Stantec

Memo

To:	C/O Lindsay Strachan (Envitech NZ Limited) National Green Steel Limited	From:	Stantec New Zealand Level 4 105 Carlton Gore Road Newmarket, Auckland 1023 NEW ZEALAND Mail to: PO Box 13052, Christchurch 8140
Project/File:	310003448 Green Steel Sensitivity Analysis	Date:	2 February 2026

Reference: Sensitivity Analysis

1 Introduction

National Green Steel Limited (the client) have engaged Stantec New Zealand (Stantec) to undertake Sensitivity Analysis to address the following from the *Joint Witness Statement (JWS) in Relation to: Monofills, Earthworks and Related Geotechnical Issues*, dated 22 January 2026:

> Liner selection
>
> b) Whether groundwater concentration assessments are adequately conservative, particularly with respect to conceptualisation of groundwater flow area.
>
> Matters of agreement
>
> All parties agree that, as soon as practicable, sensitivity analysis of the groundwater model and suitability of dilution factor, including potential environmental effects on boundary taking into account 99th percentile NEMP 3.0 ecological criteria should be undertaken.

This memo presents a summary of the Sensitivity Analysis undertaken by Stantec for the proposed Southwest Monofill (Figure 1). The analysis focuses on the calculations presented in Sections 6.4 and 6.5 of the following report:

"Monitoring Plan and Evaluation of Surface and Groundwater Effects, Green Steel Monofill, Hampton Downs, 61 Hampton Downs Road, Hampton Downs, Waikato". Earthtech Consulting Limited, dated 9 June 2025, Ref: R4424-6 (Earthtech, 2025a).

Figure 1 shows the location of the two proposed monofills. Calculations for assessment of effects undertaken by Earthtech (2025a) focussed on the Southwest Monofill. The proposed location of this monofill is considered to be the more sensitive environment given the proximity to the Waipapa Stream which runs along the southwestern boundary.

Reference: **Green Steel Hydrogeological AEE**

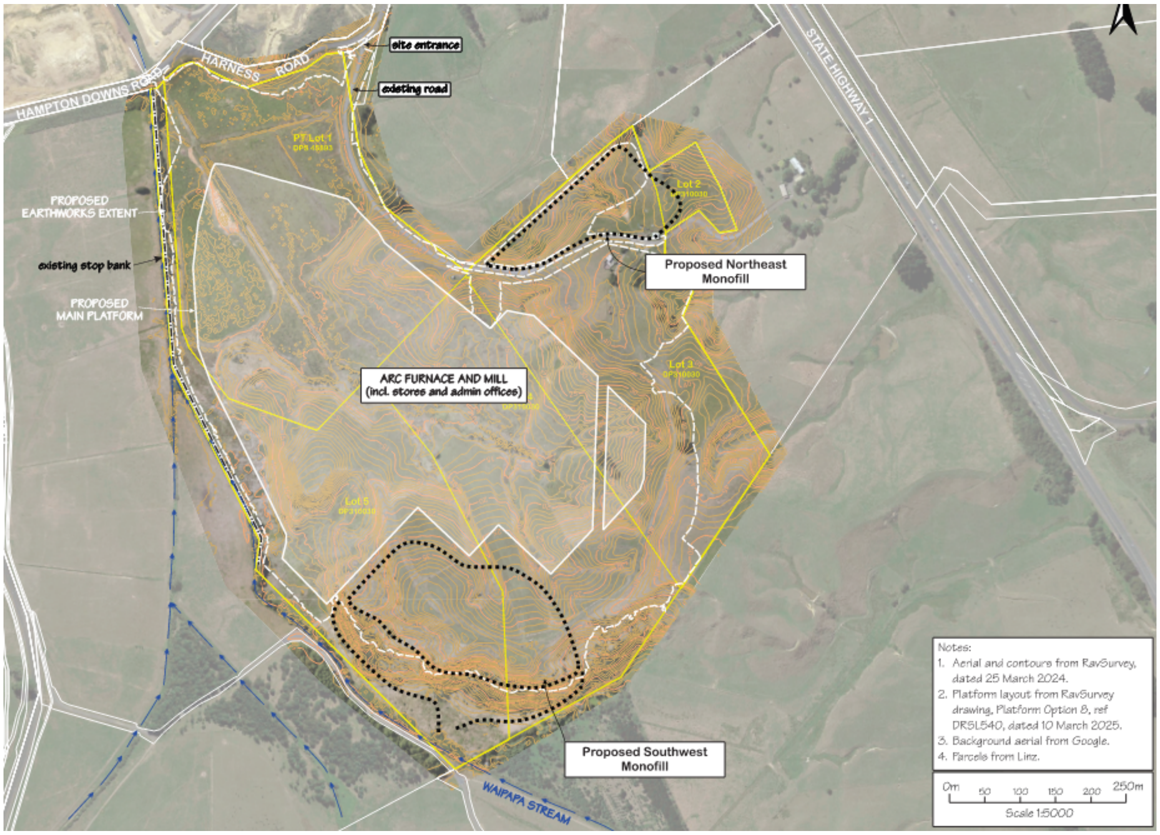

Figure 1 Monofill location plan (Earthtech, 2025)

2 Environmental Setting and Conceptual Site Model

The regional mapped geology shows three main units beneath the site; Holocene alluvium deposits, rhyolitic terrace deposits and the Amokura Formation (alternating siltstone/sandstone), which is a sub unit of the Waitemata Group (GNS Science, 2026). Ground investigations for the site confirm this geological setting. Four auger borelogs MF1, MF2, MF3 and MF54 (Figure 2) provided information on the subsurface conditions close to Southwest Monofill. MF1 and MF2 at lower elevations intercepted the Holocene alluvium, with saturated alluvium material intercepted at >1.4 m below ground level (bgl). MF3 and MF4 at higher elevations encountered alluvium underlain by volcanic ash. The two bores at higher elevations did not encounter saturated sediment. MF4 had the highest elevation and encountered Amokura sandstone material at 2.2 m bgl, approximately 10 m relative level (RL).

