

Mangati Catchment
Joint Monitoring Programme
Biennial Report
2012-2014
Technical Report 2014-127

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Executive summary

This report is the Biennial Report for the period July 2012 to June 2014 by the Taranaki Regional Council (the Council) describing the monitoring programme associated with seventeen industries within the catchment of the Mangati Stream, Bell Block.

The Mangati catchment has, in the past, been heavily utilised for the disposal of stormwater and wastewaters from a large number of industrial sites. As a consequence of inadequate treatment and management of discharges and minimal dilution capacity in the past, the water quality and aquatic ecosystems of the stream were significantly impacted. The Mangati Stream catchment is listed in the Regional Freshwater Plan for Taranaki (Appendix 1B) as having been identified for enhancement of natural, ecological and amenity values, and life supporting capacity. The Council has addressed this by requiring consents for discharges from every industrial site within the catchment that has significant potential for contamination. A combined monitoring programme has been implemented by Council to monitor these discharges, and since the 2002-2003 year a holistic approach has been applied to the monitoring of abstractions and discharges to all media.

During the 2012-2014 monitoring period a total of one water abstraction consent, 17 non agricultural water discharge consents, six air discharge consents¹ and one discharge to land consent were held by industries in this catchment. Applications were received to renew seven consents, three renewed consents were granted, and one consent review was commenced by Council. This report covers the results and findings during this monitoring period for these 25 consents, which contain a total of up to 259 special conditions that the consent holders must satisfy. It represents the seventeenth report produced by Council to cover water discharges by industries within the catchment and their effects, and is the ninth combined report to cover abstractions and discharges to all media.

Monitoring during the years under review included 136 site inspections, discussions with site operators over site management, 180 samples from chemical surveys of discharges and the receiving water, sediment sampling, macroinvertebrate and fish biomonitoring in the Mangati Stream, deposited, point source and ambient particulate monitoring and odour surveys. A number of modifications to processes or wastewater treatment have been instituted by site operators as a result of Council's investigations and requirements for remedial action to avoid, remedy or mitigate adverse environmental effects. Connections to trade waste sewer have also been made at several sites.

Monitoring in the 2012-2014 period found that, on the whole, the quality of most of the discharges is improving, as is the environmental performance and compliance with consent conditions for the consent holders in the catchment. There are, however some discharges that need further improvement and during the period under review, two companies were deemed to have demonstrated poor environmental performance.

ABB Limited (Transformer Division), Conveyorquip Engineering Services Limited, MI New Zealand Limited, Vector/Natural Gas Corporation of New Zealand Limited, New Plymouth District Council, Schlumberger Seaco Limited, and W Abrahams Limited demonstrated a high level of environmental and high level of administrative performance and compliance

¹ Additionally, McKechnie Aluminium Solutions Limited (formerly MCK Metals Pacific Limited) holds an air discharge permit that is reported on in combination with the Company's discharge to the Mangaone Stream. For the 2012-2013 and 2013-2014 years, see TRC Technical Reports 2013-91 and 2014-68).

with resource consents as defined in Section 1.1.4 of this report. However, in the case of Conveyorquip, compliance with a number of the conditions of the consent could not be assessed during blasting due to the low level of activities at the site.

During the year, McKechnie Aluminium Solutions Limited demonstrated a high level of environmental and good level of administrative performance and compliance with the resource consents as defined in Section 1.1.4. During the period under review there was one exceedance of the oil and grease limit on the consent and there was one spill to ground as a result of a bung being removed from a bund. No adverse environmental effects were found as a result of either of these matters.

During the year, Olex New Zealand Limited – A Nexans Company demonstrated a high level of environmental, but an improvement was required in relation to their level of administrative performance and compliance with the resource consents as defined in Section 1.1.4. During the period under review it was identified that there were discharges occurring to the stormwater system, the potential effects of which had not been adequately addressed at the time of the consent application in 2008, and there was the outstanding matter of clarifications requested in this consent holder's stormwater management plan. It is however noted, that all process and cooling water discharges were diverted to sewer during the period under review.

During the year, OMV New Zealand Limited demonstrated a high level of environmental performance and compliance with the resource consents as defined in Section 1.1.4. However improvement was required with regards to the level of administrative performance due to the then overdue stormwater management plan, which although not provided after the consent transfer in December 2014, has now been received and accepted.

During the year, the Tegel Foods Limited (feed mill) demonstrated a high level of environmental performance but an improvement was required in their level of administrative performance and compliance with the resource consents as defined in Section 1.1.4. During the period under review there was one non-compliance with this consent holder's stormwater consent, however, there were no resultant adverse effects. A performance based improvement plan due 1 April 2014 was not provided during the period under review and an abatement notice was issued early in the 2014-2015 year, which was complied with.

An improvement in Greymouth Petroleum Acquisitions Company Limited's environmental performance is required, but this consent holder demonstrated a high level of administrative performance and compliance with the resource consents as defined in Section 1.1.4. During the period under review both stormwater samples collected exceeded resource consent limits for suspended solids. The suspended solids concentration of the discharge has been an issue for a number of years, and it was hoped that improvements undertaken during the 2011-2012 year would have resolved the issue. This was not the case and further improvement was required.

An improvement in Halliburton New Zealand Limited's environmental performance is required, but this consent holder demonstrated a good level of administrative performance and compliance with the resource consents as defined in Section 1.1.4. During the period under review there were on-going issues with sediment control at the site that resulted in two non-compliant stormwater discharges and the issuing of an abatement notice. It is

however noted that the abatement notice was found to have been complied with on 1 July 2014.

An improvement in Tasman Oil Tools Limited's environmental performance is required, and this consent holder demonstrated a good level of administrative performance and compliance with the resource consents as defined in Section 1.1.4. During the period under review all three stormwater samples collected exceeded resource consent limits for suspended solids, and the suspended solids concentration of the discharge was also found to be an issue in the 2011-2012 year. An initial request was made for works to be undertaken in November 2013. It was found that works had not been undertaken in March 2014, however this request had been complied with by the inspection on 1 July 2014.

An improvement in BLM Feeds Limited's environmental and administrative performance (as defined in Section 1.1.4) is required. During the period under review there were on-going issues with tracking from the dry goods storage shed entering the stormwater drains, and the requested updated stormwater management and contingency plans were not received.

During the year, Hooker Bros Investments Limited (Hookers) demonstrated a poor level of environmental performance and improvement was required in their level of administrative performance and compliance with the resource consents as defined in Section 1.1.4. There were a number of breaches of this consent holder's biochemical oxygen demand limit, which on one occasion resulted in the issuing of an infringement notice. In terms of Hookers' administrative performance, as highlighted in the previous Annual Report, this consent holder's stormwater plan is overdue for review, and the site contingency planning/actions did not prevent the discharge of molasses when work was undertaken on the storage facility.

Overall, during the period under review, Tegel Foods Limited (poultry processing plant) demonstrated a poor level of environmental performance and improvement was required in the level of administrative performance and compliance with the resource consents as defined in Section 1.1.4. In relation to the discharges to water, there were a number of waste water discharges found that were not compliant with the Regional Freshwater Plan or consent limits, some of which should have been identified by this consent holder when following the site stormwater management plan. An infringement notice was issued as a result. An abatement notice was issued early in the 2014-2015 year as a result of non-provision of information required by special conditions of the consent during the period under review. In relation to discharges to air, there was a non-compliance with special conditions on the consent that resulted in off site odours.

Overall, a good level of environmental performance was achieved by the consent holders in the industrial area of the Mangati Stream catchment.

Historically, chemical and biological monitoring results for the Mangati catchment have shown there to be a two-stage reduction in water quality, one below the main stormwater outlet from Tegel Foods poultry processing plant, the other below the industrial drain which joins the stream at the main highway. During the period under review, only a small reduction in the water quality of the stream was observed, on occasion, downstream of the main industrial discharges, although a reduction in water quality was also observed, on occasion, downstream of the De Havilland Drive and combined Tasman Oil Tools/Greymouth Petroleum stormwater discharges.

Recent biomonitoring surveys had shown a recovery in the reach below Tegel Foods, and above the wetland pond 3 discharge. The results of the biological surveys of the Mangati Stream in 2004-2007 periods indicated that the macroinvertebrate communities in the stream had generally higher numbers of taxa than most past surveys, particularly in the lower part of the catchment. There had been small, but positive trends in relation to the condition of the lower stream following the installation of wetlands treatment in the mid reaches of the stream. During the years under review the biomonitoring surveys concluded that there were no effects due to the discharges upstream of Connett Road. It was found that, although there had been some improvement in the macroinvertebrate communities downstream of the wetland discharges since the discharge of washdown water from BLM Feeds Limited had stopped (late 2010), the results still indicated that there may have been a subtle impact from the wetland pond 3 discharge on three of the four surveys.

Overall MCI and SQMCI_s scores indicated that the stream communities were of poor health, but generally typical of the condition recorded in similar Taranaki streams. Although 66 % of the MCI results fell into the “poor” category, 34 % were within the “fair” range. In the October 2012 survey, the MCI score indicated “fair” water quality at the sampling site below the pond 3 discharge for the second time. It is also noted that 12 of the 32 MCI scores recorded were similar to or above the respective historical maximum MCI scores, with new maximums being recorded for five of the biomonitoring sites.

All but 9 % of the SQMCI scores were above their respective medians.

Although this assessment is very general, and does not look at other influencing factors such as seasons, it illustrates that in general the MCI and SQMCI_s scores had not deteriorated, and appeared to be improving.

Statistical analysis of the macroinvertebrate data for the Te Rima Place monitoring site (MGT000520), as reported in the Fresh Water Macroinvertebrate Fauna Biological Monitoring Programme Annual State of the Environment Monitoring Reports for 2012-2013 and 2013-2014, have found that the trend in MCI scores indicated continued improvement coincident with better control and treatment of industrial point source discharges in the upper and mid-catchment and wetland installation in mid catchment. This improvement has continued in recent years. The MCI scores were indicative that the shift from ‘very poor’ to ‘poor’ generic stream health has been maintained during these periods. This trend of improvement in stream ‘health’ at this site is much more pronounced than the trend at the site 1.5 km upstream. This indicates that improvements in the activities in the catchment between these two sites have had a significant beneficial influence, with the rate of decline per kilometre between the monitoring sites being below the historical average rate during three of the four surveys undertaken during the years under review.

The fish survey found that there were a relatively high number of fish found, but that the species diversity was low. It is, however, significant to note that during this current survey a 250 mm giant kokopu was found. The presence of this giant kokopu indicated that preceding water quality immediately below the wetland and industrial drain bypass had been sufficient to support this fish, which was likely to be a number of years old.

In recent years the results tracking the overall quality of the stormwater discharged via the industrial drain and wetlands has indicated improvement, particularly in respect of lower concentrations of zinc and copper. In 2012-2014, this was again generally reflected in

relatively low levels for both the acid soluble and dissolved metals, biochemical oxygen demand, chemical oxygen demand, dissolved reactive phosphorus and turbidity.

In contrast it was found that the acid soluble copper, and acid soluble and dissolved zinc, in the discharge to the stream from the tributary below the pipe yards was above median at the time of all three wet weather surveys.

Monitoring of the air discharges within the industrial area found that, with the exception of the Tegel poultry processing plant (as outlined above) the companies were effectively managing this aspect of their environmental performance.

There were a total of 17 substantiated unauthorised incidents recorded during the period under review, 14 of which were related to the consented companies monitored under this catchment programme.

For reference, in the 2012-2013 year, 35% 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 59% demonstrated a good level of environmental performance and compliance with their consents. In the 2013-2014 year, 60% of consent holders achieved a high level of environmental performance and compliance with their consents, while another 29% demonstrated a good level of environmental performance and compliance.

This report includes recommendations for the 2014-2015 year.

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1. Introduction

1.1 Compliance monitoring programme reports and the Resource Management Act 1991

1.1.1 Introduction

This report is the Biennial Report for the period July 2012 to June 2014 by the Taranaki Regional Council (the Council) on the monitoring programme associated with 25 resource consents held by companies within the Mangati catchment. It is the seventeenth report on the Mangati Stream Catchment Joint Monitoring Programme.

This report covers the results and findings of the monitoring programme implemented by the Council in respect of the consents held by the companies that relate to abstractions and discharges of water within the Mangati catchment, and the air discharge permits held by the companies to cover emissions to air from the sites.

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 has been integrating its environmental monitoring programmes and reporting the results of the programmes jointly. Therefore since June 2002, a combined approach has been applied to the monitoring and reporting of the non-agricultural discharges in this industrial area of Bell Block across all media. This report discusses the environmental effects of the companies' use of both water and air, and is ninth combined annual report by the Council for the industries in the Mangati catchment.

The Mangati Stream has a narrow catchment that runs from south to north in the lowland between the Waiwhakaiho and Waiongana River systems (Figure 1). The total catchment area is approximately 6.1 km². The length of the catchment, from the headwaters between Paraita and Corbett Roads to the sea at Bell Block beach, is approximately 5 km.

The industrial area at Bell Block is situated mid-catchment predominantly on the western side of the stream. Upstream, land use is pastoral and horticultural. Downstream, the Mangati flows through the residential area of Bell Block. The Mangati Reserve, with its popular well maintained walkway, borders the stream immediately below the industrial area (Photo 1). The beach at the mouth of the stream is also a popular recreational area (Photo 2).

The Mangati Stream has been the subject of numerous pollution incidents in past years, the large majority of which have related to water discharges from the industrial area. More than 150 unauthorised discharges have been investigated and reported on since 1986, three of which involved major fish kills.

The Council's response to the continued pollution of the Mangati Stream has been to require licensing of discharges of wastewater or stormwater from sites where there is the potential for contamination to occur. Thus, the Mangati Stream Catchment Monitoring Programme was implemented to ensure compliance with these consents and to determine the effects of the discharges on the water quality and biota of the stream.



Photo 1 Mangati Reserve at Parklands Avenue



Photo 2 Mangati Stream at the Coast

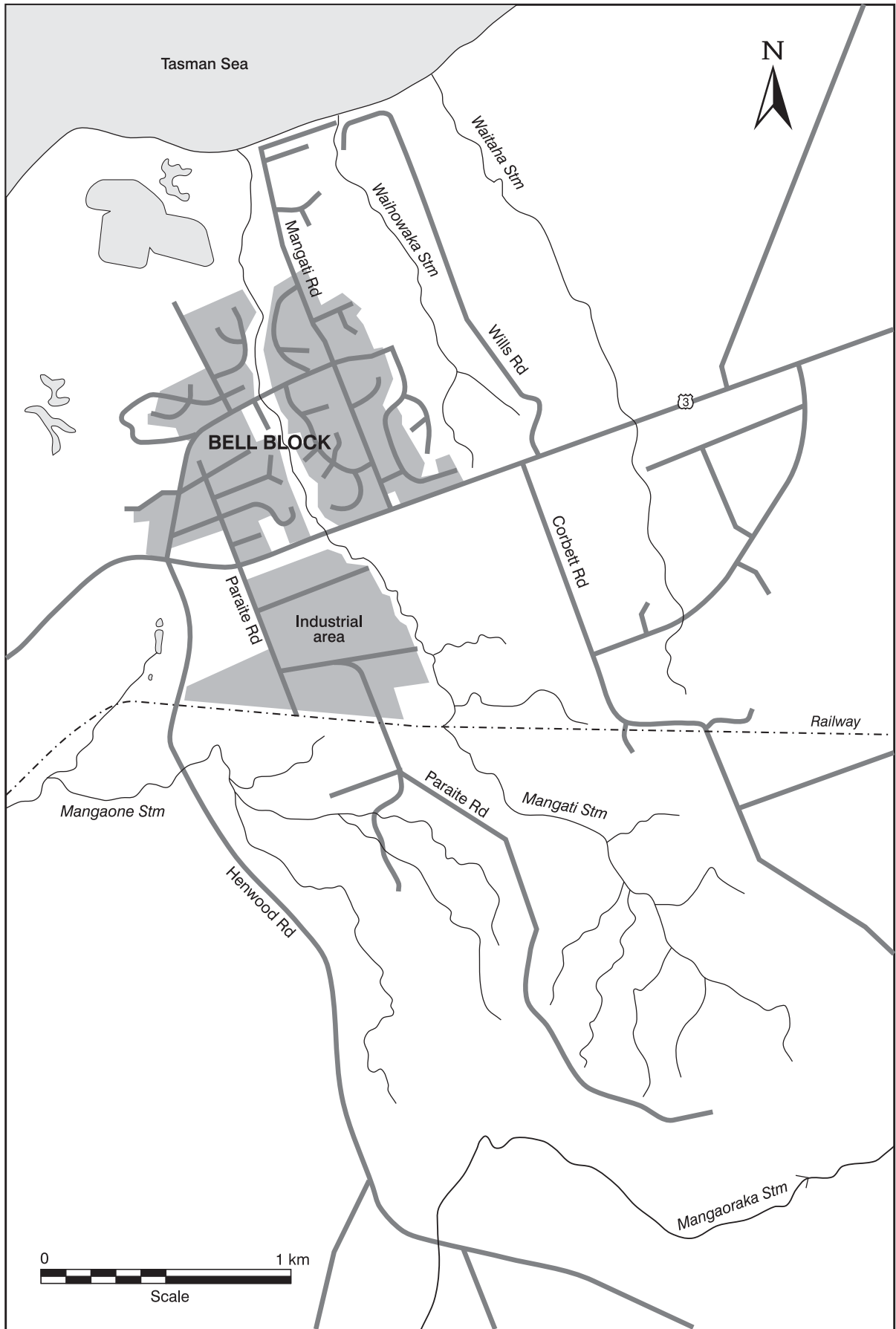


Figure 1 Mangati catchment

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, a summary of the resource consents held by companies in the Mangati catchment, and the nature of the monitoring programme in place for the period under review. Aerial photographs and maps showing the location of the industries, their discharges and the Council's monitoring sites are also provided. Each company's activity is then discussed in detail in a separate section (sections 2 to 17).

In each subsection 1 (e.g. section 2.1) there is a general description of the industrial activity and its discharges, and an outline of the matters covered by the company's permit/s.

Subsection 2 presents the results of monitoring of the company's activities during the period under review, including scientific and technical data, and any information on the Council's Register of Incidents.

Subsection 3 discusses the results, their interpretations, and their significance for the environment in the immediate vicinity of the site under discussion.

Subsection 4 presents recommendations to be implemented in the 2014-2015 monitoring year.

Section 19 presents the findings of inspections carried out at sites in the industrial area of the Mangati catchment that do not hold consents as they are permitted activities under the rules of the regional plans.

Section 20 presents a summary of the information on file about unauthorised incidents logged on the Council's database in the Mangati catchment, or relating to the region wide mobile abrasive blasting consent that is monitored under this programme.

Section 21 presents information relating to monitoring of the combined discharges to the New Plymouth District Council wetland, and to the Mangati Stream. There is a discussion of the results, their interpretation, and their significance for the environment.

Section 22 discusses the results of the monitoring of the Mangati Stream, their interpretation and their significance.

Section 23 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 a discharger, 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 (for example, 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 discharge source. 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 performance of resource users and consent holders. Compliance monitoring, including both activity and impact monitoring, enables the Council to continually re-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 Evaluation of environmental and administrative performance

Besides discussing the various details of the performance and extent of compliance by the consent holders 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 the 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 (i.e. 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 compliance

- **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 2012-2013 year, 35% 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 59% demonstrated a good level of environmental performance and compliance with their consents. In the 2013-2014 year, 60% of consent holders achieved a high level of environmental performance and compliance with their consents, while another 29% demonstrated a good level of environmental performance and compliance.

1.1.5 Investigations, interventions, and incidents

The monitoring programme for the period under review was based on what was considered to be an appropriate level of monitoring, review of data, and liaison with the consent holders. 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 Unauthorised Incident Register (UIR) 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).

1.2 Resource consents

The resource consents covered by the Mangati Joint Monitoring Programme are outlined in Table 1 and their locations are shown in Figure 2 and Figure 3. The programme covered 25 consents during the 2012-2014 monitoring period. Seventeen consents license discharges to water (twelve via the NPDC ponds); six are for discharges to air; one is for a discharge to land and one is to take and use groundwater. There are a small number of other consented discharges in the catchment, such as agricultural discharges, which are not covered directly by this monitoring programme. Outlines of the companies' activities and the special conditions on their consents are presented in later sections, and copies of the full consents are given in alphabetical order in Appendix I.

Table 1 Resource consents in the Mangati catchment covered by this report

Consent holder	Resource consent	Purpose	Next review date	Expiry date
ABB Limited (Transformer Division)	2336-3	To discharge stormwater from a transformer manufacturing site into the Mangati Stream	June 2020	1 June 2026
	5435-1	To discharge emissions into the air from dry steel grit blasting processes and associated activities. [Renewal application lodged 22 November 2013]	-	1 June 2014
BLM Feeds Limited	7707-1	To discharge stormwater into the Mangati Stream	June 2020	1 June 2026
Conveyorquip Engineering Services Limited	5964-1	To discharge emissions into the air from a mobile abrasive blasting unit and associated processes at various locations within the Taranaki region and from a permanent abrasive blasting site at Connett Road, Bell Block [Consent surrendered 27 August 2014]	-	1 June 2020
Greymouth Petroleum Acquisitions Company Limited	4664-3	To discharge treated stormwater from a pipeyard used for the cleaning and storage of casing and drilling equipment, and the storage of hazardous substances, onto and into land in circumstances where it may enter the Mangati Stream	June 2020	1 June 2026
Halliburton New Zealand Limited	2337-3	To discharge stormwater from an industrial site, used for an oil field service operation, into the Mangati Stream	June 2020	1 June 2026
Hooker Bros Investments Limited [Name change to TIL Freighting Limited on 11 December 2014]	6952-1 ²	To discharge stormwater from a truck depot into and onto land in the vicinity of the Mangaone Stream in the Waiwhakaiho catchment	-	1 June 2020
	7578-1	To discharge stormwater from a truck depot into the Mangati Stream	June 2020	1 June 2026
McKechnie Aluminium Solutions Limited	3139-3	To discharge stormwater (including cooling water) from an industrial site into an unnamed tributary of the Mangati Stream	June 2020	1 June 2026
MI New Zealand Limited	5987-1	To discharge treated stormwater from a synthetic liquid mud plant and storage site into the Mangati Stream [Transferred to Schlumberger Seaco Inc on 13 May 2014]	-	1 June 2020
New Plymouth District Council	4302-2	To discharge up to 5200 litres/second of stormwater from industrial sealed areas and roofs through piped stormwater systems into the Mangati Stream	-	1 June 2020

² This consent is for a discharge to land in the Waiwhakaiho catchment, however as part of the Hooker Bros site is in the Mangati catchment, and monitoring of consent 6952 is inspection focused, it is more cost efficient to include this consent in the Mangati Catchment Monitoring Programme.

Consent holder	Resource consent	Purpose	Next review date	Expiry date
Olex New Zealand Limited	4497-3	To discharge stormwater and cooling water from an electric wire and cable manufacturing site into the Mangati Stream	June 2020	1 June 2026
	5417-1	To discharge emissions into the air from an electric wire and cable manufacturing plant and associated activities [Renewal application lodged 4 November 2013]	-	1 June 2014
OMV New Zealand Limited [Previously held by Shaycar Trust]	3913-2	To discharge up to 125 litres/second of treated stormwater from a transport depot into an unnamed tributary of the Mangati Stream [Consent transferred on 17 December 2013] [Renewal application lodged 26 February 2014]	-	1 June 2014
Schlumberger Seaco Incorporated [Name change to Schlumberger New Zealand Limited on 10 December 2014]	6032-1	To discharge treated washwater and stormwater from a storage and maintenance premises for oil field exploration equipment into the Mangati Stream	-	1 June 2020
Tasman Oil Tools Limited	4812-2	To discharge up to 112 litres/second of stormwater including washdown water from a storage and maintenance yard for oil field drilling equipment into an unnamed tributary of the Mangati Stream	-	1 June 2020
Tegel Foods Limited (Poultry Processing Plant) - Feed mill site	2335-4	To discharge stormwater from a stock/poultry feed manufacturing site to the New Plymouth District Council stormwater drainage network [Renewed consent granted 12 February 2014]	June 2017	1 June 2026
	4038-6	To discharge emissions into the air from the milling and blending of grain and/or animal meals together with associated activities	-	1 June 2020

Consent holder	Resource consent	Purpose	Next review date	Expiry date
Tegel Foods Limited (Poultry Plant)	3470-4	To discharge stormwater from a poultry processing plant site to the New Plymouth District Council drainage network [Renewed consent granted 23 December 2013]	June 2017	1 June 2026
	4026-2 4026-3	To discharge emissions into the air from the processing of animal matter and associated processes [Renewal application lodged 27 February 2014] [Renewed consent granted 16 June 2014]	-	1 June 2032
	5494-1	To discharge poultry processing wastes by burial into land in the vicinity of the Mangati Stream in emergency circumstances only [Renewal application lodged 27 February 2014]	-	1 June 2014
	6357-1	To take and use groundwater from a bore for food processing and washdown purposes	June 2020	1 June 2038
	7389-1	To discharge stormwater from a poultry processing plant via a wetland into the Mangati Stream	-	1 June 2026
Vector Gas Limited [Name change from Natural Gas Corporation of New Zealand Limited]	4780-1	To discharge up to 608 litres/second of stormwater from an administration site into the Mangati Stream [Renewal application lodged 28 February 2014]	-	1 June 2014
W Abraham Limited	7147-1	To discharge emissions into the air from the operation of a crematorium including a natural gas-fired cremator [Renewal application lodged 13 September 2013]	-	1 June 2014

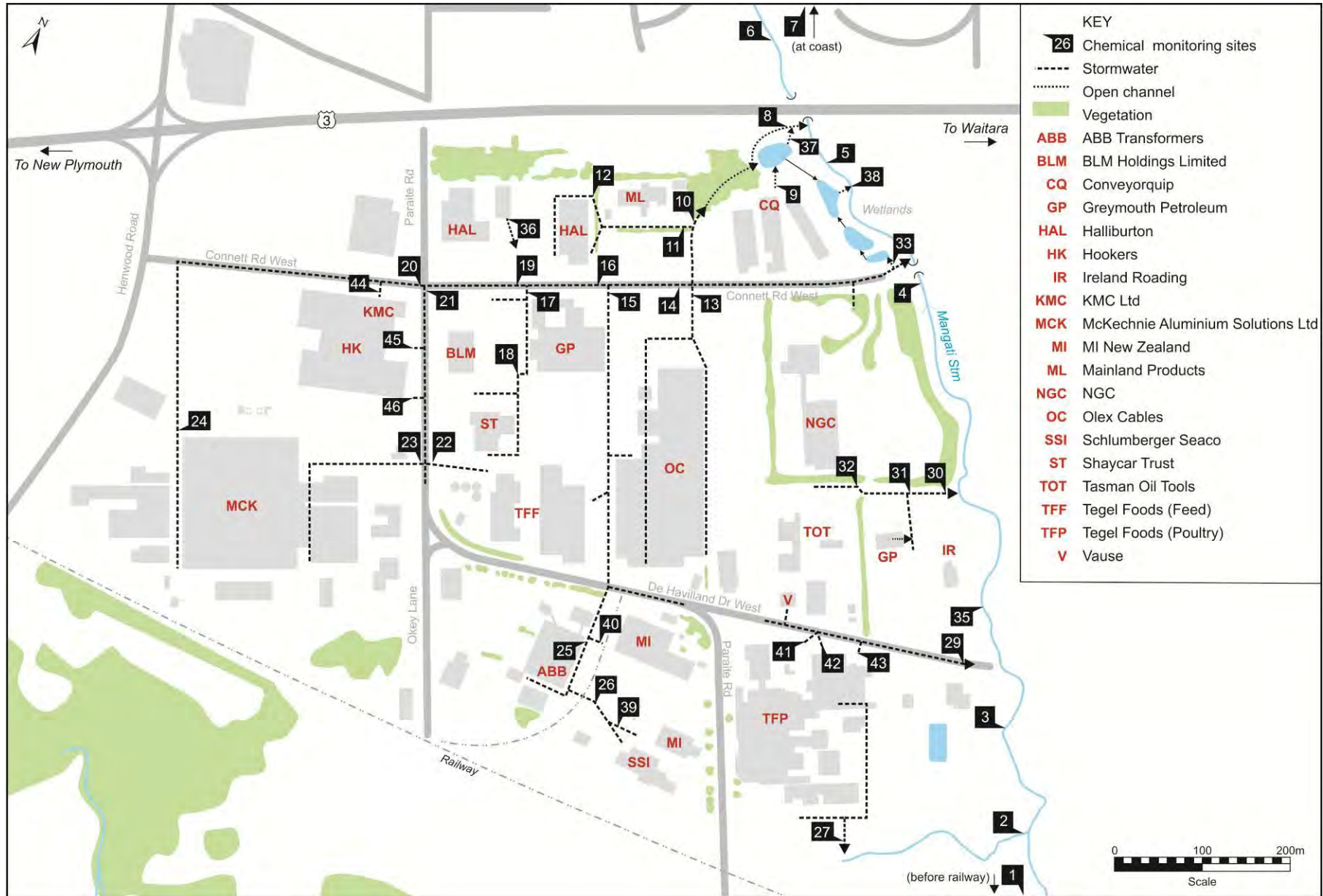


Figure 2 Stormwater drainage systems in the industrial area of Mangati catchment

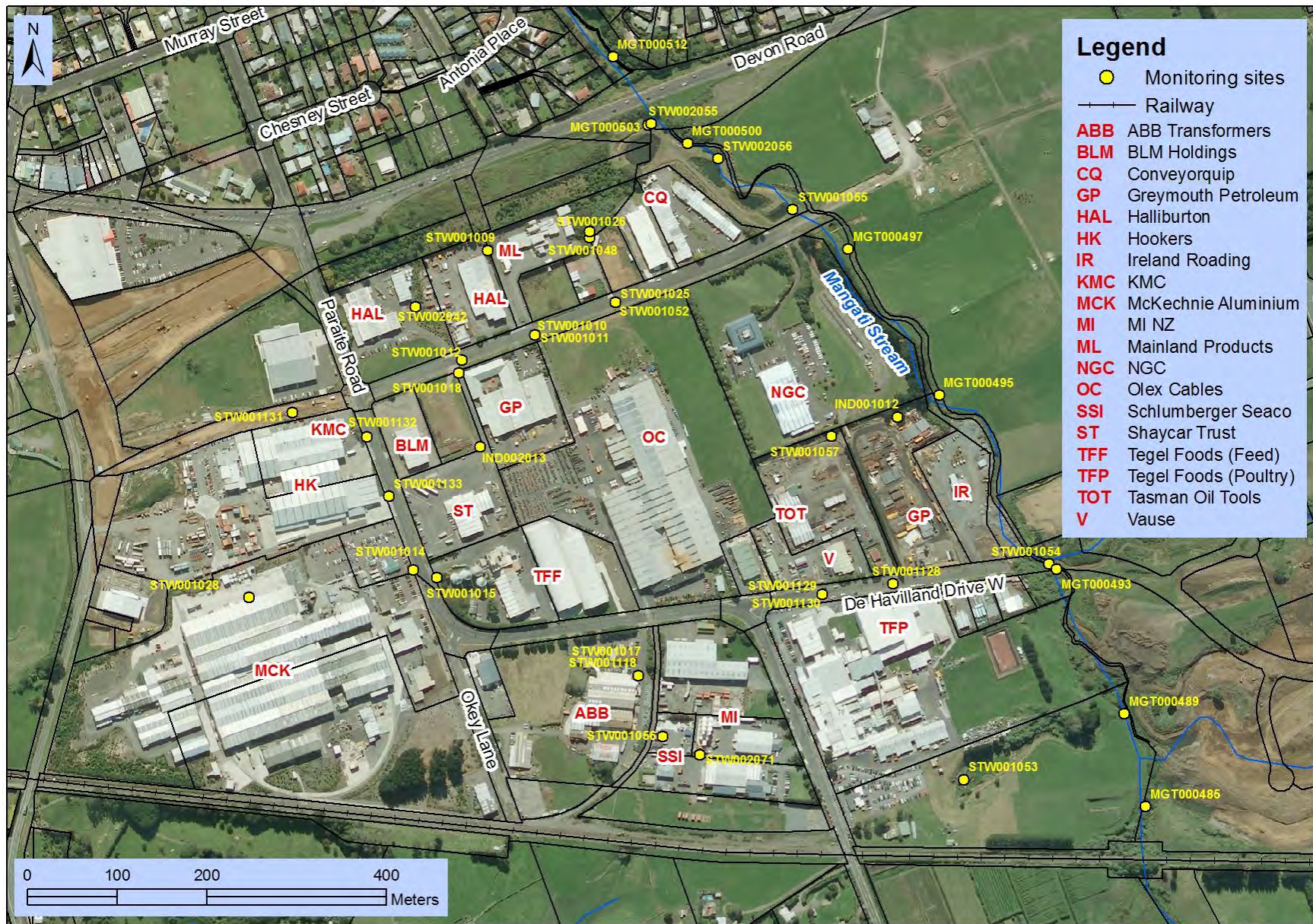


Figure 3 Location of consent holders and surface water monitoring sites

1.3 Monitoring programme

1.3.1 Introduction

Section 35 of the RMA sets out obligations for 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 for the industries in the Mangati catchment consisted of six primary components, with additional un-programmed sediment sampling being undertaken as part of an investigation (Section 11.2.3).

1.3.2 Programme liaison and management

There is generally a significant investment of time and resources by the 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 inspected during the monitoring period for compliance with any relevant consent conditions, and potential for unauthorised discharge. With regard to consents for the abstraction of or 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. Areas where chemicals or products are stored or transferred are also given particular attention. Air inspections focused on plant processes with associated actual and potential emission sources and characteristics, including potential odour, dust, noxious or offensive emissions. 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 surveyed for environmental effects.

The programmed frequency of inspection varies depending on the type of activity at the site, the outcome of previous inspections, and the stage of any investigation of unauthorised discharges of contaminants.

During the 2012-2014 monitoring period an officer of the Council carried out inspections approximately quarterly with the exception of the Vector Gas site, which

is scheduled for biannual inspections. A written report is provided to each consent holder following inspection.

1.3.4 Chemical sampling

In relation to the monitoring of water discharges, the Council undertook sampling of both the discharges from the sites, the combined discharges and the water quality upstream and downstream of the discharge points and mixing zones.

General surveys of the entire industrial stormwater drainage system and the Mangati Stream are carried out in both dry and wet weather conditions. This involves sampling at up to 42 points (refer Figure 2 and Figure 3), depending upon the weather conditions and the discharges occurring. The analysis of samples from these monitoring points includes a wide range of parameters, the particular number and type of which, is dependent on the particular sampling site location.

These synoptic surveys produce information on the combined and likely relative effects of discharges from the various industrial sites on water quality of the Mangati Stream. Where possible, these surveys also allow for the determination of compliance with consent conditions on effluent composition for particular consent holders.

The frequency of general chemical surveys has changed as the programme has developed. The programme for the sampling surveys is now approximately quarterly, three are scheduled in wet weather and one in dry weather during the summer low flow period. Due to the installation of the "wetland", through which the industrial drain and Connett Road stormwaters are directed, during one of the wet weather surveys the individual discharges going to the wetland are not sampled. Following analysis of the combined discharges follow up sampling of individual discharges may be carried out if required.

During the period under review seven surveys were performed, with the eighth survey carried over to the 2014-2015 monitoring year. The full wet weather surveys were conducted on 3 July and 3 September 2012, and 6 November 2013. Dry weather surveys were conducted on 11 December 2012, 3 April 2013, and 26 February and 24 June 2014. Due to lack of rainfall during the 2012-2014 years, further dry weather surveys were substituted for the "reduced" wet weather surveys, as these were the conditions prevailing during the periods under review.

In relation to the monitoring of air emissions, the Council undertook odour surveys in the neighbourhood of the site inspected. The monitoring programme provides for deposition gauging to be conducted every three years, this was undertaken in the 2012-2013 year. Deposition gauges were placed at selected locations in the vicinity of ABB Limited's site and Tegel Poultry Limited's feed mill site on one occasion, and the collected samples were analysed for deposited particulates.

1.3.5 Macroinvertebrate surveys

A biological (macroinvertebrate) survey was performed on four occasions at eight sites in the Mangati Stream to determine whether or not the discharges of treated and untreated stormwaters, treated washwater and cooling waters from the sites have had a detrimental effect upon the communities of the stream. Monitoring was

undertaken on 3 October 2012, 12 February 2013, 25 November 2013 and 13 February 2014.

The locations of the biomonitors sites are described in Table 2 and depicted in Figure 4.

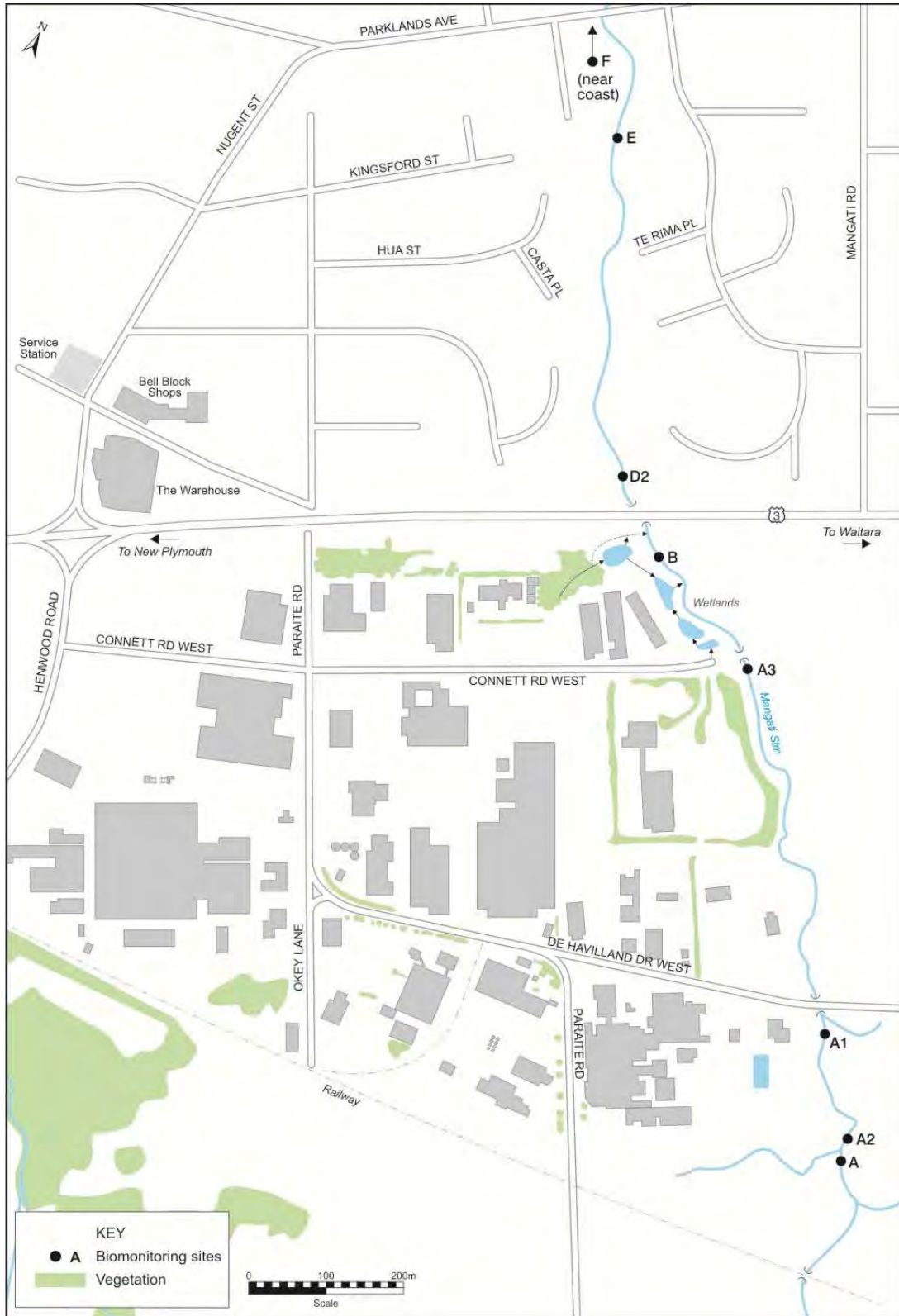


Figure 4 Location of biological monitoring sites

Table 2 Biomonitoring sites in the Mangati Stream

Site	TRC Site code	Map Reference NZTM		Location	Distance from sea, km
		Easting	Northing		
A	MGT000488	1700095	5678043	Below railway (above industrial area)	2.8
A2	MGT000490	1700062	5678084	Between wetland tributary receiving Tegel stormwater and old Tegel discharge point	2.7
A1	MGT000491	1700018	5678166	Below old Tegel Foods discharge point	2.6
A3	MGT000497	1699775	5678573	Above Connett Road	2.1
B	MGT000500	1699596	5678691	Above the industrial tributary but below the wetland	1.9
D2	MGT000512	1699513	5678787	Below the (industrial) tributary and wetland (20m below SH3)	1.9
E	MGT000520	1699385	5679103	400 metres below industrial stormwater drain	1.5
F	MGT000550	1699215	5680409	50 metres above Bell Block beach	0.0

1.3.6 Fish survey

Electric fishing and spotlighting are techniques commonly used for the assessment of fish species present in waterways. The fish communities have been monitored in the past in three areas focused around MGT000491 (Figure 4, site A1), MGT000505 (Figure 4, site D) and MGT000550 (Figure 4, site F).

Electric fishing surveys have been undertaken intermittently with the previous surveys carried out in December 1990, March 2001, and June 2007. In the 2010-2011 year it was determined by the Council's freshwater biologist that spotlighting was a more appropriate method for this small stream, and so three yearly spotlight fish surveys were recommended with the first of these carried out in March 2011.

In the March 2011 fish survey report it was suggested that future surveys may benefit from the inclusion of fyke nets set in the stream, to try and capture larger, more secretive fish. This was due to the fact that all fish found were less than two years old, and some fish that could be expected to inhabit this stream were not recorded, e.g. giant kokopu, longfin eel. It was concluded that although this may be cause for concern, it may also be as a result of the monitoring method, rather than being indicative of environmental effects.

A night-spotting survey was undertaken at three sites in the Mangati Stream in November 2013.

1.3.7 Data review

Special condition 4 of water abstraction consent 6357 held by Tegel Poultry Processing requires that their abstraction records are forwarded to Council by 31 July each year. Council reviews these records to ensure that the required records are being kept and that the abstraction has been managed according to the requirements of the consent.

Other data collected by consent holders and/or records that they are required to keep are requested periodically and reviewed by Council Officers for compliance with consent conditions.

2. ABB Limited (Transformer Division)

2.1 Introduction

2.1.1 Process description

ABB Limited (ABB) established the transformer plant on Paraité Road in 1996. Electricity distribution transformers are produced for both domestic and export markets.

The site is 2.64 ha in area, of which about one-third is roofed or sealed and half is in pasture. Stormwater from the developed area of the site enters the Bell Block industrial drainage system via seven main on site stormwater collection points. The length of the drainage system to the Mangati Stream is approximately 800 metres.

Bulk chemicals stored on the site include transformer oils, paint and thinners.

A total of up to about 60,000 litres of hydrocarbon transformer oil is stored outside in three tanks within a bunded area. There are high level alarms on the tanks. The liquid level in the bunded area is under continuous electronic surveillance. An oil separator treats drainage from the bunded area and the oil tanker unloading area.

Paint and thinners are kept in three enclosed dangerous good stores.

Solid waste containing zinc is produced during the manufacture of transformer casings, from steel shot blasting and electric arc galvanising. Three air scrubbers remove the metal dust, which is stored on site in drums awaiting sale. There are two dry (bag) scrubbers for shot blasting, and a cyclone for zinc galvanising.

ABB achieved ISO 14001 environmental certification in October 1998. Routine internal environmental compliance reporting and staff training is carried out by ABB.

A contingency plan is in place in case of spillage. The latest version of the contingency plan that was accepted by Council as being satisfactory was prepared by the Company in December 2012.

2.1.2 Water discharge permit

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.

ABB holds water discharge permit **2336-3** to discharge stormwater from a transformer manufacturing site into the Mangati Stream. This permit was originally issued on 20 November 1979 as a water right pursuant to section 21(3) of the Water and Soil Conservation Act 1967, was renewed on 12 June 1996 under Section 87(e) of the RMA, and the current consent was issued to ABB on 19 June 2008. It is due to expire on 1 June 2026.

A summary of the conditions of permit **2336-3**, are given below.

Condition 1 requires that the consent holder adopts the best practicable option to minimise effects from the discharge.

Because stormwater generation is dependant on the rainfall event and is not always practicable for the consent holder to control, condition 2 limits the catchment area from which the stormwater covered by the consent can originate, rather than limiting the discharge rate.

Conditions 3 and 4 require that all stormwater is directed for treatment prior to discharge and state that areas where hazardous substances are stored can not discharge directly to the stormwater catchment.

Conditions 5 and 6 place chemical limits on the discharge and prohibit certain effects on the receiving waters downstream of the mixing zone.

Conditions 7 and 8 require that the consent holder maintain a contingency plan and a stormwater management plan. The purpose of these conditions is

- in the case of the management plan, to ensure that the consent holder examines the activities taking place on site, and puts appropriate controls in place to minimise the potential for stormwater contamination to occur due to routine activities, and
- in the case of the contingency plan to ensure that in the event of an unforeseen situation, the chances of a spillage resulting in an unauthorised discharge leaving the site are minimised.

For the consent holder these are also a means of documenting the way in which the “best practicable option” (as required by condition 1) has been implemented.

To ensure that the potential for environmental effects is consistent with the information provided to the Council at the time the consent conditions were drafted, condition 9 requires that the Council is notified in writing of any changes at the site that could alter the nature of the stormwater discharged from the site.

Conditions 10 and 11 contain provisions for the consent to be allowed to lapse, and for Council to review the conditions of the consent.

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

2.1.3 Air discharge permit

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

ABB holds air discharge permit **5435-1** to cover the discharge of emissions into the air from dry steel grit blasting processes and associated activities. This permit was issued by the Council on 29 January 1999 under Section 87(e) of the RMA. The consent expired on 1 June 2014.

An application to renew this consent was received on 22 November 2013, and therefore under Section 124 of the RMA, ABB was allowed to operate under the conditions of the expired consent until a decision was made on the renewal application.

Condition 1 clarified that section 17 of the RMA applies to the consent holder.

Condition 2 required the consent holder to adopt the best option to minimise adverse effects.

Condition 3 stated that all abrasive blasting should be carried out in steel grit blasting rooms.

Condition 4 stated that the dust deposition rate beyond the property boundary should be less than 4.0 g/m²/30 days.

Condition 5 prohibited offensive or toxic levels of odour or dust beyond the property boundary.

Condition 6 contained provision for a review of the consent in June 2008.

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

2.2 Results

2.2.1 Water

2.2.1.1 Inspections

Inspections were undertaken on 8 January, 30 May, 26 June, 27 August, 2 December 2013, and 28 March 2014. Two further scheduled inspections were undertaken in July 2014, and these will be discussed in the 2014-2015 monitoring report.

8 January 2013

At inspection it was found that the yard area was tidy and was free from spills and potential contaminants. Puddles on the yard surface appeared to be sheen free. It was observed that the factory had been extended at the rear of the site. All stormwater drains and collection points were found to be clean, free of visible contaminants and obstructions.

30 May 2013

The site was inspected in fine weather conditions with a light westerly wind. It was observed that Transpacific (a waste management Company) were working on site at time of inspection. It was reported that the yard was tidy and the stormwater drains were clear of visible contaminants.

26 June 2013

It was reported that the site and yard were very tidy at the time of inspection. Inspection of the stormwater drain found no visual effect occurring. It was considered that the site was being managed in a satisfactory manner on the day of this inspection.

27 August 2013

It was found that the oil tank bund was dry. The interceptor system contained only small amounts of hydrocarbon in the second and third chambers. No issues were raised concerning the storage of chemicals or oils on site. Spill kits were observed to be present at the site and it was noted that drain mats were included in the kits. It was found that drain filters had been installed in the stormwater drains to capture silt and sediment. The site looked clean and tidy at the time of inspection.

2 December 2013

The site was inspected in fine weather with a light breeze. It was found that the capture bins below the extraction units were being emptied at the time of inspection. It was noted that some product (dust) had spilt onto the ground during this process. Staff advised that this would be cleaned up. All stormwater drains were in satisfactory condition and had drain filters in place. The bunded area also looked good. No issues were raised on site other than the dust from the extraction unit.

28 March 2014

An inspection was carried out to check that resource consent conditions were being complied with. The weather was overcast with no wind. The site was clean and tidy, with no deposited material noted around the dust extraction units. It was observed that drain filters were present in the stormwater drains, and it was noted that they had recently been replaced.

2.2.1.2 Results of discharge monitoring

Stormwater discharged from ABB's plant is monitored at up to eight points before it reaches the Mangati Stream (Figure 2 sites 25, 15, 14, 10, 8, 33, 37, and 38). Other discharges contribute to the flow at each monitoring point. The primary monitoring site is immediately outside the plant, at the side of the administration building (site 25). The results from chemical monitoring at site 25 are given in Table 3.

Stormwater from a number of other industries within the catchment may influence the results observed at this site (refer MI New Zealand and Schlumberger Seaco, Sections 9.2.1.2 and 13.2.1.2).

Three samples of stormwater were taken from the flow exiting ABB's site during the monitoring period.

The discharge complied with the suspended solids, pH and oil and grease limits on all monitoring occasions.

Zinc and copper are monitored because of the close proximity to where the MCK Metals copper and brass foundries used to be operated, and because zinc shot blasting and galvanising is carried out at ABB's plant.

The dissolved copper, dissolved zinc, and acid soluble zinc concentrations of the samples collected during the period under review were all below the median values calculated from previous results. The acid soluble copper concentration of the sample collected on 6 November 2013, although above median, was at a concentration that would have resulted in little, if any, environmental effect particularly after dilution with the other stormwaters in the catchment. Results showed that there was little

influence from this discharge observed in the samples collected from the stormwater entering the New Plymouth District Council's stormwater ponds, or in the bypass drain.

Table 3 Chemical monitoring results for ABB's stormwater discharge (site 25) at Paraita Road for 2012-2014, with a summary of previous monitoring data. TRC site code STW001017

Date	Condy mS/m	CuAs g/m ³	CuD g/m ³	O&G g/m ³	PbAs g/m ³	pH pH	SS g/m ³	Temp Deg.C	Turby NTU	ZnAs g/m ³	ZnD g/m ³
<i>Consent limit</i>	-	-	-	15	-	6-9	100	-	-	-	-
number	48	40	25	31	30	48	45	42	16	40	25
minimum	1.8	<0.01	<0.01	0.7	<0.05	6.6	4	10.2	4.6	0.043	0.018
maximum	131	0.4	0.06	150	0.28	10.8	290	22.2	76	2.57	1.40
median	6.0	0.05	0.01	1.7	<0.05	7.2	21	14.7	13	0.594	0.386
03-Jul-12	3.6	0.01	<0.01	1.0	<0.05	7.2	16	9.0	16	0.352	0.268
03-Sep-12	9.2	0.01	<0.01	a	<0.05	6.9	14	13.4	7.6	0.179	0.151
11-Dec-12 ^b	-	-	-	-	-	-	-	-	-	-	-
03-Apr-13 ^b	-	-	-	-	-	-	-	-	-	-	-
06-Nov-13	2.9	0.08	<0.01	a	<0.05	7.6	57	16.0	8.8	0.293	0.158
26-Feb-14 ^b	-	-	-	-	-	-	-	-	-	-	-
24-Jun-14 ^b	-	-	-	-	-	-	-	-	-	-	-

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

2.2.2 Air

2.2.2.1 Inspections

No visible emissions or objectionable odours were detected around the site during the inspections on 8 January, 30 May, 26 June, 2 December 2013 or 28 March 2014. On 27 August 2013 intermittent paint odours were noticed on the western side of the site adjacent to the extraction unit, however the odour had a low intensity and was not considered objectionable.

The capture bins below the extraction units were being emptied at the time of the 2 December 2013 inspection. It was noted that some product (dust) had spilt onto the ground during this process. Staff advised that this would be cleaned up.

Dust monitoring was conducted below the extraction system on one occasion (28 March 2014). The mass concentration value was 0.967 mg/m³, with an average of 0.714 mg/m³ and a maximum of 1.98 mg/m³.

2.2.2.2 Deposition gauging

Many industries emit dust from various sources during operational periods. In order to assess the effects of the emitted dust, industries have been monitored using deposition gauges.

Deposition gauges are basically buckets elevated on a stand to about 1.6 m. The buckets have a solution in them to ensure that any dust that settles out of the air is not resuspended by wind.

Gauges are placed around the site and within the surrounding community. The gauges were left in place for 15 days.

The rate of dustfall is calculated by dividing the weight of insoluble material (g) collected by the cross-sectional area of the gauge (m²) and the number of days over which the sample was taken. The units of measurement are g (grams)/m² (metre²)/day.

Guideline values used by the Council for dust deposition are 4 g/m²/30 days or 0.13 g/m²/day deposited matter. Consideration is given to the location of the industry and the sensitivity of the surrounding community, when assessing results against these values.

Material from the gauges was analysed for solid particulates associated with pollution and the results are presented in Table 4 below.

Table 4 ABB deposition gauge results 29 January 2013

	Unit	AIR009201	AIR009202
Deployment period	Days	15	15
Volume air deposition samples	L	0.7	0.7
Total particulate	g/m ² /day	0.05	0.08

The results for dust deposition at ABB's site were within the guideline of 0.13 g/m²/day of deposited matter.

2.2.3 Investigations, interventions, and incidents

During the 2012-2014 period, the Council was not required to undertake significant additional investigations and interventions, or record incidents, in association with ABB's conditions in resource consents or provisions in Regional Plans.

2.3 Discussion

2.3.1 Discussion of site performance

During the period under review the site, chemical storage and bunds were well managed. The stormwater discharge was found to comply with the component concentration limits specified in the consent.

The drain filters installed in the stormwater collection sumps were well maintained, as was the interceptor.

Abrasive blasting activities and the emission abatement equipment were found to be well managed. Although there was some spillage noted during the emptying of the dust collection containers on one monitoring occasion, this was cleaned up promptly.

There were no objectionable odours noted during the period under review.

2.3.2 Environmental effects of exercise of consents

During the period under review there were no adverse effects observed as a result of the stormwater discharges from the site.

No adverse effects were noted as a result of the exercise of ABB's air discharge consent, with no off site odours noted at any of the inspections.

Atmospheric particulate matter can arise from a number of sources, both natural and from human activity, for example pollens, smoke and ash, sea spray, dust from soils and paved surfaces, and manufacturing processes. While extremely fine particles may remain floating in the atmosphere for weeks or months, coarser dusts may settle out within timeframes ranging from a few seconds to minutes.

The environmental effects of dusts include loss of visibility, loss of the amenity and aesthetic values of a 'clear sky', irritation to breathing, and soiling of surfaces. It has been found that background rates of dust deposition in rural areas of New Zealand are typically 0.1-1.5 g/m²/30 days, while in urban areas rates are generally higher, in the range of 0.6-3.0 g/m²/30 days. From experience, rates above 3-4 g/m²/30 days tend to lead to complaints by neighbours over the objectionable or offensive nature of dust emissions from particular sources, hence the consent limit of 4 g/m²/30 days.

Visual assessments of the degree of dust deposition in the vicinity of the site were made during routine compliance monitoring inspections with no significant dust deposition issues recorded during the years under review. Dust monitoring was conducted below the extraction system on one occasion, with low concentrations of dust detected.

Deposition gauging was carried out at two sites on one occasion during the 2012-2014 monitoring period, and the results were found to be within the consent limit, supporting the findings of previous dust deposition surveys, which have indicated that the particulate deposition occurring in the vicinity of the site is low.

2.3.3 Evaluation of performance

A tabular summary of ABB's compliance record for the years under review is set out in Table 5 and Table 6.

Table 5 Summary of performance for Consent 2336-3, ABB's discharge of stormwater

Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Adoption of best practicable option to minimise effects on the environment	Inspection and discussion with consent holder	Yes
2. Limits stormwater catchment area	Inspection	Yes
3. Stormwater to be directed to treatment in accordance with special conditions	Inspection and discussion with consent holder	Yes

Condition requirement	Means of monitoring during period under review	Compliance achieved?
4. Above ground hazardous substance storage to be bunded and not to drain directly to stormwater catchment	Inspection and discussion with consent holder. Mineral oil tank bund drains via interceptor to soak hole	Yes
5. Limits on chemical composition of discharge	Sampling	Yes
6. Discharge cannot cause specified adverse effects beyond mixing zone	Receiving water sampling	Yes
7. Maintenance of a contingency plan for action to be taken to prevent spillage	Review of documents provided. Plan on file dated December 2012	Yes
8. Maintenance of stormwater management plan	Company's work instructions relating to chemical and oil storage and bund management (dated October 2007) on file	Yes
9. Written notification required regarding changes to activities at the site	Inspection and discussion with consent holder. No changes occurred which may alter nature of discharge	N/A
10. Provision for consent to lapse if not exercised	Consent has been exercised	N/A
11. Optional review provision re environmental effects and notifications of changes (S.C.9)	Next opportunity for review June 2020	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		High
Overall assessment of administrative performance in respect of this consent		High

N/A = not applicable or not assessed

Table 6 Summary of performance for Consent 5435-1 ABB's discharge to air

Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Clarification that section 17 of the RMA still applies to the activity	Inspections, odour surveys and ambient monitoring	Yes
2. Adoption of best practicable option to minimise effects	Inspections, odour surveys and ambient monitoring	Yes
3. Blasting to be carried out in grit rooms	Inspections	Yes
4. Limit on particulate deposition rate beyond boundary of 4 g/m ² /day	Dust monitoring and visual assessment at inspection	Yes
5. Prohibits offensive, objectionable or toxic odour or dust beyond boundary	Inspections, odour surveys and ambient monitoring	Yes
6. Optional review provision re environmental effects	Option for review in June 2008 not exercised. No further review provisions prior to expiry	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		High
Overall assessment of administrative performance in respect of this consent		High

N/A = not applicable or not assessed

During the year, ABB Limited demonstrated a high level of environmental and high level of administrative performance and compliance with the resource consents as defined in Section 1.1.4.

2.3.4 Recommendations from the 2011-2012 Annual Report

In the 2011-2012 Annual Report, it was recommended:

THAT monitoring programmed for the consented activities of ABB Limited in the 2012-2013 year continues at the level programmed for 2011-2012, but with the three yearly deposition gauging survey being conducted as scheduled.

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

2.3.5 Alterations to monitoring programmes for 2014-2015

In designing and implementing the monitoring programmes for air and 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 RMA in terms of monitoring emissions, 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 emitting to the atmosphere and/or discharging to the environment.

It is proposed that for 2014-2015 the monitoring programme remain unchanged. A recommendation to this effect is attached to this report.

2.4 Recommendation

THAT monitoring programmed for the consented activities of ABB Limited in the 2014-2015 year continues at the level programmed for 2012-2014.

3. BLM Feeds Limited

3.1 Introduction

3.1.1 Process description

BLM Feeds Limited (BLM Feeds) supplies liquid and dry stock feed from this 0.46 ha site at 21 Paraita Road, in the industrial area of Bell Block.

Stormwater from the site discharges via the New Plymouth District Council (NPDC) reticulated system and stormwater ponds, into the Mangati Stream.

Through routine monitoring of permitted activities, and stormwater surveys carried out under this programme during the 2009-2011 years there were three unauthorised discharges found in relation to discharges from the BLM Feeds site not complying with the standards/terms/conditions of Rule 23 of the Regional Freshwater Plan for Taranaki (RFP), the rule that provides for permitted stormwater discharges. This culminated in an abatement notice being issued on 14 October 2010, requiring the Company to comply with the RFP and the RMA. As a result BLM Feeds obtained a resource consent, and has been incorporated into this monitoring programme.

Activities at the site include the unloading of stock feeds from shipping containers, loading/unloading of granular stock feed, mixing stock feed blends, loading/unloading liquid stock feeds, and repacking of a liquid chlorine dioxide cleaning product.

Palm kernel and other dry stock feed ingredients are stored in a warehouse on the site, along with mineral supplements, and cleaning products in containers of up to 1,000 L capacity. In the yard area, there are bunded tanks and silos used to hold molasses and condensed distiller's syrup (CDS). There are unbunded tanks used to store molasses under a lean-to canopy on the eastern side of the building, and there is an open stormwater grate less than 5 m from one of the tanks. Shipping containers holding bladders CDS are stored in the yard temporarily, prior to unloading into the tanks/silos. The empty bladders are placed in skip bins within the stormwater catchment before being disposed of off-site. The trucks used to transport the stock feed are parked on a concrete area of the yard within the stormwater catchment. The chlorine dioxide cleaning product is decanted from 100 or 200 L drums into 20 or 5 L containers in the stormwater catchment on the eastern side of the building.

The principal contaminants of concern that may become entrained in the stormwater from this site are:

- the water soluble molasses and CDS, which are high in sugars, exhibit high biochemical oxygen demands, and are acidic in nature (approximate molasses pH 5, CDS pH 3.2),
- dry stock feed products, which could elevate suspended solids and nutrient concentrations of the stormwater discharge,
- the chlorine dioxide solution, which is a sanitiser that is classified as very toxic to aquatic life. It is acidic and a strong oxidising agent. It has a pH of approximately 2.

These contaminants have the potential result in a variety of effects in the receiving water.

As outlined, unauthorised discharges to the Mangati Stream have occurred in the past from this site. These discharges had resulted in the growth of sewage fungus in the NPDC reticulated stormwater pipes and treatment ponds, and in the Mangati Stream itself, extending to approximately 20 m below the State Highway 3 road culvert. It is considered that the unauthorised discharges were due to a lack of understanding regarding the potential environmental effects of the liquid stock feeds handled on site, and associated management practices.

A stormwater management plan has been developed to cover activities at the site. The plan outlines a number of improvements in structural and procedural controls that have been, or will be, implemented to prevent or minimise the potential for adverse environmental effects as a result of stormwater discharges from the site.

Dry products are stored under cover, and the maintenance programme includes weekly sweeping of the building entry points to remove any sediment or truck contaminants.

A spill contingency plan was drafted as part of the consent application process, however this is now over due for review. Spill kits had been strategically placed around the site, and staff had been trained in their use.

A stormwater/trade waste diversion system is in place for the molasses and CDS loading/unloading area. However, the stormwater outlet from this sump was lower than the trade waste outlet. This was remedied by increasing the height of the stormwater outlet pipe.

Another issue was that the stormwater sumps in the canopied loading/storage, did not drain via the diversion system. This was remedied by blocking off the outlet from this leg of the stormwater drainage system and installing a float activated submersible pump so that this sub-catchment is permanently directed to the diversion sump.

The stormwater plan outlined that the way in which the flow is directed from the diversion sump to either the tradewaste system or stormwater system will remain a manual system. However, clear procedures have been developed that instruct staff on the correct positioning of the stormwater/trade waste outlet valves in relation to the activities being undertaken, and the weather conditions prevailing at the time.

Training plans are in place to ensure that staff are aware that wash water is to be directed to trade waste, and “fish bins” are to be utilised to catch the minor discharges that occur from the delivery vehicles parked on site.

3.1.2 Water discharge permit

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.

BLM Feeds holds water discharge permit **7707-1** to cover the discharge of stormwater into the Mangati Stream. This permit was issued by the Council on 31 May 2011 under Section 87(e) of the RMA. It is due to expire on 1 June 2026.

Condition 1 requires the adoption of the best practicable option.

Condition 2 limits the stormwater catchment area to 0.464 ha.

Conditions 3 and 4 specify that the stormwater must be directed through a stormwater diversion system and require that all hazardous substances stored in the stormwater catchment are bunded.

Condition 5 limits the constituent concentrations of the discharge.

Conditions 6 and 7 prohibit specified effects in the Mangati Stream.

Conditions 8 and 9 relate to the provision of contingency and stormwater management plans. The purpose of these conditions is

- in the case of the management plan, to ensure that the consent holder examines the activities taking place on site, and puts appropriate controls in place to minimise the potential for stormwater contamination to occur due to routine activities, and
- in the case of the contingency plan to ensure that in the event of an unforeseen situation, the chances of a spillage resulting in an unauthorised discharge leaving the site are minimised.

For the consent holder these are also a means of documenting the way in which the “best practicable option” (as required by condition 1) has been implemented.

Condition 10 requires written notification to Council prior to changes at the site that may affect the nature of the discharge.

Conditions 11 and 12 contain provisions for lapse and review of the consent.

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

3.2 Results

3.2.1 Water

3.2.1.1 Inspections

The site was visited on 29 August 2012, 7 January 2013, 30 May 2013, 26 June 2013, 7 August 2013, 21 October 2013, and 20 March 2014, with the final scheduled inspection for the monitoring period undertaken on 1 July 2014. This last inspection will be discussed in the report covering the 2014-2015 monitoring year.

29 August 2012

The parking area was clear of potential contaminants and no spills were noted. The skip bin had a cover in place and no leaching was observed from this. The bunded area was clear and free of spills. All drains were clear. Stored intermediate bulk containers (IBC's) all had lids in place. There was minor tracking from the feed storage area, which was observed to be reaching the road. The consent holder was advised to regularly clean up the tracked material to prevent it from reaching the road/gutter where it could potentially enter surface water.

7 January 2013

Some oil stain marking was observed in the truck parking area. There were signs of material tracking from both the rear and front access doors to the storage shed. It was noted that there was a quantity of material on the ground near the bunded area at the rear of the shed. The consent holder was again advised that all material tracked from the shed should be cleaned up throughout the course of the shift to ensure no contaminants enter the storm water system in the event of rain. The consent holder was also advised that all spills around the bunded areas must be cleaned immediately.

30 May 2013

The site was found to be clean and tidy, with no sign of any spills. It was observed that drain filters had been fitted to the stormwater collection sumps. The IBC's on site all had lids on them.

26 June 2013

The interceptor system was being pumped out at the time of the inspection. There was no visual staining observed and the site was clean and tidy. There were no odours or dust issues at or beyond the site boundary.

7 August 2013

The northern car park area was tidy and clean. The pump in the stormwater sump was activated and was working well, diverting the flow to trade waste. IBC's were stored at the southern end of the building and were filled with water to prevent them from blowing over.

Tracking of feed from inside the shed to outside of the shed was observed at both doors. The consent holder was reminded that there had been repeated requests from the Council to ensure that the tracking of feed from the shed is appropriately addressed and managed and/or prevented. To date this had not happened, and BLM Feeds was advised that any discharge from the site would be likely have a direct impact on the Mangati Stream. The consent holder was asked to ensure that systems were put in place to prevent the tracking of feed to areas where it was likely to enter the stormwater system.

21 October 2013

The site was, for the most part, clean and tidy. There were a few spills on site that were brought to the attention of staff. Two spills consisted of lime, while one was oil from a truck that had parked on site during the weekend. Staff advised that these spills would be cleaned up. The Council Officer was advised that staff tried to keep product from discharging onto the site where the stormwater drains were by having trucks exit onto the side of the shed that has drains discharging to sewer. It was evident that trucks had been exiting from the building on the side that has the stormwater drains present and some residual product was observed tracking from the shed (Photo 3). Staff said that the site was swept to reduce/minimise effects on the stormwater system. The drains were inspected and appeared to contain organic matter in the sumps (Photo 4).



Photo 3 BLM Feeds – tracking from storage shed, 21 October 2013



Photo 4 BLM Feeds – organic matter in stormwater sump, 21 October 2013

The consent holder was advised to consider cleaning out the sumps of the stormwater drains to reduce the possibility of suspended organic matter discharging from the site.

20 March 2014

It was noted that a fuel tank had been placed at the northern end of the site. Staff confirmed that the tank was double lined and that access to fuel was via an electronic keypad. No spill kit was visible at the time of inspection and staff were advised to ensure that a spill kit was on site and readily available in the event that a spill were to occur.

Product tracking from the shed was again noted. Staff were again advised that silt/sediment cloth (drain filters) should be installed in the stormwater drains.

An abatement notice was issued early in the 2014-2015 year (8 July 2014) requiring that works be undertaken to ensure that any silt, sediment or organic material that enters a stormwater drain on site is captured and removed, to prevent/minimise any actual or likely adverse effects on the environment. A subsequent inspection found that drain filters had been installed. This matter will be discussed further in the 2014-2015 Annual Report.

3.2.1.2 Results of discharge monitoring

Stormwater discharged from BLM Feeds' site is monitored at up to nine points before it reaches the Mangati Stream (Figure 2 sites 47, 17, 16, 14, 10, 8, 33, 37 and 38). Other discharges contribute to the flow at the lower eight monitoring points (i.e. sites 17, 16, 14, 10, 8, 33, 37 and 38). The primary monitoring site is at a manhole in the right of way along the western side of Greymouth Petroleum's offices, prior to it mixing with the OMV and Greymouth laydown area discharges (site 47). The results of the chemical monitoring for this site are given in Table 7.

Table 7 Chemical monitoring results for BLM Feeds stormwater discharge for 2012-2014 (site 47). TRC site code STW001138

Date	BOD g/m ³	Condy mS/m	O&G g/m ³	pH pH	SS g/m ³	Temp °C	Turb NTU
<i>Consent Limit</i>	25	-	15	6-9	100	-	-
number	3	4	-	4	4	4	4
minimum	8	5.3	-	6.2	4	12.8	2.8
maximum	220	34.8	-	7.7	240	20.8	130
median	>26	9	-	7.1	42	15.6	22.5
03-Jul-12	5.1	5.8	a	7.5	6	9.9	3.0
03-Sep-12	>24	12.6	3.0	7.3	34	13.8	16
11-Dec-12 ^b	-	-	-	-	-	-	-
03-Apr-13 ^b	-	-	-	-	-	-	-
06-Nov-13 ^b	-	-	-	-	-	-	-
26-Feb-14 ^b	-	-	-	-	-	-	-
24-Jun-14 ^b	-	-	-	-	-	-	-

Key: Results shown in bold within a table indicates that a limit for a particular parameter has been exceeded
a parameter not determined, no visible hydrocarbon sheen and no odour
b not discharging at time of sampling survey

Samples collected during the years under review complied with the consent limit for pH, suspended solids and oil and grease. The biochemical oxygen demand (BOD) in the sample collected on 3 September 2012 may have exceeded the permitted concentration, however this can not be confirmed as an absolute result was not obtained.

3.2.2 Investigations, interventions, and incidents

During the 2012-2014 period, the Council was not required to undertake significant additional investigations and interventions, or record incidents, in association with BLM Feeds' conditions in resource consents or provisions in Regional Plans, however there were on-going issues with tracking from the storage shed and the resulting potential for environmental effects.

3.3 Discussion

3.3.1 Discussion of site performance

Although there have been significant improvements in the structural and procedural controls at the site during previous monitoring periods, particularly in relation to the management of stormwater and wash water from the canopied loading/storage area, there were some recurring issues found at site inspections that had the potential to affect stormwater quality. There were spills observed on site during one inspection, while tracking was noted from the storage shed on five occasions, despite repeated requests (both during the current monitoring period and the 2011-2012 year) for the consent holder to undertake measures to prevent this. This was resolved in the 2014-2015 year after an abatement notice was issued on 8 July 2014. This will be discussed further in the 2014-2015 Annual Report.

Requested updates to BLM Feeds' stormwater management plan and contingency plan were not received, and it was noted at one inspection that there was no spill kit present on site.

3.3.2 Environmental effects of exercise of consents

Although the BOD limit was likely to have been exceeded in the sample collected on 3 September 2012, on this occasion, the effects were, for the most part, mitigated by dilution by the stormwater from other sites within the catchment. The BOD's of the combined stormwaters exiting the reticulated stormwater system into the Mangati Stream and/or NPDC treatment ponds were at more acceptable levels (MGT000503, 3.8 g/m³; STW001055, 3.2 g/m³; STW001026, 5.2 g/m³). No sewage fungus or other heterotrophic growths were found downstream of the discharge during inspections and sampling.

3.3.3 Evaluation of performance

A tabular summary of BLM's compliance record for the years under review is set out in Table 8.

Table 8 Summary of performance for Consent 7707-1, BLM Feeds' stormwater discharge

Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Adoption of best practicable option to minimise effects on the environment	Inspection and discussion with consent holder	On-going issue of tracking of product from the storage shed
2. Limits stormwater catchment area	Inspection	Yes
3. Stormwater from loading/unloading area to be directed through a stormwater diversion system by 31 July 2011	Inspection	Yes
4. Above ground hazardous substance storage to be bunded	Inspection and discussion with consent holder	Yes
5. Limits on chemical composition of discharge	Discharge sampling	Likely that BOD limit was breached 1 of 2 samples
6. Discharge cannot cause specified adverse effects in Mangati Stream	Receiving water sampling and observation	Yes
7. Limit on filtered carbonaceous BOD of stream	Receiving water sampling and observation	Yes
8. Provision (by 31 July 2011) and maintenance of a contingency plan for action to be taken to prevent spillage	Review of documents submitted and assessment of practices/controls at inspection. Consent holder has previously been advised that the plan provided with application was in need of update	Updated plan not provided
9. Provision (by 31 July 2011), maintenance and adherence to stormwater management plan	Review of documents submitted and assessment of practices/controls at inspection. Consent holder has previously been advised that the plan provided with application was in need of update	Updated plan not provided
10. Written notification required regarding changes to activities at the site. Notification to include assessment of environmental effects.	Inspection and discussion with consent holder	N/A
11. Lapse of consent	Consent exercised	N/A
12. Optional review provision re environmental effects and notifications of changes (S.C.9)	Next opportunity for review June 2020	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		Improvement required
Overall assessment of administrative performance in respect of this consent		Improvement required

N/A = not applicable or not assessed

An improvement in BLM Feeds Limited's environmental and administrative performance (as defined in Section 1.1.4) is required. During the years under review there were on-going issues with tracking from the dry goods storage shed entering

the stormwater drains, and requested updated stormwater management and contingency plans were not received.

3.3.4 Recommendations from the 2011-2012 Annual Report

In the 2011-2012 Annual Report, it was recommended:

THAT monitoring programmed for the consented activities of BLM Feeds Limited in the 2012-2013 year continues at the level programmed for 2011-2012.

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

3.3.5 Alterations to monitoring programmes for 2014-2015

In designing and implementing the monitoring programmes for air and 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 RMA in terms of monitoring emissions, 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 emitting to the atmosphere and/or discharging to the environment.

It is proposed that for 2014-2015 that the monitoring programme remains unchanged. A recommendation to this effect is attached to this report.

3.4 Recommendation

THAT monitoring programmed for the consented activities of BLM Feeds Limited in the 2014-2015 year continues at the level programmed for 2012-2014.

4. Conveyorquip Engineering Services Limited

4.1 Introduction

4.1.1 Process description

Conveyorquip Engineering Services Limited (Conveyorquip) operates a mobile abrasive blasting unit at various locations within the Taranaki region and also operates a permanent abrasive blasting site at Connett Road, Bell Block.

Conveyorquip predominantly uses garnet for blasting, with minimal sand blasting being undertaken. At the permanent facility on Connett Road blasting takes place within an enclosed booth minimising emissions to air. Water is injected at the top and bottom of a cyclone system, the water comes into contact with both the heavy and fine dust, therefore minimising dust emissions. The water and dust is collected into a 200 L drum. Fine dust, not captured by the cyclone, is sprayed again before being directed to another 200 L drum. Screening is erected around both drums and the base of the cyclone. The screening is also sprayed with water. Any discharge from the dust treatment is directed to an interceptor prior to discharge to trade waste. Sludge is removed from the drum and disposed to a licensed disposal site.

There is no requirement for a spill plan for the site.

4.1.2 Air discharge permit

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

Conveyorquip holds air discharge permit **5964-1** to cover emissions into the air from a mobile abrasive blasting unit and associated processes at various locations within the Taranaki region and from a permanent abrasive blasting site at Connett Road, Bell Block. This permit was originally issued to Corrocoat Engineering Services Limited by the Council on 14 February 2002 under Section 87(e) of the RMA. The consent was transferred to Conveyorquip on 31 May 2008. It was due to expire on 1 June 2020, however it was surrendered on 27 August 2014.

The 19 conditions on the consent were of a comprehensive nature and addressed all aspects of the operation of the mobile abrasive unit, and the permanent facilities, that may affect emissions to air.

Condition 1 stated that the consent holder shall at all times adopt the best practicable option, as defined in section 2 of RMA, to prevent or minimise any adverse effect on the environment.

The remaining conditions on the consent were intended to reduce the quantity, control the quality, and minimise the potential for adverse effects from the emissions from the blasting activities and associated processes. This was achieved by:

- Limiting the locations at which blasting may be undertaken and ensuring that consideration was given to weather conditions (conditions 3 and 11). In general the blasting must have been undertaken within the permanent facilities where

the discharge must have been contained and treated to meet specific discharge limits (conditions 7 and 9).

- Ensuring that adequate screening was in place (condition 12).
- Controlling the blasting media used (conditions 2 and 10).
- Requiring that certain notifications were made and/or permissions sought prior to undertaking blasting when certain “higher risk” mobile blasting activities were undertaken (conditions 13, 14, and 15). In the case of the Council, this allowed for additional requirements to be placed on the consent holder in certain circumstances, and ensured the opportunity for the Council to undertake monitoring specific to those activities.
- Limiting the effects at or beyond the boundary of the property in relation to dust and odour issues (conditions 5, 8, and 16), and surface water quality issues (condition 17).
- Addressing housekeeping issues (condition 4).
- Requiring that the consent holder ensured that all operators understood and complied with the conditions of the consent (condition 18).

The last condition contained provision for review of the conditions of the consent.

The permit is attached to this report in Appendix I.

4.2 Results

4.2.1 Air

4.2.1.1 Inspections

Inspections were undertaken at the Conveyorquip site on 2 July 2012, 7 January, 30 May, 26 June, 7 August, 29 November 2013 and 20 March 2014, with the final inspection scheduled for the monitoring period undertaken on 1 July 2014. Whilst this inspection would normally be discussed in the report covering the 2014-2015 year, as the consent has been surrendered it will be reported here.

Blasting was only carried out a couple of times per year at the site, and there was no blasting being undertaken during any of the inspections. Sand was found to be covering the floor of the container that blasting was carried out in on 7 August 2013 and the consent holder was reminded to ensure that the sand on the floor of the blasting booth was swept up at the end of each session, or at the end of each day as required by condition 4.

The yard area was found to be tidy and spill-free on all occasions. All catchment points were clear of contaminants and obstructions, and the New Plymouth District Council (NPDC) wetland pond below the site was clear.

On 1 July 2014 it was found that no blasting operations were occurring at the time of inspection. The inspecting officer spoke with staff on site who advised that the abrasive blasting unit was no longer in use, that part of the unit was in need of replacement and that Conveyorquip was looking to sell the unit. The area around the unit was reported to be clean and tidy.

4.2.2 Investigations, interventions, and incidents

During the 2012-2014 period, the Council was not required to undertake significant additional investigations and interventions, or record incidents, in association with Conveyorquip's conditions in resource consents or provisions in Regional Plans.

4.3 Discussion

4.3.1 Discussion of site performance

There was very little blasting undertaken at the site during the 2012-2014 monitoring period, and the consent holder surrendered the consent shortly after the end of the monitoring period.

4.3.2 Environmental effects of exercise of consent

There was no visible evidence of off site effects found at inspection, and no complaints were received by the Council.

4.3.3 Evaluation of performance

A tabular summary of Conveyorquip's compliance record for the years under review is set out in Table 9.

Table 9 Summary of performance for Consent 5964-1, Conveyorquip's discharge to air

Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Adoption of best practicable option to minimise effects on the environment	Inspection and discussion with consent holder	Yes
2. Sand to have low active silica content and percentage of fine particles	Not assessed during the years under review	N/A
3. Consideration of wind conditions to minimise off-site emissions	Inspection. No complaints received	Yes
4. Clearance of blasting material	Inspection	Yes
5. Offensive and objectionable odours and dust beyond boundary not permitted	Inspection. No complaints received	Yes
6. Blasting in enclosed facility. No yard blasting	Inspection and discussion with consent holder	Yes
7. Treatment of emissions prior to discharge at permanent facilities	Not assessed during the years under review due to low level of activity at the site	N/A
8. Dust deposition rate limit beyond boundary	Not assessed during the years under review due to low level of activity at the site	N/A
9. Maximum concentrations of lead, chromium and zinc	Not measured. Discussions with consent holder about materials blasted	N/A
10. Avoidance of dry sand blasting for mobile blasting	No mobile blasting noted during years under review	N/A
11. Consideration of wind conditions to minimise of off-site emissions	No mobile blasting noted during years under review	N/A

Condition requirement	Means of monitoring during period under review	Compliance achieved?
12. Screening to contain emissions	No mobile blasting noted during years under review	N/A
13. Notification to DC prior to blasting in urban areas	No mobile blasting noted during the years under review	N/A
14. Notification to TRC prior to blasting in close proximity to water course	No notifications received by Council	N/A
15. TRC approval prior to blasting close to property boundaries	No mobile blasting noted during the years under review	N/A
16. Dust deposition and ambient suspended particulate limit	No mobile blasting noted during the years under review	N/A
17. Effects on surface water bodies not permitted	No mobile blasting noted during the years under review	N/A
18. Compliance of operators with conditions	Inspection	Yes
19. Optional review provision re environmental effects	No further options for review	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		High
Overall assessment of administrative performance in respect of this consent		High

N/A = not applicable or not assessed; TRC = Taranaki Regional Council; DC = District Council

During the year, Conveyorquip demonstrated a high level of environmental and a high level of administrative performance and compliance with the resource consents as defined in Section 1.1.4.

4.3.4 Recommendation from the 2011-2012 Annual Report

In the 2011-2012 Annual Report, it was recommended:

THAT monitoring programmed for the consented activities of Conveyorquip Engineering Services Limited in the 2012-2013 year continues at the level programmed for 2011-2012.

This recommendation was implemented, with the exception that the dust trak was not used to assess suspended particulate matter during inspections as no blasting was being undertaken.

4.3.5 Alterations to monitoring programmes for 2014-2015

In designing and implementing the monitoring programmes for air and 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 RMA in terms of monitoring emissions, 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 emitting to the atmosphere and/or discharging to the environment.

It is proposed that for 2014-2015 the monitoring programme for the site is discontinued as the consent has been surrendered. A recommendation to this effect is attached to this report.

4.4 Recommendation

THAT monitoring programmed for Conveyorquip Engineering Services Limited in the 2014-2015 year is discontinued due to the consent being surrendered.

5. Greymouth Petroleum Acquisition Company Limited

5.1 Introduction

5.1.1 Process description

Greymouth Petroleum Acquisitions Company Limited's (Greymouth Petroleum) pipeyard on De Havilland Drive, formerly operated by Fletcher Challenge Energy Taranaki Limited (FCET), was established in 1986 as a storage area for well casing, drill pipe and other drilling and testing equipment used in the oil industry. The yard has been used for cleaning and preservation of casing and drill pipe.

During development of the site, about 1 ha of the 1.48 ha area was levelled with a 2% slope eastward towards the Mangati Stream. The surface was overlain with filter cloth and metal. Perimeter drains were made along the western and northern boundaries (to divert stormwater from upslope around the site) and along the eastern boundary to collect stormwater runoff from the site itself. An oil skimmer interceptor was constructed on the eastern drain, above its junction with the northern drain, for removal of hydrocarbons. Separated hydrocarbons are skimmed off the surface of the separator as necessary and disposed of.

The discharge of stormwater from the site enters a small open drain at a point about 50 metres from the Mangati Stream. The drain also carries stormwater from several sites, including (part of) Natural Gas Corporation's warehouse and pipeyard, Tasman Oil Tools' site, and Vause Production Service's site.

New casing and drillpipe is cleaned to remove protective grease, which until recently contained some copper and zinc, and a high proportion of lead. The washwater was discharged to land with the flow directed to the eastern stormwater drain.

There have been a series of upgrades at the site aimed at improving the quality of the water discharged from the site.

In 1995, a large concrete pad was constructed for the cleaning operations, with a three-stage oil separator that removes hydrocarbons in the wastewater. At this time the discharge from the oil separator still flowed into the eastern perimeter stormwater drain. The discharge from the three-stage separator was isolated in March 1998 after increased lead levels were observed in the site effluent. In September 1998 a connection to the New Plymouth District Council (NPDC) sewer system was made. In the period between March and September 1998, the washwater was collected and disposed of appropriately off-site. During the 1999-2000 year an automatic diverter valve was installed on the washpad, which sends washwater to the sewer system via an oil separator when the washpad is in operation.

Oils and grease are now removed with hot water and a degreaser (Teepol) applied using a water blaster in the washpad area. After washing, casings and pipes are treated with a mild phosphoric acid solution to convert rust to an inert iron oxide, then with a preserving solution. Tube threads are protected with a non-drip oil, prior to storage.

In February 2003 Greymouth Petroleum provided details to the Council of a plan to add a storage area for re-usable synthetic drilling muds to their site. The proposal was to store the drilling muds in locked tanks located within a banded area. No changes to the consent conditions were considered necessary for the activity.

During the 2006-2007 monitoring period a number of changes in activities at the site took place. The tank farm was extended, a methanol storage facility was constructed, and a 72 m³ oil separator pit was sunk into the main yard, and the practice of storing waste oil in unbanded transportable containers (up to 44 m³ capacity) commenced. The Council was also advised in April 2008 that the site was now operated by GMP Environmental Limited. This Company provides oilfield and industrial waste clean-up, transportation and disposal services. As a result, the site could no longer be considered to be solely a pipeyard, and the purpose of the new consent reflected this.

Consent **4664** requires that Greymouth Petroleum maintains a contingency plan. A revised plan was submitted to Council in March 2010 as part of the consent renewal process. With the issue of consent 4664-3, conditions require that contingency planning at the site is documented within the overarching GMP Environmental Limited Pipeyard Environmental Management Plan, which has to be reviewed prior to making changes to activities at the site or upon request from the Council. No such changes or requests were made during the period under review. However, Greymouth Petroleum internal document number HSE003, referred to in the Environmental Management Plan as containing the contingency plan measures for the site, was updated in November 2011, and a copy was received and accepted by Council.

5.1.2 Water discharge permit

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.

Greymouth Petroleum holds water discharge permit **4664-3** to cover the discharge of treated stormwater from a pipeyard used for the cleaning and storage of casing and drilling equipment, and the storage of hazardous substances, onto and into land in circumstances where it may enter the Mangati Stream. This permit was originally issued to Petrocorp Exploration Limited by the Council on 8 February 1995, for a period until 1 June 1996. A new consent, **4664-2**, was issued to Fletcher Challenge Energy Taranaki Limited on 12 June 1996 under Section 87(e) of the RMA. At this time the land was leased from Natural Gas Corporation Limited. The consent was transferred to Greymouth Petroleum on 20 May 2002, and Greymouth Petroleum took ownership of the land. The current consent (**4664-3**) was granted on 1 June 2010 for a period until 1 June 2026.

The special conditions of consent, **4664-3**, are outlined below.

Condition 1 requires the adoption of the best practicable option to avoid or minimise effects.

Condition 2 limits the stormwater catchment area.

Condition 3 requires all stormwater to be directed for treatment prior to discharge.

Condition 4 limits the concentration of particular constituents in the discharge.

Condition 5 specifies a mixing zone in the Mangati Stream of 20 metres beyond which specific adverse effects are not permitted.

Condition 6 and 7 relate to the Greymouth Petroleum Environmental Management Plan, requiring that all activities are conducted in accordance with the plan, and setting out provisions and requirements associated with future reviews of the plan.

Condition 8 contains provisions for optional review of the conditions of the consent.

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

5.2 Results

5.2.1 Water

5.2.1.1 Inspections

2 October 2012

The numerous puddles on site due to recent rains were noted to be sheen free. The settling pond appeared turbid. Perimeter drains were clear, as were stormwater drains in the catchment area. The wash pad (that drains to trade waste) was in use at the time of inspection. No overspray was reported at the time of inspection. The bunded area around the diesel and drilling mud tanks contained a small amount of stormwater, which was sheen free. The hydrocarbon settling pond was emitting a slight odour, however this was not noticeable beyond the boundary of the site.

8 January 2013

The yard area was free of spills and potential contaminants. No objectionable odours were detected. All equipment on site appeared to be clean. The wash pad was in use and diverted to trade waste. The bunded area was tidy and no spills were noted. There was a small amount of stormwater in the bund around the fuel tank, no sheen was observed. The settling pond level at the separator was well below the discharge pipe. The sump had recently been pumped out and staff advised that the cement sludge would be cleaned out in the near future.

30 May 2013

The yard area was clean and tidy. The sumps had stormwater in them, however no visual sheen was present. The site was considered to be compliant with consent conditions at the time of inspection.

7 August 2013

The site was dry at the time of inspection. Staff advised that there had been issues with suspended solids discharging from the site in the past, and it was proposed that

silt cloth be placed into the drains to capture silt/sediment before it has the opportunity to enter the settlement pond. The settlement pond and separators had recently been cleaned. No samples were taken at this inspection.

29 November 2013

The site was dry at the time of inspection. The site was observed to be tidy. The stormwater in the skimmer pit was discoloured, but no oil or grease was observed and the pit was not discharging at the time of inspection.

