Common Ground: collaboration towards maximising soil re-use on a large roading project

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Mā te mahi tahi
Driving impact through collaboration

Ōtaki to north of Levin: Te Pae o Tararua

NZ TRANSPORT AGENCY
WAKA KOTAHI

Ōtaki to north of Levin: Te Pae o Tararua

Constructing a new 24km expressway between Otaki and north of Levin

Large-scale earthworks (soil disturbance):

- Cuts and fills to create the foundation for the expressway and to reconnect local roads
- Excavation of material from material supply areas
- Placement of excess material at spoil sites, and additional earthworks for construction purposes (e.g., lay down yards, stormwater retention ponds)
- Native planting (250+ ha) and creation of Wāhi Tapu at “borrow sites.”
- Consenting with four councils (HDC, KCDC, GWRC, Horizons), with approvals through multiple iwi partners and NZTA

Project alliances

NZ Transport Agency Waka Kotahi + Iwi Partners

- NZTA is committed to a partnership-based approach with Muaūpoko Tribal Authority and the hapū of Ngāti Raukawa ki te Tonga, that reflects the principles of Te Tiriti o Waitangi.

Southern Alliance

- T+T (Miles: Contaminated Land Lead), Beca, Downer, McConnell Dowell

Northern Alliance

- WSP (Stephen: Contaminated Land Lead), Aurecon, Fulton Hogan, HEB

Regulator

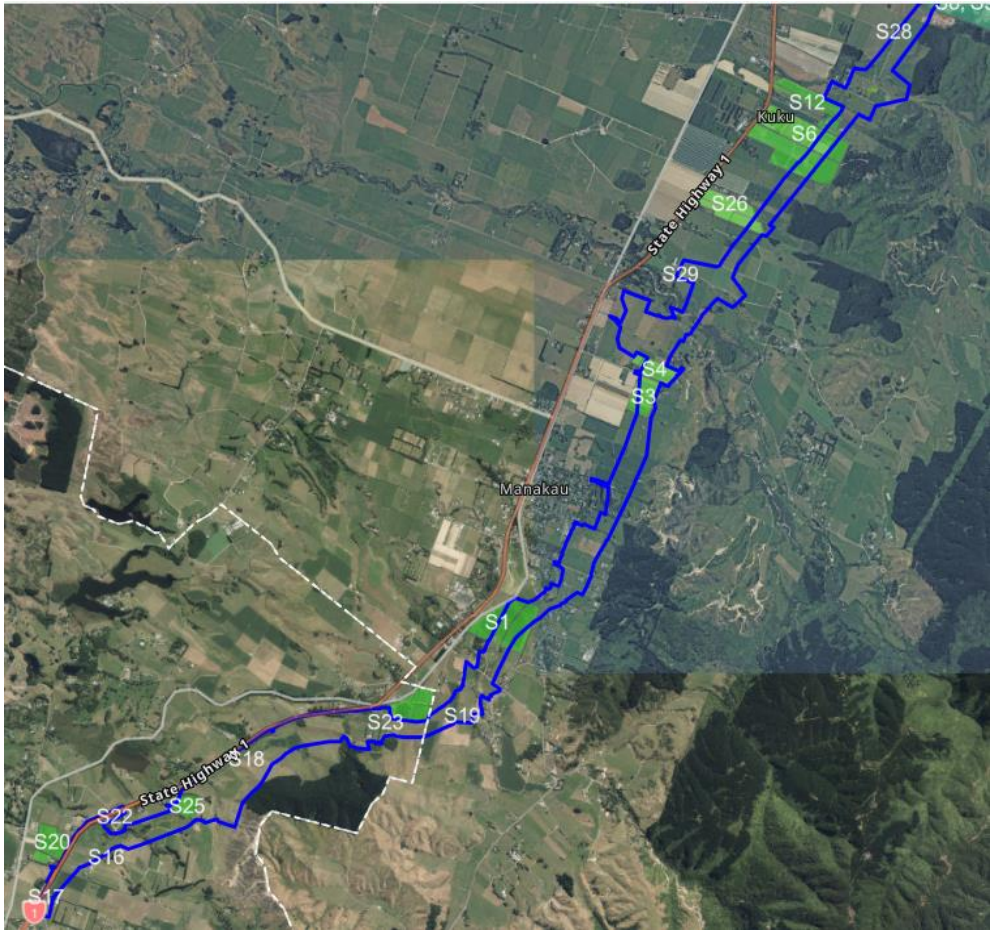
- One consultant (HAIL) representing all councils (regional and district plans, NES-CS)

