

IN THE MATTER OF The Resource Management
Act 1991

AND

IN THE MATTER OF Application CRC230609 by
Ravensdown Limited to
discharge contaminants
into groundwater and
surface water

DECISION OF THE HEARING COMMITTEE

DR BRENT COWIE (CHAIR) AND MS BIANCA SULLIVAN

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1 Introduction

This is the decision of a hearing committee comprising Commissioners Ms Bianca Sullivan and Dr Brent Cowie (Chair) appointed jointly by the Canterbury Regional Council (CRC, the Regional Council) to hear and decide an application for resource consent made by Ravensdown Limited (the Applicant) to allow ongoing discharges to groundwater, and eventually surface water. As the predominant groundwater flow is towards the ESE, the receiving surface water environment for the discharge is either the Washbourne Creek, which is an old box drain, and/or Haytons Stream, which is a degraded open water body that eventually flows to the Ōpāwaho (Heathcote) River.

The discharges originate from land owned by the Applicant at 312 Main South Road, Hornby, Christchurch. A fertiliser works built to manufacture superphosphate fertiliser was first established on this site in 1922, which is over 100 years ago. Much of what has happened on the site in those 100 years is lost in the mists of time. For instance, we have no doubt that for many decades sulphur and rock phosphate, and quite possibly other chemicals, were stored outside. That practise however ceased many years ago and now those raw materials, along with other imported fertilisers such as urea, are all stored undercover.

No resource consents are presently held by the Applicant to discharge chemicals to groundwater and surface water. Accordingly, the present application is not one for a new activity; rather it seeks to authorise existing discharges and put in place a programme to reduce or eliminate the sources of these discharges on the Ravensdown property.

The Applicant referred to discharges from historic land uses on the site as “legacy discharges”. We think that is a fair description, and it is one we will use in this decision.

The hearing took place in Wigram starting at 0930h on Wednesday 2 August, and was adjourned about 1420h on Thursday 3. We issued a minute with our directions to the parties on adjournment. In essence that said that CRC officers had until Friday 18 August to provide written authorisation from the Christchurch City Council (CCC) that Ravensdown could install one or two monitoring bores on small parcels of land they own downgradient of the Applicant’s site. Irrespective of that, the Applicant’s right of reply was due Friday 25 August. The Applicant sought this be extended to Monday 28 August, and we agreed with that request.

We undertook a site visit in a break from the hearing on Wednesday 2 August. We saw the Fluorosilicic Acid tanks, where the new replacement tanks are going to be located, and the large chemical volumes stored indoors in the plant. We were shown where the various on-site monitoring bores are located, and we saw the three stormwater retention ponds and the “green pond”. We thank Peter Hay for facilitating the site visit, Angela Doudney for “kitting us out” and Matt Mertz for showing us around.

2 Background

2.1 Site Description

The Ravensdown works site, which covers an area of about 14ha, lies on the southern margin of a large industrial area. Land to the south and south east of the site is very largely developed for residential properties, including that in the suburbs of Hornby and Wigram. Land to the north and north west of the works site is zoned for industrial use, and includes a large number of businesses involved in activities including manufacturing, car sales and servicing, and chicken processing.

The Ravensdown site was initially used solely to manufacture superphosphate fertiliser. This involves using concentrated sulphuric acid to dissolve rock phosphate to form the fertiliser. The acid is manufactured on site from raw sulphur, while the rock phosphate is imported. The Applicant holds a consent to discharge contaminants to air from the acid plant and manufacturing plant, which is fully sealed. This consent, and other CRC consents held by the Applicant, were listed in Table 1 of the Officer's s42A report.

More recently other (now) imported bulk agricultural chemicals, such as urea, are stored and dispatched from the site. In his evidence Mr Peter Hay, the site manager, told us that annually the site currently manufactures between 110,000 and 160,000 tonnes of superphosphate, and dispatches between 250,000 to 310,000 tonnes of bulk product.

Process water and other byproducts of the acid plant and manufacturing processes are managed in the "green ponds", the fluorosilicic acid (FSA) ponds and the manufacture scrubber area. All acid plant process water is collected in the green ponds where the water is reused in the superphosphate manufacturing process or is discharged to trade waste. The green ponds also collect the stormwater from around the acid plant and urea despatch area plus water from the site's washdown bay. FSA created from the superphosphate manufacture process is transferred from the scrubber area to be stored in the FSA ponds, which are located near the west end of the site, before being reused in the manufacturing process.

Almost all site stormwater is collected in three stormwater basins which became operational in June 2019. This system captures stormwater runoff from the first 25mm of a rainfall event (the "first flush") and then discharges to the CCC trade waste system. Mr Hay said this system captures 97% of rainfall events (not including > 5mm from roof areas) and 91% of all runoff from impervious areas on the site. Stormwater from rainfall events greater than 25mm flows over a weir and is discharged into the CCC stormwater system via Hayton's Stream, the Wigram retention basin and ultimately into the Ōpāwaho River (Heathcote River). It was common ground among two of the water quality experts at the hearing¹ that these stormwater ponds had led to a notable reduction in nutrient concentrations in the Haytons Stream receiving environment.

In 2019 the Applicant installed six on-site monitoring bores to supplement an old bore on the site. The locations of these are shown in Figure 2 of Mr Thomas' evidence.² The downgradient bores showed evidence of significant levels of contamination, most notably of fluoride. More generally, the

¹ Who were Linda Shamrock for the Applicant and Michelle Stevenson for the CRC.

² This same plan is attached to the consent issued as CRC 230609.

assessment carried out by Pattle Delamore Partners (PDP) found elevated concentrations of fluoride, aluminium, nitrate-nitrogen, dissolved reactive phosphorous (DRP) and manganese in downgradient bores. CRC monitoring results had also shown elevated levels of fluoride, in particular in Haytons Stream.

Directional drilling carried out by PDP showed that the FSA ponds were leaking, which is the primary source of the high fluoride concentrations in groundwater. In their Assessment of Environmental Effects (AEE) the Applicant committing to decommissioning the FSA ponds, plus several other steps, to help avoid or mitigate discharges in the future.³ These actions, together with firm timelines, have been incorporated into the conditions of the consent we have granted.

2.2 The Receiving Environments

There are effectively two receiving environments for the existing discharges to water from the Ravensdown works site. These are firstly shallow groundwater, and secondly, surface water in the Hayton's Stream catchment into which the groundwater flows. Contaminants in groundwater sourced from the Ravensdown work sites eventually enters the Haytons Stream catchment.

2.2.1 Groundwater

The groundwater receiving environment was comprehensively covered in the evidence of Mr Thomas⁴ and summarised in the s42A report of Mr Wilkins⁵. The Ravensdown site is located within the Christchurch Groundwater Protection Zone and the Christchurch West Melton Groundwater Management Zone. Groundwater is sourced from seepage from the Waimakariri River, as well as rainwater infiltration, and flows to the east to southeast.

The site overlies unconfined gravel strata to the west of the confining layers that are the source of Christchurch's drinking water. Bores drilled beneath the site record gravels with some cobbles and traces of silt. These deposits are highly heterogeneous, with preferential groundwater flow paths through zones of more open gravels. Groundwater depth is typically around 10 metres below ground level and ranges from 6 to 12 metres below ground level. Groundwater levels are lower in bores to the east of the site.

Groundwater flowing beneath the site discharges into Haytons Stream. Haytons Stream is approximately 700 m from the Ravensdown site at its closest point, however a comparison of relative levels suggests that groundwater discharges to the stream approximately 1.6 km to the east, close to Washbournes Road.

A long history of industrial activities in Hornby has resulted in elevated levels of nutrients and trace metals in groundwater. Ravensdown monitor groundwater levels and quality from eight bores drilled within their site boundaries, and from two bores between their site and Haytons Stream. Mr Thomas summarises groundwater quality as follows: *"Groundwater quality in the onsite bores shows a clear spatial trend where parameter concentrations in the western bores (MW1 and MW2) are generally*

³ The details are listed in Paragraph 33 of the Officer's Section 42A report.

⁴ Paragraphs 17-39 of the EIC of Mr Neil Thomas

⁵ Paragraphs 12-19 of the s42A report of Mr Ben Wilkins

similar to background water quality. Moving east across the site, groundwater quality appears to deteriorate, with elevated concentrations of several parameters including dissolved manganese, dissolved aluminium, fluoride and nitrate.”⁶ Groundwater monitoring has also detected elevated levels of fluoride in downgradient bores, although concentrations are substantially lower than from on-site bores downgradient of the FSA ponds.

Environment Canterbury’s database records domestic supply wells downgradient of the site, however Mr Wilkins states that “these are unlikely to still be a source of drinking water or may no longer exist as there is a reticulated water source in the area”⁷. Mr Johnston’s s42A report records the “*closest Christchurch City Council (CCC) supply bore with a Community Drinking Water Protection Zone (CDWSPZ) is M35/2275 which is located about 4 km away from the applicant’s site. This bore has been sampled as part of the monitoring and the contaminants are below the guideline values*”.⁸ Mr Thomas states that two public supply bores are located approximately 1.5 km north east of the site at around 70 m deep. Ravensdown have sampled these bores and did not detect elevated concentrations of fluoride or aluminium above background levels.

