BEFORE THE WHANGAREI DISTRICT COUNCIL AND NORTHLAND REGIONAL COUNCIL

IN THE MATTER	of the Resource Management Act 1991
AND	
IN THE MATTER	of a resource consent application by Northport Limited under section 88 of the Resource Management 1991 for a port expansion project at Marsden Point
APPLICATION NO.	APP.005055.38.01
	LU 2200107

STATEMENT OF EVIDENCE OF JAMES CRISPIN BLACKBURN

(OPERATIONAL STORMWATER MANAGEMENT)

24 August 2023

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1.0 Introduction and Qualifications and Experience

1.1 My full name is James Crispin Blackburn. I am a Consulting Civil Engineer and Director with Hawthorn Geddes engineers & architects ltd ("HG"), consultants of Whangarei. In my role as a Director of HG I lead the civil and environmental engineering team.

1.2 I graduated from The University of Southampton (UK) with a Bachelor of Engineering (Honours) degree in civil engineering in 1993. I have worked in roles associated with land development, flood control and general civil engineering design since graduating, specialising in matters associated with stormwater, hydrology and low impact design. I am a Chartered Professional Engineer (CPEng) and a Chartered Member of Engineering New Zealand in the fields of civil and environmental engineering.

1.3 I have over 25 years of experience working as a civil engineer, with the last 17 years in Northland, New Zealand. In that time, I have worked on assessments, investigations and designs for development appraisals, earthworks, and drainage as well as design review, council storm water policy & technical requirement development and in expert witness roles in the District Court and Environment Court.

1.4 HG were engaged by Northport Ltd (Northport), to provide engineering advice and design for the resource consent application before the Whangarei District Council and Northland Regional Council ("NRC") for Northport's proposed expansion. The stormwater management / engineering aspects accompanying the application were prepared by suitably experienced individuals under my supervision and direction.

1.5 I have previously been involved in the discharge consent variations for the Marsden Maritime Holdings (MMH) industrial land, adjacent to the Northport pond immediately to the south. This is relevant since the independent stormwater treatment basins for both Northport and MMH share the discharge pipe to the Whangarei harbour and utilise the same outfall beneath the Northport wharf frontage.

Environment Court Code of Conduct

1.6 I have read the Environment Court Code of Conduct for Expert Witnesses as specified in the Environment Court's Practice Note (2023). I have complied with the Code of Conduct in preparing this statement of evidence. Any opinions expressed in this evidence are my own and are not influenced by my client or their agents. I confirm that this evidence is written within my area of expertise, except where otherwise stated, and that I have not omitted to consider material facts known to me that might alter or detract from the opinions expressed.

2.0 Executive summary

2.1 The existing Northport canal/pond stormwater management system is a large-scale stormwater collection and treatment system which has been demonstrated to perform effectively, including with respect to volumetric capacity and discharge water quality.

2.2 The proposed expansion will result in an increase in stormwater runoff from the port apron. This additional runoff will require interception, conveyance, and appropriate treatment prior to discharge to the harbour, as is presently afforded to apron runoff.

2.3 The proposal is for collection, treatment and discharge of apron stormwater runoff to be via the existing pond-based stormwater system and/or proprietary devices. This is expected to require the construction of a further approximately 600m length of perimeter canal; and the provision of an additional high flow spillway weir at the eastern extent, similar to that presently provided at the western extent.

2.4 In my opinion:

(a) The proposed operational stormwater management system under the full proposed port expansion scenario is anticipated to function effectively.

(b) The operational stormwater consent conditions proposed by Northport are appropriate from a stormwater management/engineering perspective; including the proposed adjustment to stormwater quality monitoring/compliance – being the use of the current resource consent

conditions' mixing zone thresholds as a trigger for the application of proposed new at-source compliance parameters.

3.0 Scope of evidence

3.1 My evidence addresses the following topics:

(a) Assessment of the existing stormwater canal system and stormwater attenuation/quality management pond.
(b) The existing Northport stormwater resource consent, including discharge consent conditions and its relationship to discharge conditions from adjoining land using the same outfall.
(c) The proposed stormwater management system design and analysis, including in terms of treatment performance and volumetric capacity.
(d) The proposed stormwater quality monitoring and compliance regime.
(e) Response to submissions.
(f) Response to the s42A Report.
(g) Proposed consent conditions.

4.0 Existing Northport Stormwater System

4.1 The existing Northport canal/pond stormwater management system is a large-scale stormwater collection and treatment system, utilising modern design understanding of pollutant management, which has been demonstrated to perform effectively, including with respect to volumetric capacity and discharge water quality.

4.2 As shown in **Appendix A** and **B**, stormwater runoff is collected from the port apron areas via localised reticulation which discharges to a canal system without gradient around the "non-wharf frontage" perimeter of the port. Some areas of the port runoff discharge directly (as surface flow) into the same canal system. The canals collect and route runoff flows to the dedicated stormwater pond. After collation of flows from the eastern and western perimeter canals an inlet weir controls canal discharges into the pond forebay area.

