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DRAFT No. 2

Ref JND/22/1

1 February 2022

Attention: The Secretary, Des Mahoney

Potential Decommissioning of Kauri Creek Dam
Stage 1 – Overview

1.0 Introduction

This report reviews the options and procedures for decommissioning an earth embankment dam and supersedes the draft report tabled at the Kaitaia meeting on 18 January. It is presented on behalf of the Ngakahu/Ngakohu Whanau Ahuwhenua Trust in response to their request and in accordance with our mutual agreement signed on 7 January, and the site visit and discussions on 18 January.

The report describes the Kauri Creek Dam and its appurtenant structures, its history and its present condition. Reference is made to documentation and reports as provided to the Trust by Far North District Council (FNDC). Options for decommissioning by full or partial dewatering of the lake are discussed along with the engineering and environmental implications. The 18 January meeting proposed an investigatory lowering of the lake as soon as practicable with appropriate sediment control measures downstream of the two dam outlets.

The New Zealand Society on Large Dams (NZSOLD) published updated NZ Dam Safety Guidelines in 2015. Module 7 of the Guidelines, Life Cycle Management addresses Dam Decommissioning at Section 8, a copy of which is attached hereto. This report draws on Section 8 noting the engineering and environmental issues to be considered when addressing dam decommissioning, including longer term managerial and consenting issues of dewatering the reservoir, future flood passage and downstream effects of mobilisation of polluted water, sediment and debris.

2.0 History and Status of Kauri Creek Dam

The 16m high embankment dam was built on the Trust's land by Kaitaia Borough Council in the 1960's for water supply to Kaitaia township and is now owned and operate by FNDC. In recent years, water quality has become unsuitable for town supply, and there have been ongoing issues with dam seepage. The Ngakahu/Ngakohu Trust seeks decommissioning of the dam and improving the use of their land including part of the dam.

A detailed history of the dam and associated issues including ongoing seepage and consequent remedial works was given in Riley Consultants 2018 Comprehensive Dam Safety Report. That report concluded that "no major issues have been identified with the performance of the dam, however uncertainty remains on definitive explanations for the seepage evident on the top of the buttress." Using the processes in the NZSOLD 2015 Dam Safety Guidelines "indicated a Low PIC (Potential Impact Category) may be appropriate." (Riley 2018)

There was no evident reference to confirmation of spillway capacity in terms of design flood inflows. However, spillway adequacy was noted in Riley's 2003 report.

Riley's 2020 Intermediate Dam Safety Review for FNDC concluded there was no significant change in the condition of the dam and appurtenant works: some remedial work had been done in 2019.

3.0 Description of Dam

The Kauri Creek dam lies on a tributary of the Okahu Stream which then joins the Tarawhaturoa Stream running through Kaitaia township. The catchment of the lake is in bush covering about 2.0km^2 (200 ha), extending south some 2.5km into the Taumatamahoe range in the Herekino forest. The reservoir behind the dam is said to have a volume of about 170,000m^3 with a surveyed depth to about 11.0m. The reservoir lies on Conservation Land. Drone photography shows coarse localised sediment and debris accumulations at the head of the lake: finer deposits are to be expected at lower levels. Anecdotal and photographic evidence indicates some areas of instability in the catchment which likely are contributing to sedimentation at the reservoir head with particular relevance to any dewatering of the lake.

The chute spillway on the right abutment is concrete lined with a flip bucket and erosion protection at the base. It is understood to be constructed in the body of the dam but may be partially founded on natural ground. Evidently, there is no record of recent dam overtopping since the dam crest and spillway head walls were raised in the 1990's. A brief check on the passage of a representative 1/100-year flood discharge through the dam supports adequacy of the spillway under present conditions. The spillway stilling basin appears stable, with no evidence of significant erosion downstream to the Okahu Stream confluence.

The downstream face of the dam has exhibited various locations of seepage over the years and been the subject of the construction of a toe weight and drainage blanket, several series of standpipe piezometers and two sets of bored drains, all currently monitored and relatively stable. A wet area persists at the top of the buttress fill when the dam is full but diminished when the lake was lowered by some 2.0m in 2017. These features are shown on the attached drawings with acknowledgement to Riley Consultants.

4.0 Implications of Decommissioning

4.1 NZSOLD Guidelines

The following extract is from Section 8 of NZSOLD 2015 Dam Safety Guidelines Module 7. It is understood from Riley Consultants 2018 and 2020 Reports that the dam is not currently unsafe, albeit with some unresolved issues regarding seepage. Hence the following extract from Section 8 focuses on the engineering and environmental issues to be expected during and arising from dam decommissioning.

