Port Area Industrial Catchments Monitoring Programme Annual Report 2016-2017

Technical Report 2017-69

ISSN: 1178-1467 (Online)
Document: 1852563 (Word)
Document: 1995426 (Pdf)

Taranaki Regional Council
Private Bag 713
STRATFORD

March 2018

Executive summary

This report for the period July 2016 to June 2017 describes the monitoring programme implemented by the Taranaki Regional Council (the Council) to assess the environmental performance of consent holders in the Port Area Industrial Catchments of New Plymouth during the period under review. The report also details the results of the monitoring undertaken and assesses the environmental effects of the Companies' activities. This report was formerly known as the Hongihongi and Herekawe Streams Joint Monitoring Programme Annual Report.

This report covers consents held by various consent holders in the Hongihongi catchment, Herekawe, catchment, Huatoki catchment, and unnamed catchment 61, all being adjacent to the Port of Taranaki and collectively known as the Port Area Industrial Catchments. Seventeen resource consents, which include a total of 161 conditions, are held by ten consent holders in the port industrial area. These include two consents to discharge contaminants to land, two consents to discharge contaminants and stormwater to land and water, seven consents to discharge contaminants to the coastal marine area, and six consents to discharge contaminants/stormwater to water.

During the monitoring period the consent holders monitored within the Port Area Industrial Catchments demonstrated an overall high level of environmental performance.

Monitoring of consent holder sites covered by this report consisted of up to four inspections each per site, with discharge sampling on two occasions at most of the sites.

On most occasions the sites were found to be well maintained, bunded areas secure and stormwater treatment systems operating effectively. Macroinvertebrate surveys in the Herekawe Stream did not indicate any recent detrimental effect on the macroinvertebrate communities due to the discharge of treated stormwater.

During the period under review Molten Metals was issued with an abatement notice as a result of an exceedance in the concentration of suspended solids in the discharge from the scrap yard in the previous monitoring period. During the current monitoring period the levels of suspended solids in the three samples collected from the Molten Metals site were all well above consent limits, oil and grease also exceeded consent limits on one occasion. As a result an infringement notice (fine) was issued to the Company.

During the year, companies monitored within the Hongihongi and Herekawe catchments overall demonstrated a high level of environmental performance and compliance with resource consents, however in the case of Molten Metals Ltd, an improvement was required in environmental performance as a result of exceedances in the concentration of suspended solids and oil and grease in the discharge from the site.

For reference, in the 2016-2017 year, consent holders were found to achieve a high level of environmental performance and compliance for 74 % of the consents monitored through the Taranaki tailored monitoring programmes, while for another 21 % of the consents, a good level of environmental performance and compliance was achieved.

In terms of overall environmental and compliance performance by the consent holder's over the last several years, this report shows that the consent holder's performance remains at a high level for all consent holders with exception of Molten Metals Ltd whose performance remains at a level that requires improvement

This report includes recommendations for the 2017-2018 year.

Table of contents

List of tables

List of figures

1 Introduction

1.1 Compliance monitoring programme reports and the Resource Management Act 1991

1.1.1 Introduction

This report is the Annual Report for the period July 2016 to June 2017 prepared by the Taranaki Regional Council (the Council). The report describes the monitoring programme associated with resource consents held by the owners and operators of various sites in the port area catchments. This report was formerly known as the Hongihongi and Herekawe Streams Joint Monitoring Programme Report. The name of the report was changed to more accurately describe all of the activities covered by the monitoring programme and the report.

This report covers the results and findings of the monitoring programme implemented by the Council in respect of the consents relating to discharges to water within the port catchments. This is the 22st combined report to be prepared by the Council to cover the discharges in the industrial catchments that surround the port in New Plymouth. Activities undertaken within the port itself are monitored and reported separately.

1.1.2 Structure of this report

Section 1 of this report is a background section, it sets out general information about;

- consent compliance monitoring under the RMA and the Council's obligations;
- the Council's approach to monitoring sites though annual programmes;
- the resource consents held by the companies in the port area catchments;
- the nature of the monitoring programme in place for the period under review; and
- a description of the activities and operations conducted in the consent holders sites.

Section 2 sets out the resource consents held by companies that discharge via the Hongihongi Stream outfall, the nature of the monitoring programme in place for the period under review, and a description of the activities and operations conducted in the catchment. This section also presents the results of monitoring in the Hongihongi catchment during the period under review (including scientific and technical data), discusses these results, their interpretation and their significance for the environment.

Section 3 sets out the resource consents held by companies that discharge to the Herekawe Stream, the nature of the monitoring programme in place for the period under review, and a description of the activities and operations conducted in the catchment. This section also presents the results of monitoring in the Herekawe catchment during the period under review (including scientific and technical data), discusses these results, their interpretation and their significance for the environment.

Section 4 sets out the resource consents held by companies discharging to the other coastal marine areas in the port area, the nature of the monitoring programme in place for the period under review, and a description of the activities and operations conducted in the catchment. This section also presents the results of monitoring in the period under review (including scientific and technical data), discusses these results, their interpretation and their significance for the environment.

Section 5 presents recommendations to be implemented in the 2017-2018 monitoring year.

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 against regional plans and consents.

Compliance monitoring, including impact monitoring, also enables the Council to continuously assess its own performance in resource management as well as that of resource users (particularly consent holders). It further enables the Council to continually re-evaluate its approach and that of consent holders to resource management, and ultimately through the refinement of methods, to move closer to achieving sustainable development of the region's resources.

1.1.4 Evaluation of environmental performance

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

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

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

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

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

Environmental Performance

High: No or inconsequential (short-term duration, less than minor in severity) breaches of consent or regional plan parameters resulting from the activity; no adverse effects of significance noted or likely in the receiving environment. The Council did not record any verified unauthorised incidents involving significant environmental impacts and was not obliged to issue any abatement notices or infringement notices in relation to such impacts.

Good: Likely or actual adverse effects of activities on the receiving environment were negligible or minor at most. There were some such issues noted during monitoring, from self reports, or in response to unauthorised incident reports, but these items were not critical, and follow-up inspections showed they have been dealt with. These minor issues were resolved positively, co-operatively, and quickly. The Council was not obliged to issue any abatement notices or infringement notices in relation to the minor non-compliant effects; however abatement notices may have been issued to mitigate an identified potential for an environmental effect to occur.

For example:

- High suspended solid values recorded in discharge samples, however the discharge was to land or to receiving waters that were in high flow at the time;
- Strong odour beyond boundary but no residential properties or other recipient nearby.

Improvement required: Likely or actual adverse effects of activities on the receiving environment were more than minor, but not substantial. There were some issues noted during monitoring, from self reports, or in response to unauthorised incident reports. Cumulative adverse effects of a persistent minor non-compliant activity could elevate a minor issue to this level. Abatement notices and infringement notices may have been issued in respect of effects.