4.3 The canal capacity is dictated by a combination of localised restrictions (culvert installations) and available hydraulic gradient associated with the tailwater condition (pond water level).

4.4 The Northport stormwater “settlement” pond was constructed to provide treatment to stormwater runoff associated with non-extreme rainfall from the port apron prior to discharge to the Whangarei harbour.

4.5 In 2016 the pond was extended to accommodate an extension of the hardstand area behind the port, and in 2018 baffles and two forebay baffle bunds were installed within the pond to limit inflow “shortcutting” by enforcing lengthened flow paths (and associated settlement performance).

4.6 A central bund, constructed with gabion rock, splits the pond into two basins. Flows discharge both over and through the “permeable” (by virtue of its construction) central bund, around the pond baffles, and are then pumped from the second basin to discharge into a gravity pipeline.

4.7 An overflow from the pond (scruffy dome manhole riser) is located in the first basin. Discharges from the overflow also enter the gravity pipeline.

4.8 The discharge from the Northport pond then combines with flows from the treatment pond associated with the industrial land (MMH) immediately southeast of the Northport pond (independent discharge consent) before discharging to the Whangarei harbour via a diffuser at depth under Berth 1 of the current wharf face. Monitoring results indicate that the current pond performance is meeting the mixing zone discharge water quality compliance requirements of the present Northport consent.

4.9 The gravity pipeline immediately downstream of the pump discharge is a 525dia which increases to a 825dia for the gravity overflow inlet at the scruffy dome overflow. The gravity line then increases further, to a 1500dia for the combined flows, from the point at which the 1200dia outlet pipe from the MMH stormwater quality management pond connects into the line.

4.10 The discharge pump station, located within the second basin of the pond, operates a “duty-assist” pumping system - light duty flows being served by a single pump unit, augmented by the second pump where pond inflows and associated increase in water levels in the basin dictate. Records show the pumping rates to be 290m³/hr for the duty pump and 490m³/hr when the standby pump is activated (i.e. both pumps running concurrently).

4.11 There are two formalised overflow locations from the stormwater system. The scruffy dome manhole riser located in the first half of the pond and a 9m long weir spillway at the northern end of the western canal. The scruffy dome manhole riser is approximately 520mm above the pond inlet weir level and approximately 720mm above the static dead storage water level in the inlet portion of the stormwater pond. Flows entering the scruffy dome discharge directly to the 825dia gravity outlet pipeline (bypassing the pump flow control / limitation)

4.12 The western canal spillway weir level is 300mm below the port apron level and discharges directly to the harbour. The spillway location is such that it activates only when the combination of elevated tailwater (pond water level) and associated reduction in hydraulic gradient within the 600m of the western canal instigates an overflow discharge.[1]

Consented Berth 4 Stormwater Arrangement

4.13 The eastern consented, but as-yet not constructed, 4.6Ha apron area (Berth 4) runoff will be served by the existing eastern canal (as addressed below).

5.0 Existing Consent Conditions

5.1 A consent is held by Northport to discharge stormwater associated with the operation of the port to the Whangarei harbour, after treatment via the storage and settlement pond system – CON20090505532.

5.2 Key water quality requirements of the existing resource consent are set out in conditions 4 and 5. Condition 4 requires that the exercise of the consent must

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[1] Water quality monitoring of any discharges (overflow spills) from the western canal weir spillway have not been undertaken. However, it is relevant to note that the western spillway only functions during larger events, significantly in excess of the water quality "first flush" runoff. Since the discharge location is from the top of the canal system, sediments are retained in the treatment network "downstream" from the weir position within the canal and discharges at this location will be a significant period after first flush runoff has conveyed contaminants into the canals and treatment basin. Runoff treatment is provided for higher frequency rainfall events by design (1/3 of 2-year ARI), and these treatment flows will be conveyed to the treatment pond in full.

not result in certain listed effects on coastal water quality at or beyond a specified mixing zone.[2] Condition 5 requires the quality of stormwater discharged from the pond system by the pumps to meet pH and suspended solids standards.

5.3 The discharge consent conditions are limited to water quality and treatment rather than any restriction on discharge volume or rate. The peak rates of discharge are principally limited by the current pumping configuration in combination with the discharge pipe size. However, there is an advice note under section 1.2 Pumping Hours within Schedule 1 of the application which states "*the approximate average volume of stormwater to be discharged is assessed at 200,000 cubic metres per annum. The size of the discharge pipe and the proposed capacity of the pumps limit the pumped discharge rate to approximately 2,520 cubic metres per hour*". It is clear that the referenced 200,000m³ per annum is incorrect, since this represents only 408 hours (17.0 days) of pumped discharge at the maximum pump rate is 490m³/hr.

5.4 Discharge quality monitoring and compliance is required at the limit of the mixing zone in Whangarei Harbour (refer to condition 4). Monitoring results at the discharge from the pond, prior to combination with any other flows, confirm that discharges from the Northport pond currently meet the water quality discharge compliance requirements at the mixing zone limit (an indicative 10x dilution is inferred from the conditions). It is relevant to note that the compliance standards associated with the Northport discharge are not the same as those of the discharge consent from the MMH pond (CON20081072304), which I address below.

