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10 June 2025

Stephen Howard
Principal Consents Advisor
Waikato Regional Council
By email: Stephen.Howard@waikatoregion.govt.nz

Cc: Hugh.Keane@waikatoregion.govt.nz

Dear Stephen

Fast Track Application – National Green Steel Response on Waikato Regional Council Feedback

Thank you for your Council's feedback dated 28/4/25 and 1/5/25 on the National Green Steel Limited draft technical reports prepared as part of our Fast Track application material. We have found this to be a very useful process which has led to changes to some of the reports and additional investigations being undertaken in some cases, so that the application material is complete.

To demonstrate our application material, when it is submitted to the EPA, adequately considers the matters you have raised, we have written out a response in the following pages to each of your issues/question raised. The issues/questions are set out in full below and our italicized responses follow – in the same order as set out in document you sent to me on the above dates. So, each question has a response to your question/comments.

This letter will be included as one of the attachments in the application material to be sent to the EPA.

Please contact me if you have any further queries.

Yours faithfully

Craig Shearer
Project Manager
For National Green Steel Limited

NATIONAL GREEN STEEL LIMITED'S RESPONSE TO THE QUESTIONS/COMMENTS RAISED BY WAIKATO REGIONAL COUNCIL DATED 28/4/25 and 1/5/25.

V2 1/05/2025 (including Air and Ecological Comment) WRC Expert Feedback/Status (V1 28/04/2025)

ATTENTION: Craig Shearer, Vipan GARG, Hugh Keane

Compiled by Stephen Howard

- Final drafts of the technical documents were distributed to in-house experts, and their feedback is provided below. Outstanding feedback points (highlighted in yellow) will be updated soon. Feedback is provided in good faith for NZ Greensteel's consideration and use.
- Feedback includes statements, overall comments, and can include queries from the reviewer also. Although a 'further information' process isn't available under the fast-track legislation, WRC will promptly provide revised expert feedback based on the clarity provided by any responses to the queries received.
- Further engagement with WRC staff can occur as sought by NZ Greensteel.
- WRC will investigate and provide draft conditions of consent for EPA consideration.

ATTACHMENT 1: Expert Feedback

Documents	**Reviewer / Notes**
A: Water takes - groundwater take, SW re-use, Te Kauwhata water supply, re-use (Earthtech)	Cameron King

1. New Zealand Green Steel Ltd (NZGS) has identified a water requirement of maximum 2,800 m3 per day and maximum 840,000 m3 per year.
2. The Earthtech report has identified three local water supply options for meeting the water requirement:
    a. taking groundwater via multiple bores at the site;
    b. taking water from the Waikato River;
    c. taking water from roof, road, hardstand and other open areas at the site (local catchment rain harvesting).

3. WRC expert Nicki Wilson has considered the information presented in the report relating to taking groundwater.
4. Both Earthtech and Ms Wilson have noted that interference between site supply bores themselves and site supply bores on neighboring bores seems a prominent risk that will require further assessment.
5. It seems to be the case that there is no guarantee that groundwater will be available in the quantity required because of the need – identified by Earthtech – for bores to be tapping aquifer fractures which are scarce on the site.
6. Taking groundwater in the quantities required would require resource consent.
7. In terms of the option of taking water from the Waikato River, a separate consent held by NZGS allowing this is not preferred because of high capex – headworks and reticulation – compared with increasing the amount of water that NZGS might be able to access via the Te Kauwhata Water Association (TKWA).

8. Taking water from the Waikato River in the quantities required would require a resource consent if NZGS does not opt to increase the supply from TKWA.
9. In terms of local catchment rain harvesting, Earthtech have made indicative calculations and note that further assessment from an expert in this regard will be required to better inform consideration. The calculations indicate that the quantities required would not be able to be met by this option.
10. Taking water from the local catchment as rain harvesting at volumes commensurate with the indicative calculations would require resource consent.
11. The current – as at 22 April 2025 – level of cumulative allocation for the Waikato River main stem catchments relevant to the NZGS site – Waikato River at Mercer and Waikato River at the CMA – is such that:
    - there are no allocation pressures requiring a first in first served approach be taken; and
    - water is available for allocation across all months of the year within each respective catchment's primary allocable flow and if a resource was granted to NZGS:
        a. to take groundwater in the specified quantities required, water would remain available for allocation with each catchment's primary allocable flow across all months of the year;
        b. to take water from the Waikato River in the specified quantities required, water would remain available for allocation with each catchment's primary allocable flow across all months of the year;
        c. to take water from the local catchment as rain harvesting at volumes commensurate with the indicative calculations, water would remain available for allocation with each catchment's primary allocable flow across all months of the year.

12. I do not expect that increasing the amount to be supplied to NZGS from the TKWA would trigger the need for an additional resource consent to take water.
13. From the Earthtech report, it seems that there might be the possibility of the specified quantities being provided for by an integrated source approach instead of a single source. If this were to be the case, I note that WRC staff would be generally supportive in concept but would of course expect thorough planning and technical assessments be carried out for each respective source and potential associated activities a la intake structures, construction of bores, diversion and possible off-stream damming of water, use of water, etc.

Responses from Green Steel (Earthtech, Stantech):

1-3: Agreed and noted.

4: Green Steel agrees that interference between site supply bores themselves and on supply bores on neighbouring bores is a potential risk. So Green Steel commissioned Stantech to undertake a hydrogeological assessment of environmental effects for the site. The report concludes,

"Therefore, based on our drawdown calculations, the impacts on other users and onsite well interference from the proposed pumping are not significant. Stream depletion analysis was undertaken using Hunt (2003) to assess the potential impacts on the nearby Waipapa Stream. Based on this analysis, the impacts on the nearby Waipapa Stream from the proposed pumping rate will not be significant (only 3% of the daily take is from the Waipapa Stream after one week of continuous pumping)."

A copy of this report (Appendix 1) is attached to this reply and will be provided with the Fast Track application material, including an application to take groundwater for use at the steel plant.

5: Noted. Groundwater yield is dependent on production bores intercepting fractured aquifer conditions – hence the need for site geophysics which allowed targeted drilling in fractured conditions for BH42 and BH54. We are confident sufficient water as proposed will be available for this site, but Green Steel needs to demonstrate through additional geophysics and test bore drilling after consent is granted that the proposed quantities will be available. The hydrogeological assessment of environmental effects report recommends further onsite testing to better understand sustainable take rates and recharge. Testing should consist of a step test followed by a constant rate pumping test at the maximum sustainable pumping rate for three days or greater. We will be recommending to the panel that this be a condition of consent.

6: Agreed. Resource consent to take water from groundwater forms part of the application.

7: Agreed.

8: NZGS does not intend to make a new application for water from the Waikato River, and for any additional water required will opt to obtain it from TKWA which has surplus consented capacity.
9: Stormwater will be stored in the large pond to be formed at the north of the property. The calculations in the Roading and Stormwater Management Report (Airey Consultants) show that 420m³/day will be available from this source. Resource consent will be applied for in the fast track application to take this water.
10: Noted.
11: Noted.
12: Noted and agreed.
13: An integrated approach is proposed as suggested by the Council. The proposal is for three sources for water for the plant, being groundwater, reuse of stormwater stored in the large pond at the northern end of the site, with the balance from Te Kauwhata Water. Consents are being applied for to take groundwater (up to 1,000m³/day) and reuse of stormwater stored in the large pond (420m³/day). Any balance required would be sourced from Te Kauwhata water which already holds resource consent to take water from the Waikato River in excess of what it currently uses.

B. Ground Contamination -PSI/DSI and Hazardous Substances storage and use (Williamson Water and Land Advisory)	Josh Evans

1. Overall, I consider that the report appropriately identifies areas of concern that potentially were subject to HAIL activities based on historic information review. However, it is considered that the sampling investigations to date have not appropriately delineated the potential contamination extent and therefore the report is not considered to have been completed in general accordance with MfE CLMGs #1 and #5. Please see my comments and reasoning below.
2. Firstly, it is considered that the Asbestos/ACM investigation undertaken in accordance MfE CLMG/BRANZ and I agree that the works can be undertaken under PA **<u>if</u>** all ACM impacted soils are removed from site as part of remedial works.
   However, as proposed in the conclusions (Section 7) of the report, I disagree with the conclusion that no WRC consents will be required for contaminated land matters. If encapsulation of this material is undertaken as proposed in in this section as a remedial option, this would require a consent under the WRP **5.3.4.7.** Remediation of contaminated land can only be undertaken under the PA rule if clause b. is met '*No contaminants from the remediation of the contaminated land shall be discharged into water or onto land unless discharged to a landfill authorised in Section 5.2.7.'.*

3. Composite sampling is not appropriate for investigating the HAIL activities of concern (A1. And A8.). There are activities that do not tend to result in homogenous contamination with an area of concern and often results in hotspots where the activity was predominantly undertaken with the AOI. By undertaking composite sampling, there is a risk that any hotspots present will be diluted/masked due to compositing process.
4. Although the report notes that sub-surface samples will be taken, only surface samples were collected and reported on. Field observations also note that sampling locations reached a depth of 0.5 m bgl. There is no additional evidence included in the report that observations were made at depth and visual/olfactory observations are not appropriate to rely upon for assessing whether contamination is present at depth for HM. (Acknowledging that OCPs were all non-detects in surface samples, it is unlikely that OCPs will be present at depth)
5. Additionally insufficient details have been provided for the sub-samples including specific locations, whether the composite was compiled by the laboratory.

SMP

6. If encapsulation is proposed to be undertaken, delineation/validation sampling should be undertaken to confirm that all contaminated material is contained within the proposed cell and the 2-metre buffer remains appropriate.

Response from Green Steel:

See letter attached from William Water & Land Advisory (Appendix 2).

C. Geotechnical Assessment (Earthtech)	Not assigned

- An outside consultancy was engaged to provide geotechnical commentary at the Falls Rd site (G Basheer).
- Upon receipt of the technical reports for the 61 Hampton Downs site, advice was sought from Earthtech as to whether:
  i. *the proposed monofill methodology and considerations are identical between the 61 Hampton Downs site and the 650 Falls Road, Maramarua site, or if there are any differences, and*
  ii. *whether the Earthtech report for the 61 Hampton Downs site includes all review observations/recommendations from G Basheer, or if there are any discrepancies. If there are different circumstances, please elaborate*.

- The reason for this request is that an external review (by G Basheer or another suitably qualified expert) mightn't provide additional insights, given the prior work on a similar proposal.
- Earthtec response was received on the 4/4/2025 addressing all matters, where in summary, it is understood that:
  i. the monofill methodology for both sites is similar, with minor differences in geology and soils.
  ii. all recommendations from G Basheer were applied, covering earthworks, stability, and stormwater controls.

- This address all earlier matters raised by WRC, where an external review can still be commissioned with quick turn-around if NZ Greensteel seek such an approach (TBA).

Response from Green Steel:

No further response is needed as the information received on 4/4/25 from the Council is considered by WRC's consultant to be adequate.

D. On-site treatment wastewater treatment & disposal system (Ormiston Associates)	Full review not assigned

Contact was made with Waikato District Council (WDC) regarding the Landuse Engineer's review of onsite wastewater disposal, as WRC lacks specialised engineers for treatment methodology review; WDC confirmation is expected soon, and any conditions would typically be part of a District Council landuse consent.
Ms Nicki Wilsons comments. (see Attachment 3) may aid the WDC assessment but don't provide an in-depth review of Ormiston's recommendations.

Response from Green Steel:

See response to the Waikato District Council reviewer (to the Waikato District Council's Advice Notes reported separately)

E. Monofill Engineering report (Earthtech) F. Monofill Monitoring report (Earthtech)	Jonathan Caldwell/ Nicki Wilson

Notes

- High-level responses from Jonathan Caldwell are presented as Points 1-14 below;
- Nicki Wilson prepared a technical review document, presented as Attachment 3 (Pg 7-9) to cover Groundwater Aspects

Slag waste

1. How will slag waste be managed?
2. Will it involve offsite disposal?
3. How will it be stored prior to disposal to minimize discharges to stormwater and surface water?

Response from Green Steel:

1. *Slag will be processed on site, under cover. Some slag will be processed into aggregate for alternate uses. Any slag left over will be disposed of at an approved landfill.*
2. *Yes.*
3. *Contained within a bunded area inside a building so there will be no discharges to stormwater.*

Acid Sulfate Soils

4. The site, particularly the northwestern end of the site is located within medium to high risk for occurrence of acid sulfate soils. Descriptions of peat soils and Typic Orthic Gley Soils towards the northern end of the site in the Ecological Assessment as well as reference to peat soils and H-K ash in the Geological assessment provides further confirmation that there may be a risk of acid sulfate soils in this area, as has been previously identified in the neighboring Hampton Downs Landfill site.

5. Please provide details for investigating for presence of acid sulfate soils and if confirmed to be present in areas that are to be excavated how these soils will be managed?

Responses from Green Steel (Earthtech):

4. *No acid-sulphate type soils were encountered during the geotechnical investigations, but they cannot be ruled out. The monofill area is mapped as moderate to low probability for acid sulphate soils. As a result of this query from the Council there has been a revision of the Earthworks report - "Earthworks Management and Erosion and Sediment Control Plan, Green Steel Project, 61 Hampton Downs Road, Hampton Downs, Waikato. Ref: R4392-3, Rev D, 14/05/2025" – which has addressed this matter in section 4.4 as follows:*
   - *Where, or if, acid sulphate soils are encountered on the site, this would be more likely during Stage 1 earthworks. The following management approach will be adopted:*
     - *Fully identify the extent of the acid sulphate soils and record where they are encountered on a plan for site records.*
     - *Where acid sulphate soils are within the bulk fill area – leave undisturbed in-place, and place compacted fill material over the top (entombing the acid sulphate soils).*
     - *Where acid sulphate soils are within a cut, or required undercut area, or within 1m of final fill level – excavate (remove) all acid sulphate soils and place in the deepest available area of the fill. Cover with compacted fill material, thus entombing the acid sulphate soils.*

5. *Please refer above to how acid sulphate soils are addressed. Areas of the site potentially comprising acid sulphate soils have been mapped by Waikato Regional Council (see Appendix C of the Earthworks report and ESCP). The extent of the proposed building platform, and the earthworks cut / fill line are indicated on this plan.*

Subsoil water discharge

6. Where will the subsoil water discharge from the northeast monofill be discharged to?

Response from Green Steel (Earthtech):

The answer to this query is addressed in the Monitoring Report. Refer to page 4 item 2.2 of the Monofill Monitoring Report (Ref. R4424-6, 30 May 2025) which states: "Subsoil water discharge from the northeast monofill is to continue discharging to the existing receiving environment with the option of active extraction by pumping and removal."

No leakage from the monofill double (composite) lining system is anticipated.

We have also provided the following design information and details on the drainage and management of subsoil water from the northeastern monofil as follows:

- *Subsoil drainage water from the northeast monofill is to be piped into the subsoil collection chamber - shown in Figure M5.5 in the Monofill Engineering Report (Ref. R4424-2, 30 May 2025).*

- *Subsoil drainage water from the collection chamber is to be pumped to the subsoil collection tank (25,000 litre capacity) for removal by tanker.*
- *Please refer to section 4 of the Monitoring report addressing Subsoil Water Monitoring.*

Assessment of surface water effects

7. No assessment has been provided on effects on Waipapa Stream associated with leachate leakage from the two monofills apart from predicted leakage flow rate and the assumption that any adverse effects will be fully mitigated by attenuation within the clay soils below the site. This really needs some further assessment based on worst case scenarios of transport (especially for the more mobile contaminants) and dilution capacity in the stream and existing baseline stream contaminant conditions.

Response from Green Steel: (Earthtech)

The south-western monofill is to be developed (excavated, lined and operated) within a depression surrounded by elevated ground – i.e. within a "bathtub" (so to describe). Refer to Figure M1.3 in both the Engineering Report and Monitoring Report.

- *Monofill preparation/construction details are provided in Figure M5.1 and is to be carried out to ensure the assessment of effects noted in the Monitoring Report is achieved. Details are also provided in Section 4.4 (from pg 9) of the Engineering Report.*
- *No leachate leakage is anticipated from the southwest monofill. Regardless, the underlying geology has been demonstrated (in the Monitoring Report) to be highly favourable to preventing any leakage effects.*
- *Additionally, and importantly, "The subsoil drain below the lining system serves as an instrumental leachate leakage detection system below the landfill. The drain may rarely achieve a steady flow and is likely to be seasonal. Sampling of the water from this drain is to be carried out when flow is noticed…." (refer Section 4.5 of the Monitoring Report).*
- *An assessment of effects would have to be based on an extreme case liner of liner leakage scenarios – which would be unrealistic, overly optimistic and inaccurate for this site in our opinion.*
- *Baseline monitoring in the Waipapa stream is recommended in our Monitoring Report – covering water quality and stream flow rates. This should be conducted over winter high and summer low periods to obtain an appropriate range of water quality results. Water quality triggers for the existing Waipapa Stream may then be determined.*

8. Despite confirmation that all stormwater on site will be discharged via a large treatment pond at the northern end of the site with treatment to a high quality standard, there has been no assessment of effects of site stormwater discharges (post construction) on the Waipapa Stream (and eventual receiving environment, the Waikato River). A site stormwater discharge assessment should be provided that includes all of the potential building and processing activity contaminant sources. For example, discharges from the vehicle shredding processes and temporary storage prior to monofill disposal, discharges from the slag waste handling area and smelting operation, use of interceptors for petroleum hydrocarbons, high voltage substation insulator fluids etc.

Response from Green Steel (Airey Consultants):

Please refer to section 5.4 of the Airey Roading and Stormwater Report which has been updated with additional detail. Please also note the following in response to this query:

- The vast majority of the processing activities will be undertaken indoors and therefore are not anticipated to have any impact on surface water.
- The roofs of the buildings are not considered to require stormwater quality treatment as they can be constructed of materials which are inert and will not result in contaminants leaching into runoff. This can be controlled by way of a consent condition. Regardless the pond will accept runoff from the roofs and will provide some treatment of this.
- All vehicle pavements will be treated by gross pollutant traps.
- The perimeter road will discharge to a grass swale which will provide water quality treatment.
- The runoff from the open scrap yard will be treated by gross pollutant traps and membrane filters to remove heavy metals from the runoff.
- Interceptors for petroleum hydrocarbons are not anticipated to be required as there is no fuelling or servicing of vehicles anticipated on the site. For example, electric hydraulic excavators will be used.
- Any specific spill bunding or stormwater treatment required for the substation will be undertaken at the detailed design stage, this can be controlled by way of a consent condition.
- Slag waste handling will be carried out indoors.
- Please note the proposal for monitoring of the Waipapa Stream upstream and downstream of the site so that any impacts of discharges can be assessed.

Green Steel will be suggesting that a consent condition be suggested as following:
- At the detailed design stage, a plan for the treatment of stormwater from the Main Receiving Sub-Station area be prepared and submitted to the Waikato Regional Council for certification.

