

Lower Waiwhakaiho Catchment  
Monitoring Programme  
Annual Report  
2014-2015

Technical Report 2015-114

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## Executive summary

The Lower Waiwhakaiho River catchment monitoring programme addresses discharges by several consent holders in the Fitzroy area of New Plymouth. The report covers the period July 2014 – June 2015, and is the 22<sup>nd</sup> report for this combined monitoring programme.

The Waiwhakaiho River catchment is significant for the Taranaki region. It is used for domestic, agricultural and industrial water supply, hydroelectric power generation, recreational purposes, and waste assimilation. It is important to local Maori people. Because of the pressure on the river, the Taranaki Regional Council (the Council) adopted a water management plan for the river in September 1991.

At the end of the 2014-2015 monitoring period a total of 21 consents were held by the 13 industries monitored under this programme that discharge wastewater, stormwater and/or leachate from the industrial area at Fitzroy, New Plymouth to the lower Waiwhakaiho River and Mangaone Stream, or to land in the lower Waiwhakaiho and Mangaone Stream catchments. The activities and impacts of the consent holders upon water quality are discussed, as is the extent of their compliance with their permits, and their overall environmental performance. There is a separate report covering emissions to air within the catchment.

**During the year under review, the companies generally demonstrated a high level of environmental performance and a high level of administrative performance.**

The monitoring programme has included site inspections, discussions with site operators over site management, chemical surveys of discharges, groundwater and receiving waters, sediment sampling in the Mangaone Stream, and biomonitoring of the Waiwhakaiho River and Mangaone Stream.

In the lower Waiwhakaiho River and Mangaone Stream, the biomonitoring surveys generally reported results that were similar to or better than long term historical medians. In the period under review it was found that all Waiwhakaiho River sampling sites generally recorded community richnesses similar to or slightly above long term medians for their respective sites. There was a typical downstream decrease in MCI scores between the sites, but these results did not indicate any significant effects of stormwater or wastewater discharges from the Fitzroy industrial area on the macroinvertebrate communities of the Waiwhakaiho River. The results from the Mangaone Stream exhibited the expected and typical downstream decrease in MCI scores, however there are signs of a potential improvement in the scores downstream of Taranaki Sawmills Limited and Ravensdown Fertiliser Co-operative Limited.

There continued to be evidence of nutrient enrichment occurring in the lower Mangaone Stream. Chemical monitoring shows that stormwater from the fertiliser distribution depot (and old fertiliser works) presently owned and operated by Ravensdown Fertiliser Co-operative Limited, is still a source of nutrients. This enrichment is likely to be sufficient to encourage the formation of prolific algal growths in the lower Mangaone Stream, which may in turn affect the streambed fauna.

Monitoring of groundwater and leachate in relation to the old landfill area off Bewley Road showed that with exception of one ammoniacal nitrogen result, all of the samples collected from the three monitoring bores complied with consent limits.

There were three unauthorised incidents recorded that were associated with the consents covered by this report, one of which resulted in an infringement notice being issued. There were a further 11 incidents within the lower Waiwhakaiho industrial area, of which one was found to be breaching regional rules and resulted in an abatement notice being issued.

During the year under review, the companies generally demonstrated a high level of environmental performance and a high level of administrative performance.

During the period under review, AML Limited demonstrated a high level of administrative performance however an improvement was required in environmental performance and compliance. During the period under review as a result of the driveway sump not being kept clean, an illegal discharge occurred and an infringement notice was issued.

During the period under review, the Downer EDI Works Limited demonstrated a high level of environmental and high level of administrative performance and compliance with the resource consents in relation to its site at Rifle Range Road.

During the period under review, Farmlands Co-operative Society demonstrated a good level of environmental performance and high level of administrative performance and compliance with the resource consent in relation to its site on Katere Rd.

During the period under review, Firth Industries Limited demonstrated a good level of environmental performance and a high level of administrative performance and compliance with the resource consent in relation to its Clemow Rd site.

During the period under review, Fitzroy Engineering Group Limited demonstrated a high level of environmental performance and high level of administrative performance and compliance with the resource consents in relation to its site on Rifle Range Rd.

During the period under review, Freight and Bulk Transport Holdings Limited demonstrated a high level of environmental performance and administrative performance and compliance with their resource consents in relation to its site on Katere Rd.

During the period under review, the Nankervis Family Trust demonstrated a good level of environmental and high level of administrative performance and compliance with the resource consent in relation to its site on Dean Place.

During the period under review, New Plymouth District Council demonstrated a high level of environmental performance and high level of administrative performance and compliance with its resource consents.

During the period under review, New Zealand Decorative Concrete Limited demonstrated a high level of environmental performance and high level of administrative performance and compliance with the resource consents in relation to its Egmont Rd site.

During the period under review, New Zealand Railways Corporation Limited demonstrated a high level of environmental performance and high level of administrative performance and compliance with the resource consents in relation to its Smart Rd site.

Ravensdown Fertiliser Co-operative Limited demonstrated a good level of environmental performance and high level of administrative performance and compliance with the resource consents in relation to their site on Smart Rd.

During the period under review, Taranaki Sawmills Limited demonstrated a good level of environmental performance and high level of administrative performance and compliance with the resource consents in relation to its site on Katere Rd.

During the period under review, Technix Group Limited demonstrated a high level of environmental performance and high level of administrative performance and compliance with the resource consents in relation its sites on Rifle Range Rd.

For reference, in the 2014-2015 year, 75% of consent holders in Taranaki monitored through tailored compliance monitoring programmes achieved a high level of environmental performance and compliance with their consents, while another 22% demonstrated a good level of environmental performance and compliance with their consents.

This report includes recommendations for the 2015-2016 year.

## Table of contents

		Page
1.	Introduction	1
1.1	Compliance monitoring programme reports and the Resource Management Act 1991	1
1.1.1	Introduction	1
1.1.2	Structure of this report	1
1.1.3	The Resource Management Act (1991) and monitoring	2
1.1.4	Investigations, interventions, and incidents	2
1.1.5	Evaluation of environmental performance	3
1.2	Resource consents	5
1.3	Monitoring programme	12
1.3.1	Introduction	12
1.3.2	Programme liaison and management	12
1.3.3	Site inspections	12
1.3.4	Chemical sampling	13
1.3.4.1	Surface water surveys	13
1.3.4.2	Groundwater surveys	13
1.3.4.3	Streambed sediment sampling	16
1.3.5	Biomonitoring surveys	16
1.3.5.1	Macroinvertebrate surveys	16
1.3.5.2	Fish survey	16
2.	AML Limited (trading as Allied Concrete)	17
2.1	Process description	17
2.2	Water discharge permit	18
2.3	Results	18
2.3.1	Inspections	18
2.3.2	Results of discharge monitoring	19
2.3.3	Investigations, interventions, and incidents	20
2.4	Discussion	20
2.4.1	Evaluation of plant performance	20
2.4.2	Environmental effects of exercise of consent	20
2.4.3	Evaluation of performance	21
2.4.4	Recommendation from the 2012-2014 Biennial Report	22
2.4.5	Alterations to monitoring programmes for 2015-2016	22
2.5	Recommendations	22
3.	Downer EDI Works Limited	23
3.1	Process description	23
3.2	Water discharge permit	24
3.3	Results	24
3.3.1	Inspections	24
3.3.2	Results of discharge monitoring	25
3.3.3	Investigations, interventions, and incidents	26
3.4	Discussion	26

3.4.1	Discussion of site performance	26
3.4.2	Environmental effects of exercise of consent	26
3.4.3	Evaluation of performance	26
3.4.4	Recommendation from the 2012-2014 Biennial Report	27
3.4.5	Alterations to monitoring programmes for 2015-2016	28
3.5	Recommendation	28
4.	Farmlands Co-operative Society Limited	29
4.1	Process description	29
4.2	Water discharge permit	29
4.3	Results	30
4.3.1	Inspections	30
4.3.2	Results of discharge monitoring	30
4.4	Investigations, interventions, and incidents	31
4.5	Discussion	31
4.5.1	Discussion of site performance	31
4.5.2	Environmental effects of exercise of consent	31
4.5.3	Evaluation of performance	31
4.5.5	Recommendation from the 2012-2014 Biennial Report	33
4.5.6	Alterations to monitoring programmes for 2015-2016	33
4.6	Recommendation	33
5.	Firth Industries Limited (Division of Fletcher Concrete and Infrastructure Limited)	34
5.1	Process description	34
5.2	Water discharge permit	35
5.3	Results	35
5.3.1	Inspections	35
5.3.2	Results of discharge monitoring	36
5.3.3	Investigations, interventions, and incidents	36
5.4	Discussion	37
5.4.1	Discussion of site performance	37
5.4.2	Environmental effects of exercise of consent	37
5.4.3	Evaluation of performance	38
5.4.4	Recommendation from the 2012-2014 Biennial Report	38
5.4.5	Alterations to monitoring programmes for 2015-2016	39
5.5	Recommendation	39
6.	Fitzroy Engineering Group Limited	40
6.1	Process description	40
6.2	Water discharge permits	41
6.3	Results	42
6.3.1	Inspections	42
6.3.2	Results of discharge monitoring	42
6.4	Investigations, interventions, and incidents	43
6.5	Discussion	44
6.5.1	Discussion of site performance	44

6.5.2	Environmental effects of exercise of consents	44
6.5.3	Evaluation of performance	44
6.5.4	Alterations to monitoring programmes for 2015-2016	46
6.6	Recommendation	47
7.	Freight and Bulk Transport Holdings Limited	48
7.1	Process description	48
7.2	Water discharge permit	49
7.3	Results	49
7.3.1	Inspections	49
7.3.2	Investigations, interventions, and incidents	50
7.4	Discussion	50
7.4.1	Discussion of site performance	50
7.4.2	Environmental effects of exercise of consent	50
7.4.3	Evaluation of performance	50
7.4.4	Recommendation from the 2012-2014 Biennial Report	52
7.4.5	Alterations to monitoring programmes for 2015-2016	52
7.5	Recommendation	52
8.	Nankervis Family Trust	53
8.1	Process description	53
8.2	Water discharge permit	54
8.3	Results	54
8.3.1	Inspections	54
8.3.2	Results of discharge monitoring	54
8.3.3	Investigations, interventions, and incidents	55
8.4	Discussion	55
8.4.1	Discussion of site performance	55
8.4.2	Environmental effects of exercise of consent	56
8.4.3	Evaluation of performance	56
8.4.4	Recommendation from the 2012-2014 Biennial Report	57
8.4.5	Alterations to monitoring programmes for 2015-2016	57
8.5	Recommendation	57
9.	New Plymouth District Council	58
9.1	Process description	58
9.1.1	Stormwater discharges	58
9.1.2	Bewley Road closed landfill	59
9.2	Water discharge permits	60
9.3	Results	60
9.3.1	Stormwater discharges	60
9.3.1.1	Inspections	60
9.3.1.2	Chemical monitoring	61
9.3.2	Bewley Road industrial development	66
9.3.3	Investigations, interventions, and incidents	71
9.4	Discussion	71
9.4.1	Environmental effects of exercise of consents	71
9.4.2	Evaluation of performance	72



9.4.3	Recommendation from the 2012-2014 Biennial Report	73
9.4.4	Alterations to monitoring programmes for 2015-2016	74
9.5	Recommendation	74
10.	New Zealand Decorative Concrete Limited	75
10.1	Process description	75
10.2	Water discharge permits	76
10.3	Results	77
10.3.1	Inspections	77
10.3.2	Results of discharge monitoring	77
10.3.3	Investigations, interventions, and incidents	77
10.4	Discussion	77
10.4.1	Discussion of site performance	77
10.4.2	Environmental effects of exercise of consent	78
10.4.3	Evaluation of performance	78
10.4.4	Recommendation from the 2012-2014 Biennial Report	79
10.4.5	Alterations to monitoring programmes for 2015-2016	79
10.5	Recommendation	79
11.	New Zealand Railways Corporation	80
11.1	Process description	80
11.2	Water discharge permits	81
11.3	Results	81
11.3.1	Inspections	81
11.3.2	Chemical analysis	82
11.3.2.1	Results of discharge monitoring	82
11.3.2.2	Results of receiving environment monitoring	83
11.4	Investigations, interventions, and incidents	83
11.5	Discussion	84
11.5.1	Discussion of site performance	84
11.5.2	Environmental effects of exercise of consent	84
11.5.3	Evaluation of performance	84
11.5.4	Recommendation from the 2012-2014 Biennial Report	85
11.5.5	Alterations to monitoring programmes for 2015-2016	86
11.6	Recommendation	86
12.	Ravensdown Fertiliser Co-operative Limited	87
12.1	Process description	87
12.2	Water discharge permits	88
12.3	Results	89
12.3.1	Inspections	89
12.3.3	Chemical analysis	90
12.3.3.1	Results of discharge monitoring	90
12.3.3.2	Results of receiving water monitoring	91
12.3.3.3	Results of groundwater monitoring	94
12.3.4	Receiving environment monitoring	98
12.3.5	Investigations, interventions, and incidents	98

12.4	Discussion	98
12.4.1	Discussion of site performance	98
12.4.2	Environmental effects of exercise of consents	99
12.4.3	Evaluation of performance	99
12.4.4	Recommendation from the 2012-2014 Biennial Report	100
12.4.5	Alterations to monitoring programmes for 2015-2016	101
12.5	Recommendation	101
13.	Taranaki Sawmills Limited	102
13.1	Process description	102
13.2	Water discharge permit	103
13.3	Results	104
13.3.1	Inspections	104
13.3.2	Discharge chemical analysis	104
13.3.3	Investigations, interventions, and incidents	106
13.4	Discussion	107
13.4.1	Discussion of site performance	107
13.4.2	Environmental effects of exercise of consent	107
13.4.3	Evaluation of performance	107
13.4.4	Recommendation from the 2012-2014 Biennial Report	109
13.4.5	Alterations to monitoring programmes for 2014-2015	109
13.5	Recommendation	110
14.	Technix Group Limited	111
14.1	Process description	111
14.2	Water discharge permits	113
14.3	Results	113
14.3.1	Inspections	113
14.3.2	Results of discharge monitoring	113
14.4	Investigations, interventions, and incidents	116
14.5	Discussion	116
14.5.1	Discussion of site performance	116
14.5.2	Environmental effects of exercise of consents	116
14.5.3	Evaluation of performance	116
14.5.4	Recommendation from the 2012-2014 Biennial Report	119
14.5.5	Alterations to monitoring programmes for 2015-2016	119
14.6	Recommendation	119
15.	Investigations, interventions, and incidents	120
16.	Surface receiving water quality	122
16.1	Chemical analyses	122
16.1.1	Waiwhakaiho River	122
16.1.1.1	Wet weather surveys	122
16.1.1.2	Dry weather surveys	123
16.1.2	Mangaone Stream	124
16.1.2.1	Wet weather surveys	124
16.1.2.2	Dry weather surveys	129

16.2	Freshwater biomonitoring programme	130
16.2.1	Macroinvertebrate surveys	130
16.2.1.1	Macroinvertebrate survey of 16 October 2014	130
16.2.1.2	Macroinvertebrate survey of 12-13 February 2015	132
17.	Summary of recommendations	134
	Glossary of common terms and abbreviations	135
	Bibliography and references	137
Appendix I	Resource consents to discharge into the lower Waiwhakaiho River and Mangaone Stream catchments in alphabetical order (For a copy of the signed resource consent please contact the TRC consent department)	
	Waiwhakaiho River	
	Mangaone Stream	
Appendix II	Chemical surface water and discharge monitoring data	
Appendix III	Biomonitoring reports - macroinvertebrate surveys	
Appendix IV	Rule 23 of the Regional Freshwater Plan for Taranaki (permitted stormwater rule)	

## List of tables

<b>Table 1</b>	Resource consents for discharges to lower Waiwhakaiho River and Mangaone Stream from New Plymouth industrial area	6
<b>Table 2</b>	Chemical monitoring results for AML's discharge at site STW002033	19
<b>Table 3</b>	Summary of performance for consent 4539-2,	21
<b>Table 4</b>	Chemical monitoring results for Downer's air scrubber settling ponds (site IND002002)	25
<b>Table 5</b>	Chemical monitoring results for discharge from Downer' final discharge (site MGO000189)	25
<b>Table 6</b>	Summary of performance consent 3917-2 (to 20 May 2015)	26
<b>Table 7</b>	Summary of performance consent 3917-2 (from 20 May 2015)	27
<b>Table 8</b>	Chemical monitoring results for Farmlands -site MGO000058	30
<b>Table 9</b>	Summary of performance for consent 4548-2	32
<b>Table 10</b>	Chemical monitoring results for Firth -site IND002001	36
<b>Table 11</b>	Summary of performance consent 0392-3,	38
<b>Table 12</b>	Chemical monitoring results for discharge opposite FEGL's plate shop -site STW002001	43
<b>Table 13</b>	Chemical monitoring results for FEGL/Technix combined stormwater discharge-site STW001021	43
<b>Table 14</b>	Summary of performance for FEGL consent 0021-3	44
<b>Table 15</b>	Summary of performance for FEGL consent 0021-4	44
<b>Table 16</b>	Summary of performance for FEGL consent 9853-1	45
<b>Table 17</b>	Summary of performance for FEGL consent 9853-2	46
<b>Table 18</b>	Summary of performance 2041-2 (to 5 June 2015)	50
<b>Table 19</b>	Summary of performance 2041-3 (from 5 June 2015)	51
<b>Table 20</b>	Summary of performance 10008-1 (from 5 June 2015)	51
<b>Table 21</b>	Chemical monitoring results for Nankervis Family Trust - site IND002039	55
<b>Table 22</b>	Summary of performance for consent 6965	56
<b>Table 23</b>	Chemical monitoring results for Burton Street stormwater - site STW001081	62
<b>Table 24</b>	Chemical monitoring results for NPDC McLeod's Drain discharge site STW001001	62
<b>Table 25</b>	Wet weather chemical monitoring results for Struthers Place site WKH000872	64
<b>Table 26</b>	Chemical monitoring results for Vickers Rd discharge-site STW001020	64
<b>Table 27</b>	Chemical monitoring results for stormwater drain from mid Katere Road to the Mangaone Stream- site STW001116	65
<b>Table 28</b>	Chemical monitoring results for stormwater drain from Hurlstone Drive to Mangaone Stream at SH3- site STW001035	66
<b>Table 29</b>	Chemical monitoring results for Bewley Road landfill down gradient monitoring bore #1 - site GND0548	67

<b>Table 30</b>	Chemical monitoring results for Bewley Road landfill down gradient monitoring bore #2-site GND0555)	68
<b>Table 31</b>	Chemical monitoring results for Bewley Road landfill control bore #3 -site GND0556	69
<b>Table 32</b>	Chemical monitoring results for Bewley Road landfill surface water discharge monitoring - site WKH000872	69
<b>Table 33</b>	Chemical monitoring results for Bewley Road landfill, dry weather receiving water chemical monitoring	70
<b>Table 34</b>	Summary of performance for consent 1275-3	72
<b>Table 35</b>	Summary of performance for 5163-2	72
<b>Table 36</b>	Summary of performance for consent 4984-1,	73
<b>Table 37</b>	Chemical monitoring results of New Zealand Decorative Concrete Limited's stormwater - site STW001139	77
<b>Table 38</b>	Summary of performance for consent 7450-1,	78
<b>Table 39</b>	Chemical monitoring results for Smart Road rail yard stormwater discharge	82
<b>Table 40</b>	Receiving environment chemical monitoring results for Smart Road rail yard stormwater discharge to the Mangamiro Stream	83
<b>Table 41</b>	Summary of performance for consent 1735-3,	84
<b>Table 42</b>	Summary of performance for consent 3528-2	85
<b>Table 43</b>	Chemical monitoring results for Ravensdown's process effluent discharge to Macleod's drain -site IND004002	90
<b>Table 44</b>	Chemical monitoring results for Ravensdown main stormwater discharge to the Mangaone Stream -site STW002003	91
<b>Table 45</b>	Receiving water nutrient monitoring in relation to Ravensdown's discharge to the Waiwhakaiho River 23 March 2015	92
<b>Table 46</b>	Receiving water nutrient monitoring in relation to Ravensdown's discharge to the Waiwhakaiho River 15 June 2015	92
<b>Table 47</b>	Receiving water nutrient monitoring in relation to Ravensdown's discharge to the Mangaone Stream 10 December 2014	93
<b>Table 48</b>	Receiving water nutrient monitoring in relation to Ravensdown's discharge to the Mangaone Stream 23 March 2015	93
<b>Table 49</b>	Chemical monitoring results for nutrients in the groundwater and Mangaone Stream in the vicinity of Ravensdown Fertilisers for January 2015	95
<b>Table 50</b>	Chemical monitoring results for nutrients in the groundwater and Mangaone Stream in the vicinity of Ravensdown Fertilisers for 19 May 2015	96
<b>Table 51</b>	Metals and inorganic results for groundwater at Ravensdown	98
<b>Table 52</b>	Summary of performance for consent 3865-3	100
<b>Table 53</b>	Summary of performance for consent 3140-2	100
<b>Table 54</b>	Chemical monitoring results for Taranaki Sawmills stormwater discharge - site IND001006	105
<b>Table 55</b>	Summary of performance for consent 3491-2,	108

<b>Table 56</b>	Chemical monitoring results for Technix/FEGL stormwater discharge-site STW001021	114
<b>Table 57</b>	Chemical monitoring results for combined Technix/Vickers Rd discharge-site STW001020	115
<b>Table 58</b>	Receiving water results from the Mangaone Stream (Technix)	115
<b>Table 59</b>	Summary of performance for Technix consent 0291-2	116
<b>Table 60</b>	Summary of performance for Technix consent 0291-3	117
<b>Table 61</b>	Summary of performance for Technix consent 9981-1	117
<b>Table 62</b>	Summary of performance for Technix consent 9982-1	118
<b>Table 63</b>	Results of wet weather chemical monitoring of lower Waiwhakaiho River	123
<b>Table 64</b>	Results of dry weather chemical monitoring of lower Waiwhakaiho River	124
<b>Table 65</b>	Results of wet weather chemical monitoring of Mangaone Stream, December 2014	125
<b>Table 66</b>	Results of wet weather chemical monitoring of Mangaone Stream, March 2015	126
<b>Table 67</b>	Results of chemical monitoring of the Mangaone Stream at Egmont Road for McKechnie Aluminium Solutions Limited compliance monitoring-site MGO000050	128
<b>Table 68</b>	Biomonitoring sites in the Lower Waiwhakaiho River and the Mangaone Stream	130

## List of figures

<b>Figure 1</b>	Lower Waiwhakaiho River and Mangaone Stream consent holders and chemical sampling	9
<b>Figure 2</b>	Lower Waiwhakaiho River and Mangaone Stream discharges	10
<b>Figure 3</b>	Lower Waiwhakaiho River and Mangaone Stream biological monitoring sites	11
<b>Figure 4</b>	Location of groundwater monitoring bores and associated sampling sites	15
<b>Figure 5</b>	AML Limited (trading as Allied Concrete) site location and stormwater drainage	17
<b>Figure 6</b>	Downer's site and sampling point locations	23
<b>Figure 7</b>	Viterra (NZ) Limited site and sampling point locations	29
<b>Figure 8</b>	Firth Industries site location and discharge points	34
<b>Figure 9</b>	Technix Group Limited and Fitzroy Engineering Group Limited subdivided site	40
<b>Figure 10</b>	Fitzroy Engineering Group limited site and stormwater discharge points	41
<b>Figure 11</b>	Location of Freight and Bulk Transport Holdings site	48
<b>Figure 12</b>	Nankervis Family Trust site location and discharge point	53
<b>Figure 13</b>	NPDC stormwater drainage and consented discharge points to the Waiwhakaiho River	58
<b>Figure 14</b>	NPDC stormwater drainage and consented discharge points to the Mangaone Stream	59
<b>Figure 15</b>	New Zealand Decorative Concrete site and discharge point	75
<b>Figure 16</b>	New Zealand Railways Corporation's rail yard and sampling point locations	80
<b>Figure 17</b>	Ravensdown Fertiliser Co-operative Limited site and sampling point locations	87
<b>Figure 18</b>	Ammoniacal nitrogen concentration at sites GND1218, GND1218 and GND2346 from June 2002 to June 2015	97
<b>Figure 19</b>	Taranaki Sawmills site and sampling point locations	102
<b>Figure 20</b>	Tebuconazole and Propiconazole concentrations TSM's discharge-site IND001006	106
<b>Figure 21</b>	Tebuconazole and Propiconazole concentrations downstream of TSM' discharge	106
<b>Figure 22</b>	Technix site, drainage system and sampling point locations	111
<b>Figure 23</b>	Longitudinal profiles of NH <sub>4</sub> -N in the Mangaone Stream	127
<b>Figure 24</b>	Longitudinal profiles of DRP in the Mangaone Stream	127
<b>Figure 25</b>	Mangaone Stream ammoniacal nitrogen concentrations in the vicinity of the Ravensdown site under dry weather conditions 2010-2015	129





# **1. Introduction**

## **1.1 Compliance monitoring programme reports and the Resource Management Act 1991**

### **1.1.1 Introduction**

This report is the Annual Report for the period July 2014-June 2015 by the Council describing the monitoring programme associated with resource consents held by twelve industries in the Lower Waiwhakaiho Catchment. The monitoring covers discharges to water and land in the Fitzroy and Katere Road industrial areas of New Plymouth.

This report covers the results and findings of the monitoring programme implemented by the Council in respect of the consents held by these industries that relate to discharges of stormwater, wastewater and leachate to the Lower Waiwhakaiho River and Mangaone Stream, and to land in the Mangaone Stream catchment.

One of the intents of the *Resource Management Act 1991* (RMA) is that environmental management should be integrated across all media, so that a consent holder's use of water, air, and land should be considered from a single comprehensive environmental perspective. Accordingly, the Council generally implements integrated environmental monitoring programmes and reports the results of the programmes jointly. This report discusses the environmental effects of the companies' use of water and land, and is the 22<sup>nd</sup> report by the Council for these Companies.

A separate report covers the results of the Council's monitoring programmes associated with the air discharge permits held by some of these industries.

The lower Waiwhakaiho River has been identified by the Council as a resource of regional significance that has demonstrated evidence of adverse impact from catchment-wide point and diffuse source pollution and other river usage. This is apparent particularly during periods of low flow accentuated by abstraction related to operation of the hydroelectric power station at Mangamahoe. The Mangaone Stream has also been identified in Appendix IA of the Regional Freshwater Plan for Taranaki as a stream of high ecological value. This tributary of the Waiwhakaiho River has particularly high native fish diversity, including the presence of threatened species. It is therefore important that monitoring of the Waiwhakaiho River and Mangaone Stream is continued, particularly in relation to any major wastewater or stormwater discharges, in order that these water bodies are safeguarded as resources for the area.

### **1.1.2 Structure of this report**

Section 1 of this report is a background section. It sets out general information about compliance monitoring under the RMA and the Council's obligations and general approach to monitoring sites through annual programmes, lists the resource consents held by companies in the Lower Waiwhakaiho catchment, and outlines the nature of the monitoring programme in place for the period under review.

Section 2-14 discusses the results from each individual company covered by this report. Each section has details on process description, resource consents, results of inspections and sampling, an evaluation of performance and recommendations for the 2015-2016 period.

(Haidie this reference doesn't work- this is manually typed- can you please look into) Section 15 presents a summary of the information on file about incidents in the Waiwhakaiho and Mangaone catchments that have been logged on the Council's database.

Section 16 discusses the results, their interpretation, and their significance for the environment in the Waiwhakaiho River or Mangaone Stream as a whole.

Section 17 presents a summary of recommendations made in relation to the monitoring of each company's activities.

A glossary of common abbreviations and scientific terms, and a bibliography, are presented at the end of the report.

### **1.1.3 The Resource Management Act (1991) and monitoring**

The *Resource Management Act 1991* (RMA) primarily addresses environmental 'effects' which are defined as positive or adverse, temporary or permanent, past, present or future, or cumulative. Effects may arise in relation to:

- (a) the neighbourhood or the wider community around an activity, and may include cultural and socio-economic effects;
- (b) physical effects on the locality, including landscape, amenity and visual effects;
- (c) ecosystems, including effects on plants, animals, or habitats, whether aquatic or terrestrial;
- (d) natural and physical resources having special significance (eg, recreational, cultural, or aesthetic);
- (e) risks to the neighbourhood or environment.

In drafting and reviewing conditions on discharge permits, and in implementing monitoring programmes, the Council is recognising the comprehensive meaning of 'effects' inasmuch as is appropriate for each activity. Monitoring programmes are not only based on existing permit conditions, but also on the obligations of the RMA to assess the effects of the exercise of consents. In accordance with section 35 of the RMA, the Council undertakes compliance monitoring for consents and rules in regional plans, and maintains an overview of the performance of resource users and consent holders. Compliance monitoring, including both activity and impact monitoring, enables the Council to continuously evaluate its approach and that of consent holders to resource management and, ultimately, through the refinement of methods and considered responsible resource utilisation, to move closer to achieving sustainable development of the region's resources.

### **1.1.4 Investigations, interventions, and incidents**

The monitoring programme for the year was based on what was considered to be an appropriate level of monitoring, review of data, and liaison with the consent holder.

During the year matters may arise which require additional activity by the Council, for example provision of advice and information, or investigation of potential or actual causes of non-compliance or failure to maintain good practices. A pro-active approach that in the first instance avoids issues occurring is favoured.

The Council operates and maintains a register of all complaints or reported and discovered excursions from acceptable limits and practices, including non-compliance with consents, which may damage the environment. The Incident Register (IR) includes events where the Company concerned has itself notified the Council. The register contains details of any investigation and corrective action taken.

Complaints may be alleged to be associated with a particular site. If there is potentially an issue of legal liability, the Council must be able to prove by investigation that the identified company is indeed the source of the incident (or that the allegation cannot be proven).

### 1.1.5 Evaluation of environmental performance

Besides discussing the various details of the performance and extent of compliance by the consent holder/s during the period under review, this report also assigns a rating as to each Company's environmental and administrative performance.

**Environmental performance** is concerned with actual or likely effects on the receiving environment from the activities during the monitoring year.

**Administrative performance** is concerned with the Company's approach to demonstrating consent compliance in site operations and management including the timely provision of information to Council (such as contingency plans and water take data) in accordance with consent conditions.

Events that were beyond the control of the consent holder and unforeseeable (that is a defence under the provisions of the RMA can be established) may be excluded with regard to the performance rating applied. For example loss of data due to a flood destroying deployed field equipment.

The categories used by the Council for this monitoring period, and their interpretation, are as follows:

#### Environmental Performance

- **High:** No or inconsequential (short-term duration, less than minor in severity) breaches of consent or regional plan parameters resulting from the activity; no adverse effects of significance noted or likely in the receiving environment. The Council did not record any verified unauthorised incidents involving significant environmental impacts and was not obliged to issue any abatement notices or infringement notices in relation to such impacts.
- **Good:** Likely or actual adverse effects of activities on the receiving environment were negligible or minor at most. There were some such issues noted during monitoring, from self reports, or in response to unauthorised incident reports, but these items were not critical, and follow-up inspections

showed they have been dealt with. These minor issues were resolved positively, co-operatively, and quickly. The Council was not obliged to issue any abatement notices or infringement notices in relation to the minor non-compliant effects; however abatement notices may have been issued to mitigate an identified potential for an environmental effect to occur.

For example:

- High suspended solid values recorded in discharge samples, however the discharge was to land or to receiving waters that were in high flow at the time;
  - Strong odour beyond boundary but no residential properties or other recipient nearby.
- **Improvement required:** Likely or actual adverse effects of activities on the receiving environment were more than minor, but not substantial. There were some issues noted during monitoring, from self reports, or in response to unauthorised incident reports. Cumulative adverse effects of a persistent minor non-compliant activity could elevate a minor issue to this level. Abatement notices and infringement notices may have been issued in respect of effects.
  - **Poor:** Likely or actual adverse effects of activities on the receiving environment were significant. There were some items noted during monitoring, from self reports, or in response to unauthorised incident reports. Cumulative adverse effects of a persistent moderate non-compliant activity could elevate an 'improvement required' issue to this level. Typically there were grounds for either a prosecution or an infringement notice in respect of effects.

#### **Administrative performance**

- **High:** The administrative requirements of the resource consents were met, or any failure to do this had trivial consequences and were addressed promptly and co-operatively.
- **Good:** Perhaps some administrative requirements of the resource consents were not met at a particular time, however this was addressed without repeated interventions from the Council staff. Alternatively adequate reason was provided for matters such as the no or late provision of information, interpretation of 'best practical option' for avoiding potential effects, etc.
- **Improvement required:** Repeated interventions to meet the administrative requirements of the resource consents were made by Council staff. These matters took some time to resolve, or remained unresolved at the end of the period under review. The Council may have issued an abatement notice to attain compliance.
- **Poor:** Material failings to meet the administrative requirements of the resource consents. Significant intervention by the Council was required. Typically there were grounds for an infringement notice.

For reference, in the 2014-2015 year, 75% of consent holders in Taranaki monitored through tailored compliance monitoring programmes achieved a high level of environmental performance and compliance with their consents, while another 22% demonstrated a good level of environmental performance and compliance with their consents.

## 1.2 Resource consents

Section 15(1)(a) of the RMA stipulates that no person may discharge any contaminant into water, unless the activity is expressly allowed for by a resource consent or a rule in a regional plan, or by national regulations.

Sections 15(1)(b) and (d) of the RMA stipulate that no person may discharge any contaminant onto land if it may then enter water, or from any industrial or trade premises onto land under any circumstances, unless the activity is expressly allowed for by a resource consent, a rule in a regional plan, or by national regulations.

Each of the consents that pertain to the Lower Waiwhakaiho Catchment Resource Consents Monitoring Programme is listed in Table 1. The locations of the consent holders monitored under this programme and the chemical sampling sites are shown in Figure 1. The locations of the discharges are shown in Figure 2, whilst the biomonitoring sites that pertain to the monitoring programme are shown in Figure 3.

A total of 21 consents were held to discharge wastewater, stormwater and leachate from the industrial area at Fitzroy, New Plymouth to the lower Waiwhakaiho River and Mangaone Stream during the period under review. Each of these permits was issued by the Council as a resource consent under Section 87(e) of the Resource Management Act. These consents are set out in Table 1.

**Table 1** Resource consents for discharges to lower Waiwhakaiho River and Mangaone Stream from New Plymouth industrial area

Consent holder	Consent number	Type of discharge	Catchment area/Volume	Review date	Expiry date
<b>Waiwhakaiho River</b>					
Fitzroy Engineering Group Limited	0021-3 0021-4	Stormwater from an industrial site into the Waiwhakaiho River [0021-4 granted 12 March 2015]	3.3 ha	June 2020	1 June 2032
	9853-1 9853-2	Stormwater from an industrial site into the Waiwhakaiho River [9853-2 granted 12 March 2015]	3.3 ha	June 2020	1 June 2032
Firth Industries	0392-3	Treated concrete truck washings and stormwater [renewal application lodged 27 January 2014]	10 L/s; 200 L/s	-	1 June 2014
NPDC	4984-1	Leachate from former Bewley Road Landfill [renewal application lodged 28 February 2014]	20 L/s	-	1 June 2014
	5163-2	Stormwater from Waiwhakaiho industrial area, multiple outlets	-	June 2020	1 June 2026
NZ Railways Corporation	3528-2	Treated wastewater and stormwater from rail yard [renewal application lodged 28 February 2014]	13 m <sup>3</sup> /day	-	1 June 2014
Ravensdown Fertiliser	3140-2	Stormwater from fertiliser storage depot [renewal application lodged 19 November 2013]	700 L/s	-	1 June 2014
Technix Group	0291-2 0291-3	Stormwater from an industrial site into the Waiwhakaiho River [0291-3 granted 24 October 2014]	2.2 ha	June 2020	1 June 2032
	9981-1	To discharge stormwater from an industrial site into the Waiwhakaiho River [granted 24 October 2014]	1.8 ha	June 2020	1 June 2032

Consent holder	Consent number	Type of discharge	Catchment area/Volume	Review date	Expiry date
<b>Mangaone Stream</b>					
AML Limited [Trading as Allied Concrete]	4539-2	Stormwater and treated waste water from truck washing	5880 m <sup>2</sup>	June 2020	1 June 2026
Downer EDI Works	3917-2 3917-3	Treated washwater and stormwater from asphalt plant [consent 3917-3 granted 20 June 2015]	6.5 ha	June 2020	1 June 2032
Farmlands Co-operative Society Limited	4548-2	Treated wastewater and stormwater from feed mill	128 L/s	-	1 June 2020
Freight & Bulk Transport	2041-2 2041-3	Treated truck wash water and stormwater onto and into land [consent 2041-3 granted 5 June 2015]	-	-	1 June 2018
	10008-1	Stormwater onto and into land and into the Mangaone Stream	1.77 ha	June 2020	1 June 2032
Nankervis Family Trust	6965-1	Truckwash water via interceptor	Approx 1 m <sup>3</sup> /day	-	1 June 2020
NPDC	1275-3	Stormwater from Katere industrial area, multiple outlets	-	June 2020	1 June 2026
NZ Decorative Concrete	7450-1	Stormwater from a decorative concrete products manufacturing site		June 2020	1 June 2026
NZ Railways Corporation	1735-3	Stormwater from Smart Road rail terminal	11.28 ha	June 2020	1 June 2026
Ravensdown Fertiliser	3865-3	Stormwater from fertiliser storage depot [renewal application lodged 19 November 2013]	700 L/s	-	1 June 2014
Taranaki Sawmills	3491-2	Treated cooling water, wastewater and stormwater	5.3 ha + 12 m <sup>3</sup> /day	-	1 June 2020
Technix Group	9982-1	Stormwater from an industrial site into the Mangaone Stream	1.3 ha	June 2020	1 June 2032

Outlines of the companies' activities and the site specific special conditions on their consents are presented in later sections. Although there is some variation among the conditions of the consents, which were granted over a period of several years, the newest consents include some 'standardised' conditions (with some exceptions). The standardisation is in terms of some general limits on effluent composition, definition of mixing zones, and control of receiving water effects (compliance with Section 107 of the Resource Management Act 1991), contingency plans, and review of conditions.

The 'standardised' special conditions are as follows:

1. THAT the following limits shall not be exceeded in the discharge:
 

(i)	Suspended solids	100 mg/L
(ii)	Oil & grease	15 mg/L
(iii)	pH [range]	6.0 - 8.5 [or 6 - 9 for more recent consents]
  
2. THAT allowing for a mixing zone extending xx metres below the discharge pipe, the discharge shall not give rise to any of the following effects in the receiving water of the Waiwhakaiho River/Mangaone Stream:
  - (i) the production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials;
  - (ii) any conspicuous change in the colour or visual clarity;
  - (iii) any emission of objectionable odour;
  - (iv) any rendering of fresh water unsuitable for consumption by farm animals;
  - (v) any significant adverse effects on aquatic life, habitats, or ecology.
  
3. THAT the consent holder, within three months of the granting of this consent, shall provide a contingency plan, to the satisfaction of the Chief Executive, Taranaki Regional Council, for action to be taken in the event of accidental discharge or spillage of contaminants.
  
4. THAT the Taranaki Regional Council may review any or all of the conditions of this consent by giving notice of review during June 2002 and/or June 2008 and/or June 2014 for the purpose of ensuring that the conditions are adequate to deal with any adverse effects of the discharge on the environment.

A summary of each consent is given in each consent holder's subsection 1, and includes the purpose of the consent, the special conditions, and the duration of the consent. Copies of the full consents are given in alphabetical order in Appendix I.



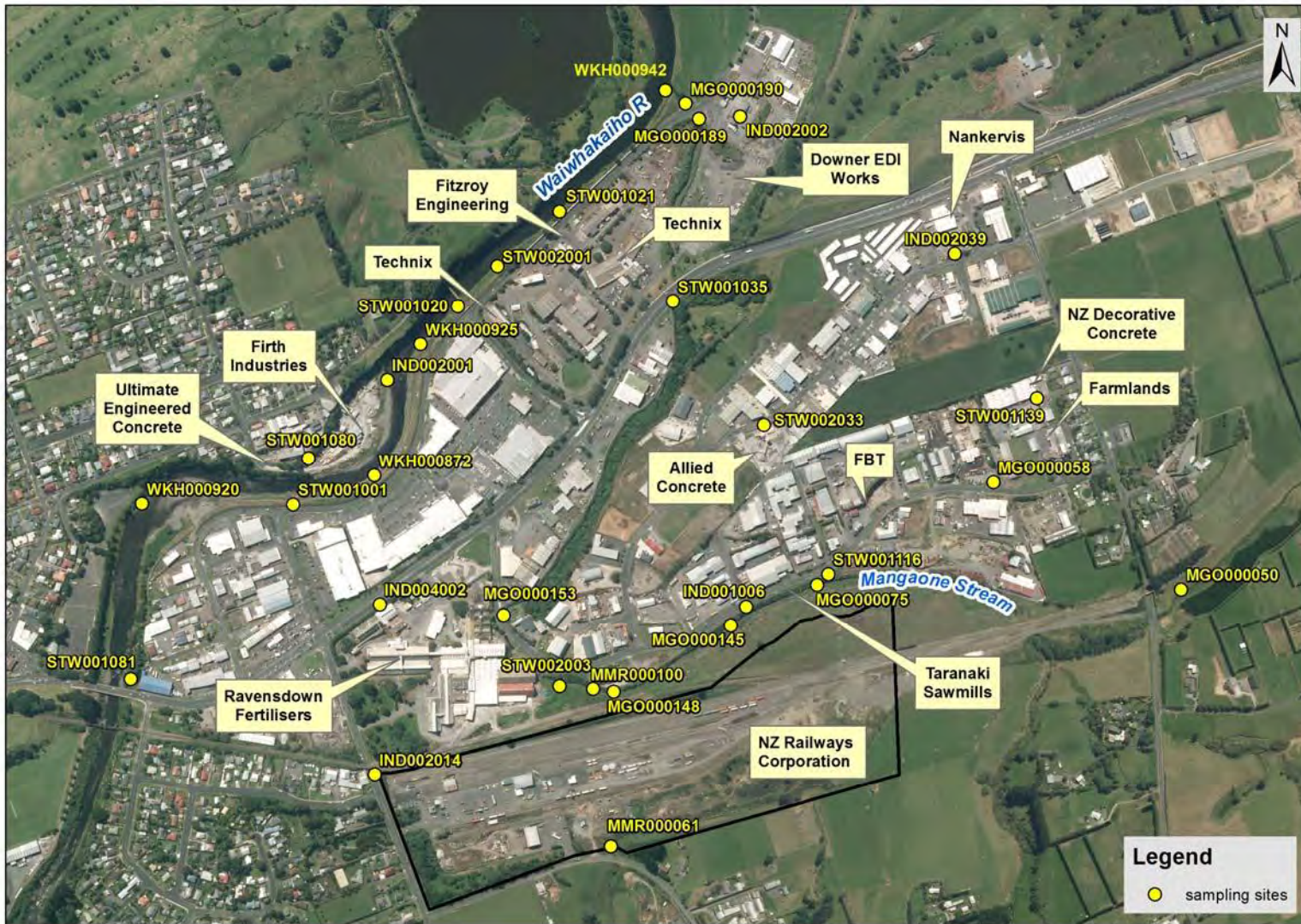
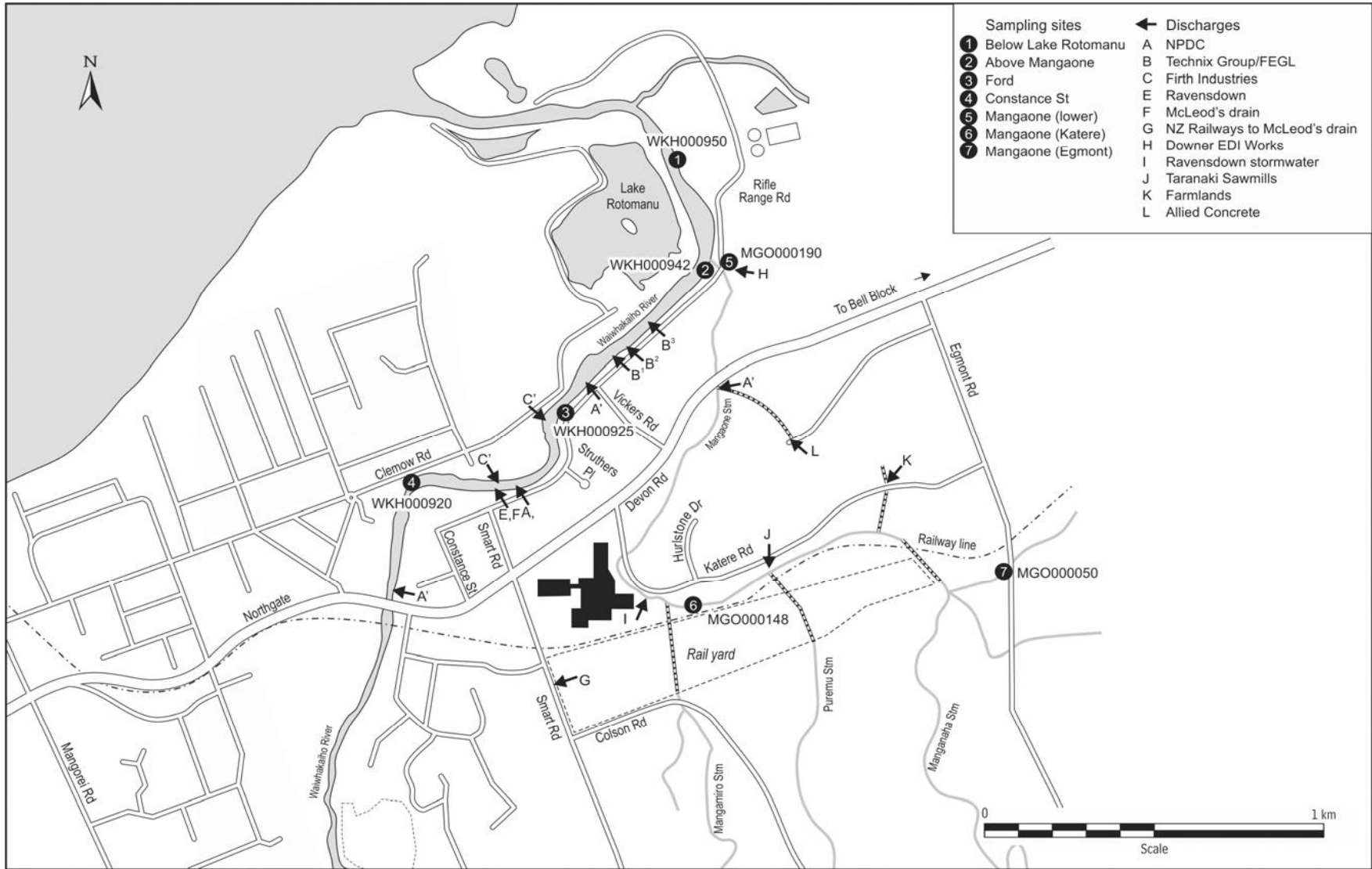
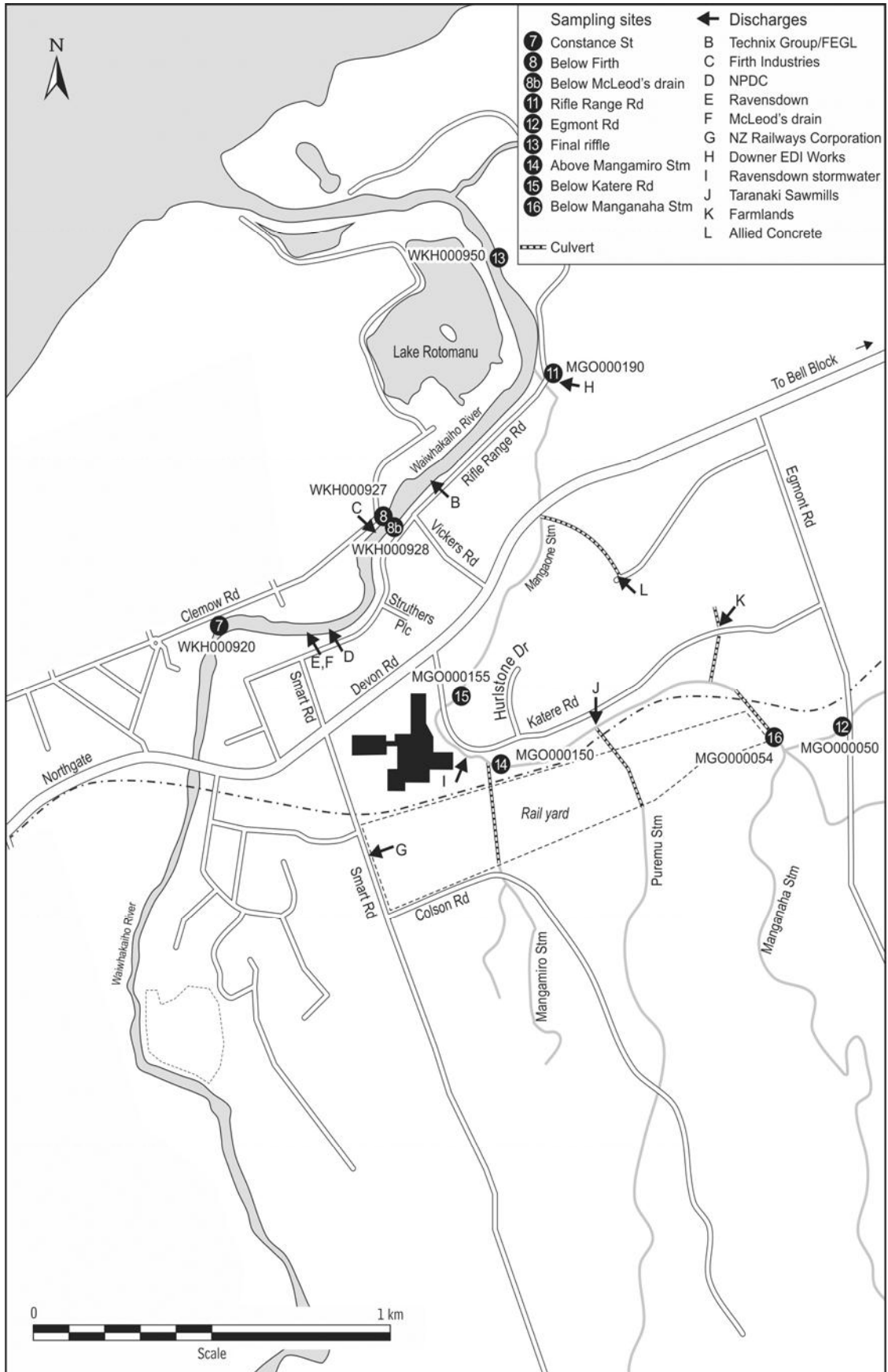


Figure 1 Lower Waiwhakaiho River and Mangaone Stream consent holders and chemical sampling



**Figure 2** Lower Waiwhakaiho River and Mangaone Stream discharges



**Figure 3** Lower Waiwhakaiho River and Mangaone Stream biological monitoring sites

## **1.3 Monitoring programme**

### **1.3.1 Introduction**

Section 35 of the RMA sets out obligations upon the Council to gather information, monitor, and conduct research on the exercise of resource consents, and the effects arising, within the Taranaki region and report upon these.

The Council may therefore make and record measurements of physical and chemical parameters, take samples for analysis, carry out surveys and inspections, conduct investigations, and seek information from consent holders.

The monitoring programme in the catchment consisted of five primary components. During the 2014-2015 monitoring period inspections of industrial sites, wet weather sampling and analysis of discharge and receiving waters, dry weather sampling and analysis of groundwaters and receiving waters, sediment sampling and macroinvertebrate surveys were undertaken (as outlined in the monitoring programme).

### **1.3.2 Programme liaison and management**

There is generally a significant investment of time and resources by the Taranaki Regional Council in:

- ongoing liaison with resource consent holders over consent conditions and their interpretation and application;
- in discussion over monitoring requirements;
- preparation for any reviews;
- renewals;
- new consents;
- advice on the Council's environmental management strategies and content of regional plans and;
- consultation on associated matters.

### **1.3.3 Site inspections**

Each of the consent holders' properties was scheduled for inspection four times per year during the period under review to assess compliance with any relevant consent conditions, and the potential for unauthorised discharge. With regard to consents for discharge to water, the main points of interest were plant processes with potential or actual discharges to receiving watercourses, including contaminated stormwater and process wastewaters.

Activities on the site are discussed with respect to general housekeeping, effects on stormwater quality and wastewater disposal. Water and waste treatment systems and areas where chemicals or products are stored or transferred are given particular attention. Sources of data being collected by the consent holder were identified and accessed, so that performance in respect of operation, internal monitoring, and supervision could be reviewed by the Council. The neighbourhood was also surveyed for environmental effects.

The frequency of inspection varied depending on the type of activity at the site, the outcome of previous inspections, and the stage of any investigation of unlicensed discharges of contaminants. Inspection frequency is approximately quarterly, however additional inspections may be carried out where necessary.

### **1.3.4 Chemical sampling**

The Council undertook sampling of both the discharges from the site and the water quality upstream and downstream of the discharge point and mixing zone.

The number and location of sites sampled, the frequency and conditions of sampling, and the range of water quality parameters determined have changed since this combined monitoring programme commenced in 1988. This evolution has occurred as knowledge of the characteristics of the discharges and waters that receive them has been gained, and as the number and composition of licensed discharges has varied.

Routine chemical sampling is now conducted on a biannual basis under wet weather conditions and groundwater monitoring is conducted on a biannual basis in dry weather. In the monitoring period under review, Council monitored 16 discharge points, 17 receiving water sites and 8 groundwater bores, and analysed the samples for a wide range of parameters depending upon the types of activities being conducted at a particular site and/or the sampling site location.

#### **1.3.4.1 Surface water surveys**

The discharge and receiving water chemical sampling sites are shown in Figure 1. As there are no samples taken downstream of the confluence of the Mangaone Stream and Waiwhakaiho River, the surface water surveys of these two water bodies, and their discharges, may sometimes be carried out separately.

Wet weather sampling was carried out on 10 December 2014 and 23 March, 2015 and 11 June 2015. The timing of sampling is dependent on rainfall, in terms of both incidence and intensity. Too little rain and there is insufficient run-off to be sampled. Too much rain and the river rises above some of the stormwater discharge points, preventing sampling. The results of the discharge monitoring are discussed in the relevant section based on the consent holder responsible for that discharge, and the receiving water results are discussed in Section 16. The results of the full wet weather monitoring conducted during the 2014-2015 period are included in Appendix II.

#### **1.3.4.2 Groundwater surveys**

Groundwater sampling in the vicinity of the old Bewley Road landfill and the Ravensdown Fertiliser Limited site took place on 16 January and 19 May 2015. Groundwater sampling is conducted independently of the wet weather surface water sampling. A discharge drain and three receiving water sites are sampled in conjunction with the Bewley Road groundwater monitoring, and two receiving water sites are sampled in conjunction with the Ravensdown groundwater monitoring. The location of the sites sampled during the groundwater surveys are shown in Figure 4.



Where possible, a summary of previous monitoring data for a particular site is provided for comparative purposes. Unless specifically stated all metals results are from acid soluble analysis.

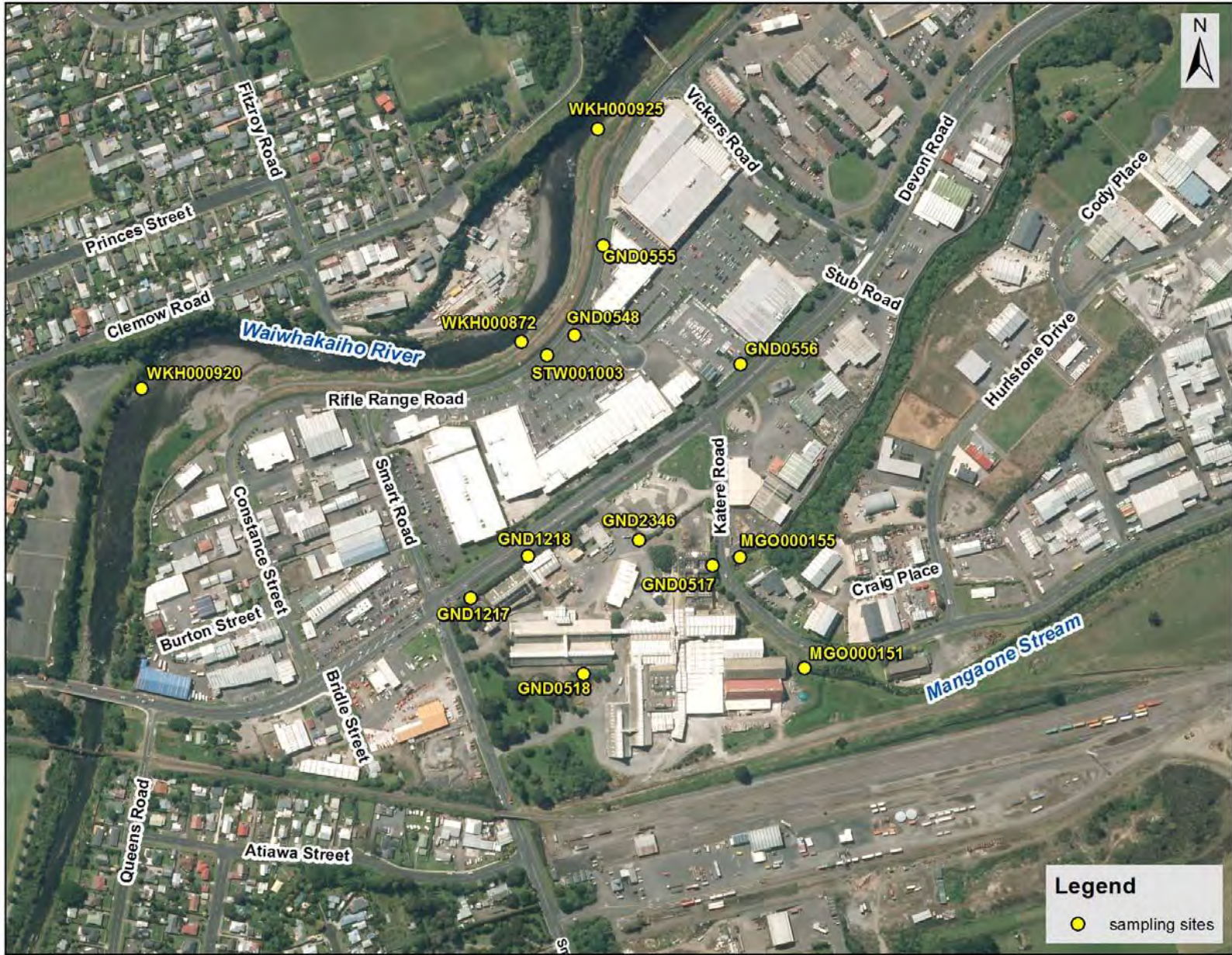


Figure 4 Location of groundwater monitoring bores and associated sampling sites

#### **1.3.4.3 Streambed sediment sampling**

Dry weather sampling of the Mangaone Stream sediments is scheduled to be carried out every other year and will next be undertaken in the 2016-2017 monitoring period. This focuses on the contaminants that may be present in the past and present discharges from the Taranaki Sawmills site.

#### **1.3.5 Biomonitoring surveys**

Biological surveys are used to determine the impacts that discharges may cause over a period of time, as distinct from chemical surveys which give detailed information upon the constituents of a discharge at the time of sampling but cannot give information upon previous discharge characteristics. Biological surveys also directly indicate any significant adverse effects of discharges upon in-stream flora and fauna, so that cause-effect relationships do not have to be established as for critical levels of individual chemical parameters, although variation in habitat must also be taken into consideration.

##### **1.3.5.1 Macroinvertebrate surveys**

Samples of streambed macroinvertebrates and algae are collected from three sampling sites in the lower Waiwhakaiho River and five sites in the Mangaone Stream on a biannual basis. During the 2014-2015 period, these surveys were conducted on 16 October 2014 and 12 and 13 February 2015. The locations of the biomonitoring sites are shown in Figure 3. A summary of the findings is discussed in section 16.2 and copies of the full reports are included in Appendix III.

##### **1.3.5.2 Fish survey**

Fish surveys in the Waiwhakaiho catchment historically surveyed only two sites in the Mangaone Stream. In the 2004-2005 fish survey report it was proposed that future surveys incorporate more sites in an attempt to compare sites with similar habitats, and to ensure that discharges to the Mangaone Stream are not presenting a barrier to upstream migration. This more comprehensive survey was scheduled to be carried out every three years, the first of which was carried out in the 2009-2010 year.

A further recommendation was subsequently made to also survey two sites in the Waiwhakaiho River.

The next fish survey is scheduled to be undertaken in the 2015-2016 monitoring year.





Contaminants that may enter the wastewater treatment system include solids and detergents from bowl washing, and cement products and additives used in AML's manufacturing process.

The use of settling bins and six settling ponds in series significantly reduces the suspended solids concentration of the discharge. The small amounts of additives in the bowl wash water are likely to bind to suspended sediment in the ponds, the majority of which will settle out during the treatment process. Concentrations of any additives remaining in the discharge will be further reduced by dilution with stormwater from the surrounding area prior to entering the Mangaone Stream.

Storage areas for the concrete additives are bunded with drainage to the wastewater treatment system

During the 2000-2001 monitoring period, it was found that untreated stormwater was exiting the site via a piped drain in the concreted car park area. This flow was channelled to the road where it entered the NPDC stormwater system discharging to the Mangaone Stream. This discharge was not covered by the wastewater discharge consent and so a cattle grid type arrangement was installed on site during the 2002-2003 year that drains to a soak hole to prevent this discharge from occurring.

## **2.2 Water discharge permit**

AML holds water discharge permit **4539-2** to cover the discharge stormwater and treated wastewater from truck washing at a concrete batching plant into the Mangaone Stream in the Waiwhakaiho catchment. This permit was issued by the Council on 30 July 2008 under Section 87(e) of the RMA. It is due to expire on 1 June 2026.

It has 10 special conditions which include limits on suspended solids and oil/grease in the discharges, limits on effects on receiving waters, limits the catchment area, require best practice, and require stormwater and contingency planning.

The permit is attached to this report in Appendix I.

## **2.3 Results**

### **2.3.1 Inspections**

AML's site was inspected on 12 September 2014, 2 December 2014, 10 March 2015, and 26 May 2015.

Inspections focussed on the cleanliness of the site, the driveway collection sump, soakage pits, treatment ponds, sand filters and fuel storage.

During the routine inspections no significant issues were noted and the site was found to compliant with consent conditions. However during a wet weather sampling it was found that the driveway sump was not functioning and that non-compliant discharges were occurring into NPDC's network. This is discussed further in sections 2.3.2 and 3.3.3.

### 2.3.2 Results of discharge monitoring

Since 1996, the discharge from the concrete plant has been monitored at a manhole outside the plant, before it enters the stormwater drain along Hurlstone Drive. It is also monitored at a second point, together with contributions from the surrounding industrial area, at the point where the combined NPDC reticulated stormwater drain discharges into the Mangaone Stream (site STW001035).

Results for the 2014-2015 monitoring of the stormwater/wastewater, where it leaves the concrete plant at site STW002033 are presented in Table 2. A summary of all monitoring results from site STW002033 is also included for comparative purposes.

The results for the stormwater drain at the Mangaone Stream (TRC site code STW001035) are given in Section 9.3.1.2, Table 28), whilst the results of the receiving water (i.e. for the purposes of monitoring compliance with consent conditions) are given in Section 16.1.2.

**Table 2** Chemical monitoring results for AML's discharge at site STW002033

Parameter:	Conductivity @ 20°C	Oil and Grease	pH	Suspended solids	Temperature	Turbidity
Unit:	mS/m@20C	g/m <sup>3</sup>	pH	g/m <sup>3</sup>	Deg.C	NTU
Minimum	6.4	0.5	8.2	2	8	0.68
Maximum	2740	38	12.8	1000	21.8	520
Median	155.5	0.2	11.9	77	13.6	69
Number	36	28	37	35	36	19
Consent limits	-	15	-	100	-	-
12 Sep 2014	32.6	<0.5	8.2	<2	13.6	1.4
10 Dec 2014	33.6	b	11.1	21	17.4	21
23 Mar 2015	34.6	b	9.8	<2	18.1	0.68

**Key:** Results shown in bold within a table indicates that a consent limit for a particular parameter has been exceeded

a flow too low to sample

b no visible hydrocarbon sheen and no odour

The concentration of suspended solids was found to be in compliance with the consent conditions at site STW002033. However during sampling on 10 December 2014 it was noted that the driveway collection sump had overflowed and this was causing a discharge to flow down the drive way and into NPDC's network. This discharge was found to have a concentration of 2000 g/m<sup>3</sup> suspended solids which was in breach of consent conditions. As a result an incident was raised and an infringement fine was issued to AML. Further details of this are given in section 2.3.3.

All pH results for the year, whilst elevated (as expected) were below the median value for the site. The influence of alkaline discharges from the concrete plant was observed at the discharge point (site STW001035) on 10 December 2014.

However, no significant changes in pH were observed in the receiving water between site MGO000153 (upstream) and MGO000190 (downstream) during the period under review. The consent condition limiting the effect the discharge is permitted to have on the receiving water pH was therefore complied with.

The oil and grease limit of 15 g/m<sup>3</sup> imposed by the Company's consent was complied with on all monitoring occasions.

### **2.3.3 Investigations, interventions, and incidents**

In the 2014-2015 period, the Council was required to undertake significant additional investigations and interventions, or record incidents, in association with AML's conditions in resource consents or provisions in Regional Plans.

#### **10 December 2014**

During routine monitoring it was found that stormwater discharges were high in suspended solids at AML's New Plymouth site. Investigation of the site found that the cause of the high suspended solids was that the entrance way sump was full and discharging into the road way stormwater system. The occupier undertook to clean out the sump and upon re-inspection found that this had been done. An infringement notice was issued as a result of the non-compliance.

## **2.4 Discussion**

### **2.4.1 Evaluation of plant performance**

At inspection the fuel and chemical storage at the AML Limited site was well managed during the period under review.

Recently the AML has put in place a number of treatment systems aimed at reducing the suspended solids concentration in the stormwater exiting the site. AML has also recently undertaken contouring and resurfacing of parts of the site to divert more stormwater to the sand filter.

Although these measures appear to be effective in relation to managing the stormwater that used to exit the site through the driveway, effective on-going maintenance of the system is necessary. During the period under review stormwater was found to be discharging down the driveway as result of the driveway sump not being cleaned regularly enough. This resulted in an incident being logged and an infringement notice being issued.

In relation to the consented stormwater/wastewater discharge via the NPDC reticulated stormwater network, the treatment systems appeared to be effective during this period.

### **2.4.2 Environmental effects of exercise of consent**

Despite the suspended solids consent exceedance, due to the conditions prevailing at the time of sampling, during the period under review there were no adverse effects observed in the Mangaone Stream as a result of discharges from the AML Limited site.

Alkaline discharges from this site have the potential to influence not only the pH of the New Plymouth District Council stormwater discharge at the State Highway 3 bridge and downstream receiving water, but also the unionised ammonia concentration. Unionised ammonia is potentially in the receiving environment at

relatively low concentrations (less than 0.025 g/m<sup>3</sup>) and the equilibrium that exists between ammoniacal nitrogen and unionised ammonia is affected by pH. In alkaline conditions the equilibrium is shifted towards the more toxic unionised ammonia.

Imposing a pH control limit on the receiving water as opposed to the discharge still appears to be an appropriate control mechanism. Monitoring results during the period under review continued to show that, whilst the pH of the discharge is quite alkaline, this 'effect' appears to be assimilated within the NPDC reticulated stormwater network and/or the receiving water.

### 2.4.3 Evaluation of performance

A tabular summary of the AML's compliance record for the period under review is set out in Table 3.

**Table 3** Summary of performance for consent 4539-2,

<b>Purpose: To discharge of stormwater and treated concrete truck washings</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
1. Adoption of best practicable option to minimise effects	Observation and discussion at inspection	No – stormwater system not maintained
2. Limit on stormwater catchment area	Observation and discussion at inspection	Yes
3. Bunding of above ground hazardous substance storage	Observation at inspection	Yes
4. Discharge cannot cause specified general adverse effects beyond mixing zone	Sampling and discharge point inspections	Yes
5. Concentration limits upon potential contaminants in discharge	Chemical sampling	No - suspended solids limit exceeded
6. pH limits on receiving water as a result of discharge	Chemical sampling	Yes
7. Maintenance of and adherence to contingency plan	Review of documentation received	Yes
8. Preparation and maintenance of operation and management plan. Initially due January 2009	Review of documentation received.	No – stormwater system not maintained as required in plan

<b>Purpose: To discharge of stormwater and treated concrete truck washings</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
9. Written notification of changes	Observation and discussion at inspection found no changes requiring notification	N/A
10. Optional review provision re environmental effects	Next opportunity for review June 2014, unless Council notified of changes.	N/A
<b>Overall assessment of consent compliance and environmental performance in respect of this consent</b>		<b>Improvement required</b>
<b>Overall assessment of administrative performance in respect of this consent</b>		<b>High</b>

N/A = not applicable

During the period under review, AML Limited demonstrated a high level of administrative performance however an improvement was required in environmental performance and compliance, as defined in Section 1.1.5. During the period under review as a result of the driveway sump not being kept clean, an illegal discharge occurred and an infringement notice was issued.

#### **2.4.4 Recommendation from the 2012-2014 Biennial Report**

In the 2012-2014 Biennial Report, it was recommended:

THAT monitoring of discharges from AML in the 2014-2015 year continues at the same level as in 2012-2014.