Existing Consent Conditions: Water Quality Monitoring/Attribution Issues - Northport and MMH

5.5 As previously outlined, the outlet to the receiving environment, and latter stages of the discharge reticulation network, are shared by two independent operators (Northport and MMH) with separate discharge consents. The consent holders'

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[2] Including with respect to temperature, pH, dissolved oxygen, visual clarity, hue, metal concentrations, and other matters.

respective monitoring and compliance requirements at the limit of the mixing zone require different thresholds to be met, with the MMH discharge concentration thresholds aligning with the Regional Coastal Plan – May 2016 – Coastal Water Quality Standards (Appendix 4), while the current Northport consent concentration thresholds (CON20090505532) align with the Proposed Northland Regional Plan Coastal Water Quality Standards (Table H.3.3).

5.6 The Northport consent imposes tighter (i.e. more stringent) standards. The allowable concentration thresholds (for copper, lead and zinc) are significantly higher in the previous Coastal Plan (adopted in the MMH consent) than in the Proposed Regional Plan for Northland, as adopted in the Northport consent:

	Proposed Regional Plan (Table H.3.3) *[Northport consent thresholds]*	**Regional Coastal Plan (Appendix 4)** *[MMH consent thresholds]*
	Maximum Allowable Concentration (mg/m^3)	
Total copper	1.3	5
Total lead	4.4	5
Total zinc	15	50

5.7 Both the current Northport and MMH discharge consents have expiry dates of December 2034.

5.8 Because the MMH and Northport discharges combine before discharge to the harbour, and the location for monitoring and compliance under both consents is at the mixing zone boundary within the harbour, there is the potential for difficulties in attributing the cause of any 'technical non-compliance' of the Northport and MMH consent condition thresholds. Exceedances of the Northport consent conditions may be caused by MMH discharges and vice versa. Due to the higher allowable concentration thresholds under the MMH conditions, MMH discharges could result in a situation where the mixing zone thresholds in Northport's consent conditions are exceeded but the corresponding (less stringent) thresholds in MMH's consent conditions are not.

A framework under which the proposal can avoid potential attribution/compliance/enforcement issues, while still imposing robust and appropriate water quality limits, is outlined in section 10.0 below.

6.0 The Proposed Stormwater Management System

6.1 The proposal is to construct, operate and maintain an expanded footprint of the existing (and consented) Northport facility (the "Proposal").

6.2 Key features of the Proposal of relevance to my evidence include:

(a) Reclamation of part of the Coastal Marine Area (CMA) to the immediate east of the existing and consented Port reclamation.
(b) Capital and associated maintenance dredging.
(c) Wharf structures on the northern (seaward) edge of the proposed reclamation.
(d) Sheet piling and rock revetment structures on the eastern edge of the reclamation.
(e) Port related activities on the proposed reclamation and wharves, and on parts of the proposed development above Mean High Water Springs.

6.3 The Proposal will expand the current (and consented Berth 4) port apron of 53.7Ha footprint to a total of 67.3Ha (i.e. an additional expansion area of 13.7Ha). The proposed expansion will therefore result in an increase in operational rainfall stormwater runoff from the port apron. This additional runoff will require interception, conveyance, and appropriate treatment prior to discharge to the harbour, as is presently afforded to apron runoff.

6.4 As outlined below, the Proposal is for treatment and discharge of operational stormwater to be via the existing pond-based stormwater system and/or proprietary devices. This is expected to require the construction of a further approximately 600m length of perimeter canal along the southern and eastern perimeter of this additional footprint, which will connect to the existing eastern canal in the vicinity of the Ralph Trimmer Drive terminus public car park (refer **Appendix A**). The sectional profile and gradient are anticipated to be as provided for the canals surrounding the port apron in the existing extents. The hydraulic grade within the Proposal's extended eastern canal is likely to require

the provision of a high flow spillway weir at the eastern extent, similar to that presently provided at the western extent (as outlined below).

7.0 Pond Performance – Treatment Capacity

7.1 The original basis of design for the port runoff treatment was based on Auckland TP10[3] (now replaced by GD01[4]).

7.2 Monitoring results indicate that the current pond performance is meeting the discharge water quality mixing zone compliance parameters of the present consent and therefore the original design basis is considered appropriate to carry forward for the expanded port apron area.

7.3 The water quality consent conditions of the current discharge consent – CON20090505532 are more stringent than the Permitted Activity thresholds set out in the Proposed Regional Plan.[5] This indicates that the current design / compliance approach is suitably conservative.

7.4 In accordance with Auckland TP10 the required water quality volume (WQV) for the currently constructed port apron area of 49Ha is 13,480m³. To comply with the design principles of TP10 this volume should be provided as dead storage within the treatment network.