21 March 2014

In general the site was tidy, with no issues raised concerning the storage of product, drums etc. It was noted that the ring drains contained a lot of sediment/silt. Improvements discussed during the inspection on 7 August 2013 around improving silt controls within the ring drain and drains had not been actioned. It was noted that the discharge sample on the 6 November 2013 found suspended solid levels in breach of resource consent conditions, and further discussion took place with Greymouth Petroleum staff during the inspection, concerning the results from samples taken, and how to improve current silt controls.

The final scheduled inspection for the monitoring period undertaken on 14 July 2014. This last inspection will be discussed in the report covering the 2014-2015 monitoring year. It is however noted, that some sediment control works had been carried, although Greymouth Petroleum was advised that further work should be undertaken.

5.2.1.2 Results of discharge monitoring

The discharge from the yard is typically monitored at up to two points before it reaches the Mangati Stream. These points are shown as sites 31 and 30 in Figure 2. Site 31 (IND001012, Figure 3) monitors the site stormwater discharge, whilst other discharges (from Tasman Oil Tools and Natural Gas Corporation) contribute to the monitoring point at site 30 (MGT000495). The results of the sampling of the combined discharge to the Mangati Stream (site 30) are reported in Table 65, Section 21.1.

The samples collected from site IND001012 were all in compliance with the limits imposed by consent 4664 for oil and grease and the pH range; however both samples showed that the suspended solids concentration was being exceeded in the discharge at the time of sampling.

There have been significant improvements in the oil and grease concentrations seen in recent monitoring, with both samples collected during the monitoring period continuing this trend, with them being found to contain less than the median calculated from previous results³.

³ Those samples having no visible sheen and no odour are assumed to contain < 2 g/m³ of oil and grease.

Table 10 Chemical monitoring results Greymouth Petroleum stormwater discharge (site 31) at De Havilland Drive for 2012-2014, with a summary of previous monitoring data from June 1995 to June 2012. TRC site code IND001012

Date	Condy mS/m	CuAs g/m ³	CuD g/m ³	O&G g/m ³	PbAs g/m ³	pH pH	SS g/m ³	Temp Deg.C	Turby NTU	ZnAs g/m ³	ZnD g/m ³
<i>Consent limit</i>	-	-	-	15	-	6-9	100	-	-	-	-
number	35	34	18	30	33	35	35	35	17	34	18
minimum	1.8	<0.01	<0.01	<0.5	<0.05	6.3	3	10.0	7.2	0.01	0.009
maximum	564	0.23	0.06	84	0.78	8.3	880	22.8	970	1.37	0.853
median	7.0	0.05	0.02	2.2	0.06	7.1	39	15.0	250	0.268	0.038
03-Jul-12	-	-	-	-	-	-	-	-	-	-	-
03-Sep-12	5.2	0.08	<0.01	1.1	0.09	7.5	410	12.1	430	0.223	0.010
11-Dec-12 ^b	-	-	-	-	-	-	-	-	-	-	-
03-Apr-13 ^b	-	-	-	-	-	-	-	-	-	-	-
06-Nov-13	4.6	0.22	0.02	a	0.10	7.4	300	16.1	360	0.459	0.057
26-Feb-14 ^b	-	-	-	-	-	-	-	-	-	-	-
24-Jun-14 ^b	-	-	-	-	-	-	-	-	-	-	-

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

There have been no similar improvements in the suspended solids concentration however, and as found since the 2005-2006 year, these were again high. The exceedance in the suspended solids concentration on 6 November 2013 was recorded on Council's register of unauthorised incidents, the outcomes of the incident investigation are summarised in Section **Error! Reference source not found..**

The discharge from this site has been monitored since June 1995, and it is noted that there were no suspended solids exceedance found in the 19 samples collected prior to the end of June 2005. Since then, only 2 the 18 samples analysed have complied with the consent limit.

At site MGT000495, where the combined stormwater from this site, Tasman Oil Tools and Vector discharges to the stream, the suspended solids concentration had reduced, but was still almost three times the 100 g/m³ permitted by the consent. It is noted that Tasman Oil Tools were also breaching their consent limit, albeit to a lesser extent on both 3 September 2012 (240 g/m³) and 6 November 2013 (140 g/m³).

Copper, lead and zinc are monitored at this site because it was known that, historically, these heavy metals were present in the grease washed from the pipes. The washwater from this activity was discharged onto land and into the Mangati Stream via the stormwater basin. Although the grease currently used does not contain these elements, and the washdown wastes are directed to sewer, it has been identified that this practice has resulted in an elevated concentration of copper, lead and zinc in the soil on site particularly in the washdown and pipe drying areas, and in sediments of the eastern site drain, stormwater basin and at the Greymouth Petroleum end of the open stormwater drain to the Mangati. Discharges from the Tasman Oil Tools site, where a similar activity is conducted, will also have contributed to the elevated metals concentration in the drain to the Mangati Stream. Shortly after taking over the site, Greymouth Petroleum undertook further remediation work in the vicinity of the washpad, stormwater basin and open drain

exiting the site. It is however noted that there is the potential for these contaminants to still be present in other areas of the site surface, and for them to become entrained in the site stormwater particularly in the acid soluble form when the suspended solids content of the discharge is elevated. The dissolved copper, lead and zinc are limited in the consent held by Tasman Oil Tools, which was renewed in 2002. There are no limits for these parameters on Greymouth Petroleum's consent.

The results for acid soluble copper and lead were both above the historical medians, whilst the acid soluble zinc results were above the historical median in one sample and just below median in the other. The dissolved copper and zinc metals concentrations were below the median of historical results in the sample collected on 3 September 2012, while both were the same as or above the median in the November 2013 sample. The metals concentrations were all below the limits imposed on Tasman Oil Tools pipeyard, which discharges into the Mangati Stream at the same point.

It is interesting to note that the sample containing the higher suspended solids concentration contained lower metals concentrations, indicating that, on this occasion, the majority of the silt/sediment came from areas of the site where the surface material present had not been as heavily impacted by historical activities.

The low conductivities of the samples collected during the years under review indicate that there was no washwater present in the stormwater discharges at the time of sampling.

5.2.2 Investigations, interventions, and incidents

In the 2012-2014 period, the Council was not required to undertake significant additional investigations, however, and interventions were required and one incident was recorded, in association with Greymouth Petroleum's conditions in resource consents or provisions in Regional Plans. Sample analysis was completed by TRC in December 2013, however, TRC failed to forward the incident information to Greymouth Petroleum in a timely manner. This resulted in TRC not being in a position to enforce the non compliance and Greymouth not being able to react to the non compliance. The details are discussed below.

6 November 2013

During the Mangati catchment wet weather run it was found that constituents in the discharge from the Greymouth Petroleum yard were not within resource consent conditions. A water sample collected from the site discharge point found that the concentration of suspended solids was higher than permitted by resource consent 4664-3. Following discussions with TRC Greymouth Petroleum placed silt controls in the ring drain to reduce the amount of silt and sediment entering the settlement pond. No further action was taken, as it was considered that, on this occasion the consent breach was relatively minor and short lived, with only minor short term effects on the stream. Council was continuing to work with Greymouth Petroleum to ensure compliance is achieved.

5.3 Discussion

5.3.1 Discussion of site performance

There has been a relatively rapid expansion of the range of activities undertaken at the site in recent years, and although the skimmer pit is present in the system to provide some containment and stormwater treatment, sample results indicate that the pit is no longer able to treat the stormwater discharged from the site to the standard required by Greymouth Petroleum's resource consent.

During the years under review there were two breaches of the suspended solids limit recorded. It is noted that there had been no recorded breaches of suspended solids found in the 19 samples collected between June 1995 and June 2005. During the period of December 2005 to date, only two of the eighteen samples collected have complied with the suspended solids limit. This indicates that changes in activities at the site have altered the nature of the stormwater discharge and that has become an on-going issue. It is however noted that the discharge sample containing the higher concentration of suspended solids during the period review, contained a lower concentration of acid soluble metals.

As part of the Greymouth Petroleum's consent renewal process, the consent holder provided a stormwater management plan so that the potential sources of contamination could be identified, along with the nature of those contaminants and the measures that are in place to minimise the risk to the receiving water body. During the 2011-2012 monitoring period, Greymouth Petroleum installed a new filtration system for the stormwater discharge, and it was hoped that this would bring about the desired improvement. Further improvements were made at the end of the 2012-2014 period, and monitoring in the 2014-2015 year will identify whether or not these have been effective.

5.3.2 Environmental effects of exercise of consent

Sampling of the site stormwater discharge, the drain into which it flows, and the Mangati Stream has in the past shown that the exercise of this consent is resulting in effects in the Mangati Stream beyond the mixing zone, in respect of suspended solids and turbidity.

During the years under review, increases in suspended solids and acid soluble metals concentrations, and turbidity of the stream were recorded on both monitoring occasions on which the Greymouth Petroleum site was found to be exceeding the suspended solids limit. It is also noted that on both occasions there was also a (lesser) contribution from the Tasman Oil Tools discharge to the increases in the suspended solids concentration of the stream.

Receiving environment monitoring showed that there were measurable, but not significant adverse, impacts on the metals concentrations in the stream as a result of the pipe yard discharge. However, it is noted that, until the release of suspended solids from the site is controlled to within the limits of Greymouth Petroleum's consent, there is the potential for off site deposition of copper and zinc in both the combined drain and the Mangati Stream itself.

5.3.3 Evaluation of performance

A tabular summary of Greymouth Petroleum's compliance record for the years under review is set out in Table 11.

Table 11 Summary of performance for Consent 4664-3, Greymouth Petroleum's stormwater discharge to Mangati Stream

Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Adoption of best practicable option to minimise effects on the environment	Inspection and discussion with consent holder	Better silt controls required
2. Limit on stormwater catchment area	Inspection	Yes
3. Stormwater to be discharged through treatment system	Observation at inspection	Yes
4. Limits on chemical composition of discharge	Discharge sampling	SS limit exceeded in 2 of 2 samples
5. Discharge cannot cause specified adverse effects beyond mixing zone	Results of receiving water sampling and observation at the time of sampling	Yes
6. Activities to be conducted in accordance with Environmental Management Plan	Inspection and discussion with consent holder	Yes
7. Plan to be reviewed on request from Council or prior to changes at the site	No review requested and inspection identified no changes requiring review to be instigated by Greymouth Petroleum	Yes
8. Optional review provision re environmental effects	Next review opportunity June 2014	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		Improvement required
Overall assessment of administrative performance in respect of this consent		High

N/A = not applicable or not assessed

An improvement in Greymouth Petroleum Acquisitions Company Limited's environmental performance is required, but this consent holder demonstrated a high level of administrative performance and compliance with the resource consents as defined in Section 1.1.4.

During the period under review both stormwater samples collected exceeded resource consent limits for suspended solids. The suspended solids concentration of the discharge has been an issue for a number of years, and it was hoped that improvements undertaken during the 2011-2012 year would have resolved the issue. This was not the case and further improvement was required.

5.3.4 Recommendation from the 2011-2012 Annual Report

In the 2011-2012 Annual Report, it was recommended:

THAT monitoring programmed for the consented activities of Greymouth Petroleum Acquisitions Company Limited in the 2012-2013 year continues at the level programmed for 2011-2012.

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

5.3.5 Alterations to monitoring programmes for 2014-2015

In designing and implementing the monitoring programmes for air/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 RMA in terms of monitoring emissions/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 emitting to the atmosphere/discharging to the environment.

It is proposed that for 2014-2015 the monitoring programme remains unchanged. A recommendation to this effect is attached to this report.

5.4 Recommendation

THAT monitoring programmed for the consented activities of Greymouth Petroleum Acquisitions Company Limited in the 2014-2015 year continues at the level programmed for 2012-2014.

6. Halliburton New Zealand Limited

6.1 Introduction

6.1.1 Process description

Halliburton New Zealand Limited (Halliburton), formerly Halliburton Overseas Limited, has operated a facility off the northern end of Paraiti Road for services to the oil field industry since 1988. Halliburton specialises in down-hole work involving drilling fluid and pumping technology. Drilling equipment and chemicals are stored on the site. Equipment maintenance is carried out. There is also a cement bulk plant, and a small laboratory that tests cementing slurries and drilling fluids.

At the start of the 2004-2005 monitoring period the consented site occupied 0.75 ha, about half of which is developed, at the head of a small sub-catchment in the northern part of the Bell Block industrial area. There is a facility for washing drilling equipment using a high pressure water hose. (The equipment is washed first at the drilling site). The washings from the wash pad at the site are treated in a three stage oil separator built to the specifications of the NPDC. A waste disposal firm cleans out the separator, on a monthly basis, or more frequently if required. Laboratory wastes are contained for disposal off-site.

The stormwater drain from the site passes through their lower yard and the property of Greenstone Developments Limited (the site of the Mainland cool store) before joining the main stormwater drain. The main stormwater drain exits the ground upstream of the industrial drain and pond 4 of the New Plymouth District Council (NPDC) stormwater treatment system, near the Mangati Stream.

A drainage system is in place that automatically diverts effluent from the washdown pad to trade waste while there is pressure on the hose, and allows stormwater to pass to the Mangati Stream when the water supply to the hose is switched off. A separator system is installed above the diverter valve.

All chemicals in the upper yard are segregated according to type and are stored in warehouses within containment bays.

During the 2003-2004 year, Halliburton started utilising the adjoining site (previously occupied by Hookers) for storage of some of their equipment. During the 2004-2005 year, Halliburton established drilling mud mixing and storage facilities on the adjoining site and varied their consent accordingly. This plant has not been used since prior to the 2007-2008 monitoring year.

Spills of substances used on the site have the potential to enter the stormwater system. The areas where the hazardous substances are used and stored are flat, and are either lined, or sealed, and bunded.

The mud mixing area was prepared by excavating the site and laying a geotextile matting and plastic 1.5 mm HDPE membrane, and then compacting metal over the top, to ensure that if a spill does occur within the bunded area, the ground beneath would not be compromised. Background soil samples were taken for future reference.

Two silos, four active mud tanks and one overflow tank were placed within the bunded area along with a mixing tank. The height of the bund wall was approximately 0.3 m, while the dimensions of the bunded area were approximately 22 m x 35 m. The bunded area was designed to hold approximately 231 m³ of material, while the largest tank on the site held up to 158 m³.

Stormwater from the bunded storage area was managed via a skimmer pit system similar to that used on wellsites throughout Taranaki. The skimmer pit discharge through a pipe along the side of the bunded area, and towards a stormwater grating. Halliburton had the ability to block the stormwater outlet from the skimmer pit so that discharge from the bunded area could be prevented if necessary. The skimmer pit also had the advantage of acting as a spill containment point. Council was informed that the skimmer pit discharge pipe would be closed and only released under supervision.

Parts of this facility were removed from the site during the 2010-2011 year.

A comprehensive spillage response and contingency plan is in place for the site, which has been accepted by the Council as being satisfactory. This plan was last reviewed in November 2013. However, it is considered that the stormwater management plan is now in need of updating to incorporate the necessary maintenance to ensure adequate on-going treatment of the site stormwater and compliance with the suspended solids limit on the consent.

6.1.2 Water discharge permit

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.

Halliburton holds water discharge permit **2337-3** to cover the discharge stormwater from an industrial site, used for an oil field service operation, into the Mangati Stream. This permit was originally issued to Paraita Partnership 11 November 1987 to discharge up to 145 L/s of stormwater from the 0.75 ha industrial site. The current consent was issued to Halliburton by the Council on 26 June 2008 under Section 87(e) of the RMA. It is due to expire on 1 June 2026.

A summary of the conditions of permit 2337-3 is given below.

Condition 1 requires the consent holder to prevent and minimise any adverse effects.

Because stormwater generation is dependent on the rainfall event and is not always practicable for the consent holder to control, rather than limiting the discharge rate, condition 2 states the maximum stormwater catchment area is 2.02 ha.

Conditions 3 and 4 require that all stormwater is treated prior to discharge and that all above ground hazardous storage areas be bunded.

Condition 5 imposes limits on the chemical concentration of the discharge, and special condition 6 prohibits adverse effects on the receiving waters downstream of the discharge.

Condition 7 requires that adequate sampling points are constructed and maintained.

Conditions 8 and 9 require the consent holder to maintain contingency and stormwater management plans. The purpose of these conditions is

- in the case of the management plan, to ensure that the consent holder examines the activities taking place on site, and puts appropriate controls in place to minimise the potential for stormwater contamination to occur due to routine activities, and
- in the case of the contingency plan to ensure that in the event of an unforeseen situation, the chances of a spillage resulting in an unauthorised discharge leaving the site are minimised.

For the consent holder these are also a means of documenting the way in which the “best practicable option” (as required by condition 1) has been implemented.

To ensure that the potential for environmental effects from the exercise of the consent is consistent with the information provided to the reporting officer at the time the consent conditions were drafted, condition 10 imposes a requirement for the consent holder to notify the Council of any changes at the site that may affect the discharge along with providing an assessment of the effect those changes might have on the environment.

Condition 11 provides for the consent to lapse if it not exercised and condition 12 provides for a review of the conditions of the consent.

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

6.2 Results

6.2.1 Water

6.2.1.1 Inspections

This site was inspected on 29 August 2012, 7 January, 10 June, 26 June, 6 August, and 29 November 2013, and 18 March 2014. The final scheduled monitoring inspection was carried out on 1 July 2014, and the results of this will be discussed in the report covering the 2014-2015 period.

29 August 2012

The upper car park, and both upper and lower yard areas were clear, with no spills observed. All equipment stored on the yard appeared to be clean and no spills or leaks were observed. Although it was noted that the wash pad was not in use at the time of the inspection, it was confirmed that the drainage system from the pad was, in any case, diverted to trade waste at the time of inspection. There was minor tracking from the concrete storage area but it was reported that this did not leave the site. All chemicals were securely stored within the bunded area and all containers had lids in place.

7 January 2013

Both the upper and lower yard areas were clear of spills. The wash pad was in use at time of inspection and was diverted to trade waste. All hazardous materials were

stored securely within the bunded area. All machinery and materials stored on site had been cleaned.

10 June 2013

The site was found to be neat and tidy. The washdown bay and separator system in the upper yard was well maintained. There was no tracking of concrete reported at this inspection. The site stormwater system and the Mangati Stream downstream of the site's discharge was noted to be in a satisfactory condition.

26 June 2013

There was a forklift operating at the time of the inspection, and no tracking issues were noted. The yard areas were found to be clean and tidy with no spills. There were no odours or dust issues at the site boundary.

6 August 2013

It was noted that good chemical storage practices were in place with most chemicals stored within bunds. The discharge from the washdown pad (via a separator system) was discoloured white, however this was not an issue as, at the time of inspection, the wash pad was discharging to trade waste. It appeared that the stormwater drain in the top carpark joined with a sump in the garden that, once full, irrigated the garden via nova flow pipes.

It was evident on the lower yard that sediment from the unsealed section was being carried on to the sealed section where the stormwater drains were located. No stormwater was discharging at the time of inspection, however Halliburton staff were advised that, in the event of a discharge, it was likely that special condition 5 (suspended solids) of resource consent 2337-3 would be breached if a discharge was to occur. Although staff advised that silt controls had previously been installed to reduce the amount of suspended solids discharging off site, these controls were not in place at the time of the inspection. It had previously been agreed during inspection (3 November 2009) that drain filters would be used to capture silt/sediment following a non-compliant discharge sample that contained suspended solid concentration 410 g/m³ (29 September 2009). It was the inspecting officer's opinion that the best practicable option to reduce suspended solids had not been adopted, and therefore special condition 1 of resource consent 2337-3 had not been complied with. This matter was recorded on the Council's unauthorised incidents register (Section 6.2.2), and the consent holder was instructed to undertake works to ensure that the best practicable option was adopted to reduce the amount of suspended solids discharging from the site.

29 November 2013

It was found that the site was very tidy. All stormwater puddles on site were clear with no hydrocarbon sheens visible. The three stage separator had recently been cleaned out. Silt cloth and absorbent material had been placed within the stormwater sumps on the lower section of the site, which appeared to have been working well. It was however noted that these sediment controls needed to be replaced, as the silt cloth was starting to rip in a couple of the sumps. Hazardous materials were bunded, however it was noted that an intermediate bulk container (IBC) containing Castrol Clean Edge was not bunded at the time of the inspection, and Halliburton staff were asked to ensure that this was bunded.

18 March 2014

It was found that the site was very tidy at the time of this inspection. As noted during the last inspection, the drain filters had rips in them and it appeared that they needed replacing. There was a large quantity of loose gravel, cement, and organic product on the sealed section of the lower yard. Halliburton staff were advised that there was a high risk that special condition 5 would be breached during the next rainfall, especially with regards to the discharge of suspended solids. It was suggested to staff that the loose material be removed, and silt controls be put in place to control the discharge of suspended solids off the unsealed section of the lower yard.

The consent holder was alerted to the fact that a sample from the stormwater system collected on 6 November 2013 yielded a suspended solid concentration of 800 g/m³. This was considered to be a significant breach of special condition 5, and adverse visual effects were observed in the industrial drain tributary (below the industrial drain outlet, TRC site code STW001026) leading to pond 4 and the bypass drain to the Mangati Stream.

It is believed that special condition 1 was not being complied with at the time of inspection. The Company was informed that an abatement notice would be issued requiring works to be undertaken to comply with consent conditions, and that a reinspection would take place after 30 June 2014. Reinspection on 1 July 2014 found that the abatement notice was being complied with. This unauthorised discharge is discussed further in section 6.2.2, with the findings of the inspection carried out on 1 July 2014 to be discussed in the report covering the 2014-2015 monitoring year.

6.2.1.2 Results of discharge monitoring

A stormwater monitoring point was identified on Halliburton's original, upper site early in 1997. Samples collected from this site are representative of stormwater exiting the upper yard via the washpad. The results for the 2012-2014 year are given in Table 12. Historically, relatively few samples have been collected because of the rapid runoff of stormwater from this small sub-catchment.

The stormwater from the lower yard, where the liquid mud plant was located, has been monitored in combination with other discharges, at the site of Hookers (previously Schreiber Transport), and at Mainland Products (refer section 19.8.1). Therefore the stormwater discharged from the expanded Halliburton site is monitored at up to five points before it reaches the Mangati Stream (Figure 2 sites 36, 12, 11, 10 and 8). Other discharges contribute to the flow at sites 11, 10 and 8. The primary monitoring site for the lower yard is at a manhole over a stormwater drain near the north eastern corner of the building. The results from chemical monitoring at this site are given in Table 13.

Table 12 Chemical monitoring results for Halliburtons' stormwater discharge for 2012-2014 (site 36), with summary of previous monitoring data. TRC site code STW002042

Date	Condy mS/m	O & G g/m ³	pH	SS g/m ³	Temp °C
Consent limits	-	15	6-9	100	-
Number	22	19	22	21	22
Minimum	2.4	0.8	6.9	3	10.2
Maximum	31.1	64.8	9.5	85	23.2
Median	4.4	3.3	7.6	20	14.4
03-Jul-12	4.8	2.3	7.5	18	9.1
03-Sep-12	2.2	1.9	7.4	29	13.4
11-Dec-12 ^b	-	-	-	-	-
03-Apr-13 ^b	-	-	-	-	-
06-Nov-13	18.3	13	7.2	46	17.2
26-Feb-14 ^b	-	-	-	-	-
24-Jun-14 ^b	-	-	-	-	-

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

The consent limits on oil and grease (15 g/m³), pH range (6-9) and suspended solids (100 g/m³) were observed as being complied with for the samples collected from the top yard interceptor discharge during the years under review.

Table 13 Chemical monitoring results for Halliburtons' lower yard stormwater discharge for 2012-2014 (site 12), with summary of previous monitoring data. TRC site code STW001009

Date	BOD g/m ³	Condy mS/m	CuAS g/m ³	CuD g/m ³	NH ₃ g/m ³ -N	NH ₄ g/m ³ -N	O & G g/m ³	pH	SS g/m ³	Temp °C	Turby NTU	ZnAS g/m ³
Consent limit	5	-		-	0.025	-	15	6-9	100	-	-	
Number	9	34	5	14	8	8	29	34	34	30	11	19
Minimum	1.0	2.6	<0.01	<0.01	0.00006	0.020	<0.5	6.4	4	9.5	13	0.091
Maximum	10	76.8	0.02	0.02	0.02029	0.084	89	9.5	1530	22.7	200	1.05
Median	3.1	7.4	0.01	<0.01	0.00045	0.030	2.3	7.3	90	14.9	98	0.419
03-Jul-12	3.2	6.2		<0.01	0.00182	0.055	1.2	8.2	66	9.1	77	0.606
03-Sep-12	3.3	5.1	0.12	<0.12	0.00665	0.020	<0.5	9.2	580	13.3	540	0.567
11-Dec-12 ^b	-	-	-	-	-	-	-	-	-	-	-	-
03-Apr-13 ^b	-	-	-	-	-	-	-	-	-	-	-	-
06-Nov-13	2.7	8.8		0.02	0.01700	0.029	<0.5	9.5	800	16.2	900	0.599
26-Feb-14 ^b	-	-	-	-	-	-	-	-	-	-	-	-
24-Jun-14 ^b	-	-	-	-	-	-	-	-	-	-	-	-

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

During the 2012-2014 period the discharge complied with the biochemical oxygen demand, oil and grease, and unionised ammonia limits on all sampling occasions. The suspended solids and pH limits were exceeded in the samples collected on 3 September 2012 and 6 November 2013. The suspended solids breach was logged on Council's Incidents database and is discussed further in section 6.2.2 below. The pH recorded on 6 November 2013 was equal to the maximum for this monitoring location.

6.2.2 Investigations, interventions, and incidents

In the 2012-2014 period, the Council was required to undertake significant additional investigations and interventions, or record incidents, in association with Halliburton's conditions in resource consents or provisions in Regional Plans.

6 August 2013

During a compliance monitoring inspection it was observed that the best practicable option was not being implemented to prevent the discharge of contaminants (notably suspended solids) from the site. An inspection notice was issued advising that the best practicable option was to undertake works to reduce the amount of suspended solids discharging from the site, and ensure that the best practicable option was adopted. Discussions were held with Halliburton concerning the discharge of suspended solids from site and the works that would be undertaken to address the matter.

6 November 2013

During the Mangati catchment wet weather run it was found that constituents in the discharge from Halliburton's lower yard were not within resource consent conditions on 6 November 2013. A water sample collected from the site discharge point from the lower yard contained a suspended solid concentration of 800 g/m³, which was higher than permitted by resource consent 2337-3. This was discussed with the consent holder at an inspection on 18 March 2014, when it was again found that the consent condition requiring that best practicable option to prevent and/or minimise adverse effects be adopted at the site, was not being complied with.



Photo 5 Halliburton stormwater drain 18 March 2014

Abatement notice EAC-20204 was issued requiring works to be undertaken to ensure that resource consent conditions are complied with. A meeting was held with Halliburton staff to discuss compliance matters, and they were advised that a reinspection would take place after 30 June 2014. Prior to the end of the period under review, Council was informed that a contractor was booked to clean the sealed area in the lower yard, and the bunded area at the Connett Road site. Reinspection of the site on 1 July 2014 found that the abatement notice was being complied with.

6.3 Discussion

6.3.1 Discussion of site performance

It was found that the wash pad, interceptors and chemical and plant storage were generally well managed during the years under review, although there was one instance where Halliburton was asked to ensure that an IBC was bunded. There was one instance where a hazardous substance was noted to be outside of a bunded area.

During the years under review the suspended solids and pH limits on the Halliburton's stormwater consent were exceeded in two of the three samples collected from the stormwater discharge from the lower yard.

In the 2011-2012 year sample results indicated that, although a reduction in the discharge of suspended solids from the lower yard had been achieved by the installation of a drain filter in one of the stormwater sumps, it appeared that better maintenance, and the installation of a filter in an additional drain was required to bring about further necessary improvements and ensure consent compliance.

During the period under review it was found that a drain filter installed in the 2009-2010 year had been removed (6 August 2013). A number of requests were made regarding works to ensure improved sediment control (6 August 2013, 29 November 2013, and 18 March 2013), some of which were not actioned at the time of the following inspection. Halliburton was informed at inspection on 6 August 2013 and 18 March 2014 that the best practicable option was not being adopted to prevent and/or minimise the discharge of suspended solids from the site. Two unauthorised incidents were recorded as a result of these findings at inspection and discharge suspended solids results. As this was proving to be an on-going issue, an abatement notice was issued. It was found that the abatement notice was being complied with early in the 2014-2015 year (inspection on 1 July 2014).

A small amount of tracking of cement was identified in one of the inspections during the period under review, and it is considered likely that this type of occurrence would have been the probable cause of the pH exceedances found in two of the three samples collected from the stormwater system in the lower yard.

6.3.2 Environmental effects of exercise of consent

Although there were two breaches of the contaminant concentration limits on Halliburton's resource consent, and visible effects were observed at the top of the industrial drain tributary on one of these occasions, dilution with other stormwater resulted in the contaminants, as sampled at the point of discharge into the stream (site 8, Figure 2), being at acceptable levels. Due to the conditions prevailing at the

time of the sampling surveys during the period under review there was little change in the suspended solids concentration of the stream, and therefore there were no significant adverse environmental effects attributable to the exercise of this consent.

6.3.3 Evaluation of performance

A tabular summary of the Halliburton's compliance record for the years under review is set out in Table 14.

Table 14 Summary of performance for Consent 2337-3, Halliburton stormwater discharge to Mangati Stream

Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Adoption of best practicable option to minimise effects	Inspection and discussion with consent holder	Inadequate sediment control
2. Stormwater catchment area limit	Inspection and discussion with consent holder	Yes
3. All stormwater to be treated in accordance with special conditions	Inspection and sampling	pH and SS limits breached in 2 of 6 samples. Inadequate sediment control
4. Above ground hazardous substance storage to be bunded	Observation at inspection	Yes
5. Limits on chemical composition of discharge	Sampling	pH and SS limits breached in 2 of 6 samples.
6. Discharge cannot cause specified adverse effects beyond mixing zone	Receiving water sampling. Visible effects in industrial drain tributary, but none in the stream itself	Yes
7. Construction and maintenance of discharge sampling points	Observation at inspection and access sampling	Yes
8. Maintenance of a contingency plan	Review of documentation submitted	Yes
9. Maintenance of stormwater management plan	Review of documentation submitted. Update now required regarding maintenance of sediment control devices	Yes, but review now required
10. Notification of changes accompanied by assessment of effects	No changes found at inspection	N/A
11. Provision for consent to lapse	Consent has been exercised	N/A

Condition requirement	Means of monitoring during period under review	Compliance achieved?
12. Optional review provision re environmental effects and notification of changes	Next review opportunity June 2020	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		Improvement required
Overall assessment of administrative performance in respect of this consent		Good

N/A = not applicable or not assessed

An improvement in Halliburton New Zealand Limited's environmental performance is required, but this consent holder demonstrated a good level of administrative performance and compliance with the resource consents as defined in Section 1.1.4.

During the period under review there were on-going issues with sediment control at the site that resulted in two non-compliant stormwater discharges and the issuing of an abatement notice. It is however noted that the abatement notice was found to have been complied with on 1 July 2014.

6.3.4 Recommendation from the 2011-2012 Annual Report

In the 2011-2012 Annual Report, it was recommended:

THAT monitoring programmed for consented activities of Halliburton New Zealand Limited in the 2012-2013 year continues at the level programmed for 2011-2012.

This recommendation was implemented in the 2012-2014 period.

6.3.5 Alterations to monitoring programmes for 2014-2015

In designing and implementing the monitoring programmes for air/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 RMA in terms of monitoring emissions/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 emitting to the atmosphere/discharging to the environment.

It is proposed that for 2014-2015 the monitoring programme remains unchanged. A recommendation to this effect is attached to this report.

6.4 Recommendation

THAT monitoring programmed for consented activities of Halliburton New Zealand Limited in the 2014-2015 year continues at the level programmed for 2012-2014.

7. Hooker Bros Investments Limited

7.1 Introduction

7.1.1 Process description

Hookers Bros Investments Limited (Hookers) operates a truck depot from a 5.7 ha site from which goods for various industries are transported throughout the country. The site was established in 2005. The three primary industries using Hookers transport services are food and beverage, agriculture, and petroleum/gas exploration. Some of the materials handled or transported through the site are classified as hazardous substances and others, although not classified as hazardous substances, would result in adverse environmental effects if discharged to water.

The site straddles the Mangati Stream/Mangaone Stream catchment boundary, and therefore Hookers holds consents to discharge stormwater in each of these catchments.

Activities in the Mangaone catchment include a container storage area, a truck parking area, a truck wash facility and Ross Graham Motors workshop.

The truck wash facility has a wash water separator, which directs stormwater into the stormwater system and any truck wash into the sewage system. The separator is a "Smart Valve", which works by directing all water from the truck wash pad to trade waste whenever it is in use (i.e. if any tap is turned on). While the truck wash is not in use, water is directed to stormwater after a certain amount of rainfall.

The truck park and container storage areas have sumps that collect stormwater, and direct it through a 300 mm pipe to the stormwater settlement pond. The pond, which is approximately 350 m² and 3 m, has an overflow outlet pipe. However, it was anticipated that the pond would be large enough for the stormwater to soak away, without overflows occurring.

The consent for this area was granted prior to the development of the site. At the time the consent was processed it was considered that, as the truck wash water is discharged to tradewaste, and stormwater is directed to the stormwater settlement pond to soak away, there should be no direct discharge to surface water and therefore no adverse environmental effects were anticipated.

The eastern area of the site (approximately 2.60 ha) is piped to the New Plymouth District Council's (NPDC) reticulated stormwater system at three points, and discharges to the Mangati Stream via the NPDC's constructed wetland.

A large proportion of this area of the site is roofed (approximately 1.26 ha) and the remainder is predominantly hard paved or metalled. Activities within the stormwater catchment include parking, loading, storage and heavy vehicle movements.

The stormwater discharges from three points, all of which contain a mixture of roof stormwater and yard stormwater. The northern catchment is predominantly leased, and contains KMC Engineering, the Coca-Cola distribution loading area and parking, and has a low traffic volume. It discharges to the NPDC system at Connett Road.

The central catchment is used for loading and storage, and has high heavy traffic volume. This area discharges to the NPDC system on Paraita Road in front of the loading tunnel. The southern catchment contains molasses storage and loading facilities, container storage, privately leased storage sheds and a wash bay used for cleaning imported containers to the standards required by the Ministry of Primary Industries (MPI). It is subject to a lower volume of heavy traffic movement and discharges to the NPDC system in front of the building leased by Turners and Growers.

There is the potential for the stormwater to become contaminated by hazardous substances and molasses, if they are spilt on site, and also hydrocarbons, suspended solids, copper and zinc from the volume of vehicular traffic. It was also stated that the roof stormwater may contain *E.coli* and coliforms from the number of birds that frequent the roofs of the properties in this area.

Mitigation measures

Hookers has in place a stormwater management plan which identifies the structural and procedural controls in place to minimise the potential for contamination of stormwater to occur due to the day to day activities undertaken at the site. As a result of preparing the stormwater management plan, some further improvements were identified and have been prioritised within the plan.

Hookers has advised the Council that nearly all the loading and unloading of trucks takes place within the covered loading tunnel. The material is then transferred by forklift to the storage sheds, accessed from inside the tunnel. It was identified that the stormwater grates within the tunnel could allow contaminants to enter the stormwater system. It was proposed that nib walls be constructed around these open grates, and that an additional spill kit be located next to the one grate that, due to traffic movements, cannot be protected by a nib wall.

There are well written procedures in place to ensure that the MPI wash bay discharges to the NPDC sewer system whilst in use. It was proposed that a containment fence be constructed to prevent spray drift entering the stormwater catchment.

The storage and transfer of molasses currently takes place within an unbunded area of the site. Although the stormwater management plan instructs that all transfer activities are supervised, it is proposed that an interceptor pit be constructed in the vicinity of the molasses tank so that any spillage can be contained.

A programme has been established to ensure that staff are trained to a level appropriate to their role on site.

An inspection and maintenance programme is in place at the site (including the areas of the site leased to other companies), and a "prospective incident card" has been developed so that staff have a means of reporting procedures or structures that have the potential to result in an unauthorised discharge.

A comprehensive spill contingency plan has been written to ensure that there is a planned response to any emergencies that relate to spillage of onsite chemicals.

Potential effects

There is a relatively small area of the stormwater catchment that is metallated, therefore despite the heavy vehicle movements on site, it is not expected that the concentration of suspended solids in the discharge will be high, and as a result, it is also likely that the concentration of copper and zinc in the discharge will be relatively low. Further, as in all but very high intensity rainfall events, the stormwater from this site will be discharged via the NPDC constructed wetlands, which will allow a certain amount of settling to take place.

It is considered that the main potential for adverse effects from the stormwater discharge from the site would be as a result of accidental spillage, or from an accumulation of small spills incidental to the transfer of materials on site.

Of particular concern in this catchment is the potential for a high biochemical oxygen demand (BOD) in the discharge from the molasses storage at the site. The concern is due to the fact that there are a number of other industries that contribute to this drainage system with potential sources of contaminants that exert a high biochemical oxygen demand, and it has been specifically mentioned as one of the water quality issues resulting in the Mangati Stream having been identified in Appendix IB of the RFWP, for enhancement of natural, ecological and amenity values and life supporting capacity.

7.1.2 Water discharge permit

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.

Hookers holds water discharge permit **7578-1** to cover the discharge of stormwater into the Mangati Stream. This permit was issued by the Council on 31 May 2011 under Section 87(e) of the RMA. It is due to expire on 1 June 2026.

A summary of the conditions of permit 7578-1 is given below.

Condition 1 requires the consent holder to prevent and minimise any adverse effects.

Because stormwater generation is dependant on the rainfall event and is not always practicable for the consent holder to control, rather than limiting the discharge rate, condition 2 states the maximum stormwater catchment area is 2.60 ha.

Condition 3 requires that all above ground hazardous storage areas be bunded (including the molasses area).

Condition 4 imposes limits on the chemical concentration of the discharge, and condition 5 prohibits adverse effects on the receiving waters downstream of the discharge.

Conditions 6 and 7 require the consent holder to maintain contingency and stormwater management plans, with reviews to be undertaken at 2 yearly intervals.

The purpose of these conditions is:

- in the case of the management plan, to ensure that the consent holder examines the activities taking place on site, and puts appropriate controls in place to minimise the potential for stormwater contamination to occur due to routine activities, and
- in the case of the contingency plan to ensure that in the event of an unforeseen situation, the chances of a spillage resulting in an unauthorised discharge leaving the site are minimised.

For the consent holder these are also a means of documenting the way in which the “best practicable option” (as required by condition 1) has been implemented.

To ensure that the potential for environmental effects from the exercise of the consent is consistent with the information provided to the reporting officer at the time the consent conditions were drafted, condition 8 imposes a requirement for the consent holder to notify the Council of any changes at the site that may affect the discharge along with providing an assessment of the effect those changes might have on the environment.

Condition 9 provides for the consent to lapse if it not exercised and condition 10 provides for a review of the conditions of the consent.

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

7.1.3 Discharges of wastes to land

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.

Hookers holds discharge permit **6952-1** to cover the discharge of stormwater from a truck depot into and onto land in the vicinity of the Mangaone Stream in the Waiwhakaiho catchment. This permit was issued by the Council on 20 September 2006 under Section 87(e) of the RMA. It is due to expire on 1 June 2020.

Condition 1 requires the consent holder to prevent and minimise any adverse effects.

Because stormwater generation is dependent on the rainfall event and is not always practicable for the consent holder to control, rather than limiting the discharge rate, condition 2 states the maximum stormwater catchment area is 4.575 ha.

Conditions 3 and 4 require the provision of a stormwater management plan and contingency plan to the Council prior to the exercise of the consent.

Condition 5 requires that all stormwater is treated prior to discharge.

To ensure that the potential for environmental effects from the exercise of the consent is consistent with the information provided to the reporting officer at the time the

consent conditions were drafted, condition 6 requires that the consent be exercised in accordance with the information provided at the time of application.

Condition 7 requires that all above ground hazardous storage areas be bunded.

Condition 8 prohibits adverse effects on the receiving waters.

Condition 9 requires a buffer distance of 30 m between the discharge to land, and any surface water, and prohibits any direct discharges to surface water.

Condition 10 provides for the consent to lapse if it not exercised and condition 11 provides for a review of the conditions of the consent.

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

7.2 Results

7.2.1 Water

7.2.1.1 Inspections

The Hookers site was visited on 2 October 2012, 7 January, 8 April, 10 June, 26 June, 6 August, and 29 November 2013 and 21 March 2014. The final scheduled monitoring inspection was delayed until 1 July 2014 so that some preliminary results of the sampling survey undertaken on 24 June 2014 would be available at the time of inspection. The full details of this final inspection will be discussed in the report covering the 2014-2015 year, however where relevant, any follow up on outstanding issues will be discussed in this report.

2 October 2012

The yard area contained a number of puddles which all appeared to be sheen free. The level of the settling pond in the Mangaone catchment was at 1.6 metres and the pond appeared to be turbid but sheen free. All drains within both catchment areas were clear of visible contaminants and free of obstructions. The storage shed, loading bay and molasses storage areas were spill free and tidy. The area around Turners & Growers was spill free, and all drains were clear. All spill kits were found to be stocked.

7 January 2013

The car parking and truck standing areas, molasses storage area, storage shed area and loading bay were all clear of spills and potential contaminants. No sheen was observed on the holding pond. All drains and collection points were clear of visible contaminants and obstructions. The Turners & Growers area was checked and this area was also found to be clean, and free from spills and potential contaminants.

8 April 2013

The matter of a stormwater overflow pipe found to have been installed in the stormwater pond in the Mangaone/Waiwhakaiho catchment at inspection on 9 August 2011 was followed up with Hookers staff in a telephone conversation.

Hookers staff had been advised that they either needed to remove the pipe or apply for a consent variation, as this was not permitted by the purpose or conditions of the

consent. Staff confirmed that the pipe was still presently in place, but that the pipe was scheduled to be removed on 10 April 2013.

10 June 2013

No visible emissions or objectionable odours were noted during the inspection around the yard, and this was clean and tidy with no visual spills. There was a slight sheen on the pond. The overflow pipe was not noted as still being present. The area around the molasses tank was clean and tidy.

26 June 2013

The site appeared to be clean and tidy with no visual effects noted in the stormwater drains or around the boundary of the site. The pond was a slightly brown colour, however, no oil sheen was noted. There were no odours or dust issues around the boundary.

6 August 2013

The loading bay was found to be dry with no leaking product visible. Silt and sediment was observed on the concrete floor and staff advised that sweeping was the only method used to prevent this from entering the drains and discharging into the Mangati Stream. The Turners site was inspected and found to be clean and dry. Molasses pumping had occurred prior to the inspection and it was evident that molasses had spilt onto the ground and was flowing (in diluted form) towards the stormwater drain adjacent to Turners. A discussion was had with staff around 'best practicable option' for preventing this from occurring in the future. It was reported that the sumps below the molasses tanks had a membrane present so could be used for emergency storage if ever required. The MPI washdown area was not in use at the time of inspection. The holding pond was discoloured with a slight hydrocarbon sheen noted on the surface. It was noted that as per the consent, overflow from the pond would flow along the roadside before entering a nearby waterway. As any overflow would result in hydrocarbons discharging from the pond first, it was recommended that works be undertaken to prevent the discharge of hydrocarbons from the pond. This could be achieved by installing a goose-necked discharge pipe. Four 25 L containers that appeared to contain waste oil were situated next to the holding pond, staff advised that they would follow up on why they were there. Staff were also requested to follow up on why several empty 200 L drums situated near the workshop did not have caps on.

29 November 2013

The loading bay was dry and there was no evidence of spillage. It was noted that silt/sediment from truck movements was building up within the loading bay and around the drain at the western end of the bay. Large (200 L) drums of liquid fertiliser were being stored outside the lock up sheds with no bunding in place. The likely adverse effects of this product entering the Mangati Stream were explained to staff and they advised that this product would be removed from its current location. It was observed that, as in the previous inspection, residual molasses was discharging onto the ground during the truck transfer process and running towards a stormwater drain. This issue was again discussed with staff at the time of the inspection and the discussion covered the possibility of one of the two sumps being reinstated, with a pump placed within the sump to direct stormwater/molasses to the trade waste drain.

21 March 2014

The site was found to be generally tidy, however it was noted that pigeon faeces was starting to accumulate in some areas around the building. The loading/unloading bay was in need of a sweep and general tidy up. It appeared that the molasses tank had not been used for an extended period of time. The rented storage area was checked and everything appeared to be satisfactory. The liquid fertiliser had been removed since the previous inspection. The holding pond was inspected and this was well below the point of discharge.

At the inspection on 1 July 2014, issues were again raised in relation to molasses spills, and silt and sediment mitigation measures. This is discussed further in Section 7.2.2.

7.2.1.2 Results of discharge monitoring

There are no limits on the constituents of the discharge directed to the on site stormwater pond that discharges onto and into land in the Waiwhakaiho/Mangaone Stream catchment, and so this is not currently programmed for sampling.

Three stormwater monitoring points were identified on Hooker's site for the areas of the site discharging to the Mangati Stream via the NPDC reticulated stormwater network and stormwater ponds.

All of these discharges contain roof water as well as stormwater from the ground level site surfaces. The stormwater discharged from each of these sampling sites is monitored at up to eight additional points before it reaches the Mangati Stream (i.e. Figure 2 sites 19, 16, 14, 10, 8, 33, 37 and 38). Other discharges contribute to the flow at each of these sites.

Stormwater from the south eastern area of the site, which contains the rented storage sheds, the molasses storage and transfer area, the MPI washpad, and Turners & Growers is sampled from a stormwater drain on Paraita Road in front of Turners & Growers southern entrance (Figure 2, site 46 and Figure 3, STW001133). The results from chemical monitoring at this location are given in Table 15.

The consent limits on oil and grease (15 g/m³), pH range (6-9) and suspended solids (100 g/m³) were observed as being complied with for the samples collected from the southern areas of the site (Turners and Growers, molasses storage and self store storage sheds) during the period under review. At 16 g/m³, the biochemical oxygen demand limit was over double the allowable limit of 7 g/m³ in the sample collected on 3 July 2012. This is discussed further in section 7.2.2.

Table 15 Chemical monitoring results for Hookers Turners & Growers stormwater discharge for 2012-2014 (site 46). TRC site code STW001133

Date	BOD g/m ³	Condy mS/m	DRP g/m ³	O & G g/m ³	pH	SS g/m ³	Temp °C	Turby NTU
<i>Consent limits</i>	7	-	-	15	6-9	100	-	-
Number	7	7	4	4	7	7	7	7
Minimum	1.6	1.3	0.011	<0.5	6.8	4	9.9	2.2
Maximum	8.3	4.0	0.183	0.6	7.3	54	18.3	34
Median	4.4	2.0	0.049	0.5	7.1	12	15.1	3.9
03-Jul-12	16	3.1	0.189	a	7.2	50	8.4	24
03-Sep-12	3.5	1.8	0.048	<0.5	7.1	5	13.2	3.3
11-Dec-12 ^b	-	-	-	-	-	-	-	-
03-Apr-13 ^b	-	-	-	-	-	-	-	-
06-Nov-13 ^b	-	-	-	-	-	-	-	-
26-Feb-14 ^b	-	-	-	-	-	-	-	-
24-Jun-14 ^b	-	-	-	-	-	-	-	-

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

Stormwater from the central eastern area of the site, which includes the main loading canopy and storage sheds, is sampled from a manhole on Parait Road in front of the loading canopy (Figure 2, site 45 and Figure 3, STW001132). The results from chemical monitoring at this location are given in Table 16.

Table 16 Chemical monitoring results for Hookers loading canopy stormwater discharge for 2012-2014 (site 45). TRC site code STW001132

Date	BOD g/m ³	Condy mS/m	DRP g/m ³	NH ₃ g/m ³	NH ₄ g/m ³ N	O & G g/m ³	pH	SS g/m ³	Temp °C	Turby NTU
<i>Consent limits</i>	7	-	-			15	6-9	100	-	-
Number	7	7	4	3	3	5	7	7	7	7
Minimum	1.5	1.7	0.005	0.00016	0.072	<0.5	6.7	14	9.7	7.6
Maximum	17	6.5	0.493	0.00077	0.110	5	7.5	120	18.3	41
Median	3.6	3.7	0.247	0.00020	0.093	0.6	7.3	45	15.6	24
03-Jul-12	65	6.2	0.731	0.02153	6.69	5.0	7.2	150	8.5	80
03-Sep-12	7.3	4.2	0.302	-	-	a	7.3	24	13.2	14
11-Dec-12 ^b	-	-	-	-	-	-	-	-	-	-
03-Apr-13 ^b	-	-	-	-	-	-	-	-	-	-
06-Nov-13 ^b	-	-	-	-	-	-	-	-	-	-
26-Feb-14 ^b	-	-	-	-	-	-	-	-	-	-
24-Jun-14	21	37.3	2.88	-	-	<0.5	7.6	11	15.4	6.5

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

Compliance was achieved with the consent limits for pH and oil and grease throughout the period under review. The suspended solids and biochemical oxygen demand limit were exceeded on 3 July 2012, while the biochemical oxygen demand limit was exceeded on 24 June 2014. This was also logged on the Council's Incidents Register as a combined incident along with the inspection findings, and result from a sample collected at that inspection, on 1 July 2014, which is also discussed in Section 7.2.2.

It is noted that on 3 July 2012 the ammoniacal nitrogen concentration was 60 times higher than the historical maximum for this site, although it is recognised that there is a limited data set, with only three previous results for comparison. The unionised ammonia concentration (which is not limited by Hookers' consent) was also elevated in this sample, but was below the guideline value of 0.025 g/m³ drawn from the standard contained in the permitted stormwater rule in the RFWP (Appendix IV).

The dissolved reactive phosphorus concentration of this discharge was another new maximum for this monitoring location on 24 June 2014, being almost six times the historical maximum calculated from a limited data set.

Stormwater from the north eastern area of the site, which includes the stormwater catchment to the north and east of the buildings leased by KMC Machinery, Coca-Cola and Laminex, is sampled from a manhole on Connett Road (Figure 2, site 44 and Figure 3, STW001131). The results from chemical monitoring at this location are given in Table 17.

The consent limits for oil and grease (15 g/m³), pH range (6-9) and suspended solids (100 g/m³) were all observed as being complied with for the samples collected from the northern area of the site (KMC Engineering and Coca-Cola) discharging via Connett Road.

Table 17 Chemical monitoring results for Hookers Connett Road stormwater discharge for 2012-2014 (site 44). TRC site code STW001131

Date	BOD g/m ³	Condy mS/m	DRP g/m ³	O & G g/m ³	pH	SS g/m ³	Temp °C	Turby NTU
<i>Consent limits</i>	7	-	-	15	6-9	100	-	-
Number	6	6	4	3	6	6	6	6
Minimum	1.0	0.9	0.009	<0.5	6.4	6	12.4	5.1
Maximum	>50	2.9	0.072	2.6	7.2	34	17.4	25
Median	1.7	1.6	0.057	1.5	6.8	18	15.2	11
03-Jul-12	12	6.6	0.151	0.7	7.1	16	9.4	16
03-Sep-12	3.6	1.2	0.109	a	6.8	10	12.9	4.4
11-Dec-12 ^b	-	-	-	-	-	-	-	-
03-Apr-13 ^b	-	-	-	-	-	-	-	-
06-Nov-13	1.8	1.3	0.094		6.9	2	14.8	2.2
26-Feb-14 ^b	-	-	-	-	-	-	-	-
24-Jun-14	21	11.2	0.330	<0.5	7.0	10	14.2	4.2

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

At 12 g/m³ and 21 g/m³, the biochemical oxygen demand limit was just under double the allowable limit of 7 g/m³ in the sample collected on 3 July 2012, and three times the allowable limit in the sample collected on 24 June 2014. These are also discussed further in section 7.2.2.

7.2.2 Investigations, interventions, and incidents

In the 2012-2014 period, the Council was required to undertake significant additional investigations and interventions, or record incidents, in association with Hookers' conditions in resource consents or provisions in Regional Plans.

3 July 2012

During analysis of sampling results it was found that resource consent limits in regards to suspended solids and biochemical oxygen demand were exceeded in the discharges from the Hookers' site on Paraité Road, Bell Block. Although these component concentrations in the discharges to the ponds were still elevated, the concentrations in the discharges to the Mangati Stream had reduced to an acceptable level. The discharge also occurred during heavy rainfall and the receiving environment already had an elevated suspended solids load. No measurable increase in suspended solids or biochemical oxygen demand was found in the receiving waters. An on site meeting was held on 26 July 2012. It was determined that the elevated sample results were most likely to have been caused by seagulls and pigeons nesting in and on the loading bay canopy. The investigating officer was informed that various methods of deterrence had been trialled, but as yet none have been successful. Contractors would be called as a matter of urgency to clean the roof. The consent holder was informed that the discharges would be discussed with site management during further routine compliance monitoring inspections.

1 July 2014

Analysis of samples taken during a sampling survey on 24 June 2014 (Table 16 and Table 17), and during a compliance monitoring inspection on 1 July 2014 (Table 18) found that resource consent conditions were not being complied with.

Table 18 Hookers discharge sample collected at inspection on 1 July 2014 during a molasses spill

Sample location	Time	BOD g/m ³	O & G g/m ³	pH	SS g/m ³	Temp °C
Hookers Yard GPS: E1699133 N5678243	09:38	62	<0.5	6.6	21	11.9

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

For the sample collected on 1 July 2014, the source of contamination was identified at the time of inspection and action was immediately taken to stop the discharge. It was found that a mechanic was working on the molasses tank in wet weather, which resulted in a spill to ground that then discharge to stormwater. An infringement notice was subsequently issued.

A letter was sent to Hookers requesting an explanation for the other (unconsented dry weather) discharges on 24 June 2014. An explanation was received in which the Company advised that inspection and cleaning of the roof and gutter systems found that there was a significant amount of nutrient rich material present including:

- Chicken bones (the amount was substantial)
- Dead seagulls both adult and chicks and egg shells
- Plastic and plastic bags, glass
- A large amount of pebbles and small rocks

- Some grass that had grown in the gutters
- An amount of sticks, twigs, straw etc
- A substantial amount of sand/gravel, bird excrement and other fine material

Another matter was also raised in that it was alleged that fertiliser dust from the BLM operation across the road was potentially impacting on the stormwater quality from the Hookers' site. The Council was informed that under some conditions, fertilizer was getting blown across to their property, into their freight tunnel, and also onto the store roof.

Hookers was informed that in relation to the detritus on the roof the Council would not be able to identify the source of the material with any certainty. However, the Council was reasonably satisfied that the local Tegel plant was not the likely source as there appeared to be little, if any, opportunity for birds to access uncovered bones, and monitoring of this would continue. The regional landfill at Colson Rd was identified as is another potential source and recently the Council had been working with NPDC to reduce the footprint of their tip face and improve the level of earthen cover over the areas that had just been filled. NPDC has also been contacted in regard to investigating methods of bird control, as culling the seagull population is not allowed as they are effectively protected, and only the Department of Conservation has authority to undertake such actions.

In relation to the dust issue Hookers was informed that Council was currently in discussion with BLM to change practices to reduce to the opportunity for dust emissions to occur. It was expected that there would be an improvement soon, otherwise they may face enforcement action. Hookers staff were also informed that if they experienced dust emissions affecting their site, that they should contact the Council as soon as possible, so that the incident could be investigated.

7.3 Discussion

7.3.1 Discussion of site performance

Although the majority of the consent holder's goods handling activities were found to be well managed at inspection, there were a number of issues found that were associated with the storage and distribution of molasses, and on one occasion unbanded drums of liquid fertiliser were found in the stormwater catchment.

Although the liquid fertiliser storage was found to have been addressed at the following inspection, the best practicable option had not been adopted to avoid or minimise potential adverse environmental effects with regards to the storage and distribution of molasses. At two inspections it was found that there had been spills tracking to stormwater drains after transfer activities.

Only three of the nine discharge samples collected during the period under review complied with the biochemical oxygen demand limit on the consent, with one of the non-compliances being found in a dry weather discharge. Whilst it is likely that sources outside the Hookers' control contributed to the elevated biochemical oxygen demands, and were being investigated and actioned by the Council (bird detritus on the building roofs and stock feed dust from the BLM Feeds site), issues associated with spills during the molasses transfer and tracking were also likely to have

contributed to these results during the period under review. It is also likely that the on-going molasses spills during transfer were a significant contributor to the much more elevated biochemical oxygen demand of 65 g/m³ found in the sample collected from this stormwater catchment on 3 July 2012.

In addition, the best practicable option was not adopted during the removal of the molasses plant, with work allowing a release of molasses, being undertaken during wet weather, which resulted in the discharge of contaminants for which an infringement fine was subsequently issued. Although this incident was discovered on 1 July 2014, it is considered that this was a reflection of Hookers' performance in the period under review, as the facility has now been removed from the site.

During the 2011-2012 year an overflow pipe was fitted to the stormwater pond in the Mangaone catchment, which Hookers was asked to remove. It was removed during the period under review, as per the Council's request. It was subsequently suggested that a modified goose neck pipe be installed to avoid the potential for discharge of any retained hydrocarbons in the event of an overflow.

7.3.2 Environmental effects of exercise of consents

No adverse environmental effects were found during the years under review as a result of the exercise of Hookers' consents. Due to the conditions prevailing at the time of the sampling surveys, dilution with other stormwaters resulted in the biochemical oxygen demand of the combined reticulated stormwaters being at an acceptable level at the points of discharge into the NPDC ponds and/or the stream.

7.3.3 Evaluation of performance

A tabular summary of Hookers' compliance record for the years under review is set out in Table 19 and Table 20.

Table 19 Summary of performance for Consent 6952-1, Hookers -stormwater discharge to land in Waiwhakaiho catchment

Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Adoption of best practicable option to minimise effects on the environment	Inspection and discussion with consent holder	Yes
2. Limits stormwater catchment area	Inspection and discussion with consent holder	Yes
3. Provision of stormwater management plan prior to exercise of consent	Review of Council records and of any correspondence or documents submitted	Yes
4. Provision of contingency plan prior to exercise of consent	Review of Council records and of any correspondence or documents submitted	Yes
5. All stormwater to be treated in accordance with special conditions	Inspection and sampling	Yes
6. Design, management and maintenance of stormwater system to be as per application	Inspection and discussion with consent holder	Yes
7. Above ground hazardous substance storage to be bunded	Inspection and discussion with consent holder	N/A

Condition requirement	Means of monitoring during period under review	Compliance achieved?
8. Direct discharge to surface water prohibited. 30 m buffer zone between discharge to land and any surface water	Observation at inspection	Yes
9. Provision for lapse of consent	Consent exercised	N/A
10. Optional review provision re environmental effects	Next opportunity for review June 2014	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		High
Overall assessment of administrative performance in respect of this consent		High

N/A = not applicable or not assessed

Table 20 Summary of performance for Consent 7578-1, Hooker Bros Investments Limited - stormwater discharge to Mangati Stream

Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Adoption of best practicable option to minimise effects on the environment	Inspection and discussion with consent holder	No
2. Limits stormwater catchment area	Inspection and discussion with consent holder	Yes
3. Above ground hazardous substance storage to be bunded	Inspection and discussion with consent holder	Yes
4. Limits on chemical composition of discharge	Sampling	6 exceedances of BOD limit
5. Discharge cannot cause specified adverse effects surface water	Observation at inspection	Yes
6. Maintenance of and adherence to contingency plan, reviews to be within 2 years	Review of Council records and of any documents submitted. Plan dated September 2009 on file	Plan either not followed or not effective during molasses tank removal
7. Maintenance of and adherence to stormwater management plan, reviews to be within 2 years	Review of Council records and of any documents submitted. Plan dated September 2009 on file	Plan over due for review
8. Written notification required regarding changes to activities at the site that alters nature of discharge	Inspection and discussion with consent holder. No changes	N/A
9. Provision for lapse of consent	Consent exercised	N/A
10. Optional review provision re environmental effects or notification of changes per condition 8	Next opportunity for review June 2014	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		Poor
Overall assessment of administrative performance in respect of this consent		Improvement required

N/A = not applicable or not assessed

During the year, Hooker Bros Investments Limited (Hookers) demonstrated a poor level of environmental performance and improvement was required in their level of administrative performance and compliance with the resource consents as defined in Section 1.1.4.

There were a number of breaches of this consent holder's biochemical oxygen demand limit, which on one occasion resulted in the issuing of an infringement notice.

In terms of Hookers' administrative performance, as highlighted in the previous Annual Report, this consent holder's stormwater plan is overdue for review, and the site contingency planning/actions did not prevent the discharge of molasses when work was undertaken on the storage facility.

7.3.4 Recommendation from the 2011-2012 Annual Report

In the 2011-2012 Annual Report, it was recommended:

THAT monitoring programmed for consented activities of Hooker Bros Investments Limited in the 2012-2013 year continues at the level programmed for 2011-2012.

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

7.3.5 Alterations to monitoring programmes for 2014-2015

In designing and implementing the monitoring programmes for air/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 RMA in terms of monitoring emissions/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 emitting to the atmosphere/discharging to the environment.

It is proposed that for 2014-2015 the monitoring programme remains unchanged. A recommendation to this effect is attached to this report.

7.4 Recommendation

THAT monitoring programmed for consented activities of Hooker Bros Investments Limited in the 2014-2015 year continues at the level programmed for 2012-2014.

8. McKechnie Aluminium Solutions Limited

8.1 Introduction

8.1.1 Process description

McKechnie Aluminium Solutions Limited (McKechnie) operates a metal melting and extrusion plant that used to process copper, brass (copper/ zinc) and aluminium. The copper and brass divisions have closed and the equipment has been removed from the site. The McKechnie manufacturing plant extends across the boundary between the Mangaone and Mangati catchments. Drainage from the eastern side of the site (aluminium processing areas) is into the Mangati Stream, whilst drainage from the western side of the site (historically copper and brass processing and now aluminium scrap storage and sorting) is to the eastern headwaters of the Mangaone Stream.

Stormwater from the eastern side of the plant flows into the Bell Block industrial drain through an underground system at two points along Paraita Road, one adjacent to (east of) the plant and one north of McKechnie's aluminium extrusion building. Cooling water is discharged from cooling of a press coil and heat treatment electrodes at the northern point.

About 2.7 ha of the site is under roof, comprising the old brass and copper processing buildings and the aluminium foundries, extrusion and finishing mills, and administration and utilities buildings. In the remainder of the catchment there are bunded areas for storage of chemicals and oils, oil/water separators, wastewater holding tanks and an open aluminium scrap yard that is now rarely used. This is because the majority of the aluminium sorting and storage is now done under cover in the Mangaone Stream catchment. Wastewater is sent to sewer, after pH neutralisation.

Since regular inspection by the Council began in 1982, MCK Metals, the former owner of the site, instituted a series of progressive upgrades of waste containment, treatment and disposal facilities, including:

- the construction of a wastewater neutralisation plant;
- cessation of soakage trenches for disposal of wastewater;
- construction of bunds around chemical storage areas;
- diversion of effluent streams to sewer;
- changes in solid waste management practice;
- the use of a mechanical sweeper for the cleaning of the scrap sorting yards; and
- the installation of baghouses in the brass and copper and aluminium foundries, thus reducing aerial deposition from the site.

A suite of contingency plans is in place in case of spillage. McKechnie operates an Environmental Management System, and specific contingency plans are included as individual Works Procedures within the McKechnie Aluminium Solutions Limited Management System - Environmental Manual. All new work procedures that have an environmental aspect are incorporated into the documented system. The strengths of this new integrated system are that responsibilities are clearly defined, and that the whole system is reviewed regularly. A revised plan was received in September

2010, which Council records indicate was confirmed as still being current in December 2012.

8.1.2 Water discharge permit

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.

McKechnie holds water discharge permit **3139-3** to cover the discharge of stormwater (including cooling water) from an industrial site into an unnamed tributary of the Mangati Stream. This permit was issued by the Council on 2 November 2007 under Section 87(e) of the RMA. It is due to expire on 1 June 2026.

This permit was originally issued on 14 September 1988 as a water right pursuant to section 21(3) of the Water and Soil Conservation Act 1967 for a period until 1 June 1996. A new consent **3139-2** was issued by the Council on 12 June 1996 under Section 87(e) of the RMA, with the 'standardised' conditions, for a period until 1 June 2008 to provide for the stormwater and also cooling water.

Pursuant to Section 128(1)(a) of the RMA, the Council completed a review of consent conditions on MCK Metals stormwater discharge permit in August 2000. The changes to the special conditions reduced the mixing zone in the receiving waters of the Mangati Stream to 10 metres, and placed a maximum induced temperature limit of 25°C in the receiving water (after allowing for the mixing zone) as a result of the discharge. Conditions relating to the preparation, adoption, and review of a stormwater management plan encompassing the cooling water discharge were also included in the reviewed consent issued on 3 August 2000, which were carried over into the renewed consent.

The consent has been transferred a number of times over the years, and was transferred to McKechnie on 4 March 2010.

A summary of the conditions of permit **3139-3** are given below.

Condition 1 requires that the consent holder adopts the best practicable option to minimise effects.

Condition 2 specifies that the consent shall be exercised in accordance with the information provided with the application, but also states that in cases of contradiction with consent conditions, the resource consent prevails.

Because stormwater generation is dependent on the rainfall event and is not always practicable for the consent holder to control, rather than limiting the discharge rate, condition 3 limits the catchment area.

Conditions 4 and 5 specify the limitations imposed on effects in the receiving waters of the Mangati Stream downstream of the mixing zone and the chemical concentration of specific components within the discharge.

Condition 6 and 7 require the maintenance of a contingency plan and stormwater management plan. The purpose of these conditions is

- in the case of the management plan, to ensure that the consent holder examines the activities taking place on site, and puts appropriate controls in place to minimise the potential for stormwater contamination to occur due to routine activities, and
- in the case of the contingency plan to ensure that in the event of an unforeseen situation, the chances of a spillage resulting in an unauthorised discharge leaving the site are minimised.

For the consent holder these are also a means of documenting the way in which the “best practicable option” (as required by condition 1) has been implemented.

Condition 8 requires compliance with the stormwater management plan, but also states that in cases of contradiction with consent conditions, the resource consent prevail.

Conditions 9 and 10 provide for lapsing of the consent if it not exercised for a period of five years, and for review of the conditions of the consent.

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

In addition to 3139, water discharge permit 1857⁴ is held to discharge stormwater from the western part of the industrial site, adjacent to Henwood Road, to a tributary of the Mangaone Stream in the Waiwhakaiho catchment.

McKechnie also holds air discharge consents 4034. Consent **4034** is held to provide for the discharge of emissions into the air from extrusion and re-melting of aluminium and associated activities.

8.2 Results

8.2.1 Stormwater management plan

A comprehensive stormwater management plan was received by the Council in the 2001-2002 monitoring year, which addressed both current and historical issues impacting on the site's discharges to the Mangati and Mangaone Streams, including the cooling water discharge. A significant financial commitment was required to progress the upgrades outlined in the plan, and therefore the improvements were staged over a number of years with initial projects targeting what were current issues with the highest potential for adverse effects. The plan incorporated a six-monthly review. It was anticipated that the control measures identified would be completed by the end of 2010.

Due to the changes in the location of some of the activities at the site, the Council wrote to MCK Metal Pacific Limited on 11 May 2009 requesting that revised plan be forwarded to Council for review. A revised MCK Metals Environmental

⁴ The monitoring associated with consents 1857 and 4034, is described in separate McKechnie Aluminium Solutions Limited Annual Reports (Technical Reports 2013-91 and 2014-68).

Management Plan, which incorporated a stormwater management plan, was received on 17 June 2009.

This document provided up to date information on the activities occurring in both the Mangati and Mangaone catchments. It highlighted the changes that had taken place and those that were about to occur at the site. It also stated that some aspects of the environmental management at the site would need to be reviewed once the powder coating plant was operational at the site.

The processes involved in the powder coating activity mean that there would be additional hazardous substances present on the site, such as those used in the chromating tank. The site plan showed that the powder coating plant was to be located in the old fabrication building. The stormwater catchment to the west of this building, drains to the Mangaone Stream; whilst the stormwater catchment to the east of this building, drains to the Mangati Stream.

The tenth revision of the Stormwater Management Plan (provided by McKechnie) became effective on 25 May 2010. Observations and discussions at inspections that relate to the stormwater management plan are contained in the following section.

The revised contingency plan received on 22 September 2010 been confirmed as still being current in December 2012, but this is now due for review.

8.2.2 Water

8.2.2.1 Inspections

The site was visited on 18 January, 11 June, 26 June, 27 August, and 2 December 2013, and 21 March 2014. A further scheduled inspection was undertaken on 1 July 2014, the results of this inspection will be discussed in the 2014-2015 Annual Report.

18 January 2013

No visible emissions or objectionable odours were noted beyond the boundary of the site. All bunded areas were spill-free and clean. The fuel tanks/drums were secure and no spills were observed. All traffic areas were clean and drains and water catchment areas appeared to be satisfactory. Some scrap aluminium was being stored outside prior to being melted down, and it was noted that this aluminium was clean. Spill kits were stocked and easily accessible.

11 June 2013

No visual emissions or objectionable odours were observed during the site inspection. The site was found to be clean and tidy. A forklift was loading a large pile of clean aluminium into metal bins. All drains were clear and tidy at the time of the inspection. Spill kits and bunded areas looked good.

26 June 2013

The site was found to be clean and tidy at the time of the inspection. Stormwater drains on the boundary were checked and were clear of visible contaminants. There were no odours or dust at or beyond the site boundary.

27 August 2013

No objectionable odours or emissions were noted during the inspection. The site was found to be tidy and clean at the time of the inspection. There were very good processes in place for the storage/bunding of chemicals and hazardous substances. No spills were observed at the time of inspection.

2 December 2013

No objectionable odours or emissions were noted during the inspection and the site was dry and reasonably tidy. There was good bunding in place around most of the site. The risk of aluminium entering the stormwater system was discussed with staff advising that stormwater from the area of concern flows via a separator, allowing the solid aluminium to be separated out. One bung had been removed allowing potentially contaminated water to discharge onto the site and a white residue was left where the water had flowed. The consent holder advised that he would investigate the matter and send a report to Council. This report was received, along with photos of the replaced bung and signs erected stating that bungs were not to be removed before notifying site environmental staff.

21 March 2014

In general the site was tidy and clean, however two issues were raised that needed addressing. It was observed that waste filters had been placed into a container and left beside a skip bin, with water that had been used to cool the filters down leaking from the container towards a stormwater drain. It was noted that the water was discoloured and was likely to contain potential contaminants in solution. Discussion was had with staff about cooling the filters down without water, or sealing the container to stop leakage.

8.2.2.2 Results of discharge monitoring

Both stormwater discharges to the Mangati catchment from McKechnie's plant are monitored at up to ten sites before reaching the Mangati Stream (Figure 2 sites 23 and 21 (east), 24 and 20 (north), and 19, 16, 14, 10, 8, 33, 37 and 38 (both)). The eastern stormwater is monitored primarily where it joins the Paraita Road stormwater drain, next to the plant entrance (site 23). The northern stormwater drain is monitored at a manhole within the plant site (site 24).

The results from chemical monitoring at these primary sites are given in Table 21 and Table 22.

Three samples were collected at site STW001014 during the 2012-2014 monitoring period. The limits on the pH range (6-9) and suspended solids (100 g/m³) were complied with on each monitoring occasion.

The concentration of and oil and grease exceeded the consent limit (15 g/m³) on one occasion and this is discussed further in section 8.2.3 below.

Copper, lead and zinc levels are not specified on consent 3139. However these parameters are monitored because of the likely presence of these contaminants on site, and the possibility of them being contained within the discharge. With the exception of dissolved zinc found on 3 July 2012, the concentrations of these contaminants were all below the historical medians.

Table 21 Chemical monitoring results for McKechnie's eastern stormwater discharge at Paraite Road for 2012-2014 (site 23), with a summary of previous monitoring data. TRC site code STW001014

Date	AIAAs g/m ³	Condy mS/m	CuAs g/m ³	CuD g/m ³	O&G g/m ³	PbAs g/m ³	pH pH	SS g/m ³	Temp Deg.C	Turby NTU	ZnAs g/m ³	ZnD g/m ³
<i>Consent limits</i>	-	-	-	-	15	-	6-9	100	-	-	-	-
Number	31	50	44	26	30	34	50	49	48	14	44	27
Minimum	<0.1	1.3	0.03	<0.01	<0.5	<0.05	6.9	<2	10.1	1.7	0.069	0.169
Maximum	13.8	153	13.0	0.26	320	0.96	11.4	470	45	36	10.6	2.52
Median	0.50	10.0	0.24	0.06	5.6	0.03	7.6	23	16.8	12	0.745	0.478
03-Jul-12	0.40	3.8	0.06	0.04	a	<0.05	7.3	8	9.8	11	0.654	0.550
03-Sep-12	0.25	1.4	0.03	0.02	1.6	<0.05	7.1	2	13.6	1.8	0.312	0.284
11-Dec-12 ^b	-	-	-	-	-	-	-	-	-	-	-	-
03-Apr-13 ^b	-	-	-	-	-	-	-	-	-	-	-	-
06-Nov-13	0.15	2.8	<0.01	<0.01	41	<0.05	7.2	86	16.4	34	0.043	0.034
26-Feb-14 ^b	-	-	-	-	-	-	-	-	-	-	-	-
24-Feb-14 ^b	-	-	-	-	-	-	-	-	-	-	-	-

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

The acid soluble aluminium concentration was also below the historical median for this discharge point.

At site STW001028 compliance was achieved with consent limits for pH, suspended solids, and oil and grease.

The sample was analysed for free and total chlorine on 11 December 2012 as it smelled of chlorine at the time of collection, which is unusual for this discharge point. The resulting values of 0.7 and 0.8 g/m³ were relatively high and when combined with the low conductivity, metals and suspended solids, are indicative of a discharge of clean town water. There was no chlorine odour noted in the sample from the reticulated stormwater system downstream of this discharge, and so there would have been little, if any, potential for environmental effects from this discharge. Continued monitoring will identify if this matter needs to be investigated further.

In recent years, the levels of total and dissolved copper and zinc were all generally similar to or below the median value for previous samples. However, similar to the 2011-2012 monitoring period, there were again some results above the historical medians for this site.

Although the acid soluble and dissolved copper results were similar to or below the (relatively low) historical median in all samples, the acid soluble aluminium concentration was four times median in the sample collected on 3 April 2013. All but one acid soluble zinc, and two dissolved zinc results, were above their respective historical medians. The results for all parameters were well below the maximum levels found at the site.

Table 22 Chemical monitoring results for McKechnie's northern stormwater and cooling water at the metal extrusion plant for 2011-2012 (site 24), with a summary of previous monitoring data. TRC site code STW001028

Date	AlAs g/m ³	Condy mS/m	CuAs g/m ³	CuD g/m ³	O&G g/m ³	pH	SS g/m ³	Temp Deg.C	Turby NTU	ZnAs g/m ³	ZnD g/m ³	CL2F g/m ³	CL2T g/m ³
<i>Consent limits</i>	-	--	-	-	15	6-9	100	-	-	-	-		
Number	33	60	48	37	27	60	53	58	21	54	42	1	1
Minimum	<0.1	1.0	<0.01	<0.01	<0.5	6.7	<2	9.8	0.36	0.020	0.006		
Maximum	0.76	21	4.1	0.35	6.4	10.2	42	23.3	4.8	1.94	1.12	0.48	0.5
Median	0.10	10.5	0.04	0.01	0.5	7.7	3	15.4	1.9	0.269	0.304		
03-Jul-12	0.1	3.7	0.04	0.02	-	7.2	5	9.9	4.1	0.718	0.631	-	-
03-Sep-12	0.1	1.2	0.01	0.01	a	7.0	<2	13.6	0.78	0.351	0.335	-	-
11-Dec-12	<0.1	14.4	<0.01	<0.01	-	8.0	<2	15.6	0.17	0.019	0.017	0.7	0.8
03-Apr-13	0.42	17.5	0.02	<0.01	a	7.9	16	18	3.0	0.328	0.072	-	-
06-Nov-13	0.12	1.1	0.02	0.01	-	7.1	3	15.7	1.6	0.408	0.375	-	-
26-Feb-14 ^b	-	-	-	-	-	-	-	-	-	-	-	-	-
24-Jun-14 ^b	-	-	-	-	-	-	-	-	-	-	-	-	-

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

8.2.3 Investigations, interventions, and incidents

In the 2012-2014 period, the Council was required to undertake significant additional investigations and interventions, or record incidents, in association with McKechnie's conditions in resource consents or provisions in Regional Plans.

6 November 2013

During analysis of water samples it was discovered that the concentration of hydrocarbons was higher than permitted by resource consent conditions on 6 November 2013. A meeting was held on site to discuss the sample results. The source of the discharge was unable to be identified. No further action was taken as, due to the conditions prevailing at the time of sampling, dilution with other stormwaters in the reticulated system resulted in little, if any, potential for adverse environmental effects. Recent monitoring had also shown that the oil and grease concentration of this discharge was generally very low, and the Council was working with McKechnie to ensure compliance is achieved in future. It was also reported that monitoring of the area would be undertaken.

8.3 Discussion

8.3.1 Discussion of site performance

Inspection found that the site was generally well managed during the period under review. An issue with a bung being removed was resolved quickly with measures put in place to prevent a reoccurrence. There was one consent exceedance of the oil and grease limit on the consent, however there were no resultant adverse environmental effects.

8.3.2 Environmental effects of exercise of consent

The concentration of and oil and grease exceeded the consent limit on one occasion, however the discharges from the McKechnie site were not found to be having any adverse effects on the Mangati Stream during the period under review, as the effects of this discharge were assimilated within the reticulated stormwater system prior to discharge into the NPDC ponds and/or to the stream from the industrial drain bypass.

8.3.3 Evaluation of performance

A tabular summary of the consent holder's compliance record for the years under review is set out in Table 23.

Table 23 Summary of performance for Consent 3139-3, McKechnie stormwater discharge to Mangati Stream

Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Adoption of best practicable option to minimise effects	Inspection and discussion with consent holder	Yes
2. Consent to be exercised in accordance with application information	Inspection and discussion with consent holder	Yes
3. Limits on chemical composition of discharge	Discharge sampling	O&G limit exceeded in 1 of 8 samples
4. Limit on stormwater catchment	Observation and discussions at inspection	Yes
5. Discharge cannot cause specified adverse effects beyond mixing zone	Receiving water sampling	Yes
6. Maintenance of a contingency plan	Updated plan received September 2010. Reviewed December 2012	Yes
7. Maintenance of stormwater management plan	Updated plan received May 2010	Yes
8. Adherence to stormwater management plan	Observations and discussions at inspection	Yes
9. Provision for consent to lapse if not exercised	Consent exercised	N/A
10. Optional review provision re environmental effects	Next review opportunity June 2020	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		High
Overall assessment of administrative performance in respect of this consent		Good

N/A = not applicable or not assessed

During the year, McKechnie Aluminium Solutions Limited demonstrated a high level of environmental and good level of administrative performance and compliance with the resource consents as defined in Section 1.1.4. During the years under review there was one exceedance of the oil and grease limit on the consent and there was one spill to ground as a result of a bung being removed from a bund. No adverse environmental effects were found as a result of either of these matters.

8.3.4 Recommendation from the 2011-2012 Annual Report

In the 2011-2012 Annual Report, it was recommended:

THAT monitoring programmed for consented activities of McKechnie Aluminium Solutions Limited in the 2012-2013 year continues at the level programmed for 2011-2012.

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

8.3.5 Alterations to monitoring programmes for 2014-2015

In designing and implementing the monitoring programmes for air/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 RMA in terms of monitoring emissions/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 emitting to the atmosphere/discharging to the environment.

It is proposed that for 2014-2015 the programme remains unchanged. A recommendation to this effect is attached to this report.

8.4 Recommendation

THAT monitoring programmed for consented activities of McKechnie Aluminium Solutions Limited in the 2014-2015 year continues at the level programmed for 2012-2014.

9. MI New Zealand Limited

9.1 Introduction

9.1.1 Process description

MI New Zealand Limited (MI New Zealand) occupies an industrial site where they operate a Liquid Mud Plant (LMP) and have a warehouse/storage facility. Close to the end of the period under review, MI New Zealand was purchased by Schlumberger Seaco Incorporated, with the consent transferred on 13 May 2014. As the majority of the monitoring during the period related to the activities of MI New Zealand, it has been reported here. From the 2014-2015 monitoring period, the reporting of the ongoing monitoring of activities at the site will be reported on in the Schlumberger section.

Activities at the site involve the mixing of synthetic based muds to be used in hydrocarbon exploration, and storage of chemicals to be used in the mixing operations. The LMP comprises a series of tanks of up to 10.9 m in height that are used to mix up the drilling mud. Once mixed the mud is tankered from the site. Chemicals used in the LMP are stored on site in a warehouse. The LMP is not used on a full time basis - mud is mixed on demand. The maximum amount of mud being mixed at any time is 1,100 m³.

The LMP area is outdoors and is not covered with a roof to prevent stormwater from entraining contaminants.

The LMP area covers approximately 420 m² and the total area of the stormwater catchment of this property is approximately 2,400 m².

The LMP area is tar-sealed to form an impervious layer that will prevent any spills contaminating soil or groundwater on the site. The LMP area is bunded to contain 110% of the largest tank (the largest tank volume being 63,000 L).

Stormwater from the site is directed to stormwater drains via land contouring. The drains connect with existing New Plymouth District Council (NPDC) stormwater culverts from the site and discharge into the Mangati Stream, via the wetland system, approximately 700 m from the site.

All stormwater discharged from the bunded LMP area is treated via an interceptor.

It was stated in the consent application that MI New Zealand would test the discharge for compliance prior to discharge into the stormwater system and that the water collected in the interceptor system would be recycled back through the LMP. At the time of the application MI New Zealand had not finalised interceptor designs. The designs and proposed location of the interceptor were to be forwarded to the Council prior to the exercise of the consent.

During the 2007-2009 monitoring years it was identified that the neighbouring site, leased by MI New Zealand, continued to be non-compliant with RFWP for a permitted stormwater discharge. Stormwater monitoring had found that the biochemical oxygen demand and suspended solids concentration of the discharge had, on occasion, breached the limits set in the RFWP for a permitted activity, and inspection

had found that, on occasion, spills had been tracked from the main site to the leased site. As a result the MI New Zealand applied for a variation to their consent to incorporate the activities undertaken on the adjacent site.

The adjacent site contains a large outdoor laydown area and large warehouse/workshop building. Sea transport containers containing flexitank bladders of synthetic fluid are stored in this laydown area door pending the availability of storage space in the LMP area. The sea containers are transferred by swing-lift transporter to the bunded loading/unloading bay alongside LMP when the synthetic fluids are required for use.

Stormwater from the driveways, access areas, parking areas, laydown area and office/warehouse buildings are not treated via the LMP interceptor.

The key concern is the potential for contaminants to be entrained in the stormwater discharge to the Mangati Stream. A contingency plan is in place for the site.

The site is manned at all times when the mixing of chemicals occurs in the LMP therefore minimising the potential of a spill occurring unnoticed. Sandbags are also located on the site for use in the event of a spill to contain liquid chemicals and to place over stormwater drains to prevent discharge from the site.

9.1.2 Water discharge permit

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.

MI New Zealand held water discharge permit **5987-1** to cover the discharge of treated stormwater from a synthetic liquid mud plant and storage site into the Mangati Stream. This permit was issued by the Council on 4 July 2002 under Section 87(e) of the RMA. It is due to expire on 1 June 2020.

Conditions were attached in respect of catchment size, provision of treatment system design information, concentrations of stormwater components (pH range 6-8, oil and grease 15 g/m³, suspended solids 100 g/m³, biochemical oxygen demand 5 g/m³, unionised ammonia 0.025 g/m³), effects in the receiving water after reasonable mixing, a contingency plan, and review of conditions.

A variation to consent was granted on 8 June 2010. Amendments to the conditions of the consent were made to;

- increase the catchment area,
- align the pH range of the stormwater with Council's standard range used for the rest of the discharges in the catchment (6-9),
- increase the BOD limit to 7 g/m³,
- specify the level of treatment required for the discharge from the LMP,
- require the provision and maintenance of, and adherence to contingency and stormwater management plans. In the case of the management plan, this ensures that the consent holder examines the activities taking place on site, and puts appropriate controls in place to minimise the potential for stormwater

contamination to occur due to routine activities. In the case of the contingency plan, this ensures that in the event of an unforeseen situation, the chances of a spillage resulting in an unauthorised discharge leaving the site are minimised. For the consent holder these plans are also a means of documenting the way in which the “best practicable option” (as required by condition 1) has implemented.

- ensure that the consent holder considers the potential environmental effects of changes to operations at the site, and then provides written notification to the Council regarding the proposed changes, and
- update the review opportunities, including an opportunity to review the conditions of the consent, if and when the Council is notified of proposed changes to activities at the site. Thus ensuring that the conditions of the consent can remain consistent with, and appropriate for, the nature and scale of activities at the site.

The consent was transferred to Schlumberger Seaco Inc. on 13 May 2014.

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

9.2 Results

9.2.1 Water

9.2.1.1 Inspections

The MI New Zealand site was visited on 2 October 2012, 8 January, 10 June, 26 June, 7 August, and 29 November 2013, and 18 March 2014. The final scheduled monitoring inspection was carried out on 1 July 2014, and the results of this will be discussed in the report covering the 2014-2015 period.

The yard area was found to be tidy and spill free during all inspections. Drains were clear, and free of obstructions and visible contaminant. All stages of the separator were sheen and odour free, and it was noted that the separator was being pumped out at the time of inspection on 26 June 2013. The LMP bund was mostly empty during visits, with the release valve in the off position. The bunded area contained a small amount of stormwater on 2 October 2012, and this was sheen free. Storage of IBC's and other products was satisfactory. Excellent spill management practiced were observed where trucks were loading or unloading at the time of inspections. On all occasions there were no visible emissions or odours noted at the time of inspection.

9.2.1.2 Results of discharge monitoring

The site is graded such that the majority of the stormwater from the consented LMP and office complex area exits the site at the southwest corner. This is monitored at STW002071. The discharge flows through a stormwater pipe passing through the Schlumberger site (monitoring site 26, STW001056), and the ABB site (monitoring site 25, STW001017). Stormwater from the adjacent site formerly occupied by Mainfreight exits the site at two points; at the middle of the western boundary of the site (STW001118) which joins the stormwater network on the ABB site, and at the northwest corner of the site to the Paraita Road stormwater drains. The results from

chemical monitoring at site STW002071 are given in Table 24, and the results from the chemical monitoring at site STW001118 are given in Table 25.

Table 24 Chemical monitoring results for stormwater discharged from MI New Zealand's LMP site for 2012-2014 (site 40), with a summary of previous monitoring data. TRC site code STW002071

Date	BOD g/m ³	Condy mS/m	NH ₃ g/m ³ -N	NH ₄ g/m ³ -N	O&G g/m ³	pH pH	SS g/m ³	Temp Deg.C	Turby NTU
<i>Consent limit</i>	5	-	0.025	-	15	6-8	100	-	-
Number	10	10	10	10	5	10	10	10	10
Minimum	0.5	1.4	0.00006	0.013	<0.5	6.6	3	10.8	2.6
Maximum	63	46.7	0.01222	0.138	2.4	8.7	270	22.1	62
Median	5.9	6.5	0.00046	0.076	1.2	7.1	25	15.6	10
03-Jul-12	1.5	4.5	0.00024	0.072	a	7.2	19	8.7	20
03-Sep-12	1.4	8.7	0.00002	0.016	3.0	6.6	15	13.3	11
11-Dec-12 ^b	-	-	-	-	-	-	-	-	-
03-Apr-13 ^b	-	-	-	-	-	-	-	-	-
06-Nov-13	1.0	3.0	0.00035	0.039	a	7.4	4	16.0	2.2
26-Feb-14 ^b	-	-	-	-	-	-	-	-	-
24-Jun-14 ^b	-	-	-	-	-	-	-	-	-

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

Table 25 Chemical monitoring results for stormwater discharged from MI New Zealand's leased warehouse/storage site for 2012-2014 (site 39), with a summary of previous monitoring data. TRC site code STW001118

Date	BOD g/m ³	Condy mS/m	NH ₃ g/m ³ -N	NH ₄ g/m ³ -N	O&G g/m ³	pH pH	SS g/m ³	Temp Deg.C	Turby NTU
<i>Consent limit</i>	7	-	0.025	-	15	6-9	100	-	-
Number	8	8	8	8	3	8	8	8	8
Minimum	1.5	2	0.00005	0.027	<0.5	6.8	21	9.2	25
Maximum	9.0	10.9	0.00192	0.194	3.0	7.5	320	18.9	410
Median	4.4	5.5	0.00026	0.080	<0.5	7.0	32	14.3	49
03-Jul-12	-	9.7	0.00025	0.078	<0.5	7.2	61	8.4	102
03-Sep-12	1.5	2.0	0.00454	0.010	a	9.4	22	13.2	22
11-Dec-12 ^b	-	-	-	-	-	-	-	-	-
03-Apr-13 ^b	-	-	-	-	-	-	-	-	-
06-Nov-13	2.7	3.4	0.00079	0.089		7.4	110	16.0	150
26-Feb-14 ^b	-	-	-	-	-	-	-	-	-
24-Jun-14 ^b	-	-	-	-	-	-	-	-	-

Key: Results shown in bold within a table indicates that a limit for a particular parameter has been exceeded
a parameter not determined, no visible hydrocarbon sheen and no odour
b not discharging at time of sampling survey

Compliance was achieved with the component concentrations for biochemical oxygen demand, unionised ammonia, and oil and grease on all monitoring occasions. Suspended solids and pH levels were generally within limits, with the exception of pH on 3 September 2012 (9.4) and suspended solids on 6 November 2012 (110 g/m³). These exceedances were minor and not persistent and therefore not logged on the Council's Incidents Register.