> *"... important engineering issues that will require careful consideration during the design and removal processes include:*
> - *The structure removal limits necessary to achieve an appropriate level of dam safety.*
> - *The long-term management of accumulated reservoir sediment (e.g. removal and disposal, removal by the river, flushing and release in to the downstream river or re-contouring and re-vegetation) and other environmental issues.*
> - *Reservoir drawdown capabilities and limitations on drawdown rates.*
> - *Flood management during decommissioning.*

- *The methodology for decommissioning the dam (e.g. removal sequence, demolition and removal methods, disposal, site restoration).*
- *The long-term safe passage of flood events.*
- *The long-term surveillance, operation and maintenance requirements for ongoing dam safety.*
- *Long-term public safety considerations where partial structures remain and are able to be accessed and used by the public."*

4.2 Partial Dewatering

Options for partial dewatering of the lake could include:

Option 1:

Permanently maintain a modest lowering of the water levels (e.g. by 1.5m as done previously to dry up the wet area at the top of the buttress fill) by floating intake and scour valve discharge. The spillway structure would be retained as at present to handle flood discharges, resulting in some degree of flood retention and attenuation of peak discharges. Some sediment would be remobilised, mostly for redistribution further down the lake and with turbidity in pipe discharges. Exposed lake margins could become revegetated but subject to periodic inundation by flood inflows.

Option 2:

Lowering the dam crest and redistributing the excavated material to form a flatter overall downstream slope such as suitable for grazing or disposal in the lake area to promote a wetland, as shown on the section on Sketch No. 22/1-1. The existing spillway provision would be extensively modified making use of the lower parts of the spillway chute and stilling basin for water level control.

More substantial ongoing partial lowering of the water level would increase flood attenuation but mobilise more sediment and debris and expose more of the lake shoreline.

A key requirement for operating the lowered dam would be maintaining the lowest practicable water levels by ongoing discharges through the floating intake and the bottom sluice valve. That procedure would provide some flood inflow retention/attenuation to reduce spillway discharge capacity. The existing pipe discharges and monitoring facilities would need to be extended and/or re-routed.

4.3 Full Decommissioning of the Dam

Options for effectively full dewatering of the lake could include:

Option 3:

As shown on the attached sketches, complete decommissioning by full lowering of the lake level would involve the effective removal of the dam and its flood retention function. A trapezoidal cut through the dam body would require stable side slopes to be determined by geotechnical analysis and a base width at least equivalent to the natural watercourse through the valley with erosion protection. That action would entail excavation and disposal of a substantial volume of dam fill of at least 20,000m^3, as shown on Sketch 22/1 - 2. Some of the excavated material could be repositioned into the dewatered lake area or for recontouring of downstream land.

It is to be expected that at least part if not most of the sediment and debris accumulated over 60 years in the lake (coarser material at the head and finer silts at the lower parts) will be mobilised during drawdown and during subsequent floods. There would likely be significant effects on downstream lands and the watercourse to and through Kaitaia with challenges in obtaining consents with comprehensive conditions.

Substantial dewatering will initially result in extensive areas of mud flats and/or slumping side slopes, taking some years to effectively revegetate. Flood discharges are likely to have higher peak flows than at present because of the removal of the retention/attenuating effect of filling the lake. The existing concrete spillway would become redundant.

Option 4:

Recognising the need to continue passing flood flows through the dam site, an alternative to the above would retain and utilise the stilling basin of the existing spillway while lowering the main part of the spillway. A smaller trapezoidal cutting would involve considerably less excavation in the order of 10,000m³ as shown on Sketch 2.

The remaining lake volume and residual sediment could be filled and stabilised by disposal of material from lowering the spillway, and from part of the dam if appropriate and thereby encourage wetland development. While there would be environmental issues from remobilisation of sediments it is likely these would be less than with Option 3. The dam would then cease to act as such, with future monitoring confined to ensuring stability and no detrimental effects or erosion downstream of the stilling basin.

The attached copy of Riley's Drawing 170308-5 shows the respective footprints of effective removal of the centre of the dam and the lesser impact of lowering the spillway, leaving the bulk of the dam 'high and dry' and hence no longer a Large Dam.

5.0 Preliminary Investigations

The above concepts and options are aimed principally at improving the Trust's land use while recognising associated water quality issues and future responsibilities. The key issues foreseen for each option are summarised in the attached table.

As a first step in investigations and as agreed at the Kaitaia meeting on 18 January it is proposed that Council arrange to lower the lake as far as practicable during the remaining summer months using both the floating intake and the scour valve. The discharges would be routed through a settling facility which would need to be constructed at an early date. Sediment ponds would be installed with discharge to land involving geotextile filters and hay bales or heavy drainage material to limit sediment entering the Kauri Creek from ongoing pipe discharges. Drawing down the lake prior to refilling from winter flood inflows would allow the dam and the lake floor to be assessed for slope stability together with the build-up of silt, mud and debris.

A prefeasility study would be commissioned concurrently to define more clearly the options and concepts outlined above. A critical issue for detailed consideration would be handling the passage of flood flows during construction of the lowered spillway and hence the timing of any excavations and demolition of most of the spillway and construction of a lower channel, either concrete lined base or erosion protection of an unlined channel.

Maintaining or modifying the existing structure with lowered water levels could be more feasible in terms of consenting and would likely entail conditions regarding revegetation of lake margins as wetlands and monitoring of downstream effects after stakeholder consultation. Significant modification of the dam structure and the spillway would also likely entail seeking Building Consents.

6.0 Outline Procedures for Decommissioning Dam – Stage 2

Reference is made to Figure 8.1 in the attached extract from Section 8, Module 7 of NZSOLD 2015 Guidelines:

Step 1 Would entail discussions by the Trust with FNDC and Northland Regional Council (NRC) to define in principle the extent of dewatering of the dam as part of an agreement to decommission at least partially, possibly with shortlisted options for more detailed assessment.