This recommendation was carried out in full.

#### **2.4.5 Alterations to monitoring programmes for 2015-2016**

In designing and implementing the monitoring programmes for water discharges in the region, the Council has taken into account the extent of information made available by previous authorities, its relevance under the RMA, the obligations of the Act in terms of monitoring discharges and effects, and subsequently reporting to the regional community. The Council also takes into account the scope of assessments required at the time of renewal of permits, and the need to maintain a sound understanding of industrial processes within Taranaki discharging to the environment.

It is proposed that for 2015-2016, the programme remains unchanged. A recommendation to this effect is attached to this report.

### **2.5 Recommendations**

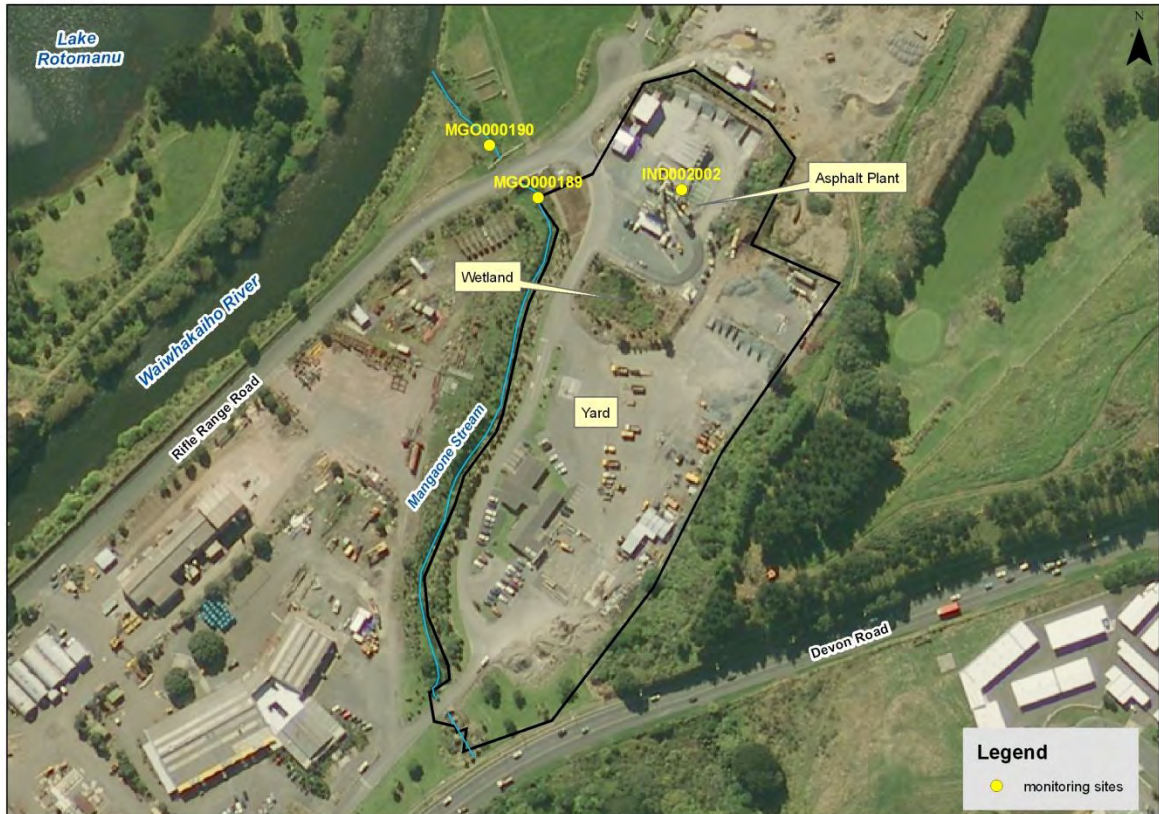
THAT monitoring of discharges from AML Limited in the 2015-2016 year continues at the same level as in 2014-2015.



### 3. Downer EDI Works Limited

#### 3.1 Process description

Downer EDI Works Limited (Downer) operates an asphalt manufacturing plant at a site off Rifle Range Road. A depot for maintenance, parking and storage of equipment and materials used in road-making is also on the site.



**Figure 6** Downer's site and sampling point locations

In the manufacturing process, aggregate metal is dried by gas heating and is mixed with heated bitumen to form hot-mix bitumen. Diesel oil and/or kerosene may be added to adjust the consistency of the mix. The product is loaded onto trucks for transport. Dust and gases generated from the process are treated in a wet scrubber. Scrubber effluent is treated in four settling ponds then reused.

The asphalt plant stormwater catchment contains raw materials, comprising various grades of aggregate, static bitumen tanks, banded emulsion tanks, and stores housing bitumen additives and plant maintenance materials, such as chain oil.

The depot includes an administration building, vehicle and equipment maintenance workshops, aggregate stores, and an area for parking motor vehicles and equipment. Stormwater from this area drains via a three-stage oil separator to a small constructed wetland that also receives piped water from springs. There is also a truck wash facility in the depot area, the drainage from which is currently diverted to sewer at all times by means of a locked diversion valve.

Drainage from the asphalt plant settling ponds (which have a baffled outlet to contain floatables) and the depot both discharge via the small wetland, to the Mangaone Stream immediately above the Rifle Range Road bridge.

## **3.2 Water discharge permit**

Downer operates an asphalt drum plant that is situated on the right bank of the Mangaone Stream near its confluence with the Waiwhakaiho River, on Rifle Range Road. Ownership of the plant has changed several times, with Works Civil Construction previously taking over the site from Technic Industries Limited in November 1997.

Discharge permit **3917-2** was granted on 1 May 1996 to discharge up to 175 litres per second of stormwater and wash down water from the site to the Mangaone Stream, with 'standardised' conditions, for a period until 1 June 2014. The consent was transferred to Works Civil Construction on 26 May 1999. The Company changed its name to Works Infrastructure Limited on 20 December 1999, who rebranded to Downer EDI Works Limited during the 2008-2009 year. The consent was transferred on 23 March 2009.

An application to renew this consent was received on 30 August 2013, and therefore under Section 124 of the RMA, the Company can continue to operate under the conditions of the expired consent until a decision is made on the renewal application.

The permit is attached to this report in Appendix I.

Downer now holds consent **3917-3** to discharge treated stormwater from an asphalt manufacturing plant onto land and into the Mangaone Stream. This was granted by the Council under section 88 of the RMA on 20 June 2015. It is due to expire on 1 June 2032.

It has 8 special conditions which set out discharge limits, limit effects on receiving waters, limit the size of catchment area, require best practice be adopted, and require stormwater and contingency planning.

The permit is attached to this report in Appendix I.

## **3.3 Results**

### **3.3.1 Inspections**

During the period under review Downer's Rifle Range Rd site was inspected on four occasions. These were on 3 September 2014, 11 December 2014, 10 March 2015 and 28 May 2015.

Site inspections focussed on treatment systems, site housekeeping, visual quality of discharges, dust and odour, and the receiving waters.

During the period under review no significant issues were noted and it was found that the site was well managed. It was also noted that treatment and mitigation measures at the site were being maintained and/or improved.



No dust or odour issues were noted during the period under review.

### 3.3.2 Results of discharge monitoring

Chemical monitoring of discharges from the site of Downer EDI Works Limited takes place at two points. The effluent to the wetland from the settling ponds at the asphalt plant is sampled at the ponds' outlet (site code IND002002). The combined flow of stormwater from the depot, which is treated in the oil separator and constructed wetland, and the pond effluent is sampled at the outlet to the Mangaone Stream (TRC site code MGO000189).

The discharge from the settling ponds is often highly turbid, however further "treatment" occurs in the constructed wetland. The discharge to the wetland is usually a grey colour, and contains a high concentration of fine suspended solids.

The results of chemical monitoring of the pond effluent and combined flows for the period under review are given in Table 4 and

Table 5. A summary of all results for each site is also given in the tables.

**Table 4** Chemical monitoring results for Downer's air scrubber settling ponds (site IND002002)

Parameter	Conductivity @ 20°C	Oil and Grease	pH	Suspended solids	Temperature	Turbidity
Unit	mS/m@20C	g/m <sup>3</sup>	pH	g/m <sup>3</sup>	Deg.C	NTU
Minimum	5.2	0.5	5.9	3	10.5	3.7
Maximum	89.5	29	9.6	600	37.4	290
Median	39.6	0.2	7.6	86	20.3	19
Number	29	24	29	29	28	15
10 Dec 2014	58.0	b	7.8	24	23.1	19
23 Mar 2015	42.2	<0.5	7.4	5	20.4	4.7

**Key:** Results shown in bold within a table indicates that a consent limit for a particular parameter has been exceeded  
b parameter not determined, no visible hydrocarbon sheen and no odour

The suspended solids and oil/grease concentrations were found to be well below the median for the site. Conductivity, whilst above the median for the site, was below the maximum value recorded.

The pH result obtained for the samples collected during the period under review were acceptable, and similar to the median calculated from previous results.

**Table 5** Chemical monitoring results for discharge from Downer' final discharge (site MGO000189)

Parameter	Conductivity @ 20°C	HCVIS	pH	Suspended solids	Temperature	Turbidity
Unit	mS/m@20C		pH	g/m <sup>3</sup>	Deg.C	NTU
Minimum	6.2	-	6.5	0.5	10.6	2.6
Maximum	32.2	-	8.4	370	19.2	380
Median	19	-	6.8	18	15.5	43
Number	48	-	48	48	44	21
10 Dec 2014	15.6	Pass	6.8	120*	17.4	62
23 Mar 2015	10.3	Pass	7.5	79	17.2	66

**Key:** HCVIS Visual/odour assessment of a sample for the presence of hydrocarbons or greases  
\* Sample may have been affected by sediments disturbed during sampling.

There was one elevated suspended solids, however review of the sampling notes indicates the possibility of the sample being affected by sediment disturbed during sampling. These results are assessed under consent 3917-2 which had no limits on contaminants in the discharge.

During the period under review the pH levels in the discharges were in acceptable ranges and hydrocarbons were not detected either visually or by odour.

Receiving water results indicate no adverse effects were occurring in the Mangaone Stream during discharges (see section **Error! Reference source not found.**).

### 3.3.3 Investigations, interventions, and incidents

In the 2014-2015 period, the Council was not required to undertake significant additional investigations and interventions, or record incidents, in association with conditions in resource consents or provisions in Regional Plans at Downer's Rifle Range Road site.

## 3.4 Discussion

### 3.4.1 Discussion of site performance

Housekeeping at the site was found to be good over the monitoring period.

The site was well managed during the period under review and the discharge from the site complied with the conditions of consent on all monitoring occasions.

Stormwater management and contingency plans are up to date for this site.

### 3.4.2 Environmental effects of exercise of consent

No adverse effects were noted on the water quality in the Mangaone Stream as a result of the exercise of Company's water permit.

### 3.4.3 Evaluation of performance

A tabular summary of the consent holder's compliance record for the period under review is set out in Table 6 and Table 7.

**Table 6** Summary of performance consent 3917-2 (to 20 May 2015)

<i>Purpose: To discharge up to 175 litres/second of stormwater and wash down water from an asphalt manufacturing plant into the Mangaone Stream in the Waiwhakaiho Catchment</i>		
Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Concentration limits upon potential contaminants in discharge	Chemical sampling	Yes
2. Discharge cannot cause specified adverse effects beyond mixing zone	Visual assessment at inspection and receiving water sampling and biomonitoring	Yes
3. Preparation of contingency plan	Latest version October 2010	Yes

<b>Purpose: To discharge up to 175 litres/second of stormwater and wash down water from an asphalt manufacturing plant into the Mangaone Stream in the Waiwhakaiho Catchment</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
4. Provision for review of consent	Not scheduled for consideration for remainder of consent duration. Consent due to expire 1 June 2014	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		<b>High</b>
Overall assessment of administrative performance in respect of this consent		<b>High</b>

N/A = not applicable

**Table 7** Summary of performance consent 3917-2 (from 20 May 2015)

<b>Purpose: To discharge up to 175 litres/second of stormwater and wash down water from an asphalt manufacturing plant into the Mangaone Stream in the Waiwhakaiho Catchment</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
1. Adopt best practice	Inspection	Yes
2. Limit on catchment size	Inspection	Yes
3. Limits on contaminants in discharge	Not assessed during the period this consent was active	N/A
4. Discharge cannot cause specified adverse effects beyond mixing zone	Visual assessment at inspection and receiving water sampling and biomonitoring	Yes
5. Maintain and adhere to a stormwater management plan	Inspection and programme supervision	Yes
6. Maintain and adhere to a spill contingency plan	Inspection and programme supervision	Yes
7. Notify the Council of changes at site	No notification received	N/A
8. Provision for review of consent	No review option this period	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		<b>High</b>
Overall assessment of administrative performance in respect of this consent		<b>High</b>

During the period under review, Downer EDI Works Limited demonstrated a high level of environmental and high level of administrative performance and compliance with the resource consents in relation to its site at Rifle Range Road, as defined in Section 1.1.5.

#### **3.4.4 Recommendation from the 2012-2014 Biennial Report**

In the 2012-2014 Biennial Report, it was recommended:

THAT monitoring of discharges from Downer EDI Works Limited in the 2014-2015 year continues at the same level as in 2012-2014.

This recommendation was implemented during the year under review.

### **3.4.5 Alterations to monitoring programmes for 2015-2016**

In designing and implementing the monitoring programmes for water discharges in the region, the Council has taken into account the extent of information made available by previous authorities, its relevance under the RMA, the obligations of the Act in terms of monitoring discharges and effects, and subsequently reporting to the regional community. The Council also takes into account the scope of assessments required at the time of renewal of permits, and the need to maintain a sound understanding of industrial processes within Taranaki discharging to the environment.

It is proposed that for 2015-2016, the programme remains unchanged. A recommendation to this effect is attached to this report.

## **3.5 Recommendation**

THAT monitoring of discharges from Downer EDI Works Limited in the 2015-2016 year continues at the same level as in 2014-2015.

## 4. Farmlands Co-operative Society Limited

### 4.1 Process description

The New Plymouth Feed Mill now owned by Farmlands Co-operative Society Limited (Farmlands) had been in operation on this 1.03 ha site at the eastern end of Katere Road, New Plymouth from 1966 to 2011. Raw grain and supplements were processed into feed for central North Island divisions of PCL Industries Limited and then Viterra (NZ) Limited.



Figure 7 Viterra (NZ) Limited site and sampling point locations

### 4.2 Water discharge permit

During the period under review, Farmlands held consent 4548 for activities relating to a stock feed mill at the eastern end of Katere Road. Consent 4548-2 was granted by the Council on 11 January 2002 under Section 88 of RMA, and it expires on 1 June 2020. The consent was transferred from Viterra (NZ) Limited to Farmlands on 10 December 2013.

The consent places conditions on pH range (6-9), and maximum concentrations of oil and grease (15 g/m<sup>3</sup>), biochemical oxygen demand (25 g/m<sup>3</sup>), and suspended solids (100 g/m<sup>3</sup>) in the discharge effluent. There are also conditions that must be met relating to the receiving water in the Mangaone Stream. A contingency plan in case of accidental spillage is required. It is also a requirement of the consent that the Company prepares, maintains and adheres to an operation and management plan.

## 4.3 Results

### 4.3.1 Inspections

The site was inspected on four occasions on 14 August 2014, 20 November 2014, 11 February 2015 and 20 March 2015. The inspections focussed on housekeeping, evidence of spills, the state of the onsite drains, and dust/odour.

During the period under review no issues were noted during the inspections and the site was found to be in compliance with consent conditions.

Dust and odour were not found to be an issue at the site.

### 4.3.2 Results of discharge monitoring

There was a discharge occurring from the site on both sampling occasions undertaken during the year under review. The results are presented in Table 8, along with a summary of all data from the sampling site (MGO00058).

**Table 8** Chemical monitoring results for Farmlands -site MGO000058

Parameter	Ammoniacal nitrogen	BOD	Conductivity	Oil and Grease	pH	Suspended solids	Temp	Turbidity
Unit	g/m <sup>3</sup> N	g/m <sup>3</sup>	mS/m@20C	g/m <sup>3</sup>	pH	g/m <sup>3</sup>	Deg.C	NTU
Minimum	0.019	1.5	2.5	0.5	5.9	2	10.1	2.7
Maximum	11.4	690	50.3	13	7.4	530	20.5	96
Median	0.221	11	11	0.5	6.6	32	16.1	29
Number	43	41	46	35	46	44	45	19
10 Dec 2014	0.019	7.6	2.5	b	7.4	85	17.2	15
23 Mar 2015	0.210	6.4	6.8	<0.5	6.7	19	18.0	25
<i>Consent limit</i>	-	25	-	15	-	100	-	-

**Key:** b parameter not determined, no visible hydrocarbon sheen and no odour

BOD biochemical oxygen demand

There were measurable increases observed in the filtered carbonaceous BOD downstream of the Farmlands discharge point at the time of both sampling surveys and on 10 December 2014 the filtered carbonaceous BOD of the stream did slightly exceed the 2 g/m<sup>3</sup> in-stream limit set out in consent conditions (by 0.5 g/m<sup>3</sup>). Due to the fact that there are several other contributing discharges between the receiving water sites and the small size of the increase no further action was taken on this occasion. Subsequent receiving water results undertaken during the monitoring period returned compliant results.

BOD is limited within the consent conditions primarily because of the potential for growth of sewage fungus in the Mangaone Stream, and to a lesser extent because of the potential for de-oxygenation of the stream as the oxygen demand of the contaminants is exerted in the receiving environment. Sewage fungus was not observed in the receiving water during the period under review

## 4.4 Investigations, interventions, and incidents

In the 2014-2015 period, the Council was not required to undertake significant additional investigations and interventions, or record incidents, in association with Farmland's conditions in resource consents or provisions in Regional Plans.

## 4.5 Discussion

### 4.5.1 Discussion of site performance

Housekeeping at the site over the monitoring period was good.

Routine sampling of the stormwater found that consent limits on component concentrations were complied with during the period under review.

In the past, whilst the mill was operating, there had on occasion been a sufficient source of nutrients to cause a growth of sewage fungus in the tributary and later in the stormwater pipe from the site. During the period under review, no sewage fungus was noted as being present in the stormwater drains at the time of the sampling runs, or at inspection.

### 4.5.2 Environmental effects of exercise of consent

Farmland's consent requires that the discharge from the feedmill does not result in the unionised ammonia being increased above 0.025g/m<sup>3</sup> or the filtered carbonaceous BOD of the stream being raised above 2 g/m<sup>3</sup>. The stream is monitored upstream at Egmont Road (site MGO000050) and approximately 200m downstream (site MGO000075). The New Plymouth District Council mid Katere Road drain also discharges between these two sites. The results of the receiving environment monitoring (Mangaone Stream) are given in, section 16.1.2.

During all surveys, the unionised ammonia was well below 0.025 g/m<sup>3</sup> at the time of sampling and there was only a small change between the upstream and downstream monitoring sites.

There were measurable increases observed in the filtered carbonaceous BOD downstream of the Farmlands discharge point found on both sampling surveys, the filtered carbonaceous BOD of the stream did exceed the 2 g/m<sup>3</sup> in-stream limit set out in consent conditions (by 0.5 g/m<sup>3</sup>) on 10 December 2014. Due to the small size of the exceedance, and the fact the increase could not be wholly ascribed to Farmlands, no action was taken in this instance, and the second sample taking during the period under review returned compliant results.

During the period under review there were no observations reported relating to sewage fungus in the stormwater pipe or the Mangaone Stream. The relevant biomonitoring reports are appended to this report and discussed in section 16.2.1.

### 4.5.3 Evaluation of performance

A tabular summary of the consent holder's compliance record for the period under review is set out in Table 9.

**Table 9** Summary of performance for consent 4548-2

<b>Purpose: To discharge treated stormwater and minor quantities of wastewater into the Mangaone Stream</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
1. Consent to be exercised as per application information	Inspections	Yes
2. Council to be informed prior to changes at site affecting discharge	Mill remained non-operational	Yes
3. Stormwater system to be maintained to Council's satisfaction	Inspection	Yes
4. Concentration limits on potential contaminants in discharge	Discharge sampling	Yes
5. Discharge cannot cause specified adverse effects beyond mixing zone	Visual assessment at inspection and receiving water sampling and biomonitoring	Yes
6. Limit on filtered carbonaceous BOD in stream	Receiving water sampling	No
7. Limit on unionised ammonia in stream	Receiving water sampling	Yes
8. Prepare and maintain contingency plan	Review of documentation received.	Yes
9. Prepare and maintain operation and management plan	Review of documentation received.	Yes
10. Consent to be exercised in accordance with management plan	Inspection and discussion with consent holder	Yes
11. Provisions for review of management plan	No request for plan review during the 2014-2015 period	N/A
12. Provision for review of consent	No further opportunities for review	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		<b>Good</b>
Overall assessment of administrative performance in respect of this consent		<b>High</b>

N/A not applicable or not assessed

During the period under review, Farmlands Co-operative Society demonstrated a good level of environmental performance and high level of administrative performance and compliance with the resource consent in relation to its site on Katere Rd as defined in Section 1.1.5.



#### **4.5.5 Recommendation from the 2012-2014 Biennial Report**

In the 2012-2014 Biennial Report, it was recommended:

THAT monitoring of discharges from Farmlands Co-operative Society Limited in the 2014-2015 year continues at the same level as in 2012-2014.

This recommendation was implemented.

#### **4.5.6 Alterations to monitoring programmes for 2015-2016**

In designing and implementing the monitoring programmes for water discharges in the region, the Council has taken into account the extent of information made available by previous authorities, its relevance under the RMA the obligations of the Act in terms of monitoring discharges and their effects, and subsequently reporting to the regional community. The Council also takes into account the scope of assessments required at the time of renewal of permits, and the need to maintain a sound understanding of industrial processes within Taranaki discharging to the environment.

It is proposed that for 2015-2016 the programme remains unchanged. A recommendation to this effect is attached to this report.

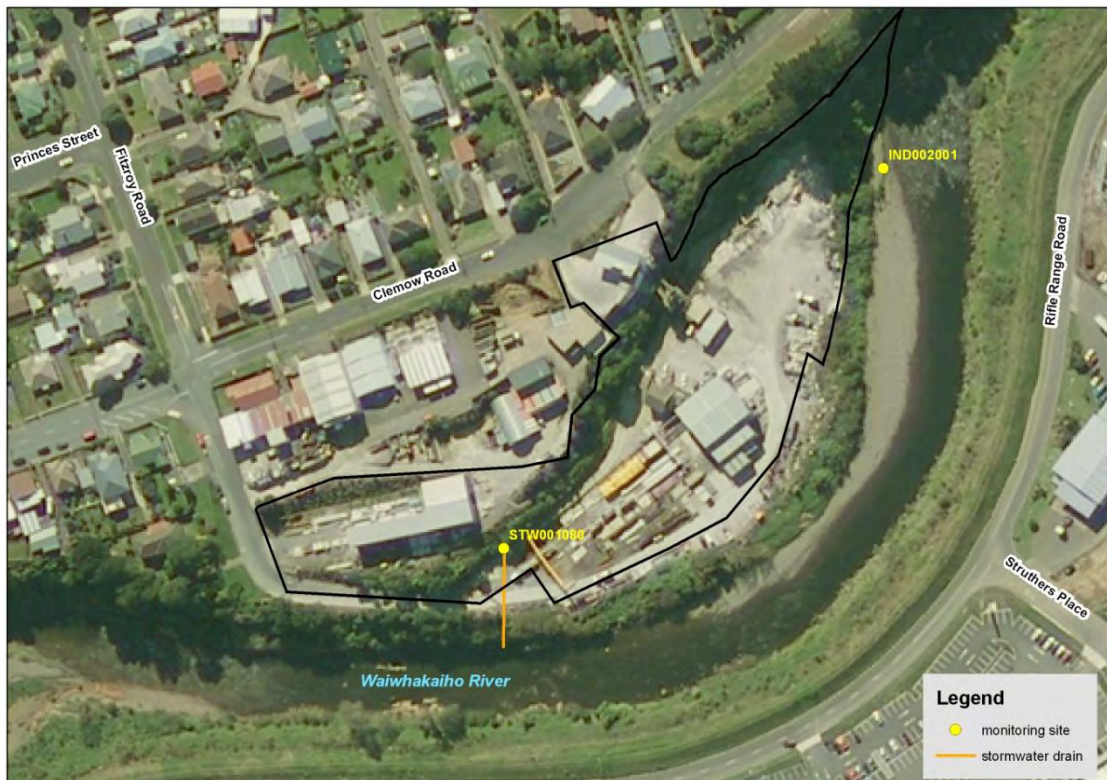
#### **4.6 Recommendation**

THAT monitoring of discharges from Farmlands Co-operative Society Limited in the 2015-2016 year continues at the same level as in 2014-2015.

## 5. Firth Industries Limited (Division of Fletcher Concrete and Infrastructure Limited)

### 5.1 Process description

Firth Industries Limited (Firth) operates a concrete batching plant on a 1.19 ha site off Clemow Road, on the true left bank of the Waiwhakaiho River. The plant is situated partly on the flood plain and partly above the escarpment formed by the river. A concrete precast factory operated by Ultimate Engineered Concrete Limited is also on the site. This includes a bedding plant, which operates from an area above the escarpment.



**Figure 8** Firth Industries site location and discharge points

Stormwater from the lower part of the site is treated in a four-pond settling system before being pumped to the Waiwhakaiho River via an old watercourse. Wastewater from the washing of plant and concrete delivery trucks is discharged to the settling system. Where possible, this is then recycled for reuse as wash water. Seepage from the escarpment also flows to the settling ponds. Under heavy or prolonged rainfall conditions, the settled washings are discharged to the Waiwhakaiho River with stormwater. There is a back-flow prevention valve on the discharge line to prevent the Waiwhakaiho River from flooding the site.

Stormwater from the upper part of the site, where the bedding plant is situated, discharges via two small settling pits to the Waiwhakaiho River at a separate point.

A range of chemicals used in the ready-mix and precast operations are held in the catchment of the main settling system. On the whole, they are either stored indoors or within bunded areas.

Off-specification and surplus concrete, and solids from the settling ponds are deposited along the riverbank. This forms part of the flood protection works for the site. Excess solids are removed from the site periodically.

## **5.2 Water discharge permit**

During the period under review Firth Industries Limited (Firth) held consent (0392-3) to discharge up to 10 litres per second of truck washing effluent and up to 200 litres per second of stormwater, for a period until 1 June 2014. This consent was granted by the Council was granted on 1 May 1996 and expired on 1 June 2014. An application to renew this consent was received on 27 January 2014, and therefore was exercised under Section 124 of the RMA allowing Firth to continue to operate under the conditions of the expired consent until a decision was made on the renewal. The renewed consent was granted on 21 July 2015.

There were seven special conditions appended to consent 0391-3, that were in force during the period under review. These include requirements that the discharge must not be allowed to alter the receiving water pH by more than 0.5 units, or cause it to exceed the range 6-9, limits on effluent composition (maximum oil and grease limit 15g/m<sup>3</sup> and suspended solids concentration 100 g/m<sup>3</sup>), effluent treatment, requirements to maintain a contingency plan and control the discharge rate, and provision for a review of conditions in June 2002 and 2008.

A copy of the permit is attached to this report in Appendix I.

## **5.3 Results**

### **5.3.1 Inspections**

Firth's site was inspected on four occasions during the period under review. Inspections focussed on general housekeeping, treatment systems, dust and odour, and discharge and receiving waters quality (by visual assessment).

During the inspections undertaken on 22 August 2014, 4 March 2015, and 25 May 2015 no significant issues were noted observed and it was noted in the May 2015 inspection that improvements in the handling and recycling waste water at the site were being implemented.

During the inspection undertaken on 14 November it was noted that the discharge was discoloured by an oxide colourant that was entering the Waiwhakaiho Stream. No effects beyond the mixing zone were noted; however, such contaminants are not expressly permitted by the consent. An incident was raised and this is discussed in Section 5.3.3.

### 5.3.2 Results of discharge monitoring

Effluent from Firth's site is monitored where it enters the Waiwhakaiho River below the main settling system. This site receives wastewater from the settling pond from the bedding plant, located above the escarpment to the south west of the main plant, and stormwater runoff from the adjacently property (which is not owned by Firth, but is within the area covered by their resource consent).

Consent conditions require that the discharges do not exceed 15 g/m<sup>3</sup> oil and grease or 100 g/m<sup>3</sup> suspended solids. Consent conditions also require that discharges do not cause a pH of below 6.0 or above 9.0 and/or an increase of pH of more than 0.5 in the Waiwhakaiho River.

The results for the stormwater drain at the Waiwhakaiho River (site IND002001) are given in Table 10. The results of the receiving water (i.e. for the purposes of monitoring compliance with consent conditions) are given in Section 16.

**Table 10** Chemical monitoring results for Firth -site IND002001

Parameter	Conductivity @ 20°C	Oil And Grease	pH	Suspended solids	Temperature	Turbidity
Unit	mS/m@20C	g/m <sup>3</sup>	pH	g/m <sup>3</sup>	Deg.C	NTU
Minimum	6.7	<0.5	9.6	1	7.9	13
Maximum	321	1.9	12.3	610	25.7	420
Median	60	<0.5	11.4	40.5	15.7	100
Number	71	43	71	70	69	22
23 Mar 2015	37.4	b	11.0	12	17.5	13
11 Jun 2015	38.7	b	11.1	84	12.1	82
Consent limit	-	15	-	100	-	-

**Key:** b parameter not determined, no visible hydrocarbon sheen and no odour

All routine sampling undertaken during the period complied with all consent limits in regard to discharge quality. Receiving water results also show that at the time of sampling, that the pH in the Waiwhakaiho River, just beyond the mixing zone, was within the consented limits.

Discharges were not occurring at site STW00180 where the effluent and stormwater leaves the upper part of the site during either of the two full catchment wet weather surveys undertaken this period. This is not unusual as flow at the discharge point tends to cease very shortly after the rain stops.

Individual discharge sampling during wet weather inspections have been programmed for the site in the 2016-2017 period to facilitate the collection of samples such as these that may be difficult to collect during full catchment surveys.

### 5.3.3 Investigations, interventions, and incidents

During the period under review, the Council was required to undertake additional investigations and interventions, or record incidents, in association with conditions in resource consents or provisions in Regional Plans in regard to Firth's Clemow Rd site.

**14 November 2014**

During routine monitoring it was found that resource consent conditions were not being complied with. A black oxide colourant was found to be contaminating the discharge entering the Waiwhakaiho River.

A follow up inspection was undertaken during an onsite consent investigation meeting. This inspection found that the colorant was no longer present in the discharge and that resource consent conditions were being complied with. A letter of explanation was received and accepted.

**16 June 2015**

A complaint was received regarding an oil spill at Firth's on Clemow Road, New Plymouth. Investigation found that hydraulic fluid had been spilled from a damaged line on a truck onto the sealed surface adjacent the loading chutes. The spill had been contained with sand and there was no run off to surface water. Downer undertook to remove the contaminated sand and replace it if necessary. A follow-up inspection found that the contaminated sand had been removed. No further action was taken.

**5.4 Discussion****5.4.1 Discussion of site performance**

In terms of housekeeping practices, the Firth facilities were generally well managed during the period under review.

The settling pits were generally found to be well managed during inspections, however discolouration from an oxide contaminant was found in the discharge on one occasion.

It is noted that Firth installed waste water recycling and trade waste disposal improvements during the period under review. Firth also plans to undertake works at the site to properly separate the wastewater and stormwater systems. These upgrades have been included as requirements in the renewed consent issued in July 2015.

One complaint was received regarding an oil spill on the unloading pad on Clemow Rd. Upon investigation it was found that ongoing clean up and containment works were being undertaken by Firth.

**5.4.2 Environmental effects of exercise of consent**

Firth demonstrated compliance with the consent conditions of consent 0392 during the period under the review.

Imposing a pH control limit on the receiving water as opposed to the discharge still appears to be an appropriate control mechanism. Whilst the pH level of the discharges is quite alkaline, this was assimilated within the receiving water with little, if any, effect observed in the Waiwhakaiho River.

Historically, some white staining of the riverbed with calcium deposits has occurred for a distance of up to about 15 metres from the lower discharge point. However, this is within the 50-metre mixing zone and no adverse biological effects have been

observed as a result. It is anticipated that with the improved treatment and waste water diversion systems currently being built at the site, the pH of the discharges will drop thus decreasing the likelihood of calcium precipitating out of solution and creating such calcium deposits at the discharge point.

### 5.4.3 Evaluation of performance

A tabular summary of the consent holder's compliance record for the period under review is set out in Table 11.

**Table 11** Summary of performance consent 0392-3,

<b>Purpose: To discharge treated concrete truck washings</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
1. Discharge cannot cause specified general adverse effects beyond mixing zone	Sampling and discharge point inspections	Yes
2. Concentration limits upon potential contaminants in the discharge (suspended solids and O&G)	Chemical sampling	Yes
3. pH limits on receiving water as a result of discharge	Chemical sampling	Yes
4. Rate of discharge to be controlled	Observation and discussion at inspection	Yes
5. Efficient maintenance and operation of ponds	Observation and discussion at inspection	No- oxide colourant found in discharge on one occasion
6. Provision and maintenance of a contingency plan	Review of plans provided.	Yes
7. Optional review provision re environmental effects	Scheduled for consideration June 2008	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		<b>Good</b>
Overall assessment of administrative performance in respect of this consent		<b>High</b>

N/A = not applicable

During the period under review, Freight and Bulk Transport Holdings Limited demonstrated a good level of environmental performance and a high level of administrative performance and compliance with resource consents as defined in Section 1.1.5. in relation to its Clemow Rd site.

### 5.4.4 Recommendation from the 2012-2014 Biennial Report

In the 2012-2014 Biennial Report, it was recommended:

THAT monitoring of discharges from Firth Industries Limited (Division of Fletcher Concrete and Infrastructure Limited) in the 2014-2015 year continues at the same level as in 2012-2014.

This recommendation was implemented in full.

#### **5.4.5 Alterations to monitoring programmes for 2015-2016**

In designing and implementing the monitoring programmes for water discharges in the region, the Council has taken into account the extent of information made available by previous authorities, its relevance under the RMA, the obligations of the Act in terms of monitoring discharges and effects, and subsequently reporting to the regional community. The Council also takes into account the scope of assessments required at the time of renewal of permits, and the need to maintain a sound understanding of industrial processes within Taranaki discharging to the environment.

It is proposed that for 2015-2016, the programme remains unchanged. A recommendation to this effect is attached to this report.

### **5.5 Recommendation**

THAT monitoring of discharges from Firth Industries Limited in the 2015-2016 year continues at the same level as in 2014-2015.

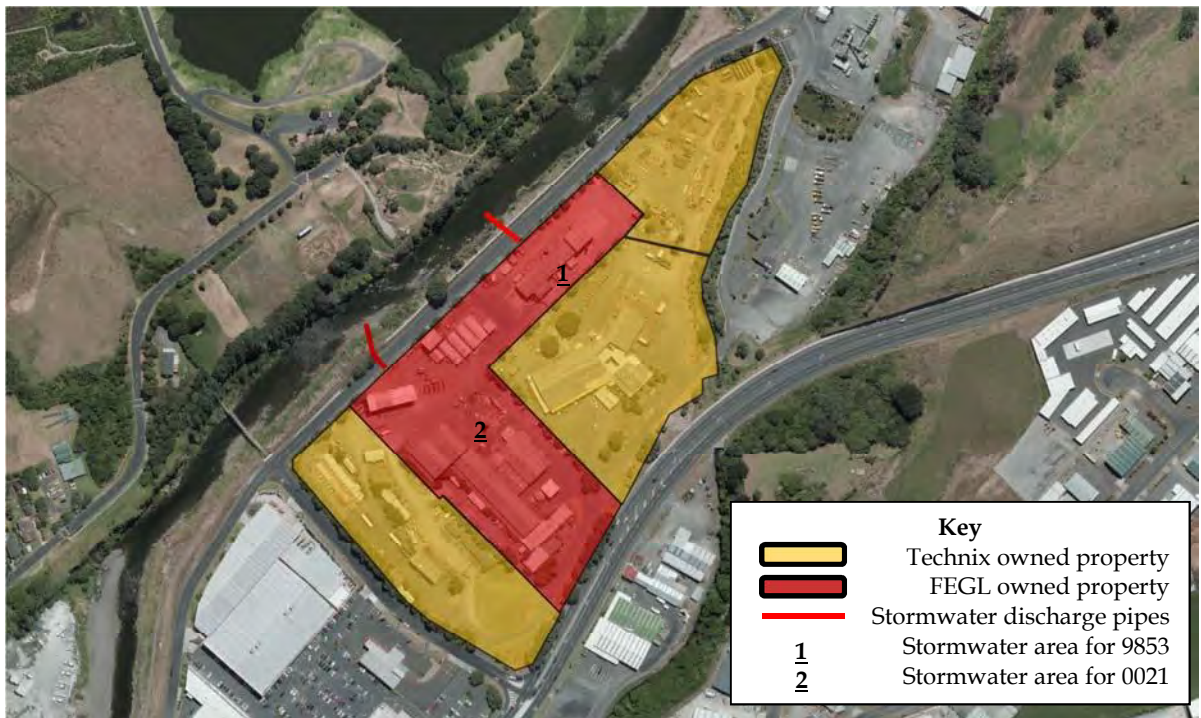


## 6. Fitzroy Engineering Group Limited

### 6.1 Process description

Fitzroy Engineering Group Limited (FEGL) operates an engineering business which involves the manufacturing of heavy engineering components and structures, and activities at the site also include abrasive blasting and painting.

The site was previously leased by FEGL from Technix Group Limited (Technix), and the stormwater discharges from FEGL's activities were covered under consents held by TGL. In 2013 FEGL purchased the part of the property they operate on from Technix (Figure 9). After the purchase of the property resource consent 0021-3 was transferred from Technix to FEGL. Resource consent 0291-3 was split into two consents as the northern area covered by this consent was now owned by FEGL. The consent number assigned to this catchment area was consent number 9853.



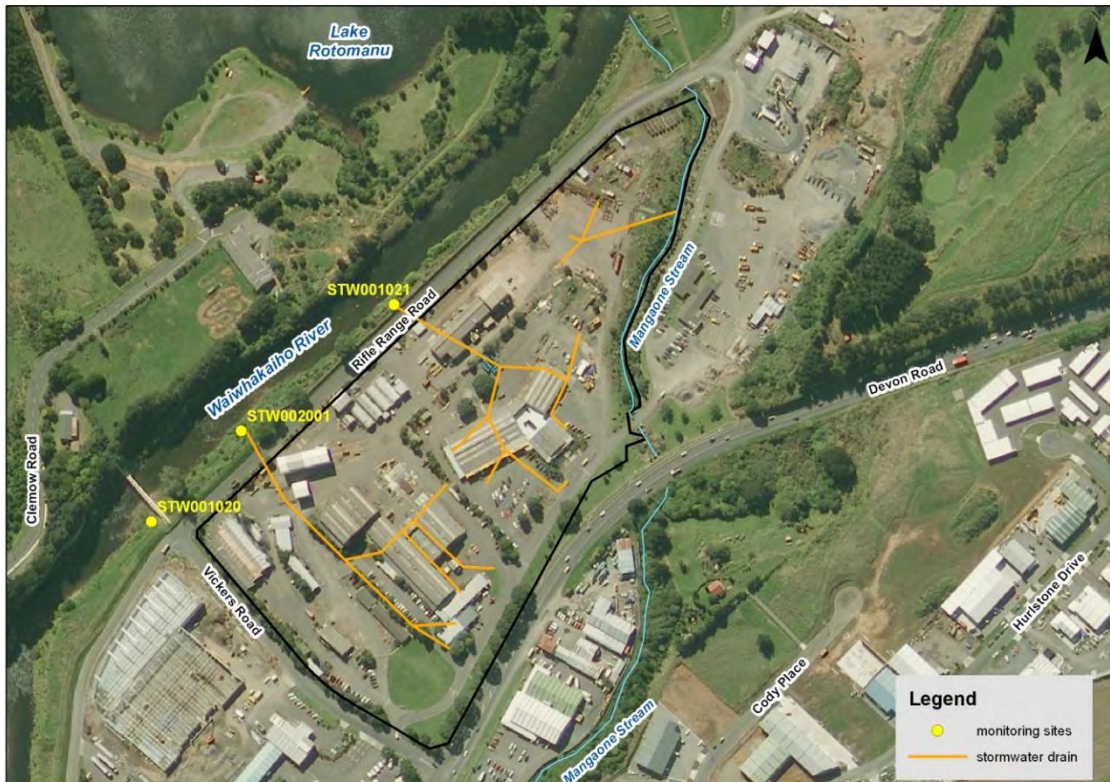
**Figure 9** Technix Group Limited and Fitzroy Engineering Group Limited subdivided site

The stormwater area for consent 0021 covers the south-west section of FEGL's property. The stormwater drainage system runs from the south and east boundary towards the east boundary, the drainage then runs north towards the Waiwhakaiho River and discharges into the river via a stormwater drain (STW002001, Figure 10). There are multiple sumps along this system to collect stormwater.

The buildings/land use within this area includes:

- Staff offices and facilities,
- Workshops (Machining, plate and general),
- Dangerous goods storage,
- Liquid oxygen tanks, and
- Blast and Paint storage.





**Figure 10** Fitzroy Engineering Group limited site and stormwater discharge points

The drainage system for the 9853 discharge begins in the adjacent Technix property, continues north through FEGL's section, and discharges into the Waiwhakaiho River via a stormwater drain (STW001021). The system has a sump on the southern boundary and another attached to the blast and paint shop. A dangerous goods storage shed is also in this catchment area.

FEGL undertakes infrequent hydrotesting processes on large fabrications, and also operations involving the passivating of stainless steel. These activities produce wastewater that may contain contaminants such as penetrant dye and rust inhibitor, and also can be acidic. These activities sometimes occur outside. FEGL has advised that the wastewater from these processes will be banded using tarpaulin sheets, and any drains will be blocked with sandbags. Once that activity is finished the waste will be removed by a waste management specialist.

FEGL has provided a stormwater management plan and spill contingency plan.

## 6.2 Water discharge permits

Discharge permit 0021 was granted on 1 May 1996 to discharge stormwater off a Vickers Road site into the Waiwhakaiho River, with the 'standardised' conditions, for a period until 1 June 2014. This permit was initially held by Technix but the renewed consent 0021-4, to discharge stormwater from an industrial site into the Waiwhakaiho River, was granted to FEGL under section 88 of the RMA on 12 March 2015. It is due to expire on 1 June 2032.

Consent **9853** provides for the discharge of stormwater to the river opposite Fitzroy Engineering Group's blast and paint shop. This is a combined discharge point as the catchment includes FEGL's blast and paint operation, another building complex (which has been occupied by about five tenants, but from 1 January 2008 the only occupants were Fitzroy Engineering, Technix Group Limited and Steelfab), a truck washing area, and a dangerous goods store. The discharges from this whole area were previously covered by a single consent held by Technix (**0291**). A partial transfer of this consent took place on 20 February 2014, with the catchment area now covered by consent **9853-1** shown **Figure 9** (area 1). Consent **9853-1** expired on 1 June 2014 and the consent continued to be exercised under Section 124 of the RMA until such time as the renewal was processed.

Discharge permit **9853-2**, to discharge stormwater from an industrial site into the Waiwhakaiho River, was granted to FEGL under section 88 of the RMA on 12 March 2015. It is due to expire on 1 June 2032.

Both the current consents (**0021-4** and **9853-2**) have the same 10 special conditions which set out discharge limits, limit effects on receiving waters, limit the size of the catchment area, and require best practice be adopted, notification of hydrotesting or significant changes to processes, and stormwater and contingency planning.

The permits are attached to this report in Appendix I

## **6.3 Results**

### **6.3.1 Inspections**

The site was inspected on four occasions during the monitoring period, on 28 August and 11 December 2014, and 13 March and 26 June 2015. The inspections focussed on housekeeping, evidence of spills, the state of the onsite drains, and dust/odour.

The stormwater drains around the site were visually clear of contaminants during all inspections. The diesel and waste oil bunds both had a hydrocarbon sheen visible on the surface during the inspection on 26 June 2015, and the consent holder was advised that this would need to be cleaned out rather than allowing it to drain to stormwater.

Blasting was taking place during all inspections and dust monitoring was undertaken at the boundary of the site during three of the inspections. The results were within acceptable levels on each occasion. There was a small volume of blast material escaping from the rear doors of the blast shed on 26 June 2015, however no dust or odour was found to be discharging beyond the boundary of the property during any of the inspections.

### **6.3.2 Results of discharge monitoring**

There are two routine sampling points for monitoring of stormwater discharges from FEGL site stormwater discharges to the Waiwhakaiho River. The storm drain opposite Fitzroy Engineering Group's plate shop (consent 0021, site STW002001), and opposite Fitzroy Engineering Group's blast and paint shop (consent 9853, site

STW001021). The latter discharge point also contains stormwater, and potentially truck wash wastewater from the area covered by Technix's consent 0291.

### Opposite Fitzroy Engineering Group's plate shop (Consent 0021)

The values for pH, suspended solids, and oil and grease are all within the limits set in the "standardised" conditions for consent 0021.

**Table 12** Chemical monitoring results for discharge opposite FEGL's plate shop -site STW002001

Parameter	Conductivity	Oil and Grease	pH	Suspended solids	Temperature	Turbidity
Unit	mS/m@ 20°C	g/m <sup>3</sup>	pH	g/m <sup>3</sup>	Deg.C	NTU
Minimum	2.7	0.5	7	5	10.3	5.6
Maximum	234	25	9.7	790	21.5	160
Median	7.9	1.0	7.4	50	15.9	57
Number	53	40	53	53	51	21
23 Mar 2015	5.3	b	7.3	11	19.0	22
11 Jun 2015	nd	nd	nd	nd	nd	nd
<i>Consent limits</i>	-	15	6-9	100	-	-

**Key:** b parameter not determined, no visible hydrocarbon sheen and no odour  
nd not discharging

### Opposite Fitzroy Engineering Group's Blast & Paint (Consent 9853)

As discussed, this discharge contains stormwater from both the Technix and FEGL sites. Up until 20 February 2014, this combined discharge was covered solely by consent 0291 held by Technix. The discharge is now also covered by FEGL consent 9853.

The conditions on stormwater composition on consent 9853 for pH range, suspended solids and oil and grease were complied with on each monitoring occasion.

**Table 13** Chemical monitoring results for FEGL/Technix combined stormwater discharge-site STW001021

Parameter	Conductivity	Hydrocarbons	pH	Suspended solids	Temperature	Turbidity
Unit	mS/m@20C	g/m <sup>3</sup>	pH	g/m <sup>3</sup>	Deg.C	NTU
Minimum	2.2	0.5	6	2	10.6	6.7
Maximum	24.4	3.5	7.7	530	23.4	200
Median	6.7	1.9	7.3	36	15.3	38.5
Number	45	6	45	45	42	22
23 Mar 2015	5.2	b	7.0	15	19.4	24
11 Jun 2015	13.3	<0.5	7.2	24	13.3	36
<i>Consent limits</i>	-	15	6-9	100	-	-

**Key:** b parameter not determined, no visible hydrocarbon sheen and no odour

## 6.4 Investigations, interventions, and incidents

In the 2014-2015 period, the Council was not required to undertake significant additional investigations and interventions, or record incidents, in association with FEGL's conditions in resource consents or provisions in Regional Plans.

## 6.5 Discussion

### 6.5.1 Discussion of site performance

Housekeeping at the site over the monitoring period was generally good, and inspection found that the bunds were generally well managed. A hydrocarbon sheen was observed on the diesel and waste oil bunds on one occasion and the consent holder was advised to clean this out instead of releasing the bund to stormwater.

The stormwater discharges from the site were found to be compliant with consent conditions on all monitoring occasions

### 6.5.2 Environmental effects of exercise of consents

There were no adverse environmental effects noted in the receiving environment as a result of FEGL discharges.

### 6.5.3 Evaluation of performance

A tabular summary of the consent holder's compliance record for the period under review is set out in Table 14, Table 15, Table 16, and Table 17

**Table 14** Summary of performance for FEGL consent 0021-3

<b>Purpose: To discharge stormwater into the Waiwhakaiho River (in effect to 12 March 2015)</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
1. Concentration limits upon potential contaminants in discharge	Not monitored (samples collected after change to 0021-4)	N/A
2. Discharge cannot cause specified adverse effects beyond mixing zone	Visual assessment at inspection and biomonitoring	Yes
3. Prepare and maintain contingency plan	Review of documentation received. Latest version received May 2014	Yes
4. Provision for review of consent	No further opportunities for review	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		<b>High</b>
Overall assessment of administrative performance in respect of this consent		<b>High</b>

N/A = not applicable

**Table 15** Summary of performance for FEGL consent 0021-4

<b>Purpose: To discharge stormwater from an industrial site into the Waiwhakaiho River (in effect from 12 March 2015)</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
1. Adopt best practicable option to prevent or minimise adverse effects	Inspections, liaison with consent holder	Yes
2. Catchment not to exceed 3.3 ha	Inspections	Yes
3. No discharge of contaminants from	Inspections	Yes

<b>Purpose: To discharge stormwater from an industrial site into the Waiwhakaiho River (in effect from 12 March 2015)</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
hydrotesting activities		
4. Notification if hydrotesting	Not undertaken during monitoring period	N/A
5. Limits on pH, suspended solids, oil and grease and chloride in discharge	Sampling	Yes
6. Discharge cannot cause specified adverse effects beyond mixing zone	Visual assessment at inspection, sampling and biomonitoring	Yes
7. Maintain and update a Contingency Plan	Review of documentation received. Latest version received May 2014	Yes
8. Site to operate in accordance with a Stormwater Management Plan	Review of documentation received. Latest version received November 2014	Yes
9. Notification prior to significant changes to processes or operations	Inspections and liaison with consent holder – no significant changes during period	Yes
10. Provision for review of consent	Next option for review in June 2020	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		<b>High</b>
Overall assessment of administrative performance in respect of this consent		<b>High</b>

N/A = not applicable

**Table 16** Summary of performance for FEGL consent 9853-1

<b>Purpose: To discharge of stormwater and treated truck wash water into the Waiwhakaiho River (in effect up to 12 March 2015)</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
1. Concentration limits upon potential contaminants in discharge	Chemical sampling	Yes
2. Discharge cannot cause specified adverse effects beyond mixing zone	Visual assessment at inspection and receiving water sampling and biomonitoring	Yes
3. Prohibits discharge of cleaning solvents	Visual assessment at inspection and receiving water sampling and biomonitoring	Yes
4. Prepare and maintain contingency plan	Review of documentation received Latest version received May 2014	Yes
5. Provision for review of consent	No further opportunities for review	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		<b>High</b>
Overall assessment of administrative performance in respect of this consent		<b>High</b>

N/A = not applicable

**Table 17** Summary of performance for FEGL consent 9853-2

<b>Purpose: To discharge stormwater from an industrial site into the Waiwhakaiho River (in effect from 12 March 2015)</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
1. Adopt best practicable option to prevent or minimise adverse effects	Inspections, liaison with consent holder	Yes
2. Catchment not to exceed 3.3 ha	Inspections	Yes
3. No discharge of contaminants from hydrotesting activities	Inspections	Yes
4. Notification if hydrotesting	Not undertaken during monitoring period	N/A
5. Limits on pH, suspended solids, oil and grease and chloride in discharge	Sampling	Yes
6. Discharge cannot cause specified adverse effects beyond mixing zone	Visual assessment at inspection and receiving water sampling and biomonitoring	Yes
7. Maintain and update a Contingency Plan	Review of documentation received. Latest version received May 2014	Yes
8. Site to operate in accordance with a Stormwater Management Plan	Review of documentation received. Latest version received November 2014	Yes
9. Notification prior to significant changes to processes or operations	Inspections and liaison with consent holder – no significant changes during period	Yes
10. Provision for review of consent	Next option for review in June 2020	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		<b>High</b>
Overall assessment of administrative performance in respect of this consent		<b>High</b>

N/A = not applicable

During the period under review, Fitzroy Engineering Group Limited demonstrated a high level of environmental performance and high level of administrative performance and compliance with the resource consents as defined in Section 1.1.5 in relation to its site on Rifle Range Rd.

#### **6.5.4 Alterations to monitoring programmes for 2015-2016**

In designing and implementing the monitoring programmes for water discharges in the region, the Council has taken into account the extent of information made available by previous authorities, its relevance under the RMA the obligations of the Act in terms of monitoring discharges and effects, and subsequently reporting to the regional community. The Council also takes into account the scope of assessments required at the time of renewal of permits, and the need to maintain a sound understanding of industrial processes within Taranaki discharging to the environment.

It is proposed that for 2015-2016, the programme remains unchanged. A recommendation to this effect is attached to this report.

## **6.6 Recommendation**

THAT monitoring of discharges from Fitzroy Engineering Group Limited in the 2015-2016 year continues at the same level as in 2014-2015.



## 7. Freight and Bulk Transport Holdings Limited

### 7.1 Process description

Freight and Bulk Transport Holdings Limited (FBT) operate a truck depot that services the rural sector from this 1.77 ha site on Katere Road.

This site was previously monitored under the annual inspection round of truck washes, and was incorporated into the Lower Waiwhakaiho Catchment Monitoring Programme at the start of the 2009-2010 year.



**Figure 11** Location of Freight and Bulk Transport Holdings site

The Company stores, blends and distributes dry stock feeds such as crushed meal, palm kernel and grains. Lime, fertiliser and gravel used for farm races are also stored at the site. The lime, stock feeds and fertilisers are stored in the sheds at the northern end of the site; only the gravel is stored outside in the stormwater catchment. Trucks are washed at the site and the wash water is directed to soak holes.

The majority of the stormwater from the site is collected by three stormwater sumps, which discharge to the Mangaone Stream via the mid Katere Road drain. However, stormwater from the catchment area around the truck wash drains to the truck wash sump and soak holes.

Some stormwater is retained on site, and is used in the truck wash.



## 7.2 Water discharge permit

FBT operates a transport depot on Katere Road, New Plymouth on the northern side of the Mangaone Stream. The site is used for the storage of stock feed and aggregate, and contains a truck wash facility. The consent (**2041-2**) to discharge from the site was granted on 1 May 1996, to provide for the discharge of up to 2.8 cubic metres per day of treated truck wash down water and stormwater onto and into land in the vicinity of the Mangaone Stream, for a period until 1 June 2014.

Three special conditions are appended to the consent, which include provisions for review of the consent, requirements to provide a contingency plan and the prohibition of specific effects in the Mangaone Stream.

An application to renew this consent was received in sufficient time to provide protection under section 124 of the RMA, allowing FBT to operate under the expired consent. FBT also applied for a new consent to discharge stormwater from the site.

FBT now holds consent **2041-3** to discharge treated truck wash water and stormwater onto and into land. This was issued by the Council under section 87(e) of the RMA on 5 June 2015 and it is due to expire on 1 June 2018.

It has seven special conditions that require the adoption of best practice, limit effects in receiving water, and require stormwater management and contingency planning.

FBT now holds consent **10008-** to discharge stormwater onto and into land and into the Mangaone Stream. This consent was issued by the Council under section 87(e) of the RMA on 5 June 2015 and it is due to expire on 1 June 2032.

It has nine special conditions that require the adoption of best practice, limit contaminant concentrations in the discharge, limit effects in receiving water, and require stormwater management and contingency planning.

Copies of all permits are attached to this report in Appendix I.

## 7.3 Results

### 7.3.1 Inspections

FBT's site was inspected on four occasions during the monitoring period. These were on 1 September 2014, 24 November 2014, 4 March 2015, and 29 June 2015

The inspections focussed on the truck wash treatment system, product tracking, general, housekeeping, stormwater drains and the receiving waters.

During the period under review the site was found to be reasonably well managed. The truck wash collection pit had a pre-treatment sand trap installed to improve the quality of the discharges flowing to the soak holes. Drain filters were installed on stormwater grates at the site (as outlined in their stormwater management plan) to remove particulate matter from the stormwater entering NPDC's network. On one occasion FBT was requested by the inspecting officer to repair and/or clean the drain filters.

No dust or odour issues were noted during the monitoring period.

### 7.3.2 Investigations, interventions, and incidents

In the 2014-2015 period, the Council was not required to undertake significant FBT's conditions in resource consents or provisions in Regional Plans in relation to this Katere Road site.

## 7.4 Discussion

### 7.4.1 Discussion of site performance

Housekeeping at the site was generally found to be good over the monitoring period, and the site was generally well managed. There was only limited tracking noted during the period under review, and drain filters were found to be in need maintenance on one of the four inspections undertaken during the year under review. Due to the consent being granted in the last month of the monitoring period, no stormwater samples were assessed this period, sampling of the stormwater discharges from the site were programmed for the 2015-2016 period.

### 7.4.2 Environmental effects of exercise of consent

No adverse effects were noted on the water quality in the Mangaone Stream as a result of the exercise of FBT's water permit as shown in the surface water monitoring section of this report (section 16). There were some measurable increases observed in the filtered carbonaceous BOD downstream of the FBT's site at the time of the sampling surveys. The filtered carbonaceous BOD of the stream did exceed the 2 g/m<sup>3</sup> in-stream RFWP guideline limit (by 0.5 g/m<sup>3</sup>) on 10 December 2014. Due to small size of the exceedance, and the fact the increase could not be wholly ascribed to any one source, no action was taken and the second sample taking during the period under review returned compliant results (23 March 2015).

Monitoring discharges covered by new consent 10008-8 have been programmed for the 2015-2016 period.

### 7.4.3 Evaluation of performance

A tabular summary of the consent holder's compliance record for the period under review is set out in Table 18, Table 19 and Table 20.

**Table 18** Summary of performance 2041-2 (to 5 June 2015)

<b>Purpose: To discharge of treated truck wash wastewater and stormwater onto and into land in the vicinity of the Mangaone Stream</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
1. Provision for review of consent	Not scheduled for consideration for remainder of consent duration. Consent due to expire 1 June 2014	N/A
2. Preparation of satisfactory contingency plan by 1 August 1996	Review of Council records. Plan on file dated 1 December 2010	Yes
3. Discharge cannot cause specified adverse effects beyond mixing zone	Visual assessment at inspection and receiving water sampling and biomonitoring	Yes
Overall assessment of consent compliance and environmental performance in respect of this consent		<b>High</b>
Overall assessment of administrative performance in respect of this consent		<b>High</b>

N/A = not applicable

**Table 19** Summary of performance 2041-3 (from 5 June 2015)

<b>Purpose: To discharge of treated truck wash wastewater and stormwater onto and into land in the vicinity of the Mangaone Stream</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
1. Adopt best practice	Inspection and programme supervision	Yes
2. Truck wash discharges to be treated	Inspection	Yes
3. Discharge cannot cause specified adverse effects beyond mixing zone	Visual assessment at inspection and receiving water sampling and biomonitoring	Yes
4. Maintain and adhere to a contingency plan	Inspection and programme supervision	Yes
5. Maintain and adhere to a stormwater plan	Inspection and programme supervision	Yes
6. Notify the Council of changes at the site	Inspection and programme supervision	N/A
7. Review condition	No review needed	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		<b>High</b>
Overall assessment of administrative performance in respect of this consent		<b>High</b>

**Table 20** Summary of performance 10008-1 (from 5 June 2015)

<b>Purpose: To discharge stormwater onto and into land and into the Mangaone Stream</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
1. Adopt best practice	Inspection and programme supervision	Yes
2. Stormwater catchment not to exceed 1.77 Ha	Inspection	Yes
3. Limits on contaminants in discharge	Not assessed this period	N/A
4. Discharge cannot cause specified adverse effects beyond mixing zone	Visual assessment at inspection and receiving water sampling and biomonitoring	Yes
5. Maintain and adhere to a contingency plan	Inspection and programme supervision	Yes
6. Maintain and adhere to a stormwater plan	Inspection and programme supervision	Yes
7. Notify the Council of changes at the site	Inspection and programme supervision	N/A
8. Lapse condition	Consent exercised	N/A
9. Review condition	No review option this period	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		<b>High</b>
Overall assessment of administrative performance in respect of this consent		<b>High</b>

During the period under review, Freight and Bulk Transport Holdings Limited demonstrated a high level of environmental performance and administrative performance and compliance with their resource consents as defined in Section 1.1.5.

#### **7.4.4 Recommendation from the 2012-2014 Biennial Report**

In the 2012-2014 Biennial Report, it was recommended:

THAT monitoring of discharges from Freight and Bulk Transport Holdings Limited in the 2014-2015 year continues at the same level as in 2012-2014.

This recommendation was carried out in full.

#### **7.4.5 Alterations to monitoring programmes for 2015-2016**

In designing and implementing the monitoring programmes for water discharges in the region, the Council has taken into account the extent of information made available by previous authorities, its relevance under the RMA, the obligations of the Act in terms of monitoring discharges and effects, and subsequently reporting to the regional community. The Council also takes into account the scope of assessments required at the time of renewal of permits, and the need to maintain a sound understanding of industrial processes within Taranaki discharging to the environment.

It is proposed that for 2015-2016 the programme.

### **7.5 Recommendation**

THAT monitoring of discharges from Freight and Bulk Transport Holdings Limited in the 2015-2016 period be changed to include sampling of discharges arising from the exercise of consent 10008-1.

## 8. Nankervis Family Trust

### 8.1 Process description

Activities at the site are undertaken by City Care. This Company operates out of the site owned by the Nankervis Family Trust, who hold the discharge consent for the site. City Care is an underground services company that carries out activities such as: reticulated drainage and sewage system maintenance, and minor earthworks.

The site is located in the Fitzroy industrial area, in the defined urban catchment of New Plymouth, approximately 380 metres from the closest water body, the Mangaone Stream.

Wash down water from the truck wash bay discharges to a drain, which is directed to an inceptor system. This then discharges into the New Plymouth District Council's stormwater system (via discharge site IND002039) and then into the Mangaone Stream (via discharge site STW001035). It was stated at the time of the application that up to approximately 1.0 m<sup>3</sup> of wash water would be discharged per day.

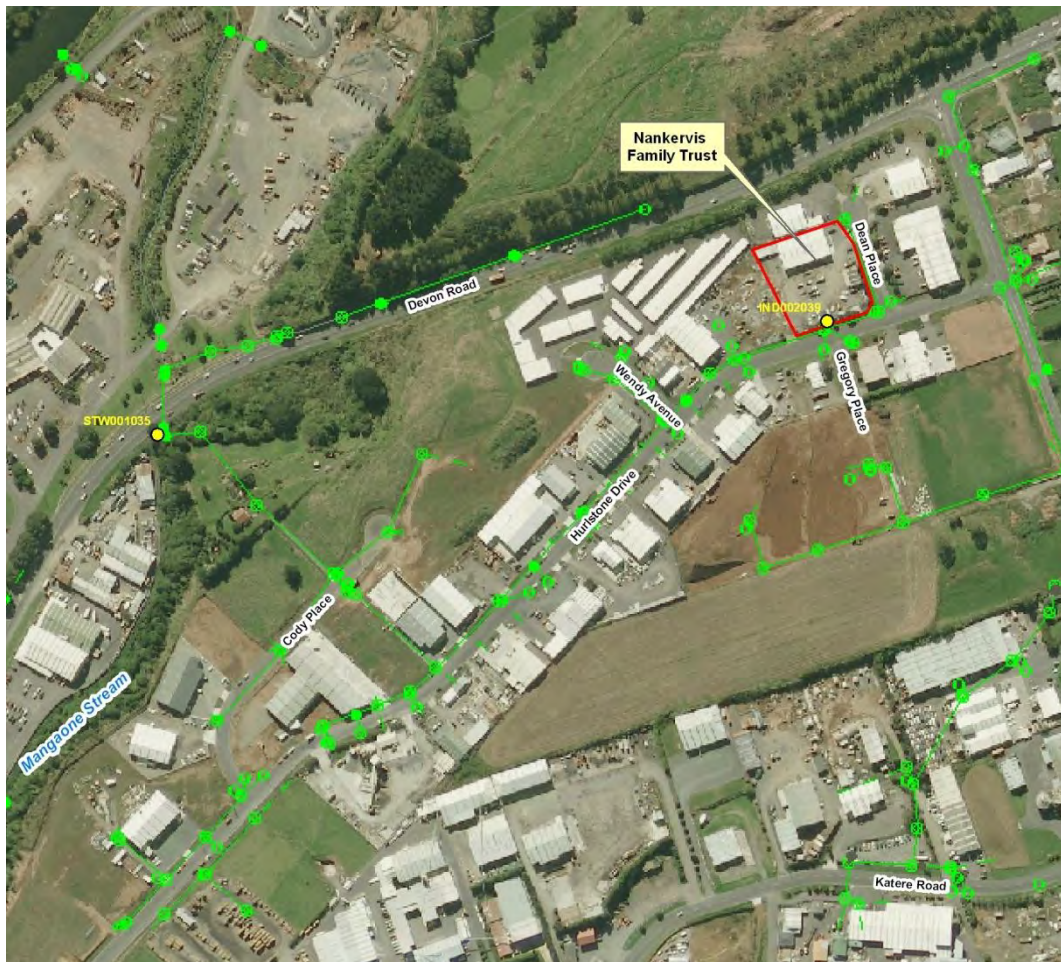


Figure 12 Nankervis Family Trust site location and discharge point

## 8.2 Water discharge permit

Although the site is operated and managed by City Care, the landowners, Nankervis Family Trust obtained consent **6965-1** to cover the discharge of truck wash water via an interceptor system into the Mangaone Stream.

The permit was issued by the Council on 20 October 2006 under Section 87(e) of the RMA. It is due to expire on 1 June 2020.

Ten special conditions are appended to the consent. These include requirements for the consent holder to adopt the best practicable option and undertake activities in line with the information submitted in the consent application. The conditions also sets out contaminant concentration limits in the discharge, limits on effects on receiving water, prohibit the discharge of degreaser or concrete washing, and require contingency and stormwater management planning.

The permit is attached to this report in Appendix I.

## 8.3 Results

### 8.3.1 Inspections

The Nankervis site was inspected on four occasions during period under review. These were on 1 September 2014, 2 December 2014, 10 March 2015, and 26 May 2015. The inspections focussed on general housekeeping, the maintenance of the treatment systems, and clarity and visual appearance of any discharges.

During the inspections no issues were noted and it was found that the interceptor was being cleaned on regular basis. On one occasion the inspecting officer noted a build up of sediments in an around some of the stormwater drains and the installation of drain filters was suggested.

### 8.3.2 Results of discharge monitoring

As the consent is for the discharge of treated wash water, if possible, sampling at this site is carried out at inspection if a discharge is occurring, and is independent of the stormwater monitoring surveys. At the time of the consent application, the stormwater discharged from the site was considered to be a permitted activity, but due the fact that stormwater from the site contributes to the New Plymouth District Council discharge at the Devon Road bridge (STW001035), it is visually inspected periodically during the wet weather sample runs, and sampled if considered necessary.

Results for the period under review of the wash water and/or stormwater, downstream of the interceptor (site IND002039), are presented in

**Table 21.**

**Table 21** Chemical monitoring results for Nankervis Family Trust - site IND002039

Parameter	Conductivity @ 20°C	Oil and grease	pH	Suspended solids	Temperature	Turbidity
Unit	mS/m@20C	g/m <sup>3</sup>	pH	g/m <sup>3</sup>	Deg.C	NTU
Minimum	3.7	<0.5	6.3	2	11.6	6.1
Maximum	15.3	3.7	8.8	200	20.7	170
Median	7.2	0.6	7.6	34	15.8	41
Number	14	4	14	14	14	14
10 Dec 2014	6.0	b	7.4	11	17.4	8.4
23 Mar 2015	5.5	b	7.0	<b>140*</b>	16.8	100
<i>Consent Limit</i>	-	15	6-9	100	-	-
<i>RFWP Limit</i>	-	15	6-9	100	-	-

**Key:** Results shown in bold within a table indicates that a consent limit for a particular parameter has been exceeded

b no visible hydrocarbon sheen and no odour

\* sampled from sump (combined stormwater and truck wash interceptor discharge)

The samples collected complied with the oil and grease limit (15 g/m<sup>3</sup>), and had a pH within the specified range (6-9) on all monitoring occasions. On 23 March it was noted that the wash pad was not in use at the time of sampling, and it was found that the suspended solids concentration in the combined direct discharge of storm water and the discharge from the interceptor exceeded the standard in the Regional Freshwater Plan (RFP) for a permitted stormwater discharge (100 g/m<sup>3</sup>).

The site operator was advised of the result and undertook to address the issue.

### 8.3.3 Investigations, interventions, and incidents

In the 2013-2015 period, the Council was not required to undertake significant additional investigations and interventions, or record incidents, in association with Nankervis Family Trust's conditions in resource consents or provisions in Regional Plans.

Although there was one stormwater discharge from the site that exceeded the permitted activity this was dealt with by way of a follow-up inspection.

## 8.4 Discussion

### 8.4.1 Discussion of site performance

Inspections of the pad, treatment system and receiving drain indicated that the facility was well managed.

The suspended solids concentration in the stormwater was found to not comply with the RFP concentration during one of the two sampling surveys. On this sampling

occasion, it was noted that the wash pad was not in use, and the non-compliant discharge was of stormwater rather than treated waste water.

The consent held for this site is for treated wastewater only, and the suspended solids concentration recorded on this occasion was noted to be in excess of the standards/terms/conditions of the permitted stormwater rule in the RFWP. Should these observations continue, and further or more significant breaches be found in future monitoring, the Company will be required to reduce the concentration of suspended solids in the discharge, or obtain a stormwater consent.