2.2.2 Surface Water

The Haytons Stream catchment was succinctly described by Ms Shamrock, an expert witness for the Applicant, as follows:⁹

Haytons Stream is a headwater, spring-fed highly-modified tributary of the Ōpāwaho Heathcote River, located in the predominantly industrial Haytons-Paparua catchment. This catchment is approximately 13 km², with Haytons Stream draining the southern part of the catchment. The stream emerges from a reticulated stormwater network, running through an open channel for approximately 600 m before re-entering the stormwater network. The stream then reemerges into an open stream that flows through an area of heavy industrial and commercial land use. Below the confluence with Paparua Stream¹⁰, Haytons Stream enters the Wigram Retention Basin. The outlet from the retention basin discharges almost directly into the Ōpāwaho Heathcote River.

Surface water quality has been monitored monthly by the CCC at the Haytons Stream outlet to the Wigram Retention Basin since 2007. The CRC has monitored other sites in the catchment since at least 2017.

In the summary of her evidence prepared for the s42A report, Ms Stevenson summarised the results of monitoring in the downgradient watercourses as follows:¹¹

Long-term monitoring by Christchurch City Council (CCC) and water quality investigations by Environment Canterbury and others have shown that Haytons Stream has poor water quality with contaminants of concern reflecting the varied industrial and commercial activities operating in the

⁶ Paragraph 32 of the EIC of Mr Thomas

⁷ Paragraph 18 of the s42A report of Mr Ben Wilkins

⁸ Paragraph 37(c)(i) of the s42A report of Mr Tim Johnston

⁹ At her Paragraph 24; more detail was provided in Paragraph 16 of her s42A report.

¹⁰ Which is an old stock water race sourced from the Waimakariri River that joins Haytons Stream about half way along its length

¹¹ At her Paragraph 5.

catchment. Limited ecological surveys indicate that the fish¹² and macroinvertebrate communities present are comprised of species that are tolerant of pollution. The water quality of the upper Ōpāwaho/Heathcote River is influenced by the quality of water that enters the river from Haytons Stream, after passing through the Wigram Retention Basin and wetlands.

Ms Shamrock provided a very helpful portrayal of existing water quality at three sites in the Haytons Stream catchment, the outlet of the Wigram detention basin and the Heathcote River upstream and downstream of the detention basin outlet using “box and whisker” plots based on data from the CRC. In summary:

Dissolved Reactive Phosphorous (DRP) is the biologically available form of this nutrient in rivers and streams. Mean DRP concentrations exceed the NPSFM 2020 Band D bottom line by a wide margin at all sites monitored. The highest concentrations were recorded at Haytons Stream at the Washbourne Road culvert, where on one occasion they exceeded the Band D criterion by over two orders of magnitude.¹³

Nitrate-nitrite (nitrate – N) has been found in significant concentrations in bores downgradient of the Ravensdown works site. Concentrations in the receiving environments were compared with those in Table 6 of the NPSFM 2020. This is somewhat misleading, as this table only looks at nitrate as a fish toxin, and not as a nutrient in rivers and streams. If the NPSFM had addressed nitrate (in its soluble form) as a nutrient that accelerates algal growth rates, the bands set would have been at much lower values.

Putting that aside, nitrate-N concentrations were only above the NPSFM “bottom line” at the inlet of the Haytons Stream catchment to the wetland downgradient of the southern motorway, and its outlet to the Heathcote River. Ms Shamrock asserted that nitrate-N concentrations in the receiving environment have dropped since the stormwater ponds were commissioned; Ms Stevenson from the CRC agreed with this conclusion.

Total ammoniacal nitrogen is generally below NPSFM 2020 thresholds at the six surface water sites monitored, except for Haytons Stream at the Washbourne Road culvert, where it has frequently exceeded NPSFM “bottom lines”. This is of concern because the dissociated ammonia fraction of ammoniacal nitrogen can be toxic to fish. However, this contamination is unlikely to be predominantly attributable to any discharge from the Ravensdown Works site, as ammoniacal nitrogen has never exceeded 2mg/l at the downgradient BP station site, which compares with a maximum pH “adjusted” concentration of 14mg/l at the Washbourne Road culvert.

Both copper and (particularly) zinc concentrations at the three sites in Haytons Stream regularly exceeded the relevant 95 and 80% species protection guidelines.¹⁴ These high concentrations are however attributable primarily to material from brake pads on roads (copper) and roof galvanising (zinc) rather than anything emanating from the Ravensdown Works site, so we do not discuss these further in this decision.

¹² Species recorded include both longfin and (particularly) shortfin eels, and historically, upland bullies.

¹³ Paragraphs 36 – 39 and Figure 6 in the EIC of Linda Shamrock.

¹⁴ Which are the Australian and New Zealand guidelines for fresh and marine water quality 2018.

Elevated concentrations of both aluminium and manganese in the receiving surface water environments are however linked to discharges from the Ravensdown site. Aluminium originates from sub-surface strata where it has been dissolved by fluorine discharges from the Ravensdown Works site, and its concentrations in Haytons Stream closely reflect fluorine concentrations.

The source of the manganese is less clear. Dr Massey speculated that it could be as a result of low oxygen concentrations in soils and sediments leading to its dissolution from solid particles and so entering water.¹⁵

2.3 Notification and Submissions

The s42A report records that the application was publicly notified on 18 March 2023 and served on four potentially affected parties:

- a. Christchurch City Council (CCC)
- b. Owner and Occupier of 291 Main South Road (Mr Peter Scholes)
- c. Te Ngāi Tūāhuriri Rūnanga
- d. Te Mana Ora/Community and Public Health

The first three submitters listed above opposed the application, while Te Mana Ora/Community and Public Health neither supported or opposed the application. Mr Michael Brathwaite also submitted on the application, which he opposed.

The CCC and Mr Scholes appeared as submitters at the hearing.

3 The Hearing

We heard from legal counsel and four witnesses for the Applicant, two submitters, and four officers from the CRC during the hearing. The Officer Reports and all expert evidence had been pre-circulated, and at our request legal submissions were provided prior to the hearing commencing.

The s42A Officer's Report had originally recommended that the application be declined. For this reason, no draft conditions of consent had been provided. We requested the officer's recommended conditions be circulated prior to the hearing, and this occurred on Monday 31 July, which was two days before the hearing commenced. This enabled a much more transparent discussion of draft consent conditions during the hearing.

While s113 of the RMA requires that strictly we should provide a summary of the evidence presented at the hearing, we do not intend to do so here. Rather we will discuss the expert evidence when we evaluate the application in Section 4 of this decision. This is because the evidence fell into three main categories, namely effects on groundwater quality, effects on surface water quality and planning issues. We discuss the expert evidence under these headings.

¹⁵ At Paragraph 34 of this main s42A report.

3.1 The Case for the Applicant

The applicant presented legal submissions from Mr Stephen Christensen, and called three expert witnesses: Mark Allen on planning, Neil Thomas on local groundwater movement and quality, and Linda Shamrock on surface water quality. We discuss their evidence in Section 4 of this decision.

In his opening submissions Mr Christensen discussed the following matters:

- a. He emphasised that the Ravensdown discharges are existing activities, and that declining the present application, as recommended by Mr Johnston, would mean there is no agreed pathway for Ravensdown to follow to remedy the effects of those discharges.
- b. He asserted that the discharges are not because Ravensdown have done something “wrong”. They have already installed stormwater treatment, and now are proposing to decommission the FSA ponds and work to reduce other on-site sources of contaminants.¹⁶
- c. He discussed what he saw as the difference between “active” and “passive” discharges. In his view the “long tail” predicted by Mr Thomas for the FSA discharge once the ponds were decommissioned mean the discharge would be “active” for the 15 year consent duration sought. Once the discharge was entirely “passive” he considered it might meet the permitted standards in Rule 5.187 of the LWRP.¹⁷
- d. He said the assessment of the effects of the activity under s104(1) need to be considered not just in terms of present-day effects, but how they would decrease in time in line with the actions proposed by Ravensdown.¹⁸
- e. He discussed how the criteria listed in s107 of the Act, particularly those in 107(1) and 107(3), could be applied.¹⁹

In his closing submissions Mr Christensen focussed on conditions of consent, and particularly the potential use of additional off-site bores as advocated for by officers of the CRC. We discuss these matters in detail in Section 8 of our decision.

3.2 The Submitters

Two submitters appeared at the hearing: Mr Peter Scholes, a local resident and Ms Katie Noakes, a waterways ecologist from the CCC. Ms Noakes provided some evidence on water quality in the Haytons Stream catchment, and made quite extensive comments on (what were then) the Applicant’s proposed conditions of consent. We discuss her evidence in several sections of this decision, most notably in Section 8.1 where we discuss the conditions of the consent we have granted, and the reasons for doing so.

¹⁶ At his Paragraphs 10 and 11.

¹⁷ At his Paragraphs 15, 16 and 23.

¹⁸ At his Paragraph 26.

¹⁹ At his Paragraphs 35 -43. We discuss this in Section 6 below.