7.5 Survey information confirms that the available dead storage in the first half of the pond (i.e. east of the midway bund), below the crest level of the central bund at 3.75m CD, is 12,320m³. The dead storage in the second half (western portion) of the pond, below the pump off level of 3.10m CD, is 5,430m³. Therefore, the total minimum dead storage available within the existing pond is 17,750m³ providing more than the Auckland TP10 required WQV for the existing port apron areas.

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3 Stormwater Management Devices: Design Guidelines Manual – Auckland Regional Council May 2003.
4 Stormwater Management Devices in the Auckland Region – Auckland Council December 2017.
5 H.3.3.

Proposed expansion

7.6 Assessed on the same TP10 basis, the proposed, fully expanded port apron footprint of 67.3Ha will require a total WQV of 18,510m³ which exceeds the present minimum dead storage volume currently provided in the existing pond by some 760m³.

7.7 This additional dead storage can be provided within the base volume of the conveyance canals (which are laid without in-built gradient and rely entirely on induced hydraulic grade to instigate conveyance) to a depth of approximately 110mm (assuming a total canal length of 2,640m – canals to full expanded port perimeter).

7.8 The effectiveness of a 110mm depth of dead storage to treat flows during rainfall events up to the treatment rainfall threshold (1/3 of the 2-year – 24hour rainfall) would likely be compromised, with the increase in hydraulic gradient and the resulting velocities. Therefore, it is proposed to install a 250mm high weir (set at 3.85m CD) within the canal, prior to the outlet to the main body of the treatment pond, which will provide an additional 2,010m³ of dead storage, effectively mitigating any effects of the increased velocities in the canal.

7.9 The installation of the weir will result in a minimum total dead storage volume of 19,760m³, providing 1,250m³ more than required and continuing the principles of appropriate (conservative) treatment design approach of the current pond, which has been shown to perform well.

7.10 This proposal will provide a staged WQV, where removal of coarse sediments and debris is addressed within the canals, finer treatment within the first basin of the pond, and polishing within the second pond basin (pump pond). Oils and floatables remain trapped within the treatment system by virtue of the pumped (sub-surface) primary discharge.

7.11 The existing spillway (western) and any future spillway installed are proposed to be modified/designed to retain oils and floatables within the port/canal network with an under-over weir setup. Presently the configuration permits loss of control of these aspects in response to a large event overflow discharge at the weir(s).

8.0 Pond Assessment – Volumetric Capacity

8.1 To assess the volumetric capacity of the pond for both the existing port apron and the proposed future expansion, a hydrologic model of the catchment, the inflows and pond was built in the HydroCAD hydrologic modelling software. This model was calibrated against a historic rainfall event of 24 December 2018, being a significant but not extreme[6] event (80mm), using available pond and canal level data and pump operating data records (automated) to establish the likely magnitude of initial losses and exfiltration from the model[7].

8.2 The storage volumes within the pond were established from survey information provided by Boundary Hunter Ltd, dated February 2021 (**Appendix C**). Storage volumes within the canal were estimated from survey / design sections of the canal and canal lengths measured from aerial photographs.

8.3 The calibration event (December 2018) is prior to the installation of a 1200dia culvert within the western canal, and during this period a portion of the southern apron was under construction with sediment ponds in place. This was reflected in the model calibration.

8.4 The pond pumps were included in the model with operational stop/start levels as advised by Northport and provided in the pond level schematic (**Appendix D**). Pump 1 was modelled as having a maximum pump rate of 290m³/hr and pump 1 and pump 2 having a combined maximum pump rate of 490m³/hr, as established from Northport pump data records.

8.5 The existing inlet weir, the central pond bund, and the scruffy dome overflow were all built into the model with elevations, dimensions and lengths taken from survey information.[8]

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6 The chosen event is therefore considered unlikely to distort pond behaviour.

7 Refer to Stormwater Pond Assessment Report for the Proposed Northport Expansion - HG rev. 4 23/2/23. This includes explanation of the calibration of the model using real rainfall event data. The modelling includes a "sensitivity" assessment in that we have considered up to the 1% AEP with a further 20% increase for climate change.

8 The Inlet weir (outlet from the canal) being 10m in length and at an elevation of 3.95m CD and the central bund with a length of approximately 75m and at 3.75m CD. The scruffy dome manhole riser with a 2100dia and rim level at 4.47m CD.

8.6 The initial condition of the canals was considered empty, with the available volume and depth (to induce flow) also included in the model (ie significant volume input is required to the canal to instigate flow).

8.7 The selection of the rainfall event used for calibration of the pond model was based on a review of pond and canal level data provided, and quality data being available for the selected event. The calibration rainfall event was selected from the period between the installation of the forebays and pond baffles in 2018 and prior to mid-2019.

8.8 Rainfall data was obtained from the NRC – Marsden Point rainfall gauge for 24 December 2018 which showed a total rainfall depth for the event of 80mm over a 24hour period (equivalent to a 2-year ARI[9] rainfall event) and a peak intensity of 40.6mm/hr for 10 minutes (equivalent to that of a 10-year ARI rainfall event).