Over the remainder of the site, the geotechnical investigation (Earthtech, 2024) interpreted the alluvium/Amokura Formation at approximately 4 mRL for most of the site, rising in elevation towards the Southwest Monofill, then falling away in elevation toward the southern boundary as observed in MF1 to

Reference: Green Steel Hydrogeological AEE

MF4. The weathering depth for the Amokura Formation has been interpreted as 3 m to 10 m (bgl) (Earthtech, 2024).

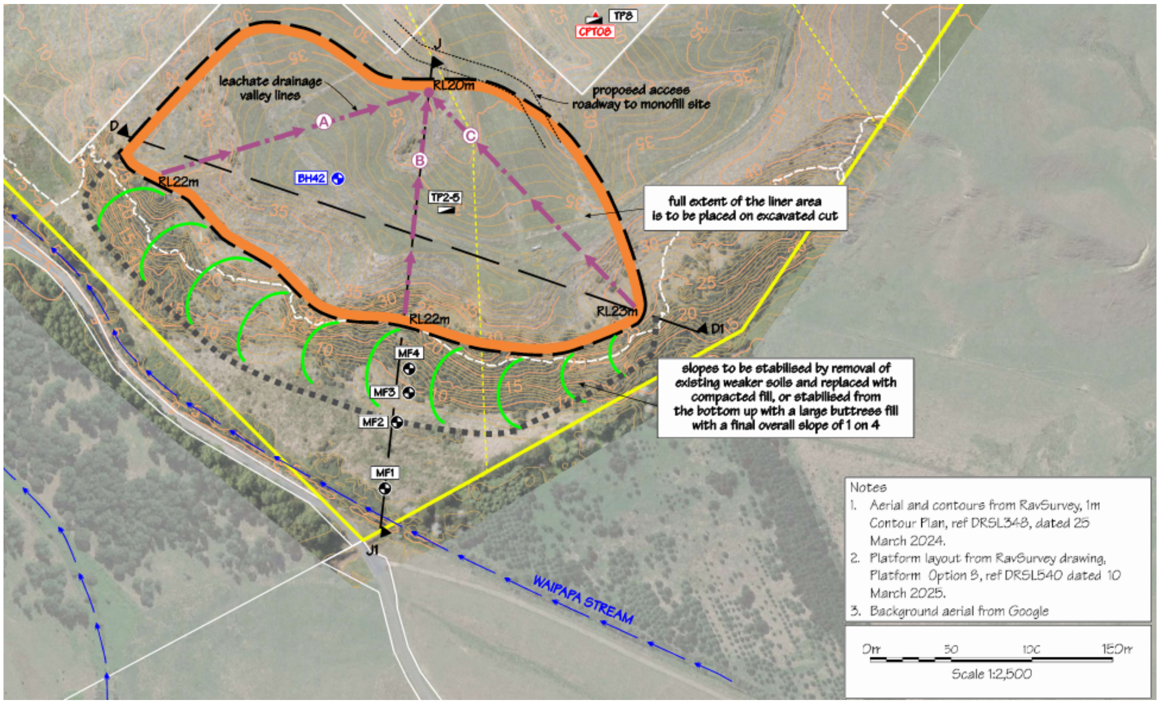

Figure 2 Southwest Monofill with hand auger locations (Earthtech, 2025)

The regional aquifer is the Waitematā Sandstone Aquifer, which is a fractured aquifer comprised of interbedded sandstone and siltstone. Groundwater flow is mostly horizontal through fractures and the sandstone beds with the mudstone sequences acting as aquitards. A transmissivity range of 6 – 62 m^2/day has been estimated for the aquifer (Pattle Delamore Partners Ltd, 2012) with an estimated hydraulic conductivity value of 2.72 x 10^{-2} m/day (Viljevac et al., 2002). Two exploration bores at the site (BH54 and BH42) intercepted groundwater associated with the fractured aquifer between 8 m and 33 m below ground surface, which correspond to 6 m and 9 mRL. These groundwater levels are associated with fractured zones intercepted at >57 m depth (-15 mRL). Estimates from site specific tests for transmissivity and storativity gave values of 12 m^2/day and 7 x 10^{-4} respectively (Earthtech, 2025b)

We could not find any published information regarding the shallow unconfined watertable. Site investigations indicate that across the wider site, groundwater was found from 0.5 to 3 m bgl in what is interpretated as the shallow watertable.

To the south of Southwest Monofill groundwater was encountered within the Holocene alluvium at a depth of approximately 4.5 mRL. The Waipapa Stream was estimated to be at approximately 4 mRL, indicating that locally the shallow aquifer is contributing to the stream. Expected hydraulic conductivity (K) for the unconfined groundwater within silty sand/sandy silt ranges between $1x10^{-7}$ m/s to $5x10^{-3}$ m/s (Freeze and Cherry, 1979).