9.2.2 Investigations, interventions, and incidents

In the 2012-2014 period, the Council was not required to undertake significant additional investigations and interventions, or record incidents, in association with MI New Zealand's conditions in resource consents or provisions in Regional Plans.

Self monitoring results were provided to Council on 11 and 18 August 2015 that indicate that the contents of the LMP separator exceeded the consent limit for biochemical oxygen demand on 21 March 2014 and 13 May 2014. At this time, although the consent had not yet been transferred, the site was under the control of Schlumberger Seaco Incorporated, and is therefore discussed in Section 13.2.1.3.

9.3 Discussion

9.3.1 Discussion of site performance

General housekeeping at the site was found to be good during the period under review with no issues noted during any of the inspections.

The drain filters installed in the drains on the leased site during the 2010-2011 year to reduce the suspended solids content of the discharge, continued to have been effective during the 2012-2014 monitoring period.

The discharges from the site generally complied with the component concentrations given in MI New Zealand's consent, with the exception of one pH and one suspended solids result, which were marginally above consent limits.

9.3.2 Environmental effects of exercise of consent

The results for the monitoring of the Mangati Stream are presented in Table 72, section 22.1.

There were no observable effects on the Mangati Stream as a result of discharges from the MI New Zealand site.

9.3.3 Evaluation of performance

A tabular summary of the MI New Zealand's compliance record for the years under review is set out in Table 26.

Table 26 Summary of performance for Consent 5987-1, MI New Zealand Limited stormwater discharge to Mangati Stream

Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Adoption of best practicable option to minimise effects	Inspection and discussion with consent holder	Yes
2. Limit on stormwater catchment	Observation and discussions at inspection	Yes
3. LMP discharge to be treated and managed as per stormwater management plan	Inspection and discussion with consent holder	Yes

Condition requirement	Means of monitoring during period under review	Compliance achieved?
4. Limits on chemical composition of discharge	Discharge sampling	Minor exceedance of pH and SS, each in 1 of 6 samples
5. Discharge cannot cause specified adverse effects beyond mixing zone	Receiving water sampling	Yes
6. Preparation and maintenance of contingency plan re measures to prevent spillage or accidental discharge and avoid, remedy or mitigate effects	Review of documentation received. Plan dated August 2010 on file. Reviewed December 2012	Yes
7. Preparation and maintenance of stormwater management plan re measures to minimise contaminants in the stormwater	Review of documentation received. Plan dated May 2010 on file. Reviewed December 2012	Yes
8. Written notification required regarding changes to activities at the site. Notification to include assessment of environmental effects	Inspection and discussion with consent holder	N/A
9. Optional review provision re environmental effects or changes	No further option for review	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		High
Overall assessment of administrative performance in respect of this consent		High

N/A = not applicable or not assessed

During the year, MI New Zealand Limited demonstrated a high level of environmental and administrative performance and compliance with the resource consents as defined in Section 1.1.4.

9.3.4 Recommendation from the 2011-2012 Annual Report

In the 2011-2012 Annual Report, it was recommended:

THAT monitoring programmed for consented activities of MI New Zealand Limited in the 2012-2013 year continues at the level programmed for 2011-2012.

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

9.3.5 Alterations to monitoring programmes for 2014-2015

In designing and implementing the monitoring programmes for air/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 RMA in terms of monitoring emissions/ 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 emitting to the atmosphere/discharging to the environment.

It is proposed that for 2014-2015 the monitoring of the activities at the site remains unchanged, however it is noted that the consent was transferred to Schlumberger Seaco Incorporated. A recommendation to this effect is attached to this report.

9.4 Recommendation

THAT monitoring programmed in the 2014-2015 year for consented activities at the former MI New Zealand Limited site (which at the end of the years under review was owned by Schlumberger Seaco Limited) continues at the level programmed for 2012-2014.

10. New Plymouth District Council

10.1 Introduction

10.1.1 Process description

The roads served by the main Bell Block industrial drainage system occupy 27.5 ha, a significant stormwater catchment. This system also serves as a conduit for the carriage of the stormwater from the industrial sites in this area. When the application for the discharge consent was lodged, New Plymouth District Council (NPDC) stated that 'NPDC has no physical control over accidental spills or deliberate disposal of contaminants into the stormwater system'.

NPDC has assisted with inspections and chemical surveys by the provision of plans of the stormwater drainage system and by loosening the covers of manholes. The plans related only to the main drains, which are serviced by NPDC. For more detailed information, the Regional Council has referred to building permit diagrams and has carried out dye tests.

The NPDC stormwater drainage system had three main discharge points; into the Mangati Stream at the bottom of De Havilland Drive West, into the Mangati Stream at the bottom of Connett Road West, and the industrial drain outlet into the unnamed tributary at the rear of the Mainland site.

At the time of the consent renewal in 2002 routine physicochemical monitoring of the discharge had shown that the discharge occasionally contained high levels of suspended solids, and generally contained elevated levels of ammoniacal nitrogen, copper and zinc. Results of biomonitoring in the receiving water had shown that although the quality of discharges from the industrial area was improving, the Mangati Stream continued to be severely impacted below the industrial area.

In order to try to mitigate the effects of the quality of the stormwater carried by the NPDC pipework, during the 2002-2003 monitoring period NPDC redesigned the way in which stormwater was directed to the stream from the Connett Road and Paraite Road areas. A constructed wetland was put in place with the intention of both upgrading the quality of water discharged to the Mangati Stream, and providing a mechanism for containment of any spills or contaminants from the industrial area. The broad scope for this project was to develop an integrated water and land management system for the middle Mangati catchment in which:

- Stormwater from industrial areas is captured and passed through a constructed wetland for trapping of litter, sediment, hydrocarbons (and chemical contaminants to the extent that this is feasible) before being discharged to the stream.
- Industrial land uses are physically and hydrologically isolated from the stream by the development of a riparian reserve.
- A riparian reserve providing public access, a utilities corridor and machine access for stream maintenance purposes is provided.
- Flood detention structures and ponding areas are developed as required and integrated into the riparian reserve development.

Construction of the four-pond system was completed in the 2002-2003 monitoring year.



Figure 5 NPDC stormwater flow paths and sampling points

The plans submitted to the Council indicated that under light rainfall conditions, the stormwater flows under Connett Road, and passes through a downstream defender pollutant entrapment device installed in the 300mm pipeline in Connett Road, before entering pond 1 adjacent to Connett Road and the Mangati Stream (STW001055). The water from pond 1 flows through pond 2, and into pond 3 from which it then discharges into the Mangati Stream (STW002056). When there is higher flow from moderate rainfall, stormwater will also discharge via the industrial drain outlet (STW001026) and unnamed tributary into pond 4, which then flows into pond 3. There is a provision for pond 4 to discharge into the Mangati Stream (STW002055) when the water level in the pond increases to a certain point. There is also a drainage channel from the unnamed tributary to the Mangati Stream (MGT000503) to allow the ponds to be bypassed under heavy rainfall conditions, when it was expected that the level of contaminants in the stormwater would be at their lowest due to the high rate of dilution.

During the 2009-2011 monitoring years it was found that, due to the way the diversion system was configured, the flow had not been preferentially flowing to pond 1 under light rainfall conditions and modifications were undertaken to correct this.

10.1.2 Water discharge permit

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.

NPDC is the territorial authority for the Bell Block industrial area and holds water discharge permit **4302-2** to cover the discharge up to 5,200 L/s of stormwater from industrial sealed areas and roofs. This permit was originally issued by the Council on 16 June 1993 under Section 87(e) of the RMA for a period until 1 June 2002. The consent was renewed on 11 September 2002 and is due to expire on 1 June 2020.

The renewed consent has five conditions, in respect of adoption of best practice to prevent or minimise adverse effect on the receiving environment, requirement for management plan, prevention and mitigation of any erosion, and review of conditions.

The permit is attached to this report in Appendix I.

10.2 Results

10.2.1 Water

10.2.1.1 Inspections

During the 2012-2014 monitoring period inspections were undertaken in the area of the constructed ponds, and of the discharges to the Mangati Stream on 2 July 2012, 7 January, 26 June, 7 August and 28 November, and 21 March 2014.

On all occasions the ponds were found to be sheen-free and there were no odours detected. Pond levels varied between almost dry (21 March 2014) to high (26 June 2013), and in all but one inspection the discharge was clear and there were no visible effects on receiving waters.

On 28 November 2013, following heavy rainfall, it was observed that there was reasonable flow through the pond system and the discharge was slightly cloudy. However there was no visual effect on the Mangati Stream which was also cloudy and discoloured at the time of inspection.

10.2.1.2 Results of discharge monitoring

Stormwater is discharged to the Mangati Stream from the wetlands, and from roads running through the industrial area. As combined discharges, the monitoring of the flow to and from the wetlands to the Mangati Stream is reported in Section 21.2.

Stormwater discharged to the Mangati Stream from roads running through the industrial area is monitored at two points, off De Havilland Drive West and Connett Road West (Figure 3 STW001054 and STW001055, Figure 2 sites 29 and 33 respectively). Other discharges contribute to the flow at both monitoring points. The De Havilland Drive stormwaters discharge directly into the Mangati Stream. The Connett Road stormwaters now discharge into pond 1 of the wetland and includes a portion of the stormwater from the industrial sites, this discharge is therefore also discussed in Section 21.2 where the combined discharges are considered.

De Havilland Drive stormwater has components from several small industrial sites, including part of Tegel Foods Limited's (Tegel's) poultry processing plant on the southern side of the road, and Ireland Roding and Construction Limited's depot and Vause Oil Production Services workshop on the northern side of the road.

The results from chemical monitoring of stormwater from De Havilland Drive are given in Table 27.

Five samples were collected during the monitoring period, with no flow found to be occurring at this monitoring location during the dry weather surveys on 26 February 2014 and 24 June 2014. In contrast to the 2011-2012 monitoring period, when there were no unconsented dry weather discharges, this has been a return to the situation found in the 2007-2009 monitoring periods.

During the period under review it was found that, on the whole, the concentrations of most of the components measured were typical for this monitoring site (within the historical range) for most of the samples, and, with the exception of BOD on 3 July 2012 and 26 February 2014, and unionised ammonia on 26 February 2014, were within the standards for a permitted stormwater discharge given in the Regional Freshwater Plan (RFP) that Council uses as a quality target/guideline for the reticulated stormwater outlets to the stream.

On 3 July 2012 the main contribution to the BOD was found to be from Tegel's poultry processing plant site STW001130, which marginally exceeded their consent. Due to the other two discharge points also exhibiting elevated (but compliant) BOD's there was insufficient dilution capacity to ensure that the discharge to the stream met the guideline. However, due to the conditions prevailing at the time of the sampling survey, the increase in the BOD of the stream was an environmentally insignificant 1 g/m³.

Table 27 Chemical monitoring results for stormwater discharged to the Mangati Stream from De Havilland Drive West for 2012-2014 (site 29), with a summary of previous monitoring data. TRC site code STW001054

Date	BOD g/m ³	Condy mS/m	DRP g/m ³ -P	NH ₃ g/m ³ -N	NH ₄ g/m ³ -N	O&G g/m ³	pH	SS g/m ³	Temp Deg.C	Turby NTU
<i>Permitted activity limits</i>	5	-	-	0.025	-	15	6-9	100	-	-
Number	21	57	20	21	21	44	57	57	54	23
Minimum	0.7	1.6	<0.004	<0.00001	<0.003	<0.5	6.3	<2	7.5	4
Maximum	66	33.8	4.44	0.04278	4.95	45	9.1	1100	22.2	60
Median	5.7	6.2	0.111	0.00047	0.150	1.3	7.1	22	15.6	21
03-Jul-12 (wet)	11	6.0	0.206	0.00091	0.344	2.4	7.1	51	8.9	48
03-Sep-12 (wet)	3.3	2.1	0.026	0.00011	0.040	a	7.0	77	13.1	41
11-Dec-12 ^b (dry)	-	-	-	-	-	-	-	-	-	-
03-Apr-13 ^b (dry)	-	-	-	-	-	-	-	-	-	-
06-Nov-13 (wet)	4.6	2.0	0.064	0.00010	0.029	-	7.0	34	15.6	24
26-Feb-14 (dry)	8.4	33.9	0.921	0.04622	5.82	a	7.3	4	17.6	1.6
24-Jun-14 (dry)	0.6	23.1	0.031	0.00013	0.232	-	6.2	<2	16.1	2.4

Key: Results shown in bold within a table indicates that a *guideline* for a particular parameter has been exceeded
a parameter not determined, no visible hydrocarbon sheen and no odour
b not discharging at time of sampling survey

On 26 February 2014 the BOD and unionised ammonia concentration of the (unconsented) dry weather discharge were above their respective guideline values, and the conductivity, dissolved reactive phosphorus and ammoniacal nitrogen concentrations were all new maximums for this monitoring location.

Sampling showed that during this survey the discharge from the Tegel poultry processing plant site STW001128 (Table 52), although only a low flow, exceeded the consent limit for BOD, contained 42.6 g/m³ of ammoniacal nitrogen resulting in an unionised ammonia concentration of 1.33 g/m³ (52 times higher than the guideline), and had a conductivity of 90.0 ms/m.

The unconsented discharge from Tegel was logged on the Council's incidents register, and subsequent investigations and works undertaken by the Tegel are expected to have eliminated the source(s) of this flow (Section 16.2.4.1)

It is noted that due to the conditions prevailing in the Mangati Stream during the sampling survey, receiving water results showed that the effect of this discharge was less than minor.

During the dry weather survey on 24 June 2014 the discharge was found to have an elevated conductivity, and a pH that was just under the historical minimum. It is noted that the discharge contained low levels of nutrients and a low BOD, and that the Tegel poultry processing plant discharges were either of an acceptable quality or were discharging at a rate that was too low to sample. The source of this discharge could not be sourced.

10.2.2 Investigations, interventions, and incidents

In the 2012-2014 period, the Council was required to undertake significant additional investigations and interventions, or record incidents, in association with NPDC's conditions in resource consents or provisions in Regional Plans.

It is noted that there were no unauthorised discharges in relation to the stormwater consent held by NPDC and monitored under this programme.

The entries on the Council's incident register discussed below relate to overflows from the reticulated wastewater network and/or the Mangati pump station(s).

NPDC have a Water & Wastes Incident Response Plan to meet their obligations under the waste water treatment plant consent (0882-4) that provides contingency measures to be undertaken in the event of sewage system overflows occurring. The plan addresses, emergency response and clean-up, notifications to the Council and the Taranaki District Health Board, erection of signage to warn the public of the potential risk, and review of the event to instigate corrective actions preventing a reoccurrence, where practicable.

For the most part, if the events leading to the overflow are considered to be due to circumstances beyond NPDC's control, and the contingency plan has been followed, they are generally not to be considered to be a breach of consent. This is assessed on a case by case basis.

18 October 2012

Email notification was received from NPDC on 18 October 2012 regarding a pump station overflow to the Mangati Stream earlier that day. The duration of the overflow was 102 minutes, and Council was advised that this had occurred due to an overnight storm and lightening, which resulted in a pump fault in addition to the issues created due to the high flows. It was reported that the pump was isolated and unblocked, and the well level was lowered by manual pumping prior to resuming normal operations. Public warning signs were erected.

21 June 2013

Notification was received from City Care advising of a sewage overflow on Gardinia Avenue, Bell Block. An inspection of the site found that City Care were removing sewage from an access track that led to the Mangati Stream with a sucker truck. The discharge from the manhole had entered the Mangati Stream. The flow within the stream was high and fast due to recent heavy rainfall. The sewage pipe was unblocked and a sign was erected to notify public users of the walkway. More signs were to be erected downstream and the access track was going to be blocked off using tape. The pipe had blocked due to fat being dislodged within the pipe during extremely high flows.

This was one of a number of overflows in the New Plymouth district and a meeting was held at the Council offices on 2 July 2013 to discuss the 10 discharges that occurred in the North Taranaki district between 17 and 21 June 2013 including:

- Dillion Drive, Bell Block, 18 June 2013
- Gardenia Avenue, Bell Block, 21 June 2013

The Council was provided with an update on work that was being undertaken to reduce the number of unauthorised discharges from pump stations. Work undertaken included maximising storage between 'high level' and 'overflow' pump station alarms. NPDC has planned considerable financial investment for Area Q (around Bell Block) in order to reduce pressure on the Mangati Pump Station.

It was discussed whether consents could be tightened with the aim of reducing the frequency of unauthorised discharges and encouraging NPDC investment in the wastewater system. NPDC mentioned that consents held by Auckland Council included conditions covering the frequency of unauthorised discharges. Following the meeting, this was discussed with the Consents Manager, who was of the opinion that existing consents (including 0882-4) might not be the most suitable avenue to achieve this, particularly regarding discharges from pump stations. It was agreed that a follow up meeting was required in order to discuss further.

In conclusion, it was agreed that none of the ten NPDC discharges had resulted in a breach of consent, as for all discharges, the Water & Wastes Incident Response Plan had been followed. Overall, it was agreed that the NPDC reporting procedure for unauthorised discharges has much improved over the last year, with reduced reporting times and more details provided regarding follow up action.

2 September 2013

On 2 September 2013 notification was received from NPDC regarding a sewage overflow into the Mangati Stream, Bell Block. Investigation found that there was no sewage discharging to the Mangati Stream at the time of inspection, however there

was solid material still present in the grass area. A sign had been erected warning of the discharge, but this was not considered to be in a prominent position. NPDC was instructed to ensure that all material was cleaned up so no further discharge to surface water could occur. A letter of explanation was received and accepted.

This letter outlined that NPDC's maintenance contractor responded to the service request well within the one hour time frame defined in NPDC's Incident Response Plan (IRP). It was found that a manhole was blocked due to fat build up, and this manhole was overflowing to the Mangati Stream. The contractor immediately undertook works to clear the blockage, clean out the manhole and stopped the discharge from occurring at 7 pm. Council was then notified by phone of the incident. Signage was erected at a secure point as close as possible to the affected area and stream and also downstream at the coast. The clean up of the site was delayed until the following morning as there were health and safety concerns related to completing this work in the dark. The contractor returned to the site just after 8 am the following morning to complete the clean up as required by the IRP. A discharge notification report was completed and forwarded to Council within the 24 hour time frame required.

1 May 2014

On 1 May 2014 self notification was received from NPDC concerning an oily substance on a site on Hercules Place, Bell Block. An inspection of the site found that the oily substance was a sheen on the surface of the water caused by iron oxide. No further action was required.

10.2.2.1 NPDC Annual Reports

Annual reports are required from NPDC by the waste water treatment plant consent. These reports summarise the sewage pump station and reticulation overflows, and also contains a summary of any upgrade works or investigations into infiltration issues undertaken by NPDC throughout the district.

In the 2012-13 report there was one overflow reported from the Mangati pump stations and none reported from the reticulated system in the Mangati catchment.

In the 2013-2014 report there were no overflows reported from the Mangati pump stations and two reported from the reticulated system in the Mangati catchment.

It is noted that the reticulation overflow notified to Council on 21 June 2013 was not included in the New Plymouth Wastewater Discharge Consent 0882-4 Annual Report, 1 July 2012 to 30 June 2013. This oversight is being discussed with NPDC.

There were no upgrade works or investigations reported that were relevant to the Mangati Stream catchment.

10.3 Discussion

10.3.1 Discussion of site performance

The wetlands were found to be well maintained during the years under review.

The number of sewage overflows to the stream that were reported is still of concern, however it is noted that the cause of the overflows were beyond NPDC's control. It is noted that the areas affected by the short term discharges were cleaned up to the Council's satisfaction, and signs were erected to notify the public. The NPDC's Incident Response Plan was followed in each case.

During the period under review, an unsourced unauthorised discharge and sewage fungus was found at one of the outlets from NPDC's reticulated stormwater system to the Mangati Stream (Section 20). NPDC provided assistance in trying to locate the source of an unauthorised discharge by way of involving their contractor to enable access and visual assessment of the flow through the network. It is also recognised that NPDC took responsibility for cleaning up an unsourced spill on a road within the catchment.

10.3.2 Environmental effects of exercise of consent

No significant adverse effects were noted as a result of the exercise of NPDC's stormwater discharge consent.

Discharges to the stream from the wetland system and the industrial drain did result in effects in the stream on occasion, but these were no more than minor and, as stated earlier in this report, NPDC has little, if any, control over the quality of the industrial discharges entering its system. For this reason the consent does not place limits on the quality of the NPDC's discharges. The effects observed are discussed in more detail in section 21 covering the combined discharges and section 22.1 covering the Mangati Stream chemical monitoring.

10.3.3 Evaluation of performance

A tabular summary of NPDC's compliance record for the years under review is set out in Table 28.

Table 28 Summary of performance for Consent 4302-2 NPDC stormwater discharge to Mangati Stream

Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Consent to be exercised in accordance with application information	Inspection and discussion with consent holder	Yes
2. Adoption of best practicable option to minimise effects	Inspection and discussion with consent holder	Yes
3. Provision of designs, specifications and operating procedures	Review of Council records	Yes
4. Prevention and mitigation of erosion	Inspection	Yes
5. Optional review provision re environmental effects	No further option for review prior to expiry	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		High
Overall assessment of administrative performance in respect of this consent		High

N/A = not applicable or not assessed

During the year, NPDC demonstrated a high level of environmental and administrative performance and compliance with their resource consent.

10.3.4 Recommendation from the 2011-2012 Annual Report

In the 2011-2012 Annual Report, it was recommended:

THAT monitoring programmed for consented activities of New Plymouth District Council in the 2012-2013 year continues at the level programmed for 2011-2012.

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

10.3.5 Alterations to monitoring programmes for 2014-2015

In designing and implementing the monitoring programmes for air/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 RMA in terms of monitoring emissions/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 emitting to the atmosphere/discharging to the environment.

It is proposed that for 2014-2015 the programme remain unchanged. A recommendation to this effect is attached to this report.

10.4 Recommendation

THAT monitoring programmed for consented activities of New Plymouth District Council in the 2014-2015 year continues at the level programmed for 2012-2014.

11. Olex New Zealand Limited – A Nexans Company

11.1 Introduction

11.1.1 Process description

The electric wire and cable manufacturing plant of Olex New Zealand Limited (Olex) was established on Paraita Road beside the railway line in 1967. The plant produces for both domestic and export markets.

The site occupies an area of 6.7 ha, of which about 85% is developed. A large variety and volume of chemicals, some potentially toxic, are stored on the site. The majority are stored within buildings in areas where they can be contained if spilled. Chlorinated paraffin, a liquid plasticiser used to make PVC pliable, is stored inside in a 28,000 L bunded tank. Chemicals are stored outside the buildings in two bunded areas. In one area, phthalate esters (also liquid plasticisers) are stored in three 50,000 L tanks. In another area, copper wire drawing liquor is stored in a 12,000 L above ground tank which is bunded. A security fence surrounds areas vulnerable to vandalism. All bunded areas are fitted with liquid level alarms and stormwater from within the bunds is discharged to the stormwater drains after appropriate quality checks.

Cooling water is also discharged via the stormwater system. Cooling water is discharged at a rate of 1.66 L/s every six months for maintenance purposes and from time to time there is also a quantity of water spilling over from the recirculated water storage tanks. The quantities of this lesser overflow vary but are estimated to be no more than 400-500 L/hr. This is equivalent to 0.14 L/s. Olex has indicated that the maximum summer water temperature of this discharge is no greater than 25 – 26 °C.

The air discharge consent held by Olex is to cover the minor discharges associated with the Curing Continuous Velocity (CCV) process. This process involves the moulding of an insulating layer around a conductor at elevated temperatures in an inert nitrogen atmosphere. The discharge stream from this process has the condensates separated before the gas is released to atmosphere via a sparge nozzle above the factory roof. The gas discharged is predominantly nitrogen, but contains alkanes at less than 0.5 %, and acetophenone (10 ppm). Acetophenone has a sweet orange blossom odour and is not expected to give rise to any adverse environmental effects.

There is a contingency plan in place in case of spillages, with a revised plan dated 13 July 2013 being received and accepted by the Council during the period under review. A subsequent revision has also been received.

A comprehensive Environmental Management System has been put in place at the Olex site, and a revised stormwater management plan was received in December 2011. After a review of this plan Olex was asked to clarify one of the points in the plan. In section 2.1 of the plan (Structural & Procedural Controls – Existing) it was stated that in the event of a major spillage from the cooling towers/recirculating pumps, this was safe to enter stormwater. On 5 December 2011 Olex were asked to outline what, if any, treatment chemicals were added to the cooling water, the maximum temperature the water might be at, and the potential maximum quantities/discharge rates involved. Council Officers have continued to follow this

up, and the revision of the plan was delayed due to improvements being made at the site during the period under review in relation to process water and cooling water discharge systems. At the time of writing this report, a revised stormwater management plan has been received and accepted (June 2015).

11.1.2 Water discharge permit

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.

Olex holds water discharge permit **4497** to cover the discharge of stormwater and cooling water from an electric wire and cable manufacturing site off Paraita Road. It was originally granted on 23 March 1994 for a period until 1 June 1996. It was renewed on 12 June 1996, and again on 25 June 2008. This permit was issued by the Council under Section 87(e) of the RMA, and is due to expire on 1 June 2026.

Condition 1 requires the adoption of the best practicable option to minimise effects. Because stormwater generation is dependent on the rainfall event and is not always practicable for the consent holder to control, rather than limiting the discharge rate, condition 2 limits the catchment area from which the discharge can originate to 6.24 ha.

Condition 3 requires hazardous substances areas to be bunded.

Conditions 4 and 5 limit the concentration of particular constituents in the discharge and prohibit specific effects in the receiving water beyond a given mixing zone.

Conditions 6 and 7 require the consent holder to provide and maintain both a contingency plan and a stormwater management plan. The purpose of these conditions is

- in the case of the management plan, to ensure that the consent holder examines the activities taking place on site, and puts appropriate controls in place to minimise the potential for stormwater contamination to occur due to routine activities, and
- in the case of the contingency plan to ensure that in the event of an unforeseen situation, the chances of a spillage resulting in an unauthorised discharge leaving the site are minimised.

For the consent holder these are also a means of documenting the way in which the “best practicable option” (as required by condition 1) has been implemented.

To ensure that the potential for environmental effects from the exercise of the consent is consistent with the information provided to the reporting officer at the time the consent conditions were drafted, condition 8 requires that Council is notified in writing of any changes in activities at the site that may affect the nature of the discharge.

Condition 9 contains provision for the consent to lapse, and condition 10 provides for the conditions of the consent to be reviewed by Council.

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

11.1.3 Air discharge permit

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

Olex held air discharge permit **5417-1** to cover the discharge of emissions into the air from an electric wire and cable manufacturing plant and associated activities. This permit was issued by the Council on 30 November 1998 under Section 87(e) of the RMA. The consent expired on 1 June 2014.

An application to renew this consent was received on 4 November 2013, and therefore under Section 124 of the RMA, Olex were allowed to continue to operate under the conditions of the expired consent until a decision was made on the renewal application⁵.

The conditions on the consent address management and operation of the plant and processes, and place limits on the boundary ground level concentrations of contaminants. Conditions also prohibit the discharge from being noxious, dangerous, offensive or objectionable at or beyond the boundary and include provisions for review of the consent.

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

11.2 Results

11.2.1 Water

11.2.1.1 Inspections

2 July 2012

The yard areas were clear and free of potential contaminants and no spills were noted. The tank bunds were inspected and these were found to be clear. All rubbish on site was stored in lidded skip bins, and there was no leachate observed from the bins.

18 January 2013

All yards areas were found to be spill free and clear of potential contaminants. All drains and stormwater catchment areas were clean. The tank bunds were inspected and were found to contain stormwater only, with no sheen or odour detected. The spill kits were stocked and were accessible throughout the site. All bins, skips, etc, had lids in place and no leaching was observed from any of these.

7 May 2013

This inspection was conducted for the purpose of continuing the investigation started in December 2012, following the uncharacteristic high volume, chemical/perfumed smelling, discharge found during the dry weather sampling survey on 11 December 2012 (see Sections 11.2.1.2 and 11.2.3).

⁵ renewed consent 5417-2.0 was granted in February 2015

Another intent of this inspection was to carry out sediment sampling, if any accessible sediment was found to be present in the flow paths from the process areas to the reticulated stormwater system.

The Council officer met on site with Olex staff to look at the plastic extrusion process, and the potential for contaminants that could be discharged from the site from these processes.

At inspection the pelletised raw materials used in both the cross linked polyethylene (XLPE) and PVC extrusion process were sighted. Photographs were taken of the cross linked polyethylene raw materials, and this process was observed. It was noted that the process involved mixing the raw materials, heating them to approximately 190 °C, and then extruding them over the cable. The coated cable was then run through an open cooling water trough approximately 33 m long, prior to the cable being wound onto a cable drum.

It was observed that an extraction system was in place over the extruder, and a strong odour was found to be present in this area. The inspecting officer was informed that a catalyst, containing dibutyltin dilaurate, was added at about 5%. Although the material was described as a catalyst, Olex had been advised that the material bonds with the polyethylene, so is bound into the coating.

The PVC coating process was also observed and it was found to be running at a slightly lower temperature of 175-180°C.

The officer was informed that Olex had six extrusion lines, five of which were capable of being used for PVC or XLPE. The inspecting officer was informed that the decision about what is produced on which line is predominantly size dependant, as one line only produced cable that is over 16mm in diameter. Olex staff advised that there was one line that runs XLPE only, and one of the lines is used very infrequently.

Once coated, the loaded XLPE cable drums were placed into a "sauna", where they would be steamed at 90°C for a period of between 3-12 hours depending on the drum size, and amount of cable on the drum. It was observed that there was steam escaping from the saunas, as the rubber seals at the bottom of the housings were deformed on both saunas. It was found that there was a strong localised intermittent odour in this area. The Company advised that the seal would be fixed.

The officer was informed that the condensate from both saunas drained to the stormwater system, but not via the adjacent open stormwater grate, as thought at the time of the previous site visit and it had since been identified that only the boiler blowdown from the small boiler that provides the steam for the saunas drained into this sump. It was outlined that the condensate drained via an underground pipe to the stormwater system, and that there was no manhole at the join that would have enabled access to the flow path. The typical flow rate of the condensate had not ascertained by Olex.

It was noted that there had been a change in the stabiliser used for the PVC. Olex had previously used a lead stabiliser, but were now using a calcium/ zinc stabiliser.

The safety data sheets for the XLPE raw materials were sighted, and a hard copy was received. It was noted that in this document, dibutyltin dilaurate was not identified as a component present in the "catalyst".

The stormwater drains were checked downstream of the saunas, and it was observed that there was a low clear flow occurring. It was found that there was no sediment present in the drains that could have allowed for sampling and dibutyltin analysis. It was agreed that Olex was to investigate whether there was any sediment present in the bends at the base of the saunas that could be sampled for analysis.

The officer was informed that until the late 1990's-early 2000's the XLPE was manufactured at the site, rather than by combining and extruding XLPA and "catalyst". When it was manufactured on site, the dibutyltin dilaurate concentration added to the "catalyst" was in the order of 0.5-1.0 %.

Sediment sampling undertaken by Olex was discussed. They advised that sediment sampling was undertaken periodically, with samples taken from within the ponds and the Mangati Stream itself, with one site being just below the State Highway 3 bridge. Staff were not sure of the frequency of monitoring, or the parameters determined.

Olex staff asked that any Council results to date relating to dibutyltin concentrations be forwarded.

Sediment samples were collected from the inlet to pond 1 and from the Mangati Stream downstream of the pond 3 discharge point. The results of this sampling are discussed in section 11.2.3.

10 June 2013

The site stormwater system was found to be clean and there were no issues raised relating to chemical storage, bunding, spills or waste management on site.

26 June 2013

It was found that a forklift was operating in the yard at the time of the inspection. The yard was observed to be clean and tidy, with no visual sign of any spills. The stormwater drains clear, and there was no visual sheen.

On 7 August 2013

All hazardous chemical and flammable goods stores were locked and well managed. It was observed that the stormwater drains had been coated with a sealant around their perimeters, to allow a tight seal to be formed when silicon mats would be placed over the drain in the event of a spill. All areas of the site were tidy, with no concerns raised during the inspection. It was noted that all sumps and bunds were empty.

29 November 2013

All hazardous, chemical, and flammable goods stores were locked and well managed. The site was tidy, and all stormwater puddles were noted as being clean and clear. No concerns were raised during the inspection. Staff explained that the recirculated cooling water currently discharged via the stormwater drains, however

this process would be changing soon, with the recirculated water being redirected to the sewer/tradewaste drain.

20 March 2014

The tanks bunds were inspected and found to be satisfactory. The dangerous goods stores around the site were all inspected and found to be well managed. It was noted that the ground around the liquid nitrogen tank was damp/wet, and this led to the stormwater drain. Council and Olex staff were unable to establish what the liquid was at the time of inspection. All bunds on site were inspected and found to contain clear water. The stormwater drains appeared to be free of contaminants.

11.2.1.2 Results of discharge monitoring

Stormwater from the Olex site discharges to the industrial stormwater drain underneath Connett Road at two points; the one from the main loading area on the western side of the plant is opposite the entrance to Mainland Products; the other, from the remainder of the site, is about 100 metres further down Connett Road. The two discharges are monitored at six (east) and seven (west) points before they reach the Mangati Stream (Figure 2 sites 13 (east), 15, 14 (west), 10, 8, 33, 37 and 38 (both)). The uppermost monitoring point for the eastern catchment (STW001025) is unaffected by other discharges, and includes Olex's cooling water. Other discharges contribute to the flow at all of the monitoring points for the western discharge, including the uppermost site (STW001011), which is influenced by discharges from ABB, MI New Zealand, Schlumberger, Tegel's feed mill storage sheds, and properties previously occupied by a temporary drum recycling facility⁶, and a car wrecking yard⁶. The results of monitoring for these two primary sites are given in Table 29 and Table 30.

Five samples were collected at this site during the 2012-2014 monitoring period. The pH of the samples complied with consent conditions.

The consent also places limits on the concentration of suspended solids in the discharge. However, these parameters are routinely determined in the discharge by analysis, as historical data (in excess of 25 samples) has shown that the maximum recorded values have generally been very low (oil and grease 2 g/m³, suspended solids 7 g/m³). The samples are inspected visually and analysis may be performed if it is considered necessary. During the period under review, on 11 December 2012, 6 November 2013 and 26 February 2014 very slight sheens and/or odours were noted at the time of sampling, and therefore oil and grease samples were collected. The samples returned results that were well below the consent limit.

⁶ These industries relocated to outside the Mangati catchment during the 2000-2001 year

Table 29 Chemical monitoring results for Olex's cooling water and eastern stormwater discharge at Connett Road for 2012-2014 (site 13), with a summary of previous monitoring data. TRC site code STW001025

Date	COD g/m ³	Condy mS/m	CuAs g/m ³	CuD g/m ³	O&G g/m ³	pH pH	Temp Deg.C	Turby NTU	ZnAs g/m ³	ZnD g/m ³
<i>Consent limits</i>	-	-	-	-	15	6-9	-	-	-	-
Number	-	55	49	26	25	55	55	16	49	26
Minimum	-	<1	<0.01	<0.01	<0.5	6.3	9.6	0.78	0.028	0.025
Maximum	-	26.8	0.16	0.1	2.2	8.1	28	31	1.98	1.98
Median	-	5.4	0.04	0.01	<0.5	7.2	15.6	1.8	0.260	0.093
03-Jul-12	-	3.6	0.02	0.01	-	7.1	9.5	4.2	0.078	0.056
03-Sep-12	-	0.8	0.03	0.03	a	6.6	13.2	0.98	0.031	0.025
11-Dec-12	160	72.4	-	0.01	2.5	8.2	19.8	5.8	0.295	0.164
03-Apr-13 ^b	-	-	-	-	-	-	-	-	-	-
06-Nov-13	-	0.8	<0.01	<0.01	<0.5	6.7	14.9	0.68	0.038	0.036
26-Feb-14 ^b	-	-	-	-	-	-	-	-	-	-
26-Feb-14	-	68.9	0.03	0.02	1.0	7.8	17.2	5.3	0.271	0.136

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

Copper is included in the analysis suite for site STW001025 because the cooling water discharged is used as part of the copper wire drawing process. Zinc is included in the analysis suite to better assist Council in the assessment of zinc contamination of the entire industrial area, and because a calcium/zinc stabiliser is used at the site.

Both acid soluble and dissolved zinc concentrations in the discharge were generally below the median values calculated from previous results, however on 11 December 2012 and 26 February 2014 the zinc concentrations were both elevated to slightly above this value.

The acid soluble copper results were all below the median value, while the dissolved copper was slightly higher than median in two of the samples. All copper results were found to be well below the historical maximum for this monitoring location.

Four samples were collected from the central drain and Olex western stormwater discharge during the period under review (STW001011, Table 30). The pH was within the limits prescribed by the consent in all but one of the samples collected.

On 3 July 2012 the pH limit was exceeded slightly. The source of the discharge resulting in the elevated pH in this combined drain could not be identified either at the time of sampling or from examination of the results from the other monitored sites in this stormwater sub catchment. Monitoring will be continued and further investigations will be undertaken if this is found to be a recurrent issue.

Table 30 Chemical monitoring results for the central drain and Olex's western stormwater discharge at Connett Road for 2012-2014 (site 15), with a summary of previous monitoring data. TRC site code STW001011

Date	Condy mS/m	NH ₄ g/m ³ -N	O&G g/m ³	pH pH	SS g/m ³	Temp °C	Turby NTU
<i>Consent limits</i>	-	-	15	6-9	100	-	-
Number	58	54	28	58	32	56	19
Minimum	1.2	0.024	<0.5	5.9	<2	9.6	6.2
Maximum	55.7	4.2	110	9.7	280	22.4	53
Median	5.8	0.105	1.3	7.0	17	15.5	14
03-Jul-12	11.8	0.467	1.4	9.6	-	8.7	33
03-Sep-12	1.8	0.036	a	7.1	-	13.2	11
11-Dec-12 ^b	-	-	-	-	-	-	-
03-Apr-13 ^b	-	-	-	-	-	-	-
06-Nov-13	2.1	0.084	a	7.1	-	15.2	10
26-Feb-14 ^b	-	-	-	-	-	-	-
24-Jun-14	16.2	0.507	<0.5	6.8	-	14.1	25

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

The consent also places limits on the suspended solids and oil and grease concentrations in the discharge. The samples were inspected visually, and in the case of suspended solids, analysis was not considered necessary as high turbidity was not noted in any of the samples.

There was no hydrocarbon sheen or suspicious odour noted for two of the sample collected during the years under review, and for the two samples for which the oil and grease was determined, the results returned were well below the consent limit.

The ammoniacal nitrogen concentration of the discharges was found to be above median on two occasions. The concentrations found were not of concern. It is noted that other industries drain via this part of the reticulated stormwater network, including the storage sheds utilised by Tegel's feed mill. Monitoring of this parameter will continue at this location, with additional monitoring of the Tegel feed mill drain being undertaken if warranted.

The temperature of the discharge was found to be acceptable during the years under review.

11.2.2 Air

Air inspections were carried out in conjunction with site water inspections on 2 July 2012, 18 January, 10 June, 26 June, 7 August and 29 November 2013, and 20 March 2014.

No visible emissions or objectionable odours were noted during any of the inspections.

11.2.3 Investigations, interventions, and incidents

In the 2012-2014 period, the Council was required to undertake significant additional investigations and interventions, or record incidents, in association with Olex's conditions in resource consents or provisions in Regional Plans.

1 July 2012

Two phone calls were received by the Council advising that there had been a minor spill on site, and that a commercial truck had lost some coolant in the yard on site. Council was advised that these discharges were contained, stormwater drains were blocked off, a waste contractor had been engaged to clean up the spill, and it was determined that neither of these discharges were likely to enter any water body.

These notifications were recorded for information purposes, and as the discharges were contained on site and managed to avoid a discharge of contaminants from the site, these events were not logged on the Council's incidents register.

11.2.3.1 Cooling water investigation summary

Olex were found to be discharging a significant volume of cooling water during a dry weather sampling survey in December 2012. The sample collected was described as having a chemical and/or perfumed odour. As a result of this, a number of site visits were conducted, water and sediment samples were collected, and there was on going correspondence and discussion with Olex. Although no breach of consent conditions occurred, the investigations discussed in Section 11.2.3.2 show that there was the potential for adverse effects that were not considered at the time of the consent renewal in 2008. Olex was forewarned that if this discharge was to continue, the Council was likely to exercise the opportunity to review the consent in June 2014. However, at the conclusion of the investigation, Olex advised the Council that they considered a better environmental outcome would be achieved by eliminating the flow from the stormwater system altogether, and the work was completed just before the end of the period under review.

11.2.3.2 Cooling water investigation details

A site visit was undertaken on 12 December 2012, the day following the discovery of an uncharacteristic discharge.

During the discussions prior to follow-up sampling being undertaken, the Council was informed that the discharge would have occurred when a staff member topping up the cooling water tanks with town water overrode an alarm. As a result the town water supply was left feeding the cooling water tanks for approximately four hours. Olex's records showed that the town water was drawn at over 3.3 L/s during this time, leading to an overflow of the cooling water tanks to the Mangati ponds via the reticulated stormwater system.

Following the discussion, the cooling water sump was sampled. This was found to have an odour similar to the sample collected during the dry weather survey the previous day. The water samples were sent for analysis, focusing on the contaminant it was thought might be present in the discharge at that time. The presence of a variety of dissolved metals, haloethers, organonitrates, phosphates, and organochlorine pesticides, polycyclic aromatic hydrocarbons, phenols, plasticisers

and other halogenated compounds were ruled out (full results attached in Appendix VI).

Subsequent investigations involving discussions with the consent holder and a more detailed inspection of the manufacturing processes on site (May 2013 inspection in Section 11.2.1.1), narrowed the likely contaminant down to a “catalyst” containing dibutyltin dilaurate.

Olex’s consent permits the discharge of cooling water. At the time of the consent application it was stated that cooling water would be discharged at a rate of approximately 0.14 L/s, however the cooling water discharge rate was not limited by the consent. No immediate significant adverse effects were noted as a result of the discharge on 11 December 2012.

It was however noted that, the application information did not make it clear that the recirculated cooling water was in direct contact with the freshly extruded (hot) plastic coated cables, nor did it identify the potential contaminants involved. This was highlighted in the outstanding request for elaboration on this aspect of Olex’s stormwater management plan, which stated that in the event of a spill from the cooling water tanks, the contents would be safe to discharge to the stream. As part of this investigation it was ascertained that dibutyltin dilaurate was a catalyst used in the production/extrusion of the cross linked polyethylene cable coating. As a catalyst, this material was physically bound within the cable coating, rather than being chemically bound, and was therefore able to leach from the hot, freshly extruded cable into the cooling water.

The completion of the cross-linking process takes place in a “sauna” in which the cable reel sits for 3-12 hours. The “sauna” is filled with steam to maintain a temperature of approximately 90°C. The condensate from the two “saunas” drained to stormwater, at what appeared to be a relatively low flowrate. Olex advised that as far as they were aware, at that stage, the dibutyltin dilaurate was effectively locked into the cable coating.

Sediment samples were collected from two locations on 7 May 2013 to investigate if dibutyltin dilaurate from the Olex site was accumulating off site. One sample was collected from the inlet to pond 1, and one sample was collected from the Mangati Stream, approximately 2 m downstream of the discharge from pond 3. The results are presented in Table 31.

Table 31 Sediment sample monitoring results for two sites downstream of the Olex site collected on 7 May 2013.

Contaminant (mg/kg)	Inlet to Pond 1	Mangati Stream downstream of Pond 3 discharge
Dibutyltin (as Sn)	0.019	<0.005
Monobutyltin (as Sn)	<0.007	<0.007
Tributyltin (as Sn)	<0.004	<0.004
Triphenyltin (as Sn)	<0.003	<0.003

The sediment sample from the inlet to pond 1 showed the presence of dibutyltin, but none was found in the stream itself. It is noted however the coarse sand/fine gravel present at the sampling locations was not ideal, in terms of the fact that the

contaminant in question binds more effectively to clay type sediments that were likely to be present at more inaccessible locations within the pond system.

On 9 January 2014 Olex undertook sampling of the water remaining in the base of the sauna after a cable had been cured. No dibutyltin was detected in this sample.

A dry weather Mangati sampling survey was undertaken on 26 February 2014, during which it was found that there was a discharge of approximately 0.5 L/s occurring from the Olex site (STW001025). The sample had the same distinctive odour that was noted at the time of the December 2012 survey, and therefore sent for dibutyltin analysis. The results showed that the discharge contained low levels of dibutyltin (Table 32).

Table 32 Chemical monitoring results for Olex Cables' cooling water and eastern stormwater discharge at Connett Road TRC site code STW001025 on 26 February 2014

Date	DBT g/m ³	TBT g/m ³	TPT g/m ³
26-Feb-14	0.0013	<0.00005	<0.00004

Investigation by Olex found that the boiler that supplies the saunas had a faulty blow-down valve, which would have resulted in the discharge of water to a stormwater drain. The valve was fixed as soon as parts were available. During the follow up of this event, Council was advised that the cooling water had been diverted to sewer prior to this sampling run being undertaken.

Following this event, and previous discussions, Olex decided to divert the sauna condensate discharge to sewer via a sump and sump pump so that as of 21 May 2014, all boiler and sauna condensate was now discharging to sewer. This eliminated the last known process water discharge to the stormwater system at the site, leaving just yard and roof run off discharging to the stream via the reticulated stormwater system and NPDC treatment ponds.

11.3 Discussion

11.3.1 Discussion of site performance

The chemical storage, bunding, and waste management on site was found to be well managed throughout the period under review. There were two small on site discharges to ground notified to the Council during the 2012-2014 years, however these were contained on site, and the clean up was well managed.

In relation to Olex's stormwater management plan, there had been an unanswered query at the end of the 2011-2012 year regarding their consideration that, in the event of a major spillage from the cooling water system, it was safe to allow the cooling water to discharge to stormwater.

Although Olex's stormwater was found to comply with consent conditions, during the period under review, there were two uncharacteristic perfumed discharges to the stormwater system that were found and investigated. The investigation identified that there were contaminants present in the cooling water discharge and that there were additional low flow discharges that had not been specified at the time of the

consent application, nor identified in the stormwater management plan. These discharges were diverted to sewer prior to the end of the 2012-2014 monitoring period leaving just yard and roof run off entering the stormwater system.

The revision of the stormwater management plan was further delayed until these improvement works had been completed, and at the time of writing this report a revised plan had been received and accepted.

There were no visible emissions observed or odours detected from the plant.

11.3.2 Environmental effects of exercise of consents

Although it was found that there were discharges of dibutyltin occurring to the Mangati Stream via the reticulated stormwater from this site there were no adverse environmental effects found as a result of discharges or emissions originating from the Olex New Zealand Limited site during the 2012-2014 monitoring period.

11.3.3 Evaluation of performance

A tabular summary of Olex's compliance record for the years under review is set out in Table 33 Table 34 and Table 34.

Table 33 Summary of performance for Consent 4497-3, Olex's discharge of stormwater

Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Adoption of best practicable option to minimise effects on the environment	Inspection and discussion with consent holder	Works undertaken to ensure best practicable option with regard to dibutyltin
2. Limits stormwater catchment area	Inspection	Yes
3. Above ground hazardous substance storage to be bunded and not to drain directly to stormwater catchment	Inspection and discussion with consent holder	Yes
4. Limits on chemical composition of discharge	Sampling	Yes
5. Discharge cannot cause specified adverse effects beyond mixing zone	Receiving water and sediment sampling. Biomonitoring	Yes
6. Maintenance of a contingency plan for action to be taken to prevent spillage	Review of documents provided. Plan on file dated July 2013	Yes
7. Maintenance of stormwater management plan	Review of documents provided. Plan on file dated November 2011 – clarification requested by Council prior to approving plan	Response to point of clarification awaited since December 2011
8. Written notification required regarding changes to activities at the site	Inspection and discussion with consent holder	Yes

Condition requirement	Means of monitoring during period under review	Compliance achieved?
9. Provision for consent to lapse if not exercised	Consent has been exercised	N/A
10. Optional review provision re environmental effects and notifications of changes (S.C.9)	Next opportunity for review June 2020	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		High
Overall assessment of administrative performance in respect of this consent		Improvement required

N/A = not applicable or not assessed

Table 34 Summary of performance for Consent 5417-1 Olex's discharge to air

Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Adoption of best practicable option to minimise effects	Inspections, odour surveys and ambient monitoring	Yes
2. Processes to be supervised and controlled to minimise emissions	Inspections	Yes
3. Notification prior to making changes which may significantly change discharge	Inspection and discussion at inspection. Review of documentation received. No changes	Yes
4. Limit on contaminant concentrations beyond boundary	Not assessed during years under review, but no visible emissions sighted	N/A
5. Prohibits noxious, dangerous, offensive, or objectionable effects at or beyond boundary	Inspections, odour surveys	Yes
6. Optional review provision re environmental effects	No further review provisions prior to expiry	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		High
Overall assessment of administrative performance in respect of this consent		High

N/A = not applicable or not assessed

During the year, Olex New Zealand Limited – A Nexans Company demonstrated a high level of environmental performance, but an improvement was required in relation to their level of administrative performance and compliance with the resource consents as defined in Section 1.1.4.

During the period under review it was identified that there were discharges occurring to the stormwater system, the potential effects of which had not been adequately addressed at the time of the consent application in 2008, and there was the outstanding matter of clarifications requested in this consent holder's stormwater management plan. It is however noted, that all process and cooling water discharges were diverted to sewer during the period under review.

11.3.4 Recommendation from the 2011-2012 Annual Report

In the 2011-2012 Annual Report, it was recommended:

THAT monitoring programmed for consented activities of Olex New Zealand Limited – A Nexans Company in the 2012-2013 year continues at the level programmed for 2011-2012.

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

11.3.5 Alterations to monitoring programmes for 2014-2015

In designing and implementing the monitoring programmes for air/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 RMA in terms of monitoring emissions/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 emitting to the atmosphere/discharging to the environment.

It is proposed that for 2014-2015 the programme remains unchanged. A recommendation to this effect is attached to this report.

11.4 Recommendation

THAT monitoring programmed for consented activities of Olex New Zealand Limited – A Nexans Company in the 2014-2015 year continues at the level programmed for 2012-2014.

12. OMV New Zealand Limited

12.1 Introduction

12.1.1 Process description

OMV New Zealand Limited (OMV) currently manages this 1.08 ha site as a storage facility to support the offshore Maari Field.

The site is used for the storage and dispatch of off-shore equipment between drilling campaigns. This equipment includes chemicals and drill pipes. The drill pipes are either new, prior to them being prepared for use, or unused pipes returned from the off-site drilling activities. There is no pipe washing, preparation, or reconditioning of used pipes carried out at the site.

Chemicals, of limited quantities and classes, are stored either under cover in the warehouse buildings, or in banded shipping containers in the yard, prior to dispatch.

Any equipment returned from off-shore is washed off-shore, if required, and is clean when it is returned to the site.

Stormwater drains via a three-stage oil separator to the Bell Block industrial drainage system.

Prior to OMV leasing the site, the entire property had been developed, with the site being roofed, tar-sealed or metalled.

A wash facility is situated on the southern side of the site, and an automatic diverter valve diverts the discharge of washings to sewer via an oil separator when the washpad is in use. Stormwater from the washing area, when the washpad is not in use, continues to be directed to the Mangati Stream via an older oil separator. At the time (the late 1990's), the diversion of truck-washings to sewer represented a large advance in the improvement of water quality in the Mangati Stream.

Historically, Clark & Rogers operated a fleet of 27 trucks from this depot that has entrances off both Connett and Paraita Roads. In the main, the trucks carried dry goods such as grain, metal and chemical fertiliser, however some live poultry was also transported, which are activities that had the potential to result in elevated levels of nutrients and elevated bacterial counts. Freight, including a range of chemicals was stored largely within buildings. At times, some freight was stored in the open.

An unmanned diesel fuelling station was situated on part of the property, with this particular facility was owned by BP Oil New Zealand Limited (BP). The fuelling station and under ground tanks were removed from the site in 2001 and Council has a copy of the tank removal report on file.

The site and trucking operation, including the trading name of Clark & Rogers was sold to Rapid Roadfreighters on 29 September 2006. In February 2008 the Council was advised that the land owner of this site was now Shaycar Trust. Shaycar Trust leased areas of the site to Rapid Road Freighters who were replaced by Thomson Carriers, Truck and Trailer Rentals, and to Olex Cables Limited for the storage of cable drums.

Council found there had been a change of lease to OMV prior to the inspection undertaken in January 2013.

12.1.2 Water discharge permit

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.

OMV holds water discharge permit **3913-2** to cover the discharge of up to 125 L/s of treated stormwater from a transport depot into the Mangati Stream from this site.

This permit was originally issued on 12 April 1991 to Clark and Rogers Limited as a water right pursuant to section 21(3) of the Water and Soil Conservation Act 1967. Permit 3913-2 was issued by the Council on 7 February 1996 under Section 87(e) of the RMA. It was transferred to Shaycar Trust on 1 December 2008, and then to OMV on 17 December 2013. This consent expired on 1 June 2014.

An application to renew this consent was received from OMV on 26 February 2014, more than three months prior to the consent expiry date. Therefore under Section 124 of the RMA, the Council has exercised its discretion and allowed the consent holder to continue to operate under the conditions of the expired consent until a decision is made on the renewal application.

The original conditions of consent **3913-2** are outlined below, along with subsequent changes made during a consent review.

Special conditions 1 and 2 related to chemical limits on the discharge and effects on the receiving waters downstream of the mixing zone.

Special condition 3 required the consent holder to maintain a contingency plan and special condition 4 was a provision for optional review in June 2008.

During the 2007-2009 years the consent was reviewed by the Council based on the high BOD results in the stormwater discharge from the site in the 2006-2007 monitoring year.

Changes were therefore recommended as follows:

- Condition 1: limit oil and grease rather than hydrocarbon concentration, include a maximum suspended solids component concentration of 100 g/m³, a maximum ammoniacal nitrogen component concentration of 10 g/m³, and a maximum biochemical oxygen demand of 16 g/m³
- Condition 5: - new - include a requirement for the provision of a stormwater management plan to ensure that the consent holder is operating activities at the site in a manner that is consistent with the best practicable option to minimise contamination of the stormwater discharged from the site.

The reviewed permit, adopting these recommendations, was issued on 21 August 2008.

This reviewed permit is attached to this report in Appendix I.

12.2 Results

12.2.1 Water

12.2.1.1 Inspections

The site was visited on 7 January, 12 June, 7 August and 29 November 2013, and 21 March 2014. The final inspection scheduled for the period was undertaken on 1 July 2014 and will be discussed in the report covering the 2014-2015 monitoring year.

It was found that the site was now used primarily for the storage of equipment, with all equipment cleaned off site prior to storage. The washpad was not in use during any of the inspections and at one of the inspections, the inspecting officer was informed that it was now used only occasionally. It was noted that no chemicals or hazardous substances were stored outside. The three separators were pumped out by Trans Pacific on 18 December 2012 and the separators were then diverted to stormwater. Drains and collection points were found to be clean and obstruction free during all inspections. No issues were noted during the monitoring period.

12.2.1.2 Results of discharge monitoring

Treated stormwater discharged from the OMV site is monitored at up to nine points before it reaches the Mangati Stream (Figure 2 sites 47, 17, 16, 14, 10, 8, 33, 37 and 38). Other discharges contribute to the flow at the lower eight monitoring points (i.e. sites 17, 16, 14, 10, 8, 33, 37 and 38). The primary monitoring site is immediately below the oil separator for treating the site stormwater discharged (site 18). The results from chemical monitoring at this site are given in Table 35.

Table 35 Results from monitoring of stormwater from the OMV site for 2012-2014 (site 18), with a summary of previous monitoring data. TRC site code IND002013

Date	BOD g/m ³	BODF g/m ³	COD g/m ³	Condy mS/m	DRP g/m ³ -P	ECol /100ml	ENT /100ml	FC /100ml	NH3 g/m ³ -N	NH4 g/m ³ -N	O&G g/m ³	PH pH	SS g/m ³	Temp Deg.C	Turby NTU
<i>Consent limits</i>	16	-	-	-	-	-	-	-	-	10	15	6-9	100	-	-
Number	44	21	45	54	51	47	50	50	49	54	37	54	53	52	16
Minimum	2.2	0.5	7.5	1.3	0.023	18	1100	18	0.00005	0.017	<0.5	6.5	6	8.0	6.3
Maximum	500	12	340	74.4	11.2	570000	840000	670000	2.552	36.5	230	9.4	1000	22.3	460
Median	8.6	3.1	50	8.6	0.32	11000	57000	12000	0.00255	0.403	2.5	7.2	73	14.4	31
03-Jul-12	6.6	4.9	16	4.3	0.09	38000	93000	38000	0.00037	0.222	0.6	6.9	14	9.1	20
03-Sep-12	2.3	1.3	16	1.5	0.028	12000	65000	12000	0.00009	0.037	a	6.9	19	13.5	10
11-Dec-12 ^b	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
03-Apr-13 ^b	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06-Nov-13	2.1	<0.5	12	1.8	0.018	20000	39000	20000	0.00035	0.091	1.4	7.0	11	17.1	7.7
26-Feb-14 ^b	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24-Jun-14 ^b	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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

The discharge complied with consent conditions for biochemical oxygen demand, ammoniacal nitrogen, pH range, oil and grease and suspended solids during the period under review.

With the exception of the bacteriological monitoring, results obtained during the 2012-2014 year, were similar to or below the previous medians. Of particular note, the BOD, COD, nutrients and suspended solids were all substantially below the historical median for this monitoring location, which is likely to be associated with the change from feed distribution and storage to a site that supports the off-shore oil and gas industry. It is also likely that it also reflects improved control over fugitive emissions from the neighbouring feedmill.

12.2.2 Investigations, interventions, and incidents

In the 2012-2014 period, the Council was not required to undertake significant additional investigations and interventions, or record incidents, in association with OMV's conditions in resource consents or provisions in Regional Plans.

12.3 Discussion

12.3.1 Discussion of site performance

The consent holder was reminded of the requirement to provide a stormwater management plan during the period under review. However, at the end of the 2012-2014 years a stormwater management plan had still not been submitted to Council for approval. As of 1 June the consent 3913-2 had expired and the new consent holders, OMV, then needed to provide an updated stormwater management plan as part of their application to renew the consent. It is noted that the site was well managed during the period under review, with no issues found during inspection and, at the time of writing this report, a stormwater management plan had been submitted and approved by the Council.

Stormwater monitoring found that the discharge from the site complied with contaminant conditions at the time of sampling. It is also notable that on the whole, the significant reduction in the total biochemical oxygen demand and nutrient loading in the discharge observed since 2007 has continued during the 2012-2014 period due to the change in activities at the site (Sections 12.1.1 and 12.2.1.2).

12.3.2 Environmental effects of exercise of consent

During the years under review, there were no adverse effects noted as a result of the exercise of OMV's water discharge consent.

12.3.3 Evaluation of performance

A tabular summary of OMV's compliance record for the years under review is set out in Table 36.

Table 36 Summary of performance for Consent 3913-2, OMV's discharge of treated stormwater

Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Limits on chemical composition of discharge	Sampling	Yes
2. Discharge cannot cause specified adverse effects beyond mixing zone	Receiving water sampling	Yes
3. Preparation of a contingency plan to be provided by March 1997	Review of documents provided. Original plan approved November 2001. Latest plan on file dated April 2011	Yes
4. Optional review provision re environmental effects	No further review opportunities	N/A
5. Preparation and maintenance of a stormwater management plan	Review of documentation on file, reminders sent, discussion at inspections, on site meeting to clarify requirements in previous monitoring periods	No
Overall assessment of consent compliance and environmental performance in respect of this consent		High
Overall assessment of administrative performance in respect of this consent		Improvement required

N/A = not applicable or not assessed

During the year, OMV New Zealand Limited [OMV] demonstrated a high level of environmental performance and compliance with the resource consents as defined in Section 1.1.4, however improvement was required with regards to the level of administrative performance due to the then overdue stormwater management plan, which although not provided after the consent transfer in December 2014, has now been received and accepted.

12.3.4 Recommendation from the 2011-2012 Annual Report

In the 2011-2012 Annual Report, it was recommended:

THAT monitoring programmed for consented activities of Shaycar Trust in the 2012-2013 year continues at the level programmed for 2011-2012.

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

12.3.5 Alterations to monitoring programmes for 2014-2015

In designing and implementing the monitoring programmes for air and 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 RMA in terms of monitoring emissions, 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 emitting to the atmosphere and/or discharging to the environment.

It is proposed that for 2014-2015 the monitoring programme is unchanged. A recommendation to this effect is attached to this report.

12.4 Recommendation

THAT monitoring programmed for consented activities of OMV New Zealand Limited in the 2014-2015 year continues at the level programmed for 2012-2014.

13. Schlumberger Seaco Incorporated

13.1 Introduction

13.1.1 Process description

Schlumberger Seaco Incorporated (Schlumberger) provides services to the oil production industry, and stores a range of hazardous substances in enclosed areas of the site. Washdown of drilling mud and occasionally oil residue from down hole tools occurs, with this water discharged to the stormwater system via an interceptor. The 1.7 ha site off Paraita Road is in the area previously occupied by Maui Metals and Taranaki Drum and Pallet Recycling. The property has been substantially improved and is now mostly either sealed or under roof. The majority of the stormwater plus the washdown water exits the site after passing through the old Ashtech Industries monitoring point (site 26).

The site is tar sealed with all maintenance activities and hazardous goods storage contained within buildings. There are purpose built facilities on site for the storage of radioactive borehole logging sources, explosives, hazardous goods and paint. Storage in the yard areas of the site is limited to off shore logging units, mechanical equipment and trucks. Schlumberger has a policy that no hazardous goods are to be stored outside the designated facilities. There is no treatment system or interceptor in place for the stormwater discharged from the general storage and standing areas of the site. However, there are dedicated three stage interceptors for the pressure test bay and for the laydown area of the site.

The wash area is housed within a building that also contains the paint, waste, oil, and chemical storage areas. The floors within this building all drain to a common 1.5 m³ capacity sealed sump. The liquid collected in this sump can either be removed by a contractor for appropriate off-site disposal, or be pumped to the stormwater drainage system via an oil separator, which removes the oily waste and suspended solids from the effluent stream. The pump intake is placed above the bottom of the sump to allow for the settlement of sludge and sediment. The pump operates as part of an automated system activated by high and low level sensors. The sensors are positioned such that free oil on the surface and sludge/sediment at the base is retained within the sump.

All washing is performed using hot water/steam only, i.e. no surfactants, degreasers or other additives (which would have the effect of emulsifying or solubilising oils and greases) are used.

The free oil and low density suspended solids removed by the oil separator are directed to a bunded 15,000 litre storage tank inside the building. This is emptied on an as required basis by a contract vacuum truck for appropriate off site disposal. There is a valve at the base of the separator for the removal of accumulated heavy solids and sludge.

Schlumberger stated that the maximum treated washwater discharge from the site would be 1.5 m³/day, only once every one to two months, with the discharge duration being a maximum of 2-3 hours.

In the 2006-2007 monitoring year a second wash pad was installed and commissioned at the site.

The consent requires contingency, stormwater management and washwater management plans are maintained for the site. The latest version of the contingency plan was received and accepted by the Council in September 2010. The latest version of the stormwater management and washwater management plans were received by the Council in August 2009, which Council records indicate was confirmed as still being current in December 2012.

Late in the 2013-2014 year Schlumberger acquired the MI New Zealand site, however as the majority of the monitoring was undertaken whilst the consent was held by MI New Zealand and the site was under their control, the only monitoring reported in this section relates to self monitoring undertaken by Schlumberger (Section 13.2.1.3).

13.1.2 Water discharge permit

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.

Schlumberger holds water discharge permit **6032** to cover the discharge treated washwater and stormwater from a storage and maintenance premises for oil field exploration equipment into the Mangati Stream. This permit was issued by the Council on 4 July 2002 under Section 87(e) of the RMA. It is due to expire on 1 June 2020.

In addition to the 'standardised' conditions for contingency planning, prohibiting particular effects in the receiving water and limiting the pH, suspended solids and oil & grease, limits have also been placed on the component concentrations of dissolved copper (0.05 g/m^3), dissolved lead (0.2 g/m^3) and dissolved zinc (0.65 g/m^3) in the discharge. The consent also requires that activities are conducted in accordance with the information provided in support of the application and that the Council is notified of any changes at the site that could alter the nature of the discharge. Plans are required to ensure that the effectiveness of the wash water treatment system is maintained and that the stormwater is not contaminated by inappropriate storage of chemicals/soiled equipment in the stormwater catchment.

The consent was reviewed during the 2008-2009 year as monitoring at the site had found that changes have been made to the processes at the site that were of significance to the Council in relation to existing special conditions 1 and 2, without formal assessments of the impact these changes may have had on the potential for environmental effects.

Changes were therefore recommended as follows:

- Condition 2: altered so the procedure for notifying Council of alterations to changes in the processes undertaken at the site, or the chemicals used or stored on site, which could alter the nature of the discharge, is in the standard Council format, requiring written notification.

- Condition 8: amended to include provision for review of the consent based on notification from the consent holder of changes at the site which may change the discharge.
- Condition 9: - new – prohibiting the use of agents that are likely to reduce the efficiency of the treatment system in place.

The reviewed permit, adopting these recommendations, was issued on 27 August 2008.

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

13.2 Results

13.2.1 Water

13.2.1.1 Inspections

This site was visited on 8 January, 12 June, 26 June, 7 August, 29 and November 2013, and 21 March 2014, with the final scheduled inspection undertaken 1 July 2014. The final inspection will be discussed in the report covering the 2014-2015 year.

8 January 2013

The yard area was spill free. No sheen was observed on the surface water in the yard areas. The wash bay was not in use. All drums and IBC's on site had lids secured. All drains and collection points were clean and free from obstructions.

12 June 2013

The site was found to be neat and tidy. All equipment was cleaned up in the washdown bay with an approved interceptor system. No effects were noted in the Mangati catchment.

26 June 2013

The yard was clean and tidy. There was no visual sheen in the stormwater drain by the boundary. No dust or odours were observed.

7 August 2013

The site was clean and tidy with general housekeeping excellent. All sumps had clear water in them. The wash bay was in use at the time of inspection. A minimal amount of spray was observed discharging from the bay. The consent holder was advised to re-paint the green paint that indicates the stormwater drains.

29 November 2013

The site was clean and tidy with general housekeeping excellent. All sumps had clear water in them. The perimeter fence between the Schlumberger and MI New Zealand sites had been removed and a discussion was had with the consent holder regarding amalgamating the consents for the two companies.

21 March 2014

The site was tidy with no issues raised during the inspection. The stormwater sumps and drains were found to be dry.

13.2.1.2 Results of discharge monitoring

The majority of the stormwater and washdown water exit the site after passing through the old Ashtech Industries monitoring point (STW001056, Figure 3; site 26, Figure 2), which is also affected by stormwater discharged from the MI New Zealand site.

Three samples were collected by the Council in the 2012-2014 period (Table 37). Standardised consent conditions for pH range, oil and grease and suspended solids were met, as were the limits for copper, lead and zinc.

Table 37 Chemical monitoring results for Schlumberger's stormwater discharge for 2012-2014 (site 26) with a summary of previous monitoring data. TRC site code STW001056

Date	COD g/m ³	Condy mS/m	CuD g/m ³	O&G g/m ³	PbAS g/m ³	pH pH	SS g/m ³	Temp Deg.C	Turby NTU	ZnD g/m ³	ZnAS g/m ³
<i>Consent limits</i>	-	-	<i>0.05</i>	<i>15</i>	<i>0.02*</i>	<i>6-9</i>	<i>100</i>	-	-	<i>0.65</i>	-
Number	24	34	3	19	3	34	35	32	16	3	2
Minimum	<5	1.4	<0.01	<0.5	<0.05	6.3	<2	9.6	3	0.034	0.105
Maximum	650	163	<0.01	119	<0.05	8.7	970	22.1	50	0.086	0.196
Median	21	7.1	<0.01	1.7	<0.05	7.3	12	15.0	6.6	0.086	0.150
03-Jul-12	31	6.1	<0.01	1.0	<0.05	7.5	19	8.3	13	0.232	-
03-Sep-12	<5	2.0	0.05	a	<0.05	7.0	8	13.3	4.6	0.050	0.053
11-Dec-12 ^b	-	-	-	-	-	-	-	-	-	-	-
03-Apr-13 ^b	-	-	-	-	-	-	-	-	-	-	-
06-Nov-13	14	2.1	<0.01	-	<0.05	7.1	14	16.1	8.1	0.041	-
26-Feb-14 ^b	-	-	-	-	-	-	-	-	-	-	-
24-Jun-14 ^b	-	-	-	-	-	-	-	-	-	-	-

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

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

b not discharging at time of sampling survey

* limit is for dissolved lead

13.2.1.3 Data review

Schlumberger undertakes monitoring of the discharges from various operations at the site including the VGS systems servicing the wash bays, the pressure bay discharge, and the discharge from the "triple yard". This monitoring is carried out approximately quarterly, and a copy of the results is forwarded to Council upon request.

Self monitoring results were provided to the Council on 11 and 18 August 2015. At this time, although the consent had not yet been transferred, the site was under the control of Schlumberger Seaco Incorporated, and is therefore discussed in Section 13.2.2.

Sampling was carried out on 9 July 2012, 29 October 2012, 17 January 2013, 21 March 2014, and 27 May 2014.

Results showed that some of the samples had component concentrations that were not within the permitted ranges. A summary of these occurrences are given in Table

38 and Table 39, along with clarification as to whether there was an actual discharge that was likely to have occurred, and the actions undertaken by Schlumberger.

In the case of the liquid mud plant (LMP) results (Table 39), it is noted that although consent 5987 had not yet been transferred from MI New Zealand at the time of the March 2014 sample, the site was under the control of Schlumberger. Discussions are continuing in order to clarify the circumstances around the location, timing, possible causes and remedial actions relating to these analytical results.

Table 38 Schlumberger self-monitoring results outside permitted range (consent 6032), along with remedial actions undertaken.

Date	Sample location	Parameter	Value g/m ³	Consent limit g/m ³	Comment/Explanation
18 January 2013	Triple yard	Dissolved zinc	0.74	0.65	A wireline unit that had returned from a location where oil based drilling had been undertaken. This was sitting on their containment pad and dripped onto the pad and into the triple separator. The master valve was closed off, and the water samples were taken. The sumps were all sucked out for cleaning, with the waste water disposed of by Transpacific. The sumps were then backfilled with clean water and integrity tested. Therefore no actual non complying discharge occurred.
21 March 2014	WL wash bay	Oil and Grease	42	15	The MI New Zealand wash bay was closed down, and they got permission to use the Wireline wash bay from management. Samples were taken after MI New Zealand used the wash bay to wash their equipment that had returned from a wellsite. The sump was cleaned out and the waste was disposed of by Transpacific. No waste water was discharged to the receiving water. The decision was made to use Transpacific services after MI New Zealand have used the wash bay.
	WL wash bay +10min		31		
	WL wash bay +10min	Dissolved copper	0.068	0.05	
28 May 2014	WL wash bay	Oil and Grease	2600	15	MI New Zealand had used the wash bay to wash their equipment that had returned from a wellsite. Again the sump was cleaned out and the waste was disposed of by Transpacific. No waste water was discharged to the receiving water. Permission for MI New Zealand to use the Wireline wash bay was withdrawn.
	WL wash bay +10min		13		

Table 39 Schlumberger LMP separator self-monitoring results outside permitted range (consent 5897)

Date	Parameter	Value g/m ³	Consent limit g/m ³	Comment/Explanation
21 March 2014	BOD	22	7	Discussion continuing
	Ammonia	0.12	0.025	
13 May 2014	BOD	8	7	Discussion continuing

13.2.2 Investigations, interventions, and incidents

In the 2012-2014 period, the Council was not required to undertake significant additional investigations and interventions, or record incidents, in association with Schlumberger's conditions in resource consents or provisions in Regional Plans.

13.3 Discussion

13.3.1 Discussion of site performance

Inspection found that material handling and plant maintenance at the site was well managed during the years under review. The Council's review of the Schlumberger self monitoring data found that, although there were samples that returned results that were above the consent limits, the consent holder employed the services of a waste contractor to clean the sumps and dispose of the waste water. The Council was advised that no discharge occurred to the receiving environment under consent 6302.

Although there were two samples from the LMP separator that exceeded consent limits, discussions are continuing with Schlumberger as it has not yet been ascertained as to whether a discharge was likely to have occurred.

The results of the Council's sampling surveys found that the discharge complied with consent conditions at the time of sampling.

13.3.2 Environmental effects of exercise of consent

There were no adverse environmental effects identified by the Council as a result of the discharges from the Schlumberger Seaco site during the years under review.

13.3.3 Evaluation of performance

A tabular summary of Schlumberger's compliance record for the years under review is set out in Table 40.

Table 40 Summary of performance for Consent 6032-1, Schlumberger's discharge of washwater and stormwater

Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Consent to be exercised in accordance with information submitted at application, and in plans (S.C. 3,4,and 7)	Inspection and discussion with consent holder. Some changes, plans to be reviewed	Yes
2. Council to be advised in writing with assessment of effects prior to changes	Inspection and discussion with consent holder. No further changes	Yes
3. Maintenance of plan for washwater treatment system	Inspection and discussion with consent holder, and review of documentation on file	Yes
4. Maintenance of stormwater management plan	Inspection and discussion with consent holder, and review of documentation on file	Yes
5. Limits on chemical composition of discharge	Sampling, and review of self-monitoring data	Yes
6. Discharge cannot cause specified adverse effects beyond mixing zone	Receiving water sampling	Yes

Condition requirement	Means of monitoring during period under review	Compliance achieved?
7. Maintenance of a contingency plan for action to be taken to prevent spillage	Plan on file received September 2010	Yes
8. Optional review provision re environmental effects and notifications of changes (S.C.2)	Next opportunity for review June 2014	N/A
9. Prohibition of wastes containing degreasers, solvents or surfactants	Inspection and discussion with consent holder. Observations at sampling	Yes
Overall assessment of consent compliance and environmental performance in respect of this consent		High
Overall assessment of administrative performance in respect of this consent		High

N/A = not applicable or not assessed

During the year, Schlumberger demonstrated a high level of environmental and administrative performance and compliance with the resource consents as defined in Section 1.1.4.

13.3.4 Recommendation from the 2011-2012 Annual Report

In the 2011-2012 Annual Report, it was recommended:

THAT monitoring programmed for consented activities of Schlumberger Seaco Incorporated in the 2012-2013 year continues at the level programmed for 2011-2012.

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

13.3.5 Alterations to monitoring programmes for 2014-2015

In designing and implementing the monitoring programmes for air/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 RMA in terms of monitoring emissions/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 emitting to the atmosphere/discharging to the environment.

It is proposed that for 2014-2015, the programme remains unchanged. A recommendation to this effect is attached to this report.

13.4 Recommendation

THAT monitoring programmed for consented activities of Schlumberger Seaco Incorporated in the 2014-2015 year continues at the level programmed for 2012-2014.

14. Tasman Oil Tools Limited

14.1 Introduction

14.1.1 Process description

Tasman Oil Tools Limited (Tasman Oil) has a 1.4 ha yard on De Havilland Drive for storage and maintenance of drill pipe, down-hole tools and other miscellaneous equipment used in the oil industry. New casing and drill pipe is cleaned to remove protective grease, which until recently contained some copper and zinc, and a high proportion of lead. The wash water was discharged to land and then flowed overland to an interceptor pit. Tasman Oil's yard is immediately upslope of the pipeyard of Greymouth Petroleum Acquisitions Company Limited (Greymouth Petroleum), where a similar activity is undertaken.

The site is mostly metalled, with some sealed areas. Stormwater flows to drains, which then run along the eastern and northern boundaries and converge at an oil interceptor pit. The discharge from the pit enters a common open stormwater drain that also receives stormwater from the adjacent properties of NGC and Greymouth Petroleum. The drain reaches the Mangati Stream about 250 m below De Havilland Drive.

Drilling pipes are cleaned with hot water and sprayed with a fast drying resin (Protekto-coat 1114NFP) on a metalled area at least 50 m from the stormwater drains.

Improvements made at the site include the construction of a roofed washpad, the installation of a three-stage oil separator to collect and treat equipment washings, the connection of the washpad to trade waste sewer, the installation of a large shipping container to house oils and chemicals, and the installation of a paint locker.

Due to elevated levels of copper being found in the stormwater discharged from the site, in April 2002 the Council investigated contaminant levels in soils on the site with samples taken from current and historical pipe storage areas and the gravelled pipe washing area. Although elevated levels of various metals were found in the samples, the concentrations met the relevant industrial guideline levels. Stormwater sampling continued to indicate that there was a significant source of heavy metals on site due to historical activities and two possible conclusions were identified.

- A 'hot spot' containing a higher concentration of heavy metals was missed during the soil sampling exercise.
- Because the original source of heavy metals was from an historical activity that occurred in excess of five years ago, the loose surface soils containing the major portion of the heavy metals have been washed from the active areas of the site and had been retained in the settlement pond.

It was considered at that time, that the second conclusion was the more probable scenario and the accumulated sediment and sludge was removed from the settlement pond. Council has continued to monitor for the presence of copper, lead and zinc in the site stormwater discharge. During the years under review however, a discharge sample containing elevated suspended solids (the second highest on record for this discharge point), also contained acid soluble zinc that was a new maximum for this monitoring location, and acid soluble copper equal to the

historical maximum. This indicates that there is likely to still be elevated levels of these components in the site surface that need to be controlled.

A contingency plan for spillage response is in place for the site. The plan was last approved by the Council as being up to date, in November 2013.

14.1.2 Water discharge permit

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.

Tasman Oil holds water discharge permit **4812-2** to cover the discharge up to 112 L/s of stormwater including washdown water from a storage and maintenance yard for oil field drilling equipment into an unnamed tributary of the Mangati Stream. This permit was originally issued by the Council on 1 November 1995 under Section 87(e) of the RMA, and was renewed on 26 November 2001. It is due to expire on 1 June 2020.

Conditions are attached in respect of concentration of stormwater components which include the 'standardised' conditions for pH, suspended solids and oil and grease, as well as for dissolved copper (0.05 g/m³), dissolved lead (0.2 g/m³) and dissolved zinc (0.65 g/m³). Other conditions require notification to the Council if the yard washpad is used more heavily than was anticipated at the time of the consent application, limit effects in the receiving water after reasonable mixing, require a contingency plan, and provide for opportunities for review of conditions.

The consent was reviewed during the 2008-2009 year as monitoring at the site had found that the conditions of the consent may not be adequate to deal with adverse effects on the environment.

Changes were therefore recommended as follows:

- Condition 4: altered so the procedure for notifying the Council of alterations to changes in the processes undertaken at the site, or the chemicals used or stored on site, which could alter the nature of the discharge, is in the standard Council format, requiring written notification.
- Condition 9: amended to include provision for review of the consent based on notification from the consent holder of changes at the site which may change the discharge.
- Condition 10: - new – prohibiting the use of agents that are likely to reduce the efficiency of the treatment system in place.
- Condition 11: - new – requiring the provision and maintenance of a stormwater management plan.

The reviewed permit, adopting these recommendations, was issued on 27 August 2008.

The permit is attached to this report in Appendix I.

14.2 Results

14.2.1 Water

14.2.1.1 Inspections

Inspections were undertaken on 8 January, 10 June, 26 June, 7 August, 29 November 2013, and 21 March 2014. A further scheduled inspection was conducted on 1 July 2014 and this will be discussed in the 2014-2015 report.

8 January 2013

There was a small, clear, discharge from the separator into the settling pond. The pond level was very low, and appeared sheen and odour free. The yard area was spill free and clear of potential contaminants, as were perimeter drains. Puddles in the yard area were also observed to be sheen free. The wash pad was not in use at the time of the inspection.

10 June 2013

It was noted that all site stormwater is directed through a three stage interceptor and skimmer pit prior to discharge to the Mangati Stream. It was reported that the final stage of the interceptor, and the discharge were visually clear of contaminants, and there appeared to be no effects in the receiving waters.

26 June 2013

The yard area was clear of spills and the skimmer system was considered to be working well. There was no visual effect from the discharge on the receiving waters at the time of inspection.

7 August 2013

A small mound of drill cuttings was found in the western corner of the site. This was immediately addressed by staff, who arranged for it to be removed. The ring drains were clean and free of debris. It was noted that the settlement pond was turbid, as was the discharge. It was however noted that the turbidity had reduced by the time the discharge entered the stream, and no visible effects were noted downstream of the discharge.

29 November 2013

It was reported that the sumps had recently been cleaned out. The skimmer pit in the northern corner of the site was not discharging at the time of inspection. A discussion was held with staff about improving silt controls within the ring drain. It was suggested that the use of, for example, silt cloth and haybales could improve the quality of the site discharge.

21 March 2014

In general the site was tidy, with no issues raised concerning the storage of product, drums etc. It was noted that the ring drains contained a lot of sediment/silt and that there had been no work undertaken to improve the silt controls on site, as discussed during the previous inspection. Tasman Oil staff were reminded that a discharge sample collected on 6 November 2013 contained suspended solid levels in breach of resource consent conditions, and that works would need to be undertaken to ensure that the level of suspended solids discharging offsite were within the parameters

stated in resource consent conditions. It was found that improvement works had been undertaken at the following inspection (1 July 2014).

14.2.1.2 Results of discharge monitoring

The discharge from Tasman Oil's yard is monitored at up to two points before it reaches the Mangati Stream (Figure 2, sites 32 and 30). Other discharges contribute to the flow at the lower monitoring point (site 30). The primary monitoring site is at the discharge point from the skimmer pit (site 32). Samples of the discharge were taken on three occasions during the 2012-2014 monitoring period. The results for the period under review are given in Table 41, along with a summary of results for previous monitoring.

Table 41 Chemical monitoring results for Tasman Oil's stormwater discharge for 2012-2014 (site 32), with a summary of previous monitoring data. TRC site code STW001057

Date	Condy mS/m	CuAs g/m ³	CuD g/m ³	O&G g/m ³	PbAs g/m ³	pH pH	SS g/m ³	Temp Deg.C	Turby NTU	ZnAs g/m ³	ZnD g/m ³
<i>Consent limits</i>	-	-	<i>0.05</i>	<i>15</i>	<i>0.5</i>	<i>6-9</i>	<i>100</i>	-	-	-	<i>0.65</i>
Number	38	30	26	39	30	38	38	38	20	30	26
Minimum	1.9	<0.01	<0.01	<0.5	<0.05	6.4	8	8.5	51	0.06	0.020
Maximum	15.9	0.4	0.09	600	0.29	7.9	620	22.6	570	1.04	0.56
Median	5.1	0.08	0.02	2.2	0.08	7.1	88	14.9	140	0.310	0.106
03-Jul-12	19	0.40	0.01	3.5	0.28	7.1	600	7.8	520	1.18	0.204
03-Sep-12	4.4	0.17	0.01	6.9	0.08	8.2	240	13.0	210	0.414	0.017
11-Dec-12 ^b	-	-	-	-	-	-	-	-	-	-	-
3-Apr-13 ^b	-	-	-	-	-	-	-	-	-	-	-
06-Nov-13	4.6	0.14	0.03	1.3	0.06	7.4	140	16.4	170	0.319	0.093
26-Feb-14 ^b	-	-	-	-	-	-	-	-	-	-	-
24-Jun-14 ^b	-	-	-	-	-	-	-	-	-	-	-

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

Copper, lead and zinc are monitored at this site because it was known that, historically, these heavy metals were present in the grease washed from the pipes. The washwater from this activity was discharged onto land and into the Mangati Stream via the interceptor pit. Although the grease currently used does not contain these elements, and the majority of the washdown wastes are directed to sewer, it has been identified that this practice has resulted in an elevated concentration of copper, lead and zinc in the soil on site.

The results for pH, oil and grease, dissolved copper, lead and zinc were within the consent limits.

The suspended solids exceeded the permitted concentration in all three samples collected during the monitoring period, on two of these occasions the discharge was recorded as an unauthorised discharge on the Council's Incidents Register. The potential effects of these consent exceedances are discussed further below, whilst the outcomes of the incident investigation are summarised in section 14.2.2.

It is noted that the result of 600 g/m³ obtained for the sample collected on 3 July 2012 was six times the consent limit, and the second highest on record. It was accompanied by a new maximum concentration of acid soluble zinc and an acid soluble copper concentration that was equal to the historical maximum. Under the conditions prevailing at the time of the survey, the suspended solids concentration had reduced to 240 g/m³ at the discharge point from the combined drain to the stream (MGT000495), and although this was still higher than desirable, there were no significant adverse effects found in the stream.

It is however noted that, on this occasion, there was a reduction in suspended solids, acid soluble copper and acid soluble zinc between sites STW001057 and MGT000495, and that the turbidity was relatively stable. This could possibly indicate that larger particles, with adsorbed copper and zinc, may have been deposited in the combined drain, potentially leading to a build-up of contaminants in the drain, which is beyond the boundary of the Tasman Oil's site.

On 3 September 2012 at site MGT000495, where the combined stormwater from this site, Greymouth Petroleum and Vector discharges to the stream, the suspended solids concentration had reduced, but was still almost three times the 100 g/m³ permitted by the consent. On this occasion the biggest increase in the instream suspended solids was found at site MGT000500, which is below the De Havilland Drive stormwater drains, and the Tasman Oil and Greymouth Petroleum combined discharge. Whilst an increase in suspended solids may be considered transient and therefore less than minor, particularly at times of high stream flow, the increases in suspended solids was accompanied by an increase in the acid soluble metals concentrations in the stream (as discussed further in Section 22.1), some of which may settle out on the stream bed. It is noted that Greymouth Petroleum were also breaching their consent limit to a greater extent on both 3 September 2012 (410 g/m³) and 6 November 2013 (300 g/m³).

In the case of dissolved metals, with the exception of dissolved zinc in the sample collected on 3 July 2012, the dissolved copper and zinc concentrations were similar to or below the historical medians.

However, the acid soluble copper and zinc concentrations during the years under review were again similar to or above the historical medians for this monitoring site. The association between the high suspended solids and high acid soluble metals concentrations that has been found at this monitoring location highlights the importance of bringing the concentration of suspended solids in the discharge under control, due to the entrained heavy metals in the sediment, and the potential for sedimentation downstream of the discharge.

14.2.1.3 Data review

Special conditions 2 and 3 require that:

"The consent holder shall keep and make available to the Chief Executive, Taranaki Regional Council, upon request, records of the date, frequency and duration of all washing conducted outside the constructed washpad; such records to be kept for at least 12 months."

“The consent holder shall notify the Chief Executive, Taranaki Regional Council, if yard washing is to be undertaken for periods in excess of one day per week.”

When Tasman Oil applied to renew this consent in October 2001 it was stated that items that are too large for the roofed washpad (which drains to tradewaste) were washed to land in an area of the metalled yard. This wash water drains overland for approximately 60 m before entering the interceptor pit. The amount of washdown conducted outside the washpad was variable. Tasman Oil estimated that this was to occur, on average, for approximately 4 hours per month. At the time the consent was processed, it was reported that inspection had found that the use of this washpad may have resulted in discoloured overland flow and may have contributed to discolouration of the water within the interceptor pit. Therefore the intent of special condition 3 was to ensure that the Council is notified of periods when the yard washpad is experiencing heavier than expected use, and can ensure that this is not leading to adverse effects.

Tasman Oil forwarded the yard washdown usage logs for 2012-2014 to the Council upon request. The washpad usage reported is included as Appendix V and is summarised in Figure 6. The total washpad usage was relatively low for the 2012-2014 period (60.3 hours), however, it is noted that at times the intensity of wash pad use has been greater than anticipated at the time of the consent application.

