

BEFORE THE BAY OF PLENTY REGIONAL COUNCIL

IN THE MATTER OF

the Resource Management Act 1991

AND

IN THE MATTER OF

resource a consent application 66758
to discharge stormwater from a site
at Jellicoe Street, Te Puke to Factory
Drain.

APPLICANT

Pukepine Sawmills (1998) Limited

STATEMENT OF EVIDENCE OF ROGER WAUGH

1. Introduction

My full name is Roger Stephen Waugh. I am Managing Director and Principal Engineer of Riverspace Limited. I have been engaged by Bay of Plenty Regional Council Rivers and Drainage (RAD) section to provide engineering advice and represent them as managers of the Kaituna Catchment Control Scheme (KCCS) as an affected party subject to Pukepine Sawmills (1998) Limited's resource consent application.

The KCCS is a comprehensive flood control and drainage scheme which includes the Kaituna River, Lake Rotorua and Lake Rotoiti Catchments. The scheme consists of two discrete areas divided at Okere: Upper Kaituna (Lakes Rotorua, Rotoiti and tributaries) and Lower Kaituna (the Kaituna River, tributary streams, canals and drainage network).

2. Qualifications and Experience

Prior to establishing Riverspace Ltd in late 2018 I worked in excess of 35 years for various regional councils (or their predecessors) and in various positions. Immediately prior to my involvement with Riverspace Ltd I worked for the Bay of Plenty Regional Council (BOPRC) for 26 years. Within that organisation I held the positions of Rivers and Drainage Assets Manager, Programme Leader (Rivers and Drainage), Principal Technical Engineer, Works Engineer, Asset Management Engineer and Hydrological Officer. Before joining BOPRC I worked as a Water Resources Officer at the Wellington Regional Council for 4 years and as an Engineering Officer and Engineering Officer Cadet at Hawkes Bay Catchment Board for 6 years prior to that.

I hold the qualifications of NZ Certificate in Engineering (Civil) completed in 1991 and I am a Registered Engineering Associate.

My involvement with the KCCS has been widespread both geographically and functionally.

My experience includes the management and administration of flood protection, river control and drainage schemes including providing evidence at resource consent hearings, providing engineering review of resource consents applications, resource consent applicant on behalf of council,

engineering design, capital works construction, operational maintenance, asset management including valuations, and flood management and response roles.

I have complied with the Environment Court's Expert Witness Code of Conduct in the preparation of this evidence. Except where I state that I am relying on the evidence of another person, this written statement of evidence is within my area of expertise. To the best of my knowledge, I have not omitted material facts known to me that might alter or detract from the opinions expressed in this evidence.

3. Evidence

3.1 Scope of evidence

This evidence is to support RAD's written submission opposing the granting of resource consent to Pukepine Sawmills (1998) limited to discharge stormwater into Factory Drain.

My evidence covers:

- Historical and ongoing contamination of Factory Drain
- Water quality and quantity management of the discharge
- Monitoring
- Proposed consent conditions

I have read the parts of the Officers Report, including the draft conditions and the technical reviews requested that are relevant to the topics of my evidence.

I have also read the applicants application, additional information, other supporting information and expert witness evidence provided for this hearing that are relevant to the topics my evidence.

3.2 Factory Drain Contamination

RAD contests that the historical contamination of Factory Drain is a matter that should be considered along with this application. The existing and ongoing contaminants in and entering Factory Drain requires a remediation project to clean-up the silt in the bed of the drain and the contamination on land adjacent to the drain. Following the clean-up ongoing drain cleanings from maintenance operations will need to be disposed of off-site at a considerable cost to the KCCS.

Pukepine Sawmills (1998) Ltd as probable contributors to the problem should also be part of the solution to the clean-up of historical contamination of the drain and adjacent land.

The officer's report has stated that the historical contamination is not a matter that can be addressed through this consent process. The officer has stated that this consent application is to authorise future discharges. If this is legally correct (legal advice has been sort) and the consent authority cannot impose conditions to address this matter, then the only other legal option would be for the applicant to offer up a condition (an Augier condition) that contributes to the remediation project.

Pukepine did not want to hold pre-hearing meetings with the submitters for this to be able to be discussed.

The ongoing monitoring prior to desilting operations and disposal costs of any contaminated sediment can be included as conditions. RAD respectfully requests a consent condition reflecting these additional costs be considered by the commissioners.

3.3 Water Quality and Quantity Management of the Discharge

3.31 Water Quality Management

The applicant has undertaken sites works to separate roof stormwater from yard stormwater. I agree this is an appropriate way to reduce the amount of contaminated yard stormwater that will require a higher level of treatment.