#### 8.4.2 Environmental effects of exercise of consent

There were no adverse effects found during the period under review that were attributable to activities at the Nankervis Family Trust site.

#### 8.4.3 Evaluation of performance

A tabular summary of the consent holder's compliance record for the period under review is set out in Table 22.

**Table 22** Summary of performance for consent 6965

<b>Purpose: To discharge of truck wash water via an interceptor into the Mangaone Stream</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
1. Adopt best practicable option to avoid, remedy or mitigate effects	Inspection and consultation with site operators	Yes
2. To be exercised in accordance with application information	Inspection and consultation with site operators	Yes
3. Stormwater contingency plan and wash water management plan to be submitted prior to exercising consent	Review of Council records. Updated contingency and stormwater management plans requested during the period under review	Yes
4. Discharge cannot cause specified adverse effects beyond mixing zone	Observation of river during sampling runs	Yes
5. No direct discharge of untreated wash water to Mangaone Stream	Inspection and observations during sampling runs	Yes
6. Limits on chemical composition of discharge	Observation during inspection and discharge sampling	Yes
7. No degreasers to be used and no wash waters containing concrete products to be discharged	Inspection and consultation with site operators	Yes
8. No adverse effects permitted on surface water or groundwater	Inspection and observations during sampling runs. No groundwater sampling scheduled	Yes



<b>Purpose: To discharge of truck wash water via an interceptor into the Mangaone Stream</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
9. Consent to lapse after 5 period if not exercised	Consent has been exercised	N/A
10. Provision for review of consent	No review option this period	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		<b>Good</b>
Overall assessment of administrative performance in respect of this consent		<b>High</b>

N/A = not applicable

During the period under review, the Nankervis Family Trust demonstrated a good level of environmental and high level of administrative performance and compliance with the resource consents as defined in Section 1.1.5 in relation to its site on Dean Place.

#### **8.4.4 Recommendation from the 2012-2014 Biennial Report**

In the 2012-2014 Biennial Report, it was recommended:

THAT monitoring of discharges from Nankervis Family Trust in the 2014-2015 year continues at the same level as in 2012-2014.

This recommendation was implemented in full.

#### **8.4.5 Alterations to monitoring programmes for 2015-2016**

In designing and implementing the monitoring programmes for water discharges in the region, the Council has taken into account the extent of information made available by previous authorities, its relevance under the RMA, the obligations of the Act in terms of monitoring discharges and effects, and subsequently reporting to the regional community. The Council also takes into account the scope of assessments required at the time of renewal of permits, and the need to maintain a sound understanding of industrial processes within Taranaki discharging to the environment.

It is proposed that for 2015-2016, the programme remains unchanged. A recommendation to this effect is attached to this report.

### **8.5 Recommendation**

THAT monitoring of discharges from Nankervis Family Trust in the 2015-2016 year continues at the same level as in 2014-2015.

## 9. New Plymouth District Council

### 9.1 Process description

New Plymouth District Council (NPDC) holds consents to discharge stormwater to the lower Waiwhakaiho River and Mangaone Stream, and to discharge rubbish dump leachate to groundwater and the Waiwhakaiho River from an industrial development off Bewley Road. The catchment areas and discharge points associated with the stormwater consents are shown in Figure 13 and Figure 14. The results for the stormwater and leachate discharge monitoring are reported on separately.

NPDC holds two resource consents in relation to discharges to the Lower Waiwhakaiho River below State Highway 3, and one consent in relation to discharges to the Mangaone Stream.



Figure 13 NPDC stormwater drainage and consented discharge points to the Waiwhakaiho River

#### 9.1.1 Stormwater discharges

It has been acknowledged that the NPDC has no direct control over the quality of discharges from sites in the catchment. However, road run-off and surface flooding due to poorly maintained drains may contribute to the contamination of stormwater entering the Waiwhakaiho River and Mangaone Stream.

All stormwater screen inlets and outlets in the system are inspected and cleaned regularly by NPDC to ensure that debris is not accumulated in any way that may affect

the network capacity. Outfalls with flap gates are serviced every two months. These inspections are usually undertaken following a heavy rainfall event.

During periods of high rainfall, one of the key features of the performance of the stormwater drainage system is its susceptibility to inlet and outlet blockages. The NPDC maintenance plan aims to reduce reactive maintenance and improve the operation and reliability of the system through preventative maintenance. This includes pipeline condition assessment using video inspection.



Figure 14 NPDC stormwater drainage and consented discharge points to the Mangaone Stream

### 9.1.2 Bewley Road closed landfill

The old Taranaki County Council (TCC) depot site was quarried at the end of its life, and was then infilled, becoming the Bewley Road Landfill. The former Bewley Road landfill extended for about 740m along the Waiwhakaiho River bank between Constance Street and Vickers Road, and back to Devon Road. In 2006 the closed landfill area was developed and is now the site of the Valley Mega Centre retail outlet and car park. Leachate from the site discharges to groundwater which seeps into both the stormwater network, and the Waiwhakaiho River, along the river bank between Constance Street and Vickers Road. There is no treatment of the leachate generated from this closed landfill. Leachate is discharged continuously to the river at very low levels and low volumes.



## 9.2 Water discharge permits

### Waiwhakaiho River

NPDC holds consent **5163-2**. This was granted on 10 June 2008 to authorise the discharge of stormwater from the Waiwhakaiho industrial area into the Waiwhakaiho River via multiple outfalls between the State Highway 3 bridge and the confluence with the Mangaone Stream.

Conditions on the consent require the consent holder to adopt the best practicable option to prevent or minimise any adverse effects, address erosion, and prohibit some specific effects. There are provisions to review the conditions of the consent in June 2010, June 2014, and June 2020. The consent is due to expire on 1 June 2026.

NPDC holds consent **4984-1** to discharge leachate from the closed Bewley Road landfill to groundwater and the Waiwhakaiho River. It was granted by the Council on 23 August 1998 and expired on 1 June 2014. During the period under review the consent was being exercised under the protection of section 124 of the RMA.

The consent has conditions that set limits for contaminant concentrations in the discharge, limit effects on receiving water, require the maintenance of monitoring bores, and provide for the review of the consent.

### Katere Road industrial area

NPDC holds consent **1275-3** was granted on 10 June 2008 to provide for the discharge of stormwater from the Katere and Waiwhakaiho industrial areas into the Mangaone Stream via multiple outfalls between Egmont Road and the confluence with the Waiwhakaiho River.

Conditions on the consent require the consent holder to adopt the best practicable option to prevent or minimise any adverse effects, address erosion, and prohibit some specific effects. There are provisions to review the conditions of the consent in June 2010, June 2014, and June 2020. The consent is due to expire on 1 June 2026.

A copy of all the permits are attached to this report in Appendix I.

## 9.3 Results

### 9.3.1 Stormwater discharges

#### 9.3.1.1 Inspections

NPDC's discharge sites were inspected on four occasions during the monitoring period, these were on 1 September 2014, 24 November 2014, 16 February 2015, and 22 May 2015.

The inspections visually assessed discharge structures of evidence of staining from contaminants and the clarity of any discharges occurring. The receiving waters were also assessed.

During the inspections no issues were noted and discharges were found to be clear and not causing any visual effects on the receiving environment.

### **9.3.1.2 Chemical monitoring**

Chemical monitoring is carried out at six public stormwater drain outlets, three of which also discharge wastewater or stormwater from licensed industrial sites. These are McLeod's Drain at the bottom of Smart Road, the "mid Katere Road" storm drain to the Mangaone Stream and the storm drain to the Mangaone Stream that services the Hurlstone Drive area.

The results of this chemical monitoring are presented in Table 24, Table 27, and Table 28 (respectively), with the results for the three outlets that do not contain additional licensed discharges reported in Table 23,

No contaminant concentration limits have been incorporated into the NPDC consents as it is acknowledged that, for the most part, the district council has no direct control over the quality of the discharges from the industrial and commercial sites. However, the quality of the discharges is still monitored as road run-off and surface flooding due to poorly maintained drains may contribute to the contamination of stormwater entering the receiving waters.

#### **Discharge to Waiwhakaiho River from Burton Street**

The sampling site that monitors the discharge of stormwater from the Burton Street area as it enters the Waiwhakaiho River was introduced during the 1999-2000 monitoring period. The drain carries stormwater from a number of small commercial sites that are located along Burton Street. The discharge is monitored to determine influences on water quality occurring upstream of other larger discharge sources (such as Firths or McLeod's Drain).

The results of routine chemical monitoring for the period under review are presented in Table 23,

Table 25, and Table 26. A summary of all results for each site is also given in the tables.

**Table 23** Chemical monitoring results for Burton Street stormwater - site STW001081

Parameter	Conductivity @ 20°C	Oil and Grease	pH	Suspended solids	Temperature	Turbidity
Unit	mS/m@20C	g/m <sup>3</sup>	pH	g/m <sup>3</sup>	Deg.C	NTU
Minimum	1.2	<0.5	6.9	2	10.4	1.9
Maximum	18.7	2.4	7.9	170	21.5	130
Median	5.6	1.3	7.2	13	16.2	12.5
Number	31	19	31	31	30	22
23 Mar 2015	7.4	b	7.0	3	16.1	1.9
11 Jun 2015	8.8	b	7.3	8	12.4	9.2
<i>RFWP Guideline</i>	-	15	6-9	100	-	-

Key: b no visible hydrocarbon sheen and no odour

The pH, suspended solids and oil and grease concentrations were determined to be within the standards expected for the permitted activities within this stormwater catchment.

### Discharge to Waiwhakaiho River from McLeod's drain

The discharge from McLeod's Drain enters the Waiwhakaiho River about 50 metres downstream of the lower end of Smart Road. The drain carries stormwater from the site of Ravensdown Fertiliser's depot on Devon Road (consent 3140), other industrial sites including Smart Road railyard (consent 3258), the residential area of Glen Avon, and a rural area to the south. The discharge is monitored to determine influences on water quality in addition to those of the fertiliser storage depot and railyard.

There is likely to be slightly elevated background phosphorus and ammonia concentrations, mainly due to dissolution of fertiliser particles carried by wind or water into storm drains at and around Ravensdown's fertiliser depot, or from spillages during cartage of the fertiliser to and from the site. Ravensdown have policies in place requiring that spills during cartage on site and on public roads are cleaned up by the drivers. The results of routine chemical monitoring for 2010-2012 are presented in Table 24, together with a summary of previous results for comparison.

**Table 24** Chemical monitoring results for NPDC McLeod's Drain discharge site STW001001

Parameter	Conductivity @ 20°C	DRP	Oil and Grease	pH	Suspended solids	Temp	Un-ionised ammonia
Unit	mS/m@20C	g/m <sup>3</sup> P	g/m <sup>3</sup>	pH	g/m <sup>3</sup>	Deg.C	g/m <sup>3</sup>
Minimum	9.8	0.012	0.5	4	2	10.3	0.00002
Maximum	3450	82.6	9	10.2	420	34	6.38894
Median	30.5	0.724	0.7	7.2	24	17.1	0.02817
Number	82	51	48	87	70	76	36
23 Mar 2015	10.5	0.168	0.8	7.2	26	17.2	0.00434

11 Jun 2015	19.2	0.271	b	7.2	17	13.8	0.00486
RFWP Guideline	-	-	15	6-9	100	-	-

**Key:** DRP Dissolved reactive phosphorous

b parameter not determined, no visible hydrocarbon sheen and no odour

The pH, suspended solids, unionised ammonia, and oil and grease concentrations were all determined to be well within the standards expected for a permitted activity and within the prescribed “standardised” limits for the consent holders contributing to this discharge.

#### **Discharge to Waiwhakaiho River from Rifle Range Road and Struthers Place**

This was an open drain/tributary that was piped when the Bewley Road area was developed and the Waiwhakaiho stopbank put in. Stormwater from the retail area between Struthers Place and Constance Street, the commercial area of Struthers Place, and part of Rifle Range Road is piped to the Waiwhakaiho via this discharge point.

**Table 25** Wet weather chemical monitoring results for Struthers Place site WKH000872

Parameter	Ammoniacal nitrogen	Hydrocarbon	Oil and Grease	pH	Suspended solids	Temperature	Un-ionised ammonia
Unit	g/m <sup>3</sup> N	g/m <sup>3</sup>	g/m <sup>3</sup>	pH	g/m <sup>3</sup>	Deg.C	g/m <sup>3</sup>
Minimum	0.008	0.5	0.5	4.6	2	12.2	0.00004
Maximum	29	0.5	70	8.8	2400	21.9	0.37177
Median	3.425	0.2	0.2	7.1	31	17.3	0.01586
Number	58	1	21	74	26	63	46
23 Mar 2015	0.956	b	1.3	7.1	36	17.3	0.00470
11 Jun 2015	6.91	<0.5	b	7.1	22	14.1	<b>0.02678</b>
RFWP Guideline	-	15	6-9	100	-	-	0.025

**Key:** Results shown in bold within a table indicates that a guideline for a particular parameter (derived from Rule 23 of the Regional Freshwater Plan) has been exceeded

b parameter not determined, no visible hydrocarbon sheen and no odour

The pH, suspended solids and oil and grease concentrations were determined to be similar to or below the median value for this site, and were well within the standards expected for the permitted activities within this stormwater catchment. The ammoniacal unionised ammonia level was elevated and slightly exceeded the permitted activity level of 0.025 g/m<sup>3</sup>. It should be noted that this discharge, when at lower rates of flow (as it was on 11 June 2015) may be influenced by the ammonia discharges from the Bewley Rd landfill, and this is covered by (and in compliance with) consent 4984.

### Discharge to Waiwhakaiho River from Vickers Road

This catchment drains the area on both sides of Vickers Road along with a section of Devon Road, to the west of the Katere Road junction. The results for the period under review are given in Table 26 along with a summary of all results from the site.

**Table 26** Chemical monitoring results for Vickers Rd discharge-site STW001020

Parameter	Conductivity @ 20°C	Oil and Grease	pH	Suspended solids	Temperature	Turbidity
Unit	mS/m@20C	g/m <sup>3</sup>	pH	g/m <sup>3</sup>	Deg.C	NTU
Minimum	2.3	0.5	6.6	2	10.4	2.7
Maximum	68.1	549	9.3	510	21.2	160
Median	11.4	1.7	7.3	60	15.6	36
Number	54	47	54	53	56	23
23 Mar 2015	13.0	0.9	6.6	13	17.9	4.7
11 Jun 2015	8.7	b	7.2	84	11.8	44
RFWP Guideline	-	15	6-9	100	-	-

**Key:** b parameter not determined, no visible hydrocarbon sheen and no odour

Sampling showed that the pH, suspended solids and oil and grease concentrations were well within the standards expected for the permitted activities within this stormwater catchment on all monitoring occasions. The oil and grease and suspended solids concentrations were found to be below median on all monitoring occasions during the period under review.



### Discharge to Mangaone Stream from mid Katere Road

Stormwater from the mid section of Katere Road discharges to the Mangaone Stream in between the discharges from Farmland's (formerly Viterra's) feedmill and Taranaki Sawmill's timber treatment plant site, and carries stormwater from a number of permitted activities on the Northern side of Katere Road, and from the Freight and Bulk Transport site.

Monitoring of this discharge commenced in 2007. The results for the period under review are presented in Table 27 along with a summary of all data from the site.

**Table 27** Chemical monitoring results for stormwater drain from mid Katere Road to the Mangaone Stream- site STW001116

Parameter	Un-ionised ammonia	BOD	Conductivity @ 20°C	DRP	Oil and Grease	pH	Suspended solids	Temp
Unit	g/m <sup>3</sup>	g/m <sub>3</sub>	mS/m@20C	g/m <sub>3</sub> P	g/m <sup>3</sup>	pH	g/m <sup>3</sup>	Deg .C
Minimum	0.00057	5	4.3	0.048	0.5	7	40	10.5
Maximum	0.04149	43	40.9	2.95	8.8	8.5	280	20.9
Median	0.00925	11	12.5	0.47	2	7.6	130	15.8
Number	17	18	19	17	18	19	19	19
10 Dec 2014	0.00217	<b>7.3</b>	4.3	0.176	<0.5	7.6	53	17.8
23 Mar 2015	0.00287	<b>31</b>	14.0	0.724	0.9	7.0	94	18.9
<i>RFWP Guideline</i>	<i>0.025</i>	<i>5.0</i>	<i>6-9</i>	<i>100</i>	<i>15</i>	<i>-</i>	<i>100</i>	<i>-</i>

**Key:** DRP Dissolved reactive phosphorus

BOD Biochemical oxygen demand

The consent held by NPDC for discharges into the Mangaone Stream has no conditions relating to the quality of the discharge.

The biochemical oxygen demand of this discharge exceeded the concentration given in the Regional Freshwater Plan for Taranaki for permitted activities (Rule 23), on both of the monitoring occasions. There were no stormwater consents issued to industries discharging via this point for most of the monitoring period. Freight and Bulk Transport Limited (FBT) applied for consent to discharge stormwater from this outfall via NPDC's network and consent 10008-1 was granted on 5 June 2015. FBT discharge was until that date unconsented and likely to have been contributing to nutrient loads in the discharge. Sampling of the FBT is programmed to occur in the 2015-2016 period.

The unionised ammonia concentration were found to be in compliance with the 0.025 g/m<sup>3</sup> limit set in the RFWP.

### Discharge to Mangaone Stream from Hurlstone Drive

Stormwater from the industrial area along Hurlstone Drive discharges to the Mangaone Stream immediately upstream of the State Highway 3 bridge, stormwater and wastewater from the batching plant of Allied Concrete (consent 4539) and stormwater and wash water from Nankervis Family Trust (consent 6965) contribute to this discharge.

The results of routine chemical monitoring for the period under review are presented in Table 28, together with a summary of all results for comparison.

The renewed consent does not contain conditions controlling the quality of the stormwater discharged from the Council's stormwater system, however with the exception of pH on 10 December 2014, at the time of sampling the discharge complied with the pH, suspended solids and oil and grease standards expected for a permitted activity, and were within the prescribed limits for consent holders discharging via this outlet.

It is noted that the influence of the discharge from AML Limited (AML) was evident in the pH recorded at this site during the survey on 10 December 2014, and there is a risk that this elevated pH could result in the conversion of any ammoniacal nitrogen present in the discharge (or stream) to the more toxic unionised ammonia. During the period under reviewed the levels of unionised ammonia in the discharge were found to be below the RFWP standard of 0.025 g/m<sup>3</sup> on both monitoring occasions.

**Table 28** Chemical monitoring results for stormwater drain from Hurlstone Drive to Mangaone Stream at SH3- site STW001035

Parameter	Ammoniacal nitrogen	Conductivity @ 20°C	Oil and grease	pH	Suspended solids	Temp.	Un-ionised ammonia
Unit	g/m <sup>3</sup> N	mS/m@20C	g/m <sup>3</sup>	pH	g/m <sup>3</sup>	Deg.C	g/m <sup>3</sup>
Minimum	0.006	2.8	<b>15</b>	6.5	2	10	0.00001
Maximum	0.344	225	36	12.1	390	21.4	0.38935
Median	0.064	10.5	<0.5	8.9	24	15.1	0.01298
Number	41	55	8.8	54	54	55	39
10 Dec 2014	0.029	12.9	b	<b>9.3</b>	52	17.0	0.01361
23 Mar 2015	0.134	10.0	b	7.2	10	17.7	0.00085
<i>RFWP Guideline</i>	-	-	15	6-9	100	-	0.025

**Key:** Results shown in bold within a table indicates that a guideline for a particular parameter (derived from Rule 23 of the Regional Freshwater Plan) has been exceeded

b parameter not determined, no visible hydrocarbon sheen and no odour

### 9.3.2 Bewley Road industrial development

An area between the right bank of the Waiwhakaiho River and Devon Road was once used as a rubbish dump. The reach of river adjacent to the old dump runs for about 740 metres, from a point between the Devon Road bridge and Constance Street downstream to a point near Vickers Road. The area has been substantially developed and now contains a retail park and a number of commercial operators.

There are three groundwater monitoring bores located around the periphery of the area, which NPDC is required by their consent to maintain for groundwater monitoring. There is a discharge monitoring point, at the outlet of the main drain which carries the groundwater to the river. The locations of the four sites are shown on Figure 4 as GND0548, GND0555, GND0556, and WKH000872. Stormwater from the retail area between Struthers Place and Constance Street, the commercial area of Struthers Place and part of Rifle Range Road and a small unnamed tributary that once discharged at this location are also piped to the Waiwhakaiho via this discharge point.

Groundwater bore #1 (the south bore, GND0548) is located near the corner of Struthers Place and Rifle Range Road. This is a replacement bore as the first bore sunk in this area was destroyed during stop-bank construction in 1997. The replacement bore was itself destroyed during landscaping in front of what was then the Hookers site, and a new bore was installed prior to the sampling survey undertaken in October 2002. These facts need to be considered when interpreting the results, and in particular the median values for parameters. The results for GND0548 are shown in Table 29 along with a summary of all monitoring data from the site.

**Table 29** Chemical monitoring results for Bewley Road landfill down gradient monitoring bore #1 - site GND0548

Parameter	Unit	Min	Max	Med	N	16 Jan 2015	19 May 2015	Consent limit
Alkalinity Total	g/m <sup>3</sup> CaCO <sub>3</sub>	78	409	327	44	375	281	-
Ammoniacal nitrogen	g/m <sup>3</sup> N	1.02	13.6	7.96	49	12.1	12.2	15
Bicarbonate	g/m <sup>3</sup> HCO <sub>3</sub>	95.16	498.98	416.02	38	457.5	342.8	-
Conductivity @ 20°C	mS/m@20C	60.4	133	79.8	51	77.8	73.6	-
Dissolved reactive phosphorus	g/m <sup>3</sup> P	0.003	0.238	0.006	42	0.006	0.004	0.065
Filtered COD	g/m <sup>3</sup>	11	50	28	43	33	39	-
Nitrite/nitrate nitrogen	g/m <sup>3</sup> N	0.006	0.7	0.005	40	<0.01	<0.01	-
pH	pH	6.5	7.1	6.8	51	6.7	6.73	7.5
Potassium	g/m <sup>3</sup>	10.5	25.4	20.4	42	24.7	21.0	-
Sulphate	g/m <sup>3</sup>	1	430	13.4	40	<1	5.7	-
Temperature	Deg.C	15.9	20	17.6	42	18.3	18.9	-
Un-ionised ammonia	g/m <sup>3</sup>	0.00509	0.0339	0.01888	42	0.02555	0.03390	-
Water Level	m	1.43	3	1.95	7	1.795	1.43	-
Zinc Dissolved	g/m <sup>3</sup>	0.005	0.165	0.008	42	<0.005	0.012	-

The groundwater complied with the consent limits for ammoniacal nitrogen, dissolved reactive phosphorus, and pH. It is noted however that the ammoniacal nitrogen concentration was only slightly lower than the historical maximum of 13.18 g/m<sup>3</sup> on both monitoring occasions and subsequent sampling in next monitoring period returned a new maximum of 13.6 g/m<sup>3</sup>. A review of the data suggests a trend of increasing ammoniacal nitrogen at this bore, however an increase is also noted at the control bore GND00556.

Potassium was also found to be close to the maximum for the site on both monitoring occasions and this also reflects a slow increase in potassium concentrations at the site. However the upper limit on the range of potassium concentrations found within acceptable levels for WHO drinking water guidelines<sup>1</sup>.

Groundwater monitoring bore #2 (north bore, GND0555) is on Rifle Range Road between Struthers Place and Vickers Road. This bore was also affected by stop-bank construction in a previous review period and had to be redrilled. During the 2001-2002 monitoring period it was found that this bore had collapsed internally and the

<sup>1</sup> Potassium in Drinking-water Background document for development of WHO *Guidelines for Drinking-water Quality*. World Health Organization 2009.

NPDC was requested to clear the bore or re-drill as necessary. The bore has subsequently been re-drilled (prior to the sampling run undertaken in June 2002) and a bore log was provided to the Council. During the 2007-2008 monitoring period the bore had again been destroyed by development activities in the area. NPDC replaced the bore at the request of the Council. The fact that this bore has been re-drilled a number of times needs to be considered in interpreting the results and in particular median values for parameters. The results for GND0555 are shown in Table 30 along with a summary of all monitoring data from the site.

**Table 30** Chemical monitoring results for Bewley Road landfill down gradient monitoring bore #2-site GND0555)

Parameter	Unit	Min	Max	Med	N	16 Jan 2015	19 May 2015	Consent limit
Alkalinity Total	g/m <sup>3</sup> CaCO <sub>3</sub>	36	630	273	38	310	248	-
Ammoniacal nitrogen	g/m <sup>3</sup> N	0.132	14.8	5.605	38	6.67	5.63	15
Bicarbonate	g/m <sup>3</sup> HCO <sub>3</sub>	43.92	614.9	317.2	32	378.2	302.6	-
Conductivity @ 20°C	mS/m@20C	31.1	106	56.6	40	59.1	56.4	-
Dissolved reactive phosphorus	g/m <sup>3</sup> P	0.003	0.028	0.005	33	0.005	0.003	0.065
Filtered COD	g/m <sup>3</sup>	8	75	28	37	15	22	-
Nitrite/nitrate nitrogen	g/m <sup>3</sup> N	0.001	2.02	0.02	30	<0.01	0.50	-
pH	pH	5.6	7	6.6	40	6.51	6.51	7.5
Potassium	g/m <sup>3</sup>	2.8	18.7	10.6	37	11.8	10.7	-
Sulphate	g/m <sup>3</sup>	1	270	6	37	<1	4.2	-
Temperature	Deg.C	16.1	21	18.2	29	20.10	19.3	-
Un-ionised ammonia	g/m <sup>3</sup>	0.00002	0.022	0.0127	29	0.01279	0.01611	-
Water Level	m	2.542	3.6	2.87	6	3.375	2.621	-
Zinc Dissolved	g/m <sup>3</sup>	0.005	0.353	0.019	37	<0.005	0.008	-

The consent limits for ammoniacal nitrogen, dissolved reactive phosphorus, and pH were complied with and all parameters were either similar to median of all results and/or were below the maximum with the exception of ammoniacal nitrogen and potassium. It noted that the rises in potassium and ammoniacal nitrogen are being noted at all bores, however the actual value being seen either comply with consent conditions (for ammoniacal nitrogen) or are within the WHO guidelines (potassium).

Groundwater monitoring bore #3 (the control bore, GND0556) is drilled into natural alluvial deposits beside Devon Road. This bore was affected by the raising of the ground surface around it by approximately 0.5 metres. The results for GND0556 are shown in Table 31.

**Table 31** Chemical monitoring results for Bewley Road landfill control bore #3 –site GND0556

Parameter	Unit	Min	Max	Med	N	16 Jan 2015	19 May 2015
Alkalinity Total	g/m <sup>3</sup> CaCO <sub>3</sub>	18	224	164	45	117	108
Ammoniacal nitrogen	g/m <sup>3</sup> N	0.084	3.92	0.768	46	2.37	1.36
Bicarbonate	g/m <sup>3</sup> HCO <sub>3</sub>	111.02	273.28	197.64	39	142.7	131.8
Conductivity @ 20°C	mS/m@20C	9.1	156.2	98.6	48	141	130
Dissolved reactive phosphorus	g/m <sup>3</sup> P	0.003	0.072	0.028	39	0.015	0.006
Filtered COD	g/m <sup>3</sup>	5	64	8	44	6	6
Nitrite/nitrate nitrogen	g/m <sup>3</sup> N	0.008	1.02	0.01	37	<0.01	1.02
pH	pH	5.5	6.9	6.6	48	6.43	6.36
Potassium	g/m <sup>3</sup>	12	35.9	24.8	44	35.7	35.5
Sulphate	g/m <sup>3</sup>	20.6	560	300	43	522	436
Temperature	Deg.C	15.5	19.5	17.5	38	19.4	18.5
Un-ionised ammonia	g/m <sup>3</sup>	0.00009	0.0064	0.00173	38	0.00432	0.00184
Water Level	m	2.115	2.42	2.385	7	2.385	2.115
Zinc Dissolved	g/m <sup>3</sup>	0.005	0.216	0.009	44	<0.005	0.007

At bore #3, the levels recorded for each of the parameters analysed were similar to those values previously observed, although it is noted that the ammoniacal nitrogen and potassium concentrations have been increasing since the 2004-2005 monitoring year. The ammoniacal nitrogen concentration was still significantly lower than in the other two bores, and is not at a concentration that causes concern.

The potassium concentration has been increasing in all three bores, but it is most pronounced in this bore

Overall the leachate component concentrations reported are relatively low in comparison to most municipal landfill leachates. There were fluctuations in parameters analysed, but these may also be consistent with the flushing effects of rainfall.

The results for the associated surface water and receiving water sampling are shown in Table 32 and Table 33 respectively along with summaries of all data from the sites.

**Table 32** Chemical monitoring results for Bewley Road landfill surface water discharge monitoring - site WKH000872

Parameter	Unit	Min	Max	Med	N	19 May 2015	Consent limits
Alkalinity Total	g/m <sup>3</sup> CaCO <sub>3</sub>	27	246	159	49	214	
Ammoniacal nitrogen	g/m <sup>3</sup> N	0.008	29	3.49	59	<b>27.8</b>	15
Conductivity @ 20°C	mS/m@20C	2.5	230	80.8	75	86.0	
Dissolved reactive phosphorus	g/m <sup>3</sup> P	0.003	3.14	0.005	40	0.009	0.065
Filtered COD	g/m <sup>3</sup>	5	700	14	46	11	

Parameter	Unit	Min	Max	Med	N	19 May 2015	Consent limits
Nitrite/nitrate nitrogen	g/m <sup>3</sup> N	0.01	8.48	2.76	34	8.48	
pH	pH	4.6	8.8	7.1	75	7.3	7.5
Potassium	g/m <sup>3</sup>	2.4	43	27.3	43	24.2	
Sulphate	g/m <sup>3</sup>	78	880	192	44	142	
Temperature	Deg.C	12.2	21.9	17.3	64	18.0	
Turbidity	NTU	11	300	22	22	11	
Un-ionised ammonia	g/m <sup>3</sup>	0.00004	0.37177	0.01752	47	0.22742	

**Key:** Results shown in bold within a table indicates that a consent limit for a particular parameter has been exceeded

The level of ammoniacal nitrogen found in the discharge was found to exceed the consent limit of 15 g/m<sup>3</sup>. However this is the second such occurrence and investigations undertaken by the consent holder showed other sources of this contaminant entering the network via a connection of unknown origin. No effects were noted in the stream and the subsequent results from sampling undertaken in the next monitoring period showed a marked reduction in ammoniacal nitrogen levels. NPDC has applied for a consent renewal which provides for a higher limit of ammoniacal nitrogen until the source of the elevated results can be determined.

The values obtained during the period under review were within the range of the historical results, with the exception of unionised ammonia, ammoniacal nitrogen and nitrate/nitrite nitrogen.

It is noted that the potassium, sulphate and dissolved zinc concentrations were all similar to or below their respective historical medians at this discharge point.

To assist in the interpretation of 'effects' of the discharge, the biannual groundwater sampling runs were carried out at times of low river flow and the three river sites above (WKH000920), alongside (WKH000925), and below (WKH000942) the dump site were also sampled. The results of this monitoring are given in Table 33.

**Table 33** Chemical monitoring results for Bewley Road landfill, dry weather receiving water chemical monitoring

Parameter		Waiwhakaiho		
		Constance Street (WKH000920)	Opposite Firth's (Ford) (WKH000925)	Above Mangaone Confluence (WKH000942)
<b>16 Jan 2015</b>				
Time	NZST	11:05	10:50	10:25
Conductivity	mS/m	14.2	14.6	15
DRP	g/m <sup>3</sup> P	0.009	0.007	0.007
Unionised ammonia	g/m <sup>3</sup>	0.00045	0.00095	0.0002
Ammoniacal N	g/m <sup>3</sup> N	0.007	0.023	0.012
pH	pH	8.1	7.9	7.5
Temperature	Deg.C	21.7	21.6	21.2
Turbidity	NTU	2.7	2.1	2.3
<b>19 May 2015</b>				
Time	NZST	08:10	07:50	08:20
Conductivity	mS/m	10.9	11	11

Parameter		Waiwhakaiho		
		Constance Street (WKH000920)	Opposite Firth's (Ford) (WKH000925)	Above Mangaone Confluence (WKH000942)
DRP	g/m <sup>3</sup> P	0.014	0.013	0.013
Unionised ammonia	g/m <sup>3</sup>	0.00007	0.00014	0.0001
Ammoniacal N	g/m <sup>3</sup> N	0.008	0.021	0.015
pH	pH	7.5	7.4	7.4
Temperature	Deg.C	12.3	12.1	12.1
Turbidity	NTU	0.8	0.68	1

The analyses showed during the low flow survey undertaken in the period under review, the dissolved reactive phosphorus and ammoniacal nitrogen increased between WKH000920 and WKH000925, then decreased slightly at WKH000942. The pH decreased in a downstream direction. There would have been little, if any environmental effect associated with these changes.

### 9.3.3 Investigations, interventions, and incidents

In the period under review it was not necessary for the Council to undertake significant additional investigations and interventions, or record incidents, in association with the New Plymouth District Council's conditions in resource consents or provisions in Regional Plans that are monitored under this programme.

## 9.4 Discussion

### 9.4.1 Environmental effects of exercise of consents

During the period under review no significant adverse effects were observed in the receiving environment as a result of the exercise of the New Plymouth District Council stormwater or leachate consents.

No issues were noted associated with the maintenance of the reticulated stormwater systems or outlet structures on the either the Waiwhakaiho River or the Mangaone Stream.

The wet weather surveys found no significant effects downstream of the discharges in the Waiwhakaiho River

Elevated BOD, unionised ammonia and suspended solids were observed in discharge samples collected from the mid Katere Road drain. No significant adverse effects were noted in the Mangaone Stream at the time of sampling. The on-going discharge quality matters associated with these findings are being addressed with Freight and Bulk Transport, who discharge via this outlet.

Although the pH and unionised ammonia concentration of the discharge from the Hurlstone Drive area to the Mangaone Stream at State Highway 3 were elevated on occasion, the ammoniacal nitrogen concentration was relatively low and these effects were due to the influence of the AML's discharge. During the period under review the pH of the NPDC discharge was found to over 9.0 and this is most likely the result of an illegal discharge occurring at AML at the time. No adverse effects found were

found in the receiving water as a result of this, however and infringement notice was issued to AML for the unauthorised discharge.

Groundwater samples obtained during the period under review were in compliance with consent 4984.

Overall, with the exception of bicarbonate, the leachate component concentrations reported were relatively low in comparison to most municipal landfill leachates. There continues to be fluctuations in parameters analysed but this is generally consistent with the flushing effects of rainfall. It is noted that the ammoniacal nitrogen and potassium concentrations in the samples collected from bore 3, the control bore up gradient of the dump area, and bore 1, the south bore on the corner of Struthers Place and Rifle Range Road continue their upward trend. However, the concentrations are not so high as to be of immediate concern, and little, if any effect was observed in the receiving water. Council will continue to monitor any changes. Also noted in the control bore is the persistently elevated sulphate levels which may indicate contamination from other sources and this is currently being investigated.

#### 9.4.2 Evaluation of performance

A tabular summary of the consent holder's compliance record for the period under review is set out in Table 34, Table 35, and Table 36.

**Table 34** Summary of performance for consent 1275-3

<b>Purpose: To discharge stormwater discharge from the Katere Industrial area into the Mangaone Stream</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
1. Adoption of best practicable option to minimise adverse effects	Inspection and receiving water monitoring	Yes
2. Prevention of erosion	Visual assessment at inspection and receiving water sampling	Yes
3. Discharge can not cause specified adverse effects in Mangaone Stream	Inspection and receiving water monitoring	Yes
4. Optional review provision re environmental effects	Next opportunity to review in June 2020	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		<b>High</b>
Overall assessment of administrative performance in respect of this consent		<b>High</b>

N/A = not applicable

**Table 35** Summary of performance for 5163-2

<b>Purpose: To discharge stormwater discharge from an industrial subdivision into the Waiwhakaiho River</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
1. Adoption of best practicable option to minimise adverse effects	Inspection and receiving water monitoring	Yes
2. Prevention of erosion	Visual assessment at inspection and receiving water	Yes



<b>Purpose: To discharge stormwater discharge from an industrial subdivision into the Waiwhakaiho River</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
	sampling	
3. Discharge can not cause specified adverse effects in Mangaone Stream	Inspection and receiving water monitoring	Yes
4. Optional review provision re environmental effects	Next opportunity to review in June 2020	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		<b>High</b>
Overall assessment of administrative performance in respect of this consent		<b>High</b>

N/A = not applicable

**Table 36** Summary of performance for consent 4984-1,

<b>Purpose: To discharge leachate discharge from a former landfill into the Waiwhakaiho River</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
1. Limits on chemical composition of discharge	Inspection and sampling of discharge	Ammoniacal nitrogen exceedance due to private connection to reticulated system
2. Discharge cannot cause specified adverse effects beyond mixing zone	Visual assessment at inspection and receiving water sampling	Yes
3. Maintenance of monitoring bores	Inspection and accessibility at sampling	Yes
4. Option for review re chemical sampling finding significant adverse effects	Chemical sampling did not find significant adverse effects	N/A
5. Optional review provision re environmental effects	Consent expires 2014. No further opportunities for review	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		<b>High</b>
Overall assessment of administrative performance in respect of this consent		<b>High</b>

N/A = not applicable

During the period under review, New Plymouth District Council demonstrated a high level of environmental performance and high level of administrative performance and compliance with its resource consents as defined in Section 1.1.5.

### 9.4.3 Recommendation from the 2012-2014 Biennial Report

In the 2012-2014 Biennial Report, it was recommended:

THAT monitoring of discharges from NPDC in the 2014-2015 year continues at the same level as in 2012-2014.

This recommendation was carried out in full.

#### **9.4.4 Alterations to monitoring programmes for 2015-2016**

In designing and implementing the monitoring programmes for water discharges in the region, the Council has taken into account the extent of information made available by previous authorities, its relevance under the RMA the obligations of the Act in terms of monitoring discharges and their effects, and subsequently reporting to the regional community. The Council also takes into account the scope of assessments required at the time of renewal of permits, and the need to maintain a sound understanding of industrial processes within Taranaki discharging to the environment.

It is proposed that for 2015-2016, the programme remains unchanged. A recommendation to this effect is attached to this report.

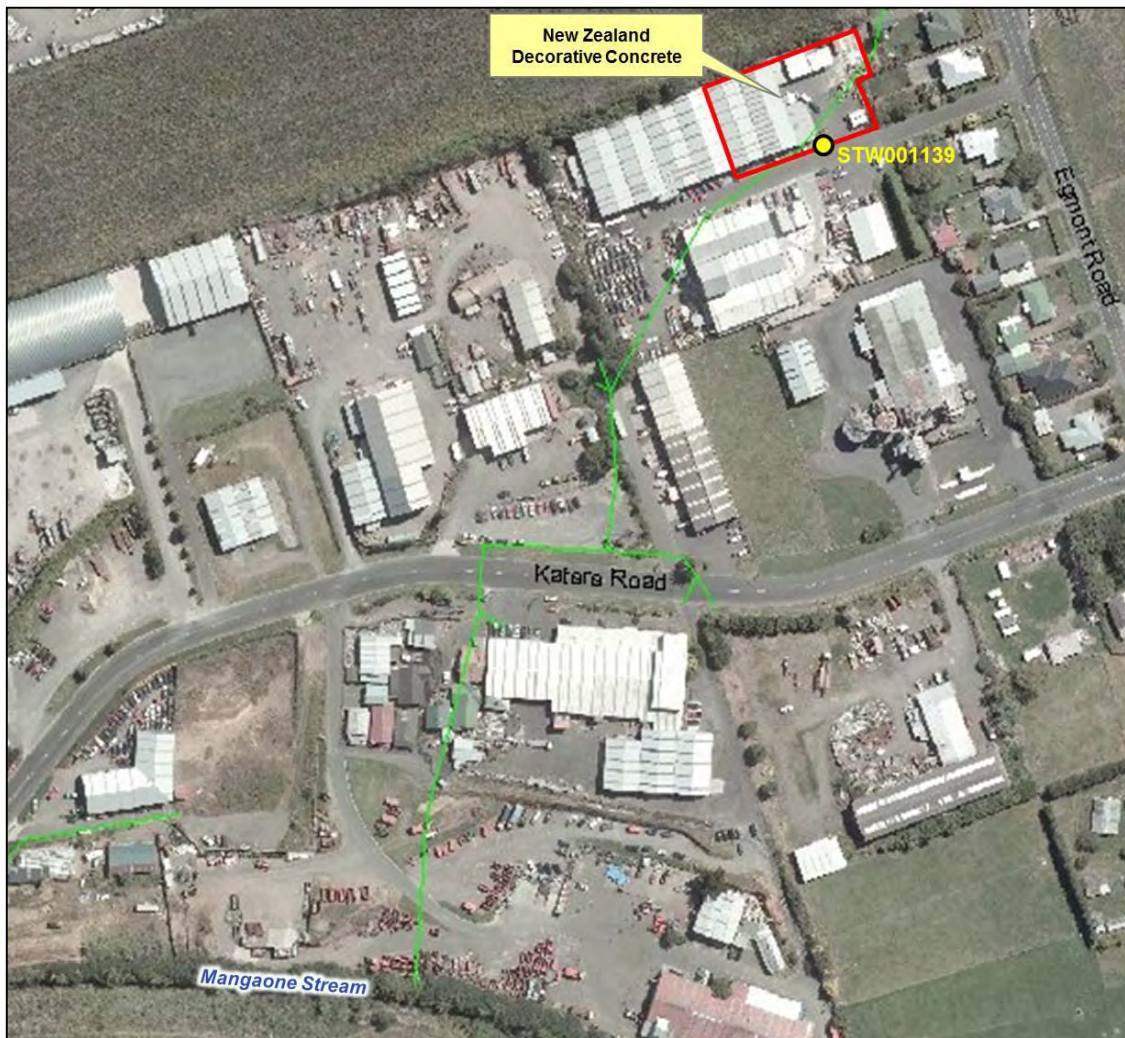
### **9.5 Recommendation**

THAT monitoring of discharges from New Plymouth District Council in the 2015-2016 year continues at the same level as in 2014-2015.

## 10. New Zealand Decorative Concrete Limited

### 10.1 Process description

New Zealand Decorative Concrete manufactures products for sealing and colouring concrete using cement, silica sands, plain sands, iron oxides and titanium dioxide. Organic solvents, acrylic resins, thinners and hydrochloric acid are also used at the site. The bulk of the hazardous substances were originally stored in a shipping container in the stormwater catchment, however a new hazardous goods store and a manufacturing building have been constructed. Stormwater from the site runs via a shallow concrete channel round the front of the office and into a stormwater grate connected to the New Plymouth District Council's stormwater drainage system. The stormwater combines with that from a number of other small industrial sites, including that of Farmlands Co-operative Society Limited, before discharging into the Mangaone Stream about 350 metres [m] downstream of Egmont Road.



**Figure 15** New Zealand Decorative Concrete site and discharge point

All manufacturing activities occur within the rear bay of the building, with the dry products stored in the front bay. Any liquid wastes generated are directed to a sump within the manufacturing area and are removed on an as required basis by a waste contractor.

The dry products are dusty therefore to minimise the potential for effects on air quality, and the potential for the dust to impact on stormwater quality, the floor of the storage bay is vacuumed daily.

A small amount of water blasting of concrete sample moulds is undertaken at the site to remove any dry concrete residues. This is currently undertaken in the stormwater catchment, but no detergents are used.

The delivery of hazardous substances occurs in the stormwater catchment, and the transport of the substances from storage to the manufacturing area is also through the stormwater catchment.

At the time of the consent application Council was informed that the Company was in the process of developing and testing a contingency plan as part of the applicant's HSNO emergency plan requirements. However, at the time of writing this report, a copy of a completed plan had not been submitted for Council approval.

## 10.2 Water discharge permits

New Zealand Decorative Concrete Limited holds consent **7450-1** to cover the discharge of stormwater from a decorative concrete products manufacturing site into the Mangaone Stream in the Waiwhakaiho catchment.

This permit was issued by Taranaki Regional Council on 22 December 2009 under Section 87(e) of the RMA. It is due to expire on 1 June 2026.

Ten special conditions are appended to the consent, which include a requirement for the consent holder to adopt the best practicable option. The 'standardised' condition limiting the pH range (6-9), and maximum concentrations of oil and grease (15 g/m<sup>3</sup>), and suspended solids (100 g/m<sup>3</sup>) are imposed. The stormwater catchment area is limited. There are requirements on the consent relating to the treatment of stormwater from the site, and hazardous substances storage.

There are also conditions that must be met relating to the receiving water of the Mangaone Stream. A contingency plan must be prepared in case of accidental spillage, and Council must be notified if there are any changes in activities at the site, as these would not have been considered at the time the consent application was processed. There was provision for the consent to lapse if it was not exercised, and there is provision for a review of the conditions of the consent in June 2014, June 2020 and/or if Council is advised of any changes to the activities undertaken at the site

The permit is attached to this report in Appendix I.

## 10.3 Results

### 10.3.1 Inspections

The site was inspected on four occasions during the period under review. These were on 12 August 2014, 10 November 2014, 11 February 2015, and 22 May 2015.

The inspections focussed on the conditions of the stormwater drains, evidence of spill and the hazard chemical storage. Generally it was found that the site was clean and tidy and that the drains were free of sources of contamination. On one occasion (22 May 2015), it was noted that one drain was due to be cleaned and the site manager undertook to have this done.

### 10.3.2 Results of discharge monitoring

Stormwater from New Zealand Decorative Concrete's site is monitored where the overland flow enters the roadside drain at the entrance to the yard (STW001139). The results for the period under review are given in Table 37 along with a summary of all results from the site.

**Table 37** Chemical monitoring results of New Zealand Decorative Concrete Limited's stormwater - site STW001139

Parameter	Conductivity @ 20°C	Oil and Grease	pH	Suspended solids	Temperature	Turbidity
Unit	mS/m@20C	g/m <sup>3</sup>	pH	g/m <sup>3</sup>	Deg.C	NTU
Minimum	3.9	0.5	7.4	6	11.9	4.6
Maximum	15.4	1.6	8.7	63	22.6	79
Median	11.6	0.2	7.9	32	17.3	21
Number	7	7	7	7	7	7
10 Dec 2014 <sup>a</sup>	-	-	-	-	-	-
23 Mar 2015	13.0	<0.5	7.7	63	17.3	21
<i>Consent limit</i>	-	15	6-9	100	-	-

**Key:** Results shown in bold within a table indicates that a consent limit for a particular parameter has been exceeded

a Insufficient flow

The discharge complied with the discharge limits for pH, suspended solids and oil and grease at the time of sampling.

### 10.3.3 Investigations, interventions, and incidents

In the period under review, the Council was not required to undertake significant additional investigations and interventions, or record incidents, in association with New Zealand Decorative Concrete's conditions in resource consents or provisions in Regional Plans.

## 10.4 Discussion

### 10.4.1 Discussion of site performance

The site was well managed during the period under review. There were no operational practices found at the site that needed addressing, and when sampled,

the site discharge complied with the component concentration limits given by the consent.

#### 10.4.2 Environmental effects of exercise of consent

There were no adverse effects found during the period under review that were attributable to activities at the New Zealand Decorative Concrete site.

#### 10.4.3 Evaluation of performance

A tabular summary of the consent holder's compliance record for the period under review is set out in Table 38.

**Table 38** Summary of performance for consent 7450-1,

<b>Purpose: To discharge of stormwater into the Mangaone Stream</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
1. Adopt best practicable option to avoid, remedy or mitigate effects	Inspection and consultation with site operators	Yes
2. Stormwater catchment area limited to 0.26 ha	Inspection	Yes
3. Stormwater to be treated by March 2010, system to be maintained to Council's satisfaction	Inspection	Yes
4. Hazardous substance storage to be bunded or otherwise contained	Inspection	Yes
5. Limits on chemical composition of discharge	Observation during inspection and discharge sampling	Yes
6. Discharge cannot cause specified adverse effects beyond mixing zone	Visual assessment at inspection and receiving water sampling and biomonitoring	Yes
7. Preparation of contingency plan by 22 March 2010. Plan to be maintained thereafter	Review of Council records, and consultation with site operator at inspection. Plan accepted as an interim plan, but Company advised that additional details required	Yes
8. Notification of changes to activities at the site	Inspection and consultation with site operators	N/A
9. Consent to lapse on 31 December 2014 if not exercised	Consent has been exercised	N/A
10. Provision for review of consent	No review option this period	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		<b>High</b>
Overall assessment of administrative performance in respect of this consent		<b>High</b>

N/A = not applicable

During the period under review, New Zealand Decorative Concrete Limited demonstrated a high level of environmental performance and high level of

administrative performance and compliance with the resource consents as defined in Section 1.1.5 in relation to its Egmont Rd site.

#### **10.4.4 Recommendation from the 2012-2014 Biennial Report**

In the 2012-2014 Biennial Report, it was recommended:

THAT monitoring of discharges from New Zealand Decorative Concrete Limited in the 2014-2015 year continues at the same level as in 2012-2014.

This recommendation was carried out in full.

#### **10.4.5 Alterations to monitoring programmes for 2015-2016**

In designing and implementing the monitoring programmes for water discharges in the region, the Council has taken into account the extent of information made available by previous authorities, its relevance under the RMA the obligations of the Act in terms of monitoring discharges and effects, and subsequently reporting to the regional community. The Council also takes into account the scope of assessments required at the time of renewal of permits, and the need to maintain a sound understanding of industrial processes within Taranaki discharging to the environment.

It is proposed that for 2015-2016, the programme remains unchanged. A recommendation to this effect is attached to this report.

#### **10.5 Recommendation**

THAT monitoring of discharges from New Zealand Decorative Concrete Limited in the 2015-2016 year continues at the same level as in 2014-2015.



## 11. New Zealand Railways Corporation

### 11.1 Process description

New Zealand Railways Corporation (NZRC) owns a rail terminal on a site off Smart Road. In addition to transportation of freight, the terminal is utilised as a maintenance depot. The freight receipt and dispatch area and the refuelling and maintenance depots are situated at the Smart Road end of the site. The various activities undertaken at the site are carried out by the subsidiaries: Ontrack, Kiwi Rail, United Group Rail, and Toll Tranzlink, and Transfield Services.



**Figure 16** New Zealand Railways Corporation's rail yard and sampling point locations

Drainage from the area to the west and north of the offices (i.e. the refuelling area and maintenance area) flows to the Waiwhakaiho River via McLeod's Drain, an underground pipe that also receives stormwater from Ravensdown's fertiliser depot, other industrial sites, a residential area, and a rural area. Wastewater from washing of wagons, containers and locomotives is treated in a three-stage oil separator before discharge to the river. Liquids from the repair depot and locomotive fuelling point are discharged to an underground holding tank that is emptied by a waste disposal company at two-monthly intervals. The holding tank is also connected to the oil separator via an automatic pump in case of overflowing.

Drainage from the (sealed) freight area and the unsealed areas of the eastern end of the site is to the Mangaone Stream and its tributaries. The consent for this area of the site remained under the name of Tranz Rail Limited until March 2008.



Railway wagons carrying containers of hazardous substances and the bulk products including urea, resins, fertilisers, di-ammonium phosphate (DAP), lime, oils, bitumen and carbon dioxide are held temporarily on the tracks in this area. No loading or unloading of freight takes place in the stormwater catchment that drains to the Mangaone Stream.

## 11.2 Water discharge permits

NZRC holds two consents for the Smart Road railway yard. One consent relates to the discharge of treated wastewater and stormwater to the Waiwhakaiho River, and the other to the discharge of stormwater to the Mangaone Stream. Both consents were previously held by Tranz Rail Limited.

NZRC held consent 3528 to discharge up to 13 cubic metres/day of stormwater, including treated wastewater from washing and maintenance of wagons, containers and locomotives, into the Waiwhakaiho River. It was granted on 24 July 1996 and it expired on 1 June 2014.

The 'standardised' conditions are imposed, with additional conditions that place limits on maximum concentrations on ammonia and dissolved phosphorus (both 20 g/m<sup>3</sup>), and restrict the type of cleaning operations. The consent is the second issued for the discharge since 1990. This consent expired on 1 June 2014.

An application to renew this consent (under the name of KiwiRail Holdings Limited) was received by Council on 28 February 2014, and therefore under Section 124 of the RMA, the Council has exercised its discretion and has allowed the activity to continue under the conditions of the expired consent until a decision is made on the renewal application.

NZRC holds consent 1735-3 to discharge stormwater from the Smart Road Rail Terminal into an unnamed tributary of the Mangaone Stream, and into the Mangaone Stream in the Waiwhakaiho catchment. It was granted on 31 July 2009 and will expire on 1 June 2026.

In addition to the 'standardised conditions' (4, 5, and 6), the consent requires the consent holder to adopt the best practicable option (1), limits the catchment area covered by the consent (2), requires the bunding of longer term storage of liquid hazardous substances (3), and requires that a stormwater management plan be prepared and maintained (7). The consent includes provisions for the consent to lapse if it is not exercised (8), and for review of the conditions of the consent (9).

Copies of all permits are attached to this report in Appendix I.

## 11.3 Results

### 11.3.1 Inspections

The site was inspected on four occasions during the period under review. These were on 12 August 2014, 20 November 2014, 4 March 2015 and 25 May 2015.

The inspections focussed on treatment systems, evidence of any spills or leaks, the condition of the drains, and the condition of the diesel containment bund.

The inspections found that overall the site was found to be in good order and free of spills and other sources of contamination. On one occasion it was noted that a silt fence needed attention and that the interceptor was due for clean.

The site was also visited for the purposes of renewing consent and New Zealand Rail was requested under section 92 of the RMA to provide a detailed site plan showing the layout of the sites stormwater and treatment systems.

## 11.3.2 Chemical analysis

### 11.3.2.1 Results of discharge monitoring

The discharge of stormwater from the freight and fuel handling and storage areas is monitored where the stormwater enters the Smart Road stormwater drain, south of the railway overbridge (site code IND002014). The results for period under review are given in **Table 39** with a summary of all results from the site for comparison. A new site (site code STW001117) had been established during the 2006-2007 year for sampling of the site discharge from the eastern end of the site into the Mangaone Stream, via the Mangamiro Stream. As the discharge sampled was only one of approximately eight NZRC discharges that enter the Mangamiro Stream (which is culverted for the entire stretch flowing under their site) it was subsequently decided that this was not truly representative of the overall quality of the NZRC discharges to this receiving water, which exits the culvert immediately upstream of its confluence with the Mangaone stream. From the start of the 2010-2012 period, a different approach was taken at the NZRC site, with any change in the stream being attributable to the consent holder. The result of this monitoring are reported in 11.3.2.2.

**Table 39** Chemical monitoring results for Smart Road rail yard stormwater discharge

Parameter	Ammoniacal nitrogen	BOD	Conductivity @ 20°C	Oil and grease	Dissolved reactive phosphorus	pH	Suspended solids	Temp.	Un-ionised ammonia
Unit	g/m <sup>3</sup> N	g/m <sup>3</sup>	mS/m@20C	g/m <sup>3</sup>	g/m <sup>3</sup> P	pH	g/m <sup>3</sup>	Deg.C	g/m <sup>3</sup>
Minimum	0.004	0.5	2.3	43	0.021	5.7	2	10.3	0.00004
Maximum	12	37	62	<0.5	3.24	8.4	160	20.8	0.12254
Median	0.177	3.7	15.4	22.7	0.182	7.2	16	16	0.0011
Number	46	42	52	0.9	43	52	51	52	45
10/12/2014	0.052	3.2	11.9	b	0.213	7.4	10	17.9	0.00053
23/03/2015	0.072	2.8	19.4	b	0.07	7.1	6	17.8	0.00037
11/06/2015	0.048	0.5	18.6	b	0.094	7.2	<2	13.9	0.00023
<i>Consent limit</i>	20	-	20	15	20	6-9	100	-	-

**Key:** b parameter not determined, no visible hydrocarbon sheen and no odour

Compliance with consent limits was achieved for all parameters during the period under review.

### 11.3.2.2 Results of receiving environment monitoring

The Mangamiro Stream is culverted under the Smart Road rail terminal and emerges immediately upstream of the confluence of the Mangamiro Stream and Mangaone Stream. The stormwater from the eastern area of the terminal is discharged into the Mangamiro Stream at about eight different points. This part of the yard is predominantly unsealed, although there is a small proportion of this sub-catchment that is sealed and contains the railyard's freight handling activities.

The Mangamiro Stream is monitored at the point of entry into the culvert (site code MMR000060) and at the culverts outlet to the Mangaone Stream (site code MMR000100). The result of the monitoring undertaken during the period under is given in Table 40.

**Table 40** Receiving environment chemical monitoring results for Smart Road rail yard stormwater discharge to the Mangamiro Stream

Parameter	Unit	10 Dec 2014		23 Mar 2015	
		MMR000061 U/s Railyard	MMR000100 D/s Railyard	MMR000061 U/s Railyard	MMR000100 D/s Railyard
Conductivity @20°C	mS/m	16.4	11.1	21	20.9
Dissolved reactive phosphorus	g/m <sup>3</sup> P	0.005	0.058	0.006	0.009
Oil and grease	g/m <sup>3</sup>	b	b	b	b
Unionised ammonia	g/m <sup>3</sup> N	0.00031	0.00057	0.00077	0.0019
Ammoniacal nitrogen	g/m <sup>3</sup> N	0.133	0.145	0.334	0.413
pH	-	6.8	7	6.8	7.1
Suspended solids	g/m <sup>3</sup>	10	190	7	4
Temperature	oC	16.7	17.3	16.3	16.4
Turbidity	NTU	9.6	190	11	7.8

**Key:** b parameter not determined, no visible hydrocarbon sheen and no odour

The sampling undertaken 10 December 2014 showed no indication that the discharges from the site were non-compliant in regards to pH and oil and grease. However on this occasion there was a marked increase in the concentration of suspended solids found in the downstream site just upstream of the confluence of the Mangamiro and Mangaone Streams. Monitoring undertaken up and downstream of the confluence in the Mangaone Stream however did not show any increase in suspended solids as a result.

The sampling undertaken on 23 March 2015 no such increase in suspended solids was observed and all other parameters were in acceptable ranges.

## 11.4 Investigations, interventions, and incidents

In the period under review, the Council was not required to undertake significant additional investigations and interventions, or record incidents, in association with NZRC's conditions in resource consents or provisions in Regional Plans.

## 11.5 Discussion

### 11.5.1 Discussion of site performance

The bulk diesel bund and interceptors were well managed during the period under review. Dangerous goods storage were generally well managed.

No other spills were noted in the refuelling area or freight handling area during the period under review. The consent holder was requested to undertake minor works during the period under review.

### 11.5.2 Environmental effects of exercise of consent

The concentrations of contaminants in the discharge to the Waiwhakaiho River for the period under review were well within the limits imposed by the conditions of the resource consent. The discharge from this site had no effect on the stormwater discharge from McLeod's drain (Table 24) or on the receiving water.

Although it was noted on one occasion there was an increase in suspended solids in the Mangamiro Stream that is likely to have been attributable to the site on one occasion, no measurable effects were noted in the Mangaone Stream as a result. Otherwise physicochemical monitoring found some measurable, changes in some of the parameters monitored surveys were less than minor, and no adverse effects were observed.

### 11.5.3 Evaluation of performance

A tabular summary of the NZRC's compliance record for the period under review is set out in Table 41 and Table 42.

**Table 41** Summary of performance for consent 1735-3,

<b>Purpose: To discharge stormwater into the Mangaone Stream</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
1. Adoption of best practicable option to prevent or minimise adverse effects	Inspection and receiving water monitoring	Yes
2. Limits stormwater catchment to 11.28 ha	Inspection	Yes
3. Bunding of hazardous substances if on site for more than 3 days	Inspection	N/A
4. Concentration limits upon potential contaminants in discharge	By inference from chemical sampling of receiving water	Yes
5. Discharge cannot cause specified adverse effects beyond mixing zone	Visual assessment at inspection and receiving water sampling and biomonitoring	Yes
6. Prepare and maintain contingency plan	Review of documentation received. Latest version May 2011	Yes

<b>Purpose: To discharge stormwater into the Mangaone Stream</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
7. Prepare and maintain management plan and review every 2 years	Review of documentation received.	New plan received with application for renewal
8. Provision for lapsing of consent	Consent exercised	N/A
9. Provision for review of conditions	Consent expired-under section 124 protection	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		<b>High</b>
Overall assessment of administrative performance in respect of this consent		<b>High</b>

N/A = not applicable

**Table 42** Summary of performance for consent 3528-2

<b>Purpose: To discharge of stormwater and treated wastewater into the Waiwhakaiho River</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
1. Concentration limits upon potential contaminants in discharge	Chemical sampling	Yes
2. Prepare and maintain contingency plan	Review of documentation received. Latest version May 2011	Yes
3. Restriction on products that can be washed from containers	Observations during inspection	Yes
4. Discharge cannot cause specified adverse effects beyond mixing zone	Visual assessment at inspection and receiving water sampling and biomonitoring	Yes
5. Provision for review of consent	No further opportunities for review	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		<b>High</b>
Overall assessment of administrative performance in respect of this consent		<b>High</b>

N/A = not applicable

During the period under review, New Zealand Railways Corporation Limited demonstrated a high level of environmental performance and high level of administrative performance and compliance with the resource consents as defined in Section 1.1.5 in relation to its Smart Rd site.

#### **11.5.4 Recommendation from the 2012-2014 Biennial Report**

In the 2012-2014 Biennial Report, it was recommended:

THAT monitoring of discharges from New Zealand Railways Corporation in the 2014-2015 year continues at the same level as in 2012-2014.

This recommendation was implemented in full.

### **11.5.5 Alterations to monitoring programmes for 2015-2016**

In designing and implementing the monitoring programmes for water discharges in the region, the Council has taken into account the extent of information made available by previous authorities, its relevance under the RMA the obligations of the Act in terms of monitoring discharges and their effects, and subsequently reporting to the regional community. The Council also takes into account the scope of assessments required at the time of renewal of permits, and the need to maintain a sound understanding of industrial processes within Taranaki discharging to the environment.

It is proposed that for 2015-2016, the programme remains unchanged. A recommendation to this effect is attached to this report.

### **11.6 Recommendation**

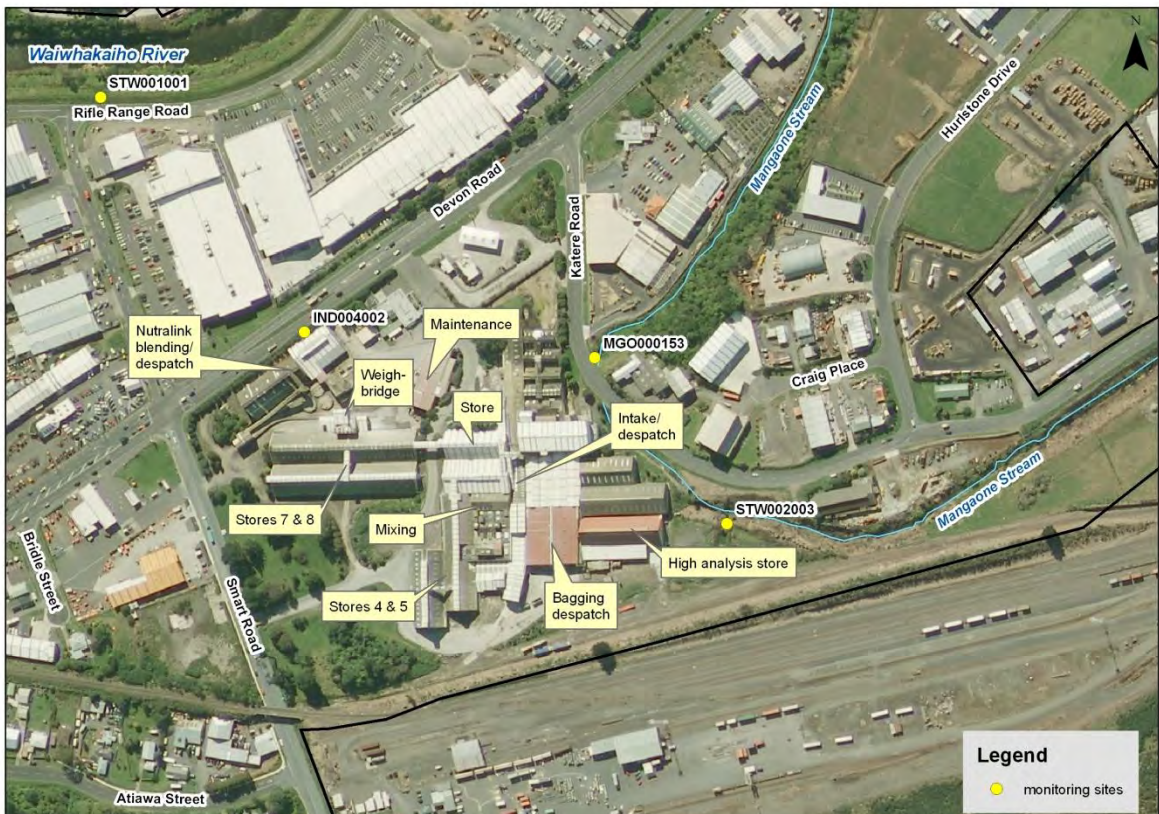
THAT monitoring of discharges from New Zealand Railways Corporation in the 2015-2016 year continues at the same level as in 2014-2015.

## 12. Ravensdown Fertiliser Co-operative Limited

### 12.1 Process description

The New Plymouth depot of Ravensdown Fertiliser Co-operative Limited (Ravensdown) occupies an area of about 7 ha bounded by Devon, Smart and Katere Roads, and the Smart Road rail yard (Figure 17). The Mangaone Stream touches the eastern boundary. The depot receives, bags, blends and distributes fertilisers in various forms, namely superphosphate, lime, dolomite and imported high analysis products such as ammonium sulphate, urea, triple super, potassium chloride (potash) and monoammonium and diammonium phosphates (MAP & DAP). Small volumes of trace element fertilisers such as zinc sulphate are also handled through the store. Approximately 250,000 tonnes of fertiliser are distributed per annum.

A total of 7 permanent staff are employed at the site, who are supplemented by 2 full time equivalent contract employees for bagging and maintenance. Three sales staff are also based on site.



**Figure 17** Ravensdown Fertiliser Co-operative Limited site and sampling point locations

Until 1 July 1997, Farmers Fertiliser Limited manufactured super phosphate on the site by acidulation of phosphate rock. Sulphuric acid was manufactured from elemental sulphur. A chrome sulphate plant was run in conjunction with the sulphuric acid plant. Hydrofluorosilicic acid was produced as a by-product of the rock acidulation process. The manufacturing plants were all decommissioned and subsequently removed from site, with the acid plant being the last plant to be removed, which was completed during the 2002-2003 year. After decommissioning,

the acid tank was retained for storage of liquid wastes containing high levels of fertiliser.

Stormwater from the site discharges to both the Waiwhakaiho River and its tributary the Mangaone Stream.

Drainage from western and northern parts of the site flows to the Waiwhakaiho River (Consent 3140), via an underground drain that runs beside Devon Road to Smart Road intersection, where it meets a piped tributary of the river. The piped tributary, known as McLeod's Drain, originates in the Queens Road area and runs beneath lower Smart Road for about 600 metres from the railway, to join the river about 50 metres downstream of Smart Road. The mean flow of the tributary is about 10 L/s. All of the manufacturing plants were in this catchment.

Drainage from southern and eastern parts of the site flows to the Mangaone Stream at several points (Consent 3865). The catchment area of about 2.8 ha includes the (road and rail) transfer area for fertilisers. Part of the fertiliser transfer area is on land owned by New Zealand Railways Corporation (formerly TranzRail). The main discharge is via a short ditch that meets the Mangaone Stream about 150 metres above the Katere Road bridge. The Mangamiro Stream, which is a small piped tributary of the Mangaone Stream, exits just upstream of the Ravensdown stormwater drain. The other discharge points are mainly roof drain outlets.

Ravensdown, when seeking new consents for the stormwater discharges in 1997, stated that its activities would be limited to receipt of fertilisers by road from Port Taranaki and by rail from Napier, and the despatch of fertilisers by both road and rail. The Company intended to use only that (south-eastern) part of the site occupied by the old acidulation plant and fertiliser load out areas, and planned to dispose of the remainder by either sale or lease. At that time Council was informed that, to minimise contamination of stormwater, all loading and unloading of fertilisers would be under cover, and vehicles would travel only on sealed surfaces. Ravensdown are continuing to progress towards the sealing of metal areas subject to heavy traffic flow, although occasional loading and unloading of trucks occurs outside the high analysis store in the south east area of the site.

Challenge Petroleum Limited purchased a parcel (0.65 ha) of the property at the intersection of Devon and Katere Roads for use as a road service station in 1998. This was the location of the old chrome plant building, which was removed completely. The service station has subsequently been redeveloped into an office block, which included the removal of the underground storage tanks.

The old acid plant site was previously occupied by Nutralink for blending of fertilisers, followed by Freight and Bulk Transport Limited for storage and dispatch of grain and similar products.

## **12.2 Water discharge permits**

Ravensdown blends, stores and distributes fertiliser at a depot situated between Devon, Katere and Smart Roads. Ravensdown was granted two resource consents on 26 November 1997, to discharge stormwater from the depot to the Waiwhakaiho River and to the Mangaone Stream for a period until 1 June 2014.



