houses designed, constructed or adapted for the elderly or, other people with impaired mobility. Essential infrastructure, such as primary transport and utilities distribution, including electricity generating power stations and sub-stations, water and sewage treatment, and potential significant sources of pollution (SEVESO sites, IPPC sites, etc.) in the event of flooding.
Less Vulnerable Development	Buildings used for retail, leisure, warehousing, commercial, industrial and non-residential institutions. Land and buildings used for holiday or short-let caravans and camping, subject to specific warning and evacuation plans. Land and buildings used for agriculture and forestry. Waste treatment (except landfill and hazardous waste). Mineral working and processing. Local transport infrastructure.
Water-compatible Development	Flood control infrastructure. Docks, marinas and wharves. Navigation facilities. Ship building, repairing and dismantling, dockside fish processing and refrigeration and compatible activities requiring a waterside location. Water-based recreation and tourism (excluding sleeping accommodation). Lifeguard and coastguard stations. Amenity open space, outdoor sports and recreation and essential facilities such as changing rooms. Essential ancillary sleeping or residential accommodation for staff required by uses in this category (subject to a specific warning and evacuation plan).

Finally, Table 1-2 below illustrates those types of development that would be appropriate to each flood zone and those that would be required to meet the Justification Test.

Table 1-2. Matrix of Vulnerability versus Flood Zone (Source: DECLG/OPW, 2009)

Vulnerability class	Flood Zone A	Flood Zone B	Flood Zone C
Highly Vulnerable	Justification Test	Justification Test	Appropriate
Less Vulnerable	Justification Test	Appropriate	Appropriate
Water-compatible	Appropriate	Appropriate	Appropriate

Landfill facilities are classed as 'Highly Vulnerable', therefore the development requires a Justification Test if it is to be located in Flood Zone A or B.

1.7 Climate Change

Flood risk is anticipated to increase as a result of climate change. Projected impacts for Ireland include:

- Sea level rise of between 18cm and 59cm this century;
- More intense storms and rainfall events;
- Increased likelihood and magnitude of river and coastal flooding; and
- Increased storm surges.

With respect to this assessment and the development area only changes in the intensity of rainfall events and the magnitude of river flooding are of direct relevance.

In all developments, climate change should be considered when assessing flood risk and in particular residual flood risk. Consideration of climate change is particularly important where flood alleviation measures are proposed, as the design standard of the proposal may reduce significantly in future years due to increased rainfall, river flows and sea levels.

The Guidelines recommend that a precautionary approach to climate change is adopted due to the level of uncertainty involved in the potential effects. A significant amount of research into climate change has been undertaken on both a national and international front, and updates are ongoing.

The OPW guidance recommends two climate change scenarios are considered and an allowance provided. These are the Mid-Range Future Scenario (MRFS) and the High-End Future Scenario (HEFS). The allowances should be applied to the 1% AEP fluvial or 0.5% AEP tidal levels. Based on these two scenarios the OPW recommended allowances for climate change are given in Table 1-3 below. These climate change allowances are particularly important at the development management stage of planning and will ensure that proposed development is designed and constructed to take into account best current knowledge.

Table 1-3. Allowances in Flood Parameters for the Mid-Range and High-End Future Scenarios for Fluvial and Tidal Sources

Parameter	MRFS	HEFS
Extreme Rainfall Depths	+20%	+30%
Peak Flood Flows	+20%	+30%
Mean Sea Level Rise	+500 mm	+1,000 mm
Land Movement	-0.5 mm/year [1]	-0.5 mm/year [1]
Urbanisation	No General Allowance – Review on Case-by-case basis	No General Allowance – Review on Case-by-case basis
Forestation	- 1/6 Tp [2]	- 1/3 Tp [2] + 10% SPR [3]
Note 1: Applicable to the southern part of the country only (Dublin – Galway and south of this) Note 2: Reduction in the time to peak (Tp) to allow for potential accelerated runoff that may arise as a result of drainage of afforested land Note 3: Add 10% to the Standard Percentage Runoff (SPR) rate: This allows for temporary increased runoff rates that may arise following felling of forestry.		

For most development, including residential, nursing homes, shops and offices, the medium-range future scenario (20% increase in flows / 0.5 m sea level) is an appropriate consideration. This should be applied in all areas that are at risk of flooding (i.e. within Flood Zone A and B) and will be considered for sites which are in Flood Zone C but are adjacent to Flood Zone A or B. This is because land which is currently not at risk may become vulnerable to flooding when climate change is taken into account.

Where a development is critical or extremely vulnerable the impact of climate change on 0.1% AEP flows should also be applied, and greater climate change allowances tested for resilience purposes (30% increase in flows / 1.0m level).

Where the risk associated with inundation of a development is low and the design life of the development is short (typically less than 30 years) the allowance provided for climate change may be less than the 20% / 0.5m level. It should be noted that the operational life of the Proposed Development in terms of landfilling activities is planned to cease in 2043.

Refer to Table 1-4 for the allowance classification by vulnerability and flood source.

Table 1-4. Climate Change Allowances by Vulnerability and Flood Source

Development Vulnerability	Fluvial climate change allowance (increase in flows)	Tidal climate change allowance (increase in sea level)	Storm water/ surface water
Less Vulnerable	+20%	0.5m (MRFS)	20% increase in rainfall
Highly Vulnerable	+20%	0.5m (MRFS)	
Critical or extremely vulnerable (e.g. hospitals, major sub-stations, blue light services)	+30%	1.0m (HEFS)	
Note: There will be no discounting of climate change allowances for shorter lifespan developments			

In general, climate change will be accounted for by the setting of finished floor levels to a height which includes an allowance for climate change. However, climate change may also reveal additional flow paths which need to be protected or give rise to flows which exceed culvert capacity or overtop defences. These outcomes will need to be specifically investigated for each site, and an appropriate response provided.

2. HYDROLOGICAL AND HYDROGEOLOGICAL ENVIRONMENT

2.1 Regional and Local Hydrology

The proposed development site is located within the former Eastern River Basin District (ERBD) (now the Irish River Basin District), as defined under the European Communities Directive 2000/60/EC, establishing a framework for community action in the field of water policy – this is commonly known as the Water Framework Directive (WFD). The site is located in the Eastern River Basin District (IESE) (Hydrometric Area No. 08).

The proposed development site lies within the Nanny-Delvin Catchment (Catchment ID: 08) and the Nanny [Meath]_SC_010 Sub-Catchment (Sub-Catchment ID: 08_4). The current EPA watercourse mapping shows two watercourses flowing adjacent to the site. The Flemingstown(Meath)_10 (European Code: IE_EA_08F050930) stream transverses with the site in the northern section, flowing in an easterly direction before turning south as it transverses with the south section of the site before discharging to River Nanny c.2.8km south of the site. The existing surface water pond discharges to the Flemingstown Stream south of the wetland. A second tributary, the Kentstown Stream flows east along the southern licensed boundary before turning south and joining the Veldonstown Stream, just upstream of its confluence with the Flemingstown Stream.

The current EPA watercourse mapping shows two watercourses flowing adjacent to the proposed development site. The Flemingstown 08 stream transverses with the site in the northern section, flowing in an easterly direction before turning south as it transverses with the south section of the site before discharging to River Nanny c.2.8km south of the site. A second tributary, the Kentstown Stream flows east along the southern licensed boundary before turning south and joining the Veldonstown Stream, just upstream of its confluence with the Flemingstown Stream. The Flemingstown Stream originates from the west near the Realtogue area c. 2.5 km upstream of the site. The stream emerges from a 1.0 m diameter circular concrete culvert at the western boundary.

With regard to the local hydrology, there is an existing surface water and foul drainage on site as shown in Figure 2-1 below. In the northern section of the site, there are a holding pond and an attenuation pond while a storm attenuation lagoon is present in the southern section of the site.

Surface water swales are present in the northern section of the site around the IBA Cells which flow from the western side of the cells flowing in a south easterly direction before turning north and discharging to the holding pond through surface water piped network. Two separate piped storm networks exist in the eastern section of the site which collects all storm water and flows in a general southernly direction. Both storm networks combine towards the centre of the site and flow in a southernly direction towards the storm attenuation lagoon.

Also, a surface water swale runs parallel on the eastern and western side of the existing landfill. The western swale flows in southern direction before flowing east while the eastern swale flows in southernly direction. Both swales merge near the southeastern boundary of the existing landfill. From here they join the exiting storm water pipeline through a piped network before discharging to the storm attenuation lagoon.

A network of foul drainage also exists along the facilities and existing buildings which collects to the foul water and discharge it into the waste leachate lagoon.

Refer to Figure 2-1 for the local hydrological environment.

Figure 2-1. Local Hydrological Environment



2.2 Hydrogeology

The bedrock aquifer underlying the proposed development site, according to the GSI (www.gsi.ie/mapping) National Draft Bedrock Aquifer Map, is classified as a "Poor Aquifer - Bedrock which is Generally Unproductive except for Local Zones". The potential for vertical or horizontal migration within this type of aquifer is not significant and on local scale. The GSI map does not identify structural faults underneath the area of the subject site.

The site is underlain by the Realtage groundwater body (GWB) (European Code: IE_EA_G_020), According to GSI (2004), The dominant subsoil lithology overlying this GWB is till, mainly derived from Namurian sediments, although some limestone-derived tills are seen closer to the contact with the limestone. There are smaller areas of alluvium and gravel deposits along the River Nanny floodplain. recharge will occur via rainfall percolating through the subsoil. The GWB is composed primarily of low permeability rocks, although localized zones of enhanced permeability do occur. Recharge occurs diffusely through the subsoils and via outcrops. It takes place mainly in the upland areas where subsoils are thinner and more permeable. The aquifers within the GWB are generally unconfined, but may become locally confined where the subsoil is thicker and/or lower permeability. Most flow in this aquifer will occur near the surface. In general, the majority of groundwater flow occurs in the upper 10 m, comprising a weathered zone of a few metres and a connected fractured zone below this. However, deep-water strikes in more isolated faults/ fractures can be encountered at 30-50 mbgl. Flow path lengths are relatively short, and in general are between 100 and 500 m. Groundwater discharges to the numerous small streams crossing the aquifer, and to the springs and seeps.

Based on the most recent data (EPA, 2025; www.epa.ie), the Realtage GWB for which the site is located entirely within, has a WFD status of "Good" (WFD Period: 2016-2021) and a WFD risk score (3rd Cycle) of "Not at Risk" of not achieving good status.

The GSI presently classifies the groundwater vulnerability of the entire site as 'Low' vulnerability, and this has been confirmed by the site investigation carried out by Ground Investigation Ireland (GII, 2025). Based on the subsoil type and description, the expected depth to bedrock is expected to be greater than 10m.

The site is sloped with elevations ranging from 70 mOD in the northwest to 55 mOD in the southeast of the site. The groundwater flow direction likely follows the local topography to Flemingstown and Kentstown Stream contributing to their baseflow

3. CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The proposed development primarily seeks to continue the existing landfill operations across an extended footprint within the site boundary. The proposed extension will add an additional 4.12 million m^3 of additional void space for landfilling. The drainage system will include additional swales, petrol interceptors, and changes and expansion of the existing attenuation ponds to manage surface water effectively. In addition, a stream diversion with a new culvert is proposed to facilitate the landfill expansion.

A 10% increase in the precipitation depth has been incorporated in the design to allow for climate change (based the Greater Dublin Regional Code of Practice (section 3.2)). According to the Drainage Report prepared by WSP and included as part of this application, a high-level analysis of storage requirements during post-closure has been undertaken to confirm that the High-Range Future Scenario 30% increase in extreme rainfall can be accommodated in the proposed attenuation ponds.

The proposed Northern Attenuation Pond system has been designed to provide long-term storage which will discharge at a maximum rate of 109 l/s for a 1:100 AEP event through a Hydro-brake device, or similar on the outlet pipe to regulate the discharge rate. The total storage volume required to attenuate the 1:100 AEP event is 7,901 m^3. The current attenuation capacity provided by the Northern Attenuation Pond and the Holding Pond will be sufficient to accommodate the proposed design storage volume, however modification will be required to the discharge pipe arrangements (refer to the Drainage Report prepared by WSP for further reference). An existing emergency spillway (which will also be part of the proposed development) has been provided above the 1:100 AEP level to safely pass any exceedance flows.

The Southern Attenuation Pond has been designed to provide long-term and short-term storage. The long-term storage will discharge at a maximum rate of 107 l/s during a 1:100 AEP event. It has been assumed that an orifice, or similar, will be installed on the outlet pipe to regulate the discharge rate. The total storage volume required to attenuate the 1:100 AEP event is 9,401m^3. Similarly, the minimum long-term storage volume required in the pond is 3,249 m^3 to attenuate the 1:1 AEP event. The current attenuation capacity provided by the Southern Attenuation Pond will be increased from 6,900m^3 app. to 12,700m^3 app. to meet this criterion. An emergency spillway has been provided above the 1:100 AEP level to safely pass any exceedance flows.

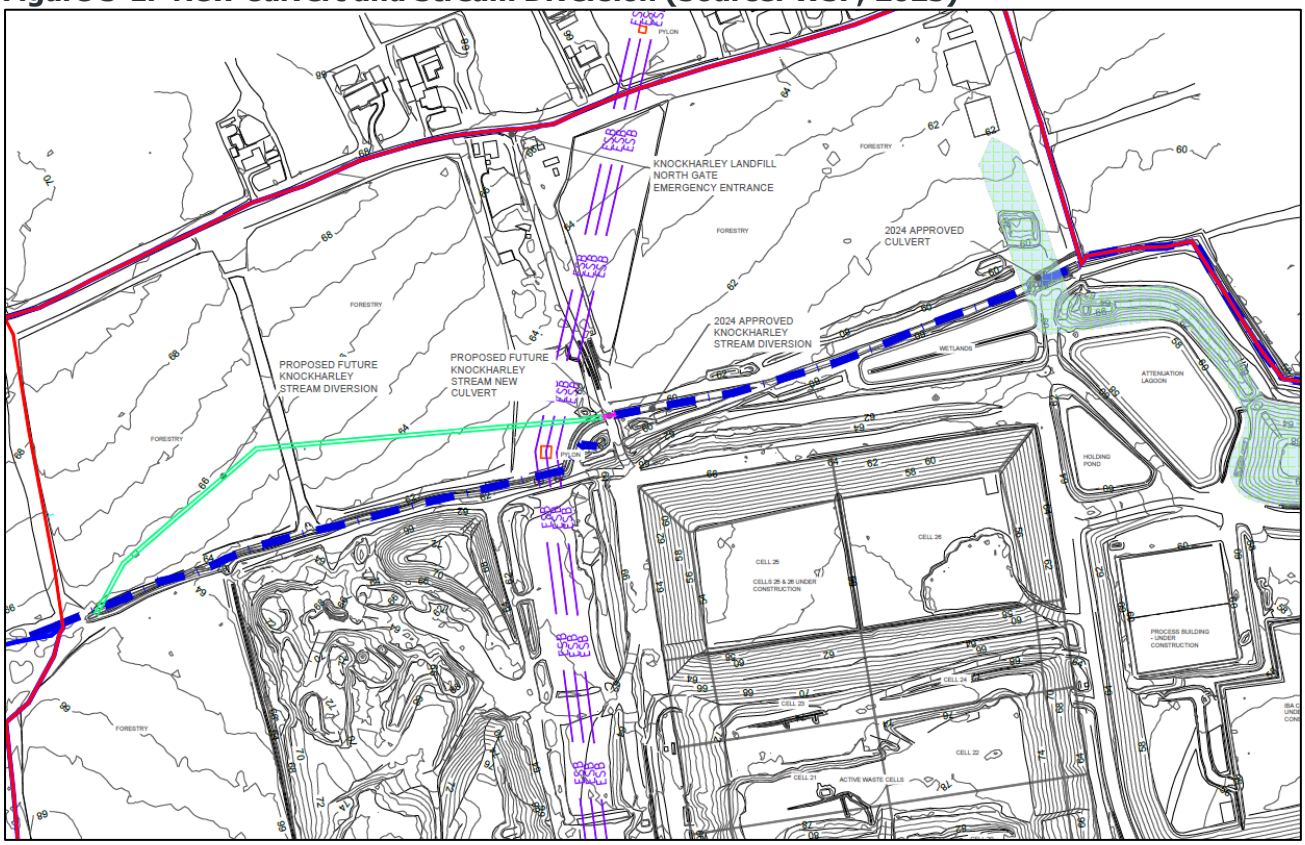
Grassed swales have been proposed to provide treatment and convey surface water from the landfill to the attenuation ponds.

The proposed development works also include the diversion of the existing Knockharley Stream. It is proposed to realign the river to the north of the current channel to facilitate the extension of the existing landfill footprint. The diverted stream will be unculverted with the exception of existing access road crossing which will require a culvert to allow the road to passover.

Consultation has taken place with Inland Fisheries Ireland regarding the design of the stream diversion and culvert. Requirements for the culvert construction were agreed on and incorporated into the design, which has been appended to the aforementioned Drainage Report prepared by WSP. Specifically, that the culvert will be buried to a minimum depth of 0.5 m below the stream bed and that the gradient in the culvert should not exceed 3%. The material used to embed the culvert will be similar to that of the existing stream bed.

A Culvert Hydrologic and Hydraulic Assessment has been prepared by WSP (2025) as part of its Section 50 application appended to the Drainage Report and submitted with the planning application documentation. The report summarises the methodologies employed and outcomes from the completed hydrologic and hydraulic assessment. The design of watercourse crossings will be subject to the approval of the OPW, under Section 50 of the Arterial Drainage Act, 1945 and OPW standards. Figure 3-1 below presents the proposed diversion.

Figure 3-1. New Culvert and Stream Diversion (Source: WSP, 2025)



According to the Hydraulic Assessment, the proposed culvert will have adequate capacity to pass the design flood flow with sufficient freeboard and without causing more than 300 mm afflux. It is not anticipated that the flood risk in the catchment area for the 1% AEP (plus 20% increase due to climate change) will increase as a result of the presence of the proposed new culvert. There are some roads, and residential buildings present in the upstream catchment of the culvert which will not be affected by the proposed culvert. Refer to the WSP Assessment for further information.

4. FLOOD RISK ASSESSMENT

4.1 Stage 1 – Flood Risk Identification

Stage 1 identifies whether there are any flooding or surface water management issues related to the area indicated from Regional Planning Guidelines or Development Plans that may warrant further investigation. This will provide a general indication of the potential flood risk to the site and identify whether there are any flooding or surface water management issues that may warrant further investigation work in the form of a Stage 2 (Initial Flood Risk Assessment) and Stage 3 (Detailed Flood Risk Assessment) as required.

The following data sources indicate if a flood risk in the area of interest exists:

- OSi Historical Flood Maps and Satellite imagery.
- OPW Flood Hazard Mapping.
- CFRAM Indicative Flood Zone Maps.
- GSI Groundwater Flooding Viewer.
- Strategic Flood Risk Assessment – Meath County Development Plan 2021-2027.

These data sources were used to identify any potential flood risk from the following sources:

1. Fluvial Flooding.
2. Pluvial Flooding – Surface Water Run-off.
3. Coastal Flooding.
4. Groundwater Flooding.

4.1.1 Fluvial Flood Risk

The OPW online viewer was accessed to establish if any historical flood plains were marked on the assessment area. No historical flood plains were identified in the vicinity of the development site. The OPW flood hazard maps were also used to establish if there is a risk of fluvial flooding.

The OPW mapping portal (www.floodinfo.ie) includes mapping showing the extent of the predicted Flood Zone A (1% AEP event) and Flood Zone B (0.1% AEP event) in the Study Area. The mapping was developed by hydraulic modelling during the CFRAM projects undertaken for the OPW and is in line with the Meath County Development Plan 2021-2027 Strategic FRA. An extract from the mapping is shown in Figure 4-1 and Figure 4-2 below in the context of the proposed development site. A Flood Zone B area is indicated in the permitted landfill area, associated with the existing northern attenuation pond as well as a Flood Zone A in its southern area associated with the existing wetland. However, part of the Flood zone B is now covered by the cell 25-26, therefore the extent of this zone may be obsolete. The Flood Risk Assessment prepared by the applicant as part of the 2021 Extent application process[1] estimated a 1:1000-year compensation flood footprint that replaces the Flood Zone B initially estimated by the CFRAM projects (refer to Figure 4-3 below).

[1] Environmental Impact Assessment Report (EIAR) for the Proposed Development at Knockharley Landfill. Appendix 12.5. Flood Risk Assessment. Fehily and Timoney, November 2018.

Figure 4-1. Extract from CFRAM Fluvial Flooding Map (Source: OPW, 2025)

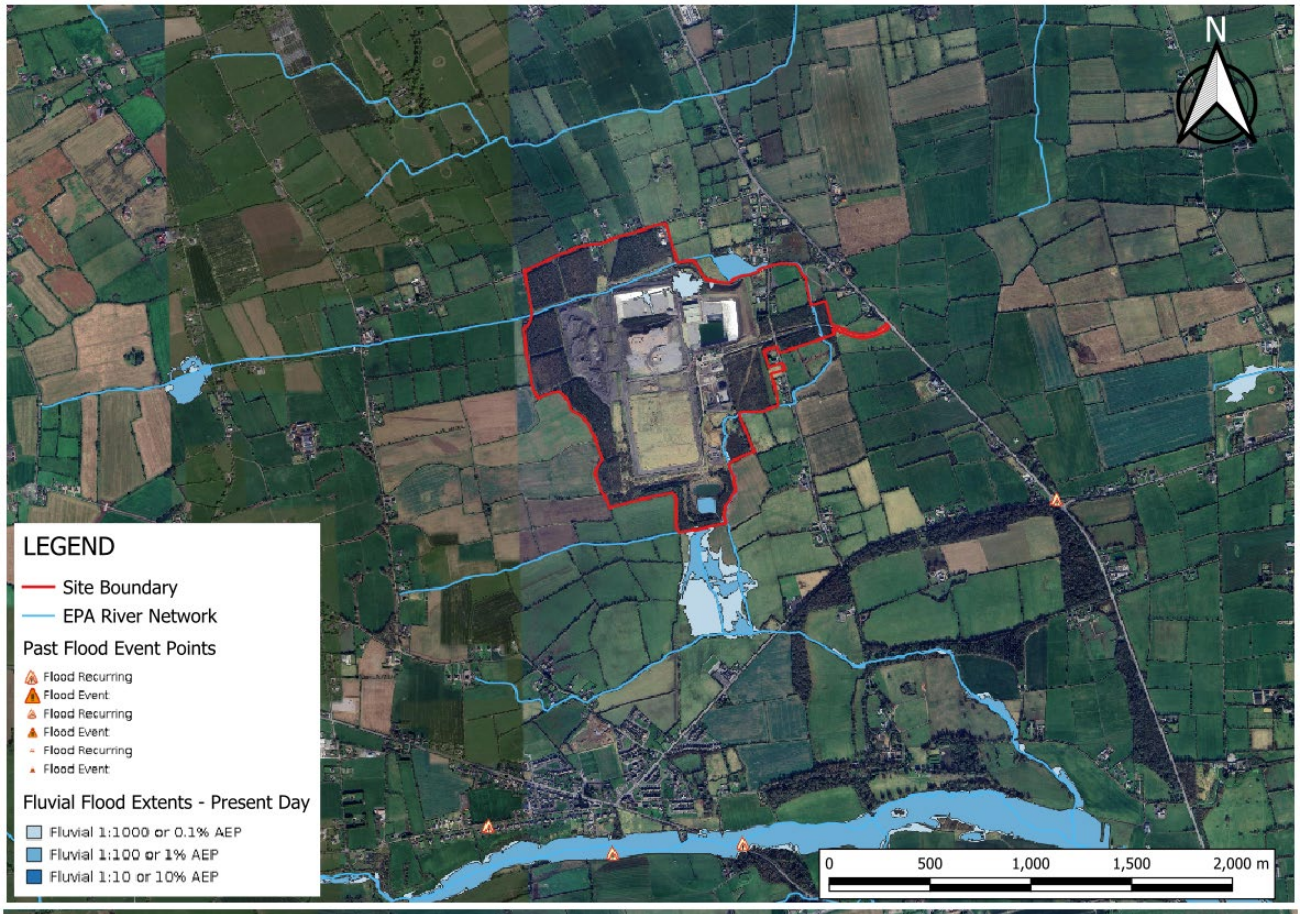
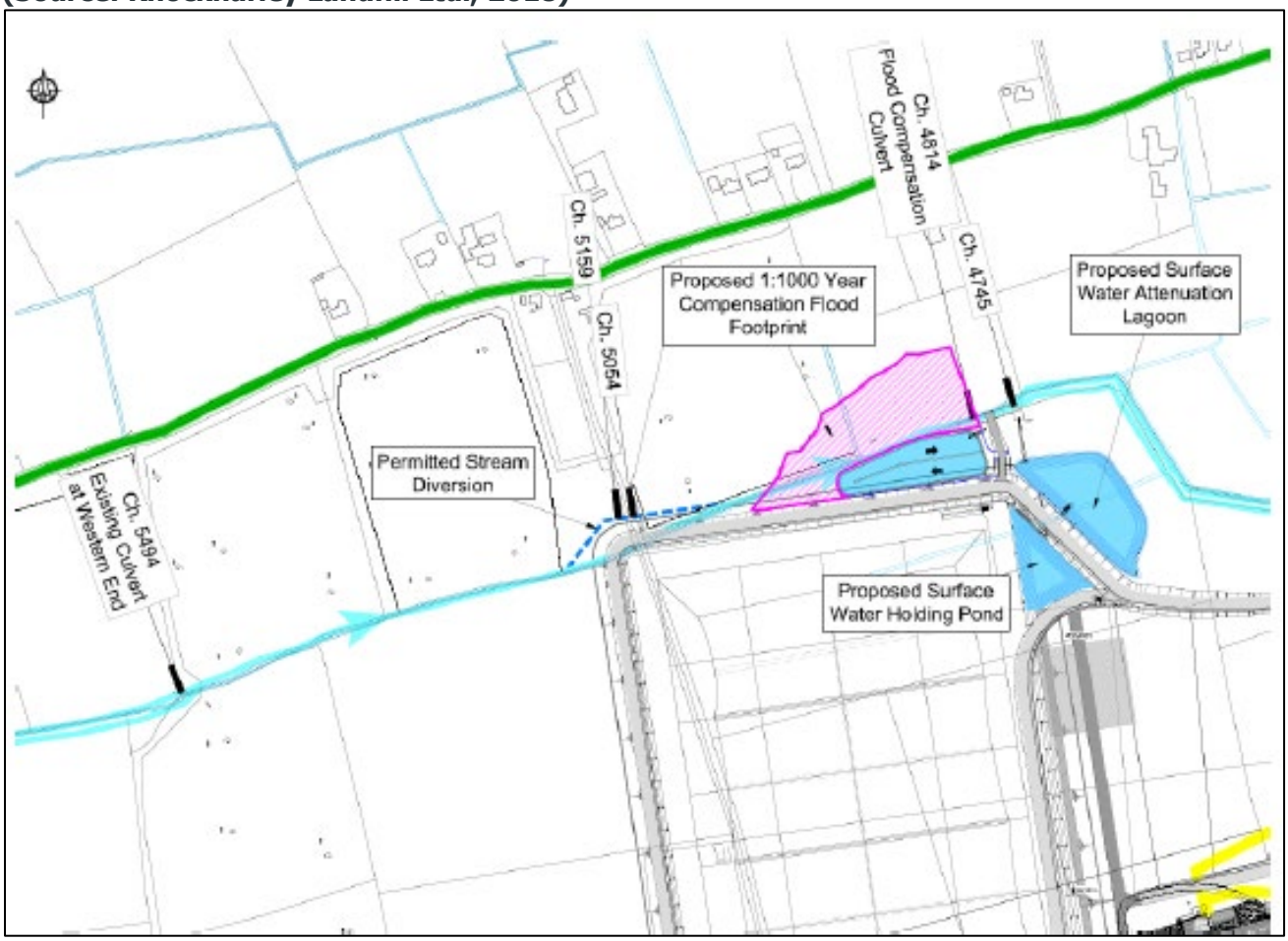




Figure 4-2. Extract from Meath County Development Plan 2021-2027



Figure 4-3. Existing Flood Footprint associated with Flood Zone B in the Northern Area (Source: Knockharley Landfill Ltd., 2018)



As mentioned in Section 3 above, the proposed development works includes the diversion of the existing Knockharley Stream to facilitate the proposed development. This diversion will require a culvert for the existing access road crossing.

4.1.2 Pluvial Flood Risk

The potential risk of flooding from surface water would arise from the accumulation of rainfall runoff across the site and the surrounding areas. The past flood events map created by the OPW does not present historical flood locations associated with the proposed layout. Small areas of indicative pluvial flooding are noted at the site and these areas are currently addressed by the existing surface water drainage in the landfill.

4.1.3 Coastal Flood Risk

The proposed development is located approximately 21km upstream from the nearest transitional/coastal waterbody on the River Nanny (Nanny Estuary). The proposed layout is therefore outside any coastal/tidal influence and the risk of coastal flooding can be considered low.

4.1.4 Groundwater Flood Risk

The Geological Survey Ireland (GSI) Groundwater Viewer provides predictive and historic groundwater flood maps for Ireland. Figure 4-4 below shows no groundwater flooding events within the development site. The risk of groundwater flooding can be considered low.

Figure 4-4. Groundwater Flooding Map (Source: GSI, 2025)



4.1.5 Summary of Potential Sources of Flooding

A brief appraisal of the potential sources of flooding and their impact on the proposed development is summarized in Table 4-1 below.

Table 4-1. Appraisal of Flood Risk Sources

Source	Pathway	Receptor	Likelihood	Consequence	Risk
Fluvial	Overbank	Infrastructure/People	Possible	Medium	Medium
Pluvial	Overflow	Infrastructure/People	Possible	Low	Low
Coastal	Overtop/breach	Infrastructure/People	Remote	Medium	Low
Groundwater	Rising water level	Infrastructure/People	Low	Low	Low

4.2 Stage 2 – Initial Flood Risk Assessment

With regard to the existing northern attenuation pond and the southern wetland both associated with CFRAM flooding zones, the proposed development will not affect these water features and their capacities. The Northern Attenuation Pond has been already designed to provide storage for the 1:100 AEP event and any flow above the 1:100 AEP level is conveyed through an emergency spillway provided to safely pass any exceedance flows.

The compensation flood footprint associated with Flood Zone B presented in the previous application process in the northern area (and presented in Figure 4-3 above) will not be affected by the proposed development and therefore, the food risk will not be increased.

The Southern Attenuation Pond has also been designed to provide long-term storage whose discharge has been designed to convey the 1:100 AEP event. An emergency spillway has been provided above the 1:100 AEP level to safely pass any exceedance flows. As such, these works do not affect the extent of the existing Flood Zone A associated with the wetland where this attenuation pond discharges, as the storm 1:100 will be attenuated and managed by this existing system.

The High-Range Future Scenario (1% AEP plus 30% increase in extreme rainfall) can be accommodated in the proposed attenuation ponds at closure.

In addition, as mentioned in Section 3 above, the proposed development works includes the diversion of the existing Knockharley Stream to facilitate the extension of the existing landfill footprint. The diverted stream will be unculverted with the exception of existing access road crossing which will require a culvert to allow the road to passover.

According to the Hydraulic Assessment carried out by WSP, the proposed culvert will have capacity to convey the design flood flow (1% annual exceedance probability or 1 in 100-year flow without significantly changing the hydraulic characteristics of the watercourse) with sufficient freeboard. The available freeboard at the culvert during the 1% AEP event, inclusive of climate change (calculated as 0.96 m). It is not anticipated that the flood risk in the catchment area for the 1% AEP + climate change will increase as a result of the presence of the proposed new culvert.

A Stage 3 (Detailed Flood Risk Assessment) is not required as the Stage 2 assessment is conclusive in terms of the potential flood risk.

4.3 Identification of Development Vulnerability

The proposed development type is considered to be essential infrastructure, associated with facilities with potential significant sources of pollution (IPPC sites, etc.) in the event of flooding and therefore it is classified as 'Highly Vulnerable' as per the definition given in 'The Planning System and Flood Risk Management: Guidelines for Planning Authorities', as shown in Table 1-1 above.

As presented above, part of the proposed layout is within Flood Zone A and B. Therefore, as this landfill is considered a "Highly Vulnerable" development, and in accordance with Table 1-2 above, a Justification Test will be required for this part of the development.

4.4 Justification Test

According to the Guidelines, if a development falls in the justification test category, then the test must demonstrate that the development meets the criteria presented in Section 1.5 above.

Table 4-2. Justification Test

Criteria	Test
(1) The subject lands have been zoned or otherwise designated for the particular use or form of development in an operative development plan, which has been adopted or varied taking account of the Guidelines.	The land at the proposed development is zoned Rural Area (RA) as part of the Meath County Development Plan. It is noted that landfill use is neither a 'open for consideration use' or 'permissible use'. The landfill use is an existing and ongoing use of the site. Section 11.14.2 of the current Meath County Development Plan (2021-2027) notes that "there are instances across the County of established uses that do not conform to the zoning objective for the particular location. Any proposals for the expansion, improvement, or alteration of such uses will be considered on their individual merits". In this regard, the proposed development is in-keeping with the policies and will assist in fulfilling objectives in the current Meath County Development Plan (2021-2027). In particular, the importance of Knockharley Landfill is identified at Section 6.17.3.6 (Disposal) of the County Development Plan which notes 'The Knockharley regional landfill, near Kentstown, accessed off the N2 National Primary Route is a privately operated landfill facility which has capacity beyond the lifetime of this Plan. It is recognised that a contingency capacity for landfill is required to facilitate emergency situations for example, the management of waste from a foot and mouth disease outbreak.' In relation to Waste Management and Infrastructure. Some of the relevant policies and objectives in the County Development Plan are listed below: • INF POL 61: To facilitate the implementation of National Waste Legislation, National and Regional Waste Management Policy and the circular economy. • INF POL 63: To encourage the development of waste infrastructure and associated developments in appropriate locations, as deemed necessary in accordance with the requirements of the current Eastern Midlands Region Waste Management Plan and the Draft Waste Facility Siting Guidelines 2016 (when finalised) or any subsequent replacement guidelines.

Criteria	Test
	• INF POL 65: To adopt the provisions of the waste management hierarchy and implement policy in relation to the County's requirements under the current or any subsequent Waste Management Plan. All prospective developments in the County shall take account of the provisions of the regional waste management plan and adhere to the requirements of the Plan. Account shall also be taken of the proximity principle and the inter-regional movement of waste. • INF POL 70: To encourage the recycling of construction and demolition waste and the reuse of aggregate and other materials in future construction projects. • INF OBJ 54: To facilitate the transition from a waste management economy to a green circular economy to enhance employment opportunities and increase the value recovery and recirculation of resources. • INF OBJ 55: To facilitate the provision of appropriate waste recovery and disposal facilities in accordance with the principles set out in the appropriate Waste Management Plan applicable from time to time made in accordance with the Waste Management Act 1996 (as amended). • INF OBJ 59: To seek to ensure, in cooperation with relevant authorities, that waste management facilities are appropriately managed and monitored according to best practice to maximise efficiencies to protect human health and the natural environment. • INF OBJ 68: To support the development of facilities to cater for commercial waste not provided for within the kerbside collection system such as the WEEE, C & D type waste and hazardous materials in accordance with the requirements of the Eastern Midlands Regional Waste Management Plan.
(2a) The proposal has been subject to an appropriate flood risk assessment that demonstrates: The development proposed will not increase flood risk elsewhere and, if practicable, will reduce overall flood risk.	The proposed extended landfill is not within the 1% or 0.1% AEP flood extents so will not have any influence on 1% and 0.1% AEP floods elsewhere. However, as mentioned above, Flood Zones A and B are present within the site, associated with the existing northern settlement pond and the southern wetland, respectively. These areas will not be altered by the proposed development.
(2b) The proposal has been subject to an appropriate flood risk assessment that demonstrates: The development proposal includes measures to minimise flood risk to people, property, the economy, and the environment as far as reasonably possible.	

Criteria	Test
(2c) The proposal has been subject to an appropriate flood risk assessment that demonstrates: The development proposed includes measures to ensure that residual risks to the area and/or development can be managed to an acceptable level as regards the adequacy of existing flood protection measures or the design, implementation and funding of any future flood risk management measures and provisions for emergency services access.	The High-Range Future Scenario 30% increase in extreme rainfall can be accommodated in the proposed attenuation ponds. The diversion of the Knockharley Stream will be unculverted with the exception of the projected culvert for the crossing of the access road. The proposed culvert was designed according to OPW standards and will be subject to the approval of the OPW, under Section 50 of the Arterial Drainage Act, 1945. It will have capacity to convey the design flood flow (1% AEP) with sufficient freeboard. The available freeboard at the culvert during the 1% AEP event, inclusive of climate change. It is not anticipated that the flood risk in the catchment area for the 1% AEP + climate change will increase as a result of the presence of the proposed new culvert.
(2d) The proposal has been subject to an appropriate flood risk assessment that demonstrates: The development proposed addresses the above in a manner that is also compatible with the achievement of wider planning objectives in relation to development of good urban design and vibrant and active streetscapes.	As mentioned above, the proposed development and is in-keeping with the policies and will assist in fulfilling objectives in the current Meath County Development Plan (2021-2027). This flood risk assessment has been prepared in line with these objectives.

4.5 Flood Mitigation Measures and Residual Risk

The proposed surface water system has been designed to meet the requirements set out in the Greater Dublin Regional Code of Practice for Drainage Works V6.0, in line with the Greater Dublin Strategic Drainage Study (GDSDS) and the CIRIA SuDS Manual C753.

The drainage system will include additional swales, petrol interceptors, and changes and expansion of the existing attenuation ponds to manage surface water effectively. In addition, a stream diversion with a new culvert is proposed to facilitate the landfill expansion.

The system has been designed to attenuate and convey the 1:100 AEP event. A 10% increase in the precipitation depth has been incorporated to allow for climate change. The drainage design has demonstrated that the High-Range Future Scenario (i.e., plus 30% increase in extreme rainfall) can be accommodated in the proposed attenuation ponds.

In addition, as mentioned in Section 3 above, the Proposed Development works includes the diversion of the existing Knockharley Stream to facilitate the extension of the existing landfill footprint. The diverted stream will be unculverted with the exception of existing access road crossing which will require a culvert to allow the road to passover. This culvert will have capacity to convey the design flood flow (1% AEP + 20% climate change) without significantly changing the hydraulic characteristics of the watercourse) with sufficient freeboard. It is not anticipated that the flood risk in the catchment area for the 1% AEP + climate change will increase as a result of the presence of the proposed new culvert.

Therefore, it can be concluded that the 1% AEP (plus climate change allowance) will be accommodated in the proposed drainage system.

In the event of the 0.1% AEP event, it is expected that, in the northern attenuation pond, this volume will be accommodated in the existing compensation flood footprint presented in Figure 4-3 above. With regard to the southern Flood Zone B in the wetland, as can be seen in the figures above, the extent associated with the 0.1% AEP would not differ significantly from the 1% AEP and therefore the wetland would have capacity to control this excess volume that the southern attenuation pond would not have capacity to convey (i.e., flow in excess of the 1% AEP).

According to the 2009 Guidelines, the residual risk remains after all risk avoidance, substitution and mitigation measures have been implemented, on the basis that such measures only reduce risk, not eliminate it.

The residual risk associated to climate change is considered to be low, based on CFRAM Mid-Range and High-End future models. The Mid-Range models show flood extent associated with the Knockharley Stream floodplain and the existing northern settlement pond and southern wetland, similar to the present-day scenarios and also show a coastal flood zone influenced by the rising levels at Nanny Estuary, Nanny River and Knockharley Stream. Figure 4-5 and Figure 4-6 below show that there would be no additional flooding extents for these conditions. It should be noted that the High-End scenarios do not show flood extents on the subject site.

Given the short time-frame over which active closure will occur, and the relatively short facility life-time, application of this more extreme climate change allowances in design was considered excessively conservative Reference has also been paid to the Flood Risk Management, Climate Change Sectoral Adaptation Plan (CCSAP), prepared by the OPW under the National Adaptation Framework, which recommends an increase of 20% in extreme rainfall depth for the Mid-Range Future Scenario (MRFS).

As mentioned above, the High-Range Future Scenario (1% AEP plus 30% increase in extreme rainfall) can be accommodated in the proposed attenuation ponds.

Figure 4-5. Extract from CFRAM MRFS Fluvial Flooding Map (Source: OPW, 2025)

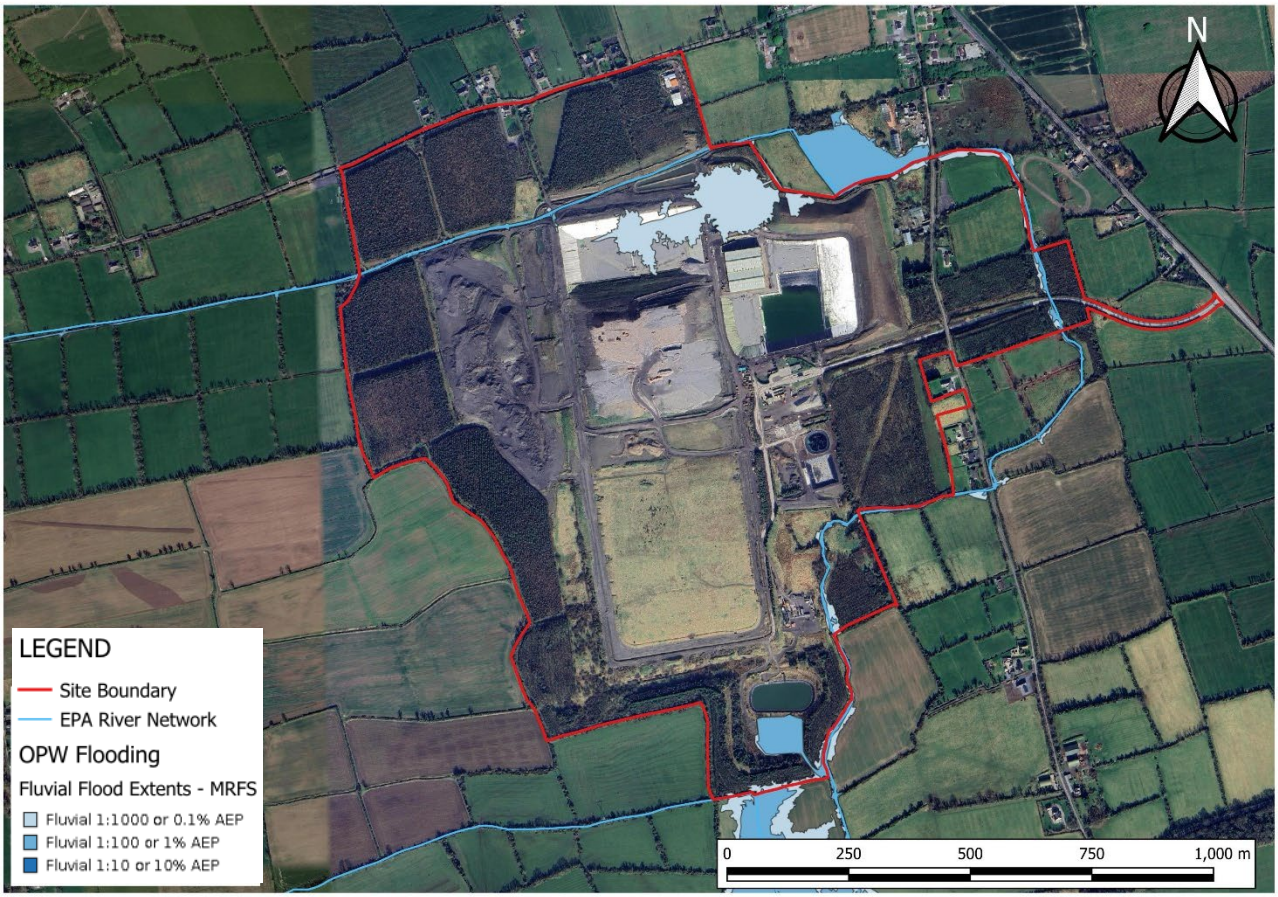
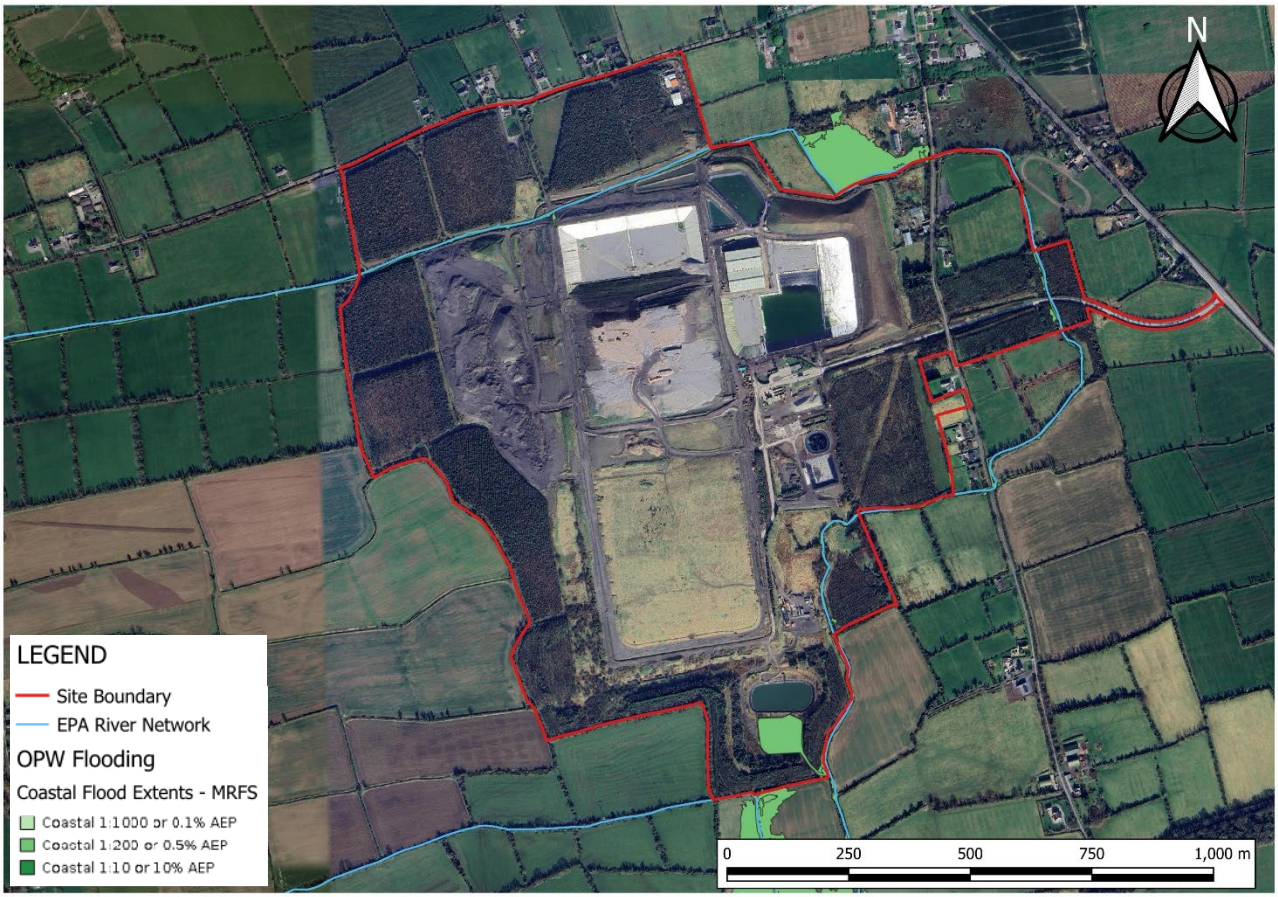


Figure 4-6. Extract from CFRAM MRFS Coastal Flooding Map (Source: OPW, 2025)



5. CONCLUSIONS

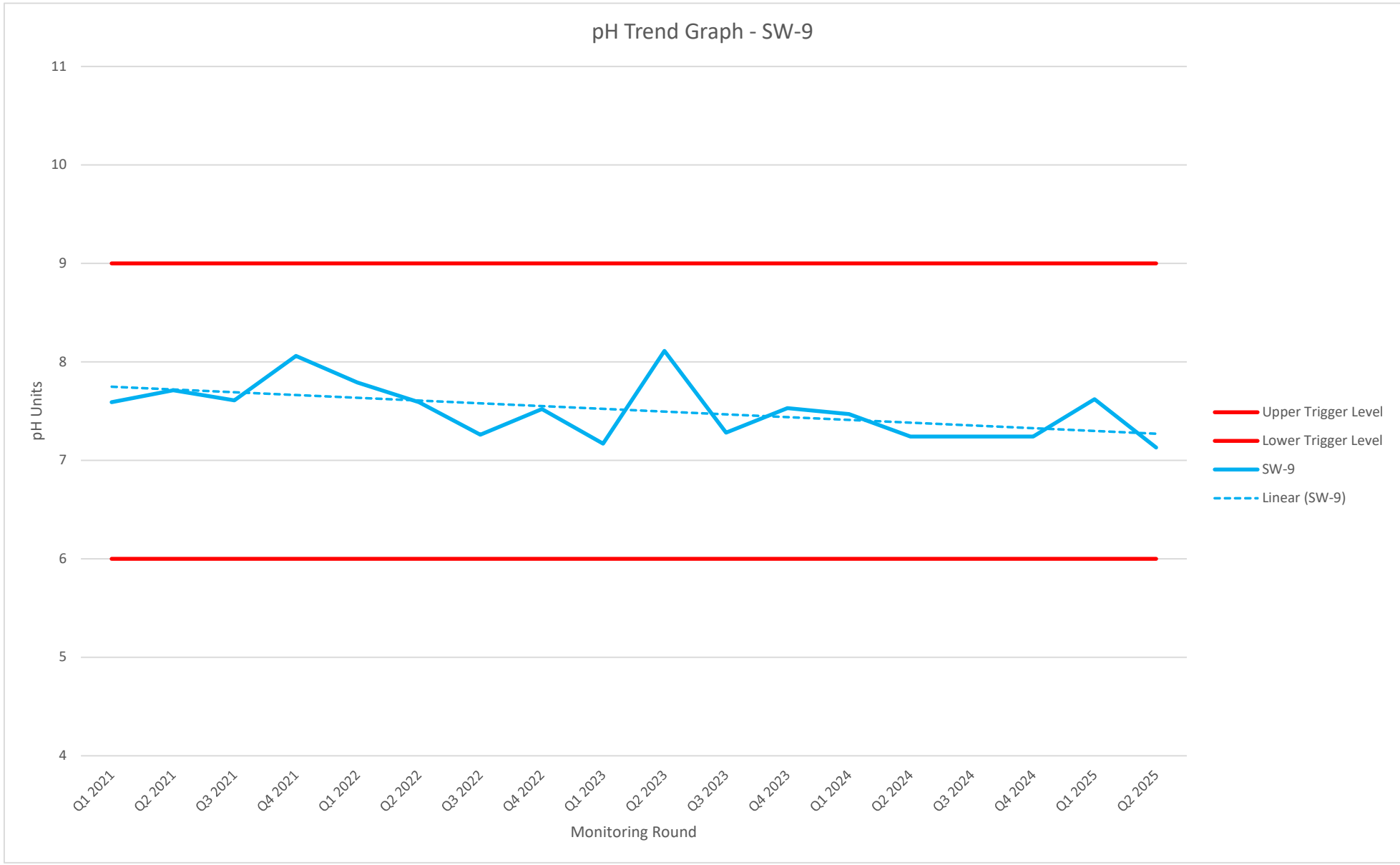
A Flood Risk Assessment has been undertaken for the proposed extension of the Knockharley Landfill facility. The assessment has identified that the proposed layout is located primarily in Flood Zone C. However, Flood Zones A and B extents are present within the site, associated with the existing northern settlement pond and southern wetland, respectively. Following the required Justification Test as required under DECLG/OPW Guidelines, it is concluded that no residual risk is foreseen as the proposed development will not affect the existing hydrological, morphological and hydraulic conditions that define the aforementioned Flood Zones.

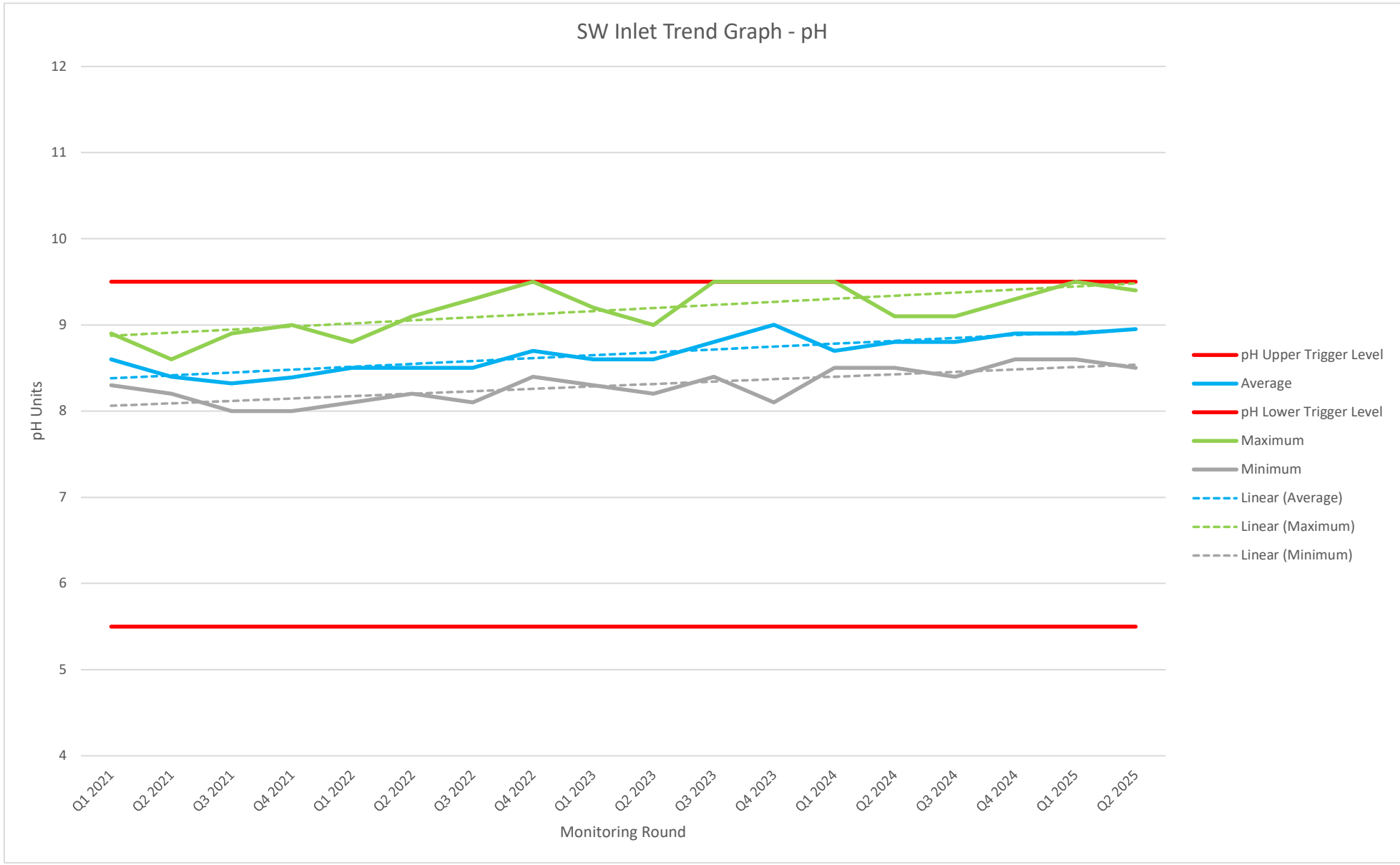
The proposed drainage system has been designed to accommodate the 1% AEP plus climate change allowance. The proposed layout will also have capacity to control and attenuate the 0.1% AEP event without additional flooding risk.

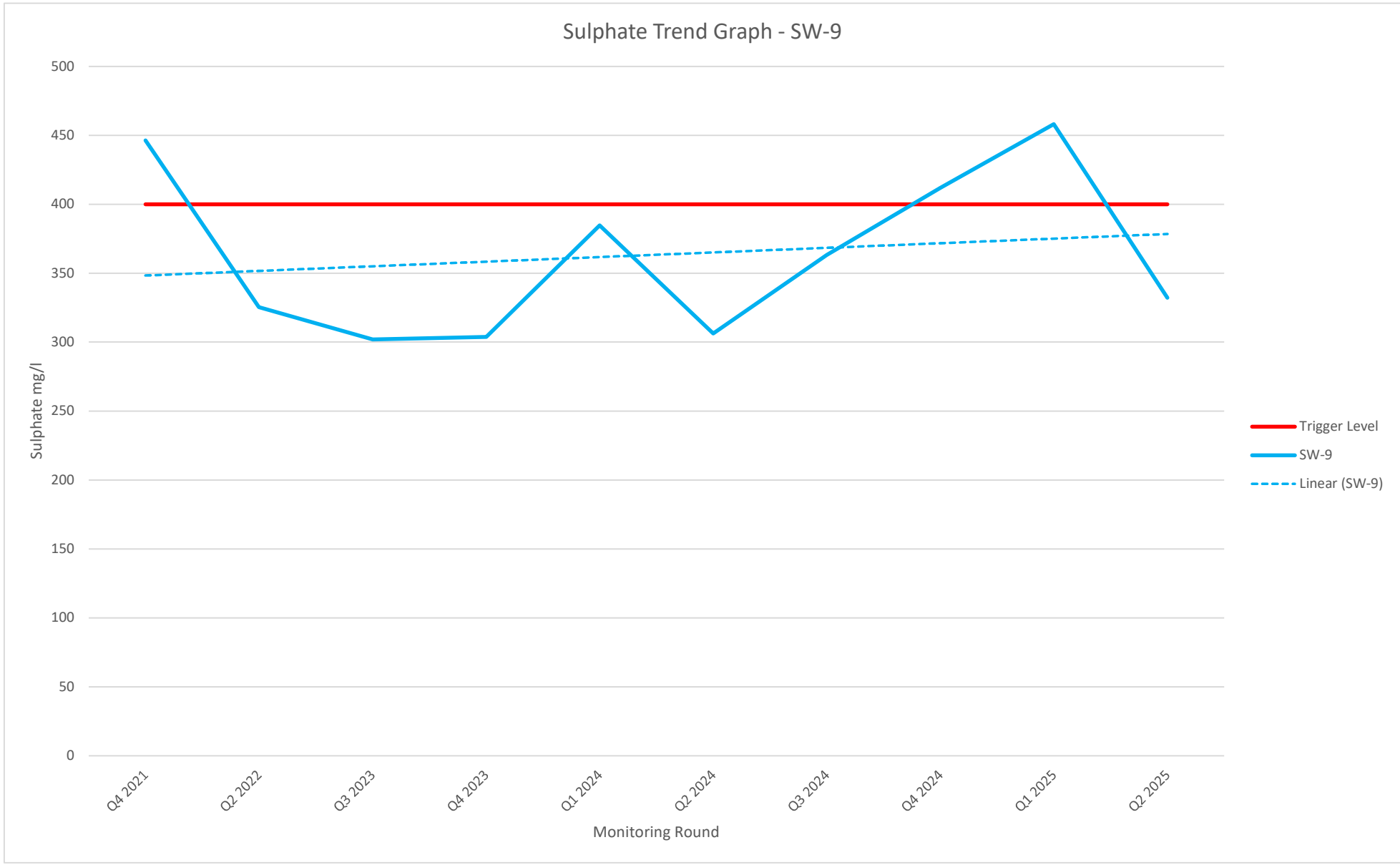
The risk from pluvial, coastal and groundwater sources is considered low.

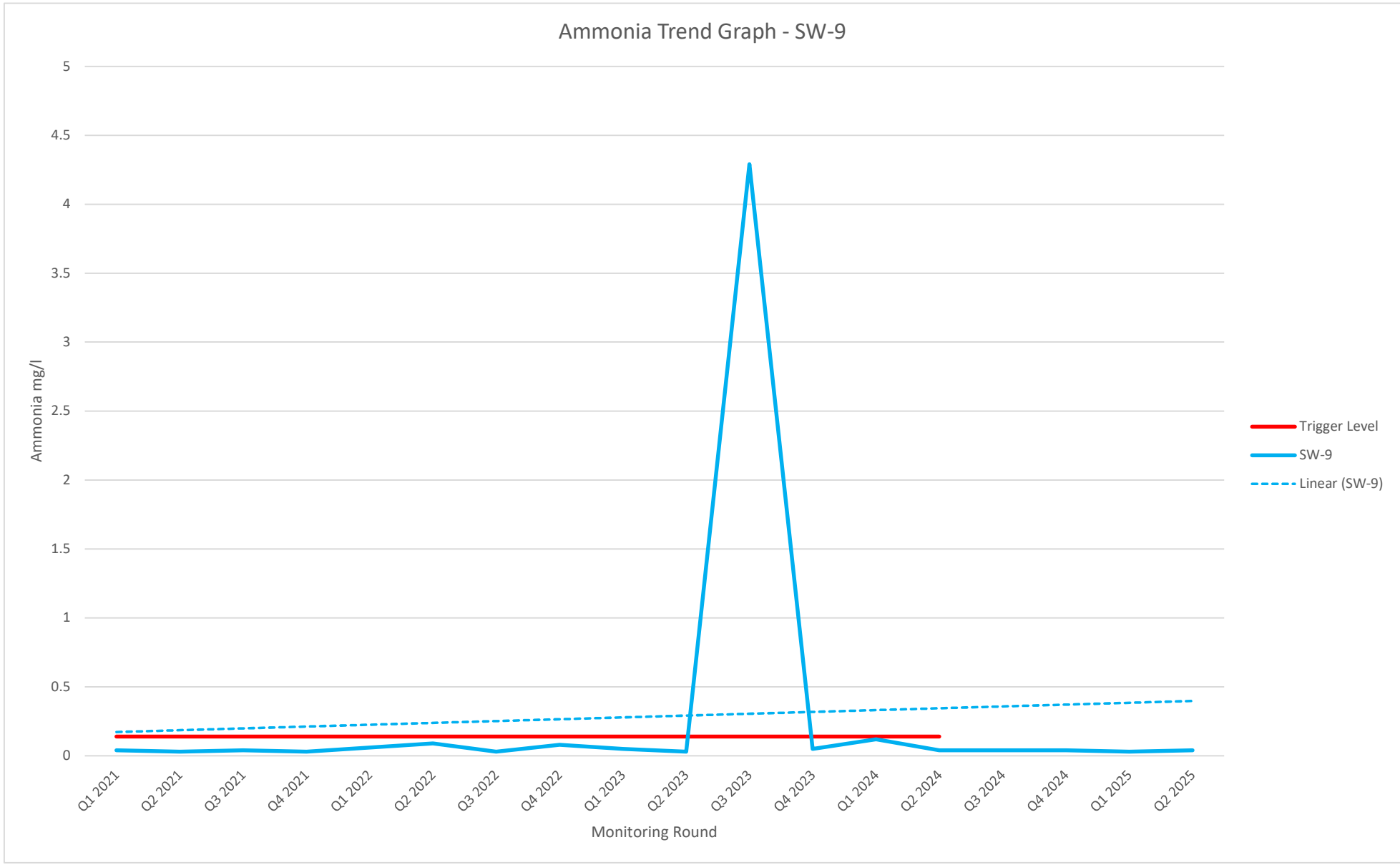
Appendix 6.5
Surface Water Monitoring Trend Graphs

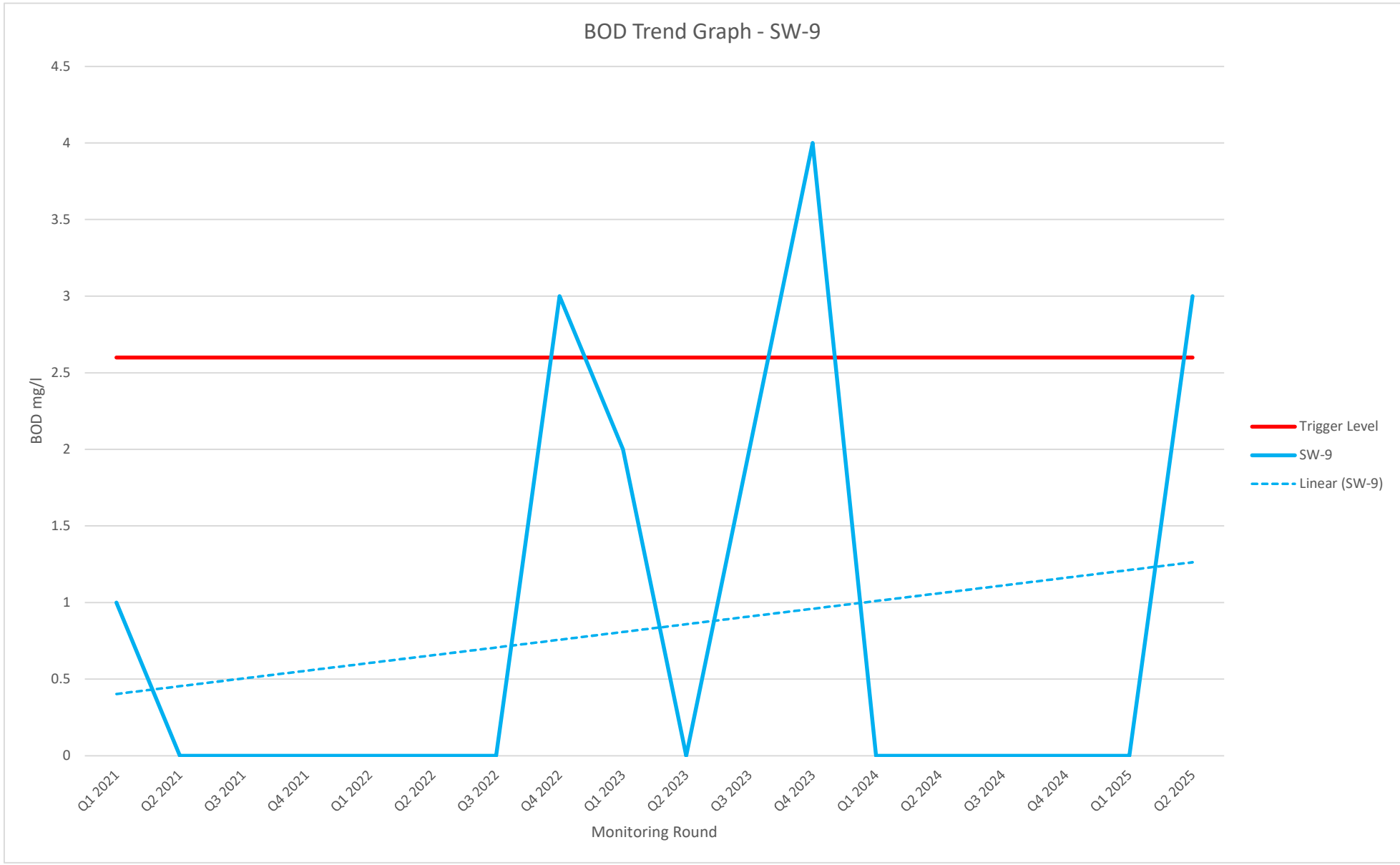
AWN Consulting Ltd, The Tecpro Building, IDA Business & Technology Park, Clonshaugh, Dublin 17, D17 XD90

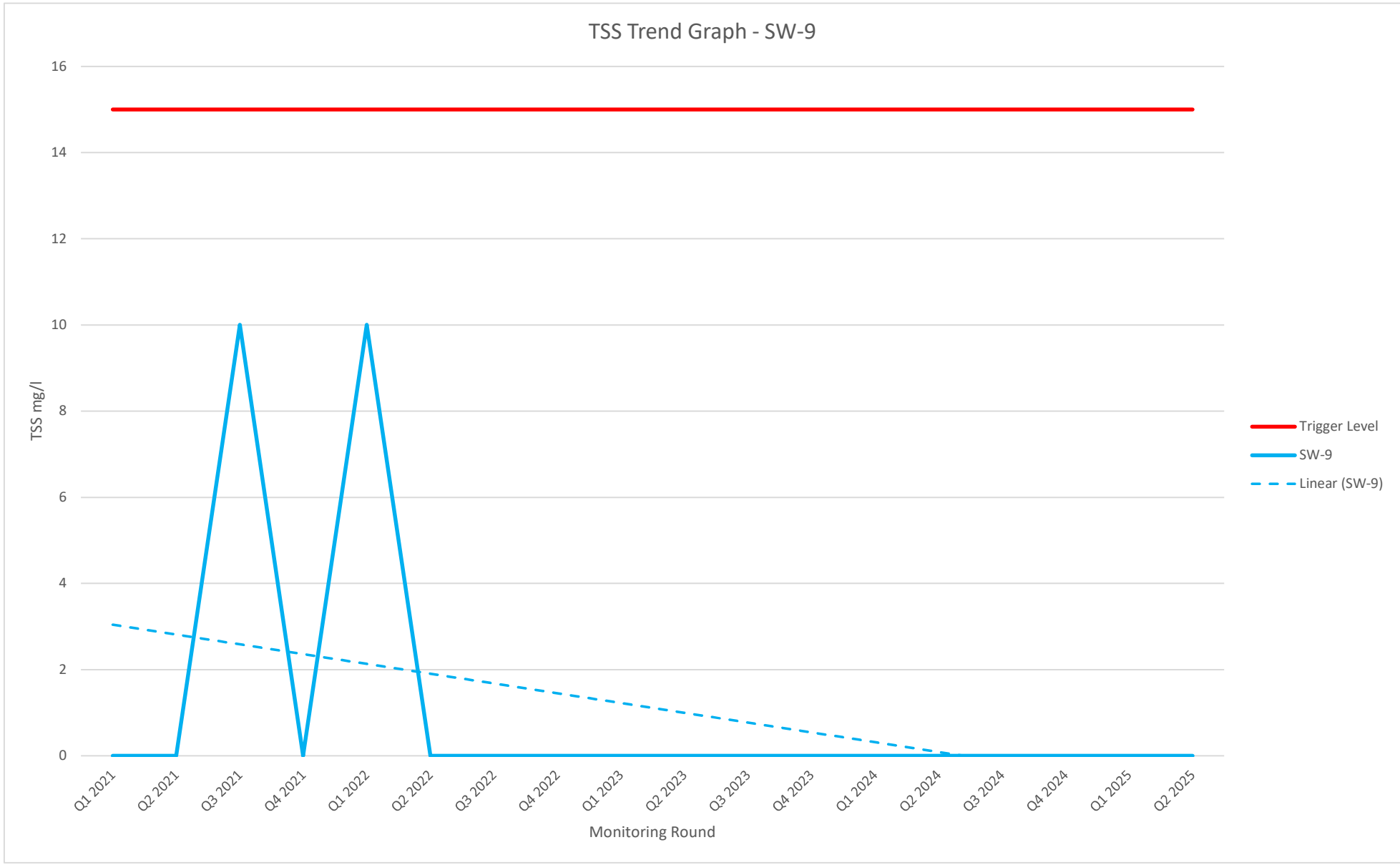

pH Trend Graph - SW-9
11
10
9
8
7
6
5
4
pH Units
Q1 2021
Q2 2021
Q3 2021
Q4 2021
Q1 2022
Q2 2022
Q3 2022
Q4 2022
Q1 2023
Q2 2023
Q3 2023
Q4 2023
Q1 2024
Q2 2024
Q3 2024
Q4 2024
Q1 2025
Q2 2025
Monitoring Round
Upper Trigger Level
Lower Trigger Level
SW-9
Linear (SW-9)

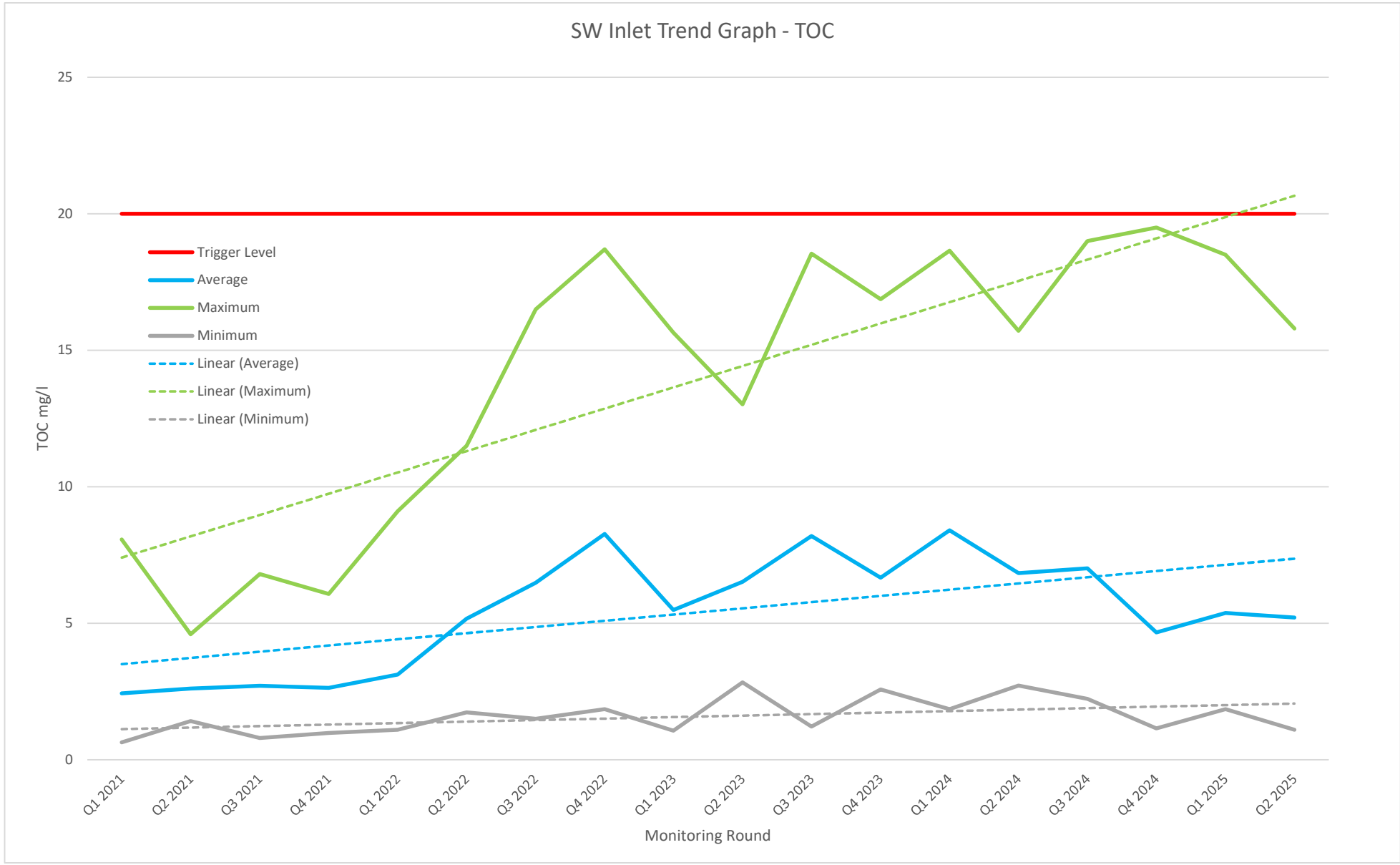

SW Inlet Trend Graph - pH
12
11
10
9
8
7
6
5
4
pH Units
Q1 2021
Q2 2021
Q3 2021
Q4 2021
Q1 2022
Q2 2022
Q3 2022
Q4 2022
Q1 2023
Q2 2023
Q3 2023
Q4 2023
Q1 2024
Q2 2024
Q3 2024
Q4 2024
Q1 2025
Q2 2025
Monitoring Round
pH Upper Trigger Level
Average
pH Lower Trigger Level
Maximum
Minimum
Linear (Average)
Linear (Maximum)
Linear (Minimum)

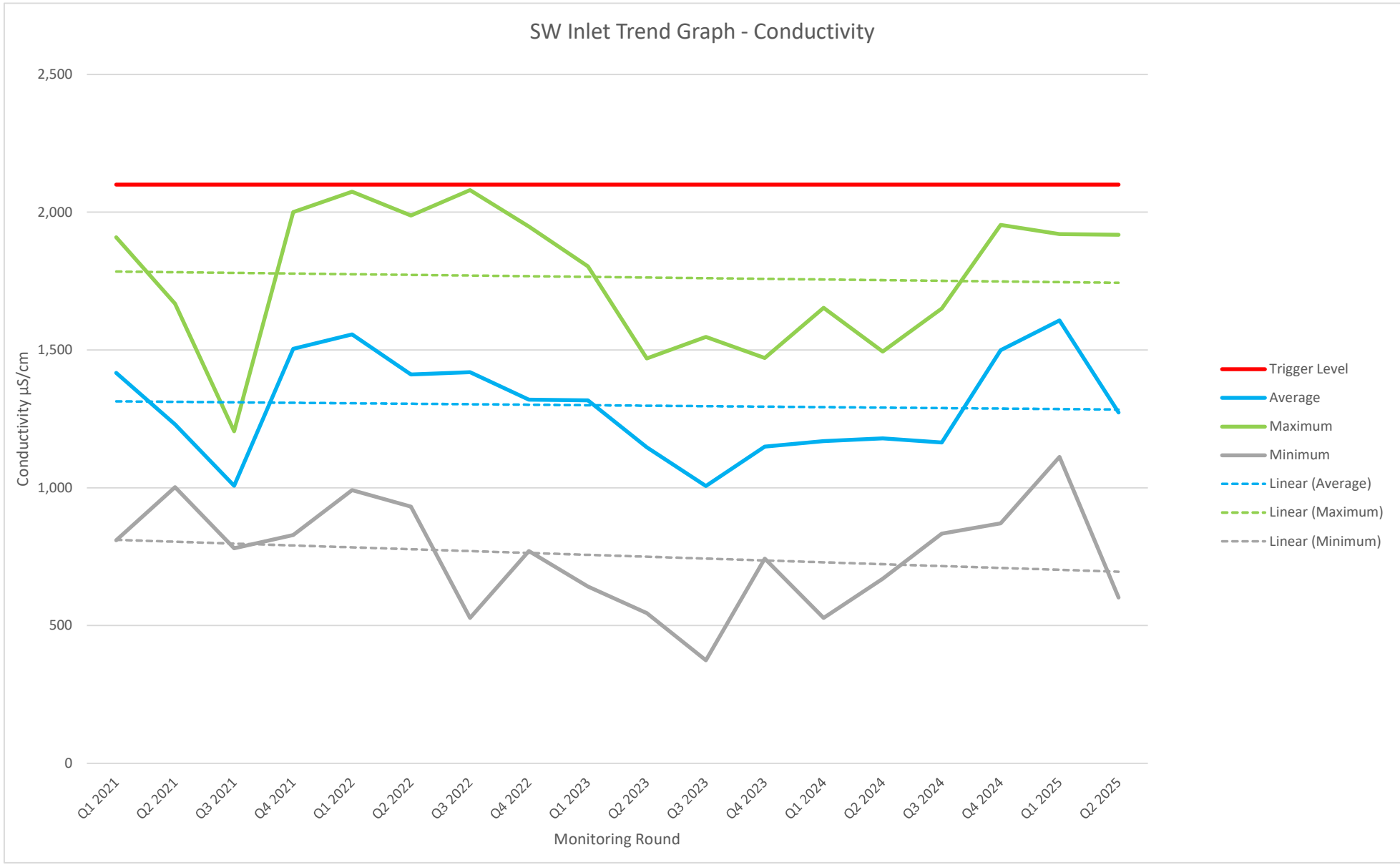

Sulphate Trend Graph - SW-9
500
450
400
350
300
250
200
150
100
50
0
Sulphate mg/l
Q4 2021
Q2 2022
Q3 2023
Q4 2023
Q1 2024
Q2 2024
Q3 2024
Q4 2024
Q1 2025
Q2 2025
Monitoring Round
Trigger Level
SW-9
Linear (SW-9)


Ammonia Trend Graph - SW-9
Ammonia mg/l
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
Q1 2021
Q2 2021
Q3 2021
Q4 2021
Q1 2022
Q2 2022
Q3 2022
Q4 2022
Q1 2023
Q2 2023
Q3 2023
Q4 2023
Q1 2024
Q2 2024
Q3 2024
Q4 2024
Q1 2025
Q2 2025
Monitoring Round
Trigger Level
SW-9
Linear (SW-9)


BOD Trend Graph - SW-9
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
BOD mg/l
Q1 2021
Q2 2021
Q3 2021
Q4 2021
Q1 2022
Q2 2022
Q3 2022
Q4 2022
Q1 2023
Q2 2023
Q3 2023
Q4 2023
Q1 2024
Q2 2024
Q3 2024
Q4 2024
Q1 2025
Q2 2025
Monitoring Round
Trigger Level
SW-9
Linear (SW-9)

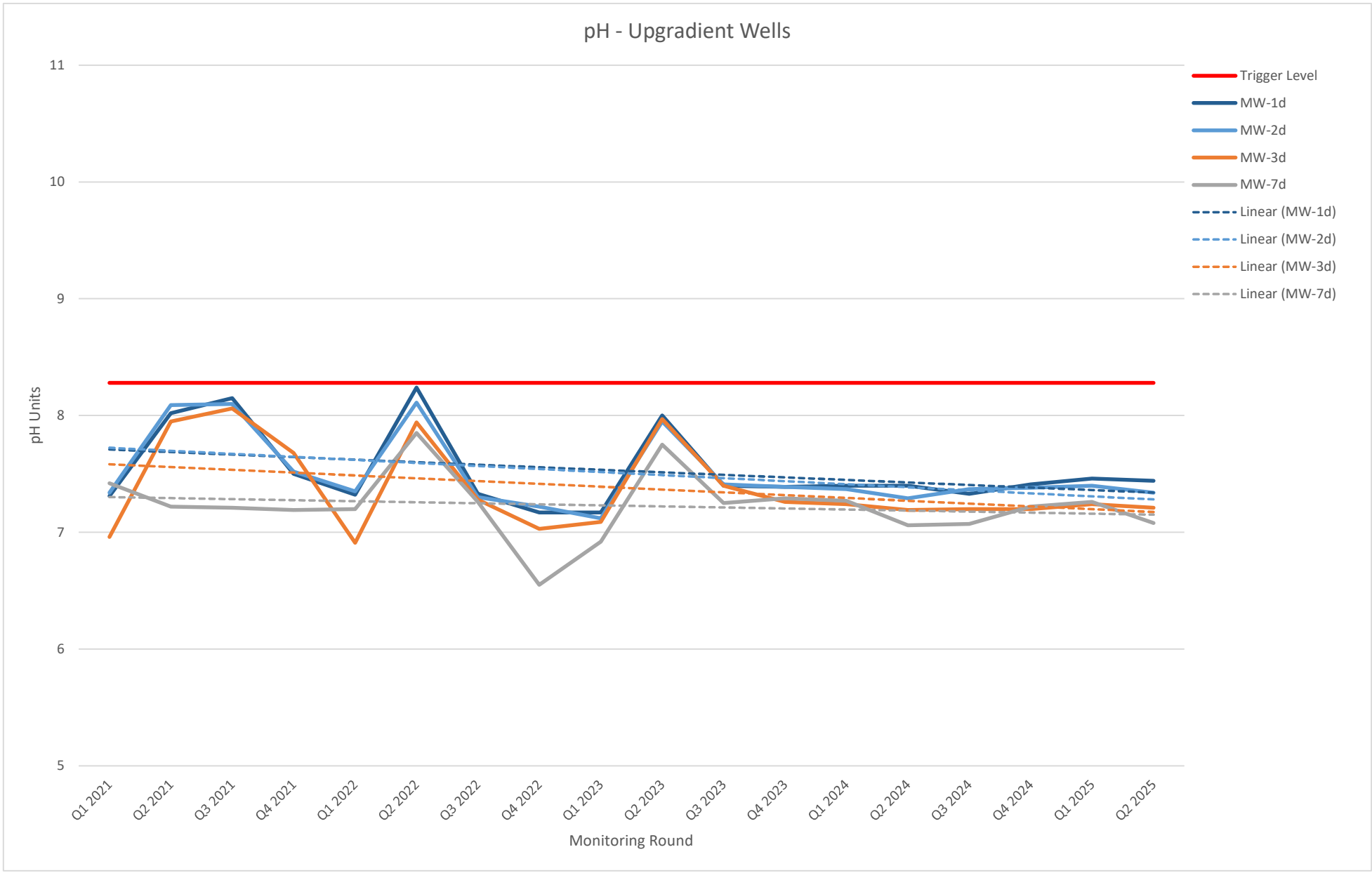

TSS Trend Graph - SW-9
16
14
12
10
8
6
4
2
0
TSS mg/l
Q1 2021
Q2 2021
Q3 2021
Q4 2021
Q1 2022
Q2 2022
Q3 2022
Q4 2022
Q1 2023
Q2 2023
Q3 2023
Q4 2023
Q1 2024
Q2 2024
Q3 2024
Q4 2024
Q1 2025
Q2 2025
Monitoring Round
Trigger Level
SW-9
Linear (SW-9)

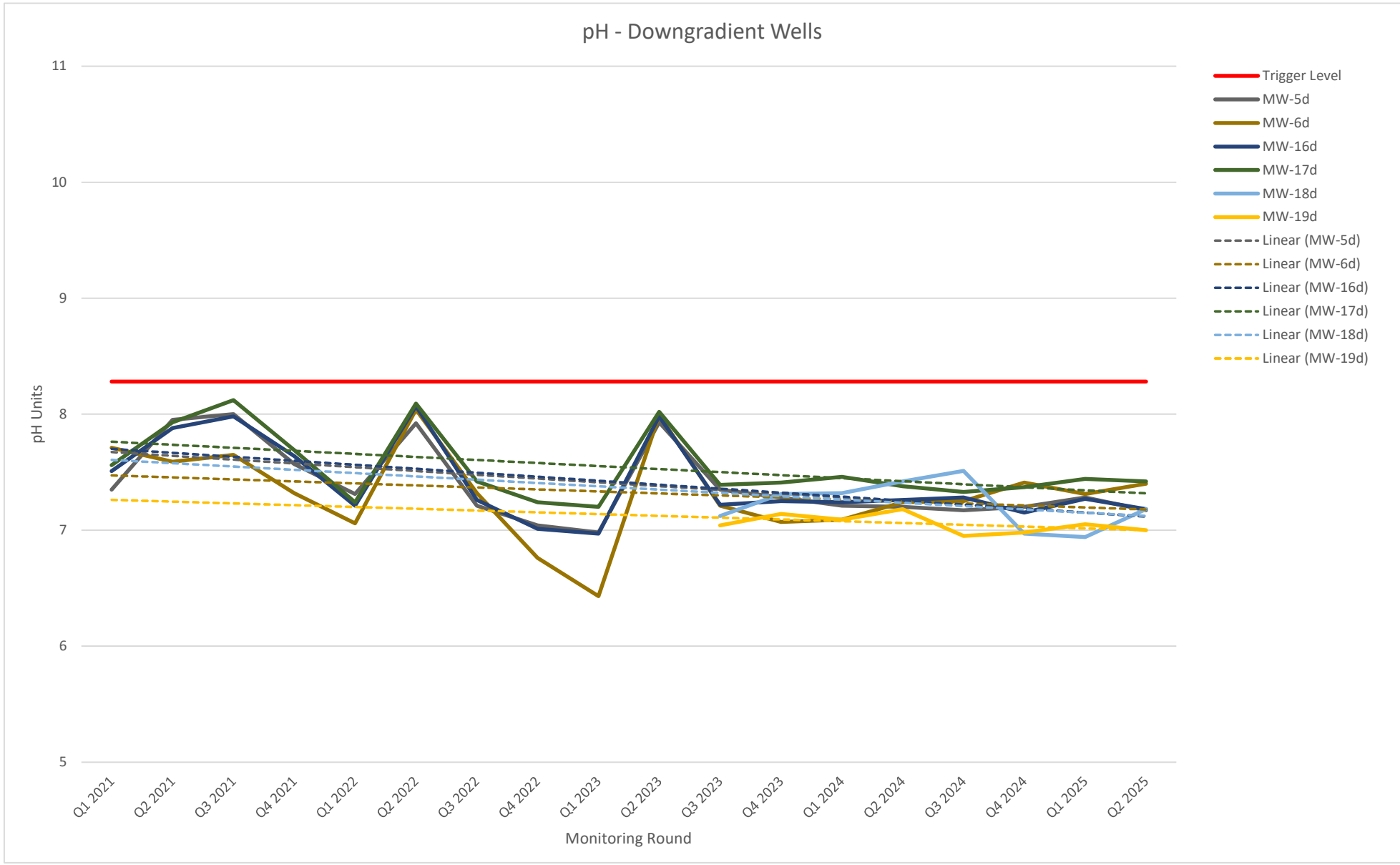

SW Inlet Trend Graph - TOC
25
20
15
10
5
0
TOC mg/l
Trigger Level
Average
Maximum
Minimum
Linear (Average)
Linear (Maximum)
Linear (Minimum)
Q1 2021
Q2 2021
Q3 2021
Q4 2021
Q1 2022
Q2 2022
Q3 2022
Q4 2022
Q1 2023
Q2 2023
Q3 2023
Q4 2023
Q1 2024
Q2 2024
Q3 2024
Q4 2024
Q1 2025
Q2 2025
Monitoring Round

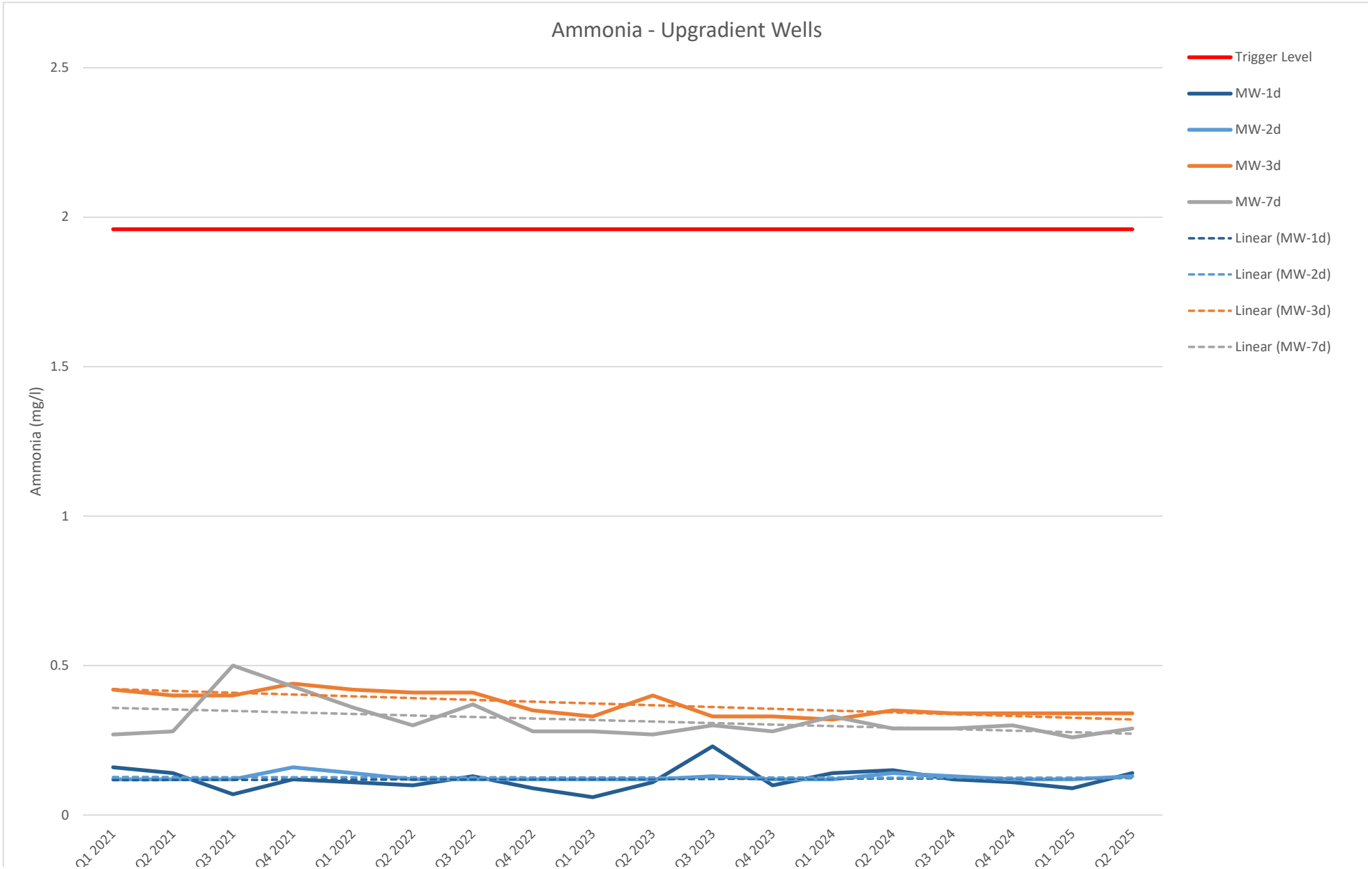

SW Inlet Trend Graph - Conductivity
2,500
2,000
1,500
1,000
500
0
Conductivity µS/cm
Q1 2021
Q2 2021
Q3 2021
Q4 2021
Q1 2022
Q2 2022
Q3 2022
Q4 2022
Q1 2023
Q2 2023
Q3 2023
Q4 2023
Q1 2024
Q2 2024
Q3 2024
Q4 2024
Q1 2025
Q2 2025
Monitoring Round
Trigger Level
Average
Maximum
Minimum
Linear (Average)
Linear (Maximum)
Linear (Minimum)

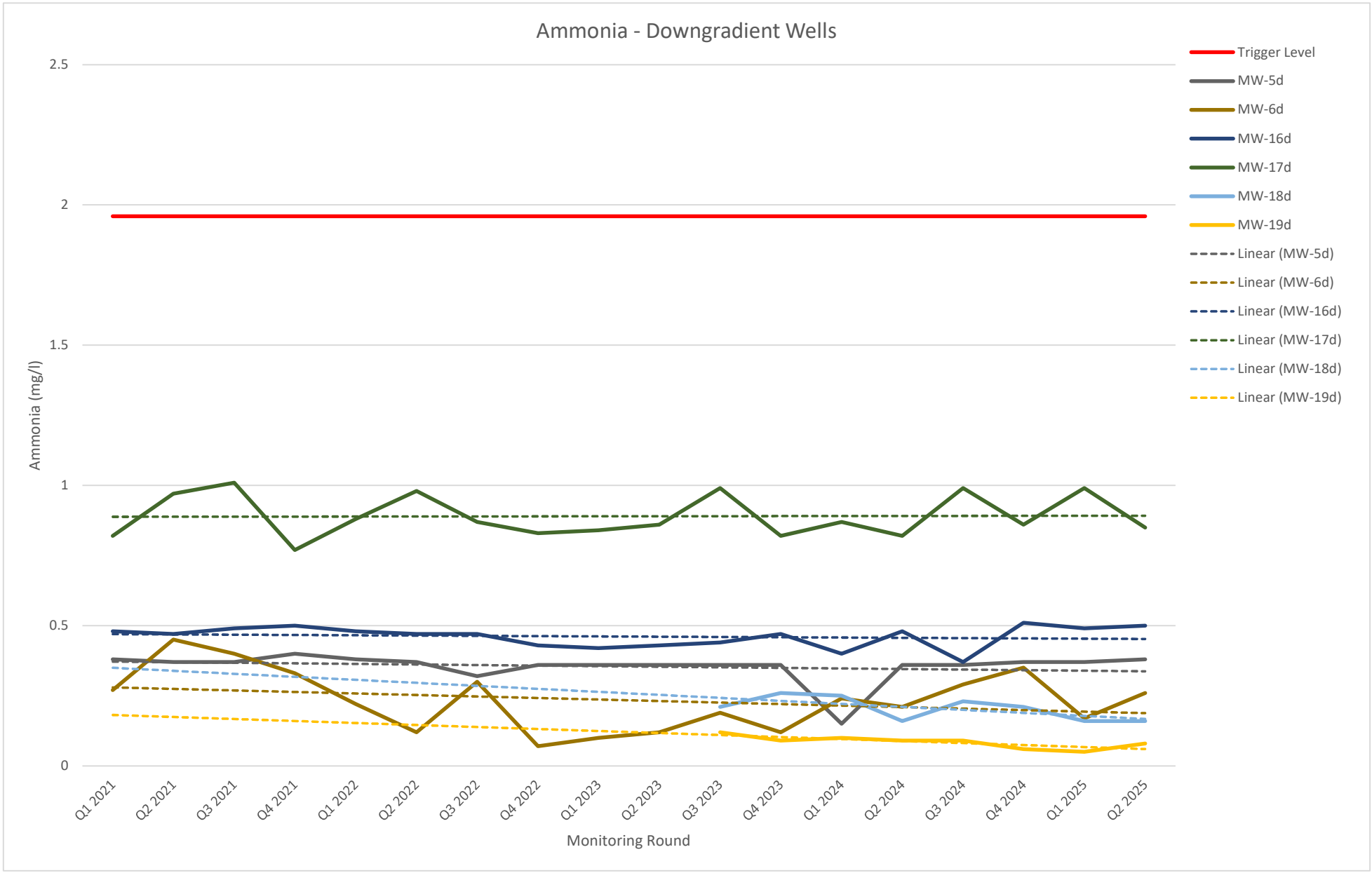
Appendix 6.6
Groundwater Monitoring Trend Graphs