All stormwater from the site requires treatment. The current BOPRC stormwater guidelines recommend a water quality volume methodology. I have undertaken a preliminary analysis based on information in the application. Excluding the 5 lots to the south and including roof stormwater and yard stormwater, a total site WQV of 1369 m³ is required. The total site area used for this calculation is 6.207ha, calculations attached.

From the changing information supplied including emails Gwilym/Bosch 23-28 Feb 2017 it is not clear to me what portion of the Purepine site is included in the catchment area and total site area being considered by this application. If the entire Purepine site and the 5 lots to the south are included then these calculations will need to be updated. The site area should be based on the catchment area contributing, a final clear concise plan of the catchment area and surfaces needs to be supplied to finalise calculations.

Roof Stormwater

The applicant has already configured the site to divert some roof stormwater directly to Factory Drain. Using the applicant's roof area of 1.754 ha, a water quality volume of 474 m³ is required.

Apart from manholes no water quality treatment is provided for roof stormwater within the current configuration.

To meet BOPRC stormwater guidelines for water quality treatment, minimum total size pond(s) of 474m³ are required prior to discharge. The recommended flow release from these treatment pond(s) is 6 litres/second.

Using the applicant's rainfall totals and a 'C' value of 0.95, I have calculated the 1:2 year 10 minute peak stormwater discharge from the roof area into Factory Drain to be 298 litres/second.

Yard Stormwater

The contaminated yard stormwater requires a higher level of treatment than the roof stormwater. Secondary treatment options are proposed but the preferred option, if any is not reflected in the draft conditions. The applicant has constructed two wedge pit sediment traps for yard stormwater from areas A and B. Along with cesspits, these primary treatment devices are the only on-site water quality treatment on site.

The two wedge pit sediment traps are not designed provide storage; they are designed to reduce flow velocities to encourage coarser sediments to drop out. In the calculations supplied, (Stormwater Analysis, RPW 30-9-16), inflow = outflow with the residence times in a 1:2 year event ranging between 2.1 - 3.5 minutes and 2.3 - 3.7 minutes for wedge pits A and B respectively.

Particle size settling velocities, metal distribution vs particle size tables and field research are all discussed in the stormwater guidelines. With the residence times of the 2 year event and available depth of the wedge pits, at best, only particle sizes between 30-50 microns (coarse silt) and above are likely to be settled out. The guidelines go on to comment that the trend is for metal contaminants to be associated with fine sediments <10 microns.

The 1:2 year flow rates for wedge pits A and B are quoted (Stormwater Runoff Analysis, RPW 30-09-2016) as 244 and 306 litres/second respectively, a total discharge flow rate of 550 litres/second into Factory Drain.

To meet current BOPRC stormwater guidelines for water quality treatment the minimum pond(s) size required prior to discharge is 902m³. The recommended flow release for this treatment pond is 10.5 litres/second.

The results from the primary treatment wedge pits are still being assessed by the applicant. The applicant included methodology for an initial rainfall proportional sampling proposal. This is to inform the design of the secondary treatment; these results have not been included in material that I have viewed to date. This sampling will give a temporal distribution of the effectiveness in reducing contaminants in the yard stormwater through chambers A and B during a minor storm event.

With no secondary treatment in place, Factory Drain and downstream landowners carry the risk of contaminated water that does not meet water quality limits discharging from the site.

RAD, and I expect other downstream affected parties, do not accept that appropriate water quality treatment is in place to meet current guidelines.

3.32 Water Quantity Treatment

The Pukepine application is seeking long term resource consent to discharge a maximum of 922 litres/second of stormwater into Factory Drain; except where the design event of a 20% AEP (1:5 year) 10 minute duration is exceeded.

Factory Drain and surrounding land is part of the managed KCCS flood protection and drainage network.

Ponding occurs from internal catchment runoff occurs, particularly in the lower reaches of Factory Drain during rainfall events. Factory Drain and the surrounding lands are protected from outside flooding by a flood-gated outlet and 1% AEP (1:100 year) stopbank network.

Good guideline material is available for applicants and consenting authorities to guide and assess the requirements of water quantity treatment through a resource consent process.

Water quantity treatment is made up of two components, peak flow and volume. Both components need to be considered in this application to address downstream effects.

Peak Discharge

The applicant's evidence and officers report state the current peak discharge for the 10 year ARI 10 minute storm event from the site is 936 litres/second

Using a site area of 6.207ha and Hirds V4 rainfall (historical), and a 'C' value of 0.85 I calculate peak flows for the site as:

ARI (Years)	Intensity (mm/hr)	Peak Discharge (l/s)
2	63.9	928
5	85.8	1247
10	103	1497
50	147	2137
100	168	2442

When considering the above figures, the site does not meet condition 2 of expired consent 25164, a maximum of 922 litres/second unless a 5 year ARI is exceeded.