9. Baseline monitoring in the stream is recommended to assist with setting trigger limits and establishing flowrates.

Response from Green Steel:

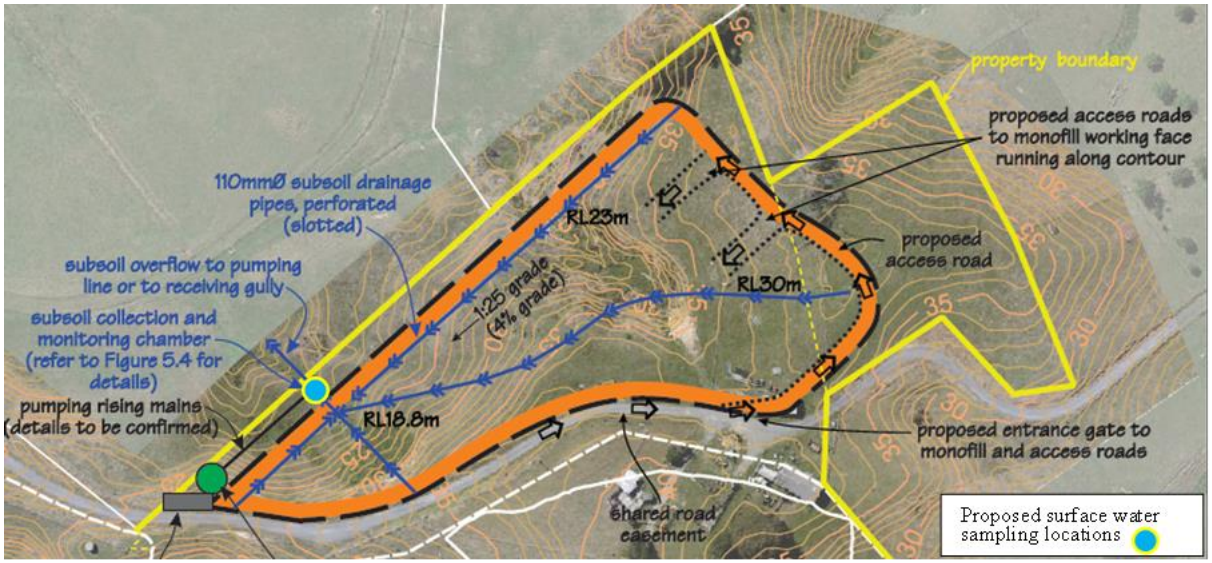
Noted and agreed. Baseline monitoring of the Waipapa Stream will be included as a proposed consent condition.

Proposed monitoring regime

10. In addition to the two sampling locations identified in Figure D in section 5 of the monitoring plan, will there be monitoring of discharges from the Northeastern monofill, the stormwater discharges from the SRP at the northern end of the site and also upstream and downstream of all discharge points so that impacts associated with the site operation can be easily identified and monitored?

Response from Green Steel (Earthtech):

Yes, the NE monofill monitoring will mirror the SW monofill. Refer to the Figure below which mirrors Figure D in Section 5.1 in the Monofill Monitoring Report. Monitoring requirements are to be included in consent conditions covering both monofill sites.



11. In addition to pH, it is recommended that hardness and dissolved organic carbon is included in the surface water sampling to assist with any toxicity modifications that could be applied to copper and zinc concentrations for example.

Response from Green Steel (Earthtech)

Noted and agreed. These parameters (i.e. hardness and dissolved organic carbon) have been included in the surface water sampling requirements, in Table 4, page 9, of the Monitoring Report (Ref: R4424-6, dated 30 May 2026).

12. Why is PFAS not included in the routine monitoring regime for SRP discharges, subsoil water discharges and groundwater? It should definitely be included.

Response from Green Steel (Earthtech):

PFAS was not demonstrated to be a parameter of key concern in the waste leaching trails (please refer to the detailed investigation and reporting in the waste lysimeter trials).

- *Notwithstanding this, PFAS is to be tested for in the annual full suite (Refer Table 5 in Section 4.4 of the Monitoring Report).*
- *Also, we have now included the testing for PFAS in groundwater sampling requirements (Refer Table 6 of the Monitoring Report).*
- *We can suggest to include annual monitoring checks of PFAS for surface water – if found in the leachate.*

13. Consideration needs to be given to other relevant contaminants for inclusion in monitoring of discharges and surface water associated with other activities on site that could be discharged via surface stormwater runoff such as petroleum hydrocarbons for example and contaminants associated with slag handling for example like cadmium, arsenic, mercury, fluoride etc in addition to metals associated with car floc.

Response from Green Steel (Earthtech):

All slag will be handled indoors in a bunded area.

Table 5 in section 4.4 of the Monitoring Report R4424-6 09/06/25 includes ethylene glycol, which was established as a parameter of potential concern (site-specifically to the monofill development).

Testing of petroleum hydrocarbons could be included in the monitoring parameters (i.e. leachate, surface water and groundwater), on an annual basis.

Please note that the parameters in Table 5 (Leachate) and Table 6 (Groundwater) of the Groundwater Monitoring report are recommended only (note that arsenic, cadmium, mercury, are included in Table 6) – which we have established to be associated with car floc (refer to the Lysimeter Trials report attached to the Engineering Report).

Fire risk management and contingency

14. Detailed management and monitoring procedures and contingencies for addressing fire risk within the monofills should be provided.

Response from Green Steel:

Section 11.3 provides site specific contingency planning for a Monofill Fire. This write-up is detailed.
It is noted that the best methods of approach (standard operating procedure) to preventing a monofil (or landfill) fire are:

- *Ensuring that the wastes are continuously processed i.e. levelled and compacted and covered with a compacted soil layer or other suitable available material*
- *Cover material is readily available close to the disposal face as well as machinery always available*
- *Staff training of fire management should one occur i.e. cover immediately and not to rely on water, etc.*
- *Material type will not comprise lithium-ion batteries*
- *Important mention that this monofill is not a general waste landfill with flammable gaseous emission – and cannot be likened to the Hampton Downs Landfill and the fire that broke out in early 2019.*

G. Earthworks Management Plan and ESCP (Earthtech)	Gareth Read

Mr Read and NZ Greensteel have verbally covered the proposal together, with it is understood that matters raised are being addressed.

Response from Green Steel (Earthtech):

Green Steel consultants have worked with Mr Read and have amended the Earthworks and Erosion and sediment Control Plan to ensure it complies with WRC standards – refer Earthworks Management and Erosion and Sediment Control Plan, Green Steel Project, 61 Hampton Downs Road, Hampton Downs, Waikato. Ref: R4392-3, Rev D, 14/05/2025.

H. Air Quality/Dust (AQ Consulting NZ)	Rachael O'Donnell/ Jonathan Caldwell

- Ms O'Donnell conducted a high-level review of the (i) Air Quality Assessment Report and (ii) Greenhouse Gas Emissions Plan. Her comments are:

  'I note the reports are prepared by experts in these fields and are what I would expect to receive if the application was lodged with the WRC. I could not see any information gaps and have no concerns to raise, however as you note the reports could be peer reviewed by experienced external consultants to provide technical review comments.
  If I was processing this application, I would likely seek advice from our in-house Chemist, Dr Jonathan Caldwell, to confirm that metals did not need to be included in the air modelling assessment as proposed by Air Quality Consulting NZ.'
  (R O'Donnell 29/4/2025)

- See Mr Caldwell's response below regarding metals within air modelling:

  Air Quality Consulting NZ make the following statement in their AEE:

  The primary emissions include: PM10 and PM2.5, oxides of nitrogen (NOx), sulphur dioxide (SO2), and carbon monoxide (CO). While there is also the potential for metal emissions, such as lead and zinc, to be discharged from this source, AQCNZ considers that the guidelines for PM10 and PM2.5 provide adequate protection against health effects, provided that off-site concentrations comply with these criteria. Consequently, no further assessment of metal emissions has been included in this assess assessment.

Based on the modelling results which predict a maximum offsite annual average of 0.2 ug/m3 for both PM10 and PM2.5 I would agree with their decision not to include further specific assessment of lead and zinc discharges.

The MfE National ambient air quality guideline for lead for example is 0.2 ug/m3 as a 3-month moving average. As lead, or more realistically lead oxide is only going to be a small proportion of the overall PM10 or PM2.5 concentrations then it would clearly be well below the guideline based on the particulate modelling undertaken.

With regards to zinc or zinc oxides, there are no NZ ambient air guidelines but we can compare against the Texas Effects Screening levels which provides a short term screening level of 20 ug/m3 based on a 1 hour averaging period. The maximum 24 hour average predictions from the modelling by Air Quality Consulting NZ indicates 5.9 ug/m3 for PM10 and PM2.5. As the 1 hour average zinc or zinc oxide concentration is expected to be higher than the 24 hour average and as zinc or zinc oxide is going to constitute only a small proportion of the particulate discharge, I am also confident that any offsite zinc concentrations will be well below any concerns for human health as well.

So in summary, I agree with Air Quality Consulting NZ's conclusion around the discharge of metals or metal oxides from the smelting process and I also agree with the overall conclusions of the AEE and that the approach taken is consistent with our usual expectations for an air quality assessment of this type of operation. (J Caldwell 1/05/2025)

Response from Green Steel:
The Air Quality report is comprehensive and WRC staff are satisfied.

I. (i) Ecology Assessment (PDP)	Josh Smith ecology - edited feedback

General

1. "The Green Steel site drains north through a series of drains and into the Waipapa stream" – aquatic habitat is present.
   It may be beneficial to expand on report commentary regarding: *"subsequent surveys were conducted on the Waipapa Stream and associated tributaries in 2019, no mudfish were found".*
   With any application received by WRC, clarity would be sought in respect to:
   - What fish were the surveys targeting? What were the methods used?
   - what was the extent of the surveys (number of traps, length of stream/drain fished)?
   - What locations and what time of year?
   - And who undertook the surveys.
2. Ecological reporting states *"the Waipapa stream sub-catchment has very low water quality and low fish fauna values and is unlikely to still be habitat for black mudfish"* WRC feedback is that sampling would verify the above statement.
3. The use of NZffdb records and eDNA records unrelated to the actual site to describe likely fish species, leading to the conclusion that fish values are "low," leaves WRC with some reservations about the conclusions of the ecological report.

4. A WRC State of the Environment (SoE) fish monitoring site (Waipapa stream Meremere @ NZR08704-3420) located on the South-Western edge of the applicant's site (East 1782257, North 5863738) has consistently recorded longfin eel (At Risk, declining, Dunn et al. 2018), shortfin eel, common bully and koura. These native species have also been confirmed as present in a six replicate (Smith et al. 2024) eDNA sample taken from the same site.
   Given the above, WRC feedback suggests that the presence of these species, along with the potential presence of black mudfish, should not be described as "low quality."
5. A recommended manner to progress could be a mudfish survey of the site to confirm their presence or absence. Mudfish are commonly found in this type of habitat, with nearby records supporting this. The peat soils in this location are particularly suited to mudfish. Should this be advanced, key steps could include:
   - Conducting the survey during the wet season (winter/early spring) when water levels are high.
   - Using high-density fine mesh Gee-minnow traps, along with hand netting and high replication eDNA sampling (Wilderlab).
6. Additionally, a general fish survey of the site's drains could be undertaken to identify all fish species present. This combined data could help establish mitigation measures and a fish management plan for relocating any species affected by habitat loss.
7. Jonathan Caldwell's comments related to aquatic ecology are supported. The presence of acid sulfate soils at this site, as noted by Jonathan, can lead to fish mortality event risk. Disturbing or draining these soils releases acidic leachate, lowering pH and increasing toxic metals like aluminium and zinc in waterways. This makes the environment unsuitable for aquatic life, potentially causing risk of localised fish mortality events. Please refer to Jonathan's notes for more details on acid sulfate soils.

Summary

The ecological conclusions could benefit from additional sampling to provide more solid evidence and increase confidence in the assessment. A fish survey could be conducted to establish ecological values, focusing on black mudfish. With an such evidence obtained, appropriate mitigation and management plans could then be developed. Any discharge to the Waipapa Stream should comply with standards, including potential contaminants from steel production/processing and vehicle shredding. Additionally, the presence of acid sulfate soils must be managed properly to prevent fish kill events.

References

- Dunn, N. R., Allibone, R. M., Closs, G. P., Crow, S. K., David, B. O., Goodman, J. M., Griffiths, M., Jack, D.C., Ling, N., Water, J. M., & Rolfe, J. R. (2018). Conservation status of Zealand freshwater fishes, 2017. New Zealand threat classification series 24. Wellington: Department of Conservation. www.doc.govt.nz/Documents/science-and-technical/nztcs24entire.pdf.
- Ling, N. 2001, New Zealand Mudfishes A Guide. Department of Conservation, Science & Research Division contract 2485.
- Smith, J., David, B., Hicks, A., Wilkinson, S., Ling, N., Fake, D., Suren, A. and Gault, A. (2024), Optimizing eDNA Replication for Standardized Application in Lotic Systems in Aotearoa, New Zealand. Environmental DNA, 6: e70017. https://doi.org/10.1002/edn3.70017

Response from Green Steel:

See letter/report attached from AWA Ecology dated June 2025 (Appendix 3).

Surveying has been undertaken to determine the presence otherwise of fish species including black mudfish on the site and no black mudfish have been found. Gambusia have been found in significant numbers with one Shortfin eel found in the survey. The report recommends fish recovery and relocation of shortfin eel be required before any in-channel works occur if water is present.

Note that discussion on treatment of discharges and sulphate soils are included elsewhere in this response.

I. (ii) Ecology Assessment (PDP)	Kaitlin Morrison wetlands

1. I have completed a review of the proposal in relation to wetlands, including reviewing the documents mentioned below. As requested given the time constraints, this is a high-level, desktop based review. My initial thoughts are:

2. WRC has no wetlands mapped within the area of the site development. The nearest wetlands we have recorded are around 2km away. An assessment is needed to confirm any potential connection between water onsite and any possible downstream wetlands. If there is a connection, then assessment of the stormwater, treated discharge, and sediment would be needed to determine level of any potential effects. There is also mention of infilling drains and collection and re-use of stormwater. Will the water currently in the drains, and that collected on site. include water that potentially naturally would have reached downstream waterways and wetlands?

3. The proposal assessed the northern part of the site for wetlands and I agree with the methods used and conclusions reached. There is no mention of assessing the rest of the site but I presume someone experienced did a review and confirmed no potential wetlands are present? Also, as mentioned above, has this expert assessed any potential connection to possible downstream wetlands and potential effects? If there is connection to downstream wetlands then, depending on the connections etc, I would potentially have similar questions/concerns as previously discussed relating to the Maramarua Monofil proposal.
4. I agree with the preparation of a Native Planting Plan for the wet areas in the northern section, as well as assessing the stormwater discharges and treatment methods, as mentioned in the proposal.

Response from Green Steel:

There is no direct connection between the site and downstream wetlands.

Most stormwater off the site will be directed through the large pond at the northern end of the site. As set out in the Roading and Stormwater Management Report to be provided as an attachment to the Fast Track Application), the proposed treatment will involve the installation of gross pollutant traps within the stormwater reticulation, in conjunction with the stormwater pond. A stormwater pond is a suitable treatment option for this site as it provides a large amount of detention and reuse volume, in conjunction with water quality treatment to remove suspended solids. The stormwater pond has been designed with a forebay (15% of the total storage volume), which will ensure that any sediment within the runoff will settle prior to reaching the main pond. It is proposed to install proprietary gross pollutant traps on the stormwater pipe network; these will provide an additional level of treatment to any runoff collected from paved areas prior to discharging to the pond. The system is anticipated to include hydrodynamic vortex separators on the pipe network in conjunction with catchpit filter inserts, detailed design of the gross pollutant traps will be provided at Building Consent stage.

J. Greenhouse Gases Comparative Emissions Assessment (Lumen)	Rachael O'Donnell

See Ms O'Donnell's comments above (H)

Response from Green Steel:

Ms O'Donnell's comments above are that she is satisfied with the report.

ATTACHMENT 2: Summary of Documents Reviewed and Relevant Reviewer

Draft Application Documents			WRC #	Expert
1. Easement report, Site Survey Plan, legal advice (Rav Survey)	WDC			
2. Site plan (Earthtech)	WDC	WRC	1	All
3. Plant layout 3D with description (R Singh Associates)	WDC	WRC	2	All
4. Transportation Assessment (CKL)	WDC			
5. Landscape assessment (Greenwood Associates)	WDC			
6. Archaeological Assessment (Clough & Associates)	WDC			
7. Economic assessment (Castalia)	WDC		3	
8. Geotechnical Assessment (Earthtech)		WRC	4	
9. Water takes - groundwater take, SW re-use, Te Kauwhata water supply, re-use (Earthtech)		WRC	5	Cameron King
10. Ground Contamination -PSI/DSI and Hazardous Substances storage and use (Williamson Water and Land Advisory)		WRC	6	Josh Evans
11. Hazardous Substances Report (Williamson Water and Land Advisory)	WDC			
12. On-site treatment wastewater treatment & disposal system (Ormiston Associates)		WRC	7A/&B	Nicki Wilson
13. Monofill Engineering report (Earthtech)		WRC	8	Jonathan Caldwell/Nicki Wilson
14. Monofill Monitoring report (Earthtech)		WRC	9	Jonathan Caldwell/Nicki Wilson
15. Earthworks Management Plan and ESCP (Earthtech)		WRC	10	Gareth Read

16. Air Quality/Dust (AQ Consulting NZ)		WRC	11	Rachael O'Donnell
17. Acoustic assessment (Hegley Acoustics)	WDC			
18. Ecology Assessment (PDP)		WRC	12	Josh Smith/ Kaitlin Morrison
19. Greenhouse Gases Comparative Emissions Assessment (Lumen)		WRC	13	Rachael O'Donnell
20 Proposal Plan - Earthtech	WDC	WRC	14	All

ATTACHMENT 3: Ms Nicki Wilsons Technical Review.

Memo

File No:	61 91 33A
Date:	17 April 2025
To:	Stephen Howard
From:	Nicki Wilson
Subject:	**Technical review – Effects on Groundwater from wastewater discharge and monofil activities, NZ Green Steel Limited, 61 Hampton Downs APP147422**

NZ Green Steel Ltd (NZGS) Limited have applied for various consents related to a recycled steel making process and a dedicated landfill (monofil) at 61 Hampton Downs Road, Hampton Downs. The applications are part of a development ("The Green Steel Project") listed under the Fast-Track Approvals Act 2024.

This memo provides high level technical advice related to the effects on groundwater from monofiling activities and an onsite wastewater discharge.

