Submitter Evidence - Kim Fogelberg

on application for resource consents for Suction Dredge Mining on Clutha River / Mata-Au

07 Nov 2023

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Kim Fogelberg - Submitter Evidence

Introduction

My Name is Kim Fogelberg
I have lived in the Upper Clutha for 20 years. I consider the Mata-au part of my backyard. I visit the river regularly on bike, I walk, kayak and canoe. The river and its users should be respected and protected.

I am presenting evidence on two elements of my submission, Environmental and Safety.

Witness evidence will be presented by two individuals.

Reginald Hall (Reg)
A qualified marine engineer and skipper. Reg was employed by CGC a decade ago during the initial launch of the Dredge at Roxburgh.

Oliver Moon (Olly)
Employed by CGC earlier this year.

Reg and Olly both share remarkably similar narratives regarding the company's attitude towards contaminants from the dredge entering the Clutha river. They also share safety concerns.

Environmental

The Applicants s92 response to a question of contaminants being discharged is:

"There will be no contaminants (except for the remobilisation of instream sediments) discharged to water."[1]

1. As highlighted in my submission, the Dredge relies on Detroit 2-stroke engines for manoeuvring. These engines were designed more than fifty years ago. Detroit ceased selling these engines over 25 years ago, due to their inability to meet environmental regulations of that era.[2] When assessed by today's standards, these engines are notably inefficient and discharge substantial amounts of hydrocarbons into the river.

   Selecting these engines for the Dredge construction is evidence of the company's lack of consideration to its environmental impact.

   Reg will briefly explain why these engines are considered heavy polluters in the marine industry.
   He will also detail the loss of hydraulic oil and fuel into the river from this Dredge.

2. Olly will talk on the matter of plastic dredge pipe liners that undergo scouring, resulting in the addition of microplastics to the river.

   These plastic pipes serve as lining for the primary dredge pipe. They are worn down by the gravel being extracted from the river bed and need to be replaced routinely.

   This practice demonstrates to me the company's inadequate commitment to the environment.

3. Both Olly and Reg can confirm sighting a practice which occurs on the dredge which is a violation of the vessels MTOP procedure. The cassette toilet used on board during the day is not taken off site to be emptied. The waste is thrown overboard.

4. Peter Hall mentioned in his brief of evidence that;
   "we do try and operate in an 'out of sight, out of mind' way to an extent."[3]

   Having conversed with both Reg and Olly, I've reached the conclusion that operating discreetly significantly facilitates the act of discharging contaminants into the river unnoticed. Once these substances are released into a swiftly flowing river, the only people likely to witness the effects are the employees of the dredge.

[1] E from applicant containing s92 response part 1
[2] https://en.wikipedia.org/wiki/Detroit_Diesel_Series_92#History
[3] Brief of Evidence of Peter Hall. 36.

5. To summarise, the following contaminants are entering the river system during operation on the Dredge.

    1. Fuel/oil exhaust from the 2 stroke engines mixed with river water used to cool is expelled directly into the river.
    2. Oil which leaks onto the dredge deck has access to the river via the cooling grates which Olly has pointed out.
    3. Diesel does enter the river during fuel transfers as witnessed by Olly.
    4. Microplastics are being added to the river system by way of a large pipe liner which is ground down during the dredging process.
    5. Toilet waste is expelled into the river as witnessed by Reg and Olly.

The applicants statements that maritime NZ audits and ORC monitoring are evidence that CGC are adhering to regulations is not proof that contaminants are not discharged to the river.

6. As an amateur kayaker who has spent time on this river I have a good appreciation of risks associated with its fast-flowing waters.
   The prospect of coming across this vessel in the Upper Clutha terrifies me.
   While the signage recommended by the harbour masters offers guidance, it differs from road signs that caution drivers to slow down in order to safely navigate an obstacle. In the river's case, I am entirely subject to the river current's force. It is not possible to slow down. I can only attempt to steer the kayak at speed to evade any potential dangers. This is challenging for someone like me who is still learning. Often I end up side on to the river flow which in turn can set me off spinning in circles whilst travelling downriver. I tend to place myself in the middle of the river to avoid obstacles on the river edges (eg willows)

7. I have visited the Dredge at its present Beaumont location. The river where the Dredge is currently sited is considerably wider than most sections of the Upper Clutha.