8.9 Calibration of the pond modelled water level for the selected event, against recorded level data, indicated noticeable losses from the pond and canal (likely exfiltration), and that initial discharge through the central pond bund is likely to occur. An exfiltration rate of 20mm/hr from the pond and canal, above the static water elevation, was incorporated in the model (unlined pond in sand soils). An estimated 50ℓ/s was allowed for flows through the pond bund into the second basin (estimated from alignment of model behaviour against recorded data).

8.10 The dividing bund contains a small number of 150mm diameter link pipes. To ensure that the WQV is maintained, it is proposed that these link pipes be plugged for the normal operating condition of the pond and are released to allow drainage of the forebay area only during sediment removal phases.

8.11 For the calibration event, pump record data indicated a total pumped discharge from the pond of 23,932m³ for the event. The calibrated modelled discharge from the pond was calculated as 23,993m³, being within 1% of the recorded data discharge volume. The modelled peak pond elevation was 3.860m, being

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9 ARI means Average Recurrence Interval.

60mm lower than the peak recorded data. The accuracy of the calibration is considered suitable for the purposes of the model's use, as variability is likely over a range of event depths and durations, and noting that the record rainfall gauge, while in close proximity, is not necessarily reflective of the actual rainfall applied to the full port apron area.

8.12 The pond hydraulic performance was then assessed for the current port apron of 49Ha utilising the calibrated model (with the inclusion of the subsequently installed 1200dia culvert in the western canal, and the impervious sealed area of the southern portion of the port apron completed), with a Type 1A nested rainfall hyetograph methodology and site-specific approximated rainfall data obtained from HIRDS version 4.[10]

8.13 The starting water elevations in both halves of the pond were set at 3.30m CD and 3.10m CD, for the east and west portions, respectively. This represents the "first" (eastern) basin at approximately half full and second basin at the "pump off" water elevation level. These initial conditions being elevated from those of the recorded level data from the calibration event and therefore considered conservative by way of reduced available total volume in the basin for response to runoff.

8.14 The model showed that the introduction of the 1200dia culvert in the western canal applies a restriction to flows from the western catchment of the port apron, resulting in the canal spillway weir operating for runoff from the existing apron extent during events in excess of a 10-year ARI event.

8.15 The model demonstrated that the pond has the capacity to accommodate the runoff generated by the current port apron area that is able to reach the pond (1200 culvert restriction in place and western canal spillway operating) for events up to and including the 100-year ARI rainfall event, and the 825dia

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[10] HIRDS (High Intensity Rainfall Design System) is an online tool that can estimate the magnitude and frequency of high intensity rainfall at any point in New Zealand.

discharge pipe to have adequate capacity to convey the peak discharge of 0.65m³/s from pumps and scruffy dome overflows (0.52m³/s).

8.16 The modelled peak pond elevation for the 100-year ARI event and current apron extents was 4.59m CD being 410mm below the port apron level of 5.00m CD. The model also indicated that the scruffy dome overflow will operate for events exceeding the 20-year ARI event, with the scruffy dome rim level being 4.47m CD.

8.17 In terms of the "failure" mode for the system, beyond that of the event limits discussed (100-year ARI), flooding of the current port apron is unlikely for any event with a rainfall depth of less than 350mm over 24hrs (extreme). If the pond pumps were to fail the current system (scruffy dome and western canal spillway) would be able to address a 100-year ARI event from the current port apron, with peak pond elevation at 4.62m CD (380mm below the port apron).

Consented Berth 4 expansion

8.18 Modelling for the consented Berth 4 apron additional area indicates that for the 100-year ARI event the western canal spillway will operate, with a peak discharge of 0.89m³/s and total discharge volume of 1,560m³, being 1% of the total runoff volume from the expanded port apron. The modelled peak elevation in the western canal for the 100-year ARI event was 4.86m CD, being 140mm below the port apron level.

Proposed expansion

8.19 To accommodate the required treatment volume in the system for the full port expansion, the starting water level in the model for the canals was set at 3.85m CD. An allowance for an additional 670m of canal was included for the 67.3Ha port catchment. The model indicated that the western canal spillway will operate for events in excess of the 10-year ARI event and overflows from the pond will occur for events exceeding the 5-year ARI rainfall event, with the capacity of the 825dia outlet exceeded for events over that of a 20-year ARI event.

8.20 For the 100-year ARI event the model showed the western canal spillway to operate with a peak discharge of 0.89m³/s and total discharge volume of

7,710m³. The calculated peak elevation in the western canal for the 100-year ARI event was 4.860m CD; being 140mm below the port apron level.

Summary

8.21 In summary, the assessment of the pond capacity identified that the existing unmodified pond has the capacity to address the 100-year ARI event runoff received by the pond from the current port footprint (noting the operation of the western spillway reduces the flows conveyed to the pond), but the capacity to address the additional runoff from the full proposed port expansion (including the already consented Berth-4 footprint) is limited to that of the 20-year ARI event.