I have reviewed the following documents in providing this advice:

- Earthtech, 14 March 2025. Water Take and Supply Plan for the Green Steel Project: Groundwater, Surface Water and Harvesting Rainfall Runoff. Earthtech reference: R3660-1, WRC reference 31737895
- Earthtech, 3 May 2024. Preliminary Geotechnical Assessment Report, 61 Hampton Downs Road, Hampton Downs. Earthtech reference: R4392-2, WRC reference 31738397
- Earthtech, 14 March 2025. Engineering Report: Green Steel Monofill, Hampton Downs. 61 Hampton Downs Road, Hampton Downs, Waikato. Earthtech reference: R4424-2, WRC reference 31737715
- Earthtech, 14 March 2025. Monofill Monitoring Plan and Evaluation of Surface and Groundwater Effects Green Steel, Hampton Downs. Earthtech reference: R4424-6, WRC reference 31738224
- Ormiston Associates Ltd, December 2024. DOMESTIC ON-SITE WASTEWATER TREATMENT & LAND DISPOSAL ASSESSMENT FOR A PROPOSED RECYCLED STEEL PLANT AT 61 HAMPTON DOWNS ROAD, HAMPTON DOWNS. Ormiston reference: 5554, WRC reference 31802964
- On-site wastewater plan by Ormiston Associates, drawing number 5577-1- V2. WRC reference 31737222

Monofil activities

The monofil facility is to accept vehicle floc material from end-of-life motor vehicles. Monofiling activities are proposed to occur between two landfill sites – the SW landfill and the NE landfill. There are no drinking water supply wells near the site and the closest receiving environment is the Waipapa Stream, 100 m from the SW landfill, and a tributary of the Waipapa Stream, 430 m from the NE landfill.

I have the following comments:

- Groundwater monitoring wells will need to be installed on site prior to the commencement of monofiling and I recommend at least 12 months of monitoring data is collected to establish baseline groundwater conditions. These baseline conditions will provide information on groundwater levels, flow, and quality. Monitoring should continue once monofiling begins on site and into the future. A groundwater monitoring plan should be developed and submitted to WRC for review.

Response from Green Steel (Earthtech):

We would suggest 6 months (6 samples) or alternatively 6 samples over 12 months. This is to be initiated immediately following installation of the Monitoring Boreholes (shown in Figure M1.3).

A groundwater monitoring plan is provided in the "Monitoring Plan and Evaluation of Surface and Groundwater Effects" Report (Ref: R4425-6, dated 30 May 2025). An updated monofill monitoring plan will be submitted to WRC following installation of the monitoring bores, providing information on the bores (i.e. bore logs, water quality testing results, borehole construction information, etc).

- The proposed locations of groundwater monitoring bores for the SW monofil as indicated on Figure M1.3 are appropriate (MBA, MBB and MBC).

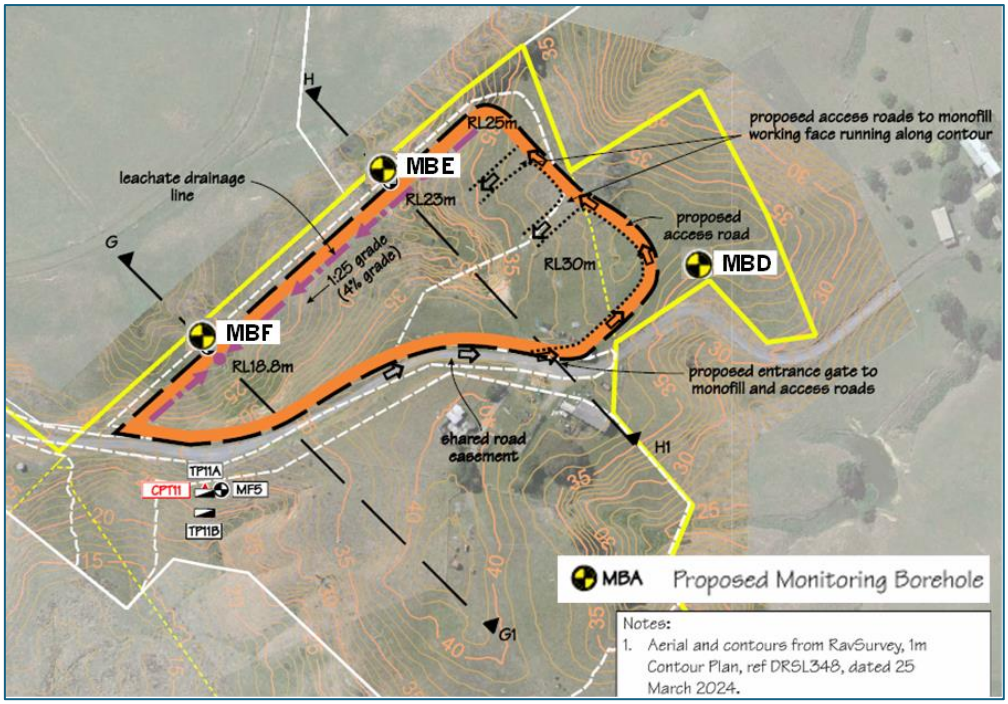
Response from Green Steel (Earthtech):

Noted.

- There is little detail presented on the monofiling activity at the NE landfill. Please provide the locations of monitoring bores for this area. It is recommended there be a minimum of three monitoring bores.

Response from Green Steel (Earthtech):

Below is a plan showing proposed locations for Monitoring Bores around (upgradient and downgradient) of the proposed northeastern monofill.



- Biennial groundwater monitoring on Table 6 should include dissolved nickel, dissolved and total iron, dissolved and total manganese, ethylene glycol, and PFAS (refer to Monofill Monitoring Plan and Evaluation of Surface and Groundwater Effects report).

Response from Green Steel (Earthtech):

We can agree with all parameters noted. Now all included in Table 6 of the updated Monofill Monitoring Report - refer below:

Table 6: Groundwater Sampling Requirements

Location	Frequency	Parameters	Laboratory Detection Limit	Trigger Value[1]
			(mg/l)	(mg/l)
Bores MBA, MBB and MBC	Half-yearly (August and March month)	pH	-	-
		Total Hardness	*mg/l (as $CaCO_3$)*	-
		Dissolved Total Organic Carbon	*mg/l*	-
		EC (Electrical Conductivity)	*mS/m*	-
		Dissolved boron	*mg/l*	2.5
		Dissolved chromium	*mg/l*	0.04
		Dissolved copper	*mg/l*	0.0025
		Dissolved nickel	*mg/l*	0.017
		Dissolved lead	*mg/l*	0.0094
		Dissolved zinc	*mg/l*	0.031
Bores MBA, MBB and MBC	Biennially	COD	*mg/l*	-
		Alk (Alkalinity)	*mg/l (as $CaCO_3$)*	-
		Ammoniacal-Nitrogen	*mg/l*	2.18
		Sodium	*mg/l*	-
		Sulphate	*mg/l*	-
		Chloride	*mg/l*	-
		Reactive silica	*mg/l*	-
		Dissolved arsenic	*mg/l*	0.36
		Dissolved boron	*mg/l*	2.5
		Dissolved cadmium	*mg/l*	0.0008
		Dissolved chromium	*mg/l*	0.040
		Dissolved copper	*mg/l*	0.0025
		Dissolved and total iron	*mg/l*	-
		Dissolved lead	*mg/l*	0.0094
		Dissolved and total manganese	*mg/l*	3.6
		Dissolved mercury	*mg/l*	0,001
		Dissolved nickel	*mg/l*	0.017
		Dissolved zinc	*mg/l*	0.031
		Ethylene glycol	*mg/l*	tbd
		PFAS	*µg/l*	tbd

[1] The trigger values are based on the ANZECC (2000) and ANZECC (2018) Default Guideline Values for 80% protection of freshwater species.

- One of the groundwater supply bores for the site (BH42, 72_12576) is located in the middle of the SW landfill. How is this going to be managed? The well head will need to be appropriately secured to prevent contaminant migration into the deeper, fractured sandstone aquifer.

Response from Green Steel (Earthtech):

Site-specific engineering is required around a groundwater production bore sited through the monofill – this is fully covered in the Engineering Report. Explanation is provided in the Engineering report (See Section 4.4.1, page 11, "Southwest Monofill - Stage 4" and Section 10.5, pages 25 and 26)

- I recommend including annual monitoring of the groundwater supply bores on site (BH42 – 72_12576, BH54 – 72_12575 and any additional supply bores) for the parameters indicated in Table 6 (and additional parameters specified above) of the Monofil Monitoring Plan and Evaluation of Surface and Groundwater Effects report (Earthtech, 2025).

Response from Green Steel (Earthtech):

The production (supply) boreholes have water intake (piezometer) zones deep into the confined rock – targeting identified fracture zones at depth.

- *BH42 is some 185m to 300m deep.*

Annual monitoring of all groundwater production wells is unrealistic in our opinion - in particular for such deep bores located some distance outside a pragmatic zone of influence of the monofill.

The site-specific monofill monitoring bores (x3 for each monofill site) are provided for this purpose.

We would recommend that the bore sited through the monofill i.e. BH42 only be monitored, on a biennial basis, in accordance with the list provided in Table 6.

Onsite wastewater disposal

An on-site wastewater treatment system (OSWT) is proposed at the site. The system will manage domestic wastewater production from the industrial facilities at the site, and discharge secondary treated effluent to land via dripper lines buried at a depth of 150mm.

Hand augered boreholes to a depth of 1.2m have been drilled at the site to assess soils and groundwater depths, these indicated silts and clays underlying approximately 0.3 m of topsoil. Groundwater was encountered in one of the 7 boreholes at a depth of 1.15m. Water supply to the site from bores BH42 and BH54 (72_12576 and 72_12575 respectivley) is proposed to be from a deeper fractured sandstone aquifer. The locations of these bores are approximately 300 m west from the land disposal area their closest, although it should be noted that additional water supply bores are currently being investigated at the site which may be located closer to the disposal area. The Waipapa stream is located 590 m west of the main disposal area, although topography and aerial photography suggest a component of shallow groundwater flow from the disposal areas may flow northeast towards a closer tributary (530 m) of the Waipapa Stream. Disposal areas are indicated on drawing 5577-1-V2 (Ormiston Associates, 13 February 2025).

I have the following comments:

- The land disposal system meets the required setback distances as listed in AS/NZS1547:2012, and is located far enough away from surface water bodies and drinking water supply wells to not raise any concern.

Response from Green Steel (Ormiston Associates):

I agree with this statement and note that our final design report dated May 2025 does not alter this assessment.

- I have undertaken a risk assessment using the Microbial Risk Assessment tool to assess the risk to drinking water at the onsite wells (72_12575 and 72_12576). The risk is acceptable for both norovirus and E.coli. Results of my assessment are saved in WRC document 31923024.

Response from Green Steel (Ormiston Associates):

This is valuable feedback and confirms that the proposal will not impact public health.

- There is no groundwater monitoring proposed to assess offsite migration of effluent. Due to the topography on site, effluent could potentially migrate northeast from both the primary and reserve wastewater disposal fields towards neighbouring gullies. It is recommended that 3 monitoring wells be established at the site boundary to assess this. I have indicated some proposed locations in Figure 1 below by red stars.

Response from Green Steel (Ormiston Associates):

The request to install groundwater monitoring bores at the site boundary is a higher level of monitoring than would normally be required for a small scale on-site wastewater disposal system, in my experience. For comparison, in terms of the volume of wastewater to be discharged, this proposal represents the equivalent of only 10 dwellings. In my opinion this level of monitoring is not required, as the proposed disposal area loading rates are in line with AS/NZS1547:2012, and the treated wastewater quality will be high (and regularly monitored), hence effects are expected to be very limited. Ms Wilson has indicated the setback distances and Microbial Risk Assessment results are favourable, hence it is unclear why groundwater monitoring is considered necessary. Also there are no nearby groundwater users who would likely be affected. Alternative mitigation measures to address the low likelihood of effects such as planting the disposal area, and construction of a soil bund below any downslope edge may be appropriate alternative approaches.

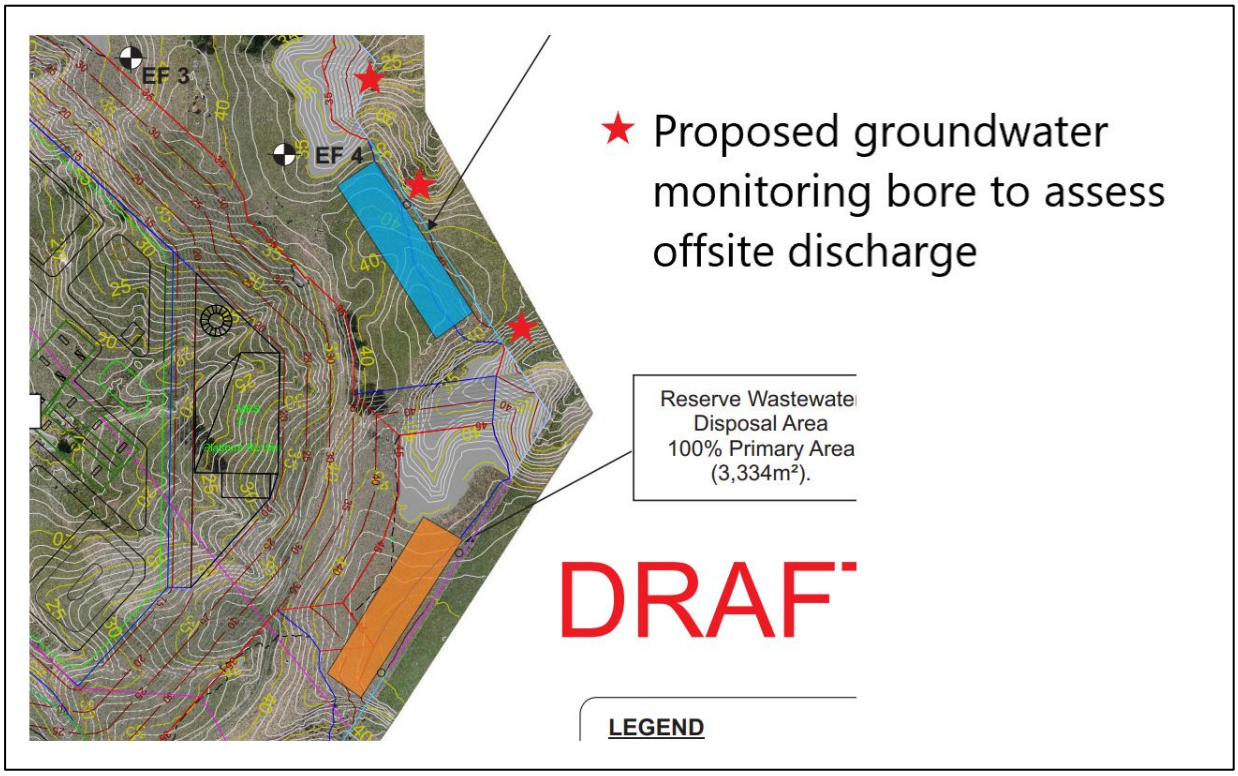


Figure 1: Snip from drawing 5577-1-V2 (Ormiston Associates, 13 February 2025) to indicate recommended monitoring bore locations.

APPENDIX 1

Stantec

Memo

To:	C/O Lindsay Strachan (Earthtech Consulting) 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 Hydrogeological Assessment of Environmental Effects	Date:	9 June 2025

Reference: Green Steel Hydrogeological AEE

1 Introduction

National Green Steel Limited (the client) have engaged Stantec New Zealand (Stantec) to carry out an Assessment of Environmental Effects (AEE) for a proposed groundwater supply. The client is proposing to develop an integrated metals resource recovery and steel manufacturing plant at 61 Hampton Downs Road, Hampton Downs, Waikato. The project, referred to as the Green Steel Project, requires water for key operational requirements of the utility and auxiliary facilities, with the primary use being cooling. National Green Steel Limited are investigating the possibility of using up to four boreholes onsite to supply 1000 m^3/day of water utilising groundwater within the fractured Waitematā Sandstone (referred herein as the Waitematā Sandstone Aquifer). The proposal presented by National Green Steel Limited originally estimated that 1,500 m^3/day may be required from the groundwater supply but further communications with the client have provided an updated estimate of 1000 m^3/day.

This memorandum reviews the hydrogeological testing and information provided by the client and provides a hydrogeological AEE based on the proposed water supply volume.

The following technical reports were provided by the client and reviewed as part of this AEE:

- Engineering Report (Earthtech 2025)
- Memorandum regarding: Air Lift Yield Results for BH54 Test Bore – Green Steel Project at 61 Hampton Downs Road (Earthtech 2025)
- Water Take and Supply Plan for the Green Steel Project: Groundwater, Surface Water and Harvesting Rainfall Runoff (Earthtech 2025)
- Preliminary Geotechnical Assessment Report (Earthtech 2024)

Additionally, Stantec have also undertaken a review of publicly available information for the geology and hydrogeology for the area including:

- The Waikato Regional Council's (WRC) wells data base[1]
- Technical reports for the Waitematā Sandstone aquifer
- GNS geology web maps[2]

2 Environmental Site Setting

2.1 Site Location

The proposed Green Steel Project is located at 61 Hampton Downs Road, Hampton Downs, Waikato. The site location, including the investigation boreholes, is shown in Figure 1, as provided by the client.

[1] Well and Bore locations - Waikato Region | Waikato Open Data and OneView
[2] https://www.gns.cri.nz/data-and-resources/geoscience-webmap/

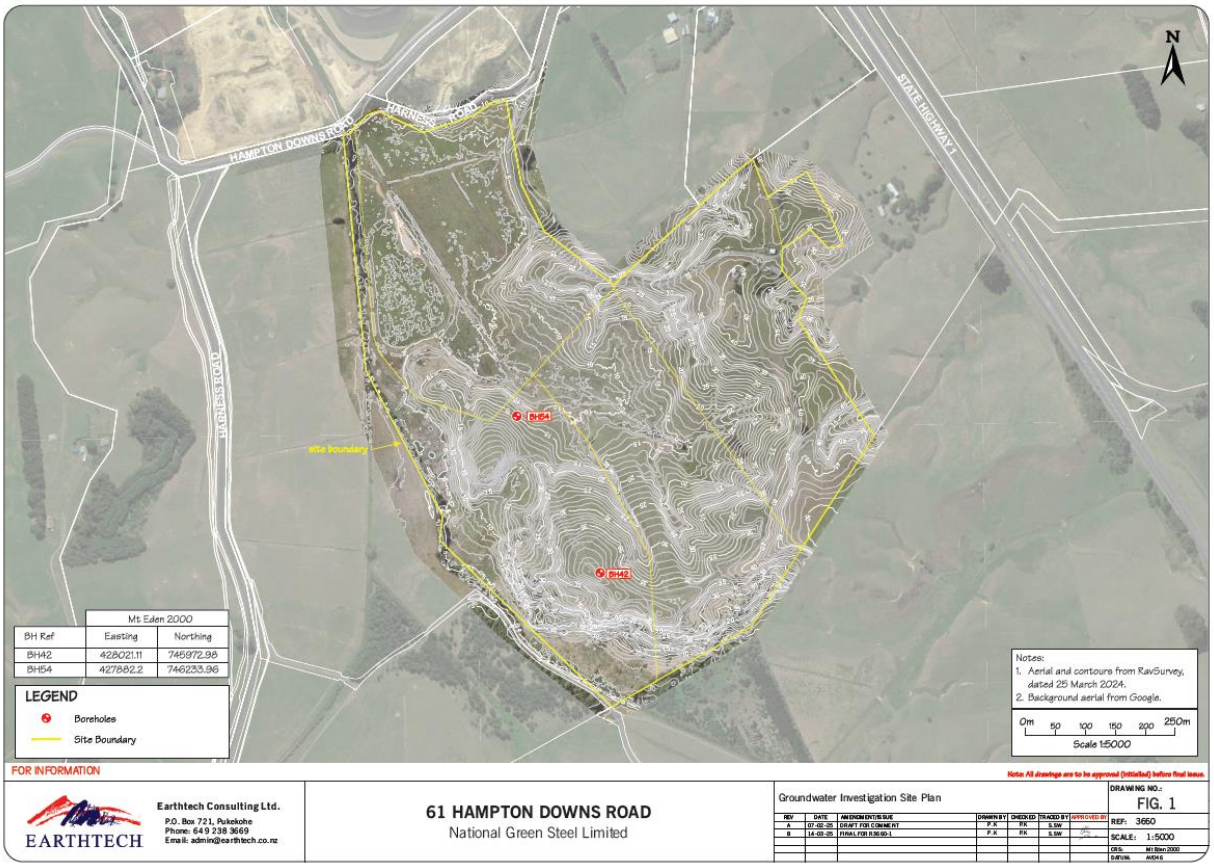


Figure 1 Site location, as provided by the client.