Steps 2 and 3 Would include collection of relevant data including the issues remaining from Riley Consultants 2018 and 2020 reports, and geotechnical data as relevant. Environmental issues in the reservoir area and downstream would be scoped with input from appropriate specialists. Preliminary cost estimates could be made to compare decommissioning options and produce preliminary budgets.

Step 4 Following a decision to proceed, support documentation would be developed by consultants to inform stakeholder consultation and support resource consents.

Steps 5 and 6 The decommissioning procedure would be contracted and managed by FNDC with NRC oversight and ongoing monitoring of effectiveness.

7.0 Conclusions

The Ngakahu/Ngakohu Whanau Ahuwhenua Trust seeks full decommissioning of the Kauri Creek Dam. Any retention of the dam function *per se* would entail ongoing responsibility for maintenance and monitoring and some resolution of ownership issues.

After considering options of full or partial dewatering this review points to effective decommissioning of the dam body but with spillway modification and retention of the spillway stilling basin to handle flood flows as outlined in Option 4 above. The lake would then be effectively dewatered with the potential of developing a wetland, with the remaining dam body ceasing to be a Large Dam.

Following the investigations outlined in Section 5 above, more details of dam excavation, lake modification and reconfiguration of the spillway would follow as part of a prefeasibility report following the steps outlined in Section 6.

8.0 Limitations

The scope of this overview has been limited to a brief site visit, the available documentation and the discussions on 18 January. The concepts outlined are preliminary and tentative and are presented for discussion and further investigations.

This Stage 1 Overview Report has been prepared for the benefit of the Ngakahu/Ngakohu Whanau Ahuwhenua Trust with respect to our particular brief and it may not be relied upon in other contexts or for any other purpose without my prior review and agreement.

9.0 Acknowledgements

Far North District Council for use of Tonkin & Taylor Ltd and Riley Consultants drawings.
Des Mahoney for advice and comments.

Ngā mihi

J N Duder
F Eng NZ, CPEng

Principal Reference Documents:

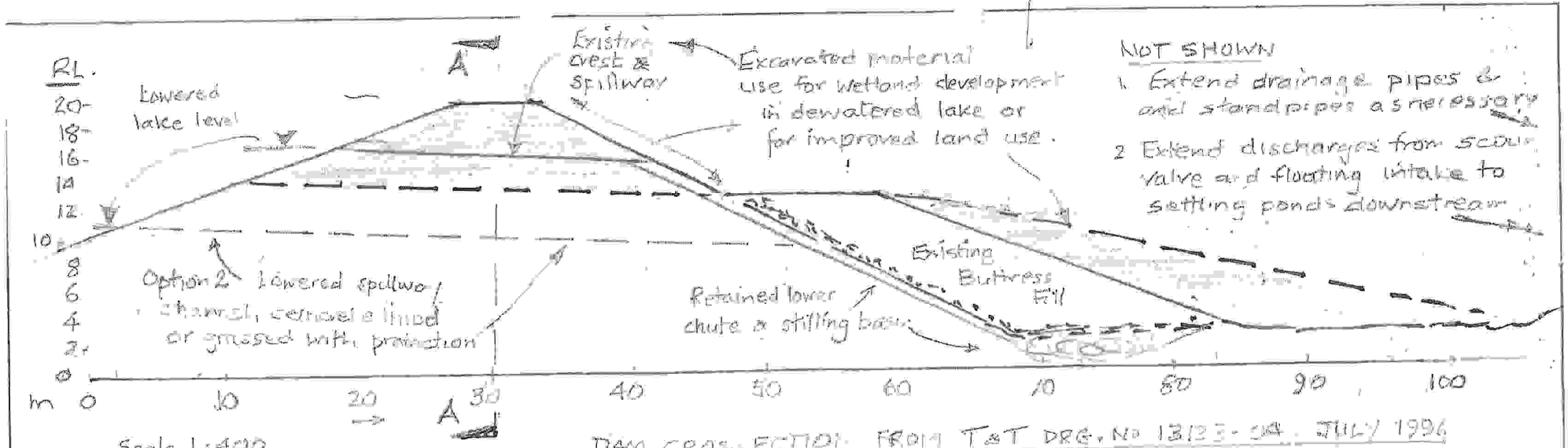
- Tonkin & Taylor Ltd Job Number 13123 July 1996
- NZSOLD Dam Safety Guidelines 2015
- Riley Consultants - Comprehensive Dam Safety Review 2018/2019
  Intermediate Dam Safety Review 2020
- Minutes of site visit and meeting on 22 January 2022.

