IN THE MATTER **of the Resource Management Act 1991(RMA)**

AND

IN THE MATTER **Resource Consent Applications by Northport Ltd – Port Expansion Project at Marsden Point.**
Application Numbers:
Whangarei District Council: LU2200107
Northland Regional Council: APP.040976.01.01

JOINT WITNESS STATEMENT (JWS) IN RELATION TO:

STORMWATER, GROUNDWATER and PLANNING

6 May 2024

Expert Conferencing Held on: 12 April & 6 May 2024

Venue: Online

Independent Facilitator: Marlene Oliver

Admin Support: Emma Cairncross

1 Attendance:

1.1 The list of participants is included in the schedule at the end of this Statement.

1.2 Greg Blomfield, Terminal Facilities Manager for Northport, is an employee of Northport and as such is not an independent expert. Greg confirmed that he has knowledge of the site, in particular relating to stormwater management, and is attending expert conferencing to assist the experts as required. Both parties represented at the expert conferencing have confirmed their agreement with Greg's participation in the conferencing.

2 Basis of Attendance and Environment Court Practice Note 2023

2.1 All participants agree to the following:

(a) The Environment Court Practice Note 2023 provides relevant guidance and protocols for the expert conferencing session;
(b) They will comply with the relevant provisions of the Environment Court Practice Note 2023;
(c) They will make themselves available to appear before the Panel;

(d) This statement is to be filed with the Panel and posted on the Council's website.

3 Matters considered at Conferencing – Agenda and Outcomes

3.1 Response to Hearing Panel Direction 17

INTRODUCTORY NOTE: The answers to various points raised by the Panel are informed by material prepared by Jon Williamson. Refer to Attachment 1 of this JWS.

1. The Stormwater Discharge Review 2015 is included in Appendix 29 of the application. It does not appear to have been referred to in the Applicant's stormwater evidence and was not reviewed by the Councils' stormwater expert. Mr Poynter is an author to this SDR 2015 report. In the Technical Memorandum, Mr Poynter comments that the "….report is somewhat dated".

Hearing Panel's Questions

a. If the SDR 2015 report is outdated, to what extent can it be relied upon, or how relevant is it, in assessing the effects of stormwater for these applications?

Mr Blackburn's position:

1a.1 The 2015 SDR report is considered to have been superseded by the Stormwater Compliance Monitoring Report prepared by 4sight Consulting dated June 2023 which was reviewed and approved for release by Mark Poynter (in relation to discharge quality and contaminant loading), and the Hawthorn Geddes hydrologic assessment study undertaken in 2021/22 (in relation to the verified hydrologic performance of the Northport drainage system). These two latter reports reflect the actual performance condition of the Northport stormwater system based on more recent comprehensive monitoring of both stormwater discharge quality, rainfall and discharge pump hours in conjunction with actual water levels within the stormwater basin (used for calibration of the hydrologic model).

1a.2 Further aspects that have potentially led to Mr Poynter's comment include that the 2015 report identified that a proportion of the stormwater management basin had developed a form of wetland biomass, which is known now to not be in place (and is not relied upon for stormwater treatment), and the port apron area has been increased since the data collation up to May 2015 by approximately 8.5ha.

1a.3 The 2015 report had relevance and was considered accurate at the time. Since 2015, the port operation has changed in scale (expanded). The 2023 report reflects the current operation of the report and is considered more accurate for the current time, hence greater weight should be given to the 2023 report. The 2015 report provides some useful contextual information.

b. What are, or is there any implications of the port being described as boat maintenance and port activities being High Risk Industrial or Trade Premises (as it is in the application), rather than low risk/low load as submitted by the Applicant's Counsel?

Mr Hood, Mr Mitchell and Mr Masefield are agreed that Rule C.6.4.6 is the applicable rule and that the activity meets the definition of a High Risk Industrial or Trade Premises.

They consider from a planning perspective that there are no implications of the Port being described as a 'High Risk Industrial or Trade Premises' beyond the discretionary activity status of the consent required under Rule C.6.4.6 (as opposed to the controlled status under Rule C.6.4.3).

The discretionary activity status enables consideration of all actual and potential effects from the discharge.

c. In relation to the above bullet point clarify the application(s) made, including in relation to Proposed Regional Plan Rule C.6.4.6?