Poor: Likely or actual adverse effects of activities on the receiving environment were significant. There were some items noted during monitoring, from self reports, or in response to unauthorised incident reports. Cumulative adverse effects of a persistent moderate non-compliant activity could elevate an 'improvement required' issue to this level. Typically there were grounds for either a prosecution or an infringement notice in respect of effects.

Administrative performance

High: The administrative requirements of the resource consents were met, or any failure to do this had trivial consequences and were addressed promptly and co-operatively.

Good: Perhaps some administrative requirements of the resource consents were not met at a particular time, however this was addressed without repeated interventions from the Council staff. Alternatively adequate reason was provided for matters such as the no or late provision of information, interpretation of 'best practical option' for avoiding potential effects, etc.

Improvement required: Repeated interventions to meet the administrative requirements of the resource consents were made by Council staff. These matters took some time to resolve, or remained unresolved at the end of the period under review. The Council may have issued an abatement notice to attain compliance.

Poor: Material failings to meet the administrative requirements of the resource consents. Significant intervention by the Council was required. Typically there were grounds for an infringement notice.

For reference, in the 2016-2017 year, consent holders were found to achieve a high level of environmental performance and compliance for 74% of the consents monitored through the Taranaki tailored monitoring programmes, while for another 21% of the consents, a good level of environmental performance and compliance was achieved.

2 Hongihongi catchment

2.1 Resource consents

2.1.1 Water and coastal discharge permits

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.

A summary of the consents for activities in the Hongihongi catchment during the monitoring period is given in

Table 1. These consents are discussed in more detail in the following sections. Copies of the consents are attached in Appendix I.

Table 1 Resource consents for in the Hongihongi Catchment

Consent holder	Consent number	Purpose of consent	Next review	Expiry
Bulk Storage Terminals Ltd	0276-3	To discharge treated stormwater and waste saltwater to the coastal marine area via the Hongihongi Stream	2020	2032
	4488-3	To discharge stormwater to the coastal marine area via the Hongihongi Stream	2020	2032
Greymouth Petroleum Ltd	9978-1	To discharge stormwater onto and into land from a bulk storage facility in the Hongihongi catchment	2020	2032
Liquigas Ltd	4524-2	To discharge process water and stormwater to the Hongihongi Stream	2020	2026
New Zealand Oil Services Ltd	1020-4	To discharge stormwater and treated wastewater to the coastal marine area via the Hongihongi Stream	2020	2032
Shell Todd Oil Services	5542-2	To discharge treated and untreated stormwater from a petrochemical storage tank facility and hydrostatic test water into the coastal marine area via the Hongihongi Stream	2020	2032

The operational boundaries of the consents monitored in the Hongihongi catchment are identified in Figure 1.

Two other consents, **6369-1** and **7526-1**, both for abrasive blasting activities within the Hongihongi catchment, were monitored under a separate programme (Regional abrasive blasting).

Figure 1 Consents and sampling points for discharges via the Hongihongi Stream outfall

2.2 Monitoring programme

2.2.1 Introduction

Section 35 of the RMA sets out an obligation for the Council to gather information, monitor, and conduct research on the exercise of resource consents within the Taranaki region. The Council is also required to assess the effects arising from the exercising of these consents and report upon them.

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 Hongihongi catchment consisted of three primary components set out below.

2.2.2 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 consent reviews, renewals or new consent applications;
- advice on the Council's environmental management strategies and content of regional plans; and
- consultation on associated matters.

2.2.3 Site inspections

Each of the consent holders' sites were inspected over the monitoring period, usually on four occasions. The main points of interest were plant processes with potential or actual discharges to receiving watercourses, including contaminated stormwater and process wastewaters. 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.

2.2.4 Chemical sampling

During the 2016-2017 period, the Council took up to two discharge samples at each site. Receiving waters were also sampled and analysed for a range of relevant parameters. Sampling sites are presented in Figure 1. Data from self-sampling by consent holders was requested and reviewed.

2.3 Bulk Storage Terminals Ltd

2.3.1 Site description

Bulk Storage Terminals Ltd (BST) operates a chemical storage facility on Centennial Drive, New Plymouth (Figure 2). Chemicals are transported to and from the facility by road tanker and by pipeline to the port.

2.3.2 Resource consents

BST holds resource consent **0276-3** to discharge treated stormwater from a bulk storage site into the coastal marine area of Ngamotu Beach. This consent was granted by the Council on 19 November 2015 and it expires on 1 June 2032.

BST holds resource consent **4488-3** to discharge treated stormwater from an industrial chemical storage site into the coastal marine area of Ngamotu Beach. This consent was granted by the Council on 19 November 2015 and it expires on 1 June 2032.

Both consents have the same eight conditions;

Condition 1 requires that the best practicable option is adopted to prevent or minimise adverse environmental effects.

Conditions 2 specifies the maximum catchment area

Condition 3 specifies maximum contaminant concentrations in the discharge.

Condition 4 deals with effects in the CMA

Conditions 5 and 6 require the preparation and maintenance of contingency and stormwater management plans.

Condition 7 requires the consent holder to notify the Council of any changes to site processes.

Condition 8 is a review provision.

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

Figure 2 Aerial photograph of the Bulk Storage Terminals Ltd site

2.3.3 Results

2.3.3.1 Inspections

Routine inspections of the site were undertaken on 5 September 2016, 8 December 2016, 4 April 2017 and 4 May 2017.

On each occasion the tank bunds, stormwater drains, and separators were checked, and an odour survey conducted, and no issues were noted (for example bunds and stormwater drains were free of any evidence of contaminants). Company staff usually accompanied the Council inspector.

During the inspection of 5 September 2016 a sample was taken of the bunded stormwater in follow up to non-compliant pH result (see section 2.3.3.3).

Whilst low pH's were noted in some of the bunds, no obvious source was found. The staff undertook to flood the bunds with fresh water to clean them and then direct that water to tradewaste.

No other issues were noted during the other inspections.

2.3.3.2 Results of discharge monitoring

Results of sample analysis as well a summary of all results are presented in Table 2. A summary of historical results for the site is also included in the table.

Table 2 Results for BST stormwater (in bund) prior to discharge site STW001043

Parameter	Conductivity	Oil and Grease	pH	Suspended solids	Temperature
Units	mS/m@20C	g/m³	pH	g/m³	Deg.C
Minimum	1.5	0.5	4.9	2	9.7
Maximum	62.6	1.8	10.7	96	20.8
Median	11.7	0.2	7.2	4	14.2
Number	43	36	43	41	39
26 Aug 2016	2.2	<0.5	**4.9**	20	13.1
07 Sep 2016	-	-	6.8	-	-
04 Apr 2017	4.7	<0.5	7.5	4	14.1

Table 2 shows that on one occasion the pH was not compliant with consent conditions. Although the bund was discharging at the time, no effects were noted in the downstream receiving water sample. A follow up sample was found to be compliant in regards to pH.