Additionally, seeps have also been observed at/within the 'horseshoe' area north of the Southwest Monofill between 25 and 30 mRL indicating perched aquifers in the near surface units at higher elevations.

2.1 Conceptual Site Model

We have reviewed the hydrogeological information for the Southwest Monofill and have updated the conceptual model (red annotation) as presented in the Earthtech (2025a) report. This is summarised below and presented in Figure 3.

From the observed geology we have assumed that the underlying Amokura Formation is elevated in the location of the Southwest Monofill and there is less alluvium coverage compared to that observed in augers MF1 to MF3. The saturated alluvium (sandy silt) observed in MF1 and MF2 is representative of the unconfined aquifer at depth of approximately 5 mRL, 7 m below the proposed liner depth of 12 mRL. We have assumed that this aquifer will be found at a similar depth across the site (within the alluvium, residual soils and weathered Amokura Formation materials) with slight variations in depth in response to geological and topographic changes. Based on site geology, we have assumed the unconfined groundwater aquifer will be situated near the interface of the alluvium and Amokura Formation (Earthtech, 2024) across the extent of the whole site. Leachate discharge will be to the unconfined aquifer rather than to the fractured Waitemata Sandstone Aquifer, which is at depth (>57 m) and under semiconfined/confined conditions. It is inferred that the unconfined groundwater beneath the monofill will follow topography and will flow southwest towards Waipapa Stream. Hydrogeological parameters will be those associated with an unconfined aquifer within sandy silt.

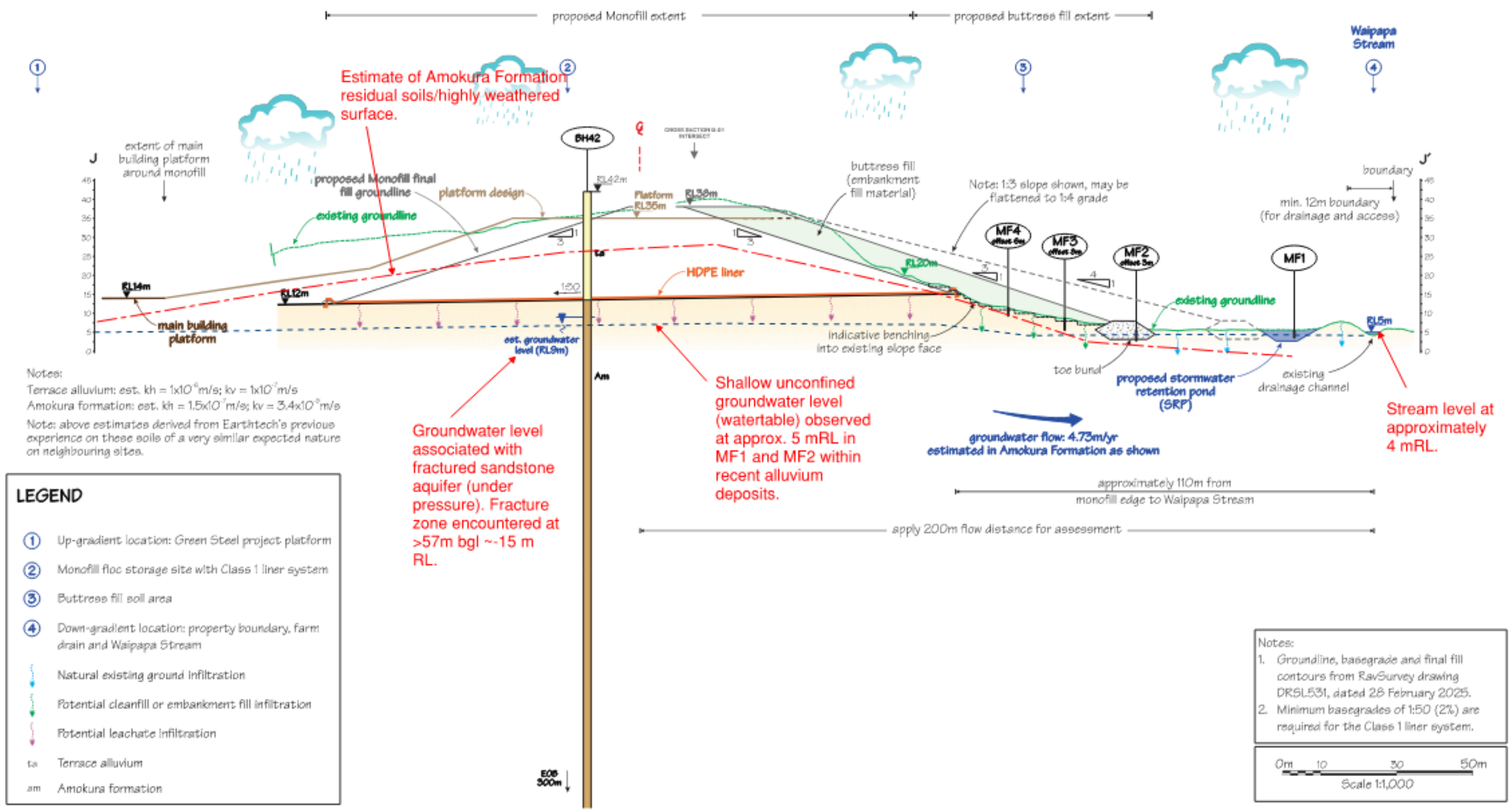

Figure 3 Conceptual Site Model, modified from Figure M6.2 (Earthtech, 2025). Stantec updates in red.