2.2 Mapped Geology

The regional mapped geology shows that three main units underlie the site; these are shown in Figure 2, as mapped by the New Zealand Geological Map (GNS Science, 2025). Ground investigations and reporting by the client show that the groundwater resource at the site is situated within the Waitematā Sandstone Aquifer, a fractured aquifer comprised of interbedded sandstone and siltstone.

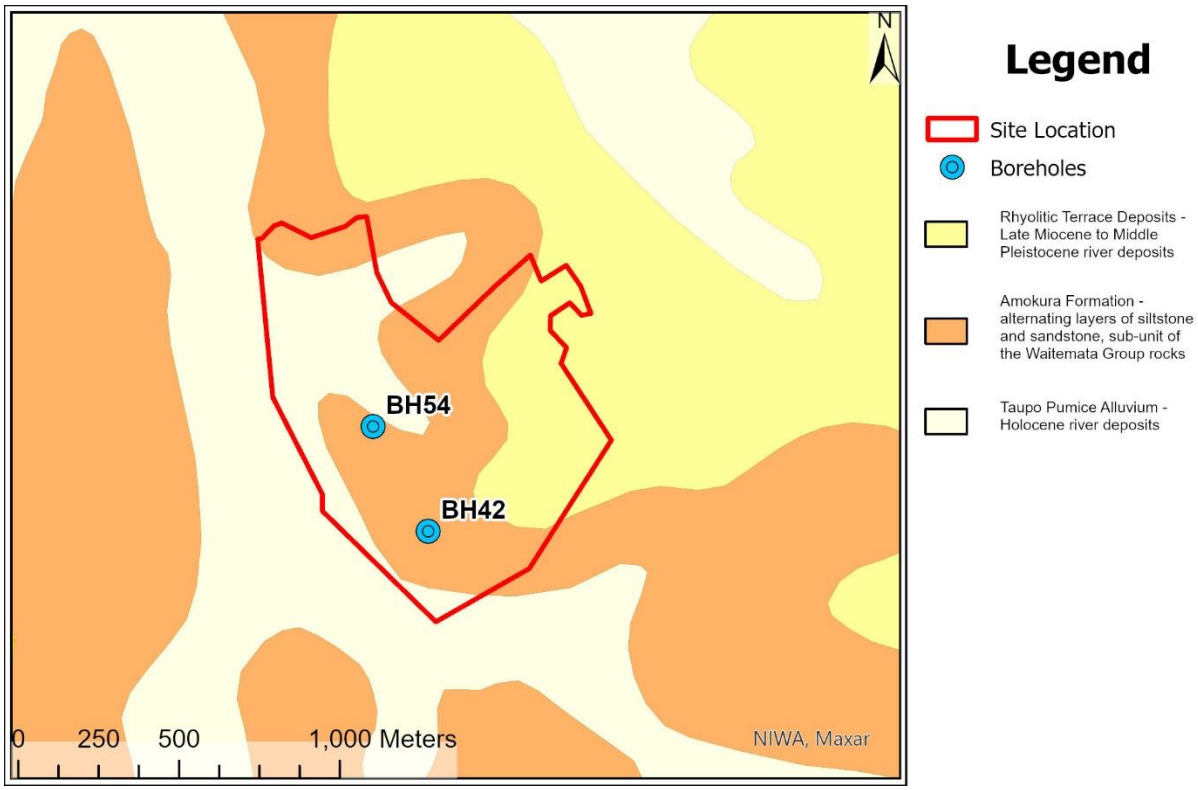


Figure 2 Mapped regional geology at the site location

2.3 Hydrology

The nearest surface water body is the Waipapa Stream, which is situated along the western boundary of the site (Figure 3). It is approximately 220 m from the closest onsite borehole and a stream depletion assessment from the proposed groundwater take has been completed (Section 4.2).

The Waikato River is situated 3.2 km from the site boundary at its closest point; at this distance it is unlikely to be an issue with this groundwater take. There are no wetlands mapped near the site.

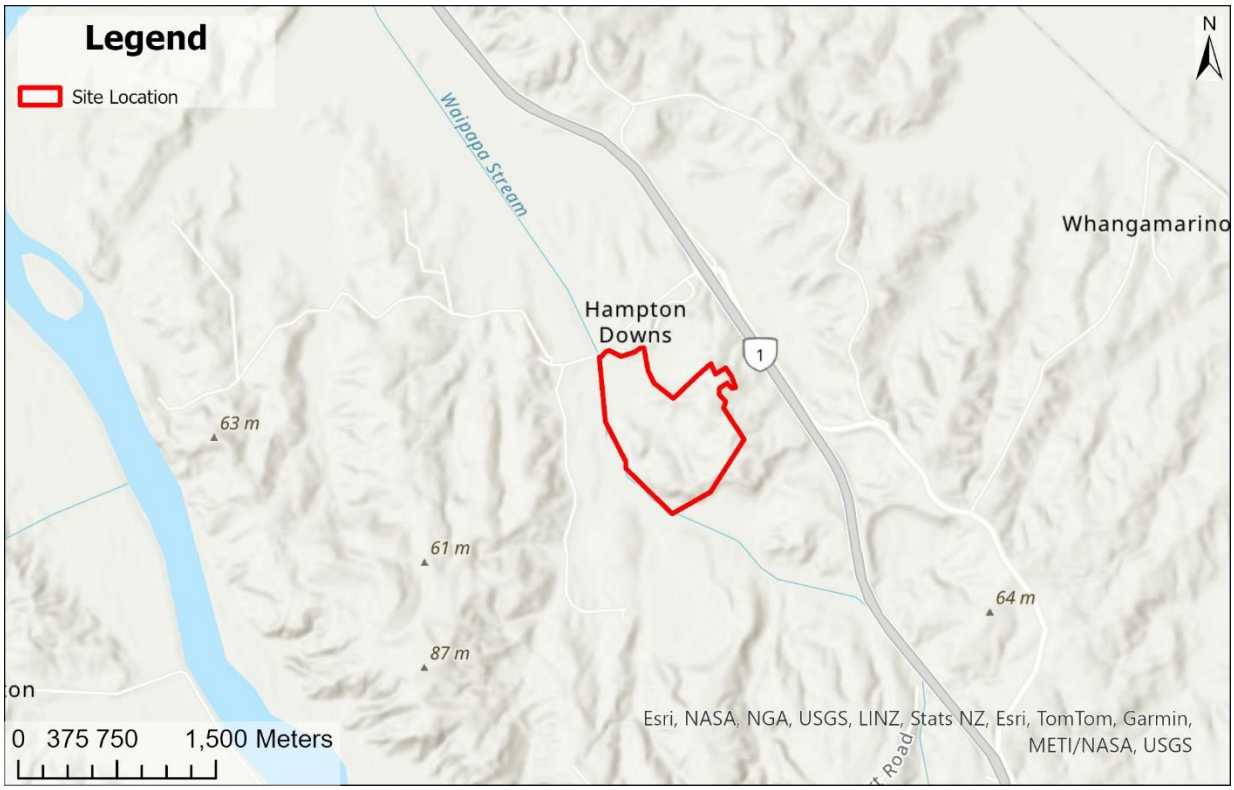


Figure 3 Nearby surface water bodies

2.4 Hydrogeology

A report by Pattle Delamore Partners Ltd described the Waitematā Sandstone Aquifer in the Karaka/Drury region, which is located approximately 35 km north of the Green Steel Project site location (Pattle Delamore Partners Ltd, 2012). The Waitematā Sandstone Aquifer was described as confined interlayering sandstone and mudstone sequences, with groundwater flow being mostly horizontal through fractures and sandstone beds and the mudstone sequences acting as aquitards. A transmissivity range of 6 – 62 m^2/day was provided.

Another report (Viljevac et al., 2002) describes the Waitematā Sandstone Aquifer in a similar manner, describing it as a confined aquifer of interbedded sandstone and mudstone with faulting. It was described as having low permeability, with an estimated hydraulic conductivity value of 2.72×10^{-2} m/day. North to south geological cross sections were provided; these are located further north than the project site area but provide a conceptual understanding of the geological formations that underlie the sit. The southern end of cross section 12 is closest to the site but is still approximately 12 km north (Figure 4).

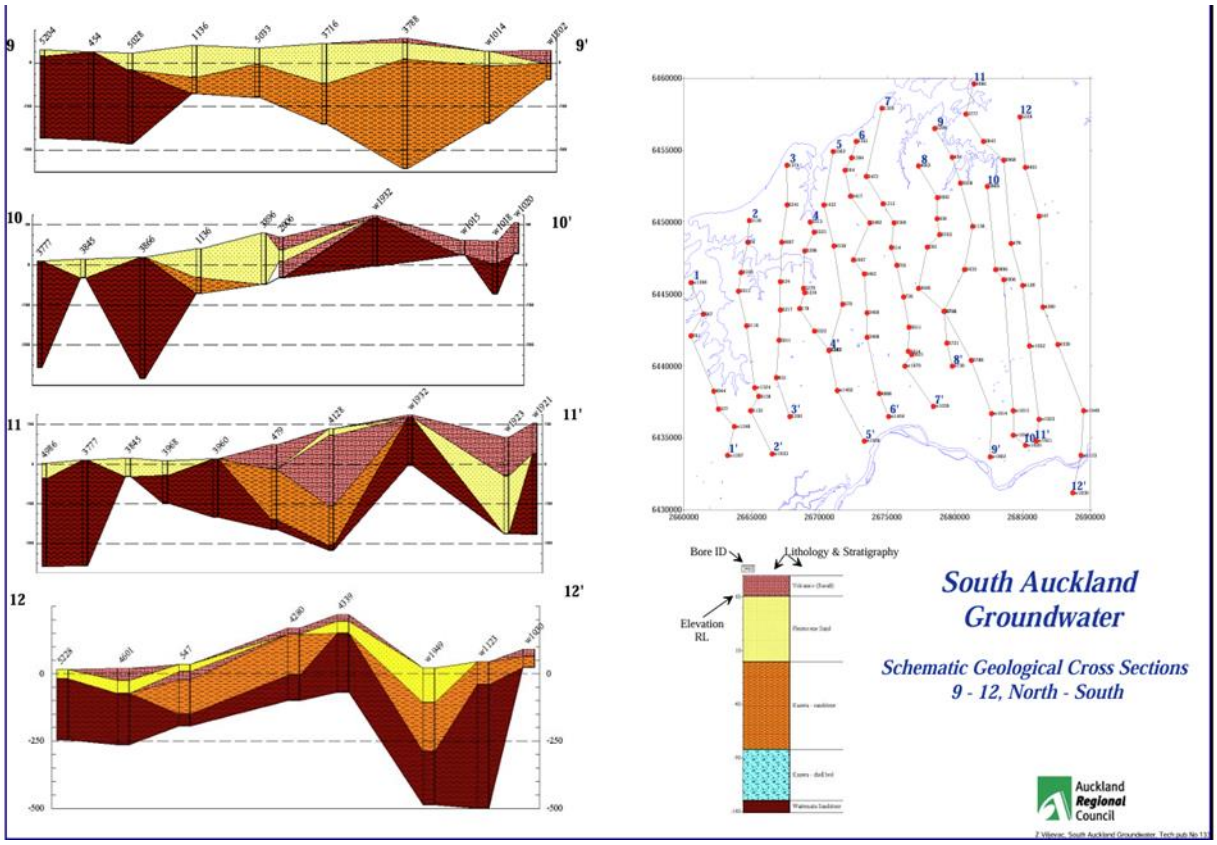


Figure 4 *North to south cross section of the Waitematā Sandstone group. Sourced from Viljevac et al., 2002.*

2.5 Other Groundwater Users

Groundwater bore data from Waikato Regional Council was reviewed. Bores within a 1 km radius of the site are shown in Figure 5.

There are two bores recorded on the site and another four bores within a 1 km radius of the site boundary. There is no information on the usage of the bores. A summary of the depths and the recorded groundwater levels (where recorded) is provided in Table 1.

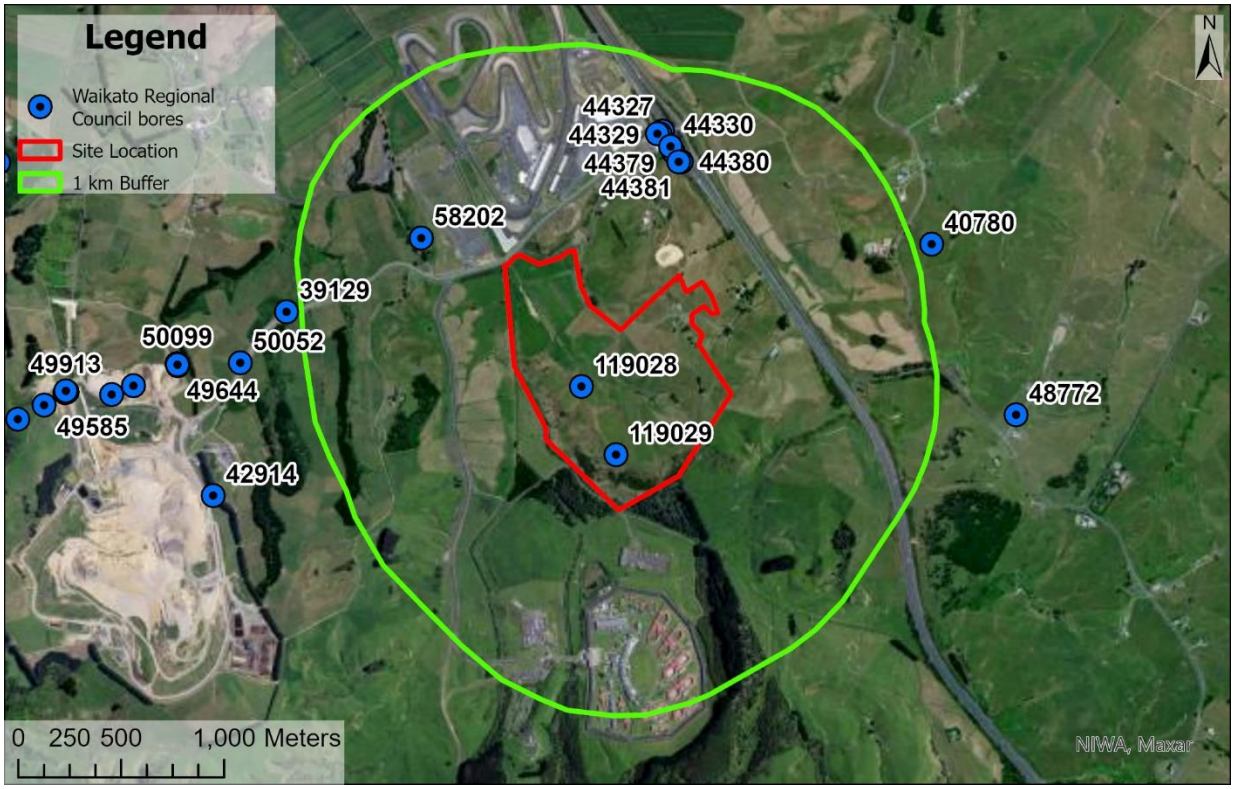


Figure 5 Waikato Regional Council bores within 1 km of the site

Table 1 Summary of Waikato Regional Council recorded bores within 1 km of site

Well Name	Distance to Site Boundary (m)	Well Depth (m)	Groundwater level (m below ground level)
119028	On site (BH54)	250	8
119029	On site (BH42)	300	33

58202	420	N/A	N/A
44381	555	10	N/A
44380	555	11	N/A
44331	600	9	N/A
44379	625	13	N/A
44330	625	11	N/A
44329	700	14	N/A
44328	700	11	1.6
44327	700	11	1.2

Notes: N/A = not available

The location of these bores was compared with data on the New Zealand Geotechnical Database (NZGD) to access any bore logs. Only one bore log was recorded for wells within in 1 km radius of the site; this was not present on the Waikato Regional Council wells database. The well location is shown in Figure 6. The bore log is provided in Appendix A, and the information is summarised as follows:

- The borehole is 15 m deep. Sandy gravel and sand was found within the first 1.5 m. The rest of the borehole is comprised of sandy silt, silt and sand, with a layer of clayey silt at 12.5 m. The names of the geological formations were not provided in the bore log.