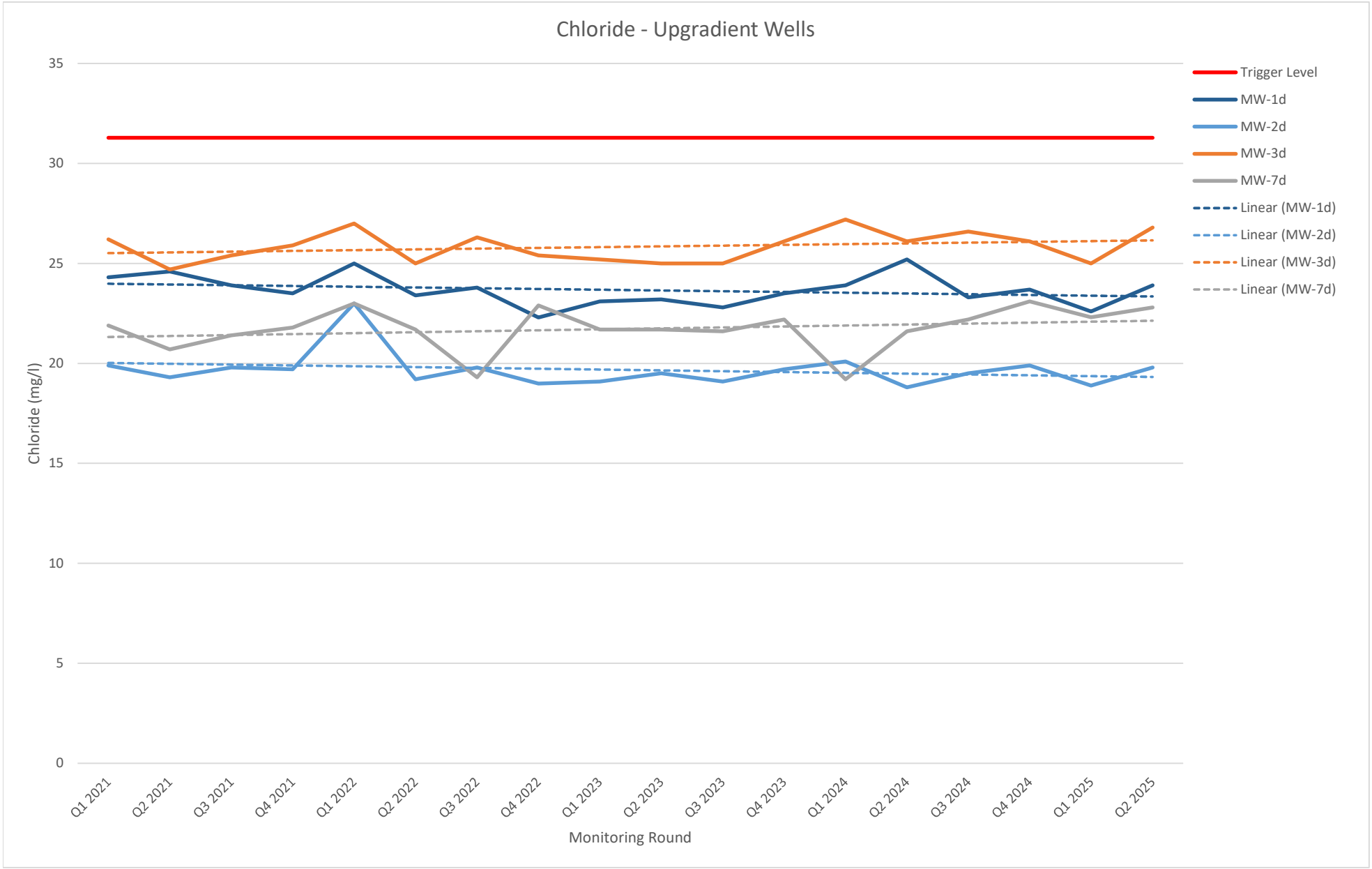
AWN Consulting Ltd, The Tecpro Building, IDA Business & Technology Park, Clonshaugh, Dublin 17, D17 XD90

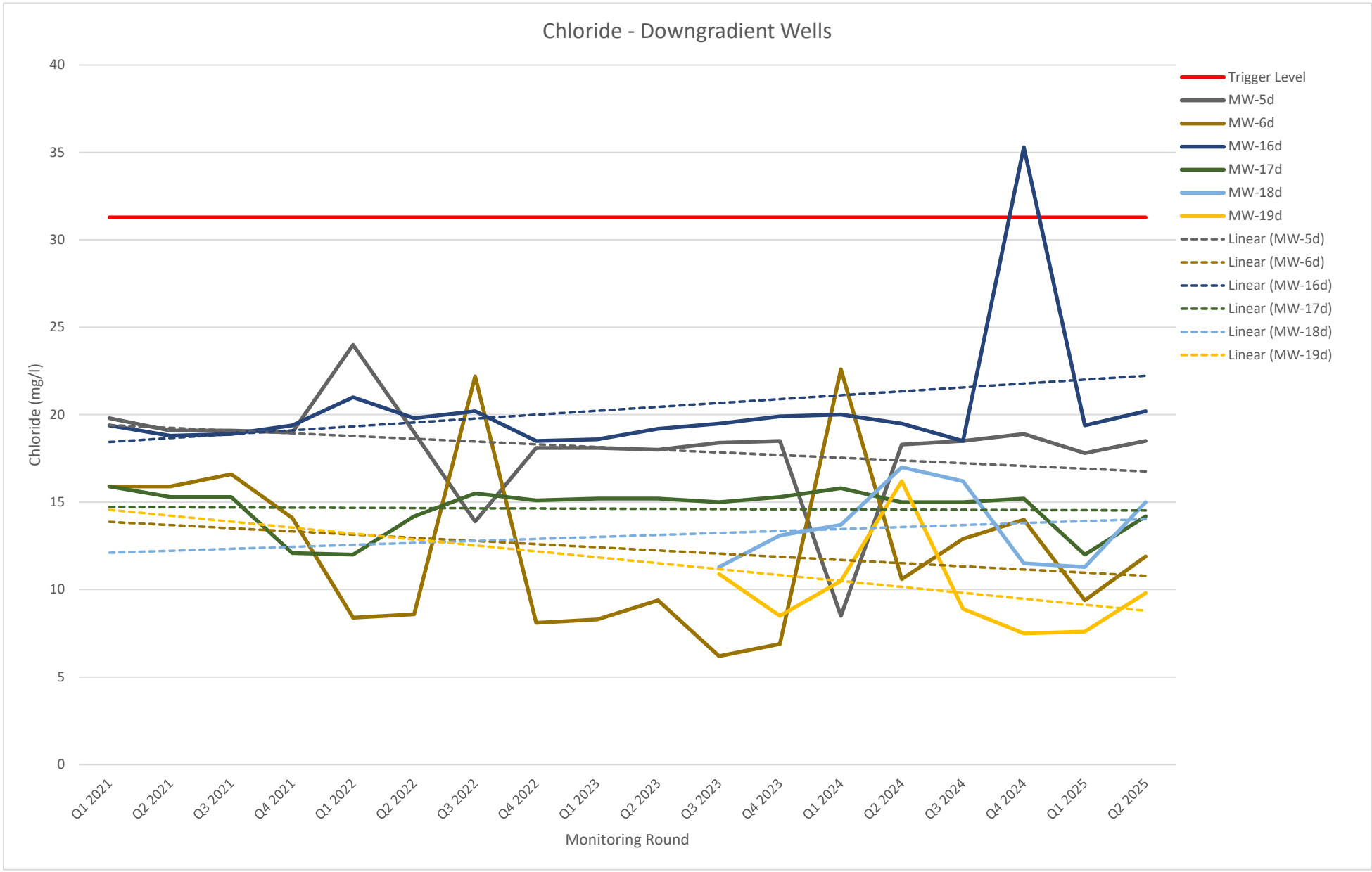

pH - Upgradient Wells
11
10
9
8
7
6
5
pH Units
Q1 2021
Q2 2021
Q3 2021
Q4 2021
Q1 2022
Q2 2022
Q3 2022
Q4 2022
Q1 2023
Q2 2023
Q3 2023
Q4 2023
Q1 2024
Q2 2024
Q3 2024
Q4 2024
Q1 2025
Q2 2025
Monitoring Round
Trigger Level
MW-1d
MW-2d
MW-3d
MW-7d
Linear (MW-1d)
Linear (MW-2d)
Linear (MW-3d)
Linear (MW-7d)

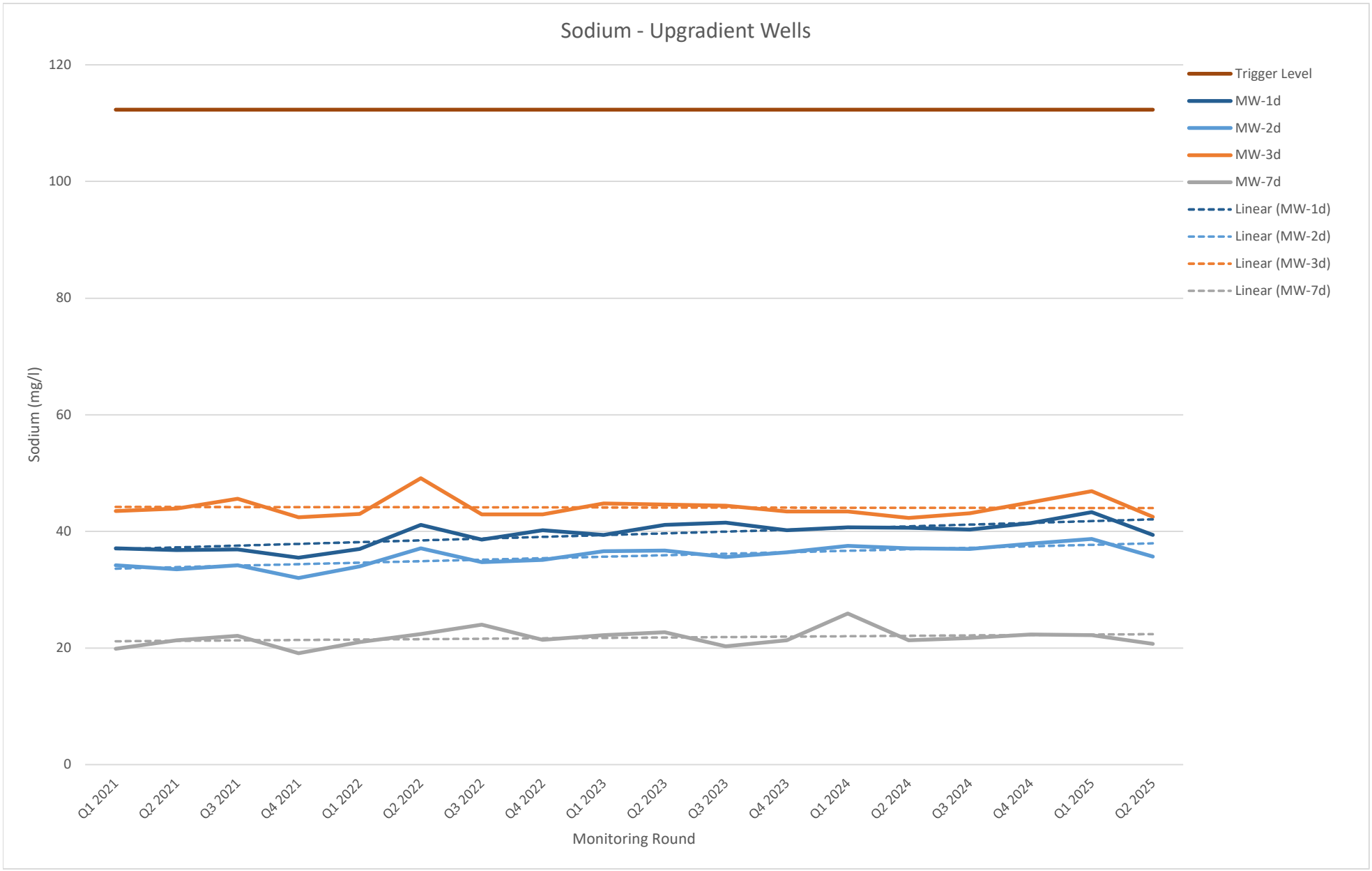

pH - Downgradient Wells
11
10
9
8
7
6
5
pH Units
Q1 2021
Q2 2021
Q3 2021
Q4 2021
Q1 2022
Q2 2022
Q3 2022
Q4 2022
Q1 2023
Q2 2023
Q3 2023
Q4 2023
Q1 2024
Q2 2024
Q3 2024
Q4 2024
Q1 2025
Q2 2025
Monitoring Round
Trigger Level
MW-5d
MW-6d
MW-16d
MW-17d
MW-18d
MW-19d
Linear (MW-5d)
Linear (MW-6d)
Linear (MW-16d)
Linear (MW-17d)
Linear (MW-18d)
Linear (MW-19d)

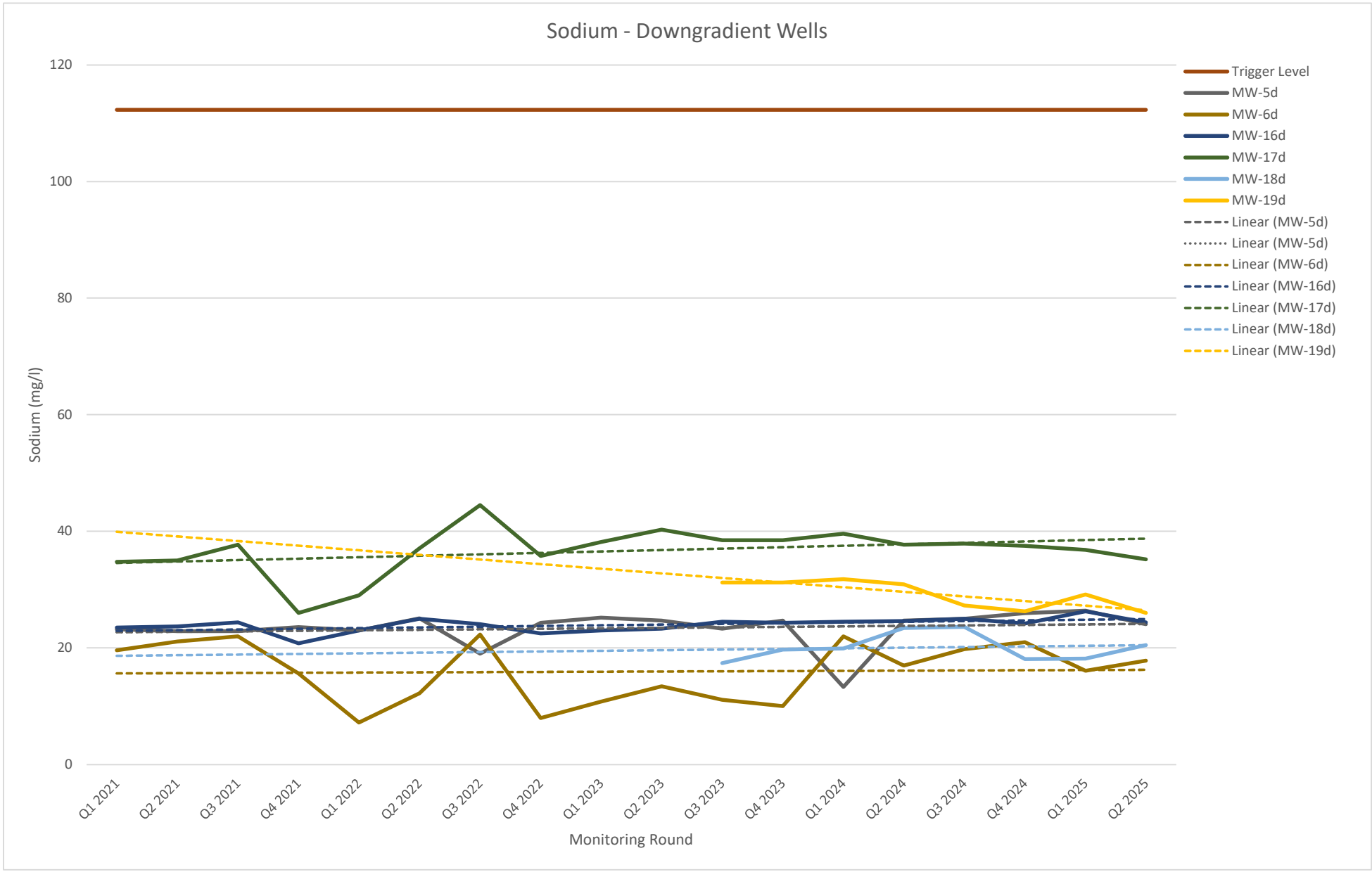

Ammonia - Upgradient Wells
Ammonia (mg/l)
2.5
2
1.5
1
0.5
0
Q1 2021
Q2 2021
Q3 2021
Q4 2021
Q1 2022
Q2 2022
Q3 2022
Q4 2022
Q1 2023
Q2 2023
Q3 2023
Q4 2023
Q1 2024
Q2 2024
Q3 2024
Q4 2024
Q1 2025
Q2 2025
Trigger Level
MW-1d
MW-2d
MW-3d
MW-7d
Linear (MW-1d)
Linear (MW-2d)
Linear (MW-3d)
Linear (MW-7d)

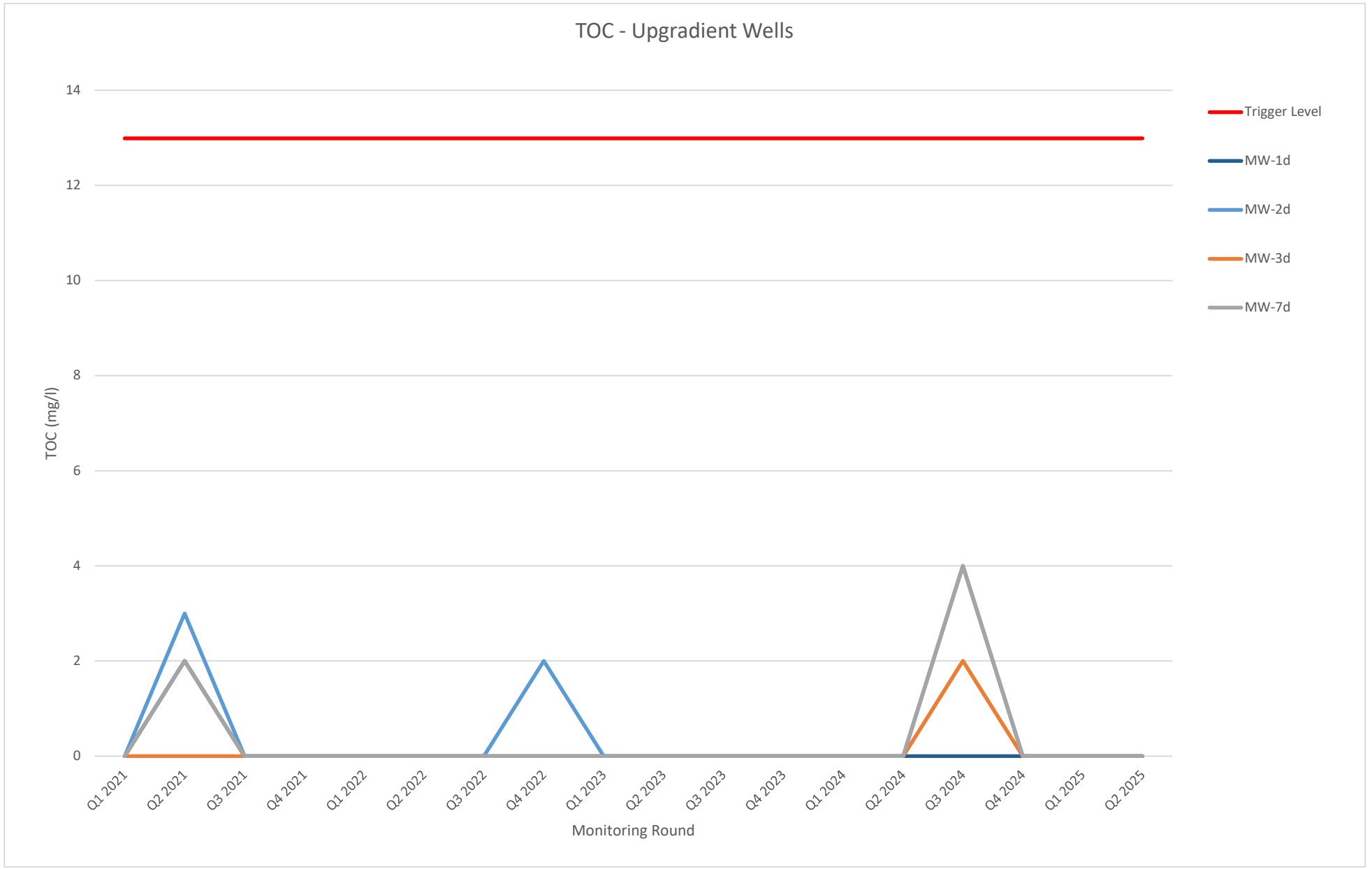

Ammonia - Downgradient Wells
2.5
2
1.5
1
0.5
0
Ammonia (mg/l)
Q1 2021
Q2 2021
Q3 2021
Q4 2021
Q1 2022
Q2 2022
Q3 2022
Q4 2022
Q1 2023
Q2 2023
Q3 2023
Q4 2023
Q1 2024
Q2 2024
Q3 2024
Q4 2024
Q1 2025
Q2 2025
Monitoring Round
Trigger Level
MW-5d
MW-6d
MW-16d
MW-17d
MW-18d
MW-19d
Linear (MW-5d)
Linear (MW-6d)
Linear (MW-16d)
Linear (MW-17d)
Linear (MW-18d)
Linear (MW-19d)

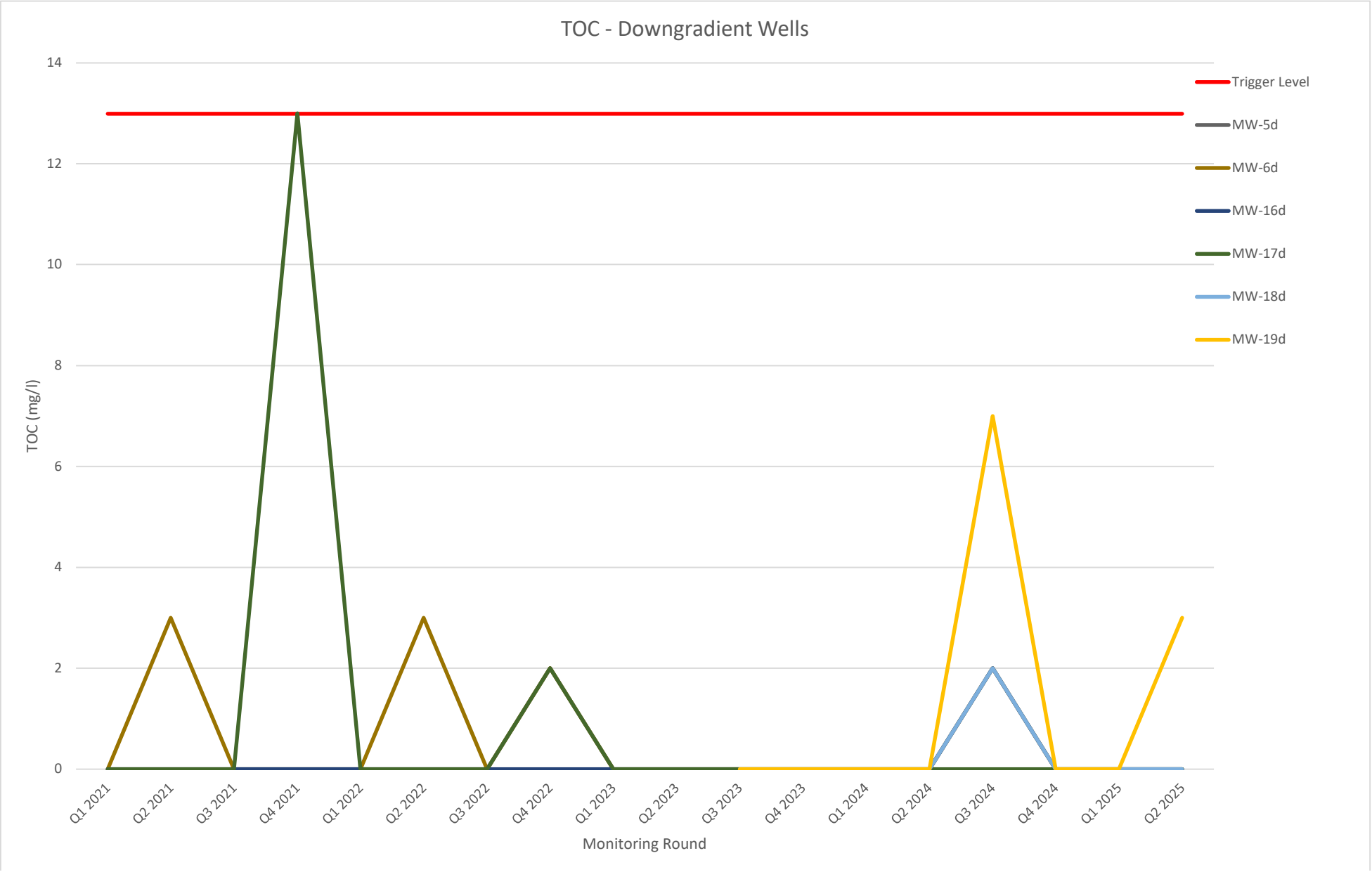

Chloride - Upgradient Wells
35
30
25
20
15
10
5
0
Chloride (mg/l)
Q1 2021
Q2 2021
Q3 2021
Q4 2021
Q1 2022
Q2 2022
Q3 2022
Q4 2022
Q1 2023
Q2 2023
Q3 2023
Q4 2023
Q1 2024
Q2 2024
Q3 2024
Q4 2024
Q1 2025
Q2 2025
Monitoring Round
Trigger Level
MW-1d
MW-2d
MW-3d
MW-7d
Linear (MW-1d)
Linear (MW-2d)
Linear (MW-3d)
Linear (MW-7d)

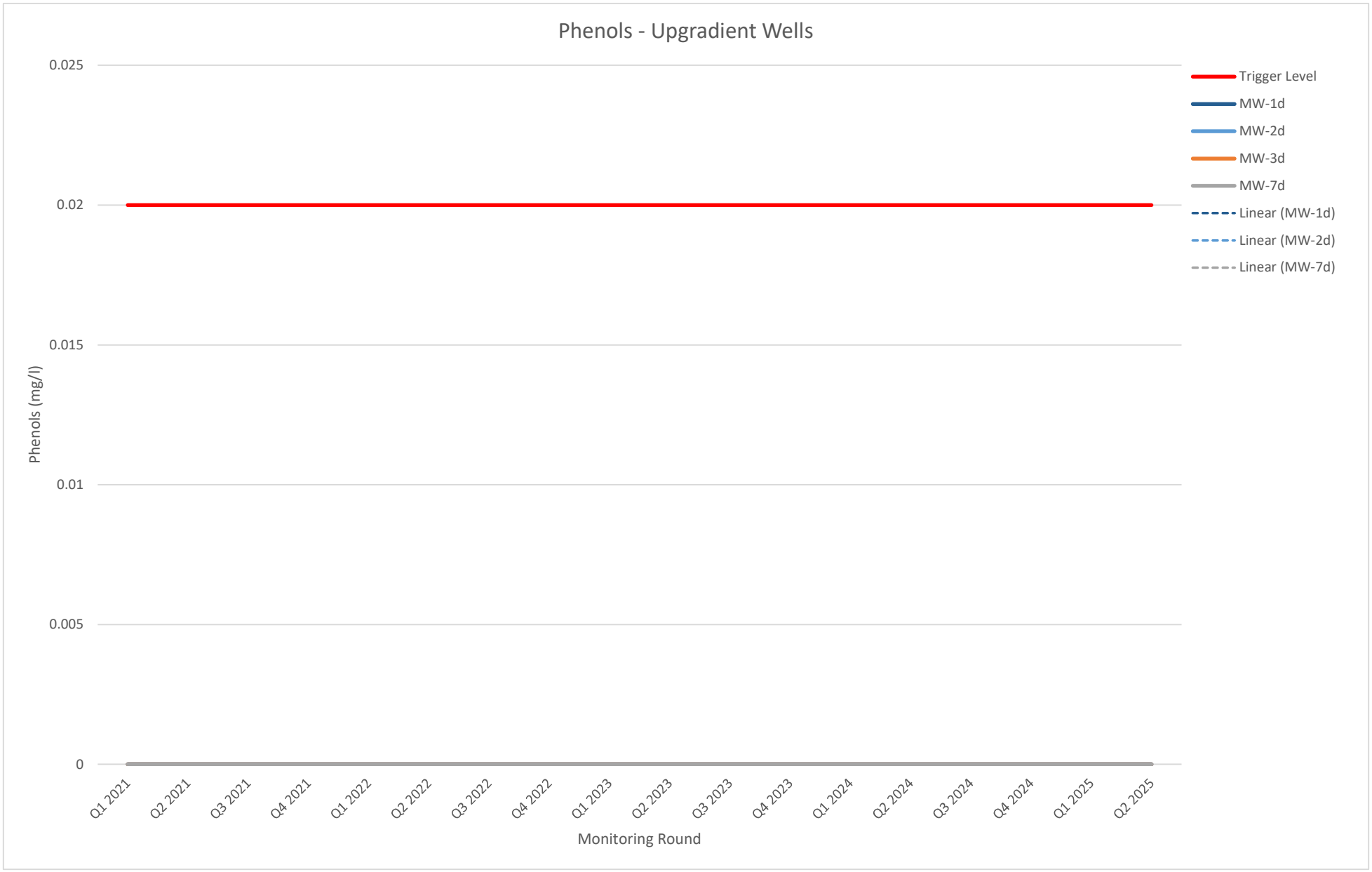

Chloride - Downgradient Wells
Chloride (mg/l)
40
35
30
25
20
15
10
5
0
Q1 2021
Q2 2021
Q3 2021
Q4 2021
Q1 2022
Q2 2022
Q3 2022
Q4 2022
Q1 2023
Q2 2023
Q3 2023
Q4 2023
Q1 2024
Q2 2024
Q3 2024
Q4 2024
Q1 2025
Q2 2025
Monitoring Round
Trigger Level
MW-5d
MW-6d
MW-16d
MW-17d
MW-18d
MW-19d
Linear (MW-5d)
Linear (MW-6d)
Linear (MW-16d)
Linear (MW-17d)
Linear (MW-18d)
Linear (MW-19d)

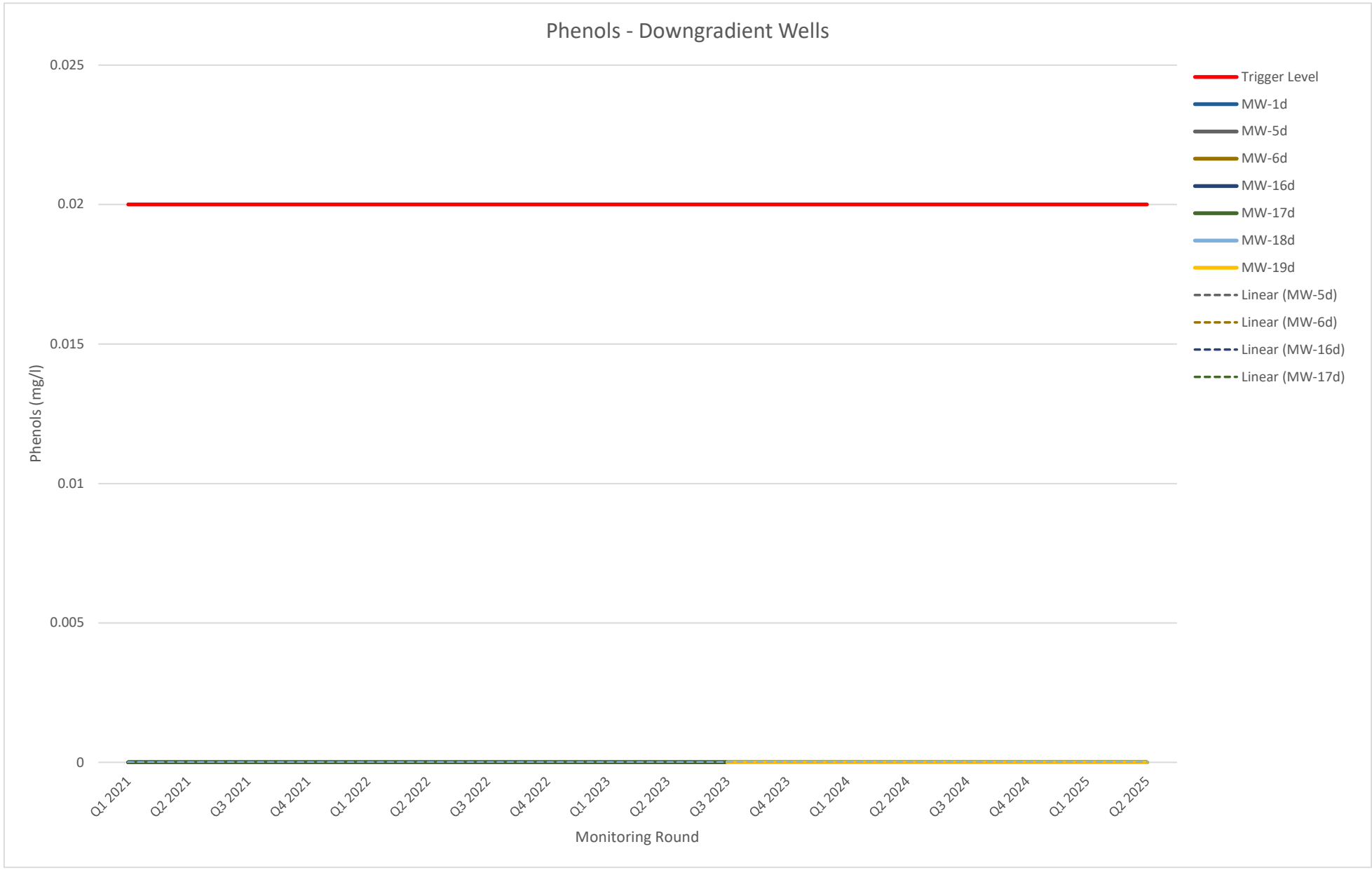

Sodium - Upgradient Wells
120
100
80
60
40
20
0
Sodium (mg/l)
Q1 2021
Q2 2021
Q3 2021
Q4 2021
Q1 2022
Q2 2022
Q3 2022
Q4 2022
Q1 2023
Q2 2023
Q3 2023
Q4 2023
Q1 2024
Q2 2024
Q3 2024
Q4 2024
Q1 2025
Q2 2025
Monitoring Round
Trigger Level
MW-1d
MW-2d
MW-3d
MW-7d
Linear (MW-1d)
Linear (MW-2d)
Linear (MW-3d)
Linear (MW-7d)


Sodium - Downgradient Wells
120
100
80
60
40
20
0
Sodium (mg/l)
Q1 2021
Q2 2021
Q3 2021
Q4 2021
Q1 2022
Q2 2022
Q3 2022
Q4 2022
Q1 2023
Q2 2023
Q3 2023
Q4 2023
Q1 2024
Q2 2024
Q3 2024
Q4 2024
Q1 2025
Q2 2025
Monitoring Round
Trigger Level
MW-5d
MW-6d
MW-16d
MW-17d
MW-18d
MW-19d
Linear (MW-5d)
Linear (MW-5d)
Linear (MW-6d)
Linear (MW-16d)
Linear (MW-17d)
Linear (MW-18d)
Linear (MW-19d)


TOC - Upgradient Wells
14
12
10
8
6
4
2
0
TOC (mg/l)
Q1 2021
Q2 2021
Q3 2021
Q4 2021
Q1 2022
Q2 2022
Q3 2022
Q4 2022
Q1 2023
Q2 2023
Q3 2023
Q4 2023
Q1 2024
Q2 2024
Q3 2024
Q4 2024
Q1 2025
Q2 2025
Monitoring Round
Trigger Level
MW-1d
MW-2d
MW-3d
MW-7d


TOC - Downgradient Wells
14
12
10
8
6
4
2
0
TOC (mg/l)
Q1 2021
Q2 2021
Q3 2021
Q4 2021
Q1 2022
Q2 2022
Q3 2022
Q4 2022
Q1 2023
Q2 2023
Q3 2023
Q4 2023
Q1 2024
Q2 2024
Q3 2024
Q4 2024
Q1 2025
Q2 2025
Monitoring Round
Trigger Level
MW-5d
MW-6d
MW-16d
MW-17d
MW-18d
MW-19d


Phenols - Upgradient Wells
0.025
0.02
0.015
0.01
0.005
0
Phenols (mg/l)
Q1 2021
Q2 2021
Q3 2021
Q4 2021
Q1 2022
Q2 2022
Q3 2022
Q4 2022
Q1 2023
Q2 2023
Q3 2023
Q4 2023
Q1 2024
Q2 2024
Q3 2024
Q4 2024
Q1 2025
Q2 2025
Monitoring Round
Trigger Level
MW-1d
MW-2d
MW-3d
MW-7d
Linear (MW-1d)
Linear (MW-2d)
Linear (MW-7d)


Phenols - Downgradient Wells
0.025
0.02
0.015
0.01
0.005
0
Phenols (mg/l)
Q1 2021
Q2 2021
Q3 2021
Q4 2021
Q1 2022
Q2 2022
Q3 2022
Q4 2022
Q1 2023
Q2 2023
Q3 2023
Q4 2023
Q1 2024
Q2 2024
Q3 2024
Q4 2024
Q1 2025
Q2 2025
Monitoring Round
Trigger Level
MW-1d
MW-5d
MW-6d
MW-16d
MW-17d
MW-18d
MW-19d
Linear (MW-5d)
Linear (MW-6d)
Linear (MW-16d)
Linear (MW-17d)

Appendix 6.7
Laboratory Testing

AWN Consulting Ltd, The Tecpro Building, IDA Business & Technology Park, Clonshaugh, Dublin 17, D17 XD90

Element Materials Technology
Unit 3 Deeside Point
Zone 3
Deeside Industrial Park
Deeside
CH5 2UA

P: +44 (0) 1244 833780
F: +44 (0) 1244 833781
W: www.element.com

AWN Consulting
Tecpro Building
Clonshaugh Business & Technology Park
Dublin
Dublin 17
Ireland

Attention :	Iain Williams
Date :	1st August, 2025
Your reference :	247501.0517
Our reference :	Test Report 25/12215 Batch 1
Location :	Knockharley
Date samples received :	25th July, 2025
Status :	Final Report
Issue :	202508011151

Six samples were received for analysis on 25th July, 2025 of which six were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

The greenhouse gas emissions generated (in Carbon – Co2e) to obtain the results in this report are estimated as:

Scope 1&2 emissions - 6.299 kg of CO2

Scope 1&2&3 emissions - 14.886 kg of CO2

Authorised By:

Bruce Leslie
Project Manager

Please include all sections of this report if it is reproduced

Client Name: AWN Consulting
Reference: 247501.0517
Location: Knockharley
Contact: Iain Williams
EMT Job No: 25/12215

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
$H=H_2SO_4$, Z=ZnAc, N=NaOH, $HN=HN0_3$

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	1-11	12-22	23-33	34-44	45-55	56-66					LOD/LOR	Units	Method No.
Sample ID	105S	105S (B)	108S	108S (B)	107S	107S (B)							
Depth													
COC No / misc													
Containers	V H HN N P G	V H HN N P G	V H HN N P G	V H HN N P G	V H HN N P G	V H HN N P G							
Sample Date	22/07/2025	22/07/2025	23/07/2025	23/07/2025	23/07/2025	23/07/2025							
Sample Type	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water							
Batch Number	1	1	1	1	1	1							
Date of Receipt	25/07/2025	25/07/2025	25/07/2025	25/07/2025	25/07/2025	25/07/2025							
PAH MS													
Naphthalene #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1					<0.1	ug/l	TM4/PM30
Acenaphthylene #	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005					<0.005	ug/l	TM4/PM30
Acenaphthene #	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005					<0.005	ug/l	TM4/PM30
Fluorene #	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005					<0.005	ug/l	TM4/PM30
Phenanthrene #	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005					<0.005	ug/l	TM4/PM30
Anthracene #	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005					<0.005	ug/l	TM4/PM30
Fluoranthene #	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005					<0.005	ug/l	TM4/PM30
Pyrene #	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005					<0.005	ug/l	TM4/PM30
Benzo(a)anthracene #	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005					<0.005	ug/l	TM4/PM30
Chrysene #	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005					<0.005	ug/l	TM4/PM30
Benzo(bk)fluoranthene #	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008					<0.008	ug/l	TM4/PM30
Benzo(a)pyrene #	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005					<0.005	ug/l	TM4/PM30
Indeno(123cd)pyrene #	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005					<0.005	ug/l	TM4/PM30
Dibenzo(ah)anthracene #	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005					<0.005	ug/l	TM4/PM30
Benzo(ghi)perylene #	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005					<0.005	ug/l	TM4/PM30
PAH 16 Total #	<0.173	<0.173	<0.173	<0.173	<0.173	<0.173					<0.173	ug/l	TM4/PM30
Benzo(b)fluoranthene	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008					<0.008	ug/l	TM4/PM30
Benzo(k)fluoranthene	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008					<0.008	ug/l	TM4/PM30
PAH Surrogate % Recovery	83	80	85	83	86	83					<0	%	TM4/PM30
MTBE #	<5	<5	<5	<5	<5	<5					<5	ug/l	TM36/PM12
Benzene #	<5	<5	<5	<5	<5	<5					<5	ug/l	TM36/PM12
Toluene #	<5	<5	<5	<5	<5	<5					<5	ug/l	TM36/PM12
Ethylbenzene #	<5	<5	<5	<5	<5	<5					<5	ug/l	TM36/PM12
m/p-Xylene #	<5	<5	<5	<5	<5	<5					<5	ug/l	TM36/PM12
o-Xylene #	<5	<5	<5	<5	<5	<5					<5	ug/l	TM36/PM12
TPH CWG													
Aliphatics													
>C5-C6 (HS_1D_AL) #	<10	<10	<10	<10	<10	<10					<10	ug/l	TM36/PM12
>C6-C8 (HS_1D_AL) #	<10	<10	<10	<10	<10	<10					<10	ug/l	TM36/PM12
>C8-C10 (HS_1D_AL) #	<10	<10	<10	<10	<10	<10					<10	ug/l	TM36/PM12
>C10-C12 (EH_CU_1D_AL) #	<5	<5	<5	<5	<5	<5					<5	ug/l	TM5/PM16/PM30
>C12-C16 (EH_CU_1D_AL) #	<10	<10	<10	<10	<10	<10					<10	ug/l	TM5/PM16/PM30
>C16-C21 (EH_CU_1D_AL) #	<10	<10	<10	<10	<10	<10					<10	ug/l	TM5/PM16/PM30
>C21-C35 (EH_CU_1D_AL) #	<10	<10	<10	<10	<10	<10					<10	ug/l	TM5/PM16/PM30
>C35-C44 (EH_CU_1D_AL)	<10	<10	<10	<10	<10	<10					<10	ug/l	TM5/PM16/PM30
Total aliphatics C5-44 (EH_CU+HS_1D_AL)	<10	<10	<10	<10	<10	<10					<10	ug/l	TM5/TM36/PM12/PM16/PM30

Element Materials Technology

Client Name: AWN Consulting
Reference: 247501.0517
Location: Knockharley
Contact: Iain Williams
EMT Job No: 25/12215

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
$H=H_2SO_4$, Z=ZnAc, N=NaOH, $HN=HN0_3$

EMT Sample No.	1-11	12-22	23-33	34-44	45-55	56-66							
Sample ID	105S	105S (B)	108S	108S (B)	107S	107S (B)							
Depth													
COC No / misc													
Containers	V H HN N P G	V H HN N P G	V H HN N P G	V H HN N P G	V H HN N P G	V H HN N P G							
Sample Date	22/07/2025	22/07/2025	23/07/2025	23/07/2025	23/07/2025	23/07/2025							
Sample Type	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water							
Batch Number	1	1	1	1	1	1							
Date of Receipt	25/07/2025	25/07/2025	25/07/2025	25/07/2025	25/07/2025	25/07/2025							
TPH CWG													
Aromatics													
>C5-EC7 (HS_1D_AR)#	<10	<10	<10	<10	<10	<10					<10	ug/l	TM36/PM12
>EC7-EC8 (HS_1D_AR)#	<10	<10	<10	<10	<10	<10					<10	ug/l	TM36/PM12
>EC8-EC10 (HS_1D_AR)#	<10	<10	<10	<10	<10	<10					<10	ug/l	TM36/PM12
>EC10-EC12 (EH_CU_1D_AR)#	<5	<5	<5	<5	<5	<5					<5	ug/l	TM5/PM16/PM30
>EC12-EC16 (EH_CU_1D_AR)#	<10	<10	<10	<10	<10	<10					<10	ug/l	TM5/PM16/PM30
>EC16-EC21 (EH_CU_1D_AR)#	<10	<10	<10	<10	<10	<10					<10	ug/l	TM5/PM16/PM30
>EC21-EC35 (EH_CU_1D_AR)#	<10	<10	<10	<10	<10	<10					<10	ug/l	TM5/PM16/PM30
>EC35-EC44 (EH_CU_1D_AR)	<10	<10	<10	<10	<10	<10					<10	ug/l	TM5/PM16/PM30
Total aromatics C5-44 (EH_CU+HS_1D_AR)	<10	<10	<10	<10	<10	<10					<10	ug/l	TM5/TM36/PM12/PM16/PM30
Total aliphatics and aromatics(C5-44) (EH_CU+HS_1D_Total)	<10	<10	<10	<10	<10	<10					<10	ug/l	TM5/TM36/PM12/PM16/PM30

Please see attached notes for all abbreviations and acronyms

Please include all sections of this report if it is reproduced
All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name: AWN Consulting
Reference: 247501.0517
Location: Knockharley
Contact: Iain Williams

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason
No deviating sample report results for job 25/12215						

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.
It is a requirement under ISO 17025 that we inform clients if samples are deviating i.e. outside what is expected. A deviating sample indicates that the sample 'may' be compromised but not necessarily will be compromised. The result is still accredited and our analytical reports will still show accreditation on the relevant analytes.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 25/12215

SOILS and ASH

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary. Asbestos samples are retained for 6 months.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C. Ash samples are dried at 35°C ±5°C.

Where Mineral Oil is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil is quoted, this refers to Total Aliphatics C10-C40.

STACK EMISSIONS

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation for Dioxins and Furans and Dioxin like PCBs has been performed on XAD-2 Resin, only samples which use this resin will be within our MCERTS scope.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a requirement of our Accreditation Body for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.
Laboratory records are kept for a period of no less than 6 years.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

Customer Provided Information

Sample ID and depth is information provided by the customer.

Age of Diesel

The age of release estimation is based on the nC17/pristane ratio only as prescribed by Christensen and Larsen (1993) and Kaplan, Galperin, Alimi et al., (1996).
Age estimation should be treated with caution as it can be influenced by site specific factors of which the laboratory are not aware.

Tentatively Identified Compounds (TICs)

Where Tentatively Identified Compounds (TICs) are reported, up to 10 Tentatively Identified Compounds will be listed where there is found to be a greater than 80% match with the NIST library. The reported concentration is determined semi-quantitively, with a matrix specific limit of detection. Note, other compounds may be present but are not reported.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above quantitative calibration range. The result should be considered the minimum value and is indicative only. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 25/12215

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM16/PM30	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE/Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM16/PM30	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE/Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM5/TM36	please refer to TM5 and TM36 for method details	PM12/PM16/PM30	please refer to PM16/PM30 and PM12 for method details				
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes			

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Clonshaugh Business & Technology Park
Dublin
Dublin 17
Ireland

Attention :	Iain Williams
Date :	4th August, 2025
Your reference :	Knockharley Landfill
Our reference :	Test Report 25/12316 Batch 1
Location :	Knockharley
Date samples received :	28th July, 2025
Status :	Final Report
Issue :	202508041502

Four samples were received for analysis on 28th July, 2025 of which four were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

The greenhouse gas emissions generated (in Carbon – Co2e) to obtain the results in this report are estimated as:

Scope 1&2 emissions - 4.054 kg of CO2

Scope 1&2&3 emissions - 9.582 kg of CO2

Authorised By:



Sean Anglish
Project Coordinator

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: AWN Consulting
Reference: Knockharley Landfill
Location: Knockharley
Contact: Iain Williams
EMT Job No: 25/12316

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
$H=H_2SO_4$, Z=ZnAc, N=NaOH, $HN=HN0_3$

EMT Sample No.	1-11	12-22	23-33	34-44							LOD/LOR	Units	Method No.
Sample ID	BH106S	BH106S (B)	BH104S	BH104S (B)									
Depth													
COC No / misc													
Containers	V H HN N P G	V H HN N P G	V H HN N P G	V H HN N P G									
Sample Date	24/07/2025 12:00	24/07/2025 12:00	25/07/2025 11:00	25/07/2025 11:00									
Sample Type	Ground Water	Ground Water	Ground Water	Ground Water									
Batch Number	1	1	1	1									
Date of Receipt	28/07/2025	28/07/2025	28/07/2025	28/07/2025									
PAH MS													
Naphthalene #	<0.1	<0.1	<0.1	<0.1							<0.1	ug/l	TM4/PM30
Acenaphthylene #	<0.005	<0.005	<0.005	<0.005							<0.005	ug/l	TM4/PM30
Acenaphthene #	<0.005	<0.005	<0.005	<0.005							<0.005	ug/l	TM4/PM30
Fluorene #	<0.005	<0.005	<0.005	<0.005							<0.005	ug/l	TM4/PM30
Phenanthrene #	<0.005	<0.005	<0.005	0.009							<0.005	ug/l	TM4/PM30
Anthracene #	<0.005	<0.005	<0.005	<0.005							<0.005	ug/l	TM4/PM30
Fluoranthene #	<0.005	<0.005	<0.005	<0.005							<0.005	ug/l	TM4/PM30
Pyrene #	<0.005	<0.005	<0.005	<0.005							<0.005	ug/l	TM4/PM30
Benzo(a)anthracene #	<0.005	<0.005	<0.005	<0.005							<0.005	ug/l	TM4/PM30
Chrysene #	<0.005	<0.005	<0.005	<0.005							<0.005	ug/l	TM4/PM30
Benzo(bk)fluoranthene #	<0.008	<0.008	<0.008	<0.008							<0.008	ug/l	TM4/PM30
Benzo(a)pyrene #	<0.005	<0.005	<0.005	<0.005							<0.005	ug/l	TM4/PM30
Indeno(123cd)pyrene #	<0.005	<0.005	<0.005	<0.005							<0.005	ug/l	TM4/PM30
Dibenzo(ah)anthracene #	<0.005	<0.005	<0.005	<0.005							<0.005	ug/l	TM4/PM30
Benzo(ghi)perylene #	<0.005	<0.005	<0.005	<0.005							<0.005	ug/l	TM4/PM30
PAH 16 Total #	<0.173	<0.173	<0.173	<0.173							<0.173	ug/l	TM4/PM30
Benzo(b)fluoranthene	<0.008	<0.008	<0.008	<0.008							<0.008	ug/l	TM4/PM30
Benzo(k)fluoranthene	<0.008	<0.008	<0.008	<0.008							<0.008	ug/l	TM4/PM30
PAH Surrogate % Recovery	68 SV	85	79	83							<0	%	TM4/PM30
MTBE #	<5	<5	<5	<5							<5	ug/l	TM36/PM12
Benzene #	<5	<5	<5	<5							<5	ug/l	TM36/PM12
Toluene #	<5	<5	<5	<5							<5	ug/l	TM36/PM12
Ethylbenzene #	<5	<5	<5	<5							<5	ug/l	TM36/PM12
m/p-Xylene #	<5	<5	<5	<5							<5	ug/l	TM36/PM12
o-Xylene #	<5	<5	<5	<5							<5	ug/l	TM36/PM12
TPH CWG													
Aliphatics													
>C5-C6 (HS_1D_AL) #	<10	<10	<10	<10							<10	ug/l	TM36/PM12
>C6-C8 (HS_1D_AL) #	<10	<10	<10	<10							<10	ug/l	TM36/PM12
>C8-C10 (HS_1D_AL) #	<10	<10	<10	<10							<10	ug/l	TM36/PM12
>C10-C12 (EH_CU_1D_AL) #	<5	<5	<5	<5							<5	ug/l	TM5/PM16/PM30
>C12-C16 (EH_CU_1D_AL) #	<10	<10	<10	<10							<10	ug/l	TM5/PM16/PM30
>C16-C21 (EH_CU_1D_AL) #	<10	<10	<10	<10							<10	ug/l	TM5/PM16/PM30
>C21-C35 (EH_CU_1D_AL) #	<10	<10	<10	<10							<10	ug/l	TM5/PM16/PM30
>C35-C44 (EH_CU_1D_AL)	<10	<10	<10	<10							<10	ug/l	TM5/PM16/PM30
Total aliphatics C5-44 (EH_CU+HS_1D_AL)	<10	<10	<10	<10							<10	ug/l	TM5/TM36/PM12/PM16/PM30

Please see attached notes for all abbreviations and acronyms

Element Materials Technology

Client Name: AWN Consulting
Reference: Knockharley Landfill
Location: Knockharley
Contact: Iain Williams
EMT Job No: 25/12316

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
$H=H_2SO_4$, Z=ZnAc, N=NaOH, HN=$HN0_3$

EMT Sample No.	1-11	12-22	23-33	34-44							LOD/LOR	Units	Method No.
Sample ID	BH106S	BH106S (B)	BH104S	BH104S (B)									
Depth													
COC No / misc													
Containers	V H HN N P G	V H HN N P G	V H HN N P G	V H HN N P G									
Sample Date	24/07/2025 12:00	24/07/2025 12:00	25/07/2025 11:00	25/07/2025 11:00									
Sample Type	Ground Water	Ground Water	Ground Water	Ground Water									
Batch Number	1	1	1	1									
Date of Receipt	28/07/2025	28/07/2025	28/07/2025	28/07/2025									
TPH CWG													
Aromatics													
>C5-EC7 (HS_1D_AR)#	<10	<10	<10	<10							<10	ug/l	TM36/PM12
>EC7-EC8 (HS_1D_AR)#	<10	<10	<10	<10							<10	ug/l	TM36/PM12
>EC8-EC10 (HS_1D_AR)#	<10	<10	<10	<10							<10	ug/l	TM36/PM12
>EC10-EC12 (EH_CU_1D_AR)#	<5	<5	<5	<5							<5	ug/l	TM5/PM16/PM30
>EC12-EC16 (EH_CU_1D_AR)#	<10	<10	<10	<10							<10	ug/l	TM5/PM16/PM30
>EC16-EC21 (EH_CU_1D_AR)#	<10	<10	<10	<10							<10	ug/l	TM5/PM16/PM30
>EC21-EC35 (EH_CU_1D_AR)#	<10	<10	<10	<10							<10	ug/l	TM5/PM16/PM30
>EC35-EC44 (EH_CU_1D_AR)	<10	<10	<10	<10							<10	ug/l	TM5/PM16/PM30
Total aromatics C5-44 (EH_CU+HS_1D_AR)	<10	<10	<10	<10							<10	ug/l	TM5/TM36/PM12/PM16/PM30
Total aliphatics and aromatics(C5-44) (EH_CU+HS_1D_Total)	<10	<10	<10	<10							<10	ug/l	TM5/TM36/PM12/PM16/PM30

Please see attached notes for all abbreviations and acronyms

Client Name: AWN Consulting
Reference: Knockharley Landfill
Location: Knockharley
Contact: Iain Williams

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason
No deviating sample report results for job 25/12316						

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.
It is a requirement under ISO 17025 that we inform clients if samples are deviating i.e. outside what is expected. A deviating sample indicates that the sample 'may' be compromised but not necessarily will be compromised. The result is still accredited and our analytical reports will still show accreditation on the relevant analytes.

Please include all sections of this report if it is reproduced

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 25/12316

SOILS and ASH

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary. Asbestos samples are retained for 6 months.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C. Ash samples are dried at 35°C ±5°C.

Where Mineral Oil is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil is quoted, this refers to Total Aliphatics C10-C40.

STACK EMISSIONS

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation for Dioxins and Furans and Dioxin like PCBs has been performed on XAD-2 Resin, only samples which use this resin will be within our MCERTS scope.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a requirement of our Accreditation Body for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.
Laboratory records are kept for a period of no less than 6 years.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

Customer Provided Information

Sample ID and depth is information provided by the customer.

Age of Diesel

The age of release estimation is based on the nC17/pristane ratio only as prescribed by Christensen and Larsen (1993) and Kaplan, Galperin, Alimi et al., (1996).
Age estimation should be treated with caution as it can be influenced by site specific factors of which the laboratory are not aware.

Tentatively Identified Compounds (TICs)

Where Tentatively Identified Compounds (TICs) are reported, up to 10 Tentatively Identified Compounds will be listed where there is found to be a greater than 80% match with the NIST library. The reported concentration is determined semi-quantitively, with a matrix specific limit of detection. Note, other compounds may be present but are not reported.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above quantitative calibration range. The result should be considered the minimum value and is indicative only. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 25/12316

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM16/PM30	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE/Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM16/PM30	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE/Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM5/TM36	please refer to TM5 and TM36 for method details	PM12/PM16/PM30	please refer to PM16/PM30 and PM12 for method details				
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes			

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AWN Consulting
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Clonshaugh Business & Technology Park
Dublin
Dublin 17
Ireland

Attention :	Iain Williams
Date :	4th August, 2025
Your reference :	Knockharley Landfill
Our reference :	Test Report 25/12381 Batch 1
Location :	Knockharley
Date samples received :	29th July, 2025
Status :	Final Report
Issue :	202508041549

Four samples were received for analysis on 29th July, 2025 of which four were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

The greenhouse gas emissions generated (in Carbon – Co2e) to obtain the results in this report are estimated as:

Scope 1&2 emissions - 4.054 kg of CO2

Scope 1&2&3 emissions - 9.582 kg of CO2

Authorised By:



Sean Anglish
Project Coordinator

Please include all sections of this report if it is reproduced

Client Name: AWN Consulting
Reference: Knockharley Landfill
Location: Knockharley
Contact: Iain Williams
EMT Job No: 25/12381

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
H=H_2SO_4, Z=ZnAc, N=NaOH, HN=$HN0_3$

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	1-11	12-22	23-33	34-44							LOD/LOR	Units	Method No.
Sample ID	BH101S	BH102S	BH101S (B)	BH102S (B)									
Depth													
COC No / misc													
Containers	V H HN N P G	V H HN N P G	V H HN N P G	V H HN N P G									
Sample Date	28/07/2025 14:00	28/07/2025 09:00	28/07/2025 14:00	28/07/2025 09:00									
Sample Type	Ground Water	Ground Water	Ground Water	Ground Water									
Batch Number	1	1	1	1									
Date of Receipt	29/07/2025	29/07/2025	29/07/2025	29/07/2025									
PAH MS													
Naphthalene #	<0.1	<0.1	<0.1	<0.1							<0.1	ug/l	TM4/PM30
Acenaphthylene #	<0.005	<0.005	<0.005	<0.005							<0.005	ug/l	TM4/PM30
Acenaphthene #	<0.005	<0.005	<0.005	<0.005							<0.005	ug/l	TM4/PM30
Fluorene #	<0.005	<0.005	<0.005	<0.005							<0.005	ug/l	TM4/PM30
Phenanthrene #	<0.005	<0.005	<0.005	<0.005							<0.005	ug/l	TM4/PM30
Anthracene #	<0.005	<0.005	<0.005	<0.005							<0.005	ug/l	TM4/PM30
Fluoranthene #	<0.005	<0.005	<0.005	<0.005							<0.005	ug/l	TM4/PM30
Pyrene #	<0.005	<0.005	<0.005	<0.005							<0.005	ug/l	TM4/PM30
Benzo(a)anthracene #	<0.005	<0.005	<0.005	<0.005							<0.005	ug/l	TM4/PM30
Chrysene #	<0.005	<0.005	<0.005	<0.005							<0.005	ug/l	TM4/PM30
Benzo(bk)fluoranthene #	<0.008	<0.008	<0.008	<0.008							<0.008	ug/l	TM4/PM30
Benzo(a)pyrene #	<0.005	<0.005	<0.005	<0.005							<0.005	ug/l	TM4/PM30
Indeno(123cd)pyrene #	<0.005	<0.005	<0.005	<0.005							<0.005	ug/l	TM4/PM30
Dibenzo(ah)anthracene #	<0.005	<0.005	<0.005	<0.005							<0.005	ug/l	TM4/PM30
Benzo(ghi)perylene #	<0.005	<0.005	<0.005	<0.005							<0.005	ug/l	TM4/PM30
PAH 16 Total #	<0.173	<0.173	<0.173	<0.173							<0.173	ug/l	TM4/PM30
Benzo(b)fluoranthene	<0.008	<0.008	<0.008	<0.008							<0.008	ug/l	TM4/PM30
Benzo(k)fluoranthene	<0.008	<0.008	<0.008	<0.008							<0.008	ug/l	TM4/PM30
PAH Surrogate % Recovery	72	80	70	75							<0	%	TM4/PM30
MTBE #	<5	<5	<5	<5							<5	ug/l	TM36/PM12
Benzene #	<5	<5	<5	<5							<5	ug/l	TM36/PM12
Toluene #	<5	<5	<5	<5							<5	ug/l	TM36/PM12
Ethylbenzene #	<5	<5	<5	<5							<5	ug/l	TM36/PM12
m/p-Xylene #	<5	<5	<5	<5							<5	ug/l	TM36/PM12
o-Xylene #	<5	<5	<5	<5							<5	ug/l	TM36/PM12
TPH CWG													
Aliphatics													
>C5-C6 (HS_1D_AL) #	<10	<10	<10	<10							<10	ug/l	TM36/PM12
>C6-C8 (HS_1D_AL) #	<10	<10	<10	<10							<10	ug/l	TM36/PM12
>C8-C10 (HS_1D_AL) #	<10	<10	<10	<10							<10	ug/l	TM36/PM12
>C10-C12 (EH_CU_1D_AL) #	<5	<5	<5	<5							<5	ug/l	TM5/PM16/PM30
>C12-C16 (EH_CU_1D_AL) #	<10	<10	<10	<10							<10	ug/l	TM5/PM16/PM30
>C16-C21 (EH_CU_1D_AL) #	<10	<10	<10	<10							<10	ug/l	TM5/PM16/PM30
>C21-C35 (EH_CU_1D_AL) #	<10	<10	<10	<10							<10	ug/l	TM5/PM16/PM30
>C35-C44 (EH_CU_1D_AL)	<10	<10	<10	<10							<10	ug/l	TM5/PM16/PM30
Total aliphatics C5-44 (EH_CU+HS_1D_AL)	<10	<10	<10	<10							<10	ug/l	TM5/TM36/PM12/PM16/PM30

Element Materials Technology

Client Name: AWN Consulting
Reference: Knockharley Landfill
Location: Knockharley
Contact: Iain Williams
EMT Job No: 25/12381

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
$H=H_2SO_4$, Z=ZnAc, N=NaOH, HN=$HN0_3$

EMT Sample No.	1-11	12-22	23-33	34-44							LOD/LOR	Units	Method No.
Sample ID	BH101S	BH102S	BH101S (B)	BH102S (B)									
Depth													
COC No / misc													
Containers	V H HN N P G	V H HN N P G	V H HN N P G	V H HN N P G									
Sample Date	28/07/2025 14:00	28/07/2025 09:00	28/07/2025 14:00	28/07/2025 09:00									
Sample Type	Ground Water	Ground Water	Ground Water	Ground Water									
Batch Number	1	1	1	1									
Date of Receipt	29/07/2025	29/07/2025	29/07/2025	29/07/2025									
TPH CWG													
Aromatics													
>C5-EC7 (HS_1D_AR)#	<10	<10	<10	<10							<10	ug/l	TM36/PM12
>EC7-EC8 (HS_1D_AR)#	<10	<10	<10	<10							<10	ug/l	TM36/PM12
>EC8-EC10 (HS_1D_AR)#	<10	<10	<10	<10							<10	ug/l	TM36/PM12
>EC10-EC12 (EH_CU_1D_AR)#	<5	<5	<5	<5							<5	ug/l	TM5/PM16/PM30
>EC12-EC16 (EH_CU_1D_AR)#	<10	<10	<10	<10							<10	ug/l	TM5/PM16/PM30
>EC16-EC21 (EH_CU_1D_AR)#	<10	<10	<10	<10							<10	ug/l	TM5/PM16/PM30
>EC21-EC35 (EH_CU_1D_AR)#	<10	<10	<10	<10							<10	ug/l	TM5/PM16/PM30
>EC35-EC44 (EH_CU_1D_AR)	<10	<10	<10	<10							<10	ug/l	TM5/PM16/PM30
Total aromatics C5-44 (EH_CU+HS_1D_AR)	<10	<10	<10	<10							<10	ug/l	TM5/TM36/PM12/PM16/PM30
Total aliphatics and aromatics(C5-44) (EH_CU+HS_1D_Total)	<10	<10	<10	<10							<10	ug/l	TM5/TM36/PM12/PM16/PM30

Please see attached notes for all abbreviations and acronyms

Element Materials Technology

Notification of Deviating Samples

Client Name: AWN Consulting
Reference: Knockharley Landfill
Location: Knockharley
Contact: Iain Williams

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason
No deviating sample report results for job 25/12381						

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.
It is a requirement under ISO 17025 that we inform clients if samples are deviating i.e. outside what is expected. A deviating sample indicates that the sample 'may' be compromised but not necessarily will be compromised. The result is still accredited and our analytical reports will still show accreditation on the relevant analytes.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 25/12381

SOILS and ASH

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary. Asbestos samples are retained for 6 months.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C. Ash samples are dried at 35°C ±5°C.

Where Mineral Oil is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil is quoted, this refers to Total Aliphatics C10-C40.

STACK EMISSIONS

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation for Dioxins and Furans and Dioxin like PCBs has been performed on XAD-2 Resin, only samples which use this resin will be within our MCERTS scope.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a requirement of our Accreditation Body for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.
Laboratory records are kept for a period of no less than 6 years.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

Customer Provided Information

Sample ID and depth is information provided by the customer.

Age of Diesel

The age of release estimation is based on the nC17/pristane ratio only as prescribed by Christensen and Larsen (1993) and Kaplan, Galperin, Alimi et al., (1996).
Age estimation should be treated with caution as it can be influenced by site specific factors of which the laboratory are not aware.

Tentatively Identified Compounds (TICs)

Where Tentatively Identified Compounds (TICs) are reported, up to 10 Tentatively Identified Compounds will be listed where there is found to be a greater than 80% match with the NIST library. The reported concentration is determined semi-quantitively, with a matrix specific limit of detection. Note, other compounds may be present but are not reported.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above quantitative calibration range. The result should be considered the minimum value and is indicative only. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 25/12381

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM16/PM30	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE/Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM16/PM30	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE/Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM5/TM36	please refer to TM5 and TM36 for method details	PM12/PM16/PM30	please refer to PM16/PM30 and PM12 for method details				
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes			

Appendix 7.1
Examples of Valuing Important Ecological Features

AWN Consulting Ltd, The Tecpro Building, IDA Business & Technology Park, Clonshaugh, Dublin 17, D17 XD90

Appendix 7-1 Examples of Valuing Important Ecological Features

International Importance:

- 'European Site' including Special Area of Conservation (SAC), Site of Community Importance (SCI), Special Protection Area (SPA) or proposed Special Area of Conservation.
- Proposed Special Protection Area (pSPA).
- Site that fulfils the criteria for designation as a 'European Site' (see Annex III of the Habitats Directive, as amended).
- Features essential to maintaining the coherence of the Natura 2000 Network.[1]
- Site containing 'best examples' of the habitat types listed in Annex I of the Habitats Directive.
- Resident or regularly occurring populations (assessed to be important at the national level)[2] of the following:
  - Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; and/or
  - Species of animal and plants listed in Annex II and/or IV of the Habitats Directive.
- Ramsar Site (Convention on Wetlands of International Importance Especially Waterfowl Habitat 1971).
- World Heritage Site (Convention for the Protection of World Cultural & Natural Heritage, 1972).
- Biosphere Reserve (UNESCO Man & The Biosphere Programme, 1971).
- Site hosting significant species populations under the Bonn Convention (Convention on the Conservation of Migratory Species of Wild Animals, 1979).
- Site hosting significant populations under the Berne Convention (Convention on the Conservation of European Wildlife and Natural Habitats, 1979).
- Biogenetic Reserve under the Council of Europe 1976.
- European Diploma Site under the Council of Europe 1965.
- Salmonid water designated pursuant to the European Communities (Quality of Salmonid Waters) Regulations, 1988, (S.I. No. 1988).[3]

National Importance:

- Site designated or proposed as a Natural Heritage Area (NHA).
- Statutory Nature Reserve.
- Refuge for Fauna and Flora protected under the Wildlife Acts.
- National Park.
- Undesignated site fulfilling the criteria for designation as a Natural Heritage Area (NHA); Statutory Nature Reserve; Refuge for Fauna and Flora protected under the Wildlife Act; and/or a National Park.
- Resident or regularly occurring populations (assessed to be important at the national level)[4] of the following:
  - Species protected under the Wildlife Acts; and/or

[1] See Articles 3 and 10 of the Habitats Directive

[2] It is suggested that, in general, 1% of the national population of such species qualifies as an internationally important population. However, a smaller population may qualify as internationally important where the population forms a critical part of a wider population or the species is at a critical phase of its life cycle.

[3] Note that such waters are designated based on these waters' capabilities of supporting salmon (*Salmo salar*), trout *(Salmo trutta*), char (*Salvelinus*) and whitefish (*Coregonus*)

[4] It is suggested that, in general, 1% of the national population of such species qualifies as a nationally important population. However, a smaller population may qualify as nationally important where the population forms a critical part of a wider population or the species is at a critical phase of its life cycle.

- Species listed on the relevant Red Data list.

- Site containing 'viable areas'[5] of the habitat types listed in Annex I of the Habitats Directive

County Importance:

- Area of Special Amenity.[6]
- Area subject to a Tree Preservation Order.
- Area of High Amenity, or equivalent, designated under the County Development Plan.
- Resident or regularly occurring populations (assessed to be important at the County level)[7] of the following:
  - Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive;
  - Species of animal and plants listed in Annex II and/or IV of the Habitats Directive;
  - Species protected under the Wildlife Acts; and/or
  - Species listed on the relevant Red Data list.
- Site containing area or areas of the habitat types listed in Annex I of the Habitats Directive that do not fulfil the criteria for valuation as of International or National importance.
- County important populations of species, or viable areas of semi-natural habitats or natural heritage features identified in the National or Local Biodiversity Action Plan, if this has been prepared.
- Sites containing semi-natural habitat types with high biodiversity in a county context and a high degree of naturalness, or populations of species that are uncommon within the county.
- Sites containing habitats and species that are rare or are undergoing a decline in quality or extent at a national level.

Local Importance (higher value):

- Locally important populations of priority species or habitats or natural heritage features identified in the Local BAP, if this has been prepared;
- Resident or regularly occurring populations (assessed to be important at the Local level)[8] of the following:
  - Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive;
  - Species of animal and plants listed in Annex II and/or IV of the Habitats Directive;
  - Species protected under the Wildlife Acts; and/or
  - Species listed on the relevant Red Data list.
- Sites containing semi-natural habitat types with high biodiversity in a local context and a high degree of naturalness, or populations of species that are uncommon in the locality;
- Sites or features containing common or lower value habitats, including naturalised species that are nevertheless essential in maintaining links and ecological corridors between features of higher ecological value.

[5] A 'viable area' is defined as an area of a habitat that, given the particular characteristics of that habitat, was of a sufficient size and shape, such that its integrity (in terms of species composition, and ecological processes and function) would be maintained in the face of stochastic change (for example, as a result of climatic variation).

[6] It should be noted that whilst areas such as Areas of Special Amenity, areas subject to a Tree Preservation Order and Areas of High Amenity are often designated on the basis of their ecological value, they may also be designated for other reasons, such as their amenity or recreational value. Therefore, it should not be automatically assumed that such sites are of County importance from an ecological perspective.

[7] It is suggested that, in general, 1% of the County population of such species qualifies as a County important population. However, a smaller population may qualify as County important where the population forms a critical part of a wider population or the species is at a critical phase of its life cycle.

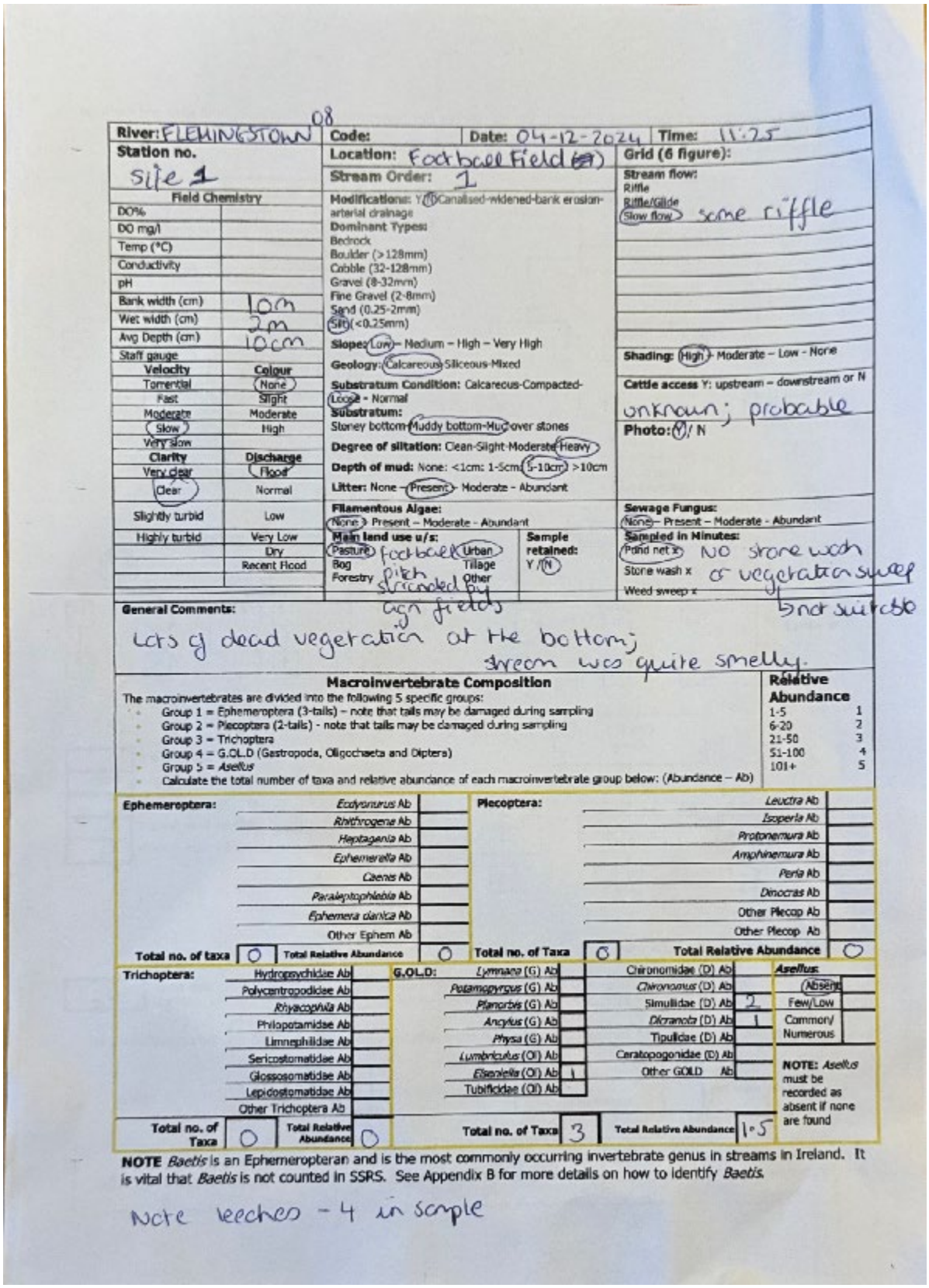
[8] It is suggested that, in general, 1% of the local population of such species qualifies as a locally important population. However, a smaller population may qualify as locally important where the population forms a critical part of a wider population or the species is at a critical phase of its life cycle.

Local Importance (lower value):
► Sites containing small areas of semi-natural habitat that are of some local importance for wildlife; ► Sites or features containing non-native species that are of some importance in maintaining habitat links.

Appendix 7.2
Small Streams Risk Score Survey Results

AWN Consulting Ltd, The Tecpro Building, IDA Business & Technology Park, Clonshaugh, Dublin 17, D17 XD90

Appendix 7-2 Small Stream Risk Score Survey Results



08

River: FLEMINGSTOWN | Code: | Date: 04-12-2024 | Time: 11:25

Station no.: site 1

Location: Football Field (GR)

Grid (6 figure):

Stream Order: 1

Stream flow: Riffle / Riffle/Glide / (Slow flow) some riffle

Modifications: Y (N) Canalised-widened-bank erosion-arterial drainage

Dominant Types: Bedrock / Boulder (>128mm) / Cobble (32-128mm) / Gravel (8-32mm) / Fine Gravel (2-8mm) / Sand (0.25-2mm) / Silt (<0.25mm)

Slope: (Low) – Medium – High – Very High

Geology: (Calcareous) Siliceous-Mixed

Substratum Condition: Calcareous-Compacted-(Loose) - Normal

Substratum: Stoney bottom-Muddy bottom-Mud over stones

Degree of siltation: Clean-Slight-Moderate-Heavy

Depth of mud: None: <1cm: 1-5cm: (5-10cm) >10cm

Litter: None – (Present) – Moderate – Abundant

Shading: (High) – Moderate – Low – None

Cattle access Y: upstream – downstream or N: unknown; probable

Photo: (Y) / N

Field Chemistry	
DO%	
DO mg/l	
Temp (°C)	
Conductivity	
pH	
Bank width (cm)	10m
Wet width (cm)	2m
Avg Depth (cm)	10cm
Staff gauge	

Velocity	Colour	Clarity	Discharge
Torrential	(None)	Very clear	(Flood)
Fast	Slight	(Clear)	Normal
Moderate	Moderate	Slightly turbid	Low
(Slow)	High	Highly turbid	Very Low
Very Slow			Dry
			Recent Flood

Filamentous Algae: (None) – Present – Moderate – Abundant

Main land use u/s: (Pasture) Football (Urban) / Bog / Tillage / Forestry / Pitch shrouded by / Other: agn fields

Sample retained: Y / (N)

Sewage Fungus: (None) – Present – Moderate – Abundant

Sampled in Minutes: (Pond net x) NO stone wash or vegetation sweep but suitable / Stone wash x / Weed sweep x

General Comments:

Lots of dead vegetation at the bottom; stream was quite smelly.

Macroinvertebrate Composition

The macroinvertebrates are divided into the following 5 specific groups:

- Group 1 = Ephemeroptera (3-tails) – note that tails may be damaged during sampling
- Group 2 = Plecoptera (2-tails) - note that tails may be damaged during sampling
- Group 3 = Trichoptera
- Group 4 = G.OL.D (Gastropoda, Oligochaeta and Diptera)
- Group 5 = *Asellus*
- Calculate the total number of taxa and relative abundance of each macroinvertebrate group below: (Abundance – Ab)

Relative Abundance	
1-5	1
6-20	2
21-50	3
51-100	4
101+	5

Ephemeroptera:		Plecoptera:	
Ecdyonurus Ab		*Leuctra* Ab	
Rhithrogena Ab		*Isoperla* Ab	
Heptagenia Ab		*Protonemura* Ab	
Ephemerella Ab		*Amphinemura* Ab	
Caenis Ab		*Perla* Ab	
Paraleptophlebia Ab		*Dinocras* Ab	
Ephemera danica Ab		Other Plecop Ab	
Other Ephem Ab		Other Plecop Ab	
Total no. of taxa: 0	Total Relative Abundance: 0	Total no. of Taxa: 0	Total Relative Abundance: 0

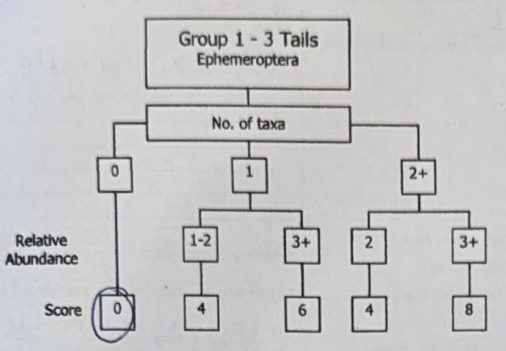
Trichoptera:		G.OL.D:				Asellus:	
Hydropsychidae Ab		*Lymnaea* (G) Ab		Chironomidae (D) Ab		(Absent)	
Polycentropodidae Ab		*Potamopyrgus* (G) Ab		*Chironomus* (D) Ab		Few/Low	
Rhyacophila Ab		*Planorbis* (G) Ab		Simulidae (D) Ab	2	Common/ Numerous	
Philopotamidae Ab		*Ancylus* (G) Ab		*Dicranota* (D) Ab	1		
Limnephilidae Ab		*Physa* (G) Ab		Tipulidae (D) Ab			
Sericostomatidae Ab		*Lumbriculus* (Ol) Ab		Ceratopogonidae (D) Ab			
Glossosomatidae Ab		*Eiseniella* (Ol) Ab	1	Other GOLD Ab			
Lepidostomatidae Ab		Tubificidae (Ol) Ab					
Other Trichoptera Ab							
Total no. of Taxa: 0	Total Relative Abundance: 0	Total no. of Taxa: 3		Total Relative Abundance: 1.5			

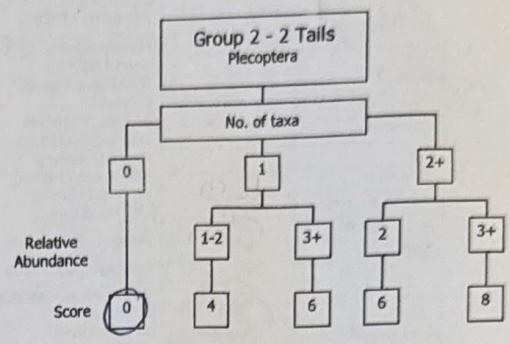
NOTE: *Asellus* must be recorded as absent if none are found

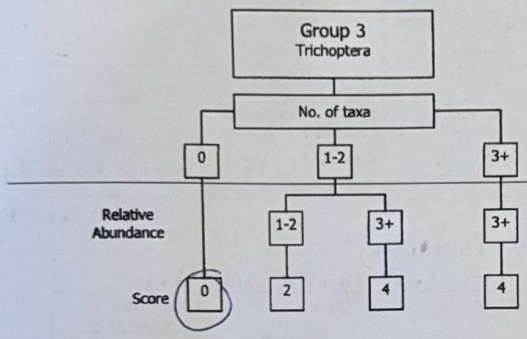
NOTE *Baetis* is an Ephemeropteran and is the most commonly occurring invertebrate genus in streams in Ireland. It is vital that *Baetis* is not counted in SSRS. See Appendix B for more details on how to identify *Baetis*.

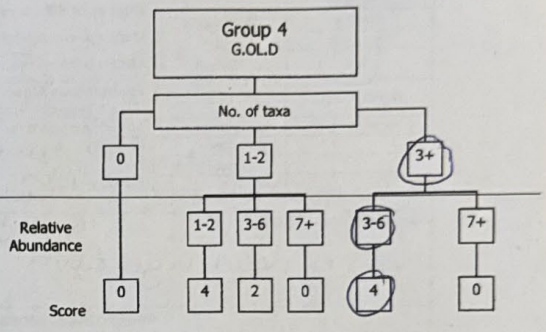
Note leeches - 4 in sample

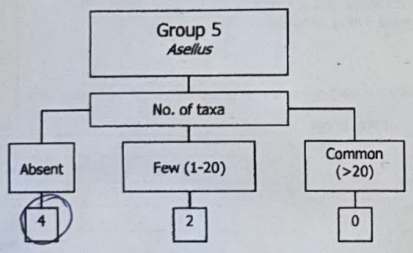
Step 1. Calculate the Index Score by circling the appropriate box representing the total number of taxa and the total abundance calculated from ***each macroinvertebrate group*** calculated from page 1 of the recording sheet and enter in to the boxes in Step 2.











Step 2

a) Index Score Group 1	
b) Index Score Group 2	
c) Index Score Group 3	
d) Index Score Group 4	4
e) Index Score Group 5	4

Step 3. Calculate the Total Index Score, the Average Index Score and the SSR Score using the boxes below

Total Index Score (TIS) sum (a+b+c+d+e)	Average Index Score (AIS) TIS/5 (5 for 5 groups)	**SSR Score** (AIS x 2)
8	1.6	3.2

Step 4. Assess the stream by comparing the final SSR score with the categories below and tick the appropriate box

> 7.25 Probably not at risk	> 6.5 – 7.25 Indeterminate Stream may be at risk	<6.5 Stream at risk
		✓

Surveyor (signed): Clicne Oflaherty Name (print): CLIONA OFLAHERTY Date: 04 / 12 / 2024

River: FLEMINGTON 03 | **Code:** | **Date:** 03-12-2024 | **Time:** 12:20

Station no. Site 2

Location: Site 2-downstream

Stream Order: 1 1 of 4th

Grid (6 figure):

Field Chemistry

DO%	
DO mg/l	
Temp (°C)	
Conductivity	
pH	
Bank width (cm)	2.8m
Wet width (cm)	2m
Avg Depth (cm)	50cm
Staff gauge	

Velocity	Colour
Torrential	None
Fast	(Slight)
Moderate	Moderate
Slow	High
(Very slow)	

Clarity	Discharge
Very clear	Flood
Clear	(Normal)
Slightly turbid	Low
(Highly turbid)	Very Low
	Dry
	Recent Flood

Modifications: Y/N Canalised-widened-bank erosion-arterial drainage

Dominant Types: wide culvert pipe

Bedrock
Boulder (>128mm)
Cobble (32-128mm)
Gravel (8-32mm)
Fine Gravel (2-8mm)
Sand (0.25-2mm)
Silt (<0.25mm)

Slope: (Low) – Medium – High – Very High

Geology: (Calcareous)-Siliceous-Mixed

Substratum Condition: Calcareous-Compacted-Loose - Normal

Substratum: Stoney bottom-Muddy bottom-Mud over stones

Degree of siltation: Clean-Slight-Moderate-Heavy

Depth of mud: None: <1cm: 1-5cm: 5-10cm: (>10cm)

Litter: (None) – Present – Moderate - Abundant

Filamentous Algae: (None) – Present – Moderate - Abundant

Main land use u/s:

Pasture	Urban	
Bog	Tillage	
Forestry	(Other)	

Sample retained: Y / (N)

Shading: (High) – Moderate – Low - None

Cattle access Y: upstream – downstream or N

upstream

Photo (Y) / N

Sewage Fungus: outflow from upstream
None – Present – Moderate – Abundant

Sampled in Minutes:

(Pond net x)	No stones
Stone wash x	no vege vegetation
~~Weed sweep x~~	

General Comments:

very silty, quite smelly, outflow upstream
large culvert downstream

Macroinvertebrate Composition

The macroinvertebrates are divided into the following 5 specific groups:

- Group 1 = Ephemeroptera (3-tails) – note that tails may be damaged during sampling
- Group 2 = Plecoptera (2-tails) - note that tails may be damaged during sampling
- Group 3 = Trichoptera
- Group 4 = G.OL.D (Gastropoda, Oligochaeta and Diptera)
- Group 5 = *Asellus*
- Calculate the total number of taxa and relative abundance of each macroinvertebrate group below: (Abundance – Ab)

Relative Abundance	
1-5	1
6-20	2
21-50	3
51-100	4
101+	5

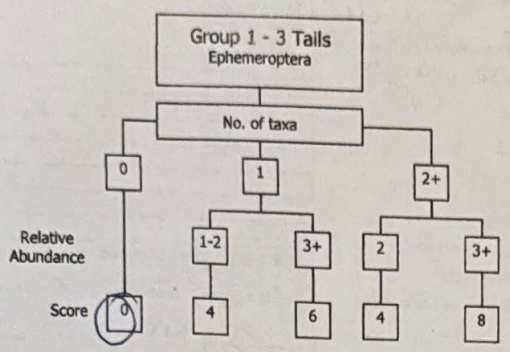
Ephemeroptera:		**Plecoptera:**	
Ecdyonurus Ab		*Leuctra* Ab	
Rhithrogena Ab		*Isoperla* Ab	
Heptagenia Ab		*Protonemura* Ab	
Ephemerella Ab		*Amphinemura* Ab	
Caenis Ab		*Perla* Ab	
Paraleptophlebia Ab		*Dinocras* Ab	
Ephemera danica Ab		Other Plecop Ab	
Other Ephem Ab		Other Plecop Ab	
Total no. of taxa	**Total Relative Abundance**	**Total no. of Taxa**	**Total Relative Abundance**

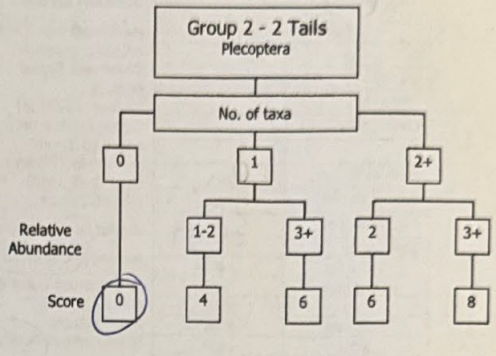
Trichoptera:		**G.OL.D:**			**Asellus:**	
Hydropsychidae Ab		*Lymnaea* (G) Ab		Chironomidae (D) Ab	Absent	
Polycentropodidae Ab		*Potamopyrgus* (G) Ab		*Chironomus* (D) Ab	(Few/Low)	
Rhyacophila Ab		*Planorbis* (G) Ab		Simulidae (D) Ab	Common/ Numerous	
Philopotamidae Ab		*Ancylus* (G) Ab		*Dicranota* (D) Ab		
Limnephilidae Ab	2	*Physa* (G) Ab		Tipulidae (D) Ab		
Sericostomatidae Ab		*Lumbriculus* (Ol) Ab		Ceratopogonidae (D) Ab		
Glossosomatidae Ab		*Eiseniella* (Ol) Ab	1	Other GOLD Ab		
Lepidostomatidae Ab		Tubificidae (Ol) Ab				
Other Trichoptera Ab						
Total no. of Taxa	1	**Total Relative Abundance**	2	**Total no. of Taxa** 1	**Total Relative Abundance**	1

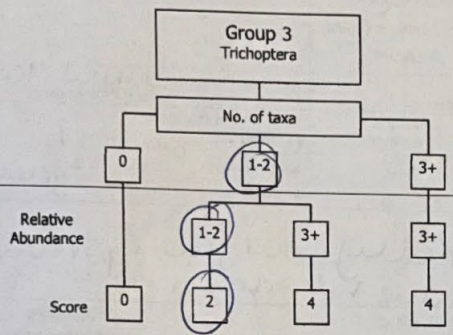
NOTE: *Asellus* must be recorded as absent if none are found

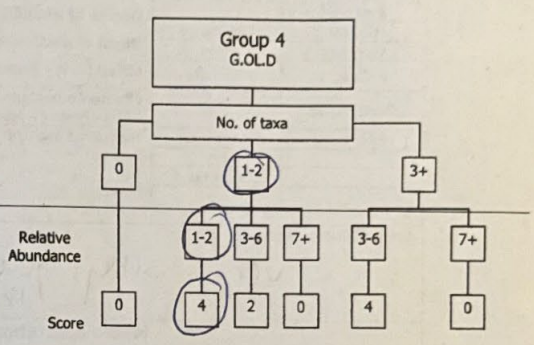
NOTE *Baetis* is an Ephemeropteran and is the most commonly occurring invertebrate genus in streams in Ireland. It is vital that *Baetis* is not counted in SSRS. See Appendix B for more details on how to identify *Baetis*.

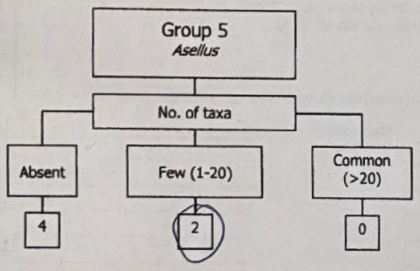
Step 1. Calculate the Index Score by circling the appropriate box representing the total number of taxa and the total abundance calculated from ***each macroinvertebrate group*** calculated from page 1 of the recording sheet and enter in to the boxes in Step 2.











Step 2

a) Index Score Group 1	0
b) Index Score Group 2	0
c) Index Score Group 3	2
d) Index Score Group 4	4
e) Index Score Group 5	2

Step 3. Calculate the Total Index Score, the Average Index Score and the SSR Score using the boxes below

Total Index Score (TIS) sum (a+b+c+d+e)	8	Average Index Score (AIS) TIS/5 (5 for 5 groups)	1.6	**SSR Score** (AIS x 2)	3.2

Step 4. Assess the stream by comparing the final SSR score with the categories below and tick the appropriate box

> 7.25 Probably not at risk		> 6.5 – 7.25 Indeterminate Stream may be at risk		<6.5 Stream at risk	✓

Surveyor (signed): Clive Cly Name (print): CLIVE CF Date: 03/12/2024

River:

Station no. Site 3 - upstream

Code: **Date:** 03-17-2024 **Time:** 11:13

Location: site 3 - upstream

Stream Order: 1 pond

Grid (6 figure):

Field Chemistry	
DO%	
DO mg/l	
Temp (°C)	
Conductivity	
pH	
Bank width (cm)	400
Wet width (cm)	150
Avg Depth (cm)	20
Staff gauge	

Velocity	Colour	Discharge
Torrential	(None)	
Fast	Slight	
(Moderate)	Moderate	
Slow	High	
Very slow		
Clarity		Flood
Very clear		
(Clear)		(Normal)
Slightly turbid		Low
Highly turbid		Very Low
		Dry
		Recent Flood

Modifications: Y/N Canalised-widened-bank erosion-arterial drainage

Dominant Types: possibly

Bedrock
Boulder (>128mm)
Cobble (32-128mm)
Gravel (8-32mm)
Fine Gravel (2-8mm)
Sand (0.25-2mm)
(Silt) (<0.25mm)

Slope: (Low) – Medium – High – Very High

Geology: (Calcareous) Siliceous-Mixed

Substratum Condition: Calcareous-Compacted-Loose (Normal)

Substratum: Stoney bottom-Muddy bottom-(Mud over stones)

Degree of siltation: Clean-Slight-Moderate-Heavy

Depth of mud: None: (<1cm: 1-5cm: 5-10cm: >10cm

Litter: (None) – Present – Moderate - Abundant

Filamentous Algae: None – Present – Moderate - Abundant

Main land use u/s:

Pasture	Urban	
Bog	Tillage	
Forestry	Landfill	Other

Sample retained: Y (N)

Stream flow:
Riffle
~~Riffle/Glide~~
~~Slow flow~~

Shading: (High) – Moderate – Low - None

Cattle access: (Y) upstream – downstream or (N)

Photo: (Y) N

Sewage Fungus: None – Present – Moderate - Abundant

Sampled in Minutes:
Pond net x ✓ 2 mins;
Stone wash x no verge of veg or
~~Weed sweep x~~ no stones

General Comments:

No verge of vegetation.