Reference Drawings:

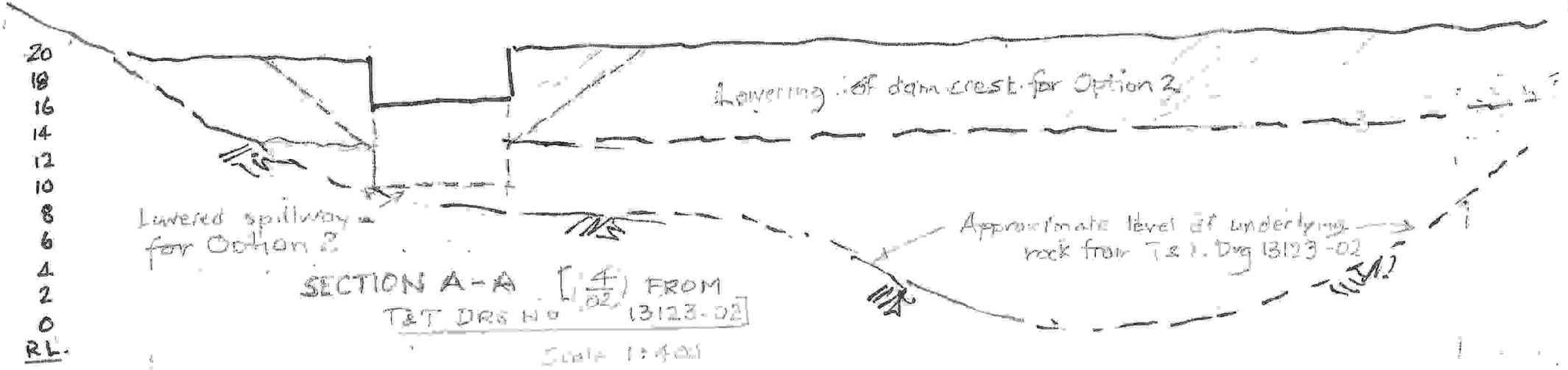
- D.B. von Sturmer Survey No 1634 1996
- Worley Consultants Drawing No 9-121-01
- Tonkin & Taylor Drawings Nos 13123-01 to 4
- Tonkin & Taylor Drawing 15544-01 (As Built)

Attachments:

- Section 8 from Module 7, NZSOLD 2015
- Riley Consultants Drawing: Nos 170308 – 3
- Sketches 22/1 - 1 & - 2
- Table: Summary of Options 1 - 4



DAM CROSS SECTION FROM T&T DRG. No 13123-04 JULY 1996
– Indicative lowering of dam & spillway for Option 2



SECTION A-A [$\frac{4}{02}$] FROM T&T DRG No 13123-02]

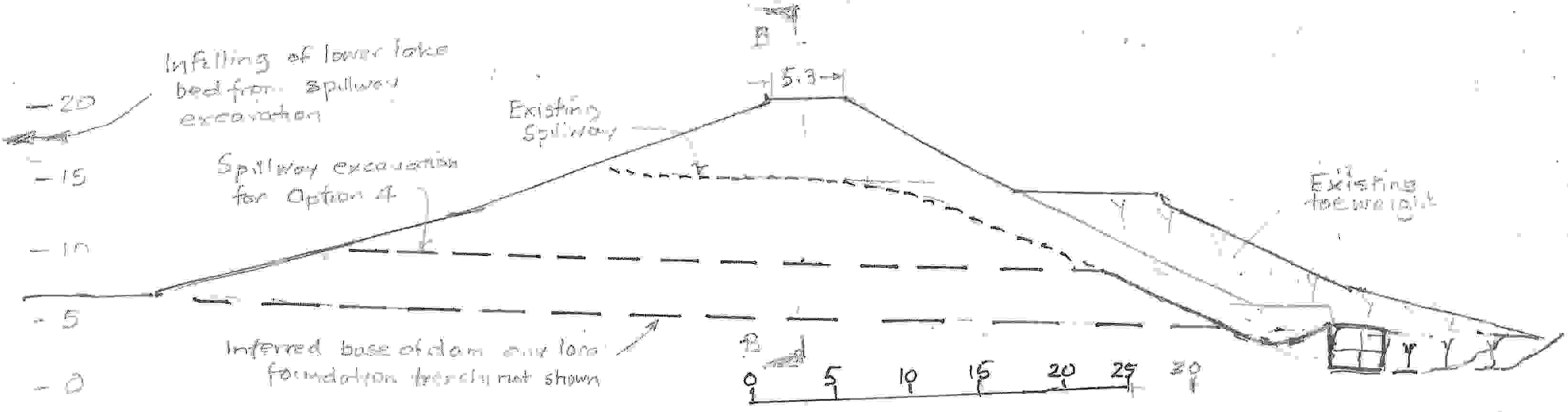
Scale 1:400

Reference Drawings:
- Tonkin & Taylor Ltd: Drg No 13123-1 to-4, 15549-01
- RILEY Consultants: Drg. No: 70508-3 & 5