Work undertaken to date

- Preliminary Site Investigation (Stantec) - Completed September 2022
- Addendum to Preliminary Site Investigation - Completed October 2024
- Consents lodged with Site-wide CSMP - January 2025
- Consents granted (June 2025) and establishing works currently underway
- DSIs and site specific CSMPs completed where required, accepted by regulator
- Bulk earthworks underway and contamination management implemented - 2025/26 construction season

Contamination Potential

- Identified 73 potential contaminated sites consisting of:
  - Orchards and market gardens
  - Potential sheep dips
  - Fuel storage
  - Landfill(s)
  - Uncontrolled fill/farm dumps
  - Older buildings potentially containing asbestos and/or lead paint



The challenge: Consenting ahead of investigation

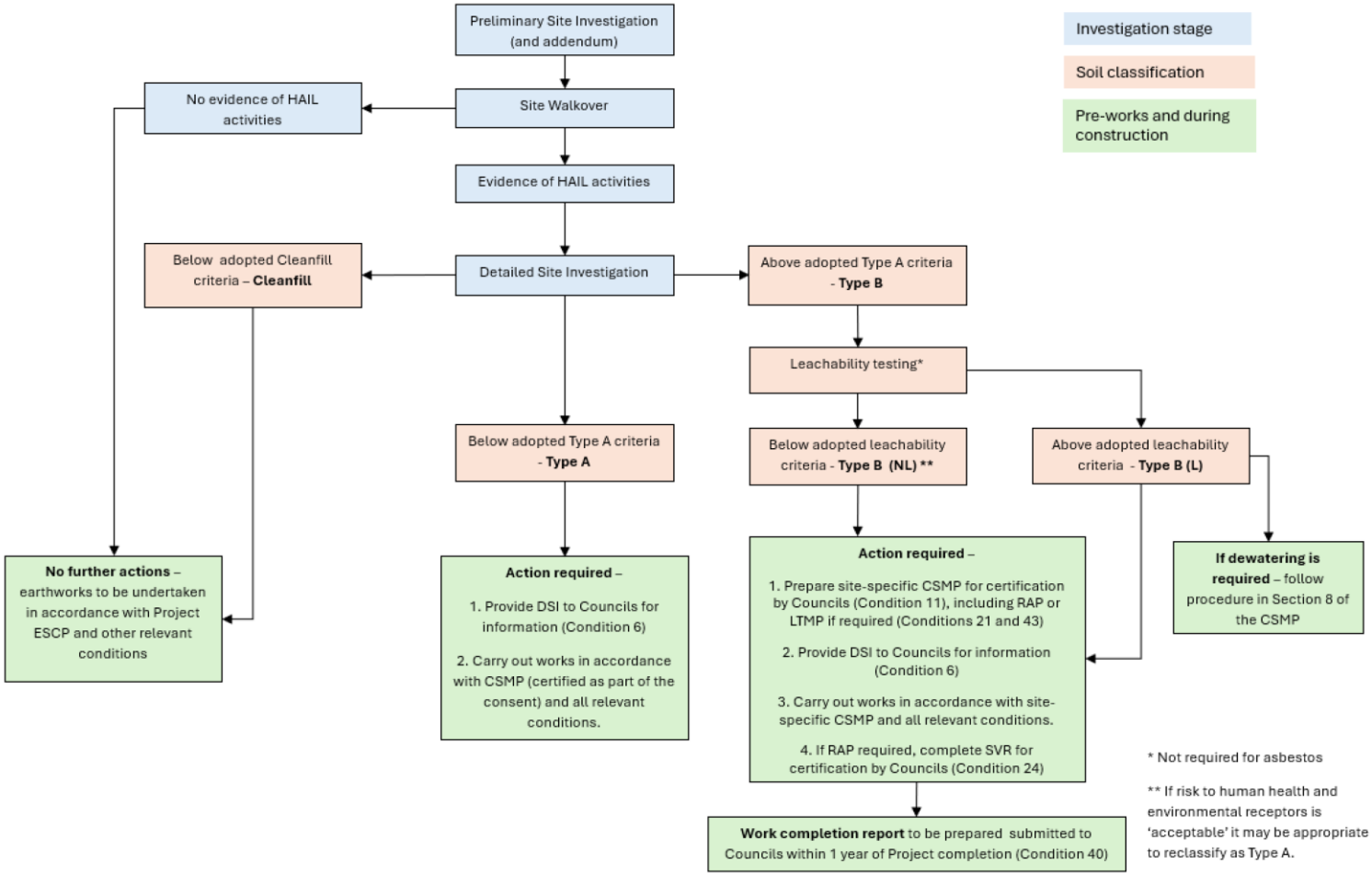
- Contaminated land consents were not included in the main project consent package (due to data gaps)
- Land access for investigations was limited and largely unavailable/unrealistic in the timeframe pre-consent
- Needed to consent on the basis of PSI / HAIL identification alone, with a detailed investigation to follow
- Required a framework that was robust enough to give regulators confidence, but flexible enough to accommodate findings as they emerged across 73+ HAIL sites