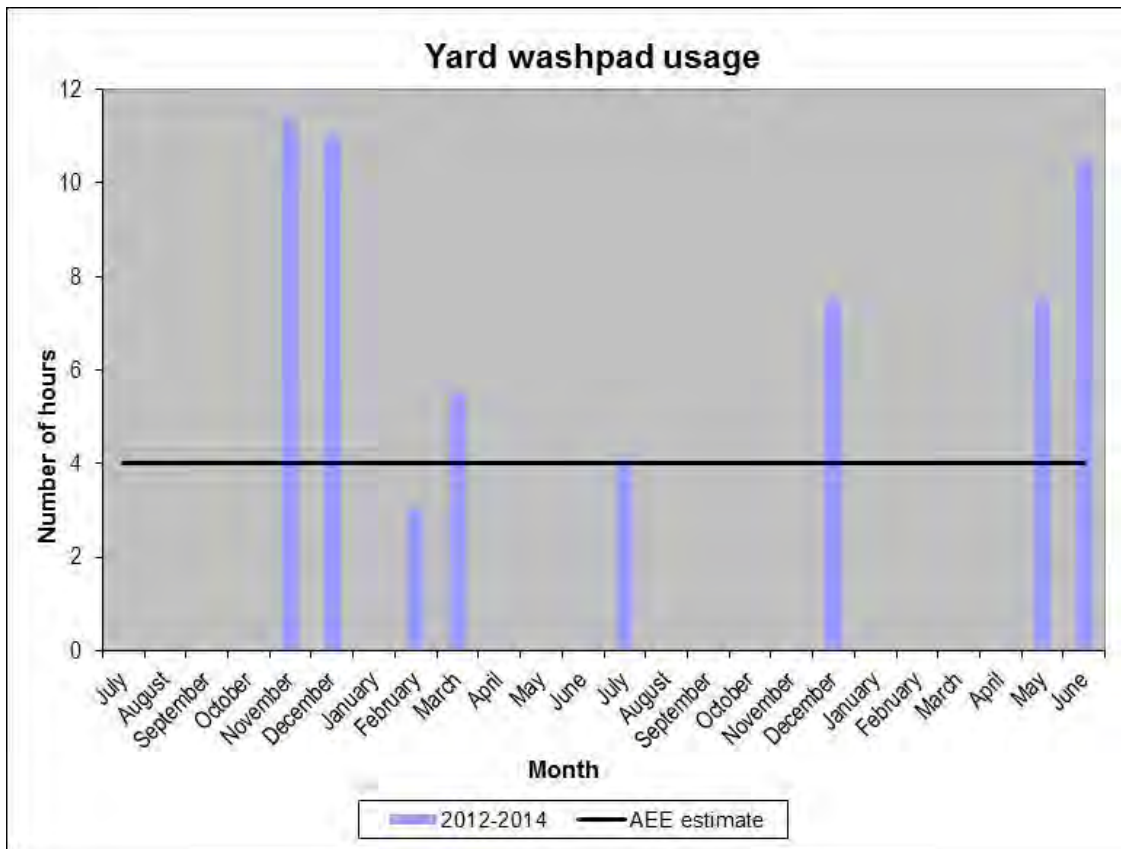


Figure 6 Yard wash pad usage – drains to stormwater

The greatest usage occurred in November and December 2012, December 2013 and May and June 2014.

In November 2012, May 2014 and June 2014, although the washpad usage exceeded the AEE estimate, the usage did not require notification to the Council under condition 3 of the consent, as the highest levels of usage within a seven day period were 7.5 hours on 30 December 2013, a total of 7.5 hours for 22 and 23 May 2014, and 6.5 hours in November 2012.

During December 2012, 11 hours of washing were carried out over a two-day period, which to comply with the intent of condition 3, should have been notified to the Council prior to this occurring.

The effects of the period of relatively intensive washpad use in December 2012 were unknown. This is because the Council was not notified, and with the schedule of routine monitoring, the discharge was not sampled for many months afterwards. Therefore the rain in the intervening period would have flushed any contained washwater through the stormwater system prior to sampling. It is however noted that no complaints were received regarding effects in the Mangati Stream in December 2013 or January 2013.

In the 2011-2012 Mangati Catchment Annual report it was noted that the wording of condition 3 was ambiguous as it specified "one day per week", which could be interpreted as 24 hours during a given calendar week, rather than the intent of 8 hours within any 7 day period. The condition also does not specify that the notification should occur prior to this level of wash pad usage being undertaken. It was therefore considered that this consent condition should be clarified at the next opportunity, and a recommendation to this effect was attached to the report. The next scheduled review opportunity was in June 2014, and Tasman Oil was informed of the Council's intent to review the consent conditions on 23 June 2014. The reviewed consent was issued in August 2014.

14.2.2 Investigations, interventions, and incidents

In the 2012-2014 period, the Council was required to undertake significant additional investigations and interventions, or record incidents, in association with Tasman Oil's conditions in resource consents or provisions in Regional Plans. There were two breaches of the suspended solids component concentration stated in the consent that were recorded as unauthorised discharges on the Council's Incidents Register.

3 July 2012

During the analysis of samples it was found that resource consent limits in regards to suspended solids were being exceeded in the discharge from the Tasman Oil site on 3 July 2012. The discharge occurred during heavy rainfall and the receiving environment already had a slightly elevated suspended solids load. Only a slight further increase in suspended solids was found in the receiving waters. A meeting was conducted on site on 26 July 2012 as a follow up to discuss the elevated results. The consent holder stated that no out of the ordinary incidents have taken place which could explain the high levels. It was mentioned that during very heavy rain events that the 3-stage separator adjacent to the skimmer pit can be overwhelmed, causing the run off to effectively bypass the separator. The lining of the pit and the perimeter drains was discussed as a potential improvement.

6 November 2013

During analysis of samples collected during the wet weather run it was found that suspended solids in the discharge from Tasman Oil had again exceeded resource consent conditions on 6 November 2013. The consent holder undertook works to reduce the amount of silt and sediment entering the skimmer pit by placing silt controls in an open drain. No further action was taken as the breach was considered to be minor and the Council was working with Tasman Oil to ensure compliance was achieved in future.

14.3 Discussion

14.3.1 Discussion of site performance

Tasman Oil generally maintained a high level of housekeeping during the years under review and activities at the site in relation to chemical storage and use of the main washpad (which is diverted to trade waste) were generally well managed. There was only one minor issue noted at inspection regarding these aspects of site management, which was the finding of drill cutting in the stormwater catchment on 7 August 2013, and it was reported that this matter was addressed at the time of inspection.

There were two unauthorised incidents logged during the period under review, both relating to non-compliance with the suspended solids limit on the Tasman Oil's consent, with sampling finding that the discharge complied with all limits except for the limit imposed on the suspended solids concentration. The suspended solids concentration was above the consent limit on and above the historical median during all three sampling surveys when a stormwater discharge was found to be occurring from the site.

Improvements to control the release of suspended solids discussed at inspection in November 2013 were found not to have been actioned at the time of the following inspection in March 2014. It is however noted that some works were found to have been carried out at the final scheduled inspection carried out on 1 July 2014.

According to the intent of condition 3 of Tasman Oil's consent notification of yard blasting should have been received on one occasion during the period under review, however it is recognised that the wording of this condition was ambiguous. This had been highlighted in previous reports, and the Company was notified of the intent to review this condition in June 2014 as per special condition 9. The reviewed consent was granted on 5 August 2014.

14.3.2 Environmental effects of exercise of consent

Although an elevation in the suspended solids of the Mangati Stream was observed on occasion, there were no significant adverse effects found as a result of the exercise of Tasman Oil's consent during the years under review.

During the period under review, increases in suspended solids and acid soluble metals concentrations, and turbidity of the stream were recorded on 3 September 2012 and 6 November 2013, with increases in suspended solids and turbidity found on 2 July 2012. It is also noted that on 3 September 2012 and 6 November 2013 there

was also a (greater) contribution to the suspended solids and turbidity from the Greymouth Petroleum discharge to the increases in these parameters in the stream. However on 3 September 2012 the greatest contribution to the acid soluble metals was from the Tasman Oil site.

As the dissolved (immediately bioavailable) copper concentration of the Tasman Oil Tools discharge was at the permitted level on all sampling occasions during the period under review, and the concentration of this parameter remained low in the Mangati Stream, it is considered that there was no significant adverse effect occurring at the time of sampling. However, it is noted that, until the release of suspended solids from the site is controlled to within the limits of the consent, there is the potential for off site deposition of copper and zinc to occur in both the combined drain and the Mangati Stream itself.

14.3.3 Evaluation of performance

A tabular summary of Tasman Oil's compliance record for the years under review is set out in Table 42.

Table 42 Summary of performance for Consent 4812-2, Tasman Oil's discharge of washwater and stormwater

Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Consent to be exercised in accordance with information submitted at application, and conditions of consent	Inspection and discussion with consent holder	Non-notification of yard washing
2. Yard washing records to be kept and provided to Council on request	Records provided	Yes
3. Council to be notified if yard washing more than 1 day per week	Inspection and discussion with consent holder, and review of documentation on file	Non-notification However, wording of consent condition ambiguous
4. Council to be advised in writing with assessment of effects prior to changes	Inspection and discussion with consent holder. No changes	Yes
5. Stormwater treatment system to be maintained satisfactorily	Inspection and discussion with consent holder	Requested improvements not made
6. Limits on chemical composition of discharge	Sampling	Exceedance of SS in all samples
7. Discharge cannot cause specified adverse effects beyond mixing zone	Receiving water sampling	Yes
8. Maintenance of a contingency plan for action to be taken to prevent spillage	Plan reconfirmed as up to date in November 2013	Yes

Condition requirement	Means of monitoring during period under review	Compliance achieved?
9. Optional review provision re environmental effects and notifications of changes (S.C.4)	Review actioned in June 2014	N/A
10. Prohibition of wastes containing degreasers, solvents or surfactants	Inspection and discussion with consent holder. Observations at sampling	Yes
11. Maintenance of stormwater management plan	Inspection and discussion with consent holder, and review of documentation on file. Plan on file dated 14 November 2008	Needs amending to ensure compliance with suspended solids limit
Overall assessment of consent compliance and environmental performance in respect of this consent		Improvement required
Overall assessment of administrative performance in respect of this consent		Good

N/A = not applicable or not assessed

An improvement in Tasman Oil Tools Limited's environmental performance is required, and this consent holder demonstrated a good level of administrative performance and compliance with the resource consents as defined in Section 1.1.4.

During the period under review all three stormwater samples collected exceeded resource consent limits for suspended solids, and the suspended solids concentration of the discharge was also found to be an issue in the 2011-2012 year. An initial request was made for works to be undertaken in November 2013. It was found that works had not been undertaken in March 2014, however, this request had been complied with by the inspection on 1 July 2014.

14.3.4 Recommendation from the 2011-2012 Annual Report

In the 2011-2012 Annual Report, it was recommended:

THAT monitoring programmed for consented activities of Tasman Oil Tools Limited in the 2012-2013 year continues at the level programmed for 2011-2012.

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

14.3.5 Alterations to monitoring programmes for 2014-2015

In designing and implementing the monitoring programmes for air/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 RMA in terms of monitoring emissions/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 emitting to the atmosphere/discharging to the environment.

It is proposed that for 2014-2015 the monitoring programme remains unchanged. A recommendation to this effect is attached to this report.

14.4 Recommendation

THAT monitoring programmed for consented activities of Tasman Oil Tools Limited in the 2014-2015 year continues at the level programmed for 2012-2014.

15. Tegel Foods Limited – feed mill

15.1 Introduction

15.1.1 Process description

The New Plymouth feed mill of Tegel Foods Limited (Tegel) has been in operation on their 1.6 ha site on Paraite Road since 1968. Raw grain and supplements are processed into feed for central North Island divisions of the company. The plant operates 20 hours per day for 5 days per week. Thirteen staff are employed.

Raw materials are transported to the site by truck in bagged and bulk form, the largest component being various types of grain. Other raw materials are soft goods or feed supplements such as lime, meat and bone meals, broll, vitamins, and minerals. Liquids such as tallow, canola oil, or molasses are also used. The grain is ground and the meal is mixed and blended with various supplements and liquids according to requirements. The feed is then pelletised and, bagged, or stored in bulk before being loaded onto trucks for dispatch.

Storage tanks for tallow (40 tonne), molasses (30 tonne), and canola oil (40 tonne) feed supplements are situated outside the mill. The “alimet” tank, in which the canola oil is stored, is situated within a bund. There is no bund around the tallow and molasses tanks owing to the high viscosity of the liquids. A dangerous goods store holds miscellaneous liquids such as weed sprays, paint and oils.

During the 2005-2006 year the site stormwater drainage system was modified and a diversion valve installed so that in the event of a spillage, or during washdown activities, the flow from the stormwater catchment could be directed to a wastewater holding tank. The contents of this tank are disposed of appropriately by waste contractors.

Major releases of dust to the atmosphere are controlled by treatment of airflows through cyclones, which separate the dust from the air. Other potential discharges arise from operations such as the discharge of raw materials from bulk trucks into tipping pits and the discharge of final product into dry tanks, from any potential spillage during storage, and from dust generation during processing and bagging.

A comprehensive contingency plan is in place for action to be taken in the event of liquid spills. The latest version of the plan was produced in December 2012. A dust management plan was forwarded to the Council on 27 June 2002, and was accepted as being satisfactory. Updated information on the emission abatement equipment at the site and management practices in place to prevent an accumulation of dust occurring in the stormwater catchment was provided to the Council in the 2012-2013 monitoring year, during the renewal of the stormwater consent 2335.

15.1.2 Water discharge permit

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.

Tegel held water discharge permit **2335-1** to cover the discharge of up to 370 L of stormwater from a stock/poultry feed manufacturing site into an unnamed tributary of the Mangati Stream. This permit was originally issued to NRM Feeds Limited on 11 November 1987 as a water right pursuant to section 21(3) of the Water and Soil Conservation Act 1967 for a period until 1 June 1996. The consent was transferred to Tegel on 9 November 1992. A new permit (**2335-2**) was issued by the Council on 12 June 1996 under Section 87(e) of the RMA. It was due to expire on 1 June 2008.

An application to renew this permit was received on 19 February 2008, and therefore Tegel was able to operate under the conditions of the expired consent until a decision was made on the application.

The application was put on hold a number of times to allow for consultation with the applicant under sections 37 (2)(a) and 37 (2)(b) of the RMA, and in order to obtain non-notified approval under section 94 of the RMA.

Water discharge permit **2335-3** to cover the discharge of stormwater from a stock/poultry feed manufacturing site to the New Plymouth District Council (NPDC) stormwater drainage network was issued by the Council on 30 March 2008. It expired on 1 June 2012.

The Mangati Stream is a waterbody identified as being in need of improvement in the Regional Freshwater Plan for Taranaki (RFWP). One of the issues identified is the biochemical oxygen demand of the stream. Consent 2335-2 did not limit the BOD of the discharge, and when the introduction of a limit on consent 2335-3 was considered, historical monitoring indicated that the discharge from the site was not of the desired quality. It was therefore recommended that a short term consent be issued, which had a higher than desirable limit, but strong focus on management practices, monitoring and identification of opportunities for improvement. A clear message was presented to Tegel that at the time of the next renewal, this limit would be reduced as it had also been evident in the 2006-2007 year that, although a system had been put in place to divert contaminated water to a holding tank, this was not being used to best effect by the operators at the site indicating that staff training was an issue to be addressed during the term of this consent.

An application to renew the consent was received on 29 February 2012, which was put on hold under Section 37A with the applicant's agreement. The application was put on hold on 28 May 2012 under section 92 of the RMA whilst awaiting further information. The further information requested was:

- An updated site plan showing the tradewaste and stormwater pipes for the whole of the site.
- An updated the AEE to reflect the locations of the drain filters used on site, including details of the monitoring and cleaning practices associated with them.
- An up to date Contingency Plan.
- Details of how Tegel prevents an accumulation of dust within the stormwater catchment as a result of normal operation emissions and what practices occur to minimise the entrainment of this deposited material in the storm water. This should also include management and maintenance practices relating to both

minimising emissions, minimising and addressing deposited material, and also details of any records kept by Tegel in this regard. This should also include the cleaning regime referred to in Appendix 3 'Stormwater Monitoring, Investigation and Actions Report' and the procedures that are in place to ensure that this regime is effective.

- Details of the frequency of the delivery and quantity of dry products brought onto site, and the management practices associated with their receipt, onsite storage, and transport through the stormwater catchment.
- Condition 8a of consent 2335-3 requires that a monitoring programme, with no less than 15 samples being taken, shall be provided to the Council. Only 12 results of these samples had been provided to the Council. The applicant was asked to provide the remaining monitoring results, detailing which sampling point the samples had been taken from.

On 18 June 2012 Tegel requested that the timeframe for the provision of the information be extended. This was extended to 31 July 2012.

The application was received on 29 February 2012, and therefore under Section 124 of the RMA, the Council exercised its discretion and has allowed the consent holder to continue to operate under the conditions of the expired consent until a decision is made on the renewal application.

Although Tegel's response to the Council's request for additional information was provided on 6 August 2012, clarification of a number of points was requested. A number of extensions were requested regarding the timeframes for the provision of the clarifications, and ultimately it was agreed that the processing of the consent should be progressed, with any outstanding matters incorporated as requirements within the conditions of the consent.

2335-3 (1 July 2012 to 11 February 2014)

Condition 1 required the adoption of the best practicable option.

Because stormwater generation is dependant on the rainfall event and is not always practicable for the consent holder to control, rather than limiting the discharge rate, condition 2 limited the stormwater catchment area to 2 ha.

Conditions 3 and 4 specified that the stormwater must be treated to ensure compliance with the conditions of the consent and required that all hazardous substances stored in the stormwater catchment were banded.

Condition 5 limited the constituent concentrations of the discharge.

Conditions 6, 7, and 8 related to the provision of contingency and stormwater management plans, and the monitoring programme that was going to be put in place to ensure that the discharge could be better characterised, and areas for improvement could be identified prior to the expiry of this consent. The purpose of the plans was

- in the case of the management plan, to ensure that the consent holder examined the activities taking place on site, and put appropriate controls in

place to minimise the potential for stormwater contamination to occur due to routine activities, and

- in the case of the contingency plan to ensure that in the event of an unforeseen situation, the chances of a spillage resulting in an unauthorised discharge leaving the site were minimised.

For Tegel, these were also a means of documenting the way in which the “best practicable option” (as required by condition 1) had been implemented.

To ensure that the potential for environmental effects from the exercise of the consent was consistent with the information provided to the reporting officer at the time the consent conditions were drafted, condition 9 required written notification to the Council prior to changes at the site that may have affected the nature of the discharge, and condition 10 provided opportunities for review of the consent.

Water discharge permit **2335-4** to cover the discharge of stormwater from a stock/poultry feed manufacturing site to the NPDC stormwater drainage network was issued by the Council on 12 February 2014 under Section 87(e) of the RMA. It is due to expire on 1 June 2026.

2335-4 (12 February 2014 to date)

Condition 1 requires the adoption of the best practicable option, and specifies that this requirement incorporates ensuring that the BOD of the discharge is as low as practically achievable.

Again, for the reasoning stated above, condition 2 limits the stormwater catchment area to 2 ha.

Condition 3 limits the constituent concentrations of the discharge. In relation to the BOD of the discharge a concentration of 50 g/m³ is permitted until 30 November 2014, with a maximum of 25 g/m³ permitted there after to allow for a staged improvement plan to be developed and implemented (refer special conditions 5 and 6).

Condition 4 prohibits adverse effects on the receiving waters downstream of the discharge.

Conditions 5 and 6 relate to improvements at the site. Condition 5 requires that the waste water is piped directly to the NPDC trade waste system rather than being stored on site in a large fibreglass tank, and condition 6 requires that the consent holder develops and documents a performance based improvement programme that is to be certified by the Council. Both of these requirements have a deadline for completion, and condition 7 requires that a performance report be provided to the Council by 1 July each year.

Conditions 8 and 9 relate to the provision of contingency and stormwater management plans, with the purpose of the plans being outlined above (ref consent 2335-3).

Again, to ensure that the potential for environmental effects from the exercise of the consent was consistent with the information provided to the reporting officer at the

time the consent conditions were drafted, condition 10 requires written notification to the Council prior to changes at the site that may affect the nature of the discharge, and condition 11 provides opportunities for review of the consent.

A copy of both of these permits is attached to this report in Appendix I.

15.1.3 Air discharge permit

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

Tegel holds air discharge permit **4038** to cover the discharge emissions into the air from the milling and blending of grain and/or animal meals together with associated activities. This permit was originally issued to NRM Feeds Limited on 17 June 1992. It was transferred to Tegel Foods on 9 November 1992 and was renewed by the Council on 23 November 2001 under Section 87(e) of the RMA. It is due to expire on 1 June 2020.

Special conditions limit the discharge of dust (less than 125 mg/m³ normal temperature and pressure (NTP)), dust deposition rate beyond the boundary (less than 4.0 g/m²/30 days), and suspended particulate matter at or beyond the boundary (3 mg/m³). Conditions also address maintenance, operation, and control of, or alteration to the plant and processes, and require that Tegel keeps and makes available to Council, a record of any dust or smoke emission incidents, and provides and maintains a dust management plan.

The permit is attached to this report in Appendix I.

15.2 Results

15.2.1 Water

15.2.1.1 Inspections

The feed mill site was inspected on 2 July 2012, 7 January 2013, 10 June 2013, 26 June 2013, 27 August 2013, 2 December 2013, and 28 March 2014.

The final scheduled inspection for period under review was undertaken on 1 July 2014. The inspection found the site to be compliant with consent conditions, and the inspection findings will be discussed in the report covering the 2014-2015 monitoring year.

2 July 2012

No visible emissions (that might have to potential to impact on stormwater quality) were noted during the inspection. It was found that the traffic areas were clean and free of potential contaminants. No spills were observed at the time of inspection.

7 January 2013

Again, no air emissions that had the potential to impact on stormwater quality were found at the time of inspection. The yard area was reported to be tidy and free from spills and potential contaminants. It was observed that all drains and catchment

points were clear and well maintained. The entry areas to the feed stores were clean and no tracking was present.

10 June 2013

It was reported that the inspecting officer signed in at the office and completed an induction prior to undertaking the inspection with Tegel's New Plymouth Regional EHS Coordinator. Spill kits were observed around site and it was found that the site was clean and tidy throughout.

26 June 2013

At the time of inspection it was noted that there was a lot of construction under way on site. It was found that the stormwater drain was visually clear at the site boundary, and no issues were noted relating to spills, tracking or on site aerial deposition of particulates that could have the potential to affect stormwater quality. It was reported that the site was being managed in a satisfactory manner, compliant with consent conditions.

27 August 2013

No issues were raised at the feed mill site that may have the potential to impact on stormwater quality. It was raining at the time of inspection and all stormwater observed appeared to be clean and clear of visible contaminants. Tegel was informed that no samples were taken at the time of inspection.

2 December 2013

The site was inspected in fine weather with a slight intermittent breeze. It was reported that no issues were raised with the feed mill operations and it was considered that excellent stormwater management practices were in place at the time of inspection.

28 March 2014

An inspection notice was issued to advise Tegel that an inspection of the feed mill was carried out on the above date to check that resource consent special conditions were being complied with. The weather at the time of inspection was overcast with no wind. The site was found to be tidy and clean. The drains had silt cloth filters installed in them. The Production Manager advised that a new stormwater system, with a fox valve⁷, has been granted consent from NPDC. Once this was installed, all wastes from the site would be directed to trade waste. The feed mill operational areas were reported to be clean and tidy. No drums or containers were observed to be getting stored out of place.

15.2.1.2 Results of discharge monitoring

Stormwater discharged from Tegel's feed mill is monitored at up to ten points before it reaches the Mangati Stream (Figure 2, sites, 22, 21, 19, 16, 14, 10, 8, 33, 37 and 38). The primary monitoring site (STW001015) is at a manhole over the stormwater drain at the northern entrance to the mill from Paraita Road (site 22). The site is not influenced by discharges from other sources. The results from chemical monitoring at that site are given in Table 43.

⁷ This is a diversion valve regulating the direction of first flush stormwater and waste water

Samples were collected on four occasions during the monitoring period. The consent conditions for unionised ammonia (0.025 g/m³), pH range (6-9), and oil and grease (15 g/m³) were complied with on all monitoring occasions. The biochemical oxygen demand and suspended solids concentrations exceeded the permitted limit on 3 July 2012. This was logged as an unauthorised discharge and is discussed further in section 15.2.3 below.

There were no numerical limits specified in the consent for any of the other parameters tested. However, these additional analyses were performed in order to monitor the overall quality of the discharge.

Table 43 Chemical monitoring results for Tegel's feed mill stormwater discharge for 2012-2014 (site 22), with a summary of previous monitoring data. TRC site code STW001015

Date	BOD g/m ³	BODF g/m ³	COD g/m ³	Condy mS/m	DRP g/m ³ -P	ECOL /100mL	ENT /100mL	FC /100mL	NH ₃ g/m ³ -N	NH ₄ g/m ³ -N	O&G g/m ³	pH	SS g/m ³	Temp °C	Turby NTU
<i>Consent limits</i>	50	-	-	-	-	-	-	-	0.025	-	15	6-9	100	-	-
Number	33	26	48	55	32	36	37	38	43	44	43	54	57	51	18
Minimum	1.2	0.7	<5	2	0.008	17	2600	17	0.00015	0.016	<0.5	6.5	14	10.0	3.9
Maximum	730	98	10500	1320	1.85	1900000	8300000	2000000	0.03016	5.34	990	7.9	8440	22.2	120
Median	34	10.5	93	12.7	0.383	41000	90000	48000	0.00246	0.847	3.2	7.0	92	15.3	47
03-Jul-12	94	34	300	12.4	0.301	130000	2400000	130000	0.00301	0.929	3.1	7.2	240	8.6	149
03-Sep-12	21	4.7	49	2.8	0.104	36000	2000000	36000	0.00069	0.238	3.1	7.0	68	13.3	33
11-Dec-12	10	2.2	17	30.2	0.207	970	19000	1000	0.00597	0.532	<0.5	7.5	64	16.1	25
03-Apr-13 ^b	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6-Nov-13	9.2	3.2	56	467	0.096	24000	140000	25000	0.00179	0.244	1.3	7.3	75	16.5	23
<i>Consent limits</i>	50	-	-	-	-	-	-	-	-	-	15	6-9	100	-	-
26-Feb-14 ^b	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24-Jun-14 ^b	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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

Chemical oxygen demand (COD) analysis was performed to assess the relative organic strengths of the discharges. It was noted in the 2009-2011 Biennial Report that there had been an overall trend of increasing COD when looking at the results from the previous 11 years. During the 2011-2012 year it was found that the COD concentration appeared to have stabilised, with the results for that period being similar to the historical median. During the period under review, three of the samples collected during the years under review exhibited COD's well below the historical median, however the sample collected on 3 July 2012 contained a relatively high COD at 300 g/m³. This is the highest COD recorded since 2007.

Dissolved reactive phosphorus and ammoniacal nitrogen are measured in order to monitor these nutrients in the discharge. The dissolved reactive phosphorus concentrations observed during the years under review were all below the historical median. Ammoniacal nitrogen values were generally similar to or below the historical median.

The faecal bacteria, enterococci and *E.coli* counts were again high during the 2012-2014 period. The presence of these types of bacteria is attributed to the breeding or concentration of micro-organisms in the storm drain from excrement that has been deposited on site by birds and rodents attracted to the feed.

15.2.2 Air

15.2.2.1 Inspections

The inspections focus on assessing the relevant emission sources to air particularly:

- the cyclonic dust extraction systems;
- the boiler and exhaust gas stack;
- general processing areas within the plant;
- raw and finished material storage areas (including the main silos);
- and conveyance system within the factory.

In addition to this any changes to the mill which could have an effect upon local air quality were also checked.

The feed mill site was inspected on 2 July 2012, 7 January, 10 June, 26 June, 27 August, and 2 December 2013, and 28 March 2014.

The final scheduled inspection for period under review was undertaken on 1 July 2014, with monitoring of the particulate concentration undertaken on 14 July 2014 (delayed due to failure of the Council's monitoring equipment). Both of these inspections found the site to be compliant. The inspection findings will be discussed in the report covering the 2014-2015 monitoring year.

The site was inspected in a variety of wind and weather conditions. During the period under review, no visible emissions were found from the emission abatement equipment, the processing buildings or the dry goods/grain storage sheds at any of the inspections. No issues were found regarding deposited dust either on or off site, and no off-site air borne dust or odours were detected.

A dust sample was taken from the cyclone discharge point on the roof on 28 March 2014. The concentration of dust recorded was 0.92 mg/m³, which is well below the 125 mg/m³ permitted by Tegel's resource consent.

15.2.2.2 Deposition gauging

Many industries emit dust from various sources during operational periods. In order to assess the effects of the emitted dust, industries have been monitored using deposition gauges.

Deposition gauges are basically buckets elevated on a stand to about 1.6 m. The buckets have a solution in them to ensure that any dust that settles out of the air is not resuspended by wind.

Gauges are placed a site and within the surrounding community. The gauges were left in place for 15 days.

Guideline values used by the Council for dust deposition are 4 g/m²/30 days or 0.13 g/m²/day deposited matter. Consideration is given to the location of the industry and the sensitivity of the surrounding community, when assessing results against these values.

Material from the gauges was analysed for solid particulates associated with pollution. The location of the gauges is shown in Figure 7, and the results are presented in Table 44 below.



Figure 7 Location of Tegel's feed mill deposition gauges

Table 44 Tegel's feed mill air deposition gauge results 29 January 2013

	Unit	AIR009101	AIR009102
Deployment period	Days	15	16
Volume of liquid in gauge	L	0.06	0.10
Total particulate	g/m ² /day	0.7	1.0

The results for dust deposition at the Tegel feed mill site showed that particulate deposition rate in the vicinity of the site was below the consent limit of 0.13 g/m²/day of deposited particulate.

15.2.3 Investigations, interventions, and incidents

In the 2012-2014 period, the Council was required to undertake significant additional investigations and interventions, or record incidents, in association with conditions in resource consents or provisions in Regional Plans.

15.2.3.2 Water

3 July 2012

During the analysis of samples collected during routine sampling on 3 July 2012, it was found that resource consent limits in regards to suspended solids were being slightly exceeded. The discharge occurred during extremely heavy rainfall and the receiving environment had an already high suspended solids load. No measurable suspended solids increase was found in the receiving waters.

Resource consent limits in regards to BOD were also exceeded on 3 July 2012. Tegel is undertaking investigations to find the cause of the slight elevation.

An inspection was undertaken on 26 July 2012, as a follow-up to the higher than consented levels of BOD and suspended solids recorded in samples collected on 3 July 2012. A meeting was held on site with Tegel staff. Incident logs that were examined offered no clues as to what might have caused the increased levels. On the day sampling was undertaken an increased number of trucks entering and exiting the site were recorded due to the unloading of a shipment of grain, however there was no record of any grain spills during this period. Further investigations were being conducted in house as to the cause of the incident.

In addition, during the sampling survey undertaken on 3 July 2012 a further sample was collected from an overland flow in the gutter on the northern side of the western driveway. This sample was collected as there was a sheen observed on a discharge that was flowing from the site entrance (Photo 6) into a roadside drain that joins the reticulated stormwater network that flows to the NPDC ponds before entering the Mangati Stream. The sample was analysed for oil and grease only, and returned a result of 6.3 g/m^3 , which is well below the component concentration limit given in the consent for this parameter.



Photo 6 Tegel feed mill, sheen on overland flow discharge 3 July 2012

There was also a non-compliance with respect to the reporting requirement contained in special condition 6 of consent 2335-4

15.2.3.3 Reporting

During the processing of the stormwater consent renewal application, further information requested to support the renewal (that was initially requested on 28 May 2012) was not addressed in its entirety. The main issue surrounded contingency measures for the large unbunded fibreglass waste water tank close to the site boundary. After lengthy investigations Tegel decided that getting a trade waste connection and removing the trade waste tank was the best practicable option. However the design, consenting and implementation of this would take some time to complete. Rather than delaying the processing of the consent any further, it was agreed that a consent would be issued that contained specific requirements and deadlines in regard of diverting the waste water flows directly to trade waste, a staged reduction in the BOD limit, and for Tegel to produce a plan that ensures monitoring, identification and resolution of issues such that it can be demonstrated that they are using the best practicable option to achieve as high a standard as is practically achievable for the BOD of the discharge.

The performance based improvement plan was due by 1 April 2014. An email was received on 31 March 2014 outlining that Tegel had obtained building consent for the trade waste connection, but were awaiting confirmation of the trade waste consenting requirements from NPDC. As the design of any treatment, and the connection, would depend on their requirements, Tegel advised that they were therefore not yet in a position to provide the programme. Tegel apologised for the

delay in providing the plan and advised that they would be able to submit the plan once this element had been resolved. As this plan had still not been received by the end of the period under review, an abatement notice was issued requiring provision of the plan by 31 July 2014. The abatement notice was complied with.

15.3 Discussion

15.3.1 Discussion of site performance

During the years under review, air discharges from the site were found to be well managed.

At inspection it was found that activities occurring in the stormwater catchment were well managed.

Chemical monitoring found that, although the biochemical oxygen demand and suspended solids limits were breached on one occasion resulting in the logging of an unauthorised incident, the unionised ammonia, pH and oil & grease limits on the consent were met consistently.

In terms of administrative compliance with the stormwater consent, there was one non-compliance related to the provision of a performance based improvement plan. This was due by 1 April 2014, and although Tegel advised that there would be a delay in providing this report, it had still not been submitted by the end of the monitoring period. This was resolved after and abatement notice was issued in July 2014, which Tegel complied with.

15.3.2 Environmental effects of exercise of consents

During the years under review there were no significant adverse environmental effects attributable to the exercise of the Tegel's stormwater or air discharge consents for activities at their feed mill site.

Although there was one exceedance of the BOD and suspended solids limits on the consent, under the particular circumstances prevailing at the time of the sampling survey, the level of contaminants had, for the most part, been assimilated within the reticulated stormwater network through dilution by stormwater from the other sites draining into the system, and would be further treated in the NPDC ponds. It is noted that there was a direct discharge occurring to the stream via the bypass channel around pond 4 (TRC site code MGT000503), but at the time of sampling the BOD and suspended solids in this discharge were only $<0.5 \text{ g/m}^3$ and 33 g/m^3 respectively.

Atmospheric particulate matter can arise from a number of sources, both natural and from human activity, for example vegetation pollens, smoke and ash, sea spray, dust from soils and paved surfaces, and manufacturing processes. While extremely fine particles may remain floating in the atmosphere for weeks or months, coarser dusts may settle out within timeframes ranging from a few seconds to minutes.

The environmental effects of dusts include loss of visibility, loss of the amenity and aesthetic values of a 'clear sky', irritation to breathing, and soiling of surfaces. It has

been found that background rates of dust deposition in rural areas of New Zealand are typically 0.1-1.5 g/m²/30 days, while in urban areas rates are generally higher, in the range of 0.6-3.0 g/m²/30 days. From experience, rates above 3-4 g/m²/30 days tend to lead to complaints by neighbours over the objectionable or offensive nature of dust emissions from particular sources.

Deposition gauging was conducted for the third time during the 2012-2013 monitoring year around the Tegel feed mill site.

The results from this gauging indicated that the particulate deposition occurring in the vicinity of the site was less than the maximum permitted by Tegel's consent.

Deposition gauging is programmed to be carried out every three years and these findings support this being an acceptable monitoring interval. The next deposition gauge survey is due in the 2015-2016 monitoring year.

15.3.3 Evaluation of performance

A tabular summary of Tegel's compliance record for the years under review is set out in Table 45, Table 46 and Table 47.

Table 45 Summary of performance for Consent 2335-3, Tegel's feed mill stormwater discharge to NPDC drainage system 1 July 2012 to 11 February 2014

Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Adoption of best practicable option to minimise effects on the environment	Inspection and discussion with consent holder	No
2. Limits stormwater catchment area	Inspection	Yes
3. All stormwater to be treated in accordance with consent conditions	Inspection and discussion with consent holder	BOD and SS limit exceeded in 1 of 4 samples
4. Above ground hazardous substance storage to be bunded and not to drain directly to stormwater catchment	Inspection and discussion with consent holder	Yes, with exception of trade waste tank
5. Limits on chemical composition of discharge	Not assessed during time this consent in force	1 BOD and SS exceedance
6. Maintenance of a contingency plan for action to be taken to prevent spillage	Review of documents provided. Plan on file produced December 2012 (combined contingency/operation and management plan)	Yes
7. Maintenance of and adherence to operation and management plan. Due 30 June 2009	Review of documents provided. Plan on file produced December 2012 (combined contingency/operation and management plan)	Yes
8. Preparation of monitoring programme	Review of documents provided.	Yes

Condition requirement	Means of monitoring during period under review	Compliance achieved?
9. Written notification required regarding changes to activities at the site	Inspection and discussion with consent holder. No changes occurred which may alter nature of discharge	N/A
10. Optional review provision re environmental effects and notifications of changes (S.C.9)	Consent expires June 2012. No further opportunities for review	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		High
Overall assessment of administrative performance in respect of this consent		Good

N/A = not applicable or not assessed

Table 46 Summary of performance for Consent 2335-4, Tegel's feed mill stormwater discharge to NPDC drainage system 11 February 2014 to 30 June 2014

Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Adoption of best practicable option to minimise effects on the environment, particularly with respect to BOD	Inspection and discussion with consent holder	Improvements identified, but full timetable for implementation timeframes not provided
2. Limits stormwater catchment area	Inspection	Yes
3. Limits on chemical composition of discharge	Not assessed during time this consent in force	Yes
4. Discharge cannot cause specified adverse effects beyond mixing zone	Receiving water sampling	Yes
5. Waste water tank to be replaced with trade waste connection by 30 November 2014	Inspection, work not due to be completed yet	N/A
6. Provision of performance based improvement programme by 1 April 2014	Review of documents provided. Advised it would be delayed, but still not provided by end of monitoring period	No
7. Performance report to be provided by 1 July each year	Inspection and discussion with consent holder	Plan not developed prior to 1 June 2014
8. Maintenance of a contingency plan for action to be taken to prevent spillage	Review of documents provided. Plan on file produced December 2012 (combined contingency/operation and management plan)	Yes
9. Maintenance of and adherence to operation and management plan. Due 30 June 2009.	Review of documents provided. Plan on file produced December 2012 (combined contingency/operation and management plan)	Yes

Condition requirement	Means of monitoring during period under review	Compliance achieved?
10. Written notification required regarding changes to activities at the site	Inspection and discussion with consent holder. No changes occurred which may alter nature of discharge	N/A
11. Optional review provision re environmental effects and notifications of changes (S.C.9)	Next opportunity for review June 2017	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		High
Overall assessment of administrative performance in respect of this consent		Improvement required

Table 47 Summary of performance for Consent 4038-6, Tegel's feed mill discharge to air

Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Adoption of best practicable option to prevent or minimise effects on the environment	Inspection and discussion with consent holder. Investigation of complaint	Yes
2. No alterations that might change the nature/quantity of discharge without prior consultation with Council	Inspection and discussion with consent holder. No changes occurred which may alter nature of discharge	Yes
3. Maintenance of plan to prevent accumulation of dust in stormwater catchment	Inspection and discussion with consent holder	Yes
4. Limit on point source particulate emissions (125 mg/m ³)	Discharge monitoring at inspection	Yes
5. Limit on dust deposition beyond boundary (4.0 mg/m ² /day)	Deposition gauging	N/A
6. Limit on boundary suspended particulates (3 mg/m ³)	Ambient monitoring	Yes
7. Keep, and make available, records of all dust and smoke incidents	Inspection of records and discussion with consent holder	Yes
8. Clearance of accumulated dust	Inspection	Yes
9. Optional review provision re environmental effects	Consent expires June 2014. No further review opportunities	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		High
Overall assessment of administrative performance in respect of this consent		High

N/A = not applicable or not assessed

During the year, the Tegel Foods Limited (feed mill) demonstrated a high level of environmental performance but an improvement was required in their level of administrative performance and compliance with the resource consents as defined in Section 1.1.4.

During the period under review there was one non-compliance with this consent holder's stormwater consent, however, there were no resultant adverse effects. A

performance based improvement plan due 1 April 2014 was not provided during the period under review and an abatement notice was issued early in the 2014-2015 year, which was complied with.

15.3.4 Recommendations from the 2011-2012 Annual Report

In the 2011-2012 Annual Report, it was recommended:

THAT monitoring programmed for consented activities of Tegel Foods Limited (feed mill) in the 2012-2013 year continues at the level programmed for 2011-2012, but with the three yearly deposition gauging survey being conducted as scheduled.

These recommendations were implemented during the 2012-2014 monitoring period.

15.3.5 Alterations to monitoring programmes for 2014-2015

In designing and implementing the monitoring programmes for air/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 RMA in terms of monitoring emissions/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 emitting to the atmosphere/discharging to the environment.

It is proposed that for 2014-2015 the programme remains unchanged. A recommendation to this effect is attached to this report.

15.4 Recommendation

THAT monitoring programmed for consented activities of Tegel Foods Limited (feed mill) in the 2014-2015 year continues at the level programmed for 2012-2014.

16. Tegel Foods Limited – poultry processing plant

16.1 Introduction

16.1.1 Process description

Tegel Foods Limited (Tegel) operates a poultry processing plant on Paraitē Road in the south-east corner of the Bell Block industrial area. The plant processes, on average, 65,000 birds per day, but has the capacity to process 85,000 per day.

Poultry are delivered in plastic crates to the hanging area where they are hung on a chain line, in a semi-enclosed area under a roof with two exhaust fans discharging to the atmosphere. Slaughter is accomplished via stunning and bleeding, then the carcasses are scalded and plucked. The chickens then enter a primary processing stage where they are prepared to a 'dressed' stage prior to secondary processing or alternatively chilling and dispatch as whole chickens. The refrigeration system in place utilises ammonia as a coolant replacing a carbon dioxide based system. Primary and secondary processed chickens are chilled and frozen on site before being moved off site for storage.

All materials to be rendered, including feathers, are transferred by screw conveyer into trucks and removed off site to Taranaki By-Products Limited for further processing. Blood is pumped to a holding tank prior to discharge.

Wastewaters such as cooling water, blowdown, and process water, along with truckwash water are directed to trade waste sewer. Modifications have been made to divert runoff from the live bird reception area and yard to the trade waste system also. Areas with potential for spillage of chemicals have been bunded. Spill containment equipment is on site.

Stormwater from a developed area of 1.7 ha discharges to the Mangati catchment at two points. Drainage from most of the site flows to a small wetland on the southern side of the plant that feeds into the Mangati Stream. Drainage from the relatively small remainder, including the car park and part of the load-out area in the north western area of the site, flows into the New Plymouth District Council (NPDC) De Havilland Drive stormwater drain.

Major construction activities occurred at the site during the 2002-2003 monitoring period. In large, upgrades have been driven by the relocation of processing activities from the Te Horo region to the New Plymouth site. New structures included a new crate wash, concreting in the area around the ammonia plant, and 5,000 m² of roofing, which covers the bird reception area, renderable waste storage area, and areas that flowed to both the stormwater and trade waste catchments. A new chlorinated water tank has been installed within a bunded area that drains to trade waste.

Additional expansions at the site have also included a new cool store and load out area, and a sausage plant.

Contingency plans in place for the site included a contingency plan in case of spillage, a contingency plan for burial to land, and a contingency plan for discharge to air.

16.1.2 Water abstraction permit

Section 14 of the RMA stipulates that no person may take, use, dam or divert any water, unless the activity is expressly allowed for by a resource consent or a rule in a regional plan, or it falls within some particular categories set out in Section 14.

Tegel holds water permit **6357** to cover the take and use of groundwater from a bore for food processing and washdown purposes. This permit was issued by the Council on 20 May 2005 under Section 87(d) of the RMA. It is due to expire on 1 June 2038.

The consent conditions limit the daily abstraction volume, rate of abstraction, and water level in the bore, set out monitoring, record keeping and reporting requirements, and provide for lapsing and review of the consent.

Condition 7 specified a lapse date of 20 May 2010. An application to extend the lapse date was received on 29 March 2010. A varied consent, with a new lapse date of 20 May 2015, was issued on 31 March 2010. This was the only change made to the conditions of the consent.

The permit is attached to this report in Appendix I.

16.1.3 Water discharge permit

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.

Tegel held water discharge permit **3470-1** to cover the discharge of up to 238 L/s of stormwater from a poultry processing plant site into the Mangati Stream and/or an unnamed tributary of the Mangati Stream. This permit was originally issued to Tegel Poultry Company Limited on 18 April 1990, as a water right pursuant to section 21(3) of the Water and Soil Conservation Act 1967, for a lesser volume. It was transferred to GFW Agri Products Limited on 16 April 1992, which then changed its name to Tegel Foods Limited on 1 October 1992. This permit expired on 1 June 1996. Permit 3470-2, with the same purpose, was issued by the Council on 12 June 1996 under Section 87(e) of the RMA. It expired on 1 June 2008.

During the renewal process it was agreed that two separate permits would be issued. One would cover the discharge from the southern area of the site to the Mangati Stream via the wetland treatment system, and the other one to cover the northern area of the site, which discharges to the Mangati Stream at De Havilland Drive via the NPDC stormwater drainage system.

The purpose of water discharge permit **3470-3** was changed and this permit now covers the discharge of stormwater from a poultry processing plant site to the NPDC drainage network. This permit was issued by the Council on 30 March 2009 under Section 87(e) of the RMA. It is due to expire on 1 June 2012.

The Mangati Stream is a waterbody identified as being in need of improvement in the Regional Freshwater Plan for Taranaki (RFWP). One of the issues identified is the biochemical oxygen demand (BOD) of the stream. Consent 3470-2 did not limit the

BOD of the discharge, and when the introduction of a limit on consent 3470-3 was considered, historical monitoring indicated that the discharge from the site was not of the desired quality. It was therefore recommended that a short term consent be issued, which had a higher than desirable limit, but strong focus on management practices, monitoring and identification of opportunities for improvement. A clear message was presented to the Company that at the time of the next renewal, this limit would be reduced.

An application to renew the consent was received on 29 February 2012, which was put on hold under Section 37A with the applicant's agreement. The application was put on hold on 28 May 2012 under section 92 of the RMA whilst awaiting further information. The further information requested was:

- A plan showing the trade waste and stormwater pipes for the whole of the site. The applicant was advised that the plan should also include an outline of the activities occurring in each area, the potential contaminants arising from those activities, and any stormwater ingress points.
- An Engineer's assessment of the current stormwater drain layout. This shall assess the performance characteristics of the stormwater drainage from the site, and include such detail as:
 - a. Confirmation of the flow paths for the stormwater from the various stormwater ingress points, to the outlet points, under the different potential rainfall intensities.
 - b. The potential for deposition of solids within the stormwater system given the competing flow paths.
 - c. The effect this may have on the preferential stormwater flow paths and stormwater quality.
- Clarification as to whether it was Tegel's intention to provide drain filters in any of the stormwater or trade waste drains. If it is Tegel's intention to provide them, please advise where they would be located.
- An updated Stormwater Management Plan detailing the monitoring and maintenance of the stormwater drains.
- Condition 7a of consent 3470-3 required that a monitoring programme, consisting of no less than 15 samples being taken, with the results being provided to the Council. Only 11 results of these samples had been provided to the Council at the time of application. Tegel was asked to provide the remaining monitoring results, detailing which sampling point these samples have been taken from.

On 18 June 2012 Tegel requested that the timeframe for the provision of the information be extended. This was extended to 31 July 2012.

The application was received on 29 February 2012, and therefore under Section 124 of the RMA, the Council exercised its discretion and has allowed Tegel to continue to operate under the conditions of the expired consent until a decision is made on the renewal application.

A number of further extensions to the timeframe for providing the further information were granted, as although the majority of the further information requested was provided, there were issues with the provision of an accurate stormwater network analysis, which would be required in order for Tegel to provide a satisfactory stormwater management plan.

At the time of determining the consent the applicant had still not provided this information, however, the Council decided that this information was not necessary for the application to proceed. As it was unclear which specific areas of the site discharge via the wetland into the Mangati Stream (consent 7389-1) and which discharge to the NPDC drainage network as part of consent 3470 this was addressed through the requirements of the special conditions of the consent.

Water discharge permit **3470-4** to cover the discharge of stormwater from a poultry processing plant site to the NPDC drainage network. This permit was issued by the Council on 23 December 2013 under Section 87(e) of the RMA. It is due to expire on 1 June 2026.

A summary of the conditions of expired permit 3470-3 and the current permit 3470-4 are both given below.

3470-3 (1 July 2012 to 22 December 2013)

Condition 1 requires the adoption of the best practicable option.

Because stormwater generation is dependent on the rainfall event and is not always practicable for the consent holder to control, rather than limiting the discharge rate, condition 2 limits the stormwater catchment area to 1.4 ha.

Condition 3 requires that all hazardous substances stored in the stormwater catchment are banded.

Condition 4 limits the constituent concentrations of the discharge.

Conditions 5, 6, and 7 relate to the provision of contingency and stormwater management plans, and the monitoring programme that is going to be put in place to ensure that the discharge can be better characterised, and areas for improvement can be identified prior to the expiry of this consent. The purpose of the plans is:

- in the case of the management plan, to ensure that the consent holder examines the activities taking place on site, and puts appropriate controls in place to minimise the potential for stormwater contamination to occur due to routine activities, and
- in the case of the contingency plan to ensure that in the event of an unforeseen situation, the chances of a spillage resulting in an unauthorised discharge leaving the site are minimised.

For the consent holder these are also a means of documenting the way in which the “best practicable option” (as required by condition 1) has been implemented. To ensure that the potential for environmental effects from the exercise of the consent is consistent with the information provided to the reporting officer at the time the consent conditions were drafted, condition 8 requires written notification to the

Council prior to changes at the site that may affect the nature of the discharge, and condition 9 provides opportunities for review of the consent.

3470-4 (23 December 2013 to date)

Condition 1 requires the adoption of the best practicable option, and specifies that this requirement incorporates ensuring that the BOD of the discharge is as low as practically achievable.

Again, for the reasoning stated above, condition 2 limits the stormwater catchment area to 1.4 ha.

Condition 3 limits the constituent concentrations of the discharge, and condition 4 prohibits specific effects in the Mangati Stream beyond the mixing zone of 20 metres.

Condition 5 required the provision of an accurate stormwater network analysis to be provided before 28 February 2014, to allow the stormwater flow paths to be determined and management practices to be put in place to ensure that the quality of the stormwater discharging from the site, without the benefit of treatment through the sites wetland, can be managed effectively.

Conditions 6 and 7 relate to the provision of contingency and stormwater management plans, with the purpose of the plans being outlined above (ref consent 3470-3).

Again, to ensure that the potential for environmental effects from the exercise of the consent was consistent with the information provided to the reporting officer at the time the consent conditions were drafted, condition 8 requires written notification to Council prior to changes at the site that may affect the nature of the discharge, and condition 9 provides opportunities for review of the consent.

Tegel also holds water discharge permit **7389-1** to cover the discharge stormwater from a poultry processing plant via a wetland into the Mangati Stream. This permit was issued by the Council on 30 March 2009 under Section 87(e) of the Resource Management Act. It is due to expire on 1 June 2026.

Condition 1 requires the adoption of the best practicable option.

Condition 2 limits the stormwater catchment area to 2.6 ha.

Conditions 3 and 4 specify that the stormwater must be treated to ensure compliance with the conditions of the consent and require that all hazardous substances stored in the stormwater catchment are banded.

Condition 4 limits the constituent concentrations of the discharge.

Conditions 6 and 7 prohibit specified effects in the Mangati Stream.

Conditions 8 and 9 ensure that the wetland treatment system is managed and maintained in such a way as to achieve continued effective treatment performance, and to enhance the riparian margins of the wetland and the Mangati Stream along the site boundary.

Conditions 10 and 11 relate to the provision of contingency and stormwater management plans aimed at minimising the concentrations of contaminants in the discharge.

Condition 12 requires written notification to Council prior to changes at the site which may affect the nature of the discharge, and condition 13 provides opportunities for review of the consent.

As per the recommendation in the 2009-2011 Biennial Report, Tegel were notified of the intention to review the conditions of this consent on 20 June 2012. The reviewed consent was granted on 30 July 2012, with the only amendment being the inclusion of contaminant concentration limits for pH, oil and grease, and suspended solids on the wetland discharge to the stream in special condition 5.

These permits are attached to this report in Appendix I.

16.1.4 Air discharge permit

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

Tegel held air discharge permit **4026-2** to cover the discharge of emissions into the air from the processing of animal matter and associated processes. This permit was issued by the Council on 6 December 1995 under Section 87(e) of the RMA. Variations were granted on 10 February 1997 and 10 November 1999, and it expired on 1 June 2014. A renewed consent, 4026-3 (with the same purpose), was issued by the Council on 16 June 2014. It is due to expire on 1 June 2032.

As the application to renew this consent was received on 27 February 2014, under Section 124 of the RMA, the Council exercised its discretion and allowed Tegel to continue to operate under the conditions of the expired consent until a decision was made on the renewal application.

4026-2 (1 July 2012 to 15 June 2014)

The seventeen special conditions of the consent are of a comprehensive nature and address all aspects of the poultry processing plants operation that may affect emissions to air, including the management of the wastewater holding pond (conditions 5 to 8), storage of offal and blood (conditions 9 to 12), contingency planning (conditions 13, 15 and 16), and provision for review (condition 17).

4026-2 (16 June 2014 to date)

The seven conditions on the renewed consent are much less prescriptive than on the expired consent, with many of the specific requirements around management of the waste water pond and storage of offal and blood contained in the former conditions now expected to be covered in Tegel's 'Operation and Maintenance plan' that is to be certified by the Council.

The remaining special conditions;

- require the 'best practicable option' to be adopted to prevent or minimise effects, and prohibit objectionable or offensive off site odours (conditions 1 and 3),
- require approval from the Council prior to making any changes that significantly alter the emissions from the site (condition 2),
- prohibit blood and offal from being discharged to the waste water pond (condition 4),
- requires maintenance of a contingency plan (condition 5), and
- contains provisions for review of the conditions of the consent.

The permits are attached to this report in Appendix I.

16.1.5 Discharges of wastes to land

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.

Tegel held discharge permit **5494** to cover the discharge of poultry processing wastes by burial into land in the vicinity of the Mangati Stream in emergency circumstances only. This permit was issued by the Council on 20 December 1999 under Section 87(e) of the RMA. The consent was varied on 27 March 2002 to allow burial of wastes on the true-right of the wetland area, due to the presence of a water bore near the former burial area. It expired on 1 June 2014.

An application to renew this consent was received on 27 February 2014, and therefore under Section 124 of the RMA, the Council exercised its discretion and allowed Tegel to continue to operate under the conditions of the expired consent until a decision was made on the renewal application.

It was requested that Tegel provide an updated contingency plan for this activity in April 2014, as the previous plan on file was dated August 2003. This was provided after the end of the period under review.

The 17 special conditions of the consent require Tegel to gain the approval of the Council prior to each occasion on which they need to exercise the consent, and to discharge wastes to land only in accordance with information provided in support of the consent application. The burial trenches are required to be designed, constructed and managed in such a way as that the base of the trenches are above groundwater level. The exercise of the consent shall not lead to contaminants entering the surface water body, or lead to adverse effects on the groundwater in the vicinity of the discharge. The consent holder is also required to keep records that are to be made available to the Council, of the amounts, types and dates of disposal of waste.

The permit is attached to this report in Appendix I.

16.2 Results

16.2.1 Water

16.2.1.1 Reporting on exercise of groundwater abstraction consent

It was confirmed by Tegel that the groundwater bore had been capped and that abstraction consent 6357 was not exercised during the 2012-2014 monitoring period.

16.2.1.2 Inspections

Inspections of the site concentrated on the loading areas, particularly the live bird reception area, the truckwash area, the wastewater treatment plant, chemical storage, the dispatch area, and the drainage systems for trade waste and stormwater.

Inspections occurred on 2 July 2012, 18 January 2013, 10 June 2013, 26 June 2013, 27 August 2013, 2 December 2013, and 21 March 2014.

The final scheduled inspection for period under review was undertaken on 1 July 2014. The inspection found the site to be compliant with consent conditions, and the inspection findings will be discussed in the report covering the 2014-2015 monitoring year.

2 July 2012

It was found that the traffic areas were clean and free of potential contaminants. No spills were found. It was reported that the sump in the battery charging shed contained stormwater and needed to be pumped out. The diesel tank bund was secure, but contained storm water that had a visible sheen present. The wetland area appeared to be healthy, and it was noted that the discharge was visually clear and odour free. The inspecting officer was informed that plans were being made to install a new dissolved air floatation (DAF) system to improve the discharge quality. The new system was to be installed at the rear of the loading dock on what was, at that time, vacant land. The Council was also advised that drain filters were to be installed in the stormwater drains around the site. Tegel advised that a new drain and discharge pipe had been installed in the staff car park, with the discharge point about 15 m from the discharge point to the wetland. Tegel was asked to monitor this discharge during rain events to ensure suspended solids, silt etc. were eliminated prior to discharge (to ensure on-going compliance with Rule 23 of the RFWP for this car park area)

18 January 2013

It was found that all traffic areas were spill free and clear of potential contaminants. All stormwater drains and their catchment areas appeared to be clean. It was noted that the fuel tank bund contained some stormwater, but this was sheen free. It was reported that the wetland appeared to be healthy. The discharge was visually clear, and very little odour was noted. It was observed that the level in the wastewater holding pond was low at the time of the inspection.

10 June 2013

It was reported that the inspecting officer signed in at the office and completed an induction prior to undertaking the inspection with Tegel's New Plymouth Regional EHS Coordinator. Spill kits were observed around the site and the site appeared

clean and tidy throughout. It was reported that the wetland area looked good, however, concerns were raised over metal pipes that were near the waterbody and they appeared to have been there for some time. Tegel was instructed that the removal of the metal pipes from the bank near the wetland was to be undertaken.

26 June 2013

It was found that there was a lot of construction under way on the site, and that there were a lot of freezer panels stacked up. It was found that the stormwater drain was visually clear at the boundary, and it was considered that the site was being managed in a manner such that the conditions of the consent were being complied with. The metal pipes were not reported as being present at this inspection.

27 August 2013

The weather conditions at the time of this inspection were intermittent showers, with a slight breeze. It was found that all bunding of chemicals appeared to be secure. The wastewater ponds were approximately one third full. The burial area was checked and appeared to be satisfactory. It was observed that the soil had not been recently disturbed, and no slumping was visible. The wetland was visually checked and appeared to be healthy. The inspecting officer was informed that more planting of trees was to take place soon. The discharge from the wetland into the Mangati looked good, with no visible change in water clarity of the Mangati Stream downstream of the discharge point. It was noted that the drain screen was working well, however, the screen could be moved slightly to ensure that all debris was being screened out. An objectionable odour was detected at a stormwater drain near an area where the poultry crates were stored. A chicken's foot and feathers were observed near the drain. The New Plymouth Regional EHS Coordinator advised that the area where the poultry was received was washed down with water, and that the wastewater is directed to sewer/trade waste. At the time of inspection it was found that some of the washdown water appeared to be escaping the area, and flowing into the stormwater drain. It was reported that action was taken at the time of inspection to investigate the odour and clean out the drain. It was noted that the live bird delivery and storage area had been identified as a potential source of contamination in Tegel's Management Plan. As such, it was the inspecting officer's view that the daily housekeeping inspections of the area, as stated in the plan, should have identified this problem. It was suggested that works be undertaken to ensure that all washdown water is directed to trade waste. It was also observed that washdown water was escaping from a building on the western side of the site. Bunding had been installed, however, the washdown water was still entering a stormwater drain. It was reported that Tegel staff were aware of this problem, and that works would begin in the near future to remedy the problem. Tegel was informed that no samples were taken at the time of inspection.

At the end of the inspection Tegel was informed that it was the Council's opinion that the best practicable option to prevent any adverse effects on the environment is not being exercised when washing down the live bird delivery and storage area. For this reason consent compliance was not achieved during this inspection. Tegel was instructed to ensure that works were undertaken to ensure that contaminants from this area do not enter the stormwater drains.

This was logged on the Council's Incidents Register, with the remedial actions undertaken therefore discussed in section 16.2.4.1.

2 December 2013

The site was inspected in fine weather conditions. It was found that, in general the site was tidy and clean. There were good processes in place regarding the bunding and storage of chemicals. The wastewater pond appeared to be approximately half full. The burial area looked satisfactory, with no slumping evident. It was considered that the wetland was working well, with a clear discharge from the exit point into the Mangati Stream. It was observed that washdown water from inside a building on the western side of the site was still discharging nutrient rich wastewater. This discharge was entering a stormwater drain at the time of inspection. HSE staff advised that since the last inspection, attempts had been made to stop the discharge. Photographs were taken at the time of inspection (Photo 7). Tegel was instructed that this discharge must stop, and it was likely that an abatement notice would be issued requiring further works to be undertaken. This matter was logged as a further unauthorised discharge on the Council's Incidents Register and is discussed further in section 16.2.4.1. It was noted that the issue raised during the last inspection, concerning waste material entering as stormwater drain near the crate storage area, had been addressed.



Photo 7 Tegel poultry processing plant leak from free flow building, 2 December 2013

21 March 2014

An inspection of the site was carried out to check that consent conditions were being complied with. The weather was fine at the time of inspection, with little to no wind present. The inspection was carried out with Tegel's Central EHS Manager. The site was found to be tidy at the time of inspection. The Central EHS Manager was advised of the high conductivity reading (467 ms/L) in a sample taken on 6 November 2013. Tegel was informed that no further action would be taken with regards to this as there had been no breach of consent. It was observed that the burial

area looked good. The wastewater pond appeared to be in a satisfactory condition. It was noted that the filter at the entrance to the wetland was full and needed to be cleaned of debris. It was found that the discharge from the wetland was clear of visible contaminants. It was found that guttering was being used to capture wastewater discharging from a building on the western side of the site and was directing it to a wastewater drain. No discharges were observed on to the ground at the time of inspection.

16.2.1.3 Results of discharge monitoring

During the years under review the stormwater discharges from Tegel's poultry plant was monitored at a total of six points (sites 2, 27, 29, 41, 42, and 43).

Two points relate to discharges from the combined stormwater drain from their site to their wetland, one (site 27, TRC site code STW001053) at the stormwater drain outlet above the wetland, and one (site 2, TRC site code MGT000489) where the flow from their wetland enters the Mangati Stream. Site MGT000489 is the designated sampling point for the discharge in relation to assessing compliance with the component concentrations in the discharge. Site STW001053 is sampled in order to ensure that the contaminants present in the discharge will not result in significant adverse effects in the wetland, and to assess the performance of the wetland. The results from chemical monitoring of the discharge to the wetland and from the wetland itself are given in Table 48 and Table 49 respectively.

There are also four monitoring points that relate to the stormwater discharges from the northern area of the site to the Mangati Stream via the NPDC stormwater network that services De Havilland Drive. Monitoring site 29 (TRC site code STW001054) is at the piped stormwater outlet to the Mangati Stream at the De Havilland Drive road bridge on the true left bank of the stream. This site is influenced by discharges from several other sources.

The sample results are presented in Table 27 and discussed in section 10.2.1.2. High BOD's and material consistent in appearance to chicken fat have been observed at this sampling site in the past. Although Tegel was the most obvious potential source of these contaminants, monitoring had not been geared towards positively isolating the discharges from the poultry processing plant. During the renewal of consent 3470 in the 2008-2009 year it was identified that the poultry processing plant discharge via this point may not be of the desired quality, and it was therefore proposed that additional sampling sites be identified and monitored to assist Tegel in identifying and controlling contaminants in preparation for the anticipated renewal of the short term consent.

Three new monitoring sites were identified and have been sampled since the 2009-2011 years. Site 41 (TRC site code STW001130, site 42 (TRC site code STW001129) and site 42 (TRC site code STW001128) are stormwaters discharged from different sub-catchments within the Tegel poultry processing plant. This monitoring found that these discharges were not compliant with the stormwater permitted activity rule in the RFWP (Rule 23, see Appendix IV), and therefore is now covered by consent 3470. The results of the monitoring of these sites are presented in Table 50, Table 51, and Table 52 respectively.

Four samples were collected at site STW001053 during the monitoring period under review.

Consent 7389 – treated stormwater discharge via wetland

The discharge from the plant to the wetland was observed to already be within the consent limits given by consent 7389 for unionised ammonia and BOD on two of the four monitoring occasions. The unionised ammonia, BOD and COD results were similar to or below the historical medians only on two of the four monitoring occasions. The above median results for these parameters obtained on 3 July 2012 and 3 April 2013 are consistent with the findings from the 2006-2007 to the 2010-2011 years, which have indicated that there has been a continued deterioration in the stormwater quality that had been occurring at this site.

It is also noted that the highest BOD observed during the years under review was collected during a dry weather survey (3 April 2013). As the consent permits only stormwater discharges, this particular discharge was not covered by Tegel's resource consent. At the time of sampling it was reported that the discharge was a low flow discharge that was grey in colour and slightly turbid.

Table 48 Chemical monitoring results for Tegel's poultry processing plant lower stormwater discharge to Mangati Stream tributary (wetland) for 2012-2014 (site 27), with a summary of previous monitoring data. TRC site code STW001053

Date	BOD g/m ³	COD g/m ³	Condy mS/m	DRP g/m ³ -P	NH ₃ g/m ³ -N	NH ₄ g/m ³ -N	O&G g/m ³	pH pH	SS g/m ³	Temp °C	Turby NTU
Number	49	22	52	51	50	51	41	53	52	52	19
Minimum	<0.5	12	1.6	0.049	0.00015	0.109	<0.5	6.6	<2	10.1	3.1
Maximum	96	290	142	23.9	0.99937	5.3	68	9.9	400	27.2	140
Median	9.7	39	13.7	0.278	0.00629	0.753	1.0	7.4	33	14.6	33
03-Jul-12	29	160	24.4	0.450	0.01769	2.01	a	7.6	110	9.5	130
03-Sep-12	11	34	3.3	0.181	0.00323	0.372	a	7.5	68	12.6	62
11-Dec-12 ^b	-	-	-	-	-	-	-	-	-	-	-
03-Apr-13	32	92	16.6	1.30	0.02033	2.56	4.7	7.3	41	17.6	60
06-Nov-13	12	20	4.1	0.344	0.00318	0.767		7.1	51	15.0	59
26-Feb-14 ^b	-	-	-	-	-	-	-	-	-	-	-
24-Jun-14 ^b	-	-	-	-	-	-	-	-	-	-	-

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

Three samples were taken of the discharge from the wetland to the stream. This monitoring location is considered to be the discharge point when assessing compliance with the component concentrations given on the consent.

Table 49 Chemical monitoring results for stormwater discharge to Mangati Stream from wetland receiving stormwater from Tegel's poultry processing for 2012-2014 (site 2), with a summary of previous monitoring data. TRC site code MGT000489

Date	BOD g/m ³	BODCF g/m ³	Condy mS/m	DO	DRP g/m ³ -P	ECOL /100mL	ENT /100mL	FC /100mL	NH ₃ g/m ³ -N	NH ₄ g/m ³ -N	pH pH	SS g/m ³	Temp °C	Turby NTU
<i>Consent limits</i>	15	-	-	-	-	-	-	-	0.025	-	-	-	-	-
Number	68	3	70	64	68	34	37	36	67	68	69	66	69	27
Minimum	<0.5	0.6	7.4	0.4	<0.003	170	14	170	0.00002	0.018	6.2	2	9.6	1.2
Maximum	73	1.0	39.4	8.7	0.214	71000	200000	73000	0.00725	5.44	7.0	260	20.6	120
Median	2.0	0.8	17.8	5.1	0.012	1100	670	1400	0.00036	0.244	6.6	14	15.0	12
03-Jul-12	1.1	-	16.4	7.8	0.016	-	-	-	0.00005	0.038	6.7	<2	10.7	1.2
03-Sep-12	6.6	-	8.1	8.4	0.057	-	-	-	0.00064	0.366	6.8	57	12.6	57
<i>Consent limits</i>	15	-	-	-	-	-	-	-	0.025	-	6-9	100	-	-
11-Dec-12	3.1	<0.5	16.9	3.4	0.010	1800	1400	1800	0.00007	0.036	6.8	26	15.0	28
03-Apr-13	0.9	<0.5	17.0	3.9	0.143	-	-	-	0.00068	0.282	6.8	16	17.0	8.3
06-Nov-13	6.8	-	10.8	5.5	0.053	-	-	-	0.00058	0.588	6.5	15	14.3	16
26-Feb-14	2.0	1.0	20.1	4.9	0.032	-	120	350	0.00078	0.483	6.7	26	14.7	24
24-Jun-14	2.3	<0.5	16.9	3.1	0.018	1400	300	1400	0.00066	0.583	6.6	5	13.1	5.8

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

Consent 7389, specifically covering only the discharge to the Mangati Stream via the wetland, was issued on 30 March 2009. Samples collected prior to this date (i.e. the majority of the historical data) were compared against the conditions of consent 3470, which covered the discharges from the site prior to the issuing of consent 7389. The pH range, suspended solids and oil and grease limits included in consent 3470 were not included in consent 7389, but were reinstated in the reviewed consent that was issued on 30 July 2012.

The discharge was not analysed for oil and grease as there was no hydrocarbon sheen or odour detected in the discharge sample during any of the surveys.

The BOD of three of the seven samples collected during the years under review exceeded the median calculated from previous results for this monitoring site, although only two were marginally above the concentration that would be allowed for a permitted stormwater discharge under Rule 23 of the RFWP. It is noted that all the BOD concentrations were well below the consent limit.

The ammoniacal nitrogen content of five of the seven discharge samples was also above the historical median value for this monitoring site. However, the unionised ammonia concentration of the discharge was well below that permitted by the consent on all monitoring occasions during the period under review.

A comparison between the median values for the discharge from the plant to wetland and the discharge from wetland to stream show the benefits of the wetland treatment system for this type of discharge. The median values show that the solids content and organic strength of the stormwater are significantly reduced by the

wetland. However, it is noted that the dissolved oxygen content of the discharge is frequently quite low.

Consent 4370 – untreated stormwater discharges via De Havilland Drive

Site 41 (TRC site code STW001130) collects stormwater predominantly from the paved areas around the deboning building in the north western corner of the site. However, the stormwater drainage plan shows that there are connections in the stormwater drainage pipes that, under heavy rainfall conditions, may allow stormwater from the central northern and southern parts of the site to discharge via this monitoring location, through a connection underneath the nurses clinic. This was the matter to be resolved by the stormwater network analysis asked for in the further information request, and later included as a condition of the renewed consent.

The stormwater samples collected from this monitoring location complied with the unionised ammonia, oil and grease and pH limits on all monitoring occasions. The BOD limit and the suspended solids limit were each exceeded in one of the three samples collected. On 3 July 2012, the BOD concentration at the point of discharge to the stream (STW001054, Table 27) was higher than desirable at 11 g/m³. However, due to the conditions prevailing at the time of the survey, the increase in BOD of the stream was only 1.0 g/m³. On 6 November 2013, due to dilution with other stormwaters, the suspended solids concentration of the combined stormwater flow at the point of discharge to the stream (STW001054) was at an acceptable level of 34 g/m³.

It is noted that the BOD and ammoniacal nitrogen on 3 July 2012 were both new maximums for this monitoring location when compared to the relatively small historical data set.

Table 50 Chemical monitoring results for Tegel's poultry processing plant stormwater discharge for 2012-2014 (site 41), TRC site code STW001130

Date	BOD g/m ³	Condy mS/m	DRP g/m ³ -P	NH ₃ g/m ³ -N	NH ₄ g/m ³ -N	O & G g/m ³	pH	SS g/m ³	Temp °C	Turby NTU
<i>Consent Limit</i>	25	-	-	0.025	-	15	6-9	100	-	-
Number	6	6	4	6	6	3	6	6	6	6
Minimum	7.6	3.1	0.218	0.00048	0.109	0.6	6.9	8	9.7	3.6
Maximum	25	7.5	0.365	0.00217	0.459	2.3	7.4	470	19.9	180
Median	19	4.3	0.332	0.00108	0.179	0.8	7.2	92	15.3	43
03-Jul-12	28	14.2	0.600	0.00382	0.964	<0.5	7.3	58	8.2	48
03-Sep-12	5.1	2.6	0.185	0.00048	0.106	a	7.2	6	13.1	3.7
11-Dec-12 ^b	-	-	-	-	-	-	-	-	-	-
03-Apr-13 ^b	-	-	-	-	-	-	-	-	-	-
06-Nov-13	7.1	3.1	0.170	0.00013	0.035	-	7.0	220	16.9	140
<i>Consent Limit</i>	15	-	-	-	-	15	6-9	100	-	-
26-Feb-14 ^b	-	-	-	-	-	-	-	-	-	-
24-Jun-14 ^b	-	-	-	-	-	-	-	-	-	-

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

Stormwater in the northern area of the site, west of the cool stores discharges via site 42 (TRC site code STW001129). However, the stormwater drainage plan shows that

there are connections in the stormwater drainage pipes that, under heavy rainfall conditions, may allow stormwater from the north western and southern parts of the site to discharge through this monitoring location.

Table 51 Chemical monitoring results for Tegel's poultry processing plant stormwater discharge for 2012-2014 (site 42), TRC site code STW001129

Date	BOD g/m ³	Condy mS/m	DRP g/m ³ -P	NH ₃ g/m ³ -N	NH ₄ g/m ³ -N	O & G g/m ³	pH	SS g/m ³	Temp °C	Turby NTU
Consent Limit	25	-	-	0.025	-	15	6-9	100	-	-
Number	6	6	4	6	6	3	6	5	6	6
Minimum	0.5	1.7	0.016	0.00030	0.041	<0.5	6.8	4	9.4	3.4
Maximum	160	9.8	4.24	0.12090	20	9.2	7.4	700	20.1	220
Median	2.5	3.3	0.055	0.00080	0.320	3.6	7.1	9	15.3	7.9
03-Jul-12	5.8	7.1	0.212	0.00684	2.11	<0.5	7.2	10	8.6	13
03-Sep-12	1.1	1.1	0.028	0.00006	0.056	a	6.6	3	13.0	1.1
11-Dec-12 ^b	-	-	-	-	-	-	-	-	-	-
03-Apr-13 ^b	-	-	-	-	-	-	-	-	-	-
06-Nov-13	7.8	3.1	0.097	0.00106	0.148	<0.5	7.3	2	16.2	24
Consent Limit	15	-	-	-	-	15	6-9	100	-	-
26-Feb-14	5.5	28.8	0.334	0.24637	2.80	a	8.3	2	19.9	1.4
24-Jun-14	<0.5	14.2	0.029	0.00466	0.241	-	7.8	<2	14.2	0.59

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

The stormwater samples collected from this monitoring location complied with the unionised ammonia, BOD, oil and grease, pH and suspended solids limits on all monitoring occasions during the period of time that these parameters were limited by the Company's consent.

It is noted that there were discharges occurring on two of the dry weather surveys (26 February and 26 June 2014). As the consent permits only stormwater discharges, these were not covered by Tegel's resource consent. At the time of sampling the flows were estimated to be relatively low at up to 1 L/min.

The conductivity, unionised ammonia, and pH on 26 February 2014 were all new maximums for this monitoring location when compared to the relatively small historical data set.

On 26 February 2014 the unionised ammonia concentration of this unconsented discharge was almost ten times that permitted by the RFWP. On this occasion, the unionised ammonia concentration at the point of discharge to the stream (STW001054, Table 27) was still higher than desirable at 0.046 g/m³, which would also have been elevated by the very low flow discharge from site STW001128 as this contained an unionised ammonia concentration that was 53 times higher than this standard, and limit on the previous consent (Table 52). It is noted that due to the conditions prevailing in the Mangati Stream during the sampling survey, receiving water results showed that the effect of this discharge was less than minor.

Subsequent investigations and works undertaken by Tegel are expected to have eliminated the source(s) of this flow (Section 16.2.4.1 and additional work that will be

discussed in the report covering the 2014-2015 year), however, consideration needs to be given to reinstating the unionised ammonia limit on consent 3470 at the next review opportunity.

Stormwater from the north eastern corner of the site, east of the loadout area discharges via site 43 (TRC site code STW001128). Three samples were collected from this monitoring location during the period under review.

Both samples stormwater collected during the wet weather surveys complied with all of the component concentration limits imposed by consent 3470.

However, as with site STW001129, there was an unconsented (but in this case very low flow) discharge occurring from site STW001128 on 26 February 2014 that was high in BOD, conductivity, dissolved reactive phosphorus, ammoniacal nitrogen and unionised ammonia, which were all new maximums for this monitoring location when compared to the relatively small historical data set.

Again, subsequent investigations and work undertaken by Tegel are expected to have eliminated this flow.

Table 52 Chemical monitoring results for Tegel's poultry processing plant stormwater discharge for 2012-2014 (site 43), TRC site code STW001128

Date	BOD g/m ³	Condy mS/m	DRP g/m ³ -P	NH ₃ g/m ³ -N	NH ₄ g/m ³ -N	O & G g/m ³	pH	SS g/m ³	Temp °C	Turby NTU
<i>Consent Limit</i>	25	-	-	0.025	-	15	6-9	100	-	-
Number	6	6	4	6	6	1	6	6	6	6
Minimum	1.9	1.9	0.029	0.00018	0.035	0.7	7.2	6	9.0	2.5
Maximum	16	14.6	0.074	0.15403	7.41	0.7	8.3	51	17.3	18
Median	2.6	3.6	0.070	0.00112	0.112	0.7	7.4	15	15.1	9.9
03-Jul-12	9.6	8.0	0.335	0.02453	2.46	0.9	7.7	20	8.3	16
03-Sep-12	1.2	2.3	0.038	0.00041	0.058	a	7.4	6	12.9	1.2
11-Dec-12 ^b	-	-	-	-	-	-	-	-	-	-
03-Apr-13 ^b	-	-	-	-	-	-	-	-	-	-
06-Nov-13 ^b	-	-	-	-	-	-	-	-	-	-
<i>Consent Limit</i>	15	-	-	-	-	15	6-9	100	-	-
26-Feb-14	41	90.0	5.39	1.33121	42.6	c	7.8		20.8	c
24-Jun-14 ^b	-	-	-	-	-	-	-	-	-	-

Key: Results shown in bold within a table indicates that a consent limit for a particular parameter has been exceeded
a parameter not determined, no visible hydrocarbon sheen and no odour
b not discharging at time of sampling survey
c very low flow discharge, insufficient sample volume able to be collected for all parameters to be analysed

16.2.2 Air

16.2.2.1 Inspections

Inspections focused on the areas associated with the following potential emissions:

- Combustion products from the two units within the boiler house.
- Ammonia, which is used as a refrigerant, is circulated through pipes under vacuum. Contamination with small amounts of air requires purging of the system

releasing small quantities of ammonia. The odour is not noticeable more than ten metres from the purge outlet.

- Heat and water vapour discharged to the atmosphere from the cooling units on-site, including evaporative towers and oil coolers.
- Dust (during summer) and odours may be discharged from the area of the plant where the birds are received and slaughtered. These effects are not usually discernible off-site.
- Odours from the offal and blood storage areas.
- Odours from the effluent system. The effluent passes through a milliscreen to separate out solids, then a Dissolved Air Flotation (DAF) treatment unit to aerate the wastewater and remove fats. The rate of discharge of wastewater to the sewage system is maintained at a constant 10 L/s during the day, with the remainder of the wastewater being stored in a holding pond, to enable the entire flow of wastewater to be directed to the sewage system if any contingency event should make this necessary.

Routine compliance monitoring inspections were undertaken on 2 July 2012, 18 January 2013, 10 June 2013, 26 June 2013, 27 August 2013, 2 December 2013, and 21 March 2014, in various weather conditions.

During routine compliance monitoring inspections no issues were noted regarding the management of the blood, offal or feathers at the site, with the exception of finding a localised (on site) objectionable odour on 27 August 2014, when a chicken's foot and feathers were observed near a stormwater drain. It was also reported at the routine compliance monitoring inspections that the waste water treatment systems and holding pond, the burial area and stormwater discharge from the wetland were all found to be managed in an acceptable manner to prevent or minimise the potential for off site odours. It was reported that no visible emissions were observed during the period under review.

The final scheduled inspection for period under review was undertaken on 1 July 2014. The inspection found the site to be compliant with consent conditions, and the inspection findings will be discussed in the report covering the 2014-2015 monitoring year.

16.2.3 Exercise of discharge to land consent

It was confirmed that no discharges to land occurred during the 2012-2014 monitoring years.

16.2.4 Investigations, interventions, and incidents

In the 2012-2014 period, the Council was required to undertake significant additional investigations and interventions, or record incidents, in association with Tegel's conditions in resource consents or provisions in Regional Plans on seven occasions.

16.2.4.1 Land/water

3 July 2012

During analysis of sampling results it was found that resource consent limits in regards to BOD were being slightly exceeded at a poultry processing plant at Paraitē

Road, Bell Block on 3 July 2012. Tegel undertook investigations to find the cause of the slight elevation, and an incident investigation inspection was undertaken on 26 July 2012 that failed to identify the cause of the elevated BOD concentration in the discharge. It was reported that further investigations were being conducted in house as to the cause of the incident, and the discharge would be discussed with site management during further routine compliance monitoring inspections.

27 August 2013

On 27 August 2013 during a compliance monitoring inspection it was observed that contaminants in wash down water were entering a stormwater drain. Staff were made aware of the non-compliance. Action was taken to clean the stormwater drain at the time of inspection. Tegel carried out works to prevent the discharge of wash down water to stormwater drains. Tegel was informed that a follow up inspection would be undertaken during further routine compliance monitoring. An email was received on 30 August 2013 advising that a contractor had been engaged to undertake the kerbing and bunding as discussed, and it was estimated that this would be completed by 15 September 2013. At the following routine compliance monitoring inspection it was found that one of the sources of contaminants had been addressed, however, one remained. This is discussed below (2 December 2013).

2 December 2013

During a compliance monitoring inspection it was found that washdown water from within a factory was still leaking from a building and flowing to a stormwater drain. Works were undertaken to stop the discharge from entering a stormwater drain. The discharge was now being captured and directed to trade waste. On going monitoring was being undertaken to ensure the effectiveness of the works. A letter of explanation was received and accepted.

In this letter it was acknowledged that the leak from the free flow building could have contributed to the appearance of a discharge from the free flow area that can be seen in May 2013 aerial photography of the site. Attempts had been made to resolve the issue, however, Tegel had not been overly concerned as they had concluded that the wetness in the area was predominantly from the defrosting of ice around the external pipes of the ammonia plant.

Tegel advised that short term mitigation measures were employed immediately following inspection, and successful longer standing mitigation measures were completed a week after the inspection. Tegel took this matter seriously, and advised that they would be reviewing their Stormwater Management Plan to ensure that such issues are not overlooked again.

An infringement fine was subsequently issued for the discharge of a contaminant, namely nutrient rich washdown water, onto land in circumstances which may have resulted in that contaminant entering water, when the discharge was not expressly allowed by a national environmental standard or other regulations, a rule in a regional plan, or a resource consent, at 91-95 Paraite Road, Bell Block, New Plymouth on 2 December 2013.

26 February 2014

During a routine sampling run it was found that the concentration of constituents in the discharge from the Tegel site fell outside the parameters allowed by resource

consent conditions on 26 February 2014. At the time of sampling it was noted that it was a very low flow rate discharge, but that it was odorous, had a yellowy-green tinge and was foamy. A meeting was held with Tegel on 2 April 2014 to discuss off site discharges. Following the meeting a site inspection of the Mangati Stream identified discharges from Tegel. The source of the discharge was identified and action was immediately taken by Tegel to fix the problem. No further action was considered necessary. Council was working with Tegel to ensure that on-going compliance was achieved.

16.2.4.2 Air

22 January 2013

A complaint was received about an odour on Paraita road, Bell Block. An odour survey in the area could find no trace of any odour at the time of investigation.

22 February 2014

A complaint was received regarding odour discharging off-site from the Tegel Processing plant, Bell Block. It was reported that an inspection was carried out following a complaint being received from a member of the public regarding objectionable odours in the Paraita Road industrial area. The inspection tracked the odour back to the Tegel processing plant. However at the time of investigation the odour was noticeable along the rear boundary of the site when wind gusts were present. The odour was intermittent in nature and considered to be strongest at about GPS: E: 6999834, N: 5677943. At the time of investigation the odour was intermittent and not considered to be objectionable. The complainant advised that the odour was strongest at approximately 1100 hrs that day. The investigating officer was unable to locate persons about the plant. A card notifying Tegel of the inspection was left in the door jam leading to the main reception of the building. Tegel was asked to ensure that no offensive or objectionable odours are present beyond the boundary of the site.

Although the complaint could not be substantiated at the time of investigation, Tegel's investigation identified the likely source of the odour.

It was outlined that since the fire at Taranaki By Products, alternative arrangement had been made for the disposal of blood.

Normally two uplifts were required at the site during processing days, but from the week commencing 17 February the usual tanker had been unavailable. FBT picked up two loads of blood each day on 17 and 18 February.

On 19 and 20 February one load of blood was removed from site each day as there was only one suitable truck available. As a result of this, blood remained at the site for longer than usual. One load was collected from the site in the afternoon of Friday 21 February and a further two loads were uplifted on Saturday 22 February at 8:50 am and 13.36 pm.

Given the time frames and wind direction, it was considered likely that the process of blood removal was the cause of the odour complaint received by the Council.

The following remedial and preventative actions were undertaken:

- The blood tank was cleaned and sanitised on the 22 February 2014.
- All blood was to be removed from site and the tank cleaned daily. This task was assigned to Primary Processing and FBT, effectively immediately.
- Ensure supply of sodium metabisulphate was available on site in the event that blood could not be uplifted. This task was assigned to Dry Stores, also effective immediately.

23 March 2014

A complaint was received concerning odour discharging from the Tegel processing plant on Paraita Road, Bell Block. Tegel was advised that a complaint was received concerning odours discharging from the Tegel processing factory. The complainant reported that "sewage crossed with rotten dead animals" type odours were detected. The odours were intermittent. An odour survey was carried out around the complainant's property by an Investigating Officer and no odours were detected. The complainant agreed that the odour had gone. The complainant first noticed the odour around midday and contacted Council at 14:05. At the time survey the wind had changed direction. An odour was detected on De Havilland Drive (downwind of Tegel) but was not considered objectionable at the time. Tegel was advised that, on this occasion, no further action would be undertaken. Tegel was advised that, on this occasion, no further action would be undertaken.

16.3 Discussion

16.3.1 Discussion of site performance

At inspection chemical storage and the wastewater pond were found to be well managed throughout the years under review. No issues were raised in relation to the historical emergency burial areas, or the management of the solid waste and pet food bins. There was a minor matter noted relating to the presences of metal pipes near the wetland, which was resolved promptly by Tegel.

Discharge monitoring found that the discharge from the wetland to the Mangati Stream complied with the conditions of Tegel's consent. It is however noted that the previous trend of declining water quality of the stormwater directed to the wetland in relation to chemical and biochemical oxygen demand may have continued. Whilst it is accepted that this is in the stormwater prior to the wetland and not at the discharge point specified in the consent, the wetland is itself a natural receiving waterbody within the mix zone that Tegel has enhanced to polish the site stormwater discharge. As such, it is desirable that the concentration of contaminants in the stormwater leaving the active area of the site is minimised by good management practices on site.

During the period under review, discharges were found to both the wetland and to the stream via the De Havilland Drive stormwater during dry weather surveys.

There were a total of four water related incidents recorded as a result of findings during sampling and inspection that were associated with, or likely to have been associated with unconsented wastewater discharges going to stormwater. There were three separate discharges found to the stormwater system during dry weather sampling (alluded to above), and two non-compliant stormwater discharges found

during the wet weather surveys, one of which contributed to a discharge concentration of 5.82 g/m³ ammoniacal nitrogen and 0.046 g/m³ unionised ammonia in the discharge from the NPDC reticulated stormwater network at De Havilland Drive. During the years under review three unconsented dry weather discharge sources were identified by the Council staff during inspection, with an infringement fine being issued for one of them. Further sources were identified and isolated by Tegel.

From an administrative perspective, information requested for clarification during the consent renewal process was not provided to a satisfactory standard, which was then also not provided by the due date when the requirement was incorporated into Tegel's consent. An abatement notice was issued early in the 2014-2015 year.

As these particular issues were resolved early in the 2014-2015 year, these are considered to be a reflection of Tegel's performance during the 2012-2014 years, rather than the 2014-2015 year.

Although, at inspection no odours were noted at or beyond the site boundary, during the period under review there were three odour complaints received by the Council. No objectionable odours were found at the time of investigation by Council Officer's. However, on one of these occasions Tegel's investigation identified a likely source of odour resulting from blood not being removed from the site within the normal timeframes. The letter of explanation indicated that Tegel did not use sodium metabisulphate (or a Council approved equivalent) to preserved blood that had been on-site for more than 6 hours post slaughter. This is in contravention of special condition 12 of air discharge consent 4026.

As the letter of explanation also identified the measures they would take to prevent a reoccurrence, no further action was considered necessary at that time.

16.3.2 Environmental effects of exercise of consents

Although there were a total of eight non-complying discharges to surface water found during the period under review, monitoring found that the effects in the Mangati Stream, downstream of the Tegel poultry processing plant discharges during the years under review, were minor at most. Occasional increases in BOD, ammoniacal nitrogen and suspended solids were observed. It is noted that increases of up to 0.112 g/m³ of ammoniacal nitrogen were observed downstream of the untreated De Havilland Drive discharges, which was double the maximum increase observed downstream of the treated wetland discharge.

Three odour complaints were received by the Council. On one of these occasions it was reported that no odours at all were found. On two occasions odours were detected, however, they were not considered to be offensive or objectionable at the time of investigation. Tegel's investigation into the source of the odour reported in February 2014 did indicate that the odour was likely to have been stronger prior to the arrival of the investigating officer.

16.3.3 Evaluation of performance

A tabular summary of the consent holder's compliance record for the years under review is set out in Table 53, Table 54, Table 55, Table 56, Table 57, Table 58, and Table 59.