8.22 Calculations showed that for the stormwater network (canals, pond, and overflows) to have the capacity to address the 100-year ARI rainfall event for the port expansion, a 10m length of spillway would be required at 490mm below the port apron level. Based on using a Type 1A nested rainfall hyetograph methodology and rainfall data from HIRDS version 4, the spillway would start to operate for events in excess of the 10-year ARI event, with the 100-year ARI peak discharge calculated at 0.56m³/s and total discharge volume of 21,420m³. The 100-year ARI peak elevation in the canal was calculated at approximately 380mm below the port apron level.

9.0 Proposed System Performance - Summary

9.1 In my opinion the proposed stormwater management system under the full proposed port expansion scenario is anticipated to function effectively, including because:

(a) The facility has consistently treated stormwater runoff from the existing port apron to a higher standard than required by the existing consent, resulting in full compliance with the consent discharge standards at the edge of the mixing zone.

(b) The collection and treatment facility has almost without exception also met the *mixing zone* compliance conditions for contaminants *at the point of discharge* (before combining with the MMH discharge) without the benefit of dilution associated with the mixing zone.

(c) The fundamental basis of design is therefore appropriate and suitable to apply to the increase in contributory catchment, and manage operational runoff contaminants, from the proposed additional port apron area, subject to the implementation of the canal weir modifications outlined above.

(d) The volumetric and treatment capacity and performance of the system remains effective across an acceptable range of ARI rainfall events.

(e) The above analysis of the proposed canal/pond system performance represents a conservative assessment because any implementation of proprietary devices – as provided for in the application – will reduce the proportion of stormwater conveyed contaminants entering the canal/pond system.

(f) The system has shown to be capacity resilient, with mechanisms in place, and proposed, to restrict overloading of the treatment basin by diverting high flows directly to the marine environment at the upper end of the canal network. Such discharges will occur substantially after the first flush flows will have conveyed contaminants into the treatment network.

10.0 Proposed Consent Condition Monitoring and Compliance regime

10.1 As outlined above, it is acknowledged that there is currently a theoretical potential for a compliant water quality discharge from the MMH pond to trigger an exceedance of the thresholds under the Northport discharge consent, despite sharing the outlet. It is therefore proposed to amend the monitoring and compliance requirements for the Northport discharges to address the threshold disparity between the two consents and resolve current potential issues with attribution/compliance/enforcement.

10.2 To determine an appropriate discharge quality approach for Northport, and given that the discharge parameters currently defined are in relation to a mixing zone in the harbour, the following is proposed (as set out in the proposed consent conditions):

i. In the event that the mixing zone thresholds (i.e. the thresholds in the current consent) are exceeded, Northport be required to undertake testing within the Northport site stormwater network, upstream of (but in the vicinity of) the confluence with MMH discharges (i.e. at the downstream limit of the Northport 825mm gravity network) which will verify whether the source of the exceedance lies within their control / source.

ii. Proposed compliance parameters for the direct monitoring at this reticulation location (detailed above) have been developed based on Section 21.1.2 (e)(v) of the (previous) Regional Water & Soil Plan (RWSP) (permitted stormwater discharges), which provided standards for discharge of water to water, distinct from discharges to the CMA which have no quantifiable standards other than at the limit of a mixing zone. The standards in the Regional Water & Soil Plan are proposed to be adopted in Northport's proposed consent conditions, including because the Proposed Regional Plan **has no defined discharge parameters for a stormwater outlet discharge at the point of discharge**. The exception is the Proposed Regional Plan's parameter for Total Petroleum Hydrocarbons (15 mg/L, being more stringent than the equivalent previous Regional Water & Soil Plan standard), which is adopted in Northport's proposed consent conditions.

iii. The recommended stormwater quality compliance parameters at the location defined in Item (i) above are as follows (no mixing zone dilution effect applied):

The discharge must not contain more than:

- 15 mg/L Total Petroleum Hydrocarbons
- 10 mg/L of total copper
- 10 mg/L of total lead
- 100 mg/L of total Zinc
- 100 mg/L of suspended solids

10.3 In my opinion, the proposed approach to conditions outlined above – being the use of the current resource consent conditions' mixing zone thresholds as a trigger for the application of proposed new at-source compliance parameters – is appropriate from a stormwater management/engineering perspective because:

(a) The disparity between the MMH mixing zone thresholds and those in the current Northport consent creates a compliance issue/incompatibility, which the proposed approach will rectify.

(b) Northport have shown consistent compliance (with the mixing zone thresholds) at the pond outlet without the benefit of dilution; and previous monitoring indicates that the proposed at-source compliance parameters are unlikely to be exceeded.

(c) The use of thresholds for stormwater contaminants as contained in the previous RWSP are appropriate for application to stormwater discharges ultimately into the CMA as these standards / thresholds have been utilised for stormwater discharge consents throughout Northland and (generally) are used as the thresholds for Whangarei District Council (WDC) held catchment consent stormwater quality.