8. Appendix A to this document has a link to an article about the Clutha River. Lewis Verduyn (who has unfortunately passed) lived just above the Luggate bridge and spent 20 years rafting the Clutha.
   This article includes good insight about the velocity of the Clutha.

9. I have included with this evidence a video of the dredge navigating the river in Roxburgh. It shows how fast the vessel travels in the river current. It would clearly be unsafe for other river users to be present when the Dredge is off anchor.

10. Reg can communicate risks linked to the dredge, as perceived by a skipper, both when it is anchored and also while it is manoeuvring on the river. It's crucial to take into account the notable disparities between the Upper Clutha River and the location where the dredge currently operates to address safety concerns effectively.

Appendix A

New Zealand Geographic article

WHAT PRICE A RIVER?

WRITTEN BY DEREK GRZELEWSKI

https://www.nzgeo.com/stories/what-price-a-river/

Excerpts from “What price a river?”

The Clutha’s quiet but formidable power comes from its large catchment area. Figuratively speaking, the river is like the trunk of a giant tree, with a deep and complex root system. Three large lakes—Wanaka, Hawea and Wakatipu—anchor the system in the foothills of the Southern Alps, but the tributaries which feed them penetrate beyond the Southern Lakes district into Fiordland and as far north as Haast. The Greenstone, Caples, Rees, Dart and Route Burn; the Wilkin, Young, Makarora, Matukituki and Hunter—all these rivers form the headwaters of the Clutha, whose total catchment extends over some 20,582 square kilometres. At 322 km from source to ocean, the Clutha is not a particularly long river, but it more than makes up for shortness with volume, speed and power.
These attributes are apparent as soon as we launch Lewis’s inflatable raft at Albert Town, near the first bridge that spans the river. It picks up speed instantly, moving at 15–18 km/h, Lewis estimates, without a single oar-stroke. The water is as clear as kirsch: I can see the rocks of the riverbed three or four metres below us rushing past like a landscape through the window of a train.

Most of his passengers assume that because the Clutha has no big rapids there is no danger, Lewis says. “They don’t realise that it is the flow of the river and not its white water that is the greatest threat. So they enjoy the cruise and the scenery, unaware that if I were to misjudge a turn we could all be swimming within seconds, perhaps dead within minutes.”

Reginald Hall Evidence
7/11/2023

Clutha River/Mata-Au CGC mining dredge.

Introduction

1. Kei te rangatira, tēnā koe, my name is Reginald Hall.

   I have lived in the Upper Clutha for the past 20 years.

   My professional qualifications include being a certified Marine Engineer and Skipper. Details are enclosed as Appendix B.

   I am currently employed by Lyttelton Port Company as a Tug Engineer.

   As a keen fisherman who knows the Upper Clutha river well, I am submitting evidence about Cold Gold Clutha's suction dredge mining due to the pollution it yields and the safety aspect of its presence in the region.

   Approximately a decade ago, I was employed by CGC at Roxburgh, during the initial launch of CGC1. Following the launch and a period of operation, it was determined that the dredge needed to be taken out of the river to address certain design issues. This resulted in a workforce reduction, my departure from this position was amicable.

   I have recently met Oliver Moon (another submitter) who gave me some insight to the current operation. I was very surprised to hear environmental shortfalls on the dredge have not improved over the past 10 years.

Main Propulsion Engines

2. The principal disadvantage of the two-cycle Detroit marine engine is that its combustion configuration allows unburned fuel to pass out the exhaust valve/port before the valve has closed, resulting in excessive exhaust emissions.Two-stroke engines emit high levels of hydrocarbons in both burned and unburned form.

   Peter Hall in his brief of evidence[4] has made a misleading comparison between the two 550hp (932kW total) diesel main propulsion engines and a 2-stroke petrol outboard engine. The bulk of toxic emissions is directly related to burnt and unburnt diesel fuel and not sump design.

[4] Brief of Evidence of Peter Hall 10. & 11.

The engines are cooled by river water in heat exchangers. Once this cooling water has passed through the heat exchangers it is injected directly into the engine exhaust mufflers and then returned to the river.

All CGC1 main propulsion engine exhaust emissions are discharged directly into the river marine environment via this wet exhaust system.

Wet exhaust mufflers are also required to mitigate the high decibel noise output characteristic of the Detroit 2-stroke cycle engines. CGC has not provided a noise assessment for the main propulsion engines. The noise report that has been provided is for the dredging motors.

The design of these engines requires a complex system of seals that often fail over time, causing oil leaks.