Discharge permit **3140** provides for the discharge of up to 700 litres per second of stormwater to the Waiwhakaiho River via McLeod's Drain, with 'standardised' conditions. The mixing zone boundary in the Waiwhakaiho River extends 150 metres downstream from the point of discharge of McLeod's Drain. The concentration of un-ionised ammonia in the river may not exceed 0.025 g/m<sup>3</sup>. Review of conditions may take place in the month of June 1999, 2002 or 2008.

Discharge permit **3865** provides for the discharge of up to 700 litres per second of stormwater to the Mangaone Stream, with 'standardised' conditions. The mixing zone boundary is defined as Katere Road bridge, about 150 metres below the discharge point. The concentration of un-ionised ammonia in the stream may not exceed 0.025 g/m<sup>3</sup>. The discharge of phosphorus is to be minimised. Review of conditions may take place in the month of June 1999, 2002 or 2008.

Applications to renew these consents were received by Council on 19 November 2013, and therefore under Section 124 of the RMA, the activity can continue under the conditions of the expired consent until a decision is made on the renewal applications.

Ravensdown exercised two other resource consents in relation to the fertiliser depot. Discharge permit **4024** provides for emissions to air, mainly dust. Monitoring of this permit is addressed in a separate report.

## **12.3 Results**

### **12.3.1 Inspections**

Compliance monitoring inspections were conducted on three occasions at the Ravensdown site during the period. These were on 12 August 2014, 10 March 2015 and 8 June 2015.

The inspections focussed on product tracking, evidence of spills, ongoing works to dismantle and remediate parts of the site, the state of the drains, the treatment wetland and the receiving waters.

During the period under review several small spills of product were noted and these were cleaned up as requested. The lime store was demolished and remote video technology was being employed to check and clean pipes that lay under the old store. During inspection the wetlands and receiving waters were inspected and no issues were noted.

The site was also visited for the purpose of discussing the renewal of the consents, during the meeting it was outlined that Ravensdown was intending to build a new fertiliser store immediately up river of the old one and were planning to demolish the old store and remediate the site.

### 12.3.3 Chemical analysis

#### 12.3.3.1 Results of discharge monitoring

##### Waiwhakaiho River (Consent 3140)

The discharge to the Waiwhakaiho River is sampled at a manhole on the old effluent line to McLeod's Drain (Site Code IND004002). The results of monitoring for the period under review are presented in Table 43. A summary of all monitoring data from the site is included for comparison.

The oil and grease concentration limit given in consent 3140 was assessed as having been complied with on all monitoring occasions during the period under review. The pH and suspended solids limits were complied with on all occasions. During the sampling undertaken on 10 December 2014, it was noted that the sample had been contaminated with solids from the surrounds of the manhole and suspended solids was not assessed on this occasion.

**Table 43** Chemical monitoring results for Ravensdown's process effluent discharge to Macleod's drain –site IND004002

Parameter	Unit	Min	Max	Med	N	10 Dec 2014	23 Mar 2015	11 Jun 2015	Consent limits
Ammoniacal N	g/m <sup>3</sup> N	0.005	317	27.55	38	29.8	26.5	22.3	-
Conductivity	mS/m@ 20C	19.2	4240	96.3	61	53.2	77.3	57.0	-
DRP	g/m <sup>3</sup> P	0.004	85.9	2.01	64	5.17	3.08	4.65	-
Fluoride	g/m <sup>3</sup>	0.2	570	2.24	63	1.16	1.22	1.34	-
Oil and grease	g/m <sup>3</sup>	<0.5	13	0.4	31	b	b	b	15
pH	pH	3.3	10.2	7.6	66	8.5	7.4	7.6	6-9
Suspended solids	g/m <sup>3</sup>	2	1400	44	65	c	44	56	100
Temperature	Deg.C	10.4	47.9	17.8	61	17.4	17.1	12.9	-
Total phosphorus	g/m <sup>3</sup> P	0.043	72.6	6.25	41	15.5	3.79	5.28	-
Turbidity	NTU	16	400	78	20	c	35	32	-
Un-ionised ammonia	g/m <sup>3</sup> N	0.00002	93.3828	0.4512	30	3.37332	0.15874	0.24848	-

**Key:** b parameter not determined, no visible hydrocarbon sheen and no odour

c sample contaminated with solids during sampling – result invalid

Results show that the composition of the discharge has changed considerably since manufacturing stopped at the site. The turbidity, pH, and the concentration of suspended solids, and the nutrients ammonia and phosphorus have all increased markedly, while the temperature, fluoride concentration and conductivity have, for the most part, reduced. These changes owe largely to the cessation of the discharge of brackish cooling water from the Waiwhakaiho estuary following the closure of the fertiliser works. The large cooling water flow tended to mask any effects of stormwater, resulting in a discharge of relatively low turbidity, suspended solids and nutrient values that had a high conductivity. The elevated ammonia and phosphorus concentrations now typically observed owe to the dissolution of fertiliser particles carried by wind or water into the stormwater drains.

Ammoniacal nitrogen, total phosphorus and dissolved reactive phosphorus were found to be above median values in the sample taken on 10 December 2014, however on subsequent sampling occasions these contaminants were found to be below median values.

The fluoride concentrations found in the discharges similar to the median of the historical results and were below the NZ drinking water guideline of 1.5 mg/L.

### **Mangaone Stream (Consent 3865)**

The main discharge to the Mangaone Stream, comprising stormwater and/or groundwater seepage, is sampled from a ditch in the south-eastern corner of the site, outside the high analysis store (site code STW002003). This stormwater catchment includes the railway lines to the depot, and part of the dispatch building. Some of the catchment is owned by New Zealand Railways. The results of monitoring for the period under review are presented in Table 44. A summary of previous monitoring data is included for comparison.

**Table 44** Chemical monitoring results for Ravensdown main stormwater discharge to the Mangaone Stream -site STW002003

Parameter	Unit	Min	Max	Med	N	10 Dec 2014	23 Mar 2015	Consent limits
Ammoniacal nitrogen	g/m <sup>3</sup> N	3.97	1210	58.2	59	24.8	3.97	-
Conductivity @ 20°C	mS/m@20C	41.2	1300	165	66	82.3	77.2	-
DRP	g/m <sup>3</sup> P	3.4	697	25	66	10.0	4.38	-
Fluoride	g/m <sup>3</sup>	0.12	100	1.97	61	1.32	1.37	-
Oil and grease	g/m <sup>3</sup>	0	360	<0.5	27	b	b	15
Nitrite/nitrate nitrogen	g/m <sup>3</sup> N	3.6	151	27.3	34	21.2	11.6	-
pH	pH	3.3	8.2	6.9	65	7.2	6.9	6-9
Suspended solids	g/m <sup>3</sup>	3	1600	29	63	36	6	100
Temperature	Deg.C	10.3	23.2	15.2	62	17.3	16.5	-
Total phosphorus	g/m <sup>3</sup> P	4.2	707	19.1	43	11.0	4.41	-
Turbidity	NTU	2.2	170	23	22	25	3.3	-
Un-ionised ammonia	g/m <sup>3</sup>	0.00009	5.67691	0.17168	50	0.15323	0.01161	-

**Key:** b parameter not determined, no visible hydrocarbon sheen and no odour

Compliance was observed with the pH, oil and grease limits, and suspended solids on all four monitoring occasions. All other parameters were either similar or below median values of the site and within acceptable limits.

### **12.3.3.2 Results of receiving water monitoring**

Monitoring sites have been identified, at which sampling is undertaken during the wet weather runs, in order to assess compliance with the unionised ammonia limits (0.025 g/m<sup>3</sup>) on the Company's consents. The mix zone provided for in the Waiwhakaiho River is 150 metres downstream of the McLeod's drain discharge, and in the Mangaone Stream the mix zone extends to the Katere Road bridge. The results of the Waiwhakaiho sampling are given in Table 45 and Table 46 and the results of the Mangaone Stream sampling are given in Table 47 and Table 48. The tables also include the discharge results to aid in the interpretation of any effects in the receiving water.

### Waiwhakaiho River

Samples in Waiwhakaiho River, up and downstream of the Macleod's drain were undertaken on two occasions during the sampling of the discharges at both Ravensdown and the Macleod's drain discharge. These results are given in Table 45 and Table 46. The results show that the downstream results show little of change in the quality of the water of the downstream of MacLeod's drain. During the period under review there were generally only very small changes in the dissolved reactive phosphorus, unionised ammonia, ammoniacal nitrogen, suspended solids and turbidity concentrations of the Waiwhakaiho River 300 metres downstream of where the Ravensdown stormwater discharges (via MacLeod's drain). There was little, if any, change in the fluoride concentration of the receiving water.

The results from the sampling at the MacLeod's drain discharge to the Waiwhakaiho show that the quality of the water has improved when compared to the input from Ravensdown indicating that dilution is occurring in the stormwater network.

**Table 45** Receiving water nutrient monitoring in relation to Ravensdown's discharge to the Waiwhakaiho River 23 March 2015

Parameter	Unit	WKH000920 Constance Rd	IND004002 Ravensdown's discharge to MacLeod's drain	STW001001 MacLeod's drain prior to discharge to Waiwhakaiho	WKH000925 300 m d/s MacLeod's drain
Conductivity @ 20°C	mS/m@20C	9.1	77.3	10.5	9.6
DRP	g/m <sup>3</sup> P	0.02	3.08	0.168	0.026
Fluoride	g/m <sup>3</sup>	0.05	1.22	0.08	0.05
Oil and grease	g/m <sup>3</sup>	b	b	0.8	b
Un-ionised ammonia	g/m <sup>3</sup>	0.00004	0.15874	0.00434	0.00013
Ammoniacal nitrogen	g/m <sup>3</sup> N	<0.003	26.5	0.708	0.016
pH		7.3	7.6	7.2	7.9
Suspended solids	g/m <sup>3</sup>	5	44	26	5
Temperature	Deg.C	14.1	17.1	17.2	14.4
Turbidity	NTU	2.1	35	27	2.7

**Table 46** Receiving water nutrient monitoring in relation to Ravensdown's discharge to the Waiwhakaiho River 15 June 2015

Parameter	Unit	WKH000920 Constance Rd	IND004002 Ravensdown's discharge to MacLeod's drain	STW001001 MacLeod's drain prior to discharge to Waiwhakaiho	WKH000925 300 m d/s MacLeod's drain
Conductivity @ 20°C	mS/m@20C	8.9	57	19.2	8.3
DRP	g/m <sup>3</sup> P	0.007	4.65	0.271	0.016
Fluoride	g/m <sup>3</sup>	0.08	1.34	0.14	0.04
Oil and grease	g/m <sup>3</sup>	b	b	b	b
Un-ionised ammonia	g/m <sup>3</sup>	0.00001	0.24848	0.00486	0.00012
Ammoniacal nitrogen	g/m <sup>3</sup> N	<0.003	22.3	1.02	0.015
pH		7.3	7.6	7.2	7.5

Parameter	Unit	WKH000920 Constance Rd	IND004002 Ravensdown's discharge to MacLeod's drain	STW001001 MacLeod's drain prior to Waiwhakaiho	WKH000925 300 m d/s MacLeod's drain
Suspended solids	g/m <sup>3</sup>	<2	56	17	3
Temperature	Deg.C	11.1	12.9	13.8	11.3
Turbidity	NTU	2.1	32	10	2.3

**Key:** b no visual evidence of oil and grease contamination

### Mangaone Stream

On all monitoring occasions increases were observed in the ammoniacal nitrogen and unionised ammonia concentrations at the Katere Road bridge monitoring site, however the absolute levels found at the site immediately downstream of the Ravensdown site were well below the 0.025 g/m<sup>3</sup> guideline for chronic toxicity. Dissolved reactive phosphorus (DRP) also showed increases between the up and downstream sites, and concentrations found at the downstream site (especially on 10 December 2014) were at concentrations that may cause increased algal and/or macrophytic growth. However there appears to be a trend of decreasing DRP levels downstream of Ravensdown in recent years.

All other parameters tested for were found at acceptable levels in the downstream receiving environment.

**Table 47** Receiving water nutrient monitoring in relation to Ravensdown's discharge to the Mangaone Stream 10 December 2014

Parameter	Unit	MGO000148 250m d/s Puremu S. confluence.	STW002003 Rear Ravensdown Stormwater	MGO000153 Katere Rd bridge	MGO000190 Rifle range Rd.
Conductivity	mS/m@20C	14.4	82.3	12.8	14.8
DRP	g/m <sup>3</sup> P	0.013	10	0.114	0.037
Oil and grease	g/m <sup>3</sup>	b	b	b	b
Un-ionised ammonia	g/m <sup>3</sup>	0.00078	0.15323	0.00792	0.00095
Ammoniacal nitrogen	g/m <sup>3</sup> N	0.104	24.8	0.526	0.127
Nitrite/nitrate	g/m <sup>3</sup> N	0.61	21.2	0.9	
pH		7.3	7.2	7.6	7.3
Suspended solids	g/m <sup>3</sup>	28	36	31	63
Temperature	Deg.C	16.8	17.3	17	16.8
Turbidity	NTU	16	25	-	25

**Key:** b no visual evidence of oil and grease contamination

**Table 48** Receiving water nutrient monitoring in relation to Ravensdown's discharge to the Mangaone Stream 23 March 2015

Parameter	Unit	MGO000148 250m d/s Puremu S. confluence.	STW002003 Rear Ravensdown Stormwater	MGO000153 Katere Rd bridge	MGO000190 Rifle range Rd.
Conductivity @ 20°C	mS/m@20C	18.6	77.2	17.7	18.4
DRP	g/m <sup>3</sup> P	0.012	4.38	0.04	0.023
Oil and grease	g/m <sup>3</sup>	b	b	b	b

Parameter	Unit	MGO000148 250m d/s Puremu S. confluence.	STW002003 Rear Ravensdown Stormwater	MGO000153 Katere Rd bridge	MGO000190 Rifle range Rd.
Un-ionised ammonia	g/m <sup>3</sup>	0.00028	0.01161	0.0012	0.00135
Ammoniacal nitrogen	g/m <sup>3</sup> N	0.075	3.97	0.258	0.148
Nitrite/nitrate	g/m <sup>3</sup> N	0.62	11.6	0.68	-
pH		7	6.9	7.1	7.4
Suspended solids	g/m <sup>3</sup>	2	6	8	4
Temperature	Deg.C	16.6	16.5	16.6	16.4
Turbidity	NTU	2.6	3.3	-	4.2

**Key:** b no visual evidence of oil and grease contamination

### 12.3.3.3 Results of groundwater monitoring

From the 2002-2003 year, the routine compliance monitoring programme allowed for a full survey of the groundwater in the immediate vicinity of the Ravensdown site to be undertaken at five sites on one occasion during each monitoring year, along with associated receiving water monitoring. The location of the monitoring bores is shown in Figure 4 and the results of nutrient focused monitoring for the period under review are given in Table 49 and

Table 50, while the results of inorganic and metal analyses are given in Table 51.

**Table 49** Chemical monitoring results for nutrients in the groundwater and Mangaone Stream in the vicinity of Ravensdown Fertilisers for January 2015

Parameter	Unit	GND1217	GND1218	GND2346	MGO000151	GND0517	MGO000155	GND0518
Conductivity	mS/m	113	195.3	38.14	Not sampled due to access issues	535	19.9	47.92
DRP	g/m <sup>3</sup> P	0.006	0.009	0.187		3.57	0.036	0.187
Un-ionised ammonia	g/m <sup>3</sup>	0.00029	0.00618	0.01885		129.2453	0.00155	0.02136
Ammoniacal nitrogen	g/m <sup>3</sup> N	1.21	135	0.954		678	0.111	2.75
pH	-	5.8	4.9	7.89		8.9	7.5	7.3
Temperature	Deg.C	16.7	16.3	17.6		16.1	19.1	17.3
Turbidity	NTU	0.02	0.011	0.21		3.96	0.056	0.803

**Table 50** Chemical monitoring results for nutrients in the groundwater and Mangaone Stream in the vicinity of Ravensdown Fertilisers for 19 May 2015

Parameter	Unit	GND1218	GND2346	MGO000151	GND0517	MGO000155
Conductivity	mS/m	165	36.8	15.8	248	15.9
DRP	g/m <sup>3</sup> P	0.013	0.178	0.008	1.23	0.008
Unionised ammonia	g/m <sup>3</sup> -N	0.00095	0.01763	0.00052	5.21532	0.00055
Ammoniacal N	g/m <sup>3</sup> N	76.5	0.886	0.137	220	0.142
pH	-	4.5	7.8	7.1	8.08	7.1
Temperature	Deg.C	17.4	17.7	13.9	17	14.1

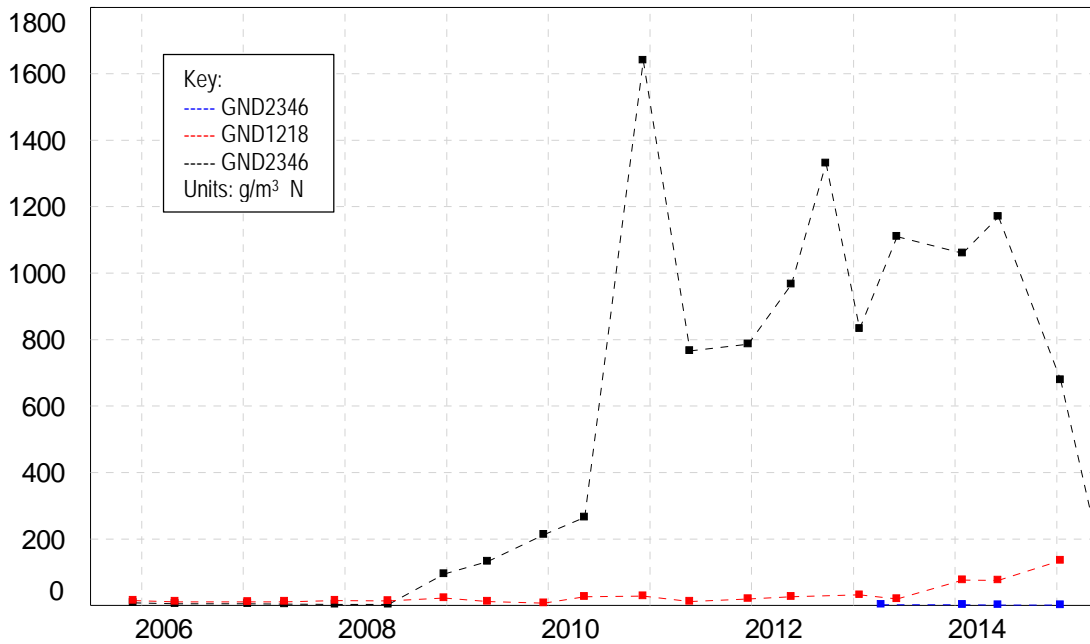
The data presented in Table 49 shows that there is a slight elevation in the total and dissolved phosphorus in the groundwater bores in the vicinity of the Ravensdown site.

The ammoniacal nitrogen concentration of the groundwater is also elevated at all three bores in the immediate vicinity of the site, with the concentrations found at GND0517, adjacent to Katere Road, continuing to be significantly above background during the period under review.

Although affected to a much lesser extent, the ammoniacal nitrogen concentration at GND1218, on the northern boundary of the site approximately 70m from the urea store, was found to have more than doubled during the 2012-2014 period. Historical results for this site show that the ammoniacal nitrogen concentration had previously varied between 6.5 and 26.2 g/m<sup>3</sup> (Figure 18). In this period the concentrations spiked again in the summer sample to 135 g/m<sup>3</sup>, however the autumn sample returned a result at 76.0 g/m<sup>3</sup>.

Samples taken from the new bore (GND2346) used in place of GND1342 returned results significantly lower than the range of results previously reported for GND1342.





**Figure 18** Ammoniacal nitrogen concentration at sites GND1218, GND1218 and GND2346 from June 2002 to June 2015

In 2003, soon after regular monitoring of this bore commenced, the ammoniacal nitrogen concentration found in this bore was 5000 g/m<sup>3</sup>. It was identified that the phosphate rock store (Rock Store) was the likely source of contaminants due to a leaking roof and broken concrete floor. The ammoniacal nitrogen concentration dropped markedly after the store was emptied in December 2003. The ammoniacal nitrogen concentration bottomed out at approximately 3 g/m<sup>3</sup> during the 2007-2008 monitoring year before beginning to increase once again. It was subsequently found by Council that this store had been put back into use. The recoverable material was removed from the store in the middle of the 2010-2011 year, and a plastic liner was placed over the remaining material to prevent contact with stormwater entering through the leaks in the roof. Since this intervention site GND0517 has exhibited elevated and fluctuating concentrations in ammoniacal nitrogen. The rock store was then demolished between October 2013 and May 2014. This was accompanied with a significant decline in the concentration of ammoniacal nitrogen found at this site. A review of current data indicates that this trend appears to be continuing.

Despite the elevated ammoniacal nitrogen in the vicinity of the Ravensdown site, dry weather in-stream monitoring (Section 16.1.2) showed that during the period under review, there were only slight increases in the ammoniacal nitrogen concentration in the Mangaone Stream as it flowed past the Ravensdown site. However the levels found at the downstream site are well below the 0.025 g/m<sup>3</sup> chronic toxicity guideline for freshwater ecosystems. The dissolved reactive phosphorous concentration was found to be slightly in excess of the ANZECC trigger value of 0.010 g/m<sup>3</sup> below the site on one of the two monitoring occasions.

At this stage no significant adverse effects are being noted in the Waiwhakaiho River during dry weather (Section 16.1.1.2). The Council is continuing to monitor the situation.

**Table 51** Metals and inorganic results for groundwater at Ravensdown

Parameter	Unit	DWSNZ MAV	GND1217 MW1	GND1218 MW2	GND2346	GND0517 MW5	GND0518 MW6
Cadmium Acid Soluble	g/m <sup>3</sup>	0.004	<0.005	<0.005	<0.005	<0.005	<0.005
Conductivity @ 20°C	mS/m@20C	-	113	195.3	38.14	535	47.92
Chromium Acid Soluble	g/m <sup>3</sup>	0.05	<0.03	<0.03	<0.03	<0.03	<0.03
Copper Acid Soluble	g/m <sup>3</sup>	2	0.03	0.03	<0.01	0.04	<0.01
Fluoride	g/m <sup>3</sup>	1.5	0.78	0.32	0.14	0.3	0.62
Nickel Acid Soluble	g/m <sup>3</sup>	0.08	0.05	<0.02	<0.02	<0.02	<0.02
Lead Acid Soluble	g/m <sup>3</sup>	0.01	<0.05	<0.05	<0.05	<0.05	<0.05
pH	pH	7-8.5	<b>5.8</b>	<b>4.9</b>	7.89	<b>8.9</b>	7.3
Suspended solids	g/m <sup>3</sup>	-	31	6	2	16	19
Temperature	Deg.C	-	16.7	16.3	17.6	16.1	17.3
Total phosphorus	g/m <sup>3</sup> P	-	0.02	0.011	0.21	3.96	0.803
Vanadium Dissolved	g/m <sup>3</sup>	-	0.001	<0.001	<0.001	0.02	<0.001
Zinc Acid Soluble	g/m <sup>3</sup>	0.008*	0.111	<0.005	<0.005	<0.005	0.02

**Key:** Results shown in bold within a table indicates that the maximum acceptable value given in the Drinking-Water Standards for New Zealand 2005 (Revised 2008) (DWSNZ MAV) has been exceeded

\*No MAV available for zinc, this is the adopted ANZECC trigger value for freshwater

The results obtained for the concentrations of metals, fluoride and the pH's observed in the groundwater are generally of the same order of magnitude as found in monitoring undertaken in previous period. For context, (with the exception of pH) results for sites 1207, 1218, and 0517, were within DWSNZ maximum allowable values (where specified).

### 12.3.4 Receiving environment monitoring

The programmed receiving environment monitoring undertaken to monitoring the condition of the receiving waters of the catchment as a whole is reported in Section 16.

### 12.3.5 Investigations, interventions, and incidents

In the 2014-2015 period, the Council was not required to undertake significant additional investigations and interventions, or record incidents, in association with Ravensdown Fertilisers Co-operative Limited's conditions in resource consents or provisions in Regional Plans.

## 12.4 Discussion

### 12.4.1 Discussion of site performance

In general, inspection found that housekeeping at the site was good. However, tracking and minor spills continued to be observed on a number of occasions.

During the period under review the discharge to the Waiwhakaiho River via McLeod's complied with discharge limits.

Consent 3865 covering the discharge of stormwater to the Mangaone Stream contains a requirement that the Company manages the stormwater disposal system to minimise the discharge of free phosphate. During the period under review, the dissolved reactive phosphorous concentrations were found to be similar to, or below median, showing that the Company is continuing to manage activities at the site that might impact on the discharge of free phosphorous.

Receiving water monitoring found that there were no significant adverse effects in the Waiwhakaiho River or in the Mangaone Stream.

Groundwater monitoring indicated that the ammoniacal nitrogen concentration in the groundwater on Katere Road, adjacent to the site, continued to be elevated, however Ravensdown demolished the rock store and this appears to have had a salutary effect on ammoniacal nitrogen levels in bore GND0517

#### **12.4.2 Environmental effects of exercise of consents**

The high ammonia and phosphorus concentrations measured at both discharge points are attributed to the dissolution of fertiliser particles carried by wind or water into the stormwater drains. A measurable increase in concentration of these nutrients below the discharge points was observed during the year under review in both receiving waters (i.e. the Mangaone and Waiwhakaiho). However, the changes were compliant with the conditions of the resource consents and were not expected to have resulted in any significant adverse effects.

During the period under review the biomonitoring reports suggested that the increase in biomass (algal cover and in stream vegetation) may be indicative of nutrient enriched groundwater inputs from this fertiliser depot. It was also noted at the last survey during the period under review that this may be exerting some influence on the biomass at the Waiwhakaiho River biomonitoring site downstream of the Mangaone Stream confluence. At the biomonitoring site 100 m downstream of the depot, it appears that the effects on the macroinvertebrate index (MCI) may be lessening very slightly.

Groundwater analysis results have shown that the ammoniacal nitrogen concentrations in the groundwater in the Katere Road area of the site continued to be elevated. However, remedial works at the site appear to be mitigating the levels of this contaminant in GND0517.

#### **12.4.3 Evaluation of performance**

A tabular summary of the consent holder's compliance record for the year under review is set out in Table 52 and Table 53.

**Table 52** Summary of performance for consent 3865-3

<b>Purpose: To discharge stormwater into the Mangaone Stream</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
1. Concentration limits upon potential contaminants in discharge	Discharge sampling	Yes
2. Minimisation of free phosphate	Discharge sampling	Yes
3. Discharge cannot cause specified adverse effects beyond mixing zone	Visual assessment at inspection and receiving water sampling and biomonitoring	Yes
4. Prepare and maintain contingency plan	Review of documentation received. Latest version 2011	Yes
5. Provision for review of consent	No further opportunities for Review	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		<b>Good</b>
Overall assessment of administrative performance in respect of this consent		<b>High</b>

N/A not applicable

**Table 53** Summary of performance for consent 3140-2

<b>Purpose: To discharge stormwater into the Waiwhakaiho River</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
1. Concentration limits upon potential contaminants in discharge	Discharge sampling	<b>Yes</b>
2. Discharge cannot cause specified adverse effects beyond mixing zone	Visual assessment at inspection and receiving water sampling and biomonitoring	Yes
3. Prepare and maintain contingency plan	Review of documentation received. Latest version 2011	Yes
4. Provision for review of consent	No further opportunities for review	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		<b>High</b>
Overall assessment of administrative performance in respect of this consent		<b>High</b>

N/A not applicable

Ravensdown Fertiliser Co-operative Limited demonstrated a good level of environmental performance and high level of administrative performance and compliance with the resource consents as defined in Section 1.1.5 in relation to their site on Smart Rd.

#### 12.4.4 Recommendation from the 2012-2014 Biennial Report

In the 2012-2014 Biennial Report, it was recommended:

THAT monitoring of discharges from Ravensdown Fertiliser Co-operative Limited in the 2014-2015 year continues at the same level as in 2012-2014.

This recommendation was implemented.

#### **12.4.5 Alterations to monitoring programmes for 2015-2016**

In designing and implementing the monitoring programmes for water discharges in the region, the Council has taken into account the extent of information made available by previous authorities, its relevance under the RMA the obligations of the Act in terms of monitoring discharges and their effects, and subsequently reporting to the regional community. The Council also takes into account the scope of assessments required at the time of renewal of permits, and the need to maintain a sound understanding of industrial processes within Taranaki discharging to the environment.

It is proposed that for 2015-2016, the programme remains unchanged. A recommendation to this effect is attached to this report.

#### **12.5 Recommendation**

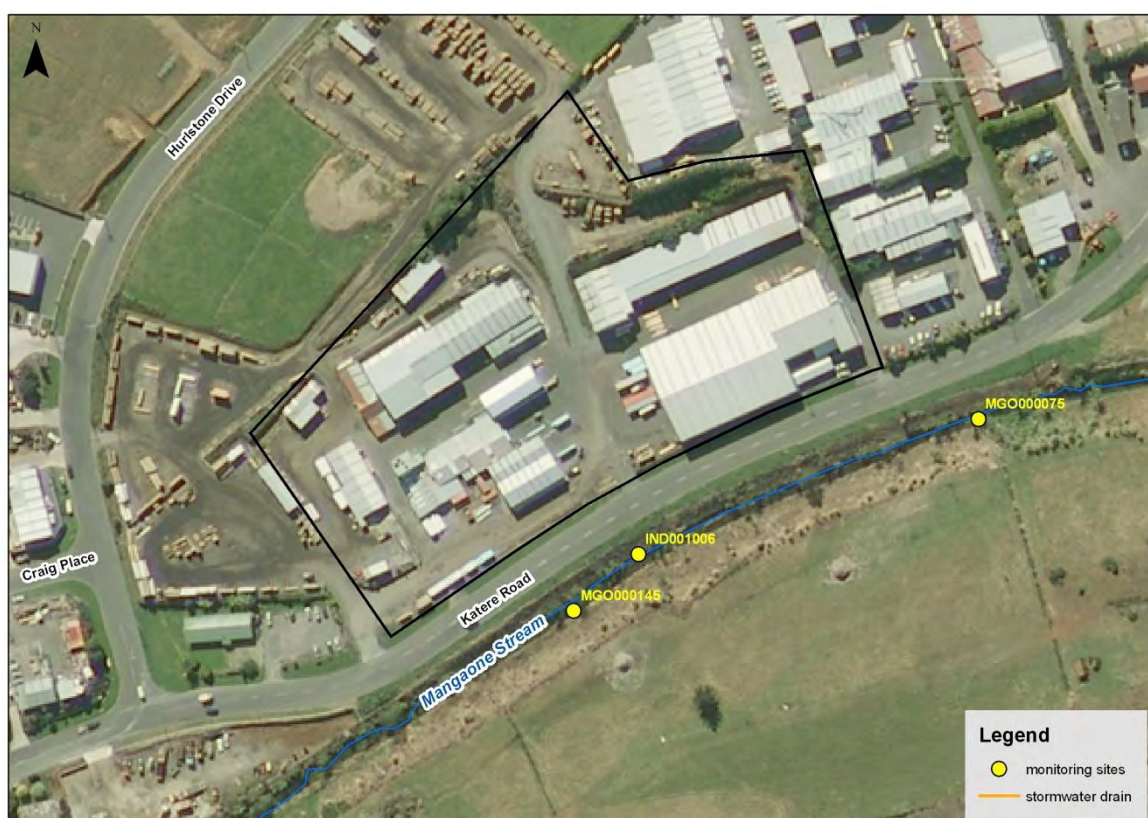
THAT monitoring of discharges from Ravensdown Fertiliser Co-operative Limited in the 2015-2016 year continues at the same level as in 2014-2015

## 13. Taranaki Sawmills Limited

### 13.1 Process description

Taranaki Sawmills Limited (TSM) has operated a timber treatment plant on Katere Road since 1956. In 1997, an adjoining site was purchased and developed for painting and packaging, packaging componentry, and a domestic despatch yard, some of which has now been on-sold. About 30 persons are employed at the site.

Timber is treated at two plants. At one plant, timber is treated with copper, chromium and arsenic (CCA), and with boron. At the other plant, light organic solvent preservative (LOSP) is used.



**Figure 19** Taranaki Sawmills site and sampling point locations

At the CCA and boron treatment plant, all chemical storage tanks and treatment vessels were once situated in the open, within areas that were sealed and banded for containment of spillage, and contaminated stormwater from banded and drip pad areas was collected in sumps and recycled back through the treatment process. The CCA process was changed in February 1999 by the addition of a steam fixation step after CCA treatment, known as the CCA Dry process. This resulted in the elimination of drippage after treatment. Previously, CCA treated timber had to be left on the drip pad for seven days, now the timber only needs to be left on the drip pad for 24 hours to ensure that there is no drippage once the wood is removed from the treatment area. There is no discharge to water as a result of the CCA dry process, as blowdown from this process is recycled. During the 2002-2003 year, a roof was constructed over the drip pad, treatment vessels and chemical storage area, thus

eliminating the potential for contaminants to be entrained in the stormwater from these areas.

Some timber is pre-treated by steaming to improve the penetration of the CCA solution. After each steam cycle, the vessel is cooled via an external water heat exchanger to reduce turnaround time. The sludge generated in the steamer vessel, and blowdown from the boiler, was discharged to a settling pit at a rate of about 1,000 litres per day. The settled wastewater, and about 15,000 litres per day of cooling water, was discharged to the Mangaone Stream via a stormwater drain. Sludge that accumulated in the pit was disposed of by a local contractor. During the 2005-2006 year, the condensate from this "steam cracking" of the timber was diverted to sewer. The discharge of cooling water to the Mangaone Stream continued until the 2008-2009 year, during which the cooling water was also diverted to trade waste.

In boron treatment, a vacuum is applied to improve chemical diffusion. The boron treated timber was left under tarpaulins on the drip pad for 14 days for diffusion to complete. An improvement in the boron treatment process was introduced in March 2007. Taranaki Sawmills now employ a dry treatment process using "Framepro". The process for "Framepro" is that the timber is kiln dried before it is sent to the treatment plant. After treatment it dries in a shed on a drip pad until being shipped out.

A new LOSP plant was commissioned in February 1999. The treatment chemicals used in the LOSP process are a range of blends containing one or more of the following, in a white spirit solvent; 3-Iodo-2-propynyl-n-butylcarbamate (IPBC), permethrin, Propiconazole (PRCA) and Tebuconazole depending on end use of the timber. At the old LOSP plant, chemical storage tanks were located outside at the northern end of the site in an area that was bunded. The drippage area, which drained to a recycle sump, was also outside. At the new plant, the process is carried out entirely within a building with internal bunds, under computer control to optimise treatment and minimise chemical use. There is no wastewater discharge.

The use of tributyltin oxide at the site ceased in April 2010. Residual tributyltin and CCA have been found in the site surfaces from historical practices. This has been mapped and managed by progressively concreting the affected areas, as discussed in previous Annual/Biennial Reports.

Uncontaminated stormwater, from outside of bunded areas and from roofs, is channelled into two drains that join prior to exiting the site at Katere Road and discharging to the Mangaone Stream.

## **13.2 Water discharge permit**

TSM holds discharge permit **3491-2** to cover discharge of cooling water and wastewater from a timber drying plant and stormwater from a timber treatment site into the Mangaone Stream in the Waiwhakaiho catchment. This consent was granted by the Council under section 88 of the RMA on 17 June 2006, and will expire on 1 June 2020.

The special conditions on the consent require that the consent holder: (1) adopts the best practicable option to minimise effects, (2) exercises the consent in a manner consistent with the description in the application, (3) adheres to the New Zealand Timber Preservation Council's best practice guideline, (4) ensures that the bunding meets HSNO requirements after a certain date, (5) limits the stormwater catchment area, (6) limits the daily discharge volume of cooling water and wastewater, (7) limits the concentration of particular contaminants known to be used in the industry, (8) limits general (RMA, Section 107) receiving water effects beyond a 30m mix zone, (9) limits the pH range and change in pH permitted in the receiving water, (10) limits temperature effects and changes in filtered carbonaceous biochemical oxygen demand in the receiving water, (11) requires the investigation of pesticide presence in the receiving water and stream sediment, (12) requires the investigation of copper in the receiving water, (13) sets the deadline by which the results of the investigations be provided to Council, (14) maintains a contingency plan, (15) provision for lapse of the consent if not exercised, (16) provision for review based on effects, and (17) provision for review based on changes in the New Zealand Timber Preservation Council's best practice guideline or specific Hazardous Substances regulations.

## **13.3 Results**

### **13.3.1 Inspections**

TSM's site was inspected on four occasions during the monitoring period. These were on 3 September 2014, 2 December 2014, 13 March 2015 and 22 May 2015.

The inspections focused on any evidence of spills or staining on the concreted areas, the condition of the stormwater drains and associated mitigation measures, the cooling water system (for leaks etc), containment bunding, vehicle tracking and general housekeeping.

On all four occasions the site was found to be compliant with conditions and generally well managed. No tracking from the treatment areas or evidence of spills were noted and the drains were found to be free of contamination upon visual inspection.

### **13.3.2 Discharge chemical analysis**

The wet weather discharge from Taranaki Sawmills was sampled on two occasions from the outlet of the storm drain to the Mangaone Stream, immediately across Katere Road (this sampling location represents the entire yard). The two individual flows from the east and west areas of the site near gate number 2 were not sampled individually during the period under review. During sampling undertaken in the subsequent monitoring period TSM staff noted that the sampling point opposite the site on Katere Rd is likely to include stormwater from the road under high flows and as a result future monitoring will be undertaken at the two drain outlets immediately outside the site.

The results are presented in Table 54 along with the upstream and downstream sampling results. A summary of all monitoring at this site is included for comparative purposes.



**Table 54** Chemical monitoring results for Taranaki Sawmills stormwater discharge - site INDO01006

Parameter	Unit	Min	Max	Med	N	10-Dec-14	23-Mar-15	Consent limits
IPBC	g/m <sup>3</sup>	0.002	0.002	0.001	10	<0.002	<0.002	-
Arsenic Total	g/m <sup>3</sup>	0.01	0.5	0.074	41	0.078	0.069	<b>0.24</b>
BOD	g/m <sup>3</sup>	2.4	890	9.7	28	7.8	7.6	-
Boron	g/m <sup>3</sup>	0.01	7	0.18	46	0.05	0.08	3.7
COD	g/m <sup>3</sup>	6	4000	63	43	23	47	-
Chromium Total	g/m <sup>3</sup>	0.023	0.34	0.073	24	0.142	0.070	<b>0.4</b>
Conductivity @ 20°C	mS/m	2.3	112	11	61	2.9	4.6	-
Copper Dissolved	g/m <sup>3</sup>	0.01	0.07	0.02	21	0.02	0.02	<b>0.088</b>
Copper Total	g/m <sup>3</sup>	0.022	0.26	0.044	24	0.044	0.048	-
Dibutyltin (as Sn)	g/m <sup>3</sup>	0.00005	0.0021 7	0.00023	17	<0.00006	<0.0011	-
Oil and Grease	g/m <sup>3</sup>	0.5	24	2.2	42	b	<0.5	<b>15</b>
Permethrin	g/m <sup>3</sup>	0.0002	0.0056	0.0008	10	0.0003	0.0010	-
pH	pH	4.4	7.6	6.3	63	7.2	7.2	6-9
Propiconazole	g/m <sup>3</sup>	0.008	0.052	0.0143	10	0.0133	0.046	-
Suspended solids	g/m <sup>3</sup>	3	760	65	56	28	3	<b>100</b>
Tebuconazole	g/m <sup>3</sup>	0.0064	0.049	0.0179	10	0.0143	0.035	-
Temperature	Deg.C	9.5	37.8	17.7	59	17.5	18.3	-
Tin Total	g/m <sup>3</sup>	0.00193	0.4	0.05	25	0.0037	0.0023	-
Tributyltin (as Sn)	g/m <sup>3</sup>	0.00004	0.0036	0.00009	17	<0.00005	<0.00009	<b>0.0046</b>
Triphenyltin (as Sn)	g/m <sup>3</sup>	0.00003	0.0014	0.00002	17	<0.00004	<0.00007	<b>0.64</b>
Turbidity	NTU	19	210	72	24	30	72	-
Zinc Dissolved	g/m <sup>3</sup>	0.145	0.537	0.29	20	0.270	0.246	-
Zinc Total	g/m <sup>3</sup>	0.21	5.5	0.52	23	0.33	0.4	-

**Key:** Results shown in bold within a table indicates that a consent limit for a particular parameter has been exceeded

b parameter not determined, no visible hydrocarbon sheen and no odour

d Total BOD for the discharge samples and filtered carbonaceous BOD for the Mangaone Stream samples

The discharges were found to compliant with consent conditions in regard to copper, chromium, arsenic, tributyltin, zinc and tin. It is noted however that the concentrations of some of the LOSP components of the discharge appear to have increased.

Monitoring of the treatment chemicals IPBC, permethrin, PRCA and tebuconazole was initiated in the 2010-2011 year after the Company changed to using these chemicals rather than tributyltin. The concentration of PRCA on 23 March 2015 (0.046 g/m<sup>3</sup>) was found to be to the highest ever at the time of sampling and this result was surpassed in monitoring undertaken in the following monitoring period. The same was also true for Tebuconazole which also attained a new maximum in the March 2015 sample, and again in subsequent monitoring undertaken in the following year. Permethrin was detected in the discharge; however this was at level similar to its historical median. IPBC was not detected in the discharge in the period under review.

PRCA and Tebuconazole were also detected in the receiving water, however despite the increases in discharge concentrations the concentrations in the receiving water appear to be decreasing.

It was found that the concentrations of the other effluent components monitored were generally within the ranges of previously reported results with most of the parameters being similar to or below the median values.

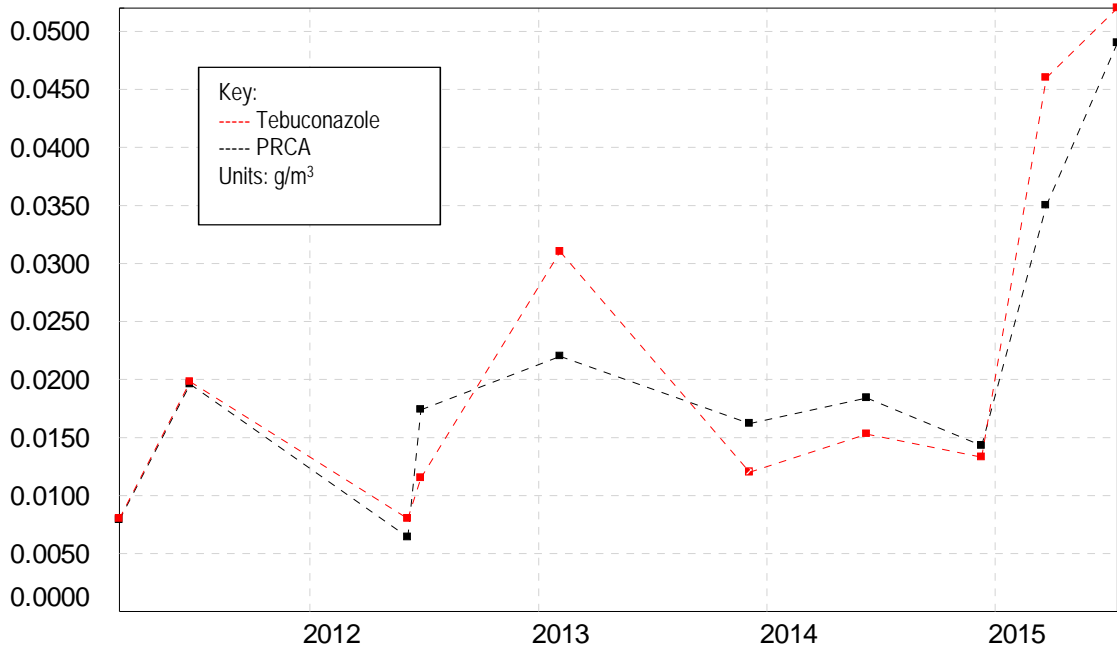


Figure 20 Tebuconazole and Propiconazole concentrations TSM's discharge-site IND001006

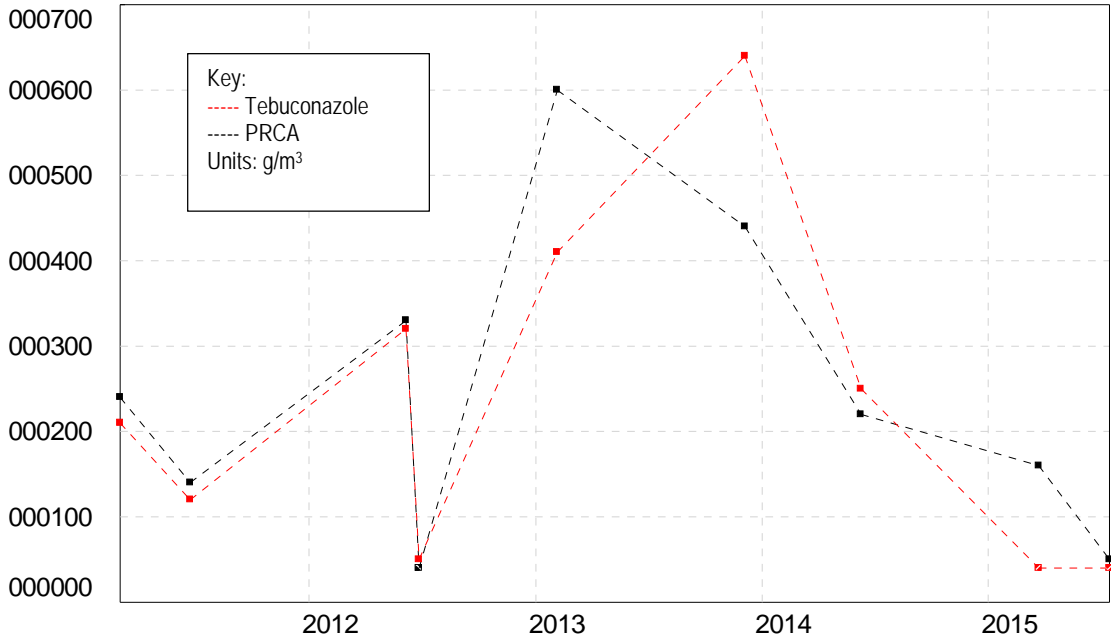


Figure 21 Tebuconazole and Propiconazole concentrations downstream of TSM's discharge

### 13.3.3 Investigations, interventions, and incidents

In the period under review, the Council was not required to undertake significant additional investigations and interventions, or record incidents, in association with Taranaki Sawmills Limited's conditions in resource consents or provisions in Regional Plans.

## 13.4 Discussion

### 13.4.1 Discussion of site performance

Housekeeping at the site was considered to be good during the period under review. No significant issues were noted during inspections and the discharge quality during the period under review was compliant with the with all consent conditions. It was noted that Tebuconazole and PRCA concentrations in the discharge appear to be increasing however no increases in concentrations of these chemicals in the receiving waters was noted.

Monitoring found that the remediation previously undertaken at the site to control the discharge of tributyltin from historical activities at the site continued to be effective.

### 13.4.2 Environmental effects of exercise of consent

Council sampling surveys showed that, during the period under review, compliance was achieved with the conditions imposed on consent 3491 relating to receiving water quality.

Concentrations of tributyltin in the receiving water and sediment in the Mangaone Stream have in previous period been found above the guideline values given in the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (October 2000), which may have accounted for some of the changes seen in the macroinvertebrate communities during biomonitoring surveys.

Tebuconazole and PRCA concentrations appear to increasing in the discharge, however the concentration these compounds in the receiving waters appears to be decreasing.

Tributyltin was detected in the water column downstream of Taranaki Sawmills Limited (TSM) discharge on one occasion during the period under review at site MG000145, however there was no corresponding detection of tributyltin in the discharges. In subsequent sampling undertaken in this, and the next monitoring period, tributyltin was not detected in the receiving water. Two of the replacement treatment chemicals (PRCA and/or Tebuconazole) now in use were found to be present in the stream at low concentrations on both sampling occasions. These results and a subsequent result seem to be part of a decreasing trend for these chemicals in receiving water and will continued to be monitored.

Biomonitoring indicates that there are improvements in biological health starting to occur downstream of the discharge from this site, although at this stage, it is too early to comment on whether this is a sustained improvement.

### 13.4.3 Evaluation of performance

A tabular summary of the TSM's compliance record for the period under review is set out in

**Table 55.**

**Table 55** Summary of performance for consent 3491-2,

<b>Purpose: To discharge cooling water, wastewater and stormwater into the Mangaone Stream</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
1. Adoption of best practicable option	Inspection and discussion with consent holder	Yes
2. Exercise of consent in accordance with application information	Inspection and discussion with consent holder	Yes
3. Adherence to Timber Treatment Best Practice Guideline	Inspection and discussion with consent holder	Yes
4. Bunding to meet HSNO requirements by 31 March 2007	Inspection and discussion with consent holder	No HSNO stationary container certification yet, but compliance plan with ERMA
5. Limits stormwater catchment area	Site inspections	Yes
6. Limit on daily wastewater discharge volume of 12,000 L/day	Discussion at inspection. Discharge directed to sewer	Yes
7. Concentration limits upon potential contaminants in discharge	Chemical sampling	Yes
8. Discharge cannot cause specified adverse effects beyond mixing zone	Visual assessment at inspection and receiving water sampling, and biomonitoring	Biomonitoring and previous sediment sampling indicates effects of historical discharges may be decreasing
9. Limit on pH effects beyond the mix zone	Chemical sampling of the discharge and receiving water	Yes
10. Limits on temperature effects and filtered carbonaceous biochemical oxygen demand (FCBOD) beyond mix zone	Chemical sampling of the discharge and receiving water, and recording the temperatures at the time of sampling	Yes
11. Investigation into specific biocide levels in discharge and receiving environment	Condition met previously	N/A
12. Investigation into dissolved copper levels in discharge and receiving environment	Condition met previously	N/A
13. Report on investigations to be received by 30 August 2007	Report received 30 August 2007	N/A

<b>Purpose: To discharge cooling water, wastewater and stormwater into the Mangaone Stream</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
14. Maintain and prepare contingency plan	Reviewed plan received January 2013	Yes
15. Provision for consent to lapse if not exercised	Consent exercised	N/A
16. Provision for review re effects	No further opportunities for review	N/A
17. Provision for review if amendments to HSNO regulations or Timber Treatment Guidelines	N/A	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		<b>Good</b>
Overall assessment of administrative performance in respect of this consent		<b>High</b>

N/A not applicable

During the period under review, Taranaki Sawmills Limited demonstrated a good level of environmental performance and high level of administrative performance and compliance with the resource consents as defined in Section 1.1.5. in relation to its site on Katere Rd. Tributyltin residues continue to be detected in the receiving waters on occasion and biomonitoring indicates that this may be having an effect on macroinvertebrate communities downstream of the site.

#### **13.4.4 Recommendation from the 2012-2014 Biennial Report**

In the 2012-2014 Biennial Report it was recommended

THAT monitoring programme for discharges from Taranaki Sawmills Limited in the 2014-2015 year continues at the same level as in 2012-2014.

This recommendation was implemented in the 2012-2014 monitoring period.

#### **13.4.5 Alterations to monitoring programmes for 2014-2015**

In designing and implementing the monitoring programmes for water discharges in the region, the Council has taken into account the extent of information made available by previous authorities, its relevance under the RMA the obligations of the Act in terms of monitoring discharges and their effects, and subsequently reporting to the regional community. The Council also takes into account the scope of assessments required at the time of renewal of permits, and the need to maintain a sound understanding of industrial processes within Taranaki discharging to the environment.

It is proposed that for 2015-2016, the programme remains unchanged. A recommendation to this effect is attached to this report.

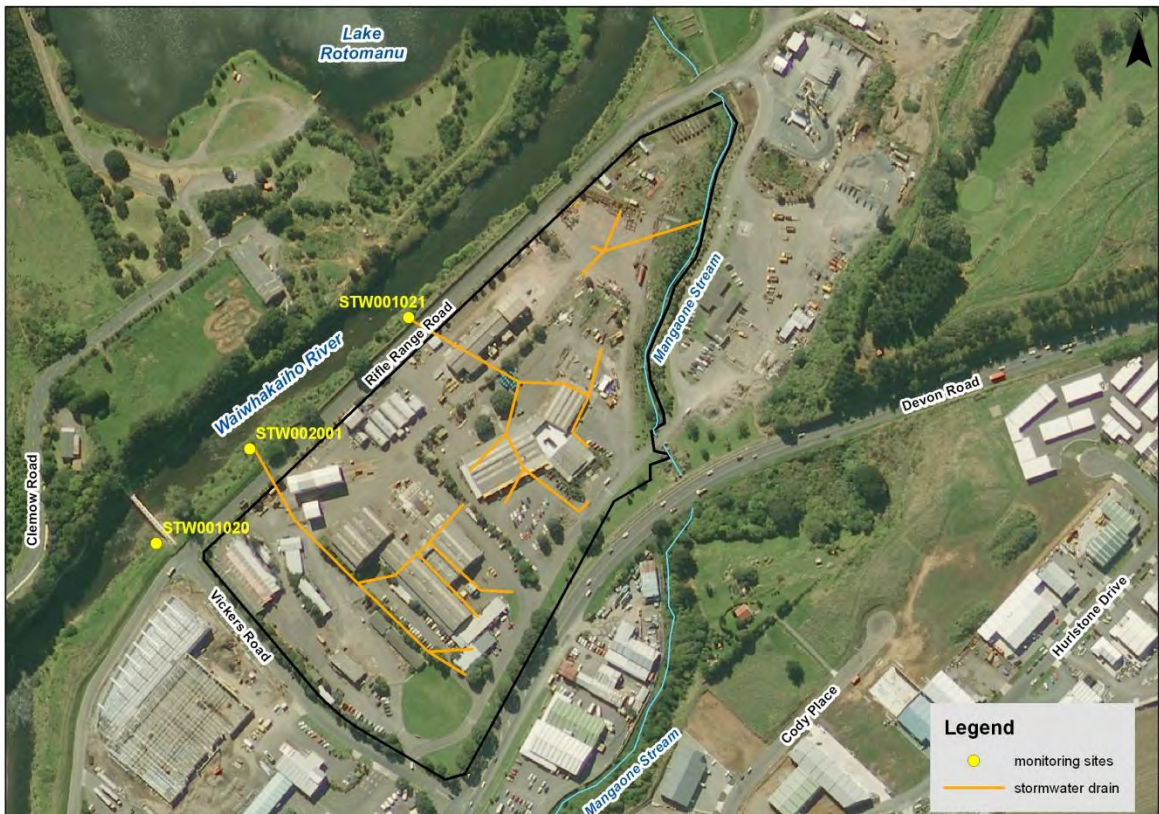
### **13.5 Recommendation**

THAT monitoring programme for discharges from Taranaki Sawmills Limited in the 2015-2016 year continues at the same level as in 2014-2015.

## 14. Technix Group Limited

### 14.1 Process description

The engineering complex of Technix Group Limited (Technix) is the largest industrial site along the lower Waiwhakaiho River. Situated on the true right bank of the river immediately above its confluence with the Mangaone Stream, the 8.4 ha area of land is bounded by Rifle Range Road, Vickers Road, State Highway 3, and the Mangaone Stream. The development comprises several building complexes, roading and drainage systems.



**Figure 22** Technix site, drainage system and sampling point locations

Technix Group leases buildings on the site to several tenant companies carrying out a range of activities.

The ground surface cover varies from bitumen seal to gravel to grass. There is a large sealed bitumen area in the northern part of the site that was once used as a truck stop.

Stormwater discharges from the site at four main points, three to the Waiwhakaiho River and one to the Mangaone Stream.

The original consented discharges were; the two discharges to the Waiwhakaiho River from the central areas of the site, and the one to the Mangaone Stream from the eastern area of the site. The other, previously unlicensed, discharge occurs from the western area of the site to the Waiwhakaiho River down Vickers Road, which also

serves commercial properties on the opposite side of the road. This discharge point was included in the New Plymouth District Council's consent 5163-2 when it was renewed on 20 November 2007. Also during the 2007-2008 year, prior to the expiry of the consent held for the discharges to the Mangaone Stream (2230), Council concluded that the activity in this area had become a permitted activity under rule 23 of the Regional Fresh Water Plan for Taranaki [RFPW] (which became operative in 2001) provided the conditions of rule 23 continued to be adhered to by Technix. Council therefore did not require that this consent was renewed.

In terms of activities with the potential for environmental effects is concerned, contaminants may be discharged to land during the day-to-day activities on the sites. These contaminants may enter water, as at some point in time (i.e. when it rains), the contaminants become entrained in stormwater along with contaminants that may be washed off equipment stored in the yard, and the stormwater is then discharged to the Waiwhakaiho River or Mangaone Stream.

The buildings/land use in the areas owned by Technix include:

- Staff offices and facilities,
- Workshops (Machining, plate and general),
- Dangerous goods storage,
- Liquid oxygen tanks, and
- Blast and Paint storage;
- Blasting and Painting sheds (until February 2014).

Contaminants that may be present on the site include;

- Grease and oils (e.g., diesel, petrols, lubricants & hydraulic oils);
- Metals (Ferrous and non-ferrous);
- Paint;
- General workshop contaminants (e.g. welding, cuttings and grinding);
- Garnet and blasting debris (until February 2014)

The stormwater area for consent 0291 covers the centre section of the site. The stormwater networks run around the perimeter of the building before running under FEGL property and into Waiwhakaiho River via a stormwater drain (STW001021). There are multiple sumps along this system to collect any stormwater. The feed pipes have an internal diameter of 150 mm and the discharge pipe has an internal diameter of 225 mm.

This site also has a truck wash bay, currently if the truck wash is used the valve joining the truck wash and stormwater network is closed. Once the cleaning is finished the user must clean the truck wash, including emptying the separator pits, before opening the valve to allow stormwater to enter the network from the truck wash.

The western area of the site collects the stormwater in a series of pipes ranging between 100 mm and 200 mm in diameter. These pipes discharge onto either Vickers or Rifle Range Road and enter the New Plymouth District Council stormwater network (which discharges into the Waiwhakaiho River).



The northern area of the site is primarily used as a storage yard, with any stormwater collected discharges via a 375 mm concrete stormwater pipe into the Mangaone Stream.

As Technix leases sections within the multiple areas, the specific type of contaminants can change depending on which business leases the section. Technix makes all tenants aware of the stormwater resource consent, the conditions of the consent, and the spill contingency plan.

## 14.2 Water discharge permits

Discharge permit **0291** was originally granted on 1 May 1996 to discharge up to 426 litres per second of stormwater, including treated truck wash water, from a Rifle Range Road site into the Waiwhakaiho River for a period until 1 June 2014. This was renewed during the current monitoring period with consent **0291-3**, to discharge stormwater from an industrial site into the Waiwhakaiho River, issued by the Council under section 87(e) of the RMA on 24 October 2014. It is due to expire on 1 June 2032.

Technix now holds consent **9981-1** to discharge stormwater from an industrial site into the Waiwhakaiho River. This was issued by the Council under section 87(e) of the RMA on 24 October 2014 and it is due to expire on 1 June 2032.

Technix now also holds consent **9982-1** to discharge stormwater from an industrial site into the Mangaone Stream. This was issued by the Council under section 87(e) of the RMA on 24 October 2014 and it is due to expire on 1 June 2032.

Both **9981-1** and **9982-1** have eight special conditions (identical except for catchment size) that require the adoption of best practice, limit the catchment area and contaminant concentrations in the discharge, limit effects in receiving water, and require stormwater management and contingency planning. Consent **0291-3** also has the same conditions, with the addition of a condition prohibiting discharge from the truck wash to the stormwater network.

## 14.3 Results

### 14.3.1 Inspections

The site was inspected on four occasions during the monitoring period, on 30 September and 2 December 2014, and 12 March and 29 June 2015.

The site was observed to be tidy during all of the inspections. There were no spills observed and stormwater drains were visually clear of contaminants. The Mangaone Stream and the Waiwhakaiho River were flowing clean and clear. No dust or odours were noted.

### 14.3.2 Results of discharge monitoring

There were three routine sampling points for monitoring of stormwater discharges from Technix Group's site, all in relation to the Waiwhakaiho River. They were the storm drain outlets at the bottom of Vickers Road where the discharge has combined

with a (previously unlicensed) New Plymouth District Council discharge, opposite Fitzroy Engineering Group's (FEGL) plate shop (consent 0021), and opposite Fitzroy Engineering Group's blast and paint shop (consent 0291). The discharge to the Mangaone Stream (previously consent 2230, permitted during the period under review) is not sampled routinely owing to inactivity in the catchment and difficulty in access to the outlet. However, due to increased activity in this area, Technix was advised during the later part of the period under review, that this discharge point should once again be covered by a consent.

As the Vickers Road outlet has now been incorporated into New Plymouth District Council's consent 5163, monitoring results for this discharge point, previously reported in Technix section, have been moved to the section covering New Plymouth District Council's discharges. Technix was also advised during the later part of the period under review, that this discharge point should be covered by a consent. Due to the difficulty in accessing the site during combined wet weather surveys the individual sampling of discharges is planned to be undertaken in the 2016-2017 period during wet weather inspections.

### **Opposite Fitzroy Engineering Group's Blast & Paint (Consent 0291)**

This discharge contains stormwater from both the Technix and FEGL sites. Up until 20 February 2014, this combined discharge was covered solely by consent 0291 held by Technix. The partial transfer of consent to FEGL resulted in the FEGL stormwater being covered by their own consent (9853).

The conditions on stormwater composition on consent 0291 and 9853 for pH range, suspended solids and oil and grease were complied with on each monitoring occasion.

**Table 56** Chemical monitoring results for Technix/FEGL stormwater discharge-site STW001021

Parameter	Conductivity @ 20°C	Oil and Grease	pH	Suspended solids	Temperature	Turbidity
Unit	mS/m@20C	g/m <sup>3</sup>	pH	g/m <sup>3</sup>	Deg.C	NTU
Minimum	2.2	0.5	6	2	10.6	6.7
Maximum	24.4	3.5	7.7	530	23.4	200
Median	6.7	1.9	7.3	36	15.3	38.5
Number	45	6	45	45	42	22
23 Mar 2015	5.2	b	7.0	15	19.4	24
11 Jun 2015	13.3	<0.5	7.2	24	13.3	36
<i>Consent limits</i>	-	15	6-9	100	-	-

**Key:** b parameter not determined, no visible hydrocarbon sheen and no odour

### **Vickers Rd discharge (consent 9981-1)**

This discharge contains stormwater from the south-western end of the Technix site that discharges via NPDC's stormwater reticulation running along Vickers Rd. The discharge also contains stormwater from Vickers Rd itself as reported in section 9.

**Table 57** Chemical monitoring results for combined Technix/Vickers Rd discharge-site STW001020

Parameter	Conductivity @ 20°C	Oil and Grease	pH	Suspended solids	Temperature	Turbidity
Unit	mS/m@20C	g/m <sup>3</sup>	pH	g/m <sup>3</sup>	Deg.C	NTU
Minimum	2.3	0.5	6.6	2	10.4	2.7
Maximum	68.1	549	9.3	510	21.2	160
Median	11.4	1.7	7.3	60	15.6	36
Number	54	47	54	53	56	23
23 Mar 2015	13.0	0.9	6.6	13	17.9	4.7
11 Jun 2015	8.7	b	7.2	84	11.8	44
Consent limits	-	15	6-9	100	-	-

**Key:** b parameter not determined, no visible hydrocarbon sheen and no odour

### Mangaone Stream discharge (consent 9982-1)

This discharge contains stormwater from the north eastern end of the Technix site which is discharged to the Mangaone Stream. No discharge samples were taken in this monitoring period, however up and downstream sampling show that that Technix is complying with consent conditions in regard to effects of receiving water (Table 58). Due to the difficulty in accessing the site during combined wet weather surveys the individual sampling of discharges from this site is planned to be undertaken in the 2016-2017 period.

**Table 58** Receiving water results from the Mangaone Stream (Technix)

Parameter		Katere Road bridge MGO000153	Rifle Range Road (d/s Technix/Dower EDI) MGO000190
<b>10 Dec 2014</b>			
Time	NZST	10:25	12:40
Conductivity @ 20°C	mS/m	12.8	14.8
Un-ionised ammonia	g/m <sup>3</sup>	0.00792	0.00095
Ammoniacal nitrogen	g/m <sup>3</sup> N	0.526	0.127
pH	pH	7.6	7.3
Suspended solids	g/m <sup>3</sup>	31	63
Temperature	Deg.C	17.0	16.8
Turbidity	NTU	-	25
<b>23 Mar 2015</b>			
Time	NZST	11:55	10:45
Conductivity	mS/m	17.7	18.4
Un-ionised ammonia	g/m <sup>3</sup>	0.00120	0.00135
Ammoniacal nitrogen	g/m <sup>3</sup> N	0.258	0.148
Oil and grease	g/m <sup>3</sup>	b	b
pH	pH	7.1	7.4
Suspended solids	g/m <sup>3</sup>	8	4
Temperature	Deg.C	16.6	16.4
Turbidity	NTU	-	4.2

**Key:** b parameter not determined, no visible hydrocarbon sheen and no odour

## 14.4 Investigations, interventions, and incidents

In the 2014-2015 period, the Council was not required to undertake significant additional investigations and interventions, or record incidents, in association with Technix Group Limited's conditions in resource consents or provisions in Regional Plans.

## 14.5 Discussion

### 14.5.1 Discussion of site performance

Housekeeping at the site over the monitoring period was generally good, and the bunds were well managed. There were no issues noted during any of the inspections.

The stormwater discharges from the site were found to be compliant with consent conditions on all monitoring occasions

### 14.5.2 Environmental effects of exercise of consents

There were no adverse environmental effects noted in the receiving environment as a result of Technix discharges.

### 14.5.3 Evaluation of performance

A tabular summary of the consent holder's compliance record for the period under review is set out in Table 59, Table 60, Table 61 and Table 62.

**Table 59** Summary of performance for Technix consent 0291-2

<b>Purpose: To discharge stormwater into the Waiwhakaiho River (in effect up to 24 October 2014)</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
1. Concentration limits upon potential contaminants in discharge	Not monitored (samples were collected after consent was replaced by 0291-3)	Yes
2. Discharge cannot cause specified adverse effects beyond mixing zone	Visual assessment at inspection	Yes
3. Prohibits discharge of cleaning solvents	Visual assessment at inspection	Yes
4. Prepare and maintain contingency plan	Review of documentation received. Latest version approved by Council in July 2014	Yes
5. Provision for review of consent	No further opportunities for review	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		<b>High</b>
Overall assessment of administrative performance in respect of this consent		<b>High</b>

N/A = not applicable

**Table 60** Summary of performance for Technix consent 0291-3

<b>Purpose: To discharge stormwater from an industrial site into the Waiwhakaiho River (in effect from 24 October 2014)</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
1. Best practicable option to prevent or minimise effects	Chemical sampling	Yes
2. Catchment area not to exceed 2.2 ha	Inspections	Yes
3. No discharge to stormwater from truck wash after 31 December 2015	Inspections and liaison with consent holder	Yes
4. Concentration limits upon potential contaminants in discharge	Chemical sampling	Yes
5. Discharge cannot cause specified adverse effects beyond mixing zone	Visual assessment at inspection and receiving water sampling and biomonitoring	Yes
6. Prepare and maintain Contingency Plan	Review of documentation. Received. Latest version approved by Council in July 2014	Yes
7. Preparation of Stormwater Management Plan	Plan Received	Yes
8. Consent holder to notify Council of significant changes to processes or operations	Inspections and liaison with consent holder	Yes
9. Provision for review of consent	Next option for review in June 2020	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		<b>High</b>
Overall assessment of administrative performance in respect of this consent		<b>High</b>

**Table 61** Summary of performance for Technix consent 9981-1

<b>Purpose: To discharge stormwater from an industrial site into the Waiwhakaiho River</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
1. Best practicable option to prevent or minimise adverse effects	Inspections	Yes
2. Catchment area not to exceed 1.8 ha	Inspections	Yes
3. Concentration limits upon potential contaminants in discharge	Chemical sampling	Yes
4. Discharge cannot cause specified adverse effects beyond mixing zone	Visual assessment at inspection and receiving water sampling and biomonitoring	Yes

<b>Purpose: To discharge stormwater from an industrial site into the Waiwhakaiho River</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
5. Prepare and maintain Contingency Plan	Review of documentation received. Latest version approved by Council in July 2014	Yes
6. Preparation of Stormwater Management Plan	Plan Provided	Yes
7. Consent holder to notify Council of significant changes to processes or operations	Liaison with consent holder	Yes
8. Provision for review of consent	Next option for review in June 2020	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		<b>High</b>
Overall assessment of administrative performance in respect of this consent		<b>High</b>

**Table 62** Summary of performance for Technix consent 9982-1

<b>Purpose: To discharge stormwater from an industrial site into the Mangaone Stream</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
1. Best practicable option to prevent or minimise adverse effects	Inspections	Yes
2. Catchment area not to exceed 1.3 ha	Inspections	Yes
3. Concentration limits upon potential contaminants in discharge	Not assessed this period	N/A
4. Discharge cannot cause specified adverse effects beyond mixing zone	Visual assessment at inspection and receiving water sampling and biomonitoring	Yes
5. Prepare and maintain Contingency Plan	Review of documentation received Latest version approved by Council in July 2014	Yes
6. Preparation of Stormwater Management Plan	Plan received	Yes
7. Consent holder to notify Council of significant changes to processes or operations	Liaison with consent holder	Yes
8. Provision for review of consent	Next option for review in June 2020	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		<b>High</b>
Overall assessment of administrative performance in respect of this consent		<b>High</b>

During the period under review, Technix Group Limited demonstrated a high level of environmental performance and high level of administrative performance and compliance with the resource consents as defined in Section 1.1.5 in relation its sites on Rifle Range Rd.