Mr Hood, Mr Mitchell and Mr Masefield are agreed that:

- The stormwater discharge consent being sought under the current application is for discharges to land and water under Rule C.6.4.6. As covered above, this is the relevant rule because port activities are included in the definition of 'High Risk Industrial or Trade Premises.'
- Rule C.6.4.61 includes text that links this rule back to section 15(1) of the RMA for stormwater discharge to water or to land where it may enter water, and section 15(2A) for stormwater discharge onto or into land.
- Council's public notice and section 95 assessment articulated the reasons for consent for the proposal in terms of activities and the sections of the RMA, rather than specific rules of the plans.
- The most onerous regional consent activity status for the proposal has been identified as Discretionary. The activity status under Rule C.6.4.6 is Discretionary.

2. SDR 2015 identifies that the predicted discharge volumes were "very much below predicted volumes".

Hearing Panel's Question

a. Did this, or should it, trigger any consideration as to where the difference in volume between predicted vs actual might be going to and what effects may arise from this discharge?

Mr Blackburn has indicated the difference between predicted and actual values is simply due to the command surface area of the port increasing over time.

In part response to point 2a of the questions from the panel, set out below is the approximate development of port apron impervious extent over the period 2006-2020 which correlate to growth in runoff associated with the port apron, through the stormwater system as consented (noting that the current consent provides for a design impervious contributing catchment runoff from up to 60 hectares). The actual volume of apron runoff annually is directly related to the total annual rainfall at the site, which in conjunction with the extent and type of stored cargo products on the apron will have significant influence on the total runoff (and ultimate discharge) annual volume.

Month/Year	Impervious Area In Hectares*
5/2006	30.6 ha
11/2010	33.3 ha
12/2012	34.6 ha
11/2016	38.7 ha
8/2020	47.4 ha
Consented	60.0 ha

* Impervious areas approximated from Google Earth aerials

With respect to the component that is discharging to ground, Mr Blackburn considers that to be relatively consistent over time, and is discussed further in the answers below.

Mr Chang notes that through course of the conferencing, two key controlling factors were identified:

1) That Northport's stormwater catchment was being developed and increased over time in the period 2015 through to current size (hence changing volumetric runoff characteristics); and
2) That the hydrogeology experts Mr Williamson and Ms France agreed that the 'exfiltration rate' from the system is likely to be significantly lower than expressed in the 2015 report. The 'exfiltration rate', or the stated rate of loss of water to ground where it could enter the receiving environment outside of the control of the stormwater treatment system is also therefore significantly less. Further discussion is provided in responses to the other questions from the panel.

Mr Chang notes that effects that might arise from the discharge, as a result of the change in runoff volumes because of change in impervious catchment over time are likely as follows:

> In terms of water quantity, the primary receiving environment is the CMA, after management by the stormwater treatment system. There would be limited concern from a quantity perspective with increasing volumes over time through the system because the receptor is the sea; and the current consented envelope is up to 53.2 ha of impervious surface (and associated stormwater generated from it) (49.1ha is constructed), and the proposed application would add an additional 13.8ha (total of 67ha).

3. According to SDR 2015 the stormwater treatment system in 2015 included 2,000m of canal and 4ha of pond system. Information from the expansion application proposes a further 670m of canal to be added. The base of the canal, assumed to be unlined, is reported as 2.6m wide. This equates to an area open for infiltration of approximately 4.7ha, being 4ha from the pond and 0.7ha from the canal system. The applicant's stormwater model assumes an infiltration rate of 20mm/hr through the base of the pond and canal system. This equates to 0.48m/day. The infiltration information provided in SDR 2015, complemented by the Applicant's model infiltration rate information over the pond/canal area suggests volumes in the order of 22,000 cubic metres per day may be discharged to the ground and ground water.

Hearing Panel's Questions

a. What is the likely range of volumes to be discharged to ground based on the best estimated infiltration rate?

Refer to Mr Williamson's statement appended as Attachment 1.