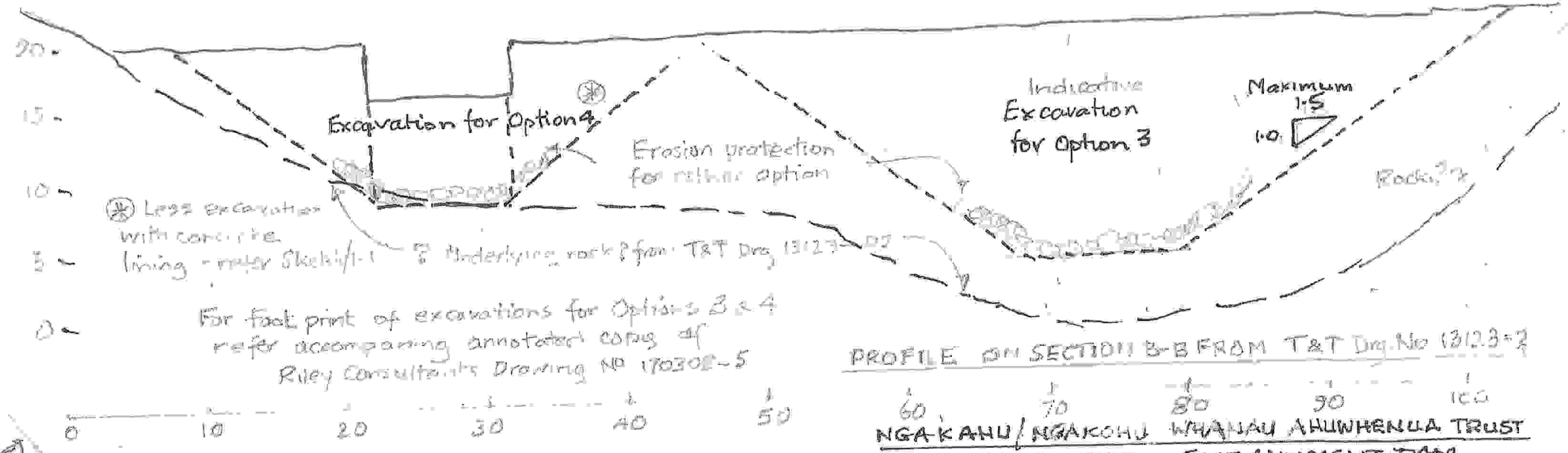
Amendment A – Revision to show Option 2.

J.N. DUDEN CONSULTING ENGINEER
FEng. NZ CPEng

NGAKAHU/NGAKOHU NHANAU AHUWHENUA TRUST
KAURI CREEK ENBANKMENT DAM
PARTIAL DECOMMISSIONING - OPTION 2.
February 2022. SKETCH 22/1 A



CROSS-SECTION OF DAM FROM T&T Drawing 13123-04



PROFILE ON SECTION B-B FROM T&T Drg. No 13123-?