#### **14.5.4 Recommendation from the 2012-2014 Biennial Report**

In the 2012-2014 Biennial Report, it was recommended:

THAT monitoring of discharges from Technix Group Limited in the 2014-2015 year continues at the same level as in 2012-2014.

This recommendation was implemented in the 2014-2015 monitoring period.

#### **14.5.5 Alterations to monitoring programmes for 2015-2016**

In designing and implementing the monitoring programmes for water discharges in the region, the Council has taken into account the extent of information made available by previous authorities, its relevance under the RMA the obligations of the Act in terms of monitoring discharges and effects, and subsequently reporting to the regional community. The Council also takes into account the scope of assessments required at the time of renewal of permits, and the need to maintain a sound understanding of industrial processes within Taranaki discharging to the environment.

It is proposed that for 2015-2016, the programme remains unchanged. A recommendation to this effect is attached to this report.

#### **14.6 Recommendation**

THAT monitoring of discharges from Technix Group Limited in the 2015-2016 year continues at the same level as in 2014-2015.

## 15. Investigations, interventions, and incidents

During the period under review there were 11 incidents involving potential or actual discharges to water in the Lower Waiwhakaiho catchment that were not directly associated with consent holders covered by this report. The details of those incidents are given below.

### 5 September 2014

Un sourced

A notification was received from New Plymouth District Council (NPDC) about hydrocarbon sheen in their carousel plant at the Waste Water Treatment Plant at the end of Rifle Range Road, Waiwhakaiho.

Investigation found that there was no sheen in the river at the time of inspection. No trace of any unauthorised discharges had been found upstream. The discharge had occurred to the Waste Water Treatment Plant via the trade waste system. All hydrocarbons were contained within the carousel plant.

### 28 September 2014

Un sourced

A complaint was received concerning a soapy/foamy discharge from a stormwater outlet in the vicinity of the Waiwhakaiho River in the Merrilands Domain, New Plymouth.

Investigation found that some foam had pooled near a stormwater outlet. No unauthorised discharges could be found. The river was in high flow at the time of inspection and no environmental impacts were found.

### 15 October 2014

Un sourced

During unrelated monitoring it was found that there was foam in Waiwhakaiho River, New Plymouth near a stormwater outlet. Samples were taken. The samples were found to be compliant with resource consents associated with the discharge, and the source of foam was not found.

### 7 November 2014

Murray & Vicky Pierce

A complaint was received concerning earthworks being undertaken in the vicinity of the Waiwhakaiho River on Smart Road, New Plymouth. Investigation of the earthworks found that they were being carried out as a permitted activity under the Regional Fresh Water Plan for Taranaki. A small amount of contouring and drainage work had been carried out to minimise flooding at a camp site.

### 3 December 2014

Fulton Hogan

A complaint was received concerning discolouration of the Waiwhakaiho River at Devon Road, New Plymouth. Investigation found that a contractor was pumping out water from a piling surround to allow concrete to be poured. The works were compliant with the resource consent held for the activity.



**8 December 2014**

Taranaki Fresh

A notification was received from NPDC regarding an oil spill in a service lane parallel to Burton Street, New Plymouth. Investigation found that soya oil had been spilt onto the asphalt. A small volume had entered the stormwater sump. The manager of Taranaki Fresh applied sawdust to the spill to soak it up. No soya oil entered the Waiwhakaiho River.

**20 February 2015**

Un sourced

A complaint was received concerning the discharge of oil into the Waiwhakaiho River from an unknown source. An investigation of the stream and stream bank failed to find any sign of oil at a number of locations around the area.

**7 February 2015**

Un sourced

A complaint was received regarding a discoloured stream at Devon Road, Fitzroy. An inspection of the Mangaone Stream found it to be running clear. The investigating officer was unable to locate source of the reported discolouration.

**18 March 2015**

Fulton Hogan Limited - New Plymouth

A notification was received regarding silt discharging from bridge foundation holes being drilled at the Waiwhakaiho bridge in Fitzroy. Investigation found that there was minimal discolouration of receiving water during the excavation of bridge pile holes. No effects to water quality beyond the mixing zone were noted.

**14 May 2015**

Drainage Plus Contracting Ltd

A complaint was received regarding silt and sediment discharging from earthworks associated with a residential development on Atiawa Street, New Plymouth. Abatement Notice EAC-20781 was issued requiring silt and sediment controls to be installed. Re-inspection found that the abatement notice was being complied with.

**15 May 2015**

Whitaker Civil Engineering Limited

A complaint was received regarding silt and sediment discharging from a subdivision overland and into surface water on Mangorei Road, New Plymouth. Investigation found that silt and sediment controls were in place at the subdivision. No sediment was found to be discharging to surface water at the time of inspection.

## 16. Surface receiving water quality

### 16.1 Chemical analyses

The results of chemical analysis of the receiving water for the period under review are given in Table 63, Table 64, Table 65, Table 66, and Table 67. Refer to Section 1.3.4 for the sampling strategy. Monitoring locations are shown in Figure 1

#### 16.1.1 Waiwhakaiho River

The lower Waiwhakaiho River was sampled at four points under wet weather (discharge monitoring) and three points under dry weather (groundwater monitoring) conditions:

- **Merrilands Domain (site code WKH000800):** At the riffle just upstream of the swimming area in the Waiwhakaiho River at the Merrilands Domain, about 5.4 km from the coast. This is the upstream, or control site with respect to New Plymouth District Council's Burton Street stormwater discharge.
- **Constance Street (site code WKH000920):** At the first bend below Devon Road bridge, about 2.6 km from the river mouth. This is the upstream, or control site, with respect to monitoring discharges to the lower Waiwhakaiho River from New Plymouth industrial area including the groundwater discharge from the Bewley Road landfill.
- **Opposite Firth's (site code WKH000925):** On the eastern side, upstream of the site of the old concrete ford opposite Firth Industries, about 540 metres below Constance Street and 280 metres below the confluence with McLeod's Drain. This was effectively the lower mixing zone boundary for the discharge from McLeod's Drain (consent 3138), which serves the largest catchment in the Fitzroy area, including the fertiliser depot (consent 3140) and rail yard (consent 1735). The ford was removed in April 1997 as part of flood protection works.
- **Above Mangaone (site code WKH000942):** Immediately above the confluence with the Mangaone Stream and any tidal saline influence, beside the eastern bank opposite Lake Rotomanu, about 1300 metres from the river mouth. This is the downstream monitoring site for discharges from Firth Industries (consent 0392), Fitzroy Engineering Group Limited (consent 0021 and 9853), and the Technix Group operations along Rifle Range Road (consents 0291 9981).

The results are shown in Table 63 and Table 64.

##### 16.1.1.1 Wet weather surveys

With the exception of a very minor increases in the concentration of ammoniacal nitrogen (and its conjugate species unionised ammonia) and turbidity, there was no discernible trend of increasing contaminant concentrations between the up and downstream receiving waters (Table 63).

The highest concentrations of ammoniacal nitrogen and unionised ammonia were well below ANZECC trigger guideline of 0.9 g/m<sup>3</sup> and the RFWP guideline of 0.025.

On 23 March the dissolved reactive phosphorous concentrations at all the sites both up and downstream of the industrial area were found to be in the 015-0.03 g/m<sup>3</sup> range that may support algal growths, however the longitudinal profile of the results indicate that no substantial inputs from the industrial area were occurring at the time.

**Table 63** Results of wet weather chemical monitoring of lower Waiwhakaiho River

Parameter	Waiwhakaiho				
	Merrilands Domain	Constance Street	Opposite Firth's (Ford)	Above Mangaone Confluence	
<b>23 March 2015</b>	<b>WKH000800</b>	<b>WKH000920</b>	<b>WKH000925</b>	<b>WKH000942</b>	
Time	NZST	09:20	09:40	10:10	10:55
Conductivity	mS/m@20C	11	9.1	9.6	9.6
DRP	g/m <sup>3</sup> P	0.025	0.02	0.026	0.025
Fluoride	g/m <sup>3</sup>	-	0.05	0.05	0.05
Un-ionised ammonia	g/m <sup>3</sup>	0.00009	0.00004	0.00013	0.00031
Ammoniacal nitrogen	g/m <sup>3</sup> N	0.007	<0.003	0.016	0.024
Nitrite/Nitrate	g/m <sup>3</sup> N	-	0.12	-	0.12
pH		7.6	7.6	7.4	7.6
Suspended solids	g/m <sup>3</sup>	4	5	5	7
Temperature	Deg.C	14.4	14.1	14.4	15
Turbidity	NTU	2	2.1	2.7	3.6
<b>11 June 2015</b>	<b>WKH000800</b>	<b>WKH000920</b>	<b>WKH000925</b>	<b>WKH000942</b>	
Time	NZST	11:50	08:25	08:45	09:55
Conductivity	mS/m@20C	9.8	8.9	8.3	8.3
DRP	g/m <sup>3</sup> P	0.014	0.007	0.016	0.008
Fluoride	g/m <sup>3</sup>	-	0.08	0.04	0.03
Un-ionised ammonia	g/m <sup>3</sup>	0.00007	0.00001	0.00012	0.00006
Ammoniacal nitrogen	g/m <sup>3</sup> N	<0.003	<0.003	0.015	<0.003
Nitrite/Nitrate	g/m <sup>3</sup> N	-	0.29	-	0.31
pH		8.0	7.3	7.5	7.9
Suspended solids	g/m <sup>3</sup>	<2	<2	3	<2
Temperature	Deg.C	11.2	11.1	11.3	11.3
Turbidity	NTU	1.3	2.1	2.3	2.1

### 16.1.1.2 Dry weather surveys

The sample results for the dry weather surveys (given in Table 64 ) show that all of the contaminants analysed for were generally relatively stable through the stretch of the river that was monitored. There were slight variations in the concentrations of ammoniacal nitrogen (and its conjugate species unionised ammonia). However the highest concentrations of ammoniacal nitrogen and unionised ammonia found were well below ANZECC trigger guideline of 0.9 g/m<sup>3</sup> and the RFWP guideline of 0.025 g/m<sup>3</sup> respectively.

All other parameters were found to be at acceptable ranges.

**Table 64** Results of dry weather chemical monitoring of lower Waiwhakaiho River

Parameter	Waiwhakaiho		
	Constance Street	Opposite Firth's (Ford)	Above Mangaone Confluence
<b>16 Jan 2016</b>	<b>WKH000920</b>	<b>WKH000925</b>	<b>WKH000942</b>
Time NZST	11:05	10:50	10:25
Conductivity mS/m@20C	14.2	14.6	15.0
DRP g/m <sup>3</sup> P	0.009	0.007	0.007
Unionised ammonia g/m <sup>3</sup>	0.00045	0.00095	0.00020
Ammoniacal nitrogen g/m <sup>3</sup> N	0.007	0.023	0.012
pH	8.1	7.9	7.5
Temperature Deg.C	21.7	21.6	21.2
Turbidity NTU	2.7	2.1	2.3
<b>19 May 2015</b>	<b>WKH000920</b>	<b>WKH000925</b>	<b>WKH000942</b>
Time NZST	08:10	07:50	08:20
Conductivity mS/m@20C	10.9	11.0	11.0
DRP g/m <sup>3</sup> P	0.014	0.013	0.013
Unionised ammonia g/m <sup>3</sup>	0.00007	0.00014	0.00010
Ammoniacal nitrogen g/m <sup>3</sup> N	0.008	0.021	0.015
pH	7.5	7.4	7.4
Temperature Deg.C	12.3	12.1	12.1
Turbidity NTU	0.80	0.68	1.0

### 16.1.2 Mangaone Stream

The Mangaone Stream was sampled at up to six points during wet weather and at two points during dry weather.

#### 16.1.2.1 Wet weather surveys

The wet weather sites are as follows:

**Egmont Road (site code MGO000050):** the uppermost site at Egmont Road bridge.

**Downstream of Farmlands and NPDC (site code MGO000075):** a site established in 2007 approximately 10m downstream of the NPDC mid Katere Road stormwater discharge. This site acts as the downstream site for Farmland's feedmill and the District Council's stormwater discharge, and as an upstream "control site" for Taranaki Sawmill's timber treatment site.

**30m downstream of Taranaki Sawmills (site code MGO000145):** also established in 2007, this site is at the end of the mix zone specified in Taranaki Sawmill's resource consent.

**Above Ravensdown (site code MGO000148):** a site established in 1996 immediately above the main stormwater drain of Ravensdown Fertiliser's depot (and also above the confluence of the Mangamiro Stream) to enable differentiation of the influence of major tributaries below Egmont Road, particularly the Puremu and Manganaha Streams which flow through Colson Road landfill, from that of discharges from Ravensdown's site.

**Katere Road bridge (site code MGO000153):** below the discharge from Ravensdown Fertiliser's depot. This site is at the end of the mixing zone specified in the Company's consent 3865.

**Rifle Range Road (site code MGO000190):** the bottom site at the Rifle Range Road bridge, immediately above the Waiwhakaiho confluence and about 50 metres below the discharge point of Downer EDI Works Limited.

The results of this monitoring are given in Table 65, Table 66, and Table 67

**Table 65** Results of wet weather chemical monitoring of Mangaone Stream, December 2014

Parameter		Egmont Road	D/S Viterra and NPDC	D/S Taranaki Sawmills	Above Ravensdown	Katere Road bridge	Rifle Range Road
10 December 2014		MGO000050	MGO000075	MGO000145	MGO000148	MGO000153	MGO000190
Time	NZST	08:50	09:45	10:10	11:00	10:25	12:40
Arsenic Total	g/m <sup>3</sup>	-	0.0059	0.0029	-	-	-
Boron	g/m <sup>3</sup>	-	0.13	0.09	0.06	-	-
BOD	g/m <sup>3</sup>	-	-	-	-	-	-
BODCF	g/m <sup>3</sup>	1.1	2.5	1.9			
Conductivity @ 20°C	mS/m	16.7	10.3	13.2	14.4	12.8	14.8
Total chromium	g/m <sup>3</sup>	-	0.0057	0.0041	-	-	-
Acid soluble copper	g/m <sup>3</sup>	0.002	-	-	-	-	0.006
Dissolved copper	g/m <sup>3</sup>	0.001	0.004	0.003	0.002		0.002
Total copper	g/m <sup>3</sup>	-	0.0162	0.0059	-	-	-
Dibutyltin (as Sn)	g/m <sup>3</sup>	-	-	<0.00006	-	-	-
Dissolved Reactive P	g/m <sup>3</sup>	0.008	-	-	0.013	0.114	0.037
Hydrocarbons	g/m <sup>3</sup>	b	0.5	b	-	-	-
Un-ionised ammonia	g/m <sup>3</sup>	0.00015	0.00021	0.00058	0.00078	0.00792	0.00095
Ammoniacal nitrogen	g/m <sup>3</sup> N	0.025	0.044	0.123	0.104	0.526	0.127
pH	pH	7.2	7.1	7.1	7.3	7.6	7.3
Suspended solids	g/m <sup>3</sup>	19	47	16	28	31	63
Tributyltin (as Sn)	g/m <sup>3</sup>	-	-	0.00012	-	-	-
Temperature	Deg.C	16.6	17.0	16.8	16.8	17.0	16.8
Triphenyltin (as Sn)	g/m <sup>3</sup>	-	-	<0.00004	-	-	-
Turbidity	NTU	10	20	14	16	-	25
Acid soluble zinc	g/m <sup>3</sup>	<0.005	-	-	-	-	0.039
Dissolved zinc	g/m <sup>3</sup>	<0.005	0.045	0.026	0.016	-	0.009
Zinc total	g/m <sup>3</sup>	-	0.119	0.041	-	-	-

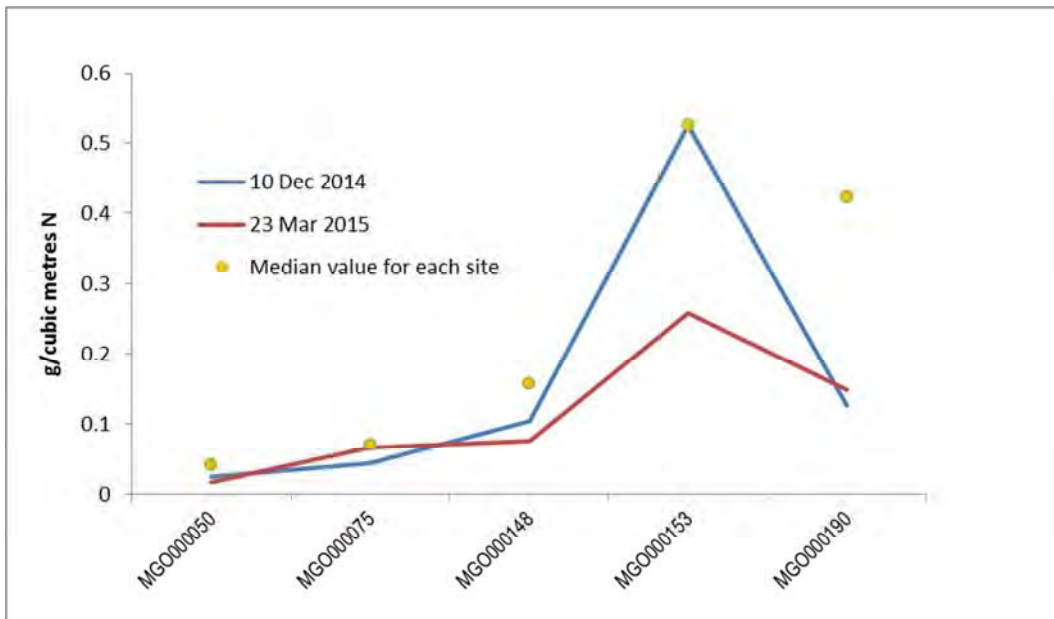
**Table 66** Results of wet weather chemical monitoring of Mangaone Stream, March 2015

Parameter		Egmont Road	D/S Viterra and NPDC	D/S Taranaki Sawmills	Above Ravensdown	Katere Road bridge	Rifle Range Road
<b>23 Mar 2015</b>		<b>MGO000050</b>	<b>MGO000075</b>	<b>MGO000145</b>	<b>MGO000148</b>	<b>MGO000153</b>	<b>MGO000190</b>
Time	NZST	09:25	11:15	11:40	13:10	11:55	10:45
Total arsenic	g/m <sup>3</sup>	-	<0.0011	<0.0011	-	-	-
Boron	g/m <sup>3</sup>	-	0.04	0.04	0.04	-	-
BOD	g/m <sup>3</sup>	-	-	-	-	-	-
BODCF	g/m <sup>3</sup>	<0.5	0.5	0.6	-	-	-
Conductivity	mS/m	19.1	17.8	18.0	18.6	17.7	18.4
Total chromium	g/m <sup>3</sup>	-	0.00064	0.00149	-	-	-
Acid soluble copper	g/m <sup>3</sup>	0.004	-	-	-	-	0.004
Dissolved copper	g/m <sup>3</sup>	<0.001	0.002	0.001	0.001	-	0.001
Total copper	g/m <sup>3</sup>	-	0.0024	0.0020	-	-	-
Dibutyltin (as Sn)	g/m <sup>3</sup>	-	-	<0.00006	-	-	-
Dissolved reactive P	g/m <sup>3</sup>	0.010	-	-	0.012	0.040	0.023
Hydrocarbons	g/m <sup>3</sup>	b	b	b	b	b	b
IPBC	g/m <sup>3</sup>	-	-	<0.0002	-	-	-
Un-ionised ammonia	g/m <sup>3</sup>	0.00004	0.00024	0.00030	0.00028	0.00120	0.00135
Ammoniacal nitrogen	g/m <sup>3</sup> N	0.016	0.066	0.082	0.075	0.258	0.148
Oil and grease	g/m <sup>3</sup>	b	b	b	b	b	b
Permethrin	g/m <sup>3</sup>	-	-	<0.00002	-	-	-
pH	pH	6.9	7.0	7.0	7.0	7.1	7.4
Propiconazole	g/m <sup>3</sup>	-	-	0.00016	-	-	-
Suspended solids	g/m <sup>3</sup>	2	5	3	2	8	4
Tributyltin (as Sn)	g/m <sup>3</sup>	-	-	<0.00005	-	-	-
Tebuconazole	g/m <sup>3</sup>	-	-	<0.00004	-	-	-
Temperature	Deg.C	15.8	16.3	16.3	16.6	16.6	16.4
Triphenyltin (as Sn)	g/m <sup>3</sup>	-	-	<0.00004	-	-	-
Turbidity	NTU	1.5	5.0	3.7	2.6	-	4.2
Acid soluble zinc	g/m <sup>3</sup>	<0.005	-	-	-	-	0.018
Dissolved zinc	g/m <sup>3</sup>	<0.005	0.008	0.014	0.007	-	0.007
Zinc total	g/m <sup>3</sup>	-	0.0147	0.0129	-	-	-

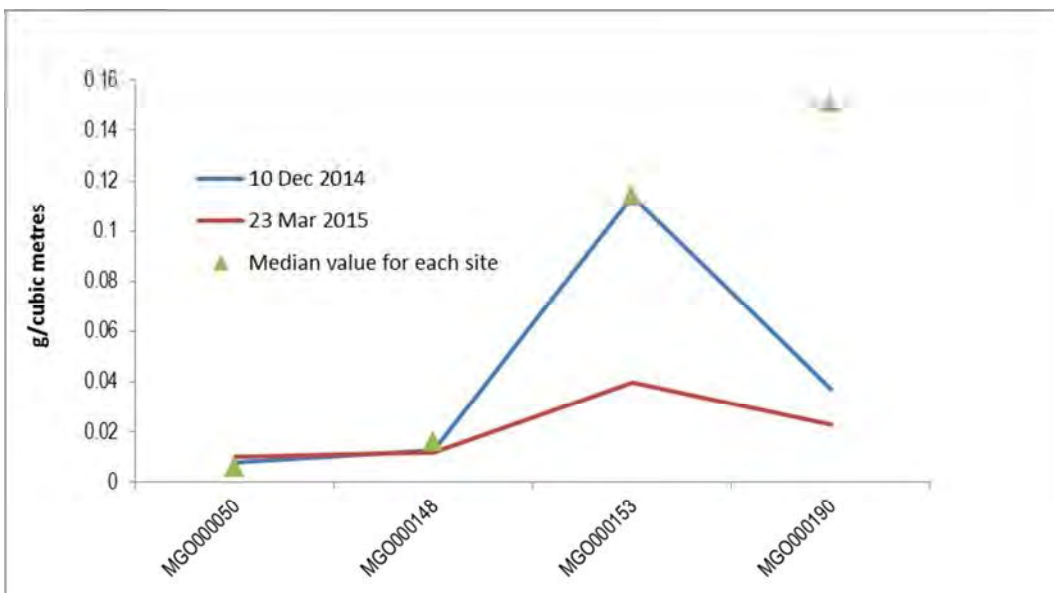
The results show that there were downstream increases in the ammonia and dissolved reactive phosphorus concentrations along the stretch of the Mangaone Stream monitored. The longitudinal trends in ammoniacal nitrogen in the stream for the period are shown in Figure 24. The median value for each site show that historically, the sites below Ravensdown site and its discharges are elevated when compared to the upstream sites. During this monitoring period the results were either similar or below the historical medians for each site and all results for unionised ammonia were well below the RFWP guideline value of 0.025 g/m<sup>3</sup>.

DRP was also found to increase at the site downstream of the Ravensdown site, however all values were found to be similar or below the historical medians as shown in Figure 24. DRP concentrations appear to be dropping at this site since

Ravensdown decommissioned and demolished the rock store. In the event that the site is completely demolished and remediated it is expected that phosphorus levels will improve.



**Figure 23** Longitudinal profiles of NH<sub>4</sub>-N in the Mangaone Stream



**Figure 24** Longitudinal profiles of DRP in the Mangaone Stream

BOD concentration during the monitoring year were also found to be low with the exception of one result of 2.5 g/m<sup>3</sup> at site MGO000075, however all subsequent monitoring results at this site were found to be below detection limits.

Tributyltin was detected in the water column downstream of Taranaki Sawmills Limited (TSM) discharge on one occasion during the period under review at site MGO000145, however there was no corresponding detection of tributyltin in the discharges from TSM at the time. In subsequent sampling undertaken in this, and the next monitoring period, tributyltin was not detected in the receiving water. One of the replacement treatment chemicals now in use was found to be present in the

stream at low concentrations. Propiconazole was detected on one occasion at site MGO000145 on 23 March. This result and a subsequent result seem to be part of a decreasing trend for this chemical in receiving water and will continued to be monitored.

Metal and metalloid concentrations are monitored in the Mangaone Stream to determine what, if any, effects may be occurring due to the discharges from Taranaki Sawmills and other industrial discharges. Sources of these contaminants include (to varying extents), the industrial sites and other non-point sources such as run-off from roads. During the two discharge surveys it was found that, on the whole, there was little, if any, change in the concentration of arsenic, dissolved copper, chromium, or boron in the receiving water of the Mangaone Stream below TSM. There were increases in zinc, however the concentrations found at the site downstream of TSM's discharges in the Mangaone Stream were found to be below the acute and chronic toxicity concentration given by the USEPA at all sites during the period under review (see paragraphs below).

In common with one of the surveys in each of the previous three monitoring periods, during the period under review it was found that the dissolved copper and zinc increased at the sampling site downstream of the Viterra/Farmlands feedmill and NPDC mid Katere stormwater drain (MGO000075) on occasion. Dissolved copper and zinc was found to have increased at this site on both monitoring occasions.

There are several guidelines for zinc and copper for assessing water quality in terms of suitability for sustaining aquatic life. The United States Environmental Protection Agency (USEPA), in defining metals criteria for protection of freshwater aquatic life, has adopted the use of dissolved metals as most closely approximating the bio available fraction of these metals in the water column. Previously, water quality criteria were based on total recoverable metal concentration.

The water quality criteria for dissolved copper and zinc, for water of hardness 50 g/m<sup>3</sup> CaCO<sub>3</sub>, are 0.005 g/m<sup>3</sup> for Cu and 0.058 g/m<sup>3</sup> for Zn respectively as a 4 day average, for chronic (long term) exposure. The corresponding criteria for acute (4-hour) exposure are 0.007 g/m<sup>3</sup> for Cu and 0.064 g/m<sup>3</sup> for Zn. Acute criteria only are applicable to wet weather sampling results, whereas both chronic and acute exposure criteria are applicable to dry weather sampling results.

Both the dissolved copper and dissolved zinc levels in the Mangaone Stream were found to be at or below the acute and chronic toxicity concentration given by the USEPA at all sites at the time of all of the surveys during the period under review.

Low level analyses for zinc and copper were also performed on samples taken at the Egmont Road site to monitor the effects of stormwater discharged upstream of the industries monitored under this programme, from McKechnie Aluminium Solutions Limited as part of their compliance monitoring programme. It is noted that historically, copper and brass were also processed at this site.

**Table 67** Results of chemical monitoring of the Mangaone Stream at Egmont Road for McKechnie Aluminium Solutions Limited compliance monitoring-site MGO000050

Parameter	Unit	Wet run	Wet run	Dry run
		10-Dec-14	23-Mar-15	28-May-15

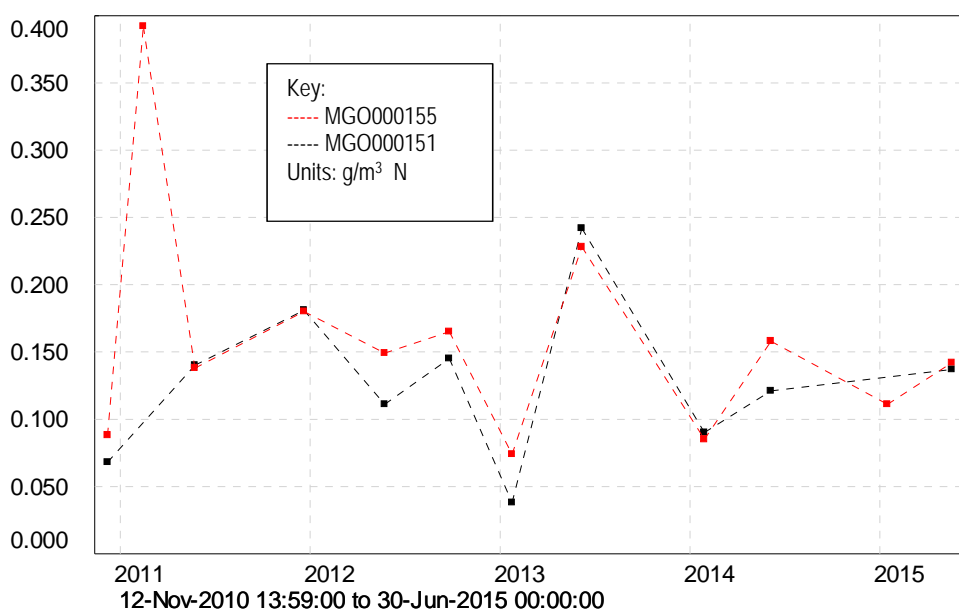


Conductivity @ 20°C	mS/m@20C	16.7	19.1	17.9
Copper Acid Soluble	g/m <sup>3</sup>	0.002	0.004	<0.01
Copper Dissolved	g/m <sup>3</sup>	0.001	<0.001	<0.001
pH	pH	7.2	6.9	7.0
Suspended solids	g/m <sup>3</sup>	19	2	9
Temperature	Deg.C	16.6	15.8	10.4
Zinc Acid Soluble	g/m <sup>3</sup>	<0.005	<0.005	<0.005
Zinc Dissolved	g/m <sup>3</sup>	<0.005	<0.005	<0.005

On these monitoring occasions, the copper and zinc concentrations in the receiving water were low upstream of the industries monitored in the Lower Waiwhakaiho Catchment Monitoring Programme.

### 16.1.2.2 Dry weather surveys

During the period under review dry weather monitoring was undertaken in the Mangaone Stream in conjunction with monitoring of the groundwater in the vicinity of the Ravensdown site (Section 12.3.3.3). The two sites monitored were MGO000151, approximately 20 m downstream of the Ravensdown rear drain, and MGO000155, approximately 15 m downstream of the Katere Road bridge. As this monitoring is predominantly carried out to assess potential effects from the Ravensdown store, the full results of these surveys are reported in Section 12.3.3.3, Table 49. Due to elevations in the ammoniacal nitrogen concentration observed in a Ravensdown bore on Katere Road, this is the parameter of primary interest here and **Error! Reference source not found.** shows the trends in ammoniacal nitrogen concentrations at the upstream and downstream sites.



**Figure 25** Mangaone Stream ammoniacal nitrogen concentrations in the vicinity of the Ravensdown site under dry weather conditions 2010-2015

Dry weather monitoring shows that, for the most part, the ammoniacal nitrogen of the downstream site was higher than the upstream site to varying degrees, although two of the samples collected during the period under review found that the ammoniacal nitrogen concentration below the Ravensdown site was similar to or

lower than the upstream site downstream.

The increases observed during these dry weather conditions are not considered to be sufficient to cause significant adverse environmental effects during dry weather, however biomonitoring inspections have found that periphyton cover in the Mangaone Stream generally increases downstream of the Ravensdown site. Aquatic macrophytes were common at the stream margins at the top and bottom sites and in the stream at the three middle sites.

## 16.2 Freshwater biomonitoring programme

### 16.2.1 Macroinvertebrate surveys

Surveys of benthic macroinvertebrates and microflora in the lower Waiwhakaiho River and/or Mangaone Stream were carried out on 16 October 2014 and 12-13 February 2015. Three sites in the Waiwhakaiho River and five sites in the Mangaone Stream were sampled. The sites monitored are shown in Figure 3, and described in Table 68. Full copies of the biomonitoring reports are given in Appendix III. A summary of discussion and conclusions of each survey is given below.

The reports both conclude that the results from the surveys indicate that the discharges from the Fitzroy industrial areas were not having a significant effect on the macroinvertebrate communities in the Waiwhakaiho River. The reports also both conclude that the results from the Mangaone Stream indicate the possibility of slight improvements in the macroinvertebrate communities downstream of Taranaki Sawmills Ltd, however that an overall degradation of the macroinvertebrate community index (MCI) scores persist as one moves downstream through the industrial area.

**Table 68** Biomonitoring sites in the Lower Waiwhakaiho River and the Mangaone Stream

Site No	Site Code	Location
7	WKH000920	Waiwhakaiho River, Constance Street
8	WKH000927	Waiwhakaiho River, below Firth industries, west (left) bank
13	WKH000950	Waiwhakaiho River, final riffle downstream of Lake Rotomanu
12	MGO000050	Mangaone Stream, Egmont Road
16	MGO000054	Mangaone Stream, 20m d/s of Manganaha Stream confluence
14	MGO000150	Mangaone Stream, 300m d/s confluence with Puremu Stream
15	MGO000155	Mangaone Stream, 100m d/s fertiliser works
11	MGO000190	Mangaone Stream, Rifle Range Road

#### 16.2.1.1 Macroinvertebrate survey of 16 October 2014

The Council's standard 'kick-net' and 'sweep-net' sampling techniques were used to collect streambed macroinvertebrates at three sites in the Waiwhakaiho River and five sites in the Mangaone Stream on 16 October 2014, in order to assess whether discharges from the Lower Waiwhakaiho Industrial area had had any adverse effects on the macroinvertebrate communities of these streams. Samples were processed to provide number of taxa (richness), MCI and SQMCI<sub>s</sub> scores for each site.

The MCI is a measure of the overall sensitivity of the macroinvertebrate community to the effects of organic pollution in stony streams. It is based on the

presence/absence of taxa with varying degrees of sensitivity to environmental conditions. The SQMCI<sub>5</sub> takes into account taxa abundances as well as sensitivity to pollution. It may indicate subtle changes in communities, and therefore be the more relevant index if non-organic impacts are occurring. Significant differences in either the MCI or SQMCI<sub>5</sub> between sites indicate the degree of adverse effects (if any) of the discharges being monitored.

This survey found that all Waiwhakaiho River sampling sites recorded community richnesses similar to long term medians for their respective sites, with richnesses similar between sites. In previous surveys there has been a typical downstream decrease in MCI scores between the sites. However in the current survey a slight increase in MCI scores was observed; although scores were not significantly different to one another. In addition, all sites recorded MCI scores insignificantly different from their respective medians. SQMCI<sub>5</sub> scores were slightly below their medians at site 8 and site 13, but significantly above the median at site 7. The lowest SQMCI<sub>5</sub> score was recorded at the furthest downstream site. Communities in the Waiwhakaiho River downstream of Lake Rotomanu may be inhibited from time-to-time by the variable current speeds caused by tidal flooding. These results did not indicate any significant effects of stormwater or wastewater discharges from the Fitzroy industrial area on the macroinvertebrate communities of the Waiwhakaiho River, although it is possible that the Mangaone Stream was contributing to the increased algal growth observed downstream of the confluence where there was a small decrease in the number of more 'sensitive' taxa characteristic of the community and an increase in the proportion of 'tolerant' taxa comprising the community.

It is apparent that the macroinvertebrate communities in the Mangaone Stream were of 'fair' health in the upper reaches deteriorating to 'poor' health in a downstream direction. The two most upstream sites had moderate taxa richnesses with lower taxa richness recorded at the lower three sites, particularly site 14 and site 11. MCI scores and SQMCI<sub>5</sub> scores were above medians at all sites, with a significant (Stark, 1998) increase in MCI score recorded at site 16 and significant increases in SQMCI<sub>5</sub> values recorded at site 14 and site 15. However, the five sampling sites in the Mangaone Stream showed a marked decline in MCI and SQMCI<sub>5</sub> values between Egmont Road (site 12) and Rifle Range Road (site 11), with a particularly marked decline in both SQMCI<sub>5</sub> and MCI scores between sites 16 and 14. Taranaki sawmills discharges stormwater to the Mangaone Stream between sites 16 and 14, and sediment sampling undertaken in early 2009 had recorded significant concentrations of not only tributyltin in the stream sediments around Taranaki Sawmills, but also elevated concentrations of arsenic, chromium, copper and zinc, all potentially toxic to aquatic biota (see BJ192). Previously there had been increased sedimentation between sites 16 and 14. Further sediment sampling undertaken in April 2012 and early March 2014, showed less contamination than that recorded in 2009; more indicative of physical habitat induced effects contributing to the smaller degree of biological health deterioration found more recently. MCI and SQMCI<sub>5</sub> values between sites 14 and 15 were very similar with some deterioration occurring in the lower reaches at site 11, most likely due to poorer habitat. Increased downstream algal biomass within the stream may have been indicative of impacts from groundwater inputs from the fertiliser depot.

The degree of decline in SQMCI<sub>5</sub> values was relatively typical for this stream, although as mentioned previously all sites recorded values in excess of their respective medians. The highest MCI improvement in terms of historical data was

recorded at site 16 (downstream of the Manganaha Stream confluence). This improvement was coincident with increased, more stable hard substrate and lower periphyton substrate cover.

Overall, the results from the current survey indicated some improvements in comparison with historical results. It appears that in general the degree of sediment contamination in the Mangaone Stream downstream of the Taranaki Sawmills discharge has reduced, although a gradual deterioration in downstream biological health was found by the current survey. Groundwater inputs may have contributed to some of this deterioration recorded immediately downstream of the fertiliser depot in the lower reaches of the stream.

Unlike typically recorded, the upstream site recorded a lower number of taxa than the three most downstream sites. Site 16 downstream of the Manganaha Stream confluence recorded the highest number of taxa (30), which was the highest number of taxa to be recorded at this site to date. The three most downstream sites all recorded the same (16) number of taxa. The MCI was also variable, but showed a slight decreasing trend through the mid reaches without recovery in the lower reaches. All sites showed MCI scores insignificantly different from historical median scores, and more typical of biological communities found under lower, warmer flow conditions in late summer.

When considering changes in community structure, the SQMCI<sub>s</sub> scores (which take into account abundances within taxa, as well as their sensitivity to pollution) was found to follow a relatively similar pattern to the MCI scores in the upper reaches with a slightly more pronounced decrease in mid reaches and minimal recovery through the lower reaches. All sites (excluding site 16) recorded SQMCI<sub>s</sub> scores significantly (Stark, 1998) higher than their historical medians, with site 16 recording only a slight improvement.

#### **16.2.1.2 Macroinvertebrate survey of 12-13 February 2015**

The Council's standard 'kick-net' and 'sweep-net' sampling techniques were used to collect streambed macroinvertebrates at five sites in the Mangaone Stream and three sites in the Waiwhakaiho River on 12 and 13 February 2015 respectively, in order to assess whether discharges from the Lower Waiwhakaiho Industrial area had had any adverse effects on the macroinvertebrate communities of these streams. Samples were processed to provide number of taxa (richness), MCI and SQMCI<sub>s</sub> scores for each site.

The MCI is a measure of the overall sensitivity of the macroinvertebrate community to the effects of organic pollution in stony streams. It is based on the presence/absence of taxa with varying degrees of sensitivity to environmental conditions. The SQMCI<sub>s</sub> takes into account taxa abundances as well as sensitivity to pollution. It may indicate subtle changes in communities, and therefore be the more relevant index if non-organic impacts are occurring. Significant differences in either the MCI or SQMCI<sub>s</sub> between sites indicate the degree of adverse effects (if any) of the discharges being monitored.

This survey found that all Waiwhakaiho River sampling sites recorded community richnesses similar to or slightly above long term medians for their respective sites, with no trend in richness in a downstream direction. MCI scores were below

historical medians at all sites with site 7 and site 8 recording slightly lower and site 13 recording significantly (Stark, 1998) lower MCI scores. However, SQMCI<sub>5</sub> scores were higher than historical medians at all sites with the furthest downstream site recording a SQMCI<sub>5</sub> score significantly higher than its historical median. SQMCI<sub>5</sub> scores were also similar between sites. These results did not indicate any significant effects of stormwater or wastewater discharges from the Fitzroy industrial area on the macroinvertebrate communities of the Waiwhakaiho River.

It is apparent that the macroinvertebrate communities in the Mangaone Stream were of 'fair' health in the upper reaches deteriorating to 'poor' health in a downstream direction. Most sites had moderate taxa richnesses decreasing in a downstream direction, while MCI scores were above or near to medians at all sites. SQMCI<sub>5</sub> scores were significantly (Stark, 1998) higher than historical medians at four out of five sites (site 16 had a SQMCI<sub>5</sub> score slightly higher than the median), with a decreasing trend recorded in a downstream direction. However, the five sampling sites in the Mangaone Stream showed a marked decline in MCI and SQMCI<sub>5</sub> values between Egmont Road (site 12) and Rifle Range Road (site 11), with a particularly marked decline in both SQMCI<sub>5</sub> and MCI scores between sites 16 and 14. Taranaki sawmills discharges stormwater to the Mangaone Stream between sites 16 and 14, and sediment sampling undertaken in early 2009 had recorded significant concentrations of not only tributyltin in the stream sediments around Taranaki Sawmills, but also elevated concentrations of arsenic, chromium, copper and zinc, all potentially toxic to aquatic biota (see BJ192). Previously there had been increased sedimentation between sites 16 and 14. Further sediment sampling undertaken in April 2012 and early March 2014, showed less contamination than that recorded in 2009; more indicative of physical habitat induced effects contributing to the smaller degree of biological health deterioration found more recently. There was a further decrease in MCI score between sites 14 and 15 and some further deterioration in the lower reaches, most likely due to poorer habitat.

Overall, the results from the current survey indicated some improvements in comparison with historical results although a gradual deterioration in downstream biological health was found by the current survey. Groundwater inputs may have contributed to some of this deterioration recorded immediately downstream of the fertiliser depot in the lower reaches of the stream.

## 17. Summary of recommendations

1. THAT monitoring of discharges from AML Limited in the 2015-2016 year continues at the same level as in 2014-2015.
2. THAT monitoring of discharges from Downer EDI Works Limited in the 2015-2016 year continues at the same level as in 2014-2015.
3. THAT monitoring of discharges from Farmlands Co-operative Society Limited in the 2015-2016 year continues at the same level as in 2014-2015.
4. THAT monitoring of discharges from Firth Industries Limited in the 2015-2016 year continues at the same level as in 2014-2015.
5. THAT monitoring of discharges from Fitzroy Engineering Group Limited in the 2015-2016 year continues at the same level as in 2014-2015.
6. THAT monitoring of discharges from Freight and Bulk Transport Holdings Limited in the 2015-2016 period be changed to include sampling of discharges arising from the exercise of consent 10008-1.
7. THAT monitoring of discharges from Nankervis Family Trust in the 2015-2016 year continues at the same level as in 2014-2015.
8. THAT monitoring of discharges from New Plymouth District Council in the 2015-2016 year continues at the same level as in 2014-2015.
9. THAT monitoring of discharges from New Zealand Decorative Concrete Limited in the 2015-2016 year continues at the same level as in 2014-2015.
10. THAT monitoring of discharges from New Zealand Railways Corporation in the 2015-2016 year continues at the same level as in 2014-2015.
11. THAT monitoring of discharges from Ravensdown Fertiliser Co-operative Limited in the 2015-2016 year continues at the same level as in 2014-2015.
12. THAT monitoring programme for discharges from Taranaki Sawmills Limited in the 2015-2016 year continues at the same level as in 2014-2015.
13. THAT monitoring of discharges from Technix Group Limited in the 2015-2016 year continues at the same level as in 2014-2015.
14. That electric fishing surveys continue to be undertaken at two sites in the Waiwhakaiho River and three sites in the Mangaone Stream at three yearly intervals, noting that the next survey is due to be undertaken in the 2015-2016 year.

## Glossary of common terms and abbreviations

The following abbreviations and terms are used within this report:

Al*	aluminium
As*	arsenic
Biomonitoring	assessing the health of the environment using aquatic organisms
BOD	biochemical oxygen demand. A measure of the presence of degradable organic matter, taking into account the biological conversion of ammonia to nitrate
BODF	biochemical oxygen demand of a filtered sample
bund	a wall around a tank to contain its contents in the case of a leak
BODCF	filtered carbonaceous biochemical oxygen demand. A measure of the presence of degradable organic matter in the filtered sample, excluding the biological conversion of ammonia to nitrate
cfu	colony forming units. A measure of the concentration of bacteria usually expressed as per 100 millilitre sample
COD	chemical oxygen demand. A measure of the oxygen required to oxidise all matter in a sample by chemical reaction
Condy	conductivity, an indication of the level of dissolved salts in a sample, usually measured at 20°C and expressed in mS/m
Cu*	copper
DO	dissolved oxygen
DRP	dissolved reactive phosphorus
<i>E.coli</i>	<i>escherichia coli</i> , an indicator of the possible presence of faecal material and pathological micro-organisms. Usually expressed as colony forming units per 100 millilitre sample
Ent	enterococci, an indicator of the possible presence of faecal material and pathological micro-organisms. Usually expressed as colony forming units per 100 millilitre of sample
F	fluoride
FC	faecal coliforms, an indicator of the possible presence of faecal material and pathological micro-organisms. Usually expressed as colony forming units per 100 millilitre sample
fresh	elevated flow in a stream, such as after heavy rainfall
g/m <sup>3</sup>	grams per cubic metre, and equivalent to milligrams per litre (mg/L). In water, this is also equivalent to parts per million (ppm), but the same does not apply to gaseous mixtures
IBC	intermediate bulk container, a square 1000L plastic tank, generally encased in a steel cage.
incident	an event that is alleged or is found to have occurred that may have actual or potential environmental consequences or may involve non-compliance with a consent or rule in a regional plan. Registration of an incident by the Council does not automatically mean such an outcome had actually occurred
intervention	action/s taken by Council to instruct or direct actions be taken to avoid or reduce the likelihood of an incident occurring

investigation	action taken by Council to establish what were the circumstances/events surrounding an incident including any allegations of an incident
L/s	litres per second
MCI	macroinvertebrate community index; a numerical indication of the state of biological life in a stream that takes into account the sensitivity of the taxa present to organic pollution in stony habitats
mS/m	millisiemens per metre
mixing zone	the zone below a discharge point where the discharge is not fully mixed with the receiving environment. For a stream, conventionally taken as a length equivalent to 7 times the width of the stream at the discharge point
NH <sub>4</sub>	ammonium, normally expressed in terms of the mass of nitrogen (N)
NH <sub>3</sub>	unionised ammonia, normally expressed in terms of the mass of nitrogen (N)
NO <sub>3</sub>	nitrate, normally expressed in terms of the mass of nitrogen (N)
NTU	Nephelometric Turbidity Unit, a measure of the turbidity of water
O&G	oil and grease, defined as anything that will dissolve into a particular organic solvent (e.g. hexane). May include both animal material (fats) and mineral matter (hydrocarbons)
pH	a numerical system for measuring acidity in solutions, with 7 as neutral. Numbers lower than 7 are increasingly acidic and higher than 7 are increasingly alkaline. The scale is logarithmic i.e. a change of 1 represents a ten-fold change in strength. For example, a pH of 4 is ten times more acidic than a pH of 5
Physicochemical	measurement of both physical properties (e.g. temperature, clarity, density) and chemical determinants (e.g. metals and nutrients) to characterise the state of an environment
PM <sub>10</sub>	relatively fine airborne particles (less than 10 micrometre diameter)
resource consent	refer Section 87 of the RMA. Resource consents include land use consents (refer Sections 9 and 13 of the RMA), coastal permits (Sections 12, 14 and 15), water permits (Section 14) and discharge permits (Section 15)
RMA	Resource Management Act 1991 and including all subsequent amendments
SS	suspended solids
SQMCI	semi quantitative macroinvertebrate community index;
Temp	temperature, measured in °C (degrees Celsius)
Turb	turbidity, expressed in NTU
UIR	Unauthorised Incident Register entry- an event recorded by the Council on the basis that it had potential or actual environmental consequences that may represent a breach of a consent or provision in a Regional Plan
Zn*	zinc

\*an abbreviation for a metal or other analyte may be followed by the letters 'As', to denote the amount of metal recoverable in acidic conditions. This is taken as indicating the total amount of metal that might be solubilised under extreme environmental conditions. The abbreviation may alternatively be followed by the letter 'D', denoting the amount of the metal present in dissolved form rather than in particulate or solid form.

For further information on analytical methods, contact the Council's laboratory.



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## **Appendix I**

### **Resource consents to discharge into the lower Waiwhakaiho River and Mangaone Stream catchments in alphabetical order**

(For a copy of the signed resource consent  
please contact the TRC consent department)



## **Waiwhakaiho River**



**Discharge Permit**  
**Pursuant to the Resource Management Act 1991**  
**a resource consent is hereby granted by the**  
**Taranaki Regional Council**

Name of  
Consent Holder: Fitzroy Engineering Group Limited  
Private Bag 2053  
New Plymouth 4342

Decision Date: 12 March 2015

Commencement Date: 12 March 2015

**Conditions of Consent**

Consent Granted: To discharge stormwater from an industrial site into the  
Waiwhakaiho River

Expiry Date: 1 June 2032

Review Date(s): June 2020, June 2026 and in accordance with special  
condition 10

Site Location: 691 Devon Road, Bell Block

Legal Description: Lot 2 DP 470783 (Discharge source & site)

Grid Reference (NZTM) 1696451E-5677694N

Catchment: Waiwhakaiho

*For General, Standard and Special conditions  
pertaining to this consent please see reverse side of this document*

### General condition

- a. The consent holder shall pay to the Taranaki Regional Council all the administration, monitoring and supervision costs of this consent, fixed in accordance with section 36 of the Resource Management Act 1991.

### Special conditions

1. The consent holder shall at all times adopt the best practicable option, as defined in section 2 of the Resource Management Act 1991, to prevent or minimise any adverse effects on the environment from the exercise of this consent.

2. The stormwater discharged shall be from a catchment area not exceeding 3.3 ha.

*Note: For the purpose of this condition the catchment area defined in this condition is a total for resource consent 0021-4.0 and 9853-2.0.*

3. There shall be no discharge of contaminants from hydrotesting activities into the stormwater network.
4. The consent holder shall notify the Chief Executive, Taranaki Regional Council in writing at least 24 hours prior to undertaking any hydrotesting activities outside of the workshop. Notification shall include the location and date of the proposed discharge, and shall be emailed to [worknotification@trc.govt.nz](mailto:worknotification@trc.govt.nz).
5. Constituents of the discharge shall meet the standards shown in the following table.

<b>Constituent</b>	<b>Standard</b>
pH	Within the range 6.0 to 9.0
suspended solids	Concentration not greater than 100 gm <sup>-3</sup>
oil and grease	Concentration not greater than 15 gm <sup>-3</sup>
chloride	Concentration not greater than 50 gm <sup>-3</sup>

This condition shall apply before entry of the stormwater into the receiving waters at a designated sampling point approved by the Chief Executive, Taranaki Regional Council.

6. After allowing for reasonable mixing, within a mixing zone extending 50 metres downstream of the discharge point, the discharge shall not, either by itself or in combination with other discharges, give rise to any or all of the following effects in the receiving water:
  - a) the production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials;
  - b) any conspicuous change in the colour or visual clarity;
  - c) any emission of objectionable odour;
  - d) the rendering of fresh water unsuitable for consumption by farm animals;
  - e) any significant adverse effects on aquatic life.
7. The consent holder consent holder shall maintain and regularly update a 'Contingency Plan' that details measures and procedures to be undertaken to prevent spillage or any discharge of contaminants not authorised by this consent The plan shall be approved by the Chief Executive, Taranaki Regional Council, acting in a certification capacity as being adequate to avoid, remedy or mitigate the environmental effects of such an event.



## Consent 0021-4.0

8. The site shall be operated in accordance with a 'Stormwater Management Plan' prepared by the consent holder and approved by the Chief Executive, Taranaki Regional Council, acting in a certification capacity. The plan shall detail how the site will be managed to achieve compliance with the conditions of this consent and shall include but not be limited to:
  - a) Identification of sources of contaminants,
  - b) Methods that will be practised to ensure contaminants entering stormwater is at a practical minimum,
  - c) Methods that will be practised to ensure contaminants from hydrotesting activities will be prevented from entering stormwater;
  - d) the loading and unloading of materials;
  - e) maintenance of conveyance systems;
  - f) general housekeeping; and
  - g) management of any interceptor system.
  
9. The consent holder shall notify the Chief Executive, Taranaki Regional Council, prior to making any changes to the processes or operations undertaken at the site, or the chemicals used or stored on site that could alter the nature of the discharge. Any such change shall then only occur following receipt of any necessary approval under the Resource Management Act. Notification shall include the consent number, a brief description of the activity consented and an assessment of the environmental effects of any changes, and be emailed to [consents@trc.govt.nz](mailto:consents@trc.govt.nz).
  
10. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review:
  - a) during the month of June 2020 and/or June 2026 and/or
  - b) within 3 months of receiving a notification under special condition 9 above;

for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 12 March 2015

For and on behalf of  
Taranaki Regional Council

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A D McLay  
**Director - Resource Management**



**Discharge Permit**  
**Pursuant to the Resource Management Act 1991**  
**a resource consent is hereby granted by the**  
**Taranaki Regional Council**

Name of  
Consent Holder: Fitzroy Engineering Group Limited  
Private Bag 2053  
NEW PLYMOUTH 4342

Consent Granted Date: 1 May 1996

**Conditions of Consent**

Consent Granted: To discharge up to 426 litres/second of stormwater,  
including treated truckwash water, from an industrial site  
into the Waiwhakaiho River

Expiry Date: 1 June 2014

Review Date(s): June 2002, June 2008

Site Location: Rifle Range Road, Fitzroy, New Plymouth

Legal Description: Lot 2 Pt Sec 199 Hua Dist City of New Plymouth Blks II &  
VI Paritutu SD

Grid Reference (NZTM) 1696554E-5677780N

Catchment: Waiwhakaiho

*For General, Standard and Special conditions  
pertaining to this consent please see reverse side of this document*

### General conditions

- a) That on receipt of a requirement from the Chief Executive, Taranaki Regional Council (hereinafter the Chief Executive), the consent holder shall, within the time specified in the requirement, supply the information required relating to the exercise of this consent.
- b) That unless it is otherwise specified in the conditions of this consent, compliance with any monitoring requirement imposed by this consent must be at the consent holder's own expense.
- c) That the consent holder shall pay to the Council all required administrative charges fixed by the Council pursuant to section 36 in relation to:
  - (i) the administration, monitoring and supervision of this consent;
  - (ii) charges for the carrying out of the Council's functions under section 35 in relation to this consent; and
  - (iii) charges authorised by regulations.

### Special Conditions

- 1) That the following limits shall not be exceeded in the discharge:

Suspended solids	100 mg/L
Oil & grease	15 mg/L
pH [range]	6.0 - 8.5
- 2) That allowing for a mixing zone of 80 metres extending downstream of the discharge pipe, the discharge shall not give rise to any of the following effects in the receiving water of the Waiwhakaiho River:
  - (i) the production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials;
  - (ii) any conspicuous change in the colour or visual clarity;
  - (iii) any emission of objectionable odour;
  - (iv) the rendering of fresh water unsuitable for consumption by farm animals;
  - (v) any significant adverse effects on aquatic life, habitats, or ecology.
- 3) That there shall be no discharge of wastes containing cleaning solvents.
- 4) That the consent holder, within three months of the granting of this consent, shall provide a contingency plan, to the satisfaction of the Chief Executive, Taranaki Regional Council, for action to be taken in the event of accidental discharge or spillage of contaminants.

Consent 9583-1.0

- 5) That the Taranaki Regional Council may review any or all of the conditions of this consent by giving notice of review during June 2002 and/or June 2008 for the purpose of ensuring that the conditions are adequate to deal with any adverse effects of the discharge on the environment.

Transferred at Stratford on 20 February 2014

For and on behalf of  
Taranaki Regional Council

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A D McLay  
**Director-Resource Management**



**Discharge Permit**  
**Pursuant to the Resource Management Act 1991**  
**a resource consent is hereby granted by the**  
**Taranaki Regional Council**

Name of  
Consent Holder: Fitzroy Engineering Group Limited  
Private Bag 2053  
New Plymouth 4342

Decision Date: 12 March 2015

Commencement Date: 12 March 2015

**Conditions of Consent**

Consent Granted: To discharge stormwater from an industrial site into the  
Waiwhakaiho River

Expiry Date: 01 June 2032

Review Date(s): June 2020, June 2026 and in accordance with special  
condition 10

Site Location: 691 Devon Road, Bell Block

Legal Description: Lot 2 DP 470783 (Discharge source & site)

Grid Reference (NZTM) 1696577E-5677800N

Catchment: Waiwhakaiho

*For General, Standard and Special conditions  
pertaining to this consent please see reverse side of this document*

### General condition

- a. The consent holder shall pay to the Taranaki Regional Council all the administration, monitoring and supervision costs of this consent, fixed in accordance with section 36 of the Resource Management Act 1991.

### Special conditions

1. The consent holder shall at all times adopt the best practicable option, as defined in section 2 of the Resource Management Act 1991, to prevent or minimise any adverse effects on the environment from the exercise of this consent.

2. The stormwater discharged shall be from a catchment area not exceeding 3.3 ha.

*Note: For the purpose of this condition the catchment area defined in this condition is a total for resource consent 0021-4.0 and 9853-2.0.*

3. There shall be no discharge of contaminants from hydrotesting activities into the stormwater network.
4. The consent holder shall notify the Chief Executive, Taranaki Regional Council in writing at least 24 hours prior to undertaking any hydrotesting activities outside of the workshop. Notification shall include the location and date of the proposed discharge, and shall be emailed to [worknotification@trc.govt.nz](mailto:worknotification@trc.govt.nz).
5. Constituents of the discharge shall meet the standards shown in the following table.

<b>Constituent</b>	<b>Standard</b>
pH	Within the range 6.0 to 9.0
suspended solids	Concentration not greater than 100 gm <sup>-3</sup>
oil and grease	Concentration not greater than 15 gm <sup>-3</sup>
chloride	Concentration not greater than 50 gm <sup>-3</sup>

This condition shall apply before entry of the stormwater into the receiving waters at a designated sampling point approved by the Chief Executive, Taranaki Regional Council.

6. After allowing for reasonable mixing, within a mixing zone extending 50 metres downstream of the discharge point, the discharge shall not, either by itself or in combination with other discharges, give rise to any or all of the following effects in the receiving water:
  - a) the production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials;
  - b) any conspicuous change in the colour or visual clarity;
  - c) any emission of objectionable odour;
  - d) the rendering of fresh water unsuitable for consumption by farm animals;
  - e) any significant adverse effects on aquatic life.
7. The consent holder consent holder shall maintain and regularly update a 'Contingency Plan' that details measures and procedures to be undertaken to prevent spillage or any discharge of contaminants not authorised by this consent The plan shall be approved by the Chief Executive, Taranaki Regional Council, acting in a certification capacity as being adequate to avoid, remedy or mitigate the environmental effects of such an event.



## Consent 9853-2.0

8. The site shall be operated in accordance with a 'Stormwater Management Plan' prepared by the consent holder and approved by the Chief Executive, Taranaki Regional Council, acting in a certification capacity. The plan shall detail how the site will be managed to achieve compliance with the conditions of this consent and shall include but not be limited to:
  - a) Identification of sources of contaminants,
  - b) Methods that will be practised to ensure contaminants entering stormwater is at a practical minimum,
  - c) Methods that will be practised to ensure contaminants from hydrotesting activities will be prevented from entering stormwater;
  - d) the loading and unloading of materials;
  - e) maintenance of conveyance systems;
  - f) general housekeeping; and
  - g) management of any interceptor system.
  
9. The consent holder shall notify the Chief Executive, Taranaki Regional Council, prior to making any changes to the processes or operations undertaken at the site, or the chemicals used or stored on site that could alter the nature of the discharge. Any such change shall then only occur following receipt of any necessary approval under the Resource Management Act. Notification shall include the consent number, a brief description of the activity consented and an assessment of the environmental effects of any changes, and be emailed to [consents@trc.govt.nz](mailto:consents@trc.govt.nz).
  
10. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review:
  - a) during the month of June 2020 and/or June 2026 and/or
  - b) within 3 months of receiving a notification under special condition 9 above;

for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 12 March 2015

For and on behalf of  
Taranaki Regional Council

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A D McLay  
**Director - Resource Management**



**Discharge Permit**  
**Pursuant to the Resource Management Act 1991**  
**a resource consent is hereby granted by the**  
**Taranaki Regional Council**

Name of  
Consent Holder: Firth Industries Ltd (Division of Fletcher Concrete &  
Infrastructure Ltd)  
P O Box 3122  
Fitzroy  
NEW PLYMOUTH

Change To  
Conditions Date: 29 May 2000 [Granted: 1 May 1996]

**Conditions of Consent**

Consent Granted: To discharge up to 200 litres/second of stormwater and up  
to 10 litres/second [2 cubic metres/day] of treated  
washdown water into the Waiwhakaiho River at or about  
GR: P19:067-397

Expiry Date: 1 June 2014

Review Date(s): June 2002, June 2008

Site Location: Fitzroy Road / Clemow Road, Fitzroy

Legal Description: DP 10146 New Plymouth City

Catchment: Waiwhakaiho

### General conditions

- a) On receipt of a requirement from the Chief Executive, Taranaki Regional Council the consent holder shall, within the time specified in the requirement, supply the information required relating to the exercise of this consent.
- b) Unless it is otherwise specified in the conditions of this consent, compliance with any monitoring requirement imposed by this consent must be at the consent holder's own expense.
- c) The consent holder shall pay to the Council all required administrative charges fixed by the Council pursuant to section 36 in relation to:
  - i) the administration, monitoring and supervision of this consent; and
  - ii) charges authorised by regulations.

### Special conditions

1. After allowing for reasonable mixing, within a mixing zone extending 50 metres downstream of the discharge point, the discharge shall not give rise to any or all of the following effects in the receiving waters of the Waiwhakaiho River:
  - a) the production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials;
  - b) any conspicuous change in the colour or visual clarity;
  - c) any emission of objectionable odour;
  - d) the rendering of fresh water unsuitable for consumption by farm animals;
  - e) any significant adverse effects on aquatic life.

2. The following limits shall not be exceeded in the discharge effluent:

Suspended solids	100	mg/L
Oil & grease	15	mg/L

This condition shall apply prior to the entry of the discharge into the receiving waters of the Waiwhakaiho River at a designated sampling point approved by the Chief Executive, Taranaki Regional Council.

3. After allowing for reasonable mixing within a mixing zone extending 50 metres downstream of the discharge point, the discharge shall not give rise to an increase of greater than 0.5 pH increment, or a pH outside the range of 6.0 to 9.0 within the receiving waters of the Waiwhakaiho River.
4. The consent holder shall ensure that the rate of the discharge can be controlled at all times, and ceased if required, to ensure compliance with the special conditions of this consent.

Consent 0392-3

5. The consent holder shall properly and efficiently maintain and operate the ponds system in such a manner that any discharge which may occur shall not breach the required standards, and any corrective measures shall be designed and constructed to a standard to the satisfaction of the Chief Executive, Taranaki Regional Council.
6. The consent holder shall provide and maintain a contingency plan, to the satisfaction of the Chief Executive, Taranaki Regional Council, for action to be taken in the event of accidental discharge or spillage of contaminants.
7. The Taranaki Regional Council may review any or all of the conditions of this consent by giving notice of review during the month of June 2002 and/or June 2008, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects of the discharge on the receiving environment arising from the exercise of this consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Transferred at Stratford on 17 February 2006

For and on behalf of  
Taranaki Regional Council

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**Director-Resource Management**



TRK964984

## DISCHARGE PERMIT

**Pursuant to the RESOURCE MANAGEMENT ACT 1991  
a resource consent is hereby granted by the  
Taranaki Regional Council**

Name of: NEW PLYMOUTH DISTRICT COUNCIL  
Consent Holder: PRIVATE BAG 2025 NEW PLYMOUTH

Consent  
Granted Date: 23 August 1996

## CONDITIONS OF CONSENT

Consent Granted: TO DISCHARGE UP TO 20 LITRES/SECOND OF LEACHATE FROM THE FORMER LANDFILL SITE AT BEWLEY ROAD BETWEEN CONSTANCE STREET AND VICKERS ROAD, NEW PLYMOUTH, INTO GROUNDWATER, AND INTO THE WAIWHAKAIHO RIVER VIA THE FLOW OF CONTAMINATED GROUNDWATER AT OR ABOUT GR: P19:064-393

Expiry Date: 1 June 2014

Review Date[s]: June 2002 and June 2008

Site Location: LAND BETWEEN STATE HIGHWAY 3 [DEVON ROAD] AND THE WAIWHAKAIHO RIVER AND FROM CONSTANCE STREET TO VICKERS ROAD, FITZROY

Legal Description: PT 2 DP17437, DP10423 SEC 1 DP1102 SEC 2 DP10423 PT 1 & SEC 2 DP9932 SEC 1 DP15861 BEING RESERVE ALSO SEC 201 BEING RESERVE BLK V PARITUTU SD

Catchment: WAIWHAKAIHO 392.000

For General, Standard and Special Conditions pertaining to this consent please see reverse side of this document.

TRK964984

### GENERAL CONDITIONS

- (a) That on receipt of a requirement from the General Manager, Taranaki Regional Council (hereinafter the General Manager), the consent holder shall, within the time specified in the requirement, supply the information required relating to the exercise of this consent.
- (b) That unless it is otherwise specified in the conditions of this consent, compliance with any monitoring requirement imposed by this consent must be at the consent holder's own expense.
- (c) That the consent holder shall pay to the Council all required administrative charges fixed by the Council pursuant to section 36 in relation to:
- (i) the administration, monitoring and supervision of this consent;
  - (ii) charges for the carrying out of the Council's functions under section 35 in relation to this consent; and
  - (iii) charges authorised by regulations.

### SPECIAL CONDITIONS

1. THAT the following limits shall not be exceeded in the discharge:

Total Ammonia [as N]	15 mg/L
Dissolved Reactive Phosphorus	0.065 mg/L
pH	7.5

2. THAT the discharge shall not give rise to any of the following effects in the receiving water:

- a) the production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials;
- b) any conspicuous change in the colour or visual clarity;
- c) any emission of objectionable odour;
- d) the rendering of fresh water unsuitable for consumption by farm animals;
- e) any significant adverse effects on aquatic life, habitats, or ecology.

3. THAT the consent holder shall ensure that the three piezometers situated at the Bewley Road site are maintained for monitoring purposes.

4. THAT the Taranaki Regional Council may review any or all of the conditions of this consent by giving written notice, should further chemical sampling reveal levels of contamination resulting in significant adverse environmental effects.

5. THAT the Taranaki Regional Council may review any or all of the conditions of this consent by giving notice of review during June 2002 and/or June 2008 for the purpose of ensuring that the conditions are adequate to deal with any adverse effects of the discharge on the environment.

Signed at Stratford on 23 August 1996

For and on behalf of  
TARANAKI REGIONAL COUNCIL

For General, Standard and Special Conditions pertaining to this consent please see reverse side of this document.



TRK964984

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OPERATIONS MANAGER



**Discharge Permit**  
**Pursuant to the Resource Management Act 1991**  
**a resource consent is hereby granted by the**  
**Taranaki Regional Council**

Name of  
Consent Holder:           New Plymouth District Council  
Private Bag 2025  
NEW PLYMOUTH 4342

Consent Granted           10 June 2008  
Date:

**Conditions of Consent**

Consent Granted:        To discharge stormwater from the Waiwhakaiho industrial area into the Waiwhakaiho River via multiple outfalls between the State Highway 3 bridge and the confluence with the Mangaone Stream at or about (NZTM) 1695807E-5676977N, 1695902E-5677235N, 1696113E-5677288N, 1696233E-5677323N, 1696377E-5677616N, 1696472E-5677706N, 1696539E-5677767N, 1696573E-5677800N, 1696611E-5677837N, and 1696683E-5677904N

Expiry Date:            1 June 2026

Review Date(s):        June 2010, June 2014, June 2020

Site Location:           Rifle Range Road, New Plymouth

Legal Description:     Various

Catchment:             Waiwhakaiho

*For General, Standard and Special conditions  
pertaining to this consent please see reverse side of this document*

### **General conditions**

- a) On receipt of a requirement from the Chief Executive, Taranaki Regional Council the consent holder shall, within the time specified in the requirement, supply the information required relating to the exercise of this consent.
- b) Unless it is otherwise specified in the conditions of this consent, compliance with any monitoring requirement imposed by this consent must be at the consent holder's own expense.
- c) The consent holder shall pay to the Council all required administrative charges fixed by the Council pursuant to section 36 in relation to:
  - i) the administration, monitoring and supervision of this consent; and
  - ii) charges authorised by regulations.

### **Special conditions**

1. The consent holder shall at all times adopt the best practicable option, as defined in section 2 of the Resource Management Act 1991, to prevent or minimise any adverse effects on the environment from the exercise of this consent.
2. The consent holder shall prevent, where possible, or mitigate any erosion occurring as a result of the exercise of this consent.
3. After allowing for reasonable mixing, within a mixing zone extending 50 metres downstream of the discharge point, the discharge shall not, either by itself or in combination with other discharges, give rise to any or all of the following effects in the Waiwhakaiho River:
  - a) the production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials;
  - b) any conspicuous change in the colour or visual clarity;
  - c) any emission of objectionable odour;
  - d) the rendering of fresh water unsuitable for consumption by farm animals;
  - e) any significant adverse effects on aquatic life.