3 Sensitivity Analysis

3.1 Liner Leachate Rates

Stantec understands the calculation on page 15 (Section 6.4) is a simplified approach, which is based on the use of Darcy's equation. The estimated flow of leachate through the whole of the base of the monofill liner is calculated to be 4.464 litres/day. However, it would appear that the number of defects assumed in the calculation is one per 4,000 m^2, and not two defects per 4,000 m^2 as stated. Correcting this approximately doubles the estimated flow through the monofill base to 8.6 litres/day.

As a check of the calculation Stantec have used the method adopted by Qian et al[1] (from Giroud and Bonaparte) to estimate the flow through the base of the monofill. This is covered in Spreadsheet 1 (appended) and is summarised as follows:

- The results show that for good contact between an HDPE geomembrane and underlying geosynthetic clay liner (GCL), the leakage would amount to approximately 0.557 litres/day for the whole of the Southwest Monofill.
- If the contact is poor, then there is more leakage and it would increase to about 3.05 litres/day for the whole of the Southwest Monofill.
- The check shows a similar order of magnitude, though less in amount, under poor contact conditions. In that respect, Stantec consider the amount derived (i.e., assume it is corrected to 8.6 litres/day) to be a conservative estimate and it would be appropriate at detailed design stage to update the design calculations.

The difference in leakage rates between having good contact and poor contact between HDPE and underlying GCL (i.e., 0.557 litres/day versus 3.05 litres/day, or 5.5 times more for poor contact) stresses the importance of having good construction practices and quality control.

An underlying assumption in Earthtech's calculation, (as well as the check done by Stantec), is that a 300 mm head of leachate could develop on top of the liner. We have checked this in Spreadsheet 2 (appended) using three different methods. Indications are that the head could be as high as 291 mm at the point where the distance between leachate drains is largest. So, to assume a value of 300 mm for all circumstances is conservative.

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[1] "*Geotechnical Aspects of Landfill Design and Construction*"; Qian, X., Koerner, R.M., Gray, D.H.; Prentice Hall; New Jersey; 2002; ISBN 0-13-012506-7.

3.2 Liner Leakage Effects on Groundwater

Stantec have reviewed the parameters used for the calculation of flow and dilutions (Section 6.5). As a check of the calculation inputs we have made the following changes and assumptions:

- We have doubled the estimated flow through the monofill base to 8.6 litres/day to account for approximately double the number of defects.
- The original calculations assume 50% of the leakage would be picked up in a subsoil drain, we have conservatively calculated 100% leachate leakage to groundwater (i.e. assumed no subsoil drain).
- The original calculations have assumed an aquifer with a depth of 50 m (and width of 330 m) in the flow calculation. We have conservatively changed this to 4 m depth (and kept the width at 330 m). This aquifer depth assumes the aquifer is restricted to the alluvium and residual soils/weathered material of the Amokura Formation (weathered layer thickness of the Amokura Formation ranged between 3 m and 10 m across the site (Earthtech, 2024)) and is unconnected to the deeper Waitematā Sandstone Aquifer.

We have checked the hydraulic conductivity parameters (K) used in the Earthtech (2025a) calculations and find the values to be at the low end of the expected range for the observed soil type. Increasing the rate will result in higher flow and therefore higher dilution rates. Therefore, we consider the K values to be conservative and have left as is.

Our calculations with the updated dilution factors and daily loading rates are presented in Spreadsheet 3 (appended).

3.3 Dilution Calculations

As per the original Earthtech (2025a) calculations Stantec have used the 'first wash' TCLP concentrations from the Lysimeter trials for the loading rates. The dilution rates within the groundwater are presented in Spreadsheet 3. For a comparison against freshwater guidelines, in the absence of flow data we have assumed stream flow values of 0.5 L/s and 1 L/s. We have chosen low flow values based on the location in the catchment and size of the stream. We note that the stream is likely groundwater fed and given it has a well-formed channel it is likely perennial. Therefore, we consider these two flow scenarios are reasonably representative of low flow periods. The results of these calculations are presented in Spreadsheet 4 (appended).

4 Assessment of Environmental Effects

We have assessed the predicted dilution estimates against the Australian & New Zealand Guidelines for Fresh & Marine Water quality (ANZG, 2018), the PFAS National Environmental Management Plan 3.0 (NEPM, 2025) and the Water Services (Drinking Water Standards for New Zealand) Regulations 2022 (DWSNZ, 2022) as summarised in Table 1 (appended). Even in low flow conditions the predicted determinand concentrations are within the ecological and drinking water guidelines. Additionally, we note that these calculations are conservative and do not take into account natural attenuation processes that will reduce contaminant concentrations prior to any possible discharges to Waipapa Stream. Therefore, the groundwater concentration assessments are considered adequately conservative, particularly with respect to conceptualisation of groundwater flow area.

5 Summary

In summary, Stantec have carried out a Sensitivity Analysis of the groundwater model and suitability of dilution factor presented in Section 6 of the Earthtech (2025a) report. We have reviewed the environmental site setting and hydrogeology and updated the conceptual site model. Where there is uncertainty around the conceptual model and/or calculation inputs, we have used the more conservative option, to assess the 'worst case' scenario for the site. We have assessed potential environmental effects on Waipapa Stream at the boundary by taking into account the ANZG guidelines for fresh water and the 99th percentile NEMP 3.0 ecological criteria.