Mr Scholes elaborated on his submission in writing, and he spoke to this at the hearing. He lives at 312 Main South Road, which is opposite the Ravensdown Works site. He drew our attention to provisions in the National Policy Statement for Freshwater Management 2020 (the “NPSFM 2020”) and the Canterbury Land and Water Regional Plan (the “LWRP”). He asserted that no consent is required for the existing Ravensdown discharges before 2030 because of the provisions of LWRP Policy 4.1.²⁰

Mr Scholes listed some alternatives or improvements that he considered the Applicant could make in addition to what they have specified in the present application. These included: importing phosphate from places other than Morocco (as he said this has a high fluoride content), “dewater the site and suck out all the pollution”, and removing all the contaminated soil from the site.

3.3 The Officer Reports

In accordance with the provisions of the RMA we were provided with an officer report, and three supporting technical reports prepared under the provisions of s42A of the RMA by staff of the Regional Council. These were taken as read. At the hearing the officers provided helpful summaries of their evidence in chief.

Mr Tim Johnston

Mr Johnston was the Council’s principal reporting officer. His original report had recommended that the application be declined, despite often stating in his report that remedial works were urgent. In his presentation to us at the hearing Mr Johnston changed his view, and considered that the application should be granted for the 15 year term sought by the Applicant. We discuss his evidence in various parts of this decision.

Mr Ben Wilkins

Mr Wilkins is a groundwater scientist with the Regional Council. We discuss his evidence in Section 4.3.1 of this decision.

Dr Michael Massey

Dr Massey works in the Regional Council’s contaminated land and waste team. We have referred in part to his evidence in Section 2.2 above, and we also refer to it in subsequent sections of this decision.

Ms Michele Stevenson

Ms Stevenson is a surface water scientist with the Regional Council. We discuss her evidence in Section 4.3.2 of this decision.

²⁰ We do not agree with this assertion. The current consent application is at best timely, and perhaps well overdue.

4 Statutory Assessment

4.1 Activity Classification

In his S42A report Mr Johnston considered that the present application should be classified as a non-complying activity under Rule 5.64 of the LWRP. He also considered that discretionary “default” rules 5.100 and 5.188 also should be applied to the application, but that the “bundling” principle should apply and so the application should be treated as a non-complying activity. Mr Allan, the planner for the Applicant, agreed with this interpretation.

We did not agree with Mr Johnston’s view that Rule 5.64 of the LWRP should be applied to the application. In an e-mail we circulated to the parties prior to the hearing we said:

We have reviewed the s42A report and applicant’s planning evidence and were surprised to see that the application has been classified as a non-complying activity under Rule 5.64 of the Land and Water Regional Plan. Rule 5.64 is one of a suite of rules (Rules 5.41 to 5.64) for managing nutrient losses from farming activities. Rule 5.64 refers to conditions 1 and 2 of Rule 5.63, which permit the discharge of nutrients where a land use consent to farm has been issued under the LWRP suite of farming rules, or similar rules in the Hurunui-Waiau River Regional Plan. Rule 5.64 applies where the conditions of Rule 5.63 aren’t met.

Our view is therefore that Rule 5.64 only applies to nutrient losses from farming activities and would not apply to the nutrient losses from Ravensdown’s Hornby site. We have therefore formed a preliminary view that the application is a discretionary activity under Rules 5.100 and 5.188, but are open to views from the parties on this.

Of relevance, we note that Rule 5.64 was amended by Plan Change 7, with the reference to Rule 5.62 being deleted. The s42A report refers to the previous version of Rule 5.64. The PC7 amendment is not subject to challenge and the decisions on PC7 were notified (November 2021) before the application was lodged by Ravensdown (August 2022). We assume that the PC7 version of the rule should apply and this version is referred to above.

Both Mr Johnston, in his verbal presentation to us at the hearing, and Mr Allan for the Applicant, eventually agreed with us that Rule 5.64 did not apply to the present application. However, in his opening submissions Mr Christensen said that only Rule 5.100 should be applied to the existing application as the discharges would be “active” for the 15 year term of consent sought. At the expiry of the consent a new application could be made for a passive discharge under Rule 5.188, if at that time the discharge did not meet the permitted activity standards of Rule 5.187.

We take a different view of what “active” and “passive” are likely to mean in this context. Taking for instance the FSA discharge, once the existing ponds are decommissioned there should no more ongoing fluoride contamination of groundwater below the Ravensdown works property. Fluoride will still be present, albeit in what are predicted to be much lower and declining concentrations, in downgradient groundwater. But we consider this will now be a “passive” discharge because there will be no “active” ongoing source of fluoride contamination from the site.

For these reasons we have assessed the application as one for a discretionary activity under Rules 5.100 and 5.188 of the LWRP.

4.2 Assessment Criteria

Decisions on resource consent applications for discretionary activities are made under the criteria listed in Section 104(1) of the RMA. Subject to Part 2 of the Act, we must have regard to the following matters:

- a) any actual and potential effects on the environment of allowing the activity; and
- (ab) any measure proposed or agreed to by the applicant for the purpose of ensuring positive effects on the environment to offset or compensate for any adverse effects on the environment that will or may result from allowing the activity; and
- (b) any relevant provisions of
 - i. a national environmental standard;
 - ii. other regulations;
 - iii. a national policy statement;
 - iv. a New Zealand coastal policy statement;
 - v. a regional policy statement or proposed regional policy statement;
 - vi. a plan or proposed plan; and
- (c) any other matter the consent authority considers relevant and reasonably necessary to determine the application

In relation to these matters and the present applications:

- We discuss Part 2 matters in Section 4.7 of this decision.
- We discuss the actual and potential effects of the activities for which consent is sought in Section 4.3.
- Section (ab) is not relevant.
- There are no relevant national environmental standards or regulations.
- The relevant national policy statement is the National Policy Statement for Freshwater Management 2020 which we discuss in Section 4.4.
- The operative Regional Policy Statement is the Canterbury Regional Policy Statement and the relevant regional plan is the LWRP which we discuss in Sections 4.5 and 4.6.
- The only S104(1)(c) relevant matter drawn to our attention is the Mahaanui Resource Management Plan 2013, which we discuss in Section 4.8 of this decision.

Section 104B of the Act is also relevant here because the activities for which consent is sought are discretionary. Under s104B, we can either grant or refuse one or more of the consents sought. If granted, we may impose conditions under s108 of the Act. In this case we have granted the consent sought with conditions that we consider avoid or mitigate the effects of the proposal.

4.3 Actual and Potential Effects

We see the actual and potential effects of the applicant's proposal as being on:

- groundwater quality;
- surface water quality and associated aquatic biota;
- cultural values of tangata whenua; and
- positive effects.

We discuss each of these in turn below.

4.3.1 Effects on Groundwater Quality

Ravensdown have undertaken regular monitoring of their onsite bores since April 2019, with monthly samples until April 2021 and quarterly samples since. Quarterly samples have been taken from two offsite bores (BH112 and M35/3719) since August 2021. These monitoring data formed the basis for the assessment of effects on groundwater quality in the AEE, and also Mr Thomas' evidence and Dr Massey and Mr Wilkins' s42A reports.

Mr Thomas made the following four key points about the concentrations of contaminants in the groundwater monitoring bores²¹:

- (a) Concentrations of the different parameters are highly variable through time in some bores. For example, concentrations of fluoride can vary by more than one order of magnitude in bore MW4 (i.e., from less than 10 mg/L to more than 100 mg/L).*
- (b) The concentrations of aluminium and fluoride generally show very similar patterns in most bores, suggesting a similar source. In contrast, the concentration of nitrate does not follow the same pattern, implying that it may originate from a separate source.*
- (c) Concentrations of manganese are variable; in some cases these follow the same patterns as fluoride and aluminium (for example MW5 and MW3), but in other bores the pattern is not well correlated. This may suggest that some manganese is attributable to the same source as fluoride and aluminium, but another source of manganese may be localised reducing zones in the strata where manganese can be mobilised. I note that the persistently highest concentrations are observed in bore MW4, although occasional spikes are also observed in bores MW3 and MW7.*
- (d) The patterns of concentrations do not generally appear to correlate with changes in water levels, although higher groundwater levels in bore MW1, MW3 and MW7 appear to correlate with spikes in concentrations of some parameters (for example manganese).*
- (e) The source of fluoride and aluminium in groundwater is located between MW1 and MW4. The FSA ponds are located between the two sites and based on investigations undertaken beneath the ponds (discussed in more detail in paragraphs 46 to 50 of my evidence), some leakage*

²¹ Paragraph 37 of the EIC of Mr Neil Thomas

occurs from the ponds, leading to elevated concentrations of fluoride and aluminium in groundwater down gradient of the ponds.

Dr Massey considered the contaminants of concern to include fluoride, ammoniacal nitrogen, phosphorus, and acidity. He stated that *“while there are other potential sources of contaminants such as ammoniacal nitrogen (e.g., old landfills, chicken meat works), upon review of the CRC Listed Land Use Register, I am aware of no other activities in the area that discharge fluoride. Monitoring indicates that the applicant’s site is a significant source of nitrogen and phosphorus, even if there are other potential sources in the area.”*²²

The experts agreed that fluoride is a useful marker of contamination from the site, given that Ravensdown is the only site in the area that could discharge significant quantities of fluoride. Fluoride sorbs to soils and it is expected that high concentrations will be present in soils and sediments underlying parts of the site.