Macroinvertebrate Composition

The macroinvertebrates are divided into the following 5 specific groups:

- Group 1 = Ephemeroptera (3-tails) – note that tails may be damaged during sampling
- Group 2 = Plecoptera (2-tails) - note that tails may be damaged during sampling
- Group 3 = Trichoptera
- Group 4 = G.OL.D (Gastropoda, Oligochaeta and Diptera)
- Group 5 = *Asellus*
- Calculate the total number of taxa and relative abundance of each macroinvertebrate group below: (Abundance – Ab)

Relative Abundance

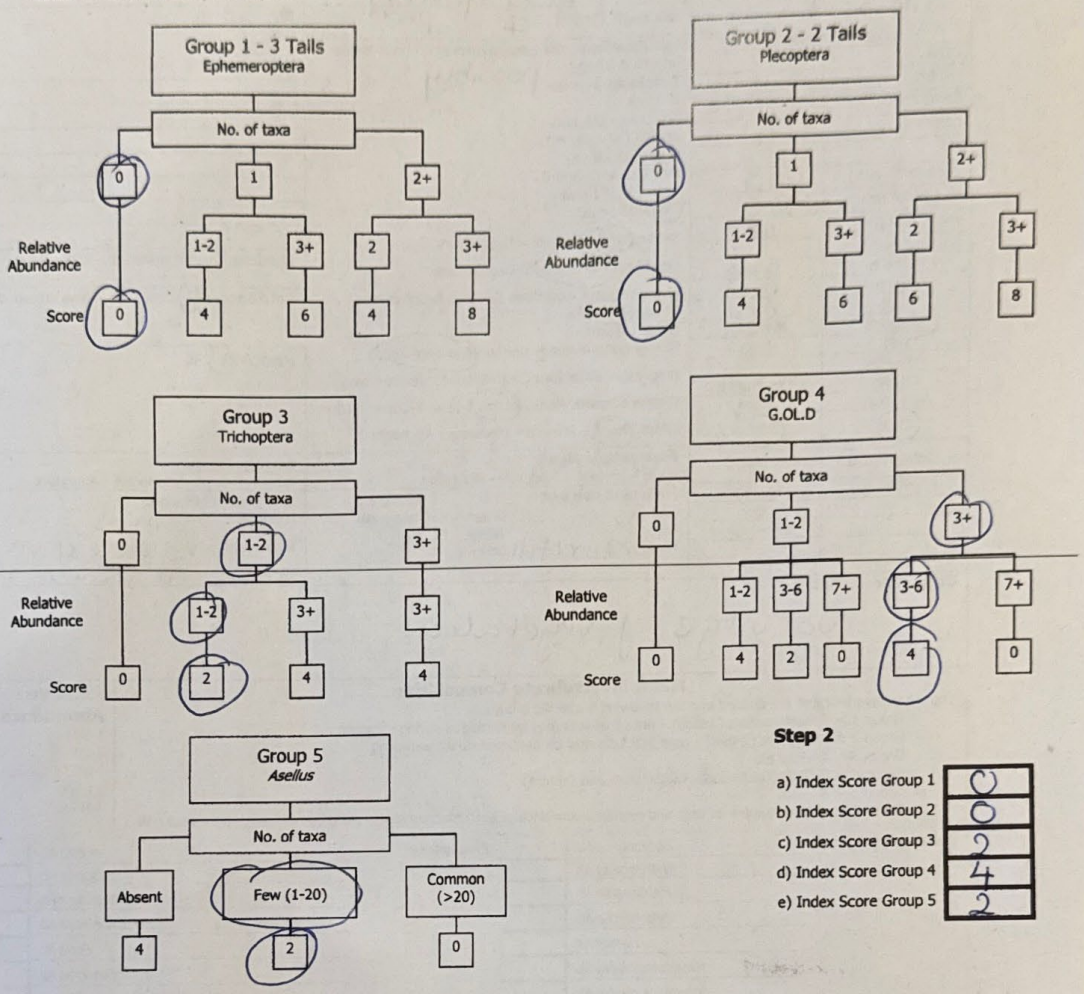
1-5	1
6-20	2
21-50	3
51-100	4
101+	5

Ephemeroptera:		**Plecoptera:**	
Ecdyonurus Ab		*Leuctra* Ab	
Rhithrogena Ab		*Isoperla* Ab	
Heptagenia Ab		*Protonemura* Ab	
Ephemerella Ab		*Amphinemura* Ab	
Caenis Ab		*Perla* Ab	
Paraleptophlebia Ab		*Dinocras* Ab	
Ephemera danica Ab		Other Plecop Ab	
Other Ephem Ab		Other Plecop Ab	
Total no. of taxa	**Total Relative Abundance**	**Total no. of Taxa**	**Total Relative Abundance**

Trichoptera:		**G.OL.D:**			**Asellus:**	
Hydropsychidae Ab		*Lymnaea* (G) Ab		Chironomidae (D) Ab	1	Absent	
Polycentropodidae Ab		*Potamopyrgus* (G) Ab		*Chironomus* (D) Ab		Few/Low	X
Rhyacophila Ab		*Planorbis* (G) Ab		Simulidae (D) Ab	1	Common/ Numerous	
Philopotamidae Ab		*Ancylus* (G) Ab		*Dicranota* (D) Ab	1		
Limnephilidae Ab		*Physa* (G) Ab		Tipulidae (D) Ab			
Sericostomatidae Ab	1	*Lumbriculus* (OI) Ab		Ceratopogonidae (D) Ab			
Glossosomatidae Ab		*Eiseniella* (OI) Ab	1	Other GOLD Ab		**NOTE:** *Asellus* must be recorded as absent if none are found	
Lepidostomatidae Ab		Tubificidae (OI) Ab					
Other Trichoptera Ab							
Total no. of Taxa	1	**Total Relative Abundance**	1	**Total no. of Taxa**	1	**Total Relative Abundance**	3

NOTE *Baetis* is an Ephemeropteran and is the most commonly occurring invertebrate genus in streams in Ireland. It is vital that *Baetis* is not counted in SSRS. See Appendix B for more details on how to identify *Baetis*.

Step 1. Calculate the Index Score by circling the appropriate box representing the total number of taxa and the total abundance calculated from ***each macroinvertebrate group*** calculated from page 1 of the recording sheet and enter in to the boxes in Step 2.



Step 2

a) Index Score Group 1	0
b) Index Score Group 2	0
c) Index Score Group 3	2
d) Index Score Group 4	4
e) Index Score Group 5	2

Step 3. Calculate the Total Index Score, the Average Index Score and the SSR Score using the boxes below

Total Index Score (TIS) sum (a+b+c+d+e)	8	Average Index Score (AIS) TIS/5 (5 for 5 groups)	1.6	**SSR Score** (AIS x 2)	3.2

Step 4. Assess the stream by comparing the final SSR score with the categories below and tick the appropriate box

> 7.25 Probably not at risk		> 6.5 – 7.25 Indeterminate Stream may be at risk		<6.5 Stream at risk	✓

Surveyor (signed): Clíona Ní Name (print): CLIONA OF Date: 03 / 12 / 2024

River: Nanny	**Code:**	**Date:** 11/12/2024	**Time:** 10:15
Station no. Site(4)	**Location:** (Tablet)		**Grid (6 figure):** TADLET
Field Chemistry	**Stream Order:**		**Stream flow:** Riffle / Riffle/Glide / Slow flow
DO%	**Modifications:** Y/N Canalised-widened-bank erosion-arterial drainage		
DO mg/l	**Dominant Types:** Bedrock; Boulder (>128mm); Cobble (32-128mm); Gravel (8-32mm); Fine Gravel (2-8mm); Sand (0.25-2mm); Silt (<0.25mm) — 3 mix		
Temp (°C) 5°C			
Conductivity			
pH			
Bank width (cm) 800cm			
Wet width (cm) 600cm			
Avg Depth (cm) 60cm			
Staff gauge	**Slope:** Low – Medium – High – Very High		**Shading:** High – Moderate – Low / None
Velocity / **Colour**	**Geology:** Calcareous-Siliceous-Mixed		
Torrential / None	**Substratum Condition:** Calcareous-Compacted-Loose - Normal		**Cattle access** Y: upstream – downstream of N: unlikely / unknown
Fast / Slight	**Substratum:** Stoney bottom-Muddy bottom-Mud over stones		
Moderate / Moderate	**Degree of siltation:** Clean-Slight-Moderate-Heavy		**Photo:** Y / N
Slow / High	**Depth of mud:** None: <1cm: 1-5cm: 5-10cm: >10cm		
Very slow	**Litter:** None – Present – Moderate - Abundant		
Clarity / **Discharge**	**Filamentous Algae:** None – Present – Moderate - Abundant		**Sewage Fungus:** None – Present – Moderate - Abundant
Very clear / Flood	**Main land use u/s:** Pasture, Bog, Forestry, Urban, Tillage, Other — Urban & Unknown	**Sample retained:** Y / N	**Sampled in Minutes:** Pond net x kick sample 2min; Stone wash x; Weed sweep x
Clear / Normal			
Slightly turbid / Low			
Highly turbid / Very Low			
Dry			
Recent Flood			

General Comments: Slight brown/green colour; Storm Doreen last weekend may influence water level, flow & benthic composition. No smell

Macroinvertebrate Composition

The macroinvertebrates are divided into the following 5 specific groups:

- Group 1 = Ephemeroptera (3-tails) – note that tails may be damaged during sampling
- Group 2 = Plecoptera (2-tails) - note that tails may be damaged during sampling
- Group 3 = Trichoptera
- Group 4 = G.OL.D (Gastropoda, Oligochaeta and Diptera)
- Group 5 = *Asellus*
- Calculate the total number of taxa and relative abundance of each macroinvertebrate group below: (Abundance – Ab)

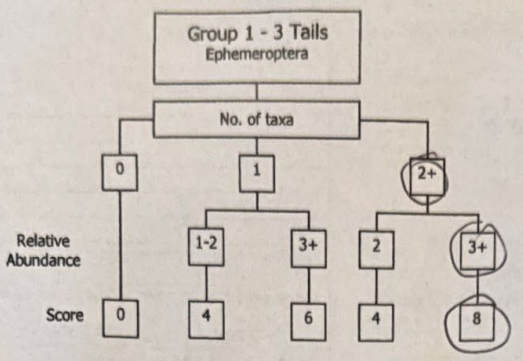
Relative Abundance	
1-5	1
6-20	2
21-50	3
51-100	4
101+	5

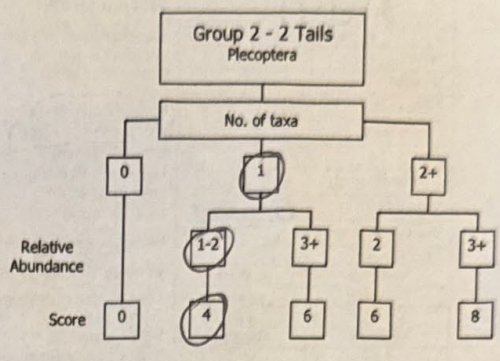
Ephemeroptera:		**Plecoptera:**	
Ecdyonurus Ab	1	1, 1 *Leuctra* Ab	2
Rhithrogena Ab	6	*Isoperla* Ab	
Heptagenia Ab		*Protonemura* Ab	
Ephemerella Ab		*Amphinemura* Ab	
Caenis Ab		*Perla* Ab	
Paraleptophlebia Ab		*Dinocras* Ab	
Ephemera danica Ab		Other Plecop Ab	
Other Ephem Ab		Other Plecop Ab	
Total no. of taxa 2	**Total Relative Abundance** 7	**Total no. of Taxa** 1	**Total Relative Abundance** 12

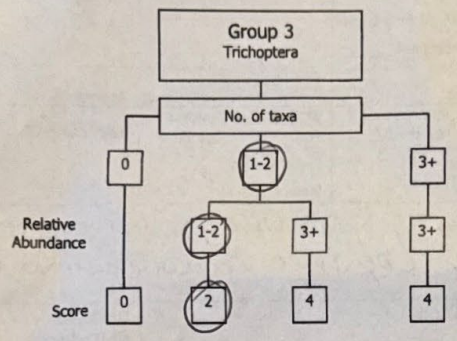
Trichoptera:		**G.OL.D:**				**Asellus:**	
Hydropsychidae Ab		*Lymnaea* (G) Ab		Chironomidae (D) Ab		Absent	✓
Polycentropodidae Ab		*Potamopyrgus* (G) Ab		*Chironomus* (D) Ab		Few/Low	
Rhyacophila Ab		*Planorbis* (G) Ab		1, Simullidae (D) Ab	1	Common/ Numerous	
Philopotamidae Ab		*Ancylus* (G) Ab		1,1 *Dicranota* (D) Ab	12		
Limnephilidae Ab		*Physa* (G) Ab		Tipulidae (D) Ab			
Sericostomatidae Ab		*Lumbriculus* (Ol) Ab		Ceratopogonidae (D) Ab			
1 Glossosomatidae Ab	1	~~Wild~~ *Eiseniella* (Ol) Ab	3	Other GOLD Ab		**NOTE:** *Asellus* must be recorded as absent if none are found	
Lepidostomatidae Ab		Tubificidae (Ol) Ab					
Other Trichoptera Ab							
Total no. of Taxa 1	**Total Relative Abundance** 1	**Total no. of Taxa** 23		**Total Relative Abundance** 56			

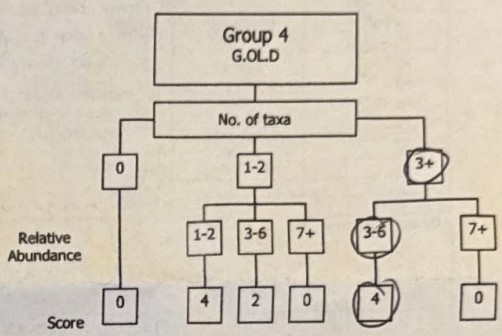
NOTE *Baetis* is an Ephemeropteran and is the most commonly occurring invertebrate genus in streams in Ireland. It is vital that *Baetis* is not counted in SSRS. See Appendix B for more details on how to identify *Baetis*.

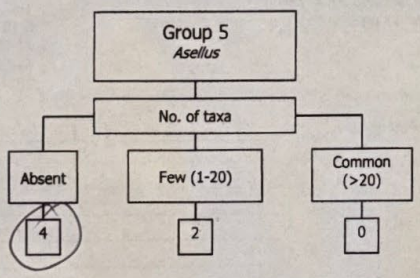
Step 1. Calculate the Index Score by circling the appropriate box representing the total number of taxa and the total abundance calculated from ***each macroinvertebrate group*** calculated from page 1 of the recording sheet and enter in to the boxes in Step 2.











Step 2

a) Index Score Group 1	8
b) Index Score Group 2	4
c) Index Score Group 3	2
d) Index Score Group 4	4
e) Index Score Group 5	4

Step 3. Calculate the Total Index Score, the Average Index Score and the SSR Score using the boxes below

Total Index Score (TIS) sum (a+b+c+d+e)	22	Average Index Score (AIS) TIS/5 (5 for 5 groups)	4.4	**SSR Score** (AIS x 2)	8.8

Step 4. Assess the stream by comparing the final SSR score with the categories below and tick the appropriate box

> 7.25 Probably not at risk	✓	> 6.5 – 7.25 Indeterminate Stream may be at risk		<6.5 Stream at risk	

Surveyor (signed): Clive O'Kelly Name (print): CLIONA CF. Date: 11 / 12 / 2024

Small Stream Risk Score Sampling Site Photos

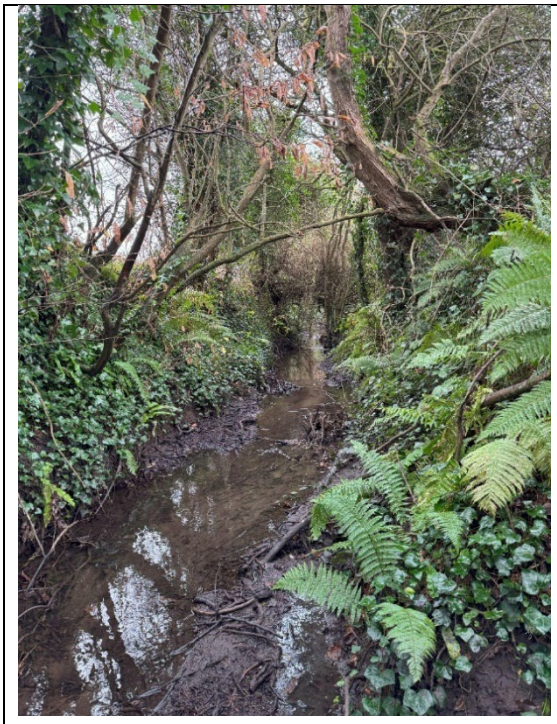


Figure 7-1 Site 1 Upstream Photo



Figure 7-2 Site 1 Downstream Photo



Figure 7-3 Site 2 Upstream Photo



Figure 7-4 Site 2 Downstream Photo



Figure 7-5 Site 3 Upstream Photo



Figure 7-6 Site 3 Downstream Photo



Figure 7-7 Site 4 Upstream Photo

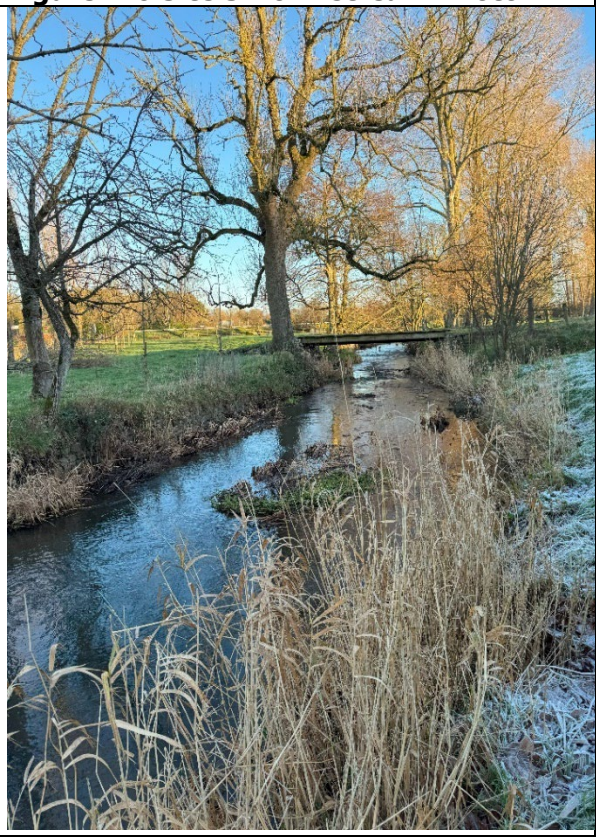


Figure 7-8 Site 4 Downstream Photo

Appendix 7.3
Desktop Records

AWN Consulting Ltd, The Tecpro Building, IDA Business & Technology Park, Clonshaugh, Dublin 17, D17 XD90

Appendix 7-3 Desktop Records

Desktop records of protected, rare, or other notable plant species are listed below in Table 7-11 These are plant species which are legally protected under the Flora (Protection) Order, 2022 and/or are listed as Critically Endangered, Endangered or Vulnerable on the relevant national Red Data list for Ireland.

Table 7-11 *Records of protected, red-listed or notable flora recorded from the desk study in the vicinity of the study area*

Common Name/ Scientific name	Legal Status[1]	Red List Status	Source
Common Wintergreen *Pyrola minor*	FPO	Near threatened	NBDC online database record (N96)
Slender Pocket-moss *Fissidens exilis*	None	Vulnerable	NBDC online database record (N96)

Desktop records of protected, rare, or other notable fauna species are listed below in Table 7-12. In relation to amphibian, reptile and mammal species those which are protected under the Wildlife Acts, the Habitats Directive and/or are listed as threatened (Vulnerable to Critically Endangered) on the relevant national Red Lists are included. In the case of bird species, only those species listed in Annex I of the Birds Directive or on the Birds of Conservation Concern in Ireland (BoCCI) Red List are included in the table below. For invertebrate species, those which are listed as threatened (Vulnerable to Critically Endangered) on the relevant national Red List are included.

[1] HDII/IV/V = Habitats Directive Annexes II/IV/V; FPO = Flora (Protection) Order, 2022; WA = Wildlife Acts

Table 7-12 *Records of protected, red-listed or notable fauna from the desktop study in the vicinity of the study area*

Common Name/ Scientific name	Legal Status	Red List Status	Source
Amphibians			
Common Frog *Rana temporaria*	HD_V, WA	Least concern	NBDC online database record (N96)
Mammals (Terrestrial)			
Brown Long-eared Bat *Plecotus auritus*	HD_IV, WA	Least concern	NBDC online database record (N96)
Eurasian Badger *Meles meles*	WA	Least concern	NBDC online database record (N96)
European Otter *Lutra lutra*	HD_II/IV, WA	Least concern	NBDC online database record (N96)
Lesser Noctule *Nyctalus leisleri*	HD_IV, WA	Least concern	NBDC online database record (N96)
Pine Marten *Martes martes*	HD_V, WA	Least concern	NBDC online database record (N96)
Pipistrelle *Pipistrellus pipistrellus*	HD_IV, WA	Least concern	NBDC online database record (N96)
Red Deer *Cervus elaphus*	WA	Least concern	NBDC online database record (N96)
Soprano Pipistrelle *Pipistrellus pygmaeus*	HD_IV, WA	Least concern	NBDC online database record (N96)
West European Hedgehog *Erinaceus europaeus*	WA	Least concern	NBDC online database record (N96)

Common Name/ Scientific name	Legal Status	Red List Status	Source
Birds			
Barn Owl *Tyto alba*	WA	Red	NBDC online database record (N96)
Barn Swallow *Hirundo rustica*	WA	Amber	NBDC online database record (N96)
Black-headed Gull *Larus ridibundus*	WA	Amber	NBDC online database record (N96)
Common Coot *Fulica atra*	WA	Amber	NBDC online database record (N96)
Common Grasshopper Warbler *Locustella naevia*	WA	Green	NBDC online database record (N96)
Common Kestrel *Falco tinnunculus*	WA	Red	NBDC online database record (N96)
Common Kingfisher *Alcedo atthis*	WA, BD_I	Amber	NBDC online database record (N96)
Common Linnet *Carduelis cannabina*	WA	Amber	NBDC online database record (N96)
Common Pheasant *Phasianus colchicus*	WA, BD_II (I), III (I)	Green	NBDC online database record (N96)
Common Snipe *Gallinago gallinago*	WA, BD_II (I), III (III)	Red	NBDC online database record (N96)
Common Starling *Sturnus vulgaris*	WA	Amber	NBDC online database record (N96)
Common Swift *Apus apus*	WA	Red	NBDC online database record (N96)
Common Wood Pigeon *Columba palumbus*	WA, BD_II (I), III (I)	Green	NBDC online database record (N96)
Corn Crake *Crex crex*	WA, BD_I	Red	NBDC online database record (N96)
Eurasian Curlew *Numenius arquata*	WA, BD_II (II)	Red	NBDC online database record (N96)
Eurasian Tree Sparrow *Passer montanus*	WA	Amber	NBDC online database record (N96)
Eurasian Woodcock *Scolopax rusticola*	WA, BD_II (I), III (III)	Red	NBDC online database record (N96)
European Golden Plover *Pluvialis apricaria*	WA, BD_I, II (II),	Red	NBDC online database record (N96)
Great Cormorant *Phalacrocorax carbo*	WA	Amber	NBDC online database record (N96)
Grey Partridge *Perdix perdix*	WA	Red	NBDC online database record (N96)
Herring Gull *Larus argentatus*	WA	Amber	NBDC online database record (N96)
House Martin *Delichon urbicum*	WA	Amber	NBDC online database record (N96)
House Sparrow *Passer domesticus*	WA	Amber	NBDC online database record (N96)
Little Egret *Egretta garzetta*	WA, BD_I	Green	NBDC online database record (N96)
Little Grebe *Tachybaptus ruficollis*	WA	Green	NBDC online database record (N96)

Common Name/ Scientific name	Legal Status	Red List Status	Source
Mallard *Anas platyrhynchos*	WA, BD_II (I), III (I)	Amber	NBDC online database record (N96)
Mew Gull *Larus canus*	WA	Amber	NBDC online database record (N96)
Mute Swan *Cygnus olor*	WA	Amber	NBDC online database record (N96)
Northern Lapwing *Vanellus vanellus*	WA, BD_II (II)	Red	NBDC online database record (N96)
Peregrine Falcon *Falco peregrinus*	WA, BD_I	Green	NBDC online database record (N96)
Ringed Plover *Charadrius hiaticula*	WA	Amber	NBDC online database record (N96)
Rock Pigeon *Columba livia*	WA, BD_II (I)	Green	NBDC online database record (N96)
Sand Martin *Riparia riparia*	WA	Amber	NBDC online database record (N96)
Sky Lark *Alauda arvensis*	WA	Amber	NBDC online database record (N96)
Spotted Flycatcher *Muscicapa striata*	WA	Amber	NBDC online database record (N96)
Stock Pigeon *Columba oenas*	WA	Red	NBDC online database record (N96)
Whooper Swan *Cygnus cygnus*	WA, BD_I	Amber	NBDC online database record (N96)
Yellowhammer *Emberiza citrinella*	WA	Red	NBDC online database record (N96)
Invertebrates			
Andrena (Melandrena) nigroaenea	None	Near threatened	NBDC online database record (N96)
Halictus (Seladonia) tumulorum	None	Vulnerable	NBDC online database record (N96)
Large Red Tailed Bumble Bee *Bombus (Melanobombus) lapidarius*	None	Near threatened	NBDC online database record (N96)
Ephemerella notata	None	Near threatened	NBDC online database record (N96)
Common Whorl Snail *Vertigo (Vertigo) pygmaea*	None	Endangered	NBDC online database record (N96)
English Chrysalis Snail *Leiostyla (Leiostyla) anglica*	None	Near threatened	NBDC online database record (N96)
Marsh Whorl Snail *Vertigo (Vertigo) antivertigo*	None	Vulnerable	NBDC online database record (N96)

Appendix 7.4
Bat Automated Detector Results

AWN Consulting Ltd, The Tecpro Building, IDA Business & Technology Park, Clonshaugh, Dublin 17, D17 XD90

Appendix 7-4 Bat Automated Detector Results

Table 1 Number of bats recorded per season

	Location 1 (NW)		Location 2 (SE)	
Species	**Autumn**	**Spring**	**Autumn**	**Spring**
Common pipistrelle Pipistrellus pipistrellus	32	317	33	248
Soprano pipistrelle Pipistrellus pygmaeus	89	561	125	173
Leisler's Bat Nyctalus leisleri	42	1065	57	437
Myotis species	29	28	131	247



Figure 1 Bat Automated Detector locations

Appendix 7.5
Wintering Bird Survey Results

AWN Consulting Ltd, The Tecpro Building, IDA Business & Technology Park, Clonshaugh, Dublin 17, D17 XD90

Appendix 7-5 Wintering Bird Survey Results

Common Name	Scientific Name	Survey Period	Number of Records	Max. Count Observed[1]	BoCCI[2]	SCI[3]	Annex I
Buzzard	*Buteo buteo*	2024-2025	1	1	Green	No	No
Chaffinch	*Fringilla coelebs*	2024-2025	3	1	Green	No	No
Goldcrest	*Regulus regulus*	2024-2025	3	1	Amber	No	No
Goldfinch	*Carduelis carduelis*	2024-2025	2	1	Green	No	No
Great black-backed gull	*Larus marinus*	2024-2025	24	13	Green	Yes	No
Greenfinch	*Chloris chloris*	2024-2025	2	1	Amber	No	No
Grey heron	*Ardea cinerea*	2024-2025	3	1	Green	Yes	No
Herring gull	*Larus argentatus*	2024-2025	1666	270	Amber	Yes	No
Hooded crow	*Corvus corone*	2024-2025	2	2	Green	No	No
Jackdaw	*Corvus monedula*	2024-2025	25	20	Green	No	No
Lesser black-backed gull	*Larus fuscus*	2024-2025	44	30	Amber	Yes	No
Magpie	*Pica pica*	2024-2025	1	1	Green	No	No
Mallard	*Anas platyrhynchos*	2024-2025	22	12	Amber	Yes	No
Meadow pipit	*Anthus pratensis*	2024-2025	1	1	Red	No	No
Mute swan	*Cygnus olor*	2024-2025	1	1	Amber	No	No
Pied wagtail	*Motacilla alba yarrellii*	2024-2025	7	1	Green	No	No
Raven	*Corvus corax*	2024-2025	3	2	Green	No	No
Robin	*Erithacus rubecula*	2024-2025	2	1	Green	No	No
Rook	*Corvus frugilegus*	2024-2025	107	50	Green	No	No
Skylark	*Alauda arvensis*	2024-2025	4	1	Amber	No	No
Song thrush	*Turdus philomelos*	2024-2025	1	1	Green	No	No
Woodpigeon	*Columba palumbus*	2024-2025	1	1	Green	No	No

[1] 'Max. Count Observed' represents the maximum number of individuals recorded within any survey site during any single survey session.

[2] Birds of Conservation Concern in Ireland (BoCCI) status after Gilbert, G., Stanbury, A. & Lewis, L. (2021) Birds of Conservation Concern in Ireland 2020-2026. *Irish Birds* **43:**1-22.

[3] Special Conservation Interests (SCI) species are Bird Directive Annex I birds, and/or migratory birds and their habitats for which sites are selected for SPA designation.

Appendix 7.6
Breeding Bird Survey Results

AWN Consulting Ltd, The Tecpro Building, IDA Business & Technology Park, Clonshaugh, Dublin 17, D17 XD90

Appendix 7-6 Breeding Bird Survey Results

Common Name	Scientific Name	Survey Period	Number of Records	Max. Count Observed[1]	BoCCI[2]	SCI[3]	Annex I
Blackbird	*Turdus merula*	2025	35	2	Green	No	No
Blackcap	*Sylvia atricapilla*	2025	13	1	Green	No	No
Blue Tit	*Cyanistes caeruleus*	2025	3	1	Green	No	No
Bullfinch	*Pyrrhula pyrrhula*	2025	2	2	Green	No	No
Chaffinch	*Fringilla coelebs*	2025	25	2	Green	No	No
Chiffchaff	*Phylloscopus collybita*	2025	10	1	Green	No	No
Coal Tit	*Periparus ater*	2025	1	1	Green	No	No
Dunnock	*Prunella modularis*	2025	6	1	Green	No	No
Goldcrest	*Regulus regulus*	2025	5	1	Amber	No	No
Goldfinch	*Carduelis carduelis*	2025	5	1	Green	No	No
Great Tit	*Parus major*	2025	5	1	Green	No	No
Grey Heron	*Ardea cinerea*	2025	2	1	Green	Yes	No
Herring Gull	*Larus argentatus*	2025	20	10	Amber	Yes	No
Hooded Crow	*Corvus corone*	2025	20	10	Green	No	No
House Martin	*Delichon urbicum*	2025	7	7	Amber	No	No
House Sparrow	*Passer domesticus*	2025	3	1	Amber	No	No
Jackdaw	*Corvus monedula*	2025	5	3	Green	No	No
Jay	*Garrulus glandarius*	2025	2	1	Green	No	No
Linnet	*Linaria cannabina*	2025	2	1	Amber	No	No
Long-Tailed Tit	*Aegithalos caudatus*	2025	3	1	Green	No	No
Magpie	*Pica pica*	2025	1	1	Green	No	No

[1] 'Max. Count Observed' represents the maximum number of individuals recorded within any survey site during any single survey session.

[2] Birds of Conservation Concern in Ireland (BoCCI) status after Gilbert, G., Stanbury, A. & Lewis, L. (2021) Birds of Conservation Concern in Ireland 2020-2026. *Irish Birds* **43:**1-22.

[3] Special Conservation Interests (SCI) species are Birds Directive Annex I birds, and/or migratory birds and their habitats for which sites are selected for SPA designation. Breeding birds aren't always migratory.

Mallard	*Anas platyrhynchos*	2025	22	9	Amber	Yes	No
Common Name	**Scientific Name**	**Survey Period**	**Number of Records**	**Max. Count Observed[13]**	**BoCCI[14]**	**SCI[15]**	**Annex I**
Meadow Pipit	*Anthus pratensis*	2025	27	4	Red	No	No
Mistle Thrush	*Turdus viscivorus*	2025	1	1	Green	No	No
Mute Swan	*Cygnus olor*	2025	2	1	Amber	No	No
Pheasant	*Phasianus colchicus*	2025	5	3	Green	No	No
Pied Wagtail	*Motacilla alba yarrellii*	2025	6	2	Green	No	No
Raven	*Corvus corax*	2025	13	5	Green	No	No
Reed Bunting	*Emberiza schoeniclus*	2025	3	1	Green	No	No
Robin	*Erithacus rubecula*	2025	14	1	Green	No	No
Rook	*Corvus frugilegus*	2025	9	3	Green	No	No
Skylark	*Alauda arvensis*	2025	9	3	Amber	No	No
Song Thrush	*Turdus philomelos*	2025	12	1	Green	No	No
Spotted Flycatcher	*Muscicapa striata*	2025	1	1	Amber	No	No
Starling	*Sturnus vulgaris*	2025	12	11	Amber	No	No
Stonechat	*Saxicola torquatus*	2025	5	2	Green	No	No
Swallow	*Hirundo rustica*	2025	6	4	Amber	No	No
Tree Pipit	*Anthus trivialis*	2025	1	1	Amber	No	No
Treecreeper	*Certhia familiaris*	2025	1	1	Green	No	No
Whitethroat	*Sylvia communis*	2025	3	1	Green	No	No
Willow Warbler	*Phylloscopus trochilus*	2025	15	2	Amber	No	No
Woodpigeon	*Columba palumbus*	2025	53	26	Green	No	No
Wren	*Troglodytes troglodytes*	2025	53	4	Green	No	No

Appendix 8.1
Description of the AERMOD Model

AWN Consulting Ltd, The Tecpro Building, IDA Business & Technology Park, Clonshaugh, Dublin 17, D17 XD90

8.1 AIR QUALITY – TECHNICAL APPENDIX

8.1 Description of the AERMOD Model

The AERMOD dispersion model has been developed in part by the U.S. Environmental Protection Agency (USEPA) (EPA, 2020; USEPA, 1995; USEPA, 2005; USEPA, 2022). The model is a steady-state Gaussian model used to assess pollutant concentrations associated with industrial sources. The model is an enhancement on the Industrial Source Complex-Short Term 3 (ISCST3) model which has been widely used for emissions from industrial sources.

Improvements over the ISCST3 model include the treatment of the vertical distribution of concentration within the plume. ISCST3 assumes a Gaussian distribution in both the horizontal and vertical direction under all weather conditions. AERMOD with PRIME, however, treats the vertical distribution as non-Gaussian under convective (unstable) conditions while maintaining a Gaussian distribution in both the horizontal and vertical direction during stable conditions. This treatment reflects the fact that the plume is skewed upwards under convective conditions due to the greater intensity of turbulence above the plume than below. The result is a more accurate portrayal of actual conditions using the AERMOD model. AERMOD also enhances the turbulence of night-time urban boundary layers thus simulating the influence of the urban heat island.

In contrast to ISCST3, AERMOD is widely applicable in all types of terrain. Differentiation of the simple versus complex terrain is unnecessary with AERMOD. In complex terrain, AERMOD employs the dividing-streamline concept in a simplified simulation of the effects of plume-terrain interactions. In the dividing-streamline concept, flow below this height remains horizontal, and flow above this height tends to rise up and over terrain. Extensive validation studies have found that AERMOD (precursor to AERMOD with PRIME) performs better than ISCST3 for many applications and as well or better than CTDMPLUS for several complex terrain data sets (USEPA, 1999).

Due to the proximity to surrounding buildings, the PRIME (Plume Rise Model Enhancements) building downwash algorithm has been incorporated into the model to determine the influence (wake effects) of these buildings on dispersion in each direction considered. The PRIME algorithm takes into account the position of the stack relative to the building in calculating building downwash. In the absence of the building, the plume from the stack will rise due to momentum and/or buoyancy forces. Wind streamlines act on the plume leads to the bending over of the plume as it disperses. However, due to the presence of the building, wind streamlines are disrupted leading to a lowering of the plume centreline.

When there are multiple buildings, the building tier leading to the largest cavity height is used to determine building downwash. The cavity height calculation is an empirical formula based on building height, the length scale (which is a factor of building height & width) and the cavity length (which is based on building width, length and height). As the direction of the wind will lead to the identification of differing dominant tiers, calculations are carried out in intervals of 10 degrees.

In PRIME, the nature of the wind streamline disruption as it passes over the dominant building tier is a function of the exact dimensions of the building and the angle at which the wind approaches the building. Once the streamline encounters the zone of influence of the building, two forces act on the plume. Firstly, the disruption caused by the building leads to increased turbulence and enhances horizontal and vertical dispersion. Secondly, the streamline descends in the lee of the building due to the reduced pressure and drags the plume (or part of) nearer to the ground, leading to higher ground level concentrations. The model calculates the descent of the plume as a function of the building shape and, using a numerical plume rise model, calculates the change in the plume centreline location with distance downwind.

The immediate zone in the lee of the building is termed the cavity or near wake and is characterised by high intensity turbulence and an area of uniform low pressure. Plume mass captured by the cavity region is re-emitted to the far wake as a ground-level volume source. The volume source is located at the base of the lee wall of the building but is only evaluated near the end of the near wake and beyond. In this region, the disruption caused by the building downwash gradually fades with distance to ambient values downwind of the building.

AERMOD has made substantial improvements in the area of plume growth rates in comparison to ISCST3 (USEPA, 1995; 1999). ISCST3 approximates turbulence using six Pasquill-Gifford-Turner Stability Classes and bases the resulting dispersion curves upon surface release experiments. This treatment, however, cannot explicitly account for turbulence in the formulation. AERMOD is based on the more realistic modern planetary boundary layer (PBL) theory which allows turbulence to vary with height. This use of turbulence-based plume growth with height leads to a substantial advancement over the ISCST3 treatment.

Improvements have also been made in relation to mixing height (USEPA, 1995; 1999). The treatment of mixing height by ISCST3 is based on a single morning upper air sounding each day. AERMOD, however, calculates mixing height on an hourly basis based on the morning upper air sounding and the surface energy balance, accounting for the solar radiation, cloud cover, reflectivity of the ground and the latent heat due to evaporation from the ground cover. This more advanced formulation provides a more realistic sequence of the diurnal mixing height changes.

AERMOD also has the capability of modelling both unstable (convective) conditions and stable (inversion) conditions. The stability of the atmosphere is defined by the sign of the sensible heat flux. Where the sensible heat flux is positive, the atmosphere is unstable whereas when the sensible heat flux is negative the atmosphere is defined as stable. The sensible heat flux is dependent on the net radiation and the available surface moisture (Bowen Ratio). Under stable (inversion) conditions, AERMOD has specific algorithms to account for plume rise under stable conditions, mechanical mixing heights under stable conditions and vertical and lateral dispersion in the stable boundary layer.

AERMOD also contains improved algorithms for dealing with low wind speed (near calm) conditions. As a result, AERMOD can produce model estimates for conditions when the wind speed may be less than 1 m/s, but still greater than the instrument threshold.

8.2 Meteorological Data - AERMET

AERMOD incorporates a meteorological pre-processor AERMET (USEPA, 2018). AERMET allows AERMOD to account for changes in the plume behaviour with height. AERMET calculates hourly boundary layer parameters for use by AERMOD, including friction velocity, Monin-Obukhov length, convective velocity scale, convective (CBL) and stable boundary layer (SBL) height and surface heat flux. AERMOD uses this information to calculate concentrations in a manner that accounts for changes in dispersion rate with height, allows for a non-Gaussian plume in convective conditions, and accounts for a dispersion rate that is a continuous function of meteorology.

The AERMET meteorological preprocessor requires the input of surface characteristics, including surface roughness (z_0), Bowen Ratio and albedo by sector and season, as well as hourly observations of wind speed, wind direction, cloud cover, and temperature. A morning sounding from a representative upper air station, latitude, longitude, time zone, and wind speed threshold are also required.

Two files are produced by AERMET for input to the AERMOD dispersion model. The surface file contains observed and calculated surface variables, one record per hour. The profile file contains the observations made at each level of a meteorological tower, if available, or the one-level observations taken from other representative data, one record level per hour.

From the surface characteristics (i.e. surface roughness, albedo and amount of moisture available (Bowen Ratio)) AERMET calculates several boundary layer parameters that are important in the evolution of the boundary layer, which, in turn, influences the dispersion of pollutants. These parameters include the surface friction velocity, which is a measure of the vertical transport of horizontal momentum; the sensible heat flux, which is the vertical transport of heat to/from the surface; the Monin-Obukhov length which is a stability parameter relating the surface friction velocity to the sensible heat flux; the daytime mixed layer height; the nocturnal surface layer height and the convective velocity scale which combines the daytime mixed layer height and the sensible heat flux. These parameters all depend on the underlying surface.

The values of albedo, Bowen Ratio and surface roughness depend on land-use type (e.g., urban, cultivated land etc) and vary with seasons and wind direction. The assessment of appropriate land-use types was carried out in line with USEPA recommendations (USEPA, 2005) and using the detailed methodology outlined by the Alaska Department of Environmental Conservation (ADEC, 2008). AERMET has also been updated to allow for an adjustment of the surface friction velocity (u*) for low wind speed stable conditions based on the work of Qian and Venkatram. Previously, the model had a tendency to over-predict concentrations produced by near-ground sources in stable conditions.

Surface roughness

Surface roughness length is the height above the ground at which the wind speed goes to zero. Surface roughness length is defined by the individual elements on the landscape such as trees and buildings. In order to determine surface roughness length, the USEPA recommends that a representative length be defined for each sector, based on geometric mean of the inverse distance area-weighted land use within the sector, by using the eight land use categories outlined by the USEPA. The area-weighted surface roughness length derived from the land use classification within a radius of 1 km from Dublin Airport is shown in Table B-1.

Appendix Table B-1. Surface Roughness based on an inverse distance area-weighted average of the land use within a 1 km radius of Dublin Airport

Sector	Area Weighted Land Use Classification	Spring	Summer	Autumn	Winter [a]
340-100	0% Water, 100% Urban, 0% Grassland	1	1	1	1
100-340	0% Water, 0% Urban, 100% Grassland	0.05	0.1	0.01	0.01

a. Winter defined as periods when surfaces covered permanently by snow whereas autumn is defined as periods when freezing conditions are common, deciduous trees are leafless and no snow is present. Thus, for the current location autumn more accurately defines "winter" conditions at the proposed facility.

Albedo

Noon-time Albedo is the fraction of the incoming solar radiation that is reflected from the ground when the sun is directly overhead. Albedo is used in calculating the hourly net heat balance at the surface for calculating hourly values of Monin-Obuklov length. The area-weighted arithmetic mean albedo derived from the land use classification over a 10 km x 10 km area centred on Dublin Airport is shown in Table B-2.

Appendix Table B-2. Albedo based on an area-weighted arithmetic mean of the land use over a 10 km x 10 km area centred on Dublin Airport

Area Weighted Land Use Classification	Spring	Summer	Autumn	Winter [a]
2% Water, 49% Urban, 31% Grassland, 19% Cultivated Land	0.152	0.173	0.185	0.185

a. For the current location autumn more accurately defines "winter" conditions at the proposed facility.

Bowen Ratio

The Bowen ratio is a measure of the amount of moisture at the surface of the earth. The presence of moisture affects the heat balance resulting from evaporative cooling which, in turn, affects the Monin-Obukhov length which is used in the formulation of the boundary layer. The area-weighted geometric mean Bowen ratio derived from the land use classification over a 10 km x 10 km area centred on Dublin Airport is shown in Table A3.

Appendix Table B-3. Bowen Ratio based on an area-weighted geometric mean of the land use over a 10 km x 10 km area centred on Dublin Airport

Area Weighted Land Use Classification	Spring	Summer	Autumn	Winter [a]
2% Water, 49% Urban, 31% Grassland, 19% Cultivated Land	0.63	1.23	1.36	1.36

a. For the current location autumn more accurately defines "winter" conditions at the proposed facility.

Appendix 10.1
Noise Models and Assumptions

AWN Consulting Ltd, The Tecpro Building, IDA Business & Technology Park, Clonshaugh, Dublin 17, D17 XD90

10. NOISE MODEL DETAILS AND ASSUMPTIONS

10.1 Noise Model

A 3D computer-based prediction model has been prepared in order to quantify the noise level associated with the proposed building. This section discusses the methodology behind the noise modelling process.

10.1.1 DGMR iNoise

Proprietary noise calculation software has been used for the purposes of this modelling exercise. The selected software, DGMR iNoise 2024.1, calculates noise levels in accordance with *ISO 9613: Acoustics – Attenuation of sound during propagation outdoors, Part 2: Engineering method for the prediction of sound pressure levels outdoors 2024*.

DGMR iNoise is a proprietary noise calculation package for computing noise levels in the vicinity of noise sources. iNoise calculates noise levels in different ways depending on the selected prediction standard. In general, however, the resultant noise level is calculated taking into account a range of factors affecting the propagation of sound, including:

- the magnitude of the noise source in terms of A weighted sound power levels (LWA);
- the distance between the source and receiver;
- the presence of obstacles such as screens or barriers in the propagation path;
- the presence of reflecting surfaces;
- the hardness of the ground between the source and receiver;
- Attenuation due to atmospheric absorption; and

Meteorological effects such as wind gradient, temperature gradient and humidity (these have significant impact at distances greater than approximately 400m).

10.2 Brief Description of ISO9613-2: 2024

ISO9613-2:2024 calculates the noise level based on each of the factors discussed previously. However, the effect of meteorological conditions is significantly simplified by calculating the average downwind sound pressure level, $L_{AT}(DW)$, for the following conditions:

- wind direction at an angle of ±45° to the direction connecting the centre of the dominant sound source and the centre of the specified receiver region with the wind blowing from source to receiver, and;
- wind speed between approximately 1ms-1 and 5ms-1, measured at a height of 3m to 11m above the ground.

The equations and calculations also hold for average propagation under a well-developed moderate ground based temperature inversion, such as commonly occurs on clear calm nights.

The basic formula for calculating $L_{AT}(DW)$ from any point source at any receiver location is given by:

$$L_{fT}(DW) = LW + Dc - A \qquad \text{Eqn. A}$$

Where:

$L_{fT}(DW)$ is an octave band centre frequency component of $L_{AT}(DW)$ in dB relative to $2x10^{-5}$Pa;

L_W is the octave band sound power of the point source;

D_c is the directivity correction for the point source;

A is the octave band attenuation that occurs during propagation, namely attenuation due to geometric divergence, atmospheric absorption, ground effect, barriers and miscellaneous other effects.

The estimated accuracy associated with this methodology is shown in Table 10.1.1

Table 10.1.1 – Estimated Accuracy for Broadband Noise of L_{AT}(DW)

Height, h*	Distance, d†	
	0 < d < 100m	100m < d < 1,000m
0<h<5m	±3dB	±3dB
5m<h<30m	±1dB	±3dB

* h is the mean height of the source and receiver. † d is the mean distance between the source and receiver.

N.B. These estimates have been made from situations where there are no effects due to reflections or attenuation due to screening.

10.3 Input Data and Assumptions

The noise model has been constructed using data from various source as follows:

Site Layout The general site layout has been obtained from the drawings forwarded by the design team.

Local Area The location of noise sensitive locations has been obtained from a combination of site drawings provided by the design team and google earth.

Heights The heights of buildings on site have been obtained from site drawings provided by the design team. Off-site buildings have been assumed to be 6m high.

Contours Site ground contours/heights have been obtained from site drawings forwarded by the design team where available.

The final critical aspect of the noise model development is the inclusion of the various plant noise sources. Details are presented in the following section.

10.4 Source Sound Power Data

The following noise sources have been modelled for the following activities.

10.4.1 Tree Felling

Table 10.1.2 – Tree Felling – Modelled Plant Items and Source Levels

Plant	BS 5228 Ref.	Sound Power (dB A)	Number of Items	Activity	Location
Harvester §	D2.14	114	6	Harvesting trees	Areas of Tree Felling North, West and South-east of site
Forwarder µ	C4.53	84	6	Moving felled trees	

Plant	BS 5228 Ref.	Sound Power (dB A)	Number of Items	Activity	Location
Lorry *	C11.9	110	24	Transporting timber and brash off site (2 two-way trips per hour)	Note * along haul route to cell

10.4.2 Screening Berms

Table 10.1.3 – Screening Berms – Modelled Plant Items and Source Levels

Plant	BS 5228 Ref.	Sound Power (dB A)	Number of Items	Activity	Location
Articulated dump truck (tipping fill)	C.2.32	102	5	Tipping fill	Berm construction areas
Tracked excavator	C.2.19	105	6	Placement of material	
Dozer	C.2.12	109	5	Distribution of material	

10.4.3 Landfill Cell Construction

Table 10.1.4– Landfill Cell Construction – Modelled Plant Items and Source Levels

Plant	BS 5228 Ref.	Sound Power (dB A)	Number of Items per cell	Activity	Location
Tracked excavator	C.8.12	102	4	Cell Excavation and loading of material	Phase 1 – Cell 31 and 32 Phase 2 – Cell 33 and 34 Note * along haul route to cell
Articulated dump truck 1	C.8.16	89	1	Distribution of material (Landfill Cells 7 trips per hour and IBA Cells four trips per hour)	
Dozer	C.8.17	90	2	Cell excavation and distribution of material	
Conveyor drive unit	C10.20	105	1	Conveyor for screener	
Water bowser (discharging)	C.6.37	109	1	Spraying water	
Screen Stockpiler	C.10.15	109	1	Screening material	
Lorry *	C11.9	110	24	Delivery of Material (Two two-way trips per hour)	
Articulated dump truck (tipping fill)	C.2.32	102	1	Tipping fill at cell	
Vibratory roller	C.5.21	109	1	Rolling and compaction	

10.4.4 Waste Placement in Cells

Table 10.1.5– Landfill Cell Waste Placement – Modelled Plant Items and Source Levels

Plant	BS 5228 Ref.	Sound Power (dB A)	Number of Items per cell	Activity	Location
Lorry *	C11.9	110	40 trips per day	Transport waste to cell	Phase 2 – Cell 31 and 32 Note * along haul route to cell
Ejector Trailer (Noise from Donkey Engine)	C4.84	102	1	Filling activities	
Tracked Excavator	C8.10	97	1		
Dozer	C8.9	102	1		
Waste Compactor	C8.1	107	1		

10.4.5 Gas Booster Pump

Table 10.1.6 – Gas Booster Pump – Modelled Plant Source Levels

Plant	Source	Sound Power (dB A)	Number of Items	Location
Gas Booster Pump - Inlet	Manufacturers Data	102 **Note 1**	1	Between proposed landfill extension and active cells. 185m from north bund of Cell 25
		102	1	

Note 1: A 10 dB correction has been applied to the inlet of this unit to reduce the operational sound power to 92 dB L_{WA}. This will be achieved through the installation of a silencer to this unit.

Appendix 11.1
Recorded Archaeological Monuments

AWN Consulting Ltd, The Tecpro Building, IDA Business & Technology Park, Clonshaugh, Dublin 17, D17 XD90

Recorded Archaeological Monuments located within c. 1.5km of the Proposed Development route are listed below (source Record of Monuments and Places, https://archaeology.ie; https://heritagemaps.ie)

SMR No	**ME026-013----**
County	Meath
Townland	Brownstown (Skreen By.)
ITM	E. 694660m, N. 767409m
Monument Class	Enclosure
Description	The following description is derived from the published 'Archaeological Inventory of County Meath' (Dublin: Stationery Office, 1987). In certain instances the entries have been revised and updated in the light of recent research. Subcircular area defined by fosse (dims. 40m E-W, 36m N-S). Fosse almost obliterated on E. Original entrance may have been here. Within large tree-ring.
Date of upload/revision:	10 July 2007

SMR No	**ME026-014----**
County	Meath
Townland	Brownstown (Skreen By.)
ITM	E. 695311m, N. 766393m
Monument Class	Church
Description	Located towards the top of the NE-facing slope of a hill. A church at Brun is listed in the ecclesiastical taxation (1302-06) of Pope Nicholas IV (Cal. doc. Ire. 5, 253). At the Suppression in 1540 the rectory, or office of parish priest, with 20 acres was vested in St. Mary's Cistercian abbey in Dublin, and Edward Dowdall of Broniston was a witness at an inquiry (White 1943, 17, 19). According to Ussher (1622) the church and chancel were ruined (Erlington 1847-64, 1, lxvii). According to Dopping's Visitation (1682-5) the parish church of St. Michael at Brownstown was unrepaired since 1641 and it was not enclosed (Ellison 1971, 35). In 1640 the whole parish of Brownstown, consisting of the townlands of Brownstown and Realtoge amounting to almost 700 acres was the property of Nicholas Dowdall (Simington 1940, 42 3). A large stone house at Brownstown is the only item recorded on the Down Survey (1656-8) parish map and its terrier or commentary. For the Down Survey barony map of Duleek see this web page accessed on 4 July, 2014 http://downsurvey.tcd.ie/down survey maps.php#bm=Duleek&c=Meath The grass-covered foundations of an E-W building (int. dims 13.35m E-W; 5.75m N-S) with possible doorways towards the W end of the N and S walls is within a neglected subrectangular graveyard (dims c. 40m N-S; c. 40m E-W) with rounded corners defined by masonry walls that has a small number of headstones dating from 1786 to 1934. Cogan (1862-70, 1, 347-8) records that the chancel arch stood 20 feet (c. 6m) from the E end of the church and that there was a tomb here of Catherine Plunkett, a daughter of Mathew Plunkett, baron of Louth, which would date c. 1700, but this tomb was not identified. The above description is derived from the published 'Archaeological Inventory of County Meath' (Dublin: Stationery Office, 1987). In certain instances the entries have been revised and updated in the light of recent research.
Compiled by:	Michael Moore
Date of revision:	22 December, 2014

SMR No	**ME026-014001-**
County	Meath
Townland	Brownstown (Skreen By.)
ITM	E. 695305m, N. 766398m
Monument Class	Graveyard

Description	Located towards the top of the NE-facing slope of a hill. The grass-covered foundations of the parish church of Brownstown (ME026-014----) are within a neglected subrectangular graveyard (dims c. 40m N-S; c. 40m E-W) with rounded corners defined by masonry walls that has a small number of headstones dating from 1786 to 1934. Cogan (1862-70, 1, 347-8) records that there was a tomb here of Catherine Plunkett, a daughter of Mathew Plunkett, baron of Louth, which would date c. 1700, but this tomb was not identified. Archaeological testing (16E0401) by D. Finn c. 80m to the NNE of the graveyard at the closest point produced no related material (excavations.ie 2016:526).
Compiled by:	Michael Moore
Date of revised upload:	22 December, 2014
Amended:	9 April 2021

SMR No	**ME026-015----**
County	Meath
Townland	Brownstown (Skreen By.)
ITM	E. 694886m, N. 765904m
Monument Class	Moated site
Description	The following description is derived from the published 'Archaeological Inventory of County Meath' (Dublin: Stationery Office, 1987). In certain instances the entries have been revised and updated in the light of recent research. W site truncated by road on W. Defined by scarps with bank on N side (dims. 67m NNE-SSW, 62m WNW-ESE) and external fosse. Entrance at S. E site defined by scarps with banks on N (dims. 70m WNW-ESE, 52m NNW-ESE) and external fosse. Fosse (W 12m) at W shared with W site. Entrance at W side with other possible entrance at S. Outer bank at S. Stream to S of both sides.
Date of upload/revision:	10 July 2007

SMR No	**ME026-016----**
County	Meath
Townland	Mullaghfin
ITM	E. 700543m, N. 766631m
Monument Class	Souterrain
Description	Located just off the summit of a prominent hill on the N-facing slope. This consists of a corbelled and lintelled passage (Wth at floor 1m; Wth at roof 0.7m; H 1.2m; L 11.4m plus) aligned ENE-WSW with the original entrance, now blocked, at WSW. The passage slopes down to the E and about half way along on the N side a passage (Wth 0.7m; H 0.8m; L 1.75m) leads N to a beehive chamber (diam. 2m) that is partly rock-cut at the base where the modern entrance was located. At the E end of the main passage a narrow doorway (Wth 0.5-0.67; H 0.87m) enters a beehive chamber (diam. 2.2-2.38m; H 1.93m) 0.45m over the level of the floor. From this chamber a doorway (Wth 1m; H 0.9m) at ground level leads ESE through a short passage (L 1.25m) and through another doorway (Wth 0.6-0.7m; H 0.9m) that has a single stone on its SW side into a final beehive chamber (diam. 2.2-2.43m; H 2.2m). There is an air vent (Wth 0.27-035m; H 0.22-0.25m) over the passage to the last chamber. The above description is derived from the published 'Archaeological Inventory of County Meath' (Dublin: Stationery Office, 1987). In certain instances the entries have been revised and updated in the light of recent research.
Compiled by:	Michael Moore
Date of upload:	10 July 2007
Amended:	22 January 2020

SMR No	**ME026-029----**
County	Meath
Townland	Mullaghfin
ITM	E. 700698m, N. 767004m
Monument Class	Enclosure
Description	This square encloure or platform was identified on Lidar coverage (Pers. comm. Dr. Stephen Davis, UCD, School of Archaeology).
Compiled by:	Geraldine Stout
Date of upload:	15/03/2012

SMR No	**ME026-030----**
County	Meath
Townland	Realtoge
ITM	E. 695333m, N. 767592m
Monument Class	Ringfort - unclassified
Description	This possible ringfort was identified on Lidar (pers. comm. Dr Stephen Davis, UCD School of Archaeology).
Compiled by:	Geraldine Stout
Date of upload:	15/03/2012

SMR No	**ME026-039----**
County	Meath
Townland	Mullaghfin
ITM	E. 700530m, N. 766790m
Monument Class	Field system
Description	Situated on the N-facing slope of a prominent hill. The cropmarks of a number of small unmapped fields (dims c. 15m x c. 30m to c. 30m x c. 100m) covering an area of about 3 ha. (c. 7 acres) are visible only on Apple maps, which utilises a survey conducted by Bluesky International during June 2018. It was first reported by Anthony Murphy.
Compiled by:	Michael Moore
Date of upload:	22 January 2020

SMR No	**ME026-041----**
County	Meath
Townland	Mullaghfin
ITM	E. 700837m, N. 766222m
Monument Class	Ring-ditch
Description	Located towards the bottom of the SE-facing slope of Mullaghfin Hill. The cropmark of a small circular feature (diam. c. 5m) defined by a continuous fosse is only visible on Apple Maps (2018). An outer fosse is visible NW-NE c. 15m distant. It was first reported by Jean Charles Caillere. See the attached enhanced aerial view from Apple Maps
Compiled by:	Michael Moore
Date of upload:	24 June 2021

SMR No	**ME032-005----**
County	Meath
Townland	Kentstown
ITM	E. 697012m, N. 765217m
Monument Class	Font (present location)
Description	The font from Timloole church (ME032-013----) was moved to the Roman Catholic church at Kentstown, c. 5km to the W, shortly after the Catholic church was built

(Cogan 1862-70, 1, 346-7). The limestone octagonal font (ext. dim. 0.64m; H 0.46m) with chamfered under-panels and a circular flat-bottomed basin (int. diam. 0.48m; D 0.24m) is resting on an octagonal sandstone base (ext. dim. c. 0.5m; H 0.27m). The English inscription in roman letters running on all the sides below the rim reads: THIS / FANT / STONE WAS / BWYLDE / D BY ROBA / RE HOLI /WOD AN / DNI. 1597 / HE BEYN / GE RROCT /OR. (Roe 1968, 69-72)

The above description is derived from the published 'Archaeological Inventory of County Meath' (Dublin: Stationery Office, 1987). In certain instances the entries have been revised and updated in the light of recent research.

Compiled by: Michael Moore
Date of revision: 23 January 2015

SMR No **ME032-006----**
County Meath
Townland Kentstown
ITM E. 697500m, N. 765186m
Monument Class Church
Description Located at the S edge of a level landscape and at the crest of a S-facing slope down to the W-E Nanny River, which is c. 150m distant. The church of the 'vill de Kent' is listed in the ecclesiastical taxation (1302-06) of Pope Nicholas IV (Cal. doc. Ire. 5, 253). Ussher (1622) describers the church as ruined and the chancel as indifferently repaired (Erlington 1847-64, lxii). Dopping (1682-5) says the church was unrepaired since 1641 and it was not enclosed (Ellison 1971, 36). The present Church of Ireland church was built c. 1750 when it became the head of Union with the parishes of Danestown and Ballymagarvey (Lewis 1837, 2, 38). It is within a subrectangular graveyard (dims c. 55m N-S; c. 38m E-W at N c. 45m E-W at S) defined by masonry walls, but there is no evidence of an earlier structure. The mid-14th century effigy of Sir Thomas de Tuite (dims 1.66m x 0.65-0.78m; T 0.1m) carved in low relief with a Latin inscription in gothic lettering along the long sides (Moore 1891; FitzGerald 1912) is displayed in the present church. The inscription has been read by Hunt (1974, 206-7, Pl. 113) as: HIC JACET THOMAS DE TUIT MILES QUONDAM DOMINUS DE KENTSISTON QUI OBIIT SECUNDO DIE JUNII ANO DOMINI MILESIMO CCC SEXUAGESIMO TERCIO (Here lies Thomas de Tuite, Knight, once lord of Kentstown, who died on the second day of June 1363).

The above description is derived from the published 'Archaeological Inventory of County Meath' (Dublin: Stationery Office, 1987). In certain instances the entries have been revised and updated in the light of recent research.

Compiled by: Michael Moore
Date of revision: 22 January 2015

SMR No **ME032-006001-**
County Meath
Townland Kentstown
ITM E. 697501m, N. 765173m
Monument Class Graveyard
Description Located at the S edge of a level landscape and at the crest of a S-facing slope down to the W-E Nanny River, which is c. 150m distant. The site of the parish church of Kentstown (ME032-006----) is within a subrectangular graveyard (dims c. 55m N-S; c. 38m E-W at N c. 45m E-W at S) defined by masonry walls. The mid-14th century effigy of Sir Thomas de Tuite (ME032-006002-) is displayed inside the present Church of Ireland church.

Compiled by: Michael Moore
Date of upload: 22 January, 2015

SMR No	**ME032-006002-**
County	Meath
Townland	Kentstown
ITM	E. 697497m, N. 765188m
Monument Class	Tomb - effigial
Description	The mid 14th century effigy of Sir Thomas de Tuite (dims 1.66m x 0.65-0.78m; T 0.1m) carved in low relief with a Latin inscription in gothic lettering along the long sides (Moore 1891; FitzGerald 1912) is displayed inside the present Church of Ireland church. It is described by Hunt (1974, 1, 206-7) as:

This effigy at Kentstown, Co. Meath, on the border of the Pale, presents what is a clear approach to the English knightly panoply of the same period, but with some variations which are seemingly peculiarly Irish. England at least provides us with no parallel. On a slightly tapering slab is carved in flat relief the figure of a knight. The commemorated man wears a tight-fitting jupon lacing up the front, and studded with circular ornaments. A dagger hangs on the right hip; it is presented rather schematically. Seen in profile it appears to have a rectangular pommel and cross-guard, but these suggest that it is a rondel dagger seen in profile. Below the jupon can be seen the engrailed border of the brigandine. The arms have vambraces but instead of gauntlets on the hands are gloves with short flaring cuffs. The legs have cuisses and greaves of plate and poleyns; the feet are shod in lamed sabatons. They rest on a couchant dog. His knightly rank, emphasised by the gloves on his hands is further indicated by the rowel spurs on his heels, though the carver has omitted both branches and spur-leathers. This may be an oversight or possibly the sculptor has shown some form of heel-spur. Such spurs without branches were known in France as early as the thirteenth century, if Viollet le Duc's evidence (1874, 403) can be accepted. Another possibility is that the sculptor intended to indicate that he wears spurs of the characteristic type used by the Irish in the fourteenth century in which the branches, instead of curving forward under the ankles, pass almost vertically downwards on either side of the Achilles tendon and then project forward low down parallel to the sole of the foot. Even so, straps should have been indicated. Over his shoulders he wears a mantle with high upstanding collar, opening down the font instead of down the right side as would be usual in England. The jupon also differs from English fashion in that it laces up the front instead of up the side. His head is bare, resting on a rectangular cushion with four tassels. His hair is dressed with double curls on either side of his face level with the ears, and he wears a forked beard and moustache. His belt is the only example of this well-known knightly type in Ireland; fastening with a clip around the hips and not by a strap and buckle. It is shown on many tombs of the fourteenth century in England and on the Continent and was probably attached to the jupon over which it was worn. In regard to the mantle, Irish effigies representing members of the upper middle classes and of the wealthy merchant class afford numerous examples of a similar style., This in England was invariably worn fastened on the right shoulder with the opening at the side. The costume in general seems to be slightly in advance of the general English fashion of its date. The closest parallel is that on the effigy of Prince William of Hatfield, 1350, in York Minster. An inscription on the slab reads, when freed from contractions: HIC JACET THOMAS DE TUIT MILES QUONDAM DOMINUS DE KENTSISTON QUI OBIIT SECUNDO DIE JUNII ANO DOMINI MILESIMO CCC SEXUAGESIMO TERCIO Here lies Thomas de Tuite, Knight, once lord of Kentstown, who died on the second day of June 1363.

Some doubt has been expressed as to whether there is not another C or hundred years to be added to this date, but careful examination shows that 1363 is indeed correct.

Date of upload:	22 January, 2015

SMR No	**ME032-007----**
County	Meath
Townland	Danestown
ITM	E. 697686m, N. 764827m
Monument Class	Ringfort - rath
Description	The following description is derived from the published 'Archaeological Inventory of County Meath' (Dublin: Stationery Office, 1987). In certain instances the entries have been revised and updated in the light of recent research. Raised oval area defined by remains of earthen bank (dims. 41m ENE-WSW, 34m NNW-SSE) with external fosse and outer bank (max. ext. dim. 82m ENE-WSW). . Entrance and causeway at SW.
Date of upload/revision:	10 July 2007

SMR No	**ME032-008----**
County	Meath
Townland	Danestown
ITM	E. 697640m, N. 764742m
Monument Class	Church
Description	Located on a slight rise of a S-facing slope near the W head of a small W-E valley. A church at Daveney is listed in the ecclesiastical taxation (1302-06) of Pope Nicholas IV (Cal. doc. Ire. 5, 255). Ussher (1622) describes the church of Danistowne as repaired and the chancel as ruined (Erlington 1847-74, 1, lxxv). According to Dopping (1682-5) the church and chancel had been ruined since 1641 and it was not enclosed (Elliot 1972, 59). The conserved remains of part of the S wall (L c. 3m; H 2m), and parts of the W and N walls indicate a rectangular building (int. dims 10m plus E-W; 5.7m N-S) within a subrectangular graveyard (dims c. 65m NE-SW; c. 30m NW-SE at NE to c. 48m NE-SW at SW) defined by a stone-faced earthen bank (Wth c. 4-5m). The inscriptions of many of the headstones have been published (Moore et al. 1974). Three pieces of window sill are used as grave-markers, and the head of an ogee-headed window and pieces of window tracery are in the graveyard. Inside the entrance on the N side of the graveyard and secured to the masonry of the bank there is part of the bottom of the basin of an octagonal font (dim. 0.3m; H 0.25m) and part of its waisted stem (dim. 0.32m; H 0.17m) with a cordon. The perimeter of Danestown rath (ME032-007----) is c. 15m outside the graveyard to the NE. The above description is derived from the published 'Archaeological Inventory of County Meath' (Dublin: Stationery Office, 1987). In certain instances the entries have been revised and updated in the light of recent research.
Compiled by:	Michael Moore
Date of revision:	23 January 2015

SMR No	**ME032-008001-**
County	Meath
Townland	Danestown
ITM	E. 697659m, N. 764739m
Monument Class	Graveyard
Description	Located on a slight rise of a S-facing slope near the W head of a small W-E valley. The parish church of Danestown (ME032-008----) is within a subrectangular graveyard (dims c. 65m NE-SW; c. 30m NW-SE at NE to c. 48m NE-SW at SW) defined by a stone-faced earthen bank (Wth c. 4-5m). The inscriptions of many of the headstones have been published (Moore et al. 1974). Three pieces of window

	sill are used as grave-markers, and the head of an ogee-headed window and pieces of window tracery are in the graveyard. Inside the entrance on the N side of the graveyard there is part of a font (ME032-008002-). The perimeter of Danestown rath (ME032-007----) is c. 15m outside the graveyard to the NE.
Compiled by:	Michael Moore
Date of upload:	23 January, 2015

SMR No	**ME032-008002-**
County	Meath
Townland	Danestown
ITM	E. 697636m, N. 764756m
Monument Class	Font
Description	Inside the entrance on the N side of Danestown graveyard (ME032-008001-) and secured to the masonry of bank there is part of the bottom of the basin of an octagonal font (dim. 0.3m; H 0.25m) and part of its waisted stem (dim. 0.32m; H 0.17m) with a cordon.
Compiled by:	Michael Moore
Date of upload:	23 January, 2015

SMR No	**ME032-063001-**
County	Meath
Townland	Burtonstown
ITM	E. 698680m, N. 764930m
Monument Class	Ring-ditch
Description	Situated on a rise in an undulating landscape. The cropmarks of two small enclosures (diam. c. 10m) defined by single fosse features and placed c. 5m apart E-W. are visible on aerial images (OSAP: 1995). A third feature (ME032-063003-) is located c. 130m to the W, and a fourth (ME032-063004-) is c. 150m to the SSE. First identified by Colin Byrne. See the atached enhanced view from OSAP (1995)
Date of upload:	15 September, 2017

SMR No	**ME032-063002-**
County	Meath
Townland	Burtonstown
ITM	E. 698659m, N. 764935m
Monument Class	Ring-ditch
Description	Situated on a rise in an undulating landscape. The cropmarks of two small enclosures (diam. c. 10m) defined by single fosse features and placed c. 5m apart E-W. are visible on aerial images (OSAP: 1995). A third feature (ME032-063003-) is located c. 110m to the W, and a fourth (ME032-063004-) is c. 160m to the SSE. First identified by Colin Byrne.
Date of upload:	15 September, 2017

SMR No	**ME032-063003-**
County	Meath
Townland	Burtonstown
ITM	E. 698549m, N. 764914m
Monument Class	Ring-ditch
Description	Situated in a hollow in an undulating landscape. The cropmark of a small enclosure (diam. c. 8m) with a central pit is visible on aerial images (OSAP: 1995). Two other ring-ditches (ME032-063001-; ME032-063002-) are c. 130m to the E, and a fourth (ME032-064004-) is c. 225m to the SE. First identified by Colin Byrne.

Date of upload:	15 September, 2017

SMR No	**ME032-063004-**
County	Meath
Townland	Burtonstown
ITM	E. 698734m, N. 764864m
Monument Class	Ring-ditch
Description	Located on a slight S-facing slope. The cropmark of a small enclosure (diam. c. 15m) defined by a single fosse feature is visible on OSI aerial images (1995). The ring-ditches (ME032-043001-; ME032-063002-) are c. 150m and c. 160m distant to the NNW respectively, and ring-ditch (ME032-063003-) is c. 225m to the NW. It was first identified by Stephen Kehoe.
Date of upload:	25 January 2018

SMR No	**ME032-064----**
County	Meath
Townland	Burtonstown
ITM	E. 698386m, N. 764711m
Monument Class	Ringfort - rath
Description	Located at the tip of a slight E-W spur. The cropmark of a circular enclosure (int. diam. c. 50m) defined by a distinct fosse (Wth c. 2-5m) is visible only on an OSI aerial image (1995). A second fosse c. 5m inside the outer is visible N-E and what might be a rectangular annexe (dims c. 40m NW-SE; c. 27m E-W) defined by a single fosse is attached at SE. The enclosure was first reported by Colin Byrne. See the attached enhanced view from OSI images (1995)
Compiled by:	Michael Moore
Date of upload:	20 April 2023

SMR No	**ME032-065----**
County	Meath
Townland	Flemingstown
ITM	E. 699243m, N. 765252m
Monument Class	Enclosure
Description	The Archaeological Survey of Ireland (ASI) is in the process of providing information on all monuments on The Historic Environment Viewer (HEV). Currently the information for this record has not been uploaded. To access available information for research purposes please make an appointment in advance with the Archive Unit (open Fridays 10.00 am – 5.00 pm), Department of Culture, Heritage and the Gaeltacht, The Custom House, Dublin 1 D01W6XO or email nmarchive@chg.gov.ie.

SMR No	**ME032-067----**
County	Meath
Townland	Flemingstown
ITM	E. 699183m, N. 765236m
Monument Class	Enclosure
Description	Aerial photographs (GB89.A.08 and GB89.K.46) show cropmark of a circular enclosure defined by a fosse with entrance facing south-east.
Compiled by:	Dr Gillian Barrett for the Archaeological Survey of Ireland.
Date of upload:	10 June 2009

SMR No	**ME032-068----**
County	Meath
Townland	Flemingstown

ITM	E. 699290m, N. 765224m
Monument Class	Enclosure
Description	Aerial photograph (GB89.K.46) shows cropmarks of two curved fosses which appear to enclose a small promontory.
Compiled by:	Dr Gillian Barrett for the Archaeological Survey of Ireland.
Date of upload:	10 June 2009

SMR No	**ME032-089----**
County	Meath
Townland	Burtonstown
ITM	E. 699062m, N. 764862m
Monument Class	Ring-ditch
Description	Situated on what might be a slight rise on a gentle N-facing slope. The cropmark of a small circular feature (diam. c. 6m) defined by a continuous fosse is visible on Apple Maps (2018). It is also faintly visible on Digital Globe (c. 2013), and it was first reported by Jean Charles Caillere. See the attached enhanced image from Apple Maps (2018)
Compiled by:	Michael Moore
Date of upload:	25 June 2021

SMR No	**ME032-090----**
County	Meath
Townland	Burtonstown
ITM	E. 698916m, N. 764650m
Monument Class	Enclosure
Description	Located on a gentle N-facing slope. The cropmark of a D-shaped enclosure (dims c. 35m E-W; c. 15-17m N-S) defined by a single fosse (Wth c. 1-2m) W-N-E is visible only on Apple Maps (2018). The enclosure springs from an E-W ditch (Wth c. 2m) curving slightly to the N although there is no evidence of this feature S of the E-W road that is just to the S. It was first reported by Jean Charles Caillere. See the attached enhanced view from Apple Maps (2018)
Compiled by:	Michael Moore
Date of upload:	25 June 2021

SMR No	**ME032-091----**
County	Meath
Townland	Burtonstown
ITM	E. 699036m, N. 764717m
Monument Class	Ringfort - rath
Description	Located on a rise on a gentle N-facing slope. The cropmark of a circular area (int. diam. c. 45m N-S; c. 40m E-W) defined by a wide fosse (Wth c. 4-5m) is visible only on Apple Maps (2018). The perimeter is slightly truncated by a N-S field bank at W and there may be an entrance (Wth c. 4m) at SW. It was first reported by Jean Charles Caillere. See the attached enhanced view from Apple Maps (2018)
Compiled by:	Michael Moore
Date of upload:	25 June 2021

Appendix 11.2
Recorded Archaeological Excavations

AWN Consulting Ltd, The Tecpro Building, IDA Business & Technology Park, Clonshaugh, Dublin 17, D17 XD90

The excavation bulletin website (https://excavations.ie; https://heritagemaps.ie) was consulted to identify previous excavations that have been carried out within the study area. This database contains summary accounts of excavations carried out in Ireland from 1970 to 2024.

License No.:	**97E0190**
Excavation No.:	**1997:425**
County:	Meath
Site Name:	KNOCKHARLEY
SMR No.:	N/A
Author:	Hilary Opie
Site type:	No archaeology found
Period/Dating:	N/A
ITM:	E 694930m, N 768019m
Lat, Long:	53.653318, -6.563952
Description:	Test-trenching was carried out at Knockharley, Co. Meath, between 23 and 25 June 1997 in one of two areas under consideration for a new landfill facility. Testing was carried out to determine the nature of a mound feature noted during earlier field survey. This was known to the landowner as a 'moat', and local tradition has it that human bones were revealed here during earth-moving works carried out in the 1930s. Furthermore, a well is located approximately 100m south-west of the mound. The combination of this information, therefore, suggested the possibility of an archaeological feature. The 'moat' consisted of a large, irregularly shaped mound, approximately 25m in diameter. Immediately east of the mound was a large, sunken hollow measuring approximately 26m (east–west) by 15m. There were no surface indications of any archaeological features, such as an enclosing ditch or bank, while the irregular shape of the mound suggested a feature of natural, probably glacial, origin. Four trenches were opened on the site using a JCB. Trench 1 was aligned north–south across the mound and measured 25m by 1.5m. Trench 2 ran east–west across the mound and measured 18m by 1.5m. Trench 3 was aligned north–south across the hollow and Trench 4 was aligned east–west across it; both measured 18m by 1.5m. Investigation of Trenches 1 and 2 indicated that the mound was a natural feature. In particular, Trench 2 appeared to be relatively undisturbed, with no archaeological finds or features present. Trench 1 showed signs of activity and disturbance at its northern end. This appeared to be of modern origin and was most likely the result of small-scale gravel-quarrying, a conclusion backed up by local information. Trenches 3 and 4, across the hollow, suggested that this too was a natural feature. Subsoil, encountered between 0.1m and 0.5m beneath the sod level, consisted of a mix of loose, gritty gravel amid large stones with a small amount of clay, suggesting that this area may have been of glacial origin. Subsoil was overlain by a topsoil/subsoil horizon which was overlain by topsoil and then sod. No finds or features of archaeological importance were observed at any level and it is possible that the hollow was also created by small-scale gravel-quarrying. In summary, the mound and hollow, noted during field survey and thought on the basis of local information to have some archaeological potential, were both natural features. However, both features showed evidence of modern interference and probable quarrying. 103 Cherrywood Drive, Clondalkin, Dublin 22

License No.:	**99E0059**
Excavation No.:	**1999:693**
County:	Meath
Site Name:	KNOCKHARLEY
SMR No.:	N/A
Author:	Malachy Conway for Margaret Gowen & Co. Ltd.
Site type:	Well and Enclosure
Period/Dating:	Undetermined
ITM:	E 696875m, N 767391m
Lat, Long:	53.647322, -6.534741
Description:	Geophysical survey and archaeological assessment were undertaken as part of a wider environmental impact statement on lands under consideration for a proposed landfill in Knockharley, Co. Meath. The site, 500m west of the N2 Dublin to Slane road and c. 1km north of Kentstown, is in a low-lying valley and consists of a large green-field area of 105 hectares. The site of the proposed landfill does not contain any recorded archaeological monuments; however, a possible holy well lies towards the centre of the site. Limited test-trenching in July 1997 by Hilary Opie (Excavations 1997, 141, 97E0190) did not reveal any archaeological features or deposits. A geophysical survey was undertaken at the site from September to October 1998. Seven test-trenches were excavated using a mechanical excavator. The geophysical results provided a number of anomalous 'targets' for the test-trenching, although none appeared to be clearly archaeological. The site of the well and the area immediately around it were tested. No archaeological stratigraphy was encountered, and no enclosing element for the possible well site was found. The testing did not prove or disprove that the feature described as a 'holy well' is such, or is indeed an archaeological feature. The test-trench strategy also tested a number of anomalous responses (mainly linear) found through the geophysical survey. In the tested areas where geophysical responses suggested linear features, all but one feature were found to be representative of removed field boundaries and natural geological variations within the subsoil. A wide cut feature revealed in Trench 2 was cut into the natural subsoil. No finds were recovered from the fill or the vicinity of this feature to confirm antiquity. The feature corresponded with a positive magnetic susceptibility response/zone, which faintly resembled a circular enclosure. No further soils, features or finds of archaeological significance were encountered. 2 Killiney View, Albert Road Lower, Glenageary, Co. Dublin

License No.:	**99E0356**
Excavation No.:	**1999:707**
County:	Meath
Site name:	PILLTOWN/ PAINESTOWN/ KILTROUGH/ BEY BEG/ BEY MORE/ PLATIN/ CAULSTOWN/ CARRANSTOWN/ COMMONS (DULEEK)/ NEWTOWN/ LONGFORD/ DOWNESTOWN/ GILLINSTOWN/ GARBALLAGH/ THOMASTOWN/ SICILY/ TUITERATH/ FLEMINGSTOWN/ KENTSTOWN/ KNOCKHARLEY/ CURRAGHTOWN/ BROWNSTOWN/ REALTOGE/ STAFFORDSTOWN/ FOLLISTOWN/ MOORETOWN/ ALEXANDER REID
SMR No.:	N/ A
Author:	Mark Clinton for Margaret Gowen & Co. Ltd., Killiney View, Albert Road Lower, Glenageary, Co. Dublin
Site type:	Excavation - miscellaneous
Period/ Dating:	Multi-period
ITM:	E 688918m, N 762584m
Lat, Long:	53.605548, -6.656417

Description:	The laying of a new gas pipeline from south of Drogheda to the outskirts of Navan necessitated the stripping of a 15m-wide corridor and the subsequent digging of a trench that varied in width from 0.65m to 2.3m (at top) and 0.7m to 0.75m (at bottom); the average depth of the trench was 2m. No features of a proven archaeological nature were uncovered during the operation. Indeed the corridor, when taken as random-sample survey, can be seen to have reaffirmed the perceived archaeological profile of the traversed terrain and its general environs. Of the 27 townlands crossed by the pipeline corridor, seventeen, to date, are totally bereft of archaeological remains of any description. A further eight townlands contain a mere one to three known sites. Only the early historic archaeological complex centred on Duleek indicates any proven significant activity in the general area. Evidence for a Neolithic presence is almost negligible. Similarly, the Bronze Age and Iron Age are poorly represented. Given the size and land quality of the area under discussion, the sum total of remains does not help to establish the existence of intensive activity during practically all of the recognised epochs.

License No.:	**00E0207**
Excavation No.:	**2000:0755**
County:	Meath
Site Name:	KENTSTOWN SEWERAGE SCHEME
SMR No.:	N/A
Author:	Clare Mullins
Site type:	No archaeology found
Period/Dating:	N/A
ITM:	E 697013m, N 765191m
Lat, Long:	53.627536, -6.533341
Description:	Monitoring of groundworks associated with the Kentstown Sewerage Scheme was carried out in early 2000. This scheme involved the laying of new sewer pipes along a distance of slightly less than 2000m and the construction of a new sewerage plant. No features of archaeological interest or potential were identified during the course of the work. 31 Millford, Athgarvan, Co. Kildare

License No.:	**01E0381**
Excavation No.:	**2001:938**
County:	Meath
Site Name:	BALGEEN AND SHALLON (River Nanny)
SMR No.:	N/A
Author:	Niall Brady, Archaeological Diving Company Ltd.
Site type:	No archaeology found
Period/Dating:	N/A
ITM:	E 699074m, N 764922m
Lat, Long:	53.624734, -6.502271
Description:	Underwater archaeological assessment of the River Nanny in advance of the Northern Motorway scheme focused on the investigation of two stone features identified previously. Site A (upstream of works area) had consisted of three courses of squared stones c. 0.2m by 0.2m in size. The feature stood from the base of the riverbank, and extended over an area c. 3m long. It was covered by c. 0.4m of topsoil. Site A was not apparent during the assessment and could not be investigated. It appears to have been eroded away. A small ford-like feature of river gravels was, however, investigated close to the works area. It did not reveal

archaeological features of significance. Several objects of 18th-century and modern date were observed.

Site B consisted of a line of seven closely set stones protruding from the base of the riverbank at a depth of 0.5m. The stones measure 0.6m by 0.3m by 0.3m in size. The topsoil overburden on the riverbank was removed. It revealed a stone fill with some red brick inclusions at a depth that is associated with the stones protruding at the base of the riverbank. A trench was opened across the adjacent riverbed. No objects or features of archaeological significance were revealed.

2 Vale Terrace, Lower Dargle Road, Bray, Co. Wicklow

License No.: **03E0187**
Excavation No.: **2004:1276**
County: Meath
Site Name: KNOCKHARLEY
SMR No.: N/A
Author: Kieran Campbell, for CRDS Ltd.
Site type: Pit and Fulacht fia
Period/Dating: Prehistoric (12700 BC-AD 400)
ITM: E 697430m, N 767519m
Lat, Long: 53.648368, -6.526312
Description: Pre-development testing and monitoring was undertaken on a proposed residual landfill site occupying most of the area of the townland of Knockharley (292 acres). Geophysical survey (03R010) identified the possible remains of a cottage and evidence for pit-like features. A programme of test-trenching was recommended. Pre-development testing was carried out initially by Laurence McGowan (No. 1275, Excavations 2004) and later by Kieran Campbell.

The modern settlement pattern, as shown in the 1836 and 1909 editions of the OS 6-inch maps, consisted of a farm of large fields, a vernacular farmhouse and yard located at the centre of the townland and some cottages at the roadside.

The topsoil was stripped by the combined use of bulldozers and a mechanical digger fitted with a ditching bucket. Several modern drainage ditches and field boundaries were revealed dispersed throughout the site. The archaeologically significant features/areas noted included a pit that contained a large quantity of antler and branches with cut ends, which was interpreted as a well or deer trap. This feature was excavated, due to its proximity to the construction works and traffic. A burnt mound or fulacht fiadh, measuring c. 20m by 10m, was not excavated. A dark linear feature with small pits containing burnt stones was not excavated. An area measuring c. 5m by 5m that had several small pits containing burnt stone was not excavated. A small burnt spread which may be a fulacht fiadh, and also a possible pit and a stone spread noted in an area c. 30m by 10m, were not excavated. A pit c. 5m by 3m and a scatter of stones c. 40m by 15m, possibly demolition debris from the original farm building, were located in the area immediately south of the farmhouse and were not excavated.

Ten further trenches were stripped and monitored in the area adjacent to, and to the east of, the house. Archaeological features were noted in four trenches but were not excavated.

Discussions are currently ongoing with the client. If the features cannot be protected, an excavation strategy will be proposed.

Unit 4, Dundrum Business Park, Dundrum, Dublin 14

License No.: **04E0778 (Ext)**
Excavation No.: **2016:343**
County: Meath

Site Name:	Knockharley
SMR No.:	N/A
Author:	Martin Fitzpatrick
Site type:	Pit features
Period/Dating:	—
ITM:	E 697080m, N 767420m
Lat, Long:	53.647542, -6.531636
Description:	A regional residual landfill facility located at Knockharley, County Meath has being developed in a number of phases over the past twelve years with the land being cleared in advance of each phase. Monitoring of topsoil stripping in advance of the next development phase was undertaken in 2016 and uncovered a number of features of archaeological significance. The report on the monitoring (04E778 Extension) recommended full archaeological resolution of three separate areas consisting of six pit features and one linear feature. The archaeological excavations took place over a period of five weeks from the 10 May 2016. Feature 1 was an irregular-shaped area of burnt stone and clay. Aligned north-south, it measures 1.3m in length and 0.7m in width. Feature 2 was located 0.9m to the north and was a sub-circular area of burnt stone and clay. It measures 1.2m north-south x 1.15m. A third area of burnt stone and clay was located 1.2m east of Feature 2. This was another irregular-shaped cut which was triangular in plan. The long axis was orientated north-south and it measures 2.05m in length and 1m in width. A fourth area of burnt stone was identified some 20m south-west of Features 1-3 . It was sub-rectangular in plan and measured 1.6m x 1.55m and cut into the yellow/brown silty subsoil. Excavation revealed all of these were shallow pits filled with firecracker stone with charcoal inclusions. In the western end of the site a short linear feature and a circular pit were identified in the course of topsoil stripping and were subsequently excavated. The linear feature was cut into the subsoil and consisted of a linear drain-like feature orientated east-west. It measures 1.1m in length, 0.3m in width and is filled with loose angular stones and clay. The other feature was located 4m to the south and comprised a circular cut 0.68m in diameter and filled with heat-fragmented angular stones and burnt clay. In addition to the pit features a spread of burnt stone and clay with a number of associated pits was uncovered in the centre of the area stripped of topsoil. As the feature was located directly below an overhead electricity line it was not directly impacted upon by the proposed development. The main feature was roughly horseshoe-shaped and consisted of fragmented burnt stone and clay covering an area 16.5m north-south by c. 13.5m. A second area of burnt clay was located to the immediate east and was cut by a field drain. A number of small pit features were identified in the surrounding area. This feature was recorded and preserved in situ. Athenry, County Galway
License No.:	**11E0132**
Excavation No.:	**2012:461**
County:	Meath
Site Name:	Kentstown
SMR No.:	N/A
Author:	Billy Quinn
Site type:	Monitoring
Period/Dating:	—
ITM:	E 700449m, N 765789m
Lat, Long:	53.632255, -6.481225

Description:	The works entailed Phase 2 of a Water Conservation Scheme within County Meath. Stage 1 of the project – Advanced Mains Rehabilitation Stage 1 – involves the replacement of c. 13.4km of existing watermains in various locations throughout the county. This report concerns works at Kentstown. This element of the scheme was the subject of an Archaeological Assessment undertaken by Byrne Mullins and Associates in 2009 (Excavations 2009, No. 629, 09E061). Following consultation with the National Monuments service it was recommended that the proposed works be regularly inspected by a suitably qualified archaeologist. The area requiring water pipe rehabilitation works is situated to the immediate east of the N2 road and the village of Balrath. The proposed scheme area comprises a minor road which incorporates grass verges on both sides. Groundworks for the Kentstown area include c. 2487m of 180mm diameter replacement PE 100 pipe, 2 junctions and 26 service connections, the laying of a new 125mm watermain and 180mm rising main, with lengths of 1454m and 1438m respectively, together with a total of 5 junctions and 11 service connections. There is only one Recorded Monuments, located c. 85m from the edge of the existing road. Previous works along the road corridor by the laying of the existing water main and connections to existing properties have disturbed the substrate. Regular inspections were carried out during the course of these works. No finds or features of archaeological significance were identified during the programme of monitoring. Moore Group, Ballybrit Business Park, Galway

License No.:	**16E0401**
Excavation No.:	**2016:526**
County:	Meath
Site name:	BROWNSTOWN
SMR No.:	ME026-014 and ME026-014001
Author:	Damian Finn, Mullagh, Kells, Co Meath
Site type:	No archaeological significance
Period/Dating:	—
ITM:	E 695379m, N 766419m
Lat, Long:	53.638862, -6.557662
Description:	The site is located in Brownstown townland, Navan, Co Meath. A site inspection did not reveal any upstanding monuments. ME026-014 and ME026-014001 lie within 100m of the site of the proposed development, which comprises of the retention of existing buildings together with the construction of a new rotary milking parlour and ancillary site works. As a condition of planning was that monitoring be carried out for the removal of topsoil, the excavation of trenches for foundations, services and drainage associated with the proposed development. In addition to relevant documentary research and site inspection. Monitoring of the topsoil and overburden removal was undertaken from 30/07/16 to 2/08/16. A mechanical excavator with a toothless bucket was utilised to topsoil strip all areas of the development site affected by ground-works. No archaeological deposits were uncovered.

License No.:	**17E0201**
Excavation No.:	**2017:439**
County:	Meath
Site Name:	Kentstown
SMR No.:	N/A
Author:	Niall Colfer, Archaeology and Built Heritage

Site type:	Prehistoric activity
Period/Dating:	—
ITM:	E 697009m, N 765327m
Lat, Long:	53.628753, -6.533362
Description:	Testing of a site at Kentstown, Co. Meath, undertaken in advance of development, found no evidence of settlement contemporary with the medieval RMP sites in the locality. In general the proposed development site was archaeologically sterile, highlighting its historic association with agricultural practices as opposed to settlement. The singular archaeological feature recorded was located in Trench 1, in the south-eastern corner of the site. This took the form of a linear feature or large pit, on the upper surface of which one flint flake (a piece of debris associated with the shaping of flint tools) and several pieces of burnt bone and charcoal were uncovered. These are all classic indicators of prehistoric activity. Spade Enterprise Centre, St. Paul's, Smithfield, North King Street, Dublin 7

License No.:	**21E0541**
Excavation No.:	**2021:206**
County:	Meath
Site name:	Kentstown
SMR No.:	N/ A
Author:	Maeve McCormick
Site type:	Medieval bivallate ringfort & associated features
Period/ Dating:	—
ITM:	E 696924m, N 765573m
Lat, Long:	53.630978, -6.534570
Description:	Test excavation was undertaken from 16-19 August 2021 in advance of a proposed development at Kentstown, Co. Meath. Eight test trenches were excavated with a combined length of 885 linear metres (1770 sq. m, c. 5.1% of total 1.91ha area). The trenches were placed to assess the anomalies, recorded in the course of a previous geophysical survey. Geophysical surveys of the site (Licence Nos 21R0180 and 21R0200 undertaken on 19 and 28 July respectively), showed anomalies suggestive of an early medieval bivallate ringfort enclosure, additional enclosures, field boundaries and settlement activity. Test excavations confirmed the presence of archaeological remains dominating the southern/ middle section of the site. These features included two concentric enclosure ditches, most likely a bivallate ringfort of early medieval date. The remains of four additional partial enclosures and associated internal features were also recorded during test excavation. Numerous field boundaries and two kilns suggested to be contemporary with the enclosures were recorded to the north and east of the enclosures. Plough furrows of uncertain date and modern drainage gullies were also noted across the site.