(d) The proposed retention of the mixing zone thresholds (which are informed by an extensive body of compliance, monitoring, and enforcement (and other scientific) evidence, data, and experience gathered over time with respect to several marine discharges/resource consents at the Whangārei Harbour entrance) as “trigger thresholds” for the application of at-source compliance parameters will continue to identify water quality effect(s) of potential environmental concerns, albeit that those thresholds are not proposed as enforceable compliance parameters.

10.4 While not relevant to Northport’s present application, in my opinion it would be appropriate in due course for MMH and/or NRC to seek alignment of the MMH consent discharge conditions with this same standard at an appropriate time appropriate.

11.0 Construction stormwater

11.1 I understand that the proposed construction methodologies for the proposed port expansion, including the reclamation, are industry standard and are

anticipated to be the same techniques used for previous reclamation at Northport.[11]

11.2 Discharges to the CMA during construction will be managed by way of proposed conditions of consent which require, among other things:

i. Monitoring and management (including water quality limits) of discharges of reclamation decant water and stormwater discharges from construction surfaces.
ii. Erosion and sediment control measures to be detailed in a Construction and Environmental Management Plan ("CEMP"). Among other things, the CEMP is required to detail best practice measures for managing the quantity and quality of decant water during reclamation construction.

12.0 Response to submissions

12.1 Several submissions raise stormwater matters. While I acknowledge the concerns raised in submissions, in my opinion all issues raised regarding stormwater are appropriately addressed in the application documents and/or my statement of evidence.

13.0 Response to the s42A report

13.1 There is a very high level of agreement between the s42A Report authors (and the Council stormwater reviewer, John McLaren)[12] and me regarding the appropriateness of the proposed system to manage operational stormwater from the expanded port.

13.2 Mr McLaren's memo concludes:

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[11] Refer for example to the summary at section 3.5.5 of the AEE.

[12] Refer to Appendix C9 Stormwater to the s42A Report.

> *Overall, I conclude that, subject to conditions, the quantity and quality of stormwater discharges from the proposal to the receiving environment will be appropriately managed.*

13.3 However, I note the s42A Report does not address Northport's amended proposed approach to conditions (being the use of the current resource consent conditions' mixing zone thresholds as a trigger for the application of proposed new at-source compliance parameters). This is because Northport's amended proposed approach is being presented with Northport's evidence in chief, including the proposed conditions attached to Mr Hood's evidence, which I address below. I have outlined above why I consider Northport's proposed approach to conditions is appropriate.

13.4 In addition, to clarify, paragraph 92 of the s42A Report indicates that the stormwater system was revised to incorporate allowance for climate change in accordance with the WDC Engineering Standards (ES) 2022. In actuality, we confirmed that there was no detriment to the overall performance of the stormwater system as a result of increased rainfall associated with climate change. The 20% uplift in rainfall depth / intensity specified in the WDC ES 2022 was used for this demonstration, noting that the WDC ES has no direct relevance to the performance of the Northport stormwater management system, with discharges being directly to the tidal environment and subject to NRC consent conditions.

13.5 Finally, Mr McLaren states the following with reference to GD01:[13]

> *…WQV can be provided without creation of weirs (dead storage) in the canals. It would be better that there be no restrictions (weirs) created in the canals, and therefore, less spills from the canals.*

13.6 I disagree that changes to the proposed stormwater management system design are warranted. While conservative, the design I have recommended –

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[13] Refer to page 13 of Mr McLaren's memorandum.

and Northport is proposing – provides greater safeguards over contaminant management; and reflects the existing configuration which has been demonstrated to perform very well. In addition, the weirs in the canal system are not the constraint triggering spillway flows (the capacity constraint of the 1200mm diameter culvert within the western canal is).

14.0 Proposed consent conditions

14.1 I have had input into and reviewed a draft version of Northport's proposed consent conditions accompanying Mr Hood's statement of evidence.

14.2 I have outlined key stormwater management aspects of the proposed consent conditions above. For the reasons outlined in my statement of evidence, in my opinion the conditions proposed by Northport are generally appropriate from a stormwater management/engineering perspective, with respect to the operational stormwater management.

James Blackburn

BEng(hons) CPEng CMEngNZ IntPE(NZ)

Appendices

Appendix A: Figure 1 - Overall Site Plan

Appendix B: Figure 2 - Catchment Plan

Appendix C: Northport Stormwater Pond Existing Contour Survey

Appendix D: Pond Levels Schematic

APPENDIX A

TO BE READ ONLY IN CONJUNCTION WITH ASSOCIATED REPORT

USE WRITTEN DIMENSIONS. DO NOT SCALE FROM DRAWING.