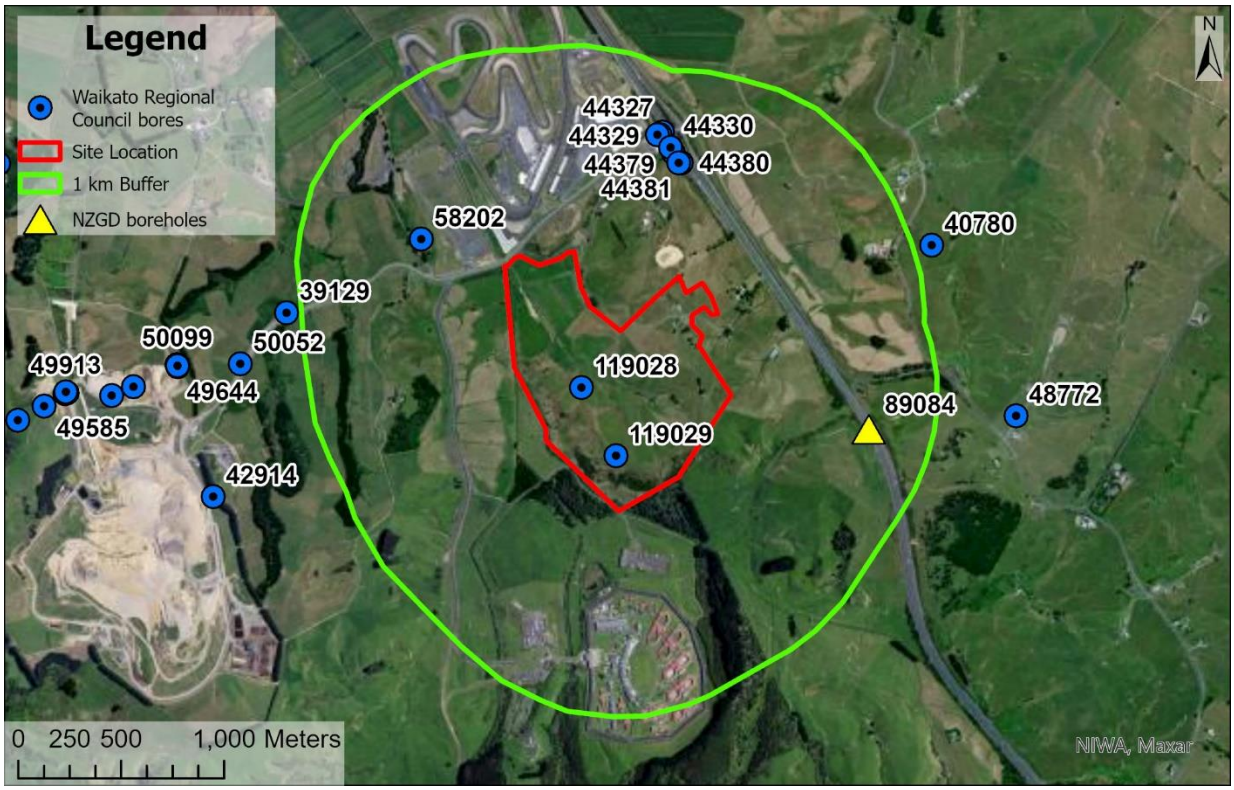


Figure 6 NZGD borehole location

2.6 Surrounding surface water bodies, wetlands and groundwater dependent ecosystems (GDES)

As discussed in Section 2.3, the nearest surface water body to the site is the Waipapa Stream, which is 220 m from bore 119029 at its closest point. No wetlands or other GDEs were identified nearby.

3 Technical Site Reports

The following is a summary of information provided by the client.

Preliminary Geotechnical Assessment Report, 61 Hampton Downs Road, Hampton Downs

The geotechnical assessment report summarised the site visits conducted from 28 December 2023 to 9 January 2024. Ten cone penetrometer tests (CPTs) were conducted, and eight hand augers were drilled. Field mapping also took place.

CPT data was collected from the locations shown in Figure 7. An interpretation of the geological formations at the site was presented; these are shown in Appendix B. The cross sections provided present layers of peat, stream alluvium, and the Amokura Formation as the main geological layers across the site.

Reference: Green Steel Hydrogeological AEE

Groundwater levels during the site investigation were presented. The range of groundwater levels encountered across the site were from 0.5 – 3 m below ground level.

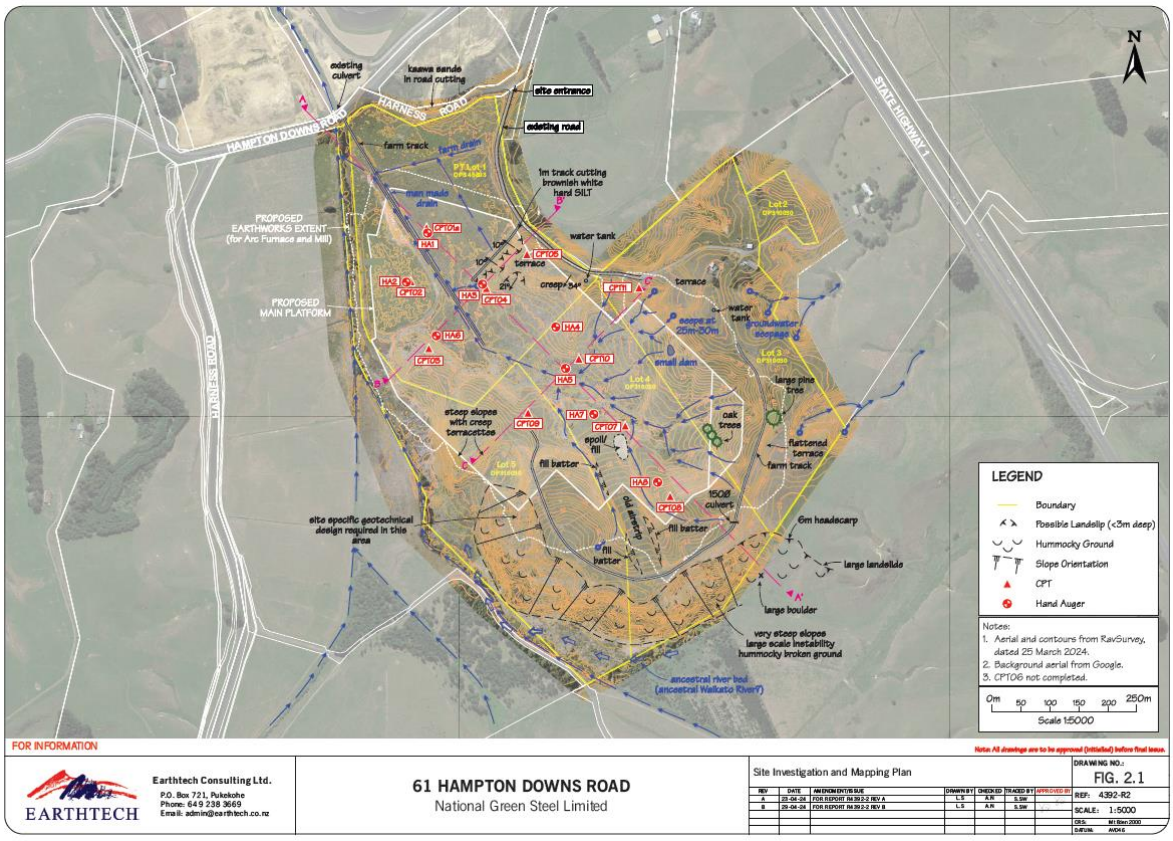


Figure 7 Location of CPT investigations during the geotechnical site investigations

Engineering Report, Green Steel Monofill, Hampton Downs

The engineering report addresses the design of the Green Steel Project, including stormwater drainage controls, leachate management and disposal, ancillary works and contingency management controls for the site. A conceptual geological model from the report is presented in Figure 8.

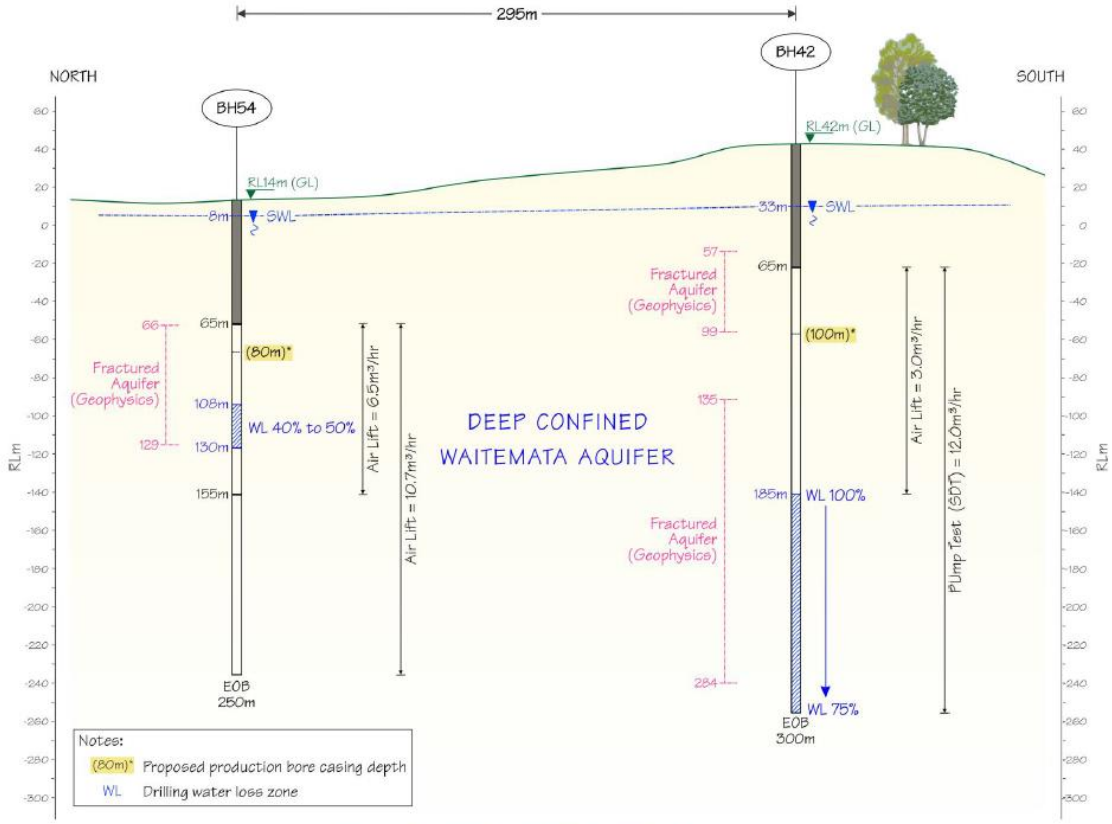


Figure D1: BH42 and BH54 Test Bore Results

Figure 8 Conceptual model and testing results from client

Water Take and Supply Plan for the Green Steel Project: Groundwater, Surface Water and Harvesting Rainfall Runoff

Information on the water supply requirements and options are provided in this report.

Details regarding the test bores, air lift yield and step drawdown test were provided. The results of the air lift yield test provided an estimated yield of 336 m^3/day for BH42 and 432 m^3/day for BH54, with a combined yield of 768 m^3/day. Based on this, it was estimated that four production boreholes (with a larger radius of 150 mm compared to the 100 mm radius test bores) could yield up to 1,540 m^3/day. As noted, based on our communications with the client, the proposed demand has reduced to 1000 m^3/day. This information was used in Stantec's assessment to calculate the drawdown effects.

The interpreted transmissivity from the air lift tests was 12 m^2/day. A separation distance of 300 m between the wells was recommended based on this.

A storativity of 7 x 10^{-4} was applied in the report based on a bulk average storativity data from the Franklin deep confined Waitematā Sandstone Aquifer. These values of transmissivity and storativity were used in Stantec's drawdown calculations.

The report provided bore logs for BH54 and BH42. The bore log for BH42 shows approximately 30 m of confining materials (silts, clays and mudstone). The bore log for BH54 shows 10 m of confining material (clay). The aquifer underlying the confining material is described by the drillers as mudstone / sandstone. The Waitematā Sandstone Aquifer is also described by others (see Section 2.4) as being “interlayered sandstone and mudstone sequences, with groundwater flow being mostly horizontal through fractures and sandstone beds”.

Based on the bore logs from the wells onsite, have assumed that there is at least 10 m of silt, clay or mudstone overlying the screened zone, confining the aquifer. Based on the literature, a conservative value for the permeability of these layers is 0.01 m/day.

There is limited information available regarding the location and extent of the fracture network within the Waitematā Sandstone Aquifer at the site. The nature of fractured aquifers means that the actual transmissivity, yield, and drawdown could vary greatly depending on the fracture system beneath the site.

4 Analytical Modelling

4.1 Drawdown Impacts

There is little to no information on how extensive the fracture network within the area is or the direction of the fracturing. For the purpose of modelling drawdown impacts we have used the Theis function to calculate drawdown vs time and drawdown vs distance for radial flow (under confined conditions).

We have modelled two scenarios, described as follows:

Scenario 1: Four bores with a combined pumping rate of 1000 m^3/day (as proposed by the client). Although in reality these bores will be spread out, we have modelled the groundwater take as being pumped from one point. This is to assess the combined take impacts on other users within a 1 km radius of the site boundary.

Scenario 2: One individual bore pumping 500 m^3/day. This is to review the potential interference between the two bores onsite, which are located approximately 300 m apart. This is a conservative calculation given the total take will be split between four evenly spaced bores but does not consider the impact of cumulative drawdown on the bore.

4.1.1 Model Inputs

The data inputs used in our drawdown calculations are based on investigations undertaken by a third party, as discussed in Section 3. Stantec have not undertaken any additional testing. However, based on a review of technical information supplied, we considered that the hydraulic properties presented are reasonable for the type of aquifer (confined). Table 2 summarises the input data we have used in our drawdown calculations. The full model inputs and outputs are provided in Appendix C.

Table 2 Summary of aquifer properties used in drawdown calculations

Scenario	**Pumping rate Q (L/s)**	**Transmissivity (T) [m^2/d]**	**Storativity (S)**	**Origin of data**
Scenario 1	11.5 (1000 m^3/d)	12	0.0007	Water Take and Supply Plan for the Green Steel Project: Groundwater, Surface Water and Harvesting Rainfall Runoff report
Scenario 2	5.75 (500 m^3/d)			

4.1.2 Model Outputs

The results of the drawdown calculations for each scenario are summarised below in Table 3.

Table 3 Summary of drawdown results

	Drawdown (m)			
	Scenario 1		**Scenario 2**	
Distance (m)	1 Day	1 Week	1 Day	1 Week
100	9.8	21.8	5.0	11.0
300	0.9	8.4	0.4	4.2
1000	0.0	0.3	0.0	0.1

Results of continuous pumping with time are considered conservative given the type of calculation used does not consider recharge.

4.2 Stream Depletion

The potential stream depletion impacts on the Waipapa Stream were assessed using the Hunt (2003) analytical equation. This analysis assesses stream depletion for an aquifer with a confining layer. For the purposes of our analysis we have assumed that the confining layer is 10 m based on the bore logs provided. The model inputs and outputs are provided below.

4.2.1 Model Inputs

The inputs to the stream depletion calculation are summarised below in Table 4. The full model input and outputs are provided in Appendix D.

Table 4 Stream depletion model inputs

	Pumped aquifer	**Aquitard**	**Streambed**	**Well**	**Origin of information**
Transmissivity (m^2/d)	12	N/A	N/A	N/A	Water Take and Supply Plan for the Green Steel Project: Groundwater, Surface Water and Harvesting Rainfall Runoff report
Storativity / specific yield	0.0007	0.01	N/A	N/A	
Hydraulic conductivity (m/d)	N/A	0.01	0.1	N/A	Wider literature
Pumping rate (L/s)	N/A	N/A	N/A	11	Water Take and Supply Plan for the Green Steel Project: Groundwater, Surface Water and Harvesting Rainfall Runoff report
Separation distance (m)	N/A	N/A	N/A	220	

4.2.2 Model Outputs

The outputs of the stream depletion analysis show that after one day, only 1% of the daily take will be from the Waipapa Stream. After seven days, only 3% of the daily take will be from the Waipapa Stream. This calculation is overly conservative as it is unlikely that the bores would be pumped at full capacity for a week or longer and the calculation does not consider recharge. It is also noted that for modelling purposes, the assessment conservatively assumes a pumping rate of 1000 m^3/day from one borehole (closest to the stream). In reality, it is proposed that four boreholes will supply the pumping rate, which will decrease the stream depletion impact as the boreholes will be spread out. Therefore, the results show that the stream depletion impacts will be insignificant. The results are summarised in Table 5 and provided in full in Appendix D.

Table 5 Summary of stream depletion model outputs

Time (days)	Stream depletion	Stream depletion (L/s)
1	1%	0.1
7	3%	0.3

5 Assessment of Environmental Effects

The nearest third-party bore (58202) is approximately 1 km from the closest onsite borehole (BH54). As shown in Table 3, after one day of continuous pumping the drawdown impact at 1000 m is 0.0 m. After one week of continuous pumping, the drawdown effect is 0.3 m. The results of the drawdown calculations show that there is minimal impact on nearby boreholes due to the proposed pumping.

The results of Scenario 2 show that after one day of continuous pumping the drawdown impacts on each of the pumping wells due to interference is 0.4 m (Table 3). After one week of continuous pumping, the drawdown is 4.2 m. The drawdown impact on each of the pumping wells due to interference is minimal considering available drawdown in the bore.

The nearest surface water body is the Waipapa Stream, which is situated along the western boundary of the site and 220 m from the nearest onsite borehole. The results of the stream depletion assessment show that the effects will be insignificant. The Waikato River is 3.2 km from the site boundary, and it is unlikely that there will be any drawdown impacts due to the proposed pumping. There are no other surface water bodies or GDEs within the vicinity of the site (Section 2.6).

Therefore, the calculations show that the impacts of the proposed take of 1000 m^3/day on other groundwater users, nearby surface water bodies and GDEs are not significant.

6 Conclusion

A hydrogeological AEE has been completed for National Green Steel Limited, for a proposed take of 1000 m^3/day from the Waitematā Sandstone Aquifer. The assessment included a review of the groundwater investigations undertaken by Earthtech Consulting, groundwater well information held by Waikato Regional Council and technical reports providing general information on the Waitematā Sandstone Aquifer.

Four groundwater wells within a 1 km radius of the project site were identified. The Waipapa Stream was identified near the border of the site. No wetlands or groundwater dependent ecosystems were identified.

Drawdown vs distance and drawdown vs time calculations were undertaken using the Theis function. The results show that continuous pumping for one week would have negligible drawdown effects on the nearby bores. Drawdown at the nearest site bore (300 m from the modelled pumped borehole) after one week of continuous pumping would be 4.2 m. Given the available drawdown in the onsite bores and the conservative nature of the calculations (do not consider recharge) the well intererence is not considered significant. Therefore, based on our drawdown calculations, the impacts on other users and onsite well interference from the proposed pumping are not significant.

Stream depletion analysis was undertaken using Hunt (2003) to assess the potential impacts on the nearby Waipapa Stream. Based on this analysis, the impacts on the nearby Waipapa Stream from the proposed pumping rate will not be significant (only 3% of the daily take is from the Waipapa Stream after one week of continuous pumping).

We recommend further onsite testing to better understand sustainable take rates and recharge. Testing should consist of a step test followed by a constant rate pumping test at the maximum sustainable pumping rate for three days or greater.