Based on these results and given natural attenuation processes have not been accounted for, the effects of the predicted leachate leakage at the site border and Waipapa Stream will be within relevant guidelines for the protection of freshwater.

Additionally, it's worth noting that liner integrity surveys can be done using electric dipole methods, which can identify minor defects in the constructed liner even after the soil protection layer has been placed. This would provide significant certainty regarding the integrity of the monofill liner given that such a survey would enable the location of all defects, even down to pin-prick size, to be identified, and the defects remediated.

Yours Sincerely,

Stantec New Zealand

Reference: Green Steel Hydrogeological AEE

References

Earthtech, 2025a. Monitoring Plan and Evaluation of Surface and Groundwater Effects, Green Steel Monofill, Hampton Downs, 61 Hampton Downs Road, Hampton Downs, Waikato. Earthtech Consulting Limited, dated 9 June 2025, Ref: R4424-6.

Earthtech, 2025b. Re: Air Lift Yield Results for BH54 Test Bore – Green Steel Project at 61 Hampton Downs Road. Earthtech Consulting Limited, dated January 2025.

Earthtech, 2024. Preliminary Geotechnical Assessment Report: 61 Hampton Downs Road, Hampton Downs. Prepared for National Green Steel Limited by Earthtech Consulting Limited, dated 12 December 2024.

A. Freeze and J. A. Cherry, 1979, Groundwater, Prentice-Hall.

Geological and Nuclear Science, 2026. *Geoscience webmap*. Retrieved from GNS Science Te Pu Ao: https://www.gns.cri.nz/data-and-resources/geoscience-webmap/ 30 January 2026.

NZ Geotechnical Database. (2026). *NZ Geotechnical Database*. Retrieved from https://nzgd.org.nz/tenant/295/hierarchy/3563/level/1823/tag/Map 30 January 2026.

Pattle Delamore Partners Ltd, 2012. Karaka Rural Urban Boundary Waitemata Aquifer Recharge Assessment.

Viljevac, Z., Murphy, G., Smaill, A., Crowcroft, G., and Bowden, D. 2002. South Auckland Groundwater, Kaawa Aquifer Recharge Study and Management of The Volcanic And Kaawa Aquifers.

Table 1 Stream dilution predictions against drinking water standards and ecological guidelines

Leachate Quality Predictions*									
Leachate Quality Parameter	Units	Long Term Leaching Strength	High Strength Monofill Leachate	Stream dilution assuming a flow of 1L/s	Stream dilution assuming 0.5L.s flow	ANZG (2018)	NZ Drinking Water Standard	NEMP 3.0	
						DGV[2] 95% Species Protection	2022	99% species protection	95% species protection
pH	-	>7.0 <7.8	7.0 to 7.1			-	-		
PFAS	µg/ℓ	<0.1	0.7	0.000069	0.000139	-	0.63		
PFOS	µg/ℓ							0.00023	0.13
PFOA	µg/ℓ							19	220
Boron	mg/ℓ	0.6	1.9	0.000189	0.000377	0.94	2.4		
Chromium (Cr)	mg/ℓ	<0.1	1	0.000100	0.000199	0.001	0.05		
Copper (Cu)	mg/ℓ	<0.1	0.3	0.000030	0.000060	0.0017	2		
Iron	mg/ℓ	<0.1	0.5	0.000050	0.000100	-	-		
Lead (Pb)	mg/ℓ	<0.1	0.3	0.000030	0.000060	0.0044	0.01		
Manganese (Mn)	mg/ℓ	0.1	2	0.000198	0.000396	1.9	0.4		
Nickel (Ni)	mg/ℓ	<0.1	0.4	0.000039	0.000079	0.011	0.08		
Zinc (Zn)	mg/ℓ	<0.1	2.8	0.000278	0.000556	0.0096	1.5		

*based on lysimeter trials set up on 27/01/2021

Notes: 1. Default Guideline Value Freshwater Guideline - 80% Species Protection

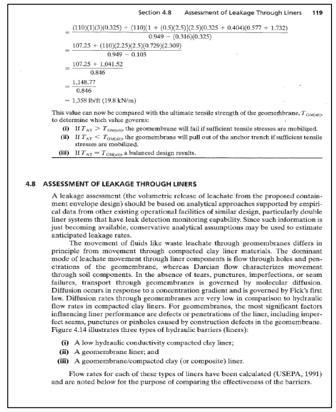
2. Default Guideline Value Freshwater Guideline - 95% Species Protection

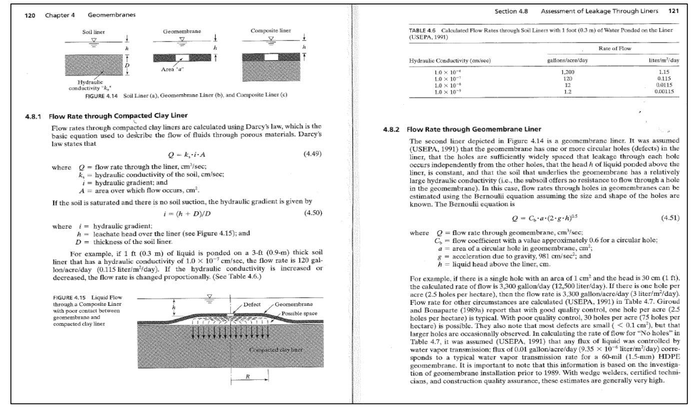
3. Bold denotes exceedance of ANZG (2018) DGVs