2.3.4 Evaluation of performance

A tabular summary of the consent holder's compliance record for the period under review is set out in Table 3 and Table 4.

Table 3 Summary of performance for BST's consent 0276-3

Purpose: ***To discharge up to 30 litres/second of treated stormwater and waste saltwater from an oil terminal site into the coastal marine area of the Hongihongi Stream***		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Adopt best practice	Inspections and sampling	Yes
2. Limit on catchment area	Inspections	Yes
3. Limits on certain chemical parameters in discharge	Discharge sample not taken this period	N/A
4. Limit on effects in receiving waters	Receiving water sample	Yes
5. Maintenance and adherence to stormwater plan	Plan provided June 2016	Yes
6. Maintenance of a contingency plan	Plan provided May 2016	Yes
7. Notification of site changes	No changes noted	Yes
8. Review provision	Next review option 2020	
Overall assessment of consent compliance and environmental performance in respect of this consent Overall assessment of administrative performance in respect of this consent		**High** **High**

Table 4 Summary of performance for BST's consent 4488-3

Purpose: ***To discharge up to 30 litres/second of treated stormwater and waste saltwater from an oil terminal site into the coastal marine area of the Hongihongi Stream***		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Adopt best practice	Inspections and sampling	Yes
2. Limit on catchment area	Inspections	Yes
3. Limits on certain chemical parameters in discharge	Sampling	No. One pH non-compliant
4. Limit on effects in receiving waters	Receiving water sample	Yes
5. Maintenance and adherence to stormwater plan	Plan provided June 2016	Yes
6. Maintenance of a contingency plan	Plan provided May 2016	Yes
7. Notification of site changes	No changes noted	Yes
8. Review provision	Next review option 2020	

Purpose: *To discharge up to 30 litres/second of treated stormwater and waste saltwater from an oil terminal site into the coastal marine area of the Hongihongi Stream*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
Overall assessment of consent compliance and environmental performance in respect of this consent Overall assessment of administrative performance in respect of this consent		**Good** **High**

During the year, Bulk Storage Terminals Ltd demonstrated a good level of environmental and high administrative performance with the resource consents as defined in Section 1.1.4.

2.4 Port Taranaki Ltd – fire water storage facility

2.4.1 Site description

This facility (Figure 3) was constructed to treat deballast water from vessels docked at the port. However, it has not been used for this purpose since 1996. Greymouth Petroleum Ltd (Greymouth Petroleum) took over the site from Methanex in 2008 to use the bunded area of the site as a holding facility for drilling fluids and produced water related to land based well-site drilling activities. The site no longer discharges any treated water to the Hongihongi Stream from this area. As the site surface is in generally poor condition and permeable, all stormwater collected within the bunded areas discharges into land through soakage. Port Taranaki Ltd (Port Taranaki) took over the site for fire water storage in 2016 with the consent being transferred to them on 25 July 2016.

Figure 3 Aerial photograph of the Greymouth bulk storage facility

2.4.2 Resource consent

Port Taranaki discharge permit **9978-1** to discharge stormwater onto and into land from a bulk storage facility. This permit was issued by the Council on 16 October 2014 under Section 87(e) of the RMA. The consent is due to expire on 1 June 2032. This consent was transferred from Greymouth Petroleum on 25 July 2016.

Condition 1 requires that the best practicable option is adopted to prevent or minimise adverse environmental effects.

Conditions 2 and 3 deal with contaminants reaching surface water or groundwater.

Condition 4 deals with changes to processes or operations at the site.

Conditions 5 and 6 require the preparation and maintenance of contingency and stormwater management plans.

Condition 7 is a review provision.

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

2.4.3 Results

2.4.3.1 Inspections

Four routine inspections were conducted at the site during the monitoring period, on 8 September, 7 November, and 6 December 2016, and 4 May 2017.

Inspections focused on the condition of the bunds, the presence and storage of hazardous substances, evidence of spills and general housekeeping.

During these inspections no issues were noted and the site was found to be compliant. No evidence of contamination was noted in the stormwater accumulated in the bund.

2.4.4 Evaluation of performance.

A tabular summary of the consent holder's compliance record for the year under review is set out in Table 5.

Table 5 Summary of performance for Greymouth Petroleum's consent 9978-1

Purpose: ***To discharge stormwater onto and into land from a bulk storage facility***		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Adopt best practicable option	Inspections of potential sources and receiving waters	Yes
2. No contaminants to reach surface water	Downstream sampling	Yes
3. No contamination of groundwater	Not assessed during review period	N/A
4. Notification prior to changes to processes or operations	No changes during period under review	N/A
5. Preparation and maintenance of a contingency plan	Received January 2015	Yes
6. Preparation and maintenance of a stormwater management plan	Received January 2015	Yes
7. Review provision	Next optional review in June 2020	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent Overall assessment of administrative performance in respect of this consent		**High** **High**

2.5 Liquigas Ltd

2.5.1 Site description

The Liquigas Ltd (Liquigas) LPG storage depot has been in operation since 1983. Onsite storage consists of ten 220 m^3 bullet tanks which are encased in a minimum of 1 metre of sand on all sides within two truncated brick pyramids. A cathodic protection system is used to minimise corrosion of the tanks. LPG is received via a pipeline from Shell Todd Oil Service's Maui Production Station at Oaonui and is piped off site to Newton King Tanker Terminal for national distribution by ship.

Figure 4 Liquigas site and sampling point

2.5.2 Resource consent

Liquigas hold water discharge permit **4524-2** to discharge the following from an LPG storage site:

a. process water from LPG storage tank de-watering;
b. water used to decommission and recommission LPG storage tanks;
c. LPG pipeline flushing water over a two-day period during emergency repairs; and
d. stormwater into the Hongihongi Stream.

This permit was issued by the Council on 3 December 2007 as a resource consent under Section 87(e) of the RMA. It is due to expire on 1 June 2026.

Condition 1 requires the consent holder to adopt the best practicable option to prevent or minimise any adverse effects.

Condition 2 limits the size of stormwater collection catchment area.

Condition 3 limits the volume of process water discharged per day.

Condition 4 requires the consent holder to prepare and maintain a contingency plan.

Conditions 5 to 7 deal with pipe flushing, and decommissioning and recommissioning of the LPG storage tanks, including providing the Council with the results of any physicochemical analysis.

Condition 8 relates to concentration limits for the discharge.

Condition 9 is a review provision.

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

2.5.3 Results

2.5.3.1 Inspections

The site was inspected on 6 December 2016, and 24 February, 3 May and 12 June 2017.

Inspections focused on, the presence and storage of hazardous substances, evidence of spills, loading and tank testing activities, and general housekeeping.