Consent 5163-2

4. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2010 and/or June 2014 and/or June 2020, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 10 June 2008

For and on behalf of  
Taranaki Regional Council

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**Director-Resource Management**



**Discharge Permit**  
**Pursuant to the Resource Management Act 1991**  
**a resource consent is hereby granted by the**  
**Taranaki Regional Council**

Name of  
Consent Holder:           New Zealand Railways Corporation  
                                  P O Box 593  
                                  WELLINGTON 6140

Consent Granted  
Date:                        24 July 1996

**Conditions of Consent**

Consent Granted:        To discharge up to 13 cubic metres/day of stormwater,  
                                  including treated wastewater from washing and  
                                  maintenance of wagons, containers and locomotives, into  
                                  the Waiwhakaiho River at or about (NZTM)  
                                  1696313E-5676749N

Expiry Date:             1 June 2014

Review Date(s):        June 2002, June 2008

Site Location:           Rail Terminal, Smart Road, New Plymouth

Legal Description:      Pt Lot 1 DP 3582 Pt CT F1/350 Pt Sec 144 Hua Dist SO  
                                  11437 Blk VI Paritutu SD

Catchment:              Waiwhakaiho

### General conditions

- a) On receipt of a requirement from the Chief Executive, Taranaki Regional Council the consent holder shall, within the time specified in the requirement, supply the information required relating to the exercise of this consent.
- b) Unless it is otherwise specified in the conditions of this consent, compliance with any monitoring requirement imposed by this consent must be at the consent holder's own expense.
- c) The consent holder shall pay to the Council all required administrative charges fixed by the Council pursuant to section 36 in relation to:
  - i) the administration, monitoring and supervision of this consent; and
  - ii) charges authorised by regulations.

### Special conditions

1. That components of the discharge shall not exceed the following concentrations:

pH [range]	6 - 9	
Oil and grease	15	gm <sup>-3</sup>
Suspended solids	100	gm <sup>-3</sup>
Ammonia	20	gm <sup>-3</sup>
Reactive dissolved phosphate	20	gm <sup>-3</sup>

This condition shall apply prior to the entry of the discharge into the Waiwhakaiho River, at a designated sampling point approved by the Chief Executive, Taranaki Regional Council.

2. That the consent holder shall maintain a contingency plan, to the satisfaction of the Chief Executive, Taranaki Regional Council, outlining measures and procedures to be undertaken to prevent spillage or accidental discharge of contaminants, and the procedures to be carried out should such a spillage occur.
3. That wastewater from cleaning operations shall be restricted to the cleaning of railway wagons and containers used for freighting the following substances: meat; dairy products; fertiliser; resin; tallow; urea and woodchips.
4. That after allowing for reasonable mixing the discharge shall not give rise to any of the following effects in the receiving waters:
  - a) the production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials;
  - b) any conspicuous change in the colour or visual clarity;
  - c) any emission of objectionable odour;
  - d) the rendering of fresh water unsuitable for consumption by farm animals;
  - e) any significant adverse effects on aquatic life, habitats or ecology.



Consent 3528-2

5. That the Taranaki Regional Council may review any or all of the conditions of this consent by giving notice of review during June 2002 and/or June 2008 for the purpose of ensuring That the conditions are adequate to deal with any adverse effects of the discharge on the receiving waters.

Transferred at Stratford on 1 June 2009

For and on behalf of  
Taranaki Regional Council

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**Director-Resource Management**



TRK973140

## DISCHARGE PERMIT

**Pursuant to the RESOURCE MANAGEMENT ACT 1991  
a resource consent is hereby granted by the  
Taranaki Regional Council**

Name of Consent Holder: RAVENSDOWN FERTILISER CO-OPERATIVE LIMITED  
P O BOX 452 DUNEDIN

Renewal  
Granted Date: 26 November 1997

## CONDITIONS OF CONSENT

Consent Granted: TO DISCHARGE UP TO 700 LITRES/SECOND OF  
STORMWATER FROM A FERTILISER STORAGE DEPOT VIA  
MCLEODS DRAIN INTO THE WAIWHAKAHIO RIVER AT OR  
ABOUT GR: P19:062-390

Expiry Date: 1 June 2014

Review Date[s]: June 1999, June 2002 and June 2008

Site Location: SMART ROAD NEW PLYMOUTH

Legal Description: WAIWHAKAIHO RIVER RESERVE BLK VI PARITUTU SD

Catchment: WAIWHAKAIHO 392.000

Tributary: MCLEODS DRAIN

For General, Standard and Special Conditions pertaining to this consent please see reverse side of this document.

TRK973140

**General conditions**

- a) That on receipt of a requirement from the General Manager, Taranaki Regional Council (hereinafter the General Manager), the consent holder shall, within the time specified in the requirement, supply the information required relating to the exercise of this consent.
- b) That unless it is otherwise specified in the conditions of this consent, compliance with any monitoring requirement imposed by this consent must be at the consent holder's own expense.
- c) That the consent holder shall pay to the Council all required administrative charges fixed by the Council pursuant to section 36 in relation to:
  - i) the administration, monitoring and supervision of this consent; and
  - ii) charges authorised by regulations.

**Special conditions**

1. THAT the following limits shall not be exceeded in the discharge:

pH [range]	6.0-8.5
Suspended solids	100 gm <sup>-3</sup>
Oil and grease	15 gm <sup>-3</sup>

This conditions shall apply prior to the entry of the discharge into the receiving water at a designated sampling point.

2. THAT allowing for a mixing zone of 150 metres extending downstream of the discharge from McLeods Drain, the discharge shall not give rise to any of the following effects in the receiving water of the Waiwhakaiho River:
- i) an un-ionised ammonia concentration of greater than 0.025 gm<sup>-3</sup>;
  - ii) the production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials;
  - iii) any conspicuous change in the colour or visual clarity;
  - iv) any significant adverse effects on aquatic life, habitats, or ecology.
3. THAT the consent holder shall maintain a contingency plan, outlining measures and procedures undertaken to prevent spillage or accidental discharge of contaminants in the stormwater catchment and measures to avoid, remedy or mitigate the environmental effects of such a spillage or discharge. The consent holder shall annually review and maintain the plan.
4. THAT the Taranaki Regional Council may review any or all of the conditions of this consent by giving notice of review during June 1999, June 2002 and/or June 2008, for the purpose of ensuring that the conditions are adequate to deal with any significant adverse effects of the discharge on the environment arising from the exercise of this consent, which were not foreseen at the time the application was considered and which it was not appropriate to deal with at that time.

Signed at Stratford on 26 November 1997

For and on behalf of  
TARANAKI REGIONAL COUNCIL

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GENERAL MANAGER

**Discharge Permit**  
**Pursuant to the Resource Management Act 1991**  
**a resource consent is hereby granted by the**  
**Taranaki Regional Council**

Name of  
Consent Holder: Technix Group Limited  
Private Bag 2222  
NEW PLYMOUTH

Consent Granted  
Date: 1 May 1996

**Conditions of Consent**

Consent Granted: To discharge up to 426 litres/second of stormwater,  
including treated truckwash water, from an industrial site  
into the Waiwhakaiho River at or about GR: P19:068-393

Expiry Date: 1 June 2014

Review Date(s): June 2002, June 2008

Site Location: Rifle Range Road, Fitzroy, New Plymouth

Legal Description: Lot 2 Pt Sec 199 Hua Dist City of New Plymouth Blks II &  
VI Paritutu SD

Catchment: Waiwhakaiho

## Consent 0291-2

### General conditions

- a) That on receipt of a requirement from the Chief Executive, Taranaki Regional Council (hereinafter the Chief Executive), the consent holder shall, within the time specified in the requirement, supply the information required relating to the exercise of this consent.
- b) That unless it is otherwise specified in the conditions of this consent, compliance with any monitoring requirement imposed by this consent must be at the consent holder's own expense.
- c) That the consent holder shall pay to the Council all required administrative charges fixed by the Council pursuant to section 36 in relation to:
  - (i) the administration, monitoring and supervision of this consent;
  - (ii) charges for the carrying out of the Council's functions under section 35 in relation to this consent; and
  - (iii) charges authorised by regulations.

### Special Conditions

- 1) That the following limits shall not be exceeded in the discharge:

Suspended solids	100 mg/L
Oil & grease	15 mg/L
pH [range]	6.0 - 8.5
- 2) That allowing for a mixing zone of 80 metres extending downstream of the discharge pipe, the discharge shall not give rise to any of the following effects in the receiving water of the Waiwhakaiho River:
  - (i) the production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials;
  - (ii) any conspicuous change in the colour or visual clarity;
  - (iii) any emission of objectionable odour;
  - (iv) the rendering of fresh water unsuitable for consumption by farm animals;
  - (v) any significant adverse effects on aquatic life, habitats, or ecology.
- 3) That there shall be no discharge of wastes containing cleaning solvents.
- 4) That the consent holder, within three months of the granting of this consent, shall provide a contingency plan, to the satisfaction of the Chief Executive, Taranaki Regional Council, for action to be taken in the event of accidental discharge or spillage of contaminants.
- 5) That the Taranaki Regional Council may review any or all of the conditions of this consent by giving notice of review during June 2002 and/or June 2008 for the purpose of ensuring that the conditions are adequate to deal with any adverse effects of the discharge on the environment.

Transferred at Stratford on 3 May 2004

For and on behalf of  
Taranaki Regional Council

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**Director-Resource Management**

**Discharge Permit**  
**Pursuant to the Resource Management Act 1991**  
**a resource consent is hereby granted by the**  
**Taranaki Regional Council**

Name of  
Consent Holder:           Technix Group Limited  
Private Bag 2222  
New Plymouth 4342

Decision Date:             24 October 2014

Commencement Date:     24 October 2014

**Conditions of Consent**

Consent Granted:         To discharge stormwater from an industrial site into the  
Waiwhakaiho River

Expiry Date:              01 June 2032

Review Date(s):         June 2020, June 2026 and in accordance with special  
condition 9

Site Location:            691 Devon Road, Bell Block

Legal Description:        Lot 2 DP 20360 (Discharge source & site)

Grid Reference (NZTM)   1696623E-5677733N

Catchment:                Waiwhakaiho

*For General, Standard and Special conditions  
pertaining to this consent please see reverse side of this document*

### General condition

- a. The consent holder shall pay to the Taranaki Regional Council all the administration, monitoring and supervision costs of this consent, fixed in accordance with section 36 of the Resource Management Act 1991.

### Special conditions

1. The consent holder shall at all times adopt the best practicable option, as defined in section 2 of the Resource Management Act 1991, to prevent or minimise any adverse effects on the environment from the exercise of this consent.
2. The stormwater discharged shall be from a catchment area not exceeding 2.2 ha.
3. After 31 December 2015 there shall be no discharge from the truckwash to the stormwater network.
4. Constituents of the discharge shall meet the standards shown in the following table.

<b>Constituent</b>	<b>Standard</b>
pH	Within the range 6.0 to 9.0
suspended solids	Concentration not greater than 100 gm <sup>-3</sup>
oil and grease	Concentration not greater than 15 gm <sup>-3</sup>
chloride	Concentration not greater than 50 gm <sup>-3</sup>

This condition shall apply before entry of the treated stormwater into the receiving waters at a designated sampling point approved by the Chief Executive, Taranaki Regional Council.

5. After allowing for reasonable mixing, within a mixing zone extending 50 metres downstream of the discharge point, the discharge shall not, either by itself or in combination with other discharges, give rise to any or all of the following effects in the receiving water:
  - a) the production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials;
  - b) any conspicuous change in the colour or visual clarity;
  - c) any emission of objectionable odour;
  - d) the rendering of fresh water unsuitable for consumption by farm animals;
  - e) any significant adverse effects on aquatic life.
6. The consent holder shall maintain and regularly update a 'Contingency Plan' that details measures and procedures that will be undertaken to prevent, and to avoid environmental effects from, a spillage or any discharge of contaminants not authorised by this consent. The plan shall be approved by the Chief Executive, Taranaki Regional Council, acting in a certification capacity.



## Consent 0291-3.0

7. Within three months of the granting of this consent, the site shall be operated in accordance with a 'Stormwater Management Plan' prepared by the consent holder and approved by the Chief Executive, Taranaki Regional Council, acting in a certification capacity. The plan shall detail how the site will be managed to achieve compliance with the conditions of this consent and shall include as a minimum:
  - a) identification of sources of contaminants,
  - b) methods that will be practised to ensure contaminants entering stormwater is at a practical minimum,
  - c) the loading and unloading of materials;
  - d) maintenance of conveyance systems;
  - e) general housekeeping; and
  - f) management of the interceptor system.
8. The consent holder shall notify the Chief Executive, Taranaki Regional Council, prior to making any changes to the processes or operations undertaken at the site, or the chemicals used or stored on site that could alter the nature of the discharge. Any such change shall then only occur following receipt of any necessary approval under the Resource Management Act 1991. Notification shall include the consent number, a brief description of the activity consented and an assessment of the environmental effects of any changes, and be emailed to [consents@trc.govt.nz](mailto:consents@trc.govt.nz).
9. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review:
  - a) during the month of June 2020 and/or 2026 and/or
  - b) within 3 months of receiving a notification under special condition 8 above and/or
  - c) within 3 months of receiving the Stormwater Management Plan under special condition 7 above.

for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 24 October 2014

For and on behalf of  
Taranaki Regional Council



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A D McLay  
**Director - Resource Management**



**Discharge Permit**  
**Pursuant to the Resource Management Act 1991**  
**a resource consent is hereby granted by the**  
**Taranaki Regional Council**

Name of  
Consent Holder:           Technix Group Limited  
Private Bag 2222  
New Plymouth 4342

Decision Date:             24 October 2014

Commencement Date:     24 October 2014

**Conditions of Consent**

Consent Granted:         To discharge stormwater from an industrial site into the  
Waiwhakaiho River

Expiry Date:             01 June 2032

Review Date(s):         June 2020, June 2026 and in accordance with special  
condition 8

Site Location:            691 Devon Road, Bell Block

Legal Description:        Lot 1 DP 20360 (Discharge source & site)

Grid Reference (NZTM)   1696449E-5677553N

Catchment:                Waiwhakaiho

*For General, Standard and Special conditions  
pertaining to this consent please see reverse side of this document*

### General condition

- a. The consent holder shall pay to the Taranaki Regional Council all the administration, monitoring and supervision costs of this consent, fixed in accordance with section 36 of the Resource Management Act 1991.

### Special conditions

1. The consent holder shall at all times adopt the best practicable option, as defined in section 2 of the Resource Management Act 1991, to prevent or minimise any adverse effects on the environment from the exercise of this consent.
2. The stormwater discharged shall be from a catchment area not exceeding 1.8 ha.
3. Constituents of the discharge shall meet the standards shown in the following table.

<u>Constituent</u>	<u>Standard</u>
pH	Within the range 6.0 to 9.0
suspended solids	Concentration not greater than 100 gm <sup>-3</sup>
oil and grease	Concentration not greater than 15 gm <sup>-3</sup>
chloride	Concentration not greater than 50 gm <sup>-3</sup>

This condition shall apply before entry of the treated stormwater into the receiving waters at a designated sampling point approved by the Chief Executive, Taranaki Regional Council.

4. After allowing for reasonable mixing, within a mixing zone extending 50 metres downstream of the discharge point, the discharge shall not, either by itself or in combination with other discharges, give rise to any or all of the following effects in the receiving water:
  - a) the production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials;
  - b) any conspicuous change in the colour or visual clarity;
  - c) any emission of objectionable odour;
  - d) the rendering of fresh water unsuitable for consumption by farm animals;
  - e) any significant adverse effects on aquatic life.
5. The consent holder shall maintain and regularly update a 'Contingency Plan' that details measures and procedures that will be undertaken to prevent, and to avoid environmental effects from, a spillage or any discharge of contaminants not authorised by this consent. The plan shall be approved by the Chief Executive, Taranaki Regional Council, acting in a certification capacity.

## Consent 9981-1.0

6. Within three months of the granting of this consent, the site shall be operated in accordance with a 'Stormwater Management Plan' prepared by the consent holder and approved by the Chief Executive, Taranaki Regional Council, acting in a certification capacity. The plan shall detail how the site will be managed to achieve compliance with the conditions of this consent and shall include as a minimum:
  - a) identification of sources of contaminants,
  - b) methods that will be practised to ensure contaminants entering stormwater is at a practical minimum,
  - c) the loading and unloading of materials;
  - d) maintenance of conveyance systems;
  - e) general housekeeping; and
  - f) management of the interceptor system.
7. The consent holder shall notify the Chief Executive, Taranaki Regional Council, prior to making any changes to the processes or operations undertaken at the site, or the chemicals used or stored on site that could alter the nature of the discharge. Any such change shall then only occur following receipt of any necessary approval under the Resource Management Act 1991. Notification shall include the consent number, a brief description of the activity consented and an assessment of the environmental effects of any changes, and be emailed to [consents@trc.govt.nz](mailto:consents@trc.govt.nz).
8. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review:
  - a) during the month of June 2020 and/or 2026 and/or
  - b) within 3 months of receiving a notification under special condition 7 above and/or
  - c) within 3 months of receiving the Stormwater Management Plan under special condition 6 above

for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 24 October 2014

For and on behalf of  
Taranaki Regional Council



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A D McLay  
**Director - Resource Management**



## **Mangaone Stream**





**Discharge Permit**  
**Pursuant to the Resource Management Act 1991**  
**a resource consent is hereby granted by the**  
**Taranaki Regional Council**

Name of  
Consent Holder:            AML Limited [Trading as Allied Concrete]  
   P O Box 3318  
   NEW PLYMOUTH

Consent Granted            30 July 2008  
Date:

**Conditions of Consent**

Consent Granted:            To discharge stormwater and treated wastewater from  
   truck washing at a concrete batching plant into the  
   Mangaone Stream in the Waiwhakaiho catchment at or  
   about (NZTM) 1696910E-5677375N

Expiry Date:                1 June 2026

Review Date(s):            June 2014, June 2020 and/or within 3 months of receiving  
   a notification under special condition 9

Site Location:              67 Hurlstone Drive, Bell Block

Legal Description:         Lot 1 DP 17583 Blk II Paritutu SD

Catchment:                 Waiwhakaiho

Tributary:                  Mangaone

### General conditions

- a) On receipt of a requirement from the Chief Executive, Taranaki Regional Council the consent holder shall, within the time specified in the requirement, supply the information required relating to the exercise of this consent.
- b) Unless it is otherwise specified in the conditions of this consent, compliance with any monitoring requirement imposed by this consent must be at the consent holder's own expense.
- c) The consent holder shall pay to the Council all required administrative charges fixed by the Council pursuant to section 36 in relation to:
  - i) the administration, monitoring and supervision of this consent; and
  - ii) charges authorised by regulations.

### Special conditions

1. Notwithstanding any conditions within this consent, the consent holder shall at all times adopt the best practicable option, as defined in section 2 of the Resource Management Act 1991, to prevent or minimise any adverse effects on the environment from the exercise of this consent.
2. The maximum stormwater catchment area shall be no more than 5880 m<sup>2</sup>.
3. Any above ground hazardous substances storage areas shall be bunded with drainage to the wastewater treatment system, and not directly to the stormwater catchment.
4. Concentrations of the following components shall not be exceeded in the discharge:

<b>Component</b>	<b>Concentration</b>
suspended solids	100 g/m <sup>3</sup>
oil and grease	15 g/m <sup>3</sup>

This condition shall apply prior to the entry of the stormwater and wastewater into the receiving waters, at a designated sampling point approved by the Chief Executive, Taranaki Regional Council.

5. After allowing for reasonable mixing, within a mixing zone extending 50 metres downstream of the discharge point, the discharge shall not, either by itself or in combination with other discharges, give rise to any or all of the following effects in the Mangaone Stream:
  - a) the production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials;
  - b) any conspicuous change in the colour or visual clarity;
  - c) any emission of objectionable odour;
  - d) the rendering of fresh water unsuitable for consumption by farm animals;
  - e) any significant adverse effects on aquatic life.

## Consent 4539-2

6. After allowing for reasonable mixing, within a mixing zone extending 50 metres downstream of the discharge point, the discharge shall not, either by itself or in combination with other discharges, give rise to an increase in pH of greater than 0.5, or a pH outside the range of 6.0 to 8.0 within the receiving waters of the Mangaone Stream.
7. The consent holder shall maintain, and adhere to, a contingency plan detailing measures and procedures to be undertaken to prevent spillage or accidental discharge of contaminants not licensed by this consent, and measures to avoid, remedy or mitigate the environmental effects of such a spillage or discharge.
8. Within three months of the granting of this consent, the consent holder shall prepare and maintain an operation and management plan. This plan shall be adhered to at all times and shall, to the satisfaction of the Chief Executive, Taranaki Regional Council, document how the site is to be managed in order to minimise the contaminants that become entrained in the stormwater. The plan shall include but not necessarily be limited to:
  - a) the loading, unloading and storage of materials;
  - b) maintenance of conveyance systems;
  - c) general housekeeping; and
  - d) management of the wastewater treatment system.
9. The consent holder shall notify the Chief Executive, Taranaki Regional Council, prior to making any changes in the processes undertaken at the site, or the chemicals used or stored on site, which could alter the nature of the discharge. Notification shall include the consent number, a brief description of the activity consented and an assessment of the environmental effects of any changes, and be emailed to [worknotification@trc.govt.nz](mailto:worknotification@trc.govt.nz). Notification by fax or post is acceptable if the consent holder does not have access to email.
10. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review:
  - a) during the month of June 2014 and/or June 2020; and/or
  - b) within 3 months of receiving a notification under special condition 9 above,for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 30 July 2008

For and on behalf of  
Taranaki Regional Council

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**Director-Resource Management**



**Discharge Permit**  
**Pursuant to the Resource Management Act 1991**  
**a resource consent is hereby granted by the**  
**Taranaki Regional Council**

Name of  
Consent Holder: Downer EDI Works Limited  
P O Box 272  
NEW PLYMOUTH

Consent Granted  
Date: 1 May 1996

**Conditions of Consent**

Consent Granted: To discharge up to 175 litres/second of stormwater and washdown water from an asphalt manufacturing plant into the Mangaone Stream in the Waiwhakaiho catchment at or about (NZTM) 1696712E-5677949N

Expiry Date: 1 June 2014

Review Date(s): June 2002, June 2008

Site Location: Rifle Range Road Fitzroy New Plymouth

Legal Description: Sec 224 Hua Dist Blk II Paritutu SD

Catchment: Waiwhakaiho

Tributary: Mangaone

### General conditions

- (a) That on receipt of a requirement from the Chief Executive, Taranaki Regional Council (hereinafter the Chief Executive), the consent holder shall, within the time specified in the requirement, supply the information required relating to the exercise of this consent.
- (b) That unless it is otherwise specified in the conditions of this consent, compliance with any monitoring requirement imposed by this consent must be at the consent holder's own expense.
- (c) That the consent holder shall pay to the Council all required administrative charges fixed by the Council pursuant to section 36 in relation to:
  - (i) the administration, monitoring and supervision of this consent;
  - (ii) charges for the carrying out of the Council's functions under section 35 in relation to this consent; and
  - (iii) charges authorised by regulations.

### Special conditions

1. That the following limits shall not be exceeded in the discharge:

Suspended solids	100 mg/L
Oil & grease	15 mg/L
pH [range]	6.0 - 8.5
2. That allowing for a mixing zone of 50 metres extending downstream of the discharge pipe, the discharge shall not give rise to any of the following effects in the receiving water of the Mangaone Stream:
  - (i) the production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials;
  - (ii) any conspicuous change in the colour or visual clarity;
  - (iii) any emission of objectionable odour;
  - (iv) the rendering of fresh water unsuitable for consumption by farm animals;
  - (v) any significant adverse effects on aquatic life, habitats, or ecology.
3. That the consent holder, within three months of the granting of this consent, shall provide a contingency plan, to the satisfaction of the Chief Executive, Taranaki Regional Council, for action to be taken in the event of accidental discharge or spillage of contaminants.

Consent 3917-2

4. That the Taranaki Regional Council may review any or all of the conditions of this consent by giving notice of review during June 2002 and/or June 2008 for the purpose of ensuring that the conditions are adequate to deal with any adverse effects of the discharge on the environment.

Transferred at Stratford on 23 March 2009

For and on behalf of  
Taranaki Regional Council

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**Director-Resource Management**





**Discharge Permit**  
**Pursuant to the Resource Management Act 1991**  
**a resource consent is hereby granted by the**  
**Taranaki Regional Council**

Name of  
Consent Holder: Downer EDI Works Limited  
PO Box 272  
New Plymouth 4340

Decision Date: 20 May 2015

Commencement Date: 20 May 2015

**Conditions of Consent**

Consent Granted: To discharge treated stormwater and minor amounts of treated air scrubber waste water from an asphalt manufacturing plant onto land and into the Mangaone Stream

Expiry Date: 1 June 2032

Review Date(s): June 2020, June 2026 and in accordance with special condition 8

Site Location: Rifle Range Road, New Plymouth

Legal Description: Sec 4 SO 436795 (Discharge source & site)

Grid Reference (NZTM) 1696712E-5677949N

Catchment: Waiwhakaiho

Tributary: Mangaone

*For General, Standard and Special conditions  
pertaining to this consent please see reverse side of this document*

### General condition

- a. The consent holder shall pay to the Taranaki Regional Council all the administration, monitoring and supervision costs of this consent, fixed in accordance with section 36 of the Resource Management Act 1991.

### Special conditions

1. The consent holder shall at all times adopt the best practicable option, as defined in section 2 of the Resource Management Act 1991, to prevent or minimise any adverse effects on the environment from the exercise of this consent.
2. The stormwater discharged shall be from a catchment area not exceeding 6.5 Ha.
3. Constituents of the discharge shall meet the standards shown in the following table.

<b>Constituent</b>	<b>Standard</b>
pH	Within the range 6.0 to 9.0
suspended solids	Concentration not greater than 100 gm <sup>-3</sup>
total recoverable hydrocarbons	Concentration not greater than 15 gm <sup>-3</sup>

This condition shall apply before entry of the treated stormwater into the receiving waters at a designated sampling point approved by the Chief Executive, Taranaki Regional Council.

4. After allowing for reasonable mixing, within a mixing zone extending 25 metres downstream of the discharge point, the discharge shall not, either by itself or in combination with other discharges, give rise to any or all of the following effects in the receiving water:
  - a) the production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials;
  - b) any conspicuous change in the colour or visual clarity;
  - c) any emission of objectionable odour;
  - d) the rendering of fresh water unsuitable for consumption by farm animals;
  - e) any significant adverse effects on aquatic life.
5. The consent holder shall maintain and regularly update a 'Contingency Plan' that details measures and procedures that will be undertaken to prevent, and to avoid environmental effects from, a spillage or any discharge of contaminants not authorised by this consent. The plan shall be approved by the Chief Executive, Taranaki Regional Council, acting in a certification capacity.
6. The site shall be operated in accordance with a 'Management Plan' prepared by the consent holder and approved by the Chief Executive, Taranaki Regional Council, acting in a certification capacity. The plan shall detail how the site is to be managed to minimise the contaminants that become entrained in the stormwater and shall include as a minimum:
  - a) the loading and unloading of materials;
  - b) general housekeeping; and
  - c) management of the treatment systems.

## Consent 3917-3.0

7. The consent holder shall notify the Chief Executive, Taranaki Regional Council, prior to making any changes to the processes or operations undertaken at the site, or the chemicals used or stored on site that could alter the nature of the discharge. Any such change shall then only occur following receipt of any necessary approval under the Resource Management Act. Notification shall include the consent number, a brief description of the activity consented and an assessment of the environmental effects of any changes, and be emailed to [consents@trc.govt.nz](mailto:consents@trc.govt.nz).
8. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review:
  - a) during the month of June 2020 and/or June 2026; and/or
  - b) within 3 months of receiving a notification under special condition 7 above;

for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 20 May 2015

For and on behalf of  
Taranaki Regional Council

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A D McLay  
**Director - Resource Management**



**Discharge Permit**  
**Pursuant to the Resource Management Act 1991**  
**a resource consent is hereby granted by the**  
**Taranaki Regional Council**

Name of  
Consent Holder: Farmlands Co-operative Society Limited  
23 Sir William Pickering Society Drive  
CHRISTCHURCH 8053

Decision Date: 11 January 2002

Commencement Date: 11 January 2002

**Conditions of Consent**

Consent Granted: To discharge minor volumes of treated industrial wastewater and up to 128 litres/second of treated stormwater from a stockfeed milling plant into an unnamed tributary of the Mangaone Stream in the Waiwhakaiho catchment at or about (NZTM) 1697412E-5677349N

Expiry Date: 1 June 2020

Review Date(s): June 2003, June 2005, June 2008, June 2014

Site Location: 99 Katere Road, New Plymouth

Legal Description: Lot 2 DP 15406 Blk VI Paritutu SD

Catchment: Waiwhakaiho

Tributary: Mangaone

*For General, Standard and Special conditions  
pertaining to this consent please see reverse side of this document*

### General conditions

- a) That on receipt of a requirement from the Chief Executive, Taranaki Regional Council the consent holder shall, within the time specified in the requirement, supply the information required relating to the exercise of this consent.
- b) That unless it is otherwise specified in the conditions of this consent, compliance with any monitoring requirement imposed by this consent must be at the consent holder's own expense.
- c) That the consent holder shall pay to the Council all required administrative charges fixed by the Council pursuant to section 36 in relation to:
  - i) the administration, monitoring and supervision of this consent; and
  - ii) charges authorised by regulations.

### Special conditions

1. This consent shall be exercised generally in accordance with the information submitted in support of application 1669 and to ensure the conditions of this consent are maintained.
2. The consent holder shall advise the Chief Executive, Taranaki Regional Council, prior to making any change in the processes undertaken at the site, or the materials used on site, which could alter the quantity or nature of the discharge.
3. The stormwater treatment system shall be maintained to the satisfaction of the Chief Executive, Taranaki Regional Council.
4. The following concentrations shall not be exceeded within the discharge effluent:

<b>Component</b>	<b>Concentration</b>
pH (range)	6.0-9.0
suspended solids	100 gm <sup>-3</sup>
oil and grease	15 gm <sup>-3</sup>
biochemical oxygen demand	25 gm <sup>-3</sup>

This condition shall apply prior to the entry of the treated stormwater and wastewater into the Katere Road stormwater system, at a designated sampling point approved by the Chief Executive, Taranaki Regional Council.

5. The discharge shall not give rise to any of the following effects in the receiving waters of the Mangaone Stream:
  - a) the production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials;
  - b) any conspicuous change in the colour or visual clarity;
  - c) any emission of objectionable odour;
  - d) the rendering of fresh water unsuitable for consumption by farm animals;
  - e) any significant adverse effects on aquatic life.

## Consent 4548-2

6. The discharge shall not cause the concentration of filtered carbonaceous biochemical oxygen demand to exceed 2.00 gm<sup>-3</sup> in the Mangaone Stream.
7. The discharge shall not cause the concentration of unionised ammonia to exceed 0.025 gm<sup>-3</sup> in the Mangaone Stream.
8. The consent holder shall prepare and maintain a contingency plan to the satisfaction of the Chief Executive, Taranaki Regional Council, outlining measures and procedures undertaken to prevent spillage or accidental discharge of contaminants, and procedures to be carried out should such a spillage or discharge occur.
9. That within three months of the granting of this consent, the consent holder shall prepare and maintain an operation and management plan to the satisfaction of the Chief Executive, Taranaki Regional Council including but not limited to:
  - a) The loading and unloading of materials;
  - b) maintenance of conveyance systems;
  - c) general housekeeping;
  - d) management of the interceptor system.
10. The consent will be exercised in accordance with the procedures set out in the operation and management plan, and the consent holder shall subsequently adhere to and comply with the procedures, requirements, obligations and all other matters specified in the operation and management plan, except by specific agreement of the Chief Executive, Taranaki Regional Council. In the case of contradiction between the operation and management plan and the conditions of this resource consent, the conditions of the resource consent shall prevail.
11. The consent holder shall advise the Taranaki Regional Council one month prior to any changes being made to the operation and management plan. Should the Taranaki Regional Council wish to review the operation and management plan, one month's notice shall be provided to the consent holder.
12. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2003 and/or June 2005 and/or June 2008 and/or June 2014, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Transferred at Stratford on 10 December 2013

For and on behalf of  
Taranaki Regional Council

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**Director-Resource Management**





TRK962041

## DISCHARGE PERMIT

**Pursuant to the RESOURCE MANAGEMENT ACT 1991  
a resource consent is hereby granted by the  
Taranaki Regional Council**

Name of FREIGHT & BULK TRANSPORT HOLDINGS LIMITED  
Consent Holder: PO BOX 472 NEW PLYMOUTH

Renewal  
Granted Date: 1 May 1996

## CONDITIONS OF CONSENT

Consent Granted: TO DISCHARGE UP TO 2.8 CUBIC METRES/DAY OF TREATED TRUCK WASHDOWN WATER AND STORMWATER ONTO AND INTO LAND IN THE VICINITY OF THE MANGAONE STREAM IN THE WAIWHAKAIHO CATCHMENT AT OR ABOUT GR: P19:067-391

Expiry Date: 1 June 2014

Review Date[s]: June 2002 and June 2008

Site Location: KATERE ROAD, FITZROY, NEW PLYMOUTH

Legal Description: LOT 1 DP13577 LOT 2 DP17884 SEC 184 HUA DIST BLK VI PARITUTU SD

Catchment: WAIWHAKAIHO 392.000

Tributary: MANGAONE 392.010

For General, Standard and Special Conditions pertaining to this consent please see reverse side of this document.

TRK962041

### GENERAL CONDITIONS

- (a) That on receipt of a requirement from the General Manager, Taranaki Regional Council (hereinafter the General Manager), the consent holder shall, within the time specified in the requirement, supply the information required relating to the exercise of this consent.
- (b) That unless it is otherwise specified in the conditions of this consent, compliance with any monitoring requirement imposed by this consent must be at the consent holder's own expense.
- (c) That the consent holder shall pay to the Council all required administrative charges fixed by the Council pursuant to section 36 in relation to:
  - (i) the administration, monitoring and supervision of this consent;
  - (ii) charges for the carrying out of the Council's functions under section 35 in relation to this consent; and
  - (iii) charges authorised by regulations.

### SPECIAL CONDITIONS

- 1) THAT the Taranaki Regional Council may review any or all of the conditions of this consent by giving notice of review during June 2002 and/or June 2008 for the purpose of ensuring that the conditions are adequate to deal with any adverse effects of the discharge on the environment.
- 2) THAT the consent holder, within three months of the granting of this consent, shall provide a contingency plan, to the satisfaction of the General Manager, Taranaki Regional Council, for action to be taken in the event of accidental discharge or spillage of contaminants.
- 3) THAT allowing for reasonable mixing, the discharge shall not give rise to any of the following effects in the receiving water:
  - (i) the production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials;
  - (ii) any conspicuous change in the colour or visual clarity;
  - (iii) any emission of objectionable odour;
  - (iv) the rendering of fresh water unsuitable for consumption by farm animals;
  - (v) any significant adverse effects on aquatic life, habitats, or ecology.

Signed at Stratford on 1 May 1996

For and on behalf of  
TARANAKI REGIONAL COUNCIL

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GENERAL MANAGER

**Discharge Permit**  
**Pursuant to the Resource Management Act 1991**  
**a resource consent is hereby granted by the**  
**Taranaki Regional Council**

Name of  
Consent Holder: Freight & Bulk Transport Limited  
PO Box 472  
New Plymouth 4340

Decision Date: 5 June 2015

Commencement Date: 5 June 2015

**Conditions of Consent**

Consent Granted: To discharge treated truck wash water and stormwater onto  
and into land

Expiry Date: 1 June 2018

Review Date(s): In accordance with special condition 7

Site Location: 69 Katere Road, New Plymouth

Legal Description: Lot 1 DP 13577 Lot 2 DP 17884 & Sec 184 Hua Dist Blk VI  
& Paritutu SD Lot 2 DP 9418 Lot 1 DP 9418  
(Discharge source & site)

Grid Reference (NZTM) 1697056E – 5677302N  
1697091E – 5677315N

Catchment: Waiwhakaiho

Tributary: Mangaone

*For General, Standard and Special conditions  
pertaining to this consent please see reverse side of this document*

### General condition

- a. The consent holder shall pay to the Taranaki Regional Council all the administration, monitoring and supervision costs of this consent, fixed in accordance with section 36 of the Resource Management Act 1991.

### Special conditions

1. The consent holder shall at all times adopt the best practicable option, as defined in section 2 of the Resource Management Act 1991, to prevent or minimise any adverse effects on the environment from the exercise of this consent.
2. All truck wash water shall be directed through the treatment system for treatment prior to discharge in accordance with the special conditions of this permit.
3. The discharge shall not, either by itself or in combination with other discharges, give rise to any of the following effects in the Mangaone Stream:
  - a) the production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials;
  - b) any conspicuous change in the colour or visual clarity;
  - c) any emission of objectionable odour;
  - d) the rendering of fresh water unsuitable for consumption by farm animals;
  - e) any significant adverse effects on aquatic life;
  - f) the concentration of unionised ammonia to exceed 0.025 g/m<sup>3</sup>;
  - g) an increase in in the concentration of filtered carbonaceous biochemical oxygen demand of 2.00 g/m<sup>3</sup>.
4. The consent holder shall maintain and regularly update a 'Contingency Plan' that details measures and procedures that will be undertaken to prevent, and to avoid environmental effects from, a spillage or any discharge of contaminants not authorised by this consent. The plan shall be approved by the Chief Executive, Taranaki Regional Council, acting in a certification capacity.
5. The site shall be operated in accordance with a 'Management Plan' prepared by the consent holder and approved by the Chief Executive, Taranaki Regional Council, acting in a certification capacity. The plan shall detail how the site is to be managed to minimise the contaminants that become entrained in the stormwater and shall include as minimum:
  - a) the maintenance and management of primary treatment measures;
  - b) the scheduling of sampling and trigger values for desludging the collection sump; and
  - c) general housekeeping.

## Consent 2041-3.0

6. The consent holder shall notify the Chief Executive, Taranaki Regional Council, prior to making any changes to the processes or operations undertaken at the site, or the chemicals used or stored on site that could alter the nature of the discharge. Any such change shall then only occur following receipt of any necessary approval under the Resource Management Act. Notification shall include the consent number, a brief description of the activity consented and an assessment of the environmental effects of any changes, and be emailed to [consents@trc.govt.nz](mailto:consents@trc.govt.nz).
7. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review within 3 months of receiving a notification under special condition 0 above; for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 5 June 2015

For and on behalf of  
Taranaki Regional Council

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A D McLay  
**Director - Resource Management**



**Discharge Permit**  
**Pursuant to the Resource Management Act 1991**  
**a resource consent is hereby granted by the**  
**Taranaki Regional Council**

Name of  
Consent Holder: Freight & Bulk Transport Limited  
PO Box 472  
New Plymouth 4340

Decision Date: 5 June 2015

Commencement Date: 5 June 2015

**Conditions of Consent**

Consent Granted: To discharge stormwater onto and into land and into the  
Mangaone Stream

Expiry Date: 1 June 2032

Review Date(s): June 2020, June 2026 and in accordance with special  
condition 9

Site Location: 69 Katere Road, New Plymouth

Legal Description: Lot 1 DP 13577 Lot 2 DP 17884 & Sec 184 Hua Dist Blk VI  
& Paritutu SD & Lot 2 DP 9418 Pt Lot 1 DP 9418  
(Discharge source & site)

Grid Reference (NZTM) 1697103E – 5677252N  
1697061E – 5677209N  
1697033E – 5677144N

Catchment: Waiwhakaiho

Tributary: Mangaone

*For General, Standard and Special conditions  
pertaining to this consent please see reverse side of this document*

### General condition

- a. The consent holder shall pay to the Taranaki Regional Council all the administration, monitoring and supervision costs of this consent, fixed in accordance with section 36 of the Resource Management Act 1991.

### Special conditions

1. The consent holder shall at all times adopt the best practicable option, as defined in section 2 of the Resource Management Act 1991, to prevent or minimise any adverse effects on the environment from the exercise of this consent.
2. The stormwater discharged shall be from an area not exceeding 1.77 Ha.
3. Constituents of the discharge shall meet the standards shown in the following table.

<u>Constituent</u>	<u>Standard</u>
pH	Within the range 6.0 to 9.0
suspended solids	Concentration not greater than 100 gm <sup>-3</sup>
oil and grease	Concentration not greater than 15 gm <sup>-3</sup>
carbonaceous biochemical oxygen demand	Concentration not greater than 15 gm <sup>-3</sup>

This condition shall apply before entry of the treated stormwater into the receiving waters at a designated sampling points approved by the Chief Executive, Taranaki Regional Council.

4. After allowing for reasonable mixing, within a mixing zone extending 30 metres downstream of the discharge point, the discharge shall not, either by itself or in combination with other discharges, give rise to any or all of the following effects in Mangaone Stream:
  - a) the production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials;
  - b) any conspicuous change in the colour or visual clarity;
  - c) any emission of objectionable odour;
  - d) the rendering of fresh water unsuitable for consumption by farm animals;
  - e) any significant adverse effects on aquatic life; and
  - f) an unionised ammonia concentration of greater the 0.025 g/ m<sup>3</sup>-N.
5. The consent holder shall maintain and regularly update a 'Contingency Plan' that details measures and procedures that will be undertaken to prevent, and to avoid environmental effects from, a spillage or any discharge of contaminants not authorised by this consent. The plan shall be approved by the Chief Executive, Taranaki Regional Council, acting in a certification capacity.



## Consent 10008-1.0

6. The site shall be operated in accordance with an up to date 'Management Plan' prepared by the consent holder and approved by the Chief Executive, Taranaki Regional Council, acting in a certification capacity. The plan shall detail how the site is to be managed to minimise the contaminants that become entrained in the stormwater and shall include as minimum:
- a) the loading and unloading of materials;
  - b) general housekeeping;
  - c) management of the treatment systems; and
  - d) timeframes for any proposed improvements.

*Note: A Stormwater Management Plan template is available in the Environment section of the Taranaki Regional Council's web site [www.trc.govt.nz](http://www.trc.govt.nz).*

7. The consent holder shall notify the Chief Executive, Taranaki Regional Council, prior to making any changes to the processes or operations undertaken at the site, or the chemicals used or stored on site that could alter the nature of the discharge. Any such change shall then only occur following receipt of any necessary approval under the Resource Management Act. Notification shall include the consent number, a brief description of the activity consented and an assessment of the environmental effects of any changes, and be emailed to [consents@trc.govt.nz](mailto:consents@trc.govt.nz).
8. This consent shall lapse on 30 June 2020 unless the consent is given effect to before the end of that period or the Taranaki Regional Council fixes a longer period pursuant to section 125(1)(b) of the Resource Management Act 1991.
9. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review:
- a) during the month of June 2020 and/or June 2026
  - b) within 3 months of receiving a notification under special condition 7 above;

for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 5 June 2015

For and on behalf of  
Taranaki Regional Council

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A D McLay  
**Director - Resource Management**



**Discharge Permit**  
**Pursuant to the Resource Management Act 1991**  
**a resource consent is hereby granted by the**  
**Taranaki Regional Council**

Name of  
Consent Holder: Nankervis Family Trust  
165 Lower Flag Range Road  
R D 9  
HASTINGS 4179

Consent Granted  
Date: 20 October 2006

**Conditions of Consent**

Consent Granted: To discharge truck washwater via an interceptor system  
into the Mangaone Stream in the Waiwhakaiho catchment  
at or about GR: P19:073-394

Expiry Date: 1 June 2020

Review Date(s): June 2008, June 2014

Site Location: 1 Dean Place, New Plymouth

Legal Description: Lot 2 DP 350826

Catchment: Waiwhakaiho

Tributary: Mangaone

### **General conditions**

- a) On receipt of a requirement from the Chief Executive, Taranaki Regional Council the consent holder shall, within the time specified in the requirement, supply the information required relating to the exercise of this consent.
- b) Unless it is otherwise specified in the conditions of this consent, compliance with any monitoring requirement imposed by this consent must be at the consent holder's own expense.
- c) The consent holder shall pay to the Council all required administrative charges fixed by the Council pursuant to section 36 in relation to:
  - i) the administration, monitoring and supervision of this consent; and
  - ii) charges authorised by regulations.

### **Special conditions**

1. The consent holder shall adopt the best practicable option, as defined in section 2 of the Resource Management Act 1991, to avoid or minimise the discharge of silt or other contaminants into water or onto the riverbed and to avoid or minimise the disturbance of the riverbed and any adverse effects on water quality.
2. The exercise of this consent shall be undertaken generally in accordance with the documentation submitted in support of application 4368. In the case of any contradiction between the documentation submitted in support of application 4368 and the conditions of this consent, the conditions of this consent shall prevail.
3. Prior to the exercise of this consent, the consent holder shall provide for the written approval of the Chief Executive, Taranaki Regional Council, a management plan relating to contingency planning and management of stormwater and washwater for the site.
4. After reasonable mixing, the contaminant whether by itself or in combination with other contaminants, shall not cause any of the following effects:
  - a) the production of conspicuous oil or grease films, scums or foams, or floatable or suspended materials;
  - b) any conspicuous change in the colour or visual clarity;
  - c) any emissions of objectionable odour;
  - d) the rendering of fresh water unsuitable for consumption by farm animals; and
  - e) any significant adverse effects on aquatic life.
5. There shall be no direct discharge of untreated washwater into the Mangaone Stream, as a result of the exercise of this consent.

## Consent 6965-1

6. The following concentrations shall not be exceeded in the discharge:

<b>Component</b>	<b>Concentration</b>
pH [range]	6-9
Suspended solids	100 gm <sup>-3</sup>
Oil and Grease	15 gm <sup>-3</sup>

This condition shall apply prior to the entry of the washwater discharge into the Mangaone Stream at a designated sampling point approved by the Chief Executive, Taranaki Regional Council.

7. The consent holder shall not discharge any product used to degrease plant or equipment or discharge any detergent used for truck washing in terms of this consent. The consent holder shall not discharge any water containing concrete, cement or water used to remove concrete and/or cement products from either trucks or equipment.
8. The consent holder shall ensure that no adverse effects shall occur to surface water or groundwater as a result of the exercise of this consent.
9. This consent shall lapse on the expiry of five years after the date of issue of this consent, unless the consent is given effect to before the end of that period or the Taranaki Regional Council fixes a longer period pursuant to section 125(1)(b) of the Resource Management Act 1991.
10. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2008 and/or June 2014 for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 20 October 2006

For and on behalf of  
Taranaki Regional Council

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**Director-Resource Management**



**Discharge Permit**  
**Pursuant to the Resource Management Act 1991**  
**a resource consent is hereby granted by the**  
**Taranaki Regional Council**

Name of  
Consent Holder:           New Plymouth District Council  
Private Bag 2025  
NEW PLYMOUTH 4342

Consent Granted           10 June 2008  
Date:

**Conditions of Consent**

Consent Granted:       To discharge stormwater from the Katere and  
Waiwhakaiho industrial areas into the Mangaone Stream  
via multiple outfalls between Egmont Road and the  
confluence with the Waiwhakaiho River at or about (NZTM)  
1697233E-5677145N, 1697032E-5677145N,  
1696882E-5677087N, 1696734E-5676990N,  
1696545E-5677175N, 1696755E-5677622N,  
1696757E-5677671N, 1696771E-5677957N, and  
1696777E-5677965N

Expiry Date:           1 June 2026

Review Date(s):       June 2010, June 2014, June 2020

Site Location:         Katere Road, New Plymouth

Legal Description:     Various

Catchment:            Waiwhakaiho

Tributary:             Mangaone

*For General, Standard and Special conditions  
pertaining to this consent please see reverse side of this document*

### **General conditions**

- a) On receipt of a requirement from the Chief Executive, Taranaki Regional Council the consent holder shall, within the time specified in the requirement, supply the information required relating to the exercise of this consent.
- b) Unless it is otherwise specified in the conditions of this consent, compliance with any monitoring requirement imposed by this consent must be at the consent holder's own expense.
- c) The consent holder shall pay to the Council all required administrative charges fixed by the Council pursuant to section 36 in relation to:
  - i) the administration, monitoring and supervision of this consent; and
  - ii) charges authorised by regulations.

### **Special conditions**

1. The consent holder shall at all times adopt the best practicable option, as defined in section 2 of the Resource Management Act 1991, to prevent or minimise any adverse effects on the environment from the exercise of this consent.
2. The consent holder shall prevent, where possible, or mitigate any erosion occurring as a result of the exercise of this consent.
3. After allowing for reasonable mixing, within a mixing zone extending 25 metres downstream of the discharge point, the discharge shall not, either by itself or in combination with other discharges, give rise to any or all of the following effects in the Mangaone Stream:
  - a) the production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials;
  - b) any conspicuous change in the colour or visual clarity;
  - c) any emission of objectionable odour;
  - d) the rendering of fresh water unsuitable for consumption by farm animals;
  - e) any significant adverse effects on aquatic life.



## Consent 1275-3

4. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2010 and/or June 2014 and/or June 2020, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 10 June 2008

For and on behalf of  
Taranaki Regional Council

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**Director-Resource Management**



**Discharge Permit**  
**Pursuant to the Resource Management Act 1991**  
**a resource consent is hereby granted by the**  
**Taranaki Regional Council**

Name of  
Consent Holder:           New Zealand Decorative Concrete Limited  
  P O Box 7022  
  NEW PLYMOUTH 4341

Consent Granted           22 December 2009  
Date:

**Conditions of Consent**

Consent Granted:       To discharge stormwater from a decorative concrete  
  products manufacturing site into the Mangaone Stream in  
  the Waiwhakaiho catchment at or about (NZTM)  
  1697381E-5677456N

Expiry Date:           1 June 2026

Review Date(s):       June 2014, June 2020

Site Location:         42A Egmont Road, New Plymouth

Legal Description:     Lot 1 DP 12763

Catchment:            Waiwhakaiho

Tributary:             Mangaone

### General conditions

- a) On receipt of a requirement from the Chief Executive, Taranaki Regional Council the consent holder shall, within the time specified in the requirement, supply the information required relating to the exercise of this consent.
- b) Unless it is otherwise specified in the conditions of this consent, compliance with any monitoring requirement imposed by this consent must be at the consent holder's own expense.
- c) The consent holder shall pay to the Council all required administrative charges fixed by the Council pursuant to section 36 in relation to:
  - i) the administration, monitoring and supervision of this consent; and
  - ii) charges authorised by regulations.

### Special conditions

1. The consent holder shall at all times adopt the best practicable option, as defined in section 2 of the Resource Management Act 1991, to prevent or minimise any adverse effects on the environment from the exercise of this consent.
2. The stormwater discharged shall be from a catchment area not exceeding 0.26ha.
3. By 22 March 2010, all stormwater shall be directed for treatment through a drain warden or equivalent stormwater treatment system, to be installed and maintained to the satisfaction of the Chief Executive, Taranaki Regional Council, for discharge in accordance with the special conditions of this permit.
4. Any above ground hazardous substances storage areas shall be bunded with drainage to sumps, or other appropriate recovery systems, and not directly to the stormwater catchment.
5. Constituents of the discharge shall meet the standards shown in the following table.

<u>Constituent</u>	<u>Standard</u>
pH	Within the range 6.0 to 9.0
suspended solids	Concentration not greater than 100 gm <sup>-3</sup>
oil and grease	Concentration not greater than 15 gm <sup>-3</sup>

This condition shall apply before entry of the treated stormwater into the receiving waters at a designated sampling point approved by the Chief Executive, Taranaki Regional Council.

## Consent 7450-1

6. After allowing for reasonable mixing, within a mixing zone extending 30 metres downstream of the discharge point, the discharge shall not, either by itself or in combination with other discharges, give rise to any or all of the following effects in the receiving water:
  - a) the production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials;
  - b) any conspicuous change in the colour or visual clarity;
  - c) any emission of objectionable odour;
  - d) the rendering of fresh water unsuitable for consumption by farm animals;
  - e) any significant adverse effects on aquatic life.
7. By 22 March 2010, the consent holder shall prepare and maintain a contingency plan. The contingency plan shall be adhered to in the event of a spill or emergency and shall, to the satisfaction of the Chief Executive, Taranaki Regional Council, detail measures and procedures to be undertaken to prevent spillage or accidental discharge of contaminants not authorised by this consent and measures to avoid, remedy or mitigate the environmental effects of such a spillage or discharge.
8. The consent holder shall notify the Chief Executive, Taranaki Regional Council, prior to making any changes to the processes or operations undertaken at the site, or the chemicals used or stored on site that could alter the nature of the discharge. Any such change shall then only occur following receipt of any necessary approval under the Resource Management Act. Notification shall include the consent number, a brief description of the activity consented and an assessment of the environmental effects of any changes, and be emailed to [worknotification@trc.govt.nz](mailto:worknotification@trc.govt.nz). Notification by fax or post is acceptable if the consent holder does not have access to email.
9. This consent shall lapse on 31 December 2014, unless the consent is given effect to before the end of that period or the Taranaki Regional Council fixes a longer period pursuant to section 125(1)(b) of the Resource Management Act 1991.
10. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review:
  - a) during the month of June 2014 and/or June 2020; and/or
  - b) within 3 months of receiving a notification under special condition 8 above;

for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 22 December 2009

For and on behalf of  
Taranaki Regional Council

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**Director-Resource Management**



**Discharge Permit**  
**Pursuant to the Resource Management Act 1991**  
**a resource consent is hereby granted by the**  
**Taranaki Regional Council**

Name of  
Consent Holder:           New Zealand Railways Corporation  
  P O Box 593  
  WELLINGTON 6140

Consent Granted           31 July 2009  
Date:

**Conditions of Consent**

Consent Granted:       To discharge stormwater from the Smart Road Rail  
  Terminal into an unnamed tributary of the Mangaone  
  Stream, and into the Mangaone Stream in the  
  Waiwhakaiho catchment at or about (NZTM)  
  1696529E-5676921N

Expiry Date:           1 June 2026

Review Date(s):       June 2014, June 2020

Site Location:         Smart Road, New Plymouth

Legal Description:     Pt Sec 144 & 145 Hua Dist, Pt Lot 1 DP 2210 & Pt Lot 2  
  DP 8654

Catchment:            Waiwhakaiho

Tributary:             Mangaone

### General conditions

- a) On receipt of a requirement from the Chief Executive, Taranaki Regional Council the consent holder shall, within the time specified in the requirement, supply the information required relating to the exercise of this consent.
- b) Unless it is otherwise specified in the conditions of this consent, compliance with any monitoring requirement imposed by this consent must be at the consent holder's own expense.
- c) The consent holder shall pay to the Council all required administrative charges fixed by the Council pursuant to section 36 in relation to:
  - i) the administration, monitoring and supervision of this consent; and
  - ii) charges authorised by regulations.

### Special conditions

1. Notwithstanding any other condition of this consent, the consent holder shall at all times adopt the best practicable option, as defined in section 2 of the Resource Management Act 1991, to prevent or minimise any adverse effects on the environment from the exercise of this consent.
2. The stormwater discharged shall be from a catchment area not exceeding 11.28ha.
3. By 30 September 2009, where goods are on site in excess of 3 days, any above ground hazardous substances storage areas shall be bunded with drainage to sumps, or discharged via a three stage interceptor and stop valve such that the flow can be isolated in the event of a spill.
4. Constituents of the discharge shall meet the standards shown in the following table.

<u>Constituent</u>	<u>Standard</u>
pH	Within the range 6.0 to 9.0
suspended solids	Concentration not greater than 100 gm <sup>-3</sup>
Oil and Grease	Concentration not greater than 15 gm <sup>-3</sup>

This condition shall apply before entry of the treated stormwater into the receiving waters at a designated sampling point approved by the Chief Executive, Taranaki Regional Council.

5. After allowing for reasonable mixing, within a mixing zone extending to the Katere Road Bridge (NZTM 1696444E-5676696N) downstream of the discharge point, the discharge shall not, either by itself or in combination with other discharges, give rise to any or all of the following effects in the receiving water:
  - a) the production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials;
  - b) any conspicuous change in the colour or visual clarity;
  - c) any emission of objectionable odour;
  - d) the rendering of fresh water unsuitable for consumption by farm animals;
  - e) any significant adverse effects on aquatic life.



## Consent 1735-3

6. The consent holder shall maintain a contingency plan, which shall be reviewed at not more than 2 yearly intervals. The contingency plan shall be adhered to in the event of a spill or emergency and shall, to the satisfaction of the Chief Executive, Taranaki Regional Council, detail measures and procedures to be undertaken to prevent spillage or accidental discharge of contaminants not authorised by this consent and measures to avoid, remedy or mitigate the environmental effects of such a spillage or discharge.
7. By 30 September 2009, the consent holder shall prepare and maintain a stormwater management plan. This plan shall be adhered to at all times and shall, to the satisfaction of the Chief Executive, Taranaki Regional Council document how the site is to be managed in order to minimise the contaminants that become entrained in the stormwater. The plan shall include but not necessarily be limited to:
  - a) the loading and unloading of materials;
  - b) maintenance of conveyance systems;
  - c) general housekeeping; and
  - d) management of the interceptor system;and shall be reviewed at not more than 2 yearly intervals.
8. This consent shall lapse on 30 September 2014, unless the consent is given effect to before the end of that period or the Taranaki Regional Council fixes a longer period pursuant to section 125(1)(b) of the Resource Management Act 1991.
9. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2014 and/or June 2020, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 31 July 2009

For and on behalf of  
Taranaki Regional Council

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**Director-Resource Management**



TRK973865

## DISCHARGE PERMIT

**Pursuant to the RESOURCE MANAGEMENT ACT 1991  
a resource consent is hereby granted by the  
Taranaki Regional Council**

Name of                      RAVENSDOWN FERTILISER CO-OPERATIVE LIMITED  
Consent Holder: P O BOX 452 DUNEDIN

Renewal  
Granted Date:              26 November 1997

## CONDITIONS OF CONSENT

Consent Granted:        TO DISCHARGE UP TO 700 LITRES/SECOND OF STORMWATER  
FROM A FERTILISER STORAGE DEPOT INTO THE MANGAONE  
STREAM IN THE WAIWHAKAIHO CATCHMENT AT OR ABOUT GR:  
P19:066-388

Expiry Date:              1 June 2014

Review Date[s]:         June 1999, June 2002 and June 2008

Site Location:            KATERE ROAD NEW PLYMOUTH

Legal Description:      18166 175 PT SUB 5 17WC 3UR SEC 1, 2 & 143 BLK VI PARITUTU  
SD

Catchment:                WAIWHAKAIHO                      392.000

Tributary:                 MANGAONE                          392.010

For General, Standard and Special Conditions pertaining to this consent please see reverse side of this document.

TRK973865

**General conditions**

- a) That on receipt of a requirement from the General Manager, Taranaki Regional Council (hereinafter the General Manager), the consent holder shall, within the time specified in the requirement, supply the information required relating to the exercise of this consent.
- b) That unless it is otherwise specified in the conditions of this consent, compliance with any monitoring requirement imposed by this consent must be at the consent holder's own expense.
- c) That the consent holder shall pay to the Council all required administrative charges fixed by the Council pursuant to section 36 in relation to:
  - i) the administration, monitoring and supervision of this consent; and
  - ii) charges authorised by regulations.

**Special conditions**

- 1. THAT the following limits shall not be exceeded in the discharge:

pH [range]	6.0-8.5
Suspended solids	100 gm <sup>-3</sup>
Oil and grease	15 gm <sup>-3</sup>
- 2. THAT the consent holder shall manage the stormwater disposal system in such a manner as to minimise the discharge of free phosphate to the Mangaone Stream.
- 3. THAT allowing for a mixing zone extending downstream to the Katere Road bridge, the discharge shall not give rise to any of the following effects in the receiving water of the Mangaone Stream:
  - i) an un-ionised ammonia concentration of greater than 0.025 gm<sup>-3</sup>;
  - ii) the production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials;
  - iii) any conspicuous change in the colour or visual clarity;
  - iv) any significant adverse effects on aquatic life, habitats, or ecology.
- 4. THAT the consent holder shall maintain a contingency plan, outlining measures and procedures undertaken to prevent spillage or accidental discharge of contaminants in the stormwater catchment and measures to avoid, remedy or mitigate the environmental effects of such a spillage or discharge. The consent holder shall annually review and maintain the plan.
- 5. THAT the Taranaki Regional Council may review any or all of the conditions of this consent by giving notice of review during June 1999 and/or June 2002 and/or June 2008, for the purpose of ensuring that the conditions are adequate to deal with any significant adverse effects of the discharge on the environment arising from the exercise of this consent, which were not foreseen at the time the application was considered and which it was not appropriate to deal with at that time.

Signed at Stratford on 26 November 1997

For and on behalf of  
TARANAKI REGIONAL COUNCIL

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GENERAL MANAGER

**Discharge Permit**  
**Pursuant to the Resource Management Act 1991**  
**a resource consent is hereby granted by the**  
**Taranaki Regional Council**

Name of  
Consent Holder: Taranaki Sawmills Limited  
P O Box 7145  
Fitzroy  
NEW PLYMOUTH

Consent Granted  
Date: 17 October 2006

**Conditions of Consent**

Consent Granted: To discharge cooling water and wastewater from a timber drying plant and stormwater from a timber treatment site into the Mangaone Stream in the Waiwhakaiho catchment at or about GR: P19:069-388

Expiry Date: 1 June 2020

Review Date(s): June 2008, June 2009, June 2010, June 2014

Site Location: 45 & 53 Katere Road, Fitzroy, New Plymouth

Legal Description: Lot 1 DP 20347 Lot 2 DP 12871 Sec 177 Hua Dist Blk VI Paritutu SD

Catchment: Waiwhakaiho

Tributary: Mangaone

*For General, Standard and Special conditions  
pertaining to this consent please see reverse side of this document*

## Consent 3491-2

### General conditions

- a) On receipt of a requirement from the Chief Executive, Taranaki Regional Council the consent holder shall, within the time specified in the requirement, supply the information required relating to the exercise of this consent.
- b) Unless it is otherwise specified in the conditions of this consent, compliance with any monitoring requirement imposed by this consent must be at the consent holder's own expense.
- c) The consent holder shall pay to the Council all required administrative charges fixed by the Council pursuant to section 36 in relation to:
  - i) the administration, monitoring and supervision of this consent; and
  - ii) charges authorised by regulations.

### Special conditions

1. The consent holder shall at all times adopt the best practicable option, as defined in section 2 of the Resource Management Act 1991, to prevent or minimise any adverse effects on the environment from the exercise of this consent.
2. The exercise of this consent shall be undertaken generally in accordance with the documentation submitted in support of application 4046. In the case of any contradiction between the documentation submitted in support of application 4046 and the conditions of this consent, the conditions of this consent shall prevail.
3. The consent holder shall adhere to the New Zealand Timber Preservation Council "Best Practice Guideline for the Safe Use of Timber Preservatives and Antisapstain Chemicals" September 2005 in so far as these guidelines address any matter relevant to the activity authorised by this consent. Where there is a conflict between the requirements of this guideline and the conditions of this consent, then the conditions of this consent shall prevail.
4. From the 31 March 2007 the consent holder shall ensure that all bunding (secondary containment) and any internal bunding, including but not limited to the internal LOSP bunding, meet the requirements of regulations 35 to 41 of the Hazardous Substances (Emergency Management) Regulations 2001 as amended by the Hazardous Substances (Classes 1 to 5 Controls) Amendment Regulations 2004 .
5. The maximum stormwater catchment area shall be no more than 5.3188 ha.
6. The wastewater/cooling water discharge shall be no more than 12 cubic metres per day.

## Consent 3491-2

7. The following concentrations shall not be exceeded in the discharge:

<b>Component</b>	<b>Concentration</b>
oil and grease	15 g/m <sup>3</sup>
suspended solids	100 g/m <sup>3</sup>
Arsenic	0.24 g/m <sup>3</sup>
Boron	3.7 g/m <sup>3</sup>
Copper (dissolved)	0.088 g/m <sup>3</sup>
Chromium	0.4 g/m <sup>3</sup>
Tributyltin	0.0046 g/m <sup>3</sup>
Zinc (dissolved)	0.64 g/m <sup>3</sup>

This condition shall apply prior to the discharge of the stormwater into the receiving environment, at a designated sampling point approved by the Chief Executive, Taranaki Regional Council.

8. After allowing for reasonable mixing, within a mixing zone extending 30 metres downstream of the discharge point, the discharge shall not either by itself, or in combination with other discharges, give rise to any or all of the following effects in the receiving waters of the Mangaone Stream:
- the production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials;
  - any conspicuous change in the colour or visual clarity;
  - any emission of objectionable odour;
  - the rendering of fresh water unsuitable for consumption by farm animals;
  - any significant adverse effects on aquatic life.
9. After allowing for reasonable mixing within a mixing zone extending 30 metres downstream of the discharge point, the discharge shall not, either by itself or in combination with other discharges, give rise to an increase of greater than 0.5 pH increment, or a pH outside the range of 6.0 to 9.0 within the receiving waters of the Mangaone Stream.
10. After allowing for reasonable mixing, within a mixing zone extending 30 metres downstream of the discharge point, the discharge shall not either by itself or in combination with other discharges give rise to any or all of the following effects in the receiving waters of the Mangaone Stream:
- an increase in temperature of more than 3 degrees Celsius;
  - the natural temperature of the water to exceed 25 degrees Celsius;
  - a filtered carbonaceous 5 day biochemical oxygen demand of more than 2 g/m<sup>3</sup>.
11. The consent holder shall investigate the permethrin, iodocarb, propiconazole and tebuconazole levels in site discharge, receiving water and Mangaone Stream sediment and to satisfaction of Chief Executive, Taranaki Regional Council

## Consent 3491-2

12. The consent holder shall investigate to satisfaction of Chief Executive, Taranaki Regional Council:
  - (a) The assimilative capacity of the Mangaone Stream under wet weather conditions, in relation to the dissolved copper concentration of the site discharge, the Mangaone Stream and the critical maximum concentration as per the United States Environmental Protection Agency National Recommended Water Quality Criteria 2006.
  - (b) What, if any remedial action is required at the site to ensure that the discharge from the site does not result in the water quality criteria, described in 12(a), from being exceeded.
13. The consent holder shall report on the investigations required by conditions 11 and 12 to the satisfaction of the Chief Executive, Taranaki Regional Council by 30 August 2007.
14. The consent holder shall provide and maintain a contingency plan, to the satisfaction of the Chief Executive, Taranaki Regional Council, for action to be taken in the event of accidental discharge or spillage of contaminants.
15. This consent shall lapse on the expiry of five years after the date of issue of this consent, unless the consent is given effect to before the end of that period or the Taranaki Regional Council fixes a longer period pursuant to section 125(1)(b) of the Resource Management Act 1991.
16. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2008, and/or June 2009, and/or June 2010, and/or June 2014, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.
17. Conditions 3 and 4 of this resource consent may be reviewed at any time, consequent to any amendment or revision of the New Zealand Timber Preservation Council "Best Practice Guideline for the Safe Use of Timber Preservatives and Antisapstain Chemicals" September 2005, or regulations 35 to 41 of the Hazardous Substances (Emergency Management) Regulations 2001 as amended in the Hazardous Substances (Classes 1 to 5 Controls) Amendment Regulations 2004

Signed at Stratford on 17 October 2006

For and on behalf of  
Taranaki Regional Council

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**Director-Resource Management**



**Discharge Permit**  
**Pursuant to the Resource Management Act 1991**  
**a resource consent is hereby granted by the**  
**Taranaki Regional Council**

Name of  
Consent Holder: Technix Group Limited  
Private Bag 2222  
New Plymouth 4342

Decision Date: 24 October 2014

Commencement Date: 24 October 2014

**Conditions of Consent**

Consent Granted: To discharge stormwater from an industrial site into the  
Mangaone Stream

Expiry Date: 01 June 2032

Review Date(s): June 2020, June 2026 and in accordance with special  
condition 8

Site Location: 691 Devon Road, Bell Block

Legal Description: Lot 1 DP 20360 (Discharge source & site)

Grid Reference (NZTM) 1696748E-5677890N

Catchment: Waiwhakaiho

Tributary: Mangaone

*For General, Standard and Special conditions  
pertaining to this consent please see reverse side of this document*

### General condition

- a. The consent holder shall pay to the Taranaki Regional Council all the administration, monitoring and supervision costs of this consent, fixed in accordance with section 36 of the Resource Management Act 1991.

### Special conditions

1. The consent holder shall at all times adopt the best practicable option, as defined in section 2 of the Resource Management Act 1991, to prevent or minimise any adverse effects on the environment from the exercise of this consent.
2. The stormwater discharged shall be from a catchment area not exceeding 1.3 ha.
3. Constituents of the discharge shall meet the standards shown in the following table.

<b>Constituent</b>	<b>Standard</b>
pH	Within the range 6.0 to 9.0
suspended solids	Concentration not greater than 100 gm <sup>-3</sup>
oil and grease	Concentration not greater than 15 gm <sup>-3</sup>
chloride	Concentration not greater than 50 gm <sup>-3</sup>

This condition shall apply before entry of the treated stormwater into the receiving waters at a designated sampling point approved by the Chief Executive, Taranaki Regional Council.

4. After allowing for reasonable mixing, within a mixing zone extending 25 metres downstream of the discharge point, the discharge shall not, either by itself or in combination with other discharges, give rise to any or all of the following effects in the receiving water:
  - a) the production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials;
  - b) any conspicuous change in the colour or visual clarity;
  - c) any emission of objectionable odour;
  - d) the rendering of fresh water unsuitable for consumption by farm animals;
  - e) any significant adverse effects on aquatic life.
5. The consent holder shall maintain and regularly update a 'Contingency Plan' that details measures and procedures that will be undertaken to prevent, and to avoid environmental effects from, a spillage or any discharge of contaminants not authorised by this consent. The plan shall be approved by the Chief Executive, Taranaki Regional Council, acting in a certification capacity.