Mr Williamson and Ms France agree that the canals are unlikely to provide significant annualised seepage to ground due to clogging. Any significant exfiltration from the system is likely to occur from Pond 1, which is directly connected to the groundwater system. Calculation performed by Mr Williamson indicated average daily exfiltration rates of approximately 400m^3 per day, noting that this value is likely to be higher during prolonged wet periods and less during drought events (head dependent).

b. For the purpose of assessment under Rule C.6.4.6 of the Proposed Regional Plan, is it appropriate to consider a volume of discharge of this potential magnitude as "ancillary" to the discharge to the CMA outfall?

c. What are the likely implications, or effects, of this discharge to ground/groundwater i.e. where will it most likely end up, and what effects may it generate?

Mr Blackburn confirms that the 20 mm/hr was used for the purpose of the calibration event and is not expected to be relied upon for continuous discharge. Mr Williamson and Ms France agree the system is unlikely to continuously discharge at 20 mm/hr.

Mr Williamson and Ms France agree that the volume of discharge to ground is small in comparison to the direct discharge to the harbour. Both agree that exfiltration from the pond will comprise a diffuse discharge to Blacksmith Creek. The environmental impact of the exfiltration to ground will have a lesser effect than the direct discharge because the groundwater will end up in the same receiving environment, but prior to reaching it will undergo further mechanical filtration via the sand media in the aquifer and dilution through mixing with the natural groundwater throughflow.

Mr Chang has been provided with a summary of the catchment characteristics (use of land on the Northport catchment) by Mr Blomfield. Mr Chang has reviewed the contaminant parameters analysed previously in stormwater, and confirmed they are appropriate indicators to analyse for. Therefore, existing (and proposed) monitoring parameters provide good context for water quality impacts on the receiving ground and groundwater receiving environment (before likely eventual discharge to the CMA).

Mr Chang notes the agreement between Mr Williamson and Ms France that exfiltration from the pond and canals should not be rolled up to a volume of 22,000m^3/day as a representation of longer-term losses to ground; but that total losses to ground from the pond are likely to be closer to 400 m^3/day on average (but will vary depending on groundwater levels, rainfall and pond levels, and tides) . When considering this updated discharge volume, then the water quality impacts on

groundwater before eventual dispersion to the CMA, are likely to be small in comparison with those exhibited in the direct discharge to the CMA via the diffuser.

4. SDR 2015 assesses the discharge of stormwater to the CMA against marine water quality criteria.

a. If the contaminants are discharging to a freshwater system via a groundwater pathway, how will the contaminant concentrations measure against freshwater criteria?

Mr Williamson, Mr Chang and Ms France agree that the eventual receiving environment is brackish and marine guidance criteria are appropriate to compare against in this instance. The short distance between the pond discharging to freshwater (groundwater) does not have any explicit receptors where it would be more appropriate to apply freshwater criteria for. Any small exfiltration from the canal does not have any freshwater receptors.

Mr Masefield and Mr Hood consider that the Proposed Regional Plan for Northland provisions (Policy D.4.1 and Objective F.1.2) give effect to the NPSFM provisions with respect to freshwater criteria and principles of Te Mana o te Wai. No additional assessment is required to address the NPSFM provisions.

b. Are any dissolved contaminants likely to have an adverse effect, including any cumulative adverse effect?

Mr Williamson considers the sand will filter suspended solids and peaty organic material within the sand will provide a carbon source to potentially reduce and bioremediate any contaminants. Biological activity within the aquifer is likely to mitigate against cumulative effects. The 2023 groundwater quality monitoring indicates very low concentrations of all the tested constituents.

As indicated in the response to question 3.c. of the Panel's questions, Mr Chang was provided with a summary of catchment characteristics by Mr Blomfield. In summary, Mr Chang understands from that meeting that the catchment for Northport generally manages (stores and transports) the following key cargo/activities:

- Logs, which forms the majority of land use at the port
- Containers
- Woodchip
- Coal
- Fertilisers
- Animal feed
- Vehicle washing/using
- Refuelling

The 2015 Stormwater Monitoring Report also provided a summary analysis of indicator contaminants arising from the stormwater at the site undertaken between 2003 and 2015. The analytes were Total Suspended Solids (TSS), Aluminium, Copper, Lead and Zinc. For the toxicants, it is not clear from the report whether analysis was undertaken for total or dissolved concentrations. A reference to monitoring of Total Resin Acids has also been provided within the stormwater system, although a fulsome summary of concentrations was not reported in the 2015 report.