DRAFT

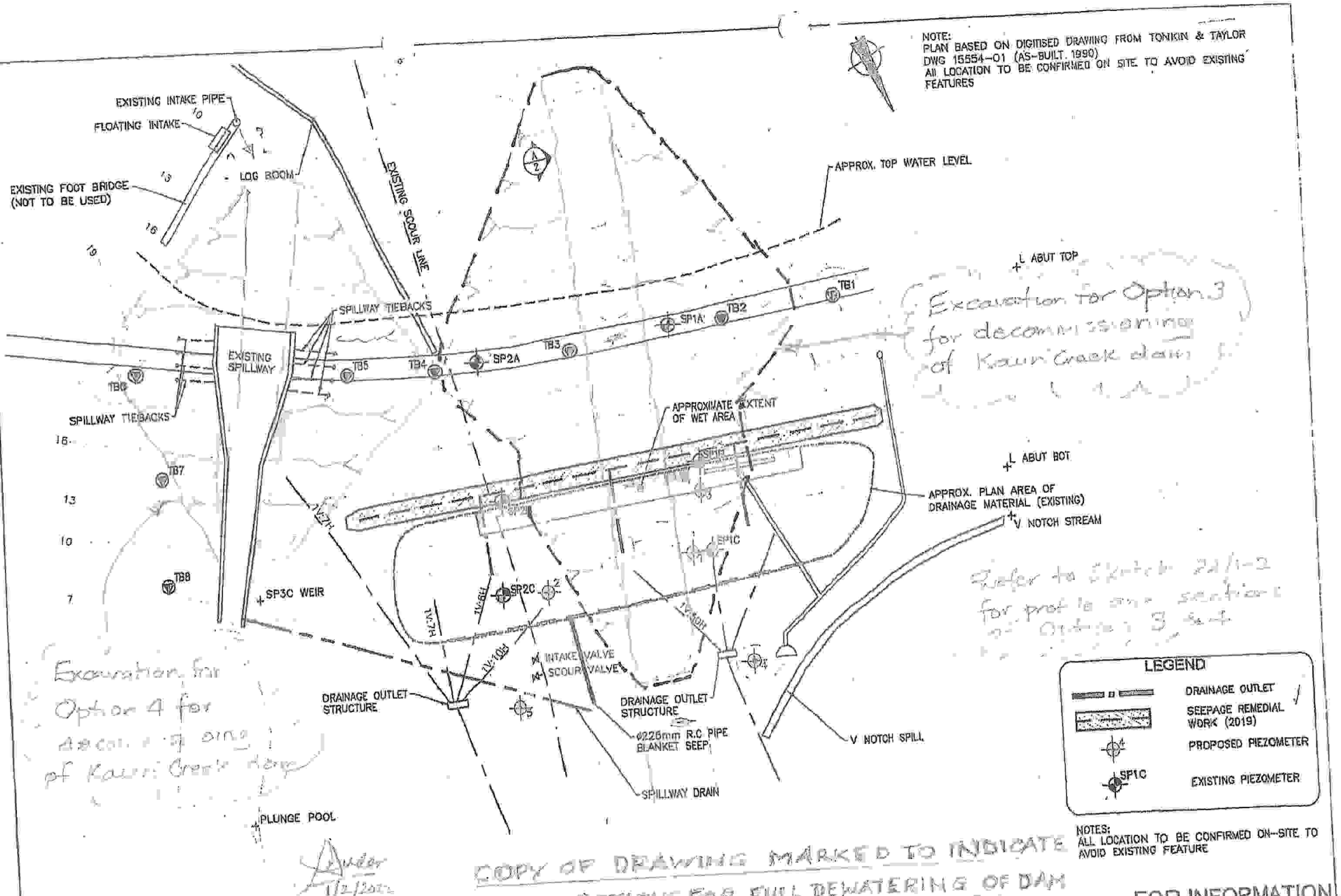
J.N.DUDER, CONSULTING ENGINEER

NGA KAHU / NGAKOHU WHANAU AHUWHENUA TRUST

KAURI CREEK EMBANKMENT DAM

FULL DECOMMISSIONING - OPTIONS 3 & 4

February 2022. SKETCH No. 22/1-2.


NOTE:
PLAN BASED ON DIGITISED DRAWING FROM TONKIN & TAYLOR
DWG 15554-01 (AS-BUILT, 1990)
All LOCATION TO BE CONFIRMED ON SITE TO AVOID EXISTING FEATURES
EXISTING INTAKE PIPE
FLOATING INTAKE
LOG BOOM
EXISTING FOOT BRIDGE (NOT TO BE USED)
EXISTING SCOUR LINE
APPROX. TOP WATER LEVEL
L ABUT TOP
SPILLWAY TIEBACKS
EXISTING SPILLWAY
TB1
TB2
TB3
TB4
TB5
TB6
TB7
TB8
SP1A
SP2A
SP3C WEIR
APPROXIMATE EXTENT OF WET AREA
SP1B
SP2B
SP1C
SP2C
L ABUT BOT
APPROX. PLAN AREA OF DRAINAGE MATERIAL (EXISTING)
V NOTCH STREAM
V NOTCH SPILL
INTAKE VALVE
SCOUR VALVE
DRAINAGE OUTLET STRUCTURE
DRAINAGE OUTLET STRUCTURE
Ø225mm R.C PIPE BLANKET SEEP
SPILLWAY DRAIN
PLUNGE POOL
Excavation for Option 3 for decommissioning of Kauri Creek dam
Refer to Sketch 22/1-2 for profile and sections of Option 3 set
Excavation for Option 4 for decommissioning of Kauri Creek dam
LEGEND
DRAINAGE OUTLET
SEEPAGE REMEDIAL WORK (2019)
PROPOSED PIEZOMETER
SP1C EXISTING PIEZOMETER
NOTES:
ALL LOCATION TO BE CONFIRMED ON-SITE TO AVOID EXISTING FEATURE
COPY OF DRAWING MARKED TO INDICATE EXCAVATION OPTIONS FOR FULL DEWATERING OF DAM
Under 1/2/2021
FOR INFORMATION
SCALE 1:500
0 5 10 15 20 30 (m)
DESIGN CM CHECKED CM
DRAWN WY CHECKED RT
APPROVED FOR ISSUE D TATE
DATE: 30/04/19
1 FIRST ISSUE WY 30/4/19
RDV DESCRIPTION BY DATE
DATE DRAWN APRIL 2019
RILEY CONSULTANTS
P.O.BOX 100 253
NORTH SHORE
AUCKLAND 0745
TEL. 09-4897872
FAX. 09-4897873
TITLE
FAR NORTH DISTRICT COUNCIL
KAURI CREEK DAM
PROPOSED PIEZOMETER LOCATIONS
CADFILE 170308-5
SCALES (A3) 1:500
DRAWING No. 170308-5
REV. 1

A proposed process for the decommissioning of a dam is shown in Figure 8.1.