Contaminated Soil Classification and Management

Solution: a project-wide CSMP, setting out the process for investigation, contamination classification (project-specific soil types), and a menu of management options - including on-site retention of contaminated material.

When developing the approach, the following were taken into consideration:

1. Potential risk to human health and the environment
2. Shallow groundwater and potential impact to groundwater/surface water
3. A deficit of soil and fill across the project
4. Minimising off-site disposal
5. Streamline reporting: Overarching DSI with three page site specific DSIs appended, with one page (A3) site specific CSMPs for each site where required


Investigation stage
Soil classification
Pre-works and during construction
Preliminary Site Investigation (and addendum)
Site Walkover
No evidence of HAIL activities
Evidence of HAIL activities
Detailed Site Investigation
Below adopted Cleanfill criteria – Cleanfill
Above adopted Type A criteria - Type B
Leachability testing*
Below adopted Type A criteria - Type A
Below adopted leachability criteria - Type B (NL) **
Above adopted leachability criteria - Type B (L)
No further actions – earthworks to be undertaken in accordance with Project ESCP and other relevant conditions
Action required –
1. Provide DSI to Councils for information (Condition 6)
2. Carry out works in accordance with CSMP (certified as part of the consent) and all relevant conditions.
Action required –
1. Prepare site-specific CSMP for certification by Councils (Condition 11), including RAP or LTMP if required (Conditions 21 and 43)
2. Provide DSI to Councils for information (Condition 6)
3. Carry out works in accordance with site-specific CSMP and all relevant conditions.
4. If RAP required, complete SVR for certification by Councils (Condition 24)
If dewatering is required – follow procedure in Section 8 of the CSMP
Work completion report to be prepared submitted to Councils within 1 year of Project completion (Condition 40)
* Not required for asbestos
** If risk to human health and environmental receptors is 'acceptable' it may be appropriate to reclassify as Type A.