Both Dr Massey and Mr Thomas considered that the elevated levels of aluminium are likely to arise from fluoride interacting with the underlying soils in acidic conditions. That is, the aluminium is likely to be an indirect discharge resulting from the discharge of fluoride, rather than being sourced directly from the site. Similarly, Dr Massey considered that manganese is most likely released from the underlying soils due to the low-oxygen conditions resulting from the discharge of urea.

The experts agreed that the FSA ponds are the likely source of contaminants and that there should be a quick response in groundwater once the ponds are decommissioned. They expect significant improvement in months to a few years, followed by a long ‘tail’ of low levels of contamination as contaminants are released from the soil. This is the transition from active to passive discharge. Dr Massey recommended a condition requiring a three yearly report, which would act as a check-in to see if the anticipated contaminant response is correct. We consider that this is a sensible suggestion.

Dr Massey and Mr Wilkins agreed with Mr Thomas that Haytons Stream is the main receptor for contaminant discharges from the site. Mr Wilkins also agrees that most of the contaminants are transported in groundwater at the water table depth, noting that the extent of connection is variable with changing water table depth and that there is not always a groundwater connection to the stream.

There was disagreement as to the number and location of offsite monitoring bores that should be required by consent conditions. Dr Massey and Mr Wilkins considered that there is not enough information to understand the groundwater connection to Haytons Stream and recommended more monitoring is required at offsite locations to better understand this connection. Mr Thomas considered that the current suite of offsite bores is sufficient. Given that the experts agree that Haytons Stream is the receptor, he questioned why further offsite bores are recommended to further characterise the plume. In his view, more offsite bores may complicate the situation by showing additional contaminants from other sites.

In response to our questioning, Mr Thomas outlined Ravensdown’s unsuccessful attempts to locate additional offsite monitoring bores. Many bores recorded in the CRC’s database no longer exist, or the bore characteristics are not suitable for monitoring use. Additionally, limitations on access to private property make the regular reliance on offsite bores challenging. We return to offsite monitoring bores

²² Paragraph 5 of the Summary of Evidence of Dr Michael Massey

further in our discussion of consent conditions, as additional downgradient monitoring was the key point of disagreement between the CRC and Ravensdown experts.

In conclusion, we acknowledge the experts' agreement that the effects on groundwater water are currently significant but that the proposed decommissioning of the FSA ponds, and other upgrade works, will substantially reduce the contaminant losses from the site. Over time, we are confident that these measures will reduce the effects on groundwater downgradient of the site.

4.3.2 Effects on Surface Water Quality and Aquatic Biota

The AEE prepared by the Applicant identified the key contaminants of concern likely originating from the Ravensdown Works site are fluoride, dissolved aluminium, dissolved manganese, nitrate-nitrogen and dissolved reactive phosphorous. All these have been found in downgradient groundwater monitoring bores. The two nutrients could also originate from on-site stormwater discharges, including from the "green pond."

Apart from fluoride, and to a large extent aluminium, it is not straightforward to determine the effects of the discharges sourced from the Ravensdown factory to surface water via either groundwater or surface water discharges. The main reason for this is that there are many potential sources of other contaminants entering the receiving environments via surface water and/or groundwater. Dr Massey said these potentially included old dumps and the Tegel Chicken processing plant, along with industrial activities such as galvanising plants that could discharge contaminants such as trace elements to groundwater.²³ Ravensdown is very likely to be one of the principal sources of nutrient discharges to the receiving environment via contaminants in shallow groundwater or stormwater, but is certainly not the only possible source of these discharges in the wider Hornby industrial zone.

It was common ground between Ms Shamrock and Ms Stevenson that the commissioning of three new stormwater ponds on the Ravensdown Works site in June 2020 had led to decreasing concentrations of the nutrients, nitrogen and phosphorous, in the receiving environment in Haytons Stream. This is shown particularly in Figures 3 and 4 of Ms Shamrock's evidence. We consider this to be an encouraging finding, and indicates that further on-site interventions should lead to similar declines in other contaminants sourced from the Ravensdown Works site.

We consider there are two contaminants of particular concern that are very largely associated with the Ravensdown discharges. These are fluoride and aluminium. As discussed in Section 4.2 above fluoride sourced from the leaking FSA pond is the "signature component" of the Ravensdown discharge, as it is highly unlikely to originate from any other source in the catchment, and has been found in high concentrations in downgradient monitoring bores.

CRC monitoring results have shown elevated levels of fluoride in Haytons Stream. For instance, Ms Stevenson told us that while upgradient concentrations of fluoride in Haytons Stream at Waterloo Road were typically about 0.1 mg/l, downstream at Washbourne's Road, where the cumulative effects

²³ S42A supplementary report of Michael Massey at Paragraphs 17 and 18.

of the Ravensdown discharges were recorded, fluoride concentrations of up to 3.7mg/l had been recorded, with a median of 0.16 mg/l.²⁴

There is not much information available about the toxicity of fluoride to aquatic life, with for instance no New Zealand based guideline available. This is unsurprising given fluoride is not a common contaminant found in our freshwaters. Ms Shamrock undertook a review of the literature about fluoride toxicity, and found a Canadian study dated 2014 that set a “default guideline value” for fluoride of 1.94 mg/l based on what appear to be to us conservative criteria.²⁵ While Ms Stevenson expressed some reservations about the development of this guideline, which has not been formally adopted in Canada, she agreed “that it was the best available information we have for chronic toxicity threshold for fluoride.”²⁶

For these reasons we find that the existing fluoride concentrations sourced from the Ravensdown works site are unlikely to be having any significant adverse effects on biota in Haytons Stream or downgradient receiving environments. Additionally, once the FSA ponds are de-commissioned, which conditions of consent specify must be by 31 January 2025, the active source of fluoride entering groundwater and then surface water will no longer exist. While fluoride concentrations in downgradient groundwater bores will remain elevated, Mr Thomas’s evidence was that this would decline rapidly, albeit with a very long tail. This should also mean that median fluoride concentrations in Haytons Stream will also decline quite quickly after the FSA ponds are de-commissioned.

Total aluminium and total manganese have been sampled in Haytons Stream for the last five years, while the dissolved biologically available forms of these two elements have only been sampled since 2022. Ms Shamrock said that dissolved aluminium concentrations were better than the ANZG 2018 99% protection level guidelines at the upper two sampling sites in Haytons Stream, and better than the 95th percentile at the lower two sites in the stream. Manganese concentrations were better than the 99% protection level guidelines at all four sites in Haytons Stream.

As already discussed, there was consensus among Mr Thomas and Mr Wilkins that the source of aluminium and manganese in the downgradient bores was from its dissolution by fluoride, sourced from the existing FSA ponds, in the greywacke sediments within shallow groundwater. Fluoride concentrations in shallow groundwater are expected to decline rapidly once the FSA ponds are de-commissioned, and a similar decline can be expected in associated aluminium and manganese concentrations in the shallow groundwater.

The only other contaminant of potentially significant concern in the Haytons Stream catchment is ammoniacal nitrogen. This is because the dissociated ammonia is very toxic to aquatic life, including fish. More dissociated ammonia is present when pH and temperatures are higher, with for instance the NPSFM 2020 attribute states in Table 5 of Appendix 2A being based on values adjusted to pH8 and 20 degrees centigrade.

Ms Stevenson said that the concentrations at Washbournes Road culvert (which has the highest values recorded) follow a similar pattern over time to those of DRP, which suggests they have a similar source. There have been no high concentrations of ammoniacal nitrogen recorded at this site since

²⁴ S42A supplementary report of Michele Stevenson at Paragraph 26.

²⁵ Evidence of Linda Shamrock at Paragraphs 49-54.

²⁶ S42A supplementary report of Michele Stevenson at Paragraph 17.

the stormwater ponds at the Ravensdown Works site were commissioned. Both Ms Stevenson and Ms Shamrock agreed that there were clearly other sources of ammoniacal nitrogen entering the catchment, particularly given Mr Thomas's evidence that ammoniacal nitrogen levels at sampling site BH112 (the BP service station) have never exceeded 2 mg/l.

Concentrations of both zinc and copper are also present in elevated concentrations in the catchment. These will be largely sourced from galvanised roofs and car brake pads respectively.

In conclusion we find that the contaminants clearly originating from the Ravensdown Works site, or dissolved from underlying strata in the shallow groundwater zone, are unlikely to be causing significant adverse effects on biota in the Haytons Stream catchment receiving environment. None of fluoride, aluminium or manganese are present in concentrations that threaten aquatic biota, and these three contaminants will eventually be present in much lower concentrations once the FSA ponds are de-commissioned.