These are dirty, noisy and inefficient engines, their only advantage being that they are less costly to purchase when compared to modern 4-stroke marine engines. These engines were not new when installed on the dredge. They are second hand reconditioned engines of unstated total hours.

Hydraulics.

3. Over the past 40 years I have operated a wide variety of commercial vessels on both the New Zealand and Australian coasts, including mining dredges. I have experienced many hydraulic equipment failures.

   Dredge mining operations are particularly harsh on hydraulic equipment. The hydraulics operate in an environment of an abrasive gravel/sand substrate, corrosive hydraulic fluid, heat, pressure and vibration. Over time failure of hoses, seals, bearings and pumps will occur. Save-alls/trays under all hydraulic and bunkering equipment is necessary.

   Whilst I operated the CGC1 dredge it was not fitted with an oily water or waste oil tank. The hydraulic anchor winch motors leaked oil directly onto the fore deck.

   I note that CGC appears to have not reported a failure in over 10 years of operation. Reporting is mandatory under Maritime New Zealand* and Otago Regional Council Rules.[5]

[5] Maritime New Zealand accident and incident reporting requirements:- https://www.maritimenz.govt.nz/content/commercial/safety/accidents-reporting/faqs.asp

Refuelling

4. Based on figures supplied by CGC the dredge would burn through about 21,000 litres of diesel oil per month.
   The CGC1 jet boat transfers the fuel to the dredge at a rate of 400 litres per trip.
   This would require 52 individual jet boat trips per month.
   Fuel has to be transferred/ pumped twice, therefore 104 fuel transfers on or immediately adjacent the river per month. 1,248 diesel transfers per year. Approximately a quarter of a million litres of diesel oil per year.
   These transfers occur on the river bank and in the middle of a large swiftly flowing river. The odds of fuel spill are extremely high.

5. To operate a commercial vessel with a length of 24 metres, Maritime New Zealand requires that the master hold a minimum qualification of Skipper Restricted Limits endorsed to 24 metres. CGC1 routinely carries out refuelling using a jet boat and dredging operations without a qualified skipper onboard. Should an accident or emergency arise such as a fire, fuel spill or injury, there are no MNZ qualified crew onboard trained to respond.
   In March 2022 CGC1 lost their jet boat due to an accident.[6]

   Please refer to the recent photo of the CGC1 river bank fuel transfer station. Note the fuel hose hanging in a willow over the river. (Appendix A.)

   This has been referred to the ORC pollution hotline.

   In over 10 years of operations CGC1 has never reported a fuel spill.

Toilet

6. The CGC1 was fitted with a basic motorhome type cassette toilet. During the time I spent on board the general practice was to urinate directly into the river. At the end of each shift faeces from the cassettes were emptied into the river. The cassette was then washed out, it did not leave the dredge.

   This is the only commercial vessel that I have operated on that does not have a sewage holding tank or a sewage treatment plant.

River Flow / oil or waste spills/ discharges.

7. In the locations I operated in, the Clutha River flows could reach 9 knots/ 16.7 kilometres per hour. Any discharge of waste or oil from the dredge would be carried one kilometre down stream by the current in 4 minutes. It is thus unlikely that a discharge would be noticed and connected to dredge operations.

6

EVT-3477 Maritime NZ incident report 15/03/2022

Transitioning from a calm area to fast flowing water the vessel slewed, ejecting the skipper. No injuries were sustained and crew member swam to the bank. The vessel continued downstream into a dredge and when recovered, damage was visible to vessel.

River Safety.

8. The proposed Upper Clutha area of dredge operations has an average of 55% less water flow than Lower Clutha River in cubic metres per second (Based on ORC river flow data). The Upper Clutha river is narrower and notoriously fast-flowing. The CGC1 has a draught of approximately 0.8 metres. To remain afloat the dredge will have to operate in the central part of the river.

9. During dredging operations the CGC1 will be connected to both the left and right banks of the river by two steel cables, chains and anchors. The 500kg anchors are heavy for the size vessel, however necessary due the swift river current. When required a backing cable/ rope will connect each anchor to a tree on the river bank. Anchor backing lines and main cable side wires intersect the river bank at shelving depths providing additional hazards along the river bank. These additional cables will move as they are loaded and unloaded. Including stern anchors, at times up to 8 separate rodes/cables/ warps can be deployed.