Appendix 11.3
National Inventory Of Architectural Heritage

AWN Consulting Ltd, The Tecpro Building, IDA Business & Technology Park, Clonshaugh, Dublin 17, D17 XD90

The recorded architectural heritage sites within c. 1.5km of the proposed development route are listed below, all noted in the National Inventory of Architectural Heritage (NIAH) (https://archaeology.ie; https://buildingsofireland.ie)

NIAH No.	**14403201**
RPS No.	**91156**



County	Meath
Townland	Kentstown
Town	Kentstown
ITM	E. 697012m, N. 765227m
Original use	church/chapel
In Use As	church/chapel
Date	1835-1845
Cat Spc Int.	Architectural, Artistic, Social, Technical
Description	Detached gable-fronted church, built c.1844, with five-bay side elevations to nave, and having sacristy to the north. Dressed limestone entrance gable, with buttresses, string courses, plaques, castellations and pinnacles. Three Tudor arched door openings with traceried pointed-arched window above, having hood and label mouldings above. Pitched slate roof with bellcote to north gable. Roughly dressed stone walls to side elevations, with traceried windows set in pointed-arched openings with ashlar dressings. Ashlar limestone gate piers with cast-iron railings and double gates. Graveyard to the east.
Appraisal	The simple form of this church is enhanced by the architectural detailing of the entrance elevation. The carved detailing, such as the castellations, pinnacles, hood mouldings, string courses and plaques, enlivens the ashlar façade. These carved details where clearly executed by skilled craftsmen and are of also of artistic interest. The ashlar piers, cast-iron railings, cast-iron gates and graveyard contribute to the setting of this prominently located church. Plaque over front door reads: 'Erected A.D. 1844. Revd. J. Sheridan P.P.'
Rating	Regional
Survey	NIAH Survey of County Meath 2002

NIAH No.	**14403202**
RPS No.	**91159**



County	Meath
Townland	Kentstown
Town	Kentstown
ITM	E. 697501m, N. 765185m
Original use	church/chapel
In Use As	church/chapel
Date	1790-1800
Cat Spc Int.	Architectural, Artistic, Social, Technical
Description	Detached church, built c.1795, and remodelled c.1850. Comprising of three-bay side elevations to nave with three-bay pinnacled tower to the west and with apsidal chancel to the east. Pitched slate roof. Roughly dressed stone walls, with string courses and plaques to tower. Paired round-arched windows with ashlar dressings. Rose window to chancel. Paired dressed limestone gate piers with cast-iron double gates and single pedestrian gates, set in rubble stone boundary walls. Graveyard to site.
Appraisal	The survival of many interesting features and materials, such as the slate roof and paired rounded-arched windows, enhance the architectural form of this church. Of particular interest is the rose window set in the chancel. The entrance and bell tower is articulated by limestone dressings, which were clearly executed by skilled craftsmen. The carved head stone in the surrounding graveyard add artistic interest to the site. Plaque reads 'Sir James Quayle Somerville Baronet Built this Steeple Anno Domini 1797'.
Rating	Regional
Survey	NIAH Survey of County Meath 2002

NIAH No.	**14403203**
RPS No.	**91158**



County	Meath
Townland	Kentstown
Town	Kentstown
ITM	E. 697470m, N. 765249m
Original use	rectory/glebe/vicarage/curate's house
In Use As	rectory/glebe/vicarage/curate's house
Date	1800-1840
Cat Spc Int.	Architectural, Technical
Description	Detached five-bay two-storey rectory over basement, built c.1820. Hipped slate roof with ashlar limestone chimneystacks. Roughly dressed stone walls with limestone string course between basement and entrance level. Timber sash windows with stone sills. Timber panelled door with flanking side lights and fanlight above, approached by limestone steps. Cast-iron double gates with ashlar limestone gates piers, set in rubble stone boundary wall. Three-ranges of outbuildings ranged around courtyard to the rear.
Appraisal	The architectural form of this rectory is enhanced by the retention of many interesting features and materials, such as the timber sash windows, ashlar chimneystacks and the timber panelled door. The related outbuildings to the rear and the piers and gates enhance the setting of the house.
Rating	Regional
Survey	NIAH Survey of County Meath 2002

NIAH No. **14403204**
RPS No. **91157**

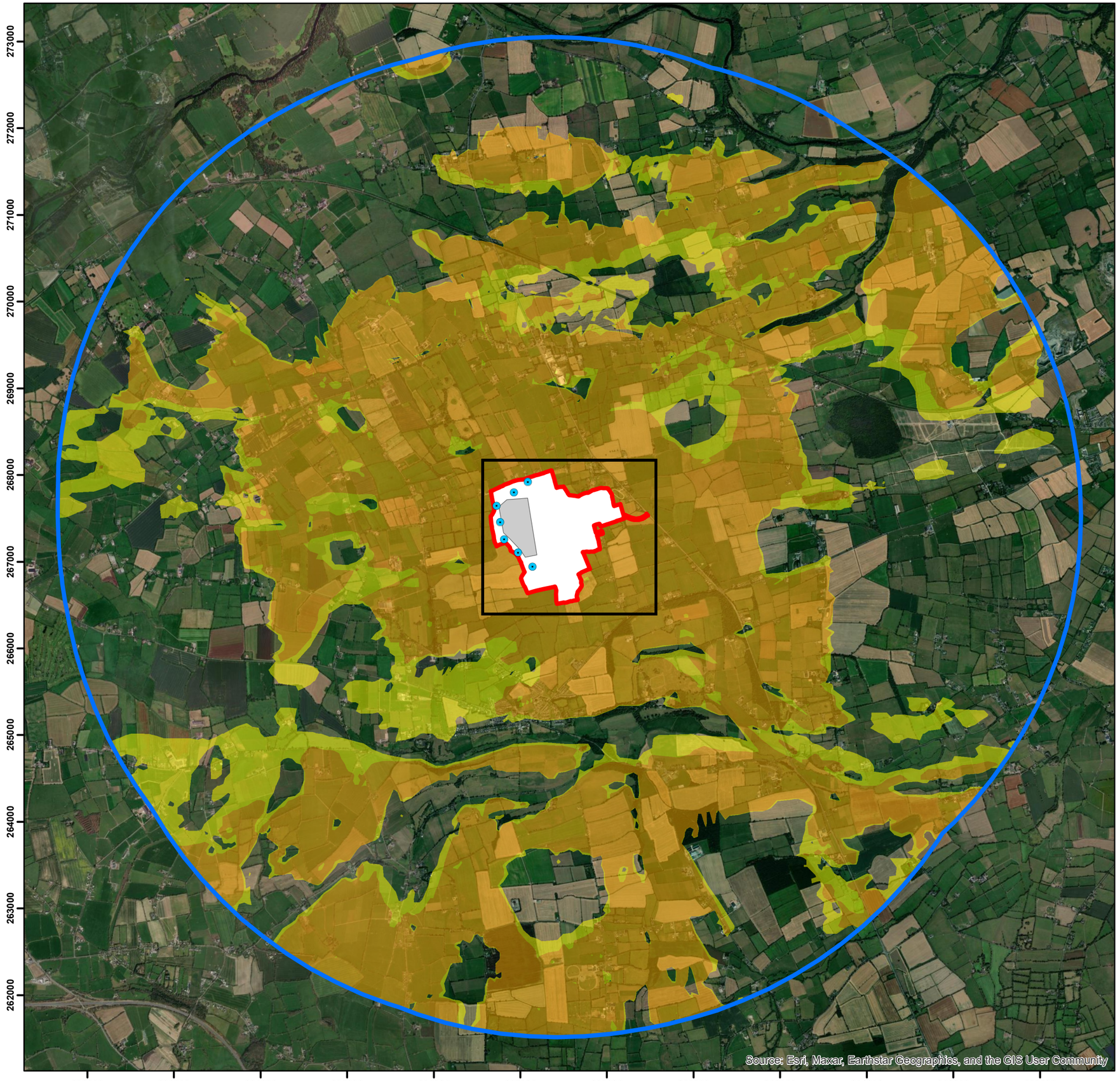


County	Meath
Townland	Kentstown
Town	Kentstown
ITM	E. 697398m, N. 765229m
Original use	house
In Use As	house
Date	1780-1820
Cat Spc Int.	Architectural, Technical
Description	Detached three-bay two-storey house, built c.1800, with single-storey porch. Hipped slate roof with red brick chimneystack. Rendered walls. Timber sash windows with stone sills. Outbuildings to the north.
Appraisal	The modest form of this house is enhanced by the retention of many original features and materials. Of particular interest are the timber sash windows which are set in small openings, which are representative of the vernacular tradition in Ireland. This house makes a positive contribution to the streetscape.
Rating	Regional
Survey	NIAH Survey of County Meath 2002

Appendix 12.1
Standard (bare-ground) ZTV map

AWN Consulting Ltd, The Tecpro Building, IDA Business & Technology Park, Clonshaugh, Dublin 17, D17 XD90

Bare Ground ZTV Map (OSI 10m DTM, 5km extent)



Site Boundary

5 km Study Area

Pylons

Landfill area

Structure Visibility

Proposed pylons

Proposed landfill and proposed pylons



1:45,000

macroworks

Appendix 13.1
Traffic Survey Data

AWN Consulting Ltd, The Tecpro Building, IDA Business & Technology Park, Clonshaugh, Dublin 17, D17 XD90

APPENDIX 13.1

Traffic Survey Data

- Site Location and Movement Diagram

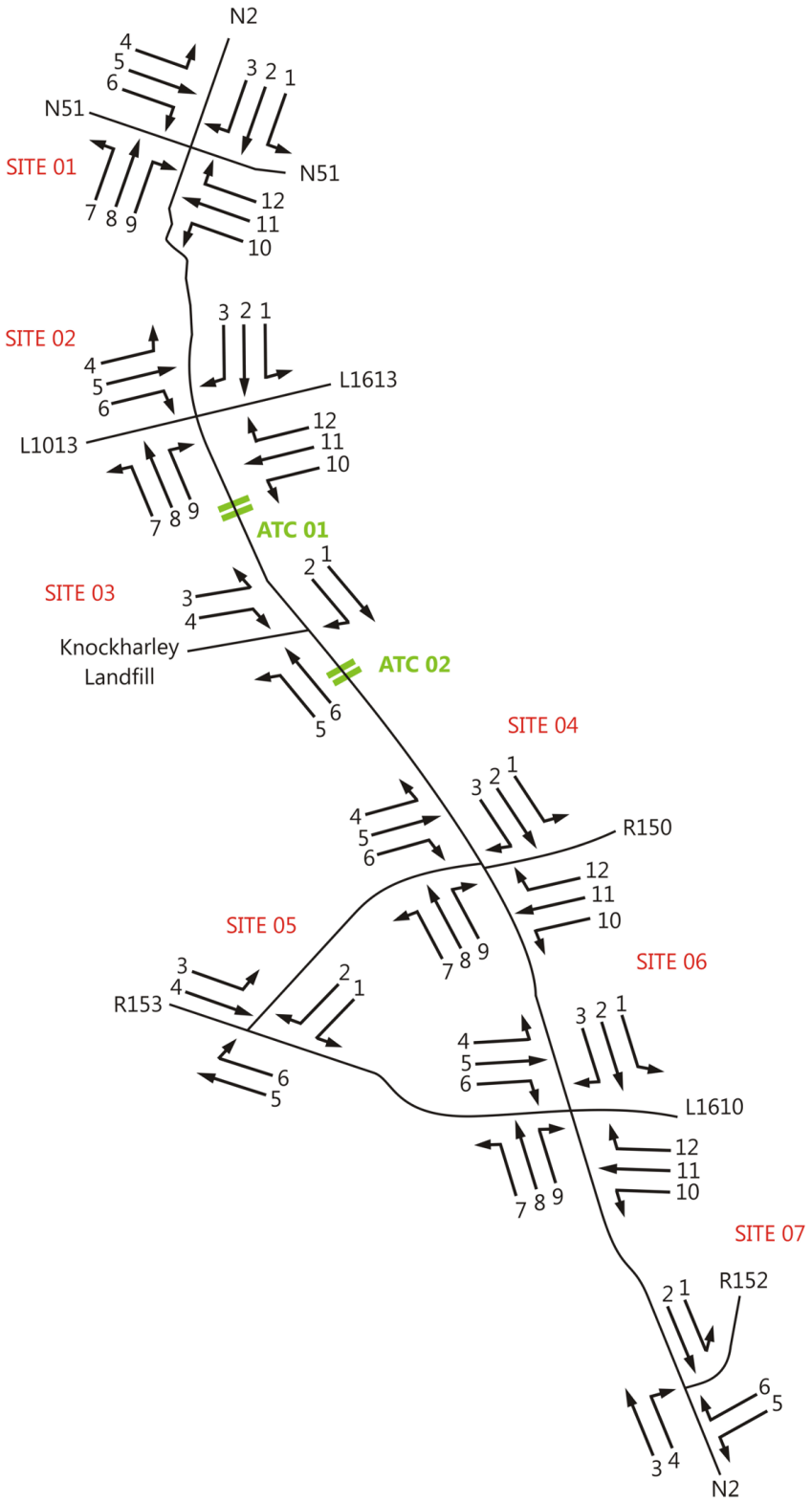
Classified Traffic Turning Counts

- Site 1: Slane Crossroads N2/N51- Signalised Crossroad
- Site 2: Rathdrinagh Crossroads N2/L1013/L1613 - Ghost Island Staggered Crossroad
- Site 3: Knockharley Landfill Site Access - Ghost Island Junction
- Site 4: O'Briens Cross N2/R150 - Ghost Island Staggered Crossroad
- Site 5: Kentstown R152/R150 – Simple Priority Junction
- Site 6: Balrath Cross N2/R153/L1610 - Ghost Island Staggered Crossroad
- Site 7: Kilmoon Cross N2/R152 - Ghost Island Junction

Automatic Traffic Counter Surveys

- Site 1: N2 North of Knockharley Landfill Access Junction
- Site 2: N2 South of Knockharley Landfill Access Junction

Site/Movement Numbering



Job number: TRA/25/046	Job Date: 8th April 2025	Drawing No: TRA/25/046-02	traffinomics.ie
Client: Trafficwise	Job Day: Tuesday	Author: JW	

TRAFFINOMICS LIMITED

KNOCKHARLEY TRAFFIC COUNTS **APRIL 2025**

MANUAL CLASSIFIED JUNCTION TURNING COUNTS **TRA/25/046**

SITE: 01 DATE: 8th April 2025

LOCATION: N2/N51 Slane DAY: Tuesday

	MOVEMENT 1							MOVEMENT 2							MOVEMENT 3						
TIME	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU
7:00	0	0	0	0	0	0	0	54	20	2	4	0	80	86	30	10	1	4	0	45	51
7:15	3	0	0	0	1	4	5	58	15	4	3	3	83	92	32	14	2	2	0	50	54
7:30	6	1	0	0	0	7	7	35	15	3	4	0	57	64	22	10	0	3	1	36	41
7:45	5	0	0	0	0	5	5	58	18	2	2	0	80	84	22	9	1	1	2	35	39
H/TOT	14	1	0	0	1	16	17	205	68	11	13	3	300	325	106	43	4	10	3	166	184
8:00	4	0	1	1	0	6	8	62	23	5	8	1	99	113	34	10	2	1	0	47	49
8:15	4	3	0	0	0	7	7	42	19	4	10	0	75	90	33	7	0	1	0	41	42
8:30	2	1	0	0	0	3	3	33	7	1	3	1	45	50	34	11	2	3	0	50	55
8:45	4	1	1	0	0	6	7	38	11	2	4	0	55	61	26	6	1	2	0	35	38
H/TOT	14	5	2	1	0	22	24	175	60	12	25	2	274	315	127	34	5	7	0	173	185
9:00	4	0	2	0	1	7	9	27	11	5	11	1	55	73	42	9	1	3	0	55	59
9:15	7	0	0	1	0	8	9	36	5	0	7	0	48	57	27	10	1	4	0	42	48
9:30	12	2	1	0	0	15	16	31	9	2	8	1	51	63	19	5	0	0	1	25	26
9:45	5	0	0	1	1	7	9	26	14	3	6	2	51	62	41	6	1	1	1	50	53
H/TOT	28	2	3	2	2	37	43	120	39	10	32	4	205	256	129	30	3	8	2	172	186
10:00	6	3	0	0	0	9	9	24	8	2	10	0	44	58	18	7	0	1	0	26	27
10:15	6	1	1	1	0	9	11	26	6	3	4	0	39	46	16	7	3	2	0	28	32
10:30	4	1	0	1	0	6	7	19	6	3	7	0	35	46	19	2	0	1	0	22	23
10:45	6	1	0	0	0	7	7	18	5	3	8	0	34	46	15	6	1	3	0	25	29
H/TOT	22	6	1	2	0	31	34	87	25	11	29	0	152	195	68	22	4	7	0	101	112
11:00	6	0	0	0	0	6	6	14	7	3	9	0	33	46	14	5	0	1	0	20	21
11:15	5	0	0	0	0	5	5	9	2	2	9	0	22	35	19	7	1	3	0	30	34
11:30	4	0	0	1	0	5	6	25	6	2	9	0	42	55	18	1	3	3	0	25	30
11:45	6	2	0	0	0	8	8	9	4	2	6	2	23	34	13	8	0	1	0	22	23
H/TOT	21	2	0	1	0	24	25	57	19	9	33	2	120	169	64	21	4	8	0	97	109
12:00	6	2	0	0	0	8	8	12	8	5	8	0	33	46	24	5	2	2	0	33	37
12:15	12	4	0	0	0	16	16	13	3	1	7	0	24	34	14	5	1	2	0	22	25
12:30	5	1	1	0	0	7	8	17	2	3	3	0	25	30	29	5	1	5	0	40	47
12:45	3	0	0	0	0	3	3	22	4	8	4	0	38	47	24	2	1	0	0	27	28
H/TOT	26	7	1	0	0	34	35	64	17	17	22	0	120	157	91	17	5	9	0	122	136

TRAFFINOMICS LIMITED

KNOCKHARLEY TRAFFIC COUNTS **APRIL 2025**

MANUAL CLASSIFIED JUNCTION TURNING COUNTS **TRA/25/046**

SITE: 01 DATE: 8th April 2025

LOCATION: N2/N51 Slane DAY: Tuesday

	MOVEMENT 4							MOVEMENT 5							MOVEMENT 6						
TIME	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU
7:00	17	10	0	1	0	28	29	33	13	0	2	0	48	51	11	7	0	4	0	22	27
7:15	25	4	1	2	1	33	37	22	15	0	6	0	43	51	14	0	0	4	0	18	23
7:30	35	9	3	3	0	50	55	31	11	1	3	3	49	56	13	3	1	2	0	19	22
7:45	48	9	1	4	0	62	68	28	11	1	4	1	45	52	13	2	1	3	0	19	23
H/TOT	125	32	5	10	1	173	190	114	50	2	15	4	185	210	51	12	2	13	0	78	96
8:00	26	6	0	1	0	33	34	27	10	0	0	1	38	39	12	4	0	3	0	19	23
8:15	24	7	1	4	1	37	44	41	8	2	1	0	52	54	9	3	1	1	0	14	16
8:30	32	7	0	3	1	43	48	47	10	3	3	1	64	70	18	2	2	5	0	27	35
8:45	28	1	4	3	0	36	42	46	8	0	0	0	54	54	12	3	1	1	0	17	19
H/TOT	110	21	5	11	2	149	168	161	36	5	4	2	208	218	51	12	4	10	0	77	92
9:00	26	5	0	1	0	32	33	22	6	1	2	1	32	36	9	1	1	0	0	11	12
9:15	30	6	0	4	1	41	47	30	3	1	4	0	38	44	10	2	1	2	0	15	18
9:30	22	9	0	1	1	33	35	23	7	2	2	1	35	40	14	1	2	2	0	19	23
9:45	23	1	2	2	1	29	34	30	6	2	5	1	44	53	4	3	3	3	0	13	18
H/TOT	101	21	2	8	3	135	149	105	22	6	13	3	149	172	37	7	7	7	0	58	71
10:00	20	4	2	2	0	28	32	24	6	1	4	0	35	41	11	3	0	1	0	15	16
10:15	16	8	0	2	1	27	31	24	6	2	6	0	38	47	10	2	1	2	0	15	18
10:30	20	0	0	2	0	22	25	16	3	2	5	1	27	36	8	3	0	4	0	15	20
10:45	14	6	0	3	0	23	27	17	8	0	5	0	30	37	7	2	2	3	1	15	21
H/TOT	70	18	2	9	1	100	114	81	23	5	20	1	130	160	36	10	3	10	1	60	76
11:00	18	4	1	1	0	24	26	22	7	4	6	2	41	53	6	2	0	2	0	10	13
11:15	19	1	2	1	0	23	25	24	5	1	5	0	35	42	8	1	0	3	0	12	16
11:30	19	3	2	0	0	24	25	17	3	2	1	1	24	27	9	4	3	3	0	19	24
11:45	24	4	1	2	0	31	34	22	6	2	3	0	33	38	7	3	1	5	0	16	23
H/TOT	80	12	6	4	0	102	110	85	21	9	15	3	133	160	30	10	4	13	0	57	76
12:00	17	7	1	1	0	26	28	21	3	0	4	0	28	33	10	2	2	0	0	14	15
12:15	29	7	0	3	0	39	43	33	7	1	2	1	44	48	6	2	0	2	0	10	13
12:30	15	2	1	5	0	23	30	21	4	0	3	0	28	32	7	2	1	8	0	18	29
12:45	21	6	2	2	0	31	35	31	3	1	2	0	37	40	6	2	0	2	0	10	13
H/TOT	82	22	4	11	0	119	135	106	17	2	11	1	137	153	29	8	3	12	0	52	69

TRAFFINOMICS LIMITED

KNOCKHARLEY TRAFFIC COUNTS **APRIL 2025**

MANUAL CLASSIFIED JUNCTION TURNING COUNTS **TRA/25/046**

SITE: 01 DATE: 8th April 2025

LOCATION: N2/N51 Slane DAY: Tuesday

	MOVEMENT 7							MOVEMENT 8							MOVEMENT 9						
TIME	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU
7:00	4	2	0	1	0	7	8	11	3	0	5	0	19	26	2	0	0	1	0	3	4
7:15	3	0	0	0	0	3	3	7	8	2	5	0	22	30	5	1	0	0	0	6	6
7:30	4	1	0	5	0	10	17	17	8	2	6	0	33	42	5	0	1	1	0	7	9
7:45	5	1	1	0	0	7	8	29	5	0	5	0	39	46	3	0	0	0	0	3	3
H/TOT	16	4	1	6	0	27	35	64	24	4	21	0	113	142	15	1	1	2	0	19	22
8:00	6	5	0	1	0	12	13	38	8	2	6	0	54	63	3	3	1	1	0	8	10
8:15	3	2	1	1	0	7	9	23	5	0	6	0	34	42	7	6	0	0	0	13	13
8:30	4	0	0	1	0	5	6	20	3	6	7	0	36	48	5	3	0	1	0	9	10
8:45	11	5	3	5	0	24	32	7	7	1	9	0	24	36	7	0	1	0	0	8	9
H/TOT	24	12	4	8	0	48	60	88	23	9	28	0	148	189	22	12	2	2	0	38	42
9:00	5	3	1	2	0	11	14	28	4	1	3	1	37	42	8	2	0	2	1	13	17
9:15	4	3	0	1	0	8	9	30	5	2	4	0	41	47	6	0	0	0	0	6	6
9:30	5	0	1	7	0	13	23	14	7	1	7	1	30	41	6	1	1	0	0	8	9
9:45	9	1	1	5	0	16	23	19	2	1	5	0	27	34	6	4	0	0	0	10	10
H/TOT	23	7	3	15	0	48	69	91	18	5	19	2	135	164	26	7	1	2	1	37	41
10:00	3	2	1	2	0	8	11	16	0	2	8	0	26	37	3	0	0	0	0	3	3
10:15	2	2	3	4	0	11	18	16	5	1	8	0	30	41	5	1	0	0	0	6	6
10:30	6	3	1	4	0	14	20	16	4	1	12	0	33	49	1	2	0	0	1	4	5
10:45	4	3	2	1	0	10	12	17	4	1	3	0	25	29	3	4	0	0	0	7	7
H/TOT	15	10	7	11	0	43	61	65	13	5	31	0	114	157	12	7	0	0	1	20	21
11:00	7	2	0	0	0	9	9	29	3	0	6	1	39	48	4	1	0	1	0	6	7
11:15	8	4	1	2	0	15	18	19	6	1	4	1	31	38	7	0	2	0	0	9	10
11:30	6	2	2	1	0	11	13	14	2	4	4	0	24	31	4	2	0	0	0	6	6
11:45	9	3	0	3	0	15	19	21	5	3	4	2	35	44	8	0	0	0	0	8	8
H/TOT	30	11	3	6	0	50	59	83	16	8	18	4	129	160	23	3	2	1	0	29	31
12:00	9	3	2	1	0	15	17	24	5	1	11	1	42	58	5	0	2	2	0	9	13
12:15	7	1	0	0	0	8	8	20	4	4	10	0	38	53	4	0	1	0	0	5	6
12:30	5	2	0	4	0	11	16	27	9	2	6	0	44	53	2	1	0	1	0	4	5
12:45	10	2	1	3	0	16	20	20	6	3	6	1	36	46	9	3	0	0	0	12	12
H/TOT	31	8	3	8	0	50	62	91	24	10	33	2	160	210	20	4	3	3	0	30	35

TRAFFINOMICS LIMITED

KNOCKHARLEY TRAFFIC COUNTS **APRIL 2025**

MANUAL CLASSIFIED JUNCTION TURNING COUNTS **TRA/25/046**

SITE: 01 DATE: 8th April 2025

LOCATION: N2/N51 Slane DAY: Tuesday

	MOVEMENT 10							MOVEMENT 11							MOVEMENT 12						
TIME	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU
7:00	10	3	1	0	0	14	15	17	7	0	2	0	26	29	1	1	0	0	0	2	2
7:15	16	1	0	2	0	19	22	19	6	2	3	0	30	35	2	0	0	1	0	3	4
7:30	15	1	0	3	0	19	23	22	6	1	2	1	32	36	1	0	0	1	0	2	3
7:45	6	6	0	0	0	12	12	31	12	0	10	1	54	68	5	1	0	0	0	6	6
H/TOT	47	11	1	5	0	64	71	89	31	3	17	2	142	168	9	2	0	2	0	13	16
8:00	11	0	1	0	0	12	13	28	6	1	7	0	42	52	4	1	0	0	0	5	5
8:15	13	3	0	0	0	16	16	15	5	2	6	0	28	37	3	0	0	0	0	3	3
8:30	15	5	0	0	0	20	20	14	4	3	1	0	22	25	0	0	0	0	0	0	0
8:45	14	2	0	2	0	18	21	20	7	0	3	0	30	34	7	0	0	0	0	7	7
H/TOT	53	10	1	2	0	66	69	77	22	6	17	0	122	147	14	1	0	0	0	15	15
9:00	10	4	0	1	0	15	16	31	8	2	3	1	45	51	10	1	0	0	0	11	11
9:15	10	3	0	1	0	14	15	26	6	1	2	1	36	40	7	0	1	0	0	8	9
9:30	3	2	0	0	1	6	7	26	11	3	4	0	44	51	4	0	0	4	0	8	13
9:45	14	0	0	0	0	14	14	16	9	1	3	2	31	37	2	2	1	0	0	5	6
H/TOT	37	9	0	2	1	49	53	99	34	7	12	4	156	179	23	3	2	4	0	32	38
10:00	6	2	0	1	0	9	10	21	4	5	4	1	35	44	5	2	0	0	0	7	7
10:15	7	2	1	0	0	10	11	16	4	0	1	0	21	22	1	1	1	0	0	3	4
10:30	6	1	2	0	0	9	10	33	6	1	3	0	43	47	6	0	0	1	0	7	8
10:45	5	2	1	0	0	8	9	19	3	2	1	1	26	29	4	0	0	0	0	4	4
H/TOT	24	7	4	1	0	36	39	89	17	8	9	2	125	143	16	3	1	1	0	21	23
11:00	3	1	0	1	0	5	6	25	5	2	4	0	36	42	2	0	0	0	0	2	2
11:15	5	1	2	0	0	8	9	26	10	3	7	0	46	57	6	0	0	0	0	6	6
11:30	3	1	0	0	0	4	4	17	4	1	4	1	27	34	5	0	0	0	0	5	5
11:45	11	0	1	1	0	13	15	20	9	2	5	1	37	46	2	3	0	0	0	5	5
H/TOT	22	3	3	2	0	30	34	88	28	8	20	2	146	178	15	3	0	0	0	18	18
12:00	4	0	0	2	0	6	9	25	8	2	4	0	39	45	4	1	0	0	0	5	5
12:15	2	1	0	0	0	3	3	19	3	2	2	0	26	30	5	2	0	0	0	7	7
12:30	4	2	2	0	0	8	9	18	8	2	6	1	35	45	4	1	1	0	0	6	7
12:45	5	1	1	0	0	7	8	19	8	0	2	0	29	32	8	2	0	0	0	10	10
H/TOT	15	4	3	2	0	24	28	81	27	6	14	1	129	151	21	6	1	0	0	28	29

TRAFFINOMICS LIMITED

KNOCKHARLEY TRAFFIC COUNTS **APRIL 2025**

MANUAL CLASSIFIED JUNCTION TURNING COUNTS **TRA/25/046**

SITE: 01 DATE: 8th April 2025

LOCATION: N2/N51 Slane DAY: Tuesday

	MOVEMENT 1							MOVEMENT 2							MOVEMENT 3						
TIME	**CAR**	**LGV**	**OGV1**	**OGV2**	**BUS**	**TOT**	**PCU**	**CAR**	**LGV**	**OGV1**	**OGV2**	**BUS**	**TOT**	**PCU**	**CAR**	**LGV**	**OGV1**	**OGV2**	**BUS**	**TOT**	**PCU**
13:00	5	2	0	0	0	7	7	16	3	1	1	0	21	23	20	4	0	1	1	26	28
13:15	9	0	1	0	0	10	11	9	2	5	3	1	20	27	25	4	2	0	0	31	32
13:30	5	0	0	0	0	5	5	20	5	3	2	1	31	36	22	7	0	1	0	30	31
13:45	8	0	0	0	0	8	8	13	3	2	3	0	21	26	20	4	1	3	1	29	34
H/TOT	27	2	1	0	0	30	31	58	13	11	9	2	93	112	87	19	3	5	2	116	126
14:00	2	0	0	0	0	2	2	20	6	1	2	1	30	34	17	7	2	2	2	30	36
14:15	2	1	0	0	0	3	3	22	7	2	5	0	36	44	26	3	1	1	0	31	33
14:30	6	0	0	0	0	6	6	8	2	2	4	1	17	24	18	4	3	2	0	27	31
14:45	3	1	2	0	0	6	7	14	4	5	3	0	26	32	14	3	0	2	0	19	22
H/TOT	13	2	2	0	0	17	18	64	19	10	14	2	109	134	75	17	6	7	2	107	121
15:00	17	1	0	0	1	19	20	20	2	1	6	1	30	39	23	7	1	4	0	35	41
15:15	4	1	0	0	0	5	5	21	3	3	3	1	31	37	19	7	0	0	0	26	26
15:30	3	1	0	0	0	4	4	13	7	2	2	0	24	28	16	4	1	4	1	26	33
15:45	5	2	0	0	0	7	7	19	8	1	3	0	31	35	33	8	2	1	0	44	46
H/TOT	29	5	0	0	1	35	36	73	20	7	14	2	116	140	91	26	4	9	1	131	146
16:00	4	1	0	0	0	5	5	25	7	2	3	0	37	42	31	3	1	3	0	38	42
16:15	6	1	0	0	0	7	7	18	3	1	2	0	24	27	28	6	1	1	0	36	38
16:30	5	1	0	0	0	6	6	29	6	2	3	1	41	47	37	8	1	3	0	49	53
16:45	5	1	0	0	1	7	8	19	3	0	3	0	25	29	30	9	0	2	0	41	44
H/TOT	20	4	0	0	1	25	26	91	19	5	11	1	127	145	126	26	3	9	0	164	177
17:00	5	0	0	0	0	5	5	24	4	2	5	1	36	45	26	12	2	0	1	41	43
17:15	7	0	0	0	0	7	7	26	11	0	2	0	39	42	32	4	4	0	0	40	42
17:30	6	0	0	0	0	6	6	30	6	2	3	0	41	46	37	7	0	0	2	46	48
17:45	1	2	0	0	0	3	3	22	6	3	5	2	38	48	39	10	0	1	0	50	51
H/TOT	19	2	0	0	0	21	21	102	27	7	15	3	154	180	134	33	6	1	3	177	184
18:00	9	1	0	0	0	10	10	32	3	0	2	0	37	40	33	3	1	3	0	40	44
18:15	4	1	0	0	0	5	5	26	6	1	5	0	38	45	29	5	1	1	0	36	38
18:30	5	1	0	0	0	6	6	15	3	0	3	0	21	25	35	4	0	2	0	41	44
18:45	7	0	0	0	0	7	7	13	0	2	5	0	20	28	39	3	2	2	0	46	50
H/TOT	25	3	0	0	0	28	28	86	12	3	15	0	116	137	136	15	4	8	0	163	175
P/TOT	258	41	10	6	5	320	338	1182	338	113	232	21	1886	2265	1234	303	51	88	13	1689	1842

TRAFFINOMICS LIMITED

KNOCKHARLEY TRAFFIC COUNTS **APRIL 2025**

MANUAL CLASSIFIED JUNCTION TURNING COUNTS **TRA/25/046**

SITE: 01 DATE: 8th April 2025

LOCATION: N2/N51 Slane DAY: Tuesday

	MOVEMENT 4							MOVEMENT 5							MOVEMENT 6						
TIME	**CAR**	**LGV**	**OGV1**	**OGV2**	**BUS**	**TOT**	**PCU**	**CAR**	**LGV**	**OGV1**	**OGV2**	**BUS**	**TOT**	**PCU**	**CAR**	**LGV**	**OGV1**	**OGV2**	**BUS**	**TOT**	**PCU**
13:00	11	1	0	3	0	15	19	17	2	1	2	0	22	25	9	2	0	2	0	13	16
13:15	21	4	4	2	1	32	38	31	4	0	2	1	38	42	8	2	0	1	0	11	12
13:30	13	3	0	1	0	17	18	20	4	0	6	1	31	40	8	2	0	2	0	12	15
13:45	14	9	3	1	0	27	30	27	6	1	4	1	39	46	8	0	1	6	0	15	23
H/TOT	59	17	7	7	1	91	105	95	16	2	14	3	130	152	33	6	1	11	0	51	66
14:00	22	9	1	7	1	40	51	33	5	2	3	0	43	48	4	3	0	3	0	10	14
14:15	17	6	0	3	0	26	30	28	3	2	4	0	37	43	6	1	2	2	0	11	15
14:30	30	4	5	4	1	44	53	27	7	3	5	1	43	52	7	0	4	2	0	13	18
14:45	32	4	0	2	2	40	45	19	5	1	2	0	27	30	11	3	0	3	0	17	21
H/TOT	101	23	6	16	4	150	178	107	20	8	14	1	150	173	28	7	6	10	0	51	67
15:00	29	7	1	0	1	38	40	29	5	1	4	1	40	47	11	2	1	4	0	18	24
15:15	19	10	1	2	0	32	35	26	7	1	4	0	38	44	10	1	1	3	0	15	19
15:30	22	5	5	3	0	35	41	24	5	2	1	2	34	38	8	3	0	3	0	14	18
15:45	21	8	1	5	0	35	42	18	8	1	0	0	27	28	13	2	1	1	0	17	19
H/TOT	91	30	8	10	1	140	158	97	25	5	9	3	139	156	42	8	3	11	0	64	80
16:00	26	8	1	0	0	35	36	26	4	1	1	0	32	34	7	0	0	1	0	8	9
16:15	37	4	2	3	0	46	51	24	8	1	0	0	33	34	4	1	1	1	0	7	9
16:30	34	7	1	1	2	45	49	28	6	2	0	1	37	39	10	1	0	1	0	12	13
16:45	35	13	0	1	0	49	50	33	2	2	1	0	38	40	9	0	1	0	0	10	11
H/TOT	132	32	4	5	2	175	186	111	20	6	2	1	140	147	30	2	2	3	0	37	42
17:00	25	15	2	0	0	42	43	26	8	1	0	0	35	36	8	0	1	1	0	10	12
17:15	31	15	1	0	0	47	48	18	5	2	1	0	26	28	9	0	0	3	0	12	16
17:30	38	7	1	2	0	48	51	18	11	0	1	0	30	31	13	2	0	1	0	16	17
17:45	29	9	0	0	0	38	38	32	4	2	0	1	39	41	3	0	0	0	0	3	3
H/TOT	123	46	4	2	0	175	180	94	28	5	2	1	130	136	33	2	1	5	0	41	48
18:00	43	11	0	1	0	55	56	22	3	1	0	1	27	29	5	3	1	0	0	9	10
18:15	35	8	1	1	1	46	49	36	3	3	0	0	42	44	15	1	0	0	0	16	16
18:30	35	4	0	0	0	39	39	47	4	2	1	2	56	60	11	1	0	1	0	13	14
18:45	27	4	0	0	0	31	31	10	6	1	0	0	17	18	8	0	1	0	0	9	10
H/TOT	140	27	1	2	1	171	175	115	16	7	1	3	142	150	39	5	2	1	0	47	49
P/TOT	1214	301	54	95	16	1680	1847	1271	294	62	120	26	1773	1986	439	89	38	106	1	673	831

TRAFFINOMICS LIMITED

KNOCKHARLEY TRAFFIC COUNTS **APRIL 2025**

MANUAL CLASSIFIED JUNCTION TURNING COUNTS **TRA/25/046**

SITE: 01 DATE: 8th April 2025

LOCATION: N2/N51 Slane DAY: Tuesday

	MOVEMENT 7							MOVEMENT 8							MOVEMENT 9						
TIME	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU
13:00	8	2	2	2	0	14	18	21	6	4	7	0	38	49	5	1	0	1	0	7	8
13:15	10	4	1	1	0	16	18	20	5	4	8	1	38	51	12	5	2	0	0	19	20
13:30	6	5	1	1	0	13	15	18	6	1	5	0	30	37	10	1	0	1	0	12	13
13:45	7	1	1	0	0	9	10	37	7	3	5	1	53	62	4	0	0	0	0	4	4
H/TOT	31	12	5	4	0	52	60	96	24	12	25	2	159	200	31	7	2	2	0	42	46
14:00	6	3	1	3	0	13	17	25	10	6	12	0	53	72	5	2	0	1	0	8	9
14:15	12	4	1	3	0	20	24	16	4	0	7	0	27	36	5	0	1	0	0	6	7
14:30	11	1	0	2	0	14	17	29	8	2	3	0	42	47	7	2	1	1	0	11	13
14:45	11	3	3	2	0	19	23	22	2	3	4	0	31	38	6	1	1	0	0	8	9
H/TOT	40	11	5	10	0	66	82	92	24	11	26	0	153	192	23	5	3	2	0	33	37
15:00	14	6	0	2	1	23	27	23	9	3	9	0	44	57	8	2	0	0	0	10	10
15:15	12	3	1	2	0	18	21	34	8	5	9	0	56	70	2	1	0	1	0	4	5
15:30	15	7	0	4	0	26	31	35	16	3	5	0	59	67	7	3	0	0	0	10	10
15:45	17	2	0	2	0	21	24	27	28	2	5	1	63	72	3	1	0	0	0	4	4
H/TOT	58	18	1	10	1	88	103	119	61	13	28	1	222	266	20	7	0	1	0	28	29
16:00	20	7	0	4	0	31	36	42	10	4	6	1	63	74	15	0	1	0	0	16	17
16:15	13	8	1	1	0	23	25	43	15	3	7	0	68	79	13	2	0	0	0	15	15
16:30	4	2	0	3	0	9	13	43	13	2	4	1	63	70	12	1	0	0	0	13	13
16:45	12	12	1	1	0	26	28	47	34	2	5	0	88	96	17	0	0	0	0	17	17
H/TOT	49	29	2	9	0	89	102	175	72	11	22	2	282	318	57	3	1	0	0	61	62
17:00	12	1	2	0	0	15	16	47	17	3	5	0	72	80	12	3	0	1	0	16	17
17:15	18	6	0	0	1	25	26	47	20	3	4	1	75	83	8	1	0	0	0	9	9
17:30	16	3	0	4	0	23	28	35	14	1	8	1	59	71	11	3	0	0	0	14	14
17:45	18	5	0	1	0	24	25	37	18	0	3	0	58	62	12	0	0	0	0	12	12
H/TOT	64	15	2	5	1	87	96	166	69	7	20	2	264	296	43	7	0	1	0	51	52
18:00	23	8	0	2	0	33	36	43	14	4	3	1	65	72	16	0	0	0	0	16	16
18:15	11	3	0	1	0	15	16	41	14	3	4	0	62	69	10	0	0	0	0	10	10
18:30	13	0	0	0	0	13	13	29	11	1	3	1	45	50	7	2	0	0	0	9	9
18:45	22	2	0	1	0	25	26	20	9	0	1	0	30	31	15	1	0	0	0	16	16
H/TOT	69	13	0	4	0	86	91	133	48	8	11	2	202	222	48	3	0	0	0	51	51
P/TOT	450	150	36	96	2	734	879	1263	416	103	282	17	2081	2516	340	66	15	16	2	439	469

TRAFFINOMICS LIMITED

KNOCKHARLEY TRAFFIC COUNTS **APRIL 2025**

MANUAL CLASSIFIED JUNCTION TURNING COUNTS **TRA/25/046**

SITE: 01 DATE: 8th April 2025

LOCATION: N2/N51 Slane DAY: Tuesday

	MOVEMENT 10							MOVEMENT 11							MOVEMENT 12						
TIME	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU
13:00	9	1	0	0	0	10	10	23	5	2	3	2	35	42	6	0	0	0	0	6	6
13:15	6	0	1	0	0	7	8	20	8	1	4	0	33	39	7	0	0	0	0	7	7
13:30	8	0	1	0	0	9	10	33	2	1	2	1	39	43	6	3	1	0	0	10	11
13:45	7	1	0	1	0	9	10	23	5	1	8	2	39	52	4	0	0	0	0	4	4
H/TOT	30	2	2	1	0	35	37	99	20	5	17	5	146	176	23	3	1	0	0	27	28
14:00	11	1	1	1	0	14	16	42	7	0	2	1	52	56	7	2	0	0	0	9	9
14:15	3	0	0	0	0	3	3	22	2	0	3	0	27	31	5	0	0	0	0	5	5
14:30	6	2	1	0	0	9	10	37	7	1	3	0	48	52	8	0	0	0	0	8	8
14:45	4	2	0	0	0	6	6	26	6	0	5	1	38	46	9	1	0	0	0	10	10
H/TOT	24	5	2	1	0	32	34	127	22	1	13	2	165	184	29	3	0	0	0	32	32
15:00	5	0	0	1	0	6	7	32	3	2	6	0	43	52	2	0	0	0	0	2	2
15:15	11	2	0	1	0	14	15	39	9	0	6	0	54	62	2	0	0	0	0	2	2
15:30	3	1	0	0	0	4	4	26	4	3	1	0	34	37	11	0	0	0	0	11	11
15:45	6	1	1	0	0	8	9	26	6	0	0	0	32	32	5	0	0	0	0	5	5
H/TOT	25	4	1	2	0	32	35	123	22	5	13	0	163	182	20	0	0	0	0	20	20
16:00	6	4	0	0	0	10	10	32	11	2	0	2	47	50	4	0	1	0	0	5	6
16:15	11	0	0	1	0	12	13	33	15	2	3	0	53	58	4	2	0	0	0	6	6
16:30	5	2	0	0	0	7	7	41	13	0	3	1	58	63	8	1	0	0	0	9	9
16:45	10	2	0	1	0	13	14	22	12	1	2	0	37	40	4	0	1	0	2	7	10
H/TOT	32	8	0	2	0	42	45	128	51	5	8	3	195	211	20	3	2	0	2	27	30
17:00	16	1	2	0	0	19	20	50	7	1	1	1	60	63	8	2	0	0	0	10	10
17:15	7	1	0	0	0	8	8	35	10	4	3	0	52	58	8	1	0	0	0	9	9
17:30	9	1	0	0	0	10	10	45	11	2	2	1	61	66	5	6	0	0	0	11	11
17:45	7	0	0	0	0	7	7	37	4	1	2	0	44	47	4	0	0	0	0	4	4
H/TOT	39	3	2	0	0	44	45	167	32	8	8	2	217	233	25	9	0	0	0	34	34
18:00	6	0	0	0	0	6	6	29	8	1	1	1	40	43	4	1	0	0	0	5	5
18:15	12	0	0	0	0	12	12	33	4	1	0	0	38	39	5	0	0	0	0	5	5
18:30	3	2	0	0	0	5	5	32	2	1	0	0	35	36	10	1	0	0	0	11	11
18:45	8	2	0	0	0	10	10	20	6	0	0	1	27	28	7	1	0	0	0	8	8
H/TOT	29	4	0	0	0	33	33	114	20	3	1	2	140	145	26	3	0	0	0	29	29
P/TOT	377	70	19	20	1	487	524	1281	326	65	149	25	1846	2097	241	39	7	7	2	296	311

TRAFFINOMICS LIMITED

KNOCKHARLEY TRAFFIC COUNTS **APRIL 2025**

MANUAL CLASSIFIED JUNCTION TURNING COUNTS **TRA/25/046**

SITE: 02 DATE: 8th April 2025

LOCATION: N2/L1013/L1613 Rathdrinagh DAY: Tuesday

	MOVEMENT 1							MOVEMENT 2							MOVEMENT 3						
TIME	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU
7:00	0	1	0	1	0	2	3	80	46	1	9	0	136	148	3	3	0	1	0	7	8
7:15	0	0	1	0	0	1	2	101	37	4	10	1	153	169	3	1	0	0	0	4	4
7:30	2	0	0	0	0	2	2	70	17	6	10	3	106	125	7	3	0	0	0	10	10
7:45	1	1	0	0	0	2	2	77	34	6	5	0	122	132	15	1	2	0	0	18	19
H/TOT	3	2	1	1	0	7	9	328	134	17	34	4	517	574	28	8	2	1	0	39	41
8:00	1	1	0	0	0	2	2	81	28	6	7	1	123	136	6	4	1	0	0	11	12
8:15	1	0	1	0	0	2	3	77	27	4	13	0	121	140	15	3	0	0	0	18	18
8:30	2	0	0	0	0	2	2	81	23	6	6	1	117	129	12	1	0	0	0	13	13
8:45	5	0	0	1	0	6	7	64	13	2	8	0	87	98	10	1	0	0	0	11	11
H/TOT	9	1	1	1	0	12	14	303	91	18	34	2	448	503	43	9	1	0	0	53	54
9:00	1	1	0	1	0	3	4	47	18	5	5	1	76	86	7	1	0	1	0	9	10
9:15	1	0	0	1	0	2	3	51	11	3	11	0	76	92	8	3	0	1	0	12	13
9:30	0	0	0	0	0	0	0	53	18	2	12	0	85	102	6	2	0	1	0	9	10
9:45	1	0	1	0	0	2	3	41	21	7	8	3	80	97	5	0	1	0	0	6	7
H/TOT	3	1	1	2	0	7	10	192	68	17	36	4	317	376	26	6	1	3	0	36	40
10:00	1	0	1	0	0	2	3	39	13	1	11	0	64	79	1	4	0	0	0	5	5
10:15	0	2	0	0	0	2	2	45	13	4	9	0	71	85	0	2	0	0	0	2	2
10:30	0	0	0	0	0	0	0	28	9	4	9	0	50	64	1	2	0	1	0	4	5
10:45	2	0	0	0	0	2	2	35	12	6	7	1	61	74	4	0	1	0	0	5	6
H/TOT	3	2	1	0	0	6	7	147	47	15	36	1	246	301	6	8	1	1	0	16	18
11:00	1	0	0	0	0	1	1	23	14	5	14	0	56	77	1	0	0	0	0	1	1
11:15	0	0	1	1	0	2	4	18	5	1	10	0	34	48	1	2	0	1	0	4	5
11:30	0	1	1	0	0	2	3	33	13	4	13	0	63	82	4	0	1	1	0	6	8
11:45	2	0	1	0	0	3	4	30	5	2	8	2	47	60	6	1	1	2	0	10	13
H/TOT	3	1	3	1	0	8	11	104	37	12	45	2	200	267	12	3	2	4	0	21	27
12:00	1	1	0	0	0	2	2	19	8	3	7	0	37	48	1	0	0	0	0	1	1
12:15	1	1	0	0	0	2	2	23	10	6	10	0	49	65	0	2	0	1	0	3	4
12:30	0	0	0	0	0	0	0	22	13	6	13	0	54	74	4	0	0	0	0	4	4
12:45	2	1	0	0	0	3	3	32	12	5	3	1	53	60	5	0	0	1	0	6	7
H/TOT	4	3	0	0	0	7	7	96	43	20	33	1	193	247	10	2	0	2	0	14	17

TRAFFINOMICS LIMITED

KNOCKHARLEY TRAFFIC COUNTS **APRIL 2025**

MANUAL CLASSIFIED JUNCTION TURNING COUNTS **TRA/25/046**

SITE: 02 DATE: 8th April 2025

LOCATION: N2/L1013/L1613 Rathdrinagh DAY: Tuesday

	MOVEMENT 4							MOVEMENT 5							MOVEMENT 6						
TIME	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU
7:00	2	1	0	0	0	3	3	0	0	0	0	0	0	0	6	2	2	0	0	10	11
7:15	7	2	0	0	0	9	9	2	1	0	0	0	3	3	4	5	2	1	0	12	14
7:30	7	0	0	2	1	10	14	1	0	0	0	0	1	1	6	2	2	2	0	12	16
7:45	8	0	0	0	0	8	8	3	1	0	0	0	4	4	6	0	2	0	0	8	9
H/TOT	24	3	0	2	1	30	34	6	2	0	0	0	8	8	22	9	8	3	0	42	50
8:00	12	1	0	0	0	13	13	3	0	1	0	0	4	5	7	1	0	1	0	9	10
8:15	4	5	0	0	0	9	9	0	0	0	0	0	0	0	8	2	1	2	0	13	16
8:30	10	1	0	1	0	12	13	3	0	1	0	0	4	5	8	2	0	1	0	11	12
8:45	8	2	0	2	0	12	15	2	1	0	0	0	3	3	9	1	0	0	0	10	10
H/TOT	34	9	0	3	0	46	50	8	1	2	0	0	11	12	32	6	1	4	0	43	49
9:00	10	1	3	0	0	14	16	5	0	0	0	0	5	5	13	1	1	0	0	15	16
9:15	6	2	0	0	0	8	8	4	0	0	1	0	5	6	13	2	2	0	0	17	18
9:30	5	2	0	0	0	7	7	1	0	0	0	0	1	1	2	0	0	0	0	2	2
9:45	5	2	0	1	0	8	9	0	1	1	0	0	2	3	8	3	1	1	0	13	15
H/TOT	26	7	3	1	0	37	40	10	1	1	1	0	13	15	36	6	4	1	0	47	50
10:00	5	0	0	1	0	6	7	3	0	0	0	0	3	3	5	2	0	3	0	10	14
10:15	1	0	0	0	0	1	1	0	1	3	0	0	4	6	3	1	0	0	0	4	4
10:30	5	2	1	0	0	8	9	1	0	0	1	0	2	3	5	0	1	1	0	7	9
10:45	2	1	0	0	0	3	3	1	1	1	0	0	3	4	3	1	2	1	0	7	9
H/TOT	13	3	1	1	0	18	20	5	2	4	1	0	12	15	16	4	3	5	0	28	36
11:00	1	1	0	1	0	3	4	0	0	1	2	0	3	6	4	1	0	0	0	5	5
11:15	3	1	0	0	0	4	4	1	2	0	0	0	3	3	5	4	0	0	0	9	9
11:30	6	0	0	0	0	6	6	1	0	0	0	0	1	1	6	1	0	0	0	7	7
11:45	1	0	0	0	0	1	1	2	0	2	2	0	6	10	5	2	1	2	0	10	13
H/TOT	11	2	0	1	0	14	15	4	2	3	4	0	13	20	20	8	1	2	0	31	34
12:00	3	1	0	0	0	4	4	1	2	0	0	0	3	3	7	1	2	2	0	12	16
12:15	2	2	0	1	0	5	6	0	0	1	1	0	2	4	3	0	1	1	0	5	7
12:30	2	3	0	1	0	6	7	1	0	1	0	0	2	3	7	2	1	1	0	11	13
12:45	3	1	0	1	0	5	6	0	0	0	0	0	0	0	4	3	0	0	0	7	7
H/TOT	10	7	0	3	0	20	24	2	2	2	1	0	7	9	21	6	4	4	0	35	42

TRAFFINOMICS LIMITED

KNOCKHARLEY TRAFFIC COUNTS **APRIL 2025**

MANUAL CLASSIFIED JUNCTION TURNING COUNTS **TRA/25/046**

SITE: 02 DATE: 8th April 2025

LOCATION: N2/L1013/L1613 Rathdrinagh DAY: Tuesday

	MOVEMENT 7							MOVEMENT 8							MOVEMENT 9						
TIME	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU
7:00	0	2	0	0	0	2	2	15	7	0	6	0	28	36	2	0	1	2	0	5	8
7:15	3	1	0	0	0	4	4	15	11	1	5	2	34	43	1	0	0	0	0	1	1
7:30	2	2	0	0	0	4	4	25	8	3	6	1	43	53	2	0	0	3	0	5	9
7:45	4	6	0	0	0	10	10	28	10	1	7	0	46	56	3	5	0	2	0	10	13
H/TOT	9	11	0	0	0	20	20	83	36	5	24	3	151	188	8	5	1	7	0	21	31
8:00	4	1	0	0	0	5	5	32	11	2	6	0	51	60	2	0	0	1	0	3	4
8:15	5	4	1	0	0	10	11	31	9	5	8	1	54	68	1	3	1	1	0	6	8
8:30	7	3	0	0	0	10	10	22	8	6	9	1	46	62	4	1	1	1	0	7	9
8:45	11	1	1	0	0	13	14	31	14	4	11	0	60	76	5	1	0	2	0	8	11
H/TOT	27	9	2	0	0	38	39	116	42	17	34	2	211	266	12	5	2	5	0	24	32
9:00	17	2	3	0	0	22	24	27	6	2	6	1	42	52	2	1	1	1	0	5	7
9:15	4	1	0	2	0	7	10	31	12	0	5	1	49	57	3	0	0	2	0	5	8
9:30	5	2	0	0	0	7	7	22	8	5	12	1	48	67	0	0	0	1	0	1	2
9:45	2	1	0	0	0	3	3	17	6	1	5	0	29	36	1	1	0	2	0	4	7
H/TOT	28	6	3	2	0	39	43	97	32	8	28	3	168	211	6	2	1	6	0	15	23
10:00	7	5	0	2	0	14	17	24	9	5	16	0	54	77	4	0	0	1	0	5	6
10:15	3	2	1	0	0	6	7	20	6	2	11	0	39	54	1	0	1	1	0	3	5
10:30	5	0	0	2	0	7	10	23	12	1	9	0	45	57	0	2	0	1	0	3	4
10:45	3	2	0	1	0	6	7	29	10	3	7	1	50	62	2	0	0	3	0	5	9
H/TOT	18	9	1	5	0	33	40	96	37	11	43	1	188	250	7	2	1	6	0	16	24
11:00	3	1	0	0	0	4	4	28	15	1	5	0	49	56	1	2	0	5	0	8	15
11:15	7	2	1	1	0	11	13	17	12	3	6	1	39	49	1	1	1	0	0	3	4
11:30	5	0	1	1	0	7	9	21	17	7	6	1	52	64	1	1	1	0	0	3	4
11:45	1	2	0	1	0	4	5	22	9	3	9	1	44	58	2	2	0	1	0	5	6
H/TOT	16	5	2	3	0	26	31	88	53	14	26	3	184	228	5	6	2	6	0	19	28
12:00	3	2	1	1	0	7	9	21	9	4	8	2	44	58	1	4	0	3	0	8	12
12:15	4	4	1	1	0	10	12	39	9	6	14	0	68	89	2	0	2	4	0	8	14
12:30	10	3	0	0	0	13	13	28	11	5	7	1	52	65	2	0	1	1	0	4	6
12:45	8	4	1	1	0	14	16	34	11	1	8	0	54	65	4	0	0	1	0	5	6
H/TOT	25	13	3	3	0	44	49	122	40	16	37	3	218	277	9	4	3	9	0	25	38

TRAFFINOMICS LIMITED

KNOCKHARLEY TRAFFIC COUNTS **APRIL 2025**

MANUAL CLASSIFIED JUNCTION TURNING COUNTS **TRA/25/046**

SITE: 02 DATE: 8th April 2025

LOCATION: N2/L1013/L1613 Rathdrinagh DAY: Tuesday

	MOVEMENT 10							MOVEMENT 11							MOVEMENT 12						
TIME	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU
7:00	1	1	1	0	0	3	4	0	0	0	0	0	0	0	0	0	1	0	0	1	2
7:15	3	1	1	2	0	7	10	0	0	0	0	0	0	0	1	1	1	2	0	5	8
7:30	5	1	0	1	0	7	8	3	0	0	1	0	4	5	0	0	0	1	0	1	2
7:45	5	2	1	1	0	9	11	1	1	0	0	0	2	2	2	2	0	0	0	4	4
H/TOT	14	5	3	4	0	26	33	4	1	0	1	0	6	7	3	3	2	3	0	11	16
8:00	1	2	0	2	0	5	8	4	0	0	0	0	4	4	0	0	0	0	0	0	0
8:15	5	2	1	0	0	8	9	1	1	0	1	0	3	4	0	0	0	0	0	0	0
8:30	1	4	0	2	0	7	10	1	1	1	0	0	3	4	1	0	0	1	0	2	3
8:45	3	2	0	2	0	7	10	2	0	0	0	0	2	2	1	0	0	1	0	2	3
H/TOT	10	10	1	6	0	27	35	8	2	1	1	0	12	14	2	0	0	2	0	4	7
9:00	2	1	1	1	0	5	7	10	0	1	1	0	12	14	2	0	0	1	0	3	4
9:15	5	2	0	2	0	9	12	0	1	0	0	0	1	1	0	0	0	0	0	0	0
9:30	4	2	0	1	0	7	8	1	0	0	1	0	2	3	0	0	0	2	0	2	5
9:45	1	0	0	1	0	2	3	1	2	0	1	0	4	5	2	0	0	0	0	2	2
H/TOT	12	5	1	5	0	23	30	12	3	1	3	0	19	23	4	0	0	3	0	7	11
10:00	0	0	1	0	0	1	2	2	0	2	0	0	4	5	0	0	0	0	0	0	0
10:15	1	0	0	1	0	2	3	1	0	0	0	0	1	1	2	1	0	0	0	3	3
10:30	2	1	1	1	0	5	7	0	1	2	1	0	4	6	0	0	0	0	0	0	0
10:45	3	1	1	4	0	9	15	0	0	0	0	0	0	0	1	0	0	0	0	1	1
H/TOT	6	2	3	6	0	17	26	3	1	4	1	0	9	12	3	1	0	0	0	4	4
11:00	1	0	0	1	0	2	3	3	0	1	0	0	4	5	1	1	0	0	0	2	2
11:15	2	1	0	2	0	5	8	2	1	1	2	0	6	9	0	0	2	0	0	2	3
11:30	1	1	2	3	0	7	12	0	1	0	0	0	1	1	0	0	0	0	0	0	0
11:45	0	4	1	2	0	7	10	1	0	0	0	0	1	1	4	0	0	0	0	4	4
H/TOT	4	6	3	8	0	21	33	6	2	2	2	0	12	16	5	1	2	0	0	8	9
12:00	4	0	0	2	0	6	9	2	0	1	0	0	3	4	2	0	0	0	0	2	2
12:15	2	2	0	2	0	6	9	1	0	2	0	0	3	4	0	0	0	0	0	0	0
12:30	0	1	0	2	0	3	6	1	0	0	2	0	3	6	1	0	0	0	0	1	1
12:45	2	3	2	1	0	8	10	0	1	0	0	0	1	1	2	0	1	0	0	3	4
H/TOT	8	6	2	7	0	23	33	4	1	3	2	0	10	14	5	0	1	0	0	6	7

TRAFFINOMICS LIMITED

KNOCKHARLEY TRAFFIC COUNTS **APRIL 2025**

MANUAL CLASSIFIED JUNCTION TURNING COUNTS **TRA/25/046**

SITE: 02 DATE: 8th April 2025

LOCATION: N2/L1013/L1613 Rathdrinagh DAY: Tuesday

	MOVEMENT 1							MOVEMENT 2							MOVEMENT 3						
TIME	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU
13:00	1	2	0	0	0	3	3	27	10	1	7	0	45	55	3	0	1	0	0	4	5
13:15	3	0	1	0	0	4	5	36	4	5	2	1	48	54	7	1	0	0	0	8	8
13:30	4	0	0	0	0	4	4	26	10	5	5	0	46	55	3	2	1	1	0	7	9
13:45	0	0	0	0	0	0	0	14	12	3	6	1	36	46	0	1	0	1	0	2	3
H/TOT	8	2	1	0	0	11	12	103	36	14	20	2	175	210	13	4	2	2	0	21	25
14:00	1	0	0	0	0	1	1	27	9	1	6	1	44	53	2	2	0	1	0	5	6
14:15	1	0	0	0	0	1	1	37	9	4	8	0	58	70	7	3	1	0	0	11	12
14:30	2	0	0	0	0	2	2	15	7	2	5	2	31	41	6	0	0	0	0	6	6
14:45	2	1	1	0	0	4	5	34	9	6	4	0	53	61	0	0	0	1	0	1	2
H/TOT	6	1	1	0	0	8	9	113	34	13	23	3	186	225	15	5	1	2	0	23	26
15:00	2	0	0	0	0	2	2	30	6	3	7	1	47	59	6	1	0	0	0	7	7
15:15	0	0	1	0	0	1	2	38	11	2	6	1	58	68	8	1	0	1	0	10	11
15:30	1	1	0	0	0	2	2	26	15	2	7	0	50	60	3	1	0	0	0	4	4
15:45	0	0	0	0	0	0	0	22	12	4	5	0	43	52	9	0	0	0	0	9	9
H/TOT	3	1	1	0	0	5	6	116	44	11	25	2	198	238	26	3	0	1	0	30	31
16:00	3	0	0	0	0	3	3	38	14	0	1	0	53	54	7	1	0	0	0	8	8
16:15	1	0	0	1	0	2	3	40	13	2	5	0	60	68	5	1	0	0	0	6	6
16:30	3	0	0	0	0	3	3	38	8	2	5	0	53	61	7	0	0	0	1	8	9
16:45	1	1	1	1	0	4	6	31	12	1	2	0	46	49	3	0	0	0	1	4	5
H/TOT	8	1	1	2	0	12	15	147	47	5	13	0	212	231	22	2	0	0	2	26	28
17:00	5	0	0	2	0	7	10	44	7	5	2	0	58	63	5	1	1	0	0	7	8
17:15	1	0	2	0	0	3	4	35	9	0	6	1	51	60	10	1	1	1	0	13	15
17:30	5	1	0	0	0	6	6	51	16	2	6	0	75	84	12	2	0	0	0	14	14
17:45	0	0	1	0	0	1	2	46	6	5	4	0	61	69	6	0	0	0	0	6	6
H/TOT	11	1	3	2	0	17	21	176	38	12	18	1	245	275	33	4	2	1	0	40	42
18:00	1	0	0	1	0	2	3	52	12	0	3	2	69	75	5	0	0	0	0	5	5
18:15	1	1	1	0	0	3	4	39	11	0	1	0	51	52	5	2	0	0	0	7	7
18:30	1	1	0	0	0	2	2	41	6	1	6	0	54	62	5	1	0	0	0	6	6
18:45	5	0	0	1	0	6	7	30	8	0	4	0	42	47	4	0	0	0	0	4	4
H/TOT	8	2	1	2	0	13	16	162	37	1	14	2	216	237	19	3	0	0	0	22	22
P/TOT	69	18	15	11	0	113	135	1987	656	155	331	24	3153	3685	253	57	12	17	2	341	371

TRAFFINOMICS LIMITED

KNOCKHARLEY TRAFFIC COUNTS **APRIL 2025**

MANUAL CLASSIFIED JUNCTION TURNING COUNTS **TRA/25/046**

SITE: 02 DATE: 8th April 2025

LOCATION: N2/L1013/L1613 Rathdrinagh DAY: Tuesday

	MOVEMENT 4							MOVEMENT 5							MOVEMENT 6						
TIME	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU
13:00	0	1	1	2	0	4	7	1	0	0	0	0	1	1	5	4	3	1	0	13	16
13:15	2	1	0	0	0	3	3	2	1	1	0	0	4	5	1	2	0	0	0	3	3
13:30	7	2	0	0	0	9	9	2	0	1	1	0	4	6	5	2	0	1	1	9	11
13:45	1	0	0	0	0	1	1	0	0	1	1	0	2	4	3	1	1	0	0	5	6
H/TOT	10	4	1	2	0	17	20	5	1	3	2	0	11	15	14	9	4	2	1	30	36
14:00	1	0	0	0	0	1	1	1	0	1	0	0	2	3	9	0	0	0	0	9	9
14:15	3	0	0	0	0	3	3	0	0	0	2	0	2	5	6	2	2	0	0	10	11
14:30	0	0	0	1	0	1	2	3	1	0	2	0	6	9	4	2	0	0	0	6	6
14:45	0	2	0	0	0	2	2	1	0	3	0	0	4	6	4	1	2	0	0	7	8
H/TOT	4	2	0	1	0	7	8	5	1	4	4	0	14	21	23	5	4	0	0	32	34
15:00	4	0	0	0	0	4	4	4	0	1	0	0	5	6	8	1	0	0	0	9	9
15:15	0	1	0	2	0	3	6	1	1	1	0	0	3	4	8	1	0	0	0	9	9
15:30	5	1	1	0	0	7	8	0	0	0	0	0	0	0	6	3	1	0	0	10	11
15:45	5	0	0	1	0	6	7	4	0	0	0	0	4	4	8	0	0	0	0	8	8
H/TOT	14	2	1	3	0	20	24	9	1	2	0	0	12	13	30	5	1	0	0	36	37
16:00	4	5	1	0	0	10	11	4	2	1	0	0	7	8	9	3	0	0	0	12	12
16:15	7	2	0	0	0	9	9	2	1	2	0	0	5	6	6	3	0	0	0	9	9
16:30	12	5	0	1	0	18	19	3	0	1	1	0	5	7	7	2	0	0	0	9	9
16:45	12	2	0	1	0	15	16	1	2	0	0	0	3	3	11	1	1	0	0	13	14
H/TOT	35	14	1	2	0	52	55	10	5	4	1	0	20	23	33	9	1	0	0	43	44
17:00	6	3	0	0	0	9	9	4	2	2	1	0	9	11	8	0	0	0	0	8	8
17:15	13	0	0	0	0	13	13	7	2	1	0	0	10	11	5	3	0	0	0	8	8
17:30	4	1	0	0	0	5	5	2	0	0	0	0	2	2	5	1	0	0	0	6	6
17:45	9	3	0	1	0	13	14	3	0	0	1	0	4	5	6	2	0	0	0	8	8
H/TOT	32	7	0	1	0	40	41	16	4	3	2	0	25	29	24	6	0	0	0	30	30
18:00	6	0	0	0	0	6	6	4	1	0	0	0	5	5	6	1	0	0	0	7	7
18:15	5	0	0	0	0	5	5	0	0	0	0	0	0	0	2	1	1	0	0	4	5
18:30	2	1	0	0	0	3	3	0	0	0	0	0	0	0	5	1	0	0	0	6	6
18:45	3	2	1	0	0	6	7	0	1	0	0	0	1	1	11	0	1	0	0	12	13
H/TOT	16	3	1	0	0	20	21	4	2	0	0	0	6	6	24	3	2	0	0	29	30
P/TOT	229	63	8	20	1	321	352	84	24	28	16	0	152	187	295	76	33	21	1	426	471

TRAFFINOMICS LIMITED

KNOCKHARLEY TRAFFIC COUNTS **APRIL 2025**

MANUAL CLASSIFIED JUNCTION TURNING COUNTS **TRA/25/046**

SITE: 02 DATE: 8th April 2025

LOCATION: N2/L1013/L1613 Rathdrinagh DAY: Tuesday

	MOVEMENT 7							MOVEMENT 8							MOVEMENT 9						
TIME	**CAR**	**LGV**	**OGV1**	**OGV2**	**BUS**	**TOT**	**PCU**	**CAR**	**LGV**	**OGV1**	**OGV2**	**BUS**	**TOT**	**PCU**	**CAR**	**LGV**	**OGV1**	**OGV2**	**BUS**	**TOT**	**PCU**
13:00	2	1	0	0	0	3	3	31	15	5	8	1	60	74	4	3	1	2	0	10	13
13:15	8	2	0	0	0	10	10	36	20	5	5	1	67	77	7	1	0	2	0	10	13
13:30	2	4	1	0	0	7	8	43	17	0	13	0	73	90	2	1	1	1	0	5	7
13:45	12	1	1	0	0	14	15	30	11	2	9	2	54	69	2	1	0	1	0	4	5
H/TOT	24	8	2	0	0	34	35	140	63	12	35	4	254	310	15	6	2	6	0	29	38
14:00	5	3	0	1	0	9	10	32	23	2	15	0	72	93	5	1	1	3	0	10	14
14:15	4	1	2	0	0	7	8	35	10	2	8	0	55	66	3	1	1	1	0	6	8
14:30	3	5	0	2	0	10	13	39	14	1	6	0	60	68	3	1	0	3	0	7	11
14:45	16	2	0	1	0	19	20	60	17	5	7	0	89	101	5	1	1	3	0	10	14
H/TOT	28	11	2	4	0	45	51	166	64	10	36	0	276	328	16	4	3	10	0	33	48
15:00	5	0	1	0	0	6	7	42	15	5	19	0	81	108	5	1	0	3	0	9	13
15:15	9	0	1	1	0	11	13	48	18	4	4	0	74	81	1	0	1	1	0	3	5
15:30	7	6	0	1	0	14	15	48	35	2	6	1	92	102	5	2	1	0	0	8	9
15:45	7	2	0	0	1	10	11	57	23	4	5	2	91	102	6	1	1	1	0	9	11
H/TOT	28	8	2	2	1	41	46	195	91	15	34	3	338	393	17	4	3	5	0	29	37
16:00	8	3	0	1	0	12	13	70	31	5	10	1	117	134	6	2	2	2	0	12	16
16:15	4	2	0	2	0	8	11	67	24	1	5	1	98	106	1	2	4	2	0	9	14
16:30	9	4	3	0	0	16	18	75	31	2	5	0	113	121	3	2	2	1	0	8	10
16:45	4	2	2	0	0	8	9	73	43	5	4	1	126	135	1	4	0	1	0	6	7
H/TOT	25	11	5	3	0	44	50	285	129	13	24	3	454	495	11	10	8	6	0	35	47
17:00	15	0	1	1	0	17	19	80	45	3	5	1	134	143	2	1	3	0	0	6	8
17:15	10	0	0	0	0	10	10	91	35	2	10	2	140	156	4	4	1	0	0	9	10
17:30	9	1	4	2	0	16	21	98	36	2	4	0	140	146	7	0	0	1	0	8	9
17:45	13	5	0	0	0	18	18	98	30	3	5	1	137	146	4	2	1	0	0	7	8
H/TOT	47	6	5	3	0	61	67	367	146	10	24	4	551	591	17	7	5	1	0	30	34
18:00	9	1	0	0	0	10	10	87	19	3	5	0	114	122	4	1	2	2	0	9	13
18:15	10	2	0	0	0	12	12	75	22	1	4	1	103	110	4	1	1	0	0	6	7
18:30	10	3	1	0	0	14	15	61	20	0	2	0	83	86	4	2	0	0	0	6	6
18:45	6	3	0	0	0	9	9	55	11	1	4	0	71	77	3	1	0	1	0	5	6
H/TOT	35	9	1	0	0	45	46	278	72	5	15	1	371	394	15	5	3	3	0	26	31
P/TOT	310	106	28	25	1	470	518	2033	805	136	360	30	3364	3930	138	60	34	70	0	302	410

TRAFFINOMICS LIMITED

KNOCKHARLEY TRAFFIC COUNTS **APRIL 2025**

MANUAL CLASSIFIED JUNCTION TURNING COUNTS **TRA/25/046**

SITE: 02 DATE: 8th April 2025

LOCATION: N2/L1013/L1613 Rathdrinagh DAY: Tuesday

	MOVEMENT 10							MOVEMENT 11							MOVEMENT 12						
TIME	**CAR**	**LGV**	**OGV1**	**OGV2**	**BUS**	**TOT**	**PCU**	**CAR**	**LGV**	**OGV1**	**OGV2**	**BUS**	**TOT**	**PCU**	**CAR**	**LGV**	**OGV1**	**OGV2**	**BUS**	**TOT**	**PCU**
13:00	1	2	1	2	0	6	9	1	0	1	1	0	3	5	1	0	0	0	0	1	1
13:15	3	3	0	0	0	6	6	1	0	0	0	0	1	1	1	0	1	0	0	2	3
13:30	4	1	0	2	0	7	10	2	0	1	0	0	3	4	2	0	1	0	0	3	4
13:45	3	2	1	1	0	7	9	3	0	0	0	0	3	3	1	0	0	1	0	2	3
H/TOT	11	8	2	5	0	26	34	7	0	2	1	0	10	12	5	0	2	1	0	8	10
14:00	3	0	0	2	0	5	8	1	0	0	0	0	1	1	2	0	0	0	0	2	2
14:15	1	0	1	0	0	2	3	0	0	0	0	0	0	0	1	1	2	2	0	6	10
14:30	4	1	2	0	0	7	8	3	0	0	0	0	3	3	1	0	0	0	0	1	1
14:45	12	0	0	1	0	13	14	6	2	0	0	0	8	8	4	0	0	1	0	5	6
H/TOT	20	1	3	3	0	27	32	10	2	0	0	0	12	12	8	1	2	3	0	14	19
15:00	4	0	0	1	0	5	6	3	2	0	1	0	6	7	4	1	0	0	0	5	5
15:15	0	1	3	1	0	5	8	1	0	0	1	0	2	3	0	1	0	1	0	2	3
15:30	4	0	2	1	0	7	9	0	1	1	0	0	2	3	1	0	0	0	0	1	1
15:45	4	0	1	2	0	7	10	6	0	0	0	0	6	6	3	2	0	0	0	5	5
H/TOT	12	1	6	5	0	24	34	10	3	1	2	0	16	19	8	4	0	1	0	13	14
16:00	3	0	0	1	0	4	5	4	0	1	0	0	5	6	4	0	0	1	0	5	6
16:15	4	1	0	0	0	5	5	2	1	0	0	0	3	3	0	1	1	0	0	2	3
16:30	3	1	0	0	0	4	4	2	1	0	0	0	3	3	7	3	1	0	0	11	12
16:45	2	2	1	2	0	7	10	4	2	0	0	0	6	6	3	4	0	0	0	7	7
H/TOT	12	4	1	3	0	20	24	12	4	1	0	0	17	18	14	8	2	1	0	25	27
17:00	4	1	1	1	0	7	9	2	1	0	0	0	3	3	1	1	2	0	0	4	5
17:15	8	0	1	1	0	10	12	3	1	0	0	0	4	4	4	0	1	0	0	5	6
17:30	5	1	0	1	0	7	8	0	0	0	0	0	0	0	4	1	0	0	0	5	5
17:45	9	1	1	0	0	11	12	8	1	0	0	0	9	9	3	0	0	0	0	3	3
H/TOT	26	3	3	3	0	35	40	13	3	0	0	0	16	16	12	2	3	0	0	17	19
18:00	4	3	1	0	0	8	9	3	1	0	0	0	4	4	2	1	0	0	0	3	3
18:15	4	0	1	1	0	6	8	1	1	0	0	0	2	2	4	1	0	0	0	5	5
18:30	1	2	0	1	0	4	5	1	0	0	0	0	1	1	5	2	1	0	0	8	9
18:45	6	1	0	0	0	7	7	2	0	1	0	0	3	4	1	1	0	0	0	2	2
H/TOT	15	6	2	2	0	25	29	7	2	1	0	0	10	11	12	5	1	0	0	18	19
P/TOT	150	57	30	57	0	294	383	96	24	16	13	0	149	174	81	25	15	14	0	135	161

TRAFFINOMICS LIMITED

KNOCKHARLEY TRAFFIC COUNTS **APRIL 2025**

MANUAL CLASSIFIED JUNCTION TURNING COUNTS **TRA/25/046**

SITE: 03 DATE: 8th April 2025

LOCATION: Knockharley Landfill Access DAY: Tuesday

	MOVEMENT 1							MOVEMENT 2							MOVEMENT 3						
TIME	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU
7:00	91	49	6	6	0	152	163	1	3	0	0	0	4	4	0	0	0	0	0	0	0
7:15	87	37	7	9	1	141	157	1	0	0	1	0	2	3	0	0	0	0	0	0	0
7:30	95	18	7	14	3	137	162	1	3	0	1	0	5	6	0	0	0	0	0	0	0
7:45	96	41	7	6	0	150	161	3	1	1	0	0	5	6	0	0	0	0	0	0	0
H/TOT	369	145	27	35	4	580	643	6	7	1	2	0	16	19	0	0	0	0	0	0	0
8:00	100	22	5	10	1	138	155	1	0	0	0	0	1	1	0	0	0	0	0	0	0
8:15	92	32	5	15	0	144	166	0	1	0	0	0	1	1	0	0	1	2	0	3	6
8:30	88	27	9	10	1	135	154	0	0	0	1	0	1	2	0	0	0	1	0	1	2
8:45	71	17	3	7	0	98	109	0	0	0	1	0	1	2	1	0	0	1	0	2	3
H/TOT	351	98	22	42	2	515	583	1	1	0	2	0	4	7	1	0	1	4	0	6	12
9:00	55	18	3	5	1	82	91	1	0	0	1	0	2	3	0	0	0	0	0	0	0
9:15	57	16	4	13	0	90	109	0	0	0	1	0	1	2	0	0	0	1	0	1	2
9:30	67	23	3	15	0	108	129	1	0	0	0	0	1	1	0	0	0	2	0	2	5
9:45	44	14	6	11	4	79	100	0	0	0	0	0	0	0	0	1	0	1	0	2	3
H/TOT	223	71	16	44	5	359	429	2	0	0	2	0	4	7	0	1	0	4	0	5	10
10:00	52	19	4	9	0	84	98	0	1	0	1	0	2	3	0	1	0	0	0	1	1
10:15	43	10	4	11	0	68	84	0	1	0	0	0	1	1	0	1	0	0	0	1	1
10:30	41	14	7	9	0	71	86	0	0	0	1	0	1	2	0	0	0	1	0	1	2
10:45	44	9	6	14	1	74	96	0	1	0	1	0	2	3	0	0	0	1	0	1	2
H/TOT	180	52	21	43	1	297	364	0	3	0	3	0	6	10	0	2	0	2	0	4	7
11:00	32	17	5	12	0	66	84	0	1	0	1	0	2	3	0	0	0	3	0	3	7
11:15	30	8	4	9	0	51	65	0	1	0	1	0	2	3	0	0	0	1	0	1	2
11:30	33	9	4	18	0	64	89	1	0	0	0	0	1	1	0	1	0	1	0	2	3
11:45	39	9	5	13	0	66	85	0	0	0	1	0	1	2	0	0	0	1	0	1	2
H/TOT	134	43	18	52	0	247	324	1	2	0	3	0	6	10	0	1	0	6	0	7	15
12:00	27	10	4	11	2	54	72	0	0	0	2	0	2	5	3	0	0	1	0	4	5
12:15	36	13	6	10	0	65	81	1	1	0	1	0	3	4	1	0	0	1	0	2	3
12:30	24	16	4	15	0	59	81	1	0	0	2	0	3	6	0	0	0	1	0	1	2
12:45	33	5	8	8	1	55	70	0	0	0	1	0	1	2	0	0	0	1	0	1	2
H/TOT	120	44	22	44	3	233	304	2	1	0	6	0	9	17	4	0	0	4	0	8	13

TRAFFINOMICS LIMITED

KNOCKHARLEY TRAFFIC COUNTS **APRIL 2025**

MANUAL CLASSIFIED JUNCTION TURNING COUNTS **TRA/25/046**

SITE: 03 DATE: 8th April 2025

LOCATION: Knockharley Landfill Access DAY: Tuesday

	MOVEMENT 4							MOVEMENT 5							MOVEMENT 6						
TIME	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU
7:00	0	0	0	0	0	0	0	1	0	0	1	0	2	3	15	7	2	7	1	32	43
7:15	0	0	0	0	0	0	0	2	1	0	1	0	4	5	18	11	1	4	2	36	44
7:30	0	0	1	0	0	1	2	1	0	1	4	0	6	12	30	10	3	7	0	50	61
7:45	0	0	0	0	0	0	0	3	3	0	3	0	9	13	33	16	2	9	0	60	73
H/TOT	0	0	1	0	0	1	2	7	4	1	9	0	21	33	96	44	8	27	3	178	220
8:00	1	0	0	1	0	2	3	1	0	0	2	0	3	6	33	12	2	9	0	56	69
8:15	0	0	0	3	0	3	7	0	0	0	2	0	2	5	36	11	6	5	1	59	70
8:30	0	0	0	2	0	2	5	1	1	0	4	0	6	11	21	13	6	9	0	49	64
8:45	0	0	0	3	0	3	7	1	2	0	3	0	6	10	42	16	7	13	1	79	100
H/TOT	1	0	0	9	0	10	22	3	3	0	11	0	17	31	132	52	21	36	2	243	302
9:00	0	2	0	9	0	11	23	0	0	0	1	0	1	2	41	8	5	6	0	60	70
9:15	0	0	0	1	0	1	2	0	0	0	1	0	1	2	25	15	2	7	2	51	63
9:30	0	0	0	4	0	4	9	0	0	0	2	0	2	5	23	7	3	12	0	45	62
9:45	0	0	0	1	0	1	2	0	0	0	2	0	2	5	27	9	2	9	0	47	60
H/TOT	0	2	0	15	0	17	37	0	0	0	6	0	6	14	116	39	12	34	2	203	255
10:00	0	2	0	4	0	6	11	0	0	0	2	0	2	5	25	10	3	16	0	54	76
10:15	0	0	0	1	0	1	2	0	0	0	1	0	1	2	24	11	4	14	0	53	73
10:30	1	0	0	2	0	3	6	0	1	0	6	0	7	15	25	14	2	15	1	57	79
10:45	0	0	0	1	0	1	2	1	0	0	3	0	4	8	27	13	3	12	0	55	72
H/TOT	1	2	0	8	0	11	21	1	1	0	12	0	14	30	101	48	12	57	1	219	300
11:00	1	0	0	3	0	4	8	0	0	0	2	0	2	5	31	23	0	6	1	61	70
11:15	0	0	0	3	0	3	7	0	0	0	4	0	4	9	26	10	7	6	0	49	60
11:30	0	0	0	1	0	1	2	0	0	0	1	0	1	2	31	11	8	8	2	60	76
11:45	0	0	0	3	0	3	7	0	0	0	2	0	2	5	20	10	5	9	0	44	58
H/TOT	1	0	0	10	0	11	24	0	0	0	9	0	9	21	108	54	20	29	3	214	265
12:00	0	0	0	2	0	2	5	0	0	0	5	0	5	12	26	13	3	11	2	55	73
12:15	0	1	0	3	0	4	8	0	0	0	0	0	0	0	33	18	11	13	0	75	97
12:30	0	1	0	3	0	4	8	1	0	0	0	0	1	1	37	14	4	7	1	63	75
12:45	0	0	0	2	0	2	5	0	0	0	3	0	3	7	37	12	2	12	0	63	80
H/TOT	0	2	0	10	0	12	25	1	0	0	8	0	9	19	133	57	20	43	3	256	325

TRAFFINOMICS LIMITED

KNOCKHARLEY TRAFFIC COUNTS **APRIL 2025**

MANUAL CLASSIFIED JUNCTION TURNING COUNTS **TRA/25/046**

SITE: 03 DATE: 8th April 2025

LOCATION: Knockharley Landfill Access DAY: Tuesday

	MOVEMENT 1							MOVEMENT 2							MOVEMENT 3						
TIME	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU
13:00	38	17	5	8	0	68	81	0	0	0	0	0	0	0	0	0	0	1	0	1	2
13:15	34	10	7	3	0	54	61	0	0	0	0	0	0	0	0	0	0	1	0	1	2
13:30	33	11	5	6	2	57	69	1	0	0	1	0	2	3	2	1	0	0	0	3	3
13:45	30	14	4	3	1	52	59	0	0	0	1	0	1	2	0	0	0	0	0	0	0
H/TOT	135	52	21	20	3	231	271	1	0	0	2	0	3	6	2	1	0	2	0	5	8
14:00	36	11	2	7	1	57	68	0	0	0	1	0	1	2	0	1	0	1	0	2	3
14:15	37	8	6	7	0	58	70	2	0	0	1	0	3	4	0	1	0	0	0	1	1
14:30	34	11	7	8	2	62	78	0	1	0	0	0	1	1	0	0	0	2	0	2	5
14:45	34	7	4	4	0	49	56	0	0	1	2	0	3	6	1	0	1	0	0	2	3
H/TOT	141	37	19	26	3	226	272	2	1	1	4	0	8	14	1	2	1	3	0	7	11
15:00	39	14	4	6	1	64	75	0	0	0	0	0	0	0	0	1	0	1	0	2	3
15:15	49	11	6	8	1	75	89	0	0	0	0	0	0	0	1	2	0	0	0	3	3
15:30	34	15	6	7	0	62	74	0	1	0	0	0	1	1	0	0	0	0	0	0	0
15:45	32	11	3	8	0	54	66	0	0	0	0	0	0	0	0	1	0	1	0	2	3
H/TOT	154	51	19	29	2	255	304	0	1	0	0	0	1	1	1	4	0	2	0	7	10
16:00	48	20	2	4	0	74	80	0	0	0	0	0	0	0	1	2	0	1	0	4	5
16:15	48	15	4	4	0	71	78	0	0	0	0	0	0	0	1	0	0	1	0	2	3
16:30	35	9	3	4	0	51	58	0	0	0	0	0	0	0	0	1	1	0	0	2	3
16:45	53	17	2	4	0	76	82	0	0	0	0	0	0	0	4	3	0	0	0	7	7
H/TOT	184	61	11	16	0	272	298	0	0	0	0	0	0	0	6	6	1	2	0	15	18
17:00	48	7	5	5	0	65	74	0	0	0	0	0	0	0	1	0	0	0	0	1	1
17:15	52	16	3	6	1	78	88	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:30	47	15	3	6	0	71	80	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:45	51	11	1	6	0	69	77	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	198	49	12	23	1	283	320	0	0	0	0	0	0	0	1	0	0	0	0	1	1
18:00	56	18	3	3	2	82	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:15	40	11	2	2	0	55	59	0	0	0	0	0	0	0	0	1	0	0	0	1	1
18:30	55	7	3	5	0	70	78	0	0	0	0	0	0	0	0	1	0	0	0	1	1
18:45	40	9	0	4	0	53	58	1	0	0	0	0	1	1	0	0	0	0	0	0	0
H/TOT	191	45	8	14	2	260	284	1	0	0	0	0	1	1	0	2	0	0	0	2	2
P/TOT	2380	748	216	388	26	3758	4396	16	16	2	24	0	58	90	16	19	3	29	0	67	106

TRAFFINOMICS LIMITED

KNOCKHARLEY TRAFFIC COUNTS **APRIL 2025**

MANUAL CLASSIFIED JUNCTION TURNING COUNTS **TRA/25/046**

SITE: 03 DATE: 8th April 2025

LOCATION: Knockharley Landfill Access DAY: Tuesday

	MOVEMENT 4							MOVEMENT 5							MOVEMENT 6						
TIME	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU
13:00	0	0	0	4	0	4	9	0	0	0	5	0	5	12	42	20	5	8	1	76	90
13:15	0	0	0	1	0	1	2	0	0	0	1	0	1	2	49	17	5	8	0	79	92
13:30	1	0	0	1	0	2	3	0	0	0	0	0	0	0	36	17	2	11	0	66	81
13:45	0	0	0	0	0	0	0	0	1	0	2	0	3	6	40	15	8	12	2	77	99
H/TOT	1	0	0	6	0	7	15	0	1	0	8	0	9	19	167	69	20	39	3	298	362
14:00	0	1	0	4	0	5	10	0	1	0	3	0	4	8	39	21	3	16	0	79	101
14:15	1	0	0	4	0	5	10	0	1	0	2	0	3	6	38	13	4	5	0	60	69
14:30	0	0	0	2	0	2	5	0	0	0	0	0	0	0	38	20	3	9	0	70	83
14:45	0	0	0	0	0	0	0	1	0	0	2	0	3	6	70	20	5	11	0	106	123
H/TOT	1	1	0	10	0	12	25	1	2	0	7	0	10	19	185	74	15	41	0	315	376
15:00	1	0	0	1	0	2	3	1	0	0	1	0	2	3	45	18	7	20	0	90	120
15:15	0	0	0	3	0	3	7	0	0	0	0	0	0	0	65	21	7	5	0	98	108
15:30	0	1	0	0	0	1	1	1	0	0	1	0	2	3	45	41	2	6	1	95	105
15:45	0	0	0	0	0	0	0	0	0	0	2	0	2	5	83	21	5	9	3	121	138
H/TOT	1	1	0	4	0	6	11	2	0	0	4	0	6	11	238	101	21	40	4	404	471
16:00	0	2	0	1	0	3	4	0	0	0	1	0	1	2	68	36	7	10	0	121	138
16:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75	30	7	8	1	121	136
16:30	1	0	0	0	0	1	1	1	0	0	0	0	1	1	77	34	4	7	0	122	133
16:45	5	3	0	0	0	8	8	0	0	0	0	0	0	0	88	49	7	5	1	150	161
H/TOT	6	5	0	1	0	12	13	1	0	0	1	0	2	3	308	149	25	30	2	514	568
17:00	2	1	0	0	0	3	3	1	0	0	0	0	1	1	97	42	7	6	1	153	165
17:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	112	42	4	11	2	171	189
17:30	0	1	0	0	0	1	1	0	0	0	0	0	0	0	112	38	4	5	0	159	168
17:45	3	0	0	0	0	3	3	0	0	0	0	0	0	0	115	35	5	3	1	159	166
H/TOT	5	2	0	0	0	7	7	1	0	0	0	0	1	1	436	157	20	25	4	642	689
18:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	96	23	4	8	0	131	143
18:15	1	0	0	0	0	1	1	0	0	0	0	0	0	0	74	21	2	3	1	101	107
18:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	66	21	1	3	0	91	95
18:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	64	15	1	4	0	84	90
H/TOT	1	0	0	0	0	1	1	0	0	0	0	0	0	0	300	80	8	18	1	407	435
P/TOT	18	15	1	73	0	107	202	17	11	1	75	0	104	202	2320	924	202	419	28	3893	4567

TRAFFINOMICS LIMITED

KNOCKHARLEY TRAFFIC COUNTS **APRIL 2025**

MANUAL CLASSIFIED JUNCTION TURNING COUNTS **TRA/25/046**

SITE: 04 DATE: 8th April 2025

LOCATION: N2/R150 DAY: Tuesday

	MOVEMENT 1							MOVEMENT 2							MOVEMENT 3						
TIME	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU
7:00	6	3	1	0	0	10	11	85	46	5	6	0	142	152	0	0	0	0	0	0	0
7:15	4	4	1	2	1	12	16	83	33	6	7	0	129	141	0	0	0	0	0	0	0
7:30	10	5	1	1	1	18	21	85	13	7	13	2	120	142	0	0	0	0	0	0	0
7:45	11	4	2	1	0	18	20	83	37	5	5	0	130	139	2	0	0	0	0	2	2
H/TOT	31	16	5	4	2	58	68	336	129	23	31	2	521	575	2	0	0	0	0	2	2
8:00	8	2	1	1	0	12	14	90	19	4	10	1	124	140	3	1	0	0	0	4	4
8:15	12	2	1	2	0	17	20	76	29	4	15	0	124	146	4	1	0	1	0	6	7
8:30	14	3	2	2	0	21	25	73	24	7	9	1	114	130	1	0	0	1	0	2	3
8:45	10	3	1	2	0	16	19	56	14	2	8	0	80	91	5	0	0	0	0	5	5
H/TOT	44	10	5	7	0	66	78	295	86	17	42	2	442	507	13	2	0	2	0	17	20
9:00	10	3	0	0	0	13	13	44	16	3	14	1	78	99	1	1	0	0	0	2	2
9:15	3	6	1	2	0	12	15	52	10	2	12	0	76	93	2	0	1	0	0	3	4
9:30	7	1	2	2	0	12	16	60	22	1	17	0	100	123	0	0	0	0	0	0	0
9:45	6	2	2	4	0	14	20	33	12	4	7	4	60	75	5	0	0	1	0	6	7
H/TOT	26	12	5	8	0	51	64	189	60	10	50	5	314	389	8	1	1	1	0	11	13
10:00	9	1	2	2	0	14	18	43	18	2	11	0	74	89	0	2	0	0	0	2	2
10:15	7	0	0	1	0	8	9	35	10	4	11	0	60	76	1	0	0	0	0	1	1
10:30	8	3	1	2	0	14	17	30	10	6	9	0	55	70	4	1	0	0	0	5	5
10:45	9	1	0	5	0	15	22	35	7	6	10	1	59	76	0	1	0	0	0	1	1
H/TOT	33	5	3	10	0	51	66	143	45	18	41	1	248	311	5	4	0	0	0	9	9
11:00	9	5	1	1	0	16	18	21	12	3	14	0	50	70	3	0	1	0	0	4	5
11:15	3	3	0	3	0	9	13	27	5	4	9	0	45	59	0	0	0	0	0	0	0
11:30	6	0	0	2	0	8	11	25	9	4	17	0	55	79	2	0	0	0	0	2	2
11:45	6	4	0	2	0	12	15	30	5	5	14	0	54	75	3	0	0	0	0	3	3
H/TOT	24	12	1	8	0	45	56	103	31	16	54	0	204	282	8	0	1	0	0	9	10
12:00	4	2	0	2	0	8	11	21	7	4	11	2	45	63	2	1	0	0	0	3	3
12:15	4	4	1	2	0	11	14	29	9	5	11	0	54	71	3	1	0	0	0	4	4
12:30	4	1	1	3	0	9	13	17	16	3	15	0	51	72	3	0	0	0	0	3	3
12:45	6	1	2	1	1	11	14	27	4	6	9	0	46	61	0	0	0	0	0	0	0
H/TOT	18	8	4	8	1	39	52	94	36	18	46	2	196	267	8	2	0	0	0	10	10

TRAFFINOMICS LIMITED

KNOCKHARLEY TRAFFIC COUNTS **APRIL 2025**

MANUAL CLASSIFIED JUNCTION TURNING COUNTS **TRA/25/046**

SITE: 04 DATE: 8th April 2025

LOCATION: N2/R150 DAY: Tuesday

	MOVEMENT 4							MOVEMENT 5							MOVEMENT 6						
TIME	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU
7:00	1	0	1	0	1	3	5	15	6	1	0	0	22	23	3	0	0	0	0	3	3
7:15	0	1	0	0	1	2	3	13	6	1	2	0	22	25	7	2	0	0	0	9	9
7:30	1	0	0	1	0	2	3	20	11	1	3	1	36	41	5	0	1	0	1	7	9
7:45	2	0	0	0	0	2	2	19	8	2	2	0	31	35	7	1	0	0	0	8	8
H/TOT	4	1	1	1	2	9	13	67	31	5	7	1	111	124	22	3	1	0	1	27	29
8:00	2	1	0	1	0	4	5	33	5	0	2	0	40	43	3	0	0	0	0	3	3
8:15	2	0	0	0	0	2	2	21	5	1	2	0	29	32	3	2	1	0	0	6	7
8:30	2	2	0	0	0	4	4	19	7	0	0	2	28	30	5	1	0	0	0	6	6
8:45	7	0	0	0	0	7	7	20	2	0	2	1	25	29	7	4	0	0	0	11	11
H/TOT	13	3	0	1	0	17	18	93	19	1	6	3	122	133	18	7	1	0	0	26	27
9:00	7	0	0	0	0	7	7	14	10	2	5	0	31	39	3	1	0	1	0	5	6
9:15	3	0	0	0	0	3	3	17	1	2	2	0	22	26	7	0	0	0	0	7	7
9:30	3	1	0	0	0	4	4	19	4	1	1	0	25	27	3	0	0	0	0	3	3
9:45	1	0	0	0	0	1	1	16	3	1	2	0	22	25	4	0	0	0	0	4	4
H/TOT	14	1	0	0	0	15	15	66	18	6	10	0	100	116	17	1	0	1	0	19	20
10:00	3	1	1	0	0	5	6	9	2	2	4	1	18	25	2	1	0	0	0	3	3
10:15	2	0	0	0	0	2	2	8	1	2	1	2	14	18	0	2	0	0	0	2	2
10:30	2	2	0	0	0	4	4	11	5	0	0	0	16	16	0	0	0	0	0	0	0
10:45	2	1	1	0	0	4	5	12	1	0	1	1	15	17	2	0	0	0	0	2	2
H/TOT	9	4	2	0	0	15	16	40	9	4	6	4	63	77	4	3	0	0	0	7	7
11:00	0	0	0	0	0	0	0	7	2	6	3	0	18	25	3	0	0	0	0	3	3
11:15	2	0	0	0	0	2	2	13	5	1	3	0	22	26	0	1	0	0	0	1	1
11:30	2	0	0	0	0	2	2	9	1	0	2	1	13	17	1	0	0	0	0	1	1
11:45	3	0	0	0	0	3	3	12	2	2	4	0	20	26	0	1	1	0	0	2	3
H/TOT	7	0	0	0	0	7	7	41	10	9	12	1	73	94	4	2	1	0	0	7	8
12:00	1	1	0	0	0	2	2	15	0	0	0	0	15	15	4	0	0	0	0	4	4
12:15	2	0	0	0	0	2	2	10	3	1	2	0	16	19	3	0	0	0	0	3	3
12:30	3	0	0	0	0	3	3	19	1	0	3	1	24	29	4	0	0	0	0	4	4
12:45	2	0	1	0	0	3	4	10	1	0	1	0	12	13	0	0	0	0	0	0	0
H/TOT	8	1	1	0	0	10	11	54	5	1	6	1	67	76	11	0	0	0	0	11	11