SPREADSHEET 1

POTENTIAL LINER LEAKAGE

Source: Qian et al: "Geotechnical Aspects of Landfill Design and Construction": Pages 119 - 126





Leakage through three liner situations considered:

- Compacted clay liner
- Geomembrane liner
- Composite geomembrane / compacted clay liner

Liner consists of:

- 1.5mm HDPE
- 5.5mm GCL (k < 2.5 x 10^{-11} m/s)
- 300 mm thick CCL (k < 1 x 10^{-9} m/s)

Assume:

- 2 holes (defects) of 2mm dia. each, per 4,000 m^2 of liner
- South-west monofill area is 45,160 m^2
- Head of leachate on liner is 300 mm
- Defect is in the HDPE in contact with underlying GCL
- Situation is as described in section 4.8.3 (starting on page 122)

2	defects per	4000	m^2
	liner area	45160	m^2

Use equations 4.53 and 4.54:

- For good contact between HDPE and GCL

$Q = 0.21 \times a^{0.1} \times h^{0.9} \times k_s^{0.74}$ where:

Q = leachate leakage rate per hole in m^3/s

a = area of the hole/defect in m^2

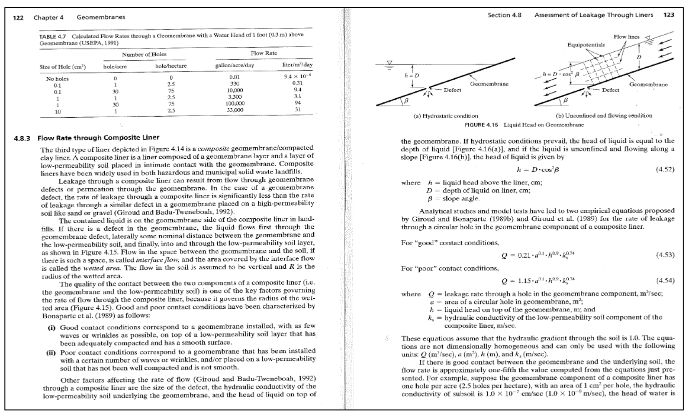
h = head of leachate above the liner in m

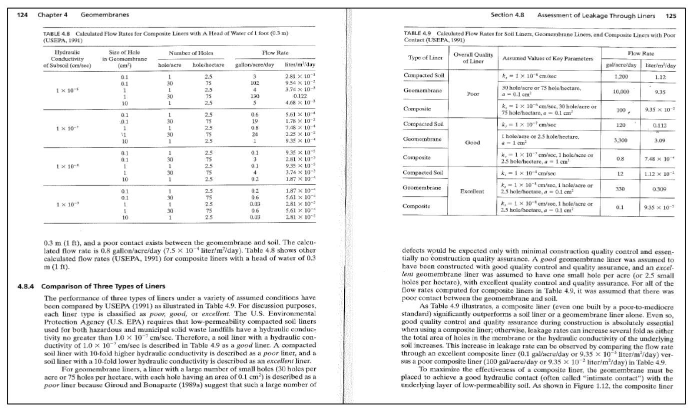
k_s = hydraulic conductivity of the low permeability soli (GCL in this case) in m/s

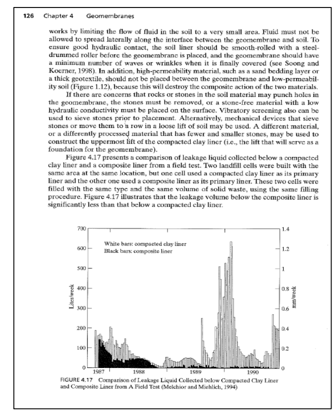
- For poor contact between HDPE and GCL

$Q = 1.15 \times a^{0.1} \times h^{0.9} \times k_s^{0.74}$

									FOR GOOD CONTACT BETWEEN HDPE AND GCL			FOR POOR CONTACT BETWEEN HDPE AND GCL		
Hole dia. (mm)	a (in mm^2)	a (in m^2)	$a^{0.1}$	h (in mm)	h (in m)	$h^{0.9}$	k_s	$k_s^{0.74}$	Q (m^3/s/hole)	holes/liner area	Q (litres/day/liner area)	Q (m^3/s/hole)	holes/liner area	Q (litres/day/liner area)
2	3.143	3.143E-06	0.282	300	0.3	0.338	2.5E-11	1.42717E-08	2.85651E-10	22.58	0.557	1.56428E-09	123.652	3.052







SPREADSHEET 2

ESTIMATE OF MAXIMUM LEACHATE HEAD ON LINER

Source: Qian et al: "Geotechnical Aspects of Landfill Design and Construction": Pages 275 - 289

Moore's 1980 Method

$y_{max} = L.(r/k)^{1/2}[(k.S^2/r)+1- (k.S/r).(S^2 + r/k)^{1/2}]$

AR	1,400	= Annual rainfall (mm/year)
L	85000	= horizontal drainage distance (mm)
r = AR/secs in Yr	4.43937E-05	= vertical inflow rate to drainage layer (mm/s)
k	1	= hydraulic conductivity of the drainage layer (mm/s)
α	1.1458	= slope angle of drainage layer , measured from horizontal in degrees (2% slope)
S	0.020008701	= slope of the drainage layer, S = tanα
y_{max}	291	= maximum liquid head on the landfill barrier (mm)