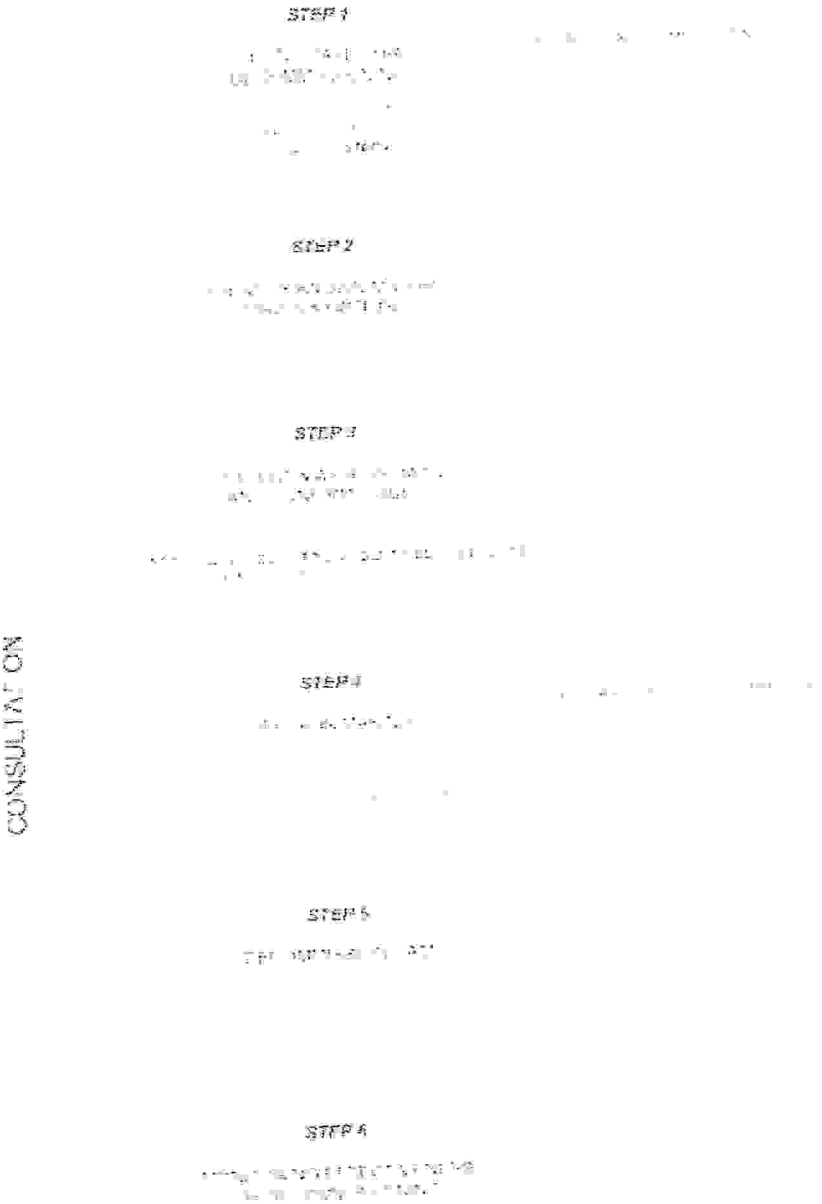


Figure 8.1: Dam Decommissioning Process

The process should include the careful evaluation of a wide range of decommissioning options that include complete removal, partial removal, changes in reservoir operation and change of use. A wide range of issues will be associated with each decommissioning option; some will be common to many of the options while others will be specific to a single option. The use of independent advice from technical specialists and stakeholders is an essential component in the identification of a preferred decommissioning option.

8. Dam Decommissioning

8.1 Introduction

Decommissioning of a dam may become necessary because the dam has outlived its usefulness, or it requires rehabilitation works which the Owner cannot afford or which render the operation of the dam uneconomic. Unless emergency action is agreed by the Regional Authority as being necessary, the decommissioning of large structures will typically require consents under the Resource Management Act and Building Act. Investigation, design and decommissioning procedures should generally follow those outlined in Modules 3, 4 and 6, with a focus on controlling the risks during the decommissioning process and leaving them acceptably low on completion.

A decision to decommission a dam should be based on the careful evaluation of a wide range of alternatives to resolve issues associated with dam safety, high rehabilitation costs, high operation and maintenance costs, environmental effects, sedimentation issues, and long-term function and ownership. Such evaluations need to consider issues arising from either retention or decommissioning of the dam as there will be effects and consequences with either approach. In some cases full removal may be necessary to resolve critical issues, while in other cases partial removal may provide a satisfactory long-term solution. The following subsections provide guidelines for the consideration of dam decommissioning as a project alternative. The guidelines are restricted to the consideration of issues related to dam safety – they do not address environmental, legal, social, economic, ownership and political issues, all of which could have significant effects on the identification of a preferred decommissioning option. The guidelines do not apply to tailings dams.

8.2 Decommissioning Considerations

8.2.1 Dam Safety

The Building Act and Building (Dam Safety) Regulations require dams to meet current dam safety criteria as recommended in these Guidelines. If the criteria are not met Owners would likely consider a number of questions including the following:

- What rehabilitation works are necessary to address the identified dam safety deficiencies?
- What is the estimated cost and time for the completion of the rehabilitation works?
- How would the completion of the rehabilitation works affect my commercial operation?
- What are the costs of decommissioning and is it economically viable for me to complete the rehabilitation works?
- What alternatives are available if it is uneconomic for me to complete the rehabilitation works?
- What are the issues associated with the alternatives and what alternatives would likely be acceptable to the consent authorities?

Decommissioning could become necessary if it was uneconomic for an Owner to complete the rehabilitation works necessary to address a dam safety deficiency. Complete removal of a dam would usually be unnecessary to satisfy current dam safety criteria and, in most cases, partial removal would be sufficient. Partial removal could include reducing the dam height or breaching the dam to permanently reduce the loads on the structure, and removing all ancillary structures (e.g. gates, pipelines, pump stations, powerhouses). Total removal would generally only become necessary to address issues unrelated to dam safety.

Stakeholder participation in the decision making process and stakeholder support of a preferred decommissioning option will usually be essential for a successful project outcome. Obtaining consents for a preferred decommissioning option will be very difficult, if not impossible, to achieve without support from community and environmental interest groups.