TRAFFINOMICS LIMITED

KNOCKHARLEY TRAFFIC COUNTS **APRIL 2025**

MANUAL CLASSIFIED JUNCTION TURNING COUNTS **TRA/25/046**

SITE: 04 DATE: 8th April 2025

LOCATION: N2/R150 DAY: Tuesday

	MOVEMENT 7							MOVEMENT 8							MOVEMENT 9						
TIME	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU
7:00	0	0	0	0	2	2	4	11	5	1	7	0	24	34	10	6	0	0	0	16	16
7:15	1	1	0	0	0	2	2	16	10	1	5	1	33	41	7	6	0	1	0	14	15
7:30	1	1	0	0	0	2	2	23	9	3	9	0	44	57	13	5	2	2	0	22	26
7:45	0	2	0	0	2	4	6	30	16	2	12	0	60	77	9	10	0	1	0	20	21
H/TOT	2	4	0	0	4	10	14	80	40	7	33	1	161	208	39	27	2	4	0	72	78
8:00	4	0	0	0	0	4	4	31	11	1	9	0	52	64	11	4	0	1	0	16	17
8:15	2	2	0	0	0	4	4	25	7	4	5	1	42	52	19	4	1	0	0	24	25
8:30	7	0	0	1	0	8	9	13	11	5	13	0	42	61	12	1	1	2	1	17	21
8:45	10	0	0	0	0	10	10	26	16	6	14	0	62	83	11	1	0	1	0	13	14
H/TOT	23	2	0	1	0	26	27	95	45	16	41	1	198	260	53	10	2	4	1	70	77
9:00	3	0	0	0	0	3	3	25	7	4	6	0	42	52	10	4	2	1	0	17	19
9:15	6	1	0	1	0	8	9	17	12	1	7	1	38	49	4	6	2	0	0	12	13
9:30	1	0	0	0	0	1	1	12	4	3	12	0	31	48	8	4	1	1	0	14	16
9:45	1	2	0	0	0	3	3	20	7	2	9	0	38	51	5	1	0	2	0	8	11
H/TOT	11	3	0	1	0	15	16	74	30	10	34	1	149	199	27	15	5	4	0	51	59
10:00	1	1	0	0	1	3	4	17	8	1	17	0	43	66	2	2	1	0	0	5	6
10:15	4	0	0	0	0	4	4	19	9	3	13	0	44	62	8	1	1	2	0	12	15
10:30	1	0	0	0	0	1	1	20	9	1	20	1	51	79	4	2	0	0	0	6	6
10:45	1	0	0	0	0	1	1	18	12	2	9	0	41	54	3	4	1	1	0	9	11
H/TOT	7	1	0	0	1	9	10	74	38	7	59	1	179	260	17	9	3	3	0	32	37
11:00	3	0	0	0	0	3	3	22	22	0	8	1	53	64	4	0	1	0	0	5	6
11:15	3	0	0	0	0	3	3	21	7	4	7	0	39	50	6	2	1	1	0	10	12
11:30	1	3	1	0	0	5	6	25	8	7	8	2	50	66	2	1	1	1	0	5	7
11:45	2	0	0	0	0	2	2	13	9	4	8	0	34	46	7	0	0	0	0	7	7
H/TOT	9	3	1	0	0	13	14	81	46	15	31	3	176	227	19	3	3	2	0	27	31
12:00	1	0	1	0	0	2	3	20	10	2	15	2	49	72	4	2	1	0	1	8	10
12:15	2	0	0	0	0	2	2	29	17	7	11	0	64	82	5	1	0	1	0	7	8
12:30	6	0	0	0	0	6	6	31	13	3	7	1	55	67	0	1	2	0	0	3	4
12:45	2	1	0	0	0	3	3	29	12	1	12	0	54	70	3	0	0	0	0	3	3
H/TOT	11	1	1	0	0	13	14	109	52	13	45	3	222	290	12	4	3	1	1	21	25

TRAFFINOMICS LIMITED

KNOCKHARLEY TRAFFIC COUNTS **APRIL 2025**

MANUAL CLASSIFIED JUNCTION TURNING COUNTS **TRA/25/046**

SITE: 04 DATE: 8th April 2025

LOCATION: N2/R150 DAY: Tuesday

	MOVEMENT 10							MOVEMENT 11							MOVEMENT 12						
TIME	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU
7:00	20	7	0	0	1	28	29	8	1	0	1	0	10	11	4	2	0	1	0	7	8
7:15	24	7	0	0	1	32	33	18	1	0	1	0	20	21	4	1	0	0	0	5	5
7:30	23	5	2	0	0	30	31	23	4	1	4	0	32	38	7	1	1	1	0	10	12
7:45	22	4	0	0	0	26	26	29	2	0	2	2	35	40	4	3	0	0	0	7	7
H/TOT	89	23	2	0	2	116	119	78	8	1	8	2	97	110	19	7	1	2	0	29	32
8:00	11	1	0	2	0	14	17	19	2	0	0	0	21	21	1	0	1	1	0	3	5
8:15	17	1	1	0	0	19	20	14	2	2	3	0	21	26	9	4	2	2	0	17	21
8:30	13	1	0	3	0	17	21	23	3	2	0	2	30	33	7	1	1	0	0	9	10
8:45	10	2	0	0	0	12	12	26	4	0	2	1	33	37	10	2	1	2	1	16	20
H/TOT	51	5	1	5	0	62	69	82	11	4	5	3	105	117	27	7	5	5	1	45	55
9:00	12	2	0	2	0	16	19	17	3	0	3	0	23	27	9	1	1	1	0	12	14
9:15	6	4	1	1	0	12	14	21	4	1	3	1	30	35	5	3	1	1	1	11	14
9:30	10	1	1	1	0	13	15	14	1	1	2	0	18	21	8	2	0	2	0	12	15
9:45	6	2	0	0	0	8	8	15	3	1	2	1	22	26	6	2	0	2	0	10	13
H/TOT	34	9	2	4	0	49	55	67	11	3	10	2	93	110	28	8	2	6	1	45	55
10:00	3	3	2	1	0	9	11	8	5	0	3	0	16	20	5	1	1	1	0	8	10
10:15	4	0	1	2	0	7	10	17	3	2	0	0	22	23	3	2	1	2	0	8	11
10:30	9	1	1	2	0	13	16	13	3	1	4	0	21	27	3	4	1	1	0	9	11
10:45	2	0	1	0	0	3	4	10	2	1	1	1	15	18	8	0	0	6	0	14	22
H/TOT	18	4	5	5	0	32	41	48	13	4	8	1	74	87	19	7	3	10	0	39	54
11:00	8	0	0	2	0	10	13	7	3	0	1	1	12	14	9	1	0	0	0	10	10
11:15	3	1	0	1	0	5	6	13	2	1	3	0	19	23	3	3	3	3	0	12	17
11:30	13	0	0	0	0	13	13	14	0	1	3	1	19	24	4	3	1	1	0	9	11
11:45	3	1	1	0	0	5	6	17	0	5	1	1	24	29	4	1	1	3	0	9	13
H/TOT	27	2	1	3	0	33	37	51	5	7	8	3	74	91	20	8	5	7	0	40	52
12:00	7	1	2	2	0	12	16	8	1	2	1	0	12	14	5	2	1	1	0	9	11
12:15	4	0	0	1	0	5	6	15	7	0	0	0	22	22	2	1	4	2	0	9	14
12:30	3	0	0	1	1	5	7	11	1	3	3	0	18	23	4	1	1	0	0	6	7
12:45	4	0	0	1	0	5	6	8	5	0	0	1	14	15	6	0	0	3	0	9	13
H/TOT	18	1	2	5	1	27	36	42	14	5	4	1	66	75	17	4	6	6	0	33	44

TRAFFINOMICS LIMITED

KNOCKHARLEY TRAFFIC COUNTS **APRIL 2025**

MANUAL CLASSIFIED JUNCTION TURNING COUNTS **TRA/25/046**

SITE: 04 DATE: 8th April 2025

LOCATION: N2/R150 DAY: Tuesday

	MOVEMENT 1							MOVEMENT 2							MOVEMENT 3						
TIME	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU
13:00	7	5	1	2	0	15	18	29	12	4	10	0	55	70	2	0	0	0	0	2	2
13:15	8	2	0	1	0	11	12	26	7	7	3	0	43	50	0	1	0	0	0	1	1
13:30	5	2	0	1	1	9	11	27	9	4	6	1	47	58	2	0	1	0	0	3	4
13:45	5	3	0	0	0	8	8	24	11	4	3	1	43	50	1	0	0	0	0	1	1
H/TOT	25	12	1	4	1	43	50	106	39	19	22	2	188	228	5	1	1	0	0	7	8
14:00	8	0	0	3	0	11	15	26	11	2	8	1	48	60	2	1	0	0	0	3	3
14:15	8	2	0	4	0	14	19	29	6	6	7	0	48	60	1	0	0	0	0	1	1
14:30	6	1	2	0	0	9	10	27	10	5	10	2	54	72	1	0	0	0	0	1	1
14:45	7	1	1	0	0	9	10	25	4	3	4	0	36	43	2	2	0	0	0	4	4
H/TOT	29	4	3	7	0	43	54	107	31	16	29	3	186	235	6	3	0	0	0	9	9
15:00	8	3	2	2	0	15	19	29	10	1	5	0	45	52	3	1	1	0	1	6	8
15:15	10	1	0	3	0	14	18	37	10	6	8	1	62	76	2	0	0	0	0	2	2
15:30	1	3	1	0	0	5	6	28	13	5	7	0	53	65	5	0	0	0	0	5	5
15:45	3	1	0	2	0	6	9	26	10	2	6	0	44	53	3	0	1	0	0	4	5
H/TOT	22	8	3	7	0	40	51	120	43	14	26	1	204	246	13	1	2	0	1	17	19
16:00	15	1	1	0	0	17	18	32	20	1	5	0	58	65	1	1	0	0	0	2	2
16:15	5	4	0	0	0	9	9	41	10	4	4	0	59	66	2	1	0	0	0	3	3
16:30	14	3	1	1	0	19	21	21	6	2	3	0	32	37	1	0	0	0	0	1	1
16:45	10	4	0	0	0	14	14	44	15	2	4	0	65	71	4	1	0	0	0	5	5
H/TOT	44	12	2	1	0	59	61	138	51	9	16	0	214	239	8	3	0	0	0	11	11
17:00	13	1	1	0	0	15	16	31	7	4	5	0	47	56	6	0	0	0	0	6	6
17:15	13	6	0	0	0	19	19	38	10	3	6	1	58	68	1	0	0	0	0	1	1
17:30	13	1	0	1	0	15	16	33	12	3	5	0	53	61	1	3	0	0	0	4	4
17:45	11	1	1	0	0	13	14	37	10	0	6	0	53	61	6	0	0	0	0	6	6
H/TOT	50	9	2	1	0	62	64	139	39	10	22	1	211	246	14	3	0	0	0	17	17
18:00	10	6	1	0	0	17	18	42	11	2	3	2	60	67	4	1	0	0	0	5	5
18:15	9	5	0	0	0	14	14	26	6	2	2	0	36	40	6	0	0	0	0	6	6
18:30	7	1	0	0	0	8	8	46	5	3	5	0	59	67	2	1	0	0	0	3	3
18:45	6	1	0	0	0	7	7	30	8	0	4	0	42	47	4	0	0	0	0	4	4
H/TOT	32	13	1	0	0	46	47	144	30	7	14	2	197	221	16	2	0	0	0	18	18
P/TOT	378	121	35	65	4	603	709	1914	620	177	393	21	3125	3745	106	22	5	3	1	137	144

TRAFFINOMICS LIMITED

KNOCKHARLEY TRAFFIC COUNTS **APRIL 2025**

MANUAL CLASSIFIED JUNCTION TURNING COUNTS **TRA/25/046**

SITE: 04 DATE: 8th April 2025

LOCATION: N2/R150 DAY: Tuesday

	MOVEMENT 4							MOVEMENT 5							MOVEMENT 6						
TIME	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU
13:00	2	0	0	0	0	2	2	15	0	0	0	0	15	15	1	0	0	0	0	1	1
13:15	5	0	1	0	0	6	7	10	0	1	0	0	11	12	4	0	0	0	0	4	4
13:30	2	0	0	0	0	2	2	9	3	0	6	1	19	28	1	0	0	0	0	1	1
13:45	4	1	0	0	1	6	7	15	1	2	0	0	18	19	2	1	0	0	0	3	3
H/TOT	13	1	1	0	1	16	18	49	4	3	6	1	63	73	8	1	0	0	0	9	9
14:00	3	0	0	0	0	3	3	18	7	0	0	0	25	25	3	0	0	0	0	3	3
14:15	1	1	0	0	0	2	2	19	1	0	1	2	23	26	0	0	0	0	0	0	0
14:30	5	0	0	0	0	5	5	17	2	1	1	1	22	25	2	2	0	0	0	4	4
14:45	3	3	0	0	0	6	6	18	1	1	2	2	24	29	3	0	0	0	0	3	3
H/TOT	12	4	0	0	0	16	16	72	11	2	4	5	94	105	8	2	0	0	0	10	10
15:00	1	2	0	0	0	3	3	18	4	2	1	1	26	29	4	0	0	0	0	4	4
15:15	1	0	0	0	0	1	1	16	0	0	0	2	18	20	1	0	0	0	1	2	3
15:30	6	0	0	0	0	6	6	21	2	0	2	2	27	32	4	1	0	0	0	5	5
15:45	4	1	0	0	2	7	9	16	3	1	0	0	20	21	0	0	0	0	0	0	0
H/TOT	12	3	0	0	2	17	19	71	9	3	3	5	91	101	9	1	0	0	1	11	12
16:00	2	2	0	0	0	4	4	12	3	3	1	0	19	22	3	0	0	0	0	3	3
16:15	4	1	0	0	0	5	5	25	3	1	1	0	30	32	0	1	0	0	0	1	1
16:30	0	0	0	0	0	0	0	18	3	2	1	0	24	26	5	0	0	0	0	5	5
16:45	2	0	0	0	0	2	2	16	2	0	0	1	19	20	4	0	0	1	0	5	6
H/TOT	8	3	0	0	0	11	11	71	11	6	3	1	92	100	12	1	0	1	0	14	15
17:00	4	1	0	0	0	5	5	15	3	0	1	1	20	22	2	1	0	0	0	3	3
17:15	5	0	0	0	0	5	5	13	4	1	0	0	18	19	2	0	0	0	0	2	2
17:30	1	1	0	0	0	2	2	29	2	0	3	0	34	38	2	1	0	0	0	3	3
17:45	1	0	0	0	0	1	1	27	2	0	1	1	31	33	3	1	0	0	0	4	4
H/TOT	11	2	0	0	0	13	13	84	11	1	5	2	103	112	9	3	0	0	0	12	12
18:00	5	0	0	0	0	5	5	20	2	0	0	0	22	22	3	1	0	0	0	4	4
18:15	3	1	0	0	0	4	4	16	4	0	0	0	20	20	4	1	1	0	0	6	7
18:30	1	0	0	1	0	2	3	15	1	0	1	0	17	18	5	1	0	0	0	6	6
18:45	3	0	0	0	0	3	3	15	2	0	0	1	18	19	2	2	0	0	0	4	4
H/TOT	12	1	0	1	0	14	15	66	9	0	1	1	77	79	14	5	1	0	0	20	21
P/TOT	123	24	5	3	5	160	171	774	147	41	69	25	1056	1191	136	29	4	2	2	173	180

TRAFFINOMICS LIMITED

KNOCKHARLEY TRAFFIC COUNTS **APRIL 2025**

MANUAL CLASSIFIED JUNCTION TURNING COUNTS **TRA/25/046**

SITE: 04 DATE: 8th April 2025

LOCATION: N2/R150 DAY: Tuesday

	MOVEMENT 7							MOVEMENT 8							MOVEMENT 9						
TIME	**CAR**	**LGV**	**OGV1**	**OGV2**	**BUS**	**TOT**	**PCU**	**CAR**	**LGV**	**OGV1**	**OGV2**	**BUS**	**TOT**	**PCU**	**CAR**	**LGV**	**OGV1**	**OGV2**	**BUS**	**TOT**	**PCU**
13:00	1	0	0	0	0	1	1	37	18	5	12	0	72	90	8	3	0	2	0	13	16
13:15	1	0	0	0	1	2	3	37	16	4	8	0	65	77	6	1	1	2	0	10	13
13:30	3	0	0	0	0	3	3	30	15	1	10	0	56	70	4	1	1	0	0	6	7
13:45	2	0	0	0	0	2	2	27	15	6	11	1	60	78	8	11	2	3	0	24	29
H/TOT	7	0	0	0	1	8	9	131	64	16	41	1	253	315	26	16	4	7	0	53	64
14:00	2	2	0	0	0	4	4	25	20	3	16	0	64	86	4	3	0	0	0	7	7
14:15	4	0	0	1	0	5	6	36	11	4	7	0	58	69	7	3	0	0	0	10	10
14:30	6	0	0	0	0	6	6	30	18	2	7	0	57	67	4	2	0	1	0	7	8
14:45	5	1	0	0	0	6	6	59	13	5	11	0	88	105	9	3	0	0	1	13	14
H/TOT	17	3	0	1	0	21	22	150	62	14	41	0	267	327	24	11	0	1	1	37	39
15:00	4	3	0	0	0	7	7	38	15	7	17	0	77	103	4	1	1	1	0	7	9
15:15	4	1	0	0	0	5	5	59	21	6	5	0	91	101	12	3	2	0	1	18	20
15:30	4	1	0	0	0	5	5	30	37	1	6	1	75	84	11	6	4	1	0	22	25
15:45	5	1	0	0	0	6	6	71	16	5	10	0	102	118	10	2	2	0	0	14	15
H/TOT	17	6	0	0	0	23	23	198	89	19	38	1	345	405	37	12	9	2	1	61	69
16:00	4	0	0	0	0	4	4	56	29	5	9	0	99	113	17	6	1	0	0	24	25
16:15	3	4	0	0	0	7	7	67	29	5	7	0	108	120	16	3	0	0	0	19	19
16:30	2	2	0	0	0	4	4	71	30	3	7	0	111	122	18	6	1	0	0	25	26
16:45	6	0	0	0	0	6	6	77	44	6	4	1	132	141	14	4	0	0	0	18	18
H/TOT	15	6	0	0	0	21	21	271	132	19	27	1	450	496	65	19	2	0	0	86	87
17:00	8	1	0	0	0	9	9	83	32	5	4	1	125	134	16	9	2	0	1	28	30
17:15	6	3	1	0	1	11	13	95	38	4	11	2	150	168	20	11	1	1	0	33	35
17:30	8	2	0	0	0	10	10	102	33	4	4	0	143	150	27	9	0	0	0	36	36
17:45	8	3	0	0	0	11	11	102	31	4	3	1	141	148	21	3	1	0	0	25	26
H/TOT	30	9	1	0	1	41	43	382	134	17	22	4	559	600	84	32	4	1	1	122	126
18:00	4	0	0	0	0	4	4	83	22	3	8	0	116	128	30	2	0	0	0	32	32
18:15	4	0	0	0	0	4	4	67	19	2	2	1	91	96	29	7	0	0	0	36	36
18:30	2	0	0	0	0	2	2	57	20	1	2	0	80	83	11	3	1	0	0	15	16
18:45	6	0	0	0	0	6	6	53	12	1	4	0	70	76	12	1	1	0	1	15	17
H/TOT	16	0	0	0	0	16	16	260	73	7	16	1	357	382	82	13	2	0	1	98	100
P/TOT	165	38	3	3	7	216	228	1905	805	160	428	18	3316	3970	485	171	39	29	6	730	793

TRAFFINOMICS LIMITED

KNOCKHARLEY TRAFFIC COUNTS **APRIL 2025**

MANUAL CLASSIFIED JUNCTION TURNING COUNTS **TRA/25/046**

SITE: 04 DATE: 8th April 2025

LOCATION: N2/R150 DAY: Tuesday

	MOVEMENT 10							MOVEMENT 11							MOVEMENT 12						
TIME	**CAR**	**LGV**	**OGV1**	**OGV2**	**BUS**	**TOT**	**PCU**	**CAR**	**LGV**	**OGV1**	**OGV2**	**BUS**	**TOT**	**PCU**	**CAR**	**LGV**	**OGV1**	**OGV2**	**BUS**	**TOT**	**PCU**
13:00	2	3	0	0	0	5	5	13	1	0	2	0	16	19	3	2	0	1	1	7	9
13:15	4	0	0	1	0	5	6	10	2	1	1	1	15	18	7	1	0	1	0	9	10
13:30	3	2	0	0	0	5	5	13	3	1	3	0	20	24	4	2	1	1	0	8	10
13:45	6	4	1	1	0	12	14	15	1	1	5	1	23	31	9	0	2	3	0	14	19
H/TOT	15	9	1	2	0	27	30	51	7	3	11	2	74	92	23	5	3	6	1	38	48
14:00	2	0	0	0	1	3	4	14	5	1	2	0	22	25	11	2	0	3	0	16	20
14:15	6	1	0	1	0	8	9	12	3	1	1	0	17	19	1	2	0	0	0	3	3
14:30	2	2	1	1	0	6	8	13	3	0	2	1	19	23	3	2	1	2	0	8	11
14:45	4	2	0	2	0	8	11	9	2	1	1	1	14	17	9	4	0	2	0	15	18
H/TOT	14	5	1	4	1	25	32	48	13	3	6	2	72	83	24	10	1	7	0	42	52
15:00	7	2	0	0	0	9	9	15	1	1	0	1	18	20	7	1	0	4	0	12	17
15:15	3	0	2	0	0	5	6	10	1	0	1	0	12	13	5	0	1	0	0	6	7
15:30	6	2	1	0	1	10	12	21	1	1	0	0	23	24	10	4	1	1	0	16	18
15:45	3	0	0	0	0	3	3	18	3	1	0	1	23	25	8	4	0	1	1	14	16
H/TOT	19	4	3	0	1	27	30	64	6	3	1	2	76	81	30	9	2	6	1	48	58
16:00	6	0	2	0	0	8	9	15	2	1	0	0	18	19	10	5	2	2	0	19	23
16:15	14	4	0	1	0	19	20	22	8	0	0	0	30	30	4	0	2	1	1	8	11
16:30	8	2	1	1	0	12	14	26	3	0	0	0	29	29	7	4	1	0	0	12	13
16:45	7	6	0	1	0	14	15	15	6	1	1	1	24	27	9	5	1	1	0	16	18
H/TOT	35	12	3	3	0	53	58	78	19	2	1	1	101	104	30	14	6	4	1	55	64
17:00	14	5	0	0	0	19	19	14	3	1	0	0	18	19	11	9	2	2	0	24	28
17:15	7	5	0	0	0	12	12	22	4	0	0	0	26	26	12	4	0	0	0	16	16
17:30	15	2	0	0	0	17	17	25	6	0	3	0	34	38	9	4	0	1	0	14	15
17:45	8	3	0	0	0	11	11	17	4	2	1	2	26	30	12	4	1	0	0	17	18
H/TOT	44	15	0	0	0	59	59	78	17	3	4	2	104	113	44	21	3	3	0	71	76
18:00	5	2	0	0	2	9	11	15	3	0	0	0	18	18	8	1	1	0	0	10	11
18:15	6	7	0	0	3	16	19	22	5	1	0	0	28	29	4	1	0	1	0	6	7
18:30	10	6	0	0	0	16	16	14	4	0	1	0	19	20	8	1	0	0	0	9	9
18:45	7	2	0	0	1	10	11	6	1	0	0	1	8	9	8	3	0	0	0	11	11
H/TOT	28	17	0	0	6	51	57	57	13	1	1	1	73	76	28	6	1	1	0	36	38
P/TOT	392	106	21	31	11	561	623	744	137	39	67	22	1009	1138	309	106	38	63	5	521	627

TRAFFINOMICS LIMITED

KNOCKHARLEY TRAFFIC COUNTS **APRIL 2025**

MANUAL CLASSIFIED JUNCTION TURNING COUNTS **TRA/25/046**

SITE: 05 DATE: 8th April 2025

LOCATION: R150/R153 Kentstown DAY: Tuesday

	MOVEMENT 1							MOVEMENT 2							MOVEMENT 3						
TIME	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU
7:00	5	4	0	0	0	9	9	9	0	0	1	0	10	11	20	6	1	0	0	27	28
7:15	2	1	0	0	0	3	3	19	4	0	0	0	23	23	16	6	2	1	0	25	27
7:30	5	1	0	1	0	7	8	24	4	1	4	1	34	41	31	10	1	4	3	49	58
7:45	7	6	0	0	1	14	15	38	3	0	3	4	48	56	29	7	2	3	0	41	46
H/TOT	19	12	0	1	1	33	35	90	11	1	8	5	115	131	96	29	6	8	3	142	158
8:00	4	1	0	0	0	5	5	31	2	0	0	0	33	33	27	7	0	1	0	35	36
8:15	9	1	0	0	0	10	10	29	5	1	3	0	38	42	30	8	1	2	0	41	44
8:30	4	0	0	0	0	4	4	19	3	2	0	1	25	27	33	2	0	2	2	39	44
8:45	12	2	0	0	1	15	16	47	4	2	3	1	57	63	63	3	1	0	0	67	68
H/TOT	29	4	0	0	1	34	35	126	14	5	6	2	153	165	153	20	2	5	2	182	192
9:00	9	4	0	0	0	13	13	45	8	0	3	1	57	62	23	6	3	4	0	36	43
9:15	7	2	0	2	1	12	16	32	3	1	1	1	38	41	18	5	0	1	1	25	27
9:30	4	2	0	0	0	6	6	19	2	0	0	0	21	21	21	2	1	2	0	26	29
9:45	3	0	1	0	1	5	7	22	6	1	4	0	33	39	26	7	2	3	0	38	43
H/TOT	23	8	1	2	2	36	41	118	19	2	8	2	149	162	88	20	6	10	1	125	142
10:00	3	0	0	0	0	3	3	18	5	1	3	0	27	31	13	2	2	2	0	19	23
10:15	4	0	0	0	0	4	4	18	3	1	0	0	22	23	9	2	1	1	2	15	19
10:30	1	2	0	0	0	3	3	31	5	1	3	0	40	44	18	6	0	0	0	24	24
10:45	4	0	1	0	1	6	8	16	5	0	2	0	23	26	15	3	3	0	0	21	23
H/TOT	12	2	1	0	1	16	18	83	18	3	8	0	112	124	55	13	6	3	2	79	88
11:00	3	0	0	0	0	3	3	17	4	0	1	1	23	25	20	2	4	3	0	29	35
11:15	3	0	0	0	0	3	3	17	2	0	3	0	22	26	11	6	0	3	0	20	24
11:30	4	0	2	0	0	6	7	19	3	1	2	1	26	30	20	3	1	3	0	27	31
11:45	6	1	1	0	0	8	9	22	1	4	3	0	30	36	29	4	2	3	0	38	43
H/TOT	16	1	3	0	0	20	22	75	10	5	9	2	101	117	80	15	7	12	0	114	133
12:00	5	2	0	0	1	8	9	23	3	0	0	0	26	26	14	1	0	0	0	15	15
12:15	5	1	1	1	0	8	10	13	3	1	0	0	17	18	21	5	0	2	0	28	31
12:30	3	2	0	0	0	5	5	23	4	3	3	0	33	38	26	2	1	3	0	32	36
12:45	6	1	0	0	0	7	7	16	2	0	0	0	18	18	19	5	1	1	0	26	28
H/TOT	19	6	1	1	1	28	31	75	12	4	3	0	94	100	80	13	2	6	0	101	110

TRAFFINOMICS LIMITED

KNOCKHARLEY TRAFFIC COUNTS **APRIL 2025**

MANUAL CLASSIFIED JUNCTION TURNING COUNTS **TRA/25/046**

SITE: 05 DATE: 8th April 2025

LOCATION: R150/R153 Kentstown DAY: Tuesday

	MOVEMENT 4							MOVEMENT 5							MOVEMENT 6						
TIME	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU
7:00	33	19	0	0	2	54	56	11	2	0	0	1	14	15	0	0	0	0	0	0	0
7:15	31	6	0	0	1	38	39	8	2	1	0	0	11	12	0	0	0	0	0	0	0
7:30	37	8	1	0	2	48	51	15	6	0	0	0	21	21	2	1	0	0	0	3	3
7:45	48	6	1	1	0	56	58	20	6	2	3	0	31	36	4	1	0	0	0	5	5
H/TOT	149	39	2	1	5	196	203	54	16	3	3	1	77	83	6	2	0	0	0	8	8
8:00	38	2	3	0	0	43	45	14	2	2	0	0	18	19	3	1	0	0	0	4	4
8:15	28	4	1	0	1	34	36	11	4	0	1	1	17	19	2	0	0	0	1	3	4
8:30	35	3	0	1	0	39	40	15	7	3	1	0	26	29	7	1	0	0	0	8	8
8:45	29	3	0	0	1	33	34	19	4	0	1	0	24	25	8	2	0	1	1	12	14
H/TOT	130	12	4	1	2	149	154	59	17	5	3	1	85	92	20	4	0	1	2	27	30
9:00	24	4	2	0	0	30	31	16	2	1	0	0	19	20	3	2	0	0	0	5	5
9:15	22	3	0	0	0	25	25	13	3	0	1	0	17	18	5	0	0	0	0	5	5
9:30	17	9	4	0	1	31	34	17	1	0	0	0	18	18	5	2	0	0	0	7	7
9:45	27	4	2	1	0	34	36	13	5	1	1	0	20	22	6	0	0	0	1	7	8
H/TOT	90	20	8	1	1	120	126	59	11	2	2	0	74	78	19	4	0	0	1	24	25
10:00	18	2	1	0	0	21	22	19	5	1	1	0	26	28	3	0	0	0	0	3	3
10:15	16	3	0	4	0	23	28	13	6	0	2	0	21	24	7	0	0	0	0	7	7
10:30	20	4	1	1	0	26	28	11	7	1	2	0	21	24	1	2	0	0	1	4	5
10:45	15	3	0	0	0	18	18	21	5	0	0	0	26	26	2	1	0	0	0	3	3
H/TOT	69	12	2	5	0	88	96	64	23	2	5	0	94	102	13	3	0	0	1	17	18
11:00	23	4	2	1	0	30	32	17	3	2	2	0	24	28	3	0	2	0	0	5	6
11:15	36	6	1	4	1	48	55	11	2	0	2	1	16	20	2	0	0	0	0	2	2
11:30	40	6	1	2	0	49	52	20	6	0	0	0	26	26	5	0	0	0	1	6	7
11:45	41	7	1	2	0	51	54	17	1	1	1	0	20	22	6	0	0	0	0	6	6
H/TOT	140	23	5	9	1	178	193	65	12	3	5	1	86	95	16	0	2	0	1	19	21
12:00	19	2	0	1	0	22	23	9	3	0	1	0	13	14	7	0	0	0	0	7	7
12:15	18	5	1	0	0	24	25	21	6	1	0	0	28	29	4	0	0	0	0	4	4
12:30	18	5	1	0	0	24	25	19	4	2	0	0	25	26	4	1	0	0	0	5	5
12:45	17	2	0	0	0	19	19	19	2	0	0	0	21	21	6	0	1	0	0	7	8
H/TOT	72	14	2	1	0	89	91	68	15	3	1	0	87	90	21	1	1	0	0	23	24

TRAFFINOMICS LIMITED

KNOCKHARLEY TRAFFIC COUNTS **APRIL 2025**

MANUAL CLASSIFIED JUNCTION TURNING COUNTS **TRA/25/046**

SITE: 05 DATE: 8th April 2025

LOCATION: R150/R153 Kentstown DAY: Tuesday

	MOVEMENT 1							MOVEMENT 2							MOVEMENT 3						
TIME	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU
13:00	5	0	0	0	1	6	7	17	4	0	0	0	21	21	18	2	0	0	0	20	20
13:15	5	0	0	0	0	5	5	19	5	2	3	0	29	34	26	4	1	1	0	32	34
13:30	2	5	0	0	0	7	7	27	4	3	2	0	36	40	26	3	0	4	0	33	38
13:45	0	1	0	0	0	1	1	25	8	1	3	0	37	41	21	2	2	0	0	25	26
H/TOT	12	6	0	0	1	19	20	88	21	6	8	0	123	136	91	11	3	5	0	110	118
14:00	1	0	0	1	1	3	5	19	8	1	3	0	31	35	26	9	0	0	0	35	35
14:15	2	0	0	0	0	2	2	24	4	2	3	0	33	38	18	3	1	2	3	27	33
14:30	1	1	0	1	0	3	4	20	3	0	1	0	24	25	32	4	0	1	1	38	40
14:45	4	1	0	0	0	5	5	21	4	1	0	1	27	29	28	1	1	1	1	32	35
H/TOT	8	2	0	2	1	13	17	84	19	4	7	1	115	127	104	17	2	4	5	132	143
15:00	8	0	0	0	2	10	12	21	3	1	1	1	27	30	23	4	2	1	0	30	32
15:15	3	0	0	0	0	3	3	15	0	1	1	0	17	19	29	0	0	1	3	33	37
15:30	14	2	0	0	1	17	18	33	1	0	0	1	35	36	27	7	0	1	2	37	40
15:45	5	1	0	0	0	6	6	18	6	2	0	0	26	27	17	1	2	0	2	22	25
H/TOT	30	3	0	0	3	36	39	87	10	4	2	2	105	112	96	12	4	3	7	122	135
16:00	5	1	0	0	1	7	8	39	2	1	0	0	42	43	19	4	2	1	0	26	28
16:15	2	1	0	0	0	3	3	24	8	0	0	0	32	32	31	1	2	0	0	34	35
16:30	5	2	0	0	0	7	7	22	7	0	0	0	29	29	37	6	2	1	2	48	52
16:45	2	0	0	0	0	2	2	25	5	0	1	0	31	32	26	3	0	1	0	30	31
H/TOT	14	4	0	0	1	19	20	110	22	1	1	0	134	136	113	14	6	3	2	138	147
17:00	8	0	0	0	1	9	10	18	3	1	0	0	22	23	36	8	0	1	1	46	48
17:15	4	2	0	0	0	6	6	30	6	0	0	0	36	36	30	5	1	1	0	37	39
17:30	6	1	1	0	0	8	9	42	5	0	3	0	50	54	27	4	0	2	0	33	36
17:45	3	0	0	0	1	4	5	35	7	1	1	1	45	48	36	3	0	1	0	40	41
H/TOT	21	3	1	0	2	27	30	125	21	2	4	1	153	160	129	20	1	5	1	156	164
18:00	7	0	0	0	0	7	7	17	4	1	0	0	22	23	26	6	1	0	0	33	34
18:15	9	2	2	0	1	14	16	30	3	0	0	0	33	33	25	3	1	0	0	29	30
18:30	2	1	0	0	0	3	3	25	1	0	1	0	27	28	28	2	0	1	0	31	32
18:45	2	0	0	0	1	3	4	17	1	0	0	0	18	18	26	2	0	0	0	28	28
H/TOT	20	3	2	0	2	27	30	89	9	1	1	0	100	102	105	13	2	1	0	121	123
P/TOT	223	54	9	6	16	308	336	1150	186	38	65	15	1454	1573	1190	197	47	65	23	1522	1653

TRAFFINOMICS LIMITED

KNOCKHARLEY TRAFFIC COUNTS **APRIL 2025**

MANUAL CLASSIFIED JUNCTION TURNING COUNTS **TRA/25/046**

SITE: 05 DATE: 8th April 2025

LOCATION: R150/R153 Kentstown DAY: Tuesday

	MOVEMENT 4							MOVEMENT 5							MOVEMENT 6						
TIME	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU
13:00	13	4	1	0	0	18	19	16	4	1	1	1	23	26	2	1	0	0	0	3	3
13:15	31	3	0	0	1	35	36	15	12	4	0	1	32	35	3	1	0	0	0	4	4
13:30	18	4	2	0	0	24	25	25	3	1	0	0	29	30	6	1	0	0	1	8	9
13:45	26	4	0	1	0	31	32	28	3	0	0	0	31	31	6	1	0	0	0	7	7
H/TOT	88	15	3	1	1	108	112	84	22	6	1	2	115	121	17	4	0	0	1	22	23
14:00	17	1	1	1	0	20	22	27	2	3	1	0	33	36	6	1	1	0	0	8	9
14:15	24	4	3	0	0	31	33	19	5	2	0	0	26	27	4	1	0	0	0	5	5
14:30	15	10	2	2	0	29	33	14	3	1	0	0	18	19	5	1	0	0	1	7	8
14:45	24	2	0	0	0	26	26	15	12	0	0	0	27	27	6	1	0	0	0	7	7
H/TOT	80	17	6	3	0	106	113	75	22	6	1	0	104	108	21	4	1	0	1	27	29
15:00	20	3	1	1	0	25	27	23	5	1	0	1	30	32	4	1	1	0	0	6	7
15:15	15	4	1	0	2	22	25	35	5	0	0	0	40	40	9	1	0	0	0	10	10
15:30	13	1	0	0	0	14	14	26	7	0	0	2	35	37	6	2	0	0	1	9	10
15:45	16	6	1	0	1	24	26	23	4	2	0	2	31	34	8	1	0	0	0	9	9
H/TOT	64	14	3	1	3	85	91	107	21	3	0	5	136	143	27	5	1	0	1	34	36
16:00	17	2	0	1	0	20	21	29	8	0	1	1	39	41	4	3	0	0	0	7	7
16:15	22	3	1	0	0	26	27	41	8	3	0	0	52	54	8	3	0	0	0	11	11
16:30	19	6	0	0	1	26	27	40	7	3	0	0	50	52	8	3	0	0	0	11	11
16:45	16	1	0	0	0	17	17	34	7	1	0	0	42	43	8	2	0	0	1	11	12
H/TOT	74	12	1	1	1	89	92	144	30	7	1	1	183	189	28	11	0	0	1	40	41
17:00	28	3	0	0	0	31	31	45	10	1	0	0	56	57	13	1	0	0	0	14	14
17:15	22	7	0	0	1	30	31	35	4	2	1	0	42	44	8	1	0	0	0	9	9
17:30	23	3	0	0	0	26	26	47	12	1	0	1	61	63	10	2	0	0	0	12	12
17:45	25	7	1	0	0	33	34	43	8	1	0	0	52	53	11	2	0	0	1	14	15
H/TOT	98	20	1	0	1	120	122	170	34	5	1	1	211	216	42	6	0	0	1	49	50
18:00	13	4	0	0	0	17	17	36	6	0	0	0	42	42	3	0	0	0	0	3	3
18:15	22	1	0	0	0	23	23	29	6	0	0	0	35	35	5	1	0	1	0	7	8
18:30	14	1	0	0	0	15	15	35	5	1	0	0	41	42	11	0	0	0	0	11	11
18:45	14	3	0	0	0	17	17	34	4	0	0	1	39	40	9	0	0	0	1	10	11
H/TOT	63	9	0	0	0	72	72	134	21	1	0	1	157	159	28	1	0	1	1	31	33
P/TOT	1117	207	37	24	15	1400	1465	1083	244	46	23	13	1409	1475	258	45	5	2	11	321	337

TRAFFINOMICS LIMITED

KNOCKHARLEY TRAFFIC COUNTS **APRIL 2025**

MANUAL CLASSIFIED JUNCTION TURNING COUNTS **TRA/25/046**

SITE: 06 DATE: 8th April 2025

LOCATION: N2/R153/L1610 Balrath Cross DAY: Tuesday

	MOVEMENT 1							MOVEMENT 2							MOVEMENT 3						
TIME	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU
7:00	1	1	0	0	0	2	2	93	48	3	7	2	153	166	6	4	0	0	1	11	12
7:15	1	2	0	0	0	3	3	107	37	8	6	1	159	172	3	3	0	0	1	7	8
7:30	1	0	2	1	1	5	8	112	16	9	7	2	146	162	4	4	0	0	0	8	8
7:45	2	0	0	0	0	2	2	91	30	6	4	0	131	139	19	4	1	0	0	24	25
H/TOT	5	3	2	1	1	12	15	403	131	26	24	5	589	638	32	15	1	0	2	50	53
8:00	0	1	0	1	0	2	3	99	27	3	9	1	139	153	10	1	0	1	0	12	13
8:15	3	1	0	0	0	4	4	84	25	6	14	0	129	150	8	1	1	2	0	12	15
8:30	2	0	1	0	0	3	4	83	20	7	14	0	124	146	3	2	0	0	0	5	5
8:45	5	1	0	0	0	6	6	71	17	2	9	1	100	114	5	4	0	1	0	10	11
H/TOT	10	3	1	1	0	15	17	337	89	18	46	2	492	563	26	8	1	4	0	39	45
9:00	1	0	0	0	0	1	1	62	15	2	9	0	88	101	6	0	0	1	0	7	8
9:15	1	1	0	0	0	2	2	64	15	2	17	1	99	123	6	1	1	0	0	8	9
9:30	0	0	0	0	0	0	0	61	14	2	9	0	86	99	7	1	2	2	0	12	16
9:45	3	1	0	0	0	4	4	46	13	4	10	3	76	94	3	1	0	1	0	5	6
H/TOT	5	2	0	0	0	7	7	233	57	10	45	4	349	417	22	3	3	4	0	32	39
10:00	1	0	0	0	0	1	1	35	16	2	11	0	64	79	7	2	2	0	0	11	12
10:15	0	0	2	0	0	2	3	46	16	2	13	0	77	95	3	1	0	1	0	5	6
10:30	1	0	0	0	0	1	1	34	11	6	12	0	63	82	6	0	0	0	0	6	6
10:45	1	0	1	0	0	2	3	34	8	4	10	0	56	71	0	0	1	0	0	1	2
H/TOT	3	0	3	0	0	6	8	149	51	14	46	0	260	327	16	3	3	1	0	23	26
11:00	1	0	0	1	0	2	3	32	10	3	12	1	58	76	6	0	1	2	0	9	12
11:15	0	0	0	0	0	0	0	29	6	2	10	0	47	61	5	1	0	2	0	8	11
11:30	0	1	0	0	0	1	1	30	7	3	17	0	57	81	8	0	0	0	0	8	8
11:45	1	0	2	1	0	4	6	31	10	2	11	0	54	69	3	2	3	1	0	9	12
H/TOT	2	1	2	2	0	7	11	122	33	10	50	1	216	287	22	3	4	5	0	34	43
12:00	0	0	0	1	0	1	2	26	6	6	14	2	54	77	6	1	0	0	0	7	7
12:15	0	0	0	0	0	0	0	31	8	4	10	0	53	68	2	1	1	2	0	6	9
12:30	1	0	0	0	0	1	1	27	13	6	12	0	58	77	2	1	1	1	1	6	9
12:45	1	0	0	1	0	2	3	20	7	9	10	0	46	64	2	0	1	0	0	3	4
H/TOT	2	0	0	2	0	4	7	104	34	25	46	2	211	285	12	3	3	3	1	22	28

TRAFFINOMICS LIMITED

KNOCKHARLEY TRAFFIC COUNTS **APRIL 2025**

MANUAL CLASSIFIED JUNCTION TURNING COUNTS **TRA/25/046**

SITE: 06 DATE: 8th April 2025

LOCATION: N2/R153/L1610 Balrath Cross DAY: Tuesday

	MOVEMENT 4							MOVEMENT 5							MOVEMENT 6						
TIME	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU
7:00	4	4	0	0	0	8	8	7	5	0	0	1	13	14	15	3	1	1	1	21	24
7:15	4	5	0	0	0	9	9	2	3	1	0	0	6	7	9	3	0	0	0	12	12
7:30	9	4	1	1	1	16	19	8	4	2	0	0	14	15	13	3	0	0	0	16	16
7:45	11	7	2	0	1	21	23	11	5	1	0	0	17	18	22	4	1	0	0	27	28
H/TOT	28	20	3	1	2	54	59	28	17	4	0	1	50	53	59	13	2	1	1	76	79
8:00	7	4	1	1	0	13	15	16	2	0	0	0	18	18	24	4	2	1	1	32	35
8:15	11	2	0	1	0	14	15	8	1	1	0	1	11	13	18	2	0	0	0	20	20
8:30	4	1	0	2	0	7	10	17	3	0	0	0	20	20	16	3	2	1	0	22	24
8:45	11	2	0	2	0	15	18	15	2	0	0	0	17	17	12	3	0	0	1	16	17
H/TOT	33	9	1	6	0	49	57	56	8	1	0	1	66	68	70	12	4	2	2	90	97
9:00	9	9	2	1	0	21	23	12	0	0	0	0	12	12	23	4	2	1	1	31	34
9:15	9	5	0	1	0	15	16	6	2	0	0	0	8	8	30	4	2	0	1	37	39
9:30	2	3	0	0	0	5	5	4	3	0	0	1	8	9	28	7	2	0	1	38	40
9:45	6	2	0	0	0	8	8	7	0	2	0	0	9	10	22	0	0	1	0	23	24
H/TOT	26	19	2	2	0	49	53	29	5	2	0	1	37	39	103	15	6	2	3	129	138
10:00	3	2	0	1	0	6	7	9	0	1	0	0	10	11	21	2	0	1	1	25	27
10:15	8	0	2	1	0	11	13	2	1	1	1	0	5	7	15	6	1	2	0	24	27
10:30	3	1	0	0	0	4	4	7	2	0	0	0	9	9	15	2	2	1	0	20	22
10:45	2	2	1	1	0	6	8	3	3	1	0	0	7	8	16	4	0	0	0	20	20
H/TOT	16	5	3	3	0	27	32	21	6	3	1	0	31	34	67	14	3	4	1	89	97
11:00	5	0	0	0	0	5	5	5	0	1	0	0	6	7	21	3	0	1	1	26	28
11:15	3	3	0	0	0	6	6	2	2	1	0	2	7	10	21	3	4	0	0	28	30
11:30	2	1	2	0	0	5	6	7	1	0	2	0	10	13	17	3	2	0	0	22	23
11:45	7	0	2	1	1	11	14	8	0	0	0	0	8	8	16	4	2	1	0	23	25
H/TOT	17	4	4	1	1	27	31	22	3	2	2	2	31	37	75	13	8	2	1	99	107
12:00	6	2	0	0	0	8	8	6	2	1	0	0	9	10	23	2	0	2	1	28	32
12:15	5	1	2	0	0	8	9	3	1	0	0	0	4	4	18	3	0	0	0	21	21
12:30	2	1	0	2	0	5	8	6	3	1	1	0	11	13	15	5	1	1	0	22	24
12:45	5	0	0	2	0	7	10	6	1	0	0	0	7	7	17	3	0	0	0	20	20
H/TOT	18	4	2	4	0	28	34	21	7	2	1	0	31	33	73	13	1	3	1	91	96

TRAFFINOMICS LIMITED

KNOCKHARLEY TRAFFIC COUNTS **APRIL 2025**

MANUAL CLASSIFIED JUNCTION TURNING COUNTS **TRA/25/046**

SITE: 06 DATE: 8th April 2025

LOCATION: N2/R153/L1610 Balrath Cross DAY: Tuesday

	MOVEMENT 7							MOVEMENT 8							MOVEMENT 9						
TIME	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU
7:00	13	3	0	0	0	16	16	22	6	0	8	2	38	50	1	1	0	1	0	3	4
7:15	12	6	0	0	0	18	18	49	15	1	7	0	72	82	0	0	0	0	0	0	0
7:30	17	6	0	1	0	24	25	29	12	1	9	0	51	63	0	0	0	0	0	0	0
7:45	18	7	2	4	0	31	37	35	21	1	14	0	71	90	2	1	1	4	0	8	14
H/TOT	60	22	2	5	0	89	97	135	54	3	38	2	232	285	3	2	1	5	0	11	18
8:00	8	4	1	0	0	13	14	22	7	2	6	0	37	46	3	1	0	0	0	4	4
8:15	7	9	2	0	1	19	21	24	10	4	6	1	45	56	1	0	2	0	0	3	4
8:30	11	4	2	1	0	18	20	20	11	6	16	0	53	77	0	0	0	0	0	0	0
8:45	17	3	1	0	0	21	22	27	10	5	7	0	49	61	1	1	0	0	0	2	2
H/TOT	43	20	6	1	1	71	76	93	38	17	35	1	184	239	5	2	2	0	0	9	10
9:00	12	1	2	0	0	15	16	29	7	2	9	0	47	60	1	0	0	0	0	1	1
9:15	11	3	0	1	0	15	16	17	10	2	11	1	41	57	1	0	0	0	0	1	1
9:30	10	5	1	0	0	16	17	19	8	3	11	0	41	57	2	0	0	0	0	2	2
9:45	10	6	2	2	1	21	26	15	8	3	11	0	37	53	1	1	0	0	0	2	2
H/TOT	43	15	5	3	1	67	74	80	33	10	42	1	166	227	5	1	0	0	0	6	6
10:00	13	5	0	1	0	19	20	19	9	2	18	1	49	74	1	0	0	0	0	1	1
10:15	11	6	0	0	0	17	17	25	8	1	16	1	51	73	0	3	0	0	0	3	3
10:30	18	6	2	1	1	28	31	25	13	2	14	1	55	75	2	0	0	0	0	2	2
10:45	18	3	0	0	0	21	21	25	9	0	9	0	43	55	1	2	0	0	0	3	3
H/TOT	60	20	2	2	1	85	90	94	39	5	57	3	198	278	4	5	0	0	0	9	9
11:00	14	4	3	1	0	22	25	33	12	2	8	1	56	68	1	0	0	1	0	2	3
11:15	10	1	1	2	0	14	17	18	7	4	9	0	38	52	1	2	0	0	0	3	3
11:30	19	6	1	0	1	27	29	25	13	3	11	2	54	72	4	0	0	0	0	4	4
11:45	22	2	1	3	0	28	32	14	13	2	10	1	40	55	1	0	0	0	0	1	1
H/TOT	65	13	6	6	1	91	103	90	45	11	38	4	188	247	7	2	0	1	0	10	11
12:00	14	4	1	2	0	21	24	24	10	8	13	1	56	78	2	0	0	0	0	2	2
12:15	22	5	1	0	0	28	29	32	12	3	11	0	58	74	1	1	0	0	0	2	2
12:30	14	2	1	0	1	18	20	25	12	3	5	1	46	55	1	0	0	0	0	1	1
12:45	18	1	1	2	0	22	25	40	16	4	10	0	70	85	1	0	0	0	0	1	1
H/TOT	68	12	4	4	1	89	97	121	50	18	39	2	230	292	5	1	0	0	0	6	6

TRAFFINOMICS LIMITED

KNOCKHARLEY TRAFFIC COUNTS **APRIL 2025**

MANUAL CLASSIFIED JUNCTION TURNING COUNTS **TRA/25/046**

SITE: 06 DATE: 8th April 2025

LOCATION: N2/R153/L1610 Balrath Cross DAY: Tuesday

	MOVEMENT 10							MOVEMENT 11							MOVEMENT 12						
TIME	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU
7:00	17	3	0	0	0	20	20	4	1	1	0	1	7	9	0	2	0	0	0	2	2
7:15	8	11	0	0	0	19	19	6	4	1	0	0	11	12	0	0	0	0	0	0	0
7:30	15	5	2	0	0	22	23	11	1	0	0	0	12	12	1	1	0	0	0	2	2
7:45	7	4	1	0	0	12	13	14	3	0	1	0	18	19	2	0	0	0	0	2	2
H/TOT	47	23	3	0	0	73	75	35	9	2	1	1	48	51	3	3	0	0	0	6	6
8:00	8	0	0	0	0	8	8	7	5	1	0	0	13	14	1	0	0	0	0	1	1
8:15	3	2	0	0	0	5	5	14	4	0	0	2	20	22	1	0	0	0	0	1	1
8:30	7	2	1	0	0	10	11	12	2	1	0	0	15	16	3	0	0	1	0	4	5
8:45	7	0	0	2	0	9	12	15	4	0	2	1	22	26	6	0	0	0	0	6	6
H/TOT	25	4	1	2	0	32	35	48	15	2	2	3	70	77	11	0	0	1	0	12	13
9:00	5	1	0	1	0	7	8	8	4	0	0	0	12	12	2	0	0	0	0	2	2
9:15	8	1	1	1	0	11	13	11	2	0	0	0	13	13	1	0	0	0	0	1	1
9:30	2	1	0	0	0	3	3	11	0	0	1	0	12	13	1	0	0	0	0	1	1
9:45	5	0	1	0	0	6	7	10	3	0	1	1	15	17	0	2	0	0	0	2	2
H/TOT	20	3	2	2	0	27	31	40	9	0	2	1	52	56	4	2	0	0	0	6	6
10:00	4	3	0	1	0	8	9	5	2	0	0	0	7	7	1	0	0	0	0	1	1
10:15	3	0	0	0	0	3	3	5	2	0	1	0	8	9	0	1	0	0	0	1	1
10:30	3	1	0	0	0	4	4	9	0	0	0	1	10	11	1	0	0	0	0	1	1
10:45	0	0	1	0	0	1	2	5	2	0	0	0	7	7	0	1	1	0	0	2	3
H/TOT	10	4	1	1	0	16	18	24	6	0	1	1	32	34	2	2	1	0	0	5	6
11:00	4	0	0	0	0	4	4	4	0	1	0	0	5	6	0	1	0	0	0	1	1
11:15	2	1	0	0	0	3	3	8	3	0	1	1	13	15	1	0	1	0	0	2	3
11:30	0	1	0	0	0	1	1	5	2	0	0	0	7	7	1	0	0	0	0	1	1
11:45	1	0	1	0	0	2	3	3	1	0	1	0	5	6	2	0	1	0	0	3	4
H/TOT	7	2	1	0	0	10	11	20	6	1	2	1	30	34	4	1	2	0	0	7	8
12:00	1	0	0	0	0	1	1	4	0	1	0	0	5	6	0	2	0	0	0	2	2
12:15	1	0	0	0	0	1	1	5	1	1	0	0	7	8	2	0	0	0	0	2	2
12:30	2	0	1	0	0	3	4	8	2	1	1	0	12	14	1	0	0	0	0	1	1
12:45	3	1	0	0	0	4	4	6	1	0	1	0	8	9	2	1	0	0	0	3	3
H/TOT	7	1	1	0	0	9	10	23	4	3	2	0	32	36	5	3	0	0	0	8	8

TRAFFINOMICS LIMITED

KNOCKHARLEY TRAFFIC COUNTS **APRIL 2025**

MANUAL CLASSIFIED JUNCTION TURNING COUNTS **TRA/25/046**

SITE: 06 DATE: 8th April 2025

LOCATION: N2/R153/L1610 Balrath Cross DAY: Tuesday

	MOVEMENT 1							MOVEMENT 2							MOVEMENT 3						
TIME	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU
13:00	2	1	1	0	0	4	5	29	10	2	10	0	51	65	4	1	1	0	0	6	7
13:15	1	0	1	0	0	2	3	25	6	5	7	0	43	55	6	2	0	0	0	8	8
13:30	1	1	0	0	0	2	2	26	9	5	6	0	46	56	3	3	0	1	0	7	8
13:45	1	1	0	0	0	2	2	26	14	3	2	1	46	51	6	3	2	0	0	11	12
H/TOT	5	3	2	0	0	10	11	106	39	15	25	1	186	227	19	9	3	1	0	32	35
14:00	4	0	0	1	0	5	6	27	11	2	6	0	46	55	4	1	0	0	1	6	7
14:15	2	0	0	1	0	3	4	33	8	4	9	1	55	70	1	2	0	0	0	3	3
14:30	1	0	0	0	0	1	1	19	11	5	7	0	42	54	2	1	0	0	0	3	3
14:45	2	0	0	0	0	2	2	24	7	5	8	1	45	59	5	0	0	2	0	7	10
H/TOT	9	0	0	2	0	11	14	103	37	16	30	2	188	237	12	4	0	2	1	19	23
15:00	2	0	1	0	0	3	4	33	10	0	5	0	48	55	6	2	0	1	0	9	10
15:15	1	2	0	0	0	3	3	37	9	4	7	0	57	68	2	1	4	0	0	7	9
15:30	3	1	0	0	0	4	4	29	11	5	4	1	50	59	5	2	1	2	1	11	15
15:45	1	1	0	0	0	2	2	26	13	3	9	0	51	64	2	1	0	0	0	3	3
H/TOT	7	4	1	0	0	12	13	125	43	12	25	1	206	246	15	6	5	3	1	30	37
16:00	2	0	0	0	0	2	2	32	16	2	4	0	54	60	4	1	1	0	0	6	7
16:15	1	0	0	0	0	1	1	32	9	1	4	0	46	52	10	2	0	0	0	12	12
16:30	0	1	0	0	0	1	1	40	10	1	4	0	55	61	13	0	1	2	0	16	19
16:45	4	2	1	0	0	7	8	38	9	2	5	0	54	62	8	5	0	0	0	13	13
H/TOT	7	3	1	0	0	11	12	142	44	6	17	0	209	234	35	8	2	2	0	47	51
17:00	1	4	0	0	0	5	5	46	9	2	3	0	60	65	12	5	1	1	0	19	21
17:15	0	0	0	1	0	1	2	35	12	5	4	1	57	66	5	5	0	1	0	11	12
17:30	1	0	0	0	0	1	1	39	12	2	5	0	58	66	6	1	0	0	0	7	7
17:45	1	0	0	1	0	2	3	41	13	2	4	0	60	66	11	0	0	0	0	11	11
H/TOT	3	4	0	2	0	9	12	161	46	11	16	1	235	262	34	11	1	2	0	48	51
18:00	2	0	0	0	0	2	2	43	10	2	5	2	62	72	5	1	0	0	2	8	10
18:15	0	0	0	0	0	0	0	35	13	1	2	0	51	54	8	7	0	0	3	18	21
18:30	2	1	0	0	0	3	3	41	8	2	7	0	58	68	8	1	0	0	0	9	9
18:45	5	3	0	0	0	8	8	34	15	0	2	1	52	56	4	0	0	0	1	5	6
H/TOT	9	4	0	0	0	13	13	153	46	5	16	3	223	249	25	9	0	0	6	40	46
P/TOT	67	27	12	10	1	117	137	2138	650	168	386	22	3364	3972	270	82	26	27	11	416	475

TRAFFINOMICS LIMITED

KNOCKHARLEY TRAFFIC COUNTS **APRIL 2025**

MANUAL CLASSIFIED JUNCTION TURNING COUNTS **TRA/25/046**

SITE: 06 DATE: 8th April 2025

LOCATION: N2/R153/L1610 Balrath Cross DAY: Tuesday

	MOVEMENT 4							MOVEMENT 5							MOVEMENT 6						
TIME	**CAR**	**LGV**	**OGV1**	**OGV2**	**BUS**	**TOT**	**PCU**	**CAR**	**LGV**	**OGV1**	**OGV2**	**BUS**	**TOT**	**PCU**	**CAR**	**LGV**	**OGV1**	**OGV2**	**BUS**	**TOT**	**PCU**
13:00	6	1	0	1	0	8	9	6	2	0	0	1	9	10	17	1	1	0	1	20	22
13:15	3	1	1	2	0	7	10	7	5	0	0	1	13	14	16	1	0	0	0	17	17
13:30	5	2	0	0	0	7	7	6	0	0	0	0	6	6	29	5	3	0	0	37	39
13:45	3	5	0	1	0	9	10	11	1	0	0	0	12	12	15	4	0	1	0	20	21
H/TOT	17	9	1	4	0	31	37	30	8	0	0	2	40	42	77	11	4	1	1	94	98
14:00	3	1	1	1	0	6	8	5	1	0	0	0	6	6	20	2	1	1	1	25	28
14:15	4	2	1	0	0	7	8	5	2	1	0	0	8	9	29	2	1	1	0	33	35
14:30	2	1	0	1	0	4	5	4	3	1	0	0	8	9	7	3	2	0	0	12	13
14:45	7	2	1	0	0	10	11	11	2	1	0	0	14	15	27	5	2	1	0	35	37
H/TOT	16	6	3	2	0	27	31	25	8	3	0	0	36	38	83	12	6	3	1	105	113
15:00	7	2	1	0	1	11	13	7	0	0	0	1	8	9	17	3	0	2	1	23	27
15:15	4	4	2	1	0	11	13	4	2	1	0	1	8	10	12	3	1	0	1	17	19
15:30	7	4	1	1	0	13	15	6	4	0	0	0	10	10	10	2	0	0	2	14	16
15:45	3	3	2	0	0	8	9	8	2	0	2	0	12	15	15	5	1	0	0	21	22
H/TOT	21	13	6	2	1	43	50	25	8	1	2	2	38	43	54	13	2	2	4	75	83
16:00	10	3	0	1	0	14	15	14	4	2	3	0	23	28	11	3	1	1	1	17	20
16:15	6	3	2	1	0	12	14	13	1	1	0	0	15	16	22	4	1	1	0	28	30
16:30	8	4	0	0	1	13	14	8	1	1	1	0	11	13	18	7	0	0	0	25	25
16:45	8	2	0	0	0	10	10	4	3	1	0	0	8	9	10	2	1	1	0	14	16
H/TOT	32	12	2	2	1	49	54	39	9	5	4	0	57	65	61	16	3	3	1	84	90
17:00	6	2	0	0	0	8	8	8	1	0	0	0	9	9	25	3	0	0	1	29	30
17:15	10	2	0	0	0	12	12	11	4	0	0	0	15	15	21	7	0	1	0	29	30
17:30	9	5	0	0	0	14	14	9	3	0	0	1	13	14	22	5	0	0	0	27	27
17:45	7	1	0	0	0	8	8	7	4	1	0	0	12	13	16	6	0	0	0	22	22
H/TOT	32	10	0	0	0	42	42	35	12	1	0	1	49	51	84	21	0	1	1	107	109
18:00	8	1	0	0	0	9	9	3	0	1	0	0	4	5	12	3	0	1	1	17	19
18:15	7	2	0	0	0	9	9	8	1	0	0	0	9	9	14	4	1	0	0	19	20
18:30	8	1	0	0	0	9	9	3	4	0	0	0	7	7	16	2	0	0	0	18	18
18:45	2	1	2	0	0	5	6	3	2	0	0	0	5	5	13	1	0	0	1	15	16
H/TOT	25	5	2	0	0	32	33	17	7	1	0	0	25	26	55	10	1	1	2	69	73
P/TOT	281	116	29	27	5	458	513	348	98	25	10	10	491	527	861	163	40	25	19	1108	1180

TRAFFINOMICS LIMITED

KNOCKHARLEY TRAFFIC COUNTS **APRIL 2025**

MANUAL CLASSIFIED JUNCTION TURNING COUNTS **TRA/25/046**

SITE: 06 DATE: 8th April 2025

LOCATION: N2/R153/L1610 Balrath Cross DAY: Tuesday

	MOVEMENT 7							MOVEMENT 8							MOVEMENT 9						
TIME	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU
13:00	23	10	3	1	1	38	42	43	18	5	13	1	80	100	2	0	0	0	0	2	2
13:15	16	3	2	0	0	21	22	34	7	5	7	1	54	67	3	0	0	0	0	3	3
13:30	19	4	1	0	1	25	27	39	10	4	10	0	63	78	0	0	0	0	0	0	0
13:45	28	6	2	0	0	36	37	43	18	10	13	1	85	108	2	0	0	0	0	2	2
H/TOT	86	23	8	1	2	120	127	159	53	24	43	3	282	353	7	0	0	0	0	7	7
14:00	24	4	1	1	0	30	32	24	20	4	10	0	58	73	1	1	0	0	0	2	2
14:15	22	3	1	2	0	28	31	46	15	4	6	0	71	81	1	0	0	0	0	1	1
14:30	28	5	2	0	1	36	38	46	13	4	7	0	70	81	2	0	0	0	0	2	2
14:45	19	9	1	0	0	29	30	55	20	3	13	1	92	111	3	0	0	0	0	3	3
H/TOT	93	21	5	3	1	123	130	171	68	15	36	1	291	346	7	1	0	0	0	8	8
15:00	32	3	0	0	1	36	37	47	17	8	15	1	88	113	2	0	0	0	0	2	2
15:15	41	4	0	0	0	45	45	64	22	6	5	0	97	107	0	1	0	0	0	1	1
15:30	25	6	0	1	1	33	35	47	33	4	9	1	94	109	0	0	1	0	0	1	2
15:45	15	6	4	0	0	25	27	67	15	4	4	0	90	97	3	0	0	0	0	3	3
H/TOT	113	19	4	1	2	139	144	225	87	22	33	2	369	425	5	1	1	0	0	7	8
16:00	35	7	1	1	0	44	46	68	29	6	9	1	113	129	2	1	0	0	0	3	3
16:15	37	12	3	0	0	52	54	97	29	3	7	0	136	147	3	0	0	0	0	3	3
16:30	31	4	0	0	1	36	37	64	32	7	7	0	110	123	4	0	1	0	0	5	6
16:45	36	4	0	0	0	40	40	83	44	8	4	0	139	148	3	6	1	0	0	10	11
H/TOT	139	27	4	1	1	172	176	312	134	24	27	1	498	546	12	7	2	0	0	21	22
17:00	32	2	0	0	0	34	34	102	51	5	4	2	164	174	5	2	0	0	0	7	7
17:15	25	7	1	1	0	34	36	114	44	7	9	2	176	193	2	3	0	0	0	5	5
17:30	43	5	2	0	1	51	53	113	30	4	5	0	152	161	2	0	0	0	0	2	2
17:45	39	3	0	0	0	42	42	112	36	4	6	1	159	170	1	4	0	0	0	5	5
H/TOT	139	17	3	1	1	161	165	441	161	20	24	5	651	697	10	9	0	0	0	19	19
18:00	29	6	0	1	0	36	37	97	27	2	5	0	131	139	4	0	0	0	0	4	4
18:15	40	6	0	0	0	46	46	98	22	2	3	1	126	132	2	1	0	0	0	3	3
18:30	40	2	0	0	0	42	42	59	19	2	3	0	83	88	2	0	0	0	0	2	2
18:45	40	12	0	1	2	55	58	60	11	0	4	0	75	80	4	0	0	0	0	4	4
H/TOT	149	26	0	2	2	179	184	314	79	6	15	1	415	439	12	1	0	0	0	13	13
P/TOT	1058	235	49	30	14	1386	1464	2235	841	175	427	26	3704	4373	82	32	6	6	0	126	137

TRAFFINOMICS LIMITED

KNOCKHARLEY TRAFFIC COUNTS **APRIL 2025**

MANUAL CLASSIFIED JUNCTION TURNING COUNTS **TRA/25/046**

SITE: 06 DATE: 8th April 2025

LOCATION: N2/R153/L1610 Balrath Cross DAY: Tuesday

	MOVEMENT 10							MOVEMENT 11							MOVEMENT 12						
TIME	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU
13:00	3	1	0	0	0	4	4	7	7	0	0	0	14	14	4	1	0	0	0	5	5
13:15	3	1	0	0	0	4	4	9	1	0	0	0	10	10	1	1	0	0	0	2	2
13:30	3	2	0	0	0	5	5	10	4	0	1	1	16	18	1	1	0	1	0	3	4
13:45	4	1	0	0	0	5	5	13	0	0	0	0	13	13	0	1	0	0	0	1	1
H/TOT	13	5	0	0	0	18	18	39	12	0	1	1	53	55	6	4	0	1	0	11	12
14:00	1	1	0	0	0	2	2	6	3	2	0	0	11	12	1	2	0	0	0	3	3
14:15	2	0	0	0	0	2	2	4	1	1	0	0	6	7	3	0	0	2	0	5	8
14:30	2	0	0	0	0	2	2	4	1	2	0	0	7	8	1	0	0	0	0	1	1
14:45	0	0	0	0	0	0	0	2	2	0	0	0	4	4	0	0	0	0	0	0	0
H/TOT	5	1	0	0	0	6	6	16	7	5	0	0	28	31	5	2	0	2	0	9	12
15:00	4	0	0	0	0	4	4	13	2	0	0	0	15	15	5	1	0	0	0	6	6
15:15	2	0	0	0	0	2	2	12	2	1	0	0	15	16	2	0	0	0	0	2	2
15:30	1	0	0	0	0	1	1	12	3	2	0	2	19	22	1	0	0	0	0	1	1
15:45	4	1	0	0	0	5	5	5	2	0	0	0	7	7	3	0	0	0	0	3	3
H/TOT	11	1	0	0	0	12	12	42	9	3	0	2	56	60	11	1	0	0	0	12	12
16:00	3	1	1	0	0	5	6	9	5	1	0	1	16	18	1	1	0	0	0	2	2
16:15	3	4	0	0	0	7	7	9	5	0	0	0	14	14	1	0	0	0	0	1	1
16:30	2	0	0	1	0	3	4	11	7	2	2	0	22	26	2	1	0	0	0	3	3
16:45	1	1	0	1	0	3	4	9	2	0	1	0	12	13	3	0	0	0	0	3	3
H/TOT	9	6	1	2	0	18	21	38	19	3	3	1	64	70	7	2	0	0	0	9	9
17:00	4	0	0	0	0	4	4	14	8	0	1	0	23	24	1	2	0	0	0	3	3
17:15	0	0	0	0	0	0	0	17	7	1	2	0	27	30	2	0	0	0	0	2	2
17:30	5	0	0	0	0	5	5	25	4	0	0	2	31	33	2	2	0	0	0	4	4
17:45	2	1	0	0	0	3	3	8	5	1	0	0	14	15	7	3	0	0	0	10	10
H/TOT	11	1	0	0	0	12	12	64	24	2	3	2	95	102	12	7	0	0	0	19	19
18:00	0	1	0	0	0	1	1	9	3	0	1	0	13	14	0	0	0	1	0	1	2
18:15	3	1	0	0	0	4	4	10	3	1	0	0	14	15	0	0	0	0	0	0	0
18:30	1	0	0	0	0	1	1	11	2	0	0	0	13	13	2	0	0	0	0	2	2
18:45	4	1	0	0	0	5	5	10	0	0	0	0	10	10	1	1	0	1	0	3	4
H/TOT	8	3	0	0	0	11	11	40	8	1	1	0	50	52	3	1	0	2	0	6	9
P/TOT	173	54	10	7	0	244	258	429	128	22	18	13	610	657	73	28	3	6	0	110	119

TRAFFINOMICS LIMITED

KNOCKHARLEY TRAFFIC COUNTS **APRIL 2025**

MANUAL CLASSIFIED JUNCTION TURNING COUNTS **TRA/25/046**

SITE: 07 DATE: 8th April 2025

LOCATION: N2/R152 DAY: Tuesday

	MOVEMENT 1							MOVEMENT 2							MOVEMENT 3						
TIME	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU
7:00	2	0	0	0	0	2	2	53	31	12	13	3	112	138	41	14	0	9	2	66	80
7:15	0	0	0	0	0	0	0	61	25	4	8	3	101	116	28	21	2	11	0	62	77
7:30	1	1	0	0	0	2	2	64	31	6	6	0	107	118	44	15	3	12	0	74	91
7:45	0	0	1	0	0	1	2	86	18	6	7	2	119	133	48	26	3	12	0	89	106
H/TOT	3	1	1	0	0	5	6	264	105	28	34	8	439	505	161	76	8	44	2	291	354
8:00	5	1	0	0	0	6	6	82	27	7	3	1	120	128	26	11	2	10	0	49	63
8:15	2	1	1	1	0	5	7	72	19	5	9	1	106	121	35	20	6	10	2	73	91
8:30	3	1	0	0	0	4	4	65	20	4	16	0	105	128	28	19	7	4	0	58	67
8:45	2	1	1	1	0	5	7	85	22	4	10	1	122	138	36	18	5	3	0	62	68
H/TOT	12	4	2	2	0	20	24	304	88	20	38	3	453	515	125	68	20	27	2	242	289
9:00	4	3	0	0	0	7	7	79	26	2	6	2	115	126	35	8	2	10	0	55	69
9:15	3	1	0	1	0	5	6	92	17	6	15	2	132	157	28	9	2	13	1	53	72
9:30	4	1	2	1	0	8	10	79	21	4	9	1	114	129	35	18	2	8	0	63	74
9:45	1	2	1	2	0	6	9	79	16	2	11	1	109	125	33	14	3	16	2	68	92
H/TOT	12	7	3	4	0	26	33	329	80	14	41	6	470	536	131	49	9	47	3	239	308
10:00	4	3	0	1	0	8	9	65	17	4	8	4	98	114	37	13	3	10	0	63	78
10:15	5	2	0	0	0	7	7	53	14	5	11	0	83	100	35	18	2	14	1	70	90
10:30	2	2	0	2	0	6	9	55	12	8	12	0	87	107	44	19	2	13	1	79	98
10:45	2	0	2	1	0	5	7	52	16	3	10	0	81	96	61	11	2	13	0	87	105
H/TOT	13	7	2	4	0	26	32	225	59	20	41	4	349	416	177	61	9	50	2	299	371
11:00	2	0	0	0	0	2	2	53	12	5	9	2	81	97	43	16	4	9	1	73	88
11:15	1	2	0	0	0	3	3	59	13	5	9	0	86	100	43	16	3	8	0	70	82
11:30	3	1	1	2	0	7	10	44	12	3	14	0	73	93	35	19	3	10	2	69	86
11:45	2	1	1	1	0	5	7	57	18	2	11	0	88	103	47	18	6	12	1	84	104
H/TOT	8	4	2	3	0	17	22	213	55	15	43	2	328	393	168	69	16	39	4	296	359
12:00	1	2	3	1	0	7	10	51	10	4	5	3	73	85	48	20	10	13	0	91	113
12:15	3	1	1	0	0	5	6	63	15	4	15	0	97	119	46	16	4	9	0	75	89
12:30	2	1	0	1	0	4	5	41	18	5	13	0	77	96	49	14	4	7	2	76	89
12:45	3	4	0	1	0	8	9	40	16	9	14	0	79	102	58	19	5	7	2	91	105
H/TOT	9	8	4	3	0	24	30	195	59	22	47	3	326	401	201	69	23	36	4	333	395

TRAFFINOMICS LIMITED

KNOCKHARLEY TRAFFIC COUNTS **APRIL 2025**

MANUAL CLASSIFIED JUNCTION TURNING COUNTS **TRA/25/046**

SITE: 07 DATE: 8th April 2025

LOCATION: N2/R152 DAY: Tuesday

	MOVEMENT 4							MOVEMENT 5							MOVEMENT 6						
TIME	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU
7:00	28	9	3	7	0	47	58	66	26	5	6	0	103	113	1	0	0	0	0	1	1
7:15	46	15	3	7	0	71	82	68	24	4	11	1	108	125	1	1	0	0	0	2	2
7:30	30	5	1	8	0	44	55	67	10	3	9	1	90	104	0	0	1	0	0	1	2
7:45	61	18	2	9	1	91	105	76	18	7	13	1	115	136	0	1	0	0	0	1	1
H/TOT	165	47	9	31	1	253	299	277	78	19	39	3	416	479	2	2	1	0	0	5	6
8:00	49	11	8	8	1	77	92	81	18	4	12	1	116	135	0	0	0	0	0	0	0
8:15	61	7	1	8	1	78	90	85	13	2	8	0	108	119	0	0	0	0	0	0	0
8:30	39	9	2	18	1	69	94	87	15	3	11	4	120	140	0	0	0	2	1	3	7
8:45	40	11	4	12	0	67	85	92	16	4	8	1	121	134	1	0	0	0	0	1	1
H/TOT	189	38	15	46	3	291	361	345	62	13	39	6	465	528	1	0	0	2	1	4	8
9:00	35	7	5	7	0	54	66	89	18	6	18	0	131	157	3	0	0	0	0	3	3
9:15	31	11	6	11	2	61	80	74	11	1	8	3	97	111	1	1	2	0	0	4	5
9:30	33	10	3	7	0	53	64	59	16	6	17	0	98	123	2	1	0	0	0	3	3
9:45	29	5	5	13	0	52	71	69	11	4	9	0	93	107	3	1	0	1	0	5	6
H/TOT	128	33	19	38	2	220	281	291	56	17	52	3	419	498	9	3	2	1	0	15	17
10:00	32	11	4	11	0	58	74	36	12	6	9	0	63	78	1	1	1	0	0	3	4
10:15	27	12	7	10	1	57	75	52	10	3	13	0	78	96	3	0	0	1	0	4	5
10:30	27	10	4	20	1	62	91	35	18	6	13	1	73	94	1	1	2	2	0	6	10
10:45	36	8	7	10	0	61	78	47	16	8	8	1	80	95	7	0	1	0	0	8	9
H/TOT	122	41	22	51	2	238	317	170	56	23	43	2	294	363	12	2	4	3	0	21	27
11:00	28	9	7	19	0	63	91	44	9	6	12	0	71	90	1	1	1	2	0	5	8
11:15	29	8	1	21	0	59	87	29	9	5	11	0	54	71	2	3	0	0	0	5	5
11:30	25	11	6	8	0	50	63	33	6	7	7	0	53	66	0	1	1	0	1	3	5
11:45	31	12	5	11	0	59	76	26	12	4	14	1	57	78	1	0	0	0	0	1	1
H/TOT	113	40	19	59	0	231	317	132	36	22	44	1	235	304	4	5	2	2	1	14	19
12:00	37	7	6	6	0	56	67	26	10	4	11	0	51	67	2	1	0	1	0	4	5
12:15	33	13	4	9	0	59	73	33	8	2	14	0	57	76	3	0	1	0	0	4	5
12:30	40	17	2	13	0	72	90	26	12	5	8	0	51	64	4	3	1	0	0	8	9
12:45	46	10	3	12	0	71	88	34	9	6	9	0	58	73	2	1	1	0	0	4	5
H/TOT	156	47	15	40	0	258	318	119	39	17	42	0	217	280	11	5	3	1	0	20	23

TRAFFINOMICS LIMITED

KNOCKHARLEY TRAFFIC COUNTS **APRIL 2025**

MANUAL CLASSIFIED JUNCTION TURNING COUNTS **TRA/25/046**

SITE: 07 DATE: 8th April 2025

LOCATION: N2/R152 DAY: Tuesday

	MOVEMENT 1							MOVEMENT 2							MOVEMENT 3						
TIME	**CAR**	**LGV**	**OGV1**	**OGV2**	**BUS**	**TOT**	**PCU**	**CAR**	**LGV**	**OGV1**	**OGV2**	**BUS**	**TOT**	**PCU**	**CAR**	**LGV**	**OGV1**	**OGV2**	**BUS**	**TOT**	**PCU**
13:00	1	1	0	0	0	2	2	52	12	6	8	1	79	93	59	25	10	10	0	104	122
13:15	5	2	1	0	0	8	9	56	13	1	6	0	76	84	55	12	7	9	2	85	102
13:30	6	3	0	0	0	9	9	47	15	6	5	0	73	83	56	14	4	5	1	80	90
13:45	2	2	0	2	0	6	9	57	14	3	6	0	80	89	66	21	10	10	0	107	125
H/TOT	14	8	1	2	0	25	28	212	54	16	25	1	308	350	236	72	31	34	3	376	439
14:00	1	0	0	2	0	3	6	47	22	3	5	1	78	87	58	17	4	12	0	91	109
14:15	1	2	0	1	0	4	5	43	9	3	5	1	61	70	69	22	5	12	0	108	126
14:30	3	1	2	0	0	6	7	59	16	6	8	0	89	102	67	21	6	8	1	103	117
14:45	2	1	1	2	0	6	9	49	15	6	5	2	77	89	77	29	5	16	1	128	152
H/TOT	7	4	3	5	0	19	27	198	62	18	23	4	305	348	271	89	20	48	2	430	504
15:00	7	1	0	0	0	8	8	48	13	2	5	1	69	78	66	19	7	10	1	103	121
15:15	2	0	0	0	0	2	2	50	15	3	11	1	80	97	87	41	1	6	2	137	147
15:30	5	0	0	4	0	9	14	51	11	3	5	1	71	80	66	29	6	7	0	108	120
15:45	3	0	0	0	0	3	3	37	15	4	7	2	65	78	87	30	9	6	0	132	144
H/TOT	17	1	0	4	0	22	27	186	54	12	28	5	285	332	306	119	23	29	3	480	532
16:00	4	1	0	1	0	6	7	44	13	2	6	1	66	76	99	37	8	6	1	151	164
16:15	6	2	1	0	0	9	10	53	16	1	4	0	74	80	109	32	3	8	0	152	164
16:30	1	1	1	1	0	4	6	63	19	3	4	0	89	96	93	31	7	7	1	139	153
16:45	2	3	1	0	0	6	7	40	15	1	3	0	59	63	109	39	6	6	0	160	171
H/TOT	13	7	3	2	0	25	29	200	63	7	17	1	288	315	410	139	24	27	2	602	651
17:00	4	2	1	0	0	7	8	62	11	1	6	1	81	90	104	34	5	8	3	154	170
17:15	8	0	0	1	0	9	10	62	16	7	7	1	93	107	121	42	4	12	0	179	197
17:30	6	0	0	0	0	6	6	56	22	0	6	0	84	92	116	38	8	7	2	171	186
17:45	3	2	0	1	0	6	7	61	17	2	6	0	86	95	123	34	5	6	0	168	178
H/TOT	21	4	1	2	0	28	31	241	66	10	25	2	344	384	464	148	22	33	5	672	731
18:00	3	0	0	0	0	3	3	50	13	3	3	3	72	80	118	25	2	6	1	152	162
18:15	1	0	0	0	0	1	1	58	16	1	3	0	78	82	115	30	2	3	0	150	155
18:30	2	0	1	1	0	4	6	53	12	5	5	0	75	84	94	19	2	4	1	120	127
18:45	5	1	0	0	0	6	6	42	13	0	3	1	59	64	92	25	0	7	3	127	139
H/TOT	11	1	1	1	0	14	16	203	54	9	14	4	284	311	419	99	6	20	5	549	583
P/TOT	140	56	23	32	0	251	304	2770	799	191	376	43	4179	4806	3069	1058	211	434	37	4809	5516

TRAFFINOMICS LIMITED

KNOCKHARLEY TRAFFIC COUNTS **APRIL 2025**

MANUAL CLASSIFIED JUNCTION TURNING COUNTS **TRA/25/046**

SITE: 07 DATE: 8th April 2025

LOCATION: N2/R152 DAY: Tuesday

	MOVEMENT 4							MOVEMENT 5							MOVEMENT 6						
TIME	**CAR**	**LGV**	**OGV1**	**OGV2**	**BUS**	**TOT**	**PCU**	**CAR**	**LGV**	**OGV1**	**OGV2**	**BUS**	**TOT**	**PCU**	**CAR**	**LGV**	**OGV1**	**OGV2**	**BUS**	**TOT**	**PCU**
13:00	43	9	4	18	0	74	99	35	9	4	10	0	58	73	3	4	1	4	0	12	18
13:15	45	9	2	19	1	76	103	45	16	4	14	0	79	99	2	0	0	0	0	2	2
13:30	47	9	4	4	0	64	71	53	8	0	8	0	69	79	2	2	1	1	0	6	8
13:45	52	19	3	3	0	77	82	32	12	2	15	0	61	82	2	2	5	0	0	9	12
H/TOT	187	46	13	44	1	291	356	165	45	10	47	0	267	333	9	8	7	5	0	29	39
14:00	43	11	4	13	1	72	92	29	12	3	16	1	61	84	2	1	1	0	0	4	5
14:15	43	13	6	15	1	78	102	40	7	2	7	0	56	66	0	0	0	0	0	0	0
14:30	51	19	2	4	4	80	90	51	15	4	5	0	75	84	4	0	0	0	0	4	4
14:45	66	17	4	6	0	93	103	37	5	3	11	2	58	76	4	0	0	4	0	8	13
H/TOT	203	60	16	38	6	323	386	157	39	12	39	3	250	310	10	1	1	4	0	16	22
15:00	76	22	8	9	0	115	131	50	15	6	15	0	86	109	6	2	0	0	0	8	8
15:15	74	25	4	10	1	114	130	39	7	3	8	1	58	71	2	0	1	0	0	3	4
15:30	69	28	2	5	1	105	114	38	9	3	13	0	63	81	0	1	0	0	0	1	1
15:45	94	44	4	9	0	151	165	40	15	3	13	0	71	89	4	1	1	0	0	6	7
H/TOT	313	119	18	33	2	485	539	167	46	15	49	1	278	350	12	4	2	0	0	18	19
16:00	99	32	4	9	0	144	158	45	19	2	4	0	70	76	1	0	1	0	0	2	3
16:15	112	39	2	2	0	155	159	78	20	4	7	0	109	120	4	0	0	0	0	4	4
16:30	115	46	4	2	1	168	174	61	16	6	4	1	88	97	1	1	0	1	0	3	4
16:45	113	38	0	4	0	155	160	60	14	4	5	0	83	92	0	1	1	0	0	2	3
H/TOT	439	155	10	17	1	622	650	244	69	16	20	1	350	385	6	2	2	1	0	11	13
17:00	134	41	4	5	0	184	193	69	20	2	3	1	95	101	1	0	0	0	0	1	1
17:15	124	24	1	0	0	149	150	78	17	1	1	2	99	103	2	2	1	0	0	5	6
17:30	115	26	1	2	0	144	147	82	13	2	3	0	100	105	1	1	0	0	0	2	2
17:45	119	26	0	4	2	151	158	64	11	0	4	1	80	86	1	1	0	0	0	2	2
H/TOT	492	117	6	11	2	628	647	293	61	5	11	4	374	395	5	4	1	0	0	10	11
18:00	104	22	3	2	0	131	135	72	8	1	1	0	82	84	4	0	1	0	1	6	8
18:15	100	15	3	3	0	121	126	61	9	1	2	0	73	76	1	1	0	0	0	2	2
18:30	90	15	2	2	1	110	115	42	3	3	5	0	53	61	3	0	0	0	0	3	3
18:45	77	7	0	1	2	87	90	45	5	1	3	0	54	58	2	0	0	0	0	2	2
H/TOT	371	59	8	8	3	449	466	220	25	6	11	0	262	279	10	1	1	0	1	13	15
P/TOT	2878	802	170	416	23	4289	4938	2580	612	175	436	24	3827	4505	91	37	26	19	3	176	217

TRAFFINOMICS LIMITED

KNOCKHARLEY TRAFFIC COUNT/SPEED SURVEYS **SUMMARY** **WEEK COMMENCING:** **Saturday 5 April 2025**
AUTOMATIC TRAFFIC COUNTS **TRA/25/046**

SITE 01

LOCATION: N2 North of Knockharley Landfill (Google Maps Ref: 53.663025, -6.527651)

SPEED SURVEY SUMMARY:

NORTHBOUND	85% Speed = 96.39 km/h, 95% Speed = 103.05 km/h, Median = 88.11 km/h	Maximum = 179.9 km/h, Minimum = 13.3 km/h, Mean = 88.0 km/h
SOUTHBOUND	85% Speed = 99.45 km/h, 95% Speed = 106.38 km/h, Median = 90.36 km/h	Maximum = 178.8 km/h, Minimum = 27.5 km/h, Mean = 89.6 km/h

VOLUMETRIC VEHICLE COUNTS:

Direction	Time	Saturday 5 April 2025	Sunday 6 April 2025	Monday 7 April 2025	Tuesday 8 April 2025	Wednesday 9 April 2025	Thursday 10 April 2025	Friday 11 April 2025	No. Vehicles	7 day Mean
NORTHBOUND	**07-19**	3120	2790	4004	4097	4091	4295	4274	26671	3810
SOUTHBOUND	**07-19**	3189	2869	3802	3823	3844	3755	3869	25151	3593
NORTHBOUND	**00-00**	4034	3564	4971	5190	5260	5443	5383	33845	4835
SOUTHBOUND	**00-00**	3988	3701	5421	5341	5431	5285	5416	34583	4940

PEAK FLOW SUMMARY:

Peak	AM	IP	PM
Most Frequent Peak Hour	0800	1400	1700
Average Vehicles per Peak Hour	248	344	508

TRAFFINOMICS LIMITED

KNOCKHARLEY TRAFFIC COUNT/SPEED SURVEYS **Saturday 5 April 2025**
AUTOMATIC TRAFFIC COUNTS **TRA/25/046**

SITE 01
NORTHBOUND

TIME	PCL/MCL	CAR*	LGV**	OGV 1	OGV 2	BUS	TOTAL	PCU
0000	0	37	5	0	5	1	48	56
0100	0	23	1	1	12	0	37	53
0200	0	17	2	0	6	1	26	35
0300	0	7	4	0	3	1	15	20
0400	0	15	1	0	3	0	19	23
0500	0	19	3	0	5	0	27	34
0600	0	37	21	1	7	0	66	76
0700	0	68	23	4	13	0	108	127
0800	2	117	19	3	11	0	152	166
0900	4	153	25	3	15	0	200	218
1000	8	207	26	2	17	1	261	279
1100	2	226	43	4	13	1	289	307
1200	5	253	30	1	14	0	303	318
1300	5	271	31	1	7	1	316	323
1400	3	277	39	0	8	0	327	335
1500	4	263	25	1	3	1	297	299
1600	4	235	27	2	7	1	276	284
1700	3	275	28	2	7	0	315	323
1800	4	241	18	3	8	2	276	287
1900	2	210	8	2	6	1	229	237
2000	0	159	7	1	9	0	176	188
2100	0	91	15	1	4	1	112	119
2200	0	81	9	1	4	1	96	103
2300	0	55	5	0	3	0	63	67
07-19	44	2586	334	26	123	7	3120	3265
06-22	46	3083	385	31	149	9	3703	3884
06-00	46	3219	399	32	156	10	3862	4054
00-00	46	3337	415	33	190	13	4034	4274

TRAFFINOMICS LIMITED

KNOCKHARLEY TRAFFIC COUNT/SPEED SURVEYS **Saturday 5 April 2025**
AUTOMATIC TRAFFIC COUNTS **TRA/25/046**

SITE 01
SOUTHBOUND

TIME	PCL/MCL	CAR*	LGV**	OGV 1	OGV 2	BUS	TOTAL	PCU
0000	0	17	2	0	3	0	22	26
0100	0	19	2	1	0	0	22	23
0200	0	6	2	1	3	0	12	16
0300	0	9	2	0	3	0	14	18
0400	0	12	4	0	2	0	18	21
0500	0	44	9	0	12	1	66	83
0600	0	82	24	1	6	0	113	121
0700	0	114	33	4	16	1	168	192
0800	0	148	26	1	16	1	192	214
0900	0	179	36	3	16	1	235	258
1000	1	256	34	1	14	1	307	326
1100	3	254	38	2	11	3	311	327
1200	1	318	38	2	10	0	369	382
1300	4	265	37	3	11	1	321	335
1400	2	262	32	0	10	0	306	317
1500	2	234	28	0	6	1	271	278
1600	4	203	15	0	1	0	223	221
1700	10	242	21	1	4	1	279	278
1800	1	183	17	1	5	0	207	213
1900	4	152	8	1	6	1	172	178
2000	0	138	10	0	7	0	155	164
2100	1	90	15	0	1	1	108	110
2200	0	55	3	0	1	0	59	60
2300	0	35	2	0	1	0	38	39
07-19	28	2658	355	18	120	10	3189	3342
06-22	33	3120	412	20	140	12	3737	3915
06-00	33	3210	417	20	142	12	3834	4014
00-00	33	3317	438	22	165	13	3988	4200

TRAFFINOMICS LIMITED

KNOCKHARLEY TRAFFIC COUNT/SPEED SURVEYS **Sunday 6 April 2025**
AUTOMATIC TRAFFIC COUNTS **TRA/25/046**

SITE 01
NORTHBOUND

TIME	PCL/MCL	CAR*	LGV**	OGV 1	OGV 2	BUS	TOTAL	PCU
0000	0	38	5	0	7	0	50	59
0100	0	24	1	0	5	0	30	37
0200	0	13	1	0	2	0	16	19
0300	0	7	2	0	3	0	12	16
0400	0	9	2	0	2	0	13	16
0500	0	13	5	0	2	0	20	23
0600	0	24	3	0	0	0	27	27
0700	2	56	7	0	1	0	66	66
0800	1	82	7	0	0	0	90	89
0900	3	130	13	1	4	0	151	154
1000	3	184	11	1	5	0	204	209
1100	14	203	16	0	5	0	238	233
1200	10	238	17	0	2	1	268	264
1300	5	273	18	2	4	0	302	304
1400	6	283	18	2	4	0	313	314
1500	3	294	22	2	5	0	326	331
1600	6	267	13	1	6	2	295	301
1700	2	242	23	1	4	0	272	276
1800	1	248	15	0	0	1	265	265
1900	3	209	21	0	5	1	239	244
2000	0	145	11	0	1	0	157	158
2100	1	90	9	0	7	1	108	117
2200	1	56	4	0	3	1	65	69
2300	0	24	5	0	8	0	37	47
07-19	56	2500	180	10	40	4	2790	2806
06-22	60	2968	224	10	53	6	3321	3353
06-00	61	3048	233	10	64	7	3423	3469
00-00	61	3152	249	10	85	7	3564	3638

TRAFFINOMICS LIMITED

KNOCKHARLEY TRAFFIC COUNT/SPEED SURVEYS **Sunday 6 April 2025**
AUTOMATIC TRAFFIC COUNTS **TRA/25/046**

SITE 01
SOUTHBOUND

TIME	PCL/MCL	CAR*	LGV**	OGV 1	OGV 2	BUS	TOTAL	PCU
0000	0	18	4	0	2	0	24	27
0100	0	21	3	0	2	0	26	29
0200	0	7	3	0	0	0	10	10
0300	0	8	1	0	1	0	10	11
0400	0	14	2	0	0	0	16	16
0500	0	32	1	0	1	0	34	35
0600	0	61	3	0	2	0	66	69
0700	0	58	12	0	2	0	72	75
0800	0	78	12	1	3	0	94	98
0900	4	146	17	1	7	0	175	181
1000	3	172	20	2	1	1	199	200
1100	1	261	21	0	9	0	292	303
1200	7	312	24	0	9	1	353	360
1300	59	251	25	1	9	2	347	314
1400	6	264	14	1	9	1	295	303
1500	13	235	20	0	7	3	278	280
1600	9	216	16	2	4	0	247	246
1700	2	257	18	0	4	0	281	285
1800	8	206	16	0	6	0	236	237
1900	3	197	17	1	4	1	223	227
2000	0	153	22	1	7	0	183	193
2100	2	111	14	2	6	1	136	144
2200	2	49	9	0	5	0	65	70
2300	0	32	6	0	1	0	39	40
07-19	112	2456	215	8	70	8	2869	2882
06-22	117	2978	271	12	89	10	3477	3515
06-00	119	3059	286	12	95	10	3581	3625
00-00	119	3159	300	12	101	10	3701	3753

TRAFFINOMICS LIMITED

KNOCKHARLEY TRAFFIC COUNT/SPEED SURVEYS **Monday 7 April 2025**
AUTOMATIC TRAFFIC COUNTS **TRA/25/046**

SITE 01
NORTHBOUND

TIME	PCL/MCL	CAR*	LGV**	OGV 1	OGV 2	BUS	TOTAL	PCU
0000	0	13	4	0	4	0	21	26
0100	0	17	3	0	4	1	25	31
0200	0	8	2	0	6	0	16	24
0300	0	7	2	0	4	0	13	18
0400	0	15	4	0	3	1	23	28
0500	0	34	6	5	7	0	52	64
0600	0	98	25	2	5	1	131	140
0700	0	137	44	2	25	0	208	242
0800	2	197	43	4	34	1	281	327
0900	1	136	36	5	39	2	219	273
1000	4	130	34	3	36	1	208	254
1100	2	149	38	5	33	1	228	273
1200	1	160	34	4	45	1	245	306
1300	1	160	61	22	44	11	299	377
1400	2	180	94	13	42	4	335	399
1500	0	265	83	11	51	1	411	484
1600	1	389	107	4	26	2	529	566
1700	0	502	84	11	17	1	615	644
1800	3	349	59	3	12	0	426	441
1900	5	207	29	4	14	2	261	279
2000	0	150	18	1	7	0	176	186
2100	1	93	14	1	12	1	122	138
2200	0	59	7	0	7	0	73	82
2300	0	39	6	0	8	1	54	65
07-19	17	2754	717	87	404	25	4004	4584
06-22	23	3302	803	95	442	29	4694	5327
06-00	23	3400	816	95	457	30	4821	5474
00-00	23	3494	837	100	485	32	4971	5665