Table 53 Summary of performance for Consent 6357-1, Tegel's poultry processing groundwater abstraction

Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Consent to be exercised in accordance with application information	Consent not exercised during period under review	N/A
2. Limit on abstraction rate: 3000m ³ /day and 35 L/s	Consent not exercised during period under review	N/A
3. Water level to be maintained above 35m below ground level at all times	Consent not exercised during period under review	N/A
4. Record of date pumping hours and daily volume abstracted to be kept and provided to council upon request	Information provided at inspection and on file. Consent not exercised during period under review	N/A
5. Water meter to be installed and maintained	Not monitored. Tegel advised that they had no immediate plans to utilise the bore	N/A
6. Consent holder to meet reasonable costs associate with monitoring	Combined monitoring programme in place	Yes
7. Provision for consent to lapse if not exercised	Lapse date extended to 20 May 2015, if not exercised prior	N/A
8. Optional review provision re environmental effects	Next opportunity for review June 2014	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		N/A
Overall assessment of administrative performance in respect of this consent		N/A

N/A = not applicable or not assessed

Table 54 Summary of performance for Consent 3470-3, Tegel's poultry processing plant stormwater discharge to NPDC drainage system, 1 July 2012 to 22 December 2013

Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Adoption of best practicable option to minimise effects on the environment	Inspection and discussion with consent holder	No. Two wastewater sources found going to stormwater
2. Limits stormwater catchment area	Inspection	Yes
3. Above ground hazardous substance storage to be bunded and not to drain directly to stormwater catchment	Inspection and discussion with consent holder	Yes
4. Limits on chemical composition of discharge	Sampling and analysis of discharges. Total of 8 samples	Exceedances: 1 BOD and 1 SS

Condition requirement	Means of monitoring during period under review	Compliance achieved?
5. Maintenance of a contingency plan for action to be taken to prevent spillage	Review of documents provided. Reviewed plan provided during consent renewal	Yes
6. Maintenance of and adherence to operation and management plan	Review of documents provided. Reviewed plan provided during consent renewal	Non-compliance with Management plan re: wastewater going to stormwater that should have been identified in following the plan. Infringement notice issued
7. Preparation of monitoring programme due 30 June 2009	Review of documents provided	Yes
8. Written notification required regarding changes to activities at the site	Inspection and discussion with consent holder. Consultation regarding new sausage plant	Yes
9. Optional review provision re environmental effects and notifications of changes (S.C.9)	No further opportunities for review	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		Poor
Overall assessment of administrative performance in respect of this consent		Improvement required

N/A = not applicable or not assessed

Table 55 Summary of performance for Consent 3470-4, Tegel's poultry processing plant stormwater discharge to NPDC drainage system 23 December 2013 to date

Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Adoption of best practicable option to minimise effects on the environment, particularly with respect to BOD	Inspection and discussion with consent holder	No. One wastewater sources found going to stormwater
2. Limits stormwater catchment area	Inspection	Yes
3. Limits on chemical composition of discharge	Sampling and analysis of discharges. Total of 3 samples	Exceedances: 1 BOD re: wastewater discharge
4. Discharge cannot cause specified adverse effects beyond mixing zone	Receiving water sampling	Yes
5. Provision of stormwater network analysis by 28 February 2014	Review of documents provided	Not provided by end of period under review. Abatement notice issued

Condition requirement	Means of monitoring during period under review	Compliance achieved?
6. Maintenance of and adherence to operation and management plan	Review of documents provided. Reviewed plan provided during consent renewal	Yes
7. Maintenance of contingency plan	Review of documents provided. Reviewed plan provided during consent renewal	Yes
8. Written notification required regarding changes to activities at the site	Inspection and discussion with consent holder. No changes occurred which may alter nature of discharge	N/A
9. Optional review provision re environmental effects and notifications of changes (S.C.9)	Next opportunity for review June 2017	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		Improvement required
Overall assessment of administrative performance in respect of this consent		Improvement required

N/A = not applicable or not assessed

Table 56 Summary of performance for Consent 7389-1, Tegel's poultry processing plant stormwater discharge to Mangati Stream via wetlands

Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Adoption of best practicable option to minimise effects on the environment	Inspection and discussion with consent holder	One wastewater discharge to wetland. No adverse environmental effects
2. Limits stormwater catchment area	Inspection	Yes
3. All stormwater directed through treatment system (wetland), and wetland to be maintained to ensure effective treatment	Inspection and discussion with consent holder	Yes
4. Above ground hazardous substance storage to be bunded and not to drain directly to stormwater catchment	Inspection and discussion with consent holder	Yes
5. Limits on chemical composition of discharge	Sampling and analysis of discharges	Yes
6. Discharge cannot cause specified adverse effects beyond mixing zone	Receiving water sampling	Yes
7. Limit on filtered carbonaceous BOD change in stream (2 g/m^3)	Receiving water sampling	Yes
8. Wetland to be maintained to ensure maximum effluent treatment at all times	Inspection and discussion with consent holder and sampling	Yes
9. Riparian fencing to be completed as per plan by 31 December 2010	Inspection by Council Land Management Officers	Yes

Condition requirement	Means of monitoring during period under review	Compliance achieved?
10. Maintenance of a contingency plan for action to be taken to prevent spillage	Review of documents provided. Reviewed plan received November 2010	Yes
11. Maintenance of and adherence to operation and management plan	Review of documents provided. Reviewed plan provided during consent renewal	Yes
12. Written notification required regarding changes to activities at the site	Inspection and discussion with consent holder. No changes occurred which may alter nature of discharge	N/A
13. Optional review provision re environmental effects and notifications of changes (S.C.9)	Next opportunity for review June 2014	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		Good
Overall assessment of administrative performance in respect of this consent		High

N/A = not applicable or not assessed

Table 57 Summary of performance for Consent 4026-2, Tegel's poultry processing plant discharge to air, 1 July 2012 to 15 June 2014

Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Adoption of best practicable option to minimise effects on the environment	Inspection and discussion with consent holder	No. Breach of SC 12
2. Monitoring and management of processes to minimise effects	Inspection and discussion with consent holder. Complaint response	No. Breach of SC 12
3. No alterations that might change the nature/quantity of discharge without prior consultation with Council	Inspection and discussion with consent holder. Review of documents provided to the Council.	N/A
4. a) Notification and reporting re incidents	Inspection and discussion with consent holder. Complaint response	N/A
4. b) stock area to be cleaned at less than 24 hour intervals	Inspection and discussion with consent holder	Yes
4. c) no objectionable or offensive odours beyond boundary	Inspection and discussion with consent holder. Complaint response. Three complaints investigated, no objectionable effects found at time of investigation	Yes
5. Requirement for wastewater holding pond to be completely emptied	Inspection and discussion with consent holder	Yes
6. Pond to be cleaned when empty	Inspection and discussion with consent holder	Yes
7. Bypass valve (to sewer) to be installed	Inspection	Yes
8. No offal or blood to be discharged to holding pond	Inspection and discussion with consent holder	Yes
9. Controls on storage of soft offal	Inspection and discussion with consent holder	Yes
10. Hard offal to be removed within 48 hours	Inspection and discussion with consent holder	Yes
11. No fellmongering, tanning or rendering emissions permitted	Inspection and discussion with consent holder	Yes

Condition requirement	Means of monitoring during period under review	Compliance achieved?
12. Controls on storage of blood	Inspection and discussion with consent holder. Documentation received on Tegel's investigation of odour complaint	No. Preservative not used
13. Contingency plan for loss of processing or transportation capacity to be prepared by 1 August 1996	Consent for emergency on site burial in place since 1999	Deficiencies in plan or plan not followed re: transportation of blood
14. Operation and maintenance plan re S.C. 1 & 2 to be prepared by 1 August 1996	Review of documents provided	Yes
15. Plans to be adhered to except by specific agreement	Inspection and discussion with consent holder	N/A
16. Plans to be reviewed, and revised every 2 years if necessary	Contingency plan overdue for review. Reviewed plan received November 2010	Yes
17. Optional review provision re environmental effects	No further review opportunities prior to expiry	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		Improvement required
Overall assessment of administrative performance in respect of this consent		Improvement required

N/A = not applicable or not assessed

Table 58 Summary of performance for Consent 4026-3, Tegel'spoultry processing plant discharge to air, 16 June 2014 to date

Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Adoption of best practicable option to minimise effects on the environment	Inspection and discussion with consent holder	Yes
2. No alterations that might change the nature/quantity of discharge without prior consultation with the Council	Inspection and discussion with consent holder. Review of documents provided to the Council.	N/A
3. Offensive and objectionable odours beyond boundary not permitted	Inspection and discussion with consent holder. Complaint response	Yes
4. No offal or blood to go to waste water pond	Inspection and discussion with consent holder	Yes
5. Contingency plan for loss of processing or transportation capacity to be maintained and regularly updated	Review of documents provided	Yes
6. Operation and maintenance plan re special conditions of consent and particular aspects of Tegel's activities	Review of documents provided. Updated plan provided during consent renewal	Yes

Condition requirement	Means of monitoring during period under review	Compliance achieved?
7. Optional review provision re environmental effects	Next opportunity for review June 2020	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		High
Overall assessment of administrative performance in respect of this consent		High

N/A = not applicable or not assessed

Table 59 Summary of performance for Consent 5494-2, Tegel's poultry processing plant stormwater discharge to land – emergency burial of offal

Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Requires written approval prior to exercising consent	Inspection and discussion with consent holder. Not exercised during period under review	N/A
2. Discharge to take place in accordance with application information	Inspection and discussion with consent holder. Not exercised during period under review	N/A
3. Burial trenches to be above groundwater level	Inspection and discussion with consent holder. No new trenches dug during period under review	N/A
4. Burial trenches to be more than 25 m from the wetland	Inspection and discussion with consent holder. No new trenches dug during period under review	N/A
5. Exercise of consent shall not be liable to lead to contaminants entering surface water	Inspection and discussion with consent holder. Chemical sampling of wetland and stream. No effects from historical disposals. No new trenches dug during period under review	Yes
6. Adverse effects on groundwater prohibited	No groundwater monitoring during period under review	N/A
7. Records of disposal dates, volumes and types of waste disposed of to be kept and made available to the Council	Inspection and discussion with consent holder. No new trenches dug during period under review	N/A
8. Optional review provision re environmental effects	No further review opportunities prior to expiry	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		High
Overall assessment of administrative performance in respect of this consent		High

N/A = not applicable or not assessed

Overall, during the period under review, Tegel Foods Limited (poultry processing plant) demonstrated a poor level of environmental performance and improvement was required in the level of administrative performance and compliance with the resource consents as defined in Section 1.1.4.

In relation to the discharges to water, there were a number of waste water discharges found that were not compliant with the Regional Freshwater Plan or consent limits, some of which should have been identified by this consent holder when following the site stormwater management plan. An infringement notice was issued as a result. An abatement notice was issued early in the 2014-2015 year as a result of non-

provision of information required by special conditions of the consent during the period under review.

In relation to discharges to air, there was a non-compliance with special conditions on the consent that resulted in off site odours.

16.3.4 Recommendations from the 2011-2012 Annual Report

In the 2011-2012 Annual Report, it was recommended:

THAT monitoring programmed for consented activities of Tegel Foods Limited poultry processing plant in the 2012-2013 year continues at the level programmed for 2011-2012.

These recommendations were implemented during the 2012-2014 monitoring periods.

16.3.5 Alterations to monitoring programmes for 2014-2015

In designing and implementing the monitoring programmes for air/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 RMA in terms of monitoring emissions/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 emitting to the atmosphere/discharging to the environment.

It is proposed that for 2014-2015 the programme remains unchanged. A recommendation to this effect is attached to this report.

16.4 Recommendations

THAT monitoring programmed for consented activities of Tegel Foods Limited (poultry processing plant) in the 2014-2015 year continues at the level programmed for 2012-2014.

THAT consideration be given to reinstating the unionised ammonia limit on consent 3470-3 at the next review opportunity (June 2017).

17. Vector Gas/ Natural Gas Corporation of New Zealand Limited

17.1 Introduction

17.1.1 Process description

Vector Gas Limited (Vector Gas) has a warehouse and gas pipe storage yard on the southern side of Connett Road West, adjacent to the Mangati Stream. Although the stormwater discharge from this site is consented, up to the end of the 2003-2004 monitoring period the consent holder had not been included in the compliance monitoring programme for the Mangati catchment.

The area of the site is approximately 4 ha. The operation building and maintenance building along with sealed car parking area and access make up approximately 60 percent of the area. The remaining 40 percent is covered in grass. The maintenance shed is enclosed, and any washdown from inside the shed is directed to a holding system which is emptied by a licensed wastewater collector.

Discharges from the site are monitored as part of the combined discharge from the Connett Road stormwater (site 33, Figure 2), and periodically at the southern discharge point which enters the open stormwater drain below Tasman Oil Tools and Greymouth Petroleum.

The site is considered to pose only a very low environmental risk and is therefore, scheduled for two inspections per year, however on occasion additional inspections are carried out when the inspecting officer is in the area.

Consent conditions do not require Vector Gas to maintain a contingency plan.

17.1.2 Water discharge permit

Section 15(1)(a) of the RMA Act 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.

Vector Gas held water discharge permit **4780-1** to cover the discharge up to 608 L/s of stormwater from an administration site into the Mangati Stream. This permit was issued to Natural Gas Corporation by the Council on 24 July 1995 under Section 87(e) of the Resource Management Act. The consent expired on 1 June 2014.

The application to renew this consent was received from Vector Gas Limited, which was effectively a company name change, rather than a change of ownership. As a result the consent was transferred, however, due to the imminent expiry of the consent, a hard copy of the consent was not issued in the new company name.

The application was received on 28 February 2014, and therefore under Section 124 of the RMA, the Council exercised its discretion and has allowed Vector Gas to continue to operate under the conditions of the expired consent until a decision is made on the renewal application.

Conditions were attached in respect of concentration of stormwater components (maximum total recoverable hydrocarbons 15 g/m³, pH range 6 - 9, suspended solids 100 g/m³), prohibiting specified effects in the receiving water after reasonable mixing, and provision for review of conditions.

This permit is attached to this report in Appendix I, under the name of Natural Gas Corporation of New Zealand Limited.

17.2 Results

17.2.1 Water

17.2.1.1 Inspections

29 August 2012

The car park area was found to be free of spills. The site in general was clear and free of potential contaminants. The gas cylinder storage area was secured and the hazmat shed was locked. IBC's stored in the material storage area had lids secured in place. The discharge of storm water from the site was clear, and there were no visible effects on the receiving waters.

7 January 2013

The carpark area was again free of spills. The wash pad was not in use at the time of inspection. All drains and catchment points were clear of visible contaminants and obstructions.

10 June 2013

The site stormwater system and receiving waters were inspected. It was reported that despite the recent heavy rain in the preceding few weeks the discharges from this site had not appeared to have caused any effects in the nearby Mangati catchment system. The yard was found to be clean and tidy, and all hazardous materials were stored appropriately, inside or contained within bunds.

26 June 2013

The site was clean and tidy, and there were no visual affects on the receiving stormwater drains. There were no odours or dust issues at the site boundary.

7 August 2013

No issues were raised as a result of the inspection. The car parking areas looked tidy, and all stormwater drains and sumps had clean water in them. No leaks or spills were observed from storage areas.

29 November 2013

Most areas of the site were clean and tidy, and all the stormwater in the puddles on site was reported to be clear. It was noted that the area around the gas storage cage was untidy and some oil had possibly discharged onto the ground. This issue was addressed at the time of inspection and the consent holder indicated that works would be undertaken to tidy the area up.

17.2.2 Investigations, interventions, and incidents

In the 2012-2014 period, the Council was not required to undertake significant additional investigations and interventions, or record incidents, in association with Vector Gas' conditions in resource consents or provisions in Regional Plans.

17.3 Discussion

17.3.1 Discussion of site performance

The site was found to be well managed throughout the 2012-2014 monitoring period, with only one minor matter noted during inspection.

17.3.2 Environmental effects of exercise of consent

There were no adverse effects found as a result of activities undertaken at the Vector Gas site.

17.3.3 Evaluation of performance

A tabular summary of Vector Gas' compliance record for the years under review is set out in Table 60.

Table 60 Summary of performance for Consent 4780-1, Vector Gas' stormwater discharge to Mangati Stream

Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Limits on chemical composition of discharge	Visual assessment of discharge during inspections and sampling surveys	Yes
2. Discharge cannot cause specified adverse effects beyond mixing zone	Receiving water sampling	Yes
3. Optional review provision re environmental effects	Consent expired June 2014	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		High
Overall assessment of administrative performance in respect of this consent		High

N/A = not applicable or not assessed

During the period under review, Vector Gas demonstrated a high level of environmental and high level of administrative performance and compliance with the resource consent as defined in Section 1.1.4

17.3.4 Recommendation from the 2011-2012 Annual Report

In the 2011-2012 Annual Report, it was recommended:

THAT monitoring programmed for consented activities of Natural Gas Corporation of New Zealand Limited in the 2012-2013 year continues at the level programmed for 2011-2012.

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

17.3.5 Alterations to monitoring programmes for 2014-2015

In designing and implementing the monitoring programmes for air and 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 RMA in terms of monitoring emissions, 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 emitting to the atmosphere and/or discharging to the environment.

It is proposed that for 2014-2015 the monitoring programme remains unchanged. A recommendation to this effect is attached to this report.

17.4 Recommendation

THAT monitoring programmed for consented activities of Vector Gas Limited in the 2014-2015 year continues at the level programmed for 2012-2014.

18. W Abraham Limited

18.1 Introduction

18.1.1 Process description

W Abraham Limited (Abraham) operates a crematorium on Swans Road, Bell Block. Approximately 250 cremations occur per year in the gas-fired cremator.

The potential impact on the environment from the operation of cremators is discharges to air that contain some low level contaminants. The complete combustion of human remains, casket materials and any special belongings put with the deceased results in the emission of carbon dioxide, carbon monoxide, water vapour, nitrogen oxides, particulate, hydrogen chloride (if plastics are present), and other volatile compounds in low concentrations. The height that the stack from the cremator discharges to air is also important.

Visible Emissions

Incomplete combustion has the potential to result in visible emissions from the exhaust stack. Combustion is a consequence of time (i.e. the duration of the high temperature cycle, to ensure all material is burned completely through), the combustion temperature (which must be high enough to combust all materials), and turbulence (i.e. enough air is introduced and mixed to ensure high temperatures are present throughout the combustion chamber). Under the worst circumstances where temperatures and/or oxygen levels are too low, there is potential for black/dark smoke to be discharged. Due to the nature of activities at a crematorium site, the visible discharge of smoke from the exhaust stack is likely to be found offensive and possibly emotionally disturbing.

The controlling computer allows automated system control of the combustion process, and conditions can be altered instantaneously. The stoichiometric fuel/air ratio, greater heat, longer combustion zone and introduction of dilution air in the exhaust stream all contribute to the positive environmental performance of the cremator.

Stack test data provided by the applicant showed particulate emission results of 23-60 mg/m³ (at 11 % O₂ reference conditions), and 30-85 g/hr. The respective British guidelines are 80 mg/m³, and 120 g/hr. While the residence time in the secondary chamber of the proposed unit (1.57 seconds) is less than that specified in the British guideline (2 seconds), the actual performance, as demonstrated, indicate that this should not (and will not be allowed to) give rise to any unacceptable visible emissions.

Odour

Odours emanating from a crematorium site are also likely to be found offensive and possibly emotionally disturbing. Again, incomplete combustion (especially at low temperature) can lead to odour discharges due to partially combusted organic material. The ALL Power-Pak II Smoke-Buster 140 cremator specifications provided with the consent application noted operating temperatures of 650 - 1000°C in the primary chamber and 760 - 1000°C in the secondary chamber. The controlling computer for the "Smoke Buster" monitors inputs and outputs to the process and manages the combustion process ensuring any odour requirements are met.

Toxic by-products

The production of toxic by-products, such as heavy metals and dioxins, is a concern with many combustion processes. The AEE provided by Abraham at the time of application clarified this issue and noted '*minute quantities of mercury vapour from amalgam fillings, if present*', can be discharged through the stack. These emissions were not considered an issue elsewhere.

No comment was made about dioxins or releases of hydrogen chloride (an acidic gas), but it was considered that, if the combustion process is complete, and PVC plastic is not combusted, then this was not expected to be an issue. PVC often contains heavy metals such as lead, cadmium and zinc as stabilisers; its elimination therefore reduces the potential for releases of these heavy metals as well as the potential for dioxins. Information viewed by Council officers confirmed the importance of removing or reducing PVC to the greatest extent practicable, in order to minimise emissions of these contaminants.

Significantly, Abraham advised that all external casket fittings made of metal or PVC would be removed prior to cremation. This removes a potential source of metals and PVC, although it is noted that most fittings are polycarbonate, which is a non-chlorinated plastic.

Particulate deposition

The reported low opacity of the smoke discharge from the ALL Power-Pak II Smoke-Buster 140 cremator indicated low levels of particulates. The controlling computer monitors particulate levels and displays these on the screen at all times. Stack test results provided for the ALL Power-Pak II Smoke-Buster 140 cremator indicated total suspended particulates of between 23 and 60 mg/m³ (at 11 % O₂ reference conditions). At this level it was not expected that there would be any adverse effects such as deposition of particulate, either off or on the crematorium site, or any cumulative effects upon soil in the vicinity of the site. Other typical sources of dust, such as surface wind erosion from farm land, landscaping or bare soil surfaces within an industrial area, vehicular emission deposits, and marine salt drift, would be comparatively far more prevalent.

Nitrogen and sulphur oxides

Nitrogen, and to a lesser extent sulphur oxides, are often by-products of the fuel combustion process. The application information indicated a gross heat input of 722 kW and a minimum discharge stack height of 5 m. Combustion facilities of this size, discharging at this height, are permitted activities according to the Regional Air Plan, except for equipment supplying direct heat to a product or material (such as in a cremation). This exclusion provides for additional measures to be put in place should other contaminants also be discharged. The compliance by Abraham with the discharge height requirements for a unit of this heat capacity means that ambient nitrogen and sulphur oxides should not be an issue at this site.

Summary

At the time of application it was noted that the adverse effects from the crematorium have the potential to be marked, given the sensitive nature of crematorium activities, and social attitudes. However, the location of the facility in an industrial area, the use of modern equipment, and proper operation should minimise environmental effects to an acceptable level. The low emission levels from a stack that was to be at least 20 metres above ground level (under the NPDC land use provisions), should not result in contaminants entering the food chain, or offending neighbours.

The requirement for an efficient combustion system is emphasised with regard to minimising these effects. From the data provided on the cremator, it is anticipated that the system would be a modern and state of the art facility. However, maintenance and effective operator training to ensure an efficient combustion process is a paramount consideration of crematorium management. The conditions of the consent (refer to Section 18.1.2, below) provide reassurance over the unit's environmental performance.

18.1.2 Air discharge permit

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

Abraham holds air discharge permit **7147-1** to cover the discharge of emissions into the air from the operation of a crematorium including a natural gas-fired cremator. This permit was issued by the Council on 12 February 2008 under Section 87(e) of the RMA. The consent expired on 1 June 2014, however as the application to renew the consent was received on 13 September 2013, Section 124 of the RMA allows the Company to continue to operate under the expired consent until a decision is made on the renewal.

As the consent controls emissions from a process of such a sensitive nature, whilst there are conditions controlling the rate and/or quantity of contaminants discharged (conditions 17, 19, 24, and 26), and limiting actual or potential off-site effects that may occur as a result of the discharge (conditions 9, 10, 24, and 26), a strong focus was been placed on the controlling the operation itself.

The majority of the conditions of this consent were written around ensuring that the cremator is designed, maintained, and operated in a way such that the emissions occurring as a result of the exercise of the consent are maintained at a practicable minimum at all times (which is a general requirement of condition 4). To this end, limits and controls were placed upon those aspects of the cremators design and operation known to minimise the potential for a range of possible adverse environmental effects that may arise from this type of activity.

More specifically these controls:

- Require the adoption of the best practicable option to prevent or minimise effects (condition 1).
- Limit the cremator design and operating conditions to ensure complete and efficient combustion is occurring (conditions 11, 15, 16, and 18).

- Require that key indicators of the cremators performance are monitored, ensuring that the consent holder and the Council can determine whether the combustion process is occurring efficiently, and within the conditions of the consent (conditions 20 and 21).
- Limit the amount of various materials (e.g. metals and PVC) that may be introduced into the cremator (conditions 12 and 13).
- Ensure all discharges occur via the stack, which must be insulated and exhaust a minimum height above ground level (conditions 5, 6, 7, and 8).

There are also various notification and information provision requirements, so that the Council can effectively monitor the environmental performance of the consent holder's exercise of the consent (conditions 3, 15, 22, 23, and 25).

The operation must be conducted generally in accordance with the information provided in support of the consent application (condition 2), and the consent holder must notify the Council prior to making any changes that may affect the nature or quantity of the contaminants discharged (condition 14).

The remaining conditions (27 and 28) contain provisions for the consent to be allowed to lapse if not exercised within 5 years of granting, and for the Council to review the conditions of the consent.

On 30 September 2010 an application was received from the consent holder requesting a change to condition 16 such that the required minimum pre-heat temperature of the secondary chamber could be reduced from 800°C to 700°C. This application was subsequently withdrawn on 26 October 2010.

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

18.2 Results

18.2.1 Air

18.2.1.1 Inspections

The crematorium was visited on 12 July and 17 December 2012, 31 May, 24 September and 19 December 2013 and May 2014, with the final scheduled inspection being carried out on 2 September 2014. This inspection will be discussed in the report covering the 2014-2015 period.

12 July 2012

A routine inspection was carried out on 12 July 2012. The 842nd cremation was started, following heating of the secondary chamber to 800°C. This was the first of two cremations scheduled for the day. The record charts of the primary and secondary chamber temperatures, and of opacity measurements, were inspected for cremations 833 (3 July) to 839 (9 July). It was noted that there had been a significant increase in the number of times per year that the cremator was in operation, and that the records examined indicated compliance with conditions 11 and 17. The gas reading was noted as being 826,081 m³. The usual (approximately monthly) servicing had been carried out. There was a slight burnt smell within building, however no smoke or odours were observed downwind of the site.

17 December 2012

An inspection was undertaken on 17 December 2012. The 964th cremation was underway, which was the first of two scheduled for the day. Mr Head reported two brief emissions of black smoke at 1545 and 1555 NZDT, about one second in duration, the first he had ever seen from the cremator stack. No smoke was visible during the inspection, which had been timed to allow the inspecting officer to observe the second cremation, which had been delayed until later that evening. There were very faint spikes on the opacity chart, up to about 50 %. The temperature was relatively high, up to 2150°F. The cremation had commenced about one hour before. The (remote) operator was alerted by an alarm connected to the opacity meter. The primary chamber temperature was high. He took action (remotely) by shutting off gas to the primary chamber, where self-combustion was occurring, and extending the cremation cycle. This appeared to be effective. It is noted that these brief smoke emissions were compliant with condition 17, which allows two smoke emissions of up to 1 minute per cremation cycle.

Record charts of primary and secondary chamber temperatures and of opacity measurement were inspected, for cremations 927 to 933. All records indicated compliance with conditions 11 and 17. The gas reading was 93,244 m³. The usual servicing had been carried out, though not entered in the log, and the consent holder was reminded to ensure that the maintenance log was filled in. No smoke or odours were observed downwind of the site at the time of inspection.

15 January 2013

Notification was received from Abraham that there had been a very brief smoke emission event that day. This had occurred at 1745 NZDT, and had lasted for less than one minute. The cause of this event was unknown. As this event was compliant with condition 17 of the resource consent, no further action (other than continued monitoring) was considered necessary.

31 May 2013

A routine inspection was undertaken on 31 May 2013. The 1063rd cremation was started, which was the first of four scheduled for the day. The temperature record was checked, and this was found to be satisfactory. The monthly service, along with annual maintenance, were due to be carried out at the end of June. It was reported that the thermocouple in the main chamber had been replaced for the first time on 6 April 2013, and the chimney had been painted the previous week. The gas reading was noted as being 1,020,972 m³. It was noted that a 350 kg cadaver had been cremated, without incident, over a period of six hours. Overheating of the secondary chamber was averted by starting the "cremation builder", which cools the unit while the main burner is on high. There were no visible emissions or odour detected upwind or downwind of the site at the time of inspection.

24 September 2013

The site was visited on 24 September 2013 during the 1178th cremation. The temperature and obscuration records were checked and found to be satisfactory, as was the service record. The gas reading was 1,116,464 m³. No visible emissions or odours were detected upwind or downwind of the site.

19 December 2013

The 1242nd cremation was started when the site was visited on 19 December 2013.

A sample of the temperature and obscuration records were checked and found to be satisfactory. The gas reading was 1,173,683 m³. Movement of air at the top of the stack was just visible from underneath. An odour survey was performed around the site. A faint "burnt" odour was detected opposite the entrance, with no odours detected away from the site, therefore consent compliance was achieved.

29 May 2014

A routine inspection was undertaken on 29 May 2014. The 1346th cremation was started, which was the first of two for the day. Temperature and obscuration records were checked and these were satisfactory. Monthly servicing had been carried out. The consent holder discussed plans to put a sleeve of powder coated steel over the brick-lined chimney, to cover unsightly rust caused by improper painting. The gas reading was 128,200 m³, and it was noted that a new meter had been installed. No odour was detected upwind or downwind of the site. Although it was noted that approximately 25 minutes into the cremation, a very faint grey emission was occasionally visible from Swan Road against the grey sky for 1-2 m above the flue, this was not a breach of resource consent conditions.

18.2.2 Investigations, interventions, and incidents

In the 2012-2014 period, the Council was not required to undertake significant additional investigations and interventions, or record incidents, in association with Abraham's conditions in resource consents or provisions in Regional Plans.

18.3 Discussion

18.3.1 Discussion of site performance

During the 2012-2014 monitoring period it was found that the cremator was operated in a satisfactory manner.

18.3.2 Environmental effects of exercise of consent

There was no evidence of off site effects found at inspections, and no complaints were received by the Council. There was generally only a slight heat haze visible and no odours found during the inspections undertaken during the period under review. There was a very faint grey emission visible just above the flue during one inspection, and Abraham advised the Council of a total of three brief smoke events. These were considered to be compliant with conditions of the consent, and constituted an effect that was less than minor.

18.3.3 Evaluation of performance

A tabular summary of Abraham's compliance record for the years under review is set out in Table 61.

Table 61 Summary of performance for Consent 7147-1, Abraham's discharge to air

Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Adoption of best practicable option to minimise effects	Inspection and discussion with consent holder	Yes

Condition requirement	Means of monitoring during period under review	Compliance achieved?
2. Consent to be exercised in accordance with application documentation	Inspection and discussion with consent holder	Yes
3. Written notification required prior to exercise of consent	Check of the Council's records. Written notification received on 27 November 2008 regarding commissioning of cremator.	Yes
4. Processes to be managed to minimise emissions	Inspection and discussion with consent holder	Yes
5. Design and operation such that discharge of contaminants during charging, other than through the stack, are prevented	Inspection	Yes
6. Cremator and ducting to be gas tight such that discharge of gases, other than through the stack, are prevented	Inspection	Yes
7. Minimum stack height of 8 m above ground level	Inspection	Yes
8. Flue and ducting to be adequately insulated to prevent specified effects	Inspection	Yes
9. Discharges shall not result in offensive or objectionable odours at or beyond the boundary	Odour survey at inspection	Yes
10. Definitions of offensive and objectionable odours for the purpose of condition 9	N/A	N/A
11. Secondary chamber and it's outlet to be above 800°C, with steps to be taken to increase temperature if it falls below 870°C	Inspection and discussion with consent holder	Yes
12. Quantity of materials listed in Australasian guidelines, to be minimised within cremator	Inspection and discussion with consent holder	Yes
13. External metal and PVC fittings to be removed from caskets	Inspection and discussion with consent holder	Yes
14. Consultation and necessary approvals required prior to alterations to the plant, process, or operations	Inspection and discussion with consent holder. No changes	N/A
15. Cremator shall have two combustion zones with specified minimum residence time and temperature in second chamber. As built diagrams and drawings demonstrating compliance to be provided prior to exercising consent	Built as proposed	Yes
16. Interlock required to prevent charging of cremator unless secondary chamber temperature is above 800°C	Confirmed at inspection	Yes
17. Stack emissions to be free from visible smoke (definition provided)	Inspection. Slight visible emissions noted on one inspection that did not fall outside the definition of "Free from visible smoke"	Yes

Condition requirement	Means of monitoring during period under review	Compliance achieved?
18. Limits minimum oxygen concentration at outlet of secondary chamber (6 %)	Not monitored. Meter to be installed if adverse effects noted	N/A
19. Limits maximum carbon monoxide concentration at outlet of secondary chamber (100 mg/m ³)	Not monitored. Meter to be installed if adverse effects noted	N/A
20. Opacity of exhaust gasses to be continuously monitored and recorded	Records checked at inspection	Yes
21. Temperature of secondary chamber to be continuously monitored and recorded	Records checked at inspection	Yes
22. 24 hrs advance notice required of maintenance that may affect specific aspects of the cremator	One advance notification received prior to commissioning of cremator	Yes
23. Provision, within 3 months of exercise of the consent, of maintenance and calibration schedule	Review of Council records. Previously provided	N/A
24. Discharge not to result in hazardous or toxic or noxious conditions at or beyond boundary	Off-site survey at inspection	Yes
25. Provision of monitoring, calibration and process control data upon request	Viewed at inspection	N/A
26. Limits maximum downwind concentration of sulphur dioxide and nitrogen dioxide	Not assessed during years under review	N/A
27. Consent to lapse 5 yrs after granting, or longer period set by Council, if not exercised	Consent exercised	N/A
28. Opportunity for review	No further opportunities for review	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		High
Overall assessment of administrative performance in respect of this consent		High

During the period under review, W Abraham Limited demonstrated a high level of environmental and high level of administrative performance and compliance with the resource consent as defined in Section 1.1.4.

18.3.4 Alterations to monitoring programmes for 2014-2015

In designing and implementing the monitoring programmes for air/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 RMA in terms of monitoring emissions/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 emitting to the atmosphere/discharging to the environment.

It is proposed that for 2014-2015 the monitoring programme remains unchanged. A recommendation to this effect is attached to this report.

18.4 Recommendation

THAT monitoring programmed for consented activities of W Abraham Limited in the 2014-2015 year continues at the level programmed for 2012-2014.

19. Inspections at unconsented sites

There are many companies in the Mangati catchment that are not required to hold permits to discharge stormwater as the activity is permitted under Rule 23 of the RFWP (Appendix IV). Several of these companies are inspected in the 'industrial inspection round' and during the course of investigations into unauthorised discharges in the Mangati catchment.

The outcomes of these inspections are given below.

19.1 Burmark Industries Limited

Burmark Industries Limited operates a light engineering facility manufacturing home furnishings at Unit 8, 39 Connett Rd, Bell Block. Activities undertaken at the site include a spray booth and workshop.

The site was inspected on 29 April 2013. It was reported that there were very few contaminants stored on the premises and that the site was tidy.

19.2 Coca-Cola Amatil (NZ) Ltd

This site is located on the corner of Connett Road and Paraita Road. The site is leased from Hooker Bros Investments Limited, and is within the area covered by that Company's consent. An inspection was carried out at this site on 5 August 2013. No objectionable odours or visible emissions were found during the inspection. No washing was occurring outside at the time of the inspection, and the stormwater catchment was clear of spills.

19.3 Core Laboratories

This site is located in one of the units at 39 Connett Road. The Company processes rock samples for the oil industry. Salt water is used to wash the samples, with the small amounts of water used being recycled. Small amounts (less than 5 L) of adhesives are stored.

The site was not inspected during the 2012-2014 period.

19.4 Doorworx (New Plymouth)

This site is located at 39c Connett Road West. The Company supplies pre-hung interior doors and exterior doors. No significant contaminants were found to be stored on site during the inspection on 29 April 2013.

19.5 Fisher Concrete Pumping

Fisher Concrete Pumping is located at 31 Connett Road West. The Company offers services including: concrete pumping, concrete slab placements, basement work and concrete flooring, concrete foundations and driveways, and general concrete contracting.

The site was visited on 24 April 2013. The new wash down and recycling area had been completed. An aggregate trap had been constructed, with wash water entering a series of settling tanks to recycle via a pump for re-use. Run off from the second wash down pad passes through a three-stage interceptor system and this can be shut off from the stormwater drain in the event of a spill. The yard area is now fully contained.

The site appeared to be well managed and maintained during an inspection on 8 May 2014. The yard area contained some concrete moulds which were used to collect any leftover concrete from the trucks and the area was fully contained.

19.6 Howard Wright Limited

This site is located at 10 Parait Rd, Bell Block. Activities at the site are related to the manufacture of hospital beds; including metal fabrication, powdercoating and assembly areas.

An extraction system is in place for the coating operations.

There is a parts wash on site. All activities are contained within the building, and all wastewater is directed to the tradewaste sewer. Rainwater off the building and carpark goes to the NPDC stormwater system.

The site was inspected on 8 July 2013. There was no noticeable dust or odour beyond the site boundary. All likely contaminants were found to be stored well. It was noted that the workshop was very tidy and well managed. The chemical wash area is bunded, and washings are pumped to IBC's and taken off site.

19.7 Ireland Roding & Construction Limited

This is a roading and construction contractor yard located at 21 De Havilland Dr West, Bell Block. Activities occurring on site include the storage and maintenance of earth moving, roading and construction vehicles and equipment, including washing, and also gravel, bitumen and diesel storage.

Stormwater from the site flows overland, directly to the Mangati Stream, which forms the eastern boundary of the site. Wastewater from vehicle washing goes to land, and the Company has previously been advised that this must be managed carefully as it may result in contamination of stormwater.

The site was visited on 30 July 2013. Waste oil was found to be stored in an IBC and emptied by contractor as required (approximately every two months). The diesel tank was situated in a bund. Stormwater drains around the site were observed to be visually clear of contaminants. Staff explained that sand was used to contain and clean up any spills around the site.

19.8 Mainland Products Limited

This site is used by a number of trucking companies including Chill Freight Limited as a depot for storage and distribution of milk and other packaged goods.

The site occupies an area of 0.93 ha, of which 0.35 ha is roofed or paved. The stormwater catchment around the goods transfer and truck-wash areas is directed to tradewaste sewer. The remainder discharges to the Bell Block industrial drain immediately above the outlet from the underground system.

The drainage system for the old milk processing plant developed in a confused pattern as a result of the several plant expansions and changes in processing methods. Historical dye tests carried out by the Council led to the blocking off or diversion of some process effluent drains.

A contingency plan in case of spillage was in place at the time that Mainland took the site over. The plan was part of an environmental management plan produced by Kiwi Co-operative Dairies Limited. The Council has provided guidance on the requirements of a contingency plan. At the end of the 2003-2004 monitoring period it was reported that a small contingency plan was being developed for the site. At the time of writing this report, an updated contingency plan had not been received. However, as monitoring during the 2007-2009 years found that there were now no hazardous substances on the site, and the Council did not require the consent to be renewed, a contingency plan was no longer required.

The site is inspected occasionally as part of the industrial inspection round, although no inspections were undertaken at the site during the period under review.

Due to periodic elevated zinc concentrations from an unidentified source being found in the discharge, monitoring of this combined discharge has continued.

19.8.1 Discharge monitoring

Stormwater discharged from Mainland's site is monitored at up to three points before it reaches the Mangati Stream (Figure 2 sites 11, 10 and 8). Other discharges contribute to the flow at each monitoring point. The primary monitoring site is at the plant boundary, at the drop-structure immediately above the outlet of the industrial stormwater drain (site 11). The results from chemical monitoring at site 11 are given in Table 62.

Stormwater from the Halliburton's site including the lower yard (formerly Hookers/Schreiber Transport) may also influence the results observed.

The discharge was sampled on three occasions during the monitoring periods under review. The permitted activity limits for oil and grease, pH, and suspended solids were observed as being complied with. Although the total and dissolved zinc concentrations on the 3 July 2012 and the dissolved zinc on 24 June 2014 were above their respective historical medians, they were still less than one third of the maximum concentration found for these parameters at this monitoring location.

Table 62 Chemical monitoring results for stormwater discharged from Mainland Products beverage storage plant to Bell Block industrial drain for 2012-2014 (site 11), with a summary of previous monitoring data. TRC site code STW001048

Date	Condy mS/m	O&G g/m ³	pH pH	SS g/m ³	Temp Deg.C	Turby NTU	ZnAs g/m ³	ZnD g/m ³
<i>Permitted activity Limits</i>	-	15	6 - 9	100	-	-	-	-
Number	43	29	43	41	40	18	26	25
Minimum	1.2	<0.5	6.2	2	9.8	5	0.016	<0.005
Maximum	20.6	83	7.6	670	22.3	540	1.71	1.44
Median	10.7	1.0	6.8	28	15.8	21	0.405	0.240
03-Jul-12	5.4	a	6.8	26	10.5	28	0.513	0.413
03-Sep-12	2.5	a	7.5	48	13.5	28	0.028	<0.005
11-Dec-12 ^b	-	-	-	-	-	-	-	-
03-Apr-13 ^b	-	-	-	-	-	-	-	-
06-Nov-13 ^b	-	-	-	-	-	-	-	-
26-Feb-14 ^b	-	-	-	-	-	-	-	-
24-Jun-14	17.3		6.7	2	14.4	2.8	0.324	0.308

Key: Results shown in bold within a table indicates that the permitted activity limit for a particular parameter has been exceeded

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

b not discharging at time of sampling survey

19.9 RHT (NZ) Limited

This Company is located at 1 Okey Lane and is involved in the fabrication and testing of radiators for electrical transformers. The Company was formerly part of ABB Ltd.

Wastewater is produced at the site from the use of clean water to pressure test heaters/pipework. The majority of stormwater from the site is directed to soak holes in a neighbouring paddock, but some overland flow occurs from the yard to the NPDC reticulated system to the Mangati Stream via the road drains. ABB's comprehensive response plan has been retained.

The site was not inspected during the 2012-2014 period.

19.10 Specialist Engineering Services Limited

Specialist Engineering Services Limited operates a light engineering facility at 39A Connett Road Bell Block. At previous inspections it has been found that there was no work carried out outdoors, and therefore it was considered that there was minimal potential for any effects on the Mangati Stream. A small amount of waste oil is collected on site, which is stored in 20 L containers and collected by Transpacific as required.

The site was inspected on 24 April 2013. The site was found to be satisfactory, with contaminants well contained.

19.11 SRS Taranaki

SRS Taranaki assembles cable drums on their site at 69 Paraite Rd, Bell Block. Site stormwater drainage is via the NPDC reticulated stormwater system and there are no processes on site that result in the generation of waste water. All assembly occurs within the building and the untreated timber and completed drums are stored on a sealed area outside.

The majority of the flanges are prefabricated in Christchurch, so on site work is mostly assembly. Cutting and sanding equipment have dust extraction systems directed to filter/collection bags, which are emptied by Waste Management regularly.

The site was inspected on 10 June 2013. There were no noticeable odours or dust beyond the boundary at the time of the inspection. A small amount of contaminants were stored on site and these were well contained.

19.12 Superior Balustrade Systems [NZ] Ltd

This site is in unit 9 of the small industrial units located at 39 Connett Road. The site was inspected on 29 April 2013. The area was tidy at the time of inspection, with no significant contaminants stored on site.

19.13 Taranaki Powdercoating Limited

Taranaki Powdercoating Limited operates a powdercoating facility in a unit at 39 Connett Road Bell Block. The site was not inspected during the 2012-2014 period.

19.14 Turners and Growers

The Turners and Growers fruit and vegetable wholesaling depot located on Paraite Road, adjacent to Hooker Bros Investments Limited, was inspected on 22 July 2013. No objectionable odours or visible emissions were observed during the visit. No washing was occurring and the stormwater catchments looked clear. The bin area was tidy and no leachate was observed.

19.15 Valve Maintenance New Zealand

Valve Maintenance New Zealand now occupy the previous Connett Engineering site at 39b Connett Road. The facility was still under construction at the time of the inspection on 29 April 2013, and there were no significant contaminants stored on site. The site manager explained that a wash down bay was to be constructed within the unit. This would be contained, with contaminants discharged to a separator where they would be stored in a holding facility for collection.

19.16 Vause Oil Production Service

Vause Oil Production Service provides oil field services at their site at 9 De Havilland Drive. Activities at the site include oil field equipment testing, washing, maintenance and storage; and logistics.

At a previous inspection it was found that there was a multi-stage interceptor on the washpad and a fully contained sump. Any wastewater generated is directed to the sump which is cleaned out regularly. Stormwater from the metalled top yard and sealed lower yard is directed through the interceptor prior to entering the NPDC drain, which flows to the Mangati Stream. Portable diesel tanks are stored on site, and although they are generally empty, the storage area for these tanks is bunded.

There is a 300 m deep training well on the site.

A site inspection was undertaken on 6 July 2012. The site was found to be tidy and well managed. The Company has installed a large wash pad with sump, shut-off valve and a three stage interceptor system at the end of the stormwater network before it discharges out into the NPDC stormwater pipeline along De Havilland Drive.

20. Investigations, interventions, and incidents

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

There were a total of 33 unauthorised incidents recorded on the Council's database in the Mangati catchment during the 2012-2014 period: 20 were water related, and 13 were air related incidents. 13 of the incidents were discovered during the course of routine monitoring and four were as a result of self-notification by the responsible party, and 16 were as a result of complaints received by Council.

A summary of the responsible parties, and whether or not the incident could be substantiated, is provided in Table 63.

The activities of industries monitored routinely under the Mangati Catchment Monitoring Programme accounted for 18 of the incidents, and they are therefore discussed in the section of the report describing the monitoring outcomes of the industries in question.

The monitored industries for which incidents were recorded were: Greymouth Petroleum Acquisitions Company Limited (1), Halliburton New Zealand Limited (2), Hooker Bros Investments Limited (1), McKechnie Aluminium Solutions (1), New Plymouth District Council (2 substantiated, 1 unsubstantiated), Tasman Oil Tools (2), Tegel Foods Feed mill (1), Tegel Foods Poultry Processing Plant (4 substantiated, 3 unsubstantiated).

The remaining 15 incidents are discussed further below.

Endeavour Holdings Ltd 15 November 2012

A complaint was received concerning an odour in the Connett Road area of Bell Block. An odour survey was undertaken in the area and only a noticeable odour was found. This was traced to Osflo fertiliser being spread on a nearby paddock. It was reported that the odour could possibly have been stronger prior to the inspection.

Table 63 Summary of the number of unauthorised incidents discovered and complaints received relating to activities in the Mangati catchment

Company	Number of substantiated incidents/complaints	Number of unsubstantiated incidents/complaints
Mangati catchment joint monitoring programme		
ABB Limited	0	0
BLM Feeds Limited	0	0
Conveyorquip Engineering Services Limited	0	0
Greymouth Petroleum Acquisitions Company Limited	1 (water)	0
Halliburton New Zealand Limited ^a	2 (water)	0
Hooker Bros Investments Limited	1 (water)	0
McKechnie Aluminium Solutions Limited	1 (water)	0
MI New Zealand Limited	0	0
Vector Gas Limited	0	0
New Plymouth District Council	2 (water)	1 (water)
Olex New Zealand Limited – A Nexans Company	0	0
OMV New Zealand Limited	0	0
Schlumberger Seaco Incorporated	0	0
Tasman Oil Tools Limited	2 (water)	0
Tegel Foods Limited – feed mill	1 (water)	0
Tegel Foods Limited – poultry processing plant	4 (water)	3 (odour complaints)
W Abrahams Limited	0	0
Other monitored/consented industries		
MiLife New Plymouth Limited ^a	1 (air)	2 (air)
Permitted activities		
Endeavour Holdings Ltd	0	1 (air)
Endurance Holdings Ltd	0	1 (air)
Ms Turner	0	1 (air)
Natural event	0	1 (water)
Unsources^a	2 (water)	2 (water), 4 (air)
Total	17	16

Key: An abatement notice was subsequently issued

Endurance Holdings Ltd

29 April 2014

At 10:32 am a complaint was received regarding objectionable odours impacting a property in Bell Block, New Plymouth. Investigation at 18:00 found that there was a light southerly wind at the time of inspection. Only noticeable chicken litter odours were extending beyond the site boundary and impacting on properties along Mangati Road. It was reported that chicken litter fertiliser had been spread in the paddock on the southern side of Devon Road. Endurance Holdings Limited was instructed to ensure that no objectionable odours discharged beyond the site boundary. The Company was informed that the best practicable option would be to spread the chicken litter fertiliser prior to rain, that would wash the odorous material into the land and prevent the activity from impacting on neighbouring properties.

Ms Turner

19 September 2012

On 19 September 2012 a complaint was received concerning smoke from a fire at a property on Paraita Road. Investigation found that dried wisteria prunings

were being burnt. No effects were occurring off-site, however it is possible that there had been effects earlier. The property owner was putting out the fire when the officer arrived on site, she explained that the wind was favourable when the fire was lit but that it had changed.

MiLife New Plymouth Limited

9 November 2012

A complaint was received concerning dust emanating from the property at Corokia Street, Bell Block. Investigation could find no dust discharging beyond the boundary at the time of inspection. The building company were advised to take all practical measures to prevent dust discharging off site.

20 February 2014

A complaint was received regarding dust discharging from a construction site at Bella Vista Retirement Village, Mangati Road, Bell Block. Investigation found that no dust was being discharge from the site at the time of the inspection.

At the time of the inspection the weather was fine with a slight swirling breeze. No activity was taking place on site at the time of the inspection and no dust was found to be travelling off-site. The complainant advised that the dust was worst when heavy machinery was in operation on site (trucks etc). The Company was asked to consider taking action during periods of dry weather to ensure that no dust was emitted from the construction site. The Company was also informed that no further action would be undertaken by Council in relation to this complaint.

23 February 2014

A complaint was received regarding dust discharging from a construction site at Mangati Road, Bell Block.

At the time of inspection the weather was dry and a gusty wind was noted travelling across the site towards Mangati Road. It was observed that wind gusts were lifting fine dust from the site and carrying it off site across Mangati Road. Dust was observed leaving the site on a number of separate occasions during the inspection. No dust suppression measures were evident on site at the time of inspection. A card with details of inspection was left at the reception block at the retirement village. The Manager was contacted and advised of the situation. The building contractor was then phoned and the situation was explained. It was agreed that building contractors would take action to address the dust issue. Abatement notice EAC-20186 was issued requiring the Company to undertake works to ensure that no objectionable or offensive level of dust were discharged beyond the boundary of the site.

Reinspection found that the abatement notice was being complied with at the time of the follow up inspection.

Natural Event

27 February 2014

A complaint was received alleging that the Mangati Stream had been dammed because nothing was flowing downstream. An inspection of the stream found that there was low flow. A film on the surface was causing leaves and twigs to remain

stationary which led the complainant to believe that the stream had been dammed. The stream was flowing both up and downstream and at the incident point.

Un sourced

6 May 2013

Notification was received from NPDC advising that a stormwater manhole lid on the road had lifted due to heavy rainfall and a car had subsequently run over the manhole, causing hydrocarbons to spill onto the road. Transpacific were contracted to suck the hydrocarbons out of the stormwater drain. An inspection of the site found the stormwater drain and kerbside clear of hydrocarbons, but a 2m² area on the road (25m from the manhole) still contained hydrocarbons in concentrations that would be likely to cause effects if not removed. NPDC was contacted and advised that further remediation works were required. Re-inspection found works had been carried out to remove excess hydrocarbons from the road. NPDC were thanked for their assistance.

27 May 2013

A complaint was received concerning stock dying as a result of drinking water out of the Mangati Stream at a property on Connett Road, Bell Block. Investigation found that the dead animals had already been buried. Samples were collected from the stream, and analysis of these did not detect any contamination. An inspection for poisonous plants was also undertaken, none were found. The landowner was advised to contact a vet in regards to animal health. The landowner was also reminded that under the rules of the RFWP stock should not be accessing any waterbodies.

24 August 2013

A complaint was received concerning an odour on Paraita Road, Bell Block. An inspection found a gusty north easterly breeze blowing and no odour could be sourced.

7 January 2014

At 11:35 am a complaint was received regarding an offensive odour at a Paraita Road industrial property. The complainant had advised that the odour had been present since 10:30 that day, however the odour could no longer be detected at time of investigation (12:05). The odour was described as a hydrocarbon type odour however its source was unable to be identified and no further action was taken, other than requesting that the complainant make contact again should the odour return.

21 February 2014

A complaint was received concerning odour near the industrial area on Paraita Road, Bell Block. An odour survey was undertaken by Council staff but no odour was detected in the area. It was reported that a similar complaint was received the following day in which an odour (that was not considered to be objectionable) was detected and tracked to the Tegel processing plant.

1 April 2014

During unrelated monitoring sewage fungus was found in the Mangati Stream near De Havilland Drive, Bell Block.

Samples (Table 64) and photographs were taken. Extensive inspections of properties and drainage systems upstream were undertaken with the assistance of NPDC's maintenance contractor.

Table 64 Unauthorised discharge from De Havilland Drive stormwater system/tributary true right bank, April 2014

Date	Location	BOD g/m ³	Condy mS/m	FC /100mL	NH ₄ g/m ³ -N	pH	Temp °C
01-Apr-14	At end of the stormwater pipe GPS E699979 N5678242	67	29.9	7700	0.038	7.2	18
01-Apr-14	Upstream of De Haviland Drive GPS E1700024 N5678187	2.2	24	990	0.299	7.2	15.1
02-Apr-14	At end of the stormwater pipe GPS E699979 N5678242	150	39.4	15000	0.118	7.1	15.6

No unauthorised discharges were found, and it was noted that further inspections would be undertaken during routine compliance monitoring.

It was also noted that polymerase chain reaction microbial source tracking would be undertaken in spring 2014 at about five or six sites, in dry weather when groundwater levels are high, to help identify the potential source(s) of the bacterial contamination.

Subsequently a truckwash discharge was found at J Swap Contractors Limited's site (12 August 2014, reference IN/30927), which was thought to have caused the sewage fungus in this incident.

Abatement Notice EAC-20460 was issued to J Swap Contractors Limited requiring any discharge to comply with the RFWP. The Company agreed to obtain a resource consent for the stormwater discharges. All other discharges were to be redirected to the trade waste system. Reinspection found that the abatement notice was being complied with.

These matters will be discussed further in the report covering the 2014-2015 monitoring year.

18 May 2014

A complaint was received regarding smoke being generated as a result of open air burning. Smoke was not observed at time of investigation and the fire could not be located. It was thought that the smoke from the fire was most likely to have been coming from lifestyle properties between Pohutakawa Drive and SH3. It was noted that this was therefore NPDC's matter under RAQP. The complainant was informed of the outcome of the investigation

26 May 2014

A complaint was received regarding hydrocarbons in the Mangati Stream at Bell Block Beach. Inspection of the Mangati Stream found no evidence of hydrocarbons. The rocks and the beach were also free of hydrocarbons

21. Chemical monitoring of combined discharges

21.1 Unnamed tributary between De Havilland Drive West and Connett Road West

Discharges from Tasman Oil Tools and Greymouth Petroleum sites, along with part of the Vector site, reach the Mangati Stream via an open drain that flows into the Mangati Stream approximately half way between De Havilland Drive West and Connett Road West.

Copper, lead and zinc are monitored at this site because it was known that these heavy metals were present in the preservation grease used in the 1980's. At that time the grease was washed from the pipes, with the washwater from this activity discharged onto land and then into the Mangati Stream via the sites' stormwater basins. Although the grease currently used does not contain these elements, it has been identified that historical practices at the sites have resulted in elevated concentrations of copper, lead and zinc at particular on-site locations and in the sediments of the open stormwater drain to the Mangati.

The results of historical sediment sampling undertaken in the Mangati Stream, in the vicinity of the discharge point of the unnamed tributary into which the De Havilland Drive pipeyards stormwater flows can be found in Technical Report 02-82. In summary, this sampling showed that there was no evidence of significant adverse environmental effects in the Mangati Stream streambed sediment as a result of current and historical activities at the pipeyards. The Council intends to continue to monitor the situation.

Table 65 Chemical monitoring results for the combined stormwater discharge – unnamed tributary downstream of De Havilland Drive for 2012-2014 (Figure 2, site 30), with summary of previous data. TRC site MGT000495

Date	Condy mS/m	CuAs g/m ³	CuD g/m ³	O&G g/m ³	PbAs g/m ³	pH pH	SS g/m ³	Temp Deg.C	Turby NTU	ZnAs g/m ³	ZnD g/m ³
<i>Tasman Oil Tools Consent Limit</i>	-	-	0.05	15	-	6-9	100	-	-	-	0.65
number	38	27	17	27	26	38	37	36	17	30	14
minimum	3.1	<0.01	<0.01	<0.5	<0.05	6.3	2	10.4	11	0.013	0.024
maximum	404	0.27	0.02	46	0.36	8.0	680	22.3	720	0.890	0.196
median	8.0	0.04	0.01	1.4	<0.05	7.0	31	15.0	190	0.204	0.056
03-Jul-12	16.6	0.06	<0.01	a	<0.05	6.6	240	9.1	630	0.232	0.081
03-Sep-12	4.8	0.10	<0.01	2.8	0.07	7.4	290	12.6	300	0.284	0.028
11-Dec-12 ^b	-	-	-	-	-	-	-	-	-	-	-
03-Apr-13 ^b	-	-	-	-	-	-	-	-	-	-	-
06-Nov-13	11.3	0.13	0.02	a	0.11	7.2	290	15.6	450	0.350	0.104
26-Feb-14 ^b	-	-	-	-	-	-	-	-	-	-	-
24-Jun-14 ^b	-	-	-	-	-	-	-	-	-	-	-

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

During the period under review acid soluble copper, lead and zinc levels were again generally higher than the median values recorded for this site, at the discharge point to the stream. This is a trend that has continued since the 2006-2007 monitoring year. The dissolved metals, suspended solids and turbidity were also generally above median. The turbidity of the sample collected on 3 July 2012 was the second highest on record. On this occasion at the time of sampling, only Tasman Oil Tools was discharging stormwater.

On all occasions when there were flows from the Greymouth Petroleum (3 September 2012 and 6 November 2013) and Tasman Oil Tools (3 July 2012, 3 September 2012 and 6 November 2013) the suspended solids concentrations were above those permitted by the company's resource consents, and there were copper, lead and zinc concentrations present in those discharges that were generally at or above median concentrations for the respective monitoring sites.

It has already been noted in previous reports that there appears to be a strong association between high levels of total metals and high suspended solids concentrations in the discharge, suggesting that the primary source of acid soluble metals is contaminated soil. It has also been found that the acid soluble zinc is generally slightly higher in relation to the suspended solids content in the discharge from the Tasman Oil Tools, than it is from the Greymouth Petroleum site.

21.2 Industrial stormwaters and the wetland discharges

Twelve of the seventeen licensed discharges to the Mangati Stream occur via the New Plymouth District Council drainage and wetland system. The wetlands routinely discharge to the stream at up to two points immediately above the main highway (SH3).

The stormwater drainage system is designed to divert low flows, and therefore, the potentially more concentrated 'first flush' of stormwater down to the bottom of Connett Road and into pond 1. Pond 1 flows through a further two ponds (ponds 2 and 3) prior to discharge to the stream. This allows more time for settling and for natural process to reduce the concentration of some of the contaminants that may be present. The level of pond 3 is controlled by a weir at the outlet above the stream. The discharge is monitored immediately downstream of this weir (TRC site code STW002056, Figure 3; site 38, Figure 2).

Under normal conditions the remainder of the stormwater flow continues to be directed through the 'industrial drain outlet' (TRC site code STW001026, Figure 3; site 10, Figure 2) into the existing man-made watercourse, which now flows in to pond 4. Pond 4 discharges preferentially to pond 3, but will discharge directly to the stream if the water level gets sufficiently high (TRC site code STW002055, Figure 3; site 37, Figure 2).

There is an extension to the existing open drain that allows stormwater to bypass the ponds altogether during very high rainfall events (TRC site code MGT000503, Figure 3; site 8, Figure 2). The drainage system is generally monitored at up to six points in order to help differentiate the effects of inflows from a large number of sources. The monitoring points are at the Mangati confluence, at the exit of the underground system to both ponds 1 and 4 and at three points where the main underground

stormwater pipe runs under Connett Road. Other points may be monitored when tracing unauthorised discharges.

The results of chemical analysis of samples taken from the in ground stormwater drainage system at the inlet to pond 1 are given in Table 66 and those taken at the 'industrial drain outlet' are given in Table 67.

The results for the treated discharge from pond 3 to the stream are given in Table 68. Historically, it has been found that, although pond 3 has been discharging to the stream on all monitoring occasions, pond 4 discharges directly to the Mangati Stream infrequently, and this was the case during the 2012-2014 years, with only two samples being collected (Table 69).

The bypass drain was found to be flowing during all three of the wet weather sampling runs, and one of the dry weather surveys during the period under review (Table 70). A summary of the results for the old industrial drain outlet monitoring site MGT000503 has also been included for comparison purposes. The corresponding results for the years under review at the other Connett Road stormwater sites may be found in Appendix II.

Table 66 Chemical monitoring results for stormwater discharged to pond 1 from Connett Road for 2012-2014 (site 33), with a summary of previous monitoring data. TRC site code STW001055

Date	BOD g/m ³	COD g/m ³	Condy mS/m	CuAs g/m ³	CuD g/m ³	DRP g/m ³	NH3 g/m ³ -N	NH4 g/m ³ -N	O&G g/m ³	pH pH	Temp Deg.C	Turby NTU	ZnAs g/m ³	ZnD g/m ³
Number	10	12	241	5	4	5	6	16	42	241	71	27	6	4
Minimum	0.2	53	1.0	<0.01	<0.01	<0.004	0.00003	<0.003	<0.5	4.1	10.2	1.4	0.014	0.068
Maximum	2900	5200	335	0.02	0.02	5.33	0.00118	9.37	29	8.4	25.2	240	0.310	0.262
Median	17	190	20.8	0.01	0.01	0.029	0.00038	0.048	<0.5	7.6	15.6	10	0.100	0.116
03-Jul-12 ^c	7.1	-	4.1	0.02	<0.01	0.087	0.00049	0.336	a	6.8	10.0	13	0.173	0.119
03-Sep-12 ^c	3.2	-	1.6	0.01	<0.01	0.028	0.00014	0.047	a	7.0	13.3	7.4	0.125	0.082
11-Dec-12	31	99	66.4	0.02	0.01	0.036	0.00068	0.021	0.8	7.9	18.1	9.9	0.270	0.116
03-Apr-13	6.9	-	10.3	0.03	0.02	0.206	0.01251	1.40	a	7.3	19.2	1.5	0.206	0.187
06-Nov-13 ^c	2.9	-	17.9	0.01	0.01	0.011	0.00039	0.280	a	6.6	15.9	6.8	0.170	0.146
26-Feb-14 ^b	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24-Jun-14	0.5	-	15.1	<0.01	<0.01	0.012	-	0.049	<0.5	6.6	-	0.63	0.110	0.107

Key: Results shown in bold within a table indicates results outside desirable range of Regional Freshwater Plan Rule 23
a parameter not determined, no visible hydrocarbon sheen and no odour
b not discharging at time of sampling survey
c wet weather surveys

There are no limits on the NPDC consent for any given parameters, however the consents held by industries in the catchment and Rule 23 of the RFWP for permitted stormwater discharges provide limits on the concentration of suspended solids (100 g/m³), pH (range 6-9), biochemical oxygen demand (5-50 g/m³), unionised ammonia (0.025 g/m³), and oil and grease (15 g/m³). In the case of BOD, consent limits have been set such that, at the point of discharge into the ponds, the BOD concentration is intended to be at a maximum of 5 g/m³. The results obtained for these parameters of the combined stormwater discharges to pond 1 were within those limits, with the exception of BOD in the samples collected during

the wet weather survey on 3 July 2012, and the dry weather surveys on 11 December 2012, and 3 April 2013. The BOD's on 3 July 2012, and 3 April 2013 were only marginally above the maximum desirable concentration, and the contaminants responsible would be easily attenuated by the wetland system. On 3 July, both Hookers and Tegel feedmill exceeded their BOD component concentrations given in their consents with the results obtained being 12, 65, and 16 g/m³ for the three Hookers discharges and 94 g/m³ for the Tegel feedmill discharge. During the dry weather surveys, the source of the elevated BOD's was unknown, as most of the monitored discharge points into the system were either not flowing, or the flow was too low to sample, and it was confirmed that the BOD of the discharge from the Tegel feedmill on 11 December 2012 was only 10 g/m³ (well below both the permitted concentration and the concentration found at STW001055 and STW001026).

It is noted that the samples collected on 11 December 2012 and 3 April 2013, from both the discharge into pond 1 and the industrial drain outlet (Table 67), were atypical for these discharge locations.

On 11 December 2012 not only were the BOD's and conductivities high, but so were the zinc concentrations at the pond 1 inlet. Both discharges were also a little atypical in regard to the pH's, which were above median, and the ammoniacal nitrogen's, which were less than half the respective medians.

In contrast, along with the elevated BOD's and metals, the discharges on 3 April 2013 contained ammoniacal nitrogen concentrations that were about 20 times median, and unionised ammonia concentrations above the desired level of 0.025 g/m³.

Table 67 Chemical monitoring results for industrial drain outlet for 2012-2014 with a summary of previous monitoring data. TRC site code STW001026 (site 10)

Date	BOD g/m ³	COD g/m ³	Condy mS/m	CuAs g/m ³	CuD g/m ³	DRP g/m ³	ECOL /100mL	ENT /100mL	FC /100mL	NH3 g/m ³ -N	NH4 g/m ³ -N	O&G g/m ³	pH pH	Temp Deg.C	Turby NTU	ZnAs g/m ³	ZnD g/m ³
Number	23	3	154	68	44	24	31	36	37	63	65	58	156	72	26	68	43
Minimum	1.9	13	1.2	<0.01	0.010	<0.003	2	<9	2	0.00001	<0.003	<0.5	6.5	9.8	1.1	0.042	0.025
Maximum	330	29	79.7	0.62	0.107	2.86	27000	110000	28000	6.1253	13.3	62	9.4	27.1	110	2.24	1.18
Median	4.5	29	14.9	0.05	0.02	0.032	77	5200	150	0.00108	0.145	1.4	7.4	16.1	15	0.394	0.219
03-Jul-12	10	-	4.8	0.03	0.01	0.134	-	-	-	0.00227	0.516	a	7.3	9.5	34	0.362	0.229
03-Sep-12	5.2	-	2.2	0.02	0.01	0.034	-	-	-	0.00046	0.080	a	7.3	13.3	21	0.233	0.109
11-Dec-12	28	94	61.9	0.02	0.01	0.118	23	<23	23	0.00270	0.055	-	8.1	17.8	5.3	0.290	0.182
03-Apr-13	12	-	17.5	0.04	0.03	0.326	-	-	-	0.03833	2.84	-	7.5	18.6	19	0.516	0.294
06-Nov-13	4.3	-	3.3	0.02	<0.01	0.048	-	-	-	0.00312	0.112	-	7.9	16.1	36	0.210	0.054
26-Feb-14 ^b	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24-Jun-14	0.7	-	18.0	<0.01	<0.01	0.017	200	3400	200	0.00103	0.320	<0.5	7.0	14.7	5.4	0.195	0.177

Key: Results shown in bold within a table indicates results outside desirable range of Regional Freshwater Plan Rule 23
a parameter not determined, no visible hydrocarbon sheen and no odour
b not discharging at time of sampling survey

Recent monitoring had shown that the dissolved reactive phosphorus and copper and zinc concentrations tended to be similar to or below the respective historical medians, and that the conductivity, oil and grease, and turbidity at these two monitoring locations were generally low.

During the period under review, with the exception of the atypical samples noted above, this trend appeared to have continued for the copper and zinc concentrations at the industrial drain outlet, and for the dissolved zinc at the inlet to pond 1. However, the dissolved zinc at the inlet to pond 1 was found to be above median on all monitoring occasions during the period under review.

The trend was not apparent in the dissolved reactive phosphorus concentrations, which showed quite a spread in results in relation to the historical medians, however, the concentrations were still relatively low given the nature of the stormwater catchment draining via these discharge points.

The monitoring results for the pond 3 and pond 4 discharges into the Mangati Stream are reported in Table 68 and Table 69.

On the whole, the quality of the discharges from both ponds was good throughout the period under review. There were no results above the historical maximum for any of the parameters monitored.

In comparing the quality of the discharge from pond 3 and pond 4, historically, it has been found that for the most part the quality of the discharge is very similar despite the extra retention time/treatment for the discharge exiting pond 3. The exception to this being for chemical and biochemical oxygen demand where pond 3 can return results significantly higher than those seen for pond 4. During the period under review, the discharge quality was generally similar for all parameters.

Table 68 Chemical monitoring results for pond 3 discharge to the Mangati Stream for 2012-2014. TRC site code STW002056 (site 38)

Date	AlAs g/m ³	BOD g/m ³	COD g/m ³	Condy mS/m	CuAs g/m ³	CuD g/m ³	DRP g/m ³ -P	ECOL /100mL	ENT /100mL	FC /100mL	NH ₃ g/m ³ -N	NH ₄ g/m ³ -N	O&G g/m ³	PbAs g/m ³	pH	SS g/m ³	Temp °C	Turby NTU	ZnAs g/m ³	ZnD g/m ³
Number	29	33	29	37	32	34	33	8	8	8	31	31	16	28	37	34	35	29	32	33
Minimum	<0.1	1.1	<5	3.8	0.003	0.002	<0.003	<7	<7	<7	<0.00001	0.007	<0.5	<0.05	4.8	3	10.9	5.9	0.020	0.010
Maximum	0.80	150	280	43.5	0.040	0.026	1.16	8700	8700	11000	0.00452	1.48	49	<0.05	7.5	110	24.2	41	0.348	0.335
Median	0.20	6.1	18	14.2	0.015	0.007	0.010	625	315	645	0.00049	0.142	<0.5	<0.05	6.9	16	17.7	10	0.170	0.128
03-Jul-12	0.20	2.1	<5	19.6	0.007	0.001	0.013	-	-	-	0.00089	0.809	a	<0.05	6.7	9	9.5	8.8	0.194	0.129
03-Sep-12	0.77	5.1	16	8.9	0.013	0.006	0.025	-	-	-	0.00062	0.344	a	<0.05	6.8	16	13.1	12	0.242	0.195
11-Dec-12	<0.1	5.4	18	14.0	-	0.002	0.007	700	680	700	0.00008	0.009	a	<0.05	7.3	10	18.8	6.7	0.099	0.056
03-Apr-13	<0.01	5.5	15	12.9	0.005	0.004	0.031	1800	1400	19000	0.00452	1.21	a	<0.05	6.9	8	19.8	4.7	0.100	0.066
06-Nov-13	0.41	4.5	12	8.8	0.002	0.001	0.009	-	-	-	0.00032	0.172	a	<0.05	6.7	11	16.5	7.7	0.020	0.013
26-Feb-14	0.06	3.6	10	23.2	0.002	0.002	0.015	1700	380	1700	0.00060	0.152	a	<0.05	6.9	12	20.5	9.3	0.010	0.007
24-Jun-14	<0.1	1.6	6	15.4	0.004	0.002	0.010	1700	4100	1700	0.00080	0.749	<0.5	<0.05	6.6	4	12.3	4.9	0.178	0.166

Key: Results shown in bold within a table indicates results outside desirable range of Regional Freshwater Plan Rule 23
a parameter not determined, no visible hydrocarbon sheen and no odour
b not discharging at time of sampling survey

The acid soluble aluminium in the discharge from pond 3 was close to the historical maximum on 3 September 2012, but the copper concentrations were less than median, and the zinc concentrations only slightly above median in this sample.

Table 69 Chemical monitoring results for pond 4 discharge to the Mangati Stream for 2012-2014.
TRC site code STW002055 (site 37)

Date	AiAs g/m ³	BOD g/m ³	COD g/m ³	Condy mS/m	CuAs g/m ³	CuD g/m ³	DRP g/m ³ -P	NH3 g/m ³ -N	NH4 g/m ³ -N	O&G g/m ³	PbAs g/m ³	pH	SS g/m ³	Temp °C	Turby NTU	ZnAs g/m ³	ZnD g/m ³
Number	17	16	17	19	18	19	18	15	15	7	15	19	18	18	15	18	18
Minimum	<0.1	2.6	6	4.2	0.010	0.004	0.003	<0.00001	0.021	<0.5	<0.05	5.5	7	11.4	5.4	0.075	0.065
Maximum	1.6	98	100	39.6	0.045	0.023	0.595	0.00176	0.534	5.2	<0.05	8.8	53	21.8	34	0.349	0.304
Median	0.50	5.8	14	9.9	0.019	0.009	0.013	0.00030	0.152	0.6	<0.05	6.7	17	15.9	14	0.235	0.206
03-Jul-12 ^b	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
03-Sep-12	0.50	3.9	10	6.8	0.010	0.005	0.020	0.00043	0.236	a	<0.05	6.8	11	13.1	7.4	0.159	0.130
11-Dec-12 ^b	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
03-Apr-13 ^b	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06-Nov-13	0.52	4.5	20	10.6	0.011	0.006	0.009	0.00041	0.286	a	<0.05	6.6	14	16.2	13	0.198	0.164
26-Feb-14 ^b	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24-Jun-14 ^b	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Key: Results shown in bold within a table indicates results outside desirable range of Regional Freshwater Plan Rule 23
a parameter not determined, no visible hydrocarbon sheen and no odour
b not discharging at time of sampling survey

All the BODs were below median, however, three of the nine discharges exhibited biochemical oxygen demands slightly higher than allowed by the permitted activity rule in the RFWP (5 g/m³).

The copper concentrations were below median on all monitoring occasions, with a number of samples from pond 3 returning results below the previous minimum value. The zinc concentrations were generally similar to or below median, and again a sample collected during the period under review returned a result below the previous minimum value.

The ammoniacal nitrogen concentrations were generally above median and the result of 1.21 g/m³ found in the sample from pond 3 was the second highest on record for this monitoring location.

The monitoring results for discharge from the industrial drain into the Mangati Stream are recorded in Table 70.

As the stormwater flows have been designed such that the industrial drain should now only flow during heavier rainfall events it would be expected that the discharge quality at this sampling point would improve due to the increased dilution potential during these events.

Overall, in recent years the quality of the stormwater discharge has shown improvement in comparison to the historical medians, particularly with lower concentrations of zinc and copper. In 2012-2014, this was general reflected in all parameters monitored with all results except dissolved zinc on 3 September 2012 and 6 November 2013 being similar to or below the reducing historical median. Given the low level of the other components, it is possible that the higher dissolved zinc on these two monitoring occasions may be due to the increasing area of unpainted galvanised and zinalume® roofs within the catchment.

Table 70 Chemical monitoring results for the industrial drain discharge to Mangati Stream for 2012-2014 TRC site code MGT000503 (site 8)

Date	AlAs g/m ³	BOD g/m ³	BODCF g/m ³	COD g/m ³	Condy mS/m	CuAs g/m ³	CuD g/m ³	DO g/m ³	DRP g/m ³ -P	NH3 g/m ³ -N	NH4 g/m ³ -N	O&G g/m ³	PbAs g/m ³	pH	SS g/m ³	Temp °C	Turby NTU	ZnAs g/m ³	ZnD g/m ³
Number	43	52	-	51	164	71	140	49	52	54	58	48	45	155	67	81	14	84	145
Minimum	<0.1	<0.5	-	<5	1.3	0.005	<0.001	2.5	<0.003	0.00002	0.017	<0.5	<0.05	4.3	<2	9.7	5.8	0.026	<0.005
Maximum	9.1	76	-	120	80.4	1.63	0.150	10.7	0.293	0.03291	6.70	590	0.2	8.9	190	21.7	37	4.84	2.50
Median	0.90	3.9	-	16	20.0	0.050	0.005	8.2	0.026	0.00058	0.159	1.4	<0.05	6.9	15	16.7	17	0.236	0.100
03-Jul-12	<0.1	<0.5	-	<5	15.0	0.005	0.002		0.004	0.00001	0.036	a	<0.05	6.2	<2	10.9	2	0.053	0.043
03-Sep-12	1.18	3.8	-	15	2.4	0.014	0.006	10.3	0.032	0.00022	0.076	a	<0.05	7.0	22	13.3	14	0.198	0.147
11-Dec-12 ^b	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
03-Apr-13 ^b	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06-Nov-13	0.61	2.5	-	13	5.9	0.014	0.008		0.010	0.00007	0.056	a	<0.05	6.5	11	17.1	12	0.188	0.157
26-Feb-14 ^b	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24-Jun-14	<0.1	<0.5	<0.05	<5	12.8	0.003	0.001	7.18	<0.003	0.00002	0.044	<0.5	<0.05	6.2	6	14.5	17	0.025	0.025

Key: Results shown in bold within a table indicates results outside desirable range of Regional Freshwater Plan Rule 23
a parameter not determined, no visible hydrocarbon sheen and no odour
b not discharging at time of sampling survey

Historical monitoring had previously shown that the component concentrations in the bypass drain had been similar to, or lower than, the pond discharges, indicating that the increased dilution present during heavy rainfall could allow the ponds to be bypassed without any detrimental effects on the water quality of the Mangati Stream.

The stormwater monitoring during the years under review found that the conductivity, BOD and concentrations of ammoniacal nitrogen in the industrial drain bypass were consistently lower than the pond discharges. For all the other parameters monitored the relative concentrations varied. On 3 July 2012 and 24 June 2014, all parameters returned results that were below the values obtained for the pond discharges, but on 3 September 2012 and November 2013 the acid soluble aluminium was higher than both pond discharges. On these occasions, the COD, copper, dissolved reactive phosphorus, suspended solids, turbidity and zinc concentrations were also similar to or higher than one, if not both, of the pond discharges.

It is noted that the acid soluble aluminium concentration in the discharge from the bypass drain was a new minimum for this monitoring site.

As this is contrary to the findings of historical data, the comparative quality of the discharges does need to be monitored both to see if this is an emerging trend, and to assess whether the previous historical trend was indicative of contaminants being mobilised from the solids in the ponds.

It is noted that during the dry weather survey on 3 April 2013 the combined discharges from pond 3 contributed to an elevation in the ammoniacal nitrogen concentration in the Mangati Stream, giving the second highest concentration found during the period under review for this contaminant (0.411 g/m³-N). The main contributors of ammoniacal nitrogen to the pond system during the period under review were found to be Hooker Bros Investments Limited (6.69 g/m³, loading canopy site on 3 July 2012) and Tegel's feed mill (2.56 g/m³ on 3 April 2013).

Although this is much higher than the ANZECC guideline of 0.021 g/m³, the instream concentration had been found to be 0.0483 g/m³ at the Railway site, and historical data shows that this concentration at site MGT000500 was within the historical range. The unionised ammonia concentration of the stream remained below the 0.025 g/m³ guideline, and no significant adverse effects were observed at the time of sampling.

Monitoring showed that the main contributors to the elevated BOD in the pond 3 discharge were likely to have been BLM, Hooker Bros Investments Limited, and/or Tegel's feed mill, who all discharged stormwater at or above the concentrations permitted by their consents on occasion during the period under review.

22. Receiving environment monitoring in the Mangati Stream

22.1 Mangati Stream chemical/bacteriological surveys

Sampling of the Mangati Stream itself was carried out on three occasions during the reporting period, concurrently with chemical surveys of the industrial stormwater drainage system. An attempt is made to sample approximately quarterly, with three runs per year being collected under wet conditions and one run being conducted during summer low flows. However, uncertain weather conditions and competing demands of other monitoring programmes often makes sampling at regular intervals difficult.

During the period under review seven surveys were performed, with the eighth survey carried over to the 2014-2015 monitoring year. The full wet weather surveys were conducted on 3 July and 3 September 2012, and 6 November 2013. Dry weather surveys were conducted on 11 December 2012, 3 April 2013, and 26 February and 24 June 2014. Due to lack of rainfall during the 2012-2014 years, further dry weather surveys were substituted for the “reduced” wet weather surveys, as these were the conditions prevailing during the periods under review.

Six sites on the Mangati Stream were monitored. These sites traverse the industrial area and include a point at the coast. The locations of the monitoring sites are shown in Figure 2 and Figure 3, and are described in Table 71.

Runs are always undertaken from the top towards the bottom of the catchment. There are occasionally anomalies in results between sites within sampling runs, owing to differences between velocity of the stream and movement downstream of samplers, and to changing flow conditions during and after rainfall events. The results are given in Table 72.

Overall, the results are considered to provide a good indication of the range of water quality conditions in the stream at the various sites. Historically, the median values have been biased towards wet weather conditions.

Table 71 Chemical sampling sites on the Mangati Stream

Site	Location	GPS (NZTM)	Site code
Mangati above Tegel poultry	Below railway bridge approx 100 m above inflow from the wetland that receives Tegel Poultry's discharge	E 1700106 N 5677953	MGT000485
Mangati below Tegel poultry	Approx 200 m below the wetland that receives Tegel Poultry's discharge and 40 m above De Havilland Drive	E 1700007 N 5678217	MGT000493
Mangati above Connett Road	Immediately above the end of Connett Road about 200 m below Greymouth Petroleum and Tasman Oil Tools discharge	E 1699775 N 5678573	MGT000497
Mangati above industrial drain	Below pond 3 discharge and immediately above pond 4 and industrial drain direct discharges	E 1699596 N 5678691	MGT000500
Mangati below industrial drain	Approx 50 m below State Highway 3	E 1699513 N 5678787	MGT000512
Mangati at coast	Opposite NPDC sewage pumping station approx 30 m from high water mark	E 1699215 N 5680409	MGT000550

The top site is above the direct influence of the industrial area, though it is possible that deposits from aerial emissions could cause effects there. The second site is below the influence of treated discharge from Tegel's poultry plant. Although there is a tributary that joins the Mangati Stream from the north approximately 100 m upstream of the Tegel swamp tributary that is not monitored. The third site, above Connett Road is below the influence of the industries on De Havilland drive and above the main stormwater drain (pond) discharge points. This site would show the influence of the untreated discharge from the northern side of the poultry processing plant, Tasman Oil Tools, Greymouth Petroleum, along with the road stormwater and permitted activities that discharge via the NPDC's reticulated stormwater outlets from De Havilland Drive on either side of the Mangati Stream. The fourth site is below the discharge from pond 3, which has been found to still be discharging even during prolonged periods of dry weather. The fifth site is below the discharges from the main stormwater drain when it either bypasses the wetlands, or discharges from pond 4. These five sites lie along a reach of about 1 km that is relatively flat, apart from the fall at the highway. The sixth site is below a steeper reach and is about 2 km further downstream, beyond the residential area, close to the mouth of the stream.

The chemical and microbiological characteristics of the stream above the industrial area are typical of a lowland stream in a pastoral catchment. In general, they have not changed significantly since monitoring began in 1992, although the BOD and dissolved reactive phosphorous do appear to be increasing in the stream at the railway site, above the industrial area, as well as through, and below, the industrial area. It also appears that there may be an emerging trend of reducing metals concentrations, particularly in dissolved copper and zinc at the site below pond 4 and the bypass drain, and at the coast.