6.3 Decommissioning Design and Removal

Dam decommissioning projects require careful design and a comprehensive understanding of the existing structures is essential to the success of a decommissioning project. In some cases there will be sufficient documentation available to confidently establish the characteristics of the existing structures while, in other cases where documentation is scarce, a programme of field work may be necessary to confirm site conditions.

The design and removal processes should generally follow the recommendations included in Modules 3 and 4. However, experience in dam decommissioning projects is very limited in New Zealand and, depending on the scale of the decommissioning project, specialist design and contractor support may be necessary to achieve a successful outcome. Important engineering issues that will require careful consideration during the design and removal processes include:

- The structure removal limits necessary to achieve an appropriate level of dam safety.
- The long-term management of accumulated reservoir sediment (e.g. removal and disposal, removal by the river, flushing and release in to the downstream river or re-contouring and re-vegetation) and other environmental issues.
- Reservoir drawdown capabilities and limitations on drawdown rates.
- Flood management during decommissioning.
- The methodology for decommissioning the dam (e.g. removal sequence, demolition and removal methods, disposal, site restoration).
- The long-term safe passage of flood events.
- The long-term surveillance, operation and maintenance requirements for ongoing dam safety.
- Long-term public safety considerations where partial structures remain and are able to be accessed and used by the public.

6.4 Dam Performance Monitoring

A programme of dam performance monitoring would normally be necessary to quantify and evaluate effects that accompany the demolition and removal of a dam and, if partial removal is adopted, to monitor the ongoing safety and public safety of the completed project.

A dam performance monitoring programme during demolition and removal should address the dam safety objectives of the programme, monitoring requirements and frequencies, acceptable performance criteria for the elements being monitored and reporting and evaluation requirements. Mitigation measures and an Emergency Action Plan (refer Module 6) should also be in place to address any dam safety concerns that could arise during demolition and removal.

If partial removal is adopted and the completed project incorporates a permanent reservoir, performance monitoring may be necessary to enable verification that the completed works are performing as intended and to identify developing or changing conditions that could affect the safety of the decommissioned dam. Post-decommissioning performance monitoring programmes should reflect the PIC of the decommissioned dam and the procedures recommended in Module 5 should be followed. Although unlikely, given that the dam is decommissioned, there may be some residual dam safety risk that requires an Emergency Action Plan to be in place to address any emergencies that arise following the decommissioning of the dam. In such a case the recommendations included in Module 6 should be followed.

NGAKAHU/NGAKOHU WHANAU AHUWHENUA TRUST
KAURI DAM DECOMISSIONING
SUMMARY OF OPTIONS

OPTION NO	MODIFICATION TO DAM	SPILWAY CONFIGURATION	DISPOSAL OF EXCAVATED MATERIAL	LAKE SEDIMENT ISSUES
Partial Dewatering – Report Section 4.2 Sketch 22/1/1				
1.	Existing dam retained.	Existing spillway retained.	"	Maintain lower lake by discharging through existing pipes; some sediment redistribution.
2.	Upper part of dam lowered.	Lower and longer intake channel, retain lower chute and stilling basin	Develop lake shorelines or flatten downstream dam shoulder.	Permanently lower top water levels, significant sediment redistribution.
Full Dewatering – Report Section 4.3 Sketch 22/1/2				
3.	Full depth trapezoidal excavation through dam >20,000m³. Dam decommissioned.	Existing structure redundant – long excavated channel, rock armoured to pass flood flows.	>20,000m³, develop lake wetland or downstream land use.	Lake dewatered. substantial excavation of sediments to minimise downstream effects of remobilisation.
4.	Trapezoidal excavation for lowered spillway c.10,000m³. Main body of dam fully decommissioned.	Excavated channel to existing still basin, with concrete lining or rock armouring.	Develop lake wetland and/or downstream land use.	Water level permanently lowered. Excavate sediments or combine with dam material for wetland.

Notes:
1. Refer to Sections 4.2 and 4.3 of J.N Duder Report dated 1 February 2022
2. Issues of flood passage and sediment control during construction are excluded.
3. Options are preliminary and tentative, all subject to further investigations.

J.N. Duder, Consulting Engineer 1 February 2022

DRAFT

Gmail Ngakahu/Ngakohu Whanau Ahuwhenua Trust <ngakahu.ngakohuwat@gmail.com>

Decommissioning report

1 message

John Duder <jnduder@gmail.com> Fri, Feb 4, 2022 at 9:04 AM
To: Des and Melva Davis Mahoney <desandmelva@gmail.com>, Ngakahu/Ngakohu Whanau Ahuwhenua Trust <ngakahu.ngakohuwat@gmail.com>

--Kiaora Des & Trustees .
I intend to add a new third paragraph into section 5 preliminary Investigations , before the para staring "A prefeasibility study---".
" A sounding survey of the lake was done by Northland regional council in 2017 , but the results were not processed.
Early processing of that data is recommended in order
a] to check the reservoir volume estimate of 172,000 m3
b] to estimate the volume of finer sediments at lower parts of the lake
c] to enable monitoring of the effect of lake drawdown on remobilising sediments during the proposed trial dewatering of the lake.
That information will provide valuable data for final design of decommissioning .
Processing the sounding survey results and the proposed trial dewatering should both be done as soon as possible, well before the coming winter inflows "

John N Duder,