Of the other contaminants present both DRP and DIN concentrations have declined since the stormwater ponds were constructed, and relatively little of the ammoniacal nitrogen found in downgradient surface water bodies appears to be sourced from the Ravensdown Works site. Consent conditions requiring that the "green pond" be desludged and any leaks repaired as necessary, along with CCTV inspections of the stormwater network and associated remedial actions should reduce potential sources of these contaminants from the Ravensdown site. For these reasons we are confident that the proportion of such contaminants sourced from Ravensdown will decline over the next few years, with some benefits for water quality in the Haytons Stream catchment.

4.3.3 Effects on Values held by Tangata Whenua

The Applicant undertook a cultural values assessment against the relevant Mahaanui Iwi Management Plan which in summary stated:

- a. The site is not located within an area of particular significance to iwi. However, water has mauri of its own and is considered a taonga.
- b. This discharge is not new, nor is it "intentional". Ravensdown's intention is to obtain consent in recognition that the discharge is occurring. Some actions have already been implemented to reduce contaminant discharges into the receiving environment, and more improvements are planned in the future. It is anticipated that these will result in improved groundwater quality and reduced effects on the mauri of these environments.
- c. Groundwater beneath the site is connected to Haytons Stream; contaminants are travelling via this groundwater and entering the stream. The stream is currently in a degraded condition and is not suitable for supporting taonga species or cultural activities such as mahinga kai. Even if Ravensdown was able to cease all contaminant losses from its site immediately, it would not make a great difference to water quality in Haytons Stream or the Ōpāwaho Heathcote River. Rather, meaningful improvement in the quality and mauri of these waterbodies over time will only occur if improvements are made throughout the catchment.

Mahaanui Kurataiao Limited (Mahaanui) represent the local Rūnanga, Te Ngāi Tūāhuriri Rūnanga, in resource management matters. They opposed the application, and submitted as follows:

Whilst it is acknowledged that there have been some improvements to the operation of the business, this has been over a reasonably long period of time in response to known contamination issues.

The application states that the exact sources and pathways of contaminants is unknown and has provided some examples of possible sources.

Pathways and sources must be identified to understand and quantify the effects of the contamination.

Mitigation and elimination measures must be established as a matter of urgency. This contamination must not be allowed to be continued for 'as long as it exists on the site'. An acceptable timeline and plan must be defined along with measures to eliminate contamination sources.

Te Ngāi Tūāhuriri Rūnanga are opposed to this application on the basis that there is not enough information provided on the sources, pathways for contamination and mitigation measures. The contamination levels are having negative impacts on the quality of waterways, ecosystems, and the environment. Controlling the effects of land use on water quality is critical to recognising and providing for the ancestral relationship of Ngāi Tahu with water.

Mahaanui did not wish to be heard, so we have no further comment from them as to whether the conditions of consent would meet, or largely meet, their concerns. What we can say is that one major source of contaminants – the FSA ponds – will be eliminated as a source of contaminants, and along with that both aluminium and manganese concentrations in the discharge will decline significantly to low (and further declining) residual levels. The stormwater ponds have already reduced nutrient losses from the Ravensdown site, and further reductions in nutrient losses are likely from works to be carried out on the “green pond”. However, on a site where legacy discharges will still exist from unknown historic sources, it is not practicable to eliminate fully all discharges from the site.

In conclusion, we consider that the conditions on which consent is granted go as far as is reasonably practicable to eliminate discharges to groundwater from the site. Ongoing monitoring will enable the level of residual legacy discharges to be determined, and whether it is necessary to reduce or eliminate these in the future to meet the concerns expressed by Mahaanui, or indeed to meet possible future receiving environment standards.

4.3.4 Positive Effects

There are positive effects from granting the present application. In particular, the conditions of consent will lead to reductions in contaminant loadings to groundwater and surface water from Ravensdown, and make some improvement to water quality in the Haytons Stream catchment. The conditions also require monitoring to determine if the environmental benefits outlined by Ravensdown’s expert witnesses do in fact occur (and we are confident that they will).

On the flip side, Ravensdown will be granted consent for 15 years for long standing discharges, and certainty that when the prescribed programme of works is completed and benefits verified via monitoring, they will be authorised to continue such discharges, albeit at no or much lower residual levels. It seems inevitable to us that some ongoing legacy discharges will continue to occur from the site, but at a level that will be very unlikely to cause any significant off-site effects.

4.4 The National Policy Statement for Freshwater Management 2020 (NPS)

The current iteration of the NPSFM is dated 3 September 2020. It is largely a new approach, and quite unlike the three previous iterations of the NPSFM, which built upon what had been present in the previous iteration. Notably, the NPSFM 2020 includes a new overall objective, and a suite of new policies, which include:

- (1) *The Objective of this NPS is to ensure that natural and physical resources are managed in a way that prioritises:*
 - (a) *first, the health and well-being of water bodies and freshwater ecosystems*
 - (b) *second, the health needs of people (such as drinking water)*
 - (c) *third, the ability of people and communities to provide for their social, economic and cultural well-being, now and in the future.*

Policy 1: Freshwater is managed in a way that gives effect to Te Mana o Te Wai.²⁷

Policy 2: Tangata whenua are actively involved in freshwater management (including decision-making processes), and Māori freshwater values are identified and provided for.

Policy 3: Freshwater is managed in an integrated way that considers the effects of the use and development of land on a whole of catchment basis, including the effects on receiving environments.

Policy 5: Freshwater is managed through a National Objectives Framework to ensure that the health and well-being of degraded water bodies and freshwater ecosystems is improved, and the health and well-being of other water bodies and freshwater ecosystems is maintained (and if communities choose) improved.

Policy 9: The habitats of indigenous freshwater species are protected.

Policy 15: Communities are enabled to provide for their social economic and cultural well-being in a way that is consistent with this National Policy Statement.

All regional authorities are presently required to notify a regional plan that is compliant with the NPSFM 2020 by 31 December 2024. The CRC is presently seeking to achieve this target, but in doing so has to go through a very prescriptive and time-consuming process involving extensive iwi and community engagement. In the meantime, we are required to weigh the objective and relevant policies of the NPSFM in this decision.

The objective of the NPSFM clearly gives first priority to instream values, and Policy 5 requires that the “health and well-being” of degraded water bodies is improved. The conditions we have imposed on the consent granted will eventually help improve water quality in Haytons Stream and the Ōpāwaho Heathcote River further downstream. In doing so, the conditions provide for the health needs of people (second priority) and the continued operation of the Ravensdown works site (third

²⁷ This embraces six principles, which we do not need to detail here.

priority), thus satisfying the balance required by Te Mana o te Wai that is expressed in clause 1.3(1) of the NPSFM. We therefore consider that the proposal is consistent with Te Mana o te Wai. These water bodies will however remain degraded regardless of further improvements made by Ravensdown, and other substantial interventions will be necessary if their habitat quality is to improve significantly.

It is reasonably certain that the discharge will have some effects on aquatic life in the receiving environment. Whether this is consistent with Policy 9 of the NPS is unclear, as it speaks about habitat protection of indigenous freshwater species, regardless of whether they are pollution tolerant or more “clean water” species, such as mayflies, stoneflies and caddisflies (the “EPT” species). Quite why the habitat of pollution tolerant species such as chironomid midge larvae (“bloodworms”), which is typically freshwater drains, should be protected totally bemuses us.

Finally, we note that Policy 15 provides for activities such as the Ravensdown discharges, albeit with the rejoinder that it must be “in a way consistent with this NPS”. This comes back to the balance referred to above, whereby the second and third priorities can only be satisfied if the health needs of freshwater are met. In conclusion, we find the activity to be not inconsistent with the objective and policies of the NPSFM 2020.

4.5 Canterbury Regional Policy Statement

The Canterbury Regional Policy Statement (RPS) became operative on 15 January 2013. While it is the operative RPS for the Canterbury Region, it was prepared prior to the NPS-FM 2020 and cannot be assumed to reflect national policy on water management. Given that the effects of this proposal are on water quality, we consider that more weight should be placed on the NPS-FM than the RPS.

Section 8.1.3 of the AEE and paragraph 123 of Mr Johnston’s s42A report identify objectives and policies of the RPS that the respective authors consider to be relevant. While different provisions are identified by each author, the overall intent of the identified provisions is to set water quality standards for groundwater and surface water and manage the adverse effects of activities to achieve these standards. Objectives 7.2.1 and 7.2.4, and policy 7.3.6 reflect this.

In his s42A report, Mr Johnston referred to policy 7.3.12, which requires a precautionary approach to be taken to the discharge of contaminants where the effects on freshwater bodies are “unknown or uncertain”. He concluded that *“the proposal in its current form cannot achieve the objectives and policies of the CRPS relating to freshwater”*.²⁸ This was a contributing factor in Mr Johnston’s recommendation in his s42A report for the application to be declined. We note that he changed this view at the hearing, after further understanding the nature of the discharge and proposed mitigations.

We have considered the relevant provisions of the RPS and find that the proposal is consistent with the RPS.