Moore's 1983 Method

$y_{max} = L.[(r/k + S^2)^{1/2} - S]$

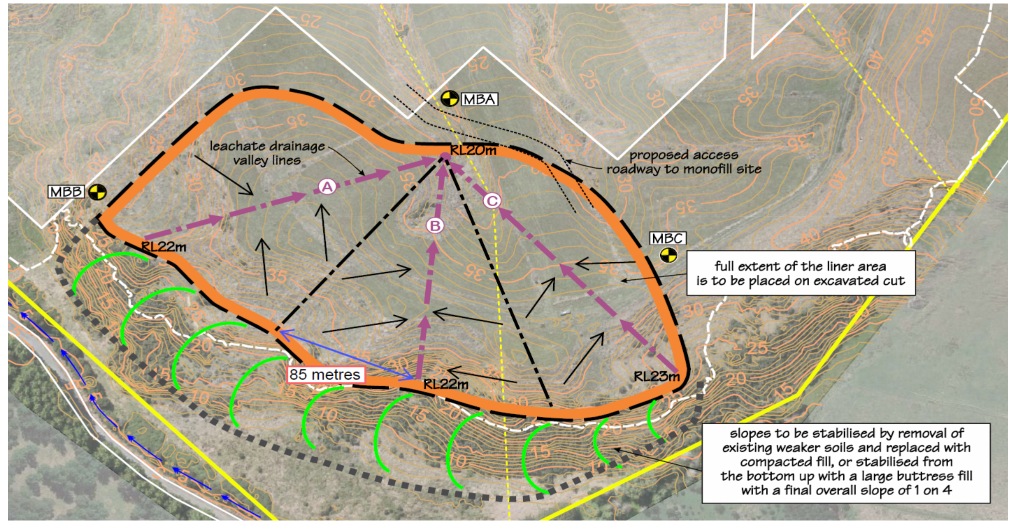
AR	1,400	= Annual rainfall (mm/year)
L	85000	= horizontal drainage distance (mm)
r = AR/secs in Yr	4.43937E-05	= vertical inflow rate to drainage layer (mm/s)
k	1	= hydraulic conductivity of the drainage layer (mm/s)
α	1.1458	= slope angle of drainage layer , measured from horizontal in degrees (2% slope)
S	0.020008701	= slope of the drainage layer, S = tanα
y_{max}	92	= maximum liquid head on the landfill barrier (mm)

Giroud's 1992 Method (Preferred Method)

$y_{max} = j.L.[(4.r/k + S^2)^{1/2} - S]/(2.cos\alpha)$

$j = 1 - 0.12 . exp\{-[log(1.6.r/k/S^2)^{5/8}]^2\}$

AR	1,400	= Annual rainfall (mm/year)
L	85000	= horizontal drainage distance (mm)
r = AR/secs in Yr	4.43937E-05	= vertical inflow rate to drainage layer (mm/s)
k	1	= hydraulic conductivity of the drainage layer (mm/s)
α	1.1458	= slope angle of drainage layer , measured from horizontal in degrees (2% slope)
S	0.020008701	= slope of the drainage layer, S = tanα
j	0.9037	= parameter in the formula
y_{max}	155	= maximum liquid head on the landfill barrier (mm)



Length	Slope	Max. Head (mm)	
85	2%	291	< 300 Acceptable

SPREADSHEET 3

UPDATED CALCULATION SHEET Based on Earthtech origninal calclation sheet dated 1 May 2025

Green Steel Monofiill

Liner Leakage and Groundwater Dilution Effects Assessment

Envitech Assessment Calculations

INPUTS

annual rainfall	1.4
Days per yr	365
hr	24
m	60
s	60
Envitech	

Dilutions

	Envitech	Sensitivity Checks	
D	4		m
W	330		m
Kv	3.4E-09		m/s
Kh	1.5E-07		m/s
GW x-sect. area	1,320.0		m^2
H	1.0		m
L	200.0		m
Hydraulic Gradient (i)	0.005		
Q GW	85.5		ℓ/day
Q liner leakag	8.6		ℓ/day
DF (Dilution Factor)	10		

Liner Leakage Rate Assumption Calculation:

Leachate Head on Liner (H)	**300**	mm
Total Liner Thickness (L_{HDPE})	1.5	mm HDPE
Total Liner Thickness (L_{GCL})	5.5	mm GCL
Total Liner Thickness (L_{CCL})	300	mm (2x 150mm CCLs
	307	mm
Hydraulic Gradient (H/L)	54.8	
Liner defects (Giroud):		
Liner area	45160	m2
No Defects	22.58	Corrected by Stantec.
Say:	23	
Defect Area	72.256631	
GCL permebility	2.5E-11	m/s
Therefore $Q_{leachate}$:	8.55571062	litres per day
Leachate to groundwater	100%	
Therefore $Q_{leachate}$:	**8.6**	**litres per day**
	0.0019	m3/ha/day

0 0 0

PFAS

$PFAS_{leachate}$	0.7	ug/l
PFAS GW	0.0	ug/l

PFAS mass (through liner)

$PFAS_L$	6.0	ug/day
$PFAS_{GW}$	0.000	ug/day

PFAS concentration (at boundary)

flux method	0.063651	ug/litre
change at boundary	0.063651	ug/litre

Boron (B)