TRAFFINOMICS LIMITED

KNOCKHARLEY TRAFFIC COUNT/SPEED SURVEYS **Monday 7 April 2025**
AUTOMATIC TRAFFIC COUNTS **TRA/25/046**

SITE 01
SOUTHBOUND

TIME	PCL/MCL	CAR*	LGV**	OGV 1	OGV 2	BUS	TOTAL	PCU
0000	0	10	1	0	0	0	11	11
0100	0	10	3	0	3	0	16	20
0200	0	10	4	0	3	0	17	21
0300	0	12	1	2	3	1	19	25
0400	1	51	12	4	7	0	75	85
0500	0	227	44	11	24	0	306	343
0600	1	453	153	5	36	1	649	699
0700	1	422	93	8	49	3	576	646
0800	1	369	96	10	44	3	523	587
0900	0	220	65	5	39	3	332	388
1000	0	184	51	2	29	1	267	307
1100	0	157	41	5	38	4	245	301
1200	0	161	50	7	42	2	262	322
1300	2	159	81	10	30	6	288	336
1400	3	147	77	8	31	3	269	314
1500	1	170	33	4	24	4	236	272
1600	3	216	44	3	16	1	283	304
1700	0	237	39	6	22	0	304	336
1800	0	168	28	2	19	0	217	243
1900	0	130	17	0	15	1	163	184
2000	3	142	24	1	17	2	189	211
2100	0	66	14	0	13	0	93	110
2200	0	38	4	2	8	0	52	63
2300	0	16	3	0	9	1	29	42
07-19	11	2610	698	70	383	30	3802	4356
06-22	15	3401	906	76	464	34	4896	5559
06-00	15	3455	913	78	481	35	4977	5664
00-00	16	3775	978	95	521	36	5421	6169

TRAFFINOMICS LIMITED

KNOCKHARLEY TRAFFIC COUNT/SPEED SURVEYS **Tuesday 8 April 2025**
AUTOMATIC TRAFFIC COUNTS **TRA/25/046**

SITE 01
NORTHBOUND

TIME	PCL/MCL	CAR*	LGV**	OGV 1	OGV 2	BUS	TOTAL	PCU
0000	0	23	3	1	12	0	39	55
0100	0	11	5	1	8	0	25	36
0200	0	8	2	0	8	0	18	28
0300	0	10	3	0	5	1	19	27
0400	0	9	5	0	2	2	18	23
0500	0	35	10	1	9	0	55	67
0600	1	92	29	0	15	0	137	156
0700	1	144	33	0	24	0	202	232
0800	1	183	38	5	38	3	268	322
0900	1	156	31	1	33	3	225	271
1000	1	156	33	3	48	0	241	304
1100	2	154	39	7	33	3	238	286
1200	2	169	44	4	51	4	274	345
1300	1	219	51	8	33	2	314	362
1400	2	222	63	5	44	4	340	402
1500	3	286	66	8	40	3	406	463
1600	2	373	103	11	33	2	524	573
1700	1	508	96	7	27	2	641	681
1800	3	347	53	3	18	0	424	447
1900	1	250	31	2	8	1	293	305
2000	0	154	25	2	13	1	195	214
2100	0	124	19	0	11	1	155	170
2200	0	62	7	0	10	0	79	92
2300	0	45	6	1	8	0	60	71
07-19	20	2917	650	62	422	26	4097	4687
06-22	22	3537	754	66	469	29	4877	5531
06-00	22	3644	767	67	487	29	5016	5694
00-00	22	3740	795	70	531	32	5190	5930

TRAFFINOMICS LIMITED

KNOCKHARLEY TRAFFIC COUNT/SPEED SURVEYS **Tuesday 8 April 2025**
AUTOMATIC TRAFFIC COUNTS **TRA/25/046**

SITE 01
SOUTHBOUND

TIME	PCL/MCL	CAR*	LGV**	OGV 1	OGV 2	BUS	TOTAL	PCU
0000	0	16	1	1	3	0	21	25
0100	0	6	0	0	3	0	9	13
0200	0	10	4	0	2	1	17	21
0300	0	11	2	1	3	0	17	21
0400	0	25	4	3	7	0	39	50
0500	0	209	52	2	26	1	290	326
0600	2	452	132	4	57	1	648	724
0700	2	423	113	5	33	4	580	628
0800	1	388	72	5	36	2	504	555
0900	1	263	59	13	38	1	375	431
1000	2	210	47	8	39	2	308	363
1100	2	165	36	3	49	2	257	323
1200	2	130	49	6	44	6	237	302
1300	1	157	51	1	22	1	233	262
1400	2	160	35	4	29	2	232	272
1500	0	185	50	1	29	3	268	309
1600	0	206	40	0	13	0	259	276
1700	0	244	31	4	19	3	301	331
1800	3	211	37	2	16	0	269	288
1900	0	125	22	4	15	1	167	190
2000	1	86	19	0	17	1	124	146
2100	1	81	9	2	14	1	108	127
2200	0	36	5	0	7	0	48	57
2300	0	19	4	0	6	1	30	39
07-19	16	2742	620	52	367	26	3823	4339
06-22	20	3486	802	62	470	30	4870	5526
06-00	20	3541	811	62	483	31	4948	5622
00-00	20	3818	874	69	527	33	5341	6078

TRAFFINOMICS LIMITED

KNOCKHARLEY TRAFFIC COUNT/SPEED SURVEYS **Wednesday 9 April 2025**
AUTOMATIC TRAFFIC COUNTS **TRA/25/046**

SITE 01
NORTHBOUND

TIME	PCL/MCL	CAR*	LGV**	OGV 1	OGV 2	BUS	TOTAL	PCU
0000	2	29	6	1	10	0	48	60
0100	0	18	2	0	11	0	31	45
0200	0	12	0	0	9	0	21	33
0300	0	6	5	0	7	1	19	29
0400	0	9	4	1	2	2	18	23
0500	0	36	7	1	7	2	53	65
0600	0	103	30	0	16	1	150	172
0700	3	146	40	4	22	1	216	245
0800	1	205	41	2	34	0	283	327
0900	0	137	36	4	32	3	212	259
1000	0	121	41	4	41	4	211	270
1100	0	128	44	5	41	2	220	278
1200	2	161	51	7	33	5	259	309
1300	0	209	53	3	34	2	301	349
1400	4	205	50	7	44	4	314	376
1500	4	318	86	6	44	3	461	521
1600	1	380	103	12	25	2	523	563
1700	0	445	79	5	22	5	556	592
1800	2	443	60	3	27	0	535	570
1900	1	245	38	3	17	0	304	327
2000	0	172	19	1	9	0	201	213
2100	1	123	17	1	13	1	156	174
2200	1	78	7	1	12	0	99	114
2300	0	51	4	1	13	0	69	86
07-19	17	2898	684	62	399	31	4091	4658
06-22	19	3541	788	67	454	33	4902	5544
06-00	20	3670	799	69	479	33	5070	5744
00-00	22	3780	823	72	525	38	5260	5999

TRAFFINOMICS LIMITED

KNOCKHARLEY TRAFFIC COUNT/SPEED SURVEYS **Wednesday 9 April 2025**
AUTOMATIC TRAFFIC COUNTS **TRA/25/046**

SITE 01
SOUTHBOUND

TIME	PCL/MCL	CAR*	LGV**	OGV 1	OGV 2	BUS	TOTAL	PCU
0000	0	10	0	0	1	0	11	12
0100	0	11	4	0	2	0	17	20
0200	0	3	2	1	3	0	9	13
0300	0	17	5	2	6	0	30	39
0400	0	39	5	2	6	1	53	63
0500	0	205	55	4	23	2	289	323
0600	2	414	142	6	36	2	602	652
0700	1	462	101	5	34	4	607	657
0800	0	412	70	11	38	3	534	592
0900	1	258	61	6	34	5	365	416
1000	2	151	47	3	37	2	242	292
1100	1	162	46	8	41	4	262	323
1200	1	173	45	7	36	2	264	316
1300	0	163	46	3	24	3	239	275
1400	3	148	40	8	34	3	236	285
1500	2	183	42	3	31	3	264	307
1600	2	196	36	3	27	1	265	301
1700	2	258	46	2	19	1	328	353
1800	1	179	37	0	21	0	238	265
1900	2	143	28	0	13	1	187	203
2000	0	133	20	1	24	2	180	214
2100	0	88	17	1	12	0	118	134
2200	0	48	7	0	8	1	64	75
2300	0	17	2	0	8	0	27	37
07-19	16	2745	617	59	376	31	3844	4381
06-22	20	3523	824	67	461	36	4931	5584
06-00	20	3588	833	67	477	37	5022	5697
00-00	20	3873	904	76	518	40	5431	6166

TRAFFINOMICS LIMITED

KNOCKHARLEY TRAFFIC COUNT/SPEED SURVEYS **Thursday 10 April 2025**
AUTOMATIC TRAFFIC COUNTS **TRA/25/046**

SITE 01
NORTHBOUND

TIME	PCL/MCL	CAR*	LGV**	OGV 1	OGV 2	BUS	TOTAL	PCU
0000	0	27	5	2	10	0	44	58
0100	0	13	4	1	11	0	29	44
0200	0	13	1	1	15	1	31	52
0300	0	13	9	0	7	2	31	42
0400	0	8	3	0	1	0	12	13
0500	0	31	6	1	6	2	46	56
0600	3	76	32	0	17	0	128	148
0700	3	164	40	2	22	1	232	260
0800	1	198	30	4	28	1	262	301
0900	2	128	38	4	34	1	207	253
1000	2	137	32	6	43	0	220	277
1100	2	165	44	6	42	2	261	319
1200	4	193	45	7	39	2	290	343
1300	0	224	64	4	43	3	338	399
1400	4	250	63	12	35	3	367	418
1500	10	334	74	14	33	6	471	519
1600	4	356	110	6	31	1	508	549
1700	6	503	89	6	26	3	633	668
1800	2	414	66	3	20	1	506	533
1900	1	256	43	2	21	1	324	353
2000	0	180	17	2	10	1	210	225
2100	2	110	14	0	9	1	136	147
2200	0	67	7	0	12	0	86	102
2300	0	52	5	1	13	0	71	88
07-19	40	3066	695	74	396	24	4295	4839
06-22	46	3688	801	78	453	27	5093	5711
06-00	46	3807	813	79	478	27	5250	5901
00-00	46	3912	841	84	528	32	5443	6167

TRAFFINOMICS LIMITED

KNOCKHARLEY TRAFFIC COUNT/SPEED SURVEYS **Thursday 10 April 2025**
AUTOMATIC TRAFFIC COUNTS **TRA/25/046**

SITE 01
SOUTHBOUND

TIME	PCL/MCL	CAR*	LGV**	OGV 1	OGV 2	BUS	TOTAL	PCU
0000	0	8	1	0	6	0	15	23
0100	0	5	0	1	1	0	7	9
0200	0	10	2	1	3	1	17	22
0300	0	9	1	0	6	0	16	24
0400	0	41	10	4	4	0	59	66
0500	0	195	37	4	25	0	261	296
0600	2	416	130	6	38	3	595	649
0700	2	438	101	8	25	3	577	615
0800	0	377	92	4	39	5	517	575
0900	0	232	60	10	48	5	355	427
1000	0	177	49	7	47	0	280	345
1100	6	157	39	2	26	4	234	268
1200	2	157	44	6	36	1	246	295
1300	1	165	38	7	30	1	242	285
1400	0	171	38	5	33	5	252	302
1500	3	158	40	2	26	1	230	263
1600	2	226	39	3	22	1	293	323
1700	0	261	42	1	20	1	325	353
1800	1	166	25	3	9	0	204	216
1900	3	130	19	1	16	1	170	190
2000	1	97	22	1	21	2	144	173
2100	0	125	19	1	9	0	154	166
2200	0	41	6	2	10	0	59	73
2300	1	21	3	0	7	1	33	42
07-19	17	2685	607	58	361	27	3755	4267
06-22	23	3453	797	67	445	33	4818	5445
06-00	24	3515	806	69	462	34	4910	5560
00-00	24	3783	857	79	507	35	5285	5999

TRAFFINOMICS LIMITED

KNOCKHARLEY TRAFFIC COUNT/SPEED SURVEYS **Friday 11 April 2025**
AUTOMATIC TRAFFIC COUNTS **TRA/25/046**

SITE 01
NORTHBOUND

TIME	PCL/MCL	CAR*	LGV**	OGV 1	OGV 2	BUS	TOTAL	PCU
0000	0	28	5	1	11	0	45	60
0100	1	21	4	1	12	0	39	54
0200	0	13	2	0	6	1	22	31
0300	0	11	6	1	10	1	29	44
0400	0	22	3	1	6	1	33	42
0500	0	41	6	3	13	0	63	81
0600	0	81	22	3	18	2	126	153
0700	0	133	51	4	31	0	219	261
0800	1	194	43	7	44	0	289	349
0900	2	138	33	3	40	2	218	272
1000	1	149	34	9	36	3	232	286
1100	1	184	39	5	41	4	274	333
1200	1	253	45	4	44	3	350	411
1300	1	261	63	8	31	3	367	414
1400	9	308	56	6	32	1	412	450
1500	5	402	88	16	35	4	550	604
1600	5	379	73	6	35	1	499	545
1700	6	418	49	5	19	0	497	519
1800	4	290	47	0	25	1	367	397
1900	1	211	33	0	7	0	252	260
2000	0	143	13	1	8	1	166	178
2100	0	117	10	1	8	0	136	147
2200	0	95	5	1	6	0	107	115
2300	1	71	6	0	13	0	91	107
07-19	36	3109	621	73	413	22	4274	4841
06-22	37	3661	699	78	454	25	4954	5579
06-00	38	3827	710	79	473	25	5152	5801
00-00	39	3963	736	86	531	28	5383	6113

TRAFFINOMICS LIMITED

KNOCKHARLEY TRAFFIC COUNT/SPEED SURVEYS **Friday 11 April 2025**
AUTOMATIC TRAFFIC COUNTS **TRA/25/046**

SITE 01
SOUTHBOUND

TIME	PCL/MCL	CAR*	LGV**	OGV 1	OGV 2	BUS	TOTAL	PCU
0000	0	28	2	0	3	0	33	37
0100	0	11	2	2	2	0	17	21
0200	0	14	5	0	7	2	28	39
0300	0	12	2	6	6	0	26	37
0400	0	31	8	3	4	0	46	53
0500	0	196	38	6	22	1	263	296
0600	1	359	125	5	40	3	533	590
0700	4	360	114	9	35	6	528	581
0800	3	337	75	13	39	4	471	530
0900	1	227	50	9	39	7	333	394
1000	1	152	43	4	33	4	237	285
1100	2	175	32	7	37	3	256	309
1200	4	249	42	4	37	2	338	387
1300	6	219	47	4	37	3	316	364
1400	1	191	48	5	29	2	276	317
1500	1	200	40	4	21	1	267	297
1600	7	227	35	5	21	5	300	329
1700	0	233	38	2	14	1	288	308
1800	3	216	28	1	11	0	259	271
1900	1	156	15	0	7	1	180	189
2000	2	126	18	1	11	1	159	173
2100	1	115	13	1	9	1	140	152
2200	0	52	13	0	6	0	71	79
2300	0	33	8	0	9	1	51	64
07-19	33	2786	592	67	353	38	3869	4373
06-22	38	3542	763	74	420	44	4881	5478
06-00	38	3627	784	74	435	45	5003	5620
00-00	38	3919	841	91	479	48	5416	6102

TRAFFINOMICS LIMITED

KNOCKHARLEY TRAFFIC COUNT/SPEED SURVEYS **SITE 01** **WEEK COMMENCING:** **Saturday 5 April 2025**
AUTOMATIC TRAFFIC COUNTS **NORTHBOUND** **TRA/25/046**

TIME PERIOD	Saturday 5 April 2025	Sunday 6 April 2025	Monday 7 April 2025	Tuesday 8 April 2025	Wednesday 9 April 2025	Thursday 10 April 2025	Friday 11 April 2025	Average
0000	48	50	21	39	48	44	45	42
0100	37	30	25	25	31	29	39	31
0200	26	16	16	18	21	31	22	21
0300	15	12	13	19	19	31	29	20
0400	19	13	23	18	18	12	33	19
0500	27	20	52	55	53	46	63	45
0600	66	27	131	137	150	128	126	109
0700	108	66	208	202	216	232	219	179
0800	152	90	281	268	283	262	289	232
0900	200	151	219	225	212	207	218	205
1000	261	204	208	241	211	220	232	225
1100	289	238	228	238	220	261	274	250
1200	303	268	245	274	259	290	350	284
1300	316	302	299	314	301	338	367	320
1400	327	313	335	340	314	367	412	344
1500	297	326	411	406	461	471	550	417
1600	276	295	529	524	523	508	499	451
1700	315	272	615	641	556	633	497	504
1800	276	265	426	424	535	506	367	400
1900	229	239	261	293	304	324	252	272
2000	176	157	176	195	201	210	166	183
2100	112	108	122	155	156	136	136	132
2200	96	65	73	79	99	86	107	86
2300	63	37	54	60	69	71	91	64
07-19	3120	2790	4004	4097	4091	4295	4274	3810
06-22	3703	3321	4694	4877	4902	5093	4954	4506
06-00	3862	3423	4821	5016	5070	5250	5152	4656
00-00	4034	3564	4971	5190	5260	5443	5383	4835

TRAFFINOMICS LIMITED

KNOCKHARLEY TRAFFIC COUNT/SPEED SURVEYS **SITE 01** **WEEK COMMENCING:** **Saturday 5 April 2025**
AUTOMATIC TRAFFIC COUNTS **SOUTHBOUND** **TRA/25/046**

TIME PERIOD	Saturday 5 April 2025	Sunday 6 April 2025	Monday 7 April 2025	Tuesday 8 April 2025	Wednesday 9 April 2025	Thursday 10 April 2025	Friday 11 April 2025	Average
0000	22	24	11	21	11	15	33	20
0100	22	26	16	9	17	7	17	16
0200	12	10	17	17	9	17	28	16
0300	14	10	19	17	30	16	26	19
0400	18	16	75	39	53	59	46	44
0500	66	34	306	290	289	261	263	216
0600	113	66	649	648	602	595	533	458
0700	168	72	576	580	607	577	528	444
0800	192	94	523	504	534	517	471	405
0900	235	175	332	375	365	355	333	310
1000	307	199	267	308	242	280	237	263
1100	311	292	245	257	262	234	256	265
1200	369	353	262	237	264	246	338	296
1300	321	347	288	233	239	242	316	284
1400	306	295	269	232	236	252	276	267
1500	271	278	236	268	264	230	267	259
1600	223	247	283	259	265	293	300	267
1700	279	281	304	301	328	325	288	301
1800	207	236	217	269	238	204	259	233
1900	172	223	163	167	187	170	180	180
2000	155	183	189	124	180	144	159	162
2100	108	136	93	108	118	154	140	122
2200	59	65	52	48	64	59	71	60
2300	38	39	29	30	27	33	51	35
07-19	3189	2869	3802	3823	3844	3755	3869	3593
06-22	3737	3477	4896	4870	4931	4818	4881	4516
06-00	3834	3581	4977	4948	5022	4910	5003	4611
00-00	3988	3701	5421	5341	5431	5285	5416	4940

TRAFFINOMICS LIMITED

KNOCKHARLEY TRAFFIC COUNT/SPEED SURVEYS **WEEK COMMENCING:** **Saturday 5 April 2025**
AUTOMATIC TRAFFIC COUNTS **TRA/25/046**

SITE 01
NORTHBOUND

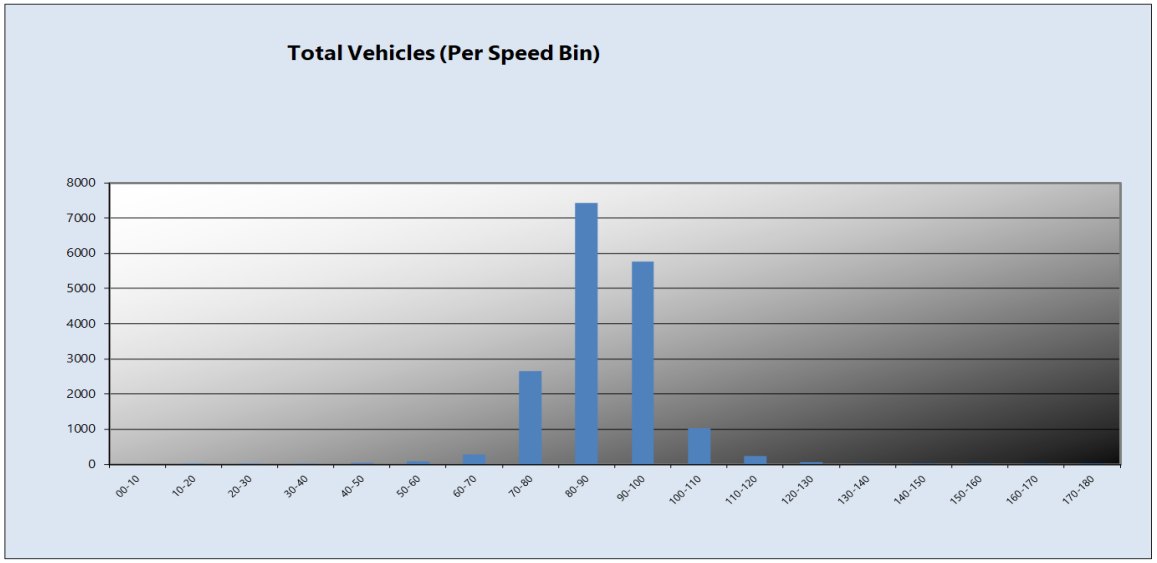
Profile:

Filter time: 00:00 5th April 2025 => 23:59 11th April 2025
Speed range: 0 - 200 km/h.
Separation: Greater than 4.00 seconds. - (Headway)
Units: Metric (meter, kilometer, m/s, km/h, kg, tonne)

Vehicles = 17682
Maximum = 179.9 km/h, Minimum = 13.3 km/h, Mean = 88.0 km/h
85% Speed = 96.39 km/h, 95% Speed = 103.05 km/h, Median = 88.11 km/h
20 km/h Pace = 78 - 98, Number in Pace = 13609 (76.97%)
Variance = 107.50, Standard Deviation = 10.37 km/h

Speed Bins:

Speed	Bin	
KPH	No.	%
00-10	0	0.0
10-20	4	0.0
20-30	19	0.1
30-40	26	0.1
40-50	44	0.2
50-60	87	0.5
60-70	277	1.6
70-80	2652	15.0
80-90	7418	42.0
90-100	5754	32.5
100-110	1028	5.8
110-120	242	1.4
120-130	70	0.4
130-140	29	0.2
140-150	18	0.1
150-160	6	0.0
160-170	4	0.0
170-180	4	0.0



TRAFFINOMICS LIMITED

KNOCKHARLEY TRAFFIC COUNT/SPEED SURVEYS **WEEK COMMENCING:** **Saturday 5 April 2025**
AUTOMATIC TRAFFIC COUNTS **TRA/25/046**

SITE 01
SOUTHBOUND

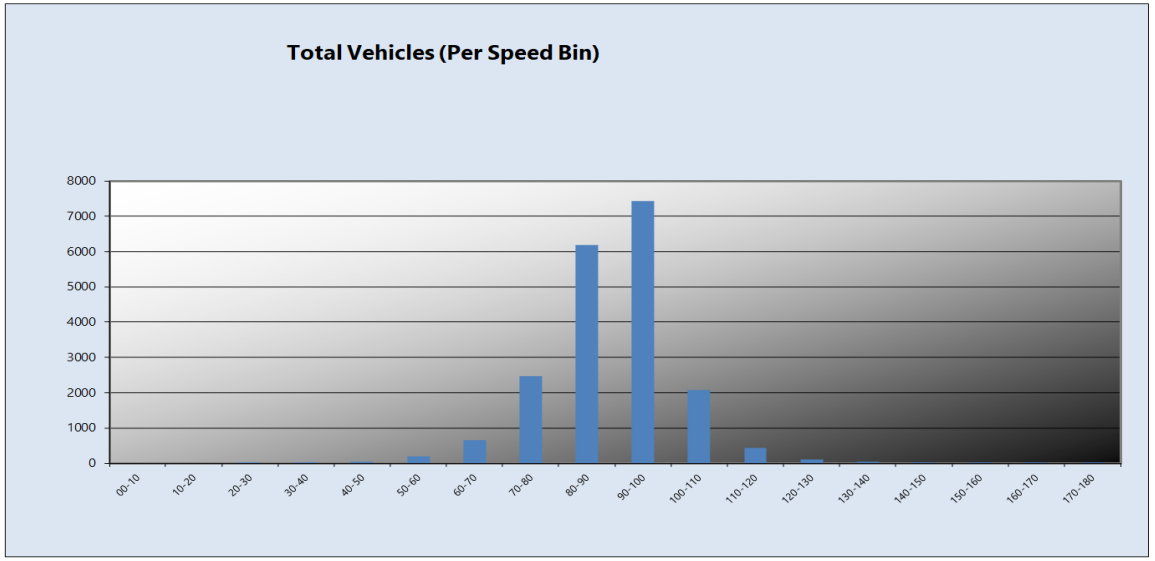
Profile:

Filter time: 00:00 5th April 2025 => 23:59 11th April 2025
Speed range: 0 - 200 km/h.
Separation: Greater than 4.00 seconds. - (Headway)
Units: Metric (meter, kilometer, m/s, km/h, kg, tonne)

Vehicles = 19689
Maximum = 178.8 km/h, Minimum = 27.5 km/h, Mean = 89.6 km/h
85% Speed = 99.45 km/h, 95% Speed = 106.38 km/h, Median = 90.36 km/h
20 km/h Pace = 80 - 100, Number in Pace = 13617 (69.16%)
Variance = 135.99, Standard Deviation = 11.66 km/h

Speed Bins:

Speed	Bin	
KPH	No.	%
00-10	0	0.0
10-20	0	0.0
20-30	2	0.0
30-40	15	0.1
40-50	51	0.3
50-60	205	1.0
60-70	653	3.3
70-80	2468	12.5
80-90	6189	31.4
90-100	7419	37.7
100-110	2065	10.5
110-120	434	2.2
120-130	111	0.6
130-140	45	0.2
140-150	15	0.1
150-160	10	0.1
160-170	3	0.0
170-180	4	0.0



TRAFFINOMICS LIMITED

KNOCKHARLEY TRAFFIC COUNT/SPEED SURVEYS **SUMMARY** **WEEK COMMENCING:** **Saturday 5 April 2025**
AUTOMATIC TRAFFIC COUNTS **TRA/25/046**

SITE 02

LOCATION: N2 South of Knockharley Landfill (Google Maps Ref: 53.646574, -6.508453)

SPEED SURVEY SUMMARY:

NORTHBOUND	85% Speed = 97.38 km/h, 95% Speed = 104.22 km/h, Median = 88.65 km/h	Maximum = 168.4 km/h, Minimum = 18.1 km/h, Mean = 88.6 km/h
SOUTHBOUND	85% Speed = 96.21 km/h, 95% Speed = 102.24 km/h, Median = 88.02 km/h	Maximum = 176.3 km/h, Minimum = 9.6 km/h, Mean = 87.7 km/h

VOLUMETRIC VEHICLE COUNTS:

Direction	Time	Saturday 5 April 2025	Sunday 6 April 2025	Monday 7 April 2025	Tuesday 8 April 2025	Wednesday 9 April 2025	Thursday 10 April 2025	Friday 11 April 2025	No. Vehicles	7 day Mean
NORTHBOUND	**07-19**	3033	2717	3997	4061	4074	4279	4197	26358	3765
SOUTHBOUND	**07-19**	3101	2821	3791	3777	3858	3764	3778	24890	3556
NORTHBOUND	**00-00**	3938	3473	4940	5120	5239	5408	5305	33423	4775
SOUTHBOUND	**00-00**	3895	3633	5380	5282	5410	5288	5285	34173	4882

PEAK FLOW SUMMARY:

Peak	AM	IP	PM
Most Frequent Peak Hour	0800	1400	1700
Average Vehicles per Peak Hour	240	340	509

TRAFFINOMICS LIMITED

KNOCKHARLEY TRAFFIC COUNT/SPEED SURVEYS **Saturday 5 April 2025**
AUTOMATIC TRAFFIC COUNTS **TRA/25/046**

SITE 02
NORTHBOUND

TIME	PCL/MCL	CAR*	LGV**	OGV 1	OGV 2	BUS	TOTAL	PCU
0000	0	38	4	0	6	1	49	58
0100	0	20	3	0	14	0	37	55
0200	0	15	2	0	7	1	25	35
0300	0	9	4	0	2	1	16	20
0400	0	14	1	0	4	0	19	24
0500	0	30	1	0	3	0	34	38
0600	0	42	15	1	10	0	68	82
0700	0	72	19	4	11	0	106	122
0800	3	114	18	4	13	0	152	169
0900	3	152	23	3	14	0	195	212
1000	7	192	29	2	16	1	247	264
1100	2	206	42	1	13	1	265	282
1200	5	244	27	2	14	0	292	307
1300	5	270	32	1	6	1	315	320
1400	2	264	34	0	9	0	309	319
1500	3	265	25	0	3	2	298	302
1600	5	228	23	3	6	1	266	272
1700	3	275	22	1	8	0	309	318
1800	3	249	14	4	8	1	279	290
1900	1	202	8	1	6	2	220	230
2000	0	153	7	1	7	0	168	178
2100	0	102	10	0	5	1	118	126
2200	0	81	6	0	4	1	92	98
2300	0	53	3	0	3	0	59	63
07-19	41	2531	308	25	121	7	3033	3177
06-22	42	3030	348	28	149	10	3607	3791
06-00	42	3164	357	28	156	11	3758	3952
00-00	42	3290	372	28	192	14	3938	4182

TRAFFINOMICS LIMITED

KNOCKHARLEY TRAFFIC COUNT/SPEED SURVEYS **Saturday 5 April 2025**
AUTOMATIC TRAFFIC COUNTS **TRA/25/046**

SITE 02
SOUTHBOUND

TIME	PCL/MCL	CAR*	LGV**	OGV 1	OGV 2	BUS	TOTAL	PCU
0000	0	17	1	0	2	0	20	23
0100	0	15	2	1	0	0	18	19
0200	0	9	2	1	2	0	14	17
0300	0	11	2	0	2	0	15	18
0400	0	13	3	0	2	0	18	21
0500	0	52	6	0	9	1	68	81
0600	0	90	24	1	5	0	120	127
0700	0	103	39	4	14	1	161	182
0800	0	157	23	1	13	0	194	211
0900	1	183	33	1	14	2	234	254
1000	2	224	36	0	13	1	276	292
1100	4	239	38	1	14	1	297	314
1200	1	312	39	1	10	2	365	380
1300	3	268	32	3	11	1	318	332
1400	1	252	24	1	7	0	285	294
1500	2	238	31	0	7	1	279	288
1600	4	202	15	0	1	0	222	220
1700	6	240	17	0	5	1	269	272
1800	2	184	10	0	5	0	201	206
1900	4	147	6	1	5	1	164	169
2000	0	140	6	0	6	1	153	162
2100	1	90	13	0	3	1	108	112
2200	0	54	3	0	2	0	59	62
2300	0	34	2	0	1	0	37	38
07-19	26	2602	337	12	114	10	3101	3244
06-22	31	3069	386	14	133	13	3646	3814
06-00	31	3157	391	14	136	13	3742	3914
00-00	31	3274	407	16	153	14	3895	4091

TRAFFINOMICS LIMITED

KNOCKHARLEY TRAFFIC COUNT/SPEED SURVEYS **Sunday 6 April 2025**
AUTOMATIC TRAFFIC COUNTS **TRA/25/046**

SITE 02
NORTHBOUND

TIME	PCL/MCL	CAR*	LGV**	OGV 1	OGV 2	BUS	TOTAL	PCU
0000	0	43	3	0	7	0	53	62
0100	0	26	1	0	5	0	32	39
0200	0	13	0	0	3	0	16	20
0300	0	7	1	0	3	0	11	15
0400	0	9	2	0	2	0	13	16
0500	0	13	5	0	2	0	20	23
0600	0	24	3	0	0	0	27	27
0700	2	61	6	0	1	0	70	70
0800	2	78	6	0	0	0	86	84
0900	2	121	14	2	5	0	144	150
1000	6	183	11	1	3	0	204	204
1100	9	198	16	1	2	0	226	222
1200	11	223	12	1	4	0	251	248
1300	7	275	14	0	3	0	299	297
1400	4	289	21	1	3	0	318	319
1500	2	286	18	3	5	1	315	322
1600	3	261	10	1	5	2	282	289
1700	3	244	18	0	4	1	270	274
1800	1	234	12	1	3	1	252	257
1900	2	205	17	0	4	1	229	234
2000	0	145	10	0	2	0	157	160
2100	1	81	7	0	9	1	99	111
2200	1	52	2	0	5	1	61	68
2300	0	23	7	0	8	0	38	48
07-19	52	2453	158	11	38	5	2717	2735
06-22	55	2908	195	11	53	7	3229	3266
06-00	56	2983	204	11	66	8	3328	3383
00-00	56	3094	216	11	88	8	3473	3556

TRAFFINOMICS LIMITED

KNOCKHARLEY TRAFFIC COUNT/SPEED SURVEYS **Sunday 6 April 2025**
AUTOMATIC TRAFFIC COUNTS **TRA/25/046**

SITE 02
SOUTHBOUND

TIME	PCL/MCL	CAR*	LGV**	OGV 1	OGV 2	BUS	TOTAL	PCU
0000	0	17	3	0	2	0	22	25
0100	0	23	2	0	2	0	27	30
0200	0	7	2	0	0	0	9	9
0300	0	9	0	0	1	0	10	11
0400	0	15	1	0	0	0	16	16
0500	0	33	1	0	1	0	35	36
0600	0	60	3	0	3	0	66	70
0700	0	63	8	0	2	0	73	76
0800	3	72	8	1	5	0	89	94
0900	4	142	17	0	8	0	171	178
1000	3	178	18	3	1	1	204	205
1100	2	250	19	0	10	0	281	292
1200	9	304	19	1	7	1	341	344
1300	53	278	18	1	12	2	364	340
1400	7	255	8	0	8	1	279	285
1500	12	221	24	0	8	2	267	270
1600	9	227	10	2	4	0	252	251
1700	2	255	9	1	3	0	270	273
1800	6	201	15	0	8	0	230	236
1900	3	194	18	0	4	1	220	224
2000	0	150	17	2	7	0	176	186
2100	2	106	10	1	8	1	128	138
2200	2	47	10	0	5	0	64	69
2300	0	33	5	0	1	0	39	40
07-19	110	2446	173	9	76	7	2821	2843
06-22	115	2956	221	12	98	9	3411	3461
06-00	117	3036	236	12	104	9	3514	3571
00-00	117	3140	245	12	110	9	3633	3697

TRAFFINOMICS LIMITED

KNOCKHARLEY TRAFFIC COUNT/SPEED SURVEYS **Monday 7 April 2025**
AUTOMATIC TRAFFIC COUNTS **TRA/25/046**

SITE 02
NORTHBOUND

TIME	PCL/MCL	CAR*	LGV**	OGV 1	OGV 2	BUS	TOTAL	PCU
0000	0	13	3	1	4	0	21	27
0100	0	15	3	0	5	1	24	32
0200	0	10	1	0	6	0	17	25
0300	0	6	2	0	5	0	13	20
0400	0	12	6	0	4	2	24	31
0500	0	32	8	4	6	0	50	60
0600	0	89	29	2	8	1	129	141
0700	0	154	30	0	30	0	214	253
0800	0	178	39	3	38	2	260	313
0900	1	140	36	6	37	2	222	274
1000	5	122	36	2	47	1	213	272
1100	2	152	41	3	43	1	242	299
1200	2	162	30	4	48	3	249	315
1300	1	190	52	11	52	2	308	382
1400	1	222	52	6	44	3	328	390
1500	1	282	74	7	49	2	415	483
1600	1	385	97	3	25	3	514	550
1700	1	523	80	8	14	2	628	651
1800	3	333	52	3	13	0	404	420
1900	4	197	27	3	14	1	246	264
2000	0	152	20	1	6	0	179	187
2100	0	96	10	0	13	1	120	138
2200	0	54	6	0	8	0	68	78
2300	0	37	5	0	9	1	52	65
07-19	18	2843	619	56	440	21	3997	4604
06-22	22	3377	705	62	481	24	4671	5334
06-00	22	3468	716	62	498	25	4791	5477
00-00	22	3556	739	67	528	28	4940	5670

TRAFFINOMICS LIMITED

KNOCKHARLEY TRAFFIC COUNT/SPEED SURVEYS **Monday 7 April 2025**
AUTOMATIC TRAFFIC COUNTS **TRA/25/046**

SITE 02
SOUTHBOUND

TIME	PCL/MCL	CAR*	LGV**	OGV 1	OGV 2	BUS	TOTAL	PCU
0000	0	11	0	0	0	0	11	11
0100	0	9	2	0	3	0	14	18
0200	0	10	4	0	3	0	17	21
0300	0	13	1	2	2	2	20	26
0400	0	50	12	3	8	0	73	85
0500	0	215	42	13	25	0	295	334
0600	1	457	155	5	37	1	656	707
0700	2	421	89	9	43	2	566	627
0800	2	371	101	6	58	3	541	621
0900	0	224	58	6	38	3	329	384
1000	0	183	54	1	40	3	281	337
1100	2	158	36	6	42	3	247	306
1200	4	172	46	6	43	1	272	329
1300	0	173	42	5	40	6	266	327
1400	2	175	36	2	37	1	253	302
1500	1	174	33	4	28	4	244	286
1600	2	215	40	4	23	0	284	314
1700	1	238	35	6	16	0	296	319
1800	1	166	29	1	15	0	212	231
1900	0	121	18	1	16	1	157	179
2000	3	136	20	1	20	2	182	208
2100	0	61	13	0	15	0	89	109
2200	0	38	3	1	8	1	51	63
2300	0	14	1	0	8	1	24	35
07-19	17	2670	599	56	423	26	3791	4381
06-22	21	3445	805	63	511	30	4875	5584
06-00	21	3497	809	64	527	32	4950	5682
00-00	21	3805	870	82	568	34	5380	6177

TRAFFINOMICS LIMITED

KNOCKHARLEY TRAFFIC COUNT/SPEED SURVEYS **Tuesday 8 April 2025**
AUTOMATIC TRAFFIC COUNTS **TRA/25/046**

SITE 02
NORTHBOUND

TIME	PCL/MCL	CAR*	LGV**	OGV 1	OGV 2	BUS	TOTAL	PCU
0000	0	21	3	1	14	0	39	58
0100	0	12	5	1	10	0	28	42
0200	0	7	2	0	8	0	17	27
0300	0	8	4	0	5	1	18	26
0400	0	12	6	0	2	2	22	27
0500	0	35	10	1	9	0	55	67
0600	0	90	27	0	21	1	139	167
0700	1	142	31	2	31	1	208	250
0800	1	178	44	4	42	2	271	329
0900	0	146	27	1	39	3	216	270
1000	0	146	33	4	58	1	242	320
1100	2	137	38	7	39	4	227	284
1200	1	158	41	7	58	3	268	349
1300	3	201	54	8	42	2	310	368
1400	2	212	60	5	48	2	329	394
1500	2	297	63	8	39	2	411	466
1600	2	382	88	12	34	1	519	569
1700	1	522	89	5	26	2	645	683
1800	2	348	46	1	18	0	415	437
1900	1	218	26	3	11	1	260	276
2000	0	152	25	2	14	0	193	212
2100	0	127	16	0	11	1	155	170
2200	0	53	5	0	12	0	70	86
2300	0	49	5	1	8	0	63	74
07-19	17	2869	614	64	474	23	4061	4719
06-22	18	3456	708	69	531	26	4808	5544
06-00	18	3558	718	70	551	26	4941	5704
00-00	18	3653	748	73	599	29	5120	5950

TRAFFINOMICS LIMITED

KNOCKHARLEY TRAFFIC COUNT/SPEED SURVEYS **Tuesday 8 April 2025**
AUTOMATIC TRAFFIC COUNTS **TRA/25/046**

SITE 02
SOUTHBOUND

TIME	PCL/MCL	CAR*	LGV**	OGV 1	OGV 2	BUS	TOTAL	PCU
0000	1	15	2	0	3	0	21	24
0100	0	6	0	0	1	0	7	8
0200	0	8	3	0	2	1	14	18
0300	0	12	2	1	3	0	18	22
0400	0	29	3	3	5	0	40	48
0500	0	203	42	3	25	1	274	309
0600	3	459	143	5	52	3	665	736
0700	1	415	102	11	29	3	561	606
0800	1	390	77	6	49	2	525	593
0900	4	238	64	10	53	1	370	442
1000	1	211	43	4	49	3	311	379
1100	2	148	34	6	60	2	252	333
1200	1	122	42	10	51	5	231	307
1300	0	151	50	1	26	1	229	264
1400	3	155	34	3	37	3	235	285
1500	2	167	49	1	31	3	253	295
1600	0	209	38	1	17	1	266	290
1700	2	231	33	1	17	3	287	311
1800	3	201	36	3	14	0	257	274
1900	0	124	19	1	13	1	158	176
2000	2	83	18	1	19	1	124	149
2100	1	81	10	2	10	1	105	119
2200	0	39	5	0	5	0	49	56
2300	0	18	4	0	7	1	30	40
07-19	20	2638	602	57	433	27	3777	4379
06-22	26	3385	792	66	527	33	4829	5559
06-00	26	3442	801	66	539	34	4908	5655
00-00	27	3715	853	73	578	36	5282	6084

TRAFFINOMICS LIMITED

KNOCKHARLEY TRAFFIC COUNT/SPEED SURVEYS **Wednesday 9 April 2025**
AUTOMATIC TRAFFIC COUNTS **TRA/25/046**

SITE 02
NORTHBOUND

TIME	PCL/MCL	CAR*	LGV**	OGV 1	OGV 2	BUS	TOTAL	PCU
0000	1	31	3	1	11	0	47	61
0100	0	15	1	0	13	0	29	46
0200	0	13	0	0	9	0	22	34
0300	0	5	3	1	7	1	17	28
0400	0	11	4	1	1	2	19	23
0500	0	33	8	2	6	1	50	60
0600	0	95	31	1	20	2	149	178
0700	1	156	32	3	27	1	220	257
0800	2	206	41	1	39	2	291	343
0900	0	119	33	5	38	1	196	249
1000	0	134	35	3	50	4	226	297
1100	2	132	46	5	43	2	230	289
1200	0	158	47	6	38	3	252	307
1300	0	210	50	5	42	1	308	366
1400	4	206	50	9	47	3	319	384
1500	2	325	84	5	45	4	465	528
1600	3	367	96	9	22	2	499	532
1700	0	455	69	1	24	4	553	589
1800	2	430	54	2	25	2	515	549
1900	1	240	34	2	19	1	297	323
2000	0	183	20	1	9	1	214	227
2100	1	126	18	1	11	1	158	173
2200	1	73	8	1	15	0	98	117
2300	0	44	5	0	16	0	65	86
07-19	16	2898	637	54	440	29	4074	4689
06-22	18	3542	740	59	499	34	4892	5590
06-00	19	3659	753	60	530	34	5055	5793
00-00	20	3767	772	65	577	38	5239	6044

TRAFFINOMICS LIMITED

KNOCKHARLEY TRAFFIC COUNT/SPEED SURVEYS **Wednesday 9 April 2025**
AUTOMATIC TRAFFIC COUNTS **TRA/25/046**

SITE 02
SOUTHBOUND

TIME	PCL/MCL	CAR*	LGV**	OGV 1	OGV 2	BUS	TOTAL	PCU
0000	0	9	0	0	1	0	10	11
0100	0	7	4	0	2	0	13	16
0200	0	3	2	1	3	0	9	13
0300	1	16	4	2	6	0	29	37
0400	0	40	6	2	6	2	56	67
0500	0	200	47	7	23	0	277	310
0600	6	421	144	7	31	4	613	656
0700	2	435	92	6	34	5	574	625
0800	2	412	66	11	48	3	542	611
0900	2	255	57	7	48	3	372	439
1000	1	161	44	4	44	3	257	318
1100	1	160	49	8	43	2	263	324
1200	0	172	43	6	44	3	268	331
1300	1	168	43	5	31	3	251	296
1400	3	143	35	4	32	4	221	266
1500	5	181	41	3	41	4	275	330
1600	5	198	34	3	31	1	272	311
1700	3	246	46	3	21	2	321	349
1800	0	180	40	0	22	0	242	271
1900	0	119	25	0	14	1	159	178
2000	1	141	19	2	18	2	183	209
2100	0	88	13	1	13	0	115	132
2200	0	47	5	0	9	0	61	73
2300	0	18	3	0	5	1	27	35
07-19	25	2711	590	60	439	33	3858	4472
06-22	32	3480	791	70	515	40	4928	5647
06-00	32	3545	799	70	529	41	5016	5754
00-00	33	3820	862	82	570	43	5410	6209

TRAFFINOMICS LIMITED

KNOCKHARLEY TRAFFIC COUNT/SPEED SURVEYS **Thursday 10 April 2025**
AUTOMATIC TRAFFIC COUNTS **TRA/25/046**

SITE 02
NORTHBOUND

TIME	PCL/MCL	CAR*	LGV**	OGV 1	OGV 2	BUS	TOTAL	PCU
0000	0	26	4	1	12	0	43	59
0100	0	14	4	1	11	0	30	45
0200	0	11	1	1	16	1	30	52
0300	0	13	7	0	8	2	30	42
0400	0	6	3	0	3	0	12	16
0500	0	30	8	2	4	2	46	54
0600	0	85	24	0	19	0	128	153
0700	0	165	41	5	28	0	239	278
0800	1	172	28	4	32	1	238	282
0900	1	128	39	4	38	1	211	263
1000	1	144	30	5	49	1	230	296
1100	3	149	41	5	43	4	245	305
1200	4	188	43	6	55	3	299	373
1300	0	243	59	5	38	2	347	401
1400	4	243	64	11	41	3	366	425
1500	4	337	74	13	42	4	474	536
1600	5	345	98	9	33	3	493	539
1700	7	527	85	5	22	2	648	676
1800	1	403	61	2	21	1	489	518
1900	1	250	42	2	18	1	314	339
2000	0	178	17	2	10	1	208	223
2100	1	103	12	0	12	2	130	147
2200	0	67	5	1	12	0	85	101
2300	0	54	5	1	13	0	73	90
07-19	31	3044	663	74	442	25	4279	4891
06-22	33	3660	758	78	501	29	5059	5752
06-00	33	3781	768	80	526	29	5217	5943
00-00	33	3881	795	85	580	34	5408	6212

TRAFFINOMICS LIMITED

KNOCKHARLEY TRAFFIC COUNT/SPEED SURVEYS **Thursday 10 April 2025**
TRA/25/046 AUTOMATIC TRAFFIC COUNTS **TRA/25/046**

SITE 02
SOUTHBOUND

TIME	PCL/MCL	CAR*	LGV**	OGV 1	OGV 2	BUS	TOTAL	PCU
0000	0	8	0	1	4	1	14	21
0100	0	6	0	0	1	0	7	8
0200	0	8	3	0	3	1	15	20
0300	0	10	1	1	5	0	17	24
0400	0	40	8	3	5	0	56	64
0500	0	193	41	5	26	0	265	301
0600	3	424	134	5	35	3	604	653
0700	1	403	98	10	31	2	545	592
0800	0	369	90	8	49	6	522	596
0900	1	254	60	8	44	6	373	439
1000	0	201	46	7	42	0	296	354
1100	5	158	41	2	28	3	237	273
1200	4	148	48	5	47	1	253	314
1300	1	191	36	6	24	0	258	291
1400	0	163	39	4	35	5	246	299
1500	5	163	35	6	35	0	244	289
1600	2	221	38	4	23	1	289	320
1700	0	235	37	3	19	1	295	322
1800	2	168	24	4	8	0	206	217
1900	1	122	19	2	16	1	161	183
2000	1	97	21	2	25	1	147	181
2100	0	114	19	1	7	0	141	151
2200	0	48	6	1	11	0	66	81
2300	1	21	3	0	5	1	31	38
07-19	21	2674	592	67	385	25	3764	4306
06-22	26	3431	785	77	468	30	4817	5473
06-00	27	3500	794	78	484	31	4914	5592
00-00	27	3765	847	88	528	33	5288	6030

TRAFFINOMICS LIMITED

KNOCKHARLEY TRAFFIC COUNT/SPEED SURVEYS **Friday 11 April 2025**
AUTOMATIC TRAFFIC COUNTS **TRA/25/046**

SITE 02
NORTHBOUND

TIME	PCL/MCL	CAR*	LGV**	OGV 1	OGV 2	BUS	TOTAL	PCU
0000	0	24	7	1	13	0	45	62
0100	0	19	3	0	15	1	38	59
0200	0	9	2	0	8	1	20	31
0300	0	13	5	1	10	1	30	45
0400	0	24	3	1	5	1	34	42
0500	0	42	8	3	10	0	63	78
0600	0	82	17	2	26	2	129	166
0700	1	160	45	2	36	0	244	291
0800	2	187	40	5	43	1	278	336
0900	1	117	31	3	48	0	200	263
1000	1	142	24	10	41	3	221	282
1100	1	183	39	7	50	3	283	354
1200	2	244	37	2	50	4	339	407
1300	2	273	51	8	33	3	370	418
1400	8	297	55	8	38	1	407	455
1500	3	398	89	13	32	4	539	589
1600	4	360	61	7	33	1	466	510
1700	9	414	51	6	20	1	501	524
1800	4	276	44	0	24	1	349	378
1900	0	215	28	0	7	2	252	263
2000	0	146	9	1	8	0	164	175
2100	0	118	10	0	8	1	137	148
2200	0	95	4	1	7	0	107	117
2300	1	68	8	0	11	1	89	104
07-19	38	3051	567	71	448	22	4197	4807
06-22	38	3612	631	74	497	27	4879	5559
06-00	39	3775	643	75	515	28	5075	5779
00-00	39	3906	671	81	576	32	5305	6095

TRAFFINOMICS LIMITED

KNOCKHARLEY TRAFFIC COUNT/SPEED SURVEYS **Friday 11 April 2025**
AUTOMATIC TRAFFIC COUNTS **TRA/25/046**

SITE 02
SOUTHBOUND

TIME	PCL/MCL	CAR*	LGV**	OGV 1	OGV 2	BUS	TOTAL	PCU
0000	0	25	3	1	2	0	31	34
0100	0	7	2	2	2	0	13	17
0200	0	13	4	0	7	2	26	37
0300	0	13	2	6	4	0	25	33
0400	0	32	5	3	4	0	44	51
0500	0	189	38	7	22	2	258	292
0600	0	355	129	4	42	3	533	593
0700	4	359	105	10	25	5	508	547
0800	2	337	71	11	55	6	482	563
0900	0	198	51	11	45	7	312	383
1000	1	154	42	5	39	5	246	303
1100	1	163	33	5	39	2	243	297
1200	1	229	37	5	41	2	315	372
1300	10	216	47	6	36	3	318	363
1400	1	174	40	5	33	4	257	306
1500	1	209	35	4	24	2	275	309
1600	6	220	38	5	24	2	295	326
1700	1	235	30	2	15	2	285	307
1800	2	202	28	1	9	0	242	253
1900	0	144	13	0	6	1	164	173
2000	2	120	18	1	11	1	153	167
2100	1	117	11	3	9	0	141	153
2200	0	53	12	1	5	0	71	78
2300	0	34	5	0	9	0	48	60
07-19	30	2696	557	70	385	40	3778	4330
06-22	33	3432	728	78	453	45	4769	5416
06-00	33	3519	745	79	467	45	4888	5553
00-00	33	3798	799	98	508	49	5285	6017

TRAFFINOMICS LIMITED

KNOCKHARLEY TRAFFIC COUNT/SPEED SURVEYS **SITE 02** **WEEK COMMENCING:** **Saturday 5 April 2025**
AUTOMATIC TRAFFIC COUNTS **NORTHBOUND** **TRA/25/046**

TIME PERIOD	Saturday 5 April 2025	Sunday 6 April 2025	Monday 7 April 2025	Tuesday 8 April 2025	Wednesday 9 April 2025	Thursday 10 April 2025	Friday 11 April 2025	Average
0000	49	53	21	39	47	43	45	42
0100	37	32	24	28	29	30	38	31
0200	25	16	17	17	22	30	20	21
0300	16	11	13	18	17	30	30	19
0400	19	13	24	22	19	12	34	20
0500	34	20	50	55	50	46	63	45
0600	68	27	129	139	149	128	129	110
0700	106	70	214	208	220	239	244	186
0800	152	86	260	271	291	238	278	225
0900	195	144	222	216	196	211	200	198
1000	247	204	213	242	226	230	221	226
1100	265	226	242	227	230	245	283	245
1200	292	251	249	268	252	299	339	279
1300	315	299	308	310	308	347	370	322
1400	309	318	328	329	319	366	407	339
1500	298	315	415	411	465	474	539	417
1600	266	282	514	519	499	493	466	434
1700	309	270	628	645	553	648	501	508
1800	279	252	404	415	515	489	349	386
1900	220	229	246	260	297	314	252	260
2000	168	157	179	193	214	208	164	183
2100	118	99	120	155	158	130	137	131
2200	92	61	68	70	98	85	107	83
2300	59	38	52	63	65	73	89	63
07-19	3033	2717	3997	4061	4074	4279	4197	3765
06-22	3607	3229	4671	4808	4892	5059	4879	4449
06-00	3758	3328	4791	4941	5055	5217	5075	4595
00-00	3938	3473	4940	5120	5239	5408	5305	4775

TRAFFINOMICS LIMITED

KNOCKHARLEY TRAFFIC COUNT/SPEED SURVEYS **SITE 02** **WEEK COMMENCING:** **Saturday 5 April 2025**
AUTOMATIC TRAFFIC COUNTS **SOUTHBOUND** **TRA/25/046**

TIME PERIOD	Saturday 5 April 2025	Sunday 6 April 2025	Monday 7 April 2025	Tuesday 8 April 2025	Wednesday 9 April 2025	Thursday 10 April 2025	Friday 11 April 2025	Average
0000	20	22	11	21	10	14	31	18
0100	18	27	14	7	13	7	13	14
0200	14	9	17	14	9	15	26	15
0300	15	10	20	18	29	17	25	19
0400	18	16	73	40	56	56	44	43
0500	68	35	295	274	277	265	258	210
0600	120	66	656	665	613	604	533	465
0700	161	73	566	561	574	545	508	427
0800	194	89	541	525	542	522	482	414
0900	234	171	329	370	372	373	312	309
1000	276	204	281	311	257	296	246	267
1100	297	281	247	252	263	237	243	260
1200	365	341	272	231	268	253	315	292
1300	318	364	266	229	251	258	318	286
1400	285	279	253	235	221	246	257	254
1500	279	267	244	253	275	244	275	262
1600	222	252	284	266	272	289	295	269
1700	269	270	296	287	321	295	285	289
1800	201	230	212	257	242	206	242	227
1900	164	220	157	158	159	161	164	169
2000	153	176	182	124	183	147	153	160
2100	108	128	89	105	115	141	141	118
2200	59	64	51	49	61	66	71	60
2300	37	39	24	30	27	31	48	34
07-19	3101	2821	3791	3777	3858	3764	3778	3556
06-22	3646	3411	4875	4829	4928	4817	4769	4468
06-00	3742	3514	4950	4908	5016	4914	4888	4562
00-00	3895	3633	5380	5282	5410	5288	5285	4882

TRAFFINOMICS LIMITED

KNOCKHARLEY TRAFFIC COUNT/SPEED SURVEYS **WEEK COMMENCING:** **Saturday 5 April 2025**
AUTOMATIC TRAFFIC COUNTS **TRA/25/046**

SITE 02
NORTHBOUND

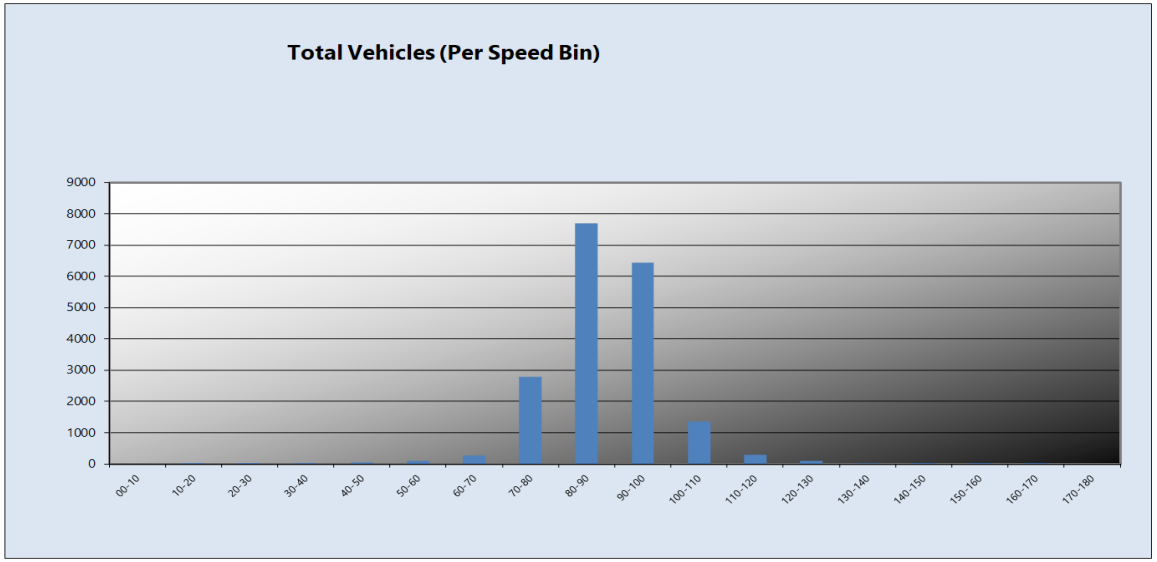
Profile:

Filter time: 00:00 5th April 2025 => 23:59 11th April 2025
Speed range: 0 - 200 km/h.
Separation: Greater than 4.00 seconds. - (Headway)
Units: Metric (meter, kilometer, m/s, km/h, kg, tonne)

Vehicles = 19156
Maximum = 168.4 km/h, Minimum = 18.1 km/h, Mean = 88.6 km/h
85% Speed = 97.38 km/h, 95% Speed = 104.22 km/h, Median = 88.65 km/h
20 km/h Pace = 78 - 98, Number in Pace = 14386 (75.10%)
Variance = 105.93, Standard Deviation = 10.29 km/h

Speed Bins:

Speed	Bin	
KPH	No.	%
00-10	0	0.0
10-20	1	0.0
20-30	14	0.1
30-40	20	0.1
40-50	47	0.2
50-60	98	0.5
60-70	272	1.4
70-80	2782	14.5
80-90	7691	40.1
90-100	6435	33.6
100-110	1360	7.1
110-120	302	1.6
120-130	87	0.5
130-140	26	0.1
140-150	11	0.1
150-160	6	0.0
160-170	4	0.0
170-180	0	0.0



TRAFFINOMICS LIMITED

KNOCKHARLEY TRAFFIC COUNT/SPEED SURVEYS **WEEK COMMENCING:** **Saturday 5 April 2025**
AUTOMATIC TRAFFIC COUNTS **TRA/25/046**

SITE 02
SOUTHBOUND

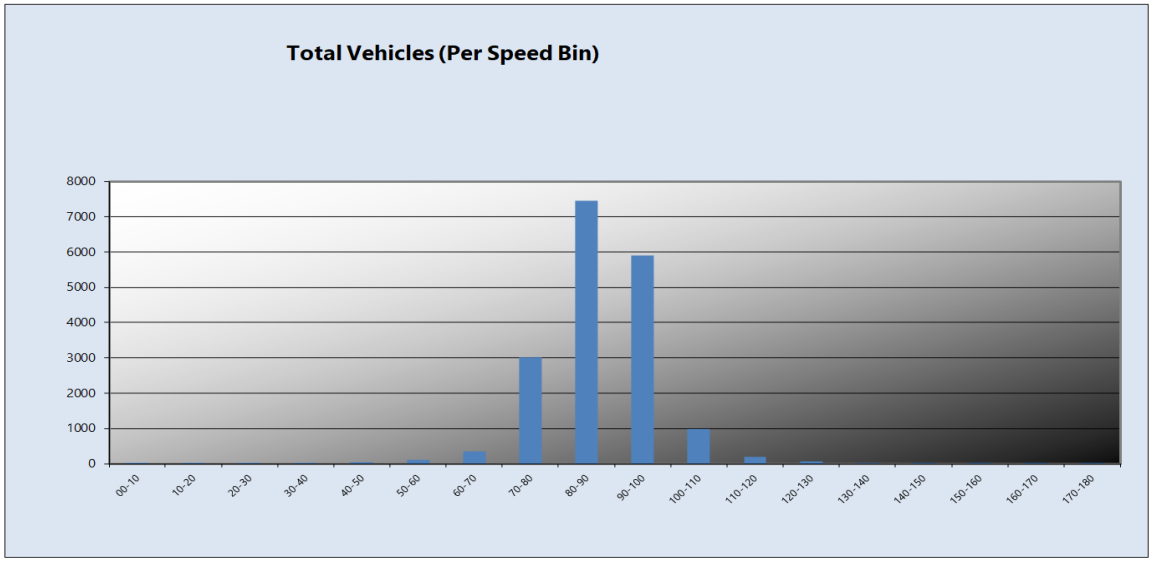
Profile:

Filter time: 00:00 5th April 2025 => 23:59 11th April 2025
Speed range: 0 - 200 km/h.
Separation: Greater than 4.00 seconds. - (Headway)
Units: Metric (meter, kilometer, m/s, km/h, kg, tonne)

Vehicles = 18159
Maximum = 176.3 km/h, Minimum = 9.6 km/h, Mean = 87.7 km/h
85% Speed = 96.21 km/h, 95% Speed = 102.24 km/h, Median = 88.02 km/h
20 km/h Pace = 77 - 97, Number in Pace = 13795 (75.97%)
Variance = 98.31, Standard Deviation = 9.92 km/h

Speed Bins:

Speed	Bin	
KPH	No.	%
00-10	1	0.0
10-20	1	0.0
20-30	3	0.0
30-40	8	0.0
40-50	44	0.2
50-60	101	0.6
60-70	351	1.9
70-80	3024	16.7
80-90	7446	41.0
90-100	5893	32.5
100-110	986	5.4
110-120	196	1.1
120-130	60	0.3
130-140	27	0.1
140-150	8	0.0
150-160	5	0.0
160-170	2	0.0
170-180	3	0.0



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CLASSIFICATION SCHEMES:

Scheme F Classification Scheme (Non-metric)

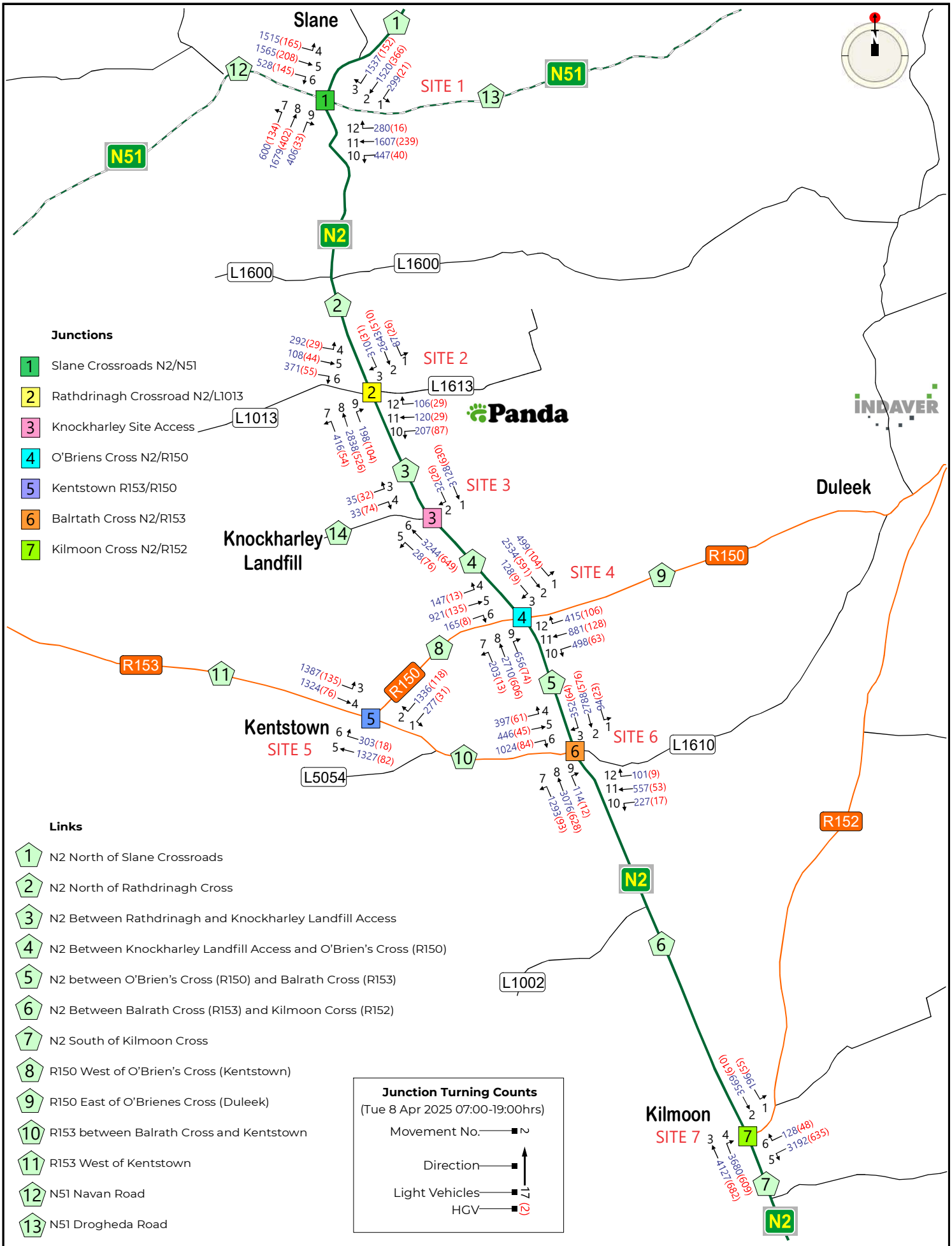
Scheme F is an attempt to implement the FWHA's visual classification scheme as an axle-based classification scheme. This is one of several interpretations.

Vehicle Class	Class	Vehicle Type	No. of Axles	Axle spacing in feet				
				Axle 1 to 2	Axle 2 to 3	Axle 3 to 4	Axle 4 to 5	Axle 5 to 6
PCL/MCL	1	motorcycle	2	<6.0				
CAR*	2	passenger car	2	6.0 - 10.0				
		car + 1 axle trailer	3	<10.0	10.0 - 18.0			
		car + 2 axle trailer	4	<10.0		<3.5		
LGV**	3	pickup	2	10.0 - 15.0				
		pickup + 1 axle trailer	3	10.0 - 15.0	10.0 - 18.0			
		pickup + 2 axle trailer	4	10.0 -15.0		<3.5		
		pickup + 3 axle trailer	5	9.9 - 15.0			<3.5	
BUS	4	bus	2	>20.0				
		bus	3	>19.0				
OGV 1	5	single unit truck - dual rear axle	2	14.9 - 20.0			<3.5	
	6	3 axle truck	3		<18.0			
OGV 2	7	4 axle truck	4					
	8	2S1	3		>18.0			
		2S2	4		>5.0	>3.5		
		3S1	4		<5.0	>10.0		
	9	3S2	5		<6.1		3.5 - 8.0	
		5 axle combination	5					
	10	6 axle combination	6			3.5 - 5.0		
		3S3	6					
	11	2S1-2	5		>6.0			
	12	3S1-2	6					>10.0
	13	truck	7 or more					

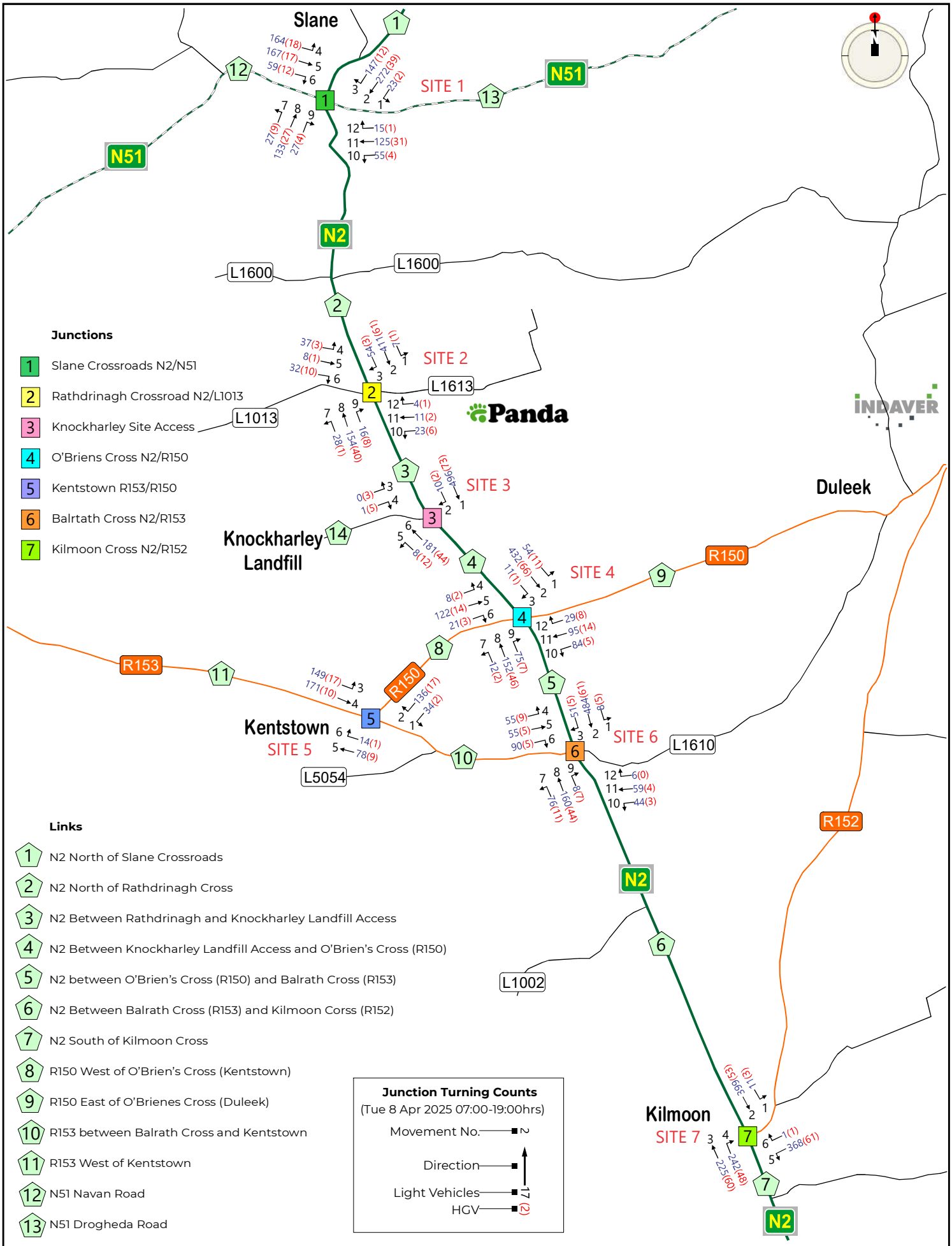
Car* Cars and LGV based cars
LGV** Light Goods Vehicles with the exception of LGV based on cars

Appendix 13.2
Network Flow Diagrams

AWN Consulting Ltd, The Tecpro Building, IDA Business & Technology Park, Clonshaugh, Dublin 17, D17 XD90



TRAFFICWISE traffic & transportation solutions Suite 5, Gowna Plaza, Bracetown Business Park D15 R59T Telephone: +353 (0)1 8253015 Website: www.trafficwise.ie E-mail: info@trafficwise.ie	Project Title: **Knockharley Landfill 2025** Drawing Title: Surveyed 2025 Weekday Daily Turning Traffic Flows 07:00-19:00hrs	Prepared: TWL Date: Sept 2025 Scale: NTS	Checked: JMK Date: Sept 2025 Project No: 03222
		Approved: JMK Date: Sept 2025 **Figure** 7 **Appendix B**	



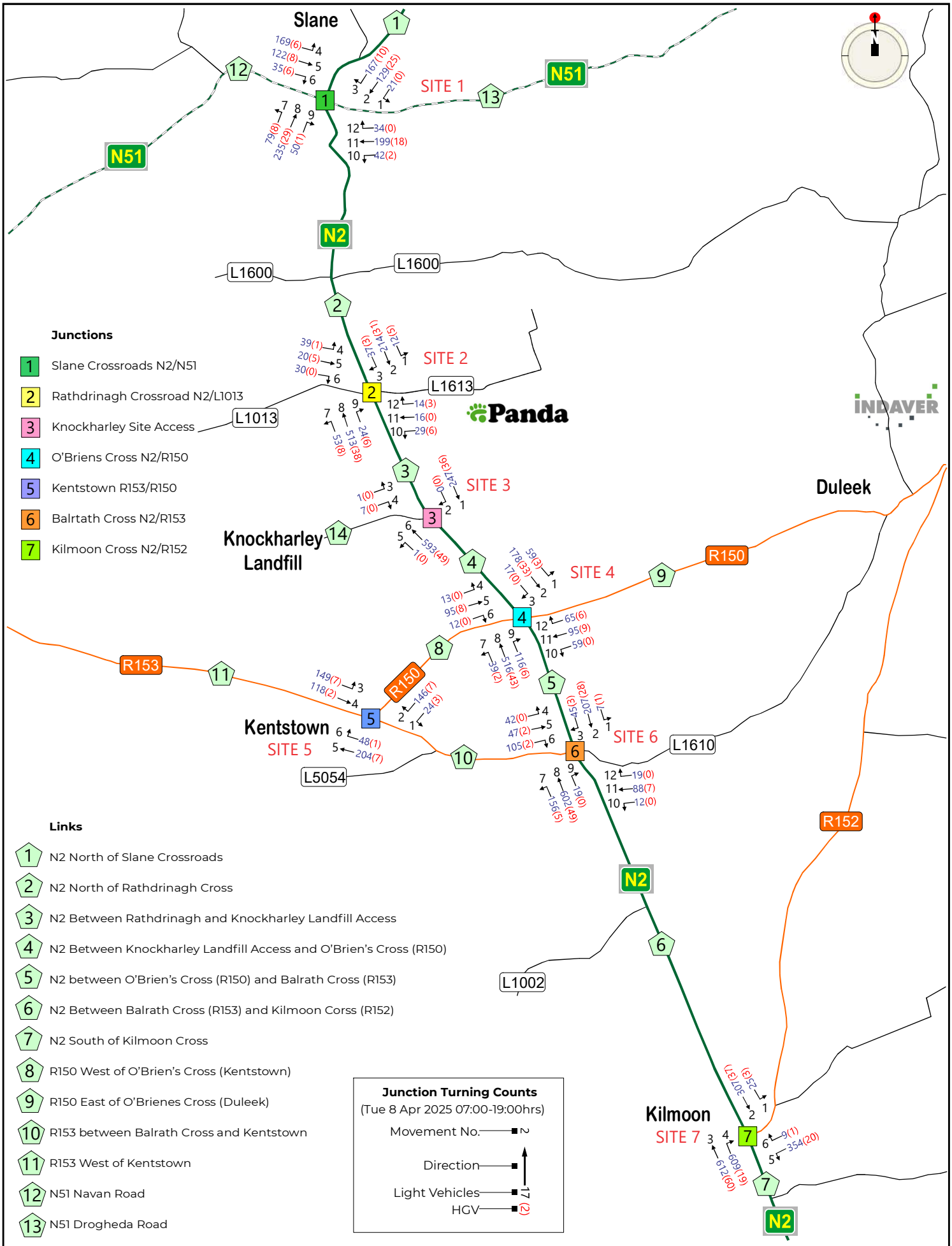
TRAFFICWISE
traffic & transportation solutions

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D15 R59T

Telephone: +353 (0)1 8253015
Website: www.trafficwise.ie
E-mail: info@trafficwise.ie

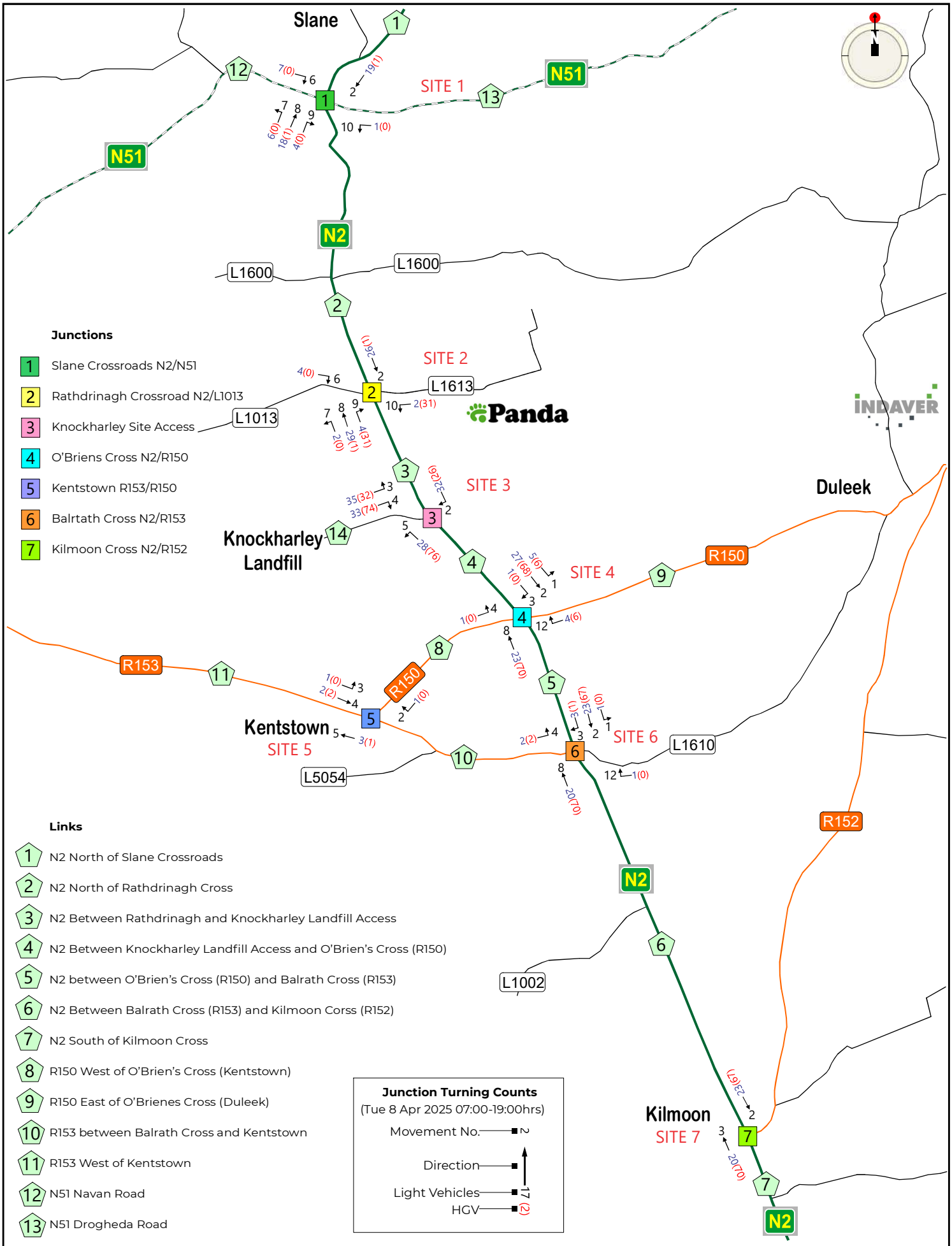
Project Title	**Knockharley Landfill 2025**		
Drawing Title	Surveyed 2025 Morning Peak Hour Traffic Flows 07:30-08:30hrs		

Prepared:	Checked:	Approved:
TWL	JMK	JMK
Date: Sept 2025	Date: Sept 2025	Date: Sept 2025
Scale: NTS	Project No: 03222	**Figure** 2
	Appendix B	



TRAFFICWISE traffic & transportation solutions Suite 5, Gowna Plaza, Bracetown Business Park D15 R59T Telephone: +353 (0)1 8253015 Website: www.trafficwise.ie E-mail: info@trafficwise.ie	Project Title: **Knockharley Landfill 2025**	Prepared: TWL	Checked: JMK
	Drawing Title: Surveyed 2025 Evening Peak Hour Traffic Flows 17:00-18:00hrs	Date: Sept 2025	Date: Sept 2025
		Scale: NTS	Project No: 03222
			Appendix B

Approved:	Date:	Figure
JMK	Sept 2025	3

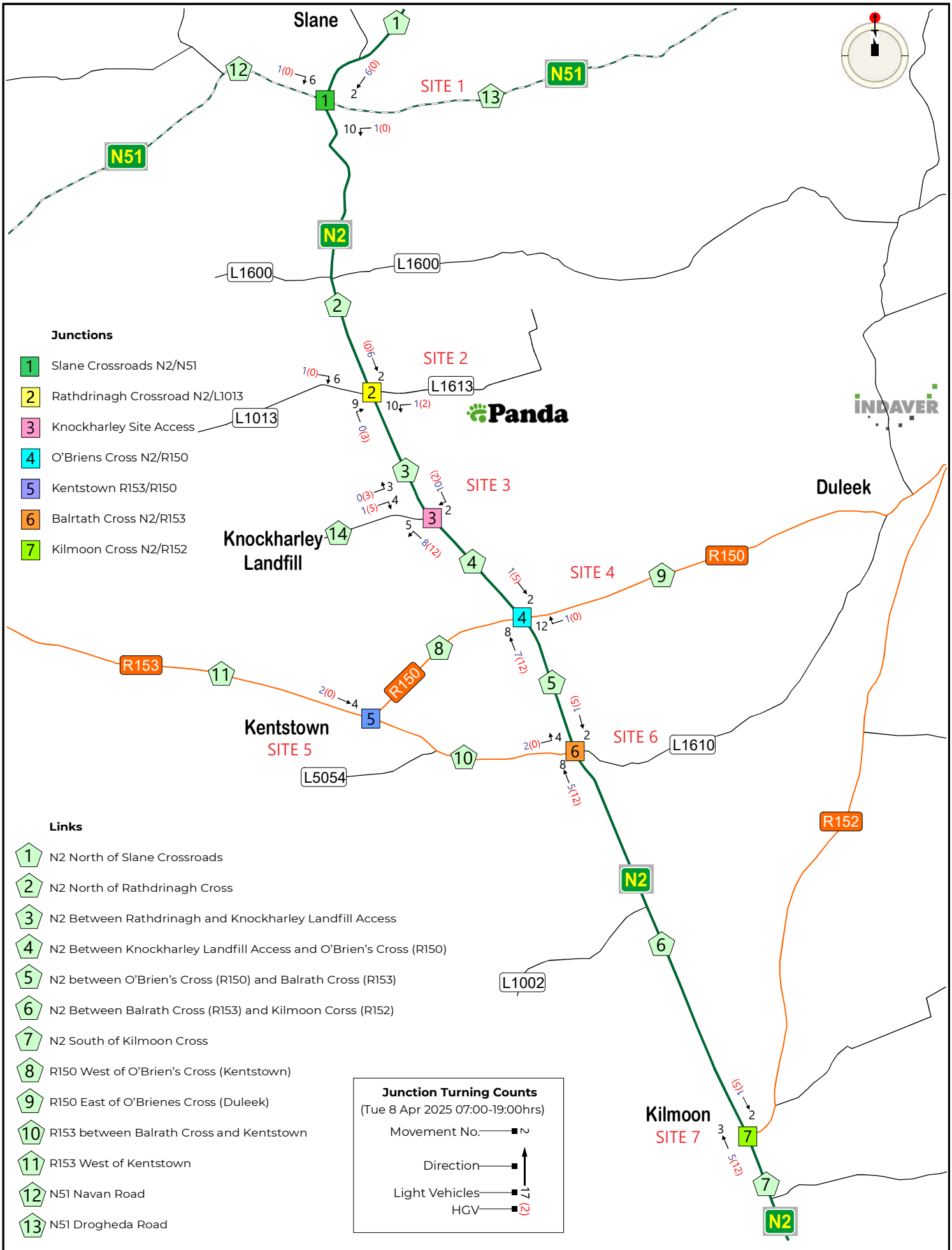


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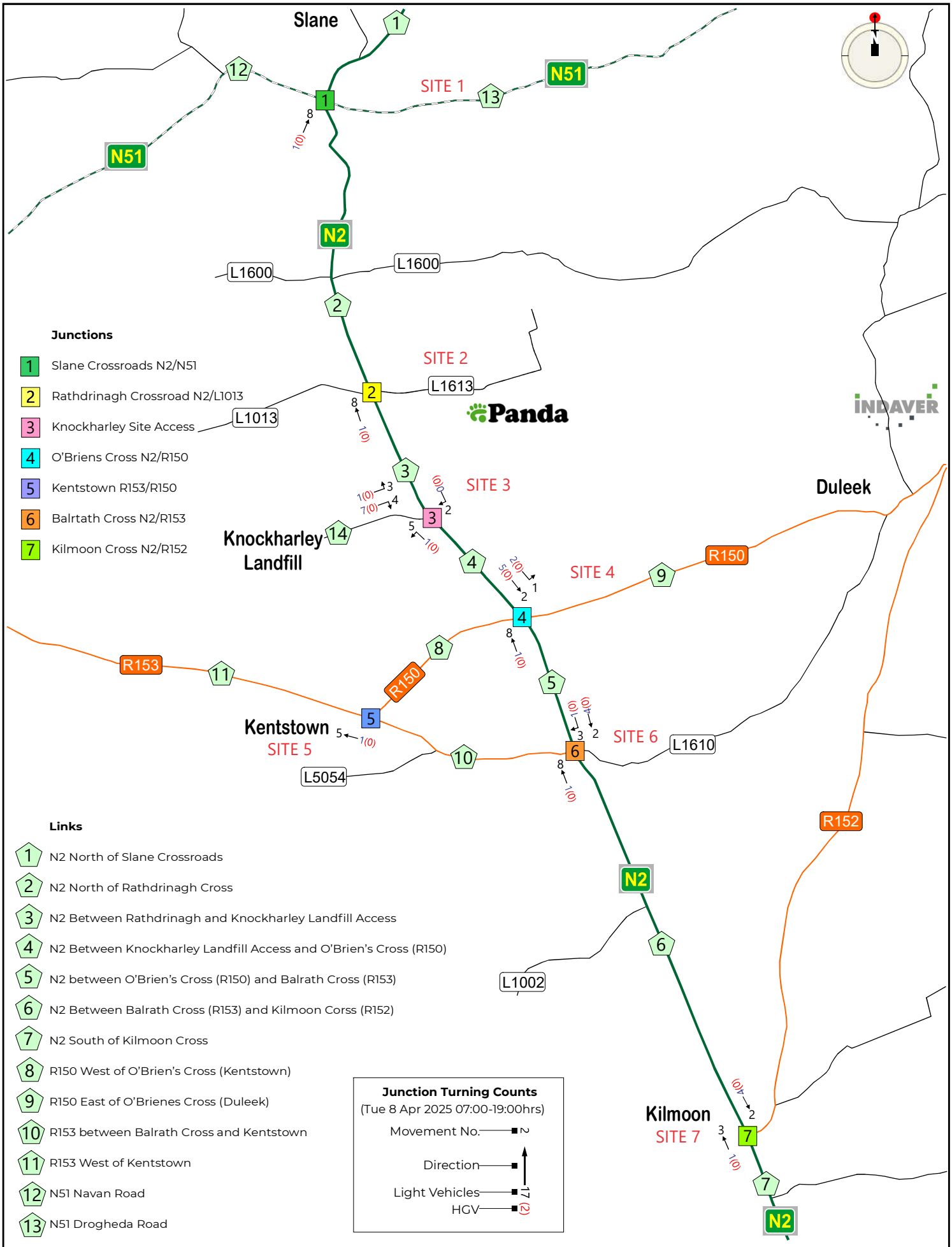
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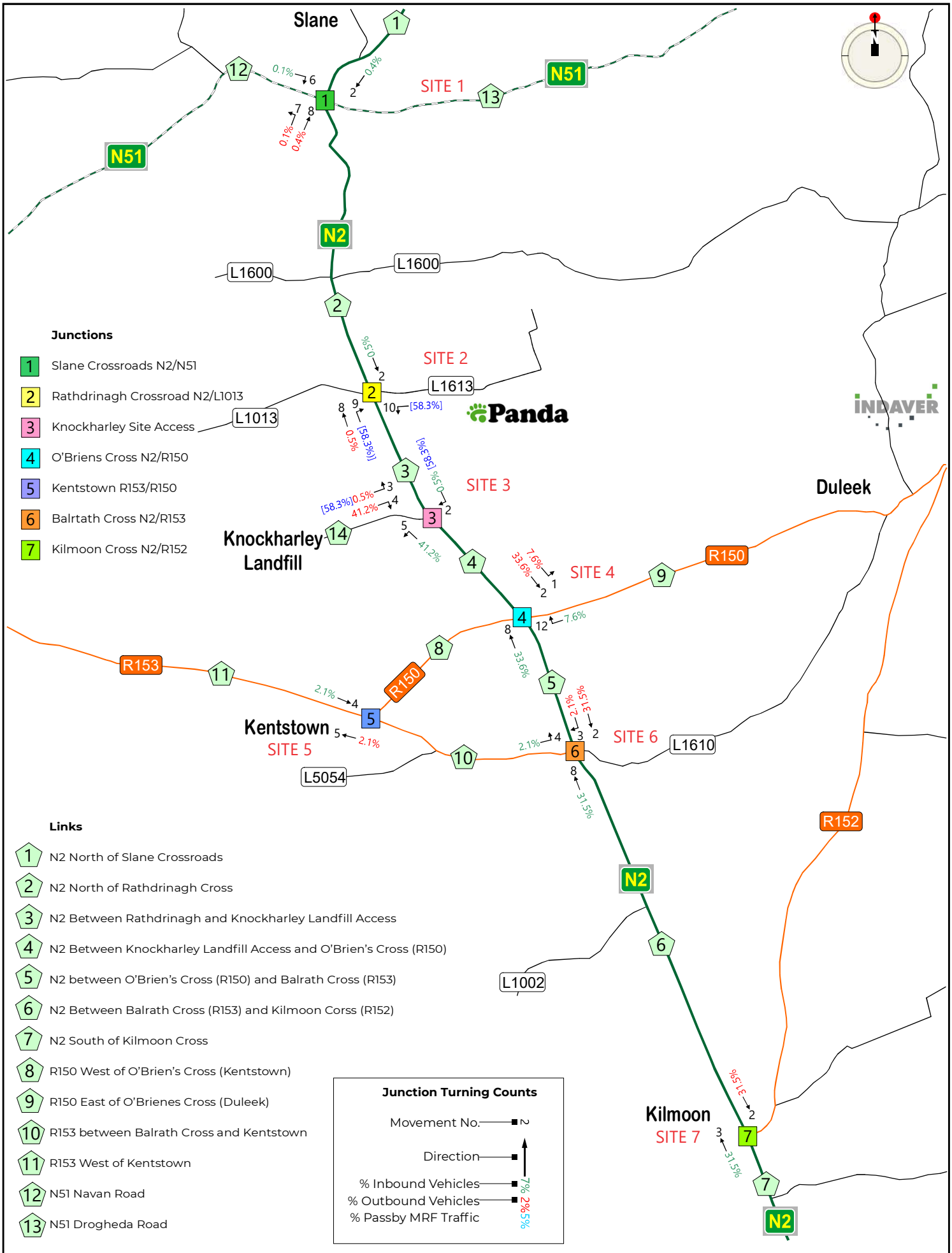
Project Title	**Knockharley Landfill 2025**	Prepared: TWL	Checked: JMK	Approved: JMK
Drawing Title	Surveyed 2025 Landfill Turning Traffic Flows Day of Survey 07:00-19:00hrs	Date: Sept 2025	Date: Sept 2025	Date: Sept 2025
		Scale: NTS	Project No: 03222	**Figure** 4
			Appendix B	



TRAFFICWISE traffic & transportation solutions Suite 5, Gowna Plaza, Bracetown Business Park D15 R59T Telephone: +353 (0)1 8253015 Website: www.trafficwise.ie E-mail: info@trafficwise.ie	Project Title: **Knockharley Landfill 2025**	Prepared: TWL	Checked: JMK	Approved: JMK
	Drawing Title: Surveyed 2025 Landfill Turning Traffic Flows Morning Peak During Survey 08:00-09:00hrs	Date: Sept 2025	Date: Sept 2025	Date: Sept 2025
		Scale: NTS	Project No: 03222	**Figure** 5
			Appendix B	

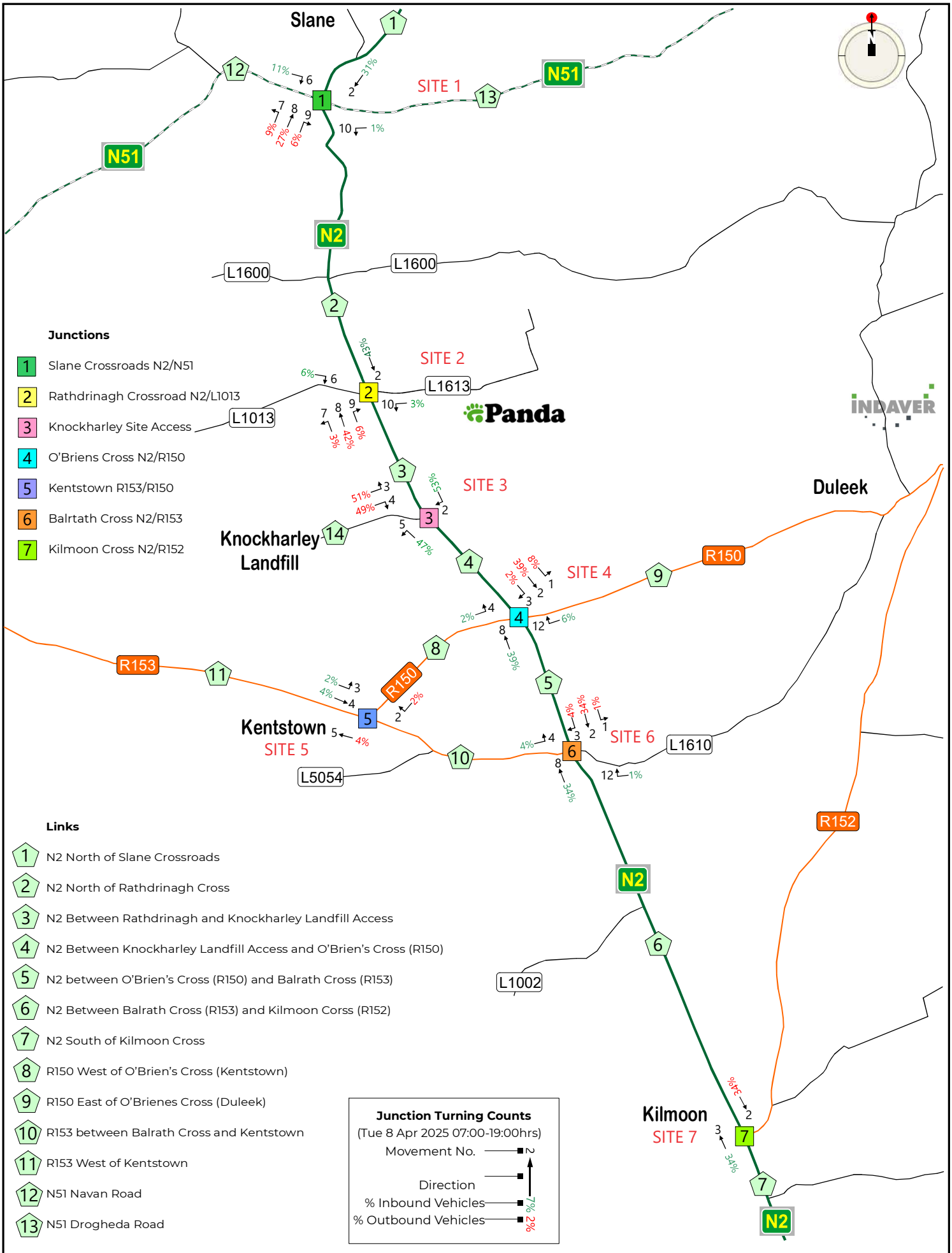


TRAFFICWISE traffic & transportation solutions Suite 5, Gowna Plaza, Bracetown Business Park D15 R59T Telephone: +353 (0)1 8253015 Website: www.trafficwise.ie E-mail: info@trafficwise.ie	Project Title: **Knockharley Landfill 2025** Drawing Title: Surveyed 2025 Evening Peak Hour Traffic Flows 17:00-18:00hrs	Prepared: TWL Date: Sept 2025 Scale: NTS	Checked: JMK Date: Sept 2025 Project No: 03222	Approved: JMK Date: Sept 2025 **Figure 6** **Appendix B**