The application sort a discharge of 922 litre/second. This is confirmed in the statement of evidence of Rob Gwilym, 9 August 2019. Also included in this statement of evidence is where I believe the 936 litre/second for the 10 year event that is quoted in the officers report comes from, the Stormwater Runoff Analysis (RPW, 30-9-16).

This analysis does not include the roof area generating stormwater from the site. It uses a rainfall figure of 109.3mm/hr, slightly higher that what I have used above. The applicants intensity figures are sourced from WBOPDC Code of Practice Table SW2B, and could include a climate change allowance. I have not included climate change allowances in my calculations.

There is no discharge quantity condition included in the officers report even though it was sort by the applicant and included as evidence.

The site has been developed since resource consent 25164 was granted in April 2005. A preliminary assessment of the photography in figure 11 (page 31) in the officers report indicate there are 14 new or extended buildings or roof lines between 2007 and 2018 over both Pukepine and Purepine sites. This has increased the peak discharge and volume generated.

Discharge Volume and Storage

The officers report excludes peak flow discharge attenuation and volume as an effect that should be considered as part of this application.

As I am aware there has been no analysis of the discharge volume generated from the site.

As indicated above, as the site discharges to a managed flood protection and drainage scheme and as flooding already exists, the appropriate criteria for storage design is:

Sufficient storage is provided so post development total peak discharge for the 50% AEP (2 year) and 10% AEP (10 year) storm events does not exceed pre development total peak discharges: and the post development peak discharge for 1% AEP (100year) event is limited to 80% of the pre development discharge

and

Sufficient storage volume is provided to attenuate additionally generated (post vs pre development) volume up to and including the 1% AEP (100 year) for the 72 hour design rainfall event.

This is to mitigate flooding effects when the Factory Drain flood-gated outlet is closed.

Apart from the complication of the hydrological analysis and flow routing, the biggest uncertainty to resolve is, what the pre-development peak discharges are.

The site has been continually developed over time since the 1970's. One resource consent has been granted for a stormwater discharge under the RMA (1991), resource consent 25164. This was applied for in April 1998, granted in June 2005 and expired 31 October 2011. Pukepine Sawmills Ltd continues to operate under the existing conditions of consent 25164 through the provisions of s124.

From RAD's perspective, pre-development is certainly not the site as it is today.

Interpretations that could satisfy pre-development conditions as I see them (in chronological order) are:

- Pre Sawmill (1970's)
- KCCS major scheme construction (early 1980's)
- RMA (1991) enactment (1991)
- Consent 25164 Application (April 1998)
- Consent 25164 Granting (June 2005)

There are no conditions included to address the additionally generated stormwater from site developments in the proposed set of draft conditions. There is a condition proposed for future developments.

Rivers and Drainage, and I expect other downstream affected parties do not accept that appropriate water quantity treatment is in place to address adverse downstream flooding effects created by the ongoing site developments.

3.4 Monitoring

A consent discharge of this nature should be monitored so confidence can be given that limits are not exceeded.

Discharge Monitoring

Discharge water quality monitoring should be included at every discharge location in addition to the upstream and downstream sampling of Factory Drain as proposed in condition 10.3. Each discharges should be monitored immediately upstream of Factory Drain.

Sampling should be undertaken by a suitable qualified and experienced technician, particularly the upstream and downstream suspended solid sampling of Factory Drain. A depth integrated sampling technique should be specified for suspended solids sampling at these points.

In addition to the quarterly discrete sampling of stormwater, there should be periodic proportional sampling of stormwater at each yard water discharge point with an automated sampler to confirm limits are being met over an entire rainfall event.

There is no discharge water quantity monitoring proposed in the draft conditions. Calculations show the site is unlikely to meet current consent quantity limits. Without water quantity monitoring actual discharge flows from the site are unknown.

Downstream Monitoring

In addition to the 5 year ecological assessment that includes sediment analysis for contaminants, sediment analysis prior to drain desilting is required as future drain cleanings are required to be disposed of offsite. On most occasions this can coincide with the 5 year monitoring. If drain monitoring prior to de-weeding is required, this should also be included.

3.5 Proposed Consent Conditions

Numbered as per the Proposed Consent Conditions, pages 51-58 of the agenda.

- (a) (page 51) States the activity as being to Discharge Treated Stormwater to Land where it May Enter Water

The application is for a stormwater discharge to Factory Drain.

- (2) Location (page 51) the application location includes Purepine Ltd but excludes the 5 lots towards town.

Is the entire Purepine Site included and who now takes responsibility for the stormwater from these 5 lots. The point from the 5 lots to Factory Drain is discharged from Pukepine Ltd, 280 Jellicoe Street. Both these points have an impact on stormwater quantity.

- 7.3 (page 52) agree at sampling points at each outlet.