$Boron_{leachate}$	1.9	mg/L
Boron $GW_{(bore 42)}$	0.072	mg/L
B_L	16.3	mg/day
B_{GW}	0.072	mg/day

B concentration (at boundary)

flux method	0.173531	mg/litre
change at boundary	0.101531	mg/litre

Chromium

$chromium_{leachate}$	1	mg/L
romimum $GW_{(bore 42)}$	0	mg/L
Cr_L	8.6	mg/day
Cr_W	0.000	mg/day

Cr concentration (at boundary)

flux method	0.090929	mg/litre
change at boundary	0.090929	mg/litre

Copper

$copper_{leachate}$	0.3	mg/L
copper $GW_{(bore 42)}$	0.0052	mg/L
Cun_L	2.6	mg/day
Cu_{GW}	0.445	mg/day

Cu concentration (at boundary)

flux method	0.032006	mg/litre
hange at boundary	0.026806	mg/litre

Iron

$Iron_{leachate}$	0.5	mg/L
Iron $GW_{(bore 42)}$		mg/L
Fe_L	4.3	mg/day
Fe_{GW}	0.000	mg/day

Fe concentration (at boundary)

flux method	0.045465	mg/litre
change at boundary	0.045465	mg/litre

Lead

$lead_{leachate}$	0.3	mg/L
lead $GW_{(bore 42)}$	0.0024	mg/L
Pb_L	2.6	mg/day
Pb_{GW}	0.205	mg/day

Pb concentration (at boundary)

flux method	0.029461	mg/litre
change at boundary	0.027061	mg/litre

NOTES: (1) GW quality (below) is from the fractured aquifer system. No GW qaulity data is available for the shallow aquifer

Total Arsenic g/m^3	0.0016	0.0038	0.0016	0.0015
Total Boron g/m^3	0.072	0.24	0.07	0.34
Total Calcium g/m^3	9	4.9	12.2	6.6
Total Copper g/m^3	0.0052	0.0045	0.0035	0.00078
Total Iron g/m^3	6.2	5	4	0.58
Total Lead g/m^3	0.0024	0.0017	0.00142	0.00043
Total Magnesium g/m^3	2.5	2.1	2.3	0.89
Total Manganese g/m^3	0.09	0.059	0.061	0.0132
Total Potassium g/m^3	1.55	1.21	1.65	1.24
Total Sodium g/m^3	107	110	96	141
Total Zinc g/m^3	0.111	0.077	0.14	0.029
Chloride g/m^3	26	27	33	101
Nitrate-N g/m^3	<0.05	<0.05	<0.05	<0.05
Sulphate g/m^3	4.5	3.4	3.9	2.5
*PFAS not tested				

Manganese

$manganese_{leachate}$	2	mg/L
manganese $GW_{(bore 42)}$	0.09	mg/L
Mn_L	17.1	mg/day
Mn_{GW}	7.698	mg/day

Mn concentration (at boundary)

flux method	0.263675	mg/litre
change at boundary	0.173675	mg/litre

Nickel

$nickel_{leachate}$	0.4	mg/L
nickel $GW_{(bore 42)}$	#REF!	mg/L
Ni_L	3.4	mg/day
Ni_{GW}	#REF!	mg/day

Ni concentration (at boundary)

flux method	#REF!	mg/litre
change at boundary	#REF!	mg/litre

Zinc (Zn)

$Zinc_{leachate}$	2.8	mg/L
Zinc $GW_{(bore 42)}$	0.111	mg/L
Zn_L	24.0	mg/day
Zn_{GW}	9.494	mg/day

Zn concentration (at boundary)

flux method	0.355509	mg/litre
change at boundary	0.244509	mg/litre

SPREADSHEET 4

Dilution calculation for stream with flow of 1L/s

$$C_{\text{diluted}} = \frac{\text{mass per day}}{86{,}400\ \text{L/day}}$$

	Loading per day	Unit	Stream dilution	Unit
PFAS	6.0	ug/day	6.94444E-05	ug/L
Boron	16.3	mg/day	0.000188657	mg/L
Chromium (Cr)	8.6	mg/day	9.9537E-05	mg/L
Copper (Cu)	2.6	mg/day	3.00926E-05	mg/L
Iron	4.3	mg/day	4.97685E-05	mg/L
Lead (Pb)	2.6	mg/day	3.00926E-05	mg/L
Manganese (Mn)	17.1	mg/day	0.000197917	mg/L
Nickel (Ni)	3.4	mg/day	3.93519E-05	mg/L
Zinc (Zn)	24.0	mg/day	0.000277778	mg/L

Dilution calculation for stream with flow of 0.5L/s

	Loading per day	Unit	Stream dilution	Unit
PFAS	6.0	ug/day	0.000138889	ug/L
Boron	16.3	mg/day	0.000377315	mg/L
Chromium (Cr)	8.6	mg/day	0.000199074	mg/L
Copper (Cu)	2.6	mg/day	6.01852E-05	mg/L
Iron	4.3	mg/day	9.9537E-05	mg/L
Lead (Pb)	2.6	mg/day	6.01852E-05	mg/L
Manganese (Mn)	17.1	mg/day	0.000395833	mg/L
Nickel (Ni)	3.4	mg/day	7.87037E-05	mg/L
Zinc (Zn)	24.0	mg/day	0.000555556	mg/L