## Consent 9982-1.0

6. Within three months of the granting of this consent, the site shall be operated in accordance with a 'Stormwater Management Plan' prepared by the consent holder and approved by the Chief Executive, Taranaki Regional Council, acting in a certification capacity. The plan shall detail how the site will be managed to achieve compliance with the conditions of this consent and shall include as a minimum:
  - a) identification of sources of contaminants,
  - b) methods that will be practised to ensure contaminants entering stormwater is at a practical minimum,
  - c) the loading and unloading of materials;
  - d) maintenance of conveyance systems;
  - e) general housekeeping; and
  - f) management of the interceptor system.
7. The consent holder shall notify the Chief Executive, Taranaki Regional Council, prior to making any changes to the processes or operations undertaken at the site, or the chemicals used or stored on site that could alter the nature of the discharge. Any such change shall then only occur following receipt of any necessary approval under the Resource Management Act. Notification shall include the consent number, a brief description of the activity consented and an assessment of the environmental effects of any changes, and be emailed to [consents@trc.govt.nz](mailto:consents@trc.govt.nz).
8. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review:
  - a) during the month of June 2020 and/or 2026 and/or
  - b) within 3 months of receiving a notification under special condition 7 above and/or
  - c) within 3 months of receiving the Stormwater Management Plan under special condition 6 above

for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 24 October 2014

For and on behalf of  
Taranaki Regional Council



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A D McLay  
**Director - Resource Management**



## **Appendix II**

### **Chemical water quality monitoring data**



## Results of chemical analyses for the Mangaone Stream and industrial drainage system

Date: 10 December 2014

Site description	Site	AsT	B	BOD	BODCF	COD	Cond	CrT	CuAs	CuD	CuT	DBT	DRP	Coli	Ent	F	FC	IPBC
NZ Rail	IND002014			3.2			11.9						0.213	470000	390000		480000	
Farmers Fertiliser	IND004002						53.2						5.17			1.16		
Mangaone @ Egmont Rd	MGO000050				1.1		16.7		0.002	0.001			0.008				36000	
NZ Decorative Concrete	STW001139																	
Viterra (NZ) Limited	MGO000058			7.6			2.5						0.017	7800	11000		7800	
NPDC mid Katere Rd	STW001116			7.3			4.3						0.176					
Mangaone d/s PCL and NPDC	MGO000075	0.0059	0.13		2.5		10.3	0.0057		0.004	0.0162							
Taranaki Sawmills	IND001006	0.078	0.05	7.8		23	2.9	0.142		0.02	0.044	<0.00006						<0.002
Mang. 30m d/s Taranaki Saw.	MGO000145	0.0029	0.09		1.9		13.2	0.0041		0.003	0.0059	<0.00006						
Mangaone u/s Ravensdown	MGO000148		0.06				14.4			0.002			0.013					
MMR u/s NZ Railways Corp	MMR000061						16.4						0.005					
MMR d/s NZ Railways Corp	MMR000100						11.1						0.058					
Ravensdown	STW002003						82.3						10			1.32		
Mangaone d/s Ravensdown	MGO000153						12.8						0.114					
Nankervis Family Trust	IND002039						6							900			930	
Allied Concrete	STW002033						33.6											
NPDC @ SH3	STW001035						12.9							2200			2200	
Works settling ponds	IND002002						58											
Works settling pond discharge	MGO000189						15.6											
Mangaone @ Rifle Range Rd	MGO000190						14.8		0.006	0.002			0.037	42000	50000		44000	

Key: AsT = Arsenic, total, g/m<sup>3</sup>; B=Boron, g/m<sup>3</sup>; BOD = biochemical oxygen demand, g/m<sup>3</sup>; b = parameter not determined, sample visually assessed for oil and grease, BODCF= filtered carbonaceous biochemical oxygen demand, g/m<sup>3</sup>; COD = chemical oxygen demand, g/m<sup>3</sup>; Cond = conductivity at 20°C, mS/m; CrT = Chromium, Total, g/m<sup>3</sup>; CuAs, CuD, CuT = Copper, acid soluble, dissolved and total, g/m<sup>3</sup>; DBT = dibutyltin, g/m<sup>3</sup>; DRP = dissolved reactive phosphorus, g/m<sup>3</sup>P; Coli = *E. coli*, n/100ml; Ent = *Enterococcus*, n/100ml; F = fluoride g/m<sup>3</sup>; FC = faecal coliform, n/100ml; IPBC = iodopropynyl butylcarbomate (iodocarb), g/m<sup>3</sup>; NH<sub>3</sub> = unionised ammonia, g/m<sup>3</sup>N; NH<sub>4</sub> = ammoniacal nitrogen, g/m<sup>3</sup>N; NNN = nitrate/nitrite nitrogen, g/m<sup>3</sup>N; O&G = oil and grease, g/m<sup>3</sup>; PERM = permethrin, g/m<sup>3</sup>; PRCA = propiconazole, g/m<sup>3</sup>; SnT = tin, total, g/m<sup>3</sup>; SS = suspended solids, g/m<sup>3</sup>; TBT = tributyltin, g/m<sup>3</sup>; TEBA = tebuconazole, g/m<sup>3</sup>; Temp = temperature, °C; TP = total phosphorus, g/m<sup>3</sup>P; Turb = turbidity, NTU, ZnAs, ZnD, ZnT = Zinc, acid soluble, dissolved and total, g/m<sup>3</sup>

Results of chemical analyses for the Mangaone Stream and industrial drainage system –cont. Date: 10 December 2014

Site description	Site	NH <sub>3</sub>	NH <sub>4</sub>	NNN	O&G	PERM	PH	PRCA	SNT	SS	TBT	TEBA	Temp	TP	TBT	Turb	ZnAs	ZnD	ZNT
NZ Rail	IND002014	0.00053	0.052				7.4			10			17.9			17			
Farmers Fertiliser	IND004002	3.37332	29.8				8.5			810			17.4	15.5		220			
Mangaone @ Egmont Rd	MGO000050	0.00015	0.025				7.2			19			16.6			10	<0.005	<0.005	
NZ Decorative Concrete	STW001139																		
Viterra (NZ) Limited	MGO000058		0.019		b		7.4			85			17.2			15			
NPDC mid Katere Rd	STW001116	0.00217	0.136		<0.5		7.6			53			17.8			17			
Mangaone d/s PCL and NPDC	MGO000075	0.00021	0.044				7.1			47			17			20		0.045	0.119
Taranaki Sawmills	IND001006					0.0003	7.2	0.0133	0.0037	28	<0.00005	0.0143	17.5		<0.00004	30		0.27	0.33
Mang. 30m d/s Taranaki Saw.	MGO000145	0.00058	0.123				7.1			16	0.00012		16.8		<0.00004	14		0.026	0.041
Mangaone u/s Ravensdown	MGO000148	0.00078	0.104	0.61			7.3			28			16.8			16		0.016	
MMR u/s NZ Railways Corp	MMR000061	0.00031	0.133				6.8			10			16.7			9.6			
MMR d/s NZ Railways Corp	MMR000100	0.00057	0.145				7			190			17.3			190			
Ravensdown	STW002003	0.15323	24.8	21.2			7.2			36			17.3	11		25			
Mangaone d/s Ravensdown	MGO000153	0.00792	0.526	0.9			7.6			31			17						
Nankervis Family Trust	IND002039						7.4			11			17.4			8.4			
Allied Concrete	STW002033						11.1			21			17.4			21			
NPDC @ SH3	STW001035	0.01361	0.029				9.3			52			17			52			
Works settling ponds	IND002002						7.8			24			23.1			19			
Works settling pond discharge	MGO000189						6.8			120			17.4			62			
Mangaone @ Rifle Range Rd	MGO000190	0.00095	0.127				7.3			63			16.8			25	0.039	0.009	



## Results of chemical analyses for the Lower Waiwhakaiho River, Mangaone Stream and industrial drainage system

Date: 23 March 2015

Site description	Site	AST	B	BOD	BODCF	COD	Cond	CRT	CuAs	CuD	CUT	DBT	DRP	Coli	Ent	F	FC	IPBC
Waiwhak. @ Merrilands	WKH000800						11						0.025					
NPDC @ Burton St	STW001081						7.4											
Waiwhak. @ Constance St	WKH000920						9.1						0.02			0.05		
NZ Railways Corporation	IND002014			2.8			19.4						0.07	9700	17000		9700	
Ravensdown	IND004002						77.3						3.08			1.22		
McLeods Drain	STW001001						10.5						0.168	9000		0.08	11000	
NPDC stormdrain	WKH000872						4.3											
Waiwhakaiho @ ford	WKH000925						9.6						0.026			0.05	1100	
Firth pond discharge	IND002001						37.4											
NPDC/Technix (Vickers Rd)	STW001020						13							430000			450000	
Technix (ACL garage)	STW002001						5.3											
Technix (Fitzroy)	STW001021						5.2											
Wai. Above Mangaone	WKH000942						9.6						0.025			0.05		
Mangaone @ Egmont Rd	MGO000050				<0.5		19.1		0.004	<0.001			0.01				730	
NZ Decorative Concrete	STW001139						13											
Viterra (NZ) Limited	MGO000058			6.4			6.8						0.126	130000	270000		130000	
NPDC mid Katere Rd	STW001116			31			14						0.724					
Mangaone d/s PCL and NPDC	MGO000075	<0.0011	0.04		0.5		17.8	0.00064		0.002	0.0024							
Taranaki Sawmills	IND001006	0.069	0.08	7.6		47	4.6	0.07		0.02	0.048	<0.00011						<0.002
Mang. 30m d/s Taranaki Saw.	MGO000145	<0.0011	0.04		0.6		18	0.00149		0.001	0.002	<0.00006						<0.0002
Mangaone u/s Ravensdown	MGO000148		0.04				18.6			0.001			0.012					
MMR u/s NZ Railways Corp	MMR000061						21						0.006					
MMR d/s NZ Railways Corp	MMR000100						20.9						0.009					
Ravensdown	STW002003						77.2						4.38			1.37		
Mangaone d/s Ravensdown	MGO000153						17.7						0.04					
Nankervis Family Trust	IND002039						5.5							7600			7800	
Allied Concrete	STW002033						34.6											
NPDC @ SH3	STW001035						10							7400			7400	
Works settling ponds	IND002002						42.2											
Works settling pond discharge	MGO000189						10.3											
Mangaone @ Rifle Range Rd	MGO000190						18.4		0.004	0.001			0.023	3600	20000		3600	

Results of chemical analyses for the Lower Waiwhakaiho River, Mangaone Stream and industrial drainage system -cont

Date: 23 March 2015

Site description	Site	NH <sub>3</sub>	NH <sub>4</sub>	NNN	O&G	PERM	PH	PRCA	SNT	SS	TBT	TEBA	Temp	TP	TPT	Turb	ZnAs	ZnD	ZNT
Waiwhak. @ Merrilands	WKH000800	0.00009	0.007				7.6			4			14.4			2			
NPDC @ Burton St	STW001081				b		7.0			3			16.1			1.9			
Waiwhak. @ Constance St	WKH000920	0.00004	<0.003	0.12			7.6			5			14.1			2.1			
NZ Railways Corporation	IND002014	0.00037	0.072		b		7.1			6			17.8			12			
Farmers Fertiliser	IND004002		26.5				7.4			44			17.1	3.79		35			
McLeods Drain	STW001001	0.00434	0.708		0.8		7.2			26			17.2			27			
NPDC stormdrain	WKH000872						7.1			36			17.3						
Waiwhakaiho @ ford	WKH000925	0.00013	0.016				7.4			5			14.4			2.7			
Firth pond discharge	IND002001						11			11			17.5			13			
NPDC/Technix (Vickers Rd)	STW001020				0.9		6.6			13			17.9			4.7			
Technix (ACL garage)	STW002001				b		7.3			11			19			22			
Technix (Fitzroy)	STW001021				b		7.0			15			19.4			24			
Wai. Above Mangaone	WKH000942	0.00031	0.024				7.6			7			15			3.6			
Mangaone @ Egmont Rd	MGO000050	0.00004	0.016				6.9			2			15.8			1.5	<0.005	<0.005	
NZ Decorative Concrete	STW001139				<0.5		7.7			63			17.3			21			
Viterra (NZ) Limited	MGO000058		0.21		<0.5		6.7			19			18			25			
NPDC mid Katere Rd	STW001116	0.00287	0.642		0.9		7.0			94			19.1			100			
Mangaone d/s PCL and NPDC	MGO000075	0.00024	0.066				7.0			5			16.3			5		0.008	0.0147
Taranaki Sawmills	IND001006				<0.5	0.001	7.2	0.046	0.0023	3	<0.00009	0.035	18.3		<0.00007	72		0.246	0.4
Mang. 30m d/s Taranaki Saw.	MGO000145	0.0003	0.082			<0.00002	7.0	0.00016		3	<0.00005	<0.00004	16.3		<0.00004	3.7		0.014	0.0129
Mangaone u/s Ravensdown	MGO000148	0.00028	0.075	0.62			7.0			2			16.6			2.6		0.007	
MMR u/s NZ Railways Corp	MMR000061	0.00077	0.334				6.8			7			16.3			11			
MMR d/s NZ Railways Corp	MMR000100	0.0019	0.413				7.1			4			16.4			7.8			
Ravensdown	STW002003	0.01161	3.97	11.6			6.9			6			16.5	4.41		3.3			
Mangaone d/s Ravensdown	MGO000153	0.0012	0.258	0.68			7.1			8			16.6						
Nankervis Family Trust	IND002039				b		7.0			140			16.8			100			
Allied Concrete	STW002033						9.8			<2			18.1			0.68			
NPDC @ SH3	STW001035	0.00085	0.134				7.2			10			17.7			13			
Works settling ponds	IND002002				<0.5		7.4			5			20.4			4.7			
Works settling pond discharge	MGO000189				b		7.5			79			17.2			66			
Mangaone @ Rifle Range Rd	MGO000190	0.00135	0.148				7.4			4			16.4			4.2	0.018	0.007	

Key: AsT = Arsenic, total, g/m<sup>3</sup>; B=Boron, g/m<sup>3</sup>; BOD = biochemical oxygen demand, g/m<sup>3</sup>; b = parameter not determined, sample visually assessed for oil and grease, BODCF = filtered carbonaceous biochemical oxygen demand, g/m<sup>3</sup>; COD = chemical oxygen demand, g/m<sup>3</sup>; Cond = conductivity at 20°C, mS/m; CrT = Chromium, Total, g/m<sup>3</sup>; CuAs, CuD, CuT = Copper, acid soluble, dissolved and total, g/m<sup>3</sup>; DBT = dibutyltin, g/m<sup>3</sup>; DRP = dissolved reactive phosphorus, g/m<sup>3</sup>P; Coli = *E. coli*, n/100ml; Ent = *Enterococcus*, n/100ml; F =fluoride g/m<sup>3</sup>; FC = faecal coliform, n/100ml; IPBC = iodopropynyl butylcarbamate (iodocarb), g/m<sup>3</sup>; NH<sub>3</sub> = unionised ammonia, g/m<sup>3</sup>N; NH<sub>4</sub> = ammoniacal nitrogen, g/m<sup>3</sup>N; NNN = nitrate/nitrite nitrogen, g/m<sup>3</sup>N; O&G = oil and grease, g/m<sup>3</sup>; PERM = permethrin, g/m<sup>3</sup>; PRCA = propiconazole, g/m<sup>3</sup>; SnT = tin, total, g/m<sup>3</sup>; SS = suspended solids, g/m<sup>3</sup>; TBT = tributyltin, g/m<sup>3</sup>; TEBA = tebuconazole, g/m<sup>3</sup>; Temp = temperature, °C; TP = total phosphorus, g/m<sup>3</sup>P; TPT = triphenyltin, g/m<sup>3</sup>; Turb = turbidity, NTU; ZnAs, ZnD, ZnT = Zinc, acid soluble, dissolved and total, g/m<sup>3</sup>

Results of chemical analyses for the Lower Waiwhakaiho River and industrial drainage system Date: 11 June 2015

Site description	Site	BOD	Cond	DRP	Coli	Ent	F	FC	NH <sub>3</sub>	NH <sub>4</sub>	NNN	O&G	pH	SS	Temp	TP	Turb
Waiwhakaiho @ Merrilands	WKH000800		9.8	0.014					0.00007	<0.003		b	8	<2	11.2		1.3
NPDC @ Burton St	STW001081		8.8									b	7.3	8	12.4		9.2
Waiwhakaiho. @ Constance	WKH000920		8.9	0.007			0.08		0.00001	<0.003	0.29	b	7.3	<2	11.1		2.1
NZ Railways Corporation	IND002014	0.5	18.6	0.094	1900	44000		1900	0.00023	0.048		b	7.2	<2	13.9		4.3
Farmers Fertiliser	IND004002		57	4.65			1.34		0.24848	22.3		b	7.6	56	12.9	5.28	32
McLeods Drain	STW001001		19.2	0.271	6900		0.14	7000	0.00486	1.02		b	7.2	17	13.8		10
NPDC stormdrain	WKH000872		36.5						0.02678	6.91		<0.5	7.1	22	14.1		
Waiwhakaiho @ ford	WKH000925		8.3	0.016			0.04	260	0.00012	0.015		b	7.5	3	11.3		2.3
Firth pond discharge	IND002001		38.7									b	11.1	84	12.1		82
NPDC/Technix (Vickers Rd)	STW001020		8.7		7300			7300				b	7.2	84	11.8		44
Technix (Fitzroy)	STW001021		13.3									<0.5	7.2	24	13.3		36
Wai. Above Mangaone	WKH000942		8.3	0.008			0.03		0.00006	<0.003	0.31	b	7.9	<2	11.3		2.1

Key: b = parameter not determined, sample visually assessed for oil and grease, BOD = biochemical oxygen demand, g/m<sup>3</sup>; Cond = conductivity at 20°C, mS/m; DRP = dissolved reactive phosphorus, g/m<sup>3</sup>P; Coli = *E coli*, n/100ml; Ent = *Enterococcus*, n/100ml; F =fluoride g/m<sup>3</sup>;FC = faecal coliform, n/100ml; NH<sub>3</sub> = unionised ammonia, g/m<sup>3</sup>N; NH<sub>4</sub> = ammoniacal nitrogen, g/m<sup>3</sup>N; NNN = nitrate/nitrite nitrogen, g/m<sup>3</sup>N; O&G = oil and grease, g/m<sup>3</sup>; SS = suspended solids, g/m<sup>3</sup>; Temp = temperature, °C; TP = total phosphorus, g/m<sup>3</sup>P; Turb = turbidity, NTU



## **Appendix III**

### **Biomonitoring reports – Macroinvertebrate Surveys**



**To** L Smith, Scientific Officer  
**From** B Jansma and B Thomas, Scientific Officers  
**Document** 1627822  
**Report No.** BT048  
**Date** 28 January 2016

## **Biomonitoring of the Lower Waiwhakaiho River and the Mangaone Stream in the Fitzroy Industrial Area, February 2015**

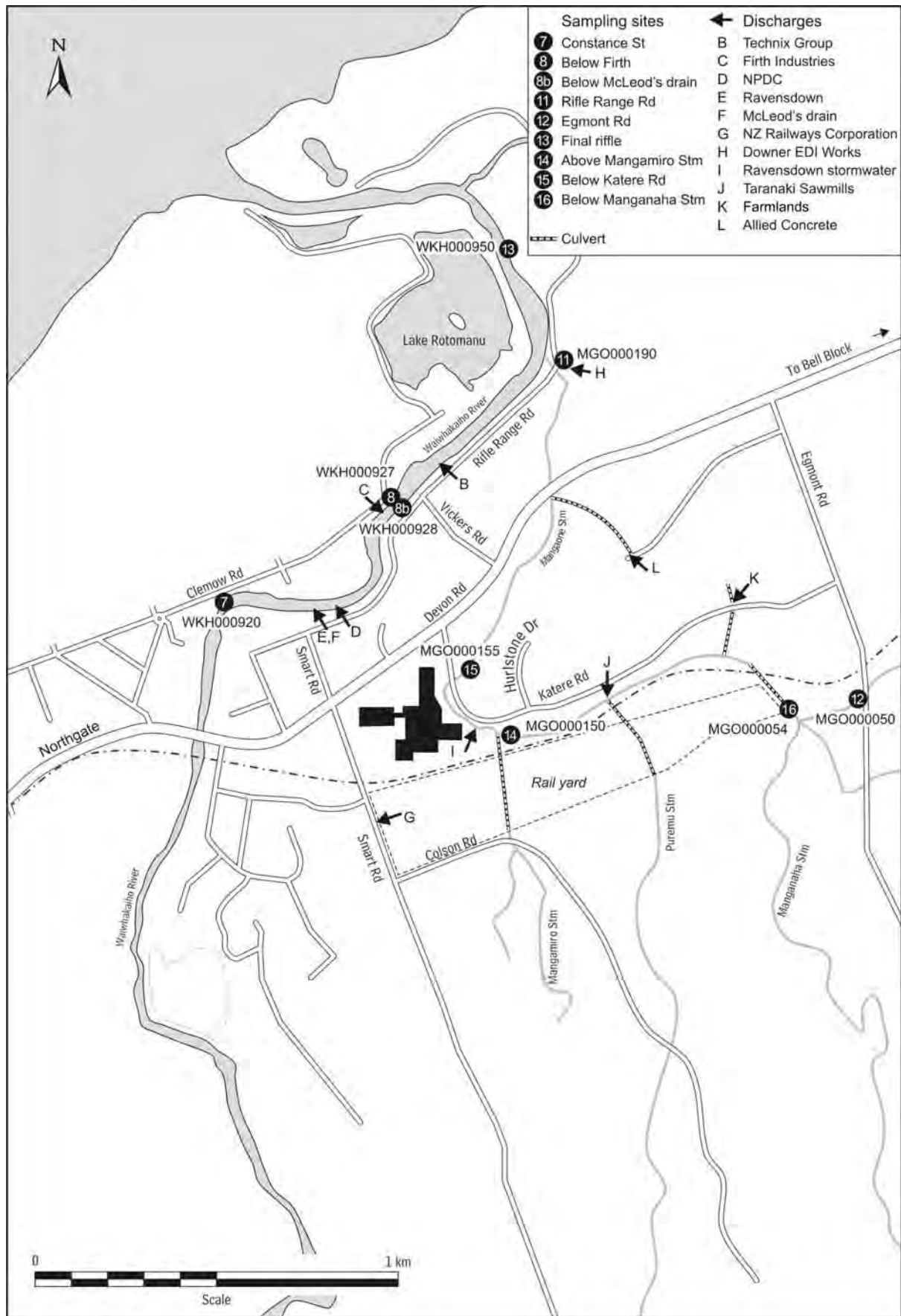
### **Introduction**

This was the second of two scheduled surveys in the 2014-2015 monitoring programme, for the combined industries of the Fitzroy industrial area. Results from surveys performed since the 2000-2001 monitoring years are discussed in several reports referenced at the end of this report. The monitoring related to the wastewater/stormwater discharge permits tabulated below:

<b>Consent holder</b>	<b>Consent No</b>
Ravensdown	3140,3865
Firth Industries	0392
Hooker Brothers	3141
NPDC (Stormwater)	3138,1126,1275
NPDC (Bewley Road)	4984
TranzRail	1735,3528
Farmlands	4548
Allied Concrete Ltd	4539
Taranaki Sawmills	3491
Technix Group Ltd	0021,0291,2230
Works Infrastructure Ltd	3917

### **Methods**

On 13 February 2015, the standard '400 ml kick sampling' technique was used to collect streambed macroinvertebrates from three sites in the lower Waiwhakaiho River and on 12 February 2015 from four sites in the Mangaone Stream, while the standard '400 ml sweep-sampling' technique was used to collect streambed macroinvertebrates from site 12 and a combination of the two techniques from site 16 in the Mangaone Stream (Table 1, Figure 1). The 'sweep-net- sampling technique is very similar to Protocol C2 (soft-bottomed, semi-quantitative), and the 'kick-sampling' technique is very similar to Protocol C1 (hard-bottomed, semi-quantitative), of the New Zealand Macroinvertebrate Working Group (NZMWG) protocols for macroinvertebrate samples in wadeable streams (Stark *et al*, 2001).





The three sites from the Waiwhakaiho River used in this survey have been sampled biannually in recent years. In the Mangaone Stream, two sites have been sampled biannually in the past with sampling of the other three sites (14, 15 and 16) biannually since February 2005.

**Table 1** Biomonitoring sites in the Lower Waiwhakaiho River and the Mangaone Stream

Site No	Site Code	Location
7	WKH000920	Waiwhakaiho River, Constance Street
8	WKH000927	Waiwhakaiho River, below Firth industries, west (left) bank
13	WKH000950	Waiwhakaiho River, final riffle downstream of Lake Rotomanu
12	MGO000050	Mangaone Stream, Egmont Road
16	MGO000054	Mangaone Stream, 20m d/s of Manganaha Stream confluence
14	MGO000150	Mangaone Stream, 300m d/s confluence with Puremu Stream
15	MGO000155	Mangaone Stream, 100m d/s fertiliser depot
11	MGO000190	Mangaone Stream, Rifle Range Road

Samples were preserved with Kahle's Fluid for later sorting and identification under a stereomicroscope according to Taranaki Regional Council methodology using protocol P1 of NZMWG protocols for sampling macroinvertebrates in wadeable streams (Stark et al. 2001). Macroinvertebrate taxa found in each sample were recorded as:

R (rare)	= less than 5 individuals;
C (common)	= 5-19 individuals;
A (abundant)	= estimated 20-99 individuals;
VA (very abundant)	= estimated 100-499 individuals;
XA (extremely abundant)	= estimated 500 individuals or more.

Stark (1985) developed a scoring system for macroinvertebrate taxa according to their sensitivity to organic pollution in stony New Zealand streams. Highly 'sensitive' taxa were assigned the highest scores of 9 or 10, while the most 'tolerant' forms scored 1. Sensitivity scores for certain taxa have been modified in accordance with Taranaki experience. Averaging the scores assigned to the taxa found at a site, and multiplying the average by a scaling factor of 20 produces a Macroinvertebrate Community Index (MCI) value.

The MCI was designed as a measure of the overall sensitivity of macroinvertebrate communities to the effects of organic pollution. MCI results can also reflect the effects of warm temperatures, slow current speeds and low dissolved oxygen levels, because the taxa capable of tolerating these conditions generally have low sensitivity scores. Usually more 'sensitive' communities (with higher MCI values) inhabit less polluted waterways. The use of this index in non-stony streams (such as the Mangaone Stream site 12) is possible if results are related to physical habitat (e.g. good quality muddy/weedy sites tend to produce lower MCI values than good quality stony sites).

A semi-quantitative MCI value (SQMCI<sub>s</sub>) has also been calculated for the taxa present at each site by multiplying each taxon score by a loading factor (related to its abundance), totalling these products, and dividing by the sum of the loading factors (Stark, 1998 and 1999). The loading factors were 1 for rare (R), 5 for common (C), 20 for abundant (A), 100 for very abundant (VA) and 500 for extremely abundant (XA). Unlike the MCI, the SQMCI<sub>s</sub> is not multiplied by a scaling factor of 20, therefore SQMCI<sub>s</sub> values range from 1 to 10, while MCI values range from 20 to 200.

## Results and discussion

The February 2014 survey was performed during moderate flow conditions (seven days since the last fresh of three times median flow and 11 days after seven times the median flow in the Waiwhakaiho River). The flow at all three sampling sites in the Waiwhakaiho River was clear and uncoloured at the time of this survey. Periphyton mats and filamentous algae were patchy at all sites. Water temperatures in the Waiwhakaiho River ranged from 18.4 to 18.5°C at the time of this morning survey. Substrate at all three sites was comprised predominantly of cobbles and boulders, with gravels also being an important component.

The low flow in the Mangaone Stream was also uncoloured and clear at all sites. The cloudiness often recorded in the Mangaone Stream at the sites downstream of the Manganaha Stream, was not observed on this survey occasion. Site 12 had a slow flow, site 16 had a steady water speed, while water speed was swift at sites 14, 15, and 11. Periphyton cover, which was not present at site 12, increased in a downstream direction, with a slippery film present at site 16, and patchy mats and filaments at sites 14, 15 and 16. Aquatic macrophytes were common in the stream at sites 12 and 14, and at the stream margins at site 16. No macrophytes were recorded growing at site 11 or site 15.

An observation made at the time of the March 2009 survey at site 11, was that the Waiwhakaiho River may have backed up the Mangaone Stream, reducing the flushing potential of the previous fresh. This was confirmed in 2010 (see photos in BJ192), and is likely to be a common feature of larger floods in this catchment.

Samples were collected from all sites using the kick sampling technique, except for site 12, as this was mainly a weedy, silty site and site 16 where some of the marginal vegetation was sweep-sampled as well. The substrate at site 12 was comprised entirely of silt and hard clay whereas substrate at site 16 was a combination of gravels and silt with some cobble, sand and bedrock. The substrate at site 14 was comprised mainly of gravels, silts and cobble (with some sand and boulders), whereas at sites 15 and 11 it comprised mainly gravels and cobbles with silt, sand and boulders (with a greater proportion of boulders at site 15). Water temperatures at the time of this early afternoon survey in the Mangaone Stream ranged from 17.4° to 21.9°C.

## Macroinvertebrate communities

A summary of taxa numbers and MCI values from previous surveys performed in the Waiwhakaiho River and the Mangaone Stream in relation to the Fitzroy industrial area are presented in Table 2 together with current results. The full results of the survey are presented in Table 3 (Waiwhakaiho River) and Table 4 (Mangaone Stream).

**Table 2** Numbers of taxa and MCI and SQMCI<sub>s</sub> values recorded in previous surveys performed in the Waiwhakaiho River and Mangaone Stream since July 1983 in relation to the Fitzroy industrial area, together with the results of the survey of 12 and 13 February 2015

Location	Site No.	Numbers of taxa				MCI values			SQMCI <sub>s</sub> Values			
		N	Median	Range	Current	Median	Range	Current	N	Median	Range	Current
Waiwhakaiho River	7	57	20	12-29	16	89	66-110	79	33	3.3	1.7-7.3	3.7
	8	55	21	13-30	20	87	69-115	80	33	3.3	1.8-6.3	3.6
	13	48	20	12-30	15	87	67-111	75	33	2.6	1.6-7.4	3.6
Mangaone Stream	12	45	18	8-28	14	81	66-95	83	33	4.3	2.4-4.9	4.9
	16	28	19	3-26	30	86	47-103	83	25	4.2	1.2-5.5	4.5
	14	30	15	6-28	16	69	53-95	70	26	2.5	1.1-3.7	3.6
	15	22	14	7-23	16	68	48-81	69	21	2.5	1.5-3.8	3.4
	11	50	13	4-21	16	66	50-85	66	33	2.0	1.5-3.6	2.7

**Table 3** Macroinvertebrate fauna of the Waiwhakaiho River in relation to the Fitzroy industrial area sampled on 13 February 2015

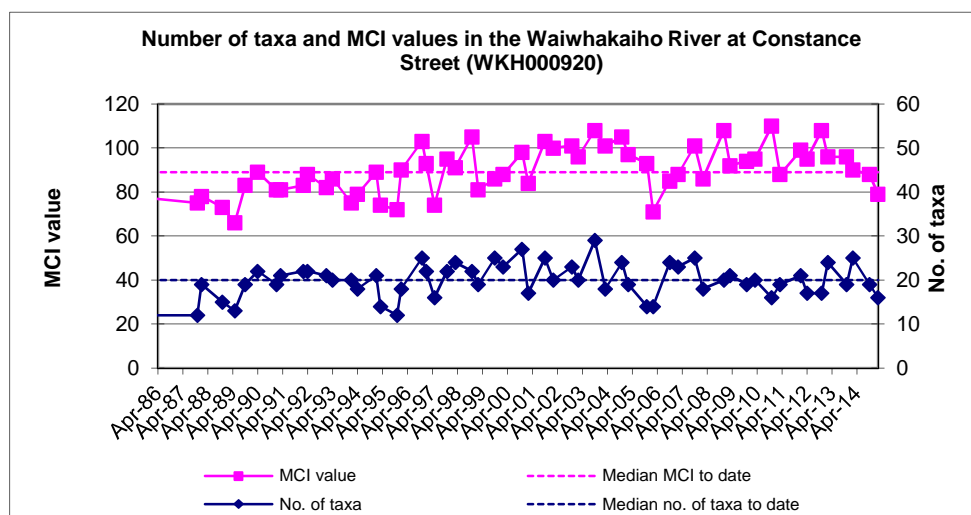
Taxa List	Site Number	MCI score	7	8	13	
	Site Code		WKH000920	WKH000927	WKH000950	
	Sample Number		FWB15112	FWB15113	FWB15114	
NEMERTEA	Nemertea	3	-	R	R	
ANNELIDA (WORMS)	Oligochaeta	1	C	A	A	
	Lumbricidae	5	-	R	-	
MOLLUSCA	<i>Potamopyrgus</i>	4	A	VA	XA	
CRUSTACEA	<i>Paracalliope</i>	5	-	-	R	
COLEOPTERA (BEETLES)	Elmidae	6	A	A	C	
	Hydraenidae	8	R	-	-	
	Staphylinidae	5	-	R	-	
MEGALOPTERA (DOBSONFLIES)	<i>Archichauliodes</i>	7	R	R	R	
TRICHOPTERA (CADDISFLIES)	<i>Hydropsyche (Aoteapsyche)</i>	4	A	A	A	
	<i>Hydrobiosis</i>	5	R	R	R	
	<i>Neurochorema</i>	6	R	-	-	
	<i>Oxyethira</i>	2	R	C	C	
	<i>Paroxyethira</i>	2	R	-	-	
	<i>Pycnocentroides</i>	5	-	R	-	
	<i>Tripletides</i>	5	-	R	-	
	DIPTERA (TRUE FLIES)	<i>Aphrophila</i>	5	-	-	R
		<i>Limonia</i>	6	-	R	-
		Orthoclaadiinae	2	A	A	VA
Tanytarsini		3	A	A	A	
Empididae		3	R	R	R	
Ephydriidae		4	-	R	-	
Muscidae		3	R	R	C	
<i>Austrosimulium</i>		3	R	R	C	
Tanyderidae		4	R	R	-	
<b>No of taxa</b>			16	20	15	
<b>MCI</b>			79	80	75	
<b>SQMCI</b>			3.7	3.6	3.6	
<b>EPT (taxa)</b>			3	4	2	
<b>%EPT (taxa)</b>			19	20	13	
'Tolerant' taxa		'Moderately sensitive' taxa		'Highly sensitive' taxa		

R = Rare      C = Common      A = Abundant      VA = Very Abundant      XA = Extremely Abundant

# Waiwhakaiho River

## Constance Street (site 7)

A moderate taxa richness (16 taxa) was found at this site, upstream of all discharges from the Fitzroy industrial area. This was four taxa less than the median richness for this site (Table 2 and Figure 2), but within the range of previous richnesses.



**Figure 2** Numbers of taxa and MCI values for Waiwhakaiho River at Constance Street since 1987

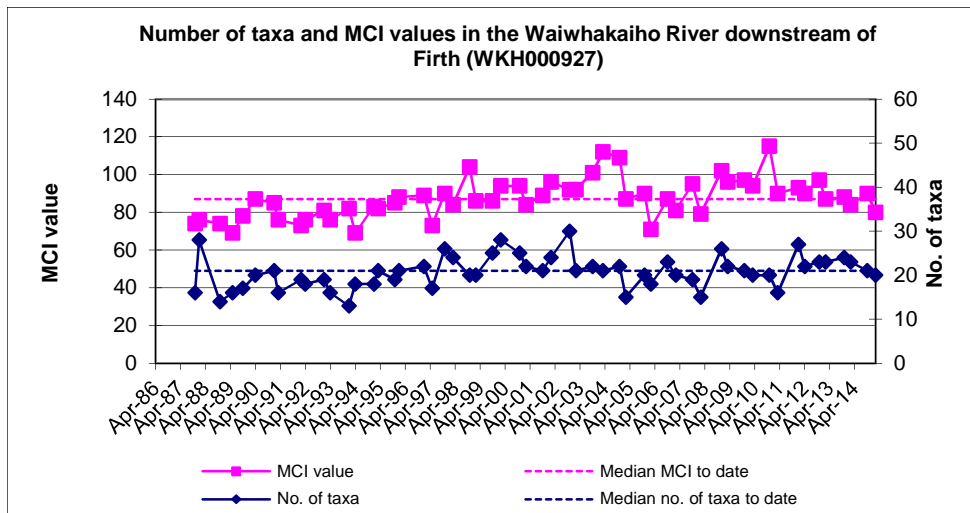
No 'highly sensitive' taxa were recorded in abundance at site 7. The community was characterised by four 'tolerant' taxa [snail (*Potamopyrgus*), net-building caddisfly (*Aoteapsyche*) and midges (tanytarsids and orthoclads)], and one 'moderately sensitive' taxon [beetle (Elmidae)].

The lower proportion of 'sensitive' taxa (31% of richness) present in the community was reflected in the MCI score of 79 units, an insignificant 10 units lower than the median score for this site (Table 2, Figure 2). This was an insignificant (Stark, 1998) nine units less than the previous spring survey score, and similar to the predictive values (Stark and Fowles, 2009) for this site situated in the lower reaches of a ringplain river (TRC, 2013).

The SQMCI<sub>5</sub> value of 3.7 units was 0.4 unit above the median value for this site, more typical of values for the lower reaches of ringplain streams and rivers subject to nutrient enrichment. This score reflected the numerical dominance by mainly 'tolerant' taxa and was similar to the previous spring survey score at this site.

## Below Firth Industries, left bank (site 8)

This site also had a moderate community richness (20 taxa), one taxon less than the historical median at this site (Table 2 and Figure 3).



**Figure 3** Numbers of taxa and MCI values for Waiwhakaiho River below Firth Industries (left bank) since 1987

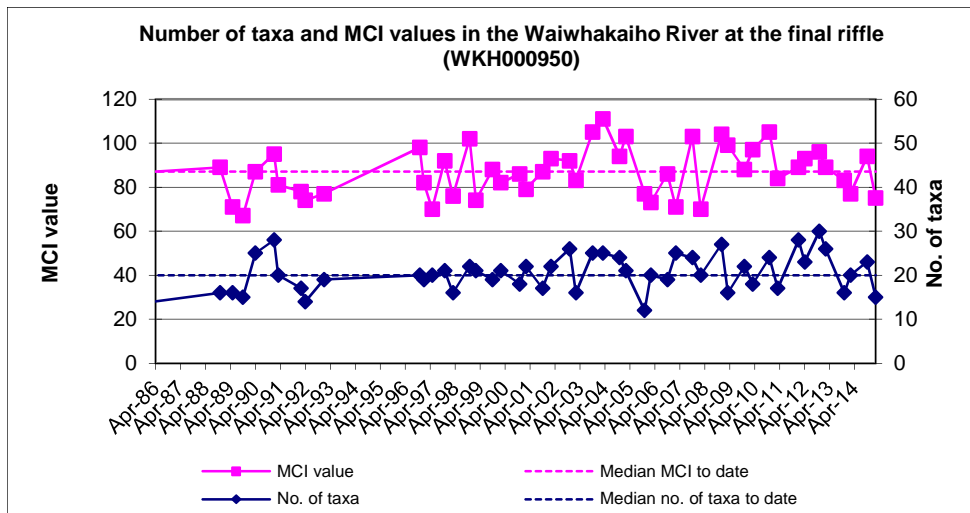
No ‘highly sensitive’ taxa were found at this site. The community was characterised by six taxa; five ‘tolerant’ taxa [oligochaete worms, snail (*Potamopyrgus*), net-building caddisfly (*Aoteapsyche*) and midges (tanytarsids and orthoclads)], and one ‘moderately sensitive’ taxon [beetle(Elmidae)]. These characteristic taxa were almost identical to those recorded at the upstream site (7), with the addition of oligochaete worms.

The significant proportion of ‘tolerant’ taxa in this site’s community (60% of richness) was reflected in the MCI score (80 units). This was an insignificant (Stark, 1998) 10 units lower than the score recorded by the previous spring survey (Figure 2) and was seven units lower than the median for this site. However, the score was one unit higher than that recorded upstream at site 7, and there were no significant changes in community composition recorded between the two sites. This MCI score remained lower than predictive scores for such a site in the lower reaches of a ringplain river (Stark and Fowles, 2009). Overall, this indicated that this survey was preceded by moderate physicochemical water quality conditions at this site although the relatively extensive periphyton substrate cover impacted on aspects of the physical habitat.

The SQMCI<sub>s</sub> score recorded at site 8 was an insignificant (Stark, 1998) 0.1 unit lower than that recorded at the upstream site and an insignificant (0.3 unit) lower than the historical median for this site and 0.5 unit higher than the value found by the previous spring survey.

### Downstream of Lake Rotomanu (site 13)

A moderate richness of 15 taxa was found at this site, situated downstream of all industrial discharges to the lower catchment, within a reach where high tides may slow river current speeds (and very occasionally increase salinity) near the river mouth. This richness was eight taxa less than that recorded by the previous spring survey and five taxa less than the historical median richness, but four taxa more than recorded at the site below Firth Industries (8) upstream (Table 2 and Figure 4).



**Figure 4** Numbers of taxa and MCI values for Waiwhakaiho River d/s of Lake Rotomanu since 1987

No 'highly sensitive' or 'moderately sensitive' taxa were recorded at site 13 while the community was characterised by the same five 'tolerant' taxa found upstream at site 8. There were no significant differences in individual taxon abundances recorded between sites 8 and 13 by the current survey. This was a relatively typical result for this site in the lower river reaches near the coast.

The high proportion of 'tolerant' taxa in the community at site 13 (67%) was higher than that recorded at site 8, resulting in a lower MCI score of 75 units, which was a significant 12 units lower than the long term median for this site (Figure 4) and significantly lower than predictive values (Stark and Fowles, 2009) for this ring plain site. In addition a numerical dominance of five 'tolerant' taxa resulted in the SQMCI<sub>s</sub> value of 3.6 units which was the same as that recorded upstream at site 8. This result was significantly (1.0 unit) higher than the median score for this site (13) and significantly higher (by 1.4 units) than that recorded by the previous spring (2014) survey, coincident with patchy periphyton substrate cover.

## Mangaone Stream

Macroinvertebrate samples collected from the two sites at the upper (site 12) and lower (site 11) ends of the surveyed reach in the Mangaone Stream in the past have found distinctly different community compositions at the two sites with much of the variation due to the streambed habitat differences, i.e. sandy-weedy, softer substrate at the upstream site (site 12 at Egmont Road) and harder, stony-gravel substrate at the downstream site (site 11 at Rifle Range Road). Additional sites have been sampled in recent years (in the reach between these historically surveyed sites) to further ascertain why poor water quality is indicated at site 11 at Rifle Range Road despite the improvement in habitat when compared to site 12 upstream of all the industrial discharges.

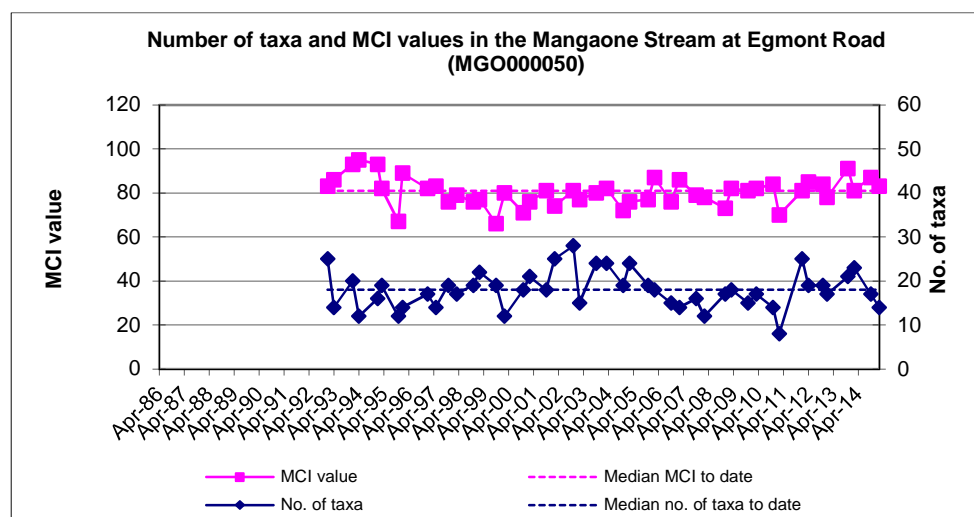
**Table 4** Macroinvertebrate fauna of the Mangaone Stream in relation to the Fitzroy industrial area sampled on 12 February 2015

Taxa List	Site Number	MCI score	12	16	14	15	11
	Site Code		MGO000050	MGO000054	MGO000150	MGO000155	MGO000190
	Sample Number		FWB15105	FWB15106	FWB15107	FWB15108	FWB15109
<b>COELENTERATA</b>	Coelenterata	3	-	R	-	-	-
<b>PLATYHELMINTHES (FLATWORMS)</b>	<i>Cura</i>	3	-	R	-	-	R
<b>NEMERTEA</b>	Nemertea	3	-	C	R	C	R
<b>NEMATODA</b>	Nematoda	3	-	R	-	-	-
<b>ANNELIDA (WORMS)</b>	Oligochaeta	1	-	A	A	VA	XA
	Lumbricidae	5	-	-	R	R	C
<b>HIRUDINEA (LEECHES)</b>	Hirudinea	3	-	-	-	R	-
<b>MOLLUSCA</b>	<i>Physa</i>	3	-	-	R	R	-
	<i>Potamopyrgus</i>	4	A	XA	XA	XA	XA
	Sphaeriidae	3	-	R	R	-	-
<b>CRUSTACEA</b>	Ostracoda	1	-	R	R	A	A
	<i>Paracalliope</i>	5	XA	XA	A	A	VA
	Paraleptamphopidae	5	R	C	-	-	-
	<i>Paratya</i>	3	C	C	-	-	-
<b>EPHEMEROPTERA (MAYFLIES)</b>	<i>Austroclima</i>	7	C	-	-	-	-
	<i>Zephlebia group</i>	7	A	A	-	-	-
<b>ODONATA (DRAGONFLIES)</b>	<i>Xanthocnemis</i>	4	C	R	-	-	-
<b>HEMIPTERA (BUGS)</b>	<i>Microvelia</i>	3	C	R	-	-	-
<b>COLEOPTERA (BEETLES)</b>	Elmidae	6	-	A	C	R	R
	Dytiscidae	5	-	-	-	R	-
<b>MEGALOPTERA (DOBSONFLIES)</b>	<i>Archichauliodes</i>	7	-	R	-	-	-
<b>TRICHOPTERA (CADDISFLIES)</b>	Ecnomidae/Psychomyiidae	6	-	C	-	-	-
	<i>Hydrobiosis</i>	5	-	R	R	R	R
	<i>Neurochorema</i>	6	-	-	R	-	-
	<i>Hydropsyche (Orthopsyche)</i>	9	-	R	-	-	-
	<i>Hudsonema</i>	6	-	R	-	-	-
	<i>Oxyethira</i>	2	-	R	C	C	C
	<i>Paroxyethira</i>	2	-	-	-	-	R
	<i>Pycnocentroides</i>	5	-	-	-	-	R
	<i>Tripletides</i>	5	A	A	-	-	-
<b>LEPIDOPTERA (MOTHS)</b>	<i>Hygraula</i>	4	-	-	R	R	-
<b>DIPTERA (TRUE FLIES)</b>	<i>Corynoneura</i>	3	C	-	-	-	-
	<i>Harrisius</i>	6	-	R	-	-	-
	<i>Maoridamesa</i>	3	-	-	-	-	R
	Orthoclaadiinae	2	R	C	VA	C	A
	<i>Polypedilum</i>	3	C	R	-	-	-
	Tanypodinae	5	-	R	-	-	-
	Tanytarsini	3	-	-	-	R	C
	<i>Paradixa</i>	4	A	R	-	-	-
	Empididae	3	-	R	R	-	-
	Muscidae	3	-	-	C	C	R
	<i>Austrosimulium</i>	3	C	A	-	-	-
	Tanyderidae	4	-	R	-	-	-
<b>No of taxa</b>			14	30	16	16	16
<b>MCI</b>			83	83	70	69	66
<b>SQMCI</b>			4.9	4.5	3.6	3.4	2.7
<b>EPT (taxa)</b>			3	6	2	1	2
<b>%EPT (taxa)</b>			21	20	13	6	13
'Tolerant' taxa		'Moderately sensitive' taxa		'Highly sensitive' taxa			

R = Rare      C = Common      A = Abundant      VA = Very Abundant      XA = Extremely Abundant

## Egmont Road (site 12)

A moderate community richness (14 taxa) was found amongst the vegetation and the soft silt- bottomed habitat of this site. This was four taxa less than the median richness for this site and three taxa less than found by the previous spring (2014) survey (Table 2 and Figure 5). This may indicate a return to continually below median community richness, a trend recorded from 2006 to 2011 (Figure 5).



**Figure 5** Number of taxa and MCI values for Mangaone Stream at Egmont Road since 1992

No 'highly sensitive' taxa were found in this community (Table 4) which was characterised by five taxa. These were two 'tolerant' taxa [snail (*Potamopyrgus*) and dixid midges] and three 'moderately sensitive' taxa [amphipods (*Paracalliope* (extremely abundant), mayfly (*Zephlebia* group) and vegetation-cased caddisfly (*Triplectides*)]. This was typical of the community found at this site which has been characterised by taxa commonly associated with vegetation in lowland streams and/or with softer-bottomed substrates and indicative of moderate physicochemical water quality.

The community was comprised of a relatively high proportion (64%) of 'tolerant' taxa resulting in the MCI score of 83 units which was slightly above the historical median score (Table 2) and an insignificant four units lower than that recorded by the previous spring survey (Figure 5).

The numerical dominance by one 'moderately sensitive' taxon in particular resulted in the relatively high SQMCI<sub>s</sub> value of 4.9 units. This was a significant (Stark, 1998) 0.6 unit higher than the median for this site and equal to the highest score recorded to date at this site (Table 2).

These results indicated that the macroinvertebrate community present at this site in the Mangaone Stream under late summer low flow conditions were of 'fair' health (see TRC, 2013), with similar health to that found by the previous spring survey performed under higher, cooler flow conditions.

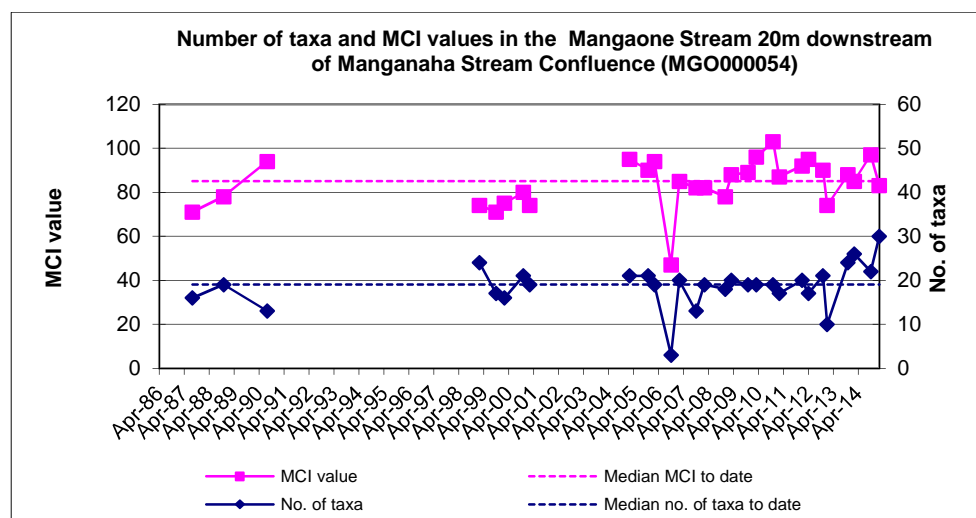
## 20m downstream of Manganaha Stream confluence (site 16)

A high richness (30 taxa) was recorded at this site, which was above the long term median for this site, eight taxa more than that recorded by the previous spring survey, and 16 taxa more than found at the upstream site 12 (Figure 6, Table 2).



There was one 'highly sensitive' taxon present in the community at this site (although only as a rarity). The community was dominated by three 'tolerant' taxa; [oligochaete worms, extremely abundant snail (*Potamopyrgus*) and orthoclad midges] and four 'moderately sensitive' taxa; [extremely abundant amphipod (*Paracalliope*), mayfly (*Zephlebia* group), elm mid beetles and vegetation-cased caddisfly (*Triplectides*)].

There were many significant changes in individual taxon abundances between adjacent sites 12 and 16 with the most significant including increased abundances of two 'tolerant' taxa [oligochaete worms and snail (*Potamopyrgus*)] a decrease in 'tolerant' dixid midges and an increase in 'sensitive' elm mid beetles. The changes recorded at this site (when compared with site 12) were coincident with an increase in periphyton substrate cover and decrease in aquatic vegetation, at the downstream site, increased hard-gravel substrate, and the resultant partial change in sampling technique.



**Figure 6** Numbers of taxa and MCI values for the Mangaone Stream downstream of the confluence with Manganaha Stream since 1987

The community was comprised of a significant proportion of 'tolerant' taxa (60%), resulting in an MCI score of 83 units. This score was an insignificant three unit lower than the median for this site and therefore, well within the range of previous scores for this site. This score was also equivalent to the score at the upstream 'control' site 12 but a significant (Stark, 1998) 12 units less than recorded by the previous spring survey.

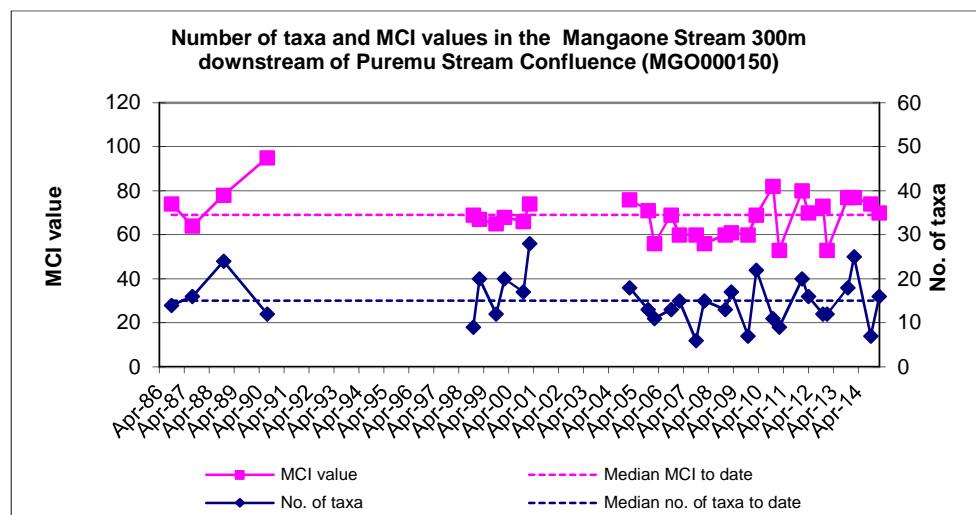
The numerical dominance by 'tolerant' snails and one 'sensitive' taxon (amphipods) resulted in the moderately high SQMCI<sub>s</sub> score of 4.5 units, which was 0.3 unit greater than the median of past values at this site, and very similar to the SQMCI<sub>s</sub> score recorded at this site by the previous spring survey (Table 2). This indicated typical health of the community which was in the 'fair' generic MCI category (TRC, 2013) at the time of these late summer, lower flow conditions.

### Mangaone Stream 300m downstream of Puremu Stream confluence (site 14)

Moderate taxa richness (16 taxa) was recorded at site 14 in the Mangaone Stream, downstream of the Puremu Stream confluence and discharges from Taranaki Sawmills and Farmlands (Figure 1). This was much lower than that recorded at the site directly upstream but slightly above that recorded at the 'control' site at Egmont Road (Table 2). However richness was well above that recorded by the previous spring survey (by 9 taxa) and was

similar to the long term median for this site. Previous reports have suggested that the sporadic observations of low community richnesses at this site may have been related to preceding toxic discharges. The current survey results didn't appear to reflect a similar recent occurrence.

Earlier surveys had noted extensive filamentous algal growth at this site. Although not as apparent during several more recent surveys, such growth was patchy at the time of the current survey and aquatic vegetation was also present. This may indicate that the surveyed riffle has become more stabilised with reduced substrate turnover during high flows, allowing for greater periphyton establishment.



**Figure 7** Numbers of taxa and MCI values for Mangaone Stream downstream of the confluence with Puremu Stream since 1986

There were no 'highly sensitive' taxa found in the community which was dominated by three 'tolerant' taxa [oligochaete worms, extremely abundant snail (*Potamopyrgus*) and orthoclad midges] and one 'moderately sensitive' taxon [amphipod (*Paracalliope*)]. This was one characteristic taxa more than recorded by the previous spring survey. There were nine significant individual taxon abundance differences between adjacent sites, the most significant being a reduced abundance within five 'moderately sensitive' taxa and an increased abundance within one 'very tolerant' taxon.

The increased proportion of 'tolerant' taxa in the community (69% of taxa richness) resulted in a 'poor' MCI score of 70 units. However, this score was similar to that recorded in the previous spring (2014) survey and similar to the long term median recorded at this site (Figure 7). This MCI score was however a significant (Stark, 1998) 13 units lower than that recorded upstream at site 16 upstream, typical of the trend at this site.

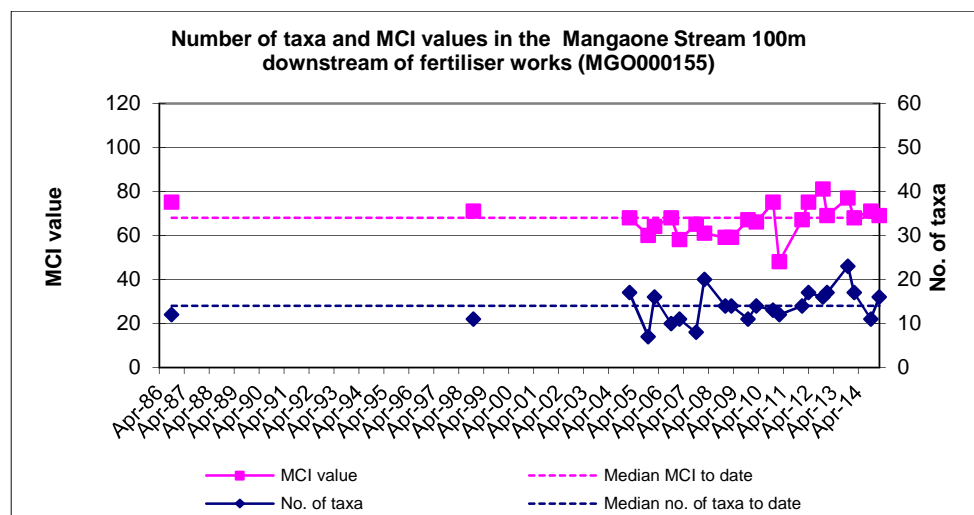
The numerical dominance by 'tolerant' taxa (particularly worms and snail) was reflected in the relatively low SQMCI<sub>s</sub> value of 3.6 units which was 0.9 unit lower than that recorded at the nearest upstream site 16, but 1.1 units above the median score for this site. It may have reflected better stability of the substrate (and increased periphyton cover and aquatic vegetation) at this site.

Overall, the reductions in MCI and SQMCI<sub>s</sub> scores at site 14, due to gains and/or increased abundances of certain 'tolerant' taxa, may be considered to have been related to the poorer

habitat compared with that at the upstream site (16), but possibly as a result of industrial discharges contributing to this deterioration.

### 100 m downstream of the fertilizer depot (site 15)

A moderate richness (16 taxa) was also recorded at this site, 100 m downstream of the discharges from the fertilizer depot. This richness was slightly above the median historical richness and slightly above that recorded by the previous spring survey (Table 2).



**Figure 8** Numbers of taxa and MCI values for Mangaone Stream 100 m downstream of the fertilizer works/depot since 1986

The community was dominated by three ‘tolerant’ taxa [oligochaete worms, extremely abundant snail (*Potamopyrgus*) and ostracod seed shrimp] and one ‘moderately sensitive’ taxon amphipod (*Paracalliope*). Only two significant individual taxon abundance differences were recorded between sites 14 and 15 coincidental with similar periphyton cover and substrates observed at this site.

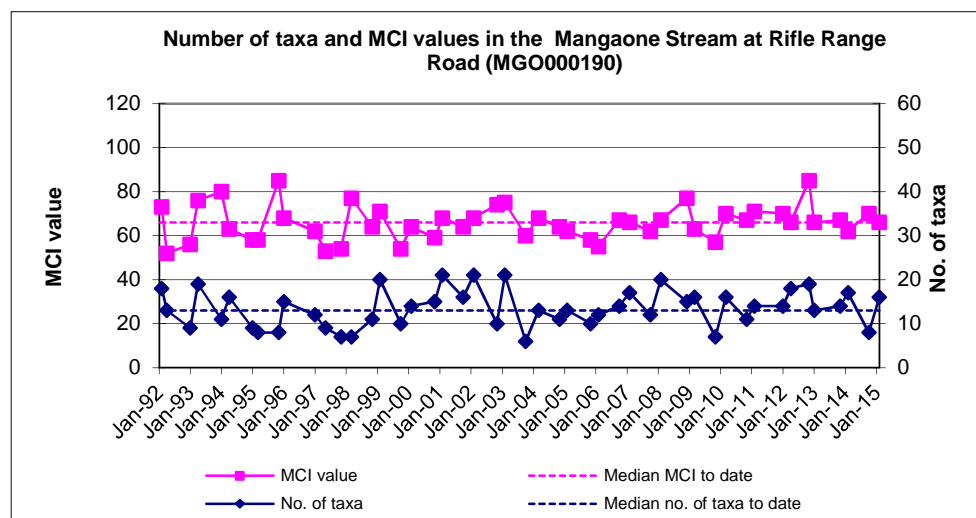
The predominance of ‘tolerant’ taxa (69% of richness) in this community was reflected in the ‘poor’ MCI score of 69 units. This was an insignificant (Stark, 1998) one unit higher than the historical median for this site, and one unit lower than the score recorded at the nearest upstream site (14).

The numerical dominance by ‘tolerant’ taxa (particularly one snail taxon) resulted in the SQMCI<sub>s</sub> value of 3.4 units, 0.9 unit higher than the median for this site, but within the range of previously recorded scores at this site. This score was 0.2 unit below that recorded upstream, typical of the trend of downstream deterioration observed by most previous surveys, although this score reflected lesser deterioration in macroinvertebrate community than previously recorded downstream of the Puremu Stream confluence.

### Rifle Range Road (site 11)

A low taxa richness (16) was found at site 11. This richness was three taxa more than the long term median for this site (Table 2 and Figure 9), and eight taxa more than recorded by the previous spring survey. Previous surveys have shown poorer communities possibly as a result of a combination of factors. These include occasional inundation by high flows in the adjacent Waiwhakaiho River (slowing flows which provide an unsuitable habitat for riffle-dwelling invertebrates (see BJ192) and a lack of downstream drift recruitment of typical

stony habitat taxa as the majority of the upstream habitat is softer-bottomed and weedy. Deterioration in physicochemical water quality between sites 12 and 11 may also have been a factor, as this reach, which runs through an industrial catchment, receives several stormwater discharges including localised run-off.



**Figure 9** Numbers of taxa and MCI values for Mangaone Stream at Rifle Range Road since 1992

The community was dominated by five of the same taxa as those characteristic to site 15 with the addition of one 'tolerant' taxon (orthoclad midges). As typically has been recorded, there was a significant contrast in dominant taxa between this site and the upstream 'control' site (12). In addition, there was a significant difference in taxa composition, with only three taxa common to both sites from a total of 27 taxa found at these two sites (12 and 11).

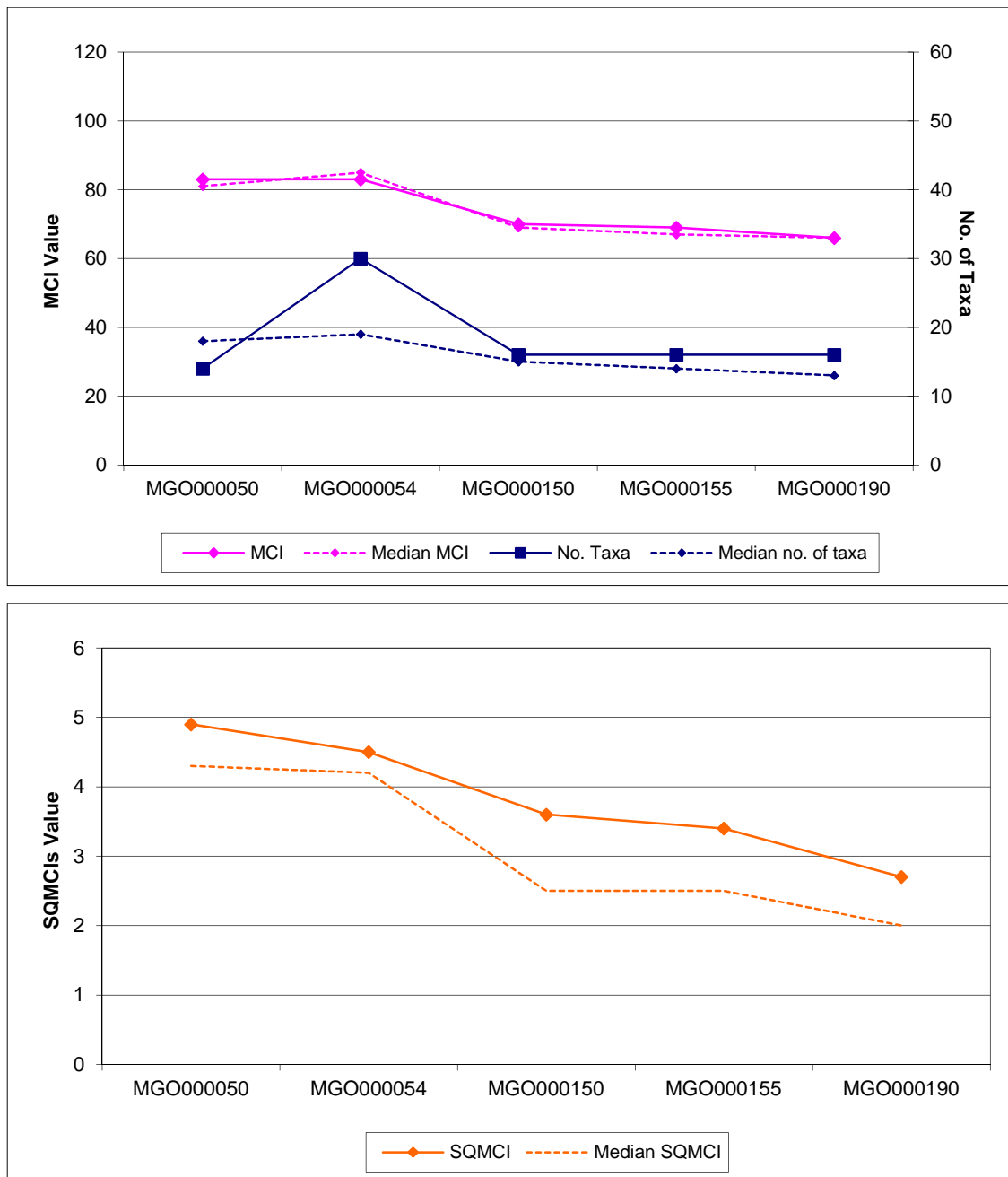
The predominance (69%) of 'tolerant' taxa in the community was reflected in the 'poor' MCI score of 66 units, which was the same as the historical median (Table 2) and four units lower than the score found by the previous spring survey. This was a significant (Stark, 1998) 17 units lower than the score recorded at site 12, and a three unit decrease from the score at the nearest upstream site (16).

One very abundant 'moderately sensitive' taxon was tempered by the (abundant to extreme abundance) of four 'tolerant' taxa resulting in a low SQMCI<sub>s</sub> value of 2.7 units. However, this still exceeded the long term median SQMCI<sub>s</sub> score by 0.7 unit and was within the range of previous scores. However, it was significantly lower than the SQMCI<sub>s</sub> scores recorded at the nearest upstream sites 14 and 15 by 0.7 to 0.9 units.

There was significant deterioration in SQMCI<sub>s</sub> (and MCI to a lesser extent) between sites 16 and 14, and more so between sites 16 and 11, which was more related to the deterioration in habitat (increase in algal substrate cover and aquatic vegetation) downstream of the fertiliser depot.

### General comments

The longitudinal trends in the number of taxa, MCI and SQMCI<sub>s</sub> values along the reach of the Mangaone Stream surveyed in February 2015 are illustrated in Figure 10.



**Figure 10** Longitudinal trend in number of taxa, MCI and SQMCI<sub>s</sub> values in the Mangaone Stream for the survey of 12 February 2015

Unlike typically recorded, the upstream site recorded a lower number of taxa than the three most downstream sites. Site 16 downstream of the Manganaha Stream confluence recorded the highest number of taxa (30), which was the highest number of taxa to be recorded at this site to date. The three most downstream sites all recorded the same (16) number of taxa. The MCI was also variable, but showed a slight decreasing trend through the mid reaches without recovery in the lower reaches. All sites showed MCI scores insignificantly different from historical median scores, and more typical of biological communities found under lower, warmer flow conditions in late summer.