4.6 Canterbury Land and Water Regional Plan

The LWRP was made operative on 1 September 2015 and has had seven subsequent plan changes. Plan Change 7 is partially operative and amended some provisions that are relevant to this application. The relevant provisions of the LWRP are identified and discussed in section 8.1.4 of the AEE and from

²⁸ Paragraph 124 of the s42A report of Mr Tim Johnston

paragraph 125 of the s42A report. There is a strong focus in the objectives and policies of the LWRP on improving water quality where it is degraded. The key provisions include Policy 2A.1 (incorporated by national direction), objective 3.8, and policies 4.13, 4.14B and 4.23.

As with the RPS, Mr Johnston concluded in his s42A report that *“the proposal as it currently stands is inconsistent with the majority of objectives and policies of the LWRP due to the adverse effects currently occurring”*²⁹. While we agree that the current adverse effects are significant and likely contrary to the LWRP, the focus of this application is on mitigation measures that should substantially reduce the contaminant loads being discharged from the site. Policy 4.13 requires

...the effects of any discharge are minimised by the use of measures that:

- (a) first, avoid the production of the contaminant;*
- (b) secondly, reuse, recovers or recycles the contaminant;*
- (c) thirdly, minimise the volume or amount of the discharge; or...”*

We consider that the measures proposed by Ravensdown, in particular decommissioning the FSA ponds, are consistent with policy 4.13, and we conclude that the proposal is consistent with the overall direction of the LWRP.

4.7 Other Relevant Matters – Section 104(c)

The Mahaanui Iwi Management Plan 2013 (MIMP) is a non-statutory planning document that is an expression of kaitiakitanga and rangatiratanga. It is a manawhenua planning document reflecting the collective efforts of six Papatipu Rūnanga that represent the hapū who hold manawhenua rights over lands and waters within the takiwā from the Hurunui River to the Hakatere River and inland to Kā Tiritiri o Te Moana.

In his 42A report Mr Johnston cited Mahaanui’s advice on the application and the submission provided, and concluded that the proposal is contrary to the MIMP.

We struggle to agree with his assessment. Mahaanui, on behalf of Ngai Tuahuriri Rūnanga, opposed the application and of the policies listed the application is consistent with Policy P10.1, particularly provision (e), and the present application cannot address all cumulative effects from other sites in the Hornby industrial zone (although importantly effects are assessed based on information on cumulative effects in the Haytons Stream catchment).

In conclusion, we find that the overall effects of the proposal will be positive, with on-site mitigations leading to improvements in water quality. We therefore struggle to see how the provisions of the MIMP could be seen as directly contrary to the present application being granted.

4.8 Part 2 of the Act

We note that the Court of Appeal’s decision in *RJ Davidson v Marlborough District Council*³⁰ clarifies how to approach the directive by section 104(1) to consider provisions subject to Part 2. It directs that

²⁹ Paragraph 127 of the s42A report of Mr Tim Johnston

³⁰ [2018] NZCA 316

there is no need to consider Part 2 unless there is invalidity, incompleteness, or uncertainty of meaning in the statutory planning documents.

Both Mr Johnston's s42A report and Mr Allan's evidence assess the application against Part 2, with Mr Allan referring to the assessment in the AEE. We questioned them as well as Mr Christensen at the hearing on whether, considering *Davidson*, we really need to consider Part 2. Mr Christensen and Mr Allen considered that consideration of Part 2 does not add much to this application, while Mr Johnston considered that consideration of Part 2 highlights concerns of iwi and the impacts on cultural values.

In this case, we do not think that there is any conflict between objectives or policies that would benefit from consideration against Part 2. We have concluded that the proposal is consistent with the relevant statutory documents. With reference to *Davidson*, we find that there would be no benefit to our evaluation of the proposal from consideration of Part 2.

5 Section 105 of the RMA

Section 105(1) of the Act requires that we must, in addition to s104 considerations, have regard to:

- a) *the nature of the discharge and the sensitivity of the environment to adverse effects;*
- b) *the applicant's reasons for the proposed choice; and*
- c) *any other possible alternative methods of discharge, including discharge into any other receiving environment.*

Turning first to s105(1)(a), we have already discussed the effects of the discharges from the Ravensdown works site to the receiving groundwater and surface water environments in Sections 4.3.1 and 4.3.2 of this decision. There we concluded that existing effects will be substantially reduced through actions imposed upon Ravensdown in conditions of consent.

There is no "reasoned" choice for groundwater, and ultimately surface water, being the receiving environments for the discharge. Nor are there any realistic alternative methods of discharge. Contaminants from the site will inevitably leach into groundwater, and from there to surface water. The key component of this decision is to avoid or remedy the sources of these discharges in the future.

The Applicant has already taken steps to limit discharges through the construction of the three stormwater basins, and conditions of consent require upgrades to the "green pond" that contains more concentrated water from the factory. The source of the FSA discharge will be removed so the discharge no longer occurs.

For these reasons we accept that the current application meets the s105 (1) criteria.

6 Section 107 of the RMA

The provisions of s107 apply to all applications for permits to discharge contaminants to fresh or coastal water. It does not apply to discharges to groundwater. S107 is drafted in a way that enables assessment of point source discharges to surface or coastal water. It was not intended to apply to diffuse sources of contaminants being discharged to surface water from groundwater, as is the case for the present application.

It was however common ground between the Applicant and the s42A reporting officers that s107 should be considered when assessing the present proposal.

It has three limbs; in this instance no party argued that the “exemption” provisions of s107(2) were applicable³¹ and so we first had to assess the modified proposal in terms of s107(1). In summary this limb states relevant to the modified proposal that “after reasonable mixing the contaminant discharged either by itself, or in combination with the same, similar or other contaminants” cannot give rise to any one of five listed characteristics, as noted in the following paragraph.

We heard no evidence, nor do we think it at all probable that the diffuse discharges to surface water will “lead to the production of any conspicuous oil or grease films, scums or foams or floatable or suspended materials” (s107(1)(c)), result in “any conspicuous change in colour or visual clarity” (s107(1)(d)), cause “any emission of objectionable odour”³² (s107(1)(e)), or “render fresh water unsuitable for consumption by farm animals (s107(1)(f)). As we have already discussed, the modified proposal is unlikely to have “any significant effects on aquatic life” (s107(1)(g)). For these reasons, we consider that it is improbable that the Applicant’s discharges will breach s107(1) of the RMA.

We also observe that if this conclusion is incorrect, s107(3) neatly fits the Applicant’s proposal. It states:

In addition to any other conditions imposed under this Act, a discharge permit ... may include conditions requiring the holder of the permit to undertake such works in such stages throughout the term of the permit as will ensure that upon the expiry of the permit the holder can meet the requirements of s107(1) and of any relevant regional rules.

In a nutshell, that is exactly what the conditions of the consent we have granted require.

7 Evaluation

In our view the consent sought can be granted. While there are some adverse effects of doing so, most notably on groundwater and surface water quality, declining the application would not give any clear means of ensuring these effects are avoided in the future. In previous sections we have evaluated the present applications in the context of sections 104, 105 and 107 of the RMA. While some of these provisions in isolation may weigh against granting the applications, none are directly contrary to doing so.

8 Term and Conditions

8.1 Conditions of Consent

There was a significant level of agreement between the officers of the Regional Council and the Applicant about the conditions of consent. Mr Johnston had prepared a set of draft conditions which

³¹ In summary these are: the discharge is of a temporary nature, or exceptional circumstances prevail, or the discharge is associated with essential maintenance.

³² Mr Johnston’s s42A report expressed the view that the discharge would breach s107 (1)(c), (d) and (g). We were bemused how he might have concluded the application breached provisions (c) and (d).

were circulated on Monday 21 August, and the Applicant's final proposed set of conditions were circulated with Mr Christensen's right of reply on Monday 28 August. In particular, there was general agreement on:

- The requirement for, and content and review of, a Site Discharge to Ground Management Plan;
- The operational conditions, including the dates by which improvement works must be completed;
- The parameters to be monitored in groundwater, surface water and from the stormwater basins; and
- Annual reporting requirements.

The main area of disagreement was about the number of downgradient groundwater sites that needed to be monitored, and the frequency of monitoring of downgradient groundwater and surface water bodies. The CRC officers were unable to secure agreement from the CCC to install additional offsite bores on CCC property before our deadline. We are reluctant to impose a requirement for additional monitoring sites where access is uncertain. In addition, and as discussed previously, we consider that the data obtained from the existing monitoring network should suffice.

Considering monitoring frequency, the CRC officers considered that monthly monitoring is appropriate for the duration of consent. Mr Thomas and Ms Shamrock considered that monitoring should be quarterly and could be reduced, or ceased, if certain triggers were achieved. We consider that monthly monitoring for the duration of consent is onerous, especially considering that the contaminant concentrations are predicted to drop quickly following decommissioning of the FSA ponds. That said, we agree with the CRC experts that monthly monitoring is appropriate until there is evidence that concentrations have dropped. Our conditions require trigger values to be met and a downward trend to be evident before monitoring frequency can be reduced to six-monthly.


8.2 Term of Consent

The applicant sought a term of 15 years for the present consent. We are satisfied that this term is appropriate. It will allow for shorter term remedial works to eliminate or reduce potential sources of contaminants entering groundwater and ultimately surface water. The effects of making these changes will then be monitored. The evidence indicates that once the major contaminant sources are eliminated or reduced from the site, downgradient concentrations in groundwater should reduce significantly during the duration of the consent. This should apply particularly to fluoride: once the existing FSA tanks are decommissioned Mr Thomas predicted there would be a relatively quick reduction in fluoride concentrations in groundwater, although there may be some lingering effects for some decades.