Soil type	Characteristics	Management options
Cleanfill[14]	Negligible risk to the environment and/or human health. Includes: • Areas where investigation results indicate potential soil contaminants are either below adopted **Cleanfill** criteria, or below laboratory detection limits • All areas determined to have not been subject to a potentially contaminating activity listed on the HAIL.	No additional contamination-specific controls required, so works can be conducted in accordance with measures set out in the project ESCP (as relevant). Options for re-use/disposal: • Material can be reused within the Project footprint without restriction or contamination-specific requirements (subject to geotechnical suitability). • Disposal to an offsite cleanfill subject to receiving site requirements and approval, however, wherever possible, cleanfill material will be retained and reused on site.
Type A	Acceptable risk to human health and/or environment. Includes: • Areas where investigation results indicate soil contaminants exceed the adopted **Cleanfill** criteria, *but* are below adopted **Type A** criteria for risk to environmental and/or human health. • Soil affected by septic disposal fields (if encountered)	No additional contamination-specific controls required, so works can be conducted in accordance with measures set out in the project ESCP (as relevant). Options for re-use/disposal: • Can generally be reused within the Project footprint without contamination-specific requirements (subject to geotechnical suitability), with preference given to the area where the material originated from. However, Type A material will not be used in stream works, or permanently placed in surface water bodies or ecological offset areas. If soils are to be placed within rehabilitation sites or recreation areas with public access, material will be placed to avoid 'active use' areas and any planned mahinga kai. • If material cannot be used immediately, material maybe stockpiled and retained for re-use. • Permanent placement of material will be on land within the Project footprint, with preference given to areas that will be retained by NZTA. • Disposal to an off-site licensed disposal facility is possible subject to (subject to receiving site requirements and approval) only if retention within the Project footprint is not practicable.

Soil type	Characteristics	Management options
Type B (NL)	Potentially poses a risk to human health and/or environment. Areas where investigation results indicate non-leachable (NL) or low-leachability soil contaminants (i.e. asbestos, historical pesticides) are present at concentrations that exceed adopted criteria for risk to environmental and/or human health but are below applicable leachability criteria (indicating risk of contaminants leaching to surrounding water bodies is acceptable).	Additional controls may be required depending on contaminants identified in investigation. Required management options will be determined on a case-by-case basis under advice from the CLS and detailed in a site-specific CSMP. Appropriate material re-use/disposal options will depend on investigation results. Selected options will be specified in a site-specific CSMP but may include: • Re-use within the Project footprint (e.g. placement in embankments, bunds or spoil sites) to reduce potential exposure to environment and/or human health receptors. • Soil mixing with less contaminated soils (preferentially Type A) in order to lower contaminant concentrations to a Type A soil level (not appropriate for asbestos) and then manage as a Type A material. • Disposal of material within a purpose-built containment cell within the Project footprint. • Disposal of material to an off-site licensed disposal facility is possible subject to (subject to receiving site requirements and approval) only if retention within the Project footprint is not practicable. • Material will not be used in stream works or permanently placed in surface water bodies, recreation areas or wāhi tapu being restored as part of the project. The site-specific CSMP will detail additional requirements as relevant. Permanent retention of Type B material within the Project footprint will be recorded in a Site Validation Report and/or Long-term Management Plan, which will outline any required ongoing monitoring or management requirements. This information will also be given to iwi partners in GIS form for their record keeping.
Type B (L)	Potentially poses a risk to human health and/or environment, with higher potential risk to groundwater and/or surface water. Areas where investigation results indicate leachable soil contaminants (i.e. hydrocarbon fuels, solvents, etc.) are present at concentrations that exceed adopted criteria for risk to environmental and/or human health, and leachability.	Additional controls may be required depending on contaminants identified in investigation. Required management options will be determined on a case-by-case basis under advice from the CLS and detailed in a site-specific CSMP. Appropriate material re-use/disposal options will depend on investigation results. Selected options will be specified in a site-specific CSMP but may include: • Stabilisation and/or treatment to reduce leachability of contaminants prior to reuse in construction within the Project footprint. • Soil mixing with less contaminated soils (preferentially Type A) to lower contaminant concentrations to a Type A soil level (e.g to reduce overall heavy metals leaching potential) and then manage as a Type A material. • Disposal of material within a purpose-built containment cell within the Project footprint. • Disposal of material to an off-site licensed disposal facility is possible subject to (subject to receiving site requirements and approval) only if retention within the Project footprint is not practicable. • Material will not be used in stream works or permanently placed in surface water bodies, recreation areas, or wāhi tapu being restored as part of the project. The site-specific CSMP will detail additional requirements as relevant. Permanent retention of Type B material within the Project footprint will be recorded in a Site Validation Report and/or Long-term Management Plan, which will outline any required ongoing monitoring or management requirements. This information will also be given to iwi partners in GIS form for their record keeping.