Yours Sincerely,

Stantec New Zealand

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Appendix A NZGD Bore log

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Fax 64 7 856 2873

Borehole No: 1

Project Name: Hampton Downs Slumping
Client: New Zealand Transport Agency
Location: SH1 RP 486/9.3 Northbound Shoulder
Project No. 2-31560.AS **Lab Ref.** 10/949/001

Co-ordinates: N645861.895, E328969.688
Grid: Datum-NZ Geodetic 1949 / Circuit-Mt Eden 1949
Elevation: 24.411m **Datum:** Ellipsoidal Heights
Inclination: Vertical **Azimuth:** N/A

Depth	Drilling Method	Casing	Description	Graphic Log	Depth/Elev	Type	Recovery	Vane Test kPa (0 20 60 100) / SPT N (0 10 30 50)	Additional Lab Tests/Notes	Piezometer Installation
			Ground Surface							
0	HQ, Triple Tube, Wireline Rotary Coring (Castle Bit)	Casing to 3.0m at 3.5m Depth	**Sandy GRAVEL** Greyish brown sandy GRAVEL. "Loose to medium dense", wet, non plastic, well graded. Gravel is fine to coarse, angular, slightly weathered.		0.00				Total water used for hole approx 850L	
			SAND Brown fine to medium SAND, minor fine gravel. "Loose to medium dense", wet, non plastic, poorly graded.		0.35					
1			**Silty CLAY** Yellowish white silty CLAY, some fine sand. Firm to stiff, wet, moderately plastic.		0.65	HQ	61		Lab Test (0.65-1.5m): LL=75, PL=29, PI=46, Nat WC=37.8%	
								>100	SV: 101kPa	
			Sandy SILT Greyish brown fine sandy SILT, some clay. Stiff, wet, slightly plastic.		1.60	SPT	53	3	2//1/0/1/1	
2			2.00m - Firm.							
			2.30m - Stiff. 2.40m - Yellowish brown, grey mottled, minor clay.			HQ	105			
								>100	SV: 130/30kPa	
3			**SILT** Brown, orange, grey mottled SILT, some clay & fine sand. Stiff, wet, slightly to moderately plastic.		2.90	SPT	96	6	2//1/1/2/2	
									Lab Test (3.0-3.6m): LL=55, PL=29, PI=26, Nat WC=40.0%	
4						HQ	90			
			Sandy SILT Yellowish brown, pink and white mottled fine sandy SILT, trace clay. Stiff, moist to wet, slightly plastic.		4.15				SV: Refusal	
						PT	70			
5						SPT	87	15	3//2/4/4/5	
						HQ	87			
6			**SILT** Yellowish brown, pink and white mottled SILT, some fine sand, minor clay. Stiff, moist to wet, slightly plastic.		5.80	SPT	100	14	2//2/2/4/6	
						HQ	100			
7			7.15m & 7.35m - Very thin bedding layers of brown SILT, minor fine sand, trace wood.							
						SPT	71	20	3//4/3/6/7	
8						HQ	91			
9						SPT	67	2	3//2/2/3/5	
			SILT Light brownish white, orange mottled SILT, some fine sand. Soft to firm, wet, slightly plastic. 9.90m - Brown, minor clay.		9.40					
10						HQ	100			

Remarks:
SPT = Standard Penetration Test (Split Spoon)
PT = Thin Walled Push Tube
_____ = Boundary
- - - - - - - = Unknown boundary
SV = Shear Vane

Logged: G Tait **Date:** 11/11/10
Checked: S Amoore
Drill Rig: Perry's Tractor
Start Date: 11/11/10 **Finish Date:** 11/11/10
Scale: 1:50 Approximately

NZGD ID: 89084

Hamilton Laboratory
Private Bag 3057
Hamilton
New Zealand
Tel. 64 7 856 2870
Fax 64 7 856 2873

Borehole No: 1

Project Name: Hampton Downs Slumping
Client: New Zealand Transport Agency
Location: SH1 RP 486/9.3 Northbound Shoulder
Project No. 2-31560.AS Lab Ref. 10/949/001

Co-ordinates: N645861.895, E328969.688
Grid: Datum-NZ Geodetic 1949 / Circuit-Mt Eden 1949
Elevation: 24.411m Datum: Ellipsoidal Heights
Inclination: Vertical Azimuth: N/A

Depth	Drilling Method	Casing	Description	Graphic Log	Depth/Elev	Type	Recovery	Vane Test (Δ kPa Δ) 0 20 60 100 / SPT (■ N ■) 0 10 30 50	Additional Lab Tests/Notes	Piezometer Installation
11	HQ, Triple Tube, Wireline Rotary Coring (Castle Bit)		**Sandy SILT** Grey fine sandy SILT. Firm to stiff, wet, slightly plastic.		10.40	SPT	0	0	0//0/0/0/0	
						HQ	70			
12			**SILT** Brownish orange SILT, some fine sand, minor clay. Firm to stiff, wet, slightly plastic.		11.40	SPT	100	4	0//1/1/1/1	
			Clayey SILT Grey clayey SILT, minor fine sand. Soft to firm, wet, moderately plastic. 12.55m - Greyish brown, soft. 12.85m - Minor fine to medium sand.		12.40	HQ	84			
13						PT	175			
			SAND Grey fine SAND, some silt. Dense, wet, non plastic, poorly graded.		13.65	SPT	100	43	9//7/8/12/16	
14			**Sandy SILT** Grey fine sandy SILT. Hard, moist, slightly plastic.		14.17	HQ	100			
			Silty SAND Grey silty fine SAND. Dense, wet, nonplastic to slightly plastic, poorly graded. 14.80m - Thinly laminated extremely closely spaced silt bedding.		14.48	HQ	100			
15			**SAND** Grey fine SAND, minor silt. Very dense, wet, non plastic, uniformly graded.		15.12	SPT	100	>50	10//8/11/17/14 for 30mm Hole bridged @ 1.9m, unable to take water level.	
			End of Log		15.41					
16										
17										
18										
19										
20										

Remarks:

SPT = Standard Penetration Test (Split Spoon)
PT = Thin Walled Push Tube
_____ = Boundary
- - - - - - - = Unknown boundary
SV = Shear Vane

Logged: G Tait Date: 11/11/10
Checked: S Amoore
Drill Rig: Perry's Tractor
Start Date: 11/11/10 Finish Date: 11/11/10
Scale: 1:50 Approximately

NZGD ID: 89084

Hampton Downs Slumping: SH1 RP 486/9.3

Project No : 2-31560.AS
Lab Ref No : 10/949/001

Core Photos

BH: 1

Northbound Shoulder

Pg 1 of 2

NZGD ID: 89084

Hampton Downs Slumping: SH1 RP 486/9.3

Project No : 2-31560.AS
Lab Ref No : 10/949/001

Core Photos

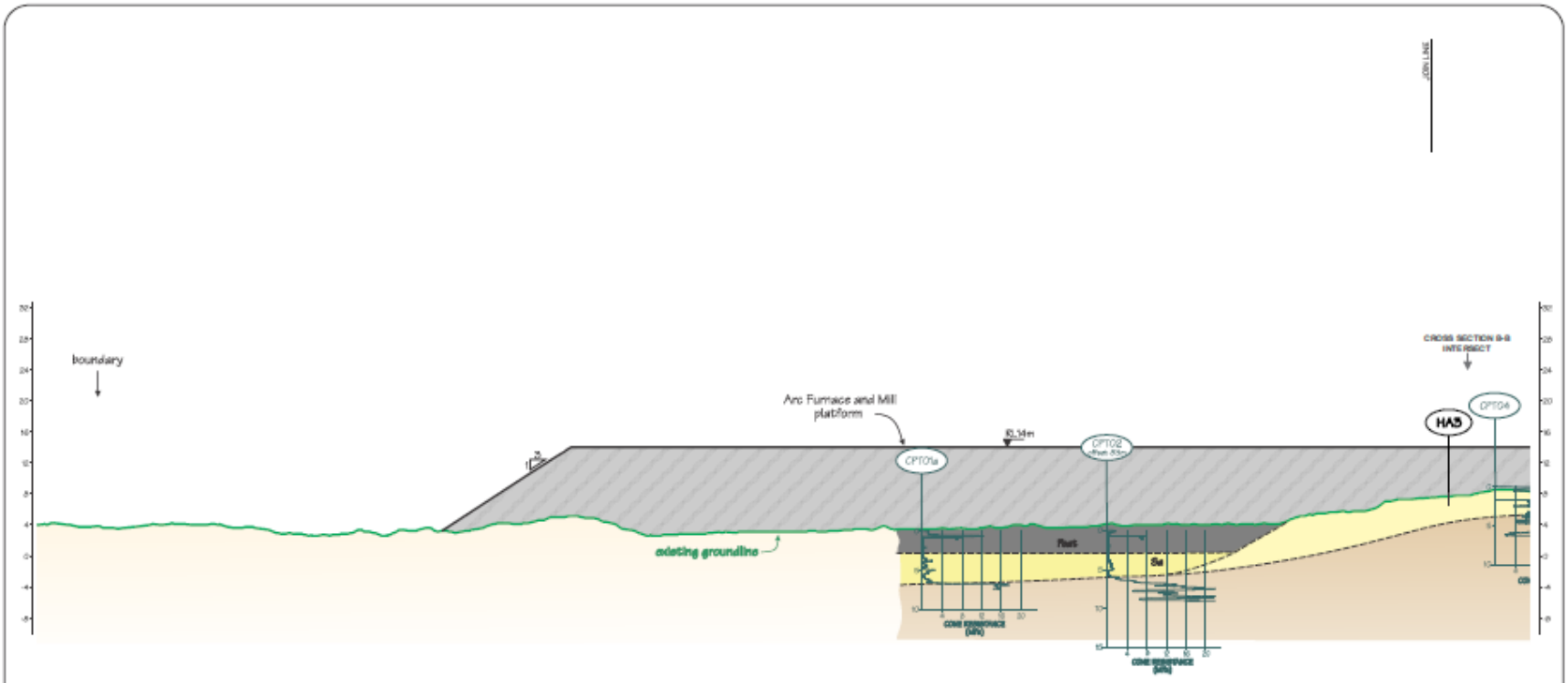
BH: 1

Northbound Shoulder

Pg 2 of 2

NZGD ID: 89084

Appendix B Geological cross sections



LEGEND

- Peat
- Se — Stream Alluvium
- Terrace Alluvium
- H-K Ash
- Am — Amokura Formation

Note:
1. Geology shown is as mapped by GNS and needs to be proven by site investigations, which include test pits and deep boreholes.
2. Groundline and design line from RavSurvey drawing DRSL371 Rev B, Long Section Line A, dated 10 Mar 24.

0m 10 20 30 40 50m
Scale 1:1000

FOR INFORMATION

Note: All drawings are to be approved (initialled) before final issue.

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Long Section A-A - Page 1 of 3

REV	DATE	AMENDMENTS	DRAWN BY	CHECKED	TRACED BY	APPROVED BY
A	28.04.26	FOR REPORT R2892.2REVA	L.S	A.N	S.S.W	
B	29.04.26	FOR REPORT R2892.2REVB	L.S	A.N	S.S.W	

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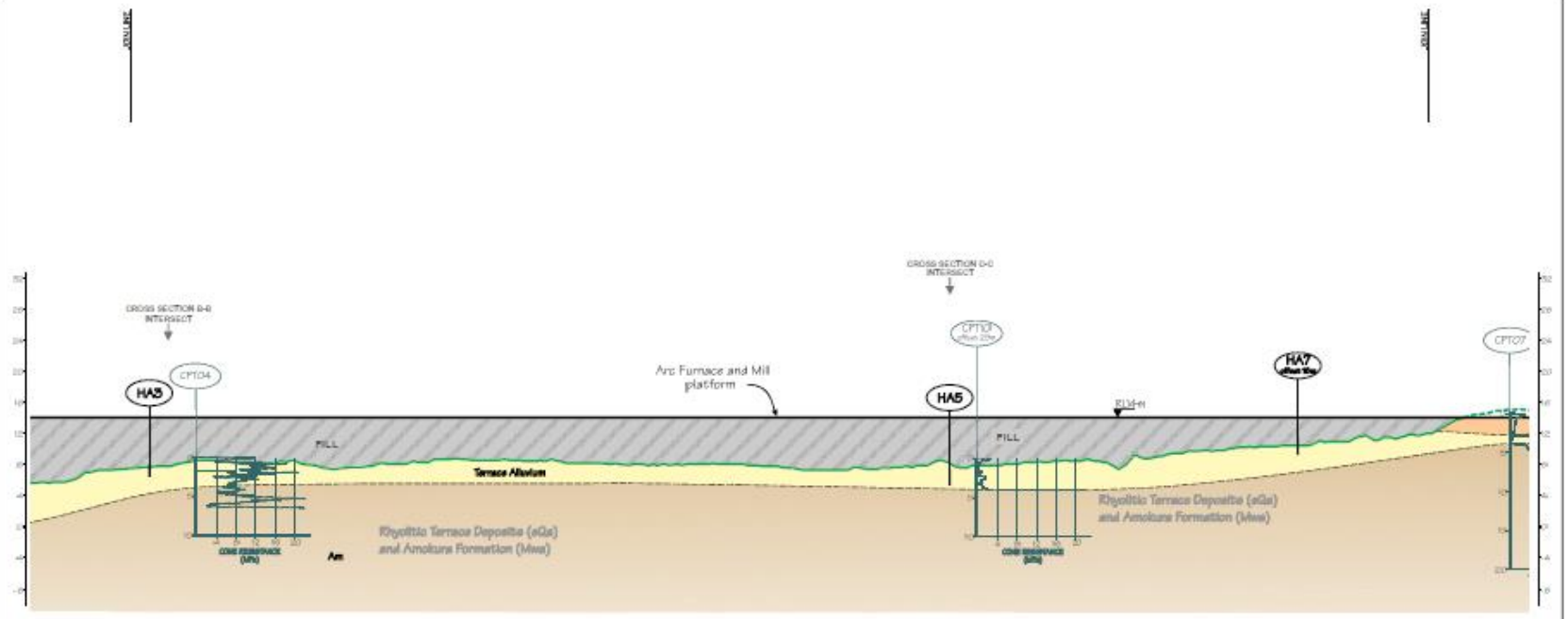

LEGEND

- Peat
- Sa — Stream Alluvium
- Terrace Alluvium
- H-K Ash
- Am — Amokura Formation

Notes:

1. Geology shown is as mapped by GNS and needs to be proven by site investigations, which include test pits and deep boreholes.
2. Groundline and design line from RavSurvey drawing DRSL371 Rev B, Long Section Line A, dated 10 Mar 24.

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Scale 1:1000

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Long Section A-A - Page 2 of 3

REV	DATE	AMENDMENTS	DRAWN BY	CHECKED	READY BY	APPROVED BY
A	26-04-24	FOR REPORT RAWD 2 REV A	LS	AR	S.BW	
B	29-04-24	FOR REPORT RAWD 2 REV B	LS	AR	S.BW	

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REF: 4392

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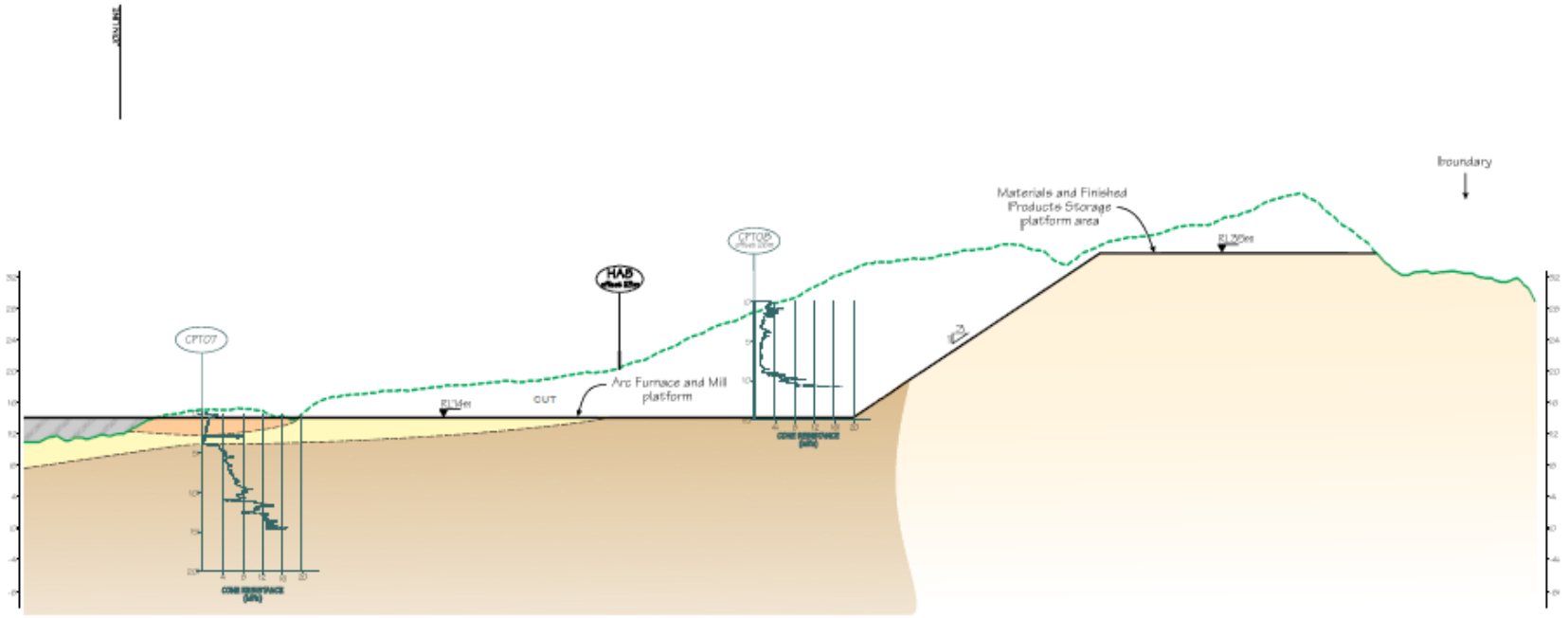

LEGEND

- Peat
- Qa — Stream Alluvium
- Terrace Alluvium
- H-K Ash
- Am — Amokura Formation

Notes:

1. Geology shown is as mapped by GNS and needs to be proven by site investigations, which include test pits and deep boreholes.
2. Groundline and design line from RavSurvey drawing DRSL371 Rev B, Long Section Line A, dated 10 Mar 24.