Mr Chang is also aware of the Stormwater system sediment disposal monitoring report (2023) which summarises sediment analysis from within the stormwater treatment train managing Northport's

catchment. These were total enumerations for the following analytes: arsenic cadmium, chromium, copper, copper, lead, nickel, zinc and total petroleum hydrocarbons (TPH).

Finally, Mr Chang notes that the Northport Intertidal Ecology Report (2018) provides some contextual analysis of the certain macroinvertebrate species identified in the ecological study, and provides a relevant pollutant indicator. While he did not seek to review the detailed toxicological studies that would form the basis of making this determination, he notes that indicators identified have been Copper, Zinc, and Lead.

In summary, Mr Chang confirms that the analytes historically are likely to have provided a reasonable set of indicator parameters that would have provided reasonable oversight of likely environmental effects arising from the operation of the port and its stormwater discharges. Mr Chang agrees with Mr Williamson that the 2023 groundwater quality monitoring indicates very low concentrations of all the tested constituents.

5. Mr Williamson's report (12 February 2024) refers to a "skin effect" creating an effective barrier to infiltration within the canals. However, the canal maintenance regime includes the removal of the base of the canals and replacement with clean sand on an annual basis.

Hearing Panel's Questions

a. How will this maintenance activity affect the infiltration rates, in particular the capturing of dissolved contaminants?

Mr Williamson and Ms France agree that that the maintenance will have a transitional short term (weeks not months) effect on infiltration rates. During this time seepage is potentially greater than the majority of the time. During the maintenance event, a new sand layer is placed which provides a separation barrier which means the majority of the dissolved contaminants (other than those which flow into the pond) will bind to the sludge and fibrous materials, and hence not pass through the sand layers to the vadose (unsaturated) zone below.

6. Mr Williamson's report (12 February 2024) concludes that groundwater quality monitoring is not required. He reaches this conclusion, in part on the basis that the stormwater system has been functional for approximately 20 years with no reported incidents to his knowledge.

Hearing Panel's Question

a. Does this suggest that there is not an issue or rather that there has been no monitoring to identify whether or not there is an issue?

Mr Williamson, Ms France and Mr Chang have reviewed the November 2023 water quality monitoring report which included some limited groundwater monitoring. The experts agree that overall there are very low concentrations of all the tested constituents.

Refer to question 7b for further context.

7. The Council's suite of draft consent conditions proposes the inclusion of conditions related to the monitoring of groundwater quality.

Hearing Panel's Questions

a. Given an apparent lack of certainty as to where untreated stormwater infiltrating to ground/groundwater is going to, and what its effects may be, is it reasonable to undertake further monitoring to close this potential information gap?

Based on the response above, the Stormwater and Groundwater experts agree that there is sufficient certainty as to where stormwater exfiltration to groundwater is occurring. Therefore, no further monitoring is required now to inform expert opinions for the purpose of this conferencing.

b. If so, what would be appropriate monitoring conditions to address this apparent lack of certainty and potential adverse effects?

Mr Williamson and Mr Chang agree that there is no requirement for groundwater monitoring on the basis that volumes discharged to ground are low. Both experts note that there is surface stormwater monitoring within the pond system outlet in the proposed conditions. They agree that this monitoring would provide an early warning system and therefore no groundwater monitoring is required.

3.2 Proposed conditions of consent - including stormwater

The experts for the Council (s42A) and the Applicant agree that the parameters, units and values for stormwater monitoring, and the monitoring review process would benefit from further refinement. No new or additional condition matters have been identified as a result of this JWS process (refer to Item 3.1 above).

The experts note that the discussions addressing all of the proposed conditions of consent remain ongoing and will be presented to the hearing.

4 PARTICIPANTS TO JOINT WITNESS STATEMENT

4.1 The participants to this Joint Witness Statement, as listed below, confirm that:

(a) They agree that the outcome(s) of the expert conferencing are as recorded in this statement; and
(b) They agree to the introduction of the attached information – Refer to para 2.1 above; and
(c) They have read the Environment Court's Practice Note 2023 and agree to comply with it; and
(d) The matters addressed in this statement are within their area of expertise; and
(e) As this session was held online, in the interests of efficiency, it was agreed that each expert would verbally confirm their position in relation to this para 4.1 to the Independent Facilitator and the other experts and this is recorded in the schedule below.