When considering changes in community structure, the SQMCI<sub>s</sub> scores (which take into account abundances within taxa, as well as their sensitivity to pollution) was found to follow a relatively similar pattern to the MCI scores in the upper reaches with a slightly more

pronounced decrease in mid reaches and minimal recovery through the lower reaches. All sites (excluding site 16) recorded SQMCI<sub>5</sub> scores significantly (Stark, 1998) higher than their historical medians, with site 16 recording only a slight improvement.

## Summary and conclusions

The Council's standard 'kick-net' and 'sweep-net' sampling techniques were used to collect streambed macroinvertebrates at five sites in the Mangaone Stream and three sites in the Waiwhakaiho River on 12 and 13 February 2015 respectively, in order to assess whether discharges from the Lower Waiwhakaiho Industrial area had had any adverse effects on the macroinvertebrate communities of these streams. Samples were processed to provide number of taxa (richness), MCI and SQMCI<sub>5</sub> scores for each site.

The MCI is a measure of the overall sensitivity of the macroinvertebrate community to the effects of organic pollution in stony streams. It is based on the presence/absence of taxa with varying degrees of sensitivity to environmental conditions. The SQMCI<sub>5</sub> takes into account taxa abundances as well as sensitivity to pollution. It may indicate subtle changes in communities, and therefore be the more relevant index if non-organic impacts are occurring. Significant differences in either the MCI or SQMCI<sub>5</sub> between sites indicate the degree of adverse effects (if any) of the discharges being monitored.

This survey found that all Waiwhakaiho River sampling sites recorded community richnesses similar to or slightly above long term medians for their respective sites, with no trend in richness in a downstream direction. MCI scores were below historical medians at all sites with site 7 and site 8 recording slightly lower and site 13 recording significantly (Stark, 1998) lower MCI scores. However, SQMCI<sub>5</sub> scores were higher than historical medians at all sites with the furthest downstream site recording a SQMCI<sub>5</sub> score significantly higher than its historical median. SQMCI<sub>5</sub> scores were also similar between sites. These results did not indicate any significant effects of stormwater or wastewater discharges from the Fitzroy industrial area on the macroinvertebrate communities of the Waiwhakaiho River.

It is apparent that the macroinvertebrate communities in the Mangaone Stream were of 'fair' health in the upper reaches deteriorating to 'poor' health in a downstream direction. Most sites had moderate taxa richnesses decreasing in a downstream direction, while MCI scores were above or near to medians at all sites. SQMCI<sub>5</sub> scores were significantly (Stark, 1998) higher than historical medians at four out of five sites (site 16 had a SQMCI<sub>5</sub> score slightly higher than the median), with a decreasing trend recorded in a downstream direction. However, the five sampling sites in the Mangaone Stream showed a marked decline in MCI and SQMCI<sub>5</sub> values between Egmont Road (site 12) and Rifle Range Road (site 11), with a particularly marked decline in both SQMCI<sub>5</sub> and MCI scores between sites 16 and 14. Taranaki sawmills discharges stormwater to the Mangaone Stream between sites 16 and 14, and sediment sampling undertaken in early 2009 had recorded significant concentrations of not only tributyltin in the stream sediments around Taranaki Sawmills, but also elevated concentrations of arsenic, chromium, copper and zinc, all potentially toxic to aquatic biota (see BJ192). Previously there had been increased sedimentation between sites 16 and 14. Further sediment sampling undertaken in April 2012 and early March 2014, showed less contamination than that recorded in 2009; more indicative of physical habitat induced effects contributing to the smaller degree of biological health deterioration found more recently. There was a further decrease in MCI score between sites 14 and 15 and some further deterioration in the lower reaches, most likely due to poorer habitat. Overall, the results from the current survey indicated some improvements in comparison with historical results although a gradual deterioration in downstream biological health was

found by the current survey. Groundwater inputs may have contributed to some of this deterioration recorded immediately downstream of the fertiliser depot in the lower reaches of the stream.

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**To** L Smith, Scientific Officer  
**From** B Jansma and B Thomas, Scientific Officers  
**Document** 1626544  
**Report No.** BT047  
**Date** 20 January 2016

## **Biomonitoring of the Lower Waiwhakaiho River and the Mangaone Stream in the Fitzroy Industrial Area, October 2014**

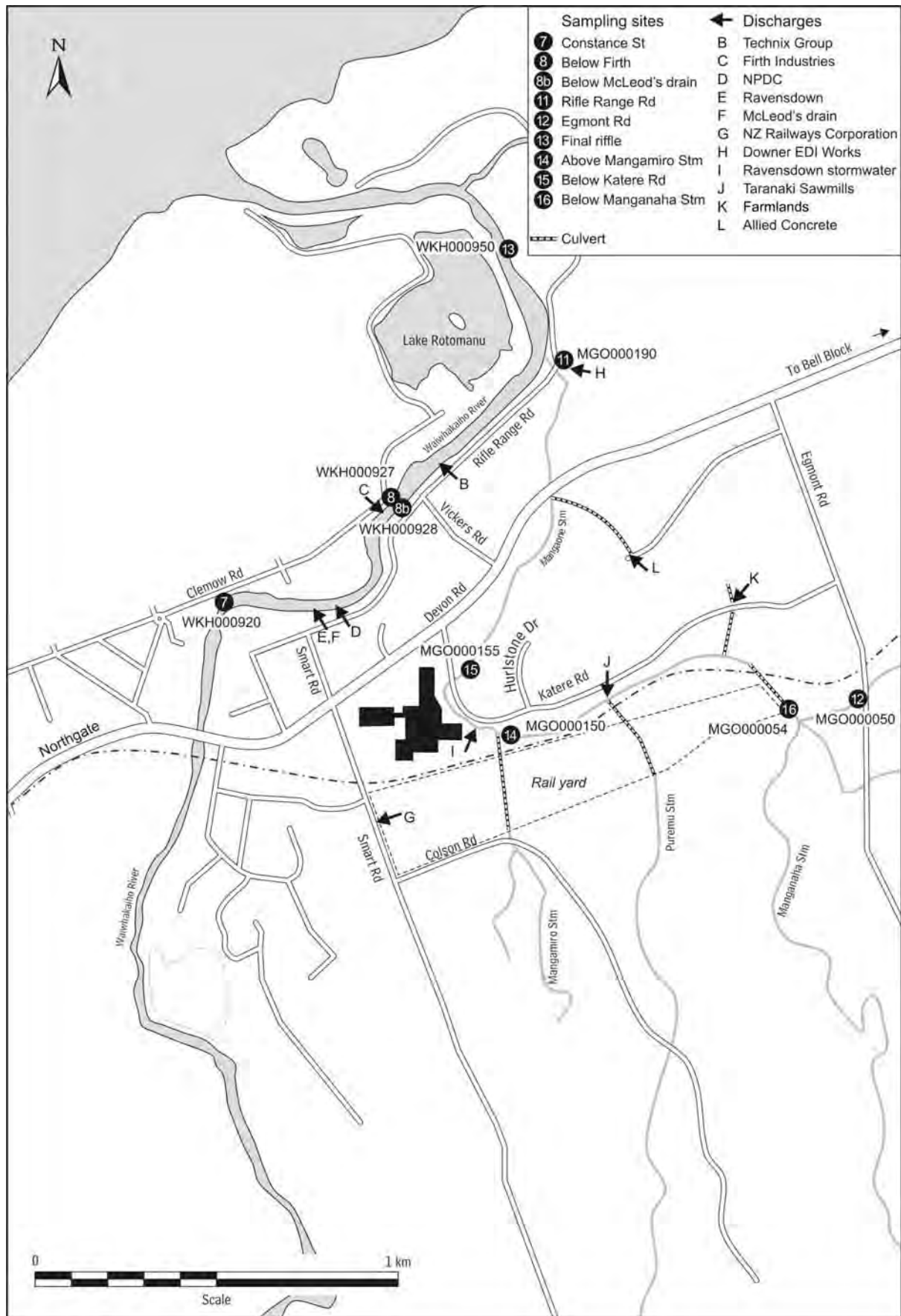
### **Introduction**

This was the first of two scheduled surveys in the 2014-2015 monitoring programme, for the combined industries of the Fitzroy industrial area. Results from surveys performed since the 2000-2001 monitoring years are discussed in several reports referenced at the end of this report. The monitoring related to the wastewater/stormwater discharge permits tabulated below:

<b>Consent holder</b>	<b>Consent No</b>
Ravensdown	3140,3865
Firth Industries	0392
Hooker Brothers	3141
NPDC (Stormwater)	3138,1126,1275
NPDC (Bewley Road)	4984
TranzRail	1735,3528
Farmlands	4548
Allied Concrete Ltd	4539
Taranaki Sawmills	3491
Technix Group Ltd	0021,0291,2230
Works Infrastructure Ltd	3917

### **Methods**

On 16 October 2014, the standard '400 ml kick sampling' technique was used to collect streambed macroinvertebrates from three sites in the lower Waiwhakaiho River and four sites in the Mangaone Stream (Table 1, Figure 1). The standard '400 ml sweep-sampling' technique was used to collect streambed macroinvertebrates from site 12 on the Mangaone Stream. The 'sweep-net-sampling' technique is very similar to Protocol C2 (soft-bottomed, semi-quantitative), and the 'kick-sampling' technique is very similar to Protocol C1 (hard-bottomed, semi-quantitative), of the New Zealand Macroinvertebrate Working Group (NZMWG) protocols for macroinvertebrate samples in wadeable streams (Stark *et al*, 2001).



The three sites from the Waiwhakaiho River used in this survey have been sampled biannually in recent years. In the Mangaone Stream, two sites have been sampled biannually in the past with sampling of the other three sites (14, 15 and 16) biannually since February 2005.

**Table 1** Biomonitoring sites in the Lower Waiwhakaiho River and the Mangaone Stream

Site No	Site Code	Location
7	WKH000920	Waiwhakaiho River, Constance Street
8	WKH000927	Waiwhakaiho River, below Firth industries, west (left) bank
13	WKH000950	Waiwhakaiho River, final riffle downstream of Lake Rotomanu
12	MGO000050	Mangaone Stream, Egmont Road
16	MGO000054	Mangaone Stream, 20m d/s of Manganaha Stream confluence
14	MGO000150	Mangaone Stream, 300m d/s confluence with Puremu Stream
15	MGO000155	Mangaone Stream, 100m d/s fertiliser depot
11	MGO000190	Mangaone Stream, Rifle Range Road

Samples were preserved with Kahle's Fluid for later sorting and identification under a stereomicroscope according to Taranaki Regional Council methodology using protocol P1 of NZMWG protocols for sampling macroinvertebrates in wadeable streams (Stark et al. 2001). Macroinvertebrate taxa found in each sample were recorded as:

R (rare)	= less than 5 individuals;
C (common)	= 5-19 individuals;
A (abundant)	= estimated 20-99 individuals;
VA (very abundant)	= estimated 100-499 individuals;
XA (extremely abundant)	= estimated 500 individuals or more.

Stark (1985) developed a scoring system for macroinvertebrate taxa according to their sensitivity to organic pollution in stony New Zealand streams. Highly 'sensitive' taxa were assigned the highest scores of 9 or 10, while the most 'tolerant' forms scored 1. Sensitivity scores for certain taxa have been modified in accordance with Taranaki experience. Averaging the scores assigned to the taxa found at a site, and multiplying the average by a scaling factor of 20 produces a Macroinvertebrate Community Index (MCI) value.

The MCI was designed as a measure of the overall sensitivity of macroinvertebrate communities to the effects of organic pollution. MCI results can also reflect the effects of warm temperatures, slow current speeds and low dissolved oxygen levels, because the taxa capable of tolerating these conditions generally have low sensitivity scores. Usually more 'sensitive' communities (with higher MCI values) inhabit less polluted waterways. The use of this index in non-stony streams (such as the Mangaone Stream site 12) is possible if results are related to physical habitat (e.g. good quality muddy/weedy sites tend to produce lower MCI values than good quality stony sites).

A semi-quantitative MCI value (SQMCI<sub>s</sub>) has also been calculated for the taxa present at each site by multiplying each taxon score by a loading factor (related to its abundance), totalling these products, and dividing by the sum of the loading factors (Stark, 1998 and 1999). The loading factors were 1 for rare (R), 5 for common (C), 20 for abundant (A), 100 for very abundant (VA) and 500 for extremely abundant (XA). Unlike the MCI, the SQMCI<sub>s</sub> is not multiplied by a scaling factor of 20, therefore SQMCI<sub>s</sub> values range from 1 to 10, while MCI values range from 20 to 200.

## Results and discussion

The October 2014 survey was performed during moderate flow conditions (seven days since the last fresh of three times median flow and ten days after seven times the median flow in the Waiwhakaiho River). The flow at all three sampling sites in the Waiwhakaiho River was clear and uncoloured at the time of this survey. Periphyton mats and filamentous algae were patchy at sites 7 and 8, while mats were widespread at site 13. Water temperatures in the Waiwhakaiho River ranged from 14.1 to 14.2°C at the time of this mid-day survey. Substrate at all three sites was comprised predominantly of cobbles and boulders, with gravels also being an important component. A small component of sand was also present at each site.

The moderate flow at the Mangaone stream was also clear and uncoloured at all sites. The cloudiness often recorded in the Mangaone Stream at the sites downstream of the Manganaha Stream, was not observed on this survey occasion. No periphyton was recorded at site 12, while patchy filaments and widespread mats were recorded at site 11. Widespread filaments and patchy mats were recorded at sites 14 and 15, while site 16 recorded less periphyton cover which was confined to slippery mats only. Particularly long filaments and thick mats were noted growing at site 14. Aquatic macrophytes were common in the stream at site 16 and at the stream margins at sites 12 and 14. No macrophytes were observed growing at site 11 or 15. Weed growth was prominent at site 12 and it was noted that habitat was limited at this site. During the previous survey it was noted that vegetation clearance from the banks adjacent to site 16 had altered habitat (less shading). At the time of the current survey there was partial shading of the streambed.

An observation made at the time of the March 2009 survey at site 11, was that the Waiwhakaiho River may have backed up the Mangaone Stream, reducing the flushing potential of the previous fresh. This was confirmed in 2010 (see photos in BJ192), and is likely to be a common feature of larger floods in this catchment.

Samples were collected from all sites using the kick sampling technique, except for site 12, as this was mainly a weedy, silty site. The substrate at site 12 was comprised predominantly of silt, with some sand, gravels and hard clay. The substrate at site 16 was predominantly hard clay with silt and smaller portions of gravels, cobbles and sand. The substrate at site 14 was comprised mainly of hard clay, cobble and gravels with some silt and sand. At site 15 there was a high portion of boulders and cobbles with some gravels and small amounts of sand and silt. At site 11 the substrate comprised mainly of cobbles and gravel with some boulders, silt and sand. Water temperatures at the time of this mid-morning survey in the Mangaone Stream ranged from 13.1° to 13.5°C.

## Macroinvertebrate communities

A summary of taxa numbers and MCI values from previous surveys performed in the Waiwhakaiho River and the Mangaone Stream in relation to the Fitzroy industrial area are presented in Table 2 together with current results. The full results of the survey are presented in Table 3 (Waiwhakaiho River) and Table 4 (Mangaone Stream).

**Table 2** Numbers of taxa and MCI and SQMCIs values recorded in previous surveys performed in the Waiwhakaiho River and Mangaone Stream since July 1983 in relation to the Fitzroy industrial area, together with the results of the survey of 16 October 2014

Location	Site No.	Numbers of taxa				MCI values			SQMCIs Values			
		N	Median	Range	Current	Median	Range	Current	N	Median	Range	Current
Waiwhakaiho River	7	56	20	12-29	19	90	66-110	88	32	3.3	1.7-7.3	3.9
	8	54	21	13-30	21	87	69-115	90	32	3.3	1.8-6.3	3.1
	13	47	20	12-30	23	87	67-111	94	32	2.7	1.6-7.4	2.2
Mangaone Stream	12	44	18	8-28	17	81	66-95	87	32	4.3	2.4-4.9	4.9
	16	27	19	3-26	22	85	47-103	97	24	4.2	1.2-5.5	4.6
	14	29	15	6-28	7	69	53-95	74	25	2.5	1.1-3.7	3.5
	15	21	14	7-23	11	67	48-81	71	20	2.4	1.5-3.8	3.5
	11	49	13	4-21	8	66	50-85	70	32	2.0	1.5-3.6	2.5

**Table 3** Macroinvertebrate fauna of the Waiwhakaiho River in relation to the Fitzroy industrial area sampled on 16 October 2014

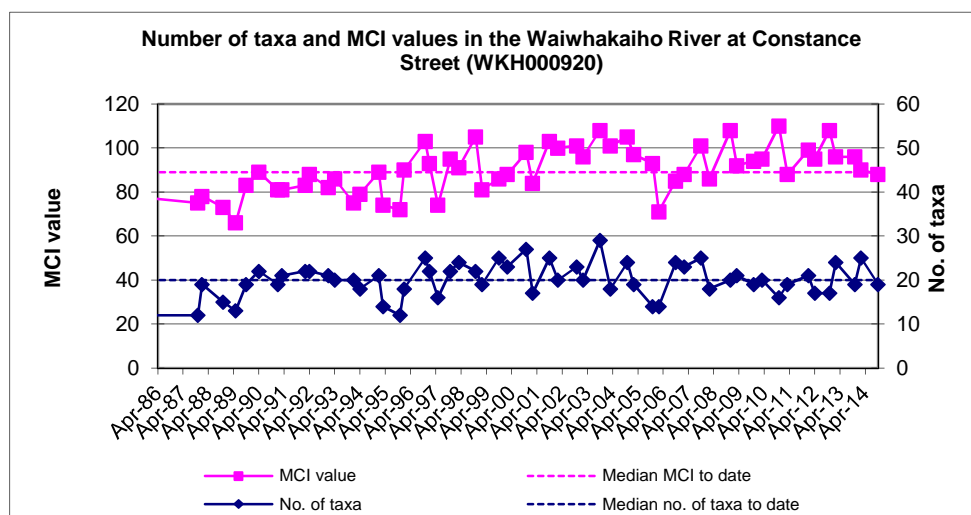
Taxa List	Site Number	MCI score	7	8	13
	Site Code		WKH000920	WKH000927	WKH000950
	Sample Number		FWB14296	FWB14297	FWB14298
<b>NEMATODA</b>	Nematoda	3	R	C	-
<b>ANNELIDA (WORMS)</b>	Oligochaeta	1	A	A	VA
	Lumbricidae	5	-	R	R
<b>MOLLUSCA</b>	<i>Potamopyrgus</i>	4	C	A	A
<b>CRUSTACEA</b>	<i>Paracalliope</i>	5	-	-	R
	Paraleptamphopidae	5	-	R	-
	<i>Paratya</i>	3	-	-	R
<b>EPHEMEROPTERA (MAYFLIES)</b>	<i>Austroclima</i>	7	R	-	-
	<i>Coloburiscus</i>	7	R	C	R
	<i>Deleatidium</i>	8	A	R	R
	<i>Zephlebia</i> group	7	-	C	-
<b>PLECOPTERA (STONEFLIES)</b>	<i>Acroperla</i>	5	-	R	C
	<i>Austroperla</i>	9	-	-	R
	<i>Zelandobius</i>	5	C	C	C
<b>COLEOPTERA (BEETLES)</b>	Elmidae	6	C	C	R
<b>MEGALOPTERA (DOBSONFLIES)</b>	<i>Archichauliodes</i>	7	-	C	R
<b>TRICHOPTERA (CADDISFLIES)</b>	<i>Hydropsyche (Aoteapsyche)</i>	4	C	C	C
	<i>Costachorema</i>	7	R	-	-
	<i>Hydrobiosis</i>	5	C	R	R
	<i>Olinga</i>	9	-	-	R
	<i>Oxyethira</i>	2	R	C	R
	<i>Pycnocentroides</i>	5	R	-	-
	<i>Aphrophila</i>	5	C	A	C
<b>DIPTERA (TRUE FLIES)</b>	<i>Maoriamesa</i>	3	A	VA	VA
	Orthoclaadiinae	2	A	VA	XA
	Tanytarsini	3	R	-	R
	Empididae	3	R	R	R
	Ephyridae	4	-	C	R
	<i>Austrosimulium</i>	3	-	R	R
	Tanyderidae	4	R	-	-
<b>No of taxa</b>			19	21	23
<b>MCI</b>			88	90	94
<b>SQMCIs</b>			3.9	3.1	2.2
<b>EPT (taxa)</b>			8	7	8
<b>%EPT (taxa)</b>			42	33	35
<b>'Tolerant' taxa</b>		<b>'Moderately sensitive' taxa</b>		<b>'Highly sensitive' taxa</b>	

R = Rare      C = Common      A = Abundant      VA = Very Abundant      XA = Extremely Abundant

# Waiwhakaiho River

## Constance Street (site 7)

A moderate taxa richness (19 taxa) was found at this site, upstream of all discharges from the Fitzroy industrial area. This was one taxon less than the median richness for this site (Table 2 and Figure 2), but within the range of previous richnesses.



**Figure 2** Numbers of taxa and MCI values for Waiwhakaiho River at Constance Street since 1987

One abundant ‘highly sensitive’ taxon was recorded at this site reflecting good preceding physicochemical water quality. The community was characterised by three ‘tolerant’ taxa [oligochaete worms, orthoclad midges, and chironomid midge (*Maoridiamesa*)]; and the aforementioned ‘highly sensitive’ taxon [mayfly (*Deleatidium*)].

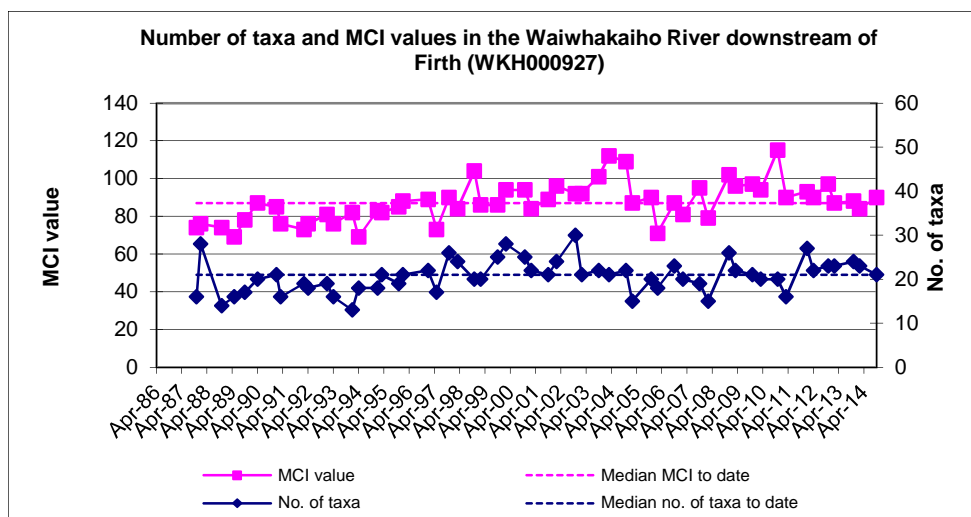
The lower proportion of ‘sensitive’ taxa (47% of richness) present in the community was reflected in the MCI score of 88 units, an insignificant two units less than the median score for this site (Table 2, Figure 2). This was two units less than the previous summer survey score, and similar to predictive values (Stark and Fowles, 2009) for this site situated in the lower reaches of a ringplain river (TRC, 2013).

The SQMCI<sub>5</sub> value of 3.9 units was a significant 0.6 unit above the median value for this site, and 0.7 unit above the previous summer score. This score reflected the numerical dominance of mainly ‘tolerant’ taxa but also one ‘highly sensitive’ taxon.

## Below Firth Industries, left bank (site 8)

This site also had a moderate community richness (21 taxa), the same as the historical median at this site (Table 2 and Figure 3).





**Figure 3** Numbers of taxa and MCI values for Waiwhakaiho River below Firth Industries (left bank) since 1987

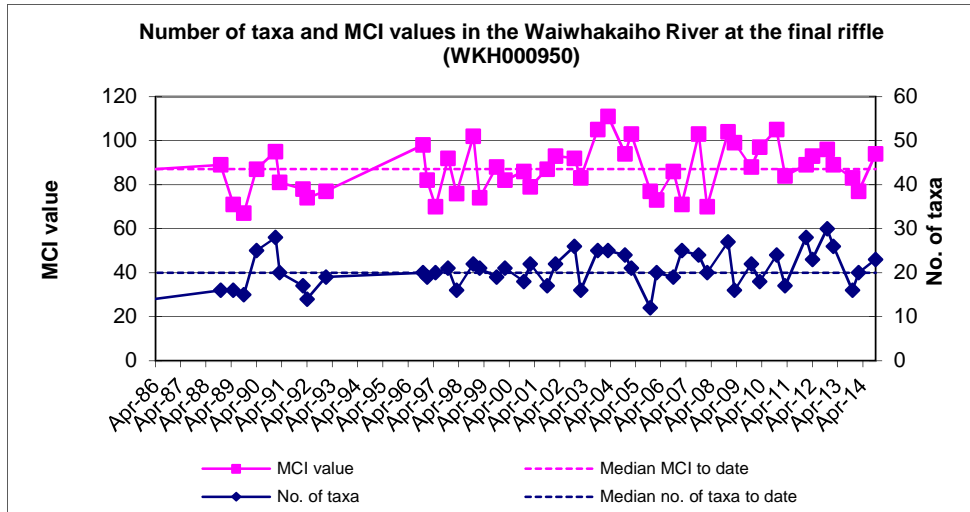
No ‘highly sensitive’ taxa were found at this site. The community was characterised by five taxa; four ‘tolerant’ taxa [oligochaete worms, snail (*Potamopyrgus*), orthoclad midges, and chironomid midge (*Maoridiamesa*)], and one ‘moderately sensitive’ taxon; [cranefly (*Aphrophila*)]. These characteristic taxa were similar to those recorded at the upstream site (7) in terms of ‘tolerant’ taxa but dissimilar for the ‘sensitive’ taxa. They also represented a decreased number of ‘tolerant’ taxa in comparison with the characteristic community taxa found by the earlier summer (2014) survey.

The significant proportion of ‘sensitive’ taxa in this site’s community (52% of richness) was reflected in the MCI score (90 units). This was six units higher than the score recorded by the previous summer survey (Figure 2) and was three units higher than the median for this site. This score was an insignificant two units higher than that recorded upstream at site 7. Only three significant changes in community composition were recorded between site 7 and site 8 including a marked decrease in numerical abundance of a ‘highly sensitive’ mayfly taxon (*Deleatidium*), an increase in abundance of mayfly (*Zephlebia* group) and the presence of one common ‘tolerant’ taxon. The MCI score was the same as predictive scores for such a site in the lower reaches of a ringplain river (Stark and Fowles, 2009). Overall, this indicated that this survey was preceded by relatively good physicochemical water quality conditions at this site although the relatively extensive periphyton substrate cover impacted on aspects of the physical habitat.

The reduced numerical abundance of one ‘highly sensitive’ taxon and an increase in one ‘tolerant’ taxon contributed to a significantly lower SQMCI<sub>5</sub> score (3.1 units), 0.8 unit lower than that recorded upstream at site 7 (Stark, 1998). This was 0.2 unit below the historical median for this site and 0.6 unit lower than the value found by the previous summer survey.

### Downstream of Lake Rotomanu (site 13)

A moderate richness of 23 taxa was found at site 13, situated downstream of all industrial discharges to the lower catchment, which is within a reach where high tides may slow river current speeds (and very occasionally increase salinity) near the river mouth. This richness was three taxa more than the historical median richness and three taxa more than that recorded by the previous summer survey and two taxa more than that recorded at the site below Firth Industries (8) upstream (Table 2 and Figure 4).



**Figure 4** Numbers of taxa and MCI values for Waiwhakaiho River d/s of Lake Rotomanu since 1987

No 'sensitive' taxa were recorded in abundance at site 13, while the community was characterised by four 'tolerant' taxa; [oligochaete worms, snail (*Potamopyrgus*), orthoclad midges and chironomid midge (*Maoridiamesa*)], all of which were also characteristic of the community upstream at site 8.

The higher proportion of 'sensitive' taxa in the community at site 13 (52%) (compared to that recorded at site 8), resulted in a slightly higher MCI score of 94 units, which was an insignificant seven units higher than the long term median for this site (Figure 4) and similar to the predictive values (Stark and Fowles, 2009) for this ring plain site. However the presence of one extremely abundant 'tolerant' taxon and two very abundant 'tolerant' taxa, together with the absence of any abundant 'sensitive' taxa resulted in the lower SQMCI<sub>s</sub> value of 2.2 units. This result was a significant 0.9 unit lower than that recorded upstream at site 8 and was slightly below the median score for this site (13). It was also slightly below (by 0.4 unit) that recorded by the previous summer (2014) survey, coincident with widespread periphyton substrate cover.

## Mangaone Stream

Macroinvertebrate samples collected from the two sites at the upper (site 12) and lower (site 11) ends of the surveyed reach in the Mangaone Stream in the past have found distinctly different community compositions at the two sites with much of the variation due to the streambed habitat differences, i.e. sandy-weedy, softer substrate at the upstream site (site 12 at Egmont Road) and harder, stony-gravel substrate at the downstream site (site 11 at Rifle Range Road). Additional sites have been sampled in recent years (in the reach between these historically surveyed sites) to further ascertain why poor water quality is indicated at site 11 at Rifle Range Road despite the improvement in habitat when compared to site 12 upstream of all the industrial discharges.

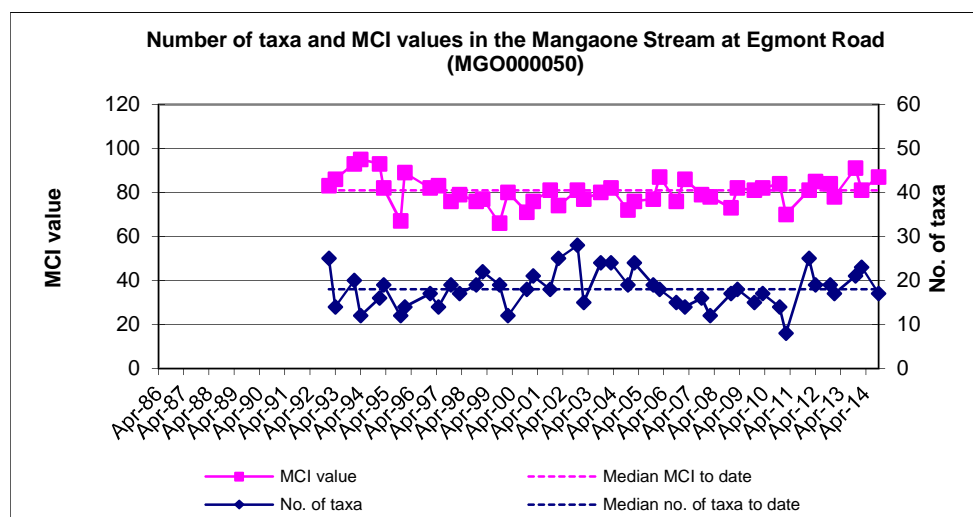
**Table 4** Macroinvertebrate fauna of the Mangaone Stream in relation to the Fitzroy industrial area sampled on 16 October 2014

Taxa List	Site Number	MCI score	12	16	14	15	11
	Site Code		MGO000050	MGO000054	MGO000150	MGO000155	MGO000190
	Sample Number		FWB14299	FWB14300	FWB14301	FWB14302	FWB14303
PLATYHELMINTHES (FLATWORMS)	<i>Cura</i>	3	R	-	-	-	-
NEMATODA	Nematoda	3	-	R	-	R	-
ANNELIDA (WORMS)	Oligochaeta	1	-	A	VA	VA	XA
	Lumbricidae	5	-	-	-	C	C
MOLLUSCA	<i>Physa</i>	3	-	-	-	R	-
	<i>Potamopyrgus</i>	4	VA	A	XA	XA	XA
CRUSTACEA	Isopoda	5	-	R	-	-	-
	<i>Paracalliope</i>	5	XA	VA	R	R	C
	Paraleptamphopidae	5	XA	-	-	-	-
	<i>Paratya</i>	3	C	C	-	-	-
EPHEMEROPTERA (MAYFLIES)	<i>Austroclima</i>	7	VA	A	-	-	-
	<i>Coloburiscus</i>	7	-	R	-	-	-
	<i>Deleatidium</i>	8	-	R	-	-	-
	<i>Zephlebia group</i>	7	C	C	-	-	-
ODONATA (DRAGONFLIES)	<i>Xanthocnemis</i>	4	A	-	-	-	-
HEMIPTERA (BUGS)	<i>Microvelia</i>	3	R	-	-	-	-
COLEOPTERA (BEETLES)	Elmidae	6	R	A	C	R	-
	Hydrophilidae	5	R	-	-	-	-
MEGALOPTERA (DOBSONFLIES)	<i>Archichauliodes</i>	7	-	R	-	-	-
TRICHOPTERA (CADDISFLIES)	<i>Hydrobiosis</i>	5	R	R	-	-	-
	<i>Hydropsyche (Orthopsyche)</i>	9	-	R	-	-	-
	<i>Oxyethira</i>	2	-	-	-	R	-
	<i>Triplectides</i>	5	A	C	-	-	-
DIPTERA (TRUE FLIES)	<i>Aphrophila</i>	5	-	R	R	-	R
	Orthoclaadiinae	2	R	C	A	A	VA
	<i>Polypedilum</i>	3	-	R	R	-	-
	<i>Paradixa</i>	4	R	-	-	-	-
	Empididae	3	C	R	-	-	-
	Muscidae	3	-	-	-	C	R
	<i>Austrosimulium</i>	3	VA	A	-	-	R
	Tanyderidae	4	-	R	-	-	-
ACARINA (MITES)	Acarina	5	-	R	-	R	-
<b>No of taxa</b>			17	22	7	11	8
<b>MCI</b>			87	97	74	71	70
<b>SQMCI</b>			4.9	4.6	3.5	3.5	2.5
<b>EPT (taxa)</b>			4	7	0	0	0
<b>%EPT (taxa)</b>			24	32	0	0	0
'Tolerant' taxa		'Moderately sensitive' taxa		'Highly sensitive' taxa			

R = Rare    C = Common    A = Abundant    VA = Very Abundant    XA = Extremely Abundant

## Egmont Road (site 12)

A moderate community richness (17 taxa) was found amongst the vegetation and the soft silt- bottomed habitat of this site. This was one taxon less than the median richness for this site and four taxa less than found by the previous summer (2014) survey (Table 2 and Figure 5).



**Figure 5** Number of taxa and MCI values for Mangaone Stream at Egmont Road since 1992

No 'highly sensitive' taxa were found in this community (Table 4) which was characterised by seven taxa. These were three 'tolerant' taxa [snail (*Potamopyrgus*), damselfly (*Xanthocnemis*), and black fly larvae (*Austrosimulium*)] and four 'moderately sensitive' taxa [amphipods (*Paracalliope* (extremely abundant) and paraleptamphopids), mayfly (*Austroclima*) and vegetation-cased caddisfly (*Triplectides*)]. This was typical of the community found at this site which has been characterised by taxa commonly associated with vegetation in lowland streams and/or with softer-bottomed substrates and indicative of moderate physicochemical water quality.

The community was comprised of a moderate proportion (53%) of 'tolerant' taxa resulting in the MCI score of 87 units which was six units more than the historical median score (Table 2) and an insignificant six units lower than that recorded by the previous summer survey (Figure 5).

The numerical dominance by two 'moderately sensitive' taxa in particular resulted in the relatively high SQMCI<sub>5</sub> value of 4.9 units. This was 0.6 unit higher than the median for this site and the same as the highest score recorded to date at this site (Table 2).

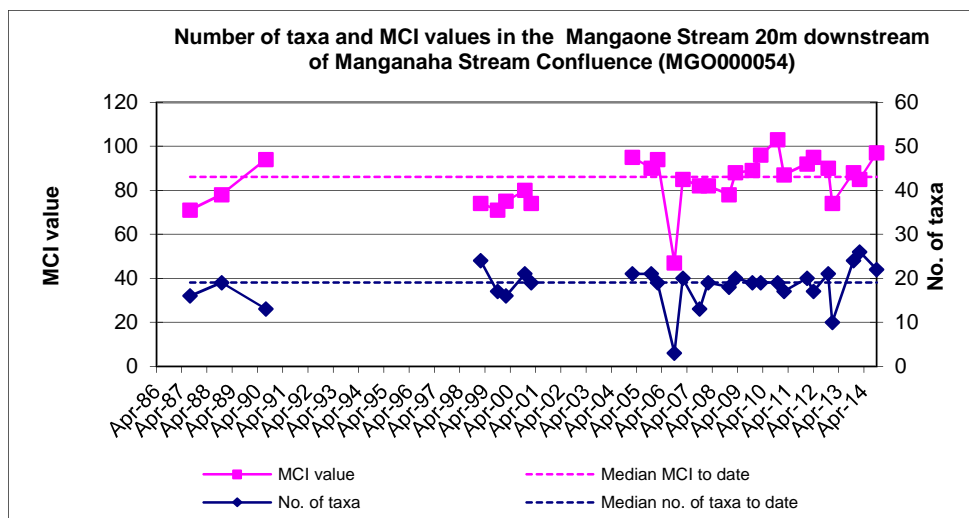
These results indicated that the macroinvertebrate community present at this site in the Mangaone Stream under spring moderate flow conditions were of 'fair' health (see TRC, 2013), but with some improvement in health from that found by the previous summer survey performed under lower flow conditions.

## 20m downstream of Manganaha Stream confluence (site 16)

A moderate richness (22 taxa) was recorded at this site, which was above the long term median for this site but four taxa less than that recorded by the previous summer survey, and five taxa more than found at the upstream site 12 (Figure 6, Table 2).

There were two 'highly sensitive' taxa present in the community at this site (although only as rarities). The community was dominated by two 'tolerant' taxa [snail (*Potamopyrgus*) and black fly larvae (*Austrosimulium*)] and three 'moderately sensitive' taxa [amphipod (*Paracalliope*), mayfly (*Austroclima*) and elmid beetles], representing a marked increase in characteristic 'sensitive' taxa compared to the community found by the summer (2014) survey.

There were only three significant changes in individual taxon abundances between adjacent sites 12 and 16 including the increased abundance of one 'moderately sensitive' taxon, (elmid beetles) and one 'tolerant' taxon (oligochaete worms) and the decreased abundance of one 'tolerant' taxon, [damselfly (*Xanthocnemis*)]. The changes recorded at this site (when compared with site 12) were coincident with an increase in aquatic vegetation, at the downstream site, increased hard-clay and silt substrate, and the resultant change in sampling technique.



**Figure 6** Numbers of taxa and MCI values for the Mangaone Stream downstream of the confluence with Manganaha Stream since 1987

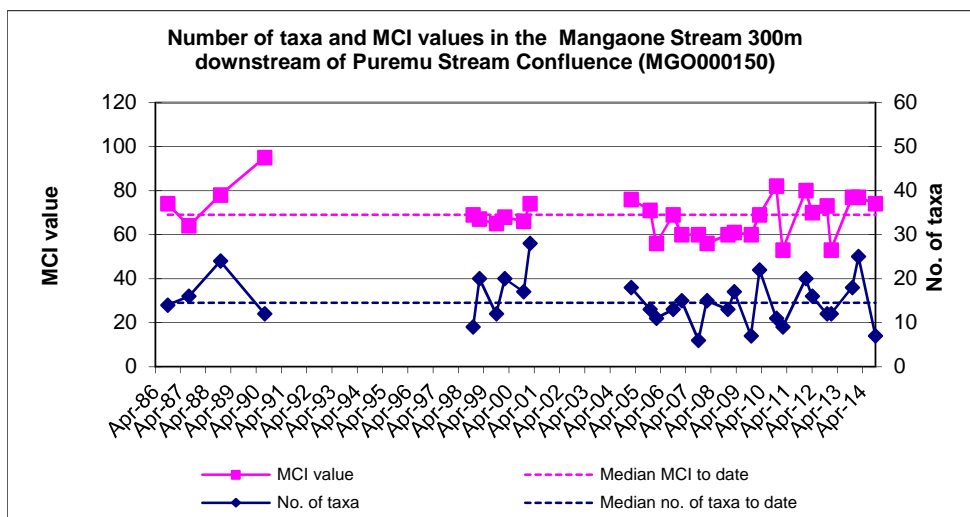
The community was comprised of a significant proportion of 'sensitive' taxa (59%), resulting in an MCI score of 97 units. This score was a significant 12 units higher than the median for this site but well within the range of previous scores for this site. This score was an insignificant 10 units higher than the score at the upstream 'control' site 12 but a significant (Stark, 1998) 12 units more than recorded by the previous summer survey.

The numerical dominance by one 'sensitive' taxon (amphipods) resulted in the moderately high SQMCI<sub>s</sub> score of 4.6 units, which was 0.4 unit greater than the median of past values at this site, and very similar to the SQMCI<sub>s</sub> score recorded at this site by the previous summer survey (Table 2). This indicated typical health of the community which was in the 'fair' generic MCI category (TRC, 2013) at the time of these spring, moderate flow conditions.

### Mangaone Stream 300m downstream of Puremu Stream confluence (site 14)

Low taxa richness (7 taxa) was recorded at site 14 in the Mangaone Stream, downstream of the Puremu Stream confluence and discharges from Taranaki Sawmills and Farmlands (Figure 1). This was much lower than that recorded at the site directly upstream and also than that at the 'control' site at Egmont Road (Table 2). Richness was also well below that recorded by the previous summer survey (by 18 taxa), and well below the long term median for this site. Previous reports have suggested that the sporadic observations of low

community richnesses at this site may have been related to preceding toxic discharges. This may be the case, however low taxa numbers may also be a result of habitat smothering from prolific periphyton growth that was recorded at the time of the current survey. Earlier surveys had also noted extensive filamentous algal growth at this site (although not in the previous summer (2014) survey). This may indicate that the surveyed riffle has become more stabilised with reduced substrate turnover during high flows, allowing for greater periphyton establishment.



**Figure 7** Numbers of taxa and MCI values for Mangaone Stream downstream of the confluence with Puremu Stream since 1986

There were no ‘highly sensitive’ taxa found in the community which was dominated by three ‘tolerant’ taxa [oligochaete worms, extremely abundant snail (*Potamopyrgus*) and orthoclad midges]. This was four characteristic taxa less than recorded by the previous summer survey. There were seven significant individual taxon abundance differences between adjacent sites, the most significant being a reduced abundance within four ‘moderately sensitive’ taxa and an increased abundance within one ‘tolerant’ taxon.

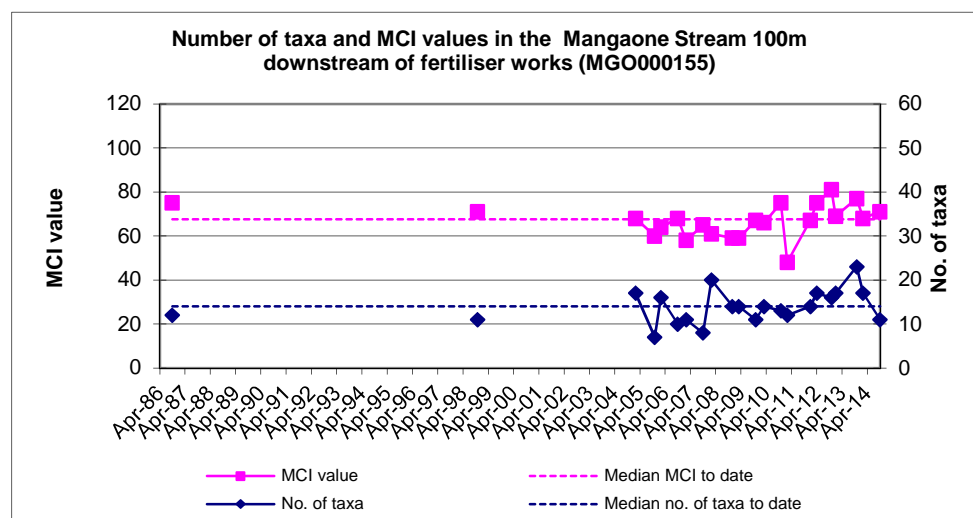
The increased proportion of ‘tolerant’ taxa in the community (57% of taxa richness) resulted in a ‘poor’ MCI score of 74 units. This score was similar to the previous two surveys and an insignificant (Stark, 1998) 5 MCI units higher than the long term median (Figure 7). This score was a significant 23 MCI units lower than found at site 16 upstream, typical of the trend at this site.

The numerical dominance by ‘tolerant’ taxa (particularly worms and snails) was reflected in the relatively low SQMCI<sub>s</sub> value of 3.5 units which was 1.1 units lower than that recorded at the nearest upstream site 16, but 1.0 unit above the median score for this site. It may have reflected better stability of the substrate (and increased periphyton cover and aquatic vegetation) at this site.

Overall, the reductions in MCI and SQMCI<sub>s</sub> scores at site 14, due to gains and/or increased abundances of certain ‘tolerant’ taxa, may be considered to have been related to the poorer habitat compared with that at the upstream site (16), but possibly as a result of industrial discharges contributing to this deterioration.

## 100 m downstream of the fertilizer depot (site 15)

A moderately low richness (11 taxa) was recorded at this site, 100 m downstream of the discharges from the fertilizer depot. This richness was slightly below the median historical richness but three taxa fewer than recorded by the previous summer survey (Table 2).



**Figure** Numbers of taxa and MCI values for Mangaone Stream 100 m downstream of the fertilizer works/depot since 1986

The community was dominated by the same three taxa as those characteristic at site 14 upstream. Only two significant individual taxon abundance differences were recorded between sites 14 and 15, coincidental with similar periphyton cover and substrate observed at this site.

The predominance of 'tolerant' taxa (64% of richness) in this community was reflected in the 'poor' MCI score of 71 units. This was an insignificant (Stark, 1998) four units higher than the historical median for this site, and three units lower than the score recorded at the nearest upstream site (14). This was three units more than the MCI score recorded by the previous summer survey at this site. This indicated a more typical increase in community health under spring cooler, slightly higher flow conditions, but that overall, health was still 'poor', coincident with the extensive algal biomass at this site.

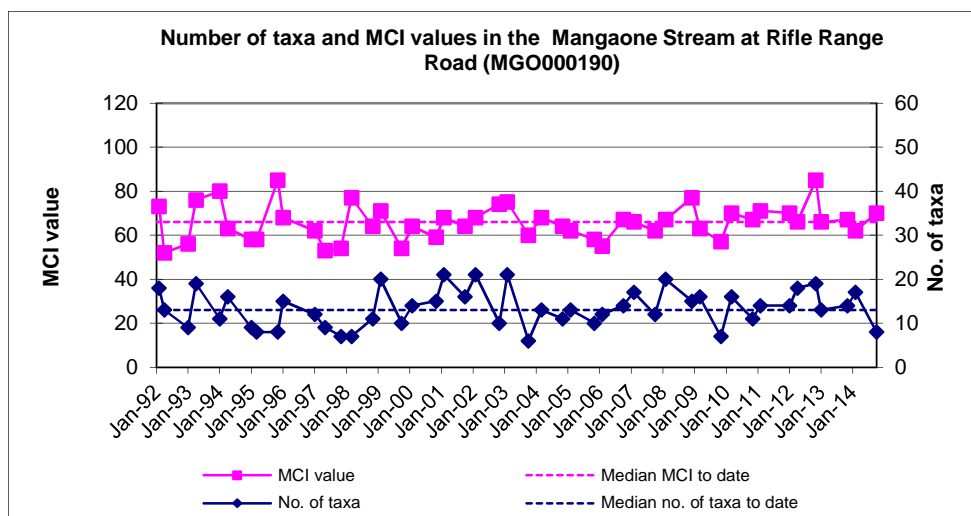
The numerical dominance by 'tolerant' taxa (particularly one snail taxon) resulted in the SQMCI<sub>5</sub> value of 3.5 units which was 1.1 units higher than the median for this site, and 0.3 unit less than the maximum of previously recorded scores at this site. This score was the same as that recorded upstream, atypical of the trend of downstream deterioration observed by most previous surveys, but this score remained indicative of poorer communities present downstream of the Puremu Stream confluence.

## Rifle Range Road (site 11)

A low taxa richness (8) was found at site 11. This richness was five taxa less than the long term median for this site (Table 2 and Figure 9), and nine taxa less than recorded by the previous summer survey. Most recent surveys have shown poorer communities possibly as a result of a combination of factors. These include occasional inundation by high flows in the adjacent Waiwhakaiho River (slowing flows which provide an unsuitable habitat for riffle-dwelling invertebrates (see BJ192) and a lack of downstream drift recruitment of typical stony habitat taxa as the majority of the upstream habitat is softer-bottomed and weedy.



Deterioration in physicochemical water quality between sites 12 and 11 may also have been a factor, as this reach, which runs through an industrial catchment, receives several stormwater discharges including localised run-off.



**Figure 8** Numbers of taxa and MCI values for Mangaone Stream at Rifle Range Road since 1992

The community was dominated by three taxa, all ‘tolerant’ taxa [extremely abundant oligochaete worms, snail (*Potamopyrgus*) and orthoclad midges]. As typically has been recorded, there was a significant contrast in dominant taxa between this site and the upstream ‘control’ site (12). In addition, there was a significant difference in taxa composition, with only four taxa (including one characteristic taxon) common to both sites from a total of 21 taxa found at these two sites (12 and 11).

The predominance (63%) of ‘tolerant’ taxa in the community was reflected in the ‘poor’ MCI score of 70 units, which was four units higher than the historical median (Table 2) and eight units higher than the score found by the previous summer survey. This was a significant (Stark, 1998) 17 units lower than the score recorded at site 12, and a one unit decrease from the score at the nearest upstream site (16).

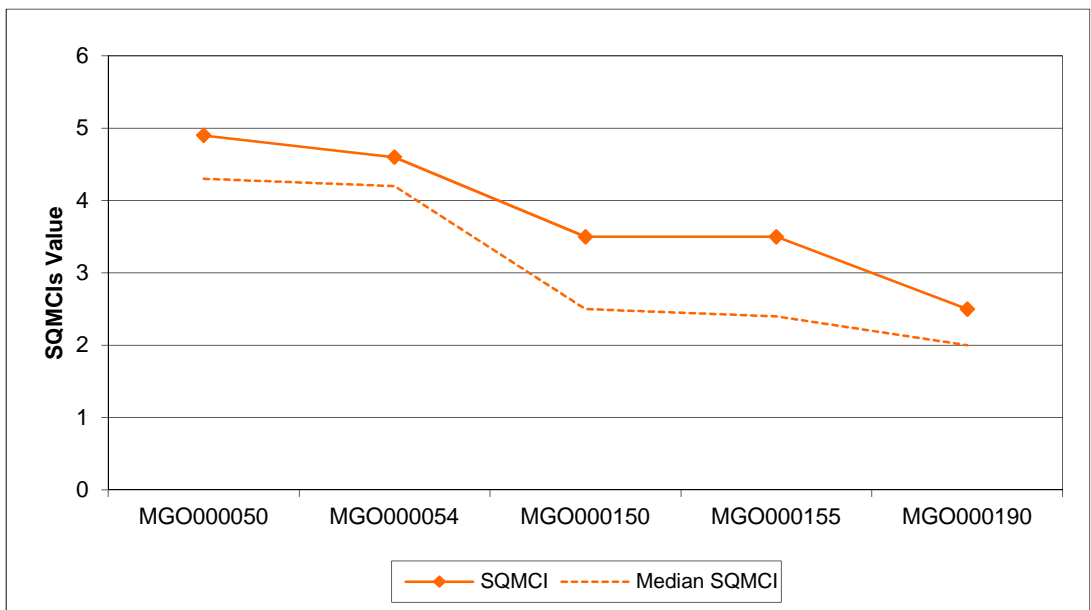
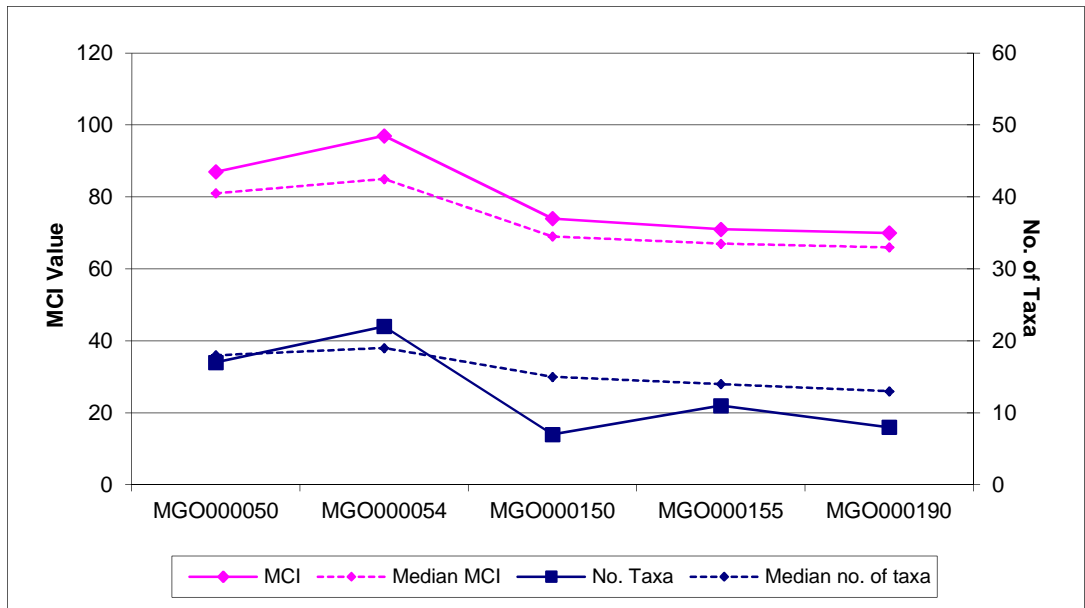
No ‘moderately sensitive’ taxa were found in abundance at site 11. Two extremely abundant ‘tolerant’ taxa and one very abundant ‘tolerant’ taxon resulted in a low SQMCI<sub>s</sub> value of 2.5 units. However, this still exceeded the long term median SQMCI<sub>s</sub> score by 0.5 unit and was within the range of previous scores. However, it was significantly lower than the SQMCI<sub>s</sub> scores recorded at the nearest upstream sites 14 and 15 by 1.0 unit.

There was significant deterioration in SQMCI<sub>s</sub> and MCI between sites 16 and 14, and more so between sites 16 and 11, which was more related to the deterioration in habitat (increase in algal substrate cover) downstream of the fertiliser depot.

## General comments

The longitudinal trends in the number of taxa, MCI and SQMCI<sub>s</sub> values along the reach of the Mangaone Stream surveyed in October 2014 are illustrated in Figure 10.





**Figure 9** Longitudinal trend in number of taxa, MCI and SQMCI<sub>s</sub> values in the Mangaone Stream for the survey of 16 October 2014

The number of taxa tended to decrease in a downstream direction, a more typical result for this stream. The highest richnesses usually have been found at the two sites in the upper reaches of the stream with site 16 recording the highest taxa richness of the current survey. The MCI was also variable, but showed a decreasing trend through the mid reaches without the recovery more recently found in the lower reaches. Site 16 showed a significant increase in MCI score from the historical median while all other sites showed scores insignificantly different from historical median scores, and more typical of biological communities found under moderate, swift to steady flow conditions in spring.

When considering changes in community structure, the SQMCI<sub>s</sub> scores (which take into account abundances within taxa, as well as their sensitivity to pollution) was found to follow a relatively similar pattern of decrease in a downstream direction, with no change between sites 14 and 15. All sites recorded SQMCI<sub>s</sub> scores higher than their historical medians, with

site 14 and site 15 recording significantly (Stark, 1998) higher SQMCI<sub>S</sub> scores; mainly due to the extreme abundance of snails amongst the extensive periphyton substrate cover vegetation at these sites.

## Summary and conclusions

The Council's standard 'kick-net' and 'sweep-net' sampling techniques were used to collect streambed macroinvertebrates at three sites in the Waiwhakaiho River and five sites in the Mangaone Stream on 16 October 2014, in order to assess whether discharges from the Lower Waiwhakaiho Industrial area had had any adverse effects on the macroinvertebrate communities of these streams. Samples were processed to provide number of taxa (richness), MCI and SQMCI<sub>S</sub> scores for each site.

The MCI is a measure of the overall sensitivity of the macroinvertebrate community to the effects of organic pollution in stony streams. It is based on the presence/absence of taxa with varying degrees of sensitivity to environmental conditions. The SQMCI<sub>S</sub> takes into account taxa abundances as well as sensitivity to pollution. It may indicate subtle changes in communities, and therefore be the more relevant index if non-organic impacts are occurring. Significant differences in either the MCI or SQMCI<sub>S</sub> between sites indicate the degree of adverse effects (if any) of the discharges being monitored.

This survey found that all Waiwhakaiho River sampling sites recorded community richnesses similar to long term medians for their respective sites, with richnesses similar between sites. In previous surveys there has been a typical downstream decrease in MCI scores between the sites. However in the current survey a slight increase in MCI scores was observed; although scores were not significantly different to one another. In addition, all sites recorded MCI scores insignificantly different from their respective medians. SQMCI<sub>S</sub> scores were slightly below their medians at site 8 and site 13, but significantly above the median at site 7. The lowest SQMCI<sub>S</sub> score was recorded at the furthest downstream site. Communities in the Waiwhakaiho River downstream of Lake Rotomanu may be inhibited from time-to-time by the variable current speeds caused by tidal flooding. These results did not indicate any significant effects of stormwater or wastewater discharges from the Fitzroy industrial area on the macroinvertebrate communities of the Waiwhakaiho River, although it is possible that the Mangaone Stream was contributing to the increased algal growth observed downstream of the confluence where there was a small decrease in the number of more 'sensitive' taxa characteristic of the community and an increase in the proportion of 'tolerant' taxa comprising the community.

It is apparent that the macroinvertebrate communities in the Mangaone Stream were of 'fair' health in the upper reaches deteriorating to 'poor' health in a downstream direction. The two most upstream sites had moderate taxa richnesses with lower taxa richness recorded at the lower three sites, particularly site 14 and site 11. MCI scores and SQMCI<sub>S</sub> scores were above medians at all sites, with a significant (Stark, 1998) increase in MCI score recorded at site 16 and significant increases in SQMCI<sub>S</sub> values recorded at site 14 and site 15. However, the five sampling sites in the Mangaone Stream showed a marked decline in MCI and SQMCI<sub>S</sub> values between Egmont Road (site 12) and Rifle Range Road (site 11), with a particularly marked decline in both SQMCI<sub>S</sub> and MCI scores between sites 16 and 14. Taranaki sawmills discharges stormwater to the Mangaone Stream between sites 16 and 14, and sediment sampling undertaken in early 2009 had recorded significant concentrations of not only tributyltin in the stream sediments around Taranaki Sawmills, but also elevated concentrations of arsenic, chromium, copper and zinc, all potentially toxic to aquatic biota (see BJ192). Previously there had been increased sedimentation between sites 16 and 14.

Further sediment sampling undertaken in April 2012 and early March 2014, showed less contamination than that recorded in 2009; more indicative of physical habitat induced effects contributing to the smaller degree of biological health deterioration found more recently. MCI and SQMCI<sub>S</sub> values between sites 14 and 15 were very similar with some deterioration occurring in the lower reaches at site 11, most likely due to poorer habitat. Increased downstream algal biomass within the stream may have been indicative of impacts from groundwater inputs from the fertiliser depot .

The degree of decline in SQMCI<sub>S</sub> values was relatively typical for this stream, although as mentioned previously all sites recorded values in excess of their respective medians. The highest MCI improvement in terms of historical data was recorded at site 16 (downstream of the Manganaha Stream confluence). This improvement was coincident with increased, more stable hard substrate and lower periphyton substrate cover.

Overall, the results from the current survey indicated some improvements in comparison with historical results. It appears that in general the degree of sediment contamination in the Mangaone Stream downstream of the Taranaki Sawmills discharge has reduced, although a gradual deterioration in downstream biological health was found by the current survey. Groundwater inputs may have contributed to some of this deterioration recorded immediately downstream of the fertiliser depot in the lower reaches of the stream.

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## **Appendix IV**

### **Rule 23 of the Regional Freshwater Plan for Taranaki (permitted stormwater rule)**





## Discharge of stormwater

Activity	Rule	Standards/Terms/Conditions	Classification	Notification	Control/Discretion	Policy Reference
<p>Discharge of stormwater into or onto land or into water (excluding those wetlands listed in Appendix II) that is not provided for by Rules 25-27</p>	<p>23</p>	<ul style="list-style-type: none"> <li>• The discharge shall not originate from any industrial or trade premise where the active area of the site is greater than 0.5 ha, unless there is an interceptor system in place that is designed and managed so that it will keep stormwater from entraining contaminants;</li> <li>• The discharge shall not originate from any industrial or trade premise where hazardous substances are used, stored or potentially spilt unless:               <ul style="list-style-type: none"> <li>(i) there is an interceptor system in place that is designed and managed so that it will keep stormwater from entraining contaminants; or</li> <li>(ii) there is an interceptor system in place that is designed and managed so that it is capable of capturing contaminated stormwater and either diverting it to trade waste or containing it and/or removing or reducing the contaminants such that:                   <ul style="list-style-type: none"> <li>- any spills can be recovered;</li> <li>- the discharge shall not contain any persistent or bioaccumulative substances;</li> <li>- the discharge shall not breach any other specified condition of this rule;</li> </ul>                   and a spill contingency and interceptor system maintenance plan is maintained and regularly updated for the site;                 </li> </ul> </li> <li>• The discharge shall not originate from any industrial or trade premises where the movement of rock, earth or other soil material is taking place, unless that movement is being undertaken in connection with site landscaping, or the installation, construction, maintenance or demolition of buildings, structures or equipment;</li> <li>• The discharge shall not be greater than is able to be discharged from a pipe of 900 mm in diameter;</li> </ul>	<p>Permitted</p>			

## Discharge of stormwater (continued)

Activity	Rule	Standards/Terms/Conditions	Classification	Notification	Control/Discretion	Policy Reference												
		<ul style="list-style-type: none"> <li>• The discharge shall not cause significant erosion, scour or deposition;</li> <li>• Discharge that will, or is liable to enter surface water, shall not exceed the following:               <table style="margin-left: 20px; border: none;"> <tr> <td style="padding-right: 10px;">pH</td> <td>6.0-9.0</td> </tr> <tr> <td>oil and grease</td> <td>15 gm<sup>-3</sup></td> </tr> <tr> <td>suspended solids</td> <td>100 gm<sup>-3</sup></td> </tr> <tr> <td>BOD</td> <td>5 gm<sup>-3</sup></td> </tr> <tr> <td>unionised ammonia</td> <td>0.025 gm<sup>-3</sup></td> </tr> <tr> <td>free chlorine</td> <td>0.2 gm<sup>-3</sup></td> </tr> </table> </li> <li>• The discharge shall not give rise to any of the following effects in receiving waters after reasonable mixing:               <ul style="list-style-type: none"> <li>(a) the production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials;</li> <li>(b) any conspicuous change in the colour or visual clarity;</li> <li>(c) any emission of objectionable odour;</li> <li>(d) the rendering of fresh water unsuitable for consumption by farm animals;</li> <li>(e) any significant adverse effects on aquatic life.</li> </ul> </li> </ul>	pH	6.0-9.0	oil and grease	15 gm <sup>-3</sup>	suspended solids	100 gm <sup>-3</sup>	BOD	5 gm <sup>-3</sup>	unionised ammonia	0.025 gm <sup>-3</sup>	free chlorine	0.2 gm <sup>-3</sup>	Permitted			
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free chlorine	0.2 gm <sup>-3</sup>																	

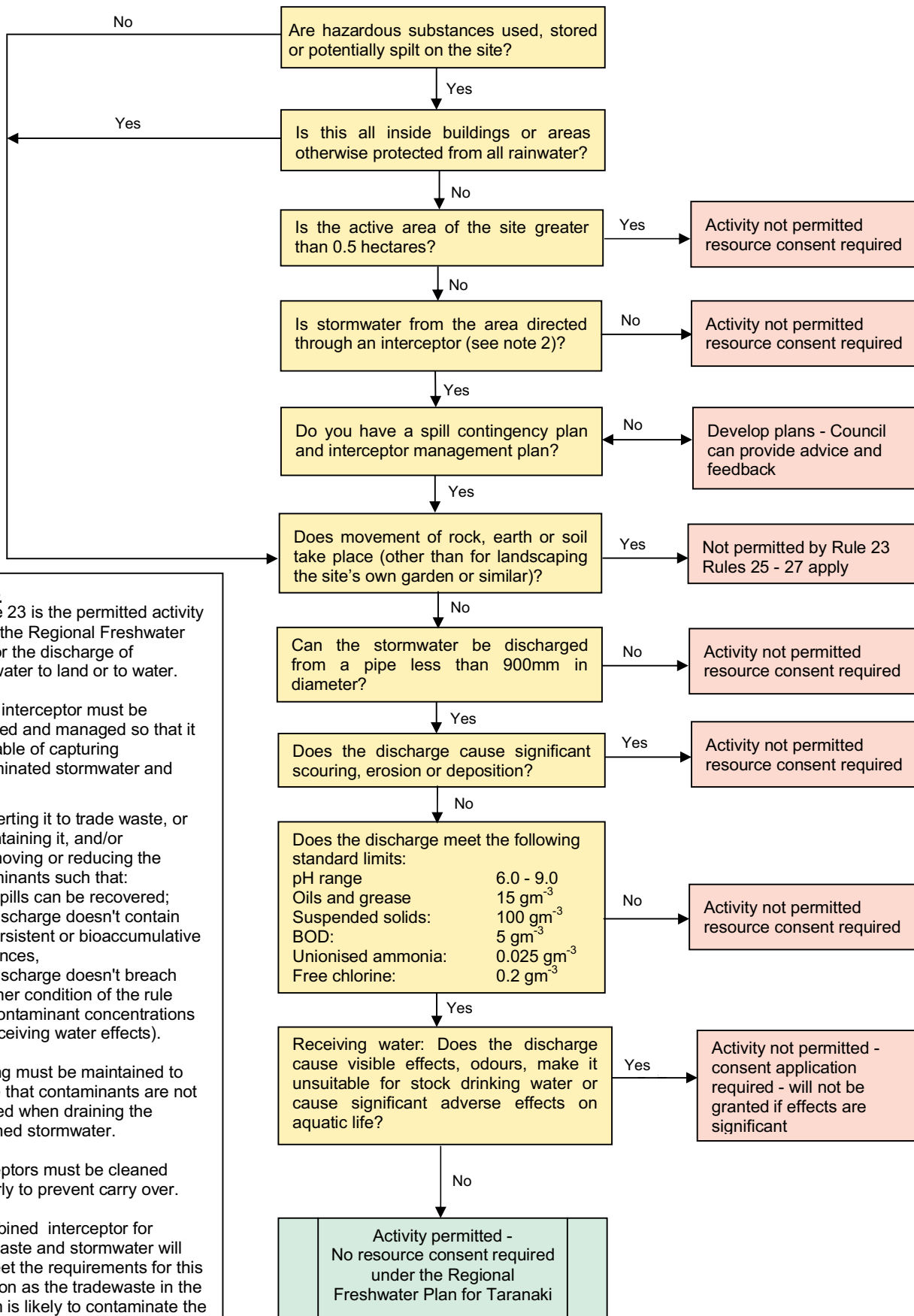
## Explanation

Rule 23 provides for the large number of stormwater discharges that have no or only minor adverse effects on the environment. A resource consent is not required for stormwater discharges to either land or water so long as the discharge can comply with the conditions of this rule. The first condition restricts discharges from industrial or trade that are over 0.5 hectares in area, unless the site has a means of ensuring that stormwater will not be contaminated [a roofed site is a good example of this]. The reference to the 'active area' of the site refers to that part of the site where industrial and trade activity is taking place, including areas on site where goods, products, hazardous substances or other materials are stored, used or potentially split, but does not include areas that are grassed; landscaped; or roofed; or carparks which are used exclusively for non-goods vehicles.

Any sites storing and/or using hazardous substances must either ensure that the stormwater cannot be contaminated [for example is the site is roofed] or that an interceptor system is designed and managed so that contaminated stormwater is diverted to trade waste or captured and contained and/or treated so that the contamination is removed and reduced. In this regard the bunding of hazardous substances and the capture and treatment of stormwater would enable the discharge of stormwater from sites under 0.5 hectares to be a permitted activity. The condition also requires that a contingency plan be maintained and regularly updated for the site.

The third condition restricts the discharge of stormwater from any industrial and trade premises where the movement of rock and other earth material is taking place, other than the types of minor works outlined in the condition. This is consistent with other rules in the Plan relating to stormwater discharges from soil disturbance activities.

Rule 23 also contains conditions relating to the receiving environment to ensure that adverse effects are avoided, remedied or mitigated. Conditions relate to both water quality [by specifying discharge limits and receiving water effects] and the quantity of water that is being discharged [to avoid erosion, scour or deposition].



**Notes**

1. Rule 23 is the permitted activity rule in the Regional Freshwater Plan for the discharge of stormwater to land or to water.

2. The interceptor must be designed and managed so that it is capable of capturing contaminated stormwater and either:

- (a) diverting it to trade waste, or
- (b) containing it, and/or
- (c) removing or reducing the contaminants such that:
  - any spills can be recovered;
  - the discharge doesn't contain any persistent or bioaccumulative substances,
  - the discharge doesn't breach any other condition of the rule (e.g. contaminant concentrations and receiving water effects).

Bunding must be maintained to ensure that contaminants are not released when draining the contained stormwater.

Interceptors must be cleaned regularly to prevent carry over.

A combined interceptor for tradewaste and stormwater will not meet the requirements for this condition as the tradewaste in the system is likely to contaminate the stormwater.