Table 72 Results from chemical surveys of the Mangati Stream for 2012-2014

Parameter	Mangati Stream					
	Railway	Above DeHavilland Drive	Above Connett Road	Below pond 3 Discharge (formerly above industrial drain)	Below pond 4 and wetland bypass drain	At Coast
03 July 2012 - wet	MGT000485	MGT000493	MGT000497	MGT000500	MGT000512	MGT000550
BOD g/m ³	1.4	1.4	2.4	2.2	2.2	2.3
Cond @20°C mS/m	17.6	17.4	16.0	16.2	16.3	14.4
CuAs g/m ³	<0.001	<0.001	0.003	0.004	0.006	0.006
CuD g/m ³	<0.001	<0.001	<0.001	0.001	0.001	<0.001
DO g/m ³	9.32	9.77	9.01	8.82	8.17	10.57
DRP g/m ³ P	0.015	0.015	0.008	0.009	0.008	0.008
NH ₃ g/m ³	0.00012	0.00016	0.00013	0.00021	0.00026	0.00028
NH ₄ g/m ³ N	0.065	0.086	0.132	0.170	0.163	0.118
N-N-N g/m ³ N	1.53	-	-	-	-	1.10
pH pH	6.9	6.9	6.6	6.7	6.8	7.0
SS g/m ³	22	15	36	28	33	35
Temp Deg.C	11.3	10.6	11.2	11.1	11.2	10.8
Turby NTU	10	10	21	23	25	30

Parameter	Mangati Stream						
	Railway	Above DeHavilland Drive	Above Connett Road	Below pond 3 Discharge (formerly above industrial drain)	Below pond 4 and wetland bypass drain	At Coast	
ZnAs	g/m ³	0.005	0.019	0.031	0.040	0.041	0.034
ZnD	g/m ³	<0.005	0.005	0.011	0.021	0.018	0.013
03 September 2012 - wet		<i>MGT000485</i>	<i>MGT000493</i>	<i>MGT000497</i>	<i>MGT000500</i>	<i>MGT000512</i>	<i>MGT000550</i>
BOD	g/m ³	3.6	3.9	6.8	5.5	5.0	5.3
Cond @20°C	g/m ³	16.9	15.4	8.7	9.9	8.4	8.0
CuAs	g/m ³	0.005	0.005	0.018	0.012	0.011	0.020
CuD	mS/m	<0.001	0.001	0.003	0.003	0.003	0.003
DO	g/m ³	8.9	8.9	9.5	9.1	9.5	9.9
DRP	g/m ³ P	0.010	0.015	0.036	0.032	0.026	0.014
NH3	g/m ³	0.00028	0.00034	0.00048	0.00046	0.00038	0.00041
NH4	g/m ³ N	0.101	0.152	0.264	0.256	0.208	0.179
N-N-N	g/m ³ N	1.09	-	-	-	-	0.48
PERSAT	%	86	85	92	87	91	96
pH	pH	7.0	6.9	6.8	6.8	6.8	6.9
SS	g/m ³	81	72	200	94	64	150
Temp	Deg.C	12.9	12.9	13.1	13.1	13.2	13.3
Turby	NTU	48	43	110	52	37	57
ZnAs	g/m ³	0.030	0.048	0.080	0.059	0.097	0.081
ZnD	g/m ³	0.010	0.022	0.017	0.018	0.051	0.026
11 December 2012 - dry		<i>MGT000485</i>	<i>MGT000493</i>	<i>MGT000497</i>	<i>MGT000500</i>	<i>MGT000512</i>	<i>MGT000550</i>
BOD	g/m ³	2.5	2.5	1.4	1.8	1.5	0.9
BODCF	g/m ³	0.7	<0.5	-	-	-	-
Cond @20°C	g/m ³	20.1	20.3	21.2	20.7	20.5	19.1
CuAs	g/m ³	0.002	0.001	0.001	0.001	0.001	0.001
CuD	mS/m	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
DO	g/m ³	7.7	7.3	5.8	6.3	7.5	10.4
DRP	g/m ³ P	0.019	0.016	0.020	0.015	0.014	0.007
ECOL	/100ml	2100	4200	900	830	840	69
ENT	/100ml	450	800	2300	1500	1400	210
FC	/100ml	2100	4200	970	830	860	69
NH3	g/m ³	0.00084	0.00073	0.00051	0.00046	0.00056	0.00058
NH4	g/m ³ N	0.205	0.220	0.185	0.163	0.157	0.048
N-N-N	g/m ³ N	1.26	-	-	-	-	1.28
PERSAT	%	76	73	57	63	75	106
pH	pH	7.1	7.0	6.9	6.9	7.0	7.5
SS	g/m ³	2	<2	2	3	2	<2

Parameter	Mangati Stream						
	Railway	Above DeHavilland Drive	Above Connett Road	Below pond 3 Discharge (formerly above industrial drain)	Below pond 4 and wetland bypass drain	At Coast	
Temp	Deg.C	14.9	15.1	15.6	15.9	16.1	17.0
Turby	NTU	2.4	3.8	2.6	2.8	2.7	2.2
ZnAs	g/m ³	<0.005	<0.005	<0.005	0.008	0.008	0.007
ZnD	g/m ³	<0.005	<0.005	<0.005	0.008	0.008	0.007
03 April 2013 - dry		<i>MGT000485</i>	<i>MGT000493</i>	<i>MGT000497</i>	<i>MGT000500</i>	<i>MGT000512</i>	<i>MGT000550</i>
BOD	g/m ³	3.6	1.2	2.1	2.9	2.6	1.3
BODCF	g/m ³	<0.5	<0.5	-	-	-	-
Cond @20°C	g/m ³	25.6	25.0	28.2	22.9	22.7	20.3
CuAs	g/m ³	<0.001	<0.001	0.001	0.002	0.002	0.003
CuD	mS/m	<0.001	<0.001	<0.001	0.002	0.002	0.002
DO	g/m ³	3.32	4.7	4.0	4.7	6.1	9.2
DRP	g/m ³ P	0.019	0.018	0.022	0.022	0.021	0.017
ECOL	/100ml	2000	2000	5500	9000	6600	3300
ENT	/100ml	3200	3900	6000	8500	9700	7200
FC	/100ml	2000	2400	5700	9300	7200	3400
NH3	g/m ³	0.00207	0.00138	0.00153	0.00221	0.00222	0.00182
NH4	g/m ³ N	0.435	0.286	0.244	0.411	0.333	0.106
N-N-N	g/m ³ N	0.73	-	-	-	-	1.21
pH	pH	7.1	7.1	7.2	7.1	7.2	7.6
SS	g/m ³	32	3	2	4	3	<2
Temp	Deg.C	16.9	17.1	17.5	18.5	18.3	18.8
Turby	NTU	8.0	5.4	3.6	3.5	3.2	2.5
ZnAs	g/m ³	0.008	0.006	0.006	0.028	0.028	0.013
ZnD	g/m ³	0.008	0.006	0.006	0.022	0.022	0.010
06 November 2013 - wet		<i>MGT000485</i>	<i>MGT000493</i>	<i>MGT000497</i>	<i>MGT000500</i>	<i>MGT000512</i>	<i>MGT000550</i>
BOD	g/m ³	1.4	1.7	2.8	3.4	3.3	2.8
Cond @20°C	g/m ³	17.0	16.0	14.2	14.2	13.9	11.6
CuAs	g/m ³	<0.001	0.010	0.007	0.006	0.006	0.008
CuD	mS/m	<0.001	0.004	0.003	0.003	0.003	0.003
DO	g/m ³	8.03	8.04	-	-	-	-
DRP	g/m ³ P	0.016	0.014	0.070	0.047	0.037	0.018
NH3	g/m ³	0.00029	0.00028	0.00033	0.00030	0.00040	0.00035
NH4	g/m ³ N	0.088	0.139	0.153	0.168	0.179	0.094
N-N-N	g/m ³ N	0.82	-	-	-	-	0.57
PERSAT	%	84	79	-	-	-	-
pH	pH	7.0	6.8	6.8	6.7	6.8	7.0
SS	g/m ³	7	14	24	18	16	17

Parameter		Mangati Stream					
		Railway	Above DeHavilland Drive	Above Connett Road	Below pond 3 Discharge (formerly above industrial drain)	Below pond 4 and wetland bypass drain	At Coast
Temp	Deg.C	14.8	14.7	15.3	15.9	15.9	16.7
Turby	NTU	3.4	6.3	21	18	12	14
ZnAs	g/m ³	<0.005	0.153	0.034	0.051	0.071	0.044
ZnD	g/m ³	<0.005	0.104	0.017	0.032	0.050	0.025
26 February 2014 - dry		<i>MGT000485</i>	<i>MGT000493</i>	<i>MGT000497</i>	<i>MGT000500</i>	<i>MGT000512</i>	<i>MGT000550</i>
BOD	g/m ³	1.4	1.5	2.3	2.5	3.1	0.8
BODCF	g/m ³	0.6	0.5	0.5	0.5	0.5	-
Cond @20°C	g/m ³	21.1	21.4	25.5	24.8	24.5	21
CuAs	g/m ³	0.004	0.002	<0.001	0.002	0.002	0.002
CuD	mS/m	0.003	0.002	<0.001	0.002	0.002	0.002
DO	g/m ³	4.3	5.6	5.6	6.3	7.4	9.2
DRP	g/m ³ P	0.026	0.018	0.026	0.021	0.021	0.011
ECOL	/100ml	2200	2100	3100	2200	3500	730
ENT	/100ml	3000	3900	3500	2700	4500	1100
FC	/100ml	2200	2100	3100	2200	3600	730
NH3	g/m ³	0.00091	0.00092	0.00201	0.00122	0.0017	0.00052
NH4	g/m ³ N	0.283	0.277	0.285	0.267	0.238	0.045
N-N-N	g/m ³ N	0.74	-	-	-	-	1.14
pH	pH	7.0	7.0	7.3	7.1	7.3	7.5
SS	g/m ³	8	9	5	15	19	<2
Temp	Deg.C	14.7	15.1	16.0	16.3	16.2	16.6
Turby	NTU	6.1	5.9	3.7	8.3	13	3.1
ZnAs	g/m ³	0.008	0.007	0.007	0.007	0.008	0.008
ZnD	g/m ³	0.008	0.007	0.007	0.005	<0.005	0.006
24 June 2014 - dry		<i>MGT000485</i>	<i>MGT000493</i>	<i>MGT000497</i>	<i>MGT000500</i>	<i>MGT000512</i>	<i>MGT000550</i>
BOD	g/m ³	1.4	1.6	1.6	1.6	1.5	1.2
BODCF	g/m ³	<0.5	<0.5	<0.5	<0.5	<0.5	
Cond @20°C	g/m ³	17.3	17.6	18.2	18.0	18.0	17.7
CuAs	g/m ³	0.001	0.001	0.002	0.002	0.002	0.003
CuD	mS/m	<0.001	<0.001	0.001	<0.001	<0.001	<0.001
DO	g/m ³	8.6	8.5	7.9	7.8	8.3	10.0
DRP	g/m ³ P	0.012	0.010	0.008	0.007	0.009	0.007
ECOL	/100ml	870	680	570	540	780	250
ENT	/100ml	500	350	330	480	380	330
FC	/100ml	870	680	570	540	780	280
NH3	g/m ³	0.0002	0.00023	0.00023	0.00035	0.00026	0.00039
NH4	g/m ³ N	0.085	0.127	0.154	0.185	0.170	0.099

Parameter	Mangati Stream						
	Railway	Above DeHavilland Drive	Above Connett Road	Below pond 3 Discharge (formerly above industrial drain)	Below pond 4 and wetland bypass drain	At Coast	
N-N-N	g/m ³ N	1.06	-	-	-	-	1.15
PERSAT	%	81.2	79.8	74.7	73.9	79.3	96.4
pH	pH	6.9	6.8	6.7	6.8	6.7	7.1
SS	g/m ³	11	12	10	10	8	3
Temp	Deg.C	13.4	13.1	13.7	13.7	13.8	14.2
Turby	NTU	6.8	9.1	5.8	6.6	7.2	4.2
ZnAs	g/m ³	0.006	0.011	0.009	0.019	0.017	0.018
ZnD	g/m ³	<0.005	0.005	0.008	0.015	0.013	0.016

The general water quality parameters temperature, conductivity, pH, turbidity and suspended solids typically vary in a predictable way according to season, weather conditions and location within the catchment. Turbidity and suspended solids usually increase across the industrial area on most occasions, and decrease by the final site at the coast. However, during the period under review the biggest increase in suspended solids was found below the De Havilland Drive stormwater drains, and the Tasman Oil Tools and Greymouth Petroleum combined discharge. The increases in suspended solids were, at times, accompanied by an increase in the acid soluble metals concentrations. An example of this was on 3 September 2012, where the suspended solids increased from 72 to 200 g/m³ below these discharges, and increases in the acid soluble copper and zinc from 0.005 to 0.018 g/m³ and from 0.048 to 0.080 g/m³, respectively, were found. This shows the importance of controlling the discharge of suspended solids from sites where there may be elevated concentrations of metals in the site surface material. The main contribution to the suspended solids on this occasion was Greymouth Petroleum (410 g/m³), but the main contribution to the acid soluble metals was Tasman Oil Tools. The discharge from this site was found to contain of suspended solids of 240 g/m³, which was less than Greymouth Petroleum, but 0.40 g/m³ of acid soluble copper (compared to 0.08g/m³), and 0.414 g/m³ of acid soluble zinc (compared to 0.223 g/m³) at the time of this survey.

During the years under review the conductivity tended to decrease through the length of the stream monitored during wet weather, and the temperature increased. However the changes in conductivity, pH and temperature recorded along the full stretch of the stream monitored were not significant.

The concentration of nutrients, such as ammonia and dissolved reactive phosphorus, and organics, such as BOD, varied across the industrial area. During the years under review both the BOD and dissolved reactive phosphorus were consistently at or above median at the Railway site, where as the ammoniacal nitrogen was found to be below median at this site during all of the wet weather surveys, and above median on all of the dry weather surveys. In the case of BOD, the downstream trend found during the surveys was that the results were generally above median at the top monitoring site, and through the catchment, but were generally below median at the coast.

The dissolved reactive phosphorus concentration in the Mangati Stream has in the past generally shown a noticeable increase downstream of the Tegel Foods poultry plant discharge and below the industrial drain. As with the 2011-2012 year, during the years under review, it was again found that the dissolved reactive phosphorus concentration downstream of the poultry processing plant was, with only one exception, similar to, or lower than, that seen above the industrial area. It is, however, noted that the dissolved reactive phosphorus at the Railway site was above median on six of the monitoring occasions during the 2012-2014 years.

The ammoniacal nitrogen concentration of the stream at the site "above De Havilland Drive" was similar to, or higher, than the Railway site on all but two occasions, both of which were under dry weather conditions. At the time of the wet weather surveys sampling showed that the discharge from the Tegel poultry plant swamp contributed to the increase on 3 September 2012, 6 November 2013, and 24 June 2014. However, the Tegel poultry processing wetland discharge also contributed to a sizeable decrease in ammoniacal nitrogen on 11 December 2012.

A slight increase in ammoniacal nitrogen was observed between De Havilland Drive and Connett Road at the time of all but two of the dry weather survey. At the time of sampling, there were contributions to this increase from Tegel's poultry processing plant via the De Havilland Drive reticulated stormwater system during three of the surveys. On 26 February 2014, during dry weather, there was a discharge (albeit very low flow) from the Tegel poultry processing plant containing 42.6 g/m³ of ammoniacal nitrogen, resulting in a concentration of 5.82 g/m³ at the discharge point from the NPDC reticulated system. This source has since been identified, and Tegel has now isolated this source from the stormwater system.

In two of the wet weather surveys and two of the dry weather surveys the ammoniacal nitrogen below pond 3 was higher than the upstream concentration. However, results recorded during the years under review found that the unionised ammonia concentration of the stream was well below that considered to be toxic to aquatic ecosystems at all monitoring locations for all sampling surveys.

BOD in the monitored reach of the Mangati Stream was found to be generally slightly elevated throughout the reach of the stream monitored during the dry weather survey, and elevated to a greater degree during the wet weather surveys.

Increases in BOD were found downstream of the poultry processing plant wetland on two of the wet weather surveys and two of the dry weather surveys, and downstream of the poultry processing plant De Havilland Drive discharges on all but one monitoring occasion. Monitoring of Tegel's discharges (section 16.2.1.3) showed that this Company's discharges made a contribution to the increases on all four occasions downstream of the wetland, and also on four of the occasions downstream of De Havilland Drive. The highest BOD found in the Mangati Stream during the years under review was 6.8 g/m³, downstream of the De Havilland Drive stormwater discharges during the 6 November 2013 wet weather survey. On this occasion the discharges from the poultry processing plant were up to 5.1 g/m³, less than the stream, and the discharge from the NPDC reticulated network through which these discharges occur was only 3.3 g/m³. It is therefore likely that during this survey, the increase in BOD at this point was either due to the progression of the rainfall event on a stream with an upper catchment running through an agricultural

area, or an unidentified unauthorised discharge. It is noted that during the period under review, sewage fungus was found at the outlet from the NPDC reticulated network at De Havilland Drive on the true right bank of the Mangati Stream and this was later traced to an unauthorised truck wash discharge from J Swap Contracting.

Downstream of pond 3, BOD increases were only observed during three of the dry weather surveys, and one of the wet weather surveys. These increases were relatively small (maximum increase observed 0.8 g/m³). In all but one survey (26 February 2014) the BOD in the stream downstream of the pond 4 discharge and the industrial drain bypass was less than or equal to the upstream site.

A staged increase in zinc and copper concentrations is often observable as the stream passes through the industrial area, followed by a decrease at the coastal site. It has previously been found that greater increases are generally observed in the acid soluble copper and zinc, with dissolved zinc also increasing, but to a lesser extent. In the case of zinc, this metal is more soluble than copper and is therefore more mobile in the water column, which is why increases in this parameter are also observed. In the years under review there was again a reasonably clear relationship between changes in the suspended solids concentration and changes in the acid soluble metals concentrations. Increases in the acid soluble metals were generally accompanied by an increase in the suspended solids concentration.

During the years under review there were no marked increases in levels of acid soluble or dissolved copper observed below the wetland pond discharges. On 6 November 2013 progressive increases in the acid soluble and dissolved zinc were observed downstream of the wetland discharges and bypass drain. On 11 December 2012 and 13 April 2013 increases were observed downstream of the discharge from pond 3, and on 3 September 2012 increases were observed downstream of the discharge from pond 4 and the bypass drain. It is noted that the degree to which these parameters increased was much less than it has been in previous years.

In previous monitoring years another potential contribution has been considered to be the sediment released from the site development works in the area on the true right bank of the Mangati Stream, which may have been slightly impacted by historical aerial deposition from the site of MCK Metals prior to the installation of the baghouse on the copper and brass foundry in the mid to late 1990's. However, during the period under review, there were very few active earthworks sites in this area.

Marked increases in acid soluble and dissolved copper and zinc were observed at the monitoring site above De Havilland Drive during the 6 November survey. On this occasion there was no coincident marked increase in suspended solids and no unauthorised discharges were noted above this site during the survey. The cause of this result is therefore unknown and on-going monitoring will clarify whether this was a spurious result or the start of an emerging trend that needs to be investigated further.

The zinc and copper results and the relevance of their concentrations to effects on aquatic life are discussed further below.

Zinc and copper

The results for the 2012-2014 period along with summaries of the monitoring data gathered to the end of the 2011-2012 monitoring year, for acid soluble and dissolved zinc and copper concentrations in the water column of the Mangati Stream, are given in Table 73 and Table 74.

Table 73 Summary of zinc monitoring data for Mangati Stream water

Date	Above industrial area (MGT000485)		Above DeHavilland Drive (MGT000493)		Above Connett Road (MGT000497)		Below pond 3 Discharge (formerly above the industrial drain) (MGT000500)		Below pond 4 and wetland bypass drain (MGT000512)		Mangati at Coast (MGT000550)	
	ZnAs g/m ³	ZnD g/m ³	ZnAs g/m ³	ZnD g/m ³	ZnAs g/m ³	ZnD g/m ³	ZnAs g/m ³	ZnD g/m ³	ZnAs g/m ³	ZnD g/m ³	ZnAs g/m ³	ZnD g/m ³
Number	67	64	9	8	45	41	47	73	91	157	61	60
Minimum	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.006	<0.005
Maximum	0.043	0.034	0.183	0.055	0.147	0.052	0.280	0.141	0.637	0.377	0.358	0.179
Median	<0.005	<0.005	0.032	0.009	0.011	0.006	0.017	0.011	0.050	0.013	0.049	0.029
3-Jul-2012	0.005	<0.005	0.019	0.005	0.031	0.011	0.040	0.021	0.041	0.018	0.034	0.013
3-Sep-2012	0.030	0.010	0.048	0.022	0.080	0.017	0.059	0.018	0.097	0.051	0.081	0.026
11-Dec-2012 ^d	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.008	0.008	0.008	0.008	0.007	0.007
3-Apr-2013 ^d	0.008	0.008	0.006	0.006	0.006	0.006	0.028	0.022	0.028	0.022	0.013	0.010
6-Nov-2013	<0.005	<0.005	0.153	0.104	0.034	0.017	0.051	0.032	0.071	0.050	0.044	0.025
26-Feb-2014 ^d	0.008	0.008	0.007	0.007	0.007	0.007	0.007	0.005	0.008	<0.005	0.008	0.006
24-Jun-2014 ^d	0.006	<0.005	0.011	0.005	0.009	0.008	0.019	0.015	0.017	0.013	0.018	0.016

d = dry weather survey

On all three wet weather occasions, results for acid soluble and dissolved zinc showed concentration increases at the site above De Havilland Drive, although it is noted that the degree to which the zinc concentrations increased on 6 November 2013 was atypical for this site, with the dissolved zinc being almost twice the historical maximum for this monitoring location. As discussed earlier, on-going monitoring will give an indication of whether or not this is the start of an emerging trend. It is also noted that the acid soluble zinc above the industrial area on 3 September 2012 was the third highest on record.

The dry weather concentrations of total and dissolved zinc were low throughout the stretch of the Mangati Stream monitored, and the results were similar to or below the historical median at all sites, with the exception of the site below the pond 3 discharge on 3 April 2013.

Above De Havilland Drive, during two of the wet weather, the results for acid soluble and dissolved zinc were above the historical for this monitoring location.

Above Connett Road, the zinc concentrations were above median during all the wet weather surveys, with the acid soluble zinc up to 7 times the historical median, and the dissolved zinc up to about 3 times the historical median. It is noted that the discharges from Greymouth Petroleum and Tasman Oil Tools also contained acid soluble zinc concentrations that were above their respective historical medians.

Below the wetland pond 3 discharge, the acid soluble and dissolved zinc concentrations during the wet weather surveys in the 2011-2012 monitoring period were again higher than the previous median values. It is considered that, in recent years, this has been mainly due to the fact that majority of historical results were for samples taken prior to the installation of the wetlands. At this time the site (MGT000500) was upstream of the industrial drain via which most of the industrial stormwater discharges to the Mangati Stream occurred. It is now more appropriate to compare the results from site MGT000500 to the historical results from site MGT000512. During wet weather surveys in the years under review the acid soluble zinc at site MGT000500 were similar to or lower than the historical medians for site MGT000512, but the dissolved zinc concentrations were similar to or above median.

The acid soluble and dissolved zinc below the pond 4 discharge (MGT000512) was also generally above median at the wet weather surveys during the years under review.

The acid soluble zinc concentration in the Mangati at the coast was above median in only one of the wet weather samples collected, however, the dissolved zinc concentration was again similar to or below median on all occasions.

Table 74 Summary of copper monitoring data for Mangati Stream water

Date	Above industrial area (MGT000485)		Above DeHavilland Drive (MGT000493)		Above Connett Road (MGT000497)		Below pond 3 Discharge (formerly above the industrial drain) (MGT000500)		Below pond 4 and wetland bypass drain (MGT000512)		Mangati at Coast (MGT000550)	
	CuAs, g/m ³	CuD, g/m ³	CuAs, g/m ³	CuD, g/m ³	CuAs, g/m ³	CuD, g/m ³	CuAs, g/m ³	CuD, g/m ³	CuAs, g/m ³	CuD, g/m ³	CuAs, g/m ³	CuD, g/m ³
Number	67	70	8	8	44	46	59	73	81	161	61	65
Minimum	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Maximum	0.020	0.010	0.039	0.001	0.090	0.016	0.060	0.016	0.280	0.066	0.210	0.025
Median	0.005	0.001	0.004	<0.001	0.010	0.002	0.010	0.003	0.010	0.003	0.010	0.006
03-Jul-2012	<0.001	<0.001	<0.001	<0.001	0.003	<0.001	0.004	0.001	0.006	0.001	0.006	<0.001
03-Sep-2012	0.005	<0.001	0.005	0.001	0.018	0.003	0.012	0.003	0.011	0.003	0.020	0.003
11-Dec-2012 ^d	0.002	<0.001	0.001	<0.001	0.001	<0.001	0.001	<0.001	0.001	<0.001	0.001	<0.001
03-Apr-2013 ^d	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	0.002	0.002	0.002	0.002	0.003	0.002
06-Nov-2013	<0.001	<0.001	0.010	0.004	0.007	0.003	0.006	0.003	0.006	0.003	0.008	0.003
26-Feb-2014 ^d	0.004	0.003	0.002	0.002	<0.001	<0.001	0.002	0.002	0.002	0.002	0.002	0.002
24-Jun-2014 ^d	0.001	<0.001	0.001	<0.001	0.002	0.001	0.002	<0.001	0.002	<0.001	0.003	<0.001

d = dry weather survey

In the 2012-2014 monitoring period the acid soluble and dissolved copper was at or below median in the samples collected at the uppermost site (MGT000485) on all occasions, with the exception of dissolved copper on 25 February 2014.

Above De Havilland Drive the dissolved copper was below the historical median for this site on all but one wet weather and one dry weather sampling occasion, and the acid soluble copper was below median on all but two of the three wet weather sampling occasions. On 6 November the acid soluble copper was a new, albeit low,

maximum for this monitoring location. It is noted that this is not particularly significant at this stage as there is a limited historical dataset.

With the exception of the acid soluble copper on 3 September 2013, the copper results were similar to below median on all occasions at the 'Above Connett Road' site.

Comparing the site below the pond 3 discharge to the historical data for below the old industrial drain discharge point (MGT000512), the copper results were all similar to or below the historical medians. The concentration remained similar to or below median downstream of the pond 4 discharge.

At the coast, the acid soluble copper concentration was above median only on 3 September 2012, however the dissolved copper was at or below median on all occasions.

In dry weather conditions, the concentrations of acid soluble and dissolved copper remained very low throughout the monitored reach of the stream.

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 metal 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 $50 \text{ g/m}^3 \text{ CaCO}_3$, are 0.005 g/m^3 for Cu and 0.058 g/m^3 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^3 for Cu and 0.064 g/m^3 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.

With the exception of dissolved zinc at "Above De Havilland Drive" on 6 November 2013, the chronic metals water quality criteria were met at all sites on each monitoring occasion. During the this wet weather survey the dissolved zinc concentration was above the acute criterion.

Additional programmed dry weather sampling was instigated at the start of the 2001-2002 year and continued through to the 2007-2009 monitoring years. The intention was for 11 samples to be taken by MCK Metals at approximately monthly intervals, following a period of at least two days without rain. The samples were forwarded to Council and were analysed for dissolved copper and zinc. During the 2009-2010 year, this aspect of the programme was amended, as the water quality had shown sustained improvements. The reduced level of sampling is now to be undertaken by Council staff, with the results of this monitoring given in Table 75 and Table 76.

Table 75 Summary of zinc monitoring data for dry weather Mangati Stream water

Date	Industrial storm drain (MGT000502)			Below main industrial storm drain (MGT000512)		
	Cond mS/m	pH	ZnD, g/m ³	Cond mS/m	pH	ZnD, g/m ³
10-Jan-13	26.6	6.8	0.028	22.8	7.1	<0.005
28-Jan-13	26.0	6.8	0.022	24.4	7.2	0.012
27-Feb-14	29.0	7.0	0.013	24.8	7.3	0.008
13-Jun-14	23.2	6.6	0.086	17.6	6.7	0.012
23-Jun14	36.7	6.7	0.097	17.9	6.8	0.012

Samples from the industrial drain were taken upstream of the wetland pond 4.

The dissolved zinc concentration recorded was in excess of the chronic and acute toxicity levels for the sample taken from the industrial drain upstream of the wetland in both samples collected in June 2014. However, the samples taken from the Mangati Stream below the discharge showed that the concentration remained lower than the chronic criteria in the stream itself throughout the years under review. Figure 8 shows the past seven years of dissolved zinc data from this aspect of the monitoring programme in relation to the chronic criteria of 0.058 g/m³.

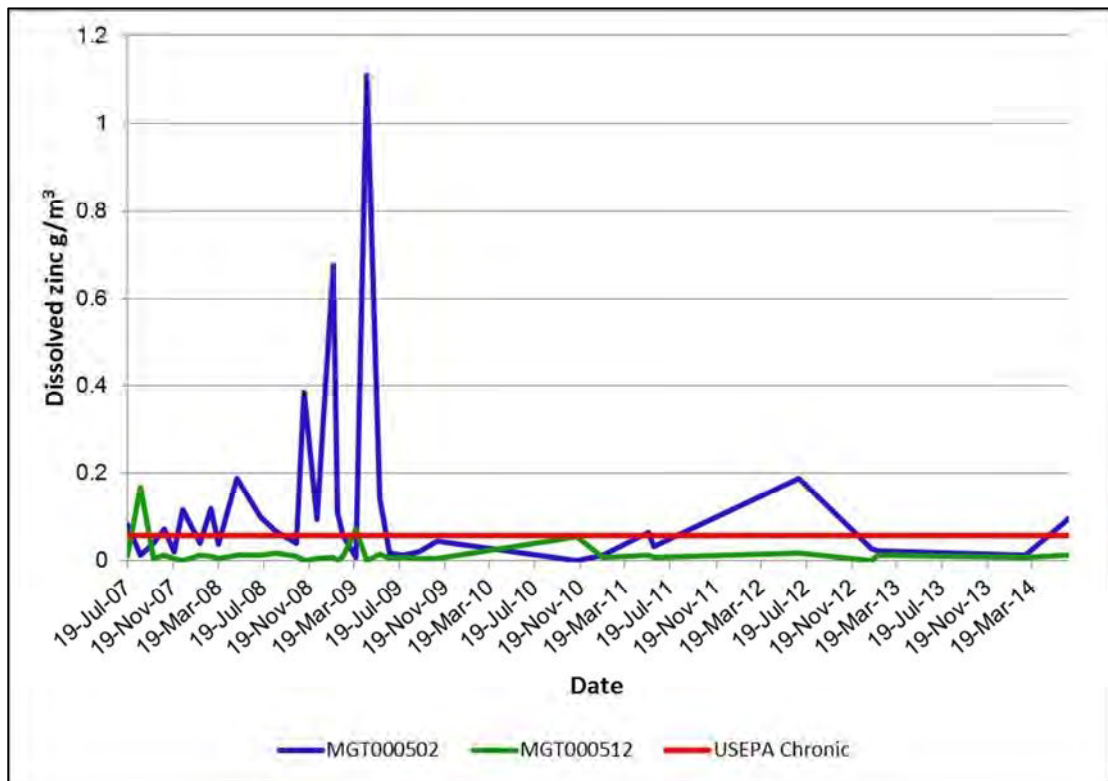


Figure 8 Dissolved zinc monitoring data for dry weather Mangati Stream water July 2007 to June 2014

Table 76 Summary of copper monitoring data for dry weather Mangati Stream water

Date	Industrial storm drain (MGT000502)			Below main industrial storm drain (MGT000512)		
	Cond mS/m	pH	CuD, g/m ³	Cond mS/m	pH	CuD, g/m ³
10-Jan-13	26.6	6.8	<0.001	22.8	7.1	<0.001
28-Jan-13	26	6.8	<0.001	24.4	7.2	<0.001
27-Feb-14	29	7.0	<0.001	24.8	7.3	<0.001
13-Jun-14	23.2	6.6	0.002	17.6	6.7	<0.001
23-Jun14	36.7	6.7	0.001	17.9	6.8	0.001

The dissolved copper concentration did not exceed the chronic criterion in either of the samples collected during the years under review, and was in fact found to be at, or below, the limit of detection in the stream on all monitoring occasions. Figure 9 shows the past seven years of dissolved copper data from this aspect of the monitoring programme in relation to the chronic criteria of 0.005 g/m³.

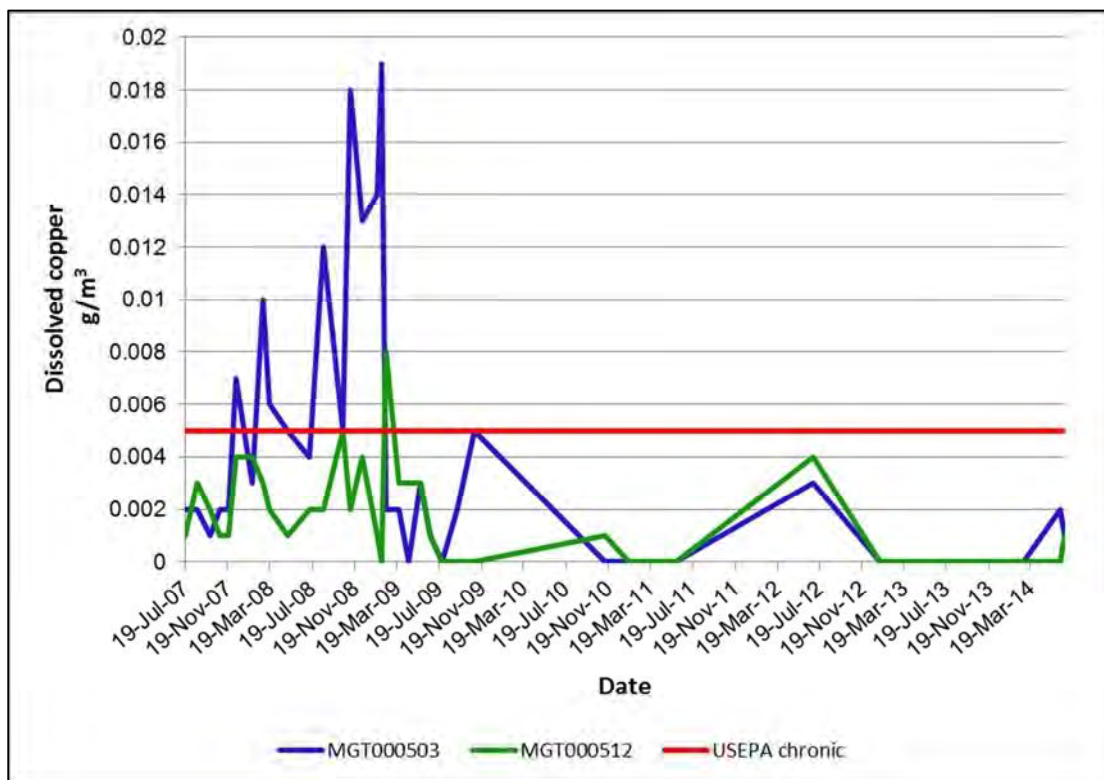


Figure 9 Dissolved copper monitoring data for dry weather Mangati Stream water July 2007 to June 2014

Bacteriological

The downstream trends found in the dry weather bacterial monitoring of the stream were variable, but it is noted that on each occasion the counts were high at the uppermost site, with *E.coli* counts of between 870 and 3300 /100 ml (for example) at this site.

Increases in the bacterial counts were found downstream of the Tegel poultry processing plant wetland discharge on one occasion (11 December 2012), downstream of the Tegel poultry processing plant De Havilland Drive discharge and the pipe yards/Vector discharge on two occasions (3 April 2013 and 26 February

2014), downstream of NPDC's pond 3 on one occasions (3 April 2013) and below State Highway 3 on three occasions (3 April 2013, 26 February 2014 and 24 June 2014).

It is noted that on 3 April 2013 the only monitored company discharging between sites MGT000493 and MGT000497 was the Tegel poultry processing discharge to the stream via the De Havilland Drive stormwater system. It is also noted that NPDC's pond 4 was not discharging during any of the four dry weather surveys.

It was found that the bacterial counts decreased between the site below State Highway 3 and the coast on all dry weather surveys. The counts at the coastal site were found to be at or below bathing guidelines "alert" during one of the two surveys conducted during the beach bathing monitoring period, and were above the bathing guidelines "action" level on one of the two surveys conducted outside the beach bathing monitoring period.

During the 2013-2014 bathing monitoring period the site at the coast was being monitored separately and more intensively under the beach bathing/NPDC waste water treatment plant programme, and any necessary actions with regard to signage etc. were undertaken under those programmes.

Due to the elevated counts found during the 2013-2014 monitoring year, further investigations and source tracking were undertaken in the 2014-2015 year. The findings from this additional work will be discussed in the report covering that period. It is however noted, that it was found that the counts were increasing through the agricultural area, and then decreasing through the industrial area. The source of the bacteria was mainly bovine at the top of the catchment, and avian at the bottom of the catchment.

Sediment

Sediment sampling was undertaken on 7 May 2013 at the NPDC wetlands pond 1 inlet, and in the Mangati Stream below the pond 3 outlet, as part of a specific investigation as a result of Council finding that the Olex cooling water discharge was from a contact cooling system. At times, the cable coating being cooled contains dibutyltin dilaurate as it is present in the catalyst used in the formation of cross linked polyethylene coatings. The investigations and outcomes are discussed in Section 11.2.3, but it is noted here that although dibutyltin was detected in the sediment at the pond 1 inlet, it was not detected in the Mangati Stream itself.

22.2 Mangati Stream biological surveys

Biological surveys produce a measure of time-integrated effects of discharges on water quality of a waterway, as opposed to the "snapshot" measure of a chemical survey.

22.2.1 Macroinvertebrate surveys

The routine surveys for the 2012-2014 monitoring period were carried out on 3 October 2012, 12 February 2013, 25 November 2013 and 13 February 2014. These were the thirty sixth, thirty seventh, thirty eighth and thirty ninth biannual surveys for this programme. The reports on the four surveys are attached as Appendix III. (The "tributary" referred to in the reports is the main industrial storm drain).

The surveys measure the “health” of the stream in terms of the presence and abundance of benthic macroinvertebrates (bottom dwelling life) and microflora. There are eight fixed sites, as described in Table 1 and Figure 1 of Appendix III. The uppermost site is above the influence of any known industrial discharge. There are five sites above and four below the pond 3 discharge from the wetland.

The reports assess the quality of the water in terms of macroinvertebrate diversities (number of taxa), Macroinvertebrate Community Index (MCI) values, and Semi-Quantitative Macroinvertebrate Community Index (SQMCI) values.

Past biological surveys of the Mangati Stream have recorded poor macroinvertebrate communities with limited numbers of taxa and low MCI values, particularly downstream of the industrial tributary. Small, slow flowing coastal streams draining farmland and industrial areas are not expected to support a large number of macroinvertebrate taxa. High MCI values are not expected in the lowland reaches of soft-bedded streams with farmland or urban catchments because not many high scoring, ‘sensitive’ taxa are suited to these conditions. However, the abundance and MCI values recorded at some sites downstream of the tributary have been unusually low even for these conditions. A summary of previous results is presented with current results in Table 77 and Table 78, and the summary and conclusions of the macroinvertebrate survey reports are given below.

Table 77 Numbers of taxa recorded in previous surveys in the Mangati Stream, together with results for the 2012-2014 period

Site	Number of previous surveys	Numbers of taxa					
		Median	Range	Oct 2012	Feb 2013	Nov 2013	Feb 2014
A	37	16	9 - 29	17	17	14	17
A2	35	16	10 - 29	18	22	18	23
A1	37	15	7 - 22	18	16	10	23
A3	35	17	9 - 23	19	19	13	17
B	43	14	3 - 29	10	16	22	20
D2	19	10	5 - 18	12	17	13	13
E	41	10	3 - 22	12	17	17	18
F	35	10	2 - 22	12	15	16	17

Table 78 Numbers of MCI and SQMCI values recorded in previous surveys in the Mangati Stream, together with results for the 2012-2014 period

Site	Number of previous surveys	MCI values						SQMCI values					
		Median	Range	Oct 2012	Feb 2013	Nov 2013	Feb 2014	Median	Range	Oct 2012	Feb 2013	Nov 2013	Feb 2014
A	37	78	56 - 85	86	91	84	84	3.4	2.2 - 4.5	4.0	4.4	4.7	4.5
A2	35	74	57 - 85	92	85	78	81	3.3	1.8 - 4.4	4.0	4.5	4.4	4.4
A1	37	72	47 - 84	86	89	78	75	3.2	1.7 - 4.7	4.1	4.5	4.4	4.1
A3	35	67	52 - 81	80	72	69	71	2.6	1.6 - 4.6	3.6	4.1	3.3	4.1
B	43	68	50 - 80	86	79	71	71	2.6	1.1 - 4.5	1.6	1.8	3.5	3.6
D2	19	68	40 - 77	72	66	71	62	2.5	1.1 - 3.5	3.5	2.5	3.5	3.3
E	41	63	44 - 78	75	75	72	71	2.5	1.1 - 3.9	3.5	3.5	3.5	3.8
F	35	66	30 - 78	72	79	68	71	2.1	1.3 - 4.1	1.9	2.9	2.5	3.6

In 3 October 2012, 12 February 2013, 25 November 2013, and 13 February 2014 the Council's standard 'kick-net' sampling technique was used at six established sites (four in February 2014) to collect streambed macroinvertebrates from the Mangati Stream to determine whether stormwater and wastewater discharges from the Mangati industrial area have had any adverse effects on the macroinvertebrate communities of this stream. Between two and four other sites were sampled on each occasion using the sweep sampling technique, or a combination of the sweep and kick sampling techniques. Samples were sorted and identified to provide the number of taxa (richness), MCI score and SQMCI_s score 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_s takes into account taxa abundance as well as sensitivity to pollution, and may reveal more subtle changes in communities, particularly if non-organic impacts are occurring. Significant differences in either the MCI or the SQMCI_s between sites indicate the degree of adverse effects (if any) of the discharges being monitored.

The Mangati Stream is a small, slower flowing, lowland stream running through farmland, an industrial area and a residential area. As such, this stream typically supports communities commonly found in lowland, soft-bedded streams that are relatively 'tolerant' to organic pollution. The communities are usually dominated by 'tolerant' taxa and those 'moderately sensitive' taxa commonly associated with macrophytes e.g. oligochaete worms, snail (*Potamopyrgus*), and amphipod (*Paracalliope*).

Overall, taxa richnesses were similar to or mainly higher than their respective medians, reflecting that populations had recovered from the spring 2010 survey, which had been impacted by a large flood that had preceded that survey. For sites B, D2 and E, taxa richnesses were higher than their respective medians showing continued recovery from that recorded in the spring 2010 survey. This indicated that the impacts caused by the wetland discharge noted during the spring 2010 survey had abated. This was supported by the absence of undesirable heterotrophic growths from all sites.

Upstream of Connett Road (and the wetland discharge), MCI scores were equal with or higher than their respective historical medians. Downstream of Connett Road, an improved pattern was noted in terms of MCI scores, with sites B, E, and F recording scores higher than their respective historical medians in all surveys. The exception was site D2 (immediately below the pond 4 and pond bypass drain discharges), which recorded a score less than the historical median in both of the late summer surveys (Figure 10 and Figure 11).

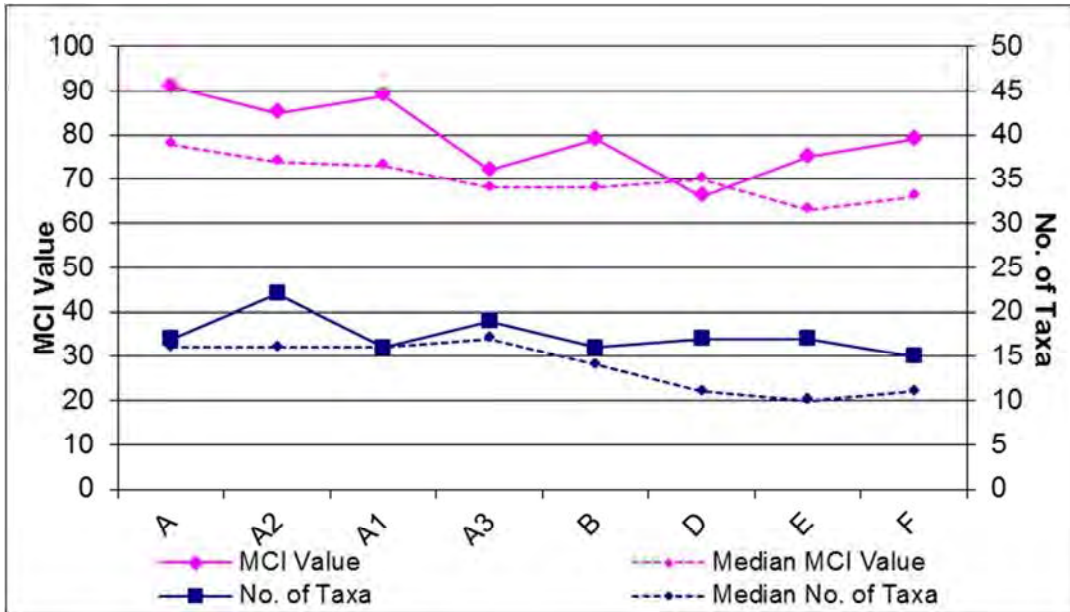


Figure 10 Numbers of taxa and MCI values recorded at sites in the Mangati Stream in the February 2013 survey

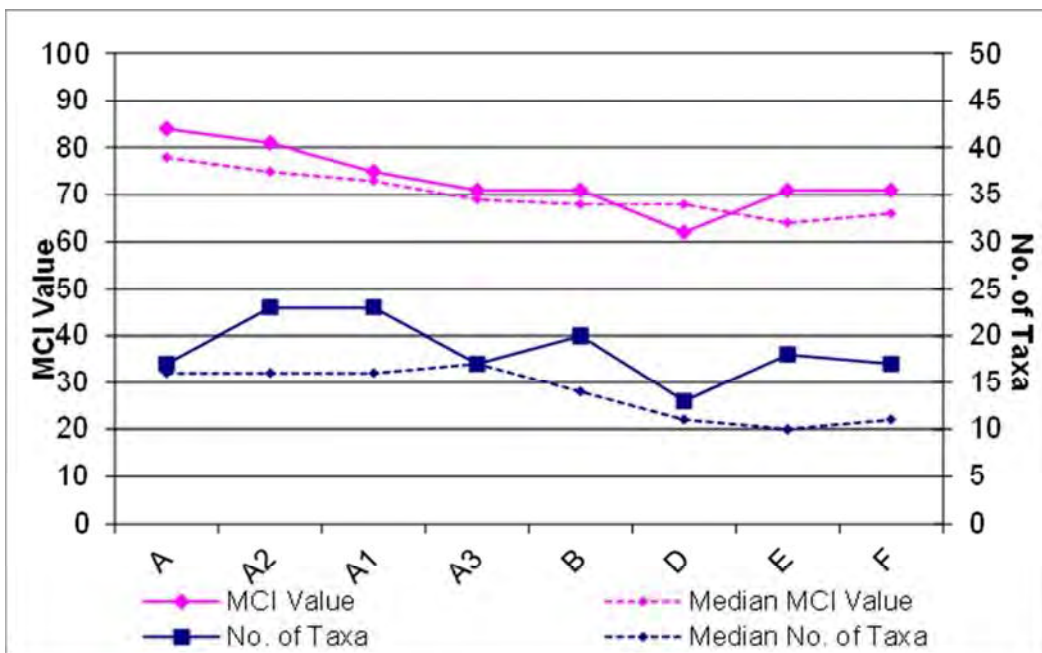


Figure 11 Numbers of taxa and MCI values recorded at sites in the Mangati Stream in the February 2014 survey

The improvements at sites B, E, and F may have been related to improved discharge quality from the wetland. Oligochaete worms, snail (*Potamopyrgus*), and amphipods (*Paracalliope*) dominated the communities at most sites. The amphipod (*Paracalliope*) was also very to extremely abundant at the sites toward the upper to mid reaches, a direct reflection of the amount of macrophyte habitat at these sites. Overall, the MCI scores indicated that the impacts of the wetland discharge recorded in more recent surveys were not as apparent at sites B, E, and F.

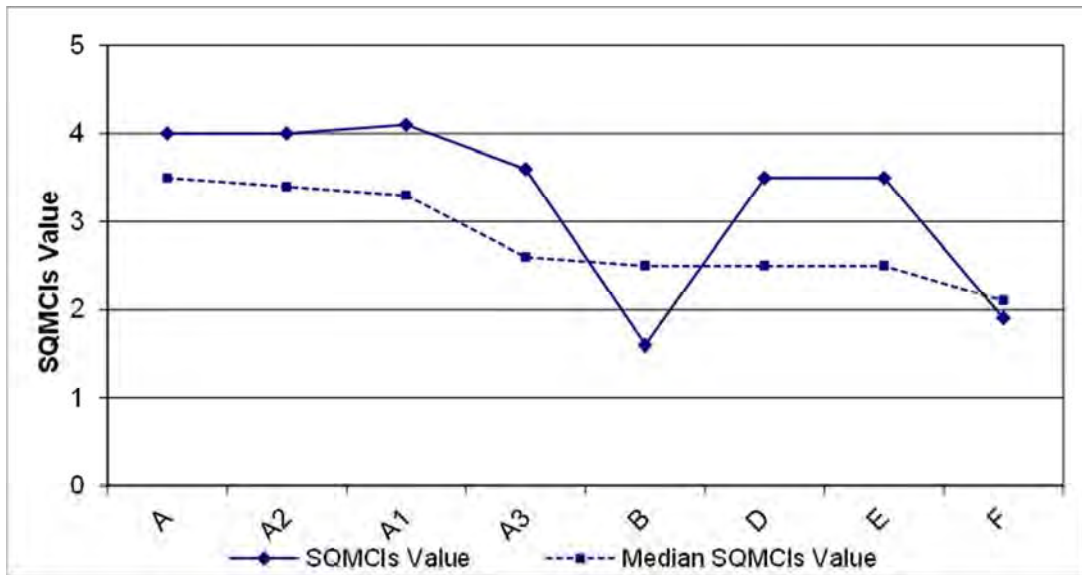


Figure 12 SQMCI_s values recorded at sites in the Mangati Stream in the October 2012 survey

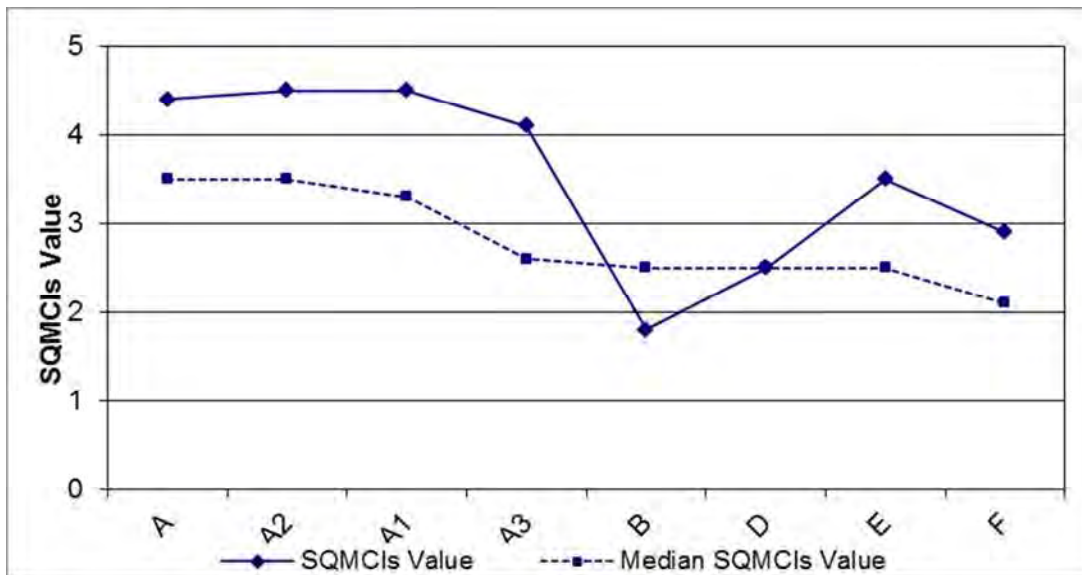


Figure 13 SQMCI_s values recorded at sites in the Mangati Stream in the February 2013 survey

Upstream of Connett Road all sites exhibited SQMCI_s scores higher than their respective historical medians, many of which were close to previous maxima. Downstream of Connett Road, Site B recorded SQMCI_s scores significantly less than the median in both October 2012 (Figure 12) and February 2013 (Figure 13), which indicated a subtle impact of the wetland discharge from pond 3, a pattern that had occurred for a number of years. However, in the November 2013 (Figure 14) and February 2014 (Figure 15) surveys all sites recorded SQMCI_s scores above their respective historical medians, indicating further recovery compared with the results of the earlier surveys.

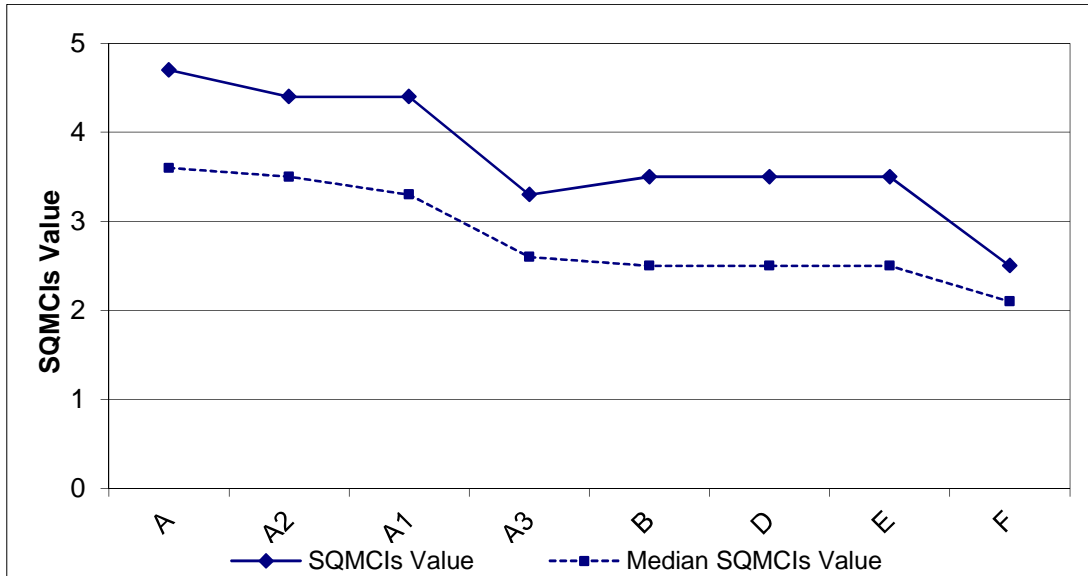


Figure 14 SQMCI_s values recorded at sites in the Mangati Stream in the November 2013 survey

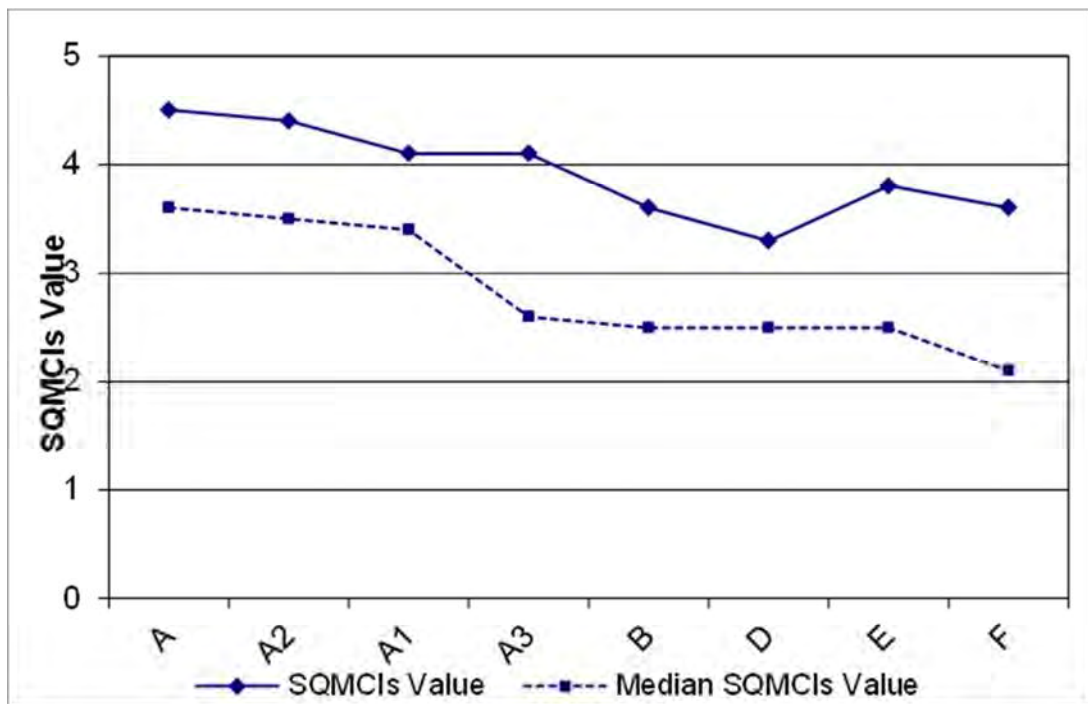


Figure 15 SQMCI_s values recorded at sites in the Mangati Stream in the February 2014 survey

Previous surveys have observed evidence of urbanisation of the Mangati Stream, such as bed erosion and significantly high preceding flows. This was not as evident in the second two surveys (November 2013 and February 2014) but urbanisation of the catchment must still be given regard to, due to increased subdivision in the headwaters, as there is potential for an increase in the 'flashiness' of the floods experienced by the Mangati Stream. This will hopefully become apparent with the recent installation of a continuous flow and rainfall data recording station (October 2012). It is considered that the impact of the flow effects is likely to worsen as the new industrial subdivision around the De Havilland Drive area is developed further.

Overall, the generally minimal changes in community structure, number of taxa, and MCI scores throughout the upper to mid reaches of the Mangati Stream, indicated that there have been no significant adverse effects on macroinvertebrate communities resulting from discharges from Tegel Poultry, De Havilland Drive West, Tasman Oil or Greymouth Petroleum. However, the discharge from the wetland ponds, although not causing the same impact as that recorded in the spring 2010 survey, may still have been subtly impacting on the macroinvertebrate community of site B, immediately downstream of the pond 3 and/or the pond 4 and pond bypass drain discharge points during the October 2012, and February 2013 and 2014 surveys. No impact was noted in the November 2013 (Figure 16) survey and this may have been attributed to higher flow conditions.

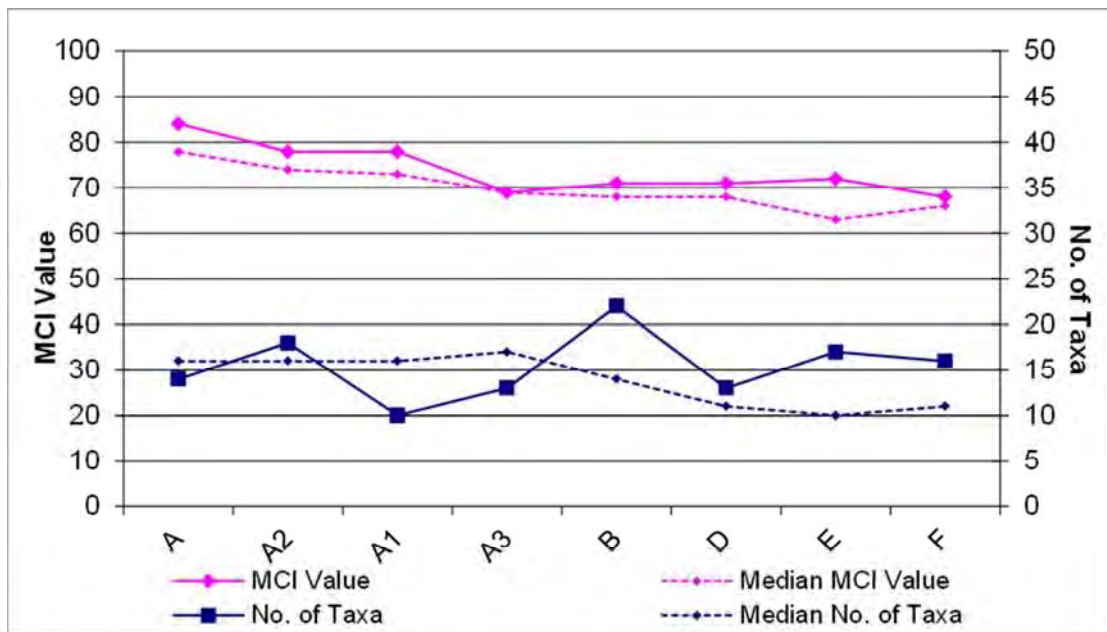


Figure 16 Numbers of taxa and MCI values recorded at sites in the Mangati Stream in the November 2013 survey

22.2.2 Fish survey

The fish communities of the Mangati Stream were surveyed at three sites using the spotlighting survey method, on 11 November 2013. The night-spotting survey was conducted using battery-powered spotlights and handheld nets, which were used by two observers to (where able), catch and identify the fish. The sites for the surveys are described in Table 70.

Table 79 Sites in the electric fishing surveys of the Mangati Stream

Site code	Site description	Altitude (m)	Distance from coast (km)
MGT000493	Mangati Stream, De Havilland Drive	30	2.64
MGT000512	Mangati Stream, 20 m downstream SH3	20	1.83
MGT000520	Mangati Stream, 400m below Devon Rd	20	1.53

These sites were specifically chosen, as sites 2 and 3 are located downstream of most discharges from the Bell Block industrial area, allowing an assessment of potential discharge impacts, and site 1 is located upstream of most discharges from this area,

allowing an assessment of potential barriers to fish passage possibly caused by discharges or instream structures.

The results of the survey are summarised in Table 80, and a copy of the full report is provided in Appendix III.

Table 80 Results of the Mangati Stream catchment fish survey conducted on 11 November 2013

Site	No. of fish species	Total fish	Banded kokopu	Giant kokopu	Inanga	Redfin bully	Shortfin eel	Longfin eel	UID eel	UID galaxiid
MGT000493	2	10	6							4
MGT000512	6	25	7	1	1	3	3	1		9
MGT000520	4	30	12	1		13			1	3

UID = *unidentified*

Most of the fish found in New Zealand streams are migratory and all the fish recorded in the Mangati Stream in this survey were migratory. Access to the stream from the sea is an important determinant of fish communities in New Zealand. Due to the frequent presence of a large gravel bar at the mouth of the Mangati Stream, access from the sea appears to be limited to times of high tide and floods. In addition, approximately 120 m upstream of the mouth, there is a natural cascade, which may impede the passage of fish. It is apparent that all species recorded in the current survey have negotiated this natural cascade. With the exception of inanga, this is not unusual, as these species are known to be good climbers which can penetrate significant distances inland. The presence of inanga upstream of the natural cascade is surprising. The results of the current survey did not indicate the presence of a barrier to fish passage, including at the SH3 culvert.

With regards to water quality, it was clear that water quality was sufficient to support a relatively diverse and abundant population of native fish. Historically, this catchment has experienced toxic discharges which have resulted in significant fish kills. No such discharge has been recorded in over ten years, although previous survey results suggests that such a discharge may have occurred approximately five years ago. This is a purely hypothetical explanation, as water quality sampling and inspections have not indicated that such a discharge took place.

Changes in land use in the area have the potential to threaten habitat within this catchment. A significant amount of pasture has been converted to industrial subdivision land, and there is the potential for habitat changes in the main stem. This is because small tributaries have been piped underground, resulting in reduced water storage in the catchment, and lower flows in summer. Furthermore, with an increase in hard surface within the catchment, if there is insufficient stormwater retention, floods will peak much quicker. This has the potential for disturbing or destroying instream habitat. How these changes will impact on the fish communities is unknown. Therefore it is recommended that fish surveys of the Mangati Stream continue as at present, with the next survey scheduled during the 2016-2017 monitoring period.

22.3 Discussion of results of Mangati Stream biological monitoring

The Mangati Stream is important for recreation and as a native fishery.

On the basis of the 2012-2014 biological monitoring results, on the whole, the quality of the Mangati Stream continues to be in the “poor” category for water quality conditions, and is amongst the poorest water qualities found in the routinely monitored waterways in Taranaki.

Historical chemical and biological monitoring results for the Mangati catchment have shown there to be a two-stage reduction in water quality, one below the main stormwater outlet from Tegel Foods poultry processing plant, the other below the industrial drain which joins the stream at the main highway. During the years under review, a reduction in the water quality of the stream was again observed on occasion downstream of the main industrial discharges, with a reduction in water quality also being observed on occasions downstream of the De Havilland Drive and Tasman Oil Tools/Greymouth Petroleum stormwater discharges.

In the past the discharge from the industrial drain has been considered to have resulted in a toxic effect on the biota of the Mangati Stream as evidenced by the disappearance of a range of species, irrespective of their tolerance to nutrients, with the effect extending to the sea.

A possible cause of the toxic effects is heavy metals, particularly zinc and copper, which have been found at high levels in both the water column and streambed sediment. The major source of the metals was the metal extrusion plant once operated by MCK Metals. Metal particulates from aerial emissions from this site had also built up in soils of the stormwater catchment over a period of 30 years. The installation of baghouses on the copper and brass and aluminium foundries, and subsequent closure of the copper and brass foundries, has since eliminated the aerial source of these metals. Stormwater run-off from roads and developed surfaces continues to carry deposited metals to the wetland and directly to the stream. In 2004-2005 it was found that the concentration of zinc in runoff to the stream appeared to be decreasing, which was attributed to remedial action taken by MCK Metals (i.e closure of the copper and brass foundries, site improvements and improvements in housekeeping at the site) and to less leaching of zinc occurring. This trend was not found to have continued in subsequent monitoring periods, although it did return during the 2009-2012 years.

In the 2012-2014 years, the copper and zinc concentrations in the industrial discharges to the stream below Connett Road were generally similar to or below the historical median values. The exceptions to these were the acid soluble and dissolve zinc from pond 3, which each returned results that were above median on two of seven occasions, and dissolved zinc in the industrial drain bypass, which was found to be above median on two of four occasions. It is also notable however, that for the second consecutive reporting period, a new minimum value was recorded for the acid soluble zinc in one of the bypass drain discharges, and a new minimum acid soluble zinc was also recorded in one of the pond 3 discharges.

In contrast it was found that the acid soluble copper, and acid soluble and dissolved zinc, in the discharge to the stream from the tributary below the pipe yards was above median at the time of all three wet weather surveys.

Monitoring also indicated that the dissolved copper and zinc concentrations in the stream remained below the USEPA chronic (long term) exposure standards under dry weather conditions, with no exceedances of these standards seen in any of the dry weather stream samples tested during the years under review.

Wet weather monitoring did, however, show that the acute criterion for dissolved zinc was exceeded during one of the three wet weather surveys at site MGT000493 (above De Havilland Drive), but even during this survey, the dissolved metals concentrations were found to be below even the chronic criteria in all the other wet weather stream samples collected.

Recent biomonitoring surveys had shown a recovery in the reach below Tegel Foods, and also above the wetland pond 3 discharge. The results of the biological surveys of the Mangati Stream in the 2004-2007 periods indicated that the macroinvertebrate communities in the stream had generally higher numbers of taxa than most past surveys, particularly in the lower part of the catchment. These were small, but positive trends in relation to the condition of the lower stream following the installation of wetlands treatment in the mid reaches of the stream.

During the years under review the biomonitoring reports concluded that there were no effects due to the discharges upstream of Connett Road.

During the years under review it was found that, although there had been some improvement in the macroinvertebrate communities downstream of the wetland discharges since the discharge of washdown water from BLM Feeds Limited had stopped (late 2010), the results still indicated that there may have been a subtle impact from the wetland pond 3 discharge on three of the four surveys.

Overall MCI and SQMCI_s scores indicated that the stream communities were of poor health, but generally typical of the condition recorded in similar Taranaki streams. Although 66 % of the MCI results fell into the "poor" category, 34 % were within the "fair" range. In the October 2012 survey, the MCI score indicated "fair" water quality at the sampling site below the pond 3 discharge for the second time. It is also noted that 12 of the 32 MCI scores recorded were similar to or above the respective historical maximum MCI scores, with new maximums being recorded for sites A, A2, A1, B, and F.

All but 9 % of the SQMCI scores were above their respective medians.

Although this assessment is very general, and does not look at other influencing factors such as seasons, it illustrates that in general the MCI and SQMCI_s scores had not deteriorated, and appeared to be improving.

Statistical analysis of the macroinvertebrate data for the Te Rima Place monitoring site (MGT000520), as reported in the Fresh Water Macroinvertebrate Fauna Biological Monitoring Programme Annual State of the Environment Monitoring Reports for 2012-2013 and 2013-2014, have found that the trend in MCI scores indicated

continued improvement coincident with better control and treatment of industrial point source discharges in the upper and mid-catchment and wetland installation in mid catchment. This improvement has continued in recent years. The MCI scores were indicative that the shift from 'very poor' to 'poor' generic stream health has been maintained during these periods. This trend of improvement in stream 'health' at this site is much more pronounced than the trend at the site 1.5 km upstream. This indicates that improvements in the activities in the catchment between these two sites have had a significant beneficial influence.

The 2013-2014 report states that the difference between the long-term median State of the Environment MCI scores of the upstream site and this site gives an overall rate of decline of 8.6 to 9.3 MCI units/km over the surveyed length of the stream (slightly less than the previous monitoring period).

The rates of decline during the 2012-2013 period were slightly higher in spring and lower in summer than this historical average rate (of 10 MCI units/km) and in the 2013-2014 period the rates of decline were lower in spring and in summer compared to the respective historical median rate (8.6 to 9.3 MCI units/km).

The November 2013 fish survey found that there were a relatively high number of fish found, but that the species diversity was low. As during the March 2011 survey it was also observed that there were no older fish present, it is significant to note that during this current survey a 250 mm giant kokopu was found. The presence of this giant kokopu indicated that preceding water quality immediately below the wetland and industrial drain bypass had been sufficient to support this fish, which was likely to be a number of years old.

During the previous survey, some concerns were noted regarding the lack of certain species. At that time it was suggested that the low abundance of some species e.g. shortfin and longfin eels, and the absence of others e.g. giant kokopu may be related to some other influence causing an impact on the fish communities of this stream, such as a discharge having occurred a year or two prior to that survey, from which the community had not yet fully recovered. The results of the current survey suggest that the communities at sites 2 and 3 are in a healthier condition than that recorded in the previous survey, lending some support to this theory.

Another theory suggested previously that may explain the lack of giant kokopu was that they are likely to be similar to trout in that more food is needed for larger fish to maintain energetic requirements (Hansen and Closs, 2005). The macroinvertebrate surveys undertaken in the Mangati Stream have recorded only a small number of invertebrates as abundant on a large number of occasions, and these invertebrates are not ideal food for giant kokopu or longfin eel, especially at the two downstream sites (Bonnet & Lambert (2002), Jellyman (1989)). However, it should be noted that giant kokopu also feed on terrestrial insects that fall into the stream, and an intact riparian margin is an important source of these terrestrial insects.

23. Summary of recommendations

1. THAT monitoring programmed for the consented activities of ABB Limited (Transformer Division) in the 2014-2015 year continues at the level programmed for 2012-2014.
2. THAT monitoring programmed for the consented activities of BLM Feeds Limited in the 2014-2015 year continues at the level programmed for 2012-2014.
3. THAT monitoring programmed for Conveyorquip Engineering Services Limited in the 2014-2015 year is discontinued due to the consent being surrendered.
4. THAT monitoring programmed for the consented activities of Greymouth Petroleum Acquisitions Company Limited in the 2014-2015 year continues at the level programmed for 2012-2014.
5. THAT monitoring programmed for consented activities of Halliburton New Zealand Limited in the 2014-2015 year continues at the level programmed for 2012-2014.
6. THAT monitoring programmed for consented activities of Hooker Bros Investments Limited in the 2014-2015 year continues at the level programmed for 2012-2014.
7. THAT monitoring programmed for consented activities of McKechnie Aluminium Solutions Limited in the 2014-2015 year continues at the level programmed for 2012-2014.
8. THAT monitoring programmed in the 2014-2015 year for consented activities at the former MI New Zealand Limited site (which at the end of the period under review had been acquired by Schlumberger Seaco Limited) continues at the level programmed for 2012-2014.
9. THAT monitoring programmed for consented activities of New Plymouth District Council in the 2014-2015 year continues at the level programmed for 2012-2014.
10. THAT monitoring programmed for consented activities of Olex New Zealand Limited - A Nexans Company in the 2014-2015 year continues at the level programmed for 2012-2014.
11. THAT monitoring programmed for consented activities of Schlumberger Seaco Incorporated in the 2014-2015 year continues at the level programmed for 2012-2014.
12. THAT monitoring programmed for consented activities of OMV New Zealand Limited in the 2014-2015 year continues at the level programmed for 2012-2014.
13. THAT monitoring programmed for consented activities of Tasman Oil Tools Limited in the 2014-2015 year continues at the level programmed for 2012-2014.

14. THAT monitoring programmed for consented activities of Tegel Foods Limited (feed mill) in the 2014-2015 year continues at the level programmed for 2012-2014.
15. THAT monitoring programmed for consented activities of Tegel Foods Limited (poultry processing plant) in the 2014-2015 year continues at the level programmed for 2012-2014.
16. THAT consideration be given to reinstating the unionised ammonia limit on consent 3470-3 (Tegel Foods Limited poultry processing plant) at the next review opportunity (June 2017).
17. THAT monitoring programmed for consented activities of Vector Gas Limited in the 2014-2015 year continues at the level programmed for 2012-2014.
18. THAT monitoring programmed for consented activities of W Abraham Limited in the 2014-2015 year continues at the level programmed for 2012-2014.
19. THAT macroinvertebrate monitoring in the 2014-2015 year continues at the level programmed for 2012-2014.
20. THAT that fish surveys of the Mangati Stream continue as at present, with the next survey scheduled during the 2016-2017 monitoring period.

Glossary of common terms and abbreviations

The following abbreviations and terms may be used within this report:

Al*	aluminium
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
BODCF	filtered carbonaceous biochemical oxygen demand. A measure of the presence of dissolved degradable organic matter, excluding the biological conversion of ammonia to nitrate
bund	a wall around a tank to contain its contents in the case of a leak
CDS	condensed distiller's syrup. A dark brown syrupy liquid with similar consistency to runny honey, which is the liquid fraction that remains after grains (principally wheat) have been fermented in the process of producing bio-ethanol in combination with yeasts and enzymes
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
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 g/m ³	elevated flow in a stream, such as after heavy rainfall 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	1,000 L intermediate bulk container
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

LMP	liquid mud plant
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 ₄	ammonium, normally expressed in terms of the mass of nitrogen (N)
NH ₃	unionised ammonia, normally expressed in terms of the mass of nitrogen (N)
NNN	total nitrate and nitrite nitrogen, expressed in terms of the mass of nitrogen (N)
NO ₃	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)
Pb*	lead
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
RFWP	Regional Freshwater Plan for Taranaki
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 subsequent amendments
SS	suspended solids
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
XLPE	cross linked polyethylene, which is hydronic tubing that is manufactured from polyethylene plastic with a three dimensional molecular bond that is created within the structure of the plastic
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 held by industries
in the Mangati catchment (alphabetical order)**

Discharge Permit
Pursuant to the Resource Management Act 1991
a resource consent is hereby granted by the
Taranaki Regional Council

Name of
Consent Holder: ABB Limited
 [Transformer Division]
 P O Box 7050
 NEW PLYMOUTH 4341

Consent Granted 19 June 2008
Date:

Conditions of Consent

Consent Granted: To discharge stormwater from a transformer manufacturing
 site into the Mangati Stream at or about (NZTM)
 1699489E-5678080N

Expiry Date: 1 June 2026

Review Date(s): June 2014, June 2020

Site Location: 60 Paraita Road, Bell Block, New Plymouth

Legal Description: Lot 2 DP 10693

Catchment: Mangati

*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. 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 2.64 hectares.
3. All stormwater shall be directed for treatment through the stormwater treatment system 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 in the discharge shall meet the standards shown in the following table.

Constituent	Standard
pH	Within the range of 6.0 to 9.0
Suspended solids	Concentration not greater than 100 gm ⁻³
Oil and grease	Concentration not greater than 15 gm ⁻³

This condition shall apply prior to the entry of the treated stormwater into the receiving waters at a designated sampling point approved by the Chief Executive, Taranaki Regional Council.

Consent 2336-3

6. That after allowing for a mixing zone of 20 metres extending downstream of the discharge, the discharge shall not give rise to any of the following effects in the receiving waters of the Mangati 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; any significant adverse effects on aquatic life.
7. The consent holder shall maintain a contingency plan. The contingency plan shall be adhered to at all times 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 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.
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, which 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. Notification by fax or post is acceptable if the consent holder does not have access to email.
10. 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.

Consent 2336-3

11. In accordance with section 128 and 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice 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 19 June 2008

For and on behalf of
Taranaki Regional Council

Director-Resource Management

TRK995435



DISCHARGE PERMIT

**Pursuant to the RESOURCE MANAGEMENT ACT 1991
a resource consent is hereby granted by the
Taranaki Regional Council**

PRIVATE BAG 713
47 CLOTEN ROAD
STRATFORD
NEW ZEALAND
PHONE 0-6-765 7127
FAX 0-6-765 5097

Name of
Consent Holder: **ABB TRANSFORMERS
[A DIVISION OF ASEA BROWN BOVERI LIMITED]
PO BOX 7050 NEW PLYMOUTH**

Consent
Granted Date: **29 January 1999**

CONDITIONS OF CONSENT

Consent Granted: **TO DISCHARGE EMISSIONS INTO THE AIR FROM DRY
STEEL GRIT BLASTING PROCESSES AND ASSOCIATED
ACTIVITIES AT OR ABOUT GR: P19:093-400**

Expiry Date: **1 June 2014**

Review Date[s]: **June 2002 and June 2008**

Site Location: **60 PARAITE ROAD, BELL BLOCK, NEW PLYMOUTH**

Legal Description: **LOT 2 DP10693 BLK II PARITUTU SD**

For General, Standard and Special Conditions pertaining to this consent please see reverse side of this document.

TRK995435

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 nothing in this consent removes from the consent holder the obligations, liabilities, duties and/or responsibilities specified in section 17 of the Resource Management Act 1991 or in any part of that Act.
- 2. THAT the consent holder shall at all times adopt the best practicable option [as defined in the Resource Management Act 1991] to prevent or minimise any adverse effects on the environment.
- 3. THAT all abrasive blasting shall be carried out in the steel grit blast rooms on the consent holder's site.
- 4. THAT the dust deposition rate beyond the property boundary arising from the discharge shall be less than $4.0 \text{ g/m}^2/30 \text{ days}$.
- 5. THAT the discharge shall not give rise to any offensive, objectionable or toxic levels of odour or dust at or beyond the boundary of the property.
- 6. THAT 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 adequately deal with the environmental effects 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 29 January 1999

For and on behalf of
TARANAKI REGIONAL COUNCIL



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: GrainCorp Feeds Limited
PO Box 5054
Westown
New Plymouth 4343

Decision Date: 31 May 2011

Commencement Date: 31 May 2011

Conditions of Consent

Consent Granted: To discharge stormwater into the Mangati Stream

Expiry Date: 1 June 2026

Review Date(s): June 2020 and/or within 3 months of receiving notification
under special condition 10

Site Location: 21 Paraitē Road, Bell Block

Legal Description: Lot 2 DP 15627 (Discharge source & site)

Grid Reference (NZTM) 1699288E-5678418N

Catchment: Mangati

*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 0.464 ha.
3. By 31 July 2011 all stormwater from the loading/unloading areas shall be directed through the stormwater diversion system.
4. Any significant volumes of hazardous substances [e.g. bulk fuel, liquid stock feeds] on site shall be:
 - a) contained in a double skinned tank, or
 - b) stored in a dedicated bunded area with drainage to sumps, or to other appropriate recovery systems, and not directly to the site stormwater system.
5. Constituents of the discharge shall meet the standards shown in the following table.

Constituent	Standard
pH	Within the range 6.0 to 9.0
suspended solids	Concentration not greater than 100 gm ⁻³
oil and grease	Concentration not greater than 15 gm ⁻³
5 day total biochemical oxygen demand	Concentration not greater than 25 gm ⁻³
total available chlorine	1 gm ⁻³

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.

6. After allowing for reasonable mixing, within a mixing zone extending 20 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. After allowing for reasonable mixing, within a mixing zone extending 20 metres downstream of the discharge point, the discharge shall not, either by itself or in combination with other discharges, give rise to a filtered carbonaceous biochemical oxygen demand in the Mangati Stream exceeding 2 gm⁻³.

Consent 7707-1

8. By 31 July 2011 the consent holder shall provide, and thereafter maintain, a satisfactory 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.
9. By 31 July 2011 the consent holder shall provide, and thereafter maintain, a satisfactory 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 systems.

A Stormwater Management Plan template is available in the Environment section of the Taranaki Regional Council's web site www.trc.govt.nz.

10. 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.
11. This consent shall lapse on 30 June 2016, 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.
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:
 - a) during the month of June 2014 and/or June 2020; and/or
 - b) within 3 months of receiving a notification under special condition 10 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.

Transferred at Stratford on 2 July 2015

For and on behalf of
Taranaki Regional Council

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: Conveyorquip Engineering Services Limited
 P O Box 158
 NEW PLYMOUTH

Consent Granted
Date: 14 February 2002

Conditions of Consent

Consent Granted: To discharge emissions into the air from a mobile abrasive
 blasting unit and associated processes at various locations
 within the Taranaki region and from a permanent abrasive
 blasting site at Connett Road, Bell Block at or about
 (NZTM) 1699562E-5678634N

Expiry Date: 1 June 2020

Review Date(s): June 2008, June 2014

Site Location: 39 Connett Road, New Plymouth

Legal Description: Lot 2 DP 13985 Blk II Paritutu SD

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

All operations

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.
2. Sand used for dry blasting must contain less than 5% by dry weight free silica and less than 2% by dry weight dust able to pass a 0.15 mm sieve.
3. All abrasive blasting is to be conducted with regard to wind direction and wind strength, such that off-site emissions are kept to a practicable minimum.
4. As far as is practicable, work areas and surrounding areas shall be cleared of accumulations of sand and any other blasted material at the end of each blasting session and by the end of each working day.
5. Any discharge to air from the exercise of this consent shall not give rise to any offensive, objectionable or toxic levels of dust or odour at or beyond the boundary of the property on which the abrasive blasting is occurring.

Operations conducted within permanent facilities

6. All abrasive blasting on the consent holder's permanent site at Connett Road, Bell Block, shall in general be carried out in a booth or shed. No abrasive blasting shall occur in the yard.
7. All emissions from abrasive blasting, surface preparation or surface coating operations and all other associated emissions from abrasive blasting at the permanent site at Connett Road, Bell Block, shall be contained and treated, as far as is practicable, prior to discharge beyond any operations enclosure. All gas streams ventilated or otherwise emitted from an enclosure shall be treated to a concentration of total particulate matter of less than 125 mg/m³ [natural temperature & pressure] corrected to dry gas basis, at any time.

Consent 5964-1

8. The dust deposition rate beyond the property boundary of the permanent site at Connett Road, Bell Block, arising from the discharge, shall be less than 4.0 g/m²/30 days.
9. The final discharge after any pre-treatment at the permanent site at Connett Road, shall not contain lead [Pb] or Pb components at a concentration greater than 0.7 mg/m³ as Pb, chromium [Cr] or Cr compounds at a concentration of 1.5 mg/m³ as Cr, or zinc [Zn] or Zn compounds at a concentration of 15 mg/m³ as Zn [discharge corrected to 0 degrees Celsius and dry gas], at any time.

Mobile operations

10. Dry sand blasting shall be used only when specified by a client. High pressure water blasting, wet sand blasting, garnet blasting, vacuum blasting or an equivalent alternative process must be used when practicable.
11. All abrasive blasting from a mobile blasting unit is to be conducted with regard to wind direction and wind strength, such that off-site emissions are kept to a practicable minimum.
12. All items or premises to be blasted from a mobile blasting unit shall be screened by means of covers, tarpaulins, cladding, or other means, as completely as practicable, to contain dust emissions and depositions and to restrict the spread of all blasting debris and materials to the satisfaction of the Chief Executive, Taranaki Regional Council.
13. Prior to undertaking abrasive blasting from a mobile blasting unit within residential areas, the consent holder shall notify the relevant District Council.
14. Where abrasive blasting or surface coating from a mobile blasting unit is to take place within 100 metres of a watercourse, the consent holder shall notify the Chief Executive, Taranaki Regional Council, prior to any operation commencing. The Chief Executive, Taranaki Regional Council, may require additional measures to prevent, minimise or mitigate any potential for adverse environmental effects. It shall be the responsibility of the consent holder to ascertain such measures prior to commencing an abrasive blasting operation, and to comply with any and all such measures at all times.
15. Dry abrasive blasting from a mobile blasting unit shall be conducted within 200 metres of any dwelling place or property boundary only with the approval of the Chief Executive, Taranaki Regional Council.
16. The suspended particulate matter shall not exceed 3 mg/m³ [measured under ambient conditions], and the deposition of dust shall not exceed 0.13 g/m²/day beyond the property boundary or beyond 50 metres of the discharge when sited on public amenity areas, whichever is less.

17. The discharge shall not give rise to any of the following effects in any surface watercourse:
- 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) an increase in suspended solids of more than 10 g/m³;
 - g) turbidity above 4 nephelometric turbidity units [NTU], except that if the turbidity within the water body is above 3.2 NTU, no more than 25% increase in NTU;
 - h) any increase in the concentration of zinc, lead, arsenic, chromium or thorium-based products.
18. It shall be the responsibility of the consent holder to ensure that all operators of abrasive blasting equipment understand and comply with the above conditions prior to the commencement of any work for which this consent is required.

Review

19. 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.

Transferred at Stratford on 31 May 2008

For and on behalf of
Taranaki Regional Council

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: Greymouth Petroleum Acquisition Company Limited
P O Box 3394
NEW PLYMOUTH 4341

Consent Granted
Date: 1 June 2010

Conditions of Consent

Consent Granted: To discharge treated stormwater from a pipeyard used for the cleaning and storage of casing and drilling equipment, and the storage of hazardous substances, onto and into land in circumstances where it may enter the Mangati Stream at or about (NZTM) 1699849E-5678405N

Expiry Date: 1 June 2026

Review Date(s): June 2014, June 2020

Site Location: 15 De Havilland Drive, Bell Block

Legal Description: Lot 4 DP 15326

Catchment: Mangati

General condition

- a. The consent holder shall pay to the Taranaki Regional Council [the Council] all the administration, monitoring and supervision costs of this consent, fixed in accordance to section 36 of the Resource Management Act.

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 1.5 hectares.
3. All stormwater, except for that which is directed to tradewaste, shall be directed for treatment through the stormwater treatment system for discharge in accordance with the special conditions of this consent.
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 ⁻³
oil and grease	Concentration not greater than 15 gm ⁻³

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 20 metres downstream of the point where the discharge enters water, 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 Mangati 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.
6. All on site operations, maintenance activities and contingency measures shall be undertaken in accordance with the GMP Environmental Limited Pipeyard Environmental Management Plan dated February 2010 or any subsequent reviews.

Consent 4664-3

7. The consent holder shall review the GMP Environmental Limited Pipeyard Environmental Management Plan prior to making any changes to the processes or operations undertaken at the site and/or on receiving written notice from the Taranaki Regional Council of:
- the requirement to review the Plan;
 - the matters which shall be addressed within the plan review; and
 - the reasons or anticipated results of the matters requiring review.

The reviewed Plan shall document all operations, maintenance activities and contingency measures and shall be submitted for approval to the Chief Executive, Taranaki Regional Council, acting in a certification capacity, at least two weeks prior to making any changes to the operations on site and/or within one month of receiving written notice of the requirement to review the Plan.

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 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 1 June 2010

For and on behalf of
Taranaki Regional Council

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: Halliburton New Zealand
P O Box 7160
NEW PLYMOUTH 4341

Decision Date: 23 June 2008

Commencement
Date: 23 June 2008

Conditions of Consent

Consent Granted: To discharge stormwater from an industrial site, used for an oil field service operation, into the Mangati Stream at or about (NZTM) 1699312E-5678527N

Expiry Date: 1 June 2026

Review Date(s): June 2014, June 2020 and/or within 3 months of receiving a notification under special condition 10

Site Location: Paraiti Road/Connett Road, Bell Block

Legal Description: Lot 1 DP 9985 Lot 1 DP 10362

Catchment: Mangati

*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. 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 2.02 hectares.
3. All stormwater shall be directed for treatment through the stormwater treatment system 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 another appropriate recovery system, and not directly to the stormwater catchment.
5. Constituents in 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 ⁻³
Oil and grease	Concentration not greater than 15 gm ⁻³
Chloride	Concentration not greater than 50 gm ⁻³
BOD	Concentration not greater than 5gm ⁻³
Unionised ammonia	Concentration not greater than 0.025gm ⁻³

This condition shall apply prior to the entry of the treated stormwater into the receiving waters at a designated sampling point approved by the Chief Executive, Taranaki Regional Council.

Consent 2337-3

6. After allowing for a mixing zone of 20 metres extending downstream of the discharge, the discharge shall not give rise to any of the following effects in the receiving waters of the Mangati 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.
7. The consent holder shall construct and maintain an adequate discharge sampling point, within three months of the granting of this consent, to the satisfaction of the Chief Executive, Taranaki Regional Council.
8. The consent holder shall maintain a contingency plan. The contingency plan shall be adhered to at all times 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.
9. The consent holders shall maintain an operational 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 and unloading of materials;
 - b) maintenance of conveyance systems;
 - c) general housekeeping; and
 - d) management of the interceptor system.
10. 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 environment effects of any changes, and to be emailed to worknotification@trc.govt.nz. Notification by fax or post is acceptable if the consent holder does not have access to email.
11. 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.

Consent 2337-3

12. In accordance with section 128 and 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 10 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.

Transferred at Stratford on 1 October 2012

For and on behalf of
Taranaki Regional Council

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: TIL Freighting Limited
Private Bag 2039
New Plymouth 4342

Decision Date: 20 September 2006

Commencement Date: 20 September 2006

Conditions of Consent

Consent Granted: To discharge stormwater from a truck depot into and onto land in the vicinity of the Mangaone Stream in the Waiwhakaiho catchment

Expiry Date: 01 June 2020

Site Location: 26 Paraita Road, New Plymouth

Legal Description: Lot 1 DP 9791 & Lot 1 DP 330342

Grid Reference (NZTM) 1699110E-5678250N

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 of the discharge on any water body.
2. The maximum stormwater catchment area shall be no more than 4.575 hectares.
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 stormwater management plan.
4. Prior to the exercise of this consent, the consent holder shall provide for the written approval of the Chief Executive, Taranaki Regional Council, site specific details relating to contingency planning for the truck depot.
5. All stormwater to be discharged under this consent shall be directed for treatment through the stormwater treatment system for discharge in accordance with the special conditions of this consent.
6. The design, management and maintenance of the stormwater system shall be generally undertaken in accordance with the information submitted in support of application 4350. In the case of any contradiction between the documentation submitted in support of application 4350 and the conditions of this consent, the conditions of this consent shall prevail.
7. Any above ground hazardous substances storage areas shall be bunded with drainage to sumps, or other appropriate recovery systems, and not to the stormwater catchment.

Consent 6952-1

8. 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) any significant adverse effects on aquatic life.
9. The discharge onto and into land shall occur a minimum of 30 metres from any surface water body. Discharge shall be onto and into land and there shall be no direct discharge to surface water.
10. 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.
11. 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.

Transferred at Stratford on 11 December 2014

For and on behalf of
Taranaki Regional Council

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: TIL Freighting Limited
Private Bag 2039
New Plymouth 4342

Decision Date: 20 April 2010

Commencement Date: 20 April 2010

Conditions of Consent

Consent Granted: To discharge stormwater from a truck depot into the Mangati Stream

Expiry Date: 01 June 2026

Review Date(s): June 2020

Site Location: 24-26 Paraita Road, Bell Block

Legal Description: Lot 1 DP 9791 Pt Lot 1 DP 330342

Grid Reference (NZTM) 1699264E-5678299N and/or 1699239E-5678364N and/or
1699149E-5678391N

Catchment: Mangati

*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 2.60 ha.
3. Any significant volumes of hazardous substances [e.g. bulk fuel, molasses] on site shall be:
 - a) contained in a double skinned tank, or
 - b) stored in a dedicated bunded area with drainage to sumps, or to other appropriate recovery systems, and not directly to the site stormwater system.
4. Constituents of the discharge shall meet the standards shown in the following table.

Constituent	Standard
pH	Within the range 6.0 to 9.0
suspended solids	Concentration not greater than 100 gm ⁻³
Oil & grease	Concentration not greater than 15 gm ⁻³
Biochemical oxygen demand	Concentration not greater than 7 gm ⁻³

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 20 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 Mangati 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.
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.

Consent 7578-1

7. The consent holder shall maintain a stormwater management plan, which shall be reviewed at not more than 2 yearly intervals. 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.

A Stormwater Management Plan template is available in the Environment section of the Taranaki Regional Council's web site www.trc.govt.nz.

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. Notification by fax or post is acceptable if the consent holder does not have access to email.
9. This consent shall lapse on 30 June 2015, 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 2012 and/or 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.

Transferred at Stratford on 11 December 2014

For and on behalf of
Taranaki Regional Council

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: McKechnie Aluminium Solutions Limited
Private Bag 2007
NEW PLYMOUTH 4342

Consent Granted
Date: 2 November 2007

Conditions of Consent

Consent Granted: To discharge stormwater [including cooling water] from an industrial site into an unnamed tributary of the Mangati Stream at or about (NZTM) 1699261E-5678255N

Expiry Date: 1 June 2026

Review Date(s): June 2014, June 2020

Site Location: Paraita Road, Bell Block, New Plymouth

Legal Description: Lot 1 DP 9212, Lot 1 DP 10008 & Lot 2 DP 330342

Catchment: Mangati

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 5010. In the case of any contradiction between the documentation submitted in support of application 5010 and the conditions of this consent, the conditions of this consent shall prevail.
3. The stormwater discharge shall be from a catchment not exceeding 5 hectares.
4. After allowing for a mixing zone of 10 metres, the discharge shall not give rise to any of the following effects in the receiving waters of the Mangati Stream:
 - (a) the production of any conspicuous oil or grease films, scums or foams or floatable or suspended matter;
 - (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 effect on aquatic life;
 - (f) the temperature of water shall not exceed 25°C.
5. Components of the discharge shall not exceed the following concentrations:

pH (range)	6.0-9.0
oil and grease	15 g/m ³
suspended solids	100 g/m ³
6. The consent holder shall maintain a contingency plan that details action to be taken in the event of accidental discharge or spillage of contaminants to ensure that the effects are minimised.

Consent 3139-3

7. The consent holder shall maintain a stormwater management plan detailing the management and discharge of stormwater and cooling water to ensure that any effects on the Mangati Stream are minimised. This shall include any capital works planned to be undertaken.
8. The consent holder shall comply with the procedures, requirements, obligations and all other matters specified in the management plan except with the specific agreement of the Chief Executive, Taranaki Regional Council. In the case of any contradiction between the management plan and the conditions of this consent, the conditions of this resource consent shall prevail.
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 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.