0m 10 20 30 40 50m
Scale 1:1000

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Long Section A-A - Page 3 of 3

REV	DATE	AMENDMENT DETAILS	DRAWN BY	CHECKED	PROVED BY	APPROVED BY
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B	29-05-24	FOR REPORT R4393-2 REV B	LS	KN	SJW	

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REF: 4392

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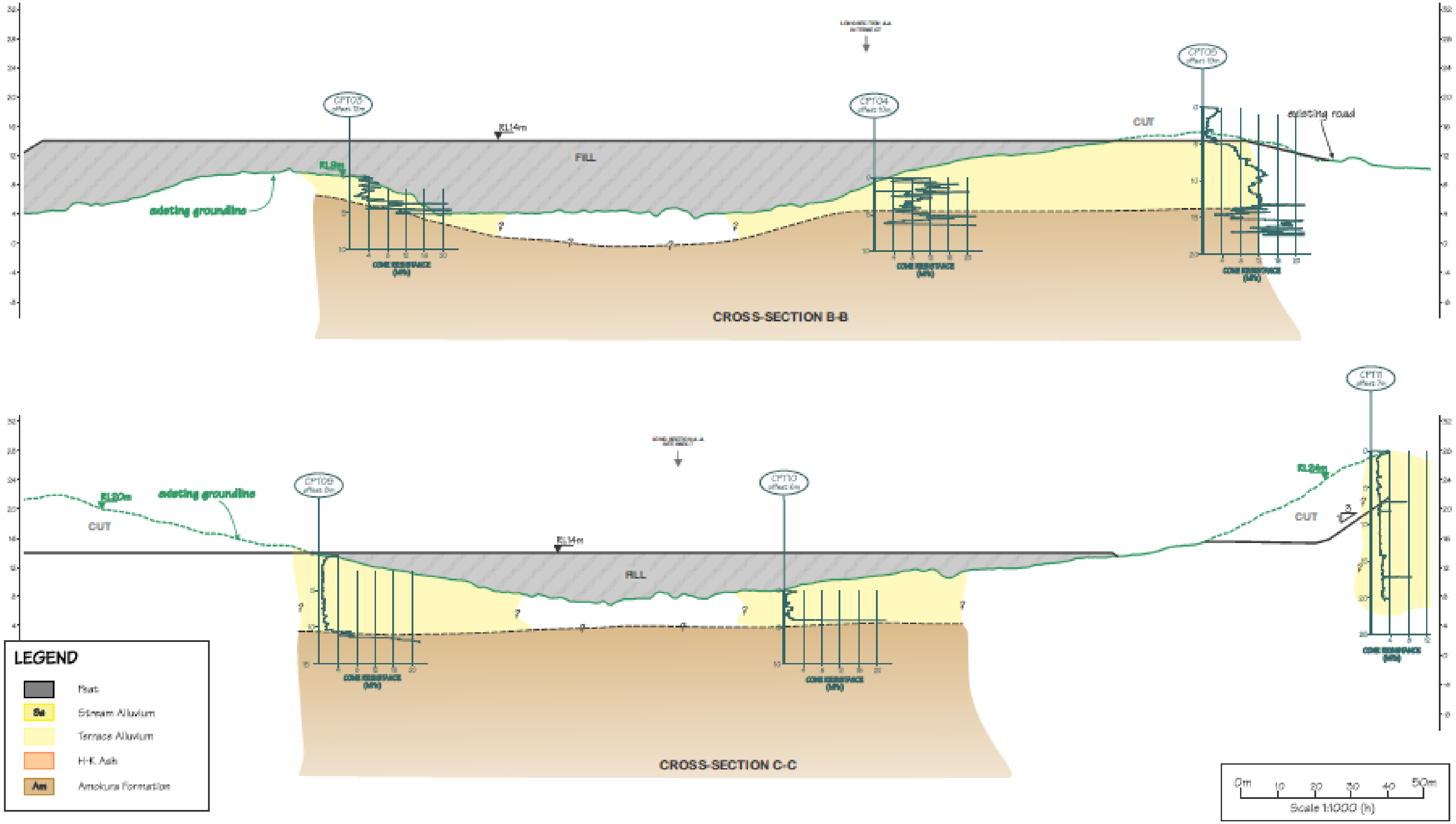
DRN: Bill Eden 2022

DATUM: AVG46



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Cross-Section B-B and C-C

REV	DATE	AMENDMENT/ISSUE	DRAWN BY	CHECKED	TRACED BY	APPROVED BY
A	24.04.24	FOR REPORT R4392-2 REV A	L.S	A.N	S.S.W	
B	26.04.24	FOR REPORT R4392-2 REV B	L.S	A.N	S.S.W	

DRAWING NO.: FIG. PD5.2

REF: 4392

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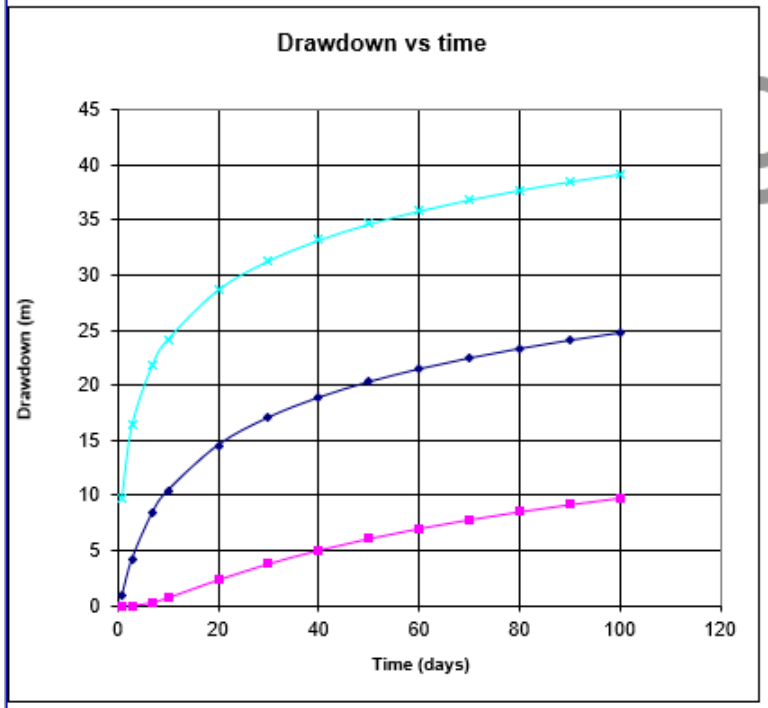
Appendix C Outputs of drawdown calculations

Scenario 1
Time-drawdown calculations using Theis equation

Aquifer parameters		
T	12	m2/d
S	0.0007	
B		
Pumping rate		
Q	11.5	l/s

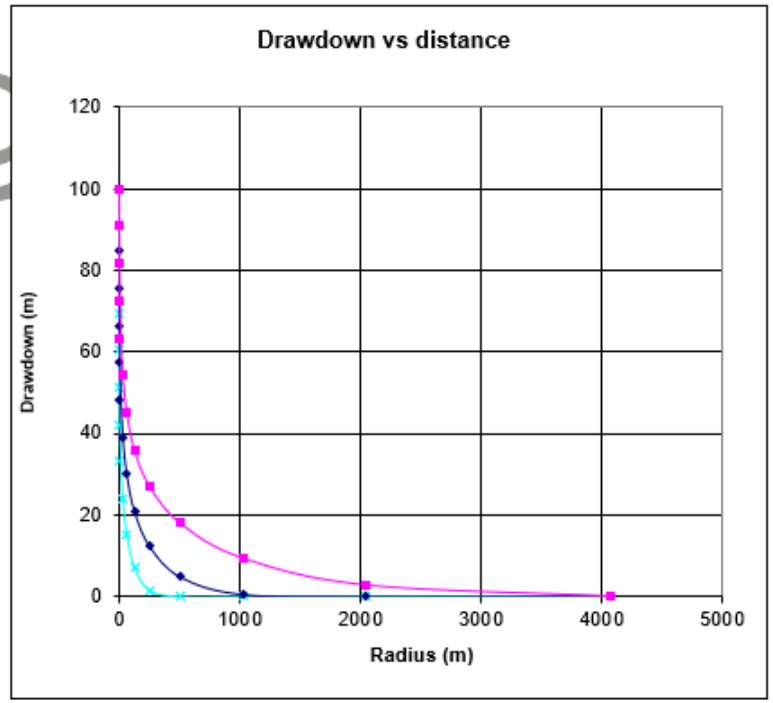
Radius (m)	100	300	1000
Time (days)	Drawdown (m)	Drawdown (m)	Drawdown (m)
1	9.809	0.875	0.000
3	16.438	4.239	0.009
7	21.841	8.406	0.287
10	24.150	10.414	0.701
20	28.669	14.569	2.331
30	31.325	17.101	3.802
40	33.213	18.925	5.045
50	34.678	20.353	6.106
60	35.876	21.526	7.026
70	36.890	22.521	7.837
80	37.768	23.386	8.561
90	38.543	24.150	9.214
100	39.236	24.835	9.809



Scenario 1
Distance-drawdown calculations using Theis equation

Aquifer parameters		
T	12	m2/d
S	0.0007	
B		
Pumping rate		
Q	11.5	l/s

Time (days)	1	10	100
Radius (m)	Drawdown (m)	Drawdown (m)	Drawdown (m)
1	69.570	84.741	99.913
2	60.436	75.607	90.779
4	51.303	66.473	81.645
8	42.173	57.339	72.510
16	33.057	48.207	63.376
32	23.996	39.080	54.243
64	15.151	29.975	45.111
128	7.114	20.958	35.989
256	1.558	12.282	26.901
512	0.031	4.830	17.954
1024	-	0.631	9.540
2048	-	0.002	2.925
4096	-	-	0.176

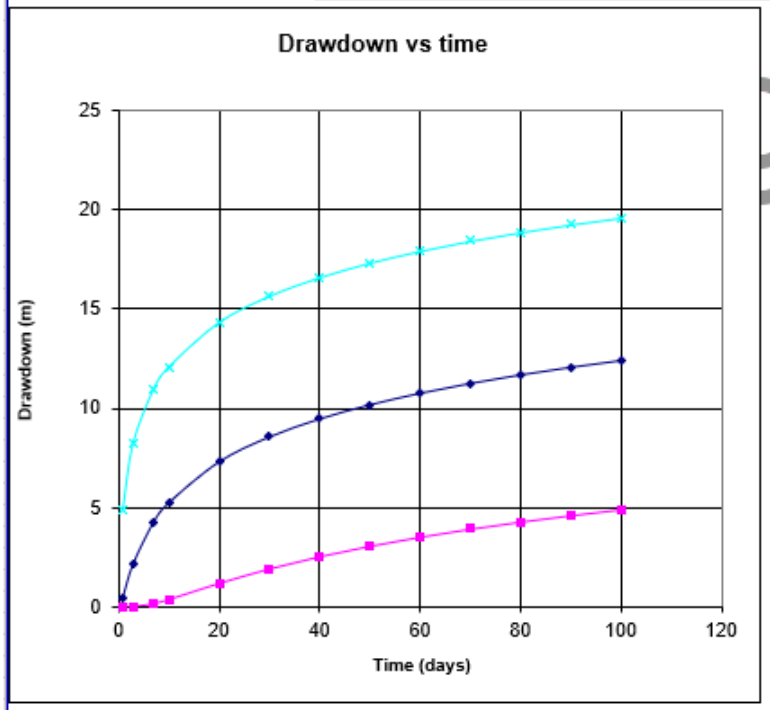


Scenario 2
Time-drawdown calculations using Theis equation

Aquifer parameters		
T	12	m2/d
S	0.0007	
B		

Pumping rate		
Q	5.75	l/s

Radius (m)	100	300	1000
Time (days)	Drawdown (m)	Drawdown (m)	Drawdown (m)
1	4.905	0.438	0.000
3	8.219	2.120	0.004
7	10.920	4.203	0.144
10	12.075	5.207	0.351
20	14.335	7.285	1.166
30	15.663	8.550	1.901
40	16.606	9.463	2.522
50	17.339	10.177	3.053
60	17.938	10.763	3.513
70	18.445	11.261	3.918
80	18.884	11.693	4.280
90	19.271	12.075	4.607
100	19.618	12.417	4.905

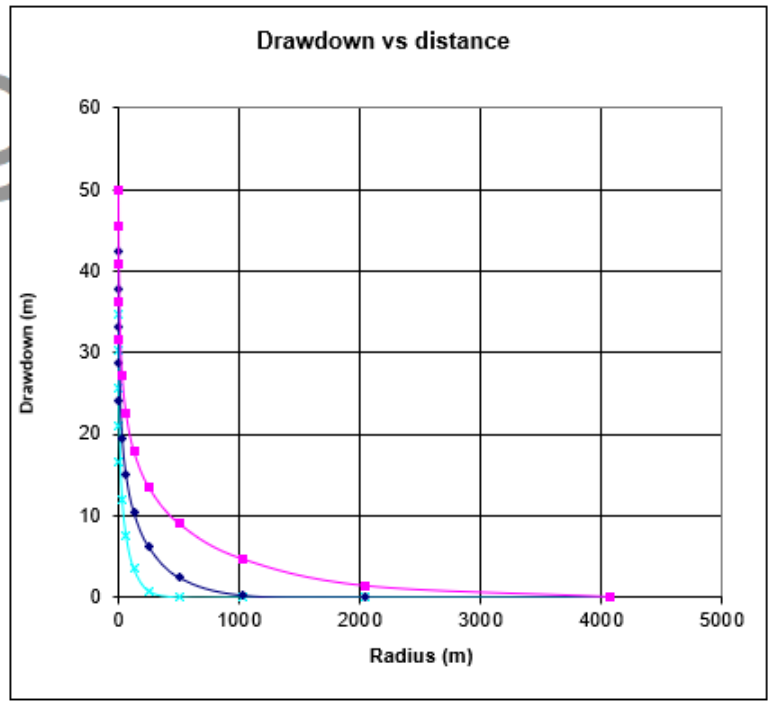


Scenario 2
Distance-drawdown calculations using Theis equation

Aquifer parameters		
T	12	m2/d
S	0.0007	
B		

Pumping rate		
Q	5.75	l/s

Time (days)	1	10	100
Radius (m)	Drawdown (m)	Drawdown (m)	Drawdown (m)
1	34.785	42.371	49.957
2	30.218	37.804	45.389
4	25.651	33.236	40.822
8	21.086	28.670	36.255
16	16.528	24.103	31.688
32	11.998	19.540	27.121
64	7.576	14.987	22.556
128	3.557	10.479	17.994
256	0.779	6.141	13.451
512	0.015	2.415	8.977
1024	-	0.316	4.770
2048	-	0.001	1.462
4096	-	-	0.088



Appendix D Inputs and outputs of stream depletion calculations

Stantec

Memo

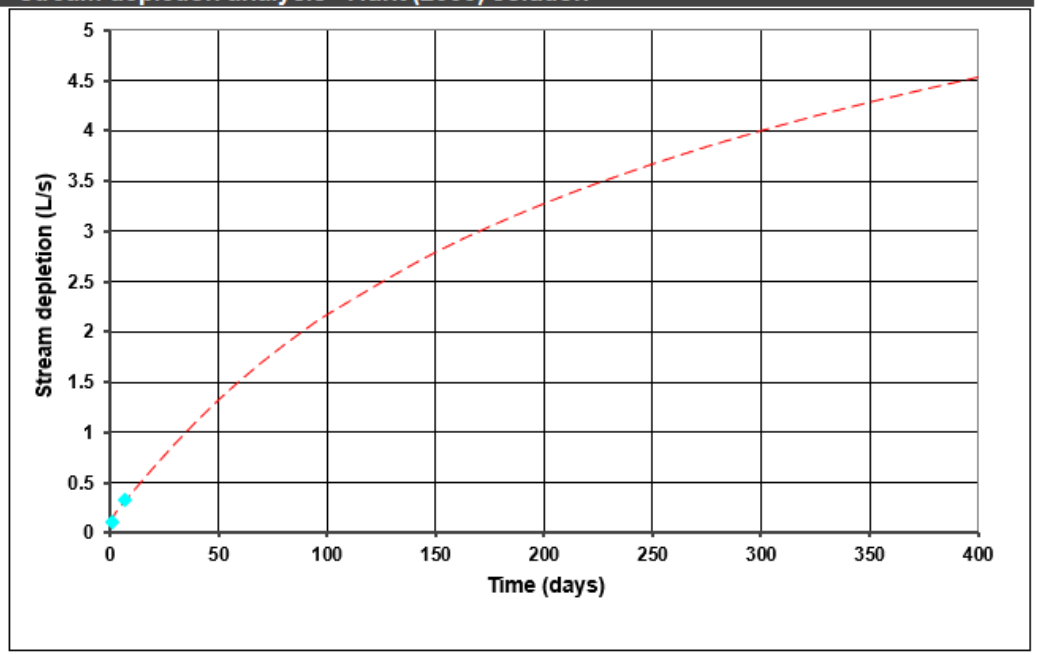
Stream depletion analysis - Hunt (2003) solution

Pumped aquifer		
Transmissivity (T)	12	(m^2/d)
Storage coefficient (S)	0.0007	-

Aquitard		
Hydraulic conductivity (K')	0.01	(m/d)
Thickness (B')	10	(m)
K'/B'	0.001	(d^{-1})
Specific yield (S_y)	0.01	-

Streambed		
Hydraulic conductivity (K'')	0.1	(m/d)
Thickness (B'')	9.5	(m)
Width (W)	3	(m)
Stream bed conductance (λ)	0.0315789	(m/d)

Well		
Pumping rate (Q)	11	(L/s)
Separation distance (L)	220	(m)



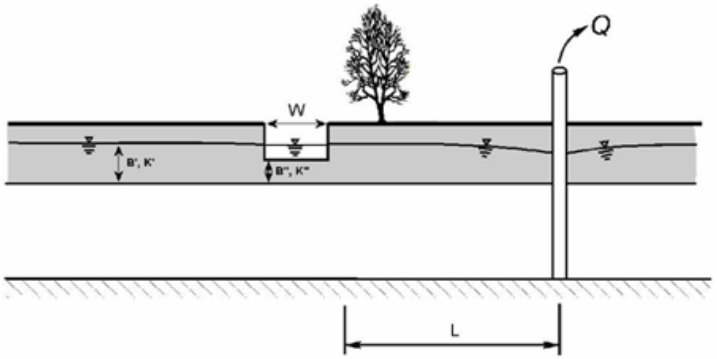
Time (days)	Depletion Rate (L/s)
1.0	0.1
2.0	0.2
3.0	0.2
4.0	0.3
5.0	0.3
6.0	0.3
7.0	0.3
8.0	0.4
9.0	0.4
10.0	0.4
20.0	0.7
30.0	0.9
40.0	1.1
50.0	1.3
60.0	1.5
70.0	1.7
80.0	1.9
90.0	2.0
100.0	2.2
150.0	2.8
200.0	3.3
250.0	3.7
300.0	4.0
350.0	4.3
400.0	4.5

Stream depletion after

Time (days)	q (L/s)	%
1	0	1%
7	0	3%
	0	0%
	0	0%

Only the values in shaded cells can be updated - all other cells are dependent on those input values.

Setting K'/B' to zreo gives Hunt 1999 solution



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APPENDIX 2

National Green Steel
c/o Shearer Consulting

Attention: Craig Shearer
craig@craigshearer.co.nz

13 May 2025 WWLA1339

Dear Craig,

Resource Consent Application 61 Hampton Downs Road, Hampton Downs (National Green Steel) – Response to Further Information Request

This letter provides a response to your email dated 28 April 2025 which set out requests for further information pursuant to section 92(1) of the Resource Management Act 1991 (RMA) from Waikato Regional Council. The requests are presented in *blue* italics, followed by our responses.