Confirmed online: 6 May 2024

EXPERT'S NAME & EXPERTISE	PARTY	EXPERT'S CONFIRMATION REFER PARA 4.1
Blair Masefield – Reporting Officer (Planner)	Northland Regional Council	Yes
Raymond Chang (Stormwater Specialist)	Northland Regional Council	Yes
Sian France (Groundwater Specialist)	Northland Regional Council	Yes – Participated in Item 3.1 only.
Brett Hood (Planner)	Northport	Yes
Phil Mitchell (Planner)	Northport	Yes – Attended on 6 May only.
Greg Blomfield (Terminal Facilities Manager)	Northport	Yes
Jon Williamson (Groundwater Specialist)	Northport	Yes – Participated in Item 3.1 only.
James Blackburn (Stormwater Specialist)	Northport	Yes

Attachment 1 – Jon Williamson Memo dated 9 April 2024

WILLIAMSON
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Memo

To	Chris Simmons	Date	09 April 2024
From	Jon Williamson	**Project No**	WWLA0321
Copy			
Subject	**Position Statement: Response to questions posed by Hearing Panel in Attachment 2 to Direction 17 (15 March 2024) in relation to Resource Consent Applications by Northport Ltd.**		

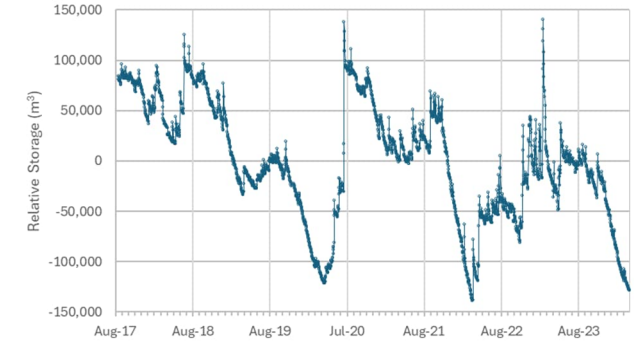
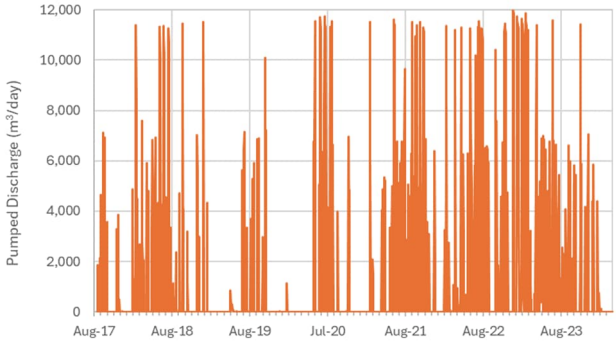
1. Introduction

This position statement has been prepared on a Confidential and Without Prejudice basis for the purposes of Expert Conferencing.

In the following table I provide my response to the questions raised by the Hearing Panel in Attachment 2 to Direction 17.