Table 4.2 Adopted Criteria

Soil Type	Criteria Selection	Application
Cleanfill	Sediment quality criteria (DGV) for protection of freshwater ecosystems were selected where possible because they conservatively assume soil is directly within freshwater ecosystems, so concentrations below criteria indicate negligible risk to environment from soil re-use anywhere in the Project designation.	Areas with concentrations below these selected criteria or laboratory detection limits will be **Cleanfill** soil type. Areas exceeding **Cleanfill** criteria will be **Type A** or **B** soil.
Type A	The lower of applicable environmental, sediment quality criteria (GV-high) and human health criteria to indicate acceptable risk to human health and/or environment. Sediment quality criteria (GV-high) were selected where possible and are considered adequately conservative to measure acceptable risk to environment (including leaching) given these assume soil is directly within freshwater ecosystems, and therefore can act as a screening criteria for risk of leaching to aquatic ecosystems (that if exceeded would trigger leachability testing)..	Areas above **Cleanfill** criteria, but below these selected environmental and human health criteria can be **Type A**. Areas exceeding **Type A** criteria will be **Type B** soil.
Type B Once an area exceeds **Type A** criteria, results will be compared against applicable Human Health criteria and when potentially mobile contaminants are present, will be subjected to testing of leachability[16] and/or groundwater to assess risk to nearby groundwater and surface water receptors. Assessment against applicable **Type B** criteria (below) will be used to inform site-specific risk assessment and management and/or remediation options.		
Type B **Human Health**	Commercial/industrial land use criteria considered most applicable for likely exposure scenarios (minimal public access to land once constructed).	Areas exceeding **Type A** criteria will be **Type B** and be assessed against applicable human health criteria to confirm site-specific risk and

Table B1: Adopted Criteria for Ō2NL Soil Types

	Cleanfill [1]	Type A [7]	Type B (Human Health) [11]	Type B (Leachability) [14, 15]
Heavy Metals				
Arsenic	20	70	160 [12]	0.13
Cadmium	1.5	10	1,300	0.002
Chromium	80	150 [8]	>10,000	0.01
Copper	65	270	>10,000	0.014
Lead	50	220	3,300	0.034
Mercury	0.15	1	4,200	0.006
Nickel	21	52	6,000 [12]	0.11
Zinc	200	410	4,0000 [12]	0.08
Organic Compounds				
DDT	0.7 [2]	2 [8]	1,000	0.0001
Dieldrin	<LOR	0.1 [8]	160	0.0001
Lindane	<LOR	0.0014	-	0.002
Polycyclic Aromatic Hydrocarbons (PAH)				
Napthalene	0.28 [3]	10 [9]	210 [13]	0.16
Pyrene	0.12 [2]	7.9 [3]	NA	-
Total PAHs / Benzo(a)pyrene TEQ	2 [2]	5.7 [3]	25 [13]	-
BTEX				
Benzene	0.029 [3]	0.11 [8]	17 [13]	9.5
Toluene	6 [3]	19 [8]	480 [13]	1.8
Ethylbenzene	7.2 [3]	10 [8]	3200 [13]	0.8
Xylene	3.7 [3]	26 [8]	780 [13]	0.75
Total Petroleum Hydrocarbons (TPH)				
C7 - C9	66 [4]	110 [10]	500 [13]	-
C10 - C14	45 [4]	70 [10]	31,000 [13]	-
C15 - C36	300 [5]	1,300 [10]	NA [13]	-
Asbestos				
Asbestos as ACM (w/w%)	Detection of asbestos [6]	Results indicate asbestos has impacted soil [6]	0.05 [6]	-
Asbestos Fibres/Fine (w/w %)			0.001 [6]	-