10. CGC1 operates a complex hybrid anchor/ dynamic positioning arrangement, where the anchor cables are used to manoeuvre the vessel whilst dredging.
    The deck anchor winches are controlled by the dredge operator. Foot pedals are used to heave in or pay out cable from hydraulic deck winches. The cables are continuously adjusted to position the dredging nozzle. This varied loading causes the cable to rise and fall in the water column. The cables do not remain static on the river bed.

11. Laying and recovering the anchors is a challenging operation. Holding the dredge stationary in the river current requires considerable main engine power and control inputs. Although stationary, the dredge is effectively travelling around 9 knots through the water. During these manoeuvres four diesel engines are required to provide thrust (x2), electrical power (1) and hydraulic power (1). The dredge is limited in its ability to respond to other river traffic. Any loss of power and or controls during these operations will seriously compromise safety. I have had personal experience of this when a main engine control feedback was lost whilst relaying anchors.

12. The applicant has stated that the anchor cable will sag to a safe depth during dredge operations.[7] A recent video of the dredge operating at Beaumont shows that this is not the case. This is backed up from my own experience as a CGC1 dredge operator.

    Depending on river flow and dredge operations the steel anchor cable is above, on, or below the river surface. The cables will span the entire navigational river channel.

13. At the proposed dredging grounds the river is considerably narrower than the Lower Clutha. Anchor cables will therefore be shorter, thus lighter and produce less catenary (sag). This will increase the risk to other vessels.
    There are many river reaches as narrow as 50 metres, where dredging operations will severely restrict other river traffic.
    These anchor cables are continuously highly loaded as the dredge displaces (weight) approximately 75 metric tonnes (75,000kg) and is positioned in the river current. Drag loading and cable movement

[7] E from applicant containing s92 response part 1 3 Aug 23.pdf
The crossed warps typically submerge directly in front of the dredge within 10-20m and, while there are variables from loading, etc, typically are around 0.5-1.0m deep within a further 5m and continue to sag towards the bottom thereafter.

increases considerably when the main dredge pipe is lowered into the water. The 350mm diameter dredge pipe can be lowered to a maximum depth of 15 metres.

14. The cables will also present a hazard whilst the dredge is unmanned and not operating. Due to the river's high current velocity, use of a buoy marking cable hazards at exact locations is not possible.

15. These cables present a severe navigational safety hazard to all recreational and commercial river users. Accidental contact with the cables could prove fatal.

16. The area of the Upper Clutha that the CDC proposes to mine has considerably more river traffic than the Lower Clutha below the Beaumant bridge. This is particularly noticeable during the summer holidays. Many of these river users are from out of town and do not have local knowledge.

Nāku noa, nā
Reg Hall

Appendix A.

Fuel transfer site on the Clutha River for CGC1 taken on 28/10/2023

Appendix B

Reginald Hall Qualifications

Marine Engineer Class 3 - Australian Maritime Safety Authority 2022.
Marine Engine Driver Class 1 - AMSA 2005.
Engineer Local Ship - Maritime New Zealand 2001.

New Zealand Offshore Master - MNZ 2001.
Master <45m – AMSA 1992.
Master River Ship – MNZ 1985.

Diploma of Marine Engineering – Newcastle TAFE 2021.
Certificate of Safety Training - AMSA 2016.
Certificate in Marine Design – UNITEC 1994.
Associate Member of the Royal Institute of Naval Architects 1995.

Oliver Moon
Witness statement to Kim Fogelberg's Evidence

Main dredge pipe liner

I would like to describe the plastic liner used in the main dredge pipe. This is used to protect the steel pipe from abrasive dredge material.

It is 6 metres long and 50mm thick.

This plastic liner is concealed inside the main dredge pipe and would not be noticed during inspections.

The liner is rotated every 100hrs and replaced once worn down.

It wears down to about 5mm and in some places is completely gone.

This particular system is unique to the CGC dredging operation. It is not implemented in other dredging processes around the world.

The rapid wear of the plastic liner releases microplastics into the Clutha River, threatening aquatic life and ecosystems.

I hold the belief that a redesign of the dredging pipe should be considered, aiming to eliminate the need for such a liner.

Toilet

In regards to the toilet cassette.

When working for CGC I turned up to work with Ricky. I noticed a rope hanging over the side and asked him what that was, he then told me that when the toilet cassette is full, Greg Webb (the operations manager) would tie a rope to it and throw it overboard.
This was my final straw and I gave my notice the next day.

Oliver Moon
Date: 6 November 2023