SITE PLAN
SCALE - 1:5000

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SCALE @ A3 1:5000
PROJECT No. **12377**
FIGURE No. **01**
REV. **R2**

18/08/2023 2:41:07 PM K:\12377 Northport Ltd - Future Development; Scope TBC - Ship Maintenance Facility, Marsden Point\12377 220711 Overall Site Plan.dwg

APPENDIX B

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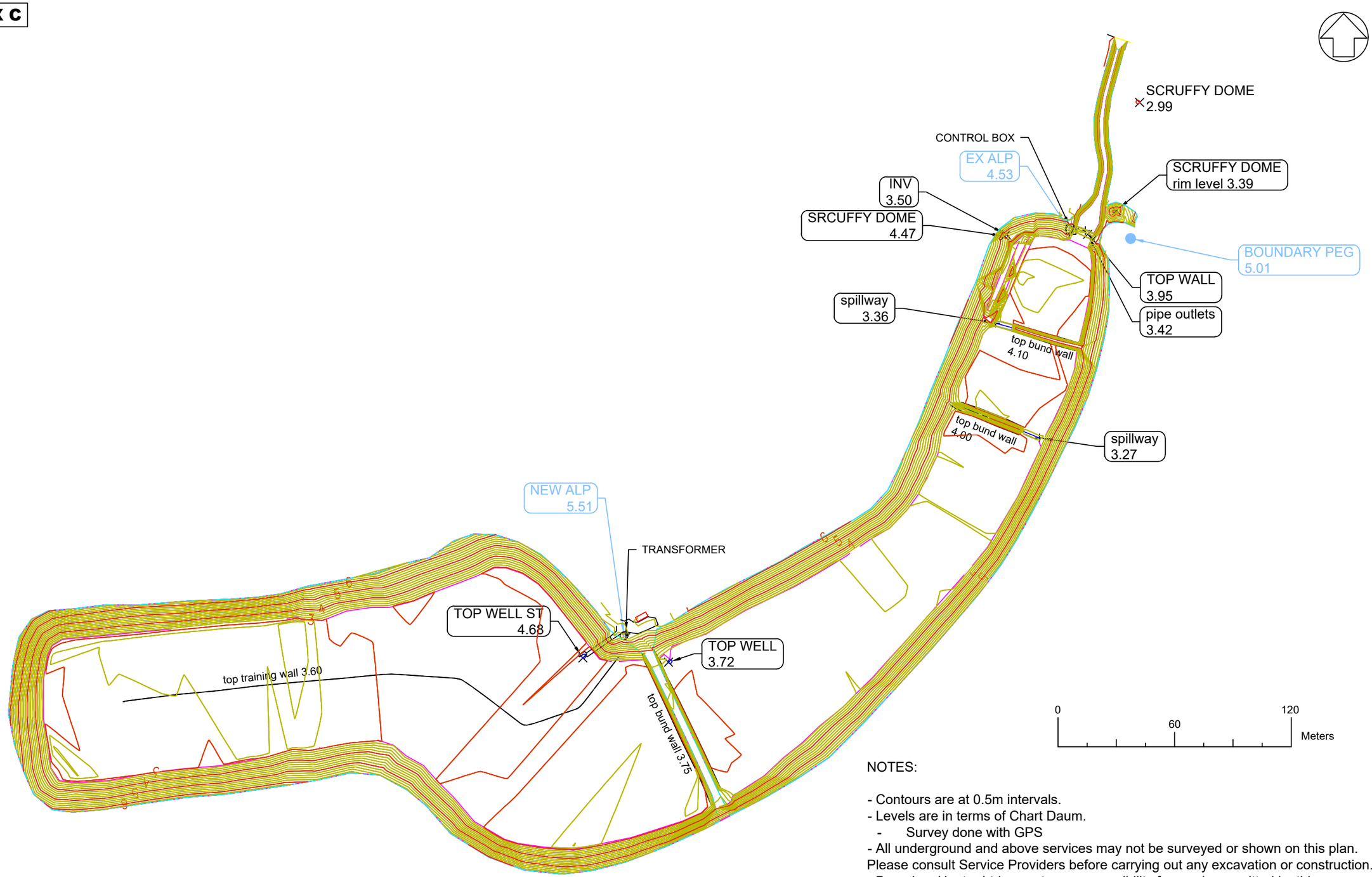
PROJECT No. **12377**
FIGURE No. **02**
REV. **R2**

18/08/2023 2:41:37 PM K:\12377 Northport Ltd - Future Development; Scope TBC - Ship Maintenance Facility, Marsden Point\12377 220711 Overall Site Plan.dwg

APPENDIX C



NOTES:

- Contours are at 0.5m intervals.
- Levels are in terms of Chart Daum.
  - Survey done with GPS
- All underground and above services may not be surveyed or shown on this plan. Please consult Service Providers before carrying out any excavation or construction.
- Boundary Hunter Ltd accepts no responsibility for services omitted by this survey.

Surveyed & Drawn by:

BOUNDARY HUNTER LTD

Ph. 09 435 5387

Email. bruce@boundaryhunter.co.nz

Northport Stormwater Pond Existing Contour Survey

Prepared for: Northport		Sheet: 1 of 1
Surveyed: BM	Checked. B Smith	
Date: 12/02/21	Scale: 1:2000 @ A3	Ref: 8934

NORTHPORT STORMWATER PUMP LEVELS