Transferred at Stratford on 4 March 2010

For and on behalf of
Taranaki Regional Council

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:	Schlumberger New Zealand Limited PO Box 7146 New Plymouth 4341	
Decision Date (Change):	08 June 2010	
Commencement Date (Change):	08 June 2010	(Granted Date: 23 March 2002)

Conditions of Consent

Consent Granted:	To discharge treated stormwater from a synthetic liquid mud plant and storage site into the Mangati Stream	
Expiry Date:	01 June 2020	
Review Date(s):	Within three months of receiving a notification under special condition 8	
Site Location:	68-92 Paraiti Road, Bell Block	
Legal Description:	Lot 1 DP 20999 & Lot 1 DP 11201	
Grid Reference (NZTM)	1699611E-5678151N and/or 1699565E-5678094N and/or 1699605E-5678163N and/or 1699631E-5678166N	
Catchment:	Mangati	

*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 the Resource Management Act 1991, to prevent or minimise any adverse effects of the discharge on the receiving environment.
2. The maximum stormwater catchment area shall be no more than 1.77 ha.
3. The consent holder shall ensure that the discharge from the Liquid Mud Plant is treated and managed in the manner described in the MI SWACO *Paraiti Road Facility Stormwater Management Plan* issue [A, 0, document number NZ-HSE-707], or to no lesser standard in an alternative system, as approved in writing by the Chief Executive, Taranaki Regional Council.
4. Constituents in the discharge shall meet the following standards:

Constituent	Standard
pH	Within the range 6.0 to 9.0
Oil & grease	Concentration not greater than 15 gm ⁻³
suspended solids	Concentration not greater than 100 gm ⁻³
Biochemical oxygen demand	Concentration not greater than 7 gm ⁻³
Unionised ammonia	Concentration not greater than 0.025 gm ⁻³

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.

5. After allowing for reasonable mixing, within a mixing zone extending 20 metres downstream of the discharge point, the discharge shall not give rise to any of the following effects in the receiving waters of the Mangati 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.
6. By 8 September 2010 the consent holder shall provide an updated contingency plan, which shall thereafter be maintained by means of reviews 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.

Consent 5987-1

7. The consent holder shall maintain a stormwater management plan, which shall be reviewed at not more than 2 yearly intervals. 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.

A Stormwater Management Plan template is available in the Environment section of the Taranaki Regional Council's web site www.trc.govt.nz.

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.
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 2008 and/or June 2014; 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 actual or potential 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 2014

For and on behalf of
Taranaki Regional Council

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

CHIEF EXECUTIVE
PRIVATE BAG 713
47 CLOTEN ROAD
STRATFORD
NEW ZEALAND
PHONE 06-765 7127
FAX 06-765 5097

Please quote our file number
on all correspondence

Name of
Consent Holder: New Plymouth District Council
Private Bag 2025
NEW PLYMOUTH

Consent Granted
Date: 11 September 2002

Conditions of Consent

Consent Granted: To discharge up to 5200 litres/second of stormwater from industrial sealed areas and roofs through piped stormwater systems into the Mangati Stream at or about GR: P19:096-404

Expiry Date: 1 June 2020

Review Date(s): June 2004, June 2008, June 2014

Site Location: Connett/Paraita Roads, Bell Block, New Plymouth

Legal Description: Lot 1 DP 10763 Blk II Pariututu SD

Catchment: Mangati

*For General, Standard and Special conditions
pertaining to this consent please see reverse side of this document*

Consent 4302-2

General conditions

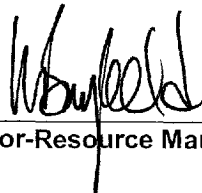
- a) On receipt of a requirement from the Chief Executive, Taranaki Regional Council (hereinafter the Chief Executive), the consent holder shall, within the time specified in the requirement, supply the information required relating to the exercise of this consent.
- b) Unless it is otherwise specified 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. This consent shall be exercised generally in accordance with the information submitted in support of application 1663 and to ensure the conditions of this consent are maintained.
2. The consent holder shall adopt the best practicable option to prevent or minimise any actual or likely adverse effect on the environment associated with the discharge.
3. Within 6 months of the granting of this consent a general outline of the methods, specifications, operating guidelines or other measures which represent the best practicable option will be supplied by the consent holder to the satisfaction of the Chief Executive, Taranaki Regional Council. This is also to include details of the proposed construction and timing of the third wetland pond and thereafter will be attached to this consent as Schedule A.
4. The consent holder shall be responsible for preventing, where possible, and mitigating any erosion which occurs as a result of the exercise of this consent.
5. 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 three months of receipt of the report specified in special condition 3 and/or during the month of June 2004 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.

Signed at Stratford on 11 September 2002

For and on behalf of
Taranaki Regional Council



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: Olex New Zealand Limited
Private Bag 2021
NEW PLYMOUTH 4620

Consent Granted
Date: 25 June 2008

Conditions of Consent

Consent Granted: To discharge stormwater and cooling water from an electric wire and cable manufacturing site into the Mangati Stream at or about (NZTM) 1699510E-5678500N

Expiry Date: 1 June 2026

Review Date(s): June 2014, June 2020 and/or within 3 months of receiving a notification under special condition 10

Site Location: Paraita Road, Bell Block

Legal Description: Lot 2 DP 338778

Catchment: Mangati

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 discharges shall be from a catchment area not exceeding 6.24 hectares.
3. 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.
4. Constituents in the discharge shall meet the standards shown in the following table.

Constituent	Standard
pH	Within the range of 6.0 to 6.9
Suspended solids	Concentration not greater than 100 gm ⁻³
Oil and grease	Concentration not greater than 15 gm ⁻³

This condition shall apply prior to the 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 20 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 Mangati 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 4497-3

6. The consent holder shall maintain a contingency plan. The contingency plan shall be adhered to at all time 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. The consent holder shall maintain stormwater 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 and unloading of materials;
 - b) maintenance of conveyance systems;
 - c) general housekeeping; and
 - d) 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, which 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 to be emailed to 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 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 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 10 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 25 June 2008

For and on behalf of
Taranaki Regional Council

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: Nexans New Zealand Limited
Private Bag 2021
New Plymouth 4342

Decision Date: 24 February 2015

Commencement Date: 24 February 2015

Conditions of Consent

Consent Granted: To discharge emissions into the air from an electric wire and cable manufacturing plant and associated activities

Expiry Date: 1 June 2032

Review Date(s): June 2020, June 2026 and in accordance with special condition 8

Site Location: 69 Paraita Road, Bell Block

Legal Description: Lot 1 DP 435659 (Discharge source & site)

Grid Reference (NZTM) 1699564E-5678312N

*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. Any discharge to air from the exercise of this consent shall not give rise to any offensive, objectionable or toxic levels of dust or odour at or beyond the boundary of the property.
3. The consent holder shall control all emissions of carbon monoxide, nitrogen dioxide, fine particles (PM₁₀) and sulphur dioxide to the atmosphere from the site, in order that the maximum ground level concentration of any of these contaminants arising from the exercise of this consent measured under ambient conditions does not exceed the relevant ambient air quality standard as set out in the Resource Management (National Environmental Standards for Air Quality Regulations, 2004) at or beyond the boundary of the property on which the site is located.
4. That the consent holder shall control all emissions to the atmosphere from the site of contaminants other than carbon dioxide, carbon monoxide, and nitrogen oxides, in order that the maximum ground level concentration for any particular contaminant arising from the exercise of this consent, measured at or beyond the boundary of the site is not increased above background levels:
 - a. by more than 1/30th of the relevant Workplace Exposure Standard-Time Weighted Average (exposure averaged over a duration as specified for the Workplace Exposure Standard-Time Weighted Average), or by more than 1/10th of the Workplace Exposure Standard-Short Term Exposure Limit over any short period of time (all terms as defined in Workplace Exposure Standards, 2010, Department of Labour); or
 - b. if no Short Term Exposure Limit is set, by more than the General Excursion Limit at any time (all terms as defined in Workplace Exposure Standards, 2010, Department of Labour).
5. Prior to undertaking any alterations to the plant, processes or operations, which may significantly change the nature or quantity of contaminants emitted to air from the site, the consent holder shall first consult with the Chief Executive, Taranaki Regional Council, and shall obtain any necessary approvals under the Resource Management Act 1991.

Consent 5417-2.0

6. The consent holder shall maintain a permanent record of any complaints received alleging adverse effects from or related to the exercise of this consent. This record shall include the following, where practicable:
- a) the name and address of the complainant, if supplied;
 - b) date, time and details of the alleged event;
 - c) weather conditions at the time of the alleged event (as far as practicable);
 - d) investigations undertaken by the consent holder in relating to the complaint and any measures adopted to remedy the effects of the incident/complaint; and
 - e) measures put in place to prevent occurrence of a similar incident.

The consent holder shall make the complaints record available to officers of Taranaki Regional Council, on request.

7. The consent holder shall provide to the Taranaki Regional Council during November of each year, for the duration of this consent, a report reviewing any technological advances in the reduction or mitigation of emissions, how these might be applicable and/or implemented at the plant, and the costs and benefits of these advances;
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 any consultation under special condition 5 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.

Transferred at Stratford on 21 May 2015

For and on behalf of
Taranaki Regional Council

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: OMV New Zealand Limited
P O Box 2621
WELLINGTON 6140

Review Completed 21 August 2008 [Granted: 7 February 1996]
Date:

Conditions of Consent

Consent Granted: To discharge up to 125 litres/second of treated stormwater from a transport depot into an unnamed tributary of the Mangati Stream at or about (NZTM) 1699411E-5678351N

Expiry Date: 1 June 2014

Site Location: Paraitē Road, Bell Block

Legal Description: Lot 3 DP 15627

Catchment: Mangati

*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

Condition 1 [changed]

1. Constituents in the discharge shall meet the standards shown in the following table:

Constituent	Standard
pH	Within the range 6.0 to 9.0
Suspended solids	Concentration not greater than 100 gm ⁻³
Oil and grease	Concentration not greater than 15 gm ⁻³
Ammoniacal nitrogen	Concentration not greater than 10 gm ⁻³
BOD	Concentration not greater than 16 gm ⁻³

This condition shall apply prior to the entry of the treated stormwater into the receiving waters at a designated sampling point approved by the Chief Executive, Taranaki Regional Council.

Conditions 2 to 4 [unchanged]

2. That after allowing for reasonable mixing the discharge shall not give rise to any of the following effects in the receiving waters of the unnamed tributary of the Mangati 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;
 - (vi) any undesirable biological growths.

Consent 3913-2

3. That the consent holder shall prepare a contingency plan to be approved by the Chief Executive, Taranaki Regional Council, to show the effect of hydrocarbon or toxic substance spill and measures to contain and deal with such spillages; this plan to be provided by 1 March 1997.
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 receiving environment.

Condition 5 [new]

5. Before 30 November 2008 the consent holder shall prepare and thereafter 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) on site hazardous substance storage;
 - b) general housekeeping; and
 - c) management of the interceptor systems.

Transferred at Stratford on 17 December 2013

For and on behalf of
Taranaki Regional Council

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: Schlumberger New Zealand Limited
PO Box 7146
New Plymouth 4341

Decision Date (Review): 27 August 2008

Commencement Date 27 August 2008 (Granted Date: 4 July 2002)
(Review):

Conditions of Consent

Consent Granted: To discharge treated washwater and stormwater from a storage and maintenance premises for oil field exploration equipment into the Mangati Stream

Expiry Date: 01 June 2020

Review Date(s): Within 3 months of receiving a notification under special condition 2

Site Location: 94 Paraiti Road, Bell Block, New Plymouth

Legal Description: Lot 2 DP 20437 Lot 2 DP 20999 Blk II Paritutu SD

Grid Reference (NZTM) 1699611E-5677951N

Catchment: Mangati

*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

Condition 1 [unchanged]

1. This consent shall be exercised in accordance with the information submitted in support of application 1914, and special conditions 3, 4 and 7 below, and to ensure the conditions of this consent are maintained.

Condition 2 [changed]

2. 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 to be emailed to worknotification@trc.govt.nz. Notification by fax or post is acceptable if the consent holder does not have access to email.

Conditions 3 to 7 [unchanged]

3. The consent holder shall prepare and maintain an operation, management and maintenance plan to the satisfaction of the Chief Executive, Taranaki Regional Council, detailing the procedures in place to ensure effective performance of the washwater treatment system.
4. The consent holder shall prepare and maintain a stormwater management plan to the satisfaction of the Chief Executive, Taranaki Regional Council, controlling the items and methods by which storage in the stormwater catchment may occur.

5. The following concentrations shall not be exceeded within the discharge effluent:

Component	Concentration
pH (range)	6.0-9.0
suspended solids	100 gm ⁻³
oil and grease	15 gm ⁻³
dissolved copper	0.05 gm ⁻³
dissolved lead	0.2 gm ⁻³
dissolved zinc	0.65 gm ⁻³

This condition shall apply prior to the entry of the discharge into the receiving waters of the unnamed tributary, at a designated sampling point approved by the Chief Executive, Taranaki Regional Council.

6. After allowing for a 20 metre mixing zone extending downstream of the discharge point the discharge shall not give rise to any of the following effects in the receiving waters of the Mangati 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.
7. Within three months of the granting of this consent, 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.

Condition 8 [changed]

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:
- during the month of June 2014; and/or
 - within 3 months of receiving a notification under special condition 2 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.

Consent 6032-1

Condition 9 [new]

9. There shall be no discharge of wastes containing surfactants, solvents, or any other degreasing agents.

Transferred at Stratford on 10 December 2014

For and on behalf of
Taranaki Regional Council

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: Tasman Oil Tools Limited
PO Box 3140
NEW PLYMOUTH 4312

Decision Date (Review): 05 August 2014

Commencement Date 05 August 2014 (Granted Date: 26 November 2001)
(Review):

Conditions of Consent

Consent Granted: To discharge up to 112 litres/second of stormwater including washdown water from a storage and maintenance yard for oil field drilling equipment into an unnamed tributary of the Mangati Stream

Expiry Date: 01 June 2020

Review Date(s): Within 3 months of receiving notification under special condition 4

Site Location: 13 De Havilland Drive, Bell Block

Legal Description: Lot 3 DP 14795 (Discharge source & site)

Grid Reference (NZTM) 1699760E-5678367N

Catchment: Mangati

*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. This consent shall be exercised generally in accordance with the information submitted in support of application 1566 and to ensure the conditions of this consent are maintained.
- 2. The consent holder shall keep and make available to the Chief Executive, Taranaki Regional Council, upon request, records of the date, frequency and duration of all washing conducted outside the constructed washpad; such records to be kept for at least 12 months.
- 3. The consent holder shall notify the Chief Executive, Taranaki Regional Council 48 hrs prior to yard washings being undertaken for periods in excess of 8 hours in any seven day period.
- 4. 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 to be emailed to worknotification@trc.govt.nz. Notification by fax or post is acceptable if the consent holder does not have access to email.
- 5. The stormwater treatment system shall be maintained to the satisfaction of the Chief Executive, Taranaki Regional Council.
- 6. The following concentrations shall not be exceeded within the discharge effluent:

Component	Concentration
pH (range)	6.0-9.0
suspended solids	100 gm ⁻³
oil and grease	15 gm ⁻³
dissolved copper	0.05 gm ⁻³
dissolved lead	0.2 gm ⁻³
dissolved zinc	0.65 gm ⁻³

This condition shall apply prior to the entry of the treated stormwater into the receiving waters of the unnamed tributary, at a designated sampling point approved by the Chief Executive, Taranaki Regional Council.

Consent 4812-2.1

7. After allowing for a 20 metre mixing zone extending downstream of the discharge point the discharge shall not give rise to any of the following effects in the receiving waters of the Mangati 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.
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. 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
 - b. within 3 months of receiving a notification under special condition 4 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.
10. There shall be no discharge of wastes containing surfactants, solvents, or any other degreasing agents.
11. Before 30 November 2008 the consent holder shall prepare and thereafter 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) on site hazardous substance storage;
 - b) general housekeeping; and
 - c) management of the interceptor systems.

Signed at Stratford on 05 August 2014

For and on behalf of
Taranaki Regional Council

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: Tegel Foods Limited
Private Bag 2015
NEW PLYMOUTH 4340

Decision Date: 12 February 2014

Commencement Date: 12 February 2014

Conditions of Consent

Consent Granted: To discharge stormwater from a stock/poultry feed manufacturing site to the New Plymouth District Council stormwater drainage network

Expiry Date: 01 June 2026

Review Date(s): June 2017, June 2020, June 2023 and/or within 3 months of receiving a notification under special condition 10

Site Location: 39 & 57 Paraita Road, Bell Block

Legal Description: Lots 1 & 2 DP 346597 (Discharge source & site)

Grid Reference (NZTM) 1699389E-5678203N

Catchment: Mangati

*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. Specifically this includes ensuring that 5 day total Biochemical Oxygen Demand (BOD) of the discharge is as low as practically achievable.
2. The stormwater discharged shall be from a catchment area not exceeding 2 hectares.
3. Constituents of the discharge shall meet the standards shown in the following table.

Constituent	Standard
pH	Within the range 6.0 to 9.0
suspended solids	Concentration not greater than 100 gm ⁻³
total recoverable hydrocarbons	Concentration not greater than 15 gm ⁻³
5 day total Biochemical Oxygen Demand (BOD) until 30 November 2014	Concentration not greater than 50 gm ⁻³
5 day total Biochemical Oxygen Demand (BOD) after 30 November 2014	Concentration not greater than 25 gm ⁻³

This condition shall apply before entry of the treated stormwater into the New Plymouth District Council pipe at a designated sampling point approved by the Chief Executive, Taranaki Regional Council.

4. After allowing for reasonable mixing, within a mixing zone extending 20 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. Before 30 November 2014, the consent holder shall empty the tank and pipe the waste water to the New Plymouth District Council's municipal trade waste system.
6. Before 1 April 2014 the consent holder shall provide, for certification by the Chief Executive of the Taranaki Regional Council, details of a performance based improvement programme outlining monitoring, trigger values, inspections, corrective actions, roles and responsibilities and performance reporting to be undertaken by the consent holder to demonstrate compliance with special condition 1.

Consent 2335-4.0

7. A copy of the performance report required by condition 6 shall be provided to the Taranaki Regional Council by 1 July each year.
8. The consent holder shall maintain 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 contingency plan shall be followed in the event of a spill or unauthorised discharge and shall be certified by the Chief Executive, Taranaki Regional Council as being adequate to avoid, remedy or mitigate the environmental effects of such a spillage or discharge.
9. Within three months of the granting of this consent, the consent holder shall prepare and maintain a stormwater management plan that documents how the site is to be managed to minimise the contaminants that become entrained in the stormwater. This plan shall be followed at all times, shall be certified by the Chief Executive, Taranaki Regional Council, and 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.

A Stormwater Management Plan template is available in the Environment section of the Taranaki Regional Council's web site www.trc.govt.nz.

10. 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 materials 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.
11. 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 2017 and/or June 2020 and/or June 2023; and
 - b) within 3 months of receiving a notification under special condition 10 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 February 2014

For and on behalf of
Taranaki Regional Council

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**

PRIVATE BAG 713
47 CLOTEN ROAD
STRATFORD
NEW ZEALAND
PHONE 0-6-765 7127
FAX 0-6-765 5097

Name of
Consent Holder: Tegel Foods Limited
Private Bag 2015
NEW PLYMOUTH

Consent Granted
Date: 23 November 2001

Conditions of Consent

Consent Granted: To discharge emissions into the air from the milling and blending of grain and/or animal meals together with associated activities at or about GR: P19:094-399

Expiry Date: 1 June 2020

Review Date(s): June 2008, June 2014

Site Location: 39/57 Paraita Road, Bell Block, New Plymouth

Legal Description: Lots 3 & 4 DP 11072 Blk II Paritutu SD

Consent 4038-6

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; and
 - ii) charges authorised by regulations.

Special conditions

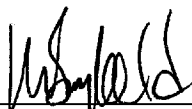
1. The consent holder shall at all times adopt the best practicable option, as defined in section 2 of the Resource Management Act 1991, to prevent or minimise any adverse effects on the environment.
2. No alteration shall be made to plant equipment or processes which may substantially alter the nature, quantity or likelihood of discharges to atmosphere without prior consultation with the Chief Executive, Taranaki Regional Council.
3. Within three months of the granting of this consent the consent holder shall prepare and maintain to the satisfaction of the Chief Executive, Taranaki Regional Council a management plan addressing the measures adopted to prevent an accumulation of dust within the stormwater catchment as a result of normal operations and emission incidents.
4. The discharge concentration of dust from any point source shall be less than 125 mg/m^3 normal temperature and pressure (NTP).
5. The dust deposition rate beyond the property boundary arising from the discharge shall be less than $4.0 \text{ g/m}^2/30 \text{ days}$.
6. Any discharge to air from the premises shall not give rise to any offensive, objectionable, noxious or toxic levels of dust or odour at or beyond the boundary of the property, and in any case, suspended particulate matter shall not exceed 3 mg/m^3 (measured under ambient conditions) beyond the boundary of the site.
7. The consent holder shall keep, and make available to the Chief Executive, Taranaki Regional Council, upon request, a record of the time, duration and cause of all dust or smoke emissions incidents having actual or potential off-site impacts.
8. As far as is practicable yard areas of the site shall be cleared of accumulations of dust.

Consent 4038-6

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 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 23 November 2001

For and on behalf of
Taranaki Regional Council



Director-Resource Management

Appendix II

Results of chemical monitoring of the Mangati Stream and industrial drainage system

3 July 2012 – wet weather run

Ste	Code	Sample	Time	AAs	BOD	BODF	COD	Condy	CuAs	CuD	DO	DRP	ECOL	ENT	FC	NH ₃	NH ₄	NNN	O&G	PbAs	pH	SS	Temp	Turby	ZnAs	ZnD
Mangati below railway	MGT000485	TRC122396	10:00		1.4			17.6	<0.001	<0.001	9.3	0.015				0.00012	0.065	1.53			6.9	22	11.3	10	0.005	<0.005
Tegel poultry to swamp	STW001053	TRC122398	10:20		29		160	24.4				0.450				0.01769	2.01		a		7.6	110	9.5	130		
Tegel swamp tributary	MGT000489	TRC122397	10:10		1.1			16.4				0.016				0.00005	0.038				6.7	<2	10.7	1.2		
Mangati below Tegel	MGT000493	TRC122399	10:30		1.4			17.4	<0.001	<0.001	9.8	0.015				0.00016	0.086				6.9	15	10.6	10	0.019	0.005
Tegel P to De Hav. Dr. W manhole Pipe B	STW001130	TRC122434	09:55		28			14.2				0.600				0.00382	0.964		<0.5		7.3	58	8.2	48		
Tegel P to De Hav. Dr. W manhole Pipe A	STW001129	TRC122435	09:58		5.8			7.1				0.212				0.00684	2.11		<0.5		7.2	10	8.6	13		
Tegel P to De Hav. Dr. E manhole	STW001128	TRC122436	10:08		9.6			8.0				0.335				0.02453	2.46		0.9		7.7	20	8.3	16		
De Havilland Drive West	STW001054	TRC122400	10:40		11			6.0				0.206				0.00091	0.344		2.4		7.1	51	8.9	48		
Tasman Oil Tools	STW001057	TRC122401	10:50					19.0	0.400	0.01									3.5	0.28	7.1	600	7.8	520	1.18	0.204
Below Greymouth	MGT000495	TRC122402	11:05					16.6	0.060	<0.01									a	<0.05	6.6	240	9.1	630	0.232	0.081
Mangati above Connett Road	MGT000497	TRC122407	11:15		2.4			16.0	0.003	<0.001	9.0	0.008				0.00013	0.132				6.6	36	11.2	21	0.031	0.011
Connett Road	STW001055	TRC122408	11:00		7.1			4.1	0.020	<0.01		0.087				0.00049	0.336		a		6.8		10.0	13	0.173	0.119
Tegel feed mill	STW001015	TRC122427	10:52		94	34	300	12.4				0.301	130000	2400000	130000	0.00301	0.929		3.1		7.2	240	8.6	149		
MCK Metals east drain	STW001014	TRC122428	12:50	0.40				3.8	0.060	0.04										<0.05	7.3	8	9.8	11	0.654	0.550
Hookers – Turners&Growers	STW001133	TRC122424	13:30		16			3.1				0.189									7.2	50	8.4	24		
Hookers – loading canopy	STW001132	TRC122422	13:50					6.2				0.731				0.02153	6.69		5.0		7.2	150	8.5	80		
MCK Northern stormwater	STW001028	TRC122429	12:42	0.1				3.7	0.040	0.02											7.2	5	9.9	4.1	0.718	0.631
Hookers to Connett Road	STW001131	TRC122421	10:15		12			6.6				0.151							0.7		7.1	16	9.4	16		
Halliburtons washpad	STW002042	TRC122404	12:05					4.8											2.3		7.5	18	9.1			
Upper Connett Road	STW001012	TRC122425	10:20		75			16.8											3.0		7.3		9.7	65		
OMV	IND002013	TRC122426	13:00		6.6	4.9	16	4.3				0.090	38000	93000	38000	0.00037	0.222		0.6		6.9	14	9.1	20		
BLM Feeds Limited	STW001138	TRC122419	13:10		5.1			5.8													7.5	6	9.9	3.0		
Below OMV	STW001018	TRC122420	13:14		5.4			4.4				0.086					0.193		a		7.0		9.5	15		
Middle Connett Road	STW001010	TRC122418	10:28					12.6									3.15				7.2		9.2	81		
MI New Zealand mud plant	STW002071	TRC122431	11:35		1.5			4.5								0.00024	0.072				7.2	19	8.7	20		
Schlumberger	STW001056	TRC122433	11:10				31	6.1		<0.01									1.0	<0.05	7.5	19	8.3	13		0.232
MI NZ	STW001118	TRC122432	11:57					9.7								0.00025	0.078		<0.5		7.2	61	8.4	102		
ABB Transformers	STW001017	TRC122430	12:00					3.6	0.010	<0.01									1.0	<0.05	7.2	16	9.0	16	0.352	0.268
Central Drain	STW001011	TRC122417	10:29					11.8									0.467		1.4		9.6		8.7	33		
Lower Connett Road	STW001052	TRC122416	10:37		35			8.9											1.9		7.4		8.7	70		
Olex Cables	STW001025	TRC122415	10:39					3.6	0.020	0.01											7.1		9.5	4.2	0.078	0.056
Halliburtons lower yard	STW001009	TRC122403	12:20		3.2			6.2		<0.01						0.00182	0.055		1.2		8.2	66	9.1	77	0.606	
Mainland Products	STW001048	TRC122406	13:00					5.4											a		6.8	26	10.5	28	0.513	0.413
Industrial drain outlet	STW001026	TRC122405	12:30		10			4.8	0.030	0.01		0.134				0.00227	0.516		a		7.3		9.5	34	0.362	0.229
NPDC wetlands pond 3	STW002056	TRC122409	11:30	0.2	2.1		<5	19.6	0.007	0.001		0.013				0.00089	0.809		a	<0.05	6.7	9	9.5	8.8	0.194	0.129
Mangati below pond 3	MGT000500	TRC122410	11:35		2.2			16.2	0.004	0.001	8.8	0.009				0.00021	0.170				6.7	28	11.1	23	0.040	0.021
Industrial drain at Mangati	MGT000503	TRC122411	11:45	<0.1	<0.5		<5	15.0	0.005	0.002		0.004				0.00001	0.036		a	<0.05	6.2	<2	10.9	2	0.053	0.043
Mangati below industrial drain	MGT000512	TRC122412	11:50		2.2			16.3	0.006	0.001	8.2	0.008				0.00026	0.163				6.8	33	11.2	25	0.041	0.018
Mangati at coast	MGT000550	TRC122413	12:40		2.3			14.4	0.006	<0.001	10.6	0.008				0.00028	0.118	1.10			7.0	35	10.8	30	0.034	0.013
Overland flow Tegel Feed mill	SSM000059	TRC122439	10:58																6.4							

3 September 2012 – wet weather run

Site	Code	Sample	Time	AiAs	BOD	BODF	COD	Condy	CuAs	CuD	DO	DRP	ECOL	ENT	FC	NH ₃	NH ₄	NO ₃	O&G	PbAs	PERS	pH	SS	Temp	Turb	ZnAs	ZnD
Mangati below railway	MGT000485	TRC122758	10:10		3.6			16.9	0.005	<0.001	8.9	0.010				0.00028	0.101	1.09			86	7.0	81	12.9	48	0.030	0.010
Tegel poultry to swamp	STW001053	TRC122760	10:25		11		34	3.3				0.181				0.00323	0.372		a			7.5	68	12.6	62		
Tegel swamp tributary	MGT000489	TRC122759	10:05		6.6			8.1			8.4	0.057				0.00064	0.366				80	6.8	57	12.6	57		
Mangati below Tegel	MGT000493	TRC122761	10:35		3.9			15.4	0.005	0.001	8.9	0.015				0.00034	0.152				85	6.9	72	12.9	43	0.048	0.022
Tegel P to De Hav. Dr. W manhole Pipe B	STW001130	TRC122796	10:20		5.1			2.6				0.185				0.00048	0.106		a			7.2	6	13.1	3.7		
Tegel P to De Hav. Dr. W manhole Pipe A	STW001129	TRC122797	10:25		1.1			1.1				0.028				0.00006	0.056		a			6.6	3	13.0	1.1		
Tegel P to De Hav. Dr. E	STW001028	TRC122791	12:30	0.1				1.2	0.01	0.01									a			7.0	<2	13.6	0.78	0.351	0.335
De Havilland Drive West	STW001054	TRC122762	10:45		3.3			2.1				0.026				0.00011	0.040		a			7.0	77	13.1	41		
Tasman Oil Tools	STW001057	TRC122763	10:55					4.4	0.17	0.01									6.9	0.08		8.2	240	13.0	210	0.414	0.017
Greymouth Petroleum	IND001012	TRC122764	11:10					5.2	0.08	<0.01									1.1	0.09		7.5	410	12.1	430	0.223	0.010
Below Greymouth	MGT000495	TRC122765	11:20					4.8	0.10	<0.01									2.8	0.07		7.4	290	12.6	300	0.284	0.028
Mangati above Connett Road	MGT000497	TRC122770	11:30		6.8			8.7	0.018	0.003	9.5	0.036				0.00048	0.264				92	6.8	200	13.1	110	0.080	0.017
Tegel feed mill	STW001015	TRC122789	13:07		21	4.7	49	2.8				0.104	36000	2000000	36000	0.00069	0.238		3.1			7.0	68	13.3	33		
MCK Metals east drain	STW001014	TRC122790	13:00	0.25				1.4	0.03	0.02									1.6	<0.05		7.1	2	13.6	1.8	0.312	0.284
Hookers – Turners&Growers	STW001133	TRC122786	13:18		3.5			1.8				0.048							<0.5			7.1	5	13.2	3.3		
Hookers – loading canopy	STW001132	TRC122785	13:27		7.3			4.2				0.302							a			7.3	24	13.2	14		
MCK Northern stormwater	STW001128	TRC122798	10:31		1.2			2.3				0.038				0.00041	0.058		a			7.4	6	12.9	1.2		
Hookers to Connett Road	STW001131	TRC122784	10:42		3.6			1.2				0.109							a			6.8	10	12.9	4.4		
Halliburtons washpad	STW002042	TRC122767	11:35					2.2											1.9			7.4	29	13.4			
Upper Connett Road	STW001012	TRC122787	10:50		0.9			1.7											a			7.1		13.3	26		
OMV	IND002013	TRC122788	13:45		2.3	1.3	16	1.5				0.028	12000	65000	12000	0.00009	0.037		a			6.9	19	13.5	10		
BLM Feeds Limited	STW001138	TRC122782	13:55		>24			12.6											3.0			7.3	34	13.8	16		
Below OMV	STW001018	TRC122783	14:05		15			3.6				0.100					0.036		0.7			7.1		13.9	6.2		
Middle Connett Road	STW001010	TRC122781	11:01					2.0									0.123		a			7.0		13.3	16		
MI New Zealand mud plant	STW002071	TRC122793	11:45		1.4			8.7								0.00002	0.016		3.0			6.6	15	13.3	11		
Schlumberger	STW001056	TRC122795	11:26				<5	2.0		0.05									a	<0.05		7.0	8	13.3	4.6	0.053	0.050
MI NZ	STW001118	TRC122794	12:40		1.5			2.0								0.00454	0.010		a			9.4	22	13.2	22		
ABB Transformers	STW001017	TRC122792	12:35					9.2	0.01	<0.01									b	<0.05		6.9	14	13.4	7.6	0.179	0.151
Central Drain	STW001011	TRC122780	10:58					1.8									0.036		a			7.1		13.2	11		
Lower Connett Road	STW001052	TRC122779	11:10		12			2.3											a			7.1		13.2	12		
Olex Cables	STW001025	TRC122778	11:07					0.8	0.03	0.03									a			6.6		13.2	0.98	0.031	0.025
Halliburtons lower yard	STW001009	TRC122766	11:45		3.3			5.1	0.12	<0.12						0.00665	0.020		<0.5			9.2	580	13.3	540	0.567	
Mainland Products	STW001048	TRC122769	11:55					2.5											a			7.5	48	13.5	28	0.028	<0.005
Industrial drain outlet	STW001026	TRC122768	12:05		5.2			2.2	0.02	0.01		0.034				0.00046	0.080		a			7.3		13.4	21	0.233	0.109
Connett Road	STW001055	TRC122771	12:10		3.2			1.6	0.01	<0.01		0.028				0.00014	0.047		a			7.0		13.4	7.4	0.125	0.082
NPDC wetlands pond 3	STW002056	TRC122773	12:30	0.77	5.1		16	8.9	0.013	0.006		0.025				0.00062	0.344		a	<0.05		6.8	16	13.1	12	0.242	0.195
Mangati below pond 3	MGT000500	TRC122774	12:20		5.5			9.9	0.012	0.003	9.1	0.032				0.00046	0.256				87	6.8	94	13.1	52	0.059	0.018
NPDC wetlands pond 4	STW002055	TRC122772	12:15	0.50	3.9		10	6.8	0.01	0.005		0.020				0.00043	0.236		a	<0.05		6.8	11	13.1	7.4	0.159	0.130
Industrial drain at Mangati	MGT000503	TRC122775	12:25	1.18	3.8		15	2.4	0.014	0.006	10.3	0.032				0.00022	0.076		a	<0.05	100	7.0	22	13.3	14	0.198	0.147
Mangati below industrial drain	MGT000512	TRC122776	12:30		5.0			8.4	0.011	0.003	9.5	0.026				0.00038	0.208				91	6.8	64	13.2	37	0.097	0.051
Mangati at coast	MGT000550	TRC122777	12:50		5.3			8.0	0.020	0.003	9.9	0.014				0.00041	0.179	0.48			96	6.9	150	13.3	57	0.081	0.026

11 December 2012 – dry weather run

Ste	Code	Sample	Time	AiAs	BOD	BODF	CL2F	CL2T	COD	Condy	CuAs	CuD	DO	DRP	ECOL	ENT	FC	NH ₃	NH ₄	NNN	O&G	PbAs	PERSAT	pH	SS	Temp	Turby	ZnAs	ZnD
Mangati below railway	MGT000485	TRC123992	8:00		2.5	0.7				20.1	0.002	<0.001	7.7	0.019	2100	450	2100	0.00084	0.205	1.26			76	7.1	2	14.9	2.4	<0.005	<0.005
Tegel swamp tributary	MGT000489	TRC123993	8:05		3.1	<0.5				16.9			3.4	0.01	1800	1400	1800	0.00007	0.036				34	6.8	26	15.0	28		
Mangati below Tegel	MGT000493	TRC123994	8:30		2.5	<0.5				20.3	0.001	<0.001	7.3	0.016	4200	800	4200	0.00073	0.220				73	7.0	<2	15.1	3.8	<0.005	<0.005
Tegel P to De Hav. Dr. E manhole	STW001028	TRC123991	9:30	<0.1			0.7	0.8		14.4	<0.01	<0.01												8.0	<2	15.6	0.17	0.019	0.017
Mangati above Connett Road	MGT000497	TRC123996	9:32		1.4					21.2	0.001	<0.001	5.8	0.020	900	2300	970	0.00051	0.185				57	6.9	2	15.6	2.6	<0.005	<0.005
Connett Road	STW001055	TRC123997	9:37		31				99	66.4	0.02	0.01		0.036				0.00068	0.021		0.8			7.9		18.1	9.9	0.270	0.116
Tegel feed mill	STW001015	TRC123990	9:15		10	2.2			17	30.2				0.207	970	19000	1000	0.00597	0.532		<0.5			7.5	64	16.1	25		
Upper Connett Road	STW001012	TRC123989	10:40		0.7					15.4														7.9		15.9	2.5		
Middle Connett Road	STW001010	TRC123988	10:25		3.8					17.7					25	<25	25		0.100					7.2		16.5	9.1		
Lower Connett Road	STW001052	TRC123987	10:10		3.5				18	17.3														7.4		16.4	2.6		
Olex Cables	STW001025	TRC123986	10:20						160	72.4		0.01									2.5			8.2		19.8	5.8	0.295	0.164
Industrial drain outlet	STW001026	TRC123995	9:20		28				94	61.9	0.02	0.01		0.118	23	<23	23	0.00270	0.055					8.1		17.8	5.3	0.290	0.182
NPDC wetlands pond 3	STW002056	TRC123998	9:45	<0.1	5.4				18	14.0		0.002		0.007	700	680	700	0.00008	0.009			<0.05		7.3	10	18.8	6.7	0.099	0.056
Mangati below pond 3	MGT000500	TRC123999	9:50		1.8					20.7	0.001	<0.001	6.3	0.015	830	1500	830	0.00046	0.163				63	6.9	3	15.9	2.8	0.008	0.008
Mangati below industrial drain	MGT000512	TRC124000	11:05		1.5					20.5	0.001	<0.001	7.5	0.014	840	1400	860	0.00056	0.157				75	7.0	2	16.1	2.7	0.008	0.008
Mangati at coast	MGT000550	TRC124001	10:30		0.9					19.1	0.001	<0.001	10.4	0.007	69	210	69	0.00058	0.048	1.28			106	7.5	<2	17.0	2.2	0.007	0.007

3 April 2013 – dry weather run

Site	Code	Sample	Time	AIAs	BOD	BODF	COD	Condy	CuAs	CuD	DO	DRP	ECOL	ENT	FC	NH ₃	NH ₄	NNN	O&G	PbAs	pH	SS	Temp	Turby	ZnAs	ZnD
Mangati below railway	MGT000485	TRC135535	09:30		3.6	<0.5		25.6	<0.001	<0.00	3.3	0.019	2000	3200	2000	0.00207	0.435	0.73			7.1	32	16.9	8.0	0.008	0.008
Tegel poultry to swamp	STW001053	TRC135537	09:20		32		92	16.6				1.30				0.00318	0.767		4.7		7.3	41	17.6	60		
Tegel swamp tributary	MGT000489	TRC135536	09:40		0.9	<0.5		17.0				0.143				0.00068	0.282				6.8	16	17.0	8.3		
Mangati below Tegel	MGT000493	TRC135538	09:55		1.2	<0.5		25.0	<0.001	<0.00	4.7	0.018	2000	3900	2400	0.00138	0.286				7.1	3	17.1	5.4	0.006	0.006
Mangati above Connett Road	MGT000497	TRC135540	10:20		2.1			28.2	0.001	<0.00	4.0	0.022	5500	6000	5700	0.00153	0.244				7.2	2	17.5	3.6	0.006	0.006
Tegel P to De Hav. Dr. E manhole	STW001028	TRC135534	10:40	0.42				17.5	0.02	<0.01									a		7.9	16	18.0	3.0	0.328	0.072
Upper Connett Road	STW001012	TRC135533	09:50		8.6			18.4				0.326							a		7.9		18.6	1.7		
Industrial drain outlet	STW001026	TRC135539	10:35		12			17.5	0.04	0.03						0.03833	2.84				7.5		18.6	19	0.516	0.294
Connett Road	STW001055	TRC135541	10:40		6.9			10.3	0.03	0.02		0.206				0.01251	1.40				7.3		19.2	1.5		
NPDC wetlands pond 3	STW002056	TRC135542	10:50	<0.01	5.5		15	12.9	0.005	0.004		0.031	1800	1400	19000	0.00452	1.21		<0.05		6.9	8	19.8	4.7	0.100	0.066
Mangati below pond 3	MGT000500	TRC135543	10:55		2.9			22.9	0.002	0.002	4.7	0.022	9000	8500	9300	0.00221	0.411				7.1	4	18.5	3.5	0.028	0.022
Mangati below industrial drain	MGT000512	TRC135544	11:00		2.6			22.7	0.002	0.002	6.1	0.021	6600	9700	7200	0.00222	0.333				7.2	3	18.3	3.2	0.028	0.022
Mangati at coast	MGT000550	TRC135545	11:45		1.3			20.3	0.003	0.002	9.2	0.017	3300	7200	3400	0.00182	0.106	1.21			7.6	<2	18.8	2.5	0.013	0.010

6 November 2013 – wet weather run

Site	Code	Sample	Time	AAs	BOD	BODF	COD	Condy	CuAs	CuD	DO	DRP	ECOL	ENT	FC	NH ₃	NH ₄	NNN	O&G	Persat	PbAs	pH	SS	Temp	Turby	ZnAs	ZnD
Mangati below railway	MGT000485	TRC137593	09:05		1.4			17.0	<0.001	<0.001	8.03	0.016				0.00029	0.088	0.82		84		7.0	7	14.8	3.4	<0.005	<0.005
Tegel poultry to swamp	STW001053	TRC137595	09:30		12		20	4.1				0.344				0.00318	0.767					7.1	51	15.0	59		
Tegel swamp tributary	MGT000489	TRC137594	09:20		6.8			10.8			5.5	0.053				0.00058	0.588					6.5	15	14.3	16		
Mangati below Tegel	MGT000493	TRC137596	09:45		1.7			16.0	0.010	0.004	8.04	0.014				0.00028	0.139					6.8	14	14.7	6.3	0.153	0.104
Tegel P to De Hav. Dr. W manhole Pipe B	STW001130	TRC137628	11:20		7.1			3.1				0.170				0.00013	0.035					7.0	220	16.9	140		
Tegel P to De Hav. Dr. W manhole Pipe A	STW001129	TRC137629	11:10		7.8			3.1				0.097				0.00106	0.148		<0.5			7.3	2	16.2	24		
De Havilland Drive West	STW001054	TRC137597	09:55		4.6			2.0				0.064				0.00010	0.029					7.0	34	15.6	24		
Tasman Oil Tools	STW001057	TRC137598	10:10					4.6	0.14	0.03									1.3		0.06	7.4	140	16.4	170	0.319	0.093
Greymouth Petroleum	IND001012	TRC137599	11:10					4.6	0.22	0.02											0.10	7.4	300	16.1	360	0.459	0.057
Below Greymouth	MGT000495	TRC137600	11:20					11.3	0.13										a		0.11	7.2	290	15.6	450	0.350	0.104
Mangati above Connett Road	MGT000497	TRC137604	11:25		2.8			14.2	0.007	0.003		0.070				0.00033	0.153					6.8	24	15.3	21	0.034	0.017
Connett Road	STW001055	TRC137605	11:35		2.9			17.9	0.01	0.01		0.011				0.00039	0.280					6.6		16.0	6.8	0.170	0.146
Tegel feed mill	STW001015	TRC137621	11:50		9.2	3.2	56	467				0.096	24000	140000	25000	0.00179	0.244		1.3			7.3	75	16.5	23		
MCK Metals east drain	STW001014	TRC137622	11:40	0.15				2.8	<0.01	<0.01									41		<0.05	7.2	86	16.4	34	0.043	0.034
MCK Northern stormwater	STW001028	TRC137623	10:45	0.12				1.1	0.02	0.01												7.1	3	15.7	1.6	0.408	0.375
Hookers to Connett Road	STW001131	TRC137618	09:25		1.8			1.3				0.094										6.9	2	14.8	2.2		
Halliburtons washpad	STW002042	TRC137602	10:30					18.3												13		7.2	46	17.2			
Upper Connett Road	STW001012	TRC137619	09:15		5.4			3.7											1.3			7.3		15.2	24		
OMV	IND002013	TRC137620	12:00		2.1	<0.5	12	1.8				0.018	20000	39000	20000	0.00035	0.091		1.4			7.0	11	17.1	7.7		
Below OMV	STW001018	TRC137617	12:10		2.3			1.8				0.019					0.06					6.9		17.1	29		
Middle Connett Road	STW001010	TRC137616	09:10		6.7			11.6									0.31		1.2			7.2		15.1	23		
MI New Zealand mud plant	STW002071	TRC137625	10:15		1.0			3.0								0.00035	0.039					7.4	4	16.0	2.2		
Schlumberger	STW001056	TRC137627	10:05				14	2.1		<0.01											<0.05	7.1	14	16.1	8.1		0.041
MI NZ	STW001118	TRC137626	10:35		2.7			3.4								0.00079	0.089					7.4	110	16.0	150		
ABB Transformers	STW001017	TRC137624	10:30					2.9	0.08	<0.01											<0.05	7.6	57	16.0	8.8	0.293	0.158
Central Drain	STW001011	TRC137615	09:10					2.1									0.084					7.1		15.2	10		
Conveyorquip	STW001051	TRC137612	08:35					2.4											<0.5			6.9	16	15.6	13		
Lower Connett Road	STW001052	TRC137614	09:05		5.0			14.3											2.1			7.2		15.1	25		
Olex Cables	STW001025	TRC137613	08:55					0.8	<0.01	<0.01									<0.5			6.7		14.9	0.68	0.038	0.036
Halliburtons lower yard	STW001009	TRC137601	10:35		2.7			8.8		0.02						0.01700	0.029		<0.5			9.5	800	16.2	900	0.599	
Industrial drain outlet	STW001026	TRC137603	10:50		4.3			3.3	0.02	<0.01		0.048				0.00312	0.112					7.9		16.2	36	0.210	0.054
NPDC wetlands pond 3	STW002056	TRC137607	11:45	0.41	4.5		12	8.8	0.002	0.001		0.009				0.00032	0.172			<0.05		6.7	11	16.5	7.7	0.020	0.013
Mangati below pond 3	MGT000500	TRC137608	11:55		3.4			14.2	0.006	0.003		0.047				0.00030	0.168					6.7	18	15.9	18	0.051	0.032
NPDC wetlands pond 4	STW002055	TRC137606	12:00	0.52	4.5		20	10.6	0.011	0.006		0.009				0.00041	0.286			<0.05		6.6	14	16.2	13	0.198	0.164
Industrial drain at Mangati	MGT000503	TRC137609	12:05	0.61	2.5		13	5.9	0.014	0.008		0.01				0.00007	0.056			<0.05		6.5	11	17.1	12	0.188	0.157
Mangati below industrial drain	MGT000512	TRC137610	12:10		3.3			13.9	0.006	0.003		0.037				0.00040	0.179	0.57		79		6.8	16	15.9	12	0.071	0.050
Mangati at coast	MGT000550	TRC13611	12:25		2.8			11.6	0.008	0.003		0.018				0.00035	0.094					7.0	17	16.7	14	0.044	0.025

26 February 2014 – dry weather run

Ste	Code	Sample	Time	AIAs	BOD	BODF	COD	Condy	CuAs	CuD	DO	DBT	DRP	ECOL	ENT	FC	NH ₃	NH ₄	NNN	O&G	PbAs	pH	SS	TBT	Temp	TPT	Turby	ZnAs	ZnD
Mangati below railway	MGT000485	TRC149246	07:45		1.4	0.6		21.1	0.004	0.003	4.3		0.026	2200	3000	2200	0.00091	0.283	0.74			7.0	8		14.7		6.1	0.008	0.008
Tegel swamp tributary	MGT000489	TRC149247	08:05		2.0	1.0		20.1			4.9		0.032		120	350	0.00078	0.483				6.7	26		14.7		24		
Mangati below Tegel	MGT000493	TRC149249	08:30		1.5	0.5		21.4	0.002	0.002	5.6		0.018	2100	3900	2100	0.00092	0.277				7.0	9		15.1		5.9	0.007	0.007
Tegel P to De Hav. Dr. W manhole Pipe A	STW001129	TRC149258	09:06		5.5			28.8					0.334				0.24637	2.80		a		8.3	2		19.9		1.4		
Tegel P to De Hav. Dr. E manhole	STW001128	TRC149259	09:20		41			90					5.39				1.33121	42.6				7.8			20.8				
De Havilland Drive West	STW001054	TRC149250	08:50		8.4			33.9					0.921		80000	61000	0.04622	5.82		a		7.3	4		17.6		1.6		
Mangati above Connett Road	MGT000497	TRC149251	09:25		2.3	0.5		25.5	<0.001	<0.001	5.6		0.026	3100	3500	3100	0.00201	0.285				7.3	5		16.0		3.7	0.007	0.007
Upper Connett Road	STW001012	TRC149257	09:43		>47			74.6												42		7.9			18.7		20		
Olex Cables	STW001025	TRC149256	10:03					68.9	0.03	0.02		0.0013								1.0		7.8		<0.00005	17.2	<0.00004	5.3	0.271	0.136
NPDC wetlands pond 3	STW002056	TRC149252	09:50	0.06	3.6		10	23.2	0.002	0.002			0.015	1700	380	1700	0.0006	0.152		a	<0.05	6.9	12		20.5		9.3	0.010	0.007
Mangati below pond 3	MGT000500	TRC149253	10:00		2.5	0.5		24.8	0.002	0.002	6.3		0.021	2200	2700	2200	0.00122	0.267				7.1	15		16.3		8.3	0.007	0.005
Mangati below industrial drain	MGT000512	TRC149254	10:15		3.1	0.5		24.5	0.002	0.002	7.4		0.021	3500	4500	3600	0.0017	0.238				7.3	19		16.2		13	0.008	<0.005
Mangati at coast	MGT000550	TRC149255	10:45		0.8			21.0	0.002	0.002	9.2		0.011	730	1100	730	0.00052	0.045	1.14			7.5	<2		16.6		3.1	0.008	0.006

24 June 2014 – dry weather run

Ste	Code	Sample	Time	AIAs	BOD	BODF	COD	Condy	CuAs	CuD	DO	DRP	ECOL	ENT	FC	NH ₃	NH ₄	NNN	O&G	PERS AT	PbAs	pH	SS	Temp	Turb	ZnAs	ZnD
Mangati below railway	MGT000485	TRC1410400	09:35		1.4	<0.5		17.3	0.001	<0.001	8.6	0.012	870	500	870	0.0002	0.085	1.06			81.2	6.9	11	13.4	6.8	0.006	<0.005
Tegel swamp tributary	MGT000489	TRC1410401	09:40		2.3	<0.5		16.9			3.1	0.018	1400	300	1400	0.00066	0.583				29	6.6	5	13.1	5.8		
Mangati below Tegel	MGT000493	TRC1410402	10:00		1.6	<0.5		17.6	0.001	<0.001	8.5	0.010	680	350	680	0.00023	0.127				79.8	6.8	12	13.1	9.1	0.011	0.005
Tegel P to De Hav. Dr. W	STW001129	TRC1410432	10:05		<0.5			14.2				0.029				0.00466	0.241					7.8	<2	14.2	0.59		
De Havilland Drive West	STW001054	TRC1410403	10:10		0.6			23.1				0.031				0.00013	0.232					6.2	<2	16.1	2.4		
Mangati above Connett Road	MGT000497	TRC1410405	11:00		1.6	<0.5		18.2	0.002	0.001	7.9	0.008	570	330	570	0.00023	0.154				74.7	6.7	10	13.7	5.8	0.009	0.008
Connett Road	STW001055	TRC1410406	11:05		0.5			15.1	<0.01	<0.01		0.012					0.049		<0.5			6.6			0.63	0.110	0.107
Hookers – loading canopy	STW001132	TRC1410420	12:20		21			37.3				2.88							<0.5			7.6	11	15.4	6.5		
Hookers to Connett Road	STW001131	TRC1410419	10:25		21			11.2				0.330							<0.5			7.0	10	14.2	4.2		
Upper Connett Road	STW001012	TRC1410422	10:41		6.5			13											5.1			7.2		14.3	10		
Middle Connett Road	STW001010	TRC1410416	10:58		1.4			17.2									0.349		1.3			6.2		15.5	1.8		
Central Drain	STW001011	TRC1410415	10:50					16.2									0.507		<0.5			6.8		14.1	25		
Lower Connett Road	STW001052	TRC1410414	11:15		3.0			17.7														6.5		15.0	6.6		
Mainland Products	STW001048	TRC1410404	11:20					17.3														6.7	2	14.4	2.8	0.324	0.308
Industrial drain outlet	STW001026	TRC1410412	12:50		0.7			18.0	<0.01	<0.01		0.017	200	3400	200	0.00103	0.320		<0.5			7.0		14.7	5.4	0.195	0.177
NPDC wetlands pond 3	STW002056	TRC1410407	11:45	<0.1	1.6		6	15.4	0.004	0.002		0.010	1700	4100	1700	0.00080	0.749		<0.5	<0.05		6.6	4	12.3	4.9	0.178	0.166
Mangati below pond 3	MGT000500	TRC1410408	11:40		1.6	<0.5		18.0	0.002	<0.001	7.8	0.007	540	480	540	0.00035	0.185				73.9	6.8	10	13.7	6.6	0.019	0.015
Industrial drain at Mangati	MGT000503	TRC1410409	11:55	<0.1	<0.5	<0.5	<5	12.8	0.003	0.001	7.2	<0.003	180	460	180	0.00002	0.044		<0.5	<0.05	69.5	6.2	6	14.5	17	0.025	0.025
Mangati below industrial drain	MGT000512	TRC1410410	12:05		1.5	<0.5		18.0	0.002	<0.001	8.3	0.009	780	380	780	0.00026	0.170				79.3	6.7	8	13.8	7.2	0.017	0.013
Mangati at coast	MGT000550	TRC1410411	12:20		1.2			17.7	0.003	<0.001	10.0	0.007	250	330	280	0.00039	0.099	1.15			96.4	7.1	3	14.2	4.2	0.018	0.016

Appendix III
Biomonitoring reports

To Job Manager, Lorraine Smith
From Freshwater Biologists, Bart Jansma and Chris Fowles
Files 03-02-005-03/01
Report No CF613
Doc No 1381138
Date July 2014

Biomonitoring of the Mangati Stream in relation to the Bell Block industrial area, October 2012

Introduction

The Mangati Stream is a small, lowland stream, running through Bell Block in North Taranaki. The upper reaches of this stream drain the area of farmland between Paraita Road and Corbett Road, approximately five kilometres from the coast. The farmland to the south (inland) and east of this catchment area feeds the Mangaoraka Stream.

Between the New Plymouth – Marton railway and Devon Road (along the mid reaches of the Mangati Stream) is an industrial area, which has been the source of a number of spillages in past years resulting in fish kills. The stream is capable of supporting significant native fish communities including members of the native eel, galaxiid (whitebait group) and bully families. Stormwater and wastewater discharges from this area are the primary concern in this biological monitoring programme.

The following consents relate to discharges to the Mangati Stream.

ABB Transformers	2336
Shaycar Trust	3913
Conveyorquip	5964
Greymouth Petroleum	4664
MI NZ Ltd	5987
Natural Gas Corp	4780
MCK Metals Pacific Ltd	3139
New Plymouth District Council	4302
Olex Cables	4497
Halliburton New Zealand Ltd	2337
Schlumberger Seaco Ltd	6032
Tasman Oil Tools	4812
Tegel Foods – Stock food	2335
Tegel Foods – Poultry plant	3470

This October 2012 survey was undertaken as the first of two surveys scheduled for the 2012-2013 monitoring year. Macroinvertebrate surveys have been undertaken in the Mangati Stream since 1992, and those reports discussing surveys undertaken between 1992 and 2001 are referenced in TRC, 2009. Results of other surveys performed in the Mangati Stream since the 2001-2002 monitoring years are discussed in various reports listed in the references in this report.

Methods

Eight established sampling sites in the Mangati Stream catchment (Table 1, Figure 1) were sampled on 3 October 2012. ‘Kick samples’ were collected at sites A, A1, B, D2, E, and F, with the samples at sites A2 and A3 collected using the sweep-sample technique. These sampling techniques are very similar to Protocol C1 (hard-bottomed, semi-quantitative) (kick-sample) and Protocol C2 (soft-bottomed, semi-quantitative) (vegetation-sweep) of the New Zealand Macroinvertebrate Working Group (NZMWG) protocols for macroinvertebrate samples in wadeable streams (Stark et al, 2001).

Table 1 Biomonitoring sites in the Mangati Stream catchment

Site	Site code	Location	GPS
A	MGT000488	Mangati Stream, 20 m upstream of swampy tributary	E1700095 N5678043
A2	MGT000490	Mangati Stream, 100 m downstream of swampy tributary	E1700062 N5678084
A1	MGT000491	Mangati Stream, 50 m upstream of De Haviland Drive	E1700018 N5678166
A3	MGT000497	Mangati Stream, 10 m above Connet Road	E1699775 N5678573
B	MGT000500	Mangati Stream above the industrial tributary, below wetland	E1699596 N5678691
D2	MGT000512	Mangati Stream, 20 m downstream SH3	E1699513 N5678787
E	MGT000520	Mangati Stream, 400 m below Devon Road	E1699385 N5679103
F	MGT000550	Mangati Stream, 50 m above Bell Block beach	E1699215 N5680409

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.

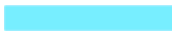


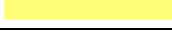


Stark (1985) developed a scoring system for macroinvertebrate taxa according to their sensitivity to organic pollution in stony New Zealand streams (HBMCI). Recently, a similar scoring system has been developed for macroinvertebrate taxa found in soft bottomed streams (Stark and Maxted, 2004, 2007) (SBMCI). The SBMCI has been used in a number of biomonitoring reports since its inception, and results to date suggest that it is not as effective at assessing the impacts of organic pollution as the HBMCI. For example, results from the February 2008 Mangati survey found a relatively unchanged SBMCI score at a site which had thick growths of sewage fungus (Jansma, 2008b). Therefore this index is considered less appropriate for the assessment of macroinvertebrate communities possibly affected by industrial discharges. Any subsequent reference to MCI refers to the HBMCI.

Highly ‘sensitive’ taxa were assigned the highest scores of 9 or 10, while the most ‘tolerant’ forms scored 1 and 0.1 in hard bottomed and soft bottomed streams respectively. The sensitivity scores for certain taxa found in hard bottomed streams have been modified in accordance with Taranaki experience. After extensive use of the MCI, categories were assigned to the sensitivity scores, to clarify their ‘relative’ sensitivity e.g. taxa that scored between 1 and 4 inclusive are considered tolerant (see Table 3).

By averaging the scores obtained from a list of taxa taken from one site and multiplying by a scaling factor of 20, a Macroinvertebrate Community Index value was obtained. The MCI is a

measure of the overall sensitivity of macroinvertebrate communities to the effects of organic pollution. More 'sensitive' communities inhabit less polluted waterways.

A gradation of biological water quality conditions based upon MCI ranges has been adapted for Taranaki streams and rivers (TRC, 2013) from Stark's classification (Stark, 1985 and Boothroyd and Stark, 2000). This is as follows:

Grading	MCI	Code
Excellent	>140	
Very Good	120-140	
Good	100-119	
Fair	80-99	
Poor	60-79	
Very Poor	<60	

A semi-quantitative MCI value (SQMCI_s) has also been calculated for the taxa present at each site by multiplying each taxon score by a loading factor (related to its abundance), totaling 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_s is not multiplied by a scaling factor of 20, so that its corresponding range of values is 20x lower.

Where necessary, sub-samples of periphyton (algae and other micro flora) were also taken from the macroinvertebrate samples and scanned under 40-400x magnification to determine the presence or absence of any mats, plumes or dense growths of bacteria, fungi or protozoa ('undesirable biological growths') at microscopic level. The presence of masses of these organisms can be an indicator of organic enrichment within a stream.

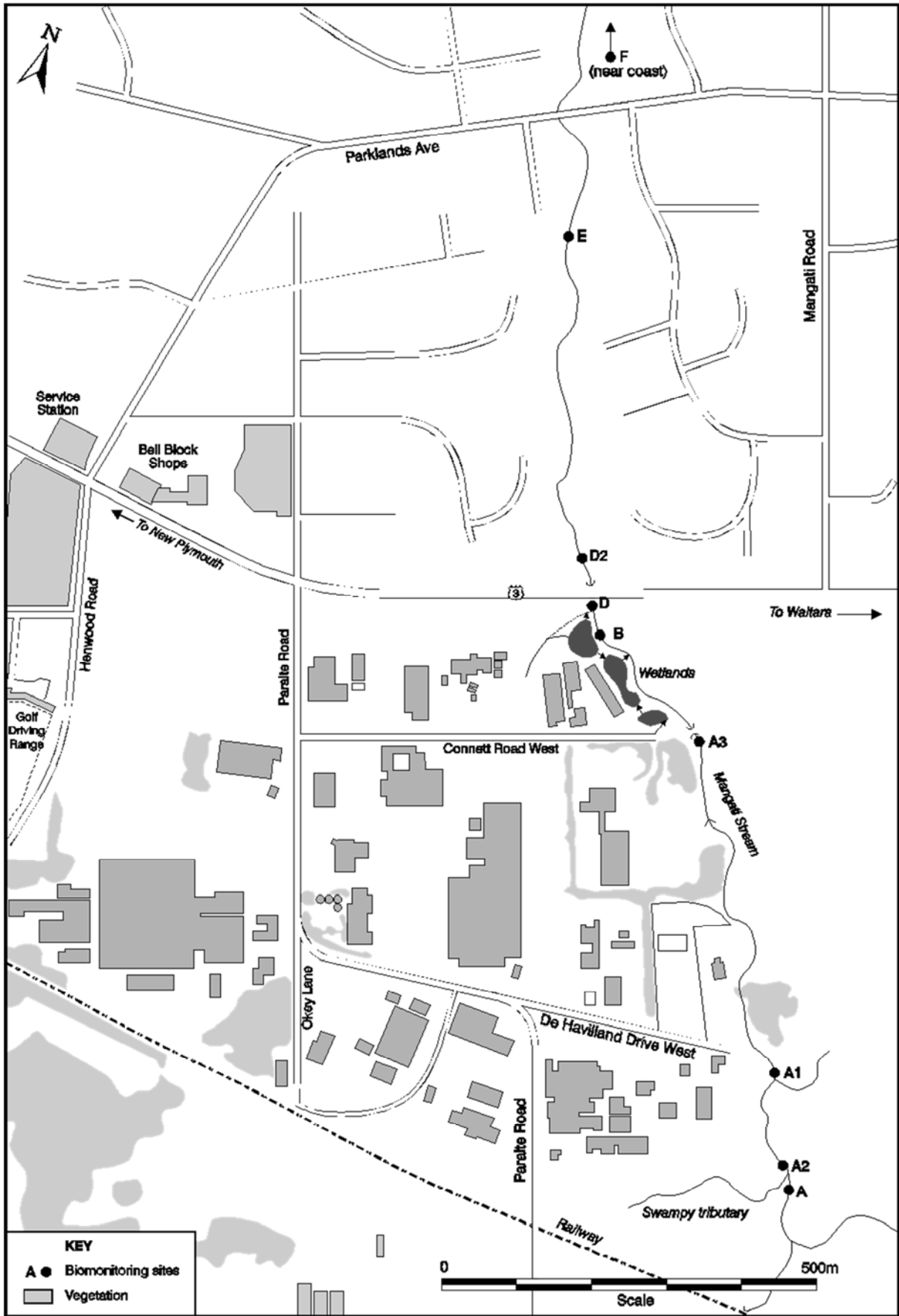


Figure 1 Sampling sites in the Mangati Stream catchment

Results

The 'industrial tributary' referred to in this report drains into the Mangati Stream immediately upstream of Devon Road (SH3), and receives stormwater and cooling water from the Bell Block industrial area. This tributary is now diverted into a series of wetland ponds to assist with treatment of the discharge (Figure 1). These ponds also receive stormwater from the Connett Road catchment, and are designed to discharge from a common point. As a result, site B monitors any potential impacts from the wetland discharge in comparison with site A3 (upstream of Connett Road). The wetland began operating in June 2004, with the flow from the 'industrial drain' directed into the two lower ponds for treatment prior to discharge to the Mangati Stream via pond 3. However, provision to progressively bypass this system during high tributary flows remains and therefore the site D2 has been used to monitor any effects of the discharges from pond 4 and this 'industrial tributary' discharge.

At the time of this late morning survey, water temperatures in the Mangati Stream ranged from 14.0 to 14.7°C. All sites had a moderate flow of clear, uncoloured water, with water speeds ranging from steady (four upper sites) to swift. Typically most of the Mangati Stream sites are very weedy throughout the channel being dominated by weed such as reed sweet grass (*Glyceria maxima*). Sites D2 and E were always the exception, due to the shade provided by the riparian vegetation, and those sites, plus site F were again the exceptions in this survey. Site F at the coast had experienced flood damage at the time of the previous survey, with complete removal of macrophyte habitat and erosion of the stream bed, leading to exposure of the gabion baskets. In addition, there were significant cyanobacteria mats on the bedrock further impacting on the habitat.

At site A1, the stream had previously been moved to enable the installation of a culvert, for the extension of De Havilland Drive. Although there has been some recovery in terms of habitat at this site, macrophytes were now not as widespread. It is also important to note that a number of unnamed tributaries have been piped, as part of the development of an industrial subdivision. As a result, where these tributaries enter the Mangati Stream, smothering by iron oxide may eventuate. No iron oxide was observed in the current survey. Other potential impacts that may occur from this piping activity include sharp flow variations at times of rain, especially if large areas are made impermeable, which could cause significant habitat instability.

With regards to periphyton growth, no mats or films were observed at sites A, A2, or A3, while mats were patchy at sites A1, B, and D2 and widespread at site E. Patches of filamentous algae were also noted at site F. In terms of substrate, sites A, A2, and D2 were dominated by hard clay with some silt, site A3 was dominated by silt, while cobbles, gravels, and boulders dominated sites A1 and B, and site E also had some bedrock. Due to erosion at site F, the gabion baskets usually sampled had some flow, and as a result the sample collected also included an area of bedrock downstream.

Macroinvertebrate communities

Past biological surveys of the Mangati Stream have recorded poor macroinvertebrate communities with limited numbers of taxa and low MCI values, particularly downstream of the industrial tributary. Small, slow flowing coastal streams draining farmland and industrial areas are not expected to support a large number of macroinvertebrate taxa [e.g. median of 17 taxa: range from 1 to 28 taxa (TRC 1999, updated 2013)]. However, in past

surveys the numbers found at some sites downstream of the industrial area have been unusually low. High MCI values are not expected in the lowland reaches of small, soft-bedded streams with farmland or urban catchments because not many high scoring, 'sensitive' taxa are suited to these conditions [e.g. median score of 78 units: range from 47 to 103 units (TRC 1999, updated 2013)]. However, the values recorded at some sites downstream of the tributary have also been unusually low even for these conditions. Previous results are presented in full in Table 2 with a summary of previous and current results presented in Table 3.

Table 2 Macroinvertebrate fauna of the Mangati Stream sampled on 3 October 2012

Taxa List	Site Number	MCI score	A	A2	A1	A3	B	D2	E	F
	Site Code		MGT000488	MGT000490	MGT000491	MGT000497	MGT000500	MGT000512	MGT000520	MGT000550
	Sample Number		FWB12336	FWB12337	FWB12338	FWB12339	FWB12340	FWB12341	FWB12342	FWB12343
PLATYHELMINTHES (FLATWORMS)	<i>Cura</i>	3	-	-	R	-	-	-	-	-
NEMERTEA	Nemertea	3	-	-	-	C	-	-	-	-
NEMATODA	Nematoda	3	R	-	-	-	-	R	-	-
ANNELIDA (WORMS)	Oligochaeta	1	C	C	VA	A	XA	VA	VA	VA
	Lumbricidae	5	R	-	-	C	-	-	R	-
MOLLUSCA	Lymnaeidae	3	-	-	-	R	-	-	-	-
	<i>Physa</i>	3	R	-	-	C	-	-	R	-
	<i>Potamopyrgus</i>	4	XA	XA	XA	XA	VA	XA	XA	C
	Sphaeriidae	3	-	-	R	-	-	-	-	-
CRUSTACEA	Ostracoda	1	-	-	-	-	-	R	-	-
	Isopoda	5	-	-	-	-	R	-	-	-
	<i>Paracalliope</i>	5	VA	XA	XA	A	R	-	R	R
	Paraleptamphopidae	5	-	-	-	R	-	-	-	-
	Talitridae	5	-	R	-	-	-	R	-	-
Ephemeroptera (MAYFLIES)	<i>Austroclima</i>	7	C	R	R	-	R	R	R	-
	<i>Zephlebia</i> group	7	R	C	R	-	-	-	-	-
HEMIPTERA (BUGS)	<i>Microvelia</i>	3	-	R	-	-	-	-	-	-
	<i>Sigara</i>	3	-	-	-	-	-	R	-	-
COLEOPTERA (BEETLES)	Elmidae	6	-	-	R	-	-	-	-	-
	Dytiscidae	5	R	R	-	R	-	-	-	-
	Hydrophilidae	5	-	C	-	-	-	-	-	-
	Scirtidae	8	-	R	-	-	-	-	-	-
	Staphylinidae	5	-	-	-	R	-	-	-	-
TRICHOPTERA (CADDISFLIES)	<i>Hydrobiosis</i>	5	C	C	C	C	C	-	R	R
	<i>Psilochorema</i>	6	R	C	R	-	C	R	-	-
	<i>Oxyethira</i>	2	-	-	-	-	-	-	R	R
	<i>Triplectides</i>	5	R	R	C	R	-	-	-	R
DIPTERA (TRUE FLIES)	<i>Aphrophila</i>	5	-	-	R	-	C	R	C	A
	<i>Zelandotipula</i>	6	R	-	-	R	-	-	-	-
	<i>Maoridamesa</i>	3	-	-	C	-	-	-	-	R
	Orthoclaadiinae	2	A	A	A	VA	A	A	A	A
	<i>Polypedilum</i>	3	R	A	C	A	C	C	C	C
	Tanypodinae	5	-	R	-	-	-	-	-	-
	<i>Paradixa</i>	4	-	R	R	R	-	-	-	-
	Empididae	3	R	-	-	-	-	C	C	R
	Ephydriidae	4	-	-	-	R	-	-	-	-
	<i>Austrosimulium</i>	3	VA	XA	R	R	-	-	-	-
ACARINA (MITES)	Acarina	5	-	-	C	R	-	-	-	R
No of taxa			17	18	18	19	10	12	12	12
MCI			86	92	86	80	86	72	75	72
SQMCI			4.0	4.0	4.1	3.6	1.6	3.5	3.5	1.9
EPT (taxa)			5	5	5	2	3	2	2	2
%EPT (taxa)			29	28	28	11	30	17	17	17
'Tolerant' taxa		'Moderately sensitive' taxa	'Highly sensitive' taxa							

R = Rare C = Common A = Abundant VA = Very Abundant XA = Extremely Abundant

Table 3 Numbers of taxa and MCI values recorded in previous surveys in the Mangati Stream, together with results of the October 2012 survey

Site	Number of previous surveys	Numbers of taxa			MCI values			SQMCI _s values		
		Median	Range	Oct 2012	Median	Range	Oct 2012	Median	Range	Oct 2012
A	37	16	9-29	17	78	56-85	86	3.4	2.2-4.5	4.0
A2	35	16	10-29	18	74	57-85	92	3.3	1.8-4.4	4.0
A1	37	15	7-22	18	72	47-84	86	3.2	1.7-4.7	4.1
A3	35	17	9-23	19	67	52-81	80	2.6	1.6-4.6	3.6
B	43	14	3-29	10	68	50-80	86	2.6	1.1-4.5	1.6
D2	19	10	5-18	12	68	40-77	72	2.5	1.1-3.5	3.5
E	41	10	3-22	12	63	44-78	75	2.5	1.1-3.9	3.5
F	35	10	2-22	12	66	30-78	72	2.1	1.3-4.1	1.9

Numbers of taxa and MCI scores recorded by the current survey in the Mangati Stream are illustrated in Figure 2.

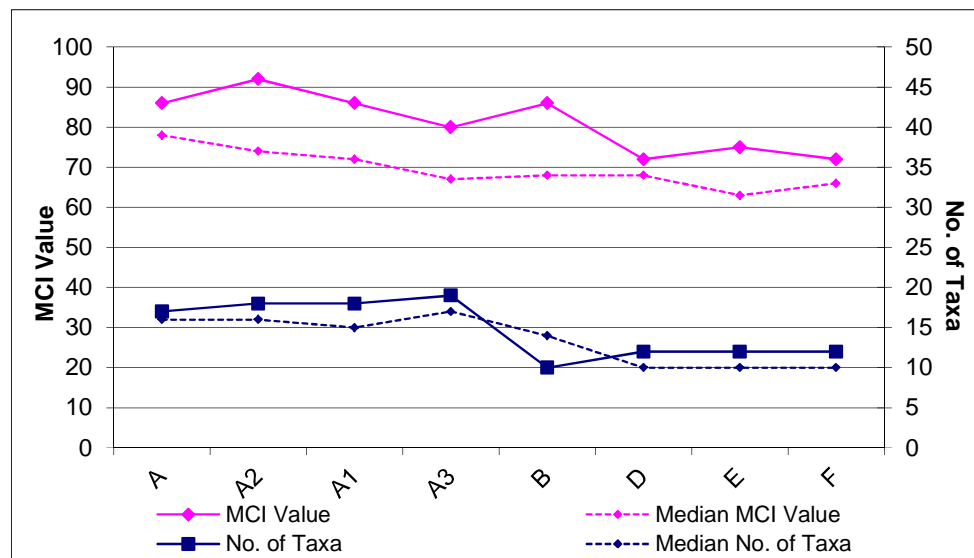


Figure 2 Numbers of taxa and MCI values recorded at sites in the Mangati Stream by the current survey

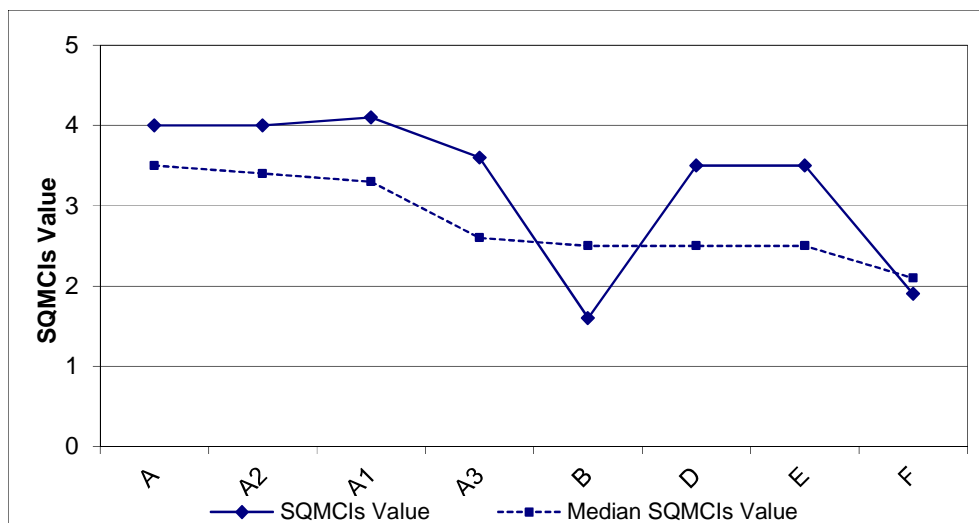


Figure 3 SQMCI_s values recorded at sites in the Mangati Stream by the current survey

Site A (MGT000488)

Seventeen taxa were found at this site near the head of the catchment above the industrial area, four taxa more than by the previous survey, and one more than the historical median for this site (Table 3, Figure 2). Previously, a reduced richness reflected the degradation in habitat caused by the channel incising, reducing the habitat available (especially macrophyte habitat), resulting in a reduction in the number of associated taxa but some recovery was indicated by the current result. The community was characterised by three 'tolerant' taxa [(extremely abundant snail (*Potamopyrgus*), orthoclad midges, and sandfly (*Austrosimulium*)] and one 'moderately sensitive' taxon [amphipod (*Paracalliope*)]. These taxa were typical 'generalists' found in weedy, softer-bottomed habitats, with slow flows typical of low gradient, lowland streams.

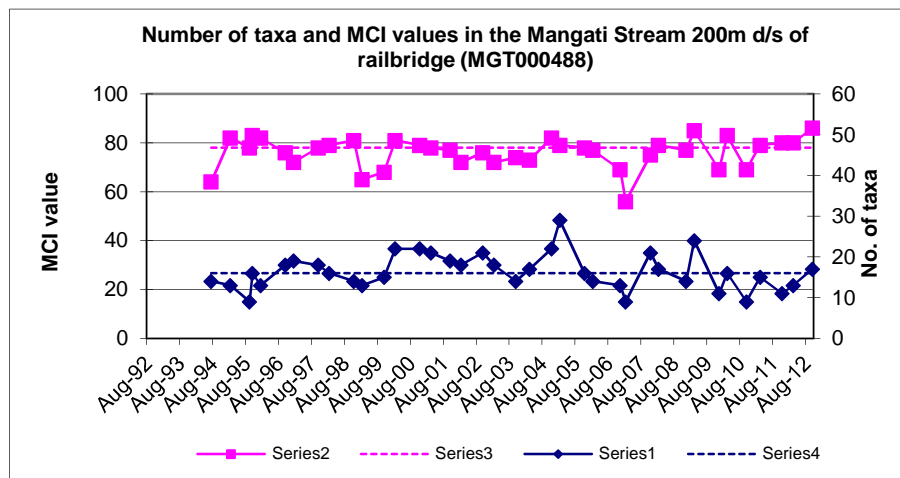


Figure 4 Numbers of taxa and MCI values recorded at site A to date

The MCI value of 86 ('fair' biological health) reflected the moderate proportion of 'sensitive' taxa (53%) in the community at this site. This was an improvement of 6 units compared with the result recorded by the previous survey, and one unit above the range of scores previously recorded at this site. The current result was also eight units higher than the median of previous surveys, representing a departure from the seasonally variable MCI results recorded in recent surveys (Table 3, Figure 4). The presence of only one abundant 'sensitive' taxon suggested moderate preceding water quality conditions. However, observations made at the time of sampling indicate that habitat was somewhat limited, due to the vigorous growth of *Glyceria maxima* (reed sweet grass) on the banks partially shading the stream, with little light reaching the bed. As a result there was little periphyton growth. This severe restriction of habitat was likely to have been responsible for the reduced abundances of 'sensitive' taxa.

Site A2 (MGT000490)

Eighteen taxa were recorded at this site, two more than the median for this site and three taxa more than recorded by the previous survey (Table 3, Figure 5). There was a significant increase in MCI score of 13 units compared with the previous survey and this current score was seven units higher than previously recorded at this site and a significant (Stark, 1998) 18 units higher than the median for this site (Table 3). This score (indicative of 'fair' biological health) was six units above that recorded at site A, with the proportion of 'sensitive' taxa in the community only slightly higher than that recorded upstream. However, the community was dominated by only the one 'moderately sensitive' taxon [extremely abundant amphipod

(*Paracalliope*) and four 'tolerant' taxa [extremely abundant snail (*Potamopyrgus*); midges (orthoclads and *Polypedium*), and extremely abundant sandfly (*Austrosimulium*)]. The resultant SQMCI_s score of 4.0 units was equivalent with that recorded upstream at site A and well above the median score recorded at this site to date. The increased abundances within two taxa in particular reflected (in part) the additional available habitat at this site and the increased area of vegetation sampled.

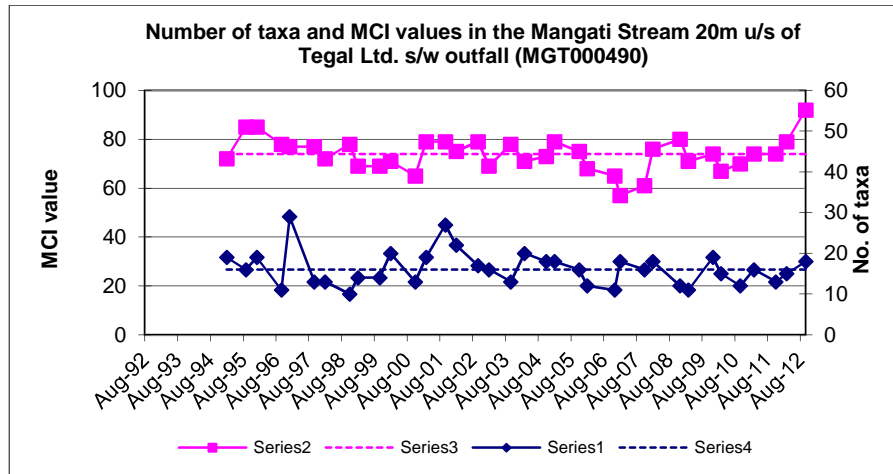


Figure 5 Numbers of taxa and MCI values recorded at site A2 to date

The fact that the MCI score was significantly higher than the long term median for this site and also higher than that recorded upstream, suggested no deterioration in the biological communities as a result of the Tegal wetland stormwater discharge to the stream.

Site A1 (MGT000491)

Eighteen taxa were recorded at this site downstream of industrial stormwater discharges and about 100 m below site A2. This was equivalent with the richness found at the nearest site upstream and three taxa more than the median richness found to date at site A1 (Table 3). This site has stabilised well since the stream was moved in 2008 to accommodate the installation of a culvert downstream. As with site A2, the improved taxa richness is likely to be related to recovery following late winter-early spring flushing flows.

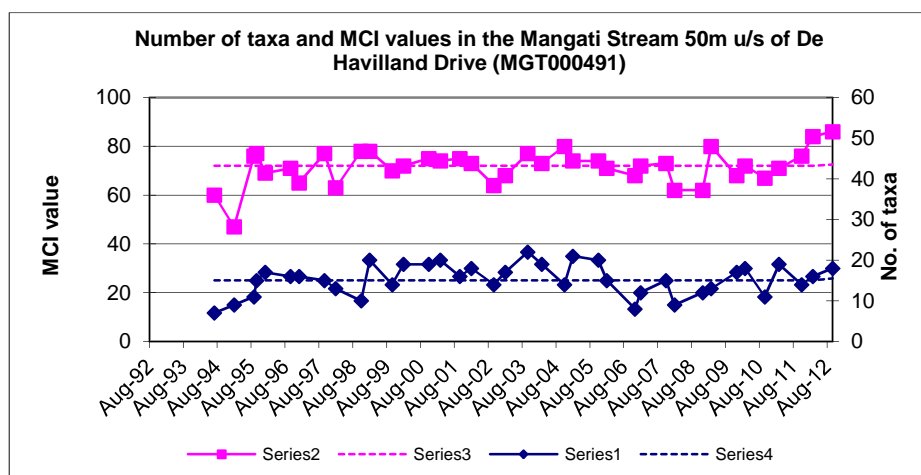


Figure 6 Numbers of taxa and MCI values recorded at site A1 to date

The MCI score recorded by the current survey was 86 units (indicative of 'fair' biological health), two units higher than that recorded in the previous survey, due to a slight increase in the proportion of 'moderately sensitive' taxa in the community (50%). The current score was a significant fourteen units higher than the median score for this site and was the highest score recorded at this site to date (Table 3, Figure 6), indicating a comparatively healthy community.

The more variable substrate was coincidental with several significant differences in individual taxon abundances compared with those at site A2 (e.g. an increase in the abundance of 'moderately sensitive' midges and 'tolerant' worms), and decreased abundances within one 'moderately sensitive' and one 'tolerant' taxa. As a result, the dominant taxa at this site included one 'moderately sensitive' taxon [amphipod (*Paracalliope*)] and three 'tolerant' taxa [oligochaete worms, snail (*Potamopyrgus*) and orthoclad midges] (Table 2). Overall, this resulted in a minimal increase in SQMCI_s score (4.1 units) which was an insignificant 0.8 unit higher than the median. As there was little change from the score recorded upstream, despite habitat changes, these results did not indicate any deterioration in water quality conditions between sites A2 and A1.

Site A3 (MGT000497)

Nineteen taxa were recorded at this site, 500 m downstream of site A1. This richness was equal with that recorded by the previous survey, and two taxa more than the historical median at this site (Figure 7, Table 3). The community was characterised by five taxa; one 'moderately sensitive' taxon [amphipod (*Paracalliope*)], and four 'tolerant' taxa [oligochaete worms, snail (*Potamopyrgus*), and midges (orthoclads and *Polypedilum*)], a small increase from those taxa recorded as characteristic by the previous survey. There were five significant changes in individual taxon abundances between sites A1 and A3 (Table 2) coincident with the change in sampling technique (kick-sampling to sweep-sampling) at this much siltier substrate site. There may also have been some influence from the farmland through which the Mangati Stream flows at this site as there is often unrestricted stock access to the stream.

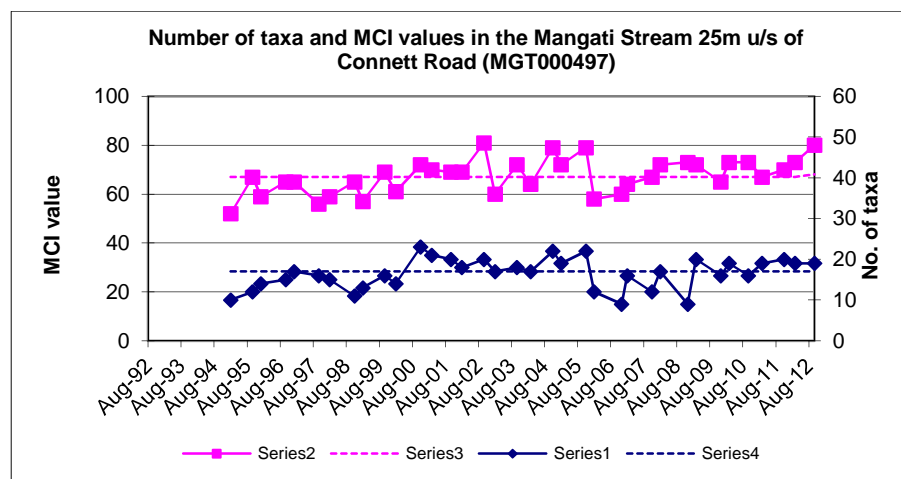


Figure 7 Numbers of taxa and MCI values recorded at site A3 to date

However, this community had an insignificantly lower MCI score than the score at site A1 (by 6 units), reflecting a small reduction in the proportion of 'sensitive' taxa present (47%). This score was significantly 13 units above the median for this site however, and continued the pattern of above, or near-to, median scores generally observed at this site since 2007 (Figure 7). The SQMCI_s score was also well above the median for this site (Table 2), but 0.5 unit lower

than that recorded at site A1, a direct result of the reduced abundance of ‘moderately sensitive’ amphipods at this site. Changes in habitat and sampling technique would normally result in a greater difference in MCI and SQMCI_s scores, and therefore the insignificant differences between sites A1 and A3 indicated no deterioration in water quality at site A3 which might be attributed to the stormwater discharges from the De Havilland Drive West area, Tasman Oil, and Greymouth Petroleum.

Site B (MGT000500)

There was a significant decrease (of 9 taxa) in the number of taxa between site A3 and site B, between which the wetland that receives discharges from a large industrial area discharges to the Mangati Stream. This decrease was greater than those recorded in the previous two surveys when decreases of three and five taxa were found between the two sites. The current richness recorded at site B was four taxa fewer than the median of previous values recorded at this site (Figure 8, Table 3).

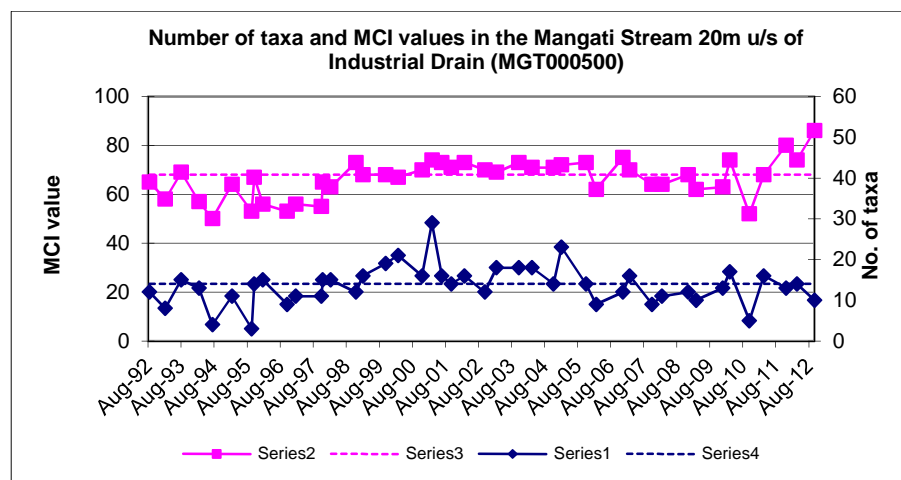


Figure 8 Numbers of taxa and MCI values recorded at site B to date

The community at site B was comprised of a higher proportion of ‘moderately sensitive’ taxa (60%) resulting in an MCI score of 86 units. This was 12 units higher than the score recorded by the previous survey and the highest score recorded to date. The previous survey had recorded the highest MCI score recorded at any site routinely monitored downstream of Connett Road since monitoring began in the spring of 1992. The current score was a significant 18 units higher than the long term median (Figure 8, Table 3). This continued the improvement recorded since spring, 2010 when an MCI score of 52 units, the second lowest score to date, was recorded at this site.