Notes:
All criteria in mg/kg, unless stated otherwise.
Concentrations for an area must be below applicable criteria to be considered the corresponding soil type
- denotes no applicable criteria available
<LOR denotes criteria is laboratory detection limit

Contaminated Soil Classification and Management

Category	Cleanfill	Type A	Type B (NL)	Type B (L)
Risk	Negligible risk to the environment and/or human health	Acceptable risk to human health and/or environment	Potentially poses a risk to human health and/or environment.	Potentially poses a risk to human health and/or environment, with higher potential risk to groundwater and/or surface water.
Criteria Source	Risk-based criteria: ANZG Sediment quality, oil industry, Eco-SGV, Class 5 WAC.	Below the lowest of environmental (Sediment quality / Eco SGVs / Class 3 WAC / NEPM EIL) and human health criteria (NESCS SCS, oil Industry)	Exceeds Type A and human health (NESCS SCS (C&I), NEPM HIL, oil industry, or contains asbestos). Triggered Leachability testing - Freshwater DGVs (95%) with 10% dilution.	Exceeds Type B criteria and leachability testing above freshwater DGVs (95%) with 10% dilution.
Management Requirement	No additional contamination-specific controls required	Material will not be used in ecological sensitive area (waterways, ecological offset areas, recreational areas)	Reuse in permanent structures away from watercourses or remediated (containment cell)	Remediation (i.e. containment cell)

Soil Type B (L) and Containment Cell – Contaminated Site Management Plan

Contamination Conditions

This plan summarises the relevant contamination-specific requirements for works in a Soil Type B (L) area from the project-wide Contaminated Site Management Plan (CSMP)[1].

Soil Type B (L) areas contain soil contaminants exceeding adopted criteria, which indicate contamination poses a risk to environment and human health, with higher potential risk to groundwater and surrounding water bodies via leaching.

Soil investigations at 50 Arapaepae Road North, Levin have identified one specific location in which heavy metals and asbestos with the potential to leach and negatively impact the environment have impacted the soil, around the buildings (amosite, chrysotile, crocidolite, copper, lead and zinc). The source of this contamination has been determined to be from the metal roof and cladding and asbestos from the building material of the various buildings.

Indicative area covered by this CSMP

Figure 1 location

Remedial and Disposal Options

Remediation of this soil comprises a scrape of the extent of the area the buildings are located, down to a depth of 0.3 metres below ground level.

The volume of material to be removed is estimated to be 600m³.

The disturbance and management of any asbestos-impacted soil must be undertaken in accordance with the Health and Safety at Work (Asbestos) Regulations 2016, WorkSafe NZ Approved Code of Practice (ACOP)[2], and the NZGAMAS 2017[3]

There is one section of Class B licensed asbestos removal as shown in Figure 2. This asbestos removal will be carried out in accordance with the asbestos contamination controls section of the CSMP (section 7.4.3) and following an asbestos removal control plan.

Figure 2 Class B Licensed Asbestos Removal Extent

Disposal of the material is proposed to be within the project footprint at the purpose built Containment Cell, details are as follows:

Containment Cell

A Containment Cell will be constructed within the footprint of Material Spoil Disposal Site No.9A, at the location of 50 Arapaepae Road North, Levin. This location is approximately 200m North of where the contaminated soils at this property are located (see Figure 1).