1. *Overall, I consider that the report appropriately identifies areas of concern that potentially were subject to HAIL activities based on historic information review. However, it is considered that the sampling investigations to date have not appropriately delineated the potential contamination extent and therefore the report is not considered to have been completed in general accordance with MfE CLMGs #1 and #5. Please see my comments and reasoning below.*

Please refer to WWLA's responses to specific questions below.

2. *Firstly, it is considered that the Asbestos/ACM investigation undertaken in accordance MfE CLMG/BRANZ and I agree that the works can be undertaken under PA if all ACM impacted soils are removed from site as part of remedial works.*
However, as proposed in the conclusions (Section 7) of the report, I disagree with the conclusion that no WRC consents will be required for contaminated land matters. If encapsulation of this material is undertaken as proposed in in this section as a remedial option, this would require a consent under the WRP 5.3.4.7. Remediation of contaminated land can only be undertaken under the PA rule if clause b. is met 'No contaminants from the remediation of the contaminated land shall be discharged into water or onto land unless discharged to a landfill authorised in Section 5.2.7.'.

The statement in Section 7 recommending no WRP contamination-related consent is in the context that consent under the NESCS[1] is being sought. The contamination identified is asbestos, and this is not typically considered an environmental contaminant, so is best addressed via the NESCS (which deals with human health effects) rather than the WRP (which deals with environmental effects). The Site Management Plan (SMP) includes appropriate controls to mitigate potential effects on both health and the environment (discharges of sediment) so consent under the WRP would not provide any additional benefit in terms of the controls required at the earthworks stage. We also note the following:

- While encapsulation has been presented as a potential option to provide for flexibility in design, we consider that given the size of the proposed facility, limited extent of contamination and the ease of soil disposal to adjacent Hampton Downs Landfill, it is highly unlikely to occur.
- If encapsulation is proposed, we will review the consent requirements to determine if a discharge is likely and provide the appropriate long-term management plans. If consent is required, it will be sought separately from the current consent package.

[1] National Environmental Standards for Assessing and Managing Contaminants in Soil to Protect Human Health Regulations, 2011

3. *Composite sampling is not appropriate for investigating the HAIL activities of concern (A1. And A8.). There are activities that do not tend to result in homogenous contamination with an area of concern and often results in hotspots where the activity was predominantly undertaken with the AOI. By undertaking composite sampling, there is a risk that any hotspots present will be diluted/masked due to compositing process.*

We generally agree that composite sampling is typically not used for these activities. However, in this case there was no certainty with regard to the exact location that the activities were undertaken (or even if they were undertaken at all) so composite sampling was used to ensure coverage across the wider area in which the activities were potentially undertaken. As per CLMG5[2], sub-samples were collected at discrete locations so that if required, individual sub-samples could be tested to refine the areas impacted (refer **Figure 1** overpage). However, in the absence of any material detections of contaminants of interest it was not considered necessary to test the subsamples.

We consider that the sampling methods and results:

- Adequately confirm that neither use of agrichemicals (A1) nor livestock dip or spray race operations (A8) have resulted in gross contamination in the areas where these activities are most likely to have been undertaken.
- Even if composite sampling has resulted in dilution of small hotspots this is immaterial in the context of project of this large scale where topsoil and other unsuitables will likely be stripped for removal offsite.

4. *Although the report notes that sub-surface samples will be taken, only surface samples were collected and reported on. Field observations also note that sampling locations reached a depth of 0.5 m bgl. There is no additional evidence included in the report that observations were made at depth and visual/olfactory observations are not appropriate to rely upon for assessing whether contamination is present at depth for HM. (Acknowledging that OCPs were all non-detects in surface samples, it is unlikely that OCPs will be present at depth).*

A description of deeper soils is provided in Section 4.3 of the report, and as stated, there was no olfactory or visual evidence of contamination within any soils observed, including natural ground to 0.5 m.

Samples were collected at 0.3-0.4 m depth (top of natural ground) in all “A” locations shown on **Figure 1** below (except HA1 which could not be penetrated). These were held at the laboratory for further testing if the surface composite indicated contamination is present in topsoil. The low levels of contamination present in surface composite samples meant that it was not necessary to test the deeper samples. This decision is supported by following lines of evidence:

- In a similar manner to OCPs, the sources of heavy metals (HM) were all associated with surficial uses of the site, i.e. spills or leaks from storage of agrichemicals; and
- As noted above there was no olfactory or visual evidence of contamination within any soils.

5. *Additionally insufficient details have been provided for the sub-samples including specific locations, whether the composite was compiled by the laboratory.*

As stated in the report composite sampling was undertaken in accordance with CLMG5; the laboratory transcripts confirm that the composites were compiled by the laboratory. We acknowledge that the specific location of sub-samples was not identified in the report. Please find the locations shown on **Figure 1** (overpage).

[2] MfE, Contaminated Land Management Guideline 5: Site Investigation and Analysis of Soils.

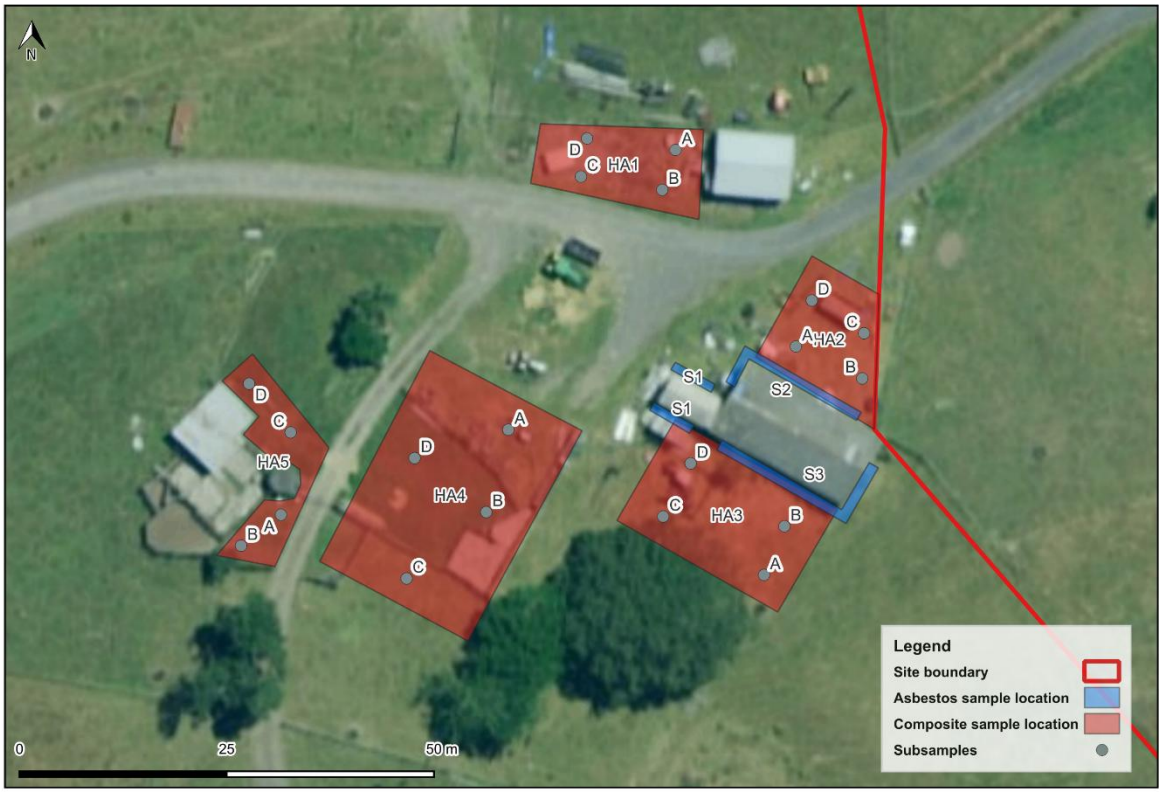

Figure 1. Subsample locations

SMP

6. *If encapsulation is proposed to be undertaken, delineation/validation sampling should be undertaken to confirm that all contaminated material is contained within the proposed cell and the 2-metre buffer remains appropriate.*

We agree that this can be undertaken should encapsulation be proposed, although this is highly unlikely and we have recommended that asbestos contamination be removed from site. A long-term management plan would be prepared to document the location of the material if it was to be retained. When the final management approach has been determined the SMP will be updated. We consider that this can be appropriately accommodated by a condition of consent.

Conclusion

We trust that there is now sufficient information available for you to continue processing the contamination aspects of the application. Please do not hesitate to contact Lauren Windross on 022 088 1201 if you require further clarification of any aspects of this letter.

Yours sincerely,

Shane Moore
Principal Contaminated Land Specialist | +64 27 445 7323
shane.moore@wwla.kiwi | www.wwla.kiwi

APPENDIX 3

4 June 2025

Vipan Garg
National Green Steel Limited
By email

Dear Vipan,

Black mudfish and fish survey at 61 Hampton Downs Road

Background

Awa Ecology have been contracted by National Steel Limited to undertake a fish survey, with a particular emphasis on the presence or absence of black mudfish (*Neochanna diversus*), at 61 Hampton Downs Road. Black mudfish are classified as At Risk – Declining under the New Zealand Threat Classification System[1]. There are several known records of black mudfish in the surrounding area, and the species is often associated with drainage habitats underlain by peat soils, similar to those present at the site.

Site description

Several shallow ephemeral watercourses are present on the site. The watercourses are generally between 30 - 60 cm wide and c.5-10 cm deep. Aquatic vegetation is common within the channel and is comprised of water celery (*Apium nodiflorum*), water purslane (*Ludwigia palustris*), reed sweet grass (*Glyceria maxima*), floating sweet grass (*G. declinata*), water pepper (*Persicaria hydropiper*), starwort (*Callitriche stagnalis*), creeping bent (*Agrostis stolonifera*) and lesser spearwort (*Ranunculus flammula*). Long green filamentous algae was also present.

Photos are available in Attachment 1.

Methods

A fish survey was undertaken in the main watercourse and targeted mudfish surveys were undertaken in the upper catchment and a side branch of the main watercourse (Figure 1). Nets and traps were set overnight on 3 June 2025. The fish survey in the main watercourse (Site 1) was conducted following standard methodology, which typically involves the deployment of six fyke nets and twelve Gee minnow traps over a 150-metre reach[2]. However, due to limited water depth, fyke nets could only be set in two suitable locations, immediately upstream and downstream of a culvert, where sufficient depth was available.

[1] Dunn, N. R., Allibone, R. M., Closs, G. P., Crow, S. K., David, B. O., Goodman, J. M., Griffiths, M., Jack, D. C., Ling, N., Waters, J. M., & Rolfe, J. M (2018). 'Conservation status of New Zealand freshwater fish, 2017', New Zealand Threat Classification Series 24, Department of Conservation, Wellington.

[2] Joy M., David B. & Lake M. 2013. New Zealand Freshwater Fish Sampling Protocols: Wadeable Rivers & Streams. The Ecology Group - Institute of Natural Resources, Massey University, Palmerston North 4442.

Sites 2 and 3 were surveyed using a modified method of the mudfish sampling methodology[3]. The method was modified so that it was in line with the proposed mudfish sampling methodology for the Rotokauri Catchment as follows:

- Trapping sites consisted of 100 m of channel length.
- Approximately 100m of channel between trapping sites.
- Ten fine mesh (1/8 inch) Gee minnow traps were set at each site. Traps were set evenly spaced where water levels allowed and were set partially submerged with an air gap.

Any fish captured were identified and indigenous fish were measured before being released back into the habitat from which they were captured. The watercourses onsite were ephemeral, and trapping was undertaken at this time of year when there was ample water in the channel. It should be noted that the ideal trapping time for mudfish is September to November when detection probabilities are the highest.

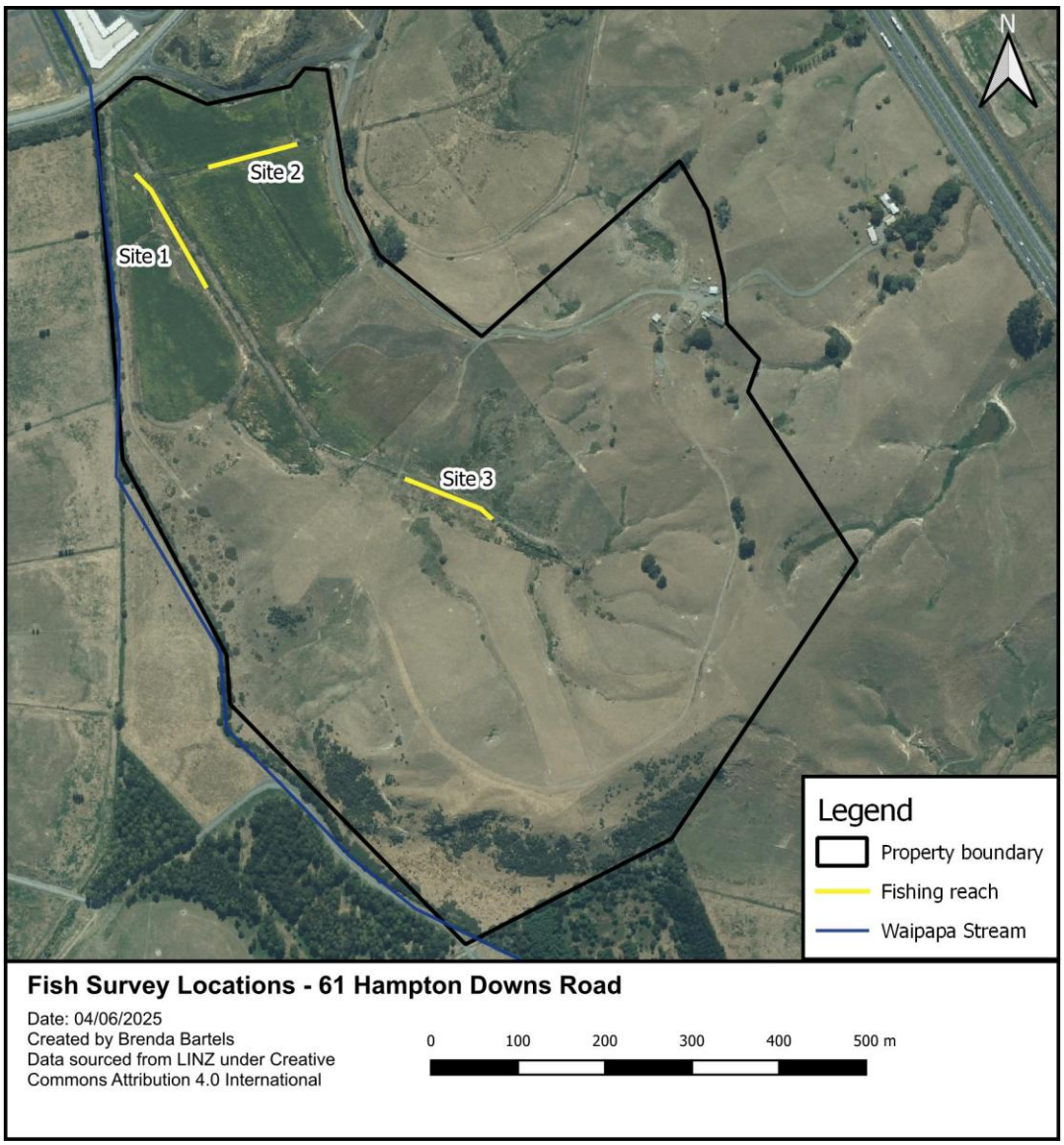

Figure 1: Fishing reaches at 61 Hampton Downs Road.

[3] Ling, N.; O'Brien, L.K.; Miller, R.; Lake, M. 2013: A revised methodology to survey and monitor New Zealand mudfish. Department of Conservation, Wellington (unpublished).

Results

Over 200 *Gambusia affinis* and a single shortfin eel (*Anguilla australis*) measuring 530 mm in length, were captured in the nets and traps deployed overnight at 61 Hampton Downs Road (raw data in Attachment 2). Gambusia is an introduced species, and shortfin eels are a common indigenous species. No black mudfish (*Neochanna diversus*) were detected. Given the site's connectivity to the Waipapa Stream and the presence of gambusia, which are known to compete with mudfish, and eels, which can prey on mudfish, it is unlikely that black mudfish are present at this location.

Table 1: Results of the fish and mudfish surveys at 61 Hampton Downs Road.

Species	Scientific name	Site 1	Site 2	Site 3
Gambusia	*Gambusia affinis*	71	120	198
Shortfin eel	*Anguilla australis*	1		

Summary

Awa Ecology was contracted by National Steel Limited to undertake a fish survey, with a particular emphasis on the presence or absence of black mudfish at 61 Hampton Downs Road. Nets and traps were set overnight on June 3, 2025, and gambusia and a single shortfin eel were captured. These species are known to compete with and prey on black mudfish, and it is unlikely that black mudfish are present at this location.

The presence of shortfin eel, an indigenous species, indicates that fish recovery and relocation will be required before any in-channel works if water is present. Fish recovery and relocation may not be required if the watercourses are dry at the time of works, which is a possibility, as the watercourses are ephemeral.

Yours sincerely

Brenda Bartels
Senior Ecologist/Director
Awa Ecology

Attachment 1: Site Photos

Attachment 2: Raw fish results

Site	Net/trap	Species	Number	Length (mm)
1	GMT 1	No species	0	
1	GMT 2	No species	0	
1	GMT 3	Gambusia	4	
1	GMT 4	Gambusia	5	
1	GMT 5	Gambusia	3	
1	GMT 6	Gambusia	25	
1	GMT 7	Gambusia	1	
1	GMT 8	Gambusia	1	
1	GMT 9	No species	0	
1	GMT 10	Gambusia	4	
1	GMT 11	No species	0	
1	GMT 12	Gambusia	20	
1	Fyke 1	No species	0	
1	Fyke 2	Shortfin eel		530
1	Fyke 2	Gambusia	8	
2	GMT 1	Gambusia	9	
2	GMT 2	Gambusia	13	
2	GMT 3	Gambusia	5	
2	GMT 4	No species	0	
2	GMT 5	Gambusia	3	
2	GMT 6	Gambusia	29	
2	GMT 7	Gambusia	9	
2	GMT 8	Gambusia	12	
2	GMT 9	Gambusia	15	
2	GMT 10	Gambusia	25	
3	GMT 1	Gambusia	35	
3	GMT 2	Gambusia	45	
3	GMT 3	Gambusia	6	
3	GMT 4	Gambusia	60	
3	GMT 5	Gambusia	2	
3	GMT 6	Gambusia	20	
3	GMT 7	Gambusia	30	
3	GMT 8	No species	0	
3	GMT 9	No species	0	
3	GMT 10	No species	0	