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E-mail: info@trafficwise.ie

Project Title: **Knockharley Landfill 2025**	Prepared: TWL	Checked: JMK	Approved: JMK
Drawing Title: Distribution of HGV Traffic Weighbridge Data Analysis 2022, 2023 and 2024	Date: Sept 2025	Date: Sept 2025	Date: Sept 2025
	Scale: NTS	Project No: 03222	**Figure** 4
		Appendix B	

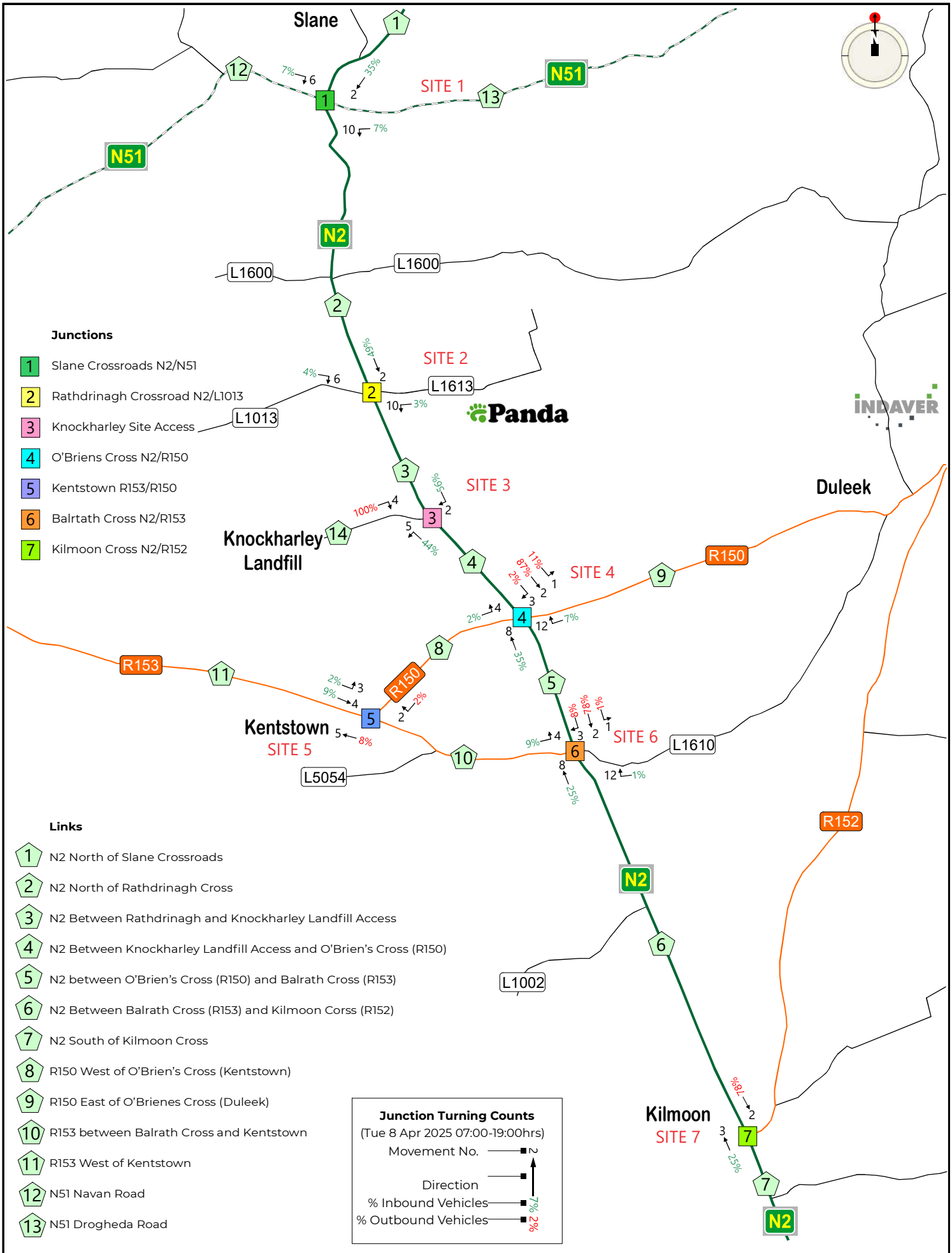


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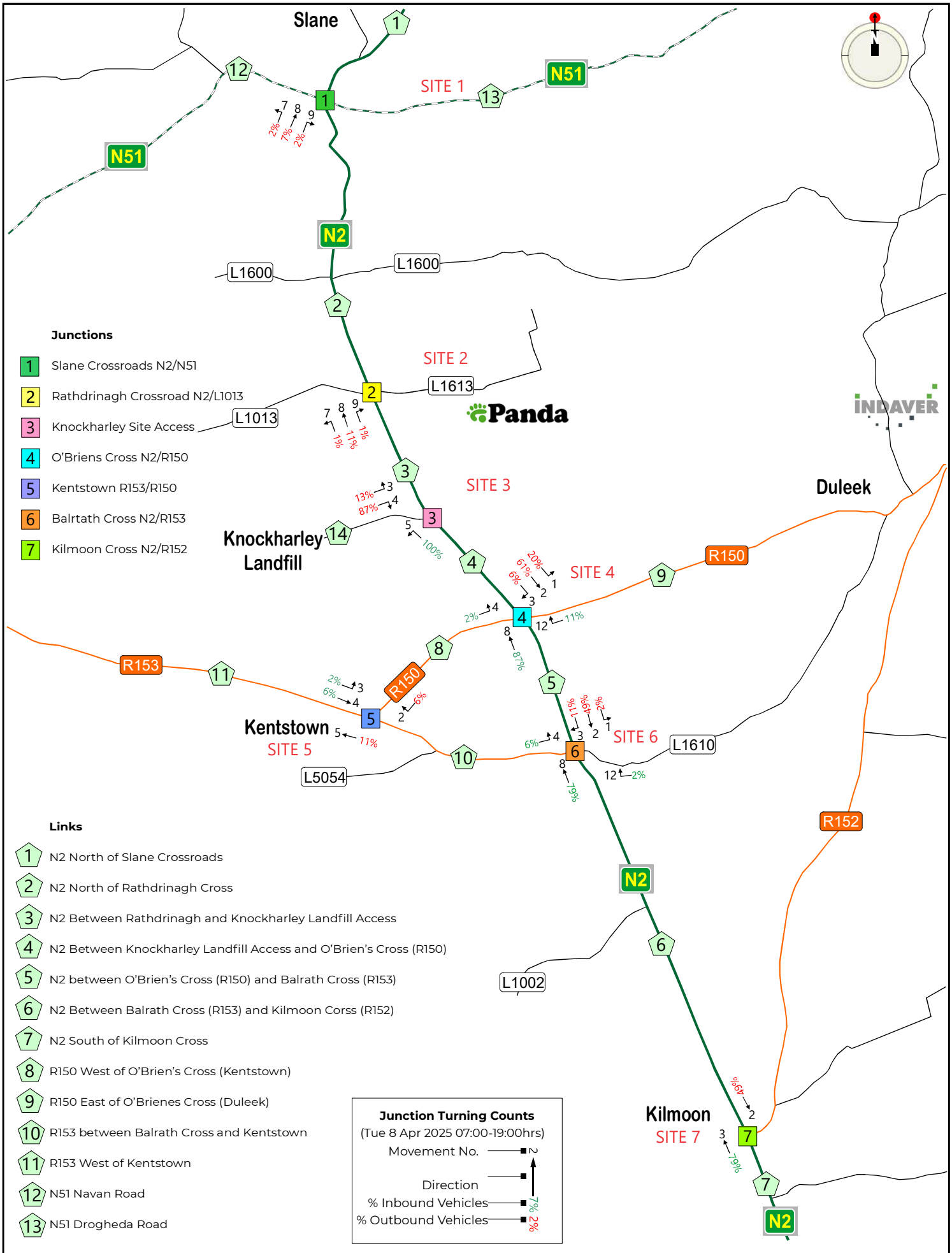
Project Title	**Knockharley Landfill 2025**
Drawing Title	Surveyed 2025 Daily Light Traffic Distribution 07:00-19:00hrs

Prepared:	Checked:	Approved:
TWL	JMK	JMK
Date: Sept 2025	Date: Sept 2025	Date: Sept 2025
Scale: NTS	Project No: 03222	**Figure** 7
	Appendix B	

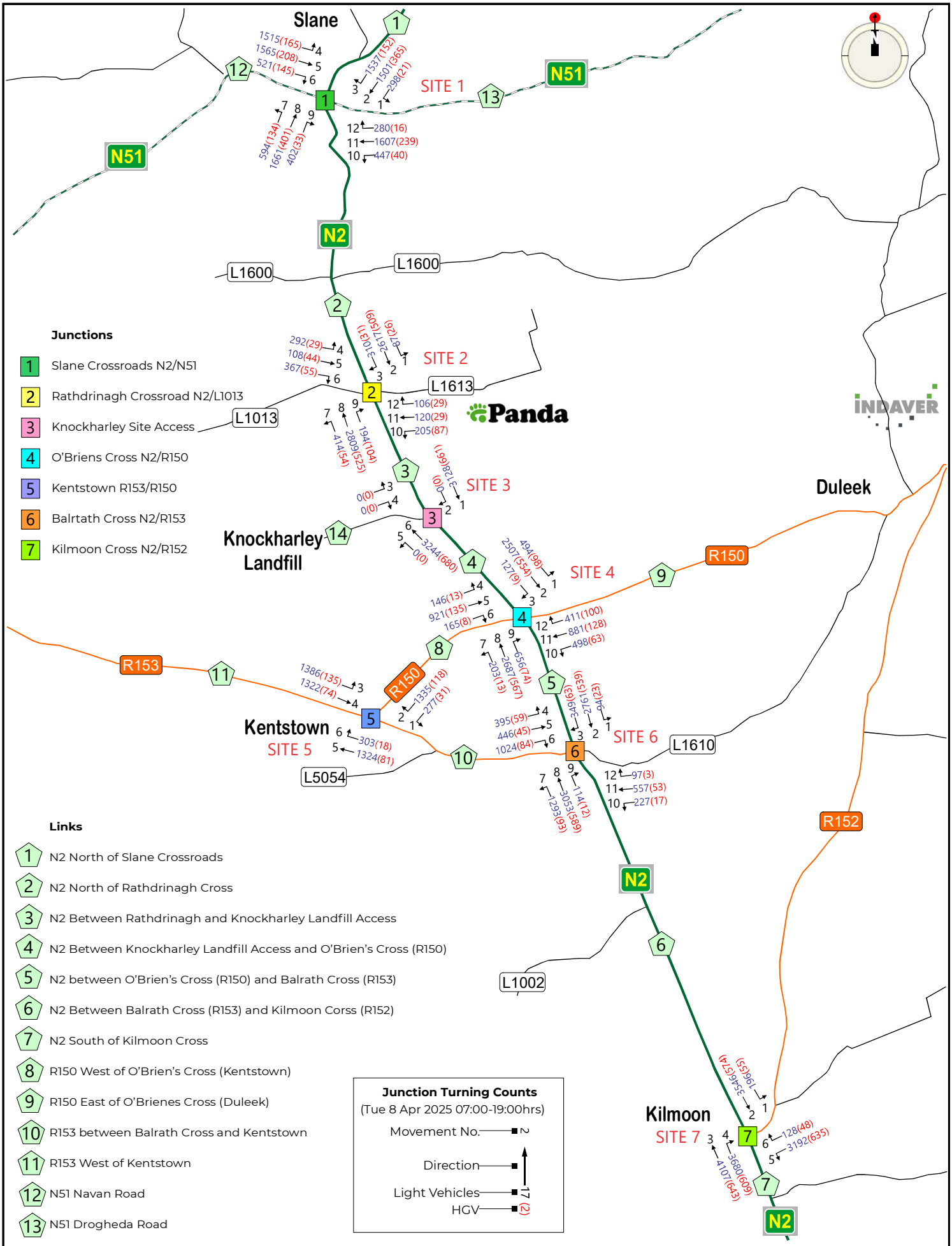


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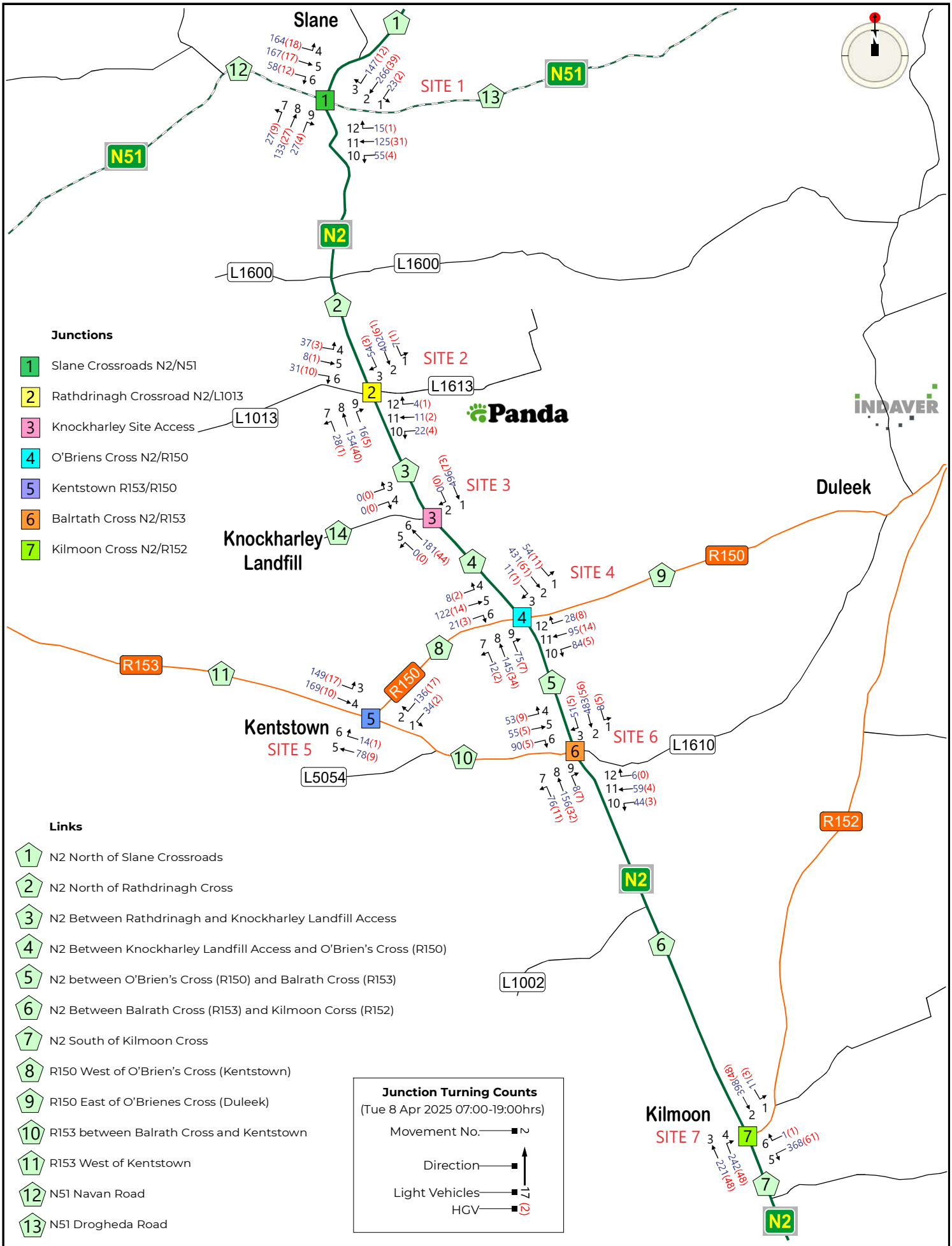
Project Title: **Knockharley Landfill 2025**	Prepared: TWL	Checked: JMK	Approved: JMK
Drawing Title: Surveyed 2025 Morning Peak Hour Light Traffic Distribution 08:00-09:00hrs	Date: Sept 2025	Date: Sept 2025	Date: Sept 2025
	Scale: NTS	Project No: 03222	**Figure** 6
		Appendix B	



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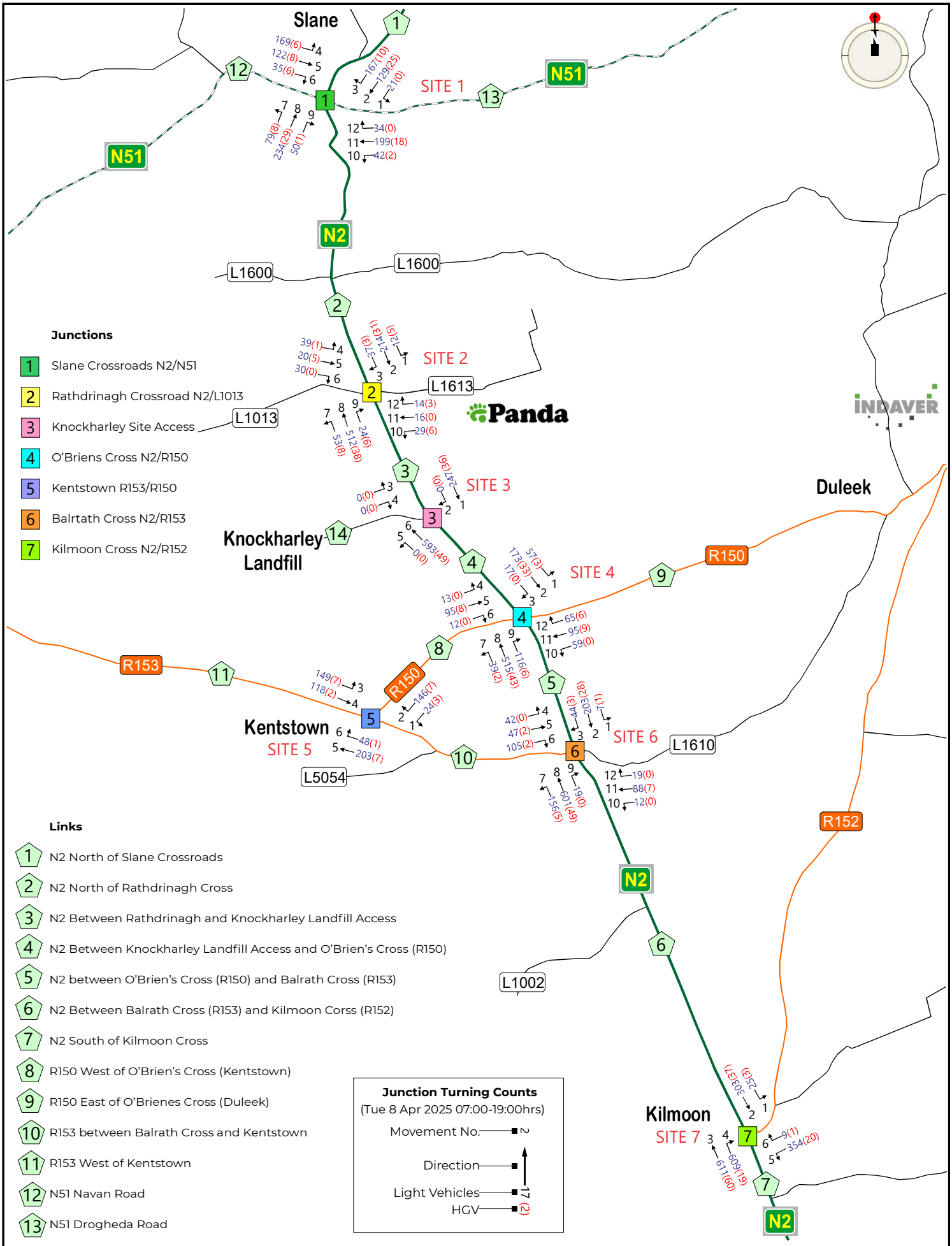
TRAFFICWISE traffic & transportation solutions Suite 5, Gowna Plaza, Bracetown Business Park D15 R59T Telephone: +353 (0)1 8253015 Website: www.trafficwise.ie E-mail: info@trafficwise.ie	Project Title: **Knockharley Landfill 2025**	Prepared: TWL	Checked: JMK	Approved: JMK
	Drawing Title: 2025 Baseline Netwrok Daily Traffic Flows Landfill Closed 07:00-19:00hrs	Date: Sept 2025	Date: Sept 2025	Date: Sept 2025
		Scale: NTS	Project No: 03222	**Figure** 11
			Appendix B	



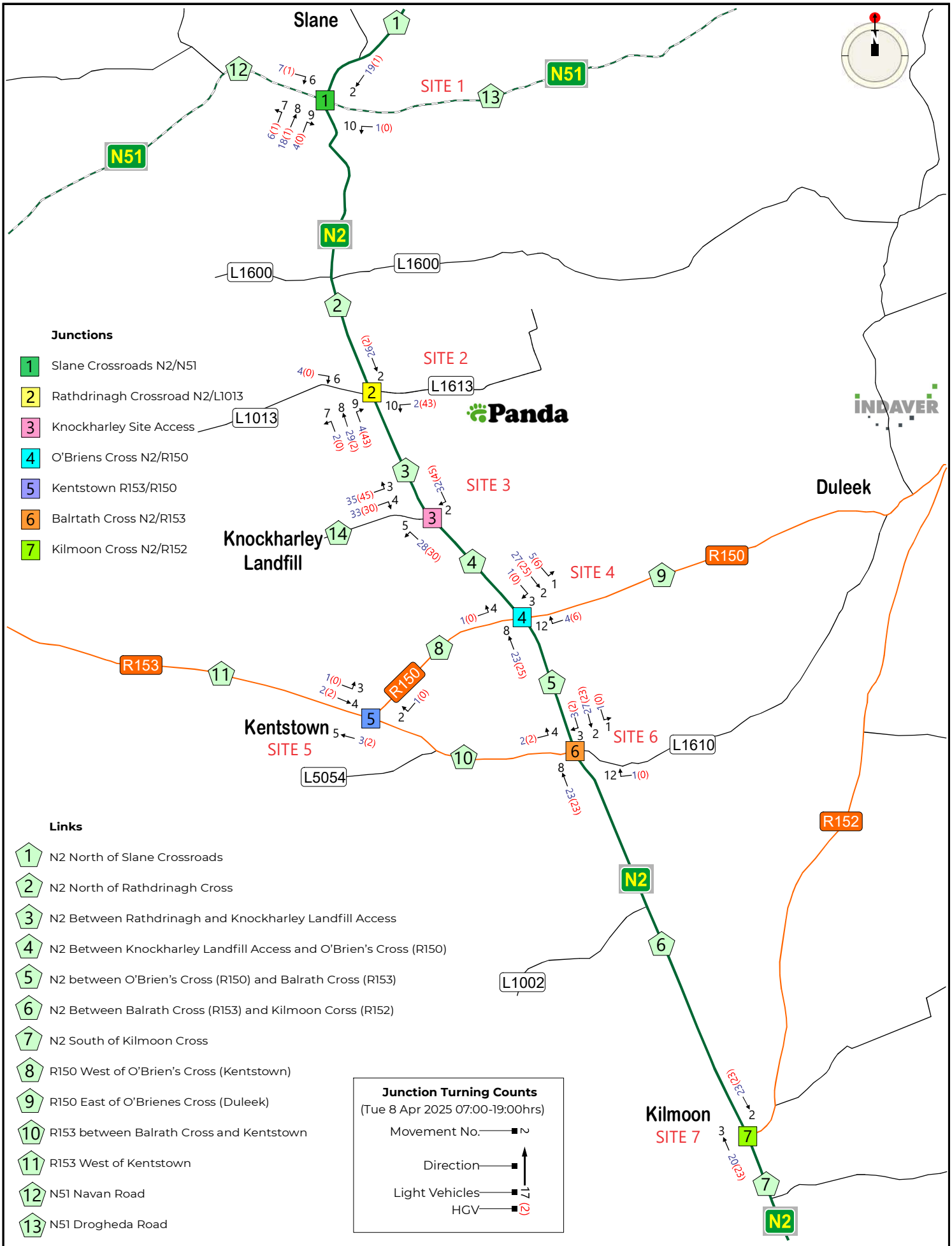
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Project Title	**Knockharley Landfill 2025**		
Drawing Title	2025 Baseline Netwrok AM Peak Traffic Flows Landfill Closed 08:00-09:00hrs		

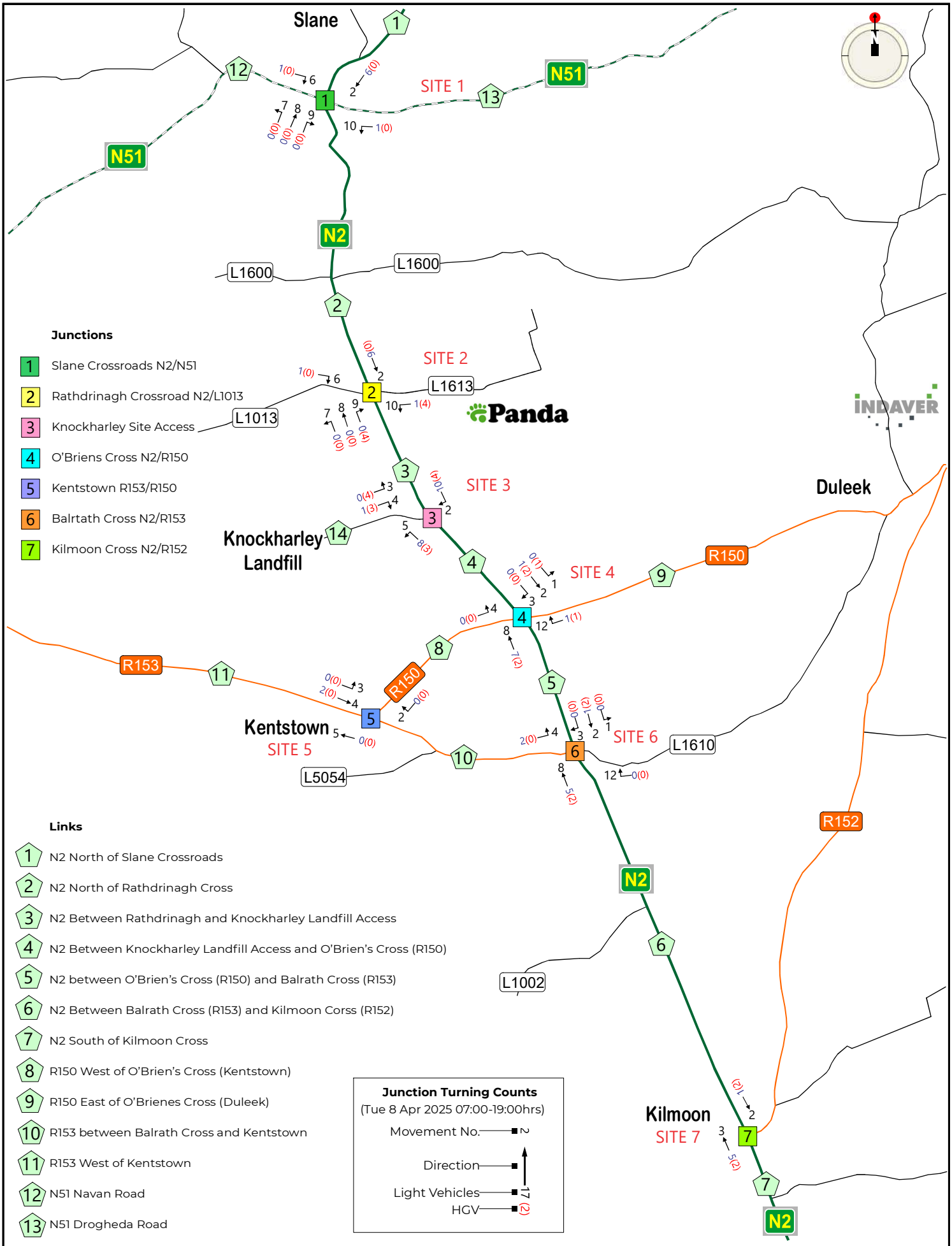
Prepared:	Checked:	Approved:
TWL	JMK	JMK
Date: Sept 2025	Date: Sept 2025	Date: Sept 2025
Scale: NTS	Project No: 03222	**Figure** 12
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	Drawing Title: 2025 Baseline Netwrok PM Peak Traffic Flows Landfill Closed 17:00-18:00hrs	Date: Sept 2025	Date: Sept 2025	Date: Sept 2025
		Scale: NTS	Project No: 03222	**Figure** 13
			Appendix B	



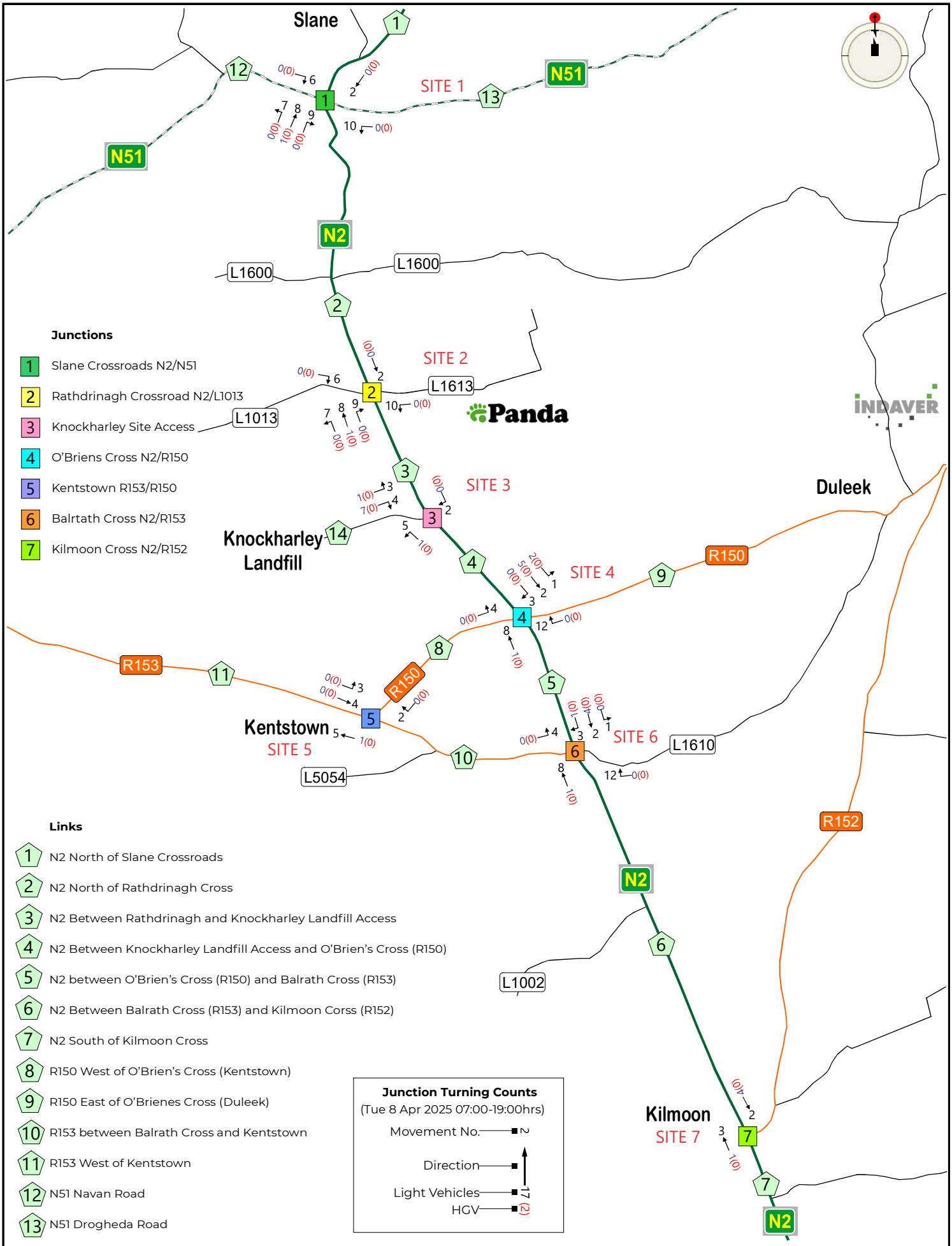
TRAFFICWISE traffic & transportation solutions Suite 5, Gowna Plaza, Bracetown Business Park D15 R59T Telephone: +353 (0)1 8253015 Website: www.trafficwise.ie E-mail: info@trafficwise.ie	Project Title: **Knockharley Landfill 2025** Drawing Title: Forecast Average Daily Traffic Generation 07:00-19:00	Prepared: TWL Date: Sept 2025 Scale: NTS	Checked: JMK Date: Sept 2025 Project No: 03222 **Appendix B**	Approved: JMK Date: Sept 2025 **Figure 14**



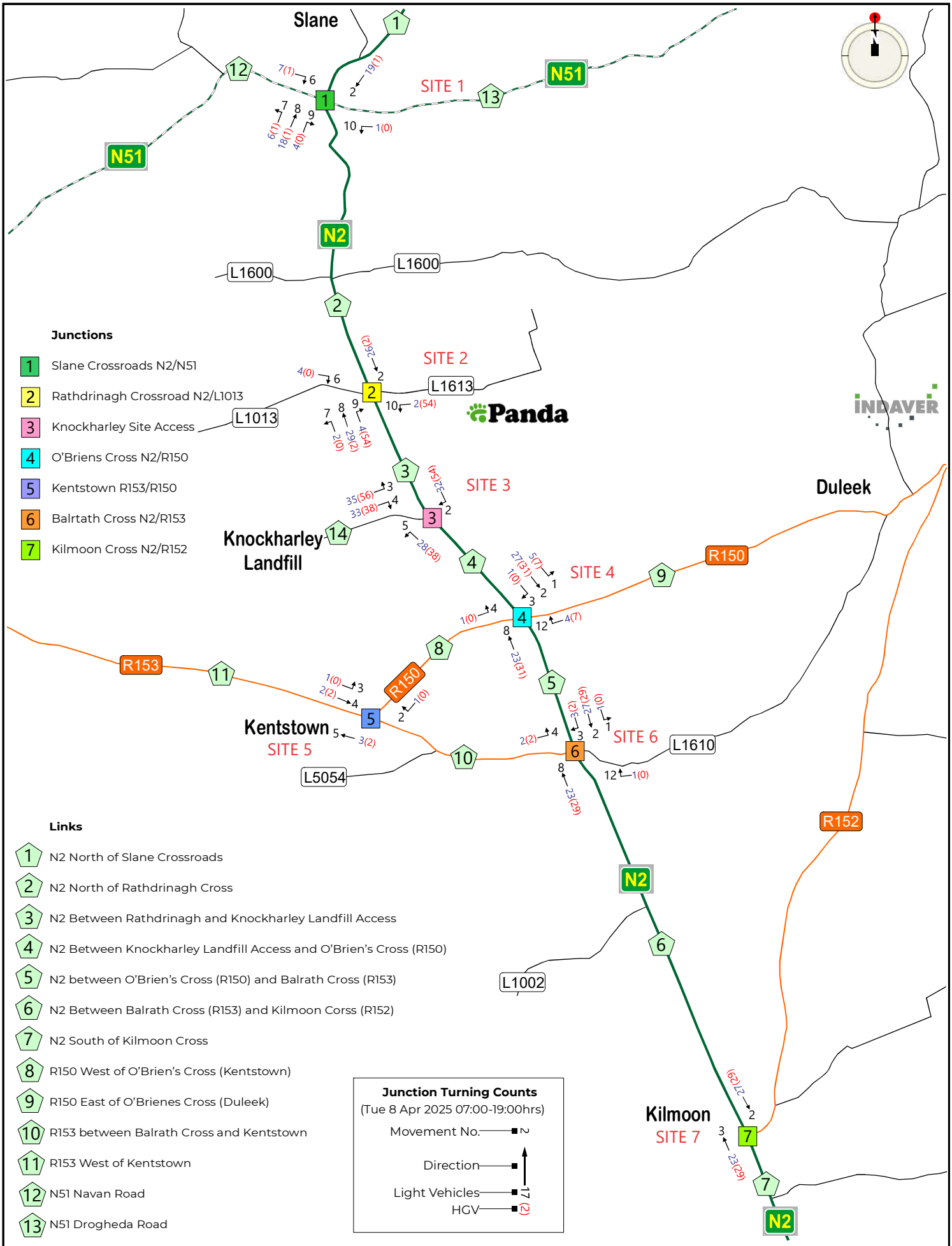
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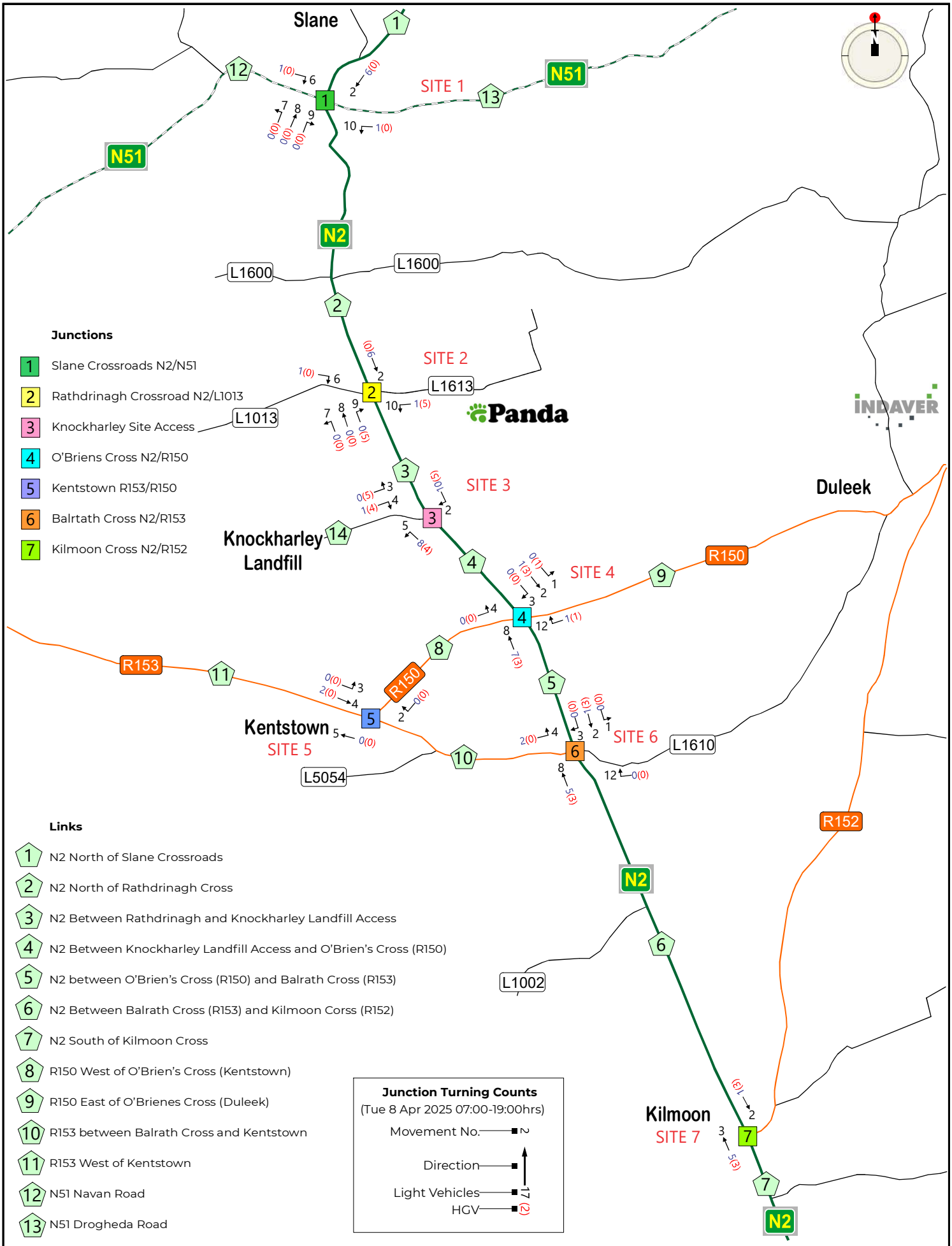
Project Title	**Knockharley Landfill 2025**	Prepared: TWL	Checked: JMK	Approved: JMK
Drawing Title	Forecast Average Morning Peak Hour Traffic Generation 08:00-09:00	Date: Sept 2025	Date: Sept 2025	Date: Sept 2025
		Scale: NTS	Project No: 03222	**Figure** 15
			Appendix B	



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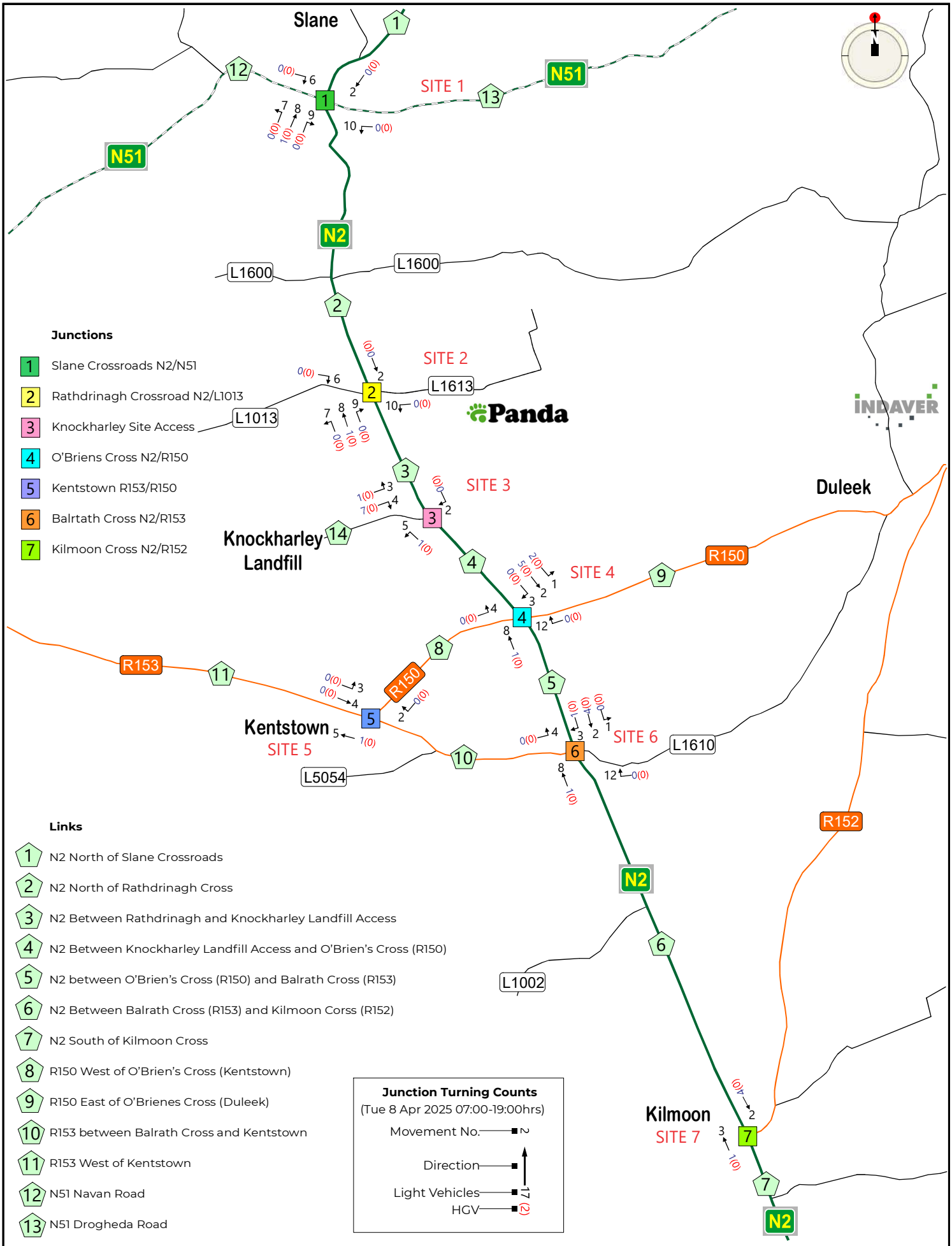
TRAFFICWISE traffic & transportation solutions Suite 5, Gowna Plaza, Bracetown Business Park D15 R59T Telephone: +353 (0)1 8253015 Website: www.trafficwise.ie E-mail: info@trafficwise.ie	Project Title: **Knockharley Landfill 2025** Drawing Title: Forecast Upper Value Daily Traffic Generation 07:00-19:00	Prepared: TWL Date: Sept 2025 Scale: NTS	Checked: JMK Date: Sept 2025 Project No: 03222 **Appendix B**	Approved: JMK Date: Sept 2025 **Figure 17**



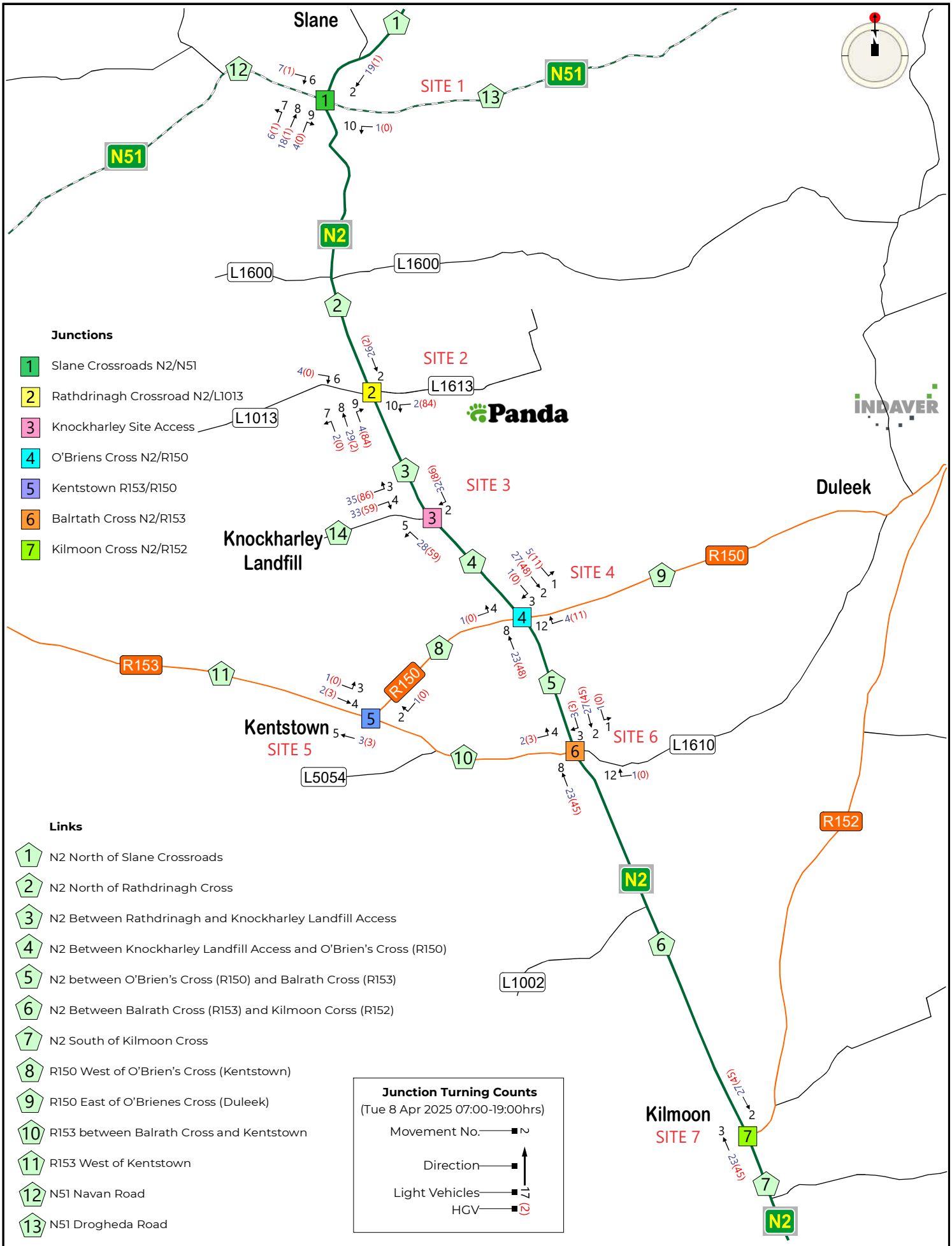
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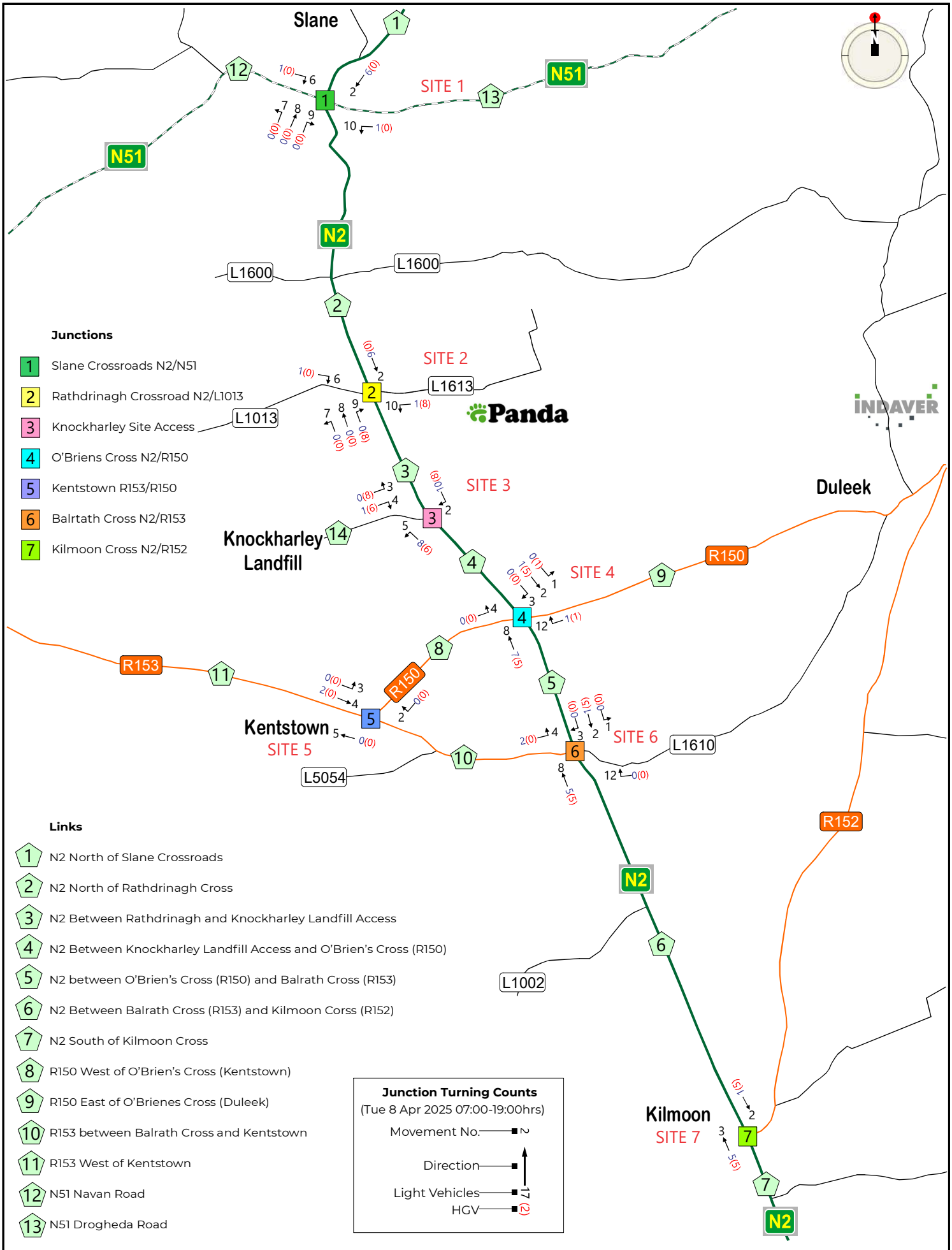
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Drawing Title	Forecast Upper Value Morning Peak Hour Traffic Generation 08:00-09:00	Date: Sept 2025	Date: Sept 2025	Date: Sept 2025
		Scale: NTS	Project No: 03222	**Figure** 16
			Appendix B	



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	Drawing Title: Forecast Upper Value Evening Peak Hour Traffic Generation 17:00-18:00	Date: Sept 2025	Date: Sept 2025	Date: Sept 2025
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			Appendix B	



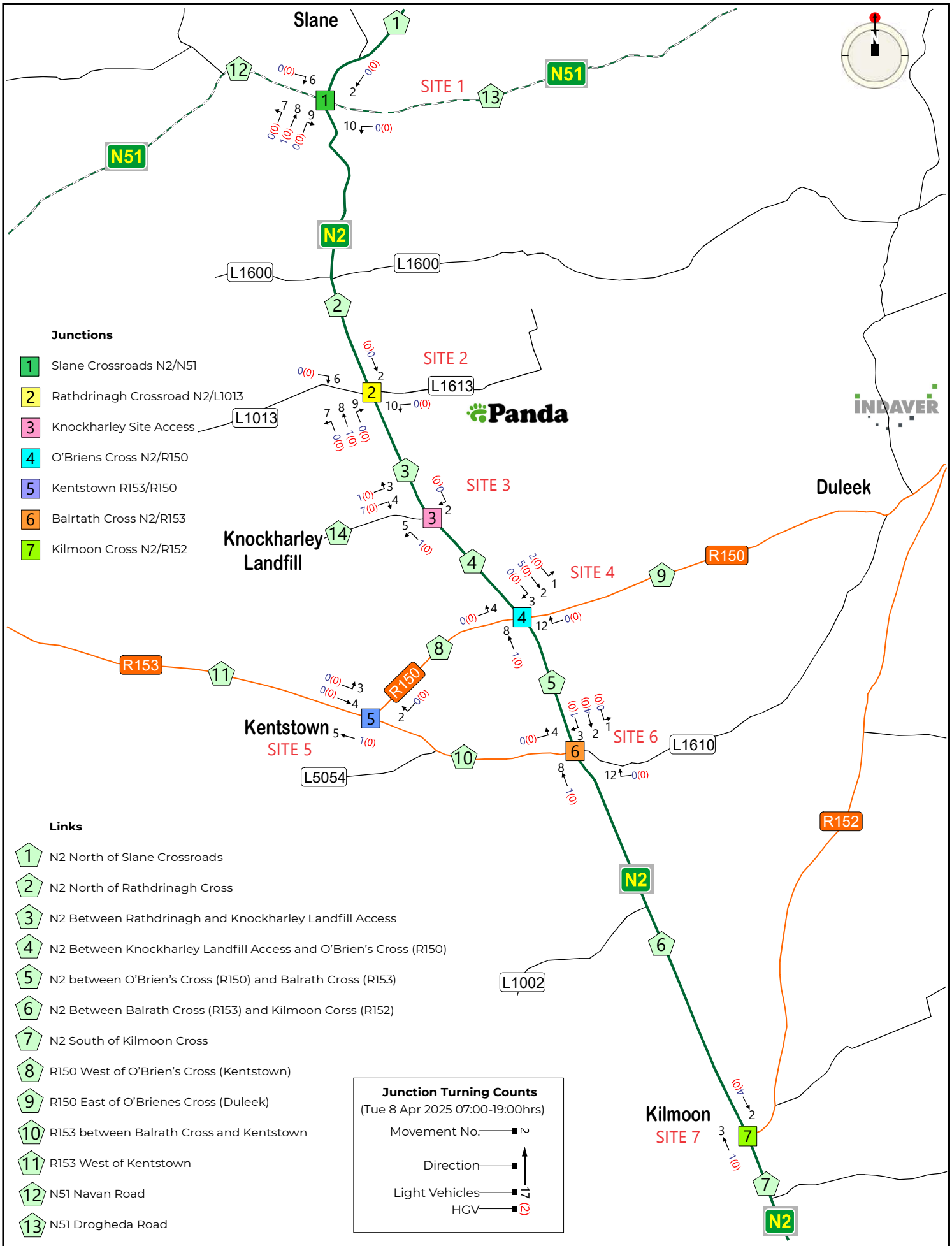
TRAFFICWISE traffic & transportation solutions Suite 5, Gowna Plaza, Bracetown Business Park D15 R59T Telephone: +353 (0)1 8253015 Website: www.trafficwise.ie E-mail: info@trafficwise.ie	Project Title: **Knockharley Landfill 2025**	Prepared: TWL	Checked: JMK	Approved: JMK
	Drawing Title: Forecast Worst Case Daily Traffic Generation 07:00-19:00	Date: Sept 2025	Date: Sept 2025	Date: Sept 2025
		Scale: NTS	Project No: 03222	**Figure** 20
			Appendix B	



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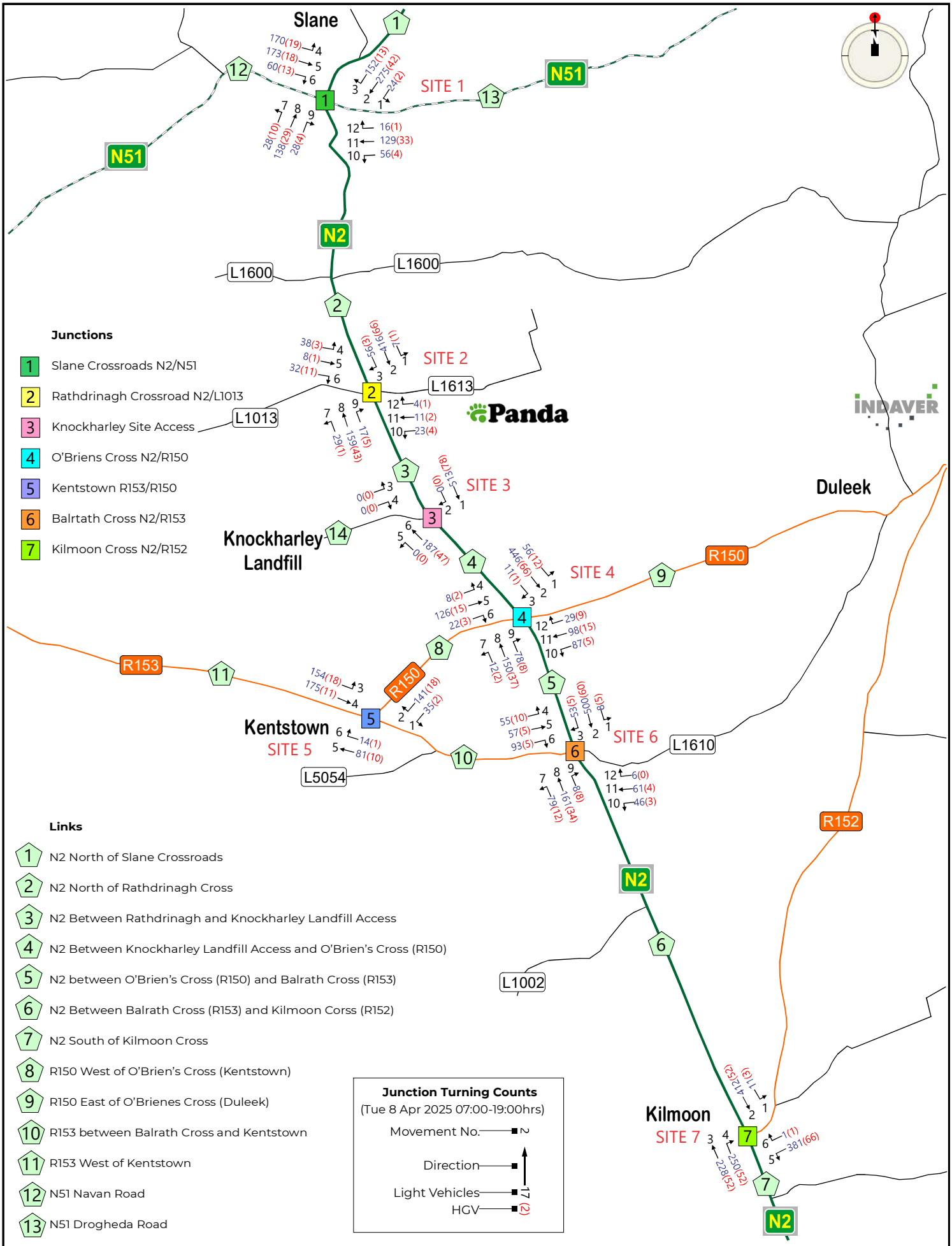
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			Appendix B	



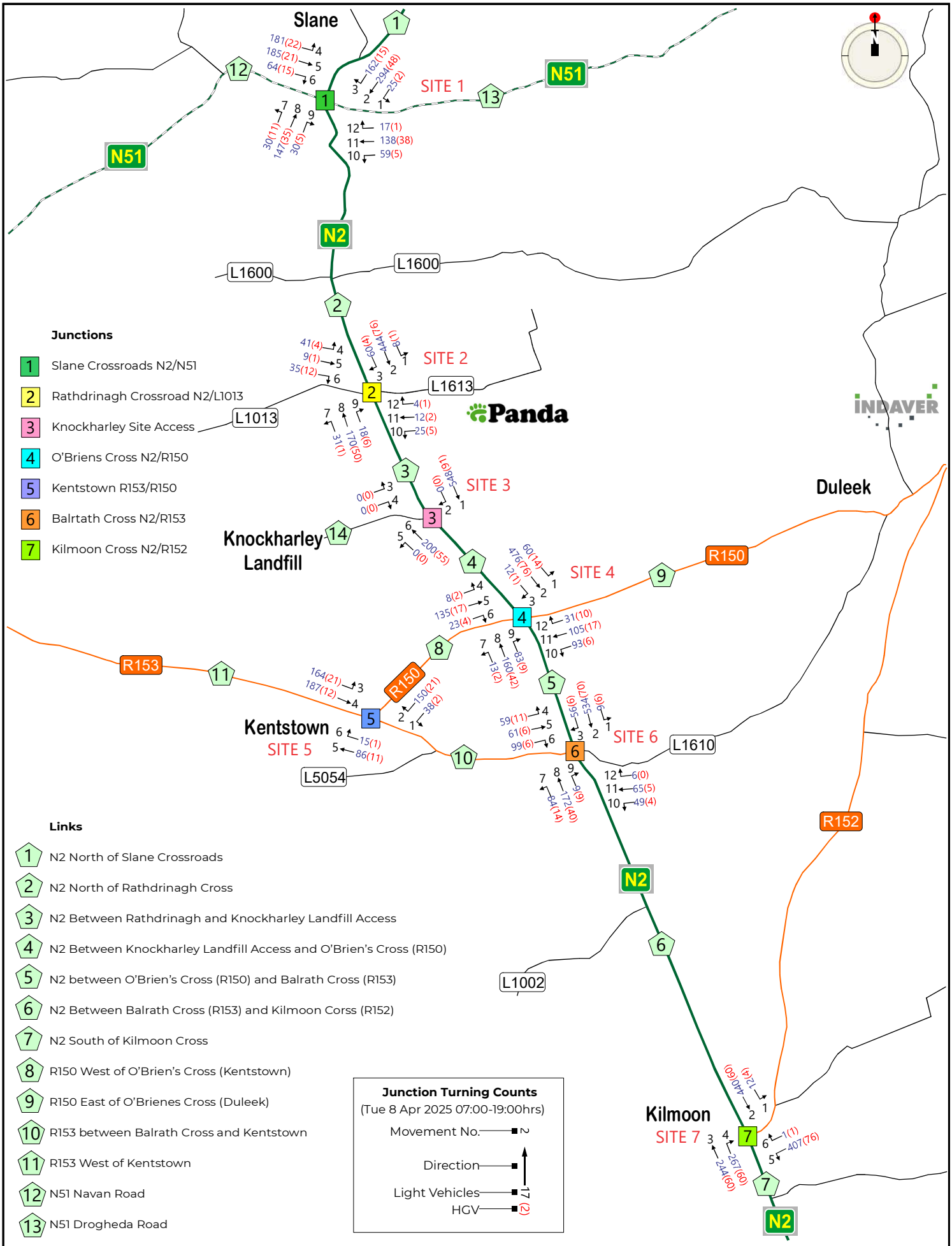
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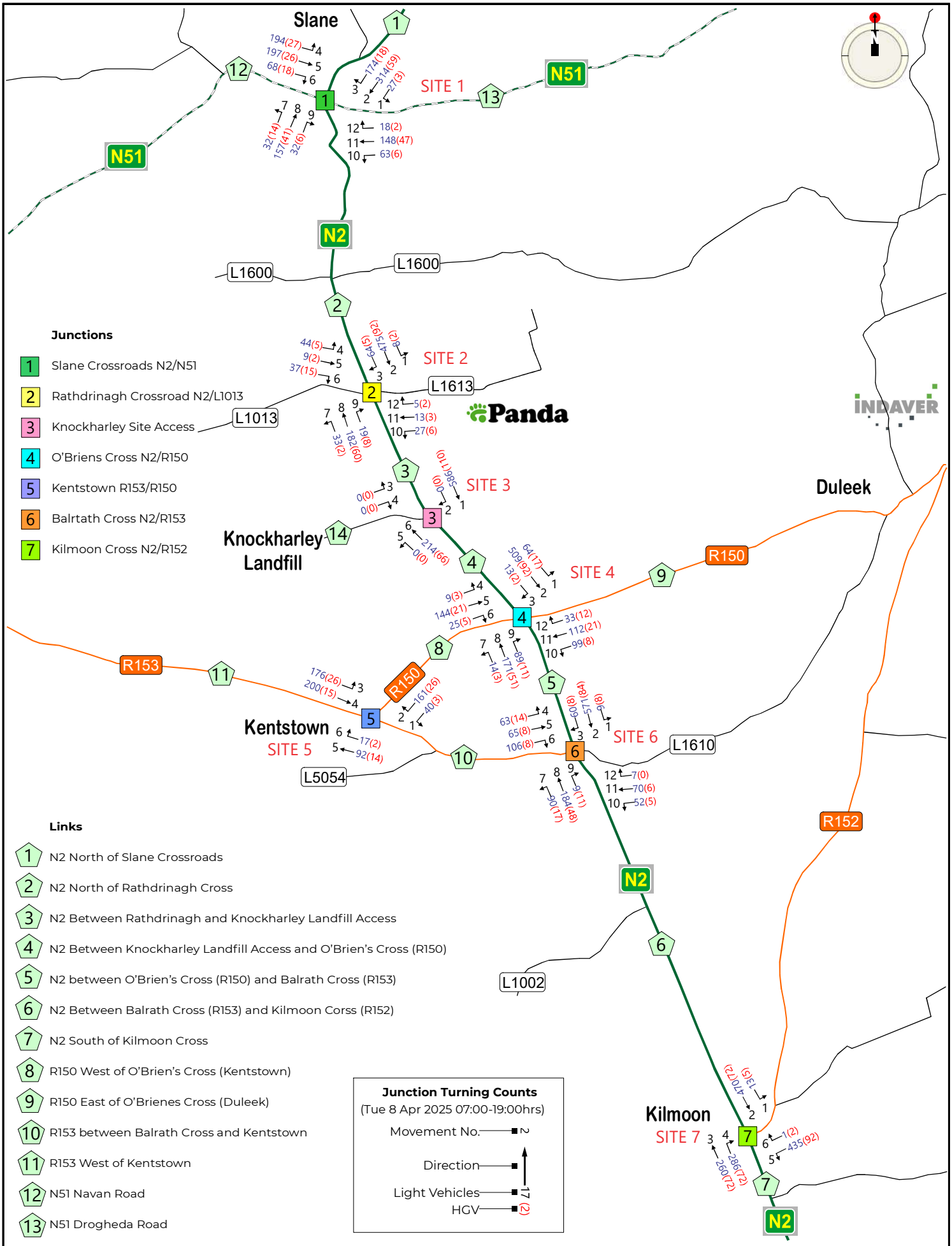
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Drawing Title	Forecast Worst Case Evening Peak Hour Traffic Generation 17:00-18:00	Date: Sept 2025	Date: Sept 2025	Date: Sept 2025
		Scale: NTS	Project No: 03222	Figure 22
			Appendix B	



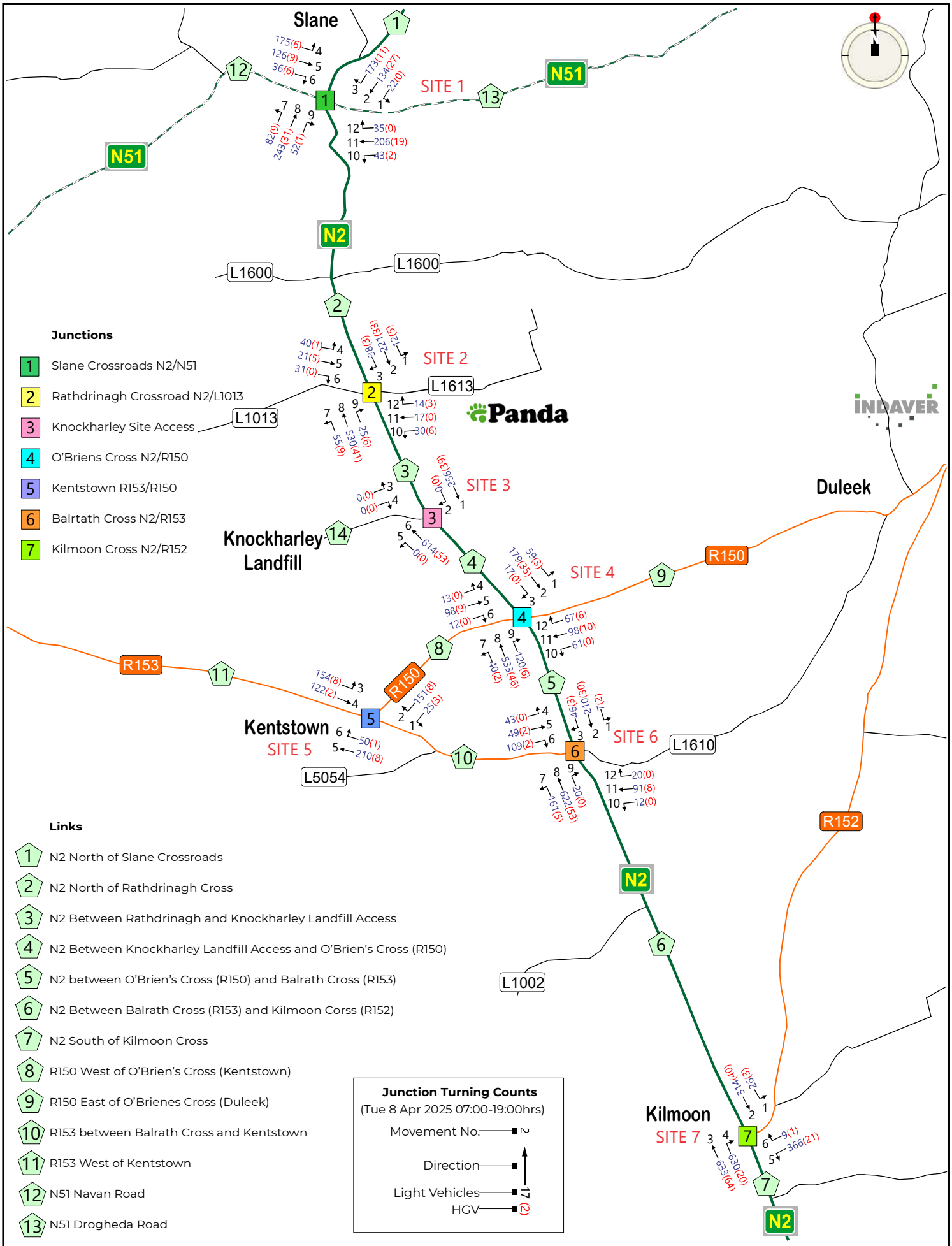
TRAFFICWISE traffic & transportation solutions Suite 5, Gowna Plaza, Bracetown Business Park D15 R59T Telephone: +353 (0)1 8253015 Website: www.trafficwise.ie E-mail: info@trafficwise.ie	Project Title: **Knockharley Landfill 2025** Drawing Title: Baseline 2027 Opening Year AM Peak Hour - Do Nothing 08:00-09:00hrs	Prepared: TWL Date: Sept 2025 Scale: NTS	Checked: JMK Date: Sept 2025 Project No: 03222 **Appendix B**	Approved: JMK Date: Sept 2025 **Figure 23**



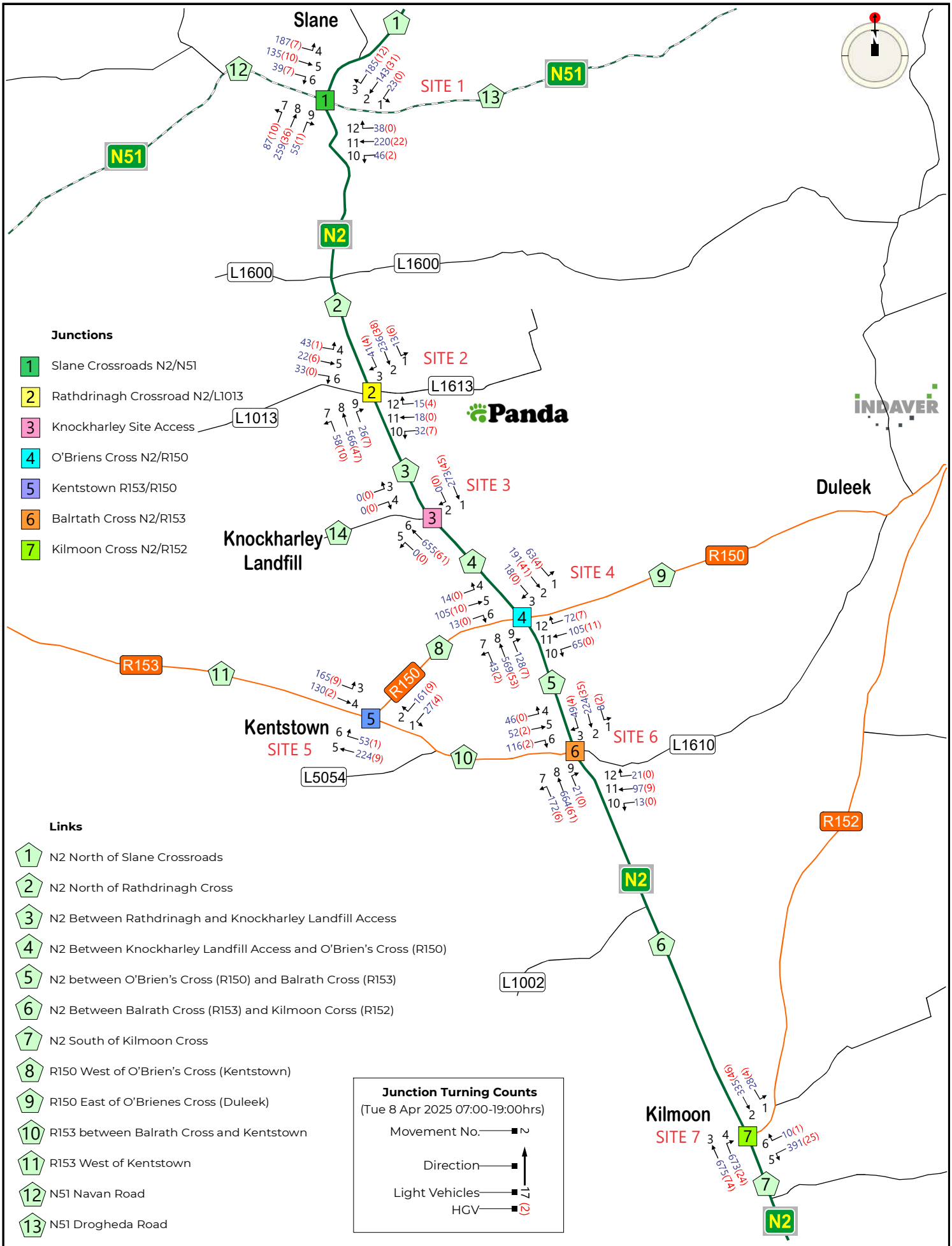
TRAFFICWISE traffic & transportation solutions Suite 5, Gowna Plaza, Bracetown Business Park D15 R59T Telephone: +353 (0)1 8253015 Website: www.trafficwise.ie E-mail: info@trafficwise.ie	Project Title: **Knockharley Landfill 2025**	Prepared: TWL	Checked: JMK	Approved: JMK
	Drawing Title: 2032 Opening Year + 5 Years AM Peak Hour - Do Nothing 08:00-09:00hrs	Date: Sept 2025	Date: Sept 2025	Date: Sept 2025
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			Appendix B	



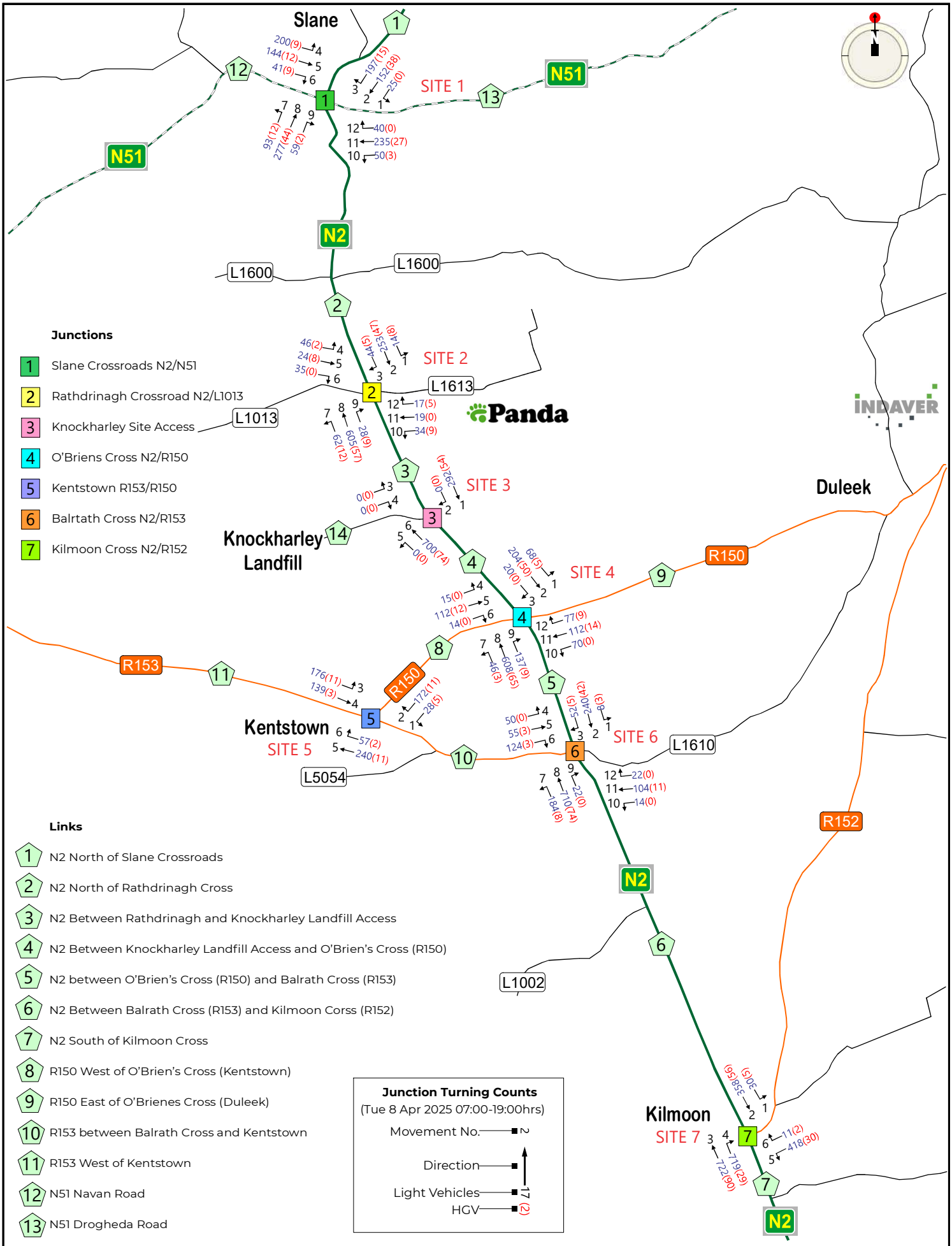
TRAFFICWISE traffic & transportation solutions Suite 5, Gowna Plaza, Bracetown Business Park D15 R59T Telephone: +353 (0)1 8253015 Website: www.trafficwise.ie E-mail: info@trafficwise.ie	Project Title: **Knockharley Landfill 2025** Drawing Title: 2042 Opening Year + 15 Years AM Peak Hour - Do Nothing 08:00-09:00hrs	Prepared: TWL Date: Sept 2025 Scale: NTS	Checked: JMK Date: Sept 2025 Project No: 03222 **Appendix B**	Approved: JMK Date: Sept 2025 **Figure 25**



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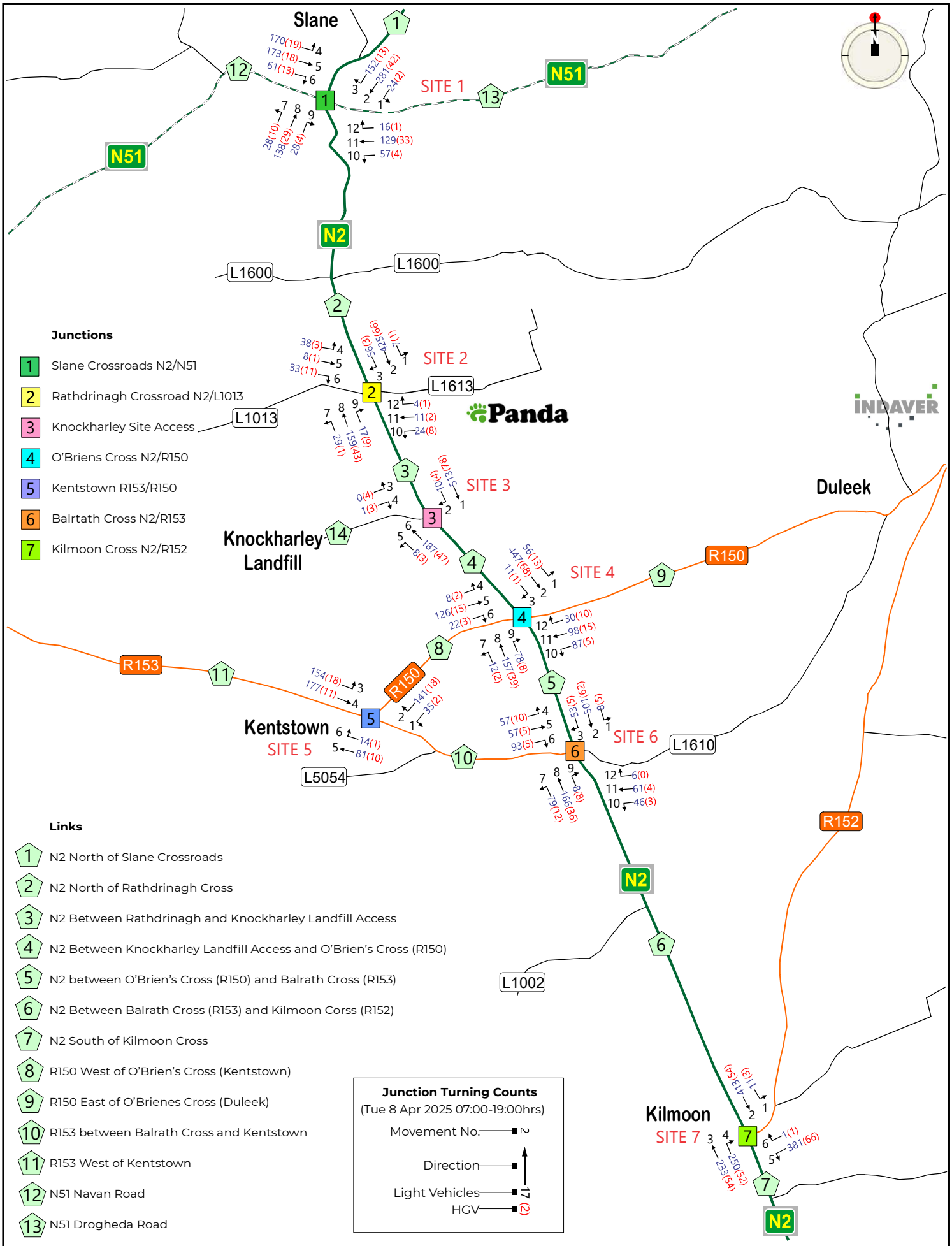


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	Drawing Title: 2032 Opening Year + 5 Years PM Peak Hour - Do Nothing 17:00-18:00hrs	Date: Sept 2025	Date: Sept 2025	Date: Sept 2025
		Scale: NTS	Project No: 03222	**Figure** 27
			Appendix B	



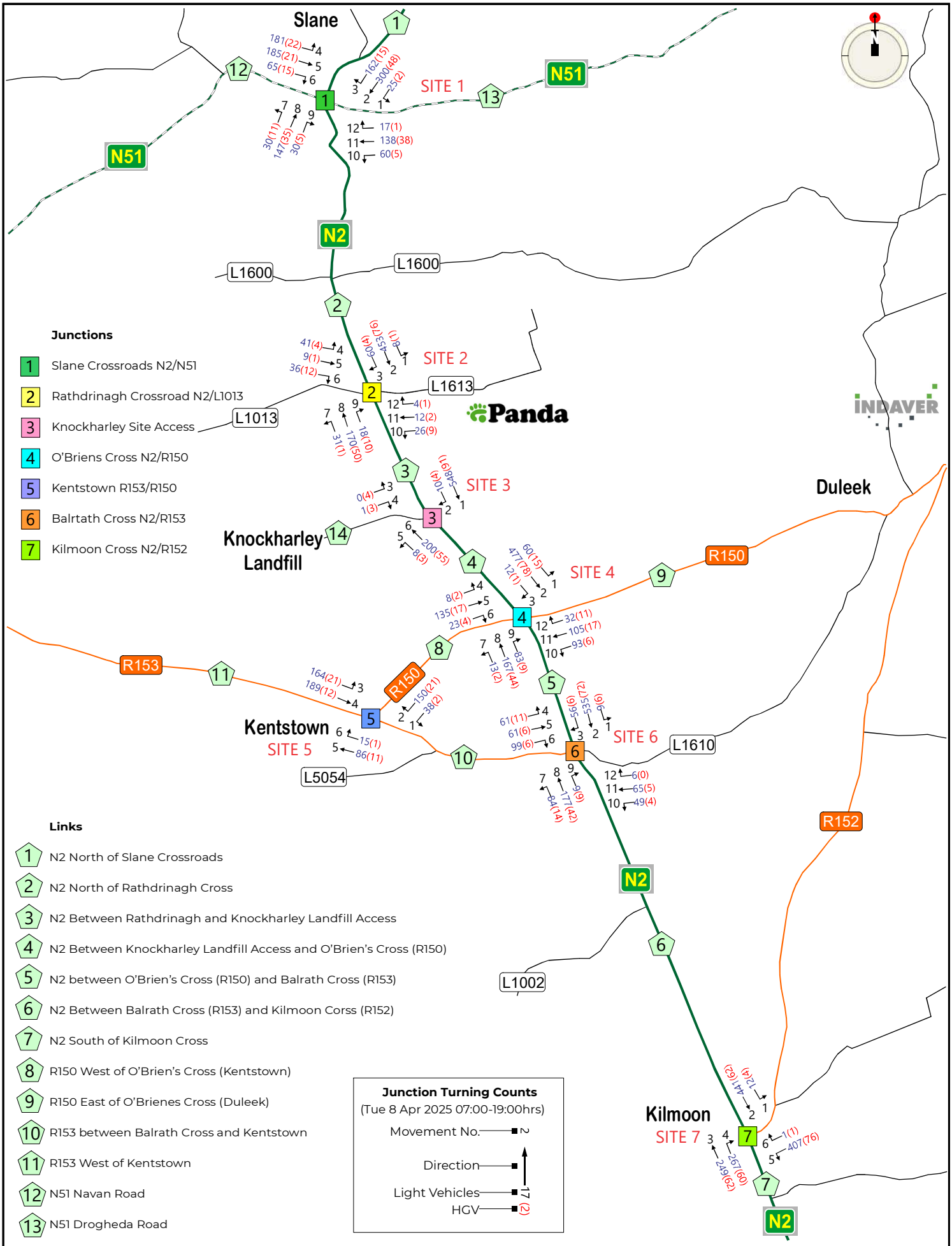
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Website: www.trafficwise.ie
E-mail: info@trafficwise.ie

Project Title: **Knockharley Landfill 2025**	Prepared: TWL	Checked: JMK	Approved: JMK
Drawing Title: 2042 Opening Year + 15 Years PM Peak Hour - Do Nothing 17:00-18:00hrs	Date: Sept 2025	Date: Sept 2025	Date: Sept 2025
	Scale: NTS	Project No: 03222	**Figure 28**
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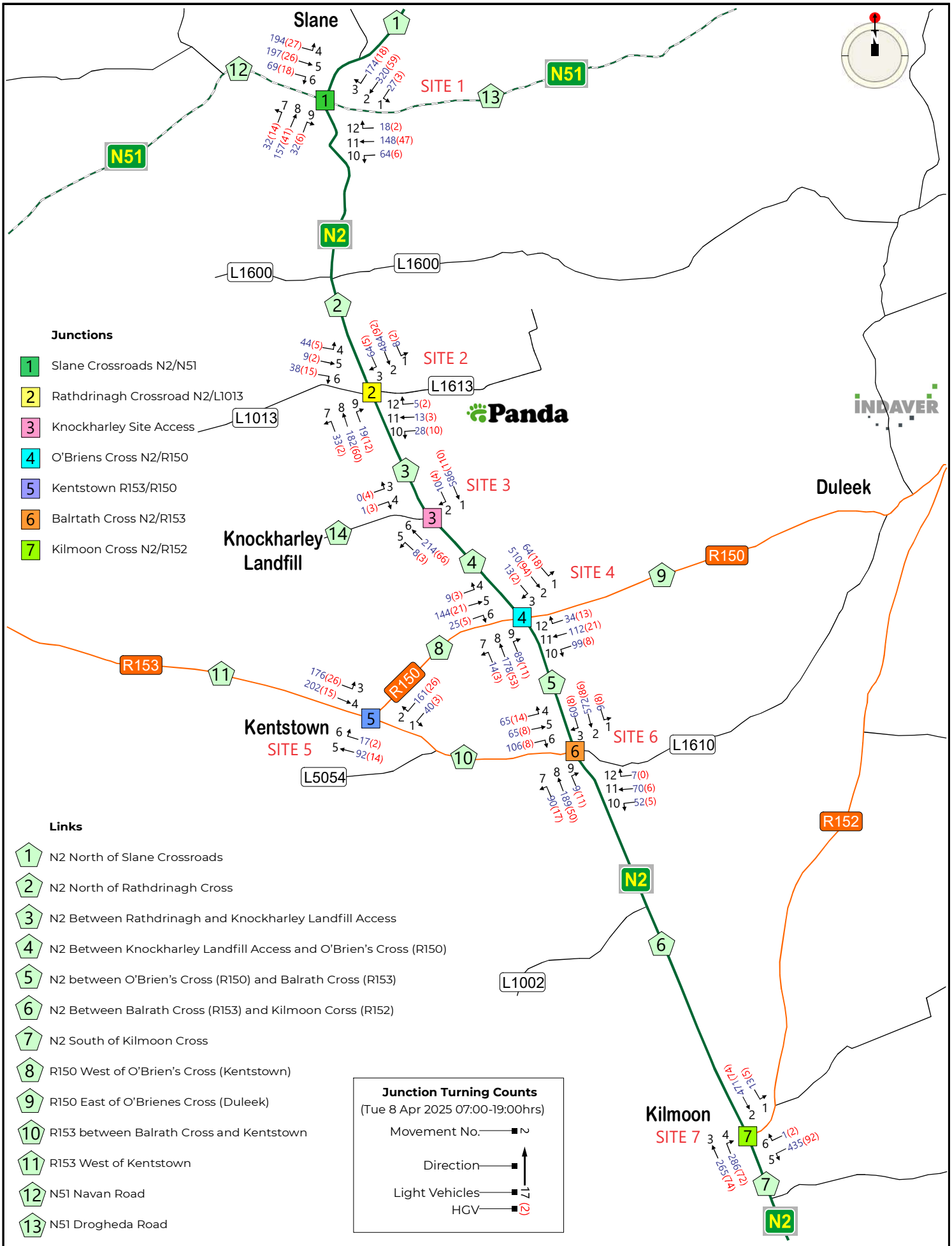


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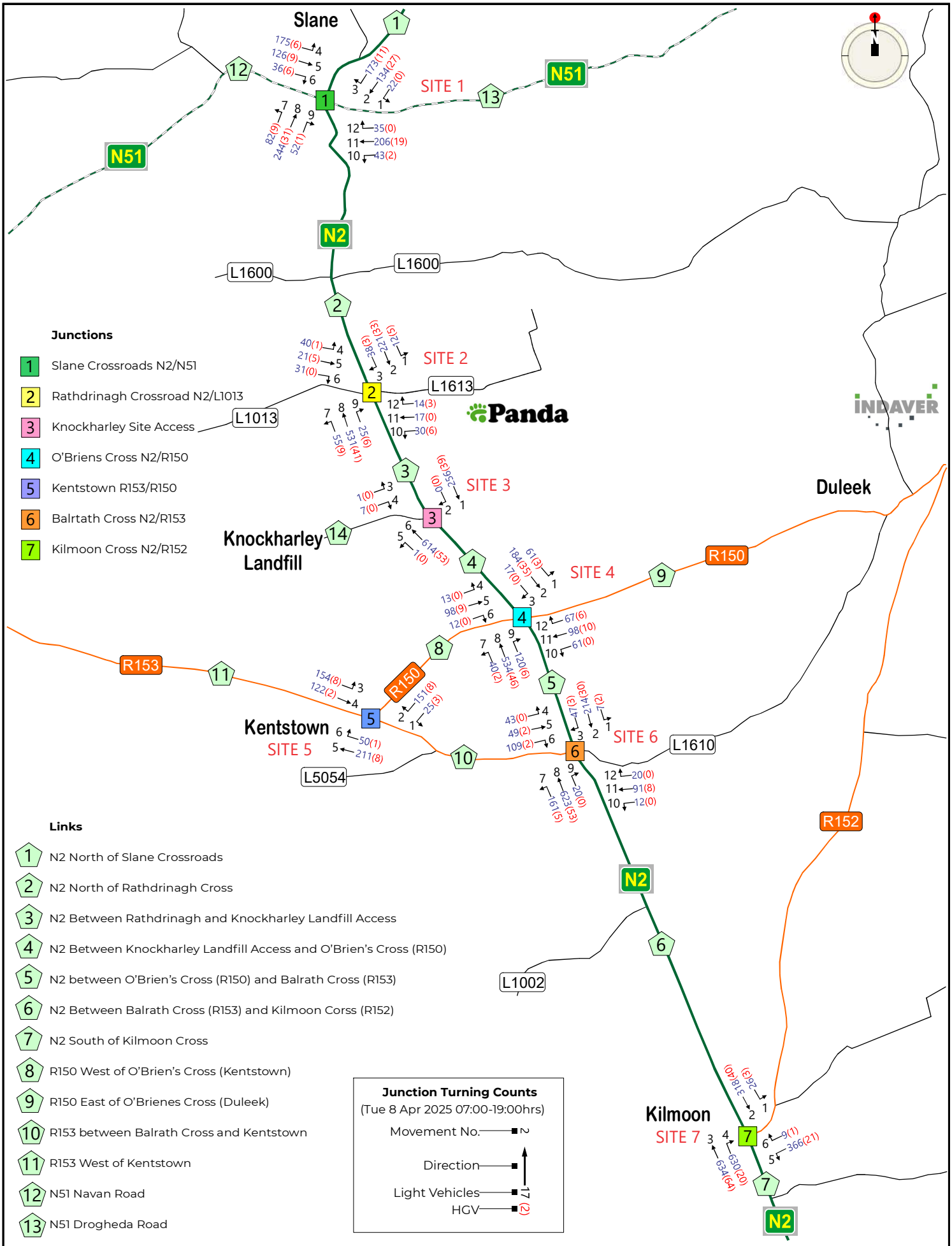
Project Title: **Knockharley Landfill 2025**	Prepared: TWL	Checked: JMK	Approved: JMK
Drawing Title: 2027 Opening Year AM Peak Hour - Do Something Average Value 08:00-09:00hrs	Date: Sept 2025	Date: Sept 2025	Date: Sept 2025
	Scale: NTS	Project No: 03222	**Figure** 29
		Appendix B	