During these inspections it was found that stormwater water drains and catchment areas were free of contamination and no issues were noted. On the inspection of 6 December 2016 LPG was being vented for valve maintenance, and no odours were detected at the boundary as a result.

2.5.3.2 Results of discharge monitoring

The Hongihongi Stream is culverted for approximately 500 metres under the LPG storage depot and Port Taranaki land, prior to discharging to the coast at the western end of Ngamotu Beach.

Two samples were collected during the monitoring period. The sample site is in the main flow of the piped Hongihongi stream immediately downstream of the Liquigas discharge. As a result the samples are indicative only as the Hongihongi Stream would contain stormwater from other sites. The results are presented in Table 6 along with a summary of historical results from the site.

Table 6 Results downstream of Liquigas' stormwater discharge (STW001104)

Parameter	Conductivity	Oil and Grease	pH	Suspended solids	Temperature
Units	**mS/m@20C**	**g/m³**	**pH**	**g/m³**	**Deg.C**
Minimum	1.5	0.5	6.7	2	8.5
Maximum	52.8	0.5	7.9	170	19.2
Median	15.36	0.2	7.3	10	14.8
Number	26	2	27	25	24
14 Oct 2016	8.4	<0.5	7.2	16	14.3
04 Apr 2017	7.9	<0.5	7.3	15	15.1
Consent limits	-	*15*	*6-9*	*100*	-

These results are indicative only as the only accessible sampling point is actually downstream of Liquigas' discharges in the stormwater network (containing stormwater water and the Hongihongi Stream). Therefore the results obtained would have contributions from all upstream sources. Based on the results of the

immediately downstream of the site, in conjunction with visual inspection, the discharge from the Liquigas was likely to be compliant with consent conditions.

2.5.4 Evaluation of performance

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

Table 7 Summary of performance for Liquigas' consent 4524-2

Purpose: ***To discharge from an LPG storage site: (a) process water; (b) water used to decommission and re-commission the LPG storage tanks; (c) LPG pipeline flushing water over a two-day period during emergency repairs; (d) stormwater into the Hongihongi Stream***		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Adopt best practicable option	Inspections of site and sampling	Yes
2. Stormwater catchment area limit	Inspections of site	Yes
3. Process water discharge not to exceed 30 litres/day	Inspections of site and records	Yes
4. Maintenance of a contingency plan	Current as of August 2014	Yes
5. Keep records of discharges during decommissioning/ recommissioning	Liaison with consent holder	Yes
6. Notify the Council 24 hours prior to discharge of process, test, or flushing water	Notifications received	Yes
7. Provide results of any analysis carried out	Liaison with consent holder – results received	Yes
8. Concentration limits in discharge	Sampling	Yes
9. Review provision	Next option for review June 2020	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent Overall assessment of administrative performance in respect of this consent		**High** **High**

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

2.6 New Zealand Oil Services Ltd – Ngamotu Road

2.6.1 Site description

This New Zealand Oil Services Ltd (NZOS) installation is primarily used for the storage of diesel which is then distributed from the site to either the Centennial Drive site or bunkered to vessels at Port Taranaki.

There are two storage tanks in a fully bunded area on the western side of the site. Only one of these tanks is currently in use, as the southernmost tank has been decommissioned.

Hydrostatic testing is undertaken at least once every five years. Most operational water generated on the site now comes from condensation or water entrained in the cargos; this and any stormwater is treated via a water/oil separator before discharging to the NPDC stormwater system.

Figure 5 Aerial photograph of the New Zealand Oil Services Ltd Ngamotu Road site

2.6.2 Resource consent

NZOS holds discharge permit **1020-4** to discharge stormwater and treated wastewater from a petroleum storage facility into the Coastal Marine Area of Ngamotu Beach (via the Hongihongi Stream). This was issued by the Council on April 2015 under section 87(e) of the RMA. It expires on 1 June 2032 and contains nine special conditions.

Condition 1 requires best practice to be adopted.

Condition 2 limits the size of the catchment area.

Condition 3 places limits on certain chemical parameters in the discharge.

Condition 4 limits effects of the receiving environment

Condition 5 and 6 deal with management and contingency planning

Condition 7 requires that notification be given when then is a change to activities at the site.

Condition 8 and 9 are lapse and review conditions.

2.6.3 Results

2.6.3.1 Inspections

Inspections of the site were undertaken on 5 September 2016, 6 December 2016, 24 February 2017, and 4 May 2017.

Company staff usually accompanied the Council inspector and the inspections focused on the bunding, stormwater drains, evidence of recent spills, general housekeeping, and the condition of the separator.

During the inspections no issues were noted, and the site was found to be compliant.

2.6.3.2 Results of discharge monitoring

Two samples were collected from the Ngamotu Road site during the period under review. The results of the analysis are presented in Table 8 along with a summary of historical results.

Table 8 Results for NZOS treated stormwater discharge (IND001011)

Parameter	Conductivity	Hydrocarbons	pH	Suspended solids	Temperature
Units	**mS/m@20C**	**g/m³**	**pH**	**g/m³**	**Deg.C**
Minimum	1.8	0.5	6.7	2	9.9
Maximum	181	54	8.4	500	24.8
Median	6.5	0.2	7	6	14
Number	37	36	36	36	32
26 Aug 2016	4.1	<0.5	7.0	**500**	11.7
07 Sep 2016	-	-	-	3	-
04 Apr 2017	6.5	<0.5	7.0	10	18.4
Consent limits	-	*15*	*6-9*	*100*	-

All results were compliant, except for the suspended solids results obtained on 26 August 2016. No effects in regards to turbidity were noted the downstream receiving water sample. Upon investigation the staff on the site outlined that sediment was recently cleaned for the interceptor which may have result in some sediments being deposited in the discharge pipe. A follow up sample was found to comply with consent conditions.

2.6.4 Evaluation of performance

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

Table 9 Summary of performance for NZOS consent 1020-4

Purpose: ***To discharge stormwater and treated wastewater from a petroleum storage facility into the Coastal Marine Area of Ngamotu Beach***		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Adopt best practice	Inspections and sampling	Yes
2. Limit on catchment area	Inspections	Yes
3. Limits on certain chemical parameters in discharge	Discharge sampling	No
4. Limit on effects in receiving waters	Receiving water sample	Yes
5. Maintenance of a contingency plan	Plan provided June 2016	Yes
6. Maintenance and adherence to stormwater plan	Plan provided May 2016	Yes
7. Notification of site changes	No changes noted	Yes
8. Lapse condition	Consent exercised	N/A
9. Review provision	Next review option 2020	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**

During the year, New Zealand Oil Services Ltd demonstrated a good level of environmental and high level of administrative performance with the resource consents as defined in Section 1.1.4.

2.7 Shell Todd Oil Services (STOS) – Paritutu Tank Farm

2.7.1 Process description

This installation is located on the corner of Paritutu Road and Centennial Drive. It consists of five condensate storage tanks bunded into three separate areas (Figure 6). The tank bunds have been progressively upgraded, and they are all now lined and HSNO compliant.