The base of the cell will be 2.8m from the highest ground water level identified during monitoring (3m below ground level). See Figure 2 for a cross section of the cell construction and position relative to groundwater. The cell will be constructed to contain 2,000m³ of contaminated soil. The expected dimensions of the cell are approximately 34m wide by 52m long.

Prior to construction of the cell:

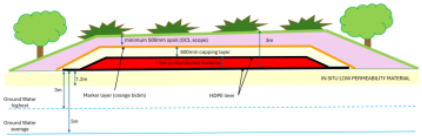
- Permeability testing in situ (soakage test) will be carried out to confirm that the bottom in situ silt layer present at 50 Arapaepae has a permeability of 1 x 10-7 m/s or less. This will confirm no work will be required on the base of the cell prior to placing the liner.
- Permeability testing in laboratory (falling head permeability testing) on two representative soil samples of the silt layer at various compaction (respectively to 90% and 95% NZ Standard Compaction), maximum dry density (MDD), optimum water contact (OWC) and particle size distribution (PSD). This will confirm the compaction required to achieve on site to form the capping layer to ensure it has a permeability of 1 x 10-7 m/s or less.
- If in-situ soils do not meet the above requirements, alternative site won materials from the Project extent will be tested per above. The approved material would need to be carted to 50 Arapaepae Road North by road trucks to form the lower and capping layer with a permeability of 1 x 10-7 m/s or less.

To construct the Containment Cell:

- ESC controls will be installed in accordance with SSESCP03N and ESC drawing sheet O2NL-NTH-SSESCP-009.
- Topsoil will be stripped and used to form a bund around the cell location to divert clean water and contain any run-off from the cell construction.
- Excess topsoil will be stockpiled for the respread.

Depending on the pre-construction testing results:

- IF silt isn't impermeable enough: excavation 600mm below ground level will be carried out (GPS model controlled), followed by placement and compaction of 600mm thick layer of approved material. Four in-situ NDM (nuclear density meter) tests are to be undertaken on the compacted capping layer to ensure the permeability of 1 x 10-7 m/s or less (the relation between compaction and permeability will be determined during pre-construction tests). Material from the excavation of the cell would be stockpiled to be used for capping of the cell or placed in the spoil site. Ideally this step won't be required.
- The base of the cell will be lined with 1.5mm thick high-density polyethylene liner (HDPE or similar). Panels will be sealed, and QA checks will be conducted. As-builts survey will be recorded to show the distance of the cell to the ground water level.
- Once the liner is installed, contaminated soil will be carted from 50 Arapaepae Road North and other sites by road trucks and be placed in 300-500mm loose layers up to a 1.9m thickness within the cell (GPS model controlled). Each layer will be track rolled by the excavator (or dozer) and shaped to have a minimum 1% grade. No other machinery will be in the cell and in contact with contaminated material. The excavator (or dozer) shall not track outside the cell without cleaning its tracks prior.
- Whilst the Containment Cell is in use, a layer of Polythene sheet will be placed over the contaminated soil in the cell to avoid any rainwater contacting exposed contaminating soil, resulting in contaminated water generation in the cell.
- All works to place contaminated soil in the cell will occur over settled weather windows.



To cap the Containment Cell;

- Following placement of the contaminated material and upon return of all validation testing ensuring no further volume is to be placed in the cell, the cell will be capped with a HDPE liner. Panels will be sealed, and QA checks will be conducted.
- The final surface of the HDPE liner will be surveyed in order to accurately detail the cell dimensions and location.