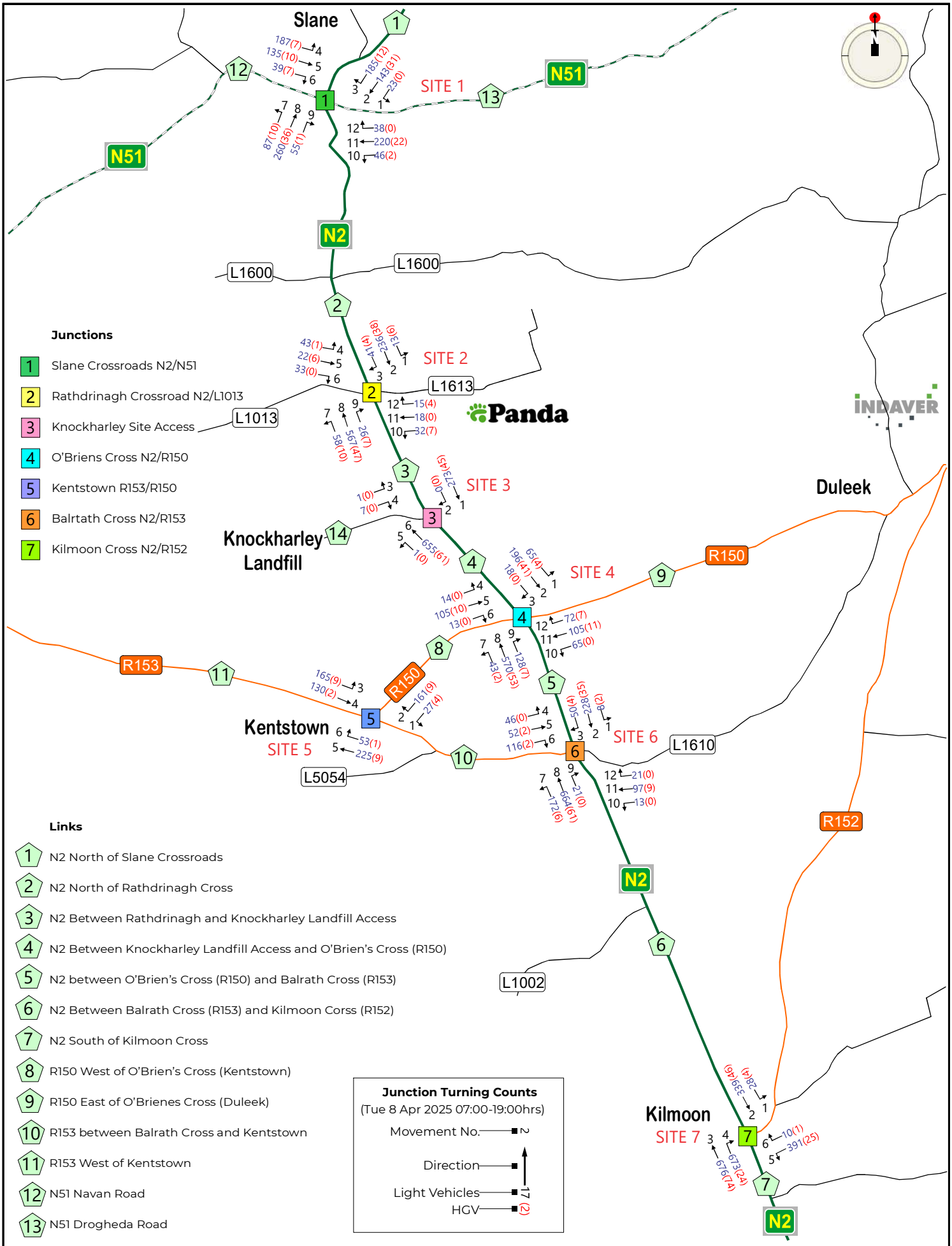
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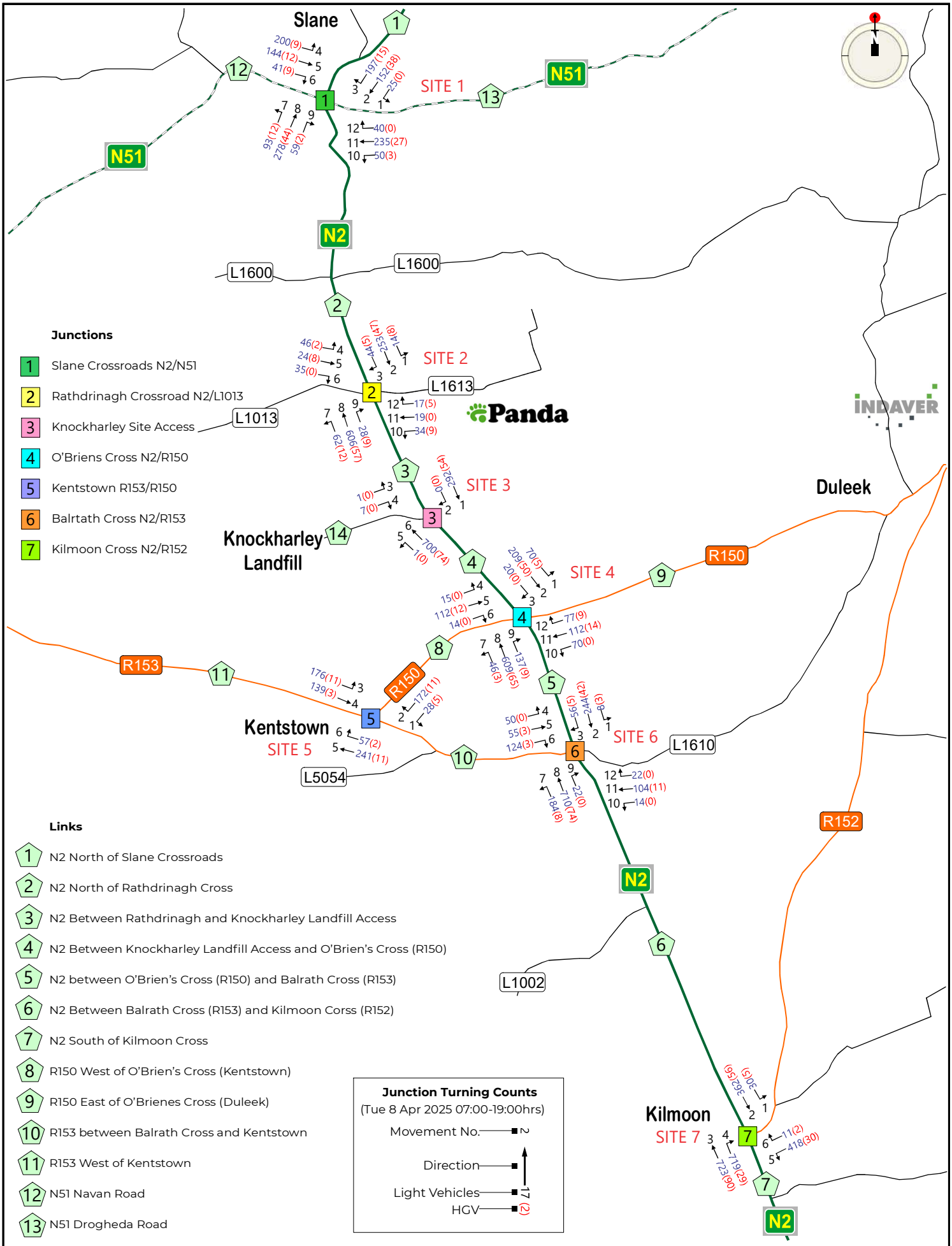
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	Drawing Title: 2042 Opening Year + 15 Years AM Peak Hour - Do Something Average Value 08:00-09:00hrs	Date: Sept 2025	Date: Sept 2025	Date: Sept 2025
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			Appendix B	



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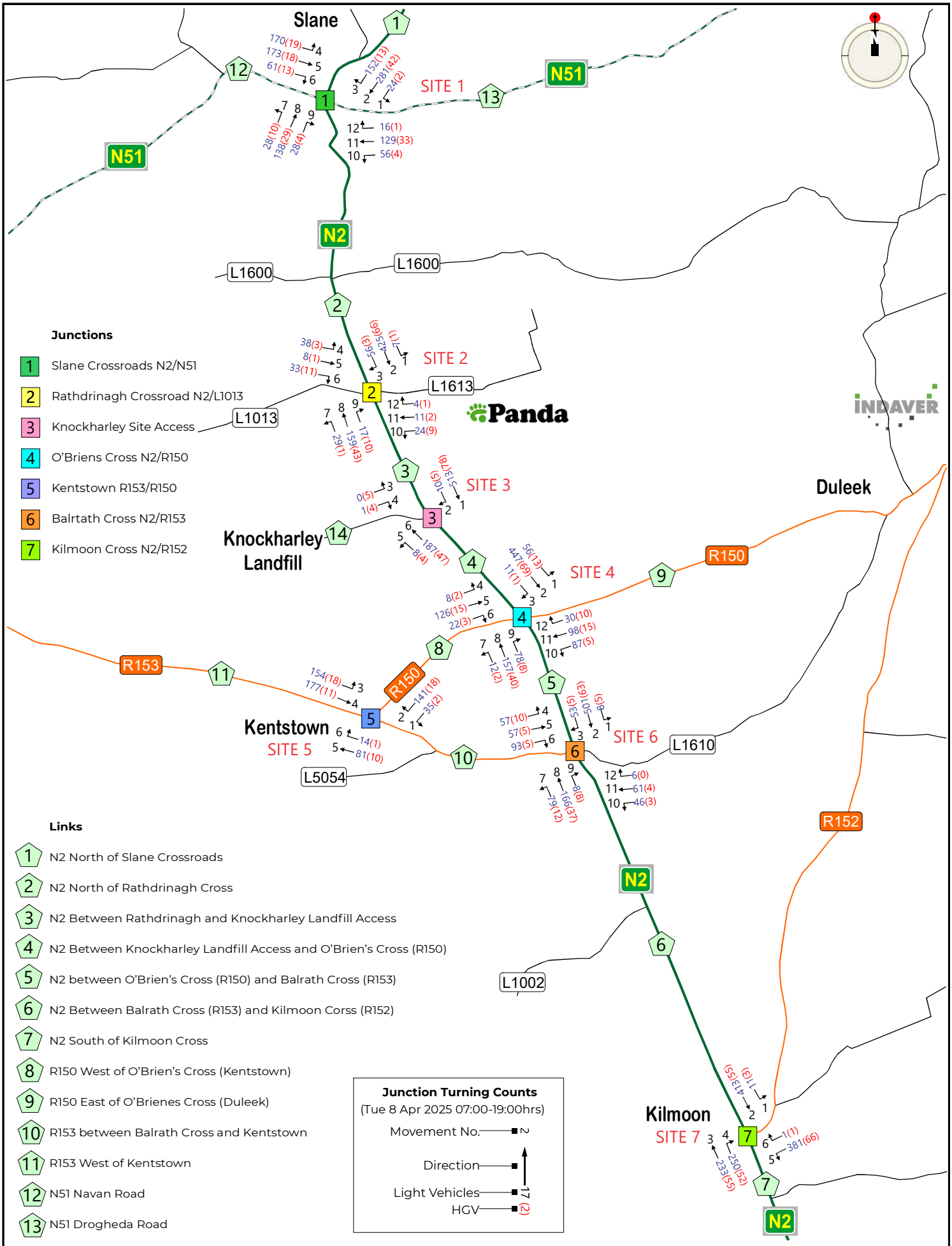


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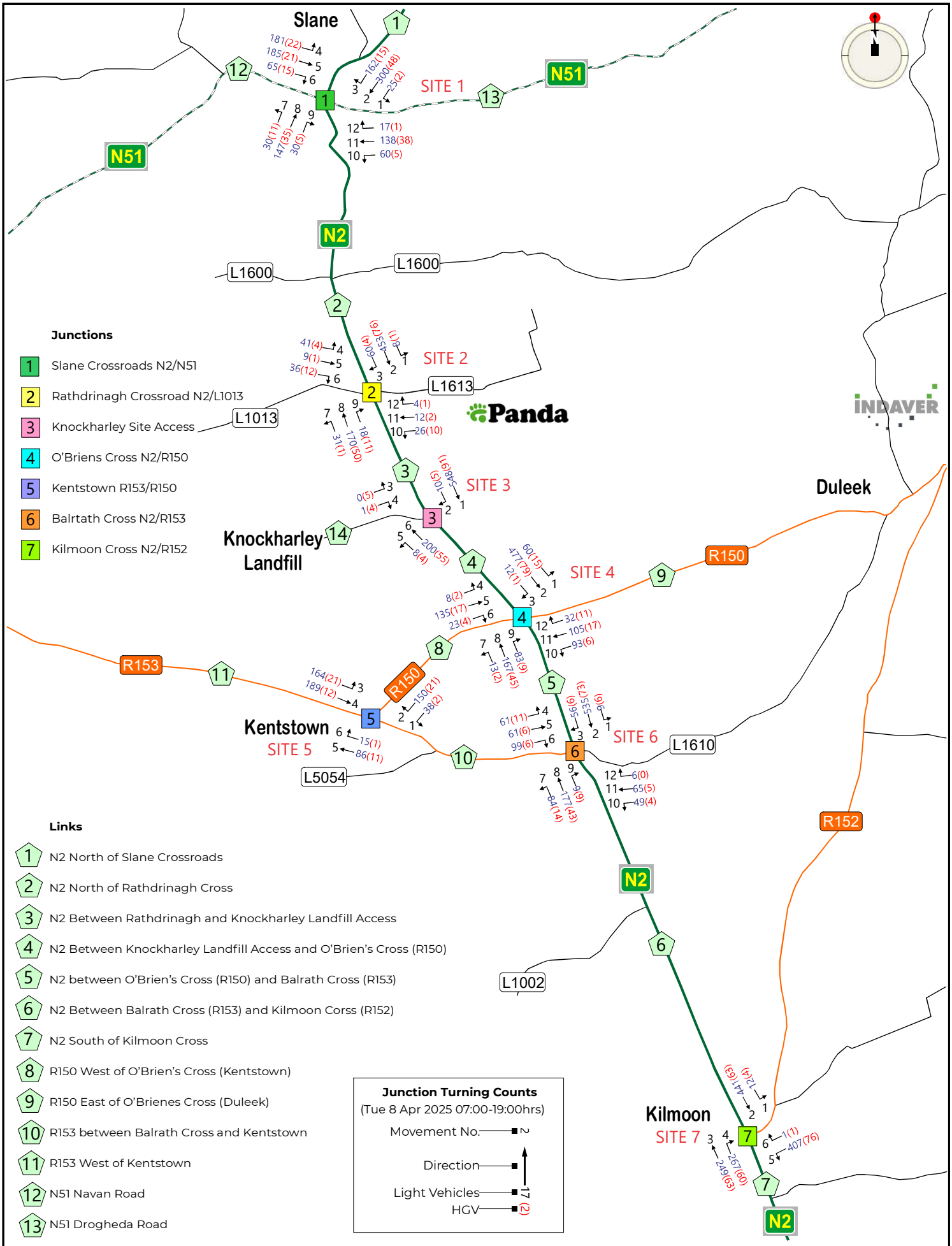


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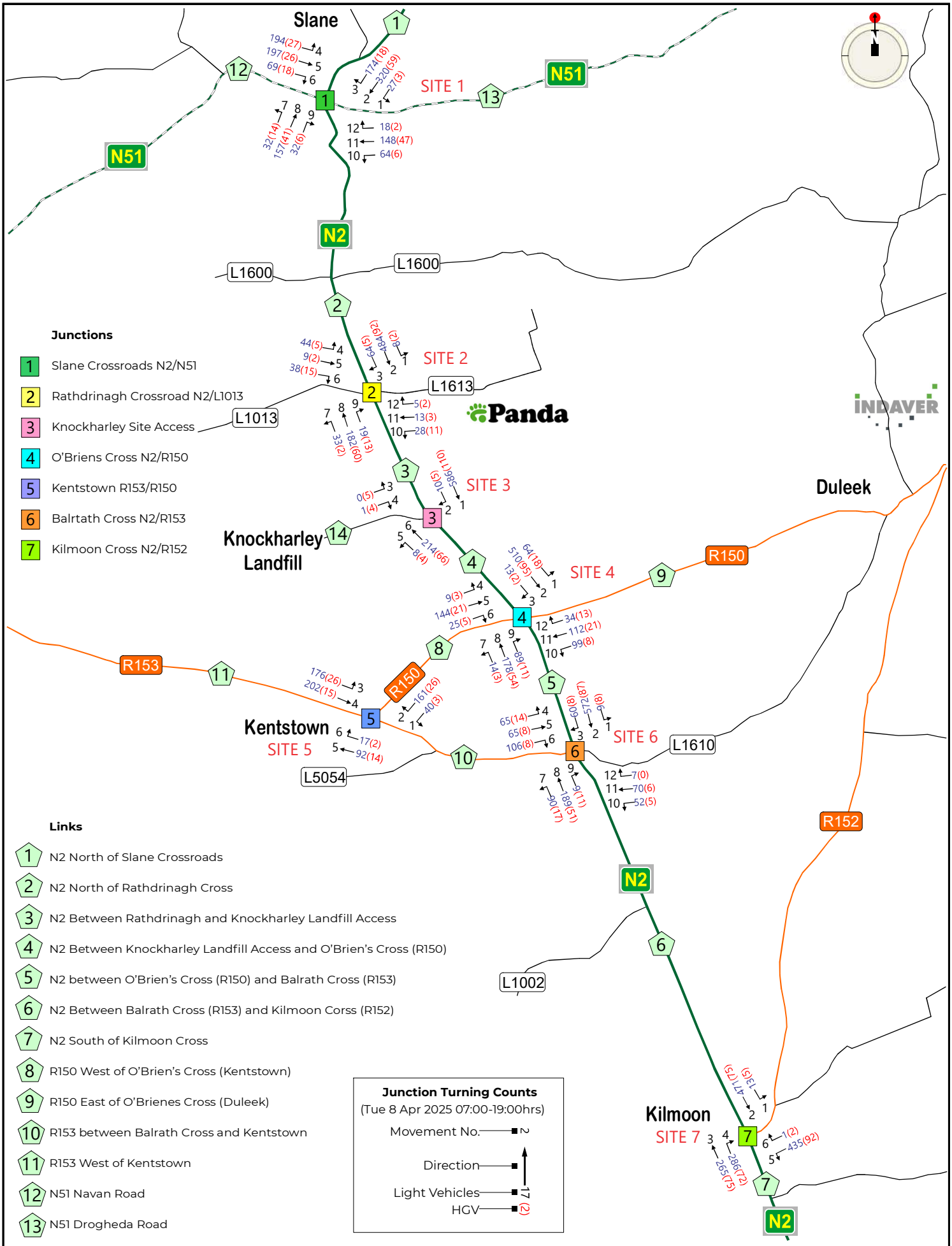


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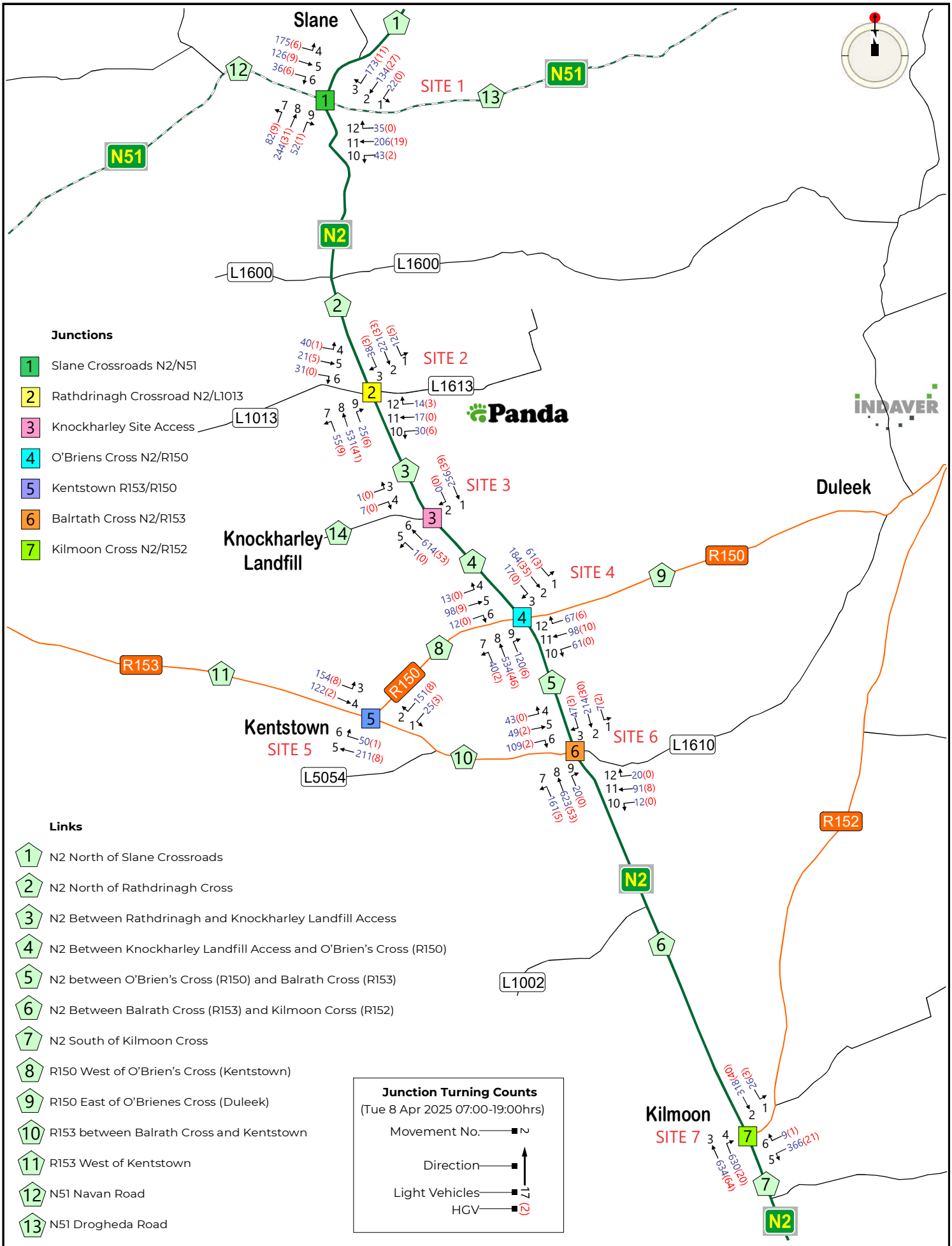


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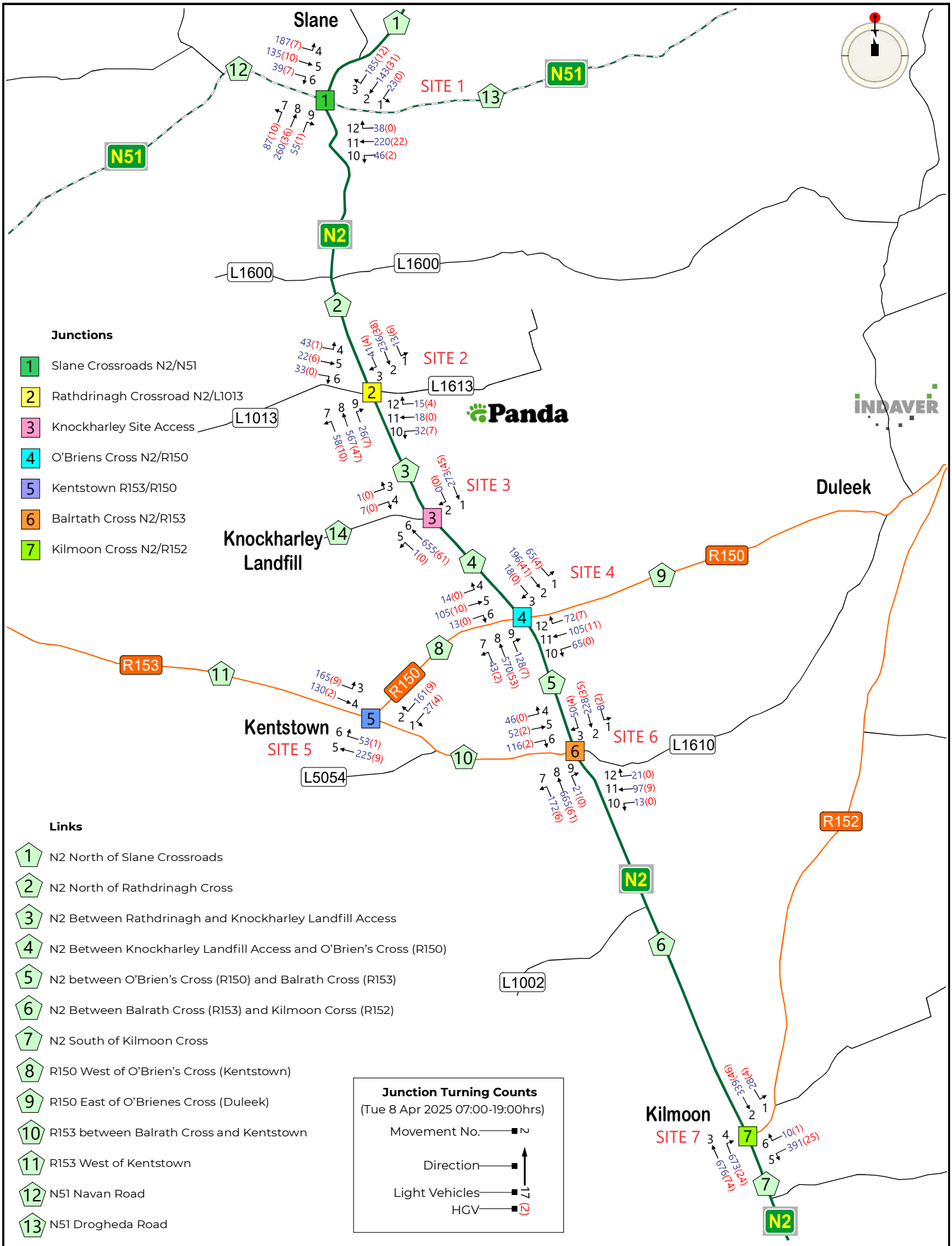
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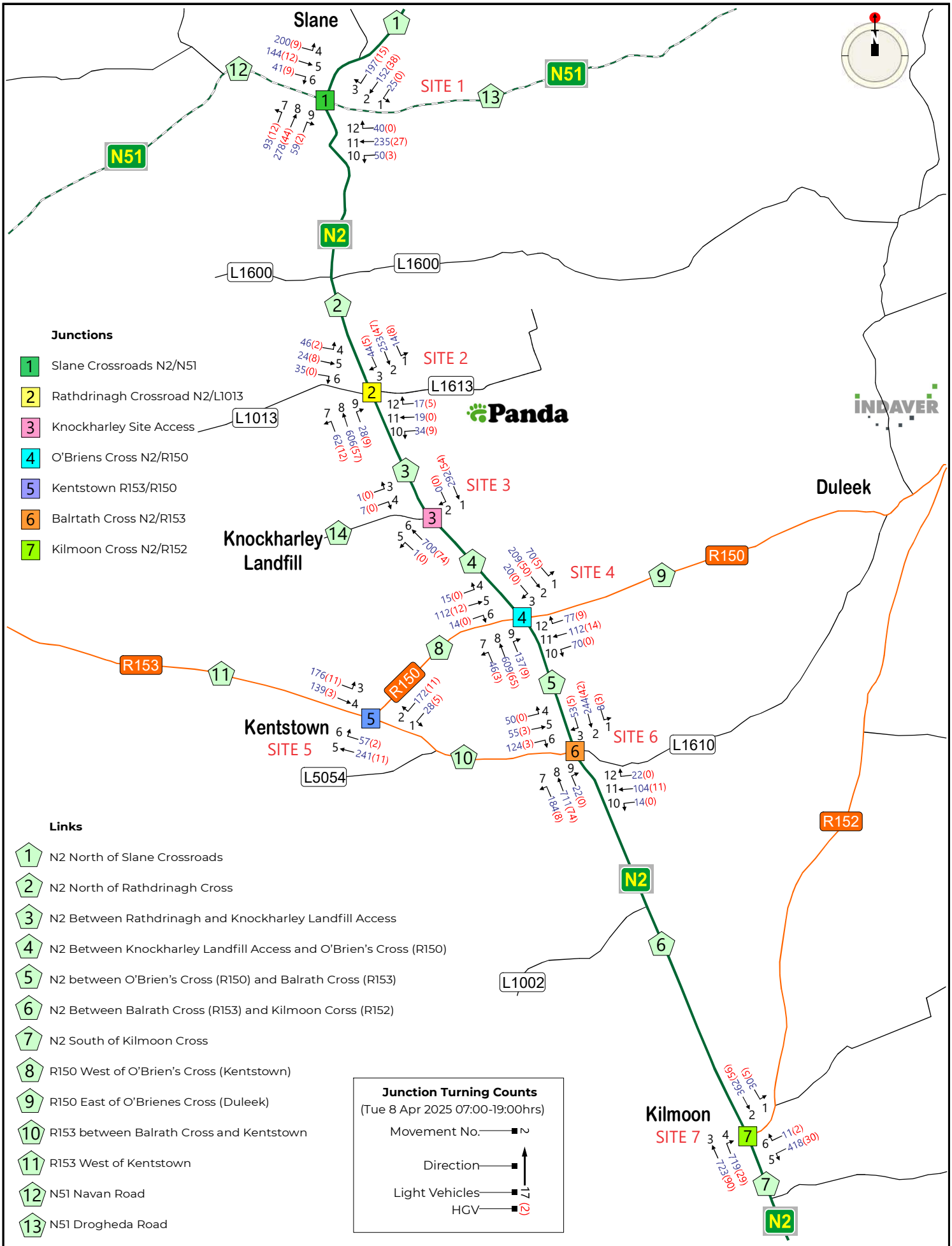
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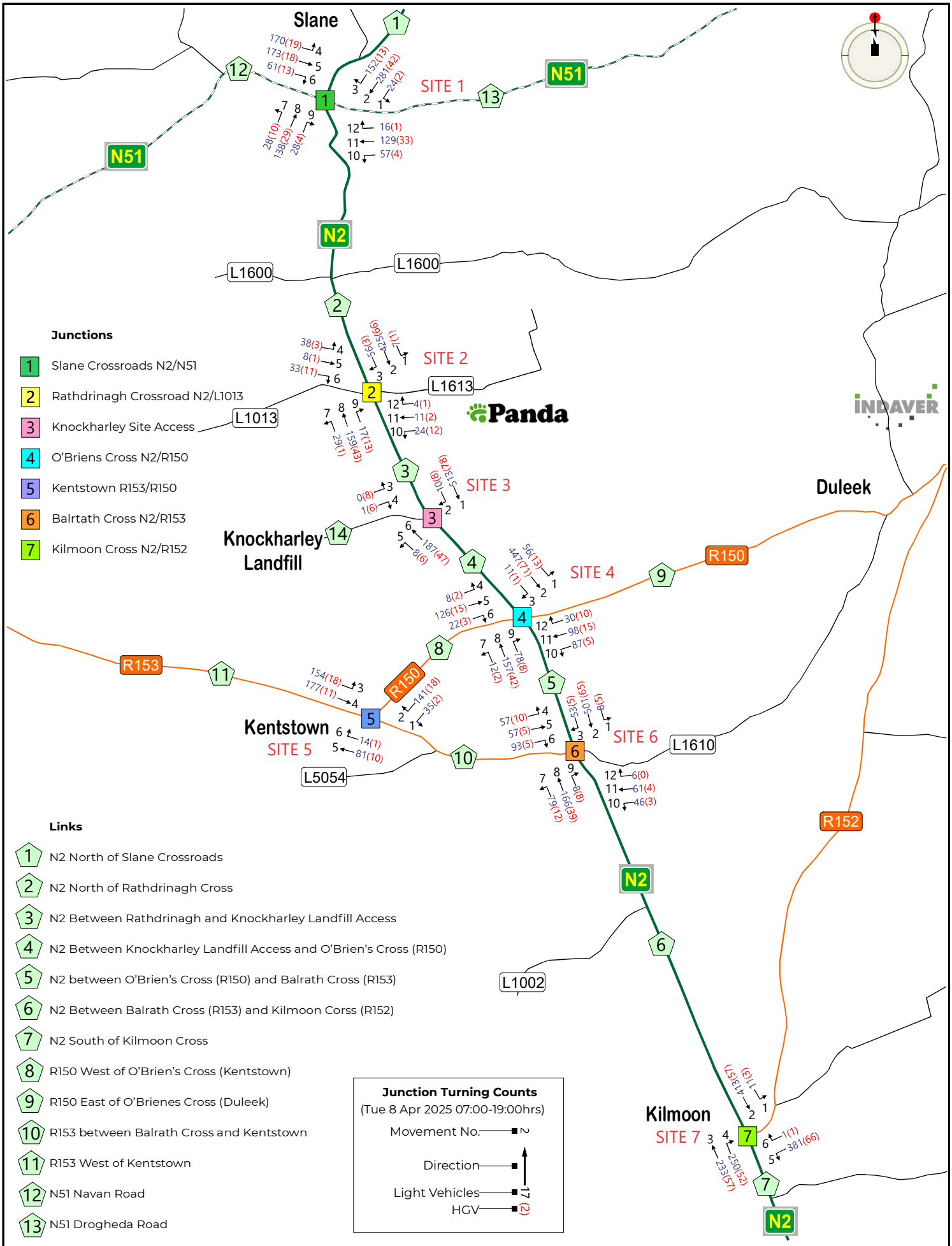
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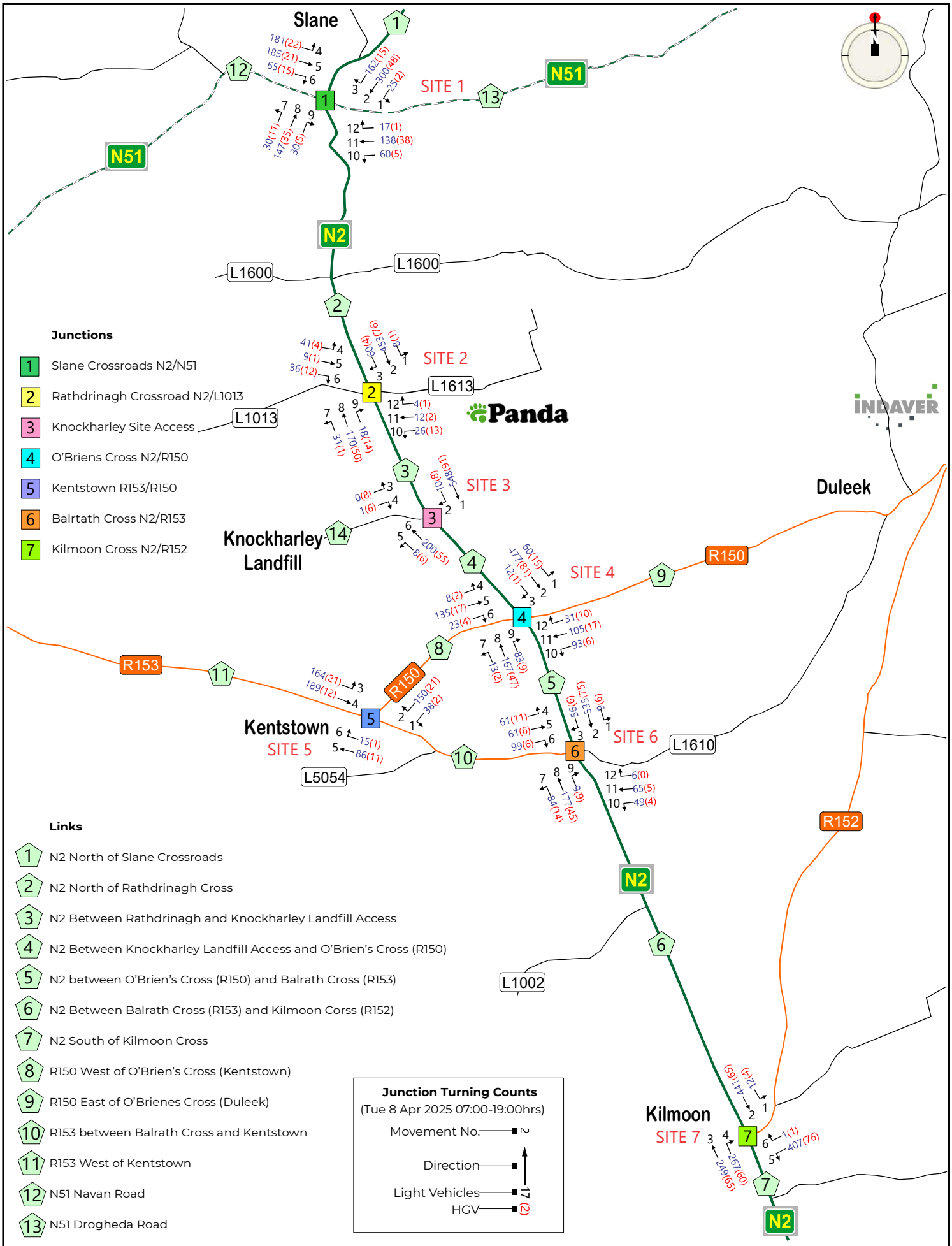
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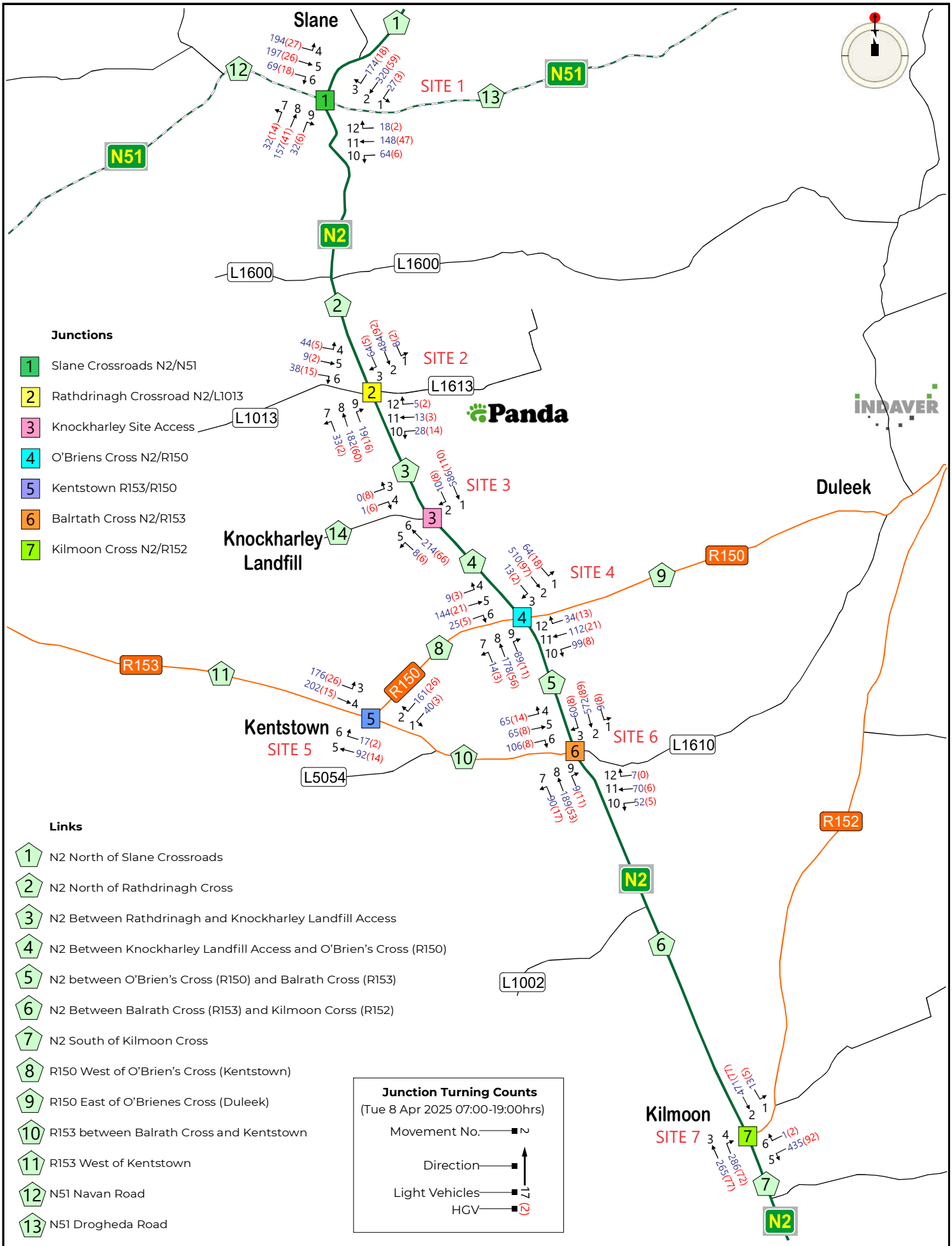
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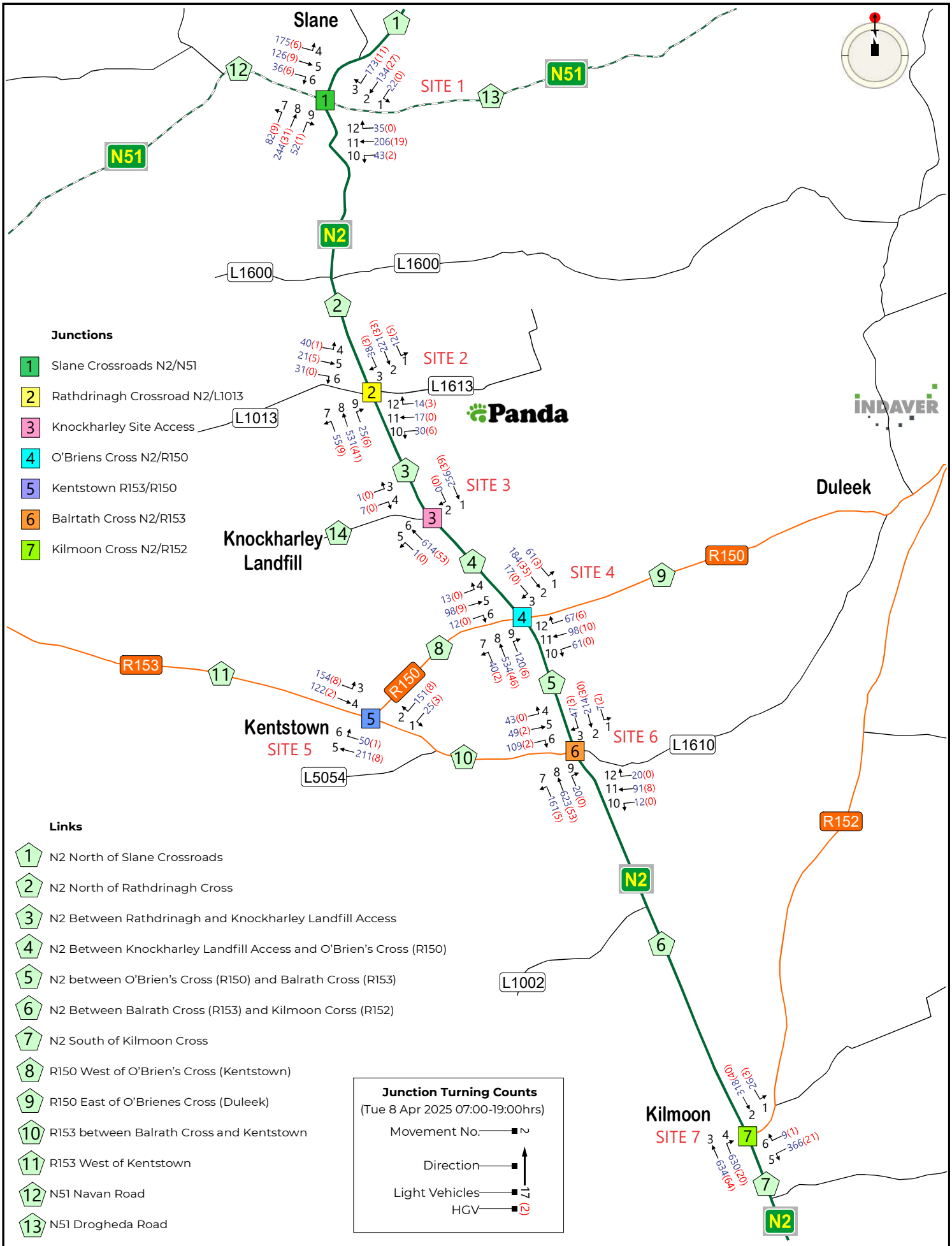
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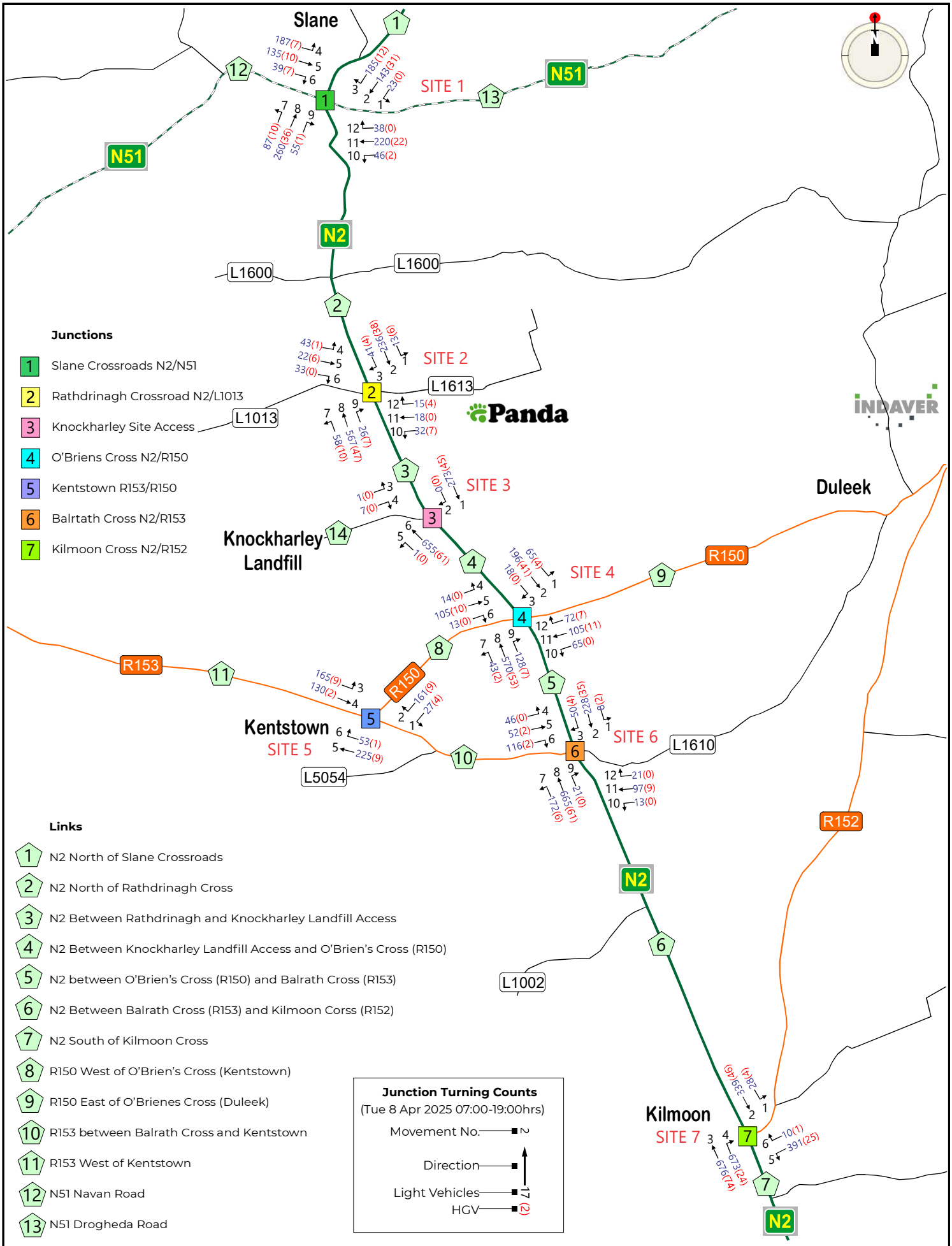
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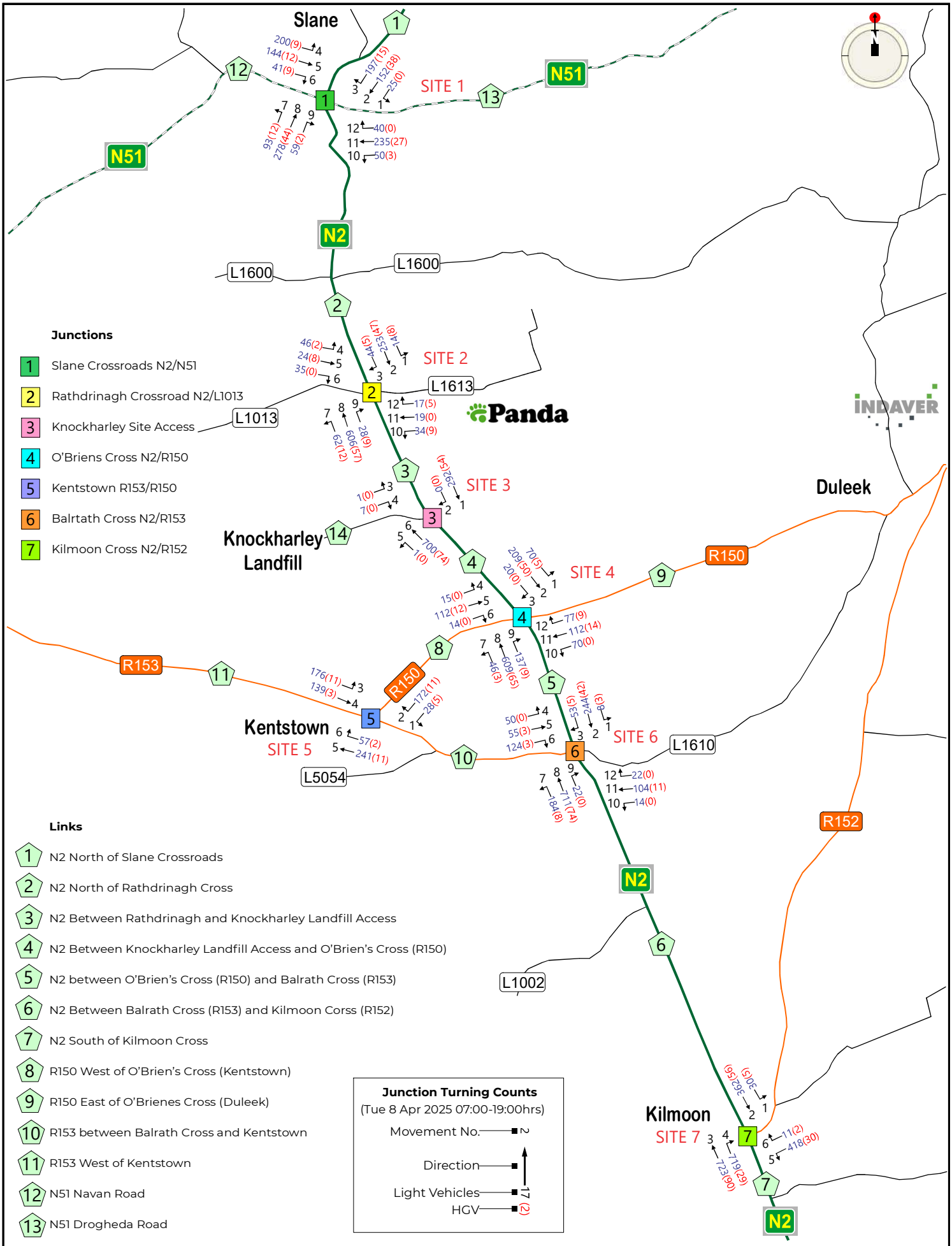
TRAFFICWISE traffic & transportation solutions Suite 5, Gowna Plaza, Bracetown Business Park D15 R59T Telephone: +353 (0)1 8253015 Website: www.trafficwise.ie E-mail: info@trafficwise.ie	Project Title: **Knockharley Landfill 2025** Drawing Title: 2042 Opening Year + 15 Years AM Peak Hour - Do Something Worst Case 08:00-09:00hrs	Prepared: TWL Date: Sept 2025 Scale: NTS	Checked: JMK Date: Sept 2025 Project No: 03222 Appendix B	Approved: JMK Date: Sept 2025 Figure 43



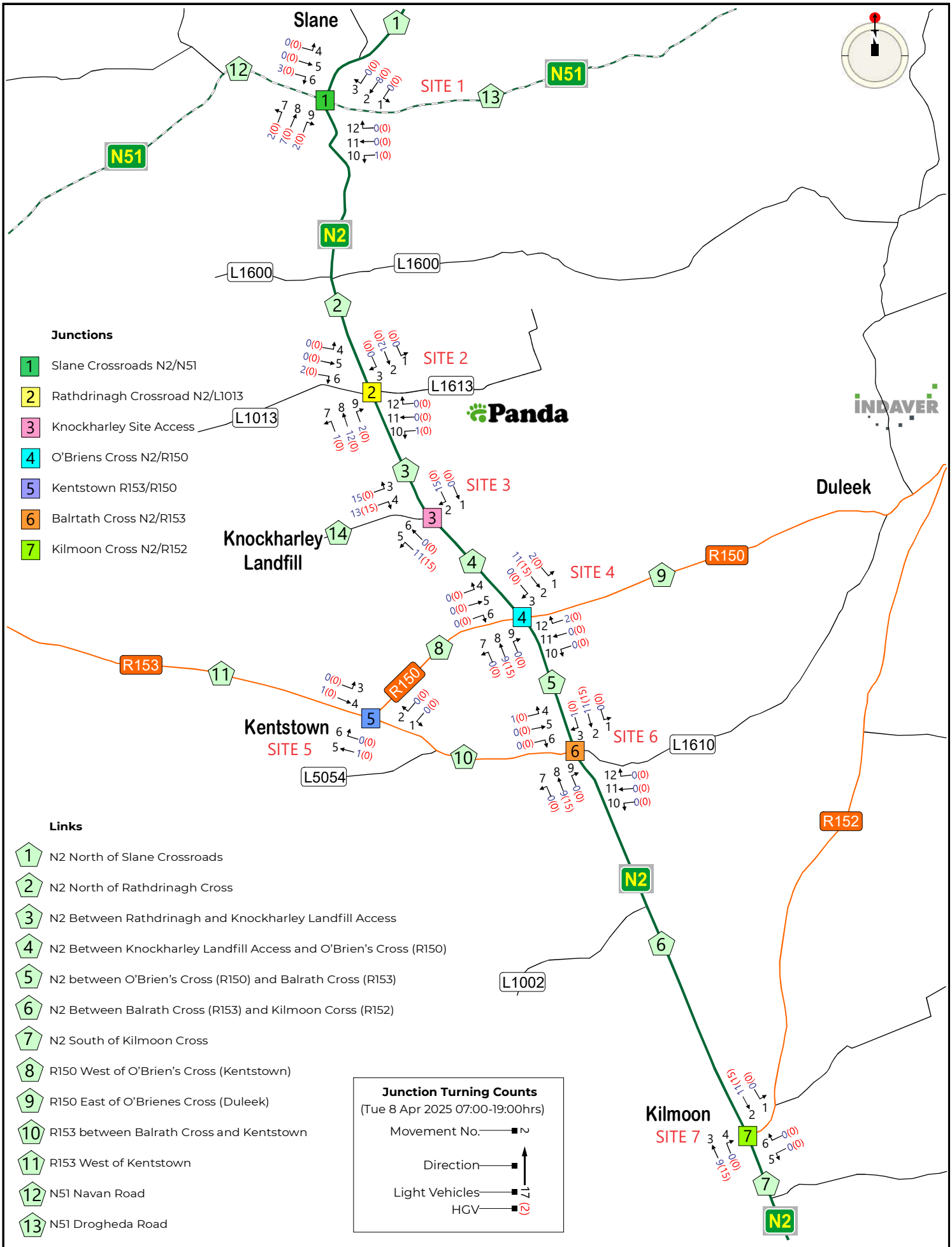
TRAFFICWISE traffic & transportation solutions Suite 5, Gowna Plaza, Bracetown Business Park D15 R59T Telephone: +353 (0)1 8253015 Website: www.trafficwise.ie E-mail: info@trafficwise.ie	Project Title: **Knockharley Landfill 2025** Drawing Title: 2027 Opening Year PM Peak Hour - Do Something Worst Case 17:00-18:00hrs	Prepared: TWL Date: Sept 2025 Scale: NTS	Checked: JMK Date: Sept 2025 Project No: 03222 Appendix B	Approved: JMK Date: Sept 2025 Figure 44



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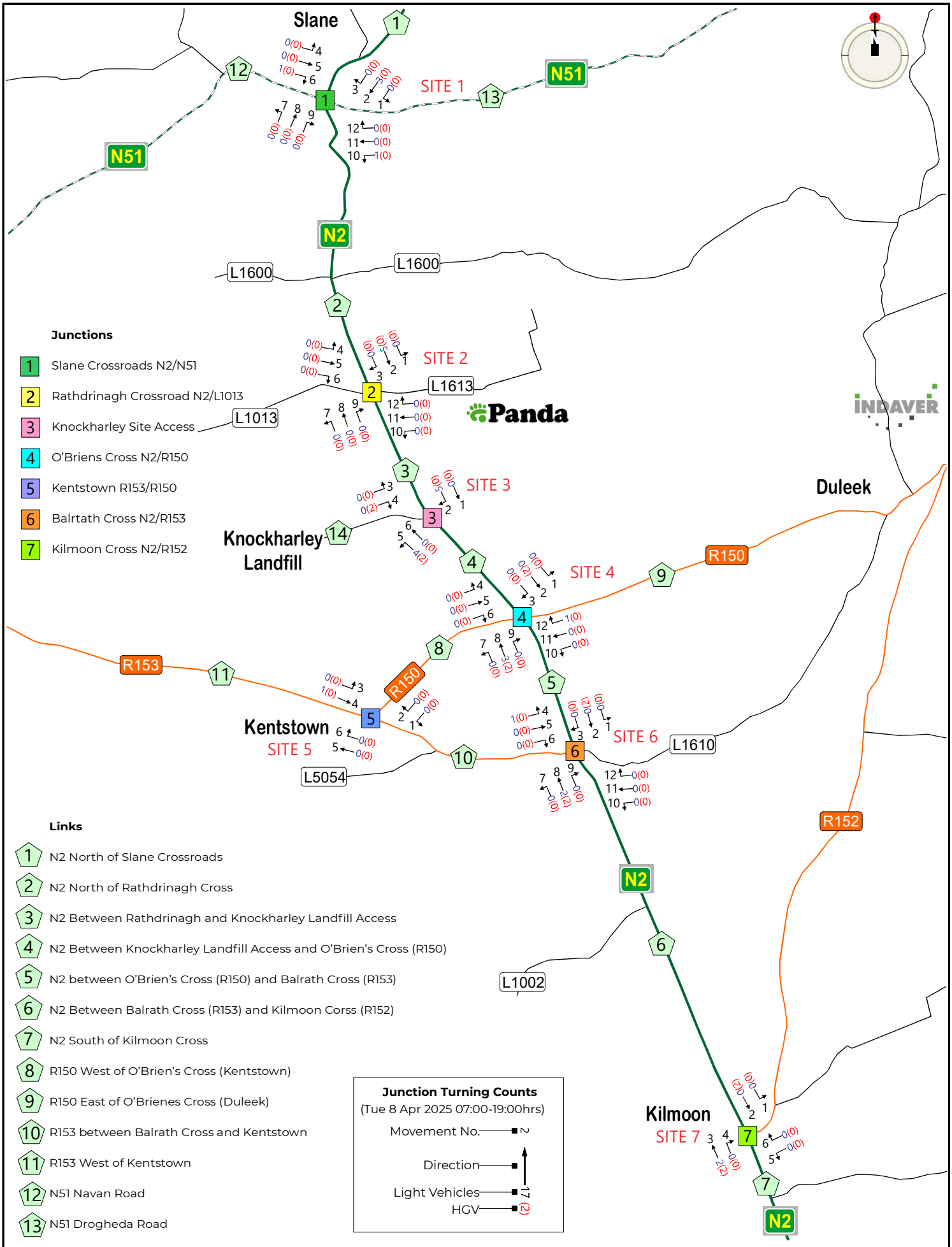
TRAFFICWISE traffic & transportation solutions Suite 5, Gowna Plaza, Bracetown Business Park D15 R59T Telephone: +353 (0)1 8253015 Website: www.trafficwise.ie E-mail: info@trafficwise.ie	Project Title: **Knockharley Landfill 2025** Drawing Title: 2042 Opening Year + 15 Years PM Peak Hour - Do Something Worst Case 17:00-18:00hrs	Prepared: TWL Date: Sept 2025 Scale: NTS	Checked: JMK Date: Sept 2025 Project No: 03222 Appendix B	Approved: JMK Date: Sept 2025 Figure 46



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Project Title	**Knockharley Landfill 2025**		
Drawing Title	Forecast Construction Traffic Daily Traffic Generation 07:00-19:00hrs		

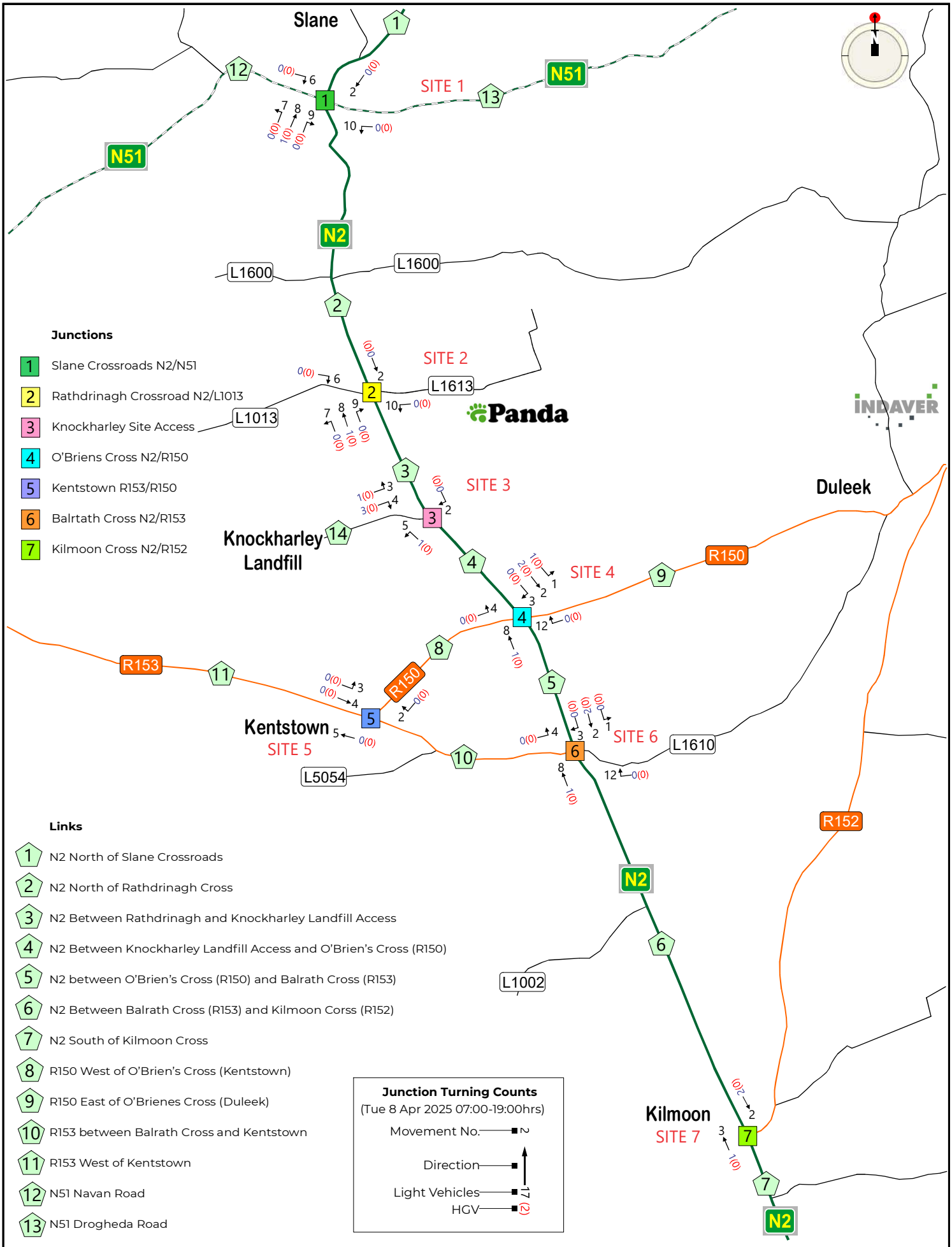
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TWL	JMK	JMK
Date: Sept 2025	Date: Sept 2025	Date: Sept 2025
Scale: NTS	Project No: 03222	**Figure** 47
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Project Title	**Knockharley Landfill 2025**	Prepared: TWL	Checked: JMK	Approved: JMK
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		Scale: NTS	Project No: 03222	**Figure** 48
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		Scale: NTS	Project No: 03222	**Figure** 49
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Appendix 14.1
Resource and Waste Management Plan

AWN Consulting Ltd, The Tecpro Building, IDA Business & Technology Park, Clonshaugh, Dublin 17, D17 XD90

Knockharley Landfill Limited

PROJECT WEST

Resource Waste Management Plan



IE0037027.9697-R14.V0
JULY 2025

PUBLIC

Knockharley Landfill Limited

PROJECT WEST

TYPE OF DOCUMENT (VERSION) PUBLIC

PROJECT NO. IE0037027.9697

OUR REF. NO. IE0037027.9697-R14.V0

DATE: JULY 2025

WSP

Town Centre House
Dublin Road
Naas
Co Kildare

WSP.com

QUALITY CONTROL

Issue/revision	First issue	Revision 1	Revision 2	Revision 3
Date	March 24			
Prepared by	RKS			
Checked by	RT			
Authorised by	RT			
Project number	IE0037027.9697-R14.V0			
Report number	CEMP.C0			

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1 INTRODUCTION

WSP Ireland Consulting Ltd (WSP) has been commissioned to prepare this Resource Waste Management Plan (RWMP) on behalf of Knockharley Landfill Ltd, the Developer and operator of the Proposed Knockharley Landfill Expansion, on lands located at Knockharley, Navan, (includes townlands of Tuiterath & Flemingstown), Co Meath hereafter referred to as the 'Site' or 'Proposed Project'.

This document has been prepared in accordance with the 2021 guidance from the EPA[1].

The RWMP shall detail how excess material/arisings from the construction are proposed to be managed primarily as resources on Site where possible to prevent waste generation as encouraged by 'A Waste Action Plan For a Circular Economy. Ireland's National Waste Policy. 2020-2025' (DECC, 2020). Materials not suitable for use on the Site to complete the overall Proposed Project as described in Section 2 will be recovered and recycled offsite under appropriate waste authorisation and disposal will be considered as the least favourable waste management option for the project.

This document is considered a 'live document' and should be updated as information becomes available or where there is any significant change to the overall resource and waste management strategy for the Proposed Project.

1.1 OBJECTIVE

The objective of this RWMP is to ensure that the project construction resources and wastes generated are managed in accordance with applicable legislation, local authority plans and policies and regional waste management targets. This RWMP shall form the appointed Main Contractor's operational RWMP and be updated by the Contractor.

The overall aims of this project are primarily to prevent waste where possible and to efficiently manage resources and waste generated during the project lifespan for construction phases.

The main objectives of the RWMP are as follows:

- Promote an integrated approach to waste and resource management throughout the project lifecycle and set out appropriate responsibilities;
- Promote sustainable waste and resource management in line with the waste management hierarchy; and
- Provide an outline for the management of waste arising from construction phase works for the project in accordance with relevant Irish and EU waste management legislation.

The RWMP outlines methods to achieve waste prevention, maximise reuse and recycling of resources (both onsite and offsite), recovery/disposal of waste. The RWMP also includes recommendations for the management of various anticipated waste streams.

[1] EPA, 2021. *The Best Practice Guidelines on the Preparation of Resource Waste Management Plans for Construction and Demolition Projects*

This plan has been developed to establish specific objectives and guidelines prior to the construction works and to be flexible to allow the plan to evolve throughout the construction phases as required by the Main Contractor.

2 DECRIPTION OF THE PROPOSED PROJECT AND SITE

2.1 PROJECT LOCATION

The Site is located at the Knockharley Landfill, (includes townlands of Tuiterath & Flemingstown), approximately 9.5 km east of the town of Navan. The Site is situated approximately 6.5 km south of Slane and is west of the village of Duleek. The N2 national road is located less than 1km to the west of the Site.

2.2 PROJECT DESCRIPTION

The expansion of the existing landfill by construction of an additional active void space of 3.38 million m^3 for landfilling (with further void space of 807,000 m^3 for the 'Piggyback Cell'). Permission is sought for the acceptance of waste until the expanded landfill void is at capacity.

There will be no increase in the permitted annual acceptance of up to 435,000 tonnes per annum of non-hazardous wastes which comprises up to 150,000 tonnes of incinerator bottom ash (IBA), as well as household, commercial and industrial wastes including residual fines, non-hazardous contaminated soils, construction and demolition (C&D) wastes and baled recyclables. In addition, the acceptance of up to 5,000 tonnes per annum of stable non-reactive hazardous waste.

2.3 EXISTING SITE

The Site is an existing landfill which operates under an Industrial Emissions license (W0146). The waste for disposal at the landfill consists of household, commercial and industrial waste and stable, non-reactive hazardous waste. IBA will also be processed and recovered at the landfill Indoor storage of baled recyclables and baled municipal solid waste will also be provided.

The installation covers an area of 135 hectares, of which approximately 25 hectares is utilised for the landfill. The site infrastructure includes a landfill gas collection and utilisation plant, flaring system, leachate management system, surface water management system and associated infrastructure including weighbridges, wheelwash, waste inspection and quarantine area, maintenance garage, administration building and a car parking area.

2.4 CONSTRUCTION/LANDSCAPING PHASE SEQUENCING & ACTIVITIES

The expansion of the landfill will follow the below proposed sequence:

- Phase 1 (Years 0-2) – construction of Cell 31 and Cell 32, including a ramp for access
- Phase 2 (Years 3-4) - construction of Cell 33 and Cell 34, including a ramp for access
- Phase 3 (Years 6-7) - construction of Cell 35 and Cell 36; capping of Cell 31 and Cell 32.
- Phase 4 (Years 9-10) - construction of Cell 37 and Cell 38; capping of Cell 33 and Cell 34
- Phase 5 (Years 12-14) - construction of Cell 39; capping of Cell 35 and Cell 36
- Phase 6 (Years 16-17) - capping of Cell 37 and Cell 38. The original landfill area will be capped and Cell 40 will be created as a piggyback cell between the original landfill and the proposed landfill areas which are capped.
- Phase 7 (Years 18-21) – Cell 39 will be capped and Cell 40 (piggyback cell) will be extended southwards and subsequently capped.

3 ROLES AND RESPONSIBILITIES

The Best Practice Guidelines on the Preparation of Resource Waste Management Plans for Construction and Demolition Projects promotes that a Resource Manager should be appointed. The Resource Manager role may be performed by a number of different individuals over the life-cycle of the Proposed Project; however, it is intended to be a reliable person chosen from within the Contracting Team, with adequate knowledge and understanding of waste practices and waste legislation, who takes the responsibility to ensure that the objectives and measures within the Resource Waste Management Plan are complied with. The Resource Manager shall have the authority to ensure the objective and obligations of the RWMP are met. The role will include activities such as conducting waste checks/audits and adopting construction methodology that is designed to facilitate maximum reuse and/or recycling of waste.

3.1 ROLE OF THE CLIENT

The 'Client' is typically the party that funds the project and are also usually the original 'waste producer' which means anyone whose activities produce waste or anyone who carries out pre-processing, mixing or other waste operations. For the purposes of this document, the 'Client' can be interpreted to be the 'waste holder' which means the waste producer or legal person who is in possession of the waste or resource until such time it is legally transferred to another party. The Client is the body establishing the aims and the performance targets for the project (often in conjunction with the 'Client Advisory Team' described below).

- The Client should require the preparation and submission of a preliminary RWMP as part of the design and planning submission;
- The Client should commission the preparation and submission of an updated RWMP as part of the construction tendering process;
- The Client should ensure that the RWMP is agreed and submitted to the local authority prior to commencement of works on site; and
- The Client should request the end-of-project RWMP from the Contractor.

3.2 ROLE OF THE CLIENT ADVISORY TEAM

The Client Advisory Team or Design Team is formed of consultants and engineers and are responsible for:

- Drafting and maintaining the RWMP through the design, planning and procurement phases of the project.
- Appointing a Resource Manager (RM) to track and document the design process, inform the Design Team and prepare the preliminary RWMP.
- Including details and estimated quantities of all projected waste streams with the support of Environmental consultants/scientists. This should also include data on waste types (e.g. waste characterisation data,
- contaminated land assessments, site investigation information) and prevention mechanisms (such as by- products) to illustrate the positive circular economy principles applied by the Design Team.
- Managing and valuing the demolition and construction work with the support quantity surveyors.

- Handing over of the RWMP to the selected Contractor at commencement of construction for the development of the RWMP in a similar fashion to how the safety file is handed over to the Contractor for updating and maintaining as a 'Live' document for the duration of the works.
- Working with the Contractor as required to meet the performance targets for the project.

3.3 ROLE OF THE CONTRACTOR

The contractor shall implement this RWMP. They shall be responsible for:

Preparing, implementing, and reviewing the (including the Pre-Demolition) RWMP through demolition and construction stage (including the management of all suppliers and sub-contractors) as per the requirements of these guidelines; Identifying a designated and suitably experienced and knowledgeable Resource Manager (RM) at construction stage who will be responsible for implementing the RWMP:

- Identifying suitably permitted/licenced haulier hauliers with the appropriate waste collection permits, to be engaged to transport each of the resources / wastes off-site;
- Implementing waste management practices whereby waste/resource materials generated on site are to be segregated, reused and recycled as far as practicable;
- Identifying all destinations for resources and resources taken off-site. As above, any resource that is legally a 'waste' must only be transported to an authorised waste facility;
- Clarification and implementation of any other statutory waste management obligations, which could include on-site processing;
- Full records of all resources (both wastes and other resources) should be maintained for the duration of the project (records should include waste/resource description, LoW Code where applicable and tonnage/volumes and
- Preparing a RWMP Implementation Review Report at project handover.

Table 3-1 – Roles and Responsibilities

Responsible Party	Responsibility	Project Stage
Client	▪ Appointment of competent Main Contractor and Design Team ▪ Responsible for waste management for lifespan of the project including all documentation	▪ Project commencement and tender award ▪ All project stages (Design, and construction stage)
Main Contractor	▪ Resource Waste Management Plan	▪ Project Implementation
Resource Manager	▪ RWMP Implementation ▪ Ensure that's the objectives of both the RWMP and the contractors RWMP are put in place. ▪ Waste characterisation. Selection of techniques and ▪ design to minimize waste and to maximize recovery	▪ Project Implementation ▪ Construction stage ▪ Construction stage

Responsible Party	Responsibility	Project Stage
	and recycling of waste during the project ▪ Maintenance of Waste Documentation for 3 years. ▪ Completion of Final Waste Management Report ▪ Educate colleagues, site staff, external contractors and suppliers about alternatives to conventional construction waste disposal	▪ Project Design Phase and during project implementation ▪ Post-construction stage ▪ Post-construction stage ▪ Construction stage
Design Team	▪ Identification of Key Waste Streams ▪ Design to minimize waste generation in lifecycle of completed construction. ▪ Adequately provide for waste management in tender documents and declare all relevant information & data	▪ Project Design Stage ▪ Project Design Stage ▪ Procurement Stage

4 PROPOSED PROJECT RESOURCE TARGETS

Project specific resource and waste management targets for the Proposed Project have not yet been set and this information should be updated for these targets once these targets have been confirmed by the client. However, it is expected for projects of this nature that a target of 70% of waste is fully re-used, recycled, or recovered. Typical Key Performance Indicators (KPIs) that may be used to set targets include (as per guidelines):

- Weight (tonnes) or Volume (m3) of waste generated per construction value;
- Weight (tonnes) or Volume (m3) of waste generated per construction floor area (m2);
- Fraction of resource reused on site;
- Fraction of resource notified as by-product;
- Fraction of waste segregated at source before being sent off-site for recycling/recovery; and
- Fraction of waste recovered, fraction of waste recycled, or fraction of waste disposed.

5 DESIGN APPROACH

It is understood that the client has considered a designing out waste approach early in the design of the overall Proposed Project by establishing the potential for any reusable site assets such as topsoil and other materials. The client has considered the re-use of topsoil and excavated material for the following on Site:

- Screening berms during construction;
- Cell formation and road construction;
- Clay lining system for cells;
- Temporary and permanent capping; and
- Landscaping.

The design proposal is deemed to provide substantial economic savings and provides a high level of sustainability through design that incorporates waste prevention, re-use, and recycling of resources on Site.

Where possible, offsite waste disposal associated with the volume of removal of soils will be designed out and potential HGV movements through the local road network will also be reduced. The design approach for designing out waste, re-use, recycling, green procurement and materials optimisation are discussed below.

5.1 CONSTRUCTION AND MATERIALS OPTIMISATION

The main construction phases largely comprises excavation works for the construction of the landfill cells. Designing out waste through the reuse of excavated material on-Site is a key element in reducing the potential to generate waste at the Site.

This avoids importing a large amount of soil or material to restore the Site, which is an efficient use of material and aligns with the EPA's Circular Economy Programme[2]

5.2 DESIGN FOR GREEN PROCUREMENT

The contractor will discuss proposed design solutions, encourage innovation in supply chain and recognise sustainable approaches. The contractor shall also discuss options for packaging reduction with subcontractors/suppliers using measures such as 'Just-in-Time' delivery and use ordering procedures that avoid excessive waste.

[2] EPA (2021) The Circular Economy Programme 2021-2027. Available at: EPA_Circular_Economy_2021_Programme_Apr22_Web.pdf

6 RESOURCE WASTE MANAGEMENT

The Main Contractor will be responsible for defining and maintaining resource management across the site during the construction phase. There will be correct segregation of waste materials. The prevention, reuse, recycling, recovery and disposal of waste and by-products will be performed as the construction phases progress and the materials are generated.

The off-site handling of waste generated by this project are subject to the required statutory authorisations under the Waste Management Act, there is also a requirement that the management of waste complies with the Waste Hierarchy. This hierarchy outlines that waste prevention and minimisation are the first priority in managing wastes, followed by waste reuse and recycling with disposal being considered as a last resort (see Figure 6-1). The EU Waste Directive (2008/98/EC) also mandates that hazardous waste generation should be avoided or at least minimised.



Figure 6-1 - Waste Hierarchy

6.1 WASTE PREVENTION AND MINIMISATION

The following waste minimisation measures will be implemented during the course of the works:

On site segregation of all waste/resource materials generated during construction stage to appropriate categories, including (non-exhaustive list):

Non-Hazardous Waste Streams

- Topsoil, sub soil, stones, made ground fill from excavations;
- Scrap metal from ESB pylons;
- Cardboard and other packaging;
- Plastic including wrapping and packaging;
- Paper;
- Glass;

- Cut off pieces of HDPE liner
- Waste from portable site toilets;
- Canteen and food waste; and
- Damaged materials.

- All waste assessed by the Resource Manager as 'not suitable for reuse' will be stored in skips or other suitable receptacles in a designated area of the site, to prevent cross contamination between waste streams;
- Uncontaminated excavated material (top-soil, sub soil, etc.) will be segregated, stockpiled and re-used on site in preference to importation of clean fill, where possible;
- All soil materials identified for re-use off site will be subject to testing and quality assurance controls to be protective of the environment;
- Where possible, the contractor will ensure that all waste leaving site will be recycled or recovered.

6.2 WASTE/RESOURCE GENERATION & QUANTIFICATION

Quantities of construction resource/waste materials may vary depending on methodologies of construction. Therefore, the difficulty of estimating resource/waste quantities is noted which depends on the approach of the appointed Main Contractor. During construction these quantities may be subject to change during the phase.

This RWMP incorporates the provisions to promote sustainable waste management in line with the waste hierarchy, and also focus on integrating good site management practices to ensure efficiency and reduce potential for any other negative environmental effects.

This Proposed Project comprises of construction activities and the main wastes and resources generated by the Proposed Project are listed below in Table 6-1.

Other potential waste/resource sources on the site are also included in Table 6-2.

Estimated quantities are also provided and should be updated as the Proposed Project advances.

Table 6-1 - Construction Arisings, LoW and Estimated Quantities/Volume

Waste/Resource Material	LoW Code	Estimated Quantities (m3)
Metals	17 04 05	50 T
Concrete	17 01 01	5 T
Masonry	17 03 02	1T
Mixed Construction and Demolition Wastes	17 09 04	5T
Timber	17 02 01	1 T

6.3 CONSTRUCTION ARISINGS

It is anticipated that the majority of resources/wastes generated will be suitable for reuse, recovery or recycling and will therefore be segregated to facilitate the reuse, recovery and/or recycling, wherever possible.

A non-exhaustive list of construction waste categories which may be generated during the construction phase of the Proposed Project have been identified below and the appropriate European Waste Catalogue Code for these wastes has been identified in Table 6-2. These LoW's only apply to construction materials that have no further use at the Site and meet the definition of waste. Where materials have a beneficial use either on site or offsite these materials should not be considered waste (subject to meeting certain criteria, e.g. excavated material being notified as by-product).

Table 6-2 - Typical C&D waste potentially expected from the construction phase of the Proposed Project.

Waste Material	LoW/EMC Code
Concrete, Bricks, Tiles and Ceramics	17 01
Concrete	17 01 01
Wood, Glass and Plastic	17 02
Wood	17 02 01
Plastic	17 02 03
Metals (including their alloys)	17 04
Iron and Steel	17 04 05
Mixed Metals	17 04 07
Soil and stones, other than those mentioned in 17 05 03*	17 05 04
Insulation and Construction Materials	17 06 04
Paper and Cardboard	20 01 01
Wood other than that mentioned in 20 01 37	20 01 38
Soil and Stones	20 02 02
Mixed Municipal Waste	20 03 01
Hydraulic oils	13 01 01*
Fuel oils and diesel	13 07 01*

Waste Material	LoW/EMC Code
Aqueous liquid waste other than those mentioned in 16 10 01 (to be considered for portable toilet wastes)	16 10 02

6.4 PROPOSED WASTE MANAGEMENT OPTIONS

The Main Contractor is responsible for defining and maintaining resource and waste storage areas across the site during the construction phase. These areas will be secured and provide for appropriate segregation of materials. The relocation of these areas will be planned appropriately as works progress. The Main Contractor will implement waste management policies whereby resource and waste materials generated on site are to be segregated as far as practicable.

The Main Contractor will ensure that all wastes which arise from the construction of the Proposed Project will be removed from site by an approved waste contractor. These contractors will be required to hold a valid waste collection permit. Furthermore, all waste materials which are required to be disposed off-site will be reused, recycled, recovered or disposed of at an appropriate facility which holds appropriate registration, permit or license. The Contractor will retain on file up-to-date copies of the relevant collection permits, and facility registrations, permits and licenses.

Other written records of the waste arisings will be maintained as per Section 7 of this RWMP.

6.5 MANAGEMENT OF WASTES AND RESOURCES

6.5.1. RESOURCES/WASTE

Quantities of materials/wastes identified below are based on estimates for a project of this size and scale. These quantities will be tracked and assessed for improvement opportunities throughout the course of the Proposed Project.

6.6 MANAGEMENT OF STOCKPILES

Segregation and storage of wastes generated during works will be segregated and temporarily stored onsite (pending removal or for re-use on site) in accordance with a pre-determined segregation and storage strategy While waste classification and acceptance at a waste facility is pending, materials for recovery/disposal shall be stockpiled as follows:

- Stockpile number;
- Origin (i.e. location and depth of excavation)
- Approximate volume of stockpile
- Date of creation;
- Description and Classification of material;
- Date sampled;
- Date removed from site;
- Disposal / recovery destination; and
- Photograph

Wastes for removal onsite will be segregated into separate skips by LoW/EWC codes pending collection by the prescribed Authorised Waste Collector – these are outlined in Section 7.2 below.

Waste storage, fuel storage and stockpiling and movement are to be undertaken with a view to protecting any essential services (electricity, water, etc) and to protect any existing surface and new water drains.

Waste will be stored on site, including soil stockpiles, in such a manner as to:

- Prevent environmental pollution (bunded and / or covered storage, minimise noise generation and implement dust / odour control measures, as may be required); and
- Maximise waste segregation minimise potential cross contamination of waste streams and facilitate subsequent re-use, recycling and recovery.
- As this report is preliminary version of a live document – the main contractor will provide the location of the waste storage areas before the demolition and construction phases begin and the report will be updated appropriately.

Protection of adjacent surface water systems from deleterious matter are achieved by the following:

- Clear marking of buffer zones to maintain their integrity before commencing any work;
- Restricting machinery access to these zones unless absolutely necessary;
- Enforcing the prohibition of material stockpiles or spoil heaps within them.

Temporary drainage systems associated with construction activities should be designed to divert water away from buffer zones and avoid direct discharge into aquatic areas. To prevent contamination, mixing of soiled water from yards and other hard surfaces with uncontaminated water from roofs or other sources is prohibited. Only clean, uncontaminated water should be discharged into soak-away systems or surface water.

6.6.1. SOILS AND STONES

Volumes of soils are to be excavated on Site during the Proposed Project. It is expected that these volumes will arise from topsoil stripping and from excavations to construct the landfill cells. It is proposed to re-use subsoil materials on Site where possible. Any excess soils that satisfy by-product criteria will notified as by- product for beneficial reuse on other sites. This accords with the waste framework hierarchy for waste prevention.

The Soil and Stone Recovery & Disposal Capacity (Update Report 2020) recommends that proposed developments with demolition and excavation processes exhaust all reuse possibilities before sending to recovery or disposal facilities. Provisions in the EC (Waste Directive) Regulations 2011 provide for the reclassification of waste as resources, and this is address under Article 27 (by-product) and Article 28 (end-of- waste).

When certain criteria can be demonstrated by the economic operator, Article 27 allows for the declaration of a material as a by-product rather than a waste. This instrument is well established for soils and stone. The classification of soils and stone as a by-product can have significant economic benefits and allow for the handling of these materials outside waste legislation. There are also large environmental benefits through facilitating a circular economy approach.

These decisions made by the economic operator must be notified to the EPA. This is considered by the EPA on a case-by-case basis and the EPA then takes a risk-based approach in making their determination. This determination has an advisory period of 10 weeks. For this declaration the economic operator is required to demonstrate that all four of the by-product conditions are met:

1. The further use of the soil and stone is certain;

2. The soil and stone can be used without any further processing other than normal industrial practice;
3. The soil and stone are produced as an integral part of a production process; and,
4. Further use is lawful fulfilling relevant product, environmental and health protection requirements for the specific use and will not lead to overall adverse environmental or human health impacts.

The Main Contractor should seek advice on this process from an appropriately qualified consultant.

Where required, the Main Contractor is responsible for ensuring permits, issued by the National Waste Collection Permit Office (NWCPO), are held by each waste collection contract in accordance with Waste permitting, licences & Documentation under the Waste Management (Collection Permit) Regulations 2007.

6.6.2. CONTAMINATED SOILS

The Site is an existing landfill, should any contaminated materials be identified during construction, these materials should be removed offsite for recovery or disposal as required.

6.6.3. METALS

Metals from ESB pylon removal will be segregated in appropriate skips or other receptacles in accordance with the authorised waste collectors' requirements. The contractor shall liaise with the metal waste contractor as to the segregation streams relevant to their site. The majority of metal waste will be recycled.

6.6.4. TIMBER AND WOOD

Uncontaminated timber and wood products will be segregated accordingly. The contractor shall ensure that appropriate segregation is maintained to exclude materials containing glues, preservatives, paints, varnishes, etc.

Waste timber production on site will be limited.

6.6.5. PLASTIC

Appropriate waste and 'off-cut' construction plastic (hard plastic) will be segregated appropriately in accordance with the waste contractor's requirements and recycled appropriately. Soft plastics and plastic wrapping shall be segregated for offsite recycling where possible. Small amount of plastics will be placed in the mixed C&D skip and segregated offsite a the waste facility where no feasible to have a separate plastics skip.

6.6.6. WASTES FROM CONSTRUCTION SITES OFFICES AND STAFF

During the course of the construction phase waste will be generated from employees on the site. These will encompass general refuse, mixed dry recyclables, food wastes and wastes from onsite portaloos. These wastes will be managed by appropriately licenced and specialised waste contractors. These wastes will be collected and stored separately from the C&D wastes generated through construction activities.

6.6.7. OTHER WASTES

As required and depending on the stage of the construction, the contractor will determine if other waste streams need appropriate segregation. These streams may include: glass, bricks and tiles. These needs will be periodically assessed and evaluated by the contractor.

Excess concrete (17 01 01) will be returned to concrete supplier.

6.6.8. HAZARDOUS WASTES

The management of all hazardous waste streams will be coordinated in conjunction with the Contractor's Site Health and Safety Manager. Hazardous waste arisings are not anticipated however the appropriate waste management practices will be employed.

Hazardous wastes (anticipated to be limited to waste oils, lubricant and other construction liquids) will be stored in secures, dedicated and clearly labelled impermeable containers. These will be located in an appropriate waste compound. If identified through additional testing, contaminated soils will also be appropriately segregated on Site for onward disposal.

6.7 COSTS OF WASTE MANAGEMENT

Re-iterating the Waste Hierarchy (Figure 6-1) it is clear that cost of waste management reflects this top-down pyramid. Therefore, incentivising this project to first prevent waste from being created as is outlined above will reduce the cost of waste management and overall construction costs.

Reuse of material also is beneficial to cost as virgin material that is manufactured or mined and subsequently transported to Site may well be in excess of reuse costs. The Proposed Project will reuse appropriate, non-hazardous waste topsoil for landscaping purposes.

Scrap metal, wood, plastics, and other wastes will be assessed by the main contractor/resource manager. Metal salvage waste costs can be offset by rebates. Acceptable plastic and wood will also be from the site.

Disposal costs for landfill are typically (est.) €160.00 per tonne including the landfill levy (Waste Management (Landfill Levy) Regulations 2015 (S.I. No. 189 of 2015)). This price is non-inclusive of skip hire and collection costs which can widely vary. Thus, the Proposed Project will endeavour to accord with the Waste Hierarchy to prevent, reuse and recycle before disposal of waste where appropriate.

7 SITE MANAGEMENT

Site Management will ultimately be the responsibility of the Contractor. Control of the Site including waste management will be transferred to the Contractor at commencement of the Proposed Project. The Design Team or client representative may set recommended tasks for the contractor to follow in the works specification.

7.1 RESOURCE MANAGEMENT RESPONSIBILITY

- Agree and revise as necessary any commitments or targets included in the RWMP developed at design/planning with the Client for acceptance and adoption in the RWMP for construction;
- Allocate responsibility for resource management to one or more individuals of sufficient seniority to put the relevant procedures into practice. Nominate a suitably qualified Resource Manager (RM) with expertise in waste and resource management to implement the RWMP;
- The RM will be required to update the plan as required to reflect new resource streams, work practices, suppliers or resource management options as required;
- The RM will be responsible for delivery of all training and induction in relation to resource management;
- The RM will be responsible for ensuring site infrastructure is supplied and maintained as fit for purpose;
- The RM will be responsible for conducting all relevant internal site audits including audits of subcontractor operations;
- The RM will be available as required for any Local Authority or other audits undertaken;
- The RM will be responsible for maintaining site records for waste and resources exported offsite and ensuring these are undertaken by suitably authorised operators to suitably authorised sites; and
- The RM will be engaged with relevant individuals who have access to ordering and stock-control records to ensure supply chain initiatives have been adopted.

7.2 AUTHORISED WASTE COLLECTION AND RECEIVING FACILITIES

All waste removed from site must be carried out by a contractor with a current waste collection permit for the waste codes to be collected.

All residual resources legally classified as a ‘waste’ taken from site must be sent to suitably authorised waste facilities for disposal or recovery. The following authorisations are applicable:

- Certificate of Registration (CoR) from the Local Authority (issued to private sector);
- Waste Facility Permit (WFP) from the Local Authority; and
- Licenced Landfill.

7.2.1. WASTE CONTRACTORS

The Main Contractor will nominate only authorised Waste Collectors and Facilities from the list available at http://www.nwcpo.ie/permitsearch.aspx for each relevant LoW Code. This RWMP document will be updated by the Contractor at the pre-construction and main construction when they have been selected. A list of authorised provisional intended Waste Collection Contractors and a list Waste Facility Permit holders.

WASTE COLLECTION CONTRACTORS

- Starrus Eco Holdings Ltd (trading as Panda) – NWCPO-13-11193-08
- Multimetals Recycling Ltd. – NWCPO-09-01185-04

NWCPO contractor(s) will be used to collect the following waste streams:

Table 3 – LoW Codes for Collection

Waste/Resource/Material	LoW Code
Metals	17 04 05
Concrete	17 01 01
Masonry	17 03 02
Mixed Construction and Demolition Wastes	17 09 04
Timber	17 02 01

Other authorised Waste Collection Contractors from the NWCPO register will be engaged if capacity issues are affecting the above contractor(s).

WASTE FACILITIES

- Starrus Eco Holdings Limited (trading as Panda) – W0140-05
- Multimetals Recycling Limited - WFP-WW-09-0014-07

The above WFP holder(s) will be used as the final destination for the following waste streams:

Table 4 – LoW Codes for Facilities

Waste/Resource/Material	LoW Code
Metals	17 04 05
Concrete	17 01 01
Masonry	17 03 02
Mixed Construction and Demolition Wastes	17 09 04
Timber	17 02 01
Metals	17 04 05

Other authorised Waste Facilities from the NWCPO register will be engaged if capacity issues are affecting the above facility.

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