Stormwater from the site is sampled to confirm compliance with consent conditions prior to being directed to a water/oil separator for treatment and discharge to the NPDC stormwater system on Centennial Drive to the coastal marine area via the piped Hongihongi Stream.

Figure 6 Aerial photograph of the STOS Paritutu Tank Farm

2.7.2 Resource consent

STOS holds coastal discharge permit **5542-2** to discharge treated and untreated stormwater from a petrochemical storage tank facility and hydrostatic test water into the coastal marine area of the Hongihongi. This permit was issued by the Council on 29 October 2015 under Section 87(c) of the RMA.

It has nine special conditions.

Condition 1 limits the catchment area.

Condition 2 limits effects on the receiving environment.

Condition 3 places limits on certain chemical parameters in the discharge.

Condition 4 requires the testing of hydrotest water prior to discharge.

Condition 5 places limits on certain chemical parameters in the hydrotest water prior to discharge.

Condition 6 deals with non-specified contaminants in the hydrotest water.

Condition 7 and 8 deal with management and contingency planning

Condition 8 requires that notification be given when then is a change to activities at the site.

Condition 9 is a review conditions.

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

2.7.3 Results

2.7.3.1 Inspections

Routine site inspections were undertaken on 19 September 2016, 6 December 2016, 11 May 2016, and 8 June 2017.

The inspections focused on the bunding, stormwater drains, treatment systems, evidence of recent spills, and general housekeeping

During the inspections it was noted that stormwater in the bunds were free of sheens and visible contamination and no evidence of spills or other issues were noted.

2.7.3.2 Results of discharge monitoring

One sample was collected from the Paritutu Tank Farm site during the period under review. The results of the analysis are presented in Table 10 along with a summary of historical results. All results complied with the consented limits. STOS tests the stormwater collected in the bunds and only discharges it through the separator if it meets consent conditions. A review of discharge data supplied by STOS show that all stormwater were compliant with consent conditions prior to discharge.

Table 10 Results for SOS Paritutu Tank Farm stormwater discharge (STW002040)

Parameter	Conductivity	Hydrocarbons	pH	Suspended solids	Temperature
Units	**mS/m@20C**	**g/m³**	**pH**	**g/m³**	**Deg.C**
04 Apr 2017	7.3	<0.5	7.4	2	14.7
Consent limits	-	*15*	*6-9*	*100*	-

2.7.4 Evaluation of performance

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

Table 11 Summary of performance for STOS' consent 5542-2

Purpose: ***To discharge treated stormwater from a petrochemical storage tank facility into the coastal marine area of the Hongihongi Stream***		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Catchment area not exceed 1.7 Ha	Inspections	Yes
2. Discharge not to have adverse effects on receiving waters	Inspections and sampling of receiving waters	Yes
3. Limits on certain chemical parameters in discharge	Sampling of discharge and review of submitted data.	Yes
4. Testing of hydrostatic test water prior to discharge	Review of submitted data – no discharges this period	N/A
5. Limits on certain chemical parameters in discharged test water	Review of submitted data – no discharges this period	N/A
6. Controls on any other contaminants in test water	Review of submitted data – no discharges this period	N/A
7. Maintenance of a contingency plan	Plan approved 19 August 2010	Yes
8. Maintenance of a stormwater plan	Plan up-to-date as of June 2017	Yes
9. Review provision	Next review provision 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**

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

2.8 Hongihongi Stream

2.8.1 Inspections

Inspections of the Hongihongi Stream mouth were conducted in conjunction with industrial site inspections during the period under review. No conspicuous or adverse environmental effects were noted during any of the inspections.

2.8.2 Results of receiving environment monitoring

Samples were collected from the Hongihongi Stream on the same day that samples of stormwater were collected from the various industrial sites, and the results of the sample analysis are presented in Table 12.

Upstream and downstream samples were collected and analysed for conductivity, hydrocarbon concentration, pH, temperature, and turbidity. Upstream and downstream samples had similar results for most parameters, indicating little, if any, adverse effects on the stream from industries discharging stormwater.

There were small increase in turbidity between upstream and downstream sites, however the values found were within acceptable ranges.

The increase in turbidity between the upstream and downstream sites could be related to the progression of the rainfall event between collecting the two stream samples, and/or run off and erosion from stream banks that occurs as a river flows towards the ocean.

Table 12 Results for the Hongihongi Stream (HGI000500 and HGI000990)

Date	Site	Conductivity (mS/m@20C)	Hydrocarbons (g/m3)	pH	Temp (°C)	Turbidity (NTU)
26 Aug 2016	HGI000500	17.9	<0.5	7.0	13.1	1.8
	HGI000990	12.0	<0.5	7.1	12.8	3.5
14 Oct 2016	HGI000500	20.2	*a*	7.3	14.2	11
	HGI000990	15.2	*a*	7.4	14.2	49
04 Apr 2017	HGI000500	10.5	<0.5	7.0	15.4	3.5
	HGI000990	6.7	<0.5	7.2	16.6	10

a = no hydrocarbon sheen or odour, parameter assumed to be below detection level

2.9 Investigations, interventions, and incidents

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

In the 2016-2017 period, the Council was not required to record an incident in the Hongihongi Catchment, in association with the consent holder's conditions in resource consents or provisions in Regional Plans.

2.10 Discussion

2.10.1 Discussion of site performance

Industries within the Hongihongi catchment have the potential to cause major pollution events if the operations are not well managed and storage facilities kept in good state.

During the 2016-2017 monitoring period, inspections of sites found them to be generally tidy and well managed.

2.10.2 Environmental effects of exercise of consents

The Hongihongi Stream is piped for approximately 500 metres before exiting at the western end of Ngamotu Beach, a popular recreational beach located near Port Taranaki. Inspections and the results of discharge monitoring at individual sites showed that consent conditions were being complied with. The results of sampling the Hongihongi Stream and foreshore inspections supported that there were no adverse effects occurring on either the stream or Ngamotu Beach.

2.10.3 Evaluation of performance

Tabular summaries of the compliance records for the year under review are set out in the relevant section for each consent holder.

During the year under review, all consent holders discharging in the Hongihongi catchment demonstrated an overall high level of environmental performance and compliance with the resource consents.

2.10.4 Recommendation from the 2015-2016 Annual Report

In the 2015-2016 Annual Report, it was recommended:

THAT the monitoring programme for discharges to the Hongihongi Stream for the 2016-2017 year is maintained at the same level as in 2015-2016.

This recommendation was implemented.

2.10.5 Alterations to monitoring programmes for 2016-2017

In designing and implementing the monitoring programmes for air/water discharges in the region, the Council has taken into account:

- the extent of information already made available through monitoring or other means to date;
- its relevance under the RMA;
- the Council's obligations to monitor consented activities and their effects under the RMA;
- the record of administrative and environmental performances of the consent holder; and
- 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 exercising resource consents.