Discussed in my evidence 3.4 above.

- 7.4 (page 52)

There are no current on-site ponds. The appropriate design criteria for future development is the same as discussed in 3.32 above.

- 9.11 (page 54)

Disagree. For the purposes of compliance each discharge point should be monitored for compliance prior to discharge to Factory Drain.

- 9.12 (page 54)

No monitoring points identified. Discharge monitoring points need to be identified and maintained as new ones are included.

10.1 (page 54)

As discussed in 3.4 above additional proportional monitoring should be included.

10.5 (page 54-55)

Disagree. Limits will be set by 9.1-9.10. Condition 10.5 then allows for exceedances with the only compliance option available to an enforcement authority to enforce condition 10.5.

14.2 (page 56-57)

The scope of any review should additionally include for the purpose of;

Addressing issues relating to downstream contamination and adverse flooding effects.

15 Page (57)

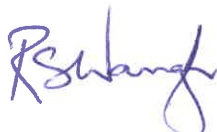
Disagree with a long term consent. The site does not have appropriate water quality and quantity treatment in place. The current conditions do not address RAD concerns around water quality and quantity.

3.6 Final Comments

RAD's submission on the consent application sort appropriate relief to address the effects on the KCCS from stormwater generated from this site.

Analysis undertaken for this hearing has shown that the site had been developed, does not meet current guidelines for a discharge of this size and type and does not meet current consent conditions. This is adversely affecting the KCCS and downstream landowners.

RAD's opposition to a consent being granted for this site has not been appeased by the work already undertaken by the applicant, the mitigation (if any) and the proposed consent conditions.



Roger Waugh

Riverspace Ltd

16-8-2019

14-8-19

Pikepine Sawmills Ltd,

RSW

Riverspace Ltd,

BOP RC Stormwater Guidelines (2012/01)

Rainfall Hinds V4

Historical Data (ie no climate change allowance)

2 year 1 hour = 31.3 mm
use 30 mm (0.030 m) max recommended.

$$Awq = 0.9(\text{imp}\%/100) \times \text{total site area} + 0.15(\text{per}\%/100) \times \text{total site area}$$

Site Area, 5.682 ha (drawing 21409-SW2 02/17)

0.525 ha (area railway land)

Total Area 6.207 ha,

Roof Area 1.754 ha (100% impervious)

Yard Area 4.453 ha ((assume 70% impervious (3.1 ha)) (30% imp (1.34 ha))

Impervious = 4.85 ha

PerVIOUS = 1.35 ha

$$\begin{aligned} \text{Total Site } Awq &= (0.9 \times 0.78 \times 62070) + (0.15 \times 0.22 \times 62070) \\ &= 43573 + 2048 \\ &= 45621 \end{aligned}$$

$$\begin{aligned} V_{wq} &= 45621 \times 0.030 \\ &= 1369 \text{ m}^3 \end{aligned}$$

$$\begin{aligned} \text{Roof Only } Awq &= 0.9 \times 1.0 \times 17540 \\ &= 15786 \end{aligned}$$

$$\begin{aligned} V_{wq} &= 15786 \times 0.030 \\ &= 474 \text{ m}^3 \end{aligned}$$

$$\begin{aligned} \text{Yard Area } Awq &= (0.9 \times 0.7 \times 44530) + (0.15 \times 0.3 \times 44530) \\ &= 28054 + 2004 \\ &= 30058 \end{aligned}$$

$$V_{wq} = 30058 \times 0.030 = 902 \text{ m}^3$$

check total $902 + 474 = 1376$ ✓ rounding error

90% Design Storm Calculation. WQV.

BOPRC Stormwater Guidelines (2012/01).

Rainfall for site from Hirds V4.

Historical Data 2 year 1 hour = 31.3 mm.
use 30 mm (0.030m) max recommended

$$Awq = 0.9(\text{imp \%}/100) \times \text{total site} + 0.15(\text{perv \%}/100) \times \text{total site area}$$

Site Area = 5.682 ha (applicant drawing 21409-SW2 02/17)
0.525 ha (area railway land to the north)

total site Area. 6.207 ha

roof area 1.754 ha (also assume as impervious) 28%

$$Awq = (0.9 \times 0.28 \times 62070) + (0.15 \times 0.72 \times 62070)$$

$$= 15641 + 6704$$

$$Awq = 22345$$

$$V_{wq} = 0.030 \times 22345$$

$$= 670 \text{ m}^3.$$

Roof Only,

$$Awq = 0.9 \times 1.0 \times 17540$$

$$= 15786$$

$$V_{wq} = 474 \text{ m}^3$$





5,017.86 m²

250

265

262

264

268

270

274

280

281

279

273

271

269

Jellicoe Street

99.98 m

99.70 m