9 Decision

Pursuant to the powers delegated to us by the Canterbury Regional Council under section 34A of the Resource Management Act 1991, we record that having read the application documents, the further information provided under section 92, and the Applicant's expert evidence; the section 42A officer's reports and technical evidence; the lay evidence presented by the submitters at the hearing; and

having considered the various requirements of the RMA, we find that **Application CRC230609** can be granted subject to the attached conditions.

A handwritten signature in black ink that reads "Brent Cowie". The letters are cursive and somewhat slanted to the right.

Signed by Brent Cowie (Chair)

A handwritten signature in blue ink that reads "Bianca Sullivan". The signature is stylized and cursive.

Bianca Sullivan
Independent Hearing Commissioner

Consent conditions: CRC230609

General

1. The discharge of contaminants onto or into land shall be limited to contaminants originating from site operation activities and infrastructure at the Ravensdown Christchurch Works Manufacturing Site (the Site) located at 312 Main South Road, Hornby, Christchurch as shown on Plan CRC230609A which forms part of this consent.
2. Within one month of the commencement of this resource consent, the consent holder shall provide an updated Site Discharge to Ground Management Plan (SDGMP) to the Canterbury Regional Council (Attention: Regional Leader Compliance Monitoring) for certification that it is consistent with the conditions of this consent and provides a framework to reduce contaminants. The purpose of the SDGMP is to provide a framework to reduce the contaminants of concerns during ongoing site operations and to reflect and give effect to the conditions of this resource consent. The SDGMP shall include as a minimum:
 - a) the content of the Site Discharge Ground Management Plan dated 13th July 2023 where it does not contradict a condition of this resource consent;
 - b) a site management strategy to minimise the potential for raw materials, fertiliser products and waste products to discharge into ground;
 - c) a groundwater and surface water monitoring programme, trigger action response procedures and reporting requirements in accordance with the conditions of this consent; and
 - d) site improvement actions and upgrades required by Condition [5] of this resource consent; and
 - e) a site plan identifying the location of site improvement actions and upgrades.
3. The Site shall be managed and operated to minimise the potential for raw materials, fertiliser products and waste products to discharge into land, where they could reach groundwater, in accordance with the SDGMP required by Condition [2].
4. The consent holder may amend the SDGMP at any time. Any amendments shall be:
 - a) for the purpose of improving the efficacy of the management of the discharge and shall not exacerbate the effects of the discharge on groundwater quality;
 - b) consistent with the conditions of this resource consent; and
 - c) submitted to the Canterbury Regional Council (Attention: Regional Leader Compliance Monitoring) for certification that subclauses (a) and (b) are met prior to the amendments being implemented.

Site Improvement Actions

5. The consent holder shall undertake the following site improvement actions:
 - a) Decommission and remove or remediate the hydrofluorosilicic acid (FSA) ponds as shown on Plan CRC230609B, and permanently seal any area of disturbance to prevent entirely any further leakage of FSA to groundwater, by 31 January 2025;
 - b) Reseal the Manufacture Scrubber Bund shown on Plan CRC230609B and test structural integrity, and rectify any defects, by 31 May 2024;
 - c) Desludge, repair, reseal and test the integrity of the eastern green pond shown on Plan CRC230609B, and rectify any defects, by 31 December 2023; and
 - d) CCTV inspection of stormwater pipework installed before July 2018 and any subsequent repair and/or replacement of damaged pipework by 31 May 2024.

Advice Note: this consent does not authorise the actual site improvement actions, which may require separate and additional approvals from Canterbury Regional Council and / or

Christchurch City Council in accordance with relevant legislation, e.g. Resource Management Act, Building Code.

6. The consent holder shall provide Canterbury Regional Council (Attention: Regional Leader Compliance Monitoring) with a certification statement from a suitably qualified and experienced person within three months of completion of each site improvement action required by Condition [5].

Monitoring

7. Groundwater monitoring shall be undertaken as follows:
 - a) on a monthly basis from onsite bores MW1 to MW7 and M35/1878 and offsite bore BH112, as shown on Plan CRC230609C, from the commencement of this consent until the third anniversary of the decommissioning of the FSA ponds, and then on a six-monthly basis thereafter, subject to Condition [12];
 - b) by a person who is suitably qualified and experienced in collecting groundwater samples;
 - c) sample analysis shall be undertaken for:
 - i. field analysis of electrical conductivity, dissolved oxygen, temperature, pH; and
 - ii. laboratory analysis for:
 - Total anion/cation balance check
 - pH
 - Total hardness
 - Electrical conductivity
 - Fluoride
 - Total Nitrogen
 - Total Ammoniacal-N
 - Nitrite-N
 - Nitrate-N
 - Nitrate-N + Nitrite-N
 - Total Kjeldahl Nitrogen (TKN)
 - Dissolved Reactive Phosphorus
 - Sulfate
 - Total and dissolved manganese
 - Total and dissolved aluminium
 - d) Laboratory analysis of samples shall be undertaken by an IANZ accredited laboratory; and
 - e) The results of the groundwater monitoring shall be forwarded to Canterbury Regional Council (Attention: RMA Compliance and Enforcement Manager), Christchurch City Council (Attention: XXX) and Te Whatu Ora Health New Zealand (Attention: Medical Officer of Health) within one month of the laboratory analysis being completed.
8. Surface water quality grab samples shall be collected from Haytons Stream at the Environment Canterbury monitoring locations at Waterloo Road (SQ36042) and Washbourne Road (SQ30572) as follows:

- a) on a monthly basis from the commencement date of this resource consent until the third anniversary of the decommissioning of the FSA ponds, and on a six-monthly basis thereafter, subject to condition [12];
 - b) by a person who is suitably qualified and experienced in collecting surface water samples;
 - c) laboratory analysis shall be undertaken for:
 - i. Fluoride
 - ii. Nitrate-N
 - iii. Total manganese
 - iv. Dissolved manganese
 - v. Total aluminium
 - vi. Dissolved aluminium
 - vii. Dissolved reactive phosphorus
 - viii. Dissolved inorganic nitrogen
 - ix. Total Ammoniacal-N
 - x. pH
 - d) Laboratory analysis of samples shall be undertaken by an IANZ accredited laboratory;
 - e) Results from the samples collected by Canterbury Regional Council (ECan) or any other party that regularly monitor Haytons Stream, can be used to fulfil this condition provided that the sampling and analysis is undertaken at an appropriate time, and analysis is by an IANZ-accredited laboratory; and
 - f) The results of the surface water monitoring shall be forwarded to Canterbury Regional Council (Attention: RMA Compliance and Enforcement Manager) and Christchurch City Council (Attention: XXX) within one month of the laboratory analysis being completed.
9. Grab samples shall be taken from the outlets of Stormwater Basins 1 and 2 on the Site, as shown on Plan CRC230609) from the commencement date of this resource consent until the second anniversary of the decommissioning of the FSA ponds, as follows:
- a) during or within 48 hours after a rainfall event exceeding 25 mm when the basins are discharging to the CCC reticulated stormwater network;
 - b) by a person who is suitably qualified and experienced in collecting surface water samples;
 - c) Laboratory analysis shall be undertaken for:
 - i. Fluoride
 - ii. Nitrate nitrogen
 - iii. Total and dissolved manganese
 - iv. Total and dissolved aluminium
 - v. Dissolved reactive phosphorus
 - vi. Total ammoniacal nitrogen
 - vii. Dissolved inorganic nitrogen
 - viii. pH
 - d) The results of the grab samples shall be forwarded to Canterbury Regional Council (Attention: RMA Compliance and Enforcement Manager) and Christchurch City Council (Attention: XXX) within one month of the laboratory analysis being completed.

10. Sampling undertaken in accordance with Conditions [7] to [9] shall adhere to the following methodology:
- All samples shall be collected using National Environmental Monitoring Standards (NEMS) procedures and stored in appropriate laboratory supplied containers.
 - All samples collected shall be transported in accordance with NEMS procedures to the laboratory.
 - All samples taken shall be analysed at an accredited laboratory with registered quality assurance procedures, and all analyses shall be undertaken using standard methods, where applicable.

Advice Note: Registered Quality Assurance Procedures are procedures which ensure that the laboratory meets recognised management practices as would include registrations such as ISO 9000, ISO Guide 25, Ministry of Health Accreditation.

Actions

11. The Consent Holder shall include the following in their annual report required by condition [16] following the third and fifth anniversaries of the FSA Ponds being decommissioned:
- Results of groundwater monitoring undertaken in accordance with this consent, interpretation of those results and an analysis of trends, including a copy of these results in an appropriate electronic format that can be incorporated into the Canterbury Regional Council's monitoring database.
 - An analysis of the surface water quality results collected from Haytons Stream, including but not limited to, consideration of the context of the groundwater results and stormwater basin discharge sampling results collected in accordance with this consent, and interpretation of those results.
 - Comparison of the groundwater monitoring results in Bores MW5, MW6 and BH112 to the trigger values in Table 1.