It is proposed that for 2017-2018 the programme is implemented at a similar level to that of 2016-2017.

It should be noted that the proposed programme represents a reasonable and risk-based level of monitoring for the sites in question. The Council reserves the right to subsequently adjust the programme from that initially prepared, should the need arise if potential or actual non-compliance is determined at any time during 2017-2018.

3 Herekawe Catchment

3.1 Resource consents

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

A summary of the consents for activities in the Herekawe catchment during the monitoring period is given Table 13.

These consents are discussed in more detail in the following sections. Copies of the consents are attached in Appendix II.

There are consented discharges into the Herekawe Stream from the urban area to the north and east (New Plymouth District Council) and Dow AgroSciences. Monitoring of the combined stormwater discharge is reported separately.

Table 13 Resource consents for activities in the Herekawe catchment

Consent holder	Consent number	Purpose of consent	Next review	Expiry
Port Taranaki	7152-1	To discharge treated stormwater and hydrotest water	2020	2026
Methanex Motunui Ltd	9880-1	To discharge stormwater from a methanol storage facility at the Omata tank farm 2 into the Herekawe Stream	2020	2032
	9881-1	To discharge stormwater from a methanol storage facility at the Omata tank farm 1 into the Herekawe Stream	2020	2032
Origin Energy Resources (Kupe) Ltd	7368-1	To discharge treated stormwater into the Herekawe Stream and to discharge hydrotest water to land, where it may enter Lloyd Pond A, and into the Herekawe Stream	2020	2026
Shell Todd Oil Services Ltd	1316-3	To discharge stormwater and wastewater to land and water	-	2020
	1944-3	To discharge stormwater and wastewater to land and water	2020	2026
New Plymouth District Council	5125-2	To discharge stormwater into the Herekawe Stream	2020	2032

The operational boundaries of the consents monitored in the Herekawe catchment covered in this section are identified in Figure 7.

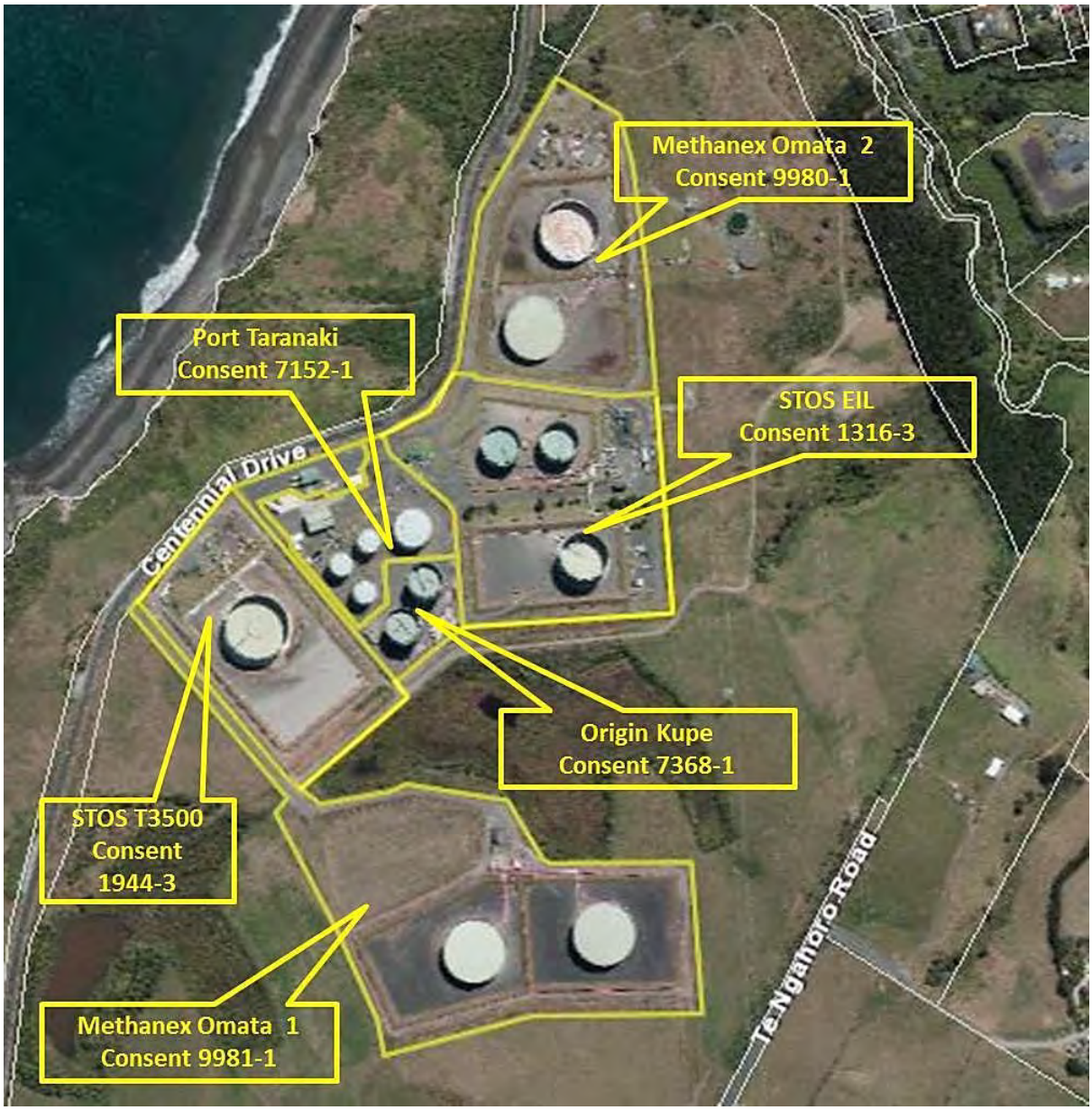

Figure 7 Consent holders' property boundaries in the Herekawe catchment

3.2 Monitoring programme

3.2.1 Introduction

Section 35 of the RMA sets out an obligation for the Council to gather information, monitor, and conduct research on the exercise of resource consents, and the effects arising, within the Taranaki region.

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 Herekawe catchment consisted of four primary components outlined below.

3.2.2 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 consent reviews, renewals or new consent applications;
- advice on the Council's environmental management strategies and content of regional plans; and
- consultation on associated matters.

3.2.3 Site inspections

Each of the consent holders' sites were inspected over the monitoring period. The main points of interest were plant processes with potential or actual discharges to receiving watercourses, including contaminated stormwater and process wastewaters. 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.

3.2.4 Chemical sampling

The Council undertook two discharge sampling runs during the period under review. Site discharges and receiving waters (upstream and downstream of discharges, as well as the mixing zone) were sampled on each occasion and water quality parameters were analysed (Figure 8).