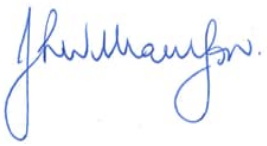
Q#	Query	Response
3.	According to SDR 2015 the stormwater treatment system in 2015 included 2,000 m of canal and 4 ha of pond system. Information from the expansion application proposes a further 670m of canal to be added. The base of the canal, assumed to be unlined, is reported as 2.6m wide. This equates to an area open for infiltration of approximately 4.7 ha, being 4 ha from the pond and 0.7 ha from the canal system. The applicant's stormwater model assumes an infiltration rate of 20mm/hr through the base of the pond and canal system. This equates to 0.48m/day. The infiltration information provided in SDR 2015, complemented by the Applicant's model infiltration rate information over the pond/canal area suggests volumes in the order of 22,000 cubic metres per day may be discharged to the ground and ground water.	
3(a)	What is the likely range of volumes to be discharged to ground based on the best estimated infiltration rate?	My response this this question is structure to address the canal first and pond second: <u>Canals</u> In my view, the canals are likely to provide very little seepage to ground, except potentially for a transitional short term (weeks not months) period after maintenance[1]. Basal clogging with fibrous debris and silt (sludge) is likely to form a low permeability skin that restricts interaction with groundwater. This is particularly given the base of the canals are largely above the groundwater table and therefore effects of buoyancy and/or other groundwater interaction do not aid in maintaining an open hydraulic connection with the sub-surface. <u>Pond</u> The pond system is designed to drop-out sediment as stormwater moves through it. Hence, the forebays are likely to have a similar lack of hydraulic connection as the canals. However, the western most pond (Pond 1) is likely to have a cleaner base and given groundwater levels have potential to reside within the range of pond water levels, there is potential for a hydraulic connection in this area. I have undertaken a very basic (rough) water balance assessment to get a sense of the likely seepage losses. I have used Whangarei aerodrome rainfall and evaporation for this assessment. **Figure 1** shows the resulting water balance (and calculation assumptions), whilst **Figure 2** shows the measured discharges that were used in the calculation. This demonstrates that <u>4.5 mm/day</u> of seepage (calculated over the pond area) was required on average to maintain an appropriate balance. This seepage rate relates to a vertical hydraulic

[1] Canal maintenance occurs annually during a dry period. See Canal Relining Procedure – attached.

Q#	Query	Response
		conductivity of the materials under the pond of $4.6x10^{-8}$ m/s (assuming a 1 m head), which is a low permeability value. Based on the calculation performed, the estimate average seepage rate is approximately 400 m^3/day. In practice, the seepage rate will be governed by head dependent, hence it will increase during periods where pond water levels significantly exceed groundwater and vice versa. I expect high seepage to coincide with winter conditions and vice versa. In comparison, the maximum pumped discharge is just under 12,000 m^3/day.
		 Figure 1. Pond water balance summary.
		 Figure 2. Measured pond pumped discharge.
3(b)	For the purpose of assessment under Rule C.6.4.6 of the Proposed Regional Plan, is it appropriate to consider a volume of discharge of this potential magnitude as "ancillary" to the discharge to the CMA outfall?	The volume of discharge to ground is small in comparison to the direct discharge to the harbour. The environmental impact of the discharge to ground will have a lesser effect than the direct discharge because the groundwater will end up in the same receiving environment, but prior to reaching it will undergo further mechanical filtration via the sand media in the aquifer and dilution through mixing with the natural groundwater throughflow.
3(c)	What are the likely implications, or effects, of this discharge to ground/groundwater i.e. where will it most likely end up, and what effects may it generate?	Addressed above.
4.	SDR 2015 assesses the discharge of stormwater to the CMA against marine water quality criteria.	
4(a)	If the contaminants are discharging to a freshwater system via a groundwater pathway, how will the contaminant concentrations measure against freshwater criteria?	As alluded to above, in a relative sense the discharge concentrations via a groundwater system will result in significantly lower concentrations than the equivalent discharge directly to the receiving environment. The point being, that if the discharge to the receiving environment via the direct discharge is considered to meet water quality criteria, then the groundwater discharge will also meet the criteria. The same criteria and principals apply with regard to groundwater mixing at the receiving environment.
4(b)	Are any dissolved contaminants likely to have an adverse effect, including any cumulative adverse effect?	I presume this question relates to in the groundwater system between the ponds and the coastal marine area. As indicated previously, the sand will filter suspended solids and peaty organic material within the sand will provide a carbon source to potentially reduce and bioremediate any contaminants. Biological activity within the aquifer is likely to mitigate against cumulative effects.
5. Mr Williamson's report (12 February 2024) refers to a "skin effect" creating an effective barrier to infiltration within the canals. However, the canal maintenance regime includes the removal of the base of the canals and replacement with clean sand on an annual basis.		
5(a)	How will this maintenance activity affect the infiltration rates, in particular the	As indicated above, it is my opinion that the maintenance will have a transitional short term (weeks not months) effect on infiltration rates. During this time seepage is potentially greater than the majority of the time. However, as indicated in the "Canal Lining Procedure" mentioned above:

Q#	Query	Response
	capturing of dissolved contaminants?	• The maintenance activity can only occur when the canals are relatively dry, hence during this time there is limited seepage occurring; and • a new sand layer is emplaced after removing the sludge. The sand layer is predominantly fine sand, which hydrogeologists call a "blinding sand" because it provides a separation barrier between substances. This is why the fibres, silt and sludge accumulate on top of it. In my opinion, the majority of the dissolved contaminants will bind to the sludge and fibrous materials, and hence not pass through the sand layers to the vadose (unsaturated) zone below.
6. Mr Williamson's report (12 February 2024) concludes that groundwater quality monitoring is not required. He reaches this conclusion, in part on the basis that the stormwater system has been functional for approximately 20 years with no reported incidents to his knowledge.		
6(a)	Does this suggest that there is not an issue or rather that there has been no monitoring to identify whether or not there is an issue?	My comment is suggesting that groundwater discharge is not an issue, based on the logic presented above, combined with the lack of practical observation of any issues manifesting with regard to groundwater related issues over the past 20 years of operation. I believe that if there was an issue, it would have been evident via a series of noticeable events caused where a combination of factors coincide over a prolonged period of time e.g. concentrated effluent discharges (such as a spill), low mixing potential, high temperatures, etc.
7. The Council's suite of draft consent conditions proposes the inclusion of conditions related to the monitoring of groundwater quality.		
7(a)	Given an apparent lack of certainty as to where untreated stormwater infiltrating to ground/groundwater is going to, and what its effects may be, is it reasonable to undertake further monitoring to close this potential information gap?	Where is groundwater going? Summarising my response above, any groundwater discharges (albeit of small volume (400 m^3/day) in comparison to the coastal discharge (up to 12,000 m^3/day) are likely to occur within Pond 1. Groundwater in the vicinity of Pond 1 is moving northward towards Blacksmith Creek, which is the immediate downgradient receptor. Is it reasonable to undertake monitoring to close information gap? In my view the risk is low and the possible consequences are also low given the mitigating circumstances between source and receptor, being: • the sand and organic sediments that groundwater would have to travel through before discharging to the marine environment; and • significant dilution within the marine environment itself. On that basis I do not consider the potential burden of additional monitoring, analysis and reporting to be warranted.
7(b)	If so, what would be appropriate monitoring conditions to address this apparent lack of certainty and potential adverse effects?	As indicated above, I am of the view no groundwater monitoring is required.

Yours sincerely,



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Northport

NORTHPORT Ltd CANAL RE-LINING

STEP	ACTION	PHOTO
1	Analyse the area of works. - The canal needs to have no surface water, and free/accessible area for the plant used. - Temporary sand dams can be put in place by the contractor to segregate areas of work.	
2	Set up laser level. - Northport supply a level control point plan (D60-00-125) providing datums around the canals to set the level to. - The canal sand base should be approx. 3.5m RL.	
3	Contractors are to excavate of the canal. - Removing debris/sludge and the top layer of the existing sand base layer. - This involves one 14T digger, and a tractor and trailer to dispose of the material.	 
4	Contractors are to deposit the excavated material in the stormwater pond area. - Location of piles to be determined by Northport Port Engineer.	
5	Excavate all sludge and top layer of sand base across the canal section.	
6	Level out base of canal prior to new sand. - Lower track skid steer into canal with digger. - Skid steer should be equipped with land leveller attachment.	

7	Once sludge has been excavated, the new sand material is loaded. The sand pile is in stormwater pond area.	
8	Dazzle proposed height of new sand layer. - Use staff from laser level to locate proposed RL (3.5 m) - Dazzle on side of canal for digger to reference.	
9	Apply new sand layer. - Digger deposits sand into canal. - Using dazzle to deposit certain amount.	
10	When the trailer is empty, sand is refilled from the sand piles in the stormwater pond area.	
11	Level out sand behind the digger. - Skid steer to be levelling out the sand as it is deposited. - Operator behind the skid steer is checking the RL as the sand is levelled out. - Level out to 3.5 m	
12	Continue step 8 and 9 until the section of canal has been covered with new a new sand layer.	
13	Supply sand to areas not meeting the proposed level.	
14	Rake out to level areas the skid steer can't get to. **Ensure base layer is at proposed level, and relatively tidy (raked and levelled out with skid steer).**