Table 1: Water quality trigger values

Contaminant	Measurement	Limit
Nitrate-N	Half MAV DWSNZ ¹	5.65 mg/L
Fluoride	Half MAV DWSNZ ¹	0.75 mg/L
Dissolved manganese	Half MAV DWSNZ ¹	0.2 mg/L
Dissolved aluminium	Half MAV DWSNZ ¹	0.5 mg/L
Dissolved reactive phosphorus	Annual median concentration	0.016 mg/L ²
1. Maximum acceptable value (MAV) in Drinking-water Standards for New Zealand 2005 (revised 2018) (DWSNZ) 2. No applicable groundwater limit. Limit is set to spring-fed plains – urban watercourse value in Table S5A of the Canterbury Land and Water Regional Plan, allowing for appropriate mixing		

12. The frequency of monitoring can be reduced in accordance with Conditions [7(a)] and [8(a)] if the analyses undertaken under condition [11]:
- demonstrate a reducing (that is, improving) trend over at least the previous three years in groundwater that is attributable to discharges from the Site; and

- b) show that the contaminant concentrations in Bores MW5, MW6 and BH112 have reduced to below the trigger values in Table 1 of condition [11]; and
- c) show that concentrations of fluoride, aluminium and manganese in Haytons Stream are showing a decreasing trend.

13. If the analyses undertaken under condition [11]:

- a) demonstrate a stable or increasing (that is, declining) trend over at least the previous three years in groundwater or surface water; and
- b) show that the contaminant concentrations in the offsite bore BH112 are above the trigger values in Table 1 of condition [11];

the Trigger Action Response Framework set out in the SDGMP shall be followed and the consent holder shall engage a suitably qualified and experienced person to prepare a Remedial Action Plan (RAP). Within three months of the groundwater monitoring assessment being completed the consent holder shall submit the RAP to Canterbury Regional Council (Attention: Regional Leader Compliance Monitoring) for certification that the RAP is compliant with the requirements of Condition [14].

14. In the event that surface water monitoring of fluoride at any time records concentrations above 1.94 mg/L at either the Waterloo Road site (SQ36042) or the Washbourne Road site (SQ30572) for three consecutive months, the Trigger Action Response Framework set out in the SDGMP shall be followed and the consent holder shall engage a suitably qualified and experienced person to prepare a Remedial Action Plan (RAP). Within three months of the surface water monitoring assessment being completed the consent holder shall submit the RAP to Canterbury Regional Council (Attention: Regional Leader Compliance Monitoring) for certification that the RAP is compliant with the requirements of Condition [14].

15. The Remedial Action Plan required by Conditions [13] and/or [14] shall include all practicable measures to identify and remediate the cause of the increasing trend, and may include:

- a) Further technical investigation of the increasing trend and the potential impact of the discharge on groundwater quality, surface water quality and aquatic life;
- b) Re-evaluation of the source of the contaminant(s); and
- c) Remediation of the source of contaminants on site if adverse effects are identified under [15(a)].

Reporting

16. An annual report shall be provided to the following parties by 30 April each year for the duration of this resource consent:

- a) the Canterbury Regional Council (Attention: Regional Leader Compliance and Enforcement) for review;
- b) Christchurch City Council (Attention: XXX) for information; and
- c) Te Whatu Ora Health New Zealand (Attention: Medical Officer of Health) for information.

The annual report shall include:

- d) a description of actions and improvements undertaken in the previous year to reduce the discharge from the Site in accordance with the SDGMP;
- e) results of groundwater monitoring undertaken in accordance with this consent and interpretation of those results and analysis of trends, including a copy of these results in an

appropriate electronic format such that it can be incorporated into the Canterbury Regional Council's monitoring database;

- f) an analysis of the results of surface water quality results collected from Haytons Stream, including but not limited to, consideration of the context of the groundwater results collected in accordance with this consent, and interpretation of those results; and
- g) any necessary amendments to the SDGMP required to provide:
 - i. an update to the contamination sources on the Site;
 - ii. a description of new source control activities that should be undertaken on the Site;
 - iii. an update to the site improvement actions to include new actions identified and new timeframes for actions if these have been determined; and
 - iv. other updates to reflect any changes to the site operations.

Advice Note: if there is no change in respect of any of the matters set out in (d) i. to iv., the annual report shall confirm no change to the SDGMP.

17. The Canterbury Regional Council may, once per year, on any of the last five working days of May, serve notice of its intention to review the conditions of this consent for the purposes of:
- a) complying with the requirements of a relevant rule in an operative regional plan; and/or
 - b) requiring the adoption of the best practicable options to remove or reduce any adverse effects on the environment and/or to minimise the risk of such effect occurring or recurring; and/or
 - c) requiring the resource consent holder to carry out monitoring and reporting instead of, or in addition to that required by the resource consent; and/or
 - d) dealing with any adverse effect on the environment that may arise from the exercise of the consent.

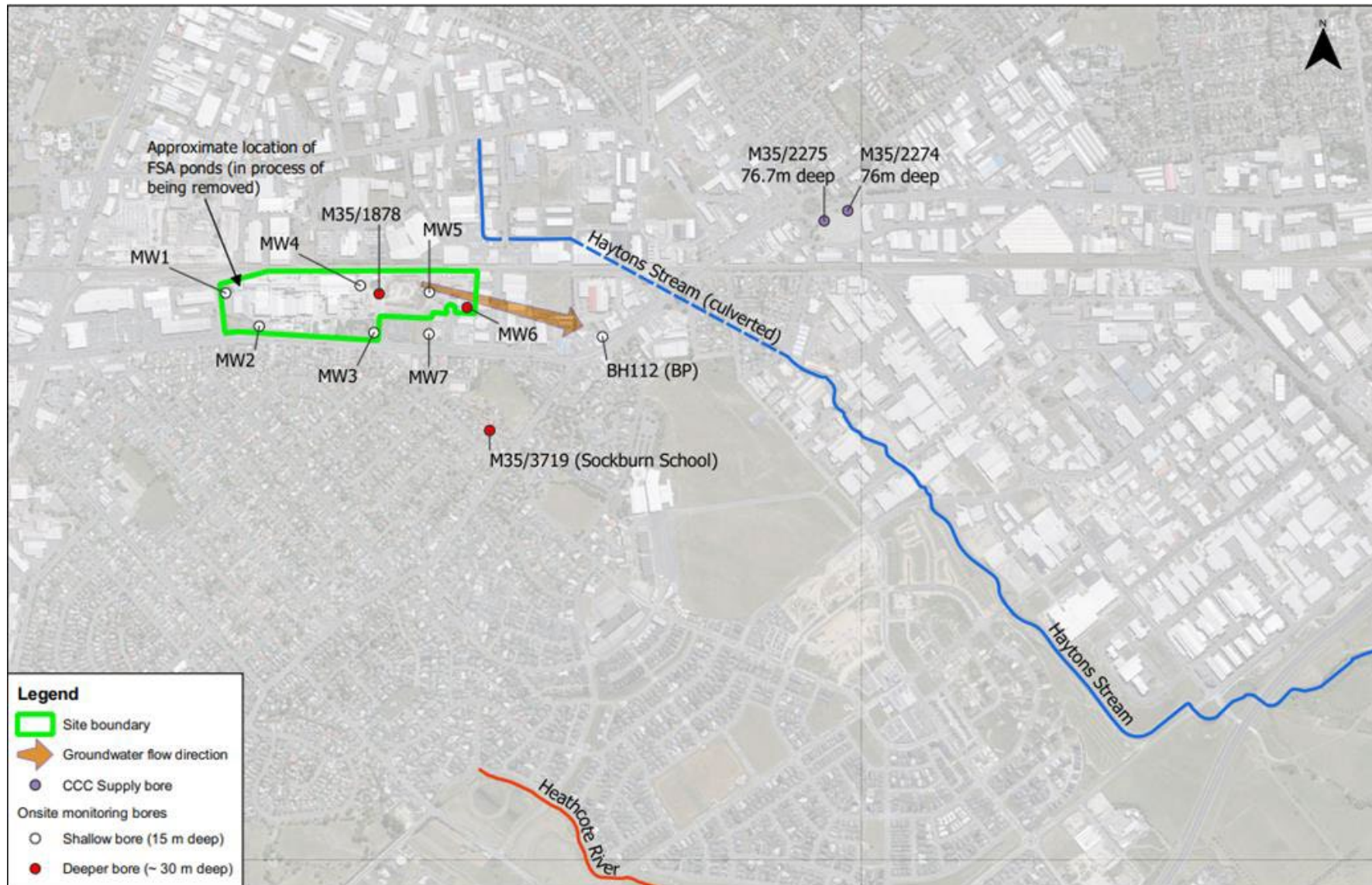
PLAN CRC230609A – Site Location – 312 Main South Road, Hornby



PLAN CRC230609B



PLAN CRC230609C



Note: Locations of features shown above are approximate.
Background image from LINZ Topo50 map.

FIGURE 2: Location of onsite and offsite monitoring bores