3.2.5 Biomonitoring surveys

Biological surveys were performed on two occasions in the Herekawe Stream to assess whether stormwater discharges from the various sites have had any adverse effects on the macroinvertebrate communities of the stream.

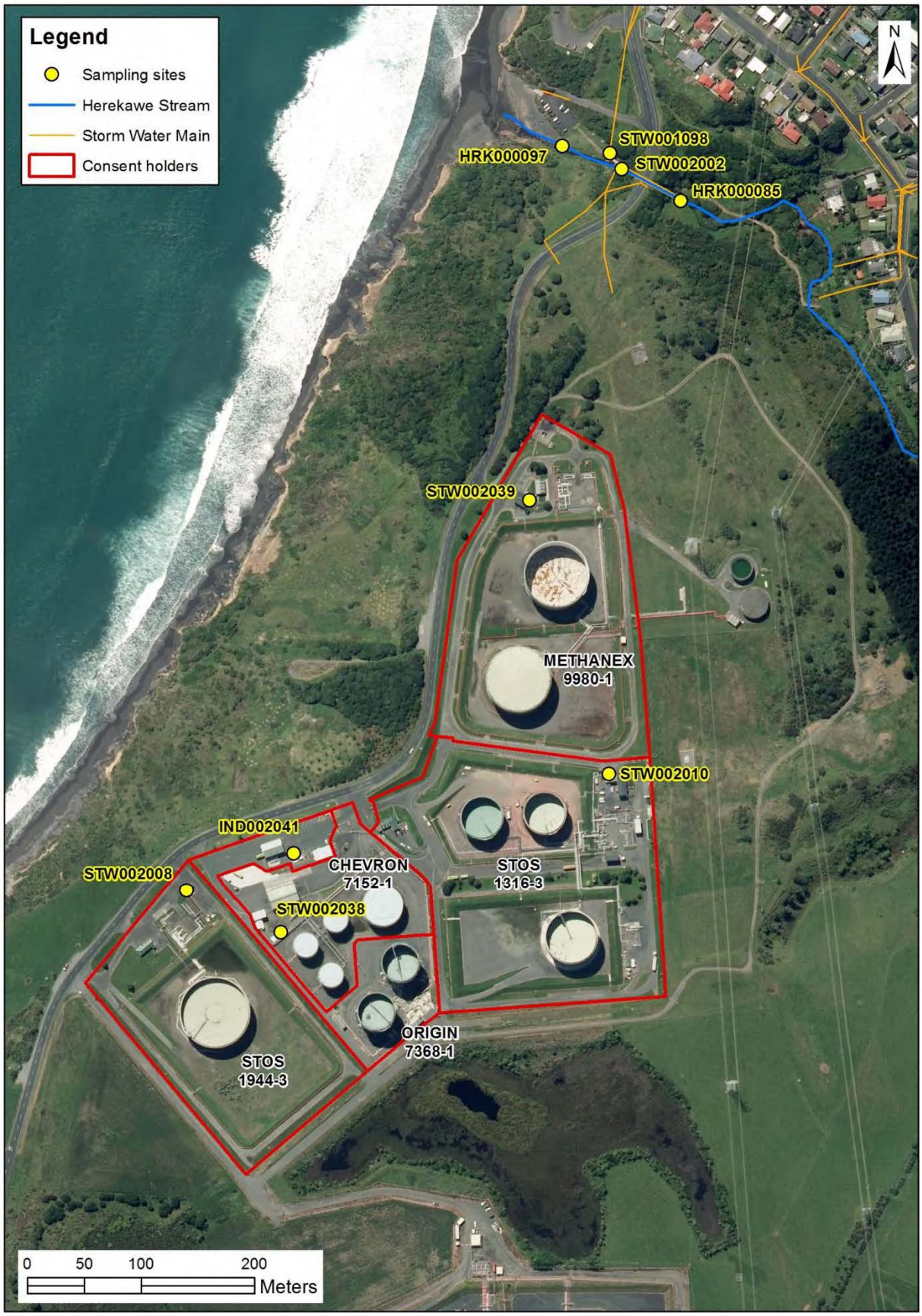

Figure 8 Sampling sites in the Herekawe catchment

3.3 Port Taranaki Ltd

3.3.1 Process description

Chevron New Zealand (Chevron) operated a hydrocarbon storage facility on Centennial Drive, New Plymouth (Figure 9). The site is approximately 3 hectares in size, and there are four tanks on the site for storing hydrocarbons. The tanks are contained in a bunded area. Stormwater from the bunded area is manually directed to a three stage separator after it is checked to ensure there is no contamination.

There is also a truck wash and truck parking on the site. Discharges from the truck wash site are directed to the New Plymouth District Council trade waste system. Stormwater discharges from the truck parking area are directed to the three stage separator.

This property was bought by Port Taranaki in December 2015 with the aim to refurbish the facility for the purpose of bulk petrol storage. Works were progressing throughout the monitoring period to prepare the site for receiving fuel.