[1] Ō2NL, 2025. Contaminated Site Management Plan

[2] WorkSafe NZ, 2019 Approved Code of Practice, Management and Removal of Asbestos

[3] New Zealand Guidelines for Assessing and Managing Asbestos in Soils. BRANZ November 2017

Collaboration in practice

Project Alliances, NZTA, and Iwi partners:

- Alliance structure and many parties needed close coordination for the shared plan
- Multiple contaminated land workshops with NZTA and iwi partners' technical representatives through approach development
- Strengthened focus on area-specific receptors and cultural values within the approach:
  - Emphasised protection of shallow groundwater and surface water from leachable contaminants.
  - Strong support for on-site containment as possible, to safely manage contamination within the role, rather “than sending it to be someone else’s problem”.
  - Iwi partners to receive GIS records and reports of all retained Type B material for ongoing kaitiakitanga
- Assumptions of reduced soil disposal have aided project affordability

Collaboration in practice

With councils' and shared peer reviewer / SQEP:

- Early engagement before lodgement - pre-lodgement walkthrough of proposed approach
- Direct line throughout the s92 process - communication outside formal council meetings agreed by all
- Joint deliberation on project-specific assessment criteria - not blanket adoption of full criteria sets, but criteria fit-for-purpose against actual/likely risk

Three lenses, one framework:

- Risk to human health and environment (non-negotiable)
- Cultural values (whenua stays where it can)
- Sustainability (material deficit, landfill avoidance, programme efficiency)

Regulator/peer reviewer perspective

- Not going to go into the ins and outs of the NES-CS and the relevant regional rules, why consent was required etc
- If I were in the audience, I would want to hear about ***how*** we made this process work, not just that we did

A few things helped from the start

- Prior knowledge of the project - awareness of the investigation work that had/hadn't been done.
- Familiarity with the area and land uses in the designation.
- On the construction-side for an earlier expressway built just down the road.
- Engagement before lodgement.
- Familiarity with the proposed consenting approach.
- Construction team had SQEPs keen to engage.
- At the time of lodgement, I was on the author team for WasteMINZ soil re-use white paper – so I *really* wanted this to work!!

Working with Applicant's SQEPs.

- Pre-lodgement presentation socialising the approach and introducing the proposed tiers of soil/criteria.
- Progressive discussions during the S92 process to get the criteria and permitted uses for tiers of soil ironed out and fit for purpose.
- Freedom to communicate outside formal meetings.
- Used the perspectives of our respective sides to contribute.

Still working on behalf of the regulator(s)…..

- There were some non-negotiables: risk to human health and the environment.
- Constructive exchange of ideas in a couple of instances: fine-tuning criteria, establishing that blanket adoption of full sets of criteria isn't the way to go.
- Ultimately, the driver was risk. Risk. Risk. Risk.
- We weren't lowering standards, we were refining them to match the actual/likely risk.
- Where we landed is not perfect: still constrained by statutory timeframes and project programme.
- Consent conditions that allow practical flexibility and regulatory confidence.

Implementation — the framework in action

First earthworks season (2025/26) has seen:

- Identification of additional HAIL areas beyond the original 73 - site walkovers and construction observations adding to the register, managed under existing consent.
- Rolling DSIs as land access becomes available and earthworks programme dictates - not a single up-front campaign.
- Unexpected contamination response triggered and worked through per CSMP procedures (Section 9), without requiring consent variations.
- On-site retention across all soil types - Cleanfill and Type A reused without restriction, Type B (NL) and Type B (L) retained in purpose-designed containment cells within the project footprint.
- Site-specific CSMPs and where required RAPs and SVRs prepared and certified for Type B areas.

Implementation — the framework in action (continues)

Continuous engagement:

- Alliance contaminated land teams (T+T south, WSP north) maintaining direct dialogue with councils' shared SQEP through implementation - not just at consenting.
- Same collaborative model that built the framework is now operating it: allowing project to find, classify and manage contamination, while keeping risk decisions transparent to regulators, NZTA and iwi partners.

Key Outcomes

- Collaboration allowed for a consented flexible management approach for contaminated soil
- So far most contaminated soil has been retained within the project designation – either reused or placed within containment cells
- Low level contaminated soil was reused within the designation, reducing the amount of material needing to be imported
- Stockpiling protocol and the presence of containment cells allowed for rapid response to managing unexpected discoveries