However, the three taxa that dominated this community were all ‘tolerant’ taxa, [extremely abundant oligochaete worms; snail (*Potamopygrus*), and orthoclad midges]. This resulted in an extremely poor SQMCI_s score 1.6 units which was significantly lower (Stark, 1998) than that recorded at site A3 (Tables 2 and 3). The primary cause of the decrease was the increased abundance of oligochaete worms, which are very ‘tolerant’ to organic enrichment, and also the reduced abundance of the ‘moderately sensitive’ amphipod (*Paracalliope*). This score was very similar to that recorded in the previous survey and 0.9 unit lower than the long term median for this site. This suggested that this site continued to be subjected to enrichment, possible as a result of the wetland discharge. Macrophyte growth was present at site B, although the sampling was focussed mainly on the harder streambed (kick) method. This

change to the sampling focus and habitat variability (compared with site A3) may have contributed to the SQMCI_s score difference between adjacent sites.

Site D2 (MGT000512)

Twelve taxa were recorded at site D2, below the industrial drain and wetlands high flow outlet from the lower pond. This richness was only one taxon fewer than that recorded by the previous survey, and slightly higher than the median for this site (Table 3). The community was dominated by exactly the same three taxa as at site B (Table 2). The community was comprised of four 'moderately sensitive' and eight 'tolerant' taxa and the MCI score (72) reflected this higher proportion of 'tolerant' taxa. This score indicated that the recovery observed in the previous three surveys had remained, with the current MCI score being midway between the median and the maximum scores of the 19 surveys undertaken to date at this site (Figure 9). Although in comparison with site B (Table 3), there was a statistically significant 14 unit decrease in MCI score (Stark, 1998) indicative of a reduction in community health (from 'fair' to 'poor') between the two sites, this was due to minor presence/absence differences in six taxa rarities (i.e. less than five individuals per taxon) between sites.

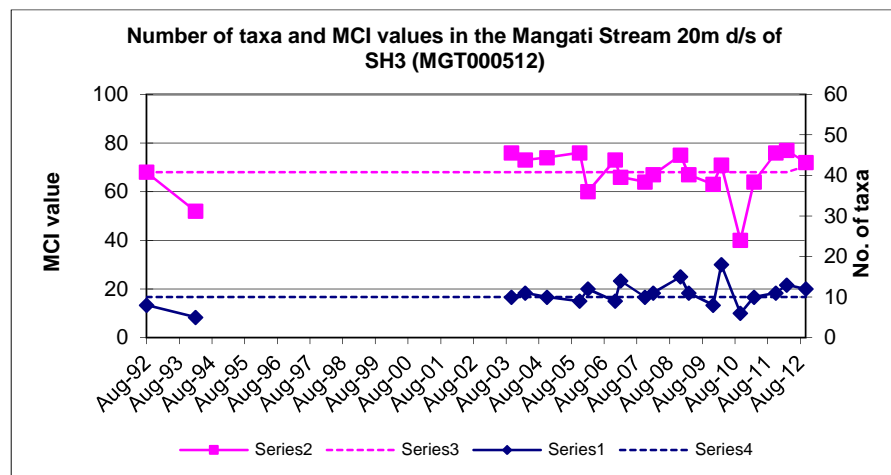


Figure 9 Numbers of taxa and MCI values recorded at site D2 to date

There were only two significant changes in individual taxon abundances between sites B and D2 (one 'tolerant' and one 'moderately sensitive' taxa). However a reduced abundance of oligochaete worms and increased abundance of snails resulted in a significant increase in SQMCI_s score of 1.9 units between sites (Figure 3). This reduced abundance of worms was also an improvement compared with recent surveys and indicated a possible improvement in physicochemical water quality at this site. Overall, the lack of 'sensitive' taxa in abundance suggested that there was some impact on the community at site D2 as a result of the wetland discharge.

Site E (MGT000520)

No change in taxa richness was observed at site E (12 taxa) in comparison with site D2. This was two taxa higher than the median for this site (Table 3, Figure 10) but six taxa fewer than found by the previous survey. This community was characterised by three 'tolerant' taxa [oligochaete worms, extremely abundant snail (*Potamopyrgus*), and orthoclad midges] similar to dominant taxa at most of the upstream sites. There were no significant differences in individual taxon abundances found between sites D2 and E resulting in no change in SQMCI_s scores (3.5 units) between sites.

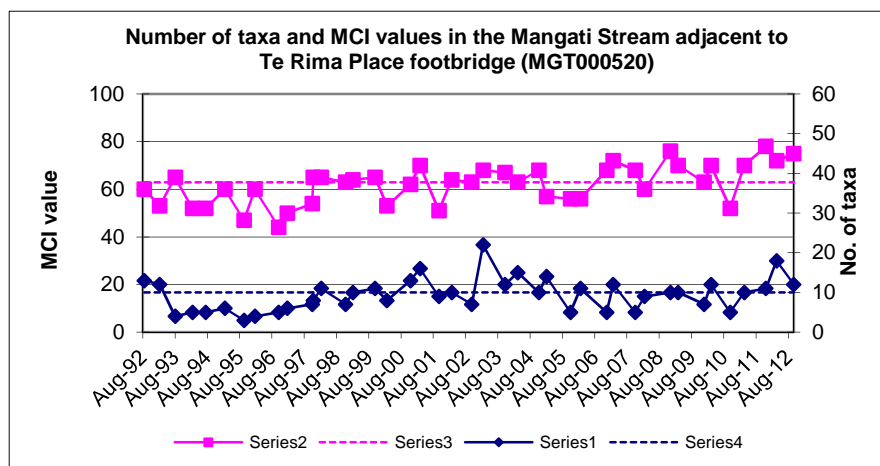


Figure 10 Numbers of taxa and MCI values recorded at site E to date

A slightly reduced proportion of sensitive taxa in the community (42%) resulted in an insignificant three units increase in the MCI score compared with the score at site D2. The MCI score (75) was a significant 12 units higher than the long term median and was the second-highest score recorded from 41 previous surveys undertaken at this site (Table 3, Figure 10). This represented a continued recovery from conditions recorded in the spring 2010 survey when impacts from a poor quality wetland discharge appeared to have extended downstream as far as this site. The SQMCI_s value (3.5 units) suggested some improvement from that recorded in the previous survey and also from that recorded in most previous surveys, as it was 1.0 unit higher than the long term median score. However, this was primarily influenced by the one taxon [(snail (*Potamopyrgus*)], coincident with the patchy, thick periphyton mats present on the hard substrate at this site.

Site F (MGT00550)

Taxa richness (12 taxa) was slightly lower than that recorded by the previous survey and was two taxa higher than the median richness (Figure 11, Table 3). This is considered to have indicated continued recovery from the significant habitat loss caused by erosion of the stream bed and banks by high flows and possibly high seas documented by the spring 2011 survey.

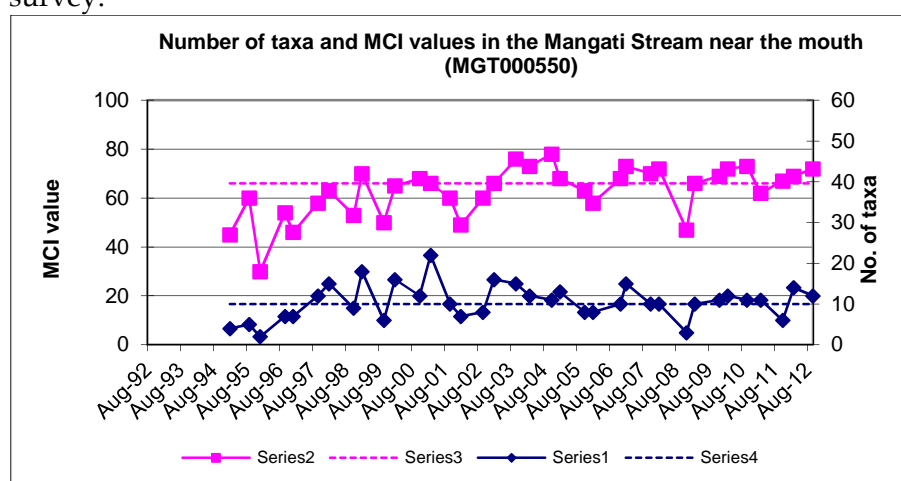


Figure 11 Numbers of taxa and MCI values recorded at site F to date

Three taxa were abundant, one 'moderately sensitive' taxon [crane fly (*Aphrophila*)] and two 'tolerant' taxa [oligochaete worms and orthoclad midges], reflecting relatively similar

dominance to that recorded at sites D2 and E. The current MCI score of 72 at site F was due to a predominance of 'tolerant' taxa. This MCI score was six units higher than the historical median score for this site and only three units less than that recorded upstream at site E. There was only one significant change in individual taxon abundance from site E (Table 2); a marked reduction in abundance of the 'tolerant' snail (*Potamopyrgus*). This was probably related to a change in habitat and resulted in a 1.6 units decrease in SQMCI_s score (1.9) from site E. However, this SQMCI_s score was an insignificant 0.2 unit lower than the median for this site (Table 3).

The MCI and SQMCI_s results for this site were near to the medians and the MCI score was insignificantly less than that recorded at sites D2 and E. Overall, this suggested that there had been little impact on the macroinvertebrate community health at this site, approximately 1.8 km downstream from the industrial area and wetland discharge.

Summary and Conclusions

On 3 October 2012, the Council's standard 'kick-net' sampling technique was used at six established sites to collect streambed macroinvertebrates from the Mangati Stream to determine whether stormwater and wastewater discharges from the Mangati industrial area have had any adverse effects on the macroinvertebrate communities of this stream. Two other sites were sampled using the sweep sampling technique. Samples were sorted and identified to provide the number of taxa (richness), MCI score and SQMCI_s score 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_s takes into account taxa abundance as well as sensitivity to pollution, and may reveal more subtle changes in communities, particularly if non-organic impact are occurring. Significant differences in either the MCI or the SQMCI_s between sites indicate the degree of adverse effects (if any) of the discharges being monitored.

The Mangati Stream is a slow to steady flowing, lowland stream running through farmland, an industrial area and a residential area. As such, this stream typically supports communities commonly found in lowland, soft-bedded streams, and that are relatively 'tolerant' to organic pollution. The communities are usually dominated by 'tolerant' taxa (particularly worms, snails, and midges), and those 'moderately sensitive' taxa commonly associated with macrophytes (e.g. amphipods).

With one exception (site B), taxa richnesses were similar to or higher than their respective medians, reflecting that populations had recovered from the previous spring survey, which had been impacted by a large flood which had preceded that survey. For sites D2 and E, taxa richness was higher than their respective medians showing continued recovery from that recorded in the spring 2010 survey. This indicated that the impacts caused by the wetland discharge noted during the spring 2010 survey had abated. This was supported by the absence of undesirable heterotrophic growths from all sites.

Upstream of Connett Road (and the wetland discharge), MCI scores were well above their respective medians. Downstream of Connett Road, an improved pattern was noted, with regards to MCI scores, with sites B, D2, E, and F all recording scores toward the highest previously recorded scores, and higher than their respective medians. The exception was site B which recorded a score higher than the maximum. The improvements at sites B, D2, and E

may have been related to improved discharge quality from the wetland. The minimal improvement at site F may suggest that the influence of the wetland previously recorded at sites B, D2, and E never extended as far as site F. 'Tolerant' oligochaete worms, snail (*Potamopyrgus*), and orthoclad midges dominated the communities at most sites. The 'moderately sensitive' amphipod (*Paracalliope*) was also abundant, but only at the four upstream sites, a reflection of the amount of macrophyte habitat at these sites. Overall, the MCI scores indicate that the impacts of the wetland discharge recorded in the recent surveys were not as apparent at sites B, D2, and E in the current survey.

Upstream of Connett Road, all sites exhibited SQMCI_s scores higher than their respective medians. Downstream of Connett Road, all but site B recorded SQMCI_s scores higher than or similar to their respective medians, indicating a recovery from conditions documented by earlier surveys. Site B recorded an SQMCI_s score significantly less than the median, which indicated a subtle impact of the wetland discharge, a pattern that has now occurred for a number of years.

Previous surveys have observed evidence of urbanisation of the Mangati Stream, such as bed erosion and significantly high preceding flows. This was again evident in the current survey, and therefore urbanisation of the catchment must still be given regard to, due to increased subdivision in the headwaters, as there is potential for an increase in the 'flashiness' of the floods experienced by the Mangati Stream. This may become apparent with the recent installation of a continuous flow and rainfall data recording station (October 2012). This impact is likely to worsen as the new industrial subdivision around the De Havilland Drive area is developed further.

Overall, the generally minimal changes in community structure, number of taxa, and MCI scores throughout the upper reaches of the Mangati Stream, indicated that there have been no significant adverse effects on macroinvertebrate communities resulting from discharges from Tegel Poultry, De Havilland Drive West, Tasman Oil or Greymouth Petroleum. However, the discharge from the wetland ponds, although not causing the same impact as that recorded in the spring 2010 survey, may still have been subtly impacting on the macroinvertebrate community of site B, immediately downstream of the discharge point, but not extending to any marked degree into the lower reaches of the Mangati Stream.

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To Job Manager, Lorraine Smith
From Freshwater Biologists, Bart Jansma and Chris Fowles
Report No CF614
Doc No 1383083
Date July 2014

Biomonitoring of the Mangati Stream in relation to the Bell Block industrial area, February 2013

Introduction

The Mangati Stream is a small, lowland stream, running through Bell Block in North Taranaki. The upper reaches of this stream drain the area of farmland between Paraita Road and Corbett Road, approximately five kilometres from the coast. The farmland to the south (inland) and east of this catchment area feeds the Mangaoraka Stream.

Between the New Plymouth – Marton railway and Devon Road (along the mid reaches of the Mangati Stream) is an industrial area, which has been the source of a number of spillages in past years resulting in fish kills. The stream is capable of supporting significant native fish communities including members of the native eel, galaxiid (whitebait group) and bully families. Stormwater and wastewater discharges from this area are the primary concern in this biological monitoring programme.

The following consents relate to discharges to the Mangati Stream.

ABB Transformers	2336
Shaycar Trust	3913
Conveyorquip	5964
Greymouth Petroleum	4664
MI NZ Ltd	5987
Natural Gas Corp	4780
MCK Metals Pacific Ltd	3139
New Plymouth District Council	4302
Olex Cables	4497
Halliburton New Zealand Ltd	2337
Schlumberger Seaco Ltd	6032
Tasman Oil Tools	4812
Tegel Foods – Stock food	2335
Tegel Foods – Poultry plant	3470

This February 2013 survey was undertaken as the second of two surveys scheduled for the 2012-2013 monitoring year. Macroinvertebrate surveys have been undertaken in the Mangati Stream since 1992, and those reports discussing surveys undertaken between 1992 and 2001 are referenced in TRC, 2009. Results of other surveys performed in the Mangati Stream since the 2001-2002 monitoring years are discussed in various reports listed in the references in this report.

Methods

Eight established sampling sites in the Mangati Stream catchment (Table 1, Figure 1) were sampled on 12 February 2013. ‘Kick samples’ were collected at sites A, A1, B, D2, E, and F, with the samples at sites A2 and A3 collected using the sweep-sample technique. These sampling techniques are very similar to Protocol C1 (hard-bottomed, semi-quantitative) (kick-sample) and Protocol C2 (soft-bottomed, semi-quantitative) (vegetation-sweep) of the New Zealand Macroinvertebrate Working Group (NZMWG) protocols for macroinvertebrate samples in wadeable streams (Stark et al, 2001).

Table 1 Biomonitoring sites in the Mangati Stream catchment

Site	Site code	Location	GPS
A	MGT000488	Mangati Stream, 20 m upstream of swampy tributary	E1700095 N5678043
A2	MGT000490	Mangati Stream, 100 m downstream of swampy tributary	E1700062 N5678084
A1	MGT000491	Mangati Stream, 50 m upstream of De Haviland Drive	E1700018 N5678166
A3	MGT000497	Mangati Stream, 10 m above Connet Road	E1699775 N5678573
B	MGT000500	Mangati Stream above the industrial tributary, below wetland	E1699596 N5678691
D2	MGT000512	Mangati Stream, 20 m downstream SH3	E1699513 N5678787
E	MGT000520	Mangati Stream, 400 m below Devon Road	E1699385 N5679103
F	MGT000550	Mangati Stream, 50 m above Bell Block beach	E1699215 N5680409

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.

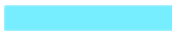


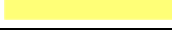


Stark (1985) developed a scoring system for macroinvertebrate taxa according to their sensitivity to organic pollution in stony New Zealand streams (HBMCI). Recently, a similar scoring system has been developed for macroinvertebrate taxa found in soft bottomed streams (Stark and Maxted, 2004, 2007) (SBMCI). The SBMCI has been used in a number of biomonitoring reports since its inception, and results to date suggest that it is not as effective at assessing the impacts of organic pollution as the HBMCI. For example, results from the February 2008 Mangati survey found a relatively unchanged SBMCI score at a site which had thick growths of sewage fungus (Jansma, 2008b). Therefore this index is considered less appropriate for the assessment of macroinvertebrate communities possibly affected by industrial discharges. Any subsequent reference to MCI refers to the HBMCI.

Highly ‘sensitive’ taxa were assigned the highest scores of 9 or 10, while the most ‘tolerant’ forms scored 1 and 0.1 in hard bottomed and soft bottomed streams respectively. The sensitivity scores for certain taxa found in hard bottomed streams have been modified in accordance with Taranaki experience. After extensive use of the MCI, categories were assigned to the sensitivity scores, to clarify their ‘relative’ sensitivity e.g. taxa that scored between 1 and 4 inclusive are considered tolerant (see Table 3).

By averaging the scores obtained from a list of taxa taken from one site and multiplying by a scaling factor of 20, a Macroinvertebrate Community Index value was obtained. The MCI is a

measure of the overall sensitivity of macroinvertebrate communities to the effects of organic pollution. More 'sensitive' communities inhabit less polluted waterways.

A gradation of biological water quality conditions based upon MCI ranges has been adapted for Taranaki streams and rivers (TRC, 2013) from Stark's classification (Stark, 1985 and Boothroyd and Stark, 2000). This is as follows:

Grading	MCI	Code
Excellent	>140	
Very Good	120-140	
Good	100-119	
Fair	80-99	
Poor	60-79	
Very Poor	<60	

A semi-quantitative MCI value (SQMCI_s) has also been calculated for the taxa present at each site by multiplying each taxon score by a loading factor (related to its abundance), totaling 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_s is not multiplied by a scaling factor of 20, so that its corresponding range of values is 20x lower.

Where necessary, sub-samples of periphyton (algae and other micro flora) were also taken from the macroinvertebrate samples and scanned under 40-400x magnification to determine the presence or absence of any mats, plumes or dense growths of bacteria, fungi or protozoa ('undesirable biological growths') at microscopic level. The presence of masses of these organisms can be an indicator of organic enrichment within a stream.

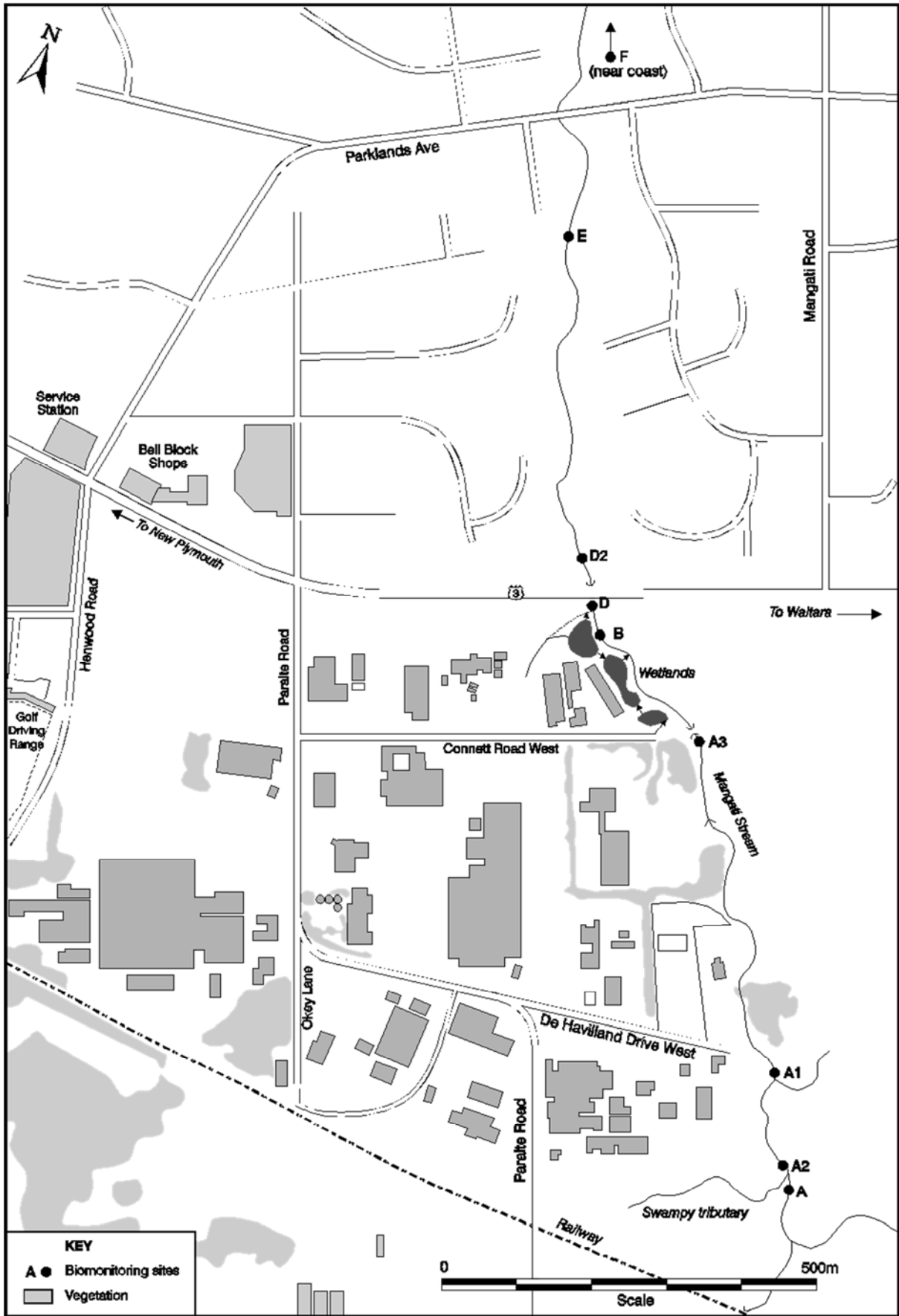


Figure 1 Sampling sites in the Mangati Stream catchment

Results

The 'industrial tributary' referred to in this report drains into the Mangati Stream immediately upstream of Devon Road (SH3), and receives stormwater and cooling water from the Bell Block industrial area. This tributary is now diverted into a series of wetland ponds to assist with treatment of the discharge (Figure 1). These ponds also receive stormwater from the Connett Road catchment, and are designed to discharge from a common point. As a result, site B monitors any potential impacts from the wetland discharge in comparison with site A3 (upstream of Connett Road). The wetland began operating in June 2004, with the flow from the 'industrial drain' directed into the two lower ponds for treatment prior to discharge to the Mangati Stream via pond 3. However, provision to progressively bypass this system during high tributary flows remains and therefore the site D2 has been used to monitor any effects of the discharges from pond 4 and this 'industrial tributary' discharge.

At the time of this late morning to early afternoon survey, water temperatures in the Mangati Stream ranged from 17.3 to 18.4°C. All sites had a low flow of clear, uncoloured water, with water speeds ranging from steady to swift with the exception of sites A2 and A3 which had slow water speeds. Typically most of the Mangati Stream sites are very weedy throughout the channel being dominated by weed such as reed sweet grass (*Glyceria maxima*). Sites D2 and E have been the exception, due to the shade provided by the riparian vegetation, and this continued at the time of this survey. Sites A, A3, and B were overgrown by reed sweet grass growth.

At site A1, the stream had previously been moved to enable the installation of a culvert, for the extension of De Havilland Drive. Macrophytes subsequently were not as widespread but were becoming more re-established at the time of the current survey. It is also important to note that a number of unnamed tributaries have been piped, as part of the development of an industrial subdivision. As a result, where these tributaries enter the Mangati Stream, smothering by iron oxide may eventuate. Some iron oxide was observed in the current survey at sites A and A3. Other potential impacts that may occur from this piping activity include sharp flow variations at times of rain, especially if large areas are made impermeable, which could cause significant habitat instability. Bank vegetation recently had been partially cleared at site E where there had been some bank disturbance and shading had reduced.

With regards to periphyton growth, slippery films were observed at sites A1 and B, while mats were patchy at sites D2, E, and F. Patches of filamentous algae were also noted at sites D2 and E while they were widespread at site F. No periphyton substrate cover was noted at sites A, A2, or A3. In terms of substrate, site A and A2 were dominated by hard clay with some silt, site A3 was dominated by silt, while cobbles and gravels dominated sites A1, B, and D2, and site E also had some bedrock. At site F (which was impounded due to high tide conditions), the gabion baskets were sampled partially as was the sand-gravel-cobble component.

Macroinvertebrate communities

Past biological surveys of the Mangati Stream have recorded poor macroinvertebrate communities with limited numbers of taxa and low MCI values, particularly downstream of the industrial tributary. Small, slow flowing coastal streams draining farmland and industrial areas are not expected to support a large number of macroinvertebrate taxa [e.g. median of 17 taxa: range from 1 to 28 taxa (TRC 1999, updated 2013)]. However, in past

surveys the numbers found at some sites downstream of the industrial area have been unusually low. High MCI values are not expected in the lowland reaches of small, soft-bedded streams with farmland or urban catchments because not many high scoring, 'sensitive' taxa are suited to these conditions [e.g. median score of 78 units: range from 47 to 103 units (TRC 1999, updated 2013)]. However, the values recorded at some sites downstream of the tributary have also been unusually low even for these conditions. Previous results are presented in full in Table 2 with a summary of previous and current results presented in Table 3.

Table 2 Macroinvertebrate fauna of the Mangati Stream sampled on 12 February 2013

Taxa List	Site Number	MCI score	A	A2	A1	A3	B	D2	E	F
	Site Code		MGT000488	MGT000490	MGT000491	MGT000497	MGT000500	MGT000512	MGT000520	MGT000550
	Sample Number		FWB13059	FWB13060	FWB13061	FWB13062	FWB13063	FWB13064	FWB13065	FWB13066
COELENTERATA	Coelenterata	3	-	R	-	C	A	R	-	-
PLATYHELMINTHES (FLATWORMS)	<i>Cura</i>	3	-	R	-	R	C	R	-	-
NEMERTEA	Nemertea	3	C	R	R	C	-	C	R	R
ANNELIDA (WORMS)	Oligochaeta	1	A	C	C	VA	XA	XA	VA	A
	Lumbricidae	5	R	-	-	-	R	-	R	-
HIRUDINEA (LEECHES)	Hirudinea	3	-	-	-	-	-	R	-	-
MOLLUSCA	Lymnaeidae	3	-	-	-	R	-	-	-	-
	<i>Physa</i>	3	-	R	-	C	R	C	-	-
	<i>Potamopyrgus</i>	4	XA	XA	XA	XA	VA	XA	XA	A
CRUSTACEA	Cladocera	5	-	-	-	-	C	-	-	-
	Ostracoda	1	-	-	-	C	C	C	C	-
	Isopoda	5	C	-	R	-	A	R	R	-
	<i>Paracalliope</i>	5	XA	XA	XA	XA	C	C	R	-
	Talitridae	5	-	-	-	-	C	-	-	-
	<i>Paratya</i>	3	-	-	-	-	-	-	-	A
EPHEMEROPTERA (MAYFLIES)	<i>Austroclima</i>	7	C	C	C	R	C	R	R	-
	<i>Zephlebia</i> group	7	C	R	C	-	-	-	-	-
ODONATA (DRAGONFLIES)	<i>Xanthocnemis</i>	4	-	R	-	R	-	-	-	-
HEMPTERA (BUGS)	<i>Microvelia</i>	3	-	C	-	-	-	-	-	-
COLEOPTERA (BEETLES)	Elmidae	6	-	-	R	-	-	-	-	-
	Dytiscidae	5	-	R	-	R	-	-	-	-
	Hydraenidae	8	-	-	-	-	-	-	-	R
	Hydrophilidae	5	-	-	R	-	-	-	-	-
	Staphylinidae	5	-	R	-	-	-	-	-	-
TRICHOPTERA (CADDISFLIES)	<i>Costachorema</i>	7	-	-	-	-	-	-	-	R
	<i>Hydrobiosis</i>	5	-	-	-	-	-	-	-	C
	<i>Polypectropus</i>	6	R	R	-	-	-	-	-	-
	<i>Psilochorema</i>	6	C	R	R	-	-	-	-	-
	<i>Oxyethira</i>	2	-	-	-	-	-	A	C	A
	<i>Triplectides</i>	5	R	R	C	R	-	C	A	C
DIPTERA (TRUE FLIES)	<i>Aphrophila</i>	5	-	R	-	-	-	-	-	R
	Eriopterini	5	C	-	-	R	-	-	R	-
	Hexatomini	5	R	-	-	-	-	-	-	-
	<i>Limonia</i>	6	-	-	-	-	R	-	-	-
	<i>Zelandotipula</i>	6	-	-	-	-	-	-	R	-
	<i>Chironomus</i>	1	-	-	-	R	-	-	-	-
	<i>Corynoneura</i>	3	-	R	-	-	-	-	-	-
	Orthocladinae	2	R	-	R	C	C	C	C	C
	<i>Polypedilum</i>	3	A	A	C	A	R	R	-	C
	<i>Paradixa</i>	4	-	R	R	-	-	-	-	-
	Empididae	3	-	R	-	-	-	R	R	C
	Sciomyzidae	3	-	-	-	-	-	-	R	-
	<i>Austrosimulium</i>	3	R	-	C	-	-	R	C	R
	Stratiomyidae	5	-	-	-	R	-	-	-	-
	Tanyderidae	4	-	-	-	-	-	-	R	-
ACARINA (MITES)	Acarina	5	R	C	R	R	R	-	-	R
	No of taxa		17	22	16	19	16	17	17	15
	MCI		91	85	89	72	79	66	75	79
	SQMCI		4.4	4.5	4.5	4.1	1.8	2.5	3.5	2.9
	EPT (taxa)		5	5	4	2	1	2	2	3
	%EPT (taxa)		29	23	25	11	6	12	12	20
'Tolerant' taxa	'Moderately sensitive' taxa	'Highly sensitive' taxa								
R = Rare	C = Common	A = Abundant	VA = Very Abundant	XA = Extremely Abundant						

Table 3 Numbers of taxa and MCI values recorded in previous surveys in the Mangati Stream, together with results of the February 2013 survey

Site	Number of previous surveys	Numbers of taxa			MCI values			SQMCI _s values		
		Median	Range	Feb 2013	Median	Range	Feb 2013	Median	Range	Feb 2013
A	38	16	9-29	17	78	56-86	91	3.5	2.2-4.5	4.4
A2	36	16	10-29	22	74	57-92	85	3.5	1.8-4.4	4.5
A1	38	16	7-22	16	73	47-86	89	3.3	1.7-4.7	4.5
A3	36	17	9-23	19	68	52-81	72	2.6	1.6-4.6	4.1
B	44	14	3-29	16	68	50-86	79	2.5	1.1-4.5	1.8
D2	20	11	5-18	17	70	40-77	66	2.5	1.1-3.5	2.5
E	42	10	3-22	17	63	44-78	75	2.5	1.1-3.9	3.5
F	36	11	2-22	15	66	30-78	79	2.1	1.3-4.1	2.9

Numbers of taxa and MCI scores recorded by the current survey in the Mangati Stream are illustrated in Figure 2.

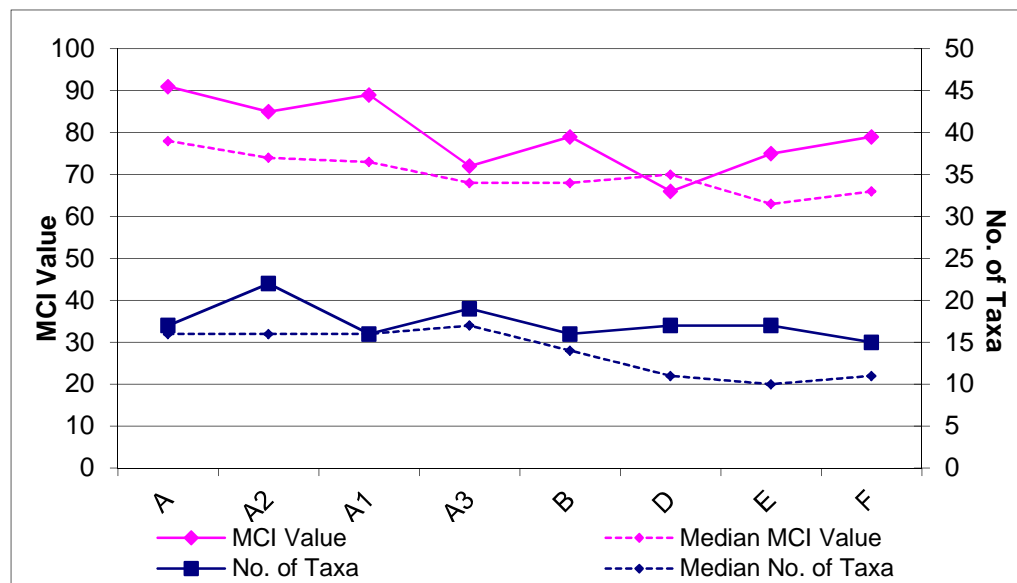


Figure 2 Numbers of taxa and MCI values recorded at sites in the Mangati Stream by the current survey

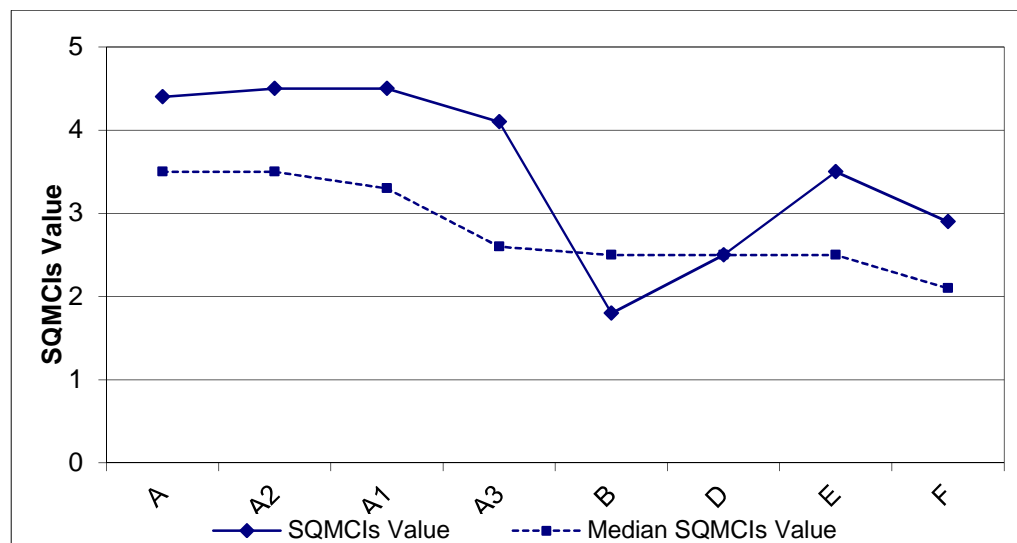


Figure 3 SQMCI_s values recorded at sites in the Mangati Stream by the current survey

Site A (MGT000488)

Seventeen taxa were found at this site near the head of the catchment above the industrial area, the same richness as that found by the previous (spring) survey, and one more taxon than the historical median for this site (Table 3, Figure 2). This improved richness reflected recovery from the degradation in habitat caused by the channel incising, as the macrophyte habitat has increased resulting in an increase in the number of associated taxa. The community was characterised by three 'tolerant' taxa [oligochaete worms, extremely abundant snail (*Potamopyrgus*), and midge (*Polypedilum*)] and one 'moderately sensitive' taxon [extremely abundant amphipod (*Paracalliope*)]. These taxa were typical 'generalists' found in weedy, steady-flowing, softer-bottomed habitats, typical of low gradient streams.

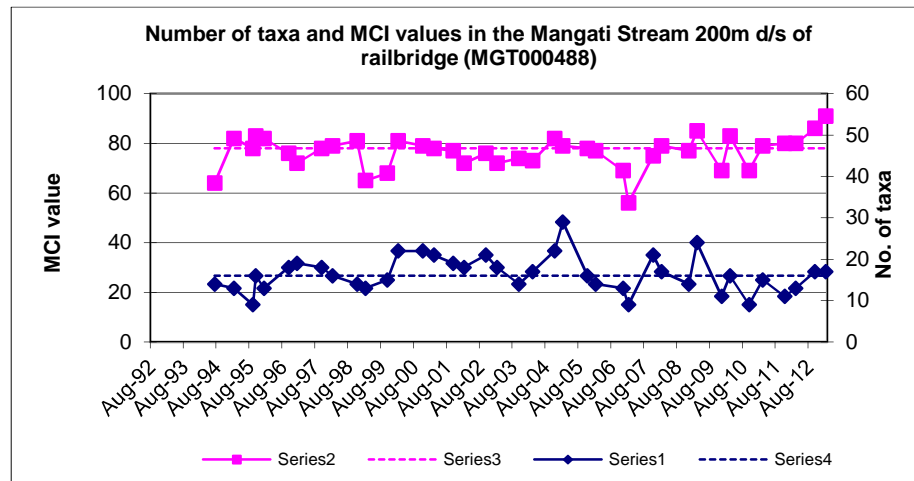


Figure 4 Numbers of taxa and MCI values recorded at site A to date

The MCI value of 91 ('fair' ecological health) reflected the significant proportion of 'tolerant' taxa in the community at this site (35%). This was a slight improvement on that recorded by the previous (spring) survey, and within the range of scores recorded over the last few years. The result was a significant (Stark, 1998) 13 units higher than the median of 38 previous surveys and five units above the previous maximum and continued some recent improvement compared to the seasonally variable MCI results frequently recorded in the past (Table 3, Figure 4). The presence of only one abundant 'sensitive' taxon suggested moderate preceding water quality conditions. However, observations made at the time of sampling indicated that habitat was somewhat limited, due to the vigorous growth of *Glyceria maxima* (reed sweet grass) on the banks partially shading the stream, with little light reaching the bed. As a result there was limited habitat with no periphyton growth. This restriction of habitat is likely to have been the primary driver behind the reduced numerical abundances within all but one 'sensitive' taxa.

Site A2 (MGT000490)

A moderately rich community (22 taxa) was recorded at this site, well above the median for this site and four taxa more than recorded by the previous (spring) survey (Table 3, Figure 5). However there was a small decrease in MCI score (85 units) from this previous survey (which had been the maximum score to date), but the current score was a significant 11 units higher than the median for this site (Table 3). This score was 6 units below that recorded at site A, due to a lower proportion of 'sensitive' taxa (45%) in the community than that recorded upstream. The community was dominated by one 'moderately sensitive' taxon [extremely abundant amphipod (*Paracalliope*)] and two 'tolerant' taxa [extremely abundant snail (*Potamopyrgus*) and midge (*Polypedilum*)] (Table 2). The resultant SQMCI_s score of 4.5

units was very similar to that recorded upstream, and the highest score recorded at this site to date. The increased number of taxa found was coincident with a change in the sampling technique (sweep sample) although there was minimal change in characteristic taxa between sites A and A2.

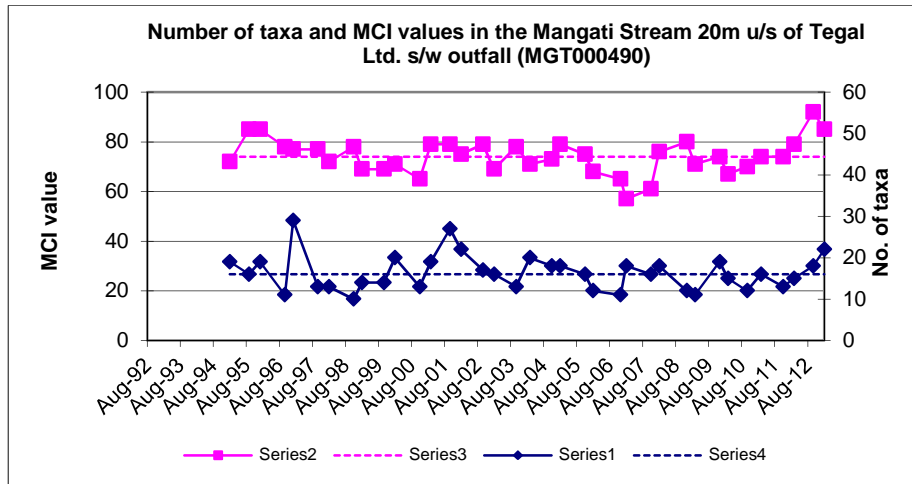


Figure 5 Numbers of taxa and MCI values recorded at site A2 to date

The SQMCI_s and MCI scores were also significantly higher than the medians for this site (Table 3), and as a result, not considered to indicate a possible deleterious influence from the Tegel wetland discharge.

Site A1 (MGT000491)

Sixteen taxa were recorded at this site downstream of industrial stormwater discharges and about 100 m below site A2. This was six taxa fewer than found at the nearest site upstream, but identical to the median richness found to date at site A1 (Table 3). This site has stabilised well since the stream was moved in 2008 to accommodate the installation of a culvert downstream.

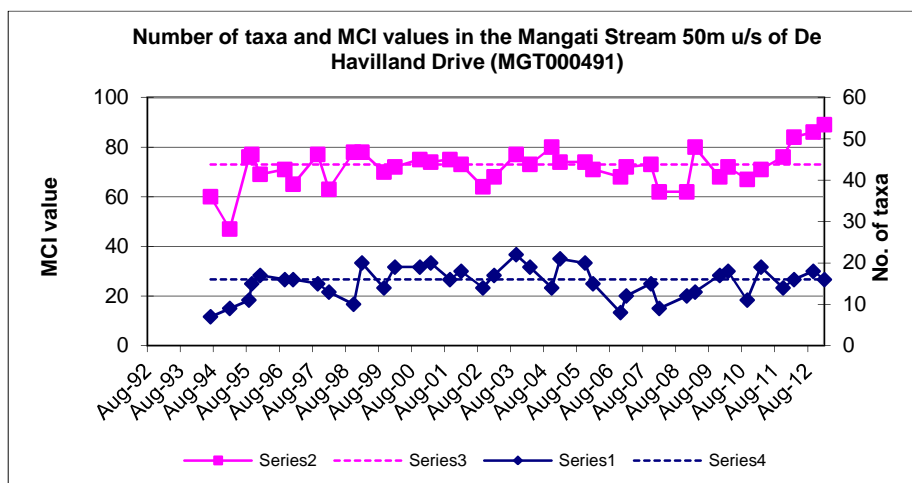


Figure 6 Numbers of taxa and MCI values recorded at site A1 to date

The MCI score recorded by the current survey was 89 units (indicative of ‘fair’ biological health), which was three units higher than that recorded in the previous (spring) survey and 4 units higher than the score at site A2, due to a slightly increased proportion of ‘moderately

sensitive' taxa in the community (56%). The current score was a significant sixteen units higher than the median score for this site and was the highest score recorded at this site to date (Table 3, Figure 6), indicating a comparatively healthy community.

Despite the more varied substrate, there were only two significant differences in individual taxon abundances from that recorded at site A2, these being an increase in the abundance of the 'tolerant' sandfly and decrease in a 'tolerant' bug (*Microvelia*). The abundant taxa at this site included one 'moderately sensitive' taxon [very abundant amphipod (*Paracalliope*)] and one 'tolerant' taxon [very abundant snail (*Potamopyrgus*)] (Table 2). Overall, this resulted in no change to the SQMCI_s score (4.5 units) which was a significant 1.2 units higher than the median. As there was minimal change from SQMCI_s and MCI scores recorded upstream, despite habitat changes, there were no indications of any deterioration in biological health from that at site A2.

Site A3 (MGT000497)

Nineteen taxa were recorded at this site, 500 m downstream of site A1. This richness was the same as that recorded by the previous (spring) survey and two taxa more than the historical median at this site (Figure 7, Table 3). The community was characterised by four taxa; one 'moderately sensitive' taxon [extremely abundant amphipod (*Paracalliope*)] and three 'tolerant' taxa [oligochaete worms, extremely abundant snail (*Potamopyrgus*), and midge (*Polypedilum*)], similar to the characteristic taxa recorded by the previous survey. There were five significant changes in individual taxon abundances from site A1 with the major change being a marked increase in very 'tolerant' oligochaete worm number (Table 2) coincident with the change in sampling technique (kick-sweep to sweep sampling) and reduction in habitat diversity. There may also have been some influence from the farmland through which the Mangati Stream flows at this site as there is often unrestricted stock access to the stream.

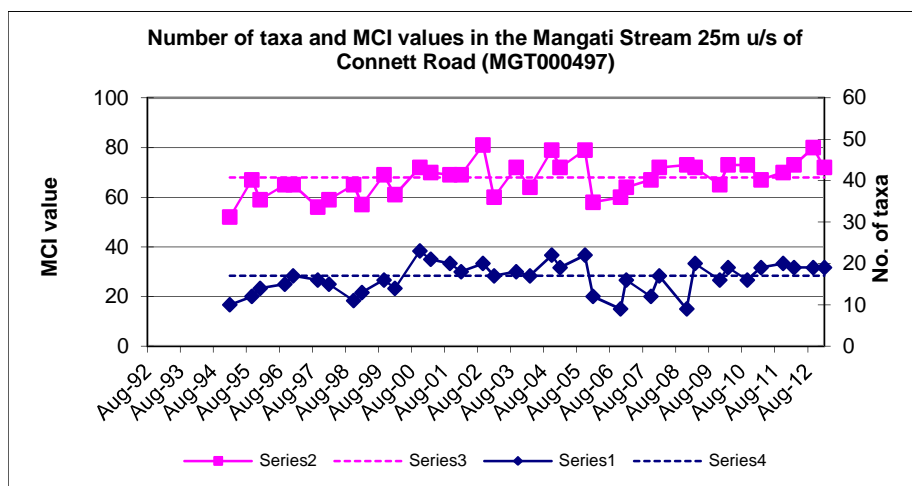


Figure 7 Numbers of taxa and MCI values recorded at site A3 to date

This community had a statistically significantly lower MCI score (72) than the score at site A1, reflecting a reduction (of 24%) in the proportion of 'sensitive' taxa present. However, this was still a slight improvement on the historical median score for this site continuing the pattern of above or near-to median scores generally observed at this site since 2007 (Figure 7). The SQMCI_s score was significantly higher than the median for this site (Table 3) and only 0.4 unit lower than that recorded at site A1, as a result of the increased abundance of oligochaete worms which have usually been extremely abundant at this site. Changes in habitat and sampling technique have often resulted in a significant difference in MCI and SQMCI_s scores,

and the decrease in MCI score between site A1 and A3, but minimal change in SQMCI_s score, may have been more reflective of habitat variability than indicative of deterioration in water quality at site A3. Overall, there was no direct indication of degradation in water quality which might be attributed to the stormwater discharges from the De Havilland Drive West area, Tasman Oil and Greymouth Petroleum in this reach of the stream.

Site B (MGT000500)

There was a slight drop in the number of taxa in the stream reach between site A3 (19 taxa) and site B (16 taxa), in which the wetland that receives discharges from a large industrial area discharges to the Mangati Stream. This was similar to that recorded in the previous spring survey, which saw a drop of five taxa between these sites. The current richness recorded at site B was two taxa more than the median of previous taxa numbers recorded at this site (Figure 8, Table 3).

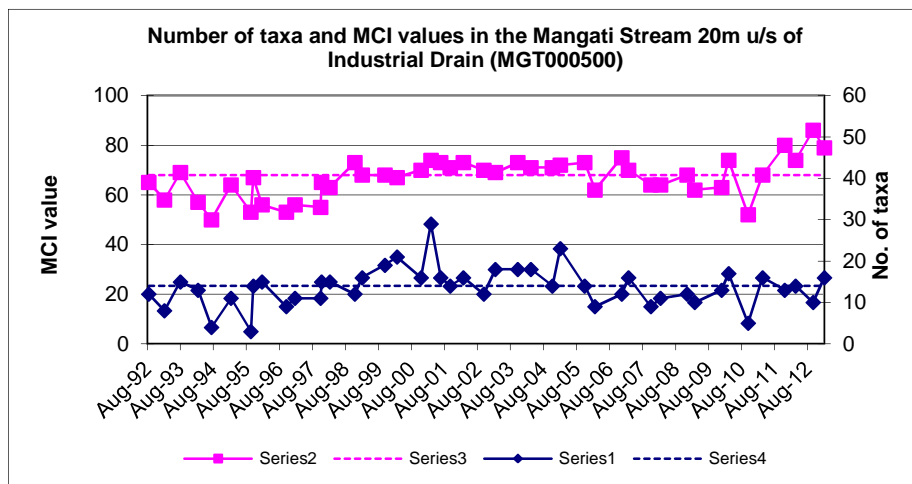


Figure 8 Numbers of taxa and MCI values recorded at site B to date

The community at site B was comprised of a relatively high proportion (50%) of ‘tolerant’ taxa resulting in an MCI score of 79 units. Although this was seven units less than that recorded in the previous (spring) survey, it was the third highest score recorded at this site to date (Figure 8). The previous (spring) survey recorded the highest MCI score recorded at any site routinely monitored downstream of Connett Road since monitoring began in the spring of 1992. The current score was a significant (Stark, 1998) 11 units higher than the long term median (Figure 8, Table 3). This continued the improvement recorded since the spring 2010 survey, which recorded an MCI score of 52 units, the second lowest score recorded at this site to date.

However, the taxa that dominated this community were mainly ‘tolerant’ taxa, [extremely abundant oligochaete worms, snail (*Potamopyrgus*), and coelenterates], together with one ‘moderately sensitive’ taxon [isopods]. This resulted in an extremely poor SQMCI_s score (1.5 units) which was significantly lower than that recorded at site A3 (Tables 2 and 3) (Stark, 1998). The primary cause of this decline in score was the increased abundance of oligochaete worms, which are very ‘tolerant’ to organic enrichment, and also the marked reduction in abundance of the ‘moderately sensitive’ amphipod (*Paracalliope*). This score was very similar to that recorded in the previous (spring) survey and 0.7 unit lower than the long term median for this site. This suggested that this site was still subject to enrichment, possibly as a result of the wetland discharge. Macrophyte growth was present at site B, although not targeted by the sampling method used (stream bed kick). This change in sampling technique

and habitat (in comparison with site A3) may also have contributed to the decrease in SQMCI_s score.

Site D2 (MGT000512)

Seventeen taxa were recorded at site D2, below the industrial drain and wetlands high flow level outlet from pond 4. This richness was five taxa more than that recorded by the previous (spring) survey and well above the median for this site (Table 2). The community was dominated by two of the same ‘tolerant’ taxa as at site B, one additional ‘tolerant’ taxon [caddisfly (*Oxyethira*)], and one fewer ‘tolerant’ and ‘moderately sensitive’ taxa (Table 3). The community contained only a small proportion (24%) of ‘moderately sensitive’ taxa which was reflected by the MCI score (66 units). This score indicated that the more recent recovery observed by the previous three surveys had not continued, with the current MCI score slightly lower than the median of all surveys’ scores to date at this site (Figure 9). When compared with site B (Table 3), there was a significant 13 unit decrease in MCI score (Stark, 1998), indicative of a deterioration in community health between the two sites.

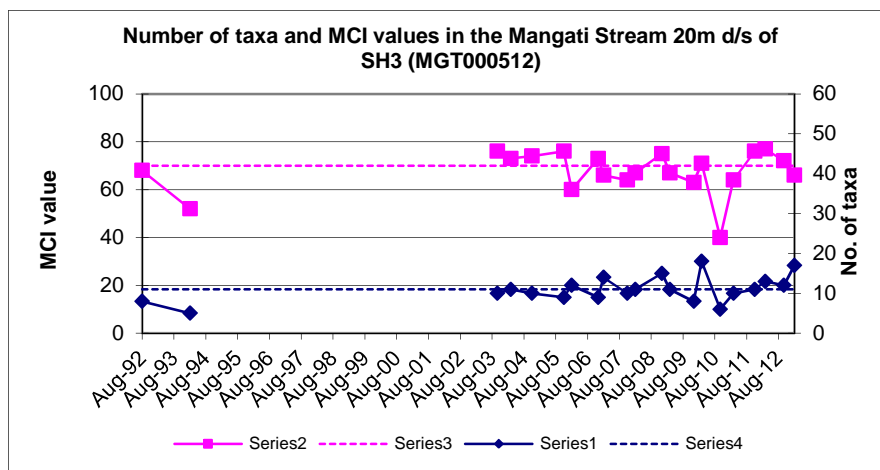


Figure 9 Numbers of taxa and MCI values recorded at site D2 to date

There were several significant changes in individual taxon abundances between adjacent sites B and D2 although overall there was a moderate increase in SQMCI_s score (2.5 units) at site D2 (Figure 3), mainly due to an increased abundance of the snail possibly coincident with an increase in substrate periphyton cover at this site. The lack of ‘sensitive’ taxa in abundance suggested that there was a deleterious influence on the community at site D2 as a result of the wetland discharge. This influence was not as pronounced at site B, where there had been a higher proportion (and increased abundances) within certain ‘sensitive’ taxa.

Site E (MGT000520)

No downstream change in taxa richness was found at site E (17 taxa), which was seven taxa more than the median richness for this site (Table 3, Figure 10). This community was characterised by two ‘tolerant’ taxa [oligochaete worms and extremely abundant snail (*Potamopyrgus*)] and one ‘moderately sensitive’ taxon [vegetation-cased caddisfly (*Triplectides*)] which was relatively similar to those at the nearest upstream site. There was only one significant difference in individual taxon abundance found between sites D2 and E, with the ‘tolerant’ snail (*Physa*) reduced in abundance.

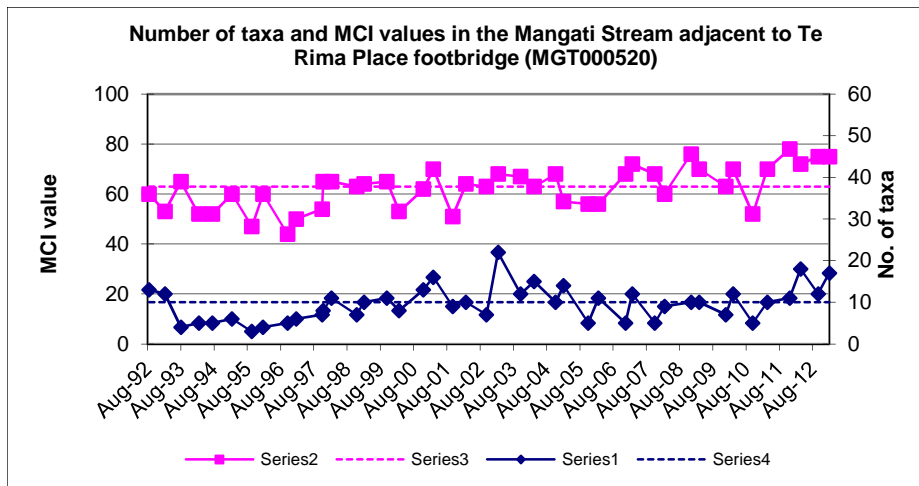


Figure 10 Numbers of taxa and MCI values recorded at site E to date

A slightly increased proportion of ‘sensitive’ taxa in the community (41%) resulted in an insignificant nine unit increase above the MCI score recorded at site D2. This MCI score (75 units) was a significant 12 units higher than the long term median, and was the second equal highest score recorded from 42 previous surveys undertaken at this site (Table 3, Figure 10). This represented a continued recovery from the score recorded in the spring 2010 survey when impacts from a poor quality wetland discharge appeared to have extended as far as this site. The SQMCI_s value (3.5 units) recorded no change from that recorded in the previous survey but was higher than recorded by most previous surveys as it was 1.0 unit higher than the long term median score (Table 3.)

Site F (MGT000550)

Taxa richness (15 taxa) was slightly higher than that recorded by the previous (spring) survey and four taxa higher than the historical median richness (Figure 11, Table 3). This was considered to indicate recovery from the significant habitat loss caused by erosion of the stream bed and banks by high flows and possibly high seas documented in the survey of spring 2011.

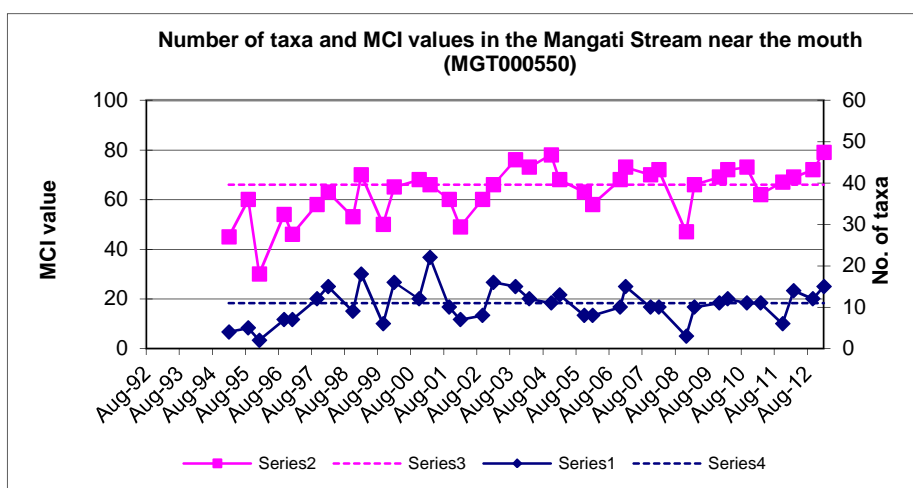


Figure 11 Numbers of taxa and MCI values recorded at site F to date

Four taxa were abundant and these were all ‘tolerant’ taxa [oligochaete worms, snail (*Potamopyrgus*), freshwater shrimp (*Paratya*), and algal-piercing caddisfly (*Oxyethira*)]. The MCI score of 79 units at site F reflected the significant proportion (60%) of ‘tolerant’ taxa. This

MCI score was a significant 13 units higher than the historical median score (Stark, 1998), and one unit higher than the historical maximum score for this site and four units above the score recorded at site E. There were two very significant changes in individual taxon abundances from site E (Table 2), being the reduced abundance of the 'tolerant' snail (*Potamopyrgus*) and increased abundance of 'tolerant' shrimp (*Paratya*) which were likely to have been related to changes in habitat. These resulted in a 0.6 unit drop in SQMCI_s score (2.9) from site E. This SQMCI_s value was 0.8 unit higher than the historical median for this site (Table 3).

The MCI and SQMCI_s results for this site were well above medians but insignificantly different or better than those recorded at sites B and E. Overall, this suggested that there had been little impact on the macroinvertebrate community health at this site, approximately 1.8 km downstream from the industrial area and wetland discharge.

Summary and Conclusions

On 12 February 2013, the Council's standard 'kick-net' sampling technique was used at six established sites to collect streambed macroinvertebrates from the Mangati Stream to determine whether stormwater and wastewater discharges from the Mangati industrial area have had any adverse effects on the macroinvertebrate communities of this stream. Two other sites were sampled using the sweep sampling technique. Samples were sorted and identified to provide the number of taxa (richness), MCI score and SQMCI_s score 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_s takes into account taxa abundance as well as sensitivity to pollution, and may reveal more subtle changes in communities, particularly if non-organic impact are occurring. Significant differences in either the MCI or the SQMCI_s between sites indicate the degree of adverse effects (if any) of the discharges being monitored.

The Mangati Stream is a slow to steady flowing, lowland stream running through farmland, an industrial area and a residential area. As such, this stream typically supports communities commonly found in lowland, soft-bedded streams, that are relatively 'tolerant' to organic pollution. The communities are usually dominated by 'tolerant' taxa, and those 'moderately sensitive' taxa commonly associated with macrophytes e.g. oligochaete worms, snail (*Potamopyrgus*), and amphipod (*Paracalliope*).

Overall, taxa richnesses were similar to or higher than their respective medians, reflecting that populations had recovered from the spring 2010 survey, which had been impacted by a large flood which had preceded that survey. For sites B, D2 and E, taxa richnesses were higher than their respective medians showing continued recovery from that recorded in the spring 2010 survey. This indicated that the impacts caused by the wetland discharge noted during the spring 2010 survey had abated. This was supported by the absence of undesirable heterotrophic growths from all sites.

Upstream of Connett Road (and the wetland discharge), MCI scores were higher than their respective historical medians. Downstream of Connett road, an improved pattern was noted in terms of MCI scores, with sites B, E, and F recording scores amongst the highest previously recorded scores and higher than their respective historical medians. The exception was site D2 (immediately below the wetlands discharge), which recorded a score slightly less than the historical median. The improvements at sites B, E, and F may have been related to improved

discharge quality from the wetland. Oligochaete worms and snail (*Potamopyrgus*) dominated the communities at most sites. The amphipod (*Paracalliope*) was also extremely abundant, but only at the four sites upstream, a direct reflection of the amount of macrophyte habitat at these sites. Overall, the MCI scores indicated that the impacts of the wetland discharge recorded in more recent surveys were not as apparent at sites B, E, and F in the current survey.

Upstream of Connett Road, all sites exhibited SQMCI_s scores higher than their respective historical medians and close to previous maxima., with site A2 recording a new maximum score. Downstream of Connett Road, all but site B recorded SQMCI_s scores similar to or above their respective historical medians, indicating a recovery from the results of more recent surveys. However, site B recorded an SQMCI_s score significantly less than the historical median, which indicated a subtle impact of the wetland discharge, a trend that has existed for a number of years.

Previous surveys have observed evidence of urbanisation of the Mangati Stream, such as bed erosion and significantly high preceding flows. This was again evident in the current survey, and therefore urbanisation of the catchment must still be given regard to, due to increased subdivision in the headwaters, as there is potential for an increase in the 'flashiness' of the floods experienced by the Mangati Stream. This will hopefully become apparent with the recent installation of a continuous flow and rainfall data recording station (October 2012). This impact is likely to worsen as the new industrial subdivision around the De Havilland Drive area is developed further.

Overall, the generally minimal changes in community structure, numbers of taxa, and MCI values throughout the upper reaches of the Mangati Stream, indicate that there have been no significant adverse effects on macroinvertebrate communities resulting from discharges from Tegel Poultry, De Havilland Drive West, Tasman Oil or Greymouth Petroleum. However, the discharge from the wetland ponds, although not causing the same impact as that recorded in the spring 2010 survey, may still have been subtly impacting on the macroinvertebrate community of site B, immediately downstream of the discharge point.

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Appendix IV

Rule 23 of the Regional Freshwater Plan (permitted stormwater rule)

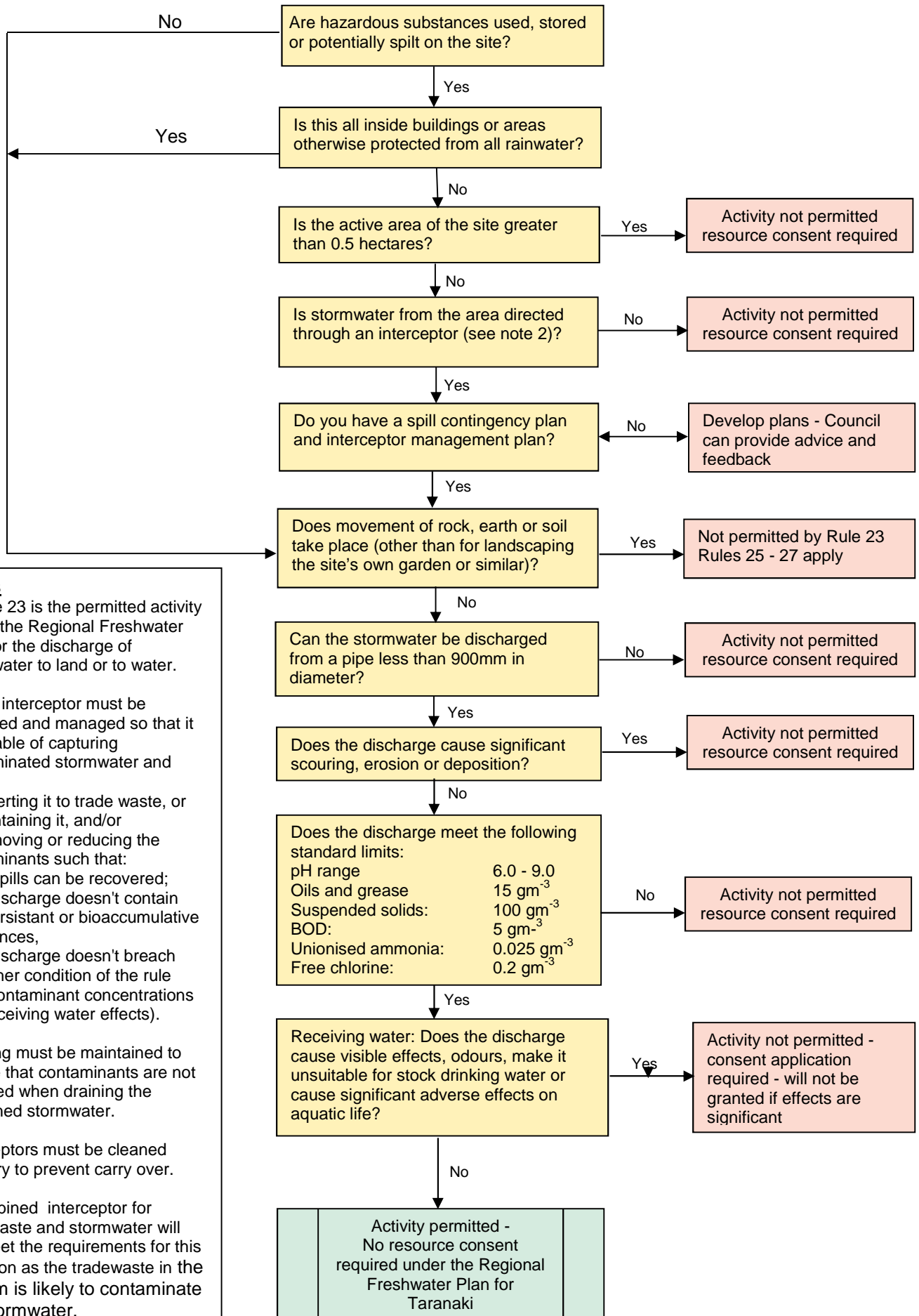
Explanation

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.

Appendix V

Tasman Oil Tools wash pad usage log

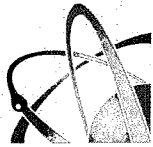
YARD WASHDOWN PAD USAGE LOG

Date	Company	Job	Our PO	Total Hours of HP WaterBlasting*	Signed
1-Nov-12	Transpacific	52x5 1/2 DP ID+ends blast plastic issue MRP	20428	2.3	ADJ
12-Nov-12	Transpacific	9x5 1/2 DP 36,000 ID blast plastic	20477	2.5	ADJ
20-Nov-12	Transpacific	101x5 1/2 DP 15,000 psi ID blast plastic	20493	6.5	ADJ
12-Dec-12	Transpacific	49x5 1/2 DP 36,000 ID blast plastic	20931	8	ADJ
13-Dec-12	Transpacific	49 continued	20931	3	ADJ
17-Feb-13	Contract Resources	78x2 7/8 reset 30x3 1/2 DP ID blast/pm	21277	3	ADJ
20-Mar-13	Contract Resources	92x4" DP ID + OD blast	21500	5.5	ADJ
24-Jul-13	Contract Resources	38x5" landing string ID's and OD's	21923	4	ADJ
30-Dec-13	Contract Resources	130x4" GPDS38 DP ID's and OD's	22860	7.5	ADJ
22-May-14	Contract Resources	251 x 3 1/2" DP, 10,000psi ID's	23660	2	ADJ
23-May-14	Contract Resources	251 x 3 1/2" DP, 10,000psi ID's	23660	5.5	ADJ
3-Jun-14	Contract Resources	145 3 1/2" DP 10,000psi ID's	23689	4.5	ADJ
9-Jun-14	Intergroup	89 x 3 1/2" DP 10,000psi ID's	23758	2	ADJ
17-Jun-14	Intergroup	176 Gi5.5 3 1/2" DP 10,000psi ID's	23740	4	ADJ
10-Jul-14	Contract Resources	18 x 5" landing string 10,000psi ID's	23931	1.5	ADJ
8-Sep-14	Contract Resources	30 x 3 1/2"/91 x 4" DP 10,000psi	24355	10	ADJ
9-Sep-14	Contract Resources	30 x 3 1/2"/91 x 4" DP 10,000psi	24355	9	ADJ
23-Jan-15	Contract Resources	60 3 1/2" DP ID+OD 10k blast	25041	5	ADJ
24-Mar-15	Contract Resources	66 4" DP ID HP blast 10k	25300	3	ADJ
8-May-15	Contract Resources	79 4" DP ID 10k blast cement	25379	7	ADJ
22-Jun-15	Contract Resources	38 x 4" DP, 3 x 4" HWDP 20k blast cement	25506	3.5	ADJ

*Deduct for Set-up, Rig Down, Pipe Loads, Breaks, etc
0 - 3hrs = minus 1/2hr
4- 6 hrs = minus 1 hr
7 hrs + = minus 2hrs

Appendix VI

Olex investigation analytical results



Hill Laboratories

BETTER TESTING

BETTER RESULTS
Taranaki Regional Council

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Hamilton 3240, New Zealand

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ANALYSIS REPORT

Page 1 of 3

Client: Taranaki Regional Council	Lab No: 1082731	SPV1
Contact: Mr J Williams	Date Registered: 18-Dec-2012	
C/- Taranaki Regional Council	Date Reported: 28-Dec-2012	
Private Bag 713	Quote No:	
STRATFORD 4352	Order No: 36268	
	Client Reference:	
	Submitted By: Mr J Williams	

3 - JAN 2013

Document No of Reply

Sample Type: Aqueous

Sample Name:	123986	124076			
Lab Number:	1082731.1	1082731.2			

Basic metals suite, dissolved, trace

Element	Unit	123986	124076			
Dissolved Aluminium	g/m ³	0.072	0.062	-	-	-
Dissolved Antimony	g/m ³	< 0.0002	< 0.0002	-	-	-
Dissolved Arsenic	g/m ³	< 0.0010	< 0.0010	-	-	-
Dissolved Boron	g/m ³	0.024	0.025	-	-	-
Dissolved Cadmium	g/m ³	0.00019	0.00017	-	-	-
Dissolved Chromium	g/m ³	0.0008	0.0008	-	-	-
Dissolved Cobalt	g/m ³	< 0.0002	< 0.0002	-	-	-
Dissolved Copper	g/m ³	0.0178	0.0187	-	-	-
Dissolved Iron	g/m ³	0.34	0.33	-	-	-
Dissolved Lead	g/m ³	0.0197	0.024	-	-	-
Dissolved Lithium	g/m ³	0.0028	0.0034	-	-	-
Dissolved Manganese	g/m ³	0.0051	0.0050	-	-	-
Dissolved Molybdenum	g/m ³	0.0018	0.0020	-	-	-
Dissolved Nickel	g/m ³	0.0009	0.0009	-	-	-
Dissolved Tin	g/m ³	0.0022	0.0025	-	-	-
Dissolved Vanadium	g/m ³	0.0013	0.0011	-	-	-
Dissolved Zinc	g/m ³	0.31	0.36	-	-	-

Haloothers Trace in SVOC Water Samples by GC-MS

Compound	Unit	123986	124076			
Bis(2-chloroethoxy) methane	g/m ³	< 0.0005	< 0.0005	-	-	-
Bis(2-chloroethyl)ether	g/m ³	< 0.0005	< 0.0005	-	-	-
Bis(2-chloroisopropyl)ether	g/m ³	< 0.0005	< 0.0005	-	-	-
4-Bromophenyl phenyl ether	g/m ³	< 0.0005	< 0.0005	-	-	-
4-Chlorophenyl phenyl ether	g/m ³	< 0.0005	< 0.0005	-	-	-

Nitrogen containing compounds Trace in SVOC Water Samples, GC-MS

Compound	Unit	123986	124076			
3,3'-Dichlorobenzidine	g/m ³	< 0.003	< 0.003	-	-	-
2,4-Dinitrotoluene	g/m ³	< 0.0010	< 0.0010	-	-	-
2,6-Dinitrotoluene	g/m ³	< 0.0010	< 0.0010	-	-	-
Nitrobenzene	g/m ³	< 0.0005	< 0.0005	-	-	-
N-Nitrosodi-n-propylamine	g/m ³	< 0.0010	< 0.0010	-	-	-
N-Nitrosodiphenylamine	g/m ³	< 0.0010	< 0.0010	-	-	-

Organochlorine Pesticides Trace in SVOC Water Samples by GC-MS

Compound	Unit	123986	124076			
Aldrin	g/m ³	< 0.0005	< 0.0005	-	-	-
alpha-BHC	g/m ³	< 0.0005	< 0.0005	-	-	-
beta-BHC	g/m ³	< 0.0005	< 0.0005	-	-	-
delta-BHC	g/m ³	< 0.0005	< 0.0005	-	-	-
gamma-BHC (Lindane)	g/m ³	< 0.0005	< 0.0005	-	-	-
4,4'-DDD	g/m ³	< 0.0005	< 0.0005	-	-	-
4,4'-DDE	g/m ³	< 0.0005	< 0.0005	-	-	-



This Laboratory is accredited by International Accreditation New Zealand (IANZ), which represents New Zealand in the International Laboratory Accreditation Cooperation (ILAC). Through the ILAC Mutual Recognition Arrangement (ILAC-MRA) this accreditation is internationally recognised. The tests reported herein have been performed in accordance with the terms of accreditation, with the exception of tests marked *, which are not accredited.

Sample Type: Aqueous						
Sample Name:	123986	124076				
Lab Number:	1082731.1	1082731.2				
Organochlorine Pesticides Trace in SVOC Water Samples by GC-MS						
4,4'-DDT	g/m ³	< 0.0010	< 0.0010	-	-	-
Dieldrin	g/m ³	< 0.0005	< 0.0005	-	-	-
Endosulfan I	g/m ³	< 0.0010	< 0.0010	-	-	-
Endosulfan II	g/m ³	< 0.0010	< 0.0010	-	-	-
Endosulfan sulfate	g/m ³	< 0.0010	< 0.0010	-	-	-
Endrin	g/m ³	< 0.0010	< 0.0010	-	-	-
Endrin ketone	g/m ³	< 0.0010	< 0.0010	-	-	-
Heptachlor	g/m ³	< 0.0005	< 0.0005	-	-	-
Heptachlor epoxide	g/m ³	< 0.0005	< 0.0005	-	-	-
Hexachlorobenzene	g/m ³	< 0.0005	< 0.0005	-	-	-
Polycyclic Aromatic Hydrocarbons Trace in SVOC Water Samples						
Acenaphthene	g/m ³	< 0.0003	< 0.0003	-	-	-
Acenaphthylene	g/m ³	< 0.0003	< 0.0003	-	-	-
Anthracene	g/m ³	< 0.0003	< 0.0003	-	-	-
Benzo[a]anthracene	g/m ³	< 0.0003	< 0.0003	-	-	-
Benzo[a]pyrene (BAP)	g/m ³	< 0.0005	< 0.0005	-	-	-
Benzo[b]fluoranthene + Benzo[j]fluoranthene	g/m ³	< 0.0005	< 0.0005	-	-	-
Benzo[g,h,i]perylene	g/m ³	< 0.0005	< 0.0005	-	-	-
Benzo[k]fluoranthene	g/m ³	< 0.0005	< 0.0005	-	-	-
2-Chloronaphthalene	g/m ³	< 0.0003	< 0.0003	-	-	-
Chrysene	g/m ³	< 0.0003	< 0.0003	-	-	-
Dibenzo[a,h]anthracene	g/m ³	< 0.0005	< 0.0005	-	-	-
Fluoranthene	g/m ³	< 0.0003	< 0.0003	-	-	-
Fluorene	g/m ³	< 0.0003	< 0.0003	-	-	-
Indeno(1,2,3-c,d)pyrene	g/m ³	< 0.0005	< 0.0005	-	-	-
2-Methylnaphthalene	g/m ³	< 0.0003	< 0.0003	-	-	-
Naphthalene	g/m ³	< 0.0003	< 0.0003	-	-	-
Phenanthrene	g/m ³	< 0.0003	< 0.0003	-	-	-
Pyrene	g/m ³	< 0.0003	< 0.0003	-	-	-
Phenols Trace (drinkingwater) in SVOC Water Samples by GC-MS						
2-Chlorophenol	g/m ³	< 0.0005	< 0.0005	-	-	-
2,4-Dichlorophenol	g/m ³	< 0.0005	< 0.0005	-	-	-
2,4,6-Trichlorophenol	g/m ³	< 0.0010	< 0.0010	-	-	-
Phenols Trace (non-drinkingwater) in SVOC Water Samples by GC-MS						
4-Chloro-3-methylphenol	g/m ³	< 0.0010	< 0.0010	-	-	-
2,4-Dimethylphenol	g/m ³	< 0.0005	< 0.0005	-	-	-
3 & 4-Methylphenol (m- + p-cresol)	g/m ³	< 0.0010	< 0.0010	-	-	-
2-Methylphenol (o-Cresol)	g/m ³	< 0.0005	< 0.0005	-	-	-
2-Nitrophenol	g/m ³	< 0.0010	< 0.0010	-	-	-
Pentachlorophenol (PCP)	g/m ³	< 0.010	< 0.010	-	-	-
Phenol	g/m ³	0.0095	< 0.0010	-	-	-
2,4,5-Trichlorophenol	g/m ³	< 0.0010	< 0.0010	-	-	-
Plasticisers Trace (non-drinkingwater) in SVOC Water by GCMS						
Butylbenzylphthalate	g/m ³	< 0.0010	< 0.0010	-	-	-
Diethylphthalate	g/m ³	< 0.0010	< 0.0010	-	-	-
Dimethylphthalate	g/m ³	< 0.0010	< 0.0010	-	-	-
Di-n-butylphthalate	g/m ³	< 0.0010	< 0.0010	-	-	-
Di-n-octylphthalate	g/m ³	< 0.0010	< 0.0010	-	-	-
Plasticisers Trace (drinkingwater) in SVOC Water Samples by GCMS						
Bis(2-ethylhexyl)phthalate	g/m ³	< 0.003	< 0.003	-	-	-
Di(2-ethylhexyl)adipate	g/m ³	< 0.0010	< 0.0010	-	-	-
Other Halogenated compounds Trace (drinkingwater) in SVOC Water						
1,2-Dichlorobenzene	g/m ³	< 0.0010	< 0.0010	-	-	-
1,3-Dichlorobenzene	g/m ³	< 0.0010	< 0.0010	-	-	-



ANALYSIS REPORT Page 1 of 1

Client:	Taranaki Regional Council	Lab No:	1132916	SPV1
Contact:	L Smith C/- Taranaki Regional Council Private Bag 713 STRATFORD 4352	Date Registered:	08-May-2013	
		Date Reported:	15-May-2013	
		Quote No:	54680	
		Order No:	38297	
		Client Reference:	DBT in Sediments	
		Submitted By:	Mr J Williams	

Sample Type: Sediment					
Sample Name:	135878	135879			
	07-May-2013	07-May-2013			
Lab Number:	1132916.1	1132916.2			
Tributyl Tin Trace in Soil samples by GCMS					
Dibutyltin (as Sn)	mg/kg dry wt	0.019	< 0.005	-	-
Monobutyltin (as Sn)	mg/kg dry wt	< 0.007	< 0.007	-	-
Tributyltin (as Sn)	mg/kg dry wt	< 0.004	< 0.004	-	-
Triphenyltin (as Sn)	mg/kg dry wt	< 0.003	< 0.003	-	-

SUMMARY OF METHODS


The following table(s) gives a brief description of the methods used to conduct the analyses for this job. The detection limits given below are those attainable in a relatively clean matrix. Detection limits may be higher for individual samples should insufficient sample be available, or if the matrix requires that dilutions be performed during analysis.

Sample Type: Sediment			
Test	Method Description	Default Detection Limit	Samples
Tributyl Tin Trace in Soil samples by GCMS	Solvent extraction, ethylation, SPE cleanup, GC-MS SIM analysis. Tested on dried sample	-	1-2

These samples were collected by yourselves (or your agent) and analysed as received at the laboratory.

Samples are held at the laboratory after reporting for a length of time depending on the preservation used and the stability of the analytes being tested. Once the storage period is completed the samples are discarded unless otherwise advised by the client.

This report must not be reproduced, except in full, without the written consent of the signatory.


Martin Cowell - BSc (Chem)
Client Services Manager - Environmental Division

Taranaki Regional Council
Document No:

15 MAY 2013

Document No of Reply:

Appendix VII

Fish survey

Memorandum

To Lorraine Smith, Job Manager
From Bart Jansma, Freshwater Biologist
File 03-02-005-03/01
Doc No. 1534977
Report No. BJ255
Date 6 July 2015

Fish survey in the Mangati Stream in relation to discharges from the Bell Block industrial area, November 2013

The fish communities of the Mangati Stream were surveyed at three sites using the spotlighting survey method, on 11 November 2013. The night-spotting survey was conducted using battery-powered spotlights and handheld nets, which were used by two observers to (where able), catch and identify the fish. Fish lengths were identified at site 3 only. The sites for the surveys are described in Table 1.

Details of the sites surveyed are given in Table 1.

Table 1 Sites in the electric fishing surveys of the Mangati Stream sampled on 9 March 2011

Site	Site code	Site description	Altitude (m)	Distance from coast (km)
1	MGT000493	Mangati Stream, De Havilland Drive	30	2.64
2	MGT000512	Mangati Stream, 20 m downstream SH3	20	1.83
3	MGT000520	Mangati Stream, 400m below Devon Rd	20	1.53

These sites were specifically chosen, as sites 2 and 3 are located downstream of most discharges from the Bell Block industrial area, allowing an assessment of potential discharge impacts, and site 1 is located upstream of most discharges from this area, allowing an assessment of potential barriers to fish passage possibly caused by discharges or instream structures.

The results of the survey are summarised in Table 2. Results from previous surveys are detailed in the references.

Only 32m² was surveyed at site 1, primarily due to the overgrown nature of this site making sampling extremely difficult. Only one fish species (banded kokopu (*Galaxias fasciatus*), was recorded at this upstream site, which is a reduction from that recorded in the previous survey, which recorded three species. It is possible other species were present, but were either not observed, or not identified, as there were four galaxiids observed that could not be identified to species. All galaxiid species are diadromous, in that they need access to the sea to complete their lifecycle.

Table 2 Results of the Mangati Stream catchment fish survey conducted on 11 November 2013. UID = unidentified

Site:		Site 1	Site 2	Site 3
Area fished (m ²):		32	88	53
Longfin eel (<i>Anguilla dieffenbachii</i>)	Number	-	1	-
	Length range (mm)	-	-	-
Shortfin eel (<i>Anguilla australis</i>)	Number	-	3	-
	Length range (mm)	-	-	-
Unidentified eel (<i>Anguilla</i> sp.)	Number	-	-	1
	Length range (mm)	-	-	350
Redfin bully (<i>Gobiomorphus huttoni</i>)	Number	-	3	13
	Length range (mm)	-	-	40-100
Banded kokopu (<i>Galaxias fasciatus</i>)	Number	6	7	12
	Length range (mm)	-	-	70-120
Giant kokopu (<i>Galaxias argenteus</i>)	Number	-	1	1
	Length range (mm)	-	250	250
Inanga (<i>Galaxias maculatus</i>)	Number	-	1	-
	Length range (mm)	-	-	-
UID galaxiid (<i>Galaxias</i> sp.)	Number	4	9	3
	Length range (mm)	-	-	70-100
Total number of species		2	6	4
Total number of fish		10	25	30

Banded kokopu were relatively abundant at this site, which had good habitat, in the form of overhanging grass and scrub. However, one of the banded kokopu was affected by a fungal growth on its head, which may suggest either an injury or that the fish was being affected by poor water quality. No eels were recorded at this site, although with the amount of bank cover available, they may have been present but not observed. Both longfin (*Anguilla dieffenbachii*) and shortfin eels (*Anguilla australis*) have been recorded in the Mangati Stream in the past.

Six species were recorded at the second site, downstream of State Highway 3 (MGT000512). This included banded kokopu, longfin and shortfin eel, inanga, redfin bully and giant kokopu. This site had a high abundance, with a total of 25 fish observed, of which banded kokopu was the most abundant. Although this high abundance may suggest that the double culvert under State Highway 3 may be providing somewhat of a barrier to fish passage at this point, it cannot be discounted that this site supported good fish habitat, with mature riparian planting and undercut banks. The number of fish has reduced from that recorded in

the previous survey, which recorded 77 fish. It is possible that there was a barrier to fish passage at the double culvert which has since improved. The presence of a 250mm giant kokopu indicates that preceding water quality immediately below the wetland and industrial drain bypass has been sufficient to support this fish, which is likely to be a number of years old.

The third site was set within the reserve area, which has good riparian cover. Four species were recorded here, with banded kokopu, giant kokopu, redfin bully and an unidentified eel being observed. Habitat appeared slightly better than that recorded at the second site, especially for banded kokopu, and in total there were slightly more fish (30 in total).

During the previous survey, some concerns were noted regarding the lack of certain species. At that time it was suggested that the low abundance of some species e.g. shortfin and longfin eels, and the absence of others e.g. giant kokopu may be related to some other influence causing an impact on the fish communities of this stream, such as a discharge having occurred a year or two prior to that survey, from which the community had not yet fully recovered. The results of the current survey suggest that the communities at sites 2 and 3 are in a healthier condition than that recorded in the previous survey, lending some support to this theory.

Another theory suggested previously that may explain the lack of giant kokopu is that they are likely to be similar to trout in that more food is needed for larger fish to maintain energetic requirements (Hansen and Closs, 2005). The macroinvertebrate surveys undertaken in the Mangati Stream have recorded only a small number of invertebrates as abundant on a large number of occasions (**Error! Reference source not found.**), and these invertebrates are not ideal food for giant kokopu or longfin eel, especially at the two downstream sites (Bonnet & Lambert (2002), Jellyman (1989)). However, it should be noted that giant kokopu also feed on terrestrial insects that fall into the stream, and an intact riparian margin is an important source of these terrestrial insects.

Table 3 Frequency (%) that certain macroinvertebrate taxa have been recorded as abundant (>20 individuals) at three sites at or near to those surveyed for fish on 11 November 2013. Only those taxa abundant in over 20% of samples are shown.

Taxa List	Site code:			
		MGT000491	MGT000512	MGT000520
	Number of Samples:	41	23	45
ANNELIDA	Oligochaeta	1	95	100
	<i>Potamopyrgus</i>	4	88	51
CRUSTACEA	<i>Paracalliope</i>	5	78	4
EPHEMEROPTERA	Orthocladiinae	2	71	43
DIPTERA	<i>Austrosimulium</i>	3	51	9

Most of the fish found in New Zealand streams are migratory and all the fish recorded in the Mangati Stream in this survey were migratory. Access to the stream from the sea is an important determinant of fish communities in New Zealand. Due to the frequent presence of a large gravel bar at the mouth of the Mangati Stream, access from the sea appears to be limited to times of high tide and floods. In addition, approximately 120 metres upstream of the mouth, there is a natural cascade, which may impede the passage of fish. It is apparent that all species recorded in the current survey have negotiated this natural cascade. With the exception of inanga, this is not unusual, as these species are known to be good climbers which can penetrate significant distances inland. The presence of inanga upstream of the

natural cascade is surprising. The results of the current survey do not indicate the presence of a barrier to fish passage, including at the SH3 culvert.

With regards to water quality, it was clear that water quality was sufficient to support a relatively diverse and abundant population of native fish. Historically, this catchment has experienced toxic discharges which have resulted in significant fish kills. No such discharge has been recorded in over ten years, although previous survey results suggests that such a discharge may have occurred approximately five years ago. This is a purely hypothetical explanation, as water quality sampling and inspections have not indicated that such a discharge took place.

Changes in land use in the area have the potential to threaten habitat within this catchment. A significant amount of pasture has been converted to industrial subdivision land, and there is the potential for habitat changes in the main stem. This is because small tributaries have been piped underground, resulting in reduced water storage in the catchment, and lower flows in summer. Furthermore, with an increase in hard surface within the catchment, if there is insufficient stormwater retention, floods will peak much quicker. This has the potential for disturbing or destroying instream habitat. How these changes will impact on the fish communities is unknown. Therefore it is recommended that fish surveys of the Mangati Stream continue as at present.

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