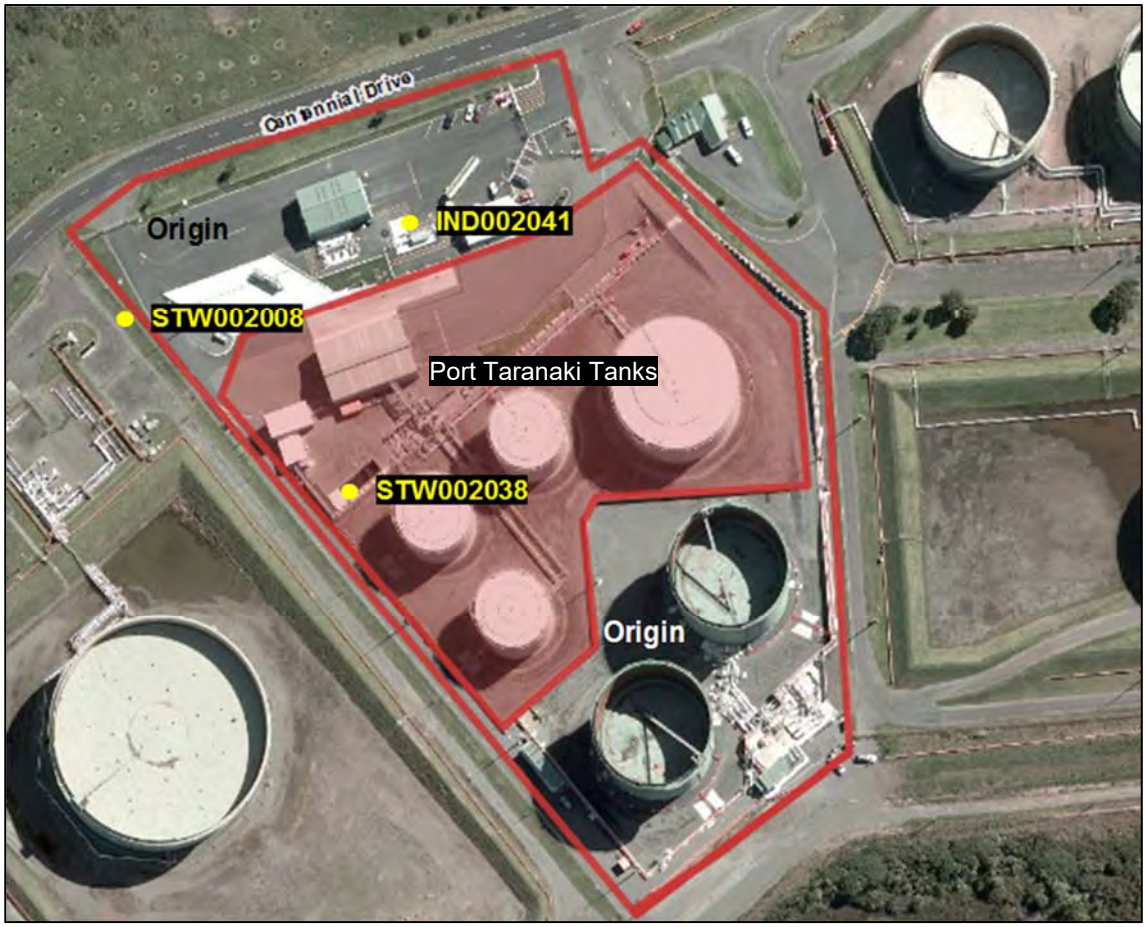

Figure 9 Aerial photograph of the Port Taranaki tank facility

3.3.2 Resource consents

Port Taranaki holds water discharge permit **7152-1** to discharge treated stormwater and hydrotest water from a hydrocarbon storage facility into the Herekawe Stream. This permit was issued by the Council on 21 September 2007 under Section 87(d) of the RMA. The consent was varied on 31 March 2009 to include the discharge of hydrotest water. This consent was transferred from Chevron to Port Taranaki on 9 March 2016 and was varied on 17 March 2017. It is due to expire on 1 June 2026.

Condition 1 requires the consent holder to adopt the best practicable option to prevent or minimise effects on the environment.

Condition 2 requires the exercise of the consent be undertaken in accordance with documentation submitted in support of the application.

Condition 3 limits the area stormwater may be discharged from to 1.6 ha.

Condition 4 states that all stormwater and hydrotest water from inside bunded areas shall be directed for treatment through the stormwater treatment system, while Condition 5 allows up to 90 % of uncontaminated reticulated water from compound and tank hydrotesting to be discharged through the interceptor bypass.

Condition 6 states that above ground hazardous substance storage areas shall be bunded with drainage to sumps, and not to the stormwater system.

Condition 7 states there shall be no discharge of wastewater from truck washing operations to the stormwater system.

Condition 8 states the concentration limits for the discharge while Condition 9 requires the consent holder to test the concentrations of contaminants in the hydrotest water prior to discharge.

Condition 10 requires the consent holder to prepare a contingency plan to be approved by Council.

Condition 11 requires the consent holder to prepare an operation and management plan to the satisfaction of Council.

Condition 12 is a review provision.

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

This summary of consent conditions may not reflect the full requirements of each condition. The consent conditions in full can be found in the resource consent which is appended to this report.

3.3.3 Results

3.3.3.1 Inspections

The site was inspected on 7 November and 6 December 2016, and 4 May and 13 June 2017.

Inspections focused on the condition of the bunds, the presence and storage of hazardous substances, evidence of spills and general housekeeping.

During these inspections no issues were noted and the site was found to be compliant.

3.3.3.2 Results of discharge monitoring

Two samples were collected from the separator at the Chevron site during the period under review. The results of the analysis are presented in Table 14 along with a summary of historical data. The low conductivity indicates that the chloride level was within consent limits and direct measurements show that pH, suspended solids and hydrocarbons were also compliant.

Table 14 Results for Chevron separator discharge (STW002038)

Parameter	Chloride	Conductivity @ 20'C	Hydrocarbons	pH	Suspended solids	Temperature
Unit	**g/m³**	**mS/m@20C**	**g/m³**	**pH**	**g/m³**	**Deg.C**
Minimum	8.4	5.6	<0.5	6.7	2	9.2
Maximum	66.2	57	7.1	7.7	19	22.5
Median	26	16.1	0.2	7.1	2	13.6
Number	8	29	28	28	27	24
19 Sep 2016	-	10.4	<0.5	7.1	<2	-
6 April 2016	-	6.1	<0.5	7.1	15	14.7
Consented limit	*50**	-	*15*	*6.0 - 9.0*	*100*	-

3.3.4 Evaluation of performance

A tabular summary of the consent holder's compliance record for the year under review is set out in Table 15.

Table 15 Summary of performance for Port Taranaki's consent 7152-1

Purpose: ***To discharge treated stormwater and hydrotest water from a hydrocarbon storage facility into the Herekawe Stream***		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Adopt best practicable option	Inspections	Yes
2. Exercise of consent to be undertaken in accordance with documentation submitted in support of application	Inspections	Yes
3. Area stormwater discharged from not to exceed 1.6ha	Inspections	Yes
4. All stormwater from bunded areas to be directed for treatment prior to discharge	Inspections	Yes
5. UP to 90% of uncontaminated reticulated water may be discharged through the interceptor bypass	Inspections	Yes
6. Hazardous storage areas are to be bunded with drainage to sumps	Inspections	Yes
7. No discharge from truck washing operations to stormwater	Inspections	Yes
8. Limits on discharge concentrations	Samples collected	Yes

Purpose: *To discharge treated stormwater and hydrotest water from a hydrocarbon storage facility into the Herekawe Stream*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
9. Consent holder to test concentrations of contaminants in hydrotest water to ensure compliance with SC9	No discharge of hydrotest water during period under review	N/A
10. Notification of commencement of discharges of hydrotest water	No discharge of hydrotest water during period under review	N/A
11. Contingency plan required	Plan on file – due for update	Yes
12. Management plan required	Plan on file – due for update	Yes
13. Review provision	Next optional review in 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**

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

3.4 Methanex Motunui Ltd - Omata 1 and 2

3.4.1 Process description

Methanol from Methanex's Motunui and Waitara Valley production plants is pumped to the Omata 1 site for storage prior to being pumped to the Port facility for loading onto tankers. The Omata 2 site has been decommissioned for several years with no product stored on the site. Some work was carried out on the site in 2014, but at present it remains in a decommissioned state. Methanex originally held certificates of compliance for the discharge of stormwater from both sites, However Methanex applied for consents for both these sites and these were granted in November 2015.

3.4.2 Resource consents

Methanex holds water discharge permits **9880-1** (Omata 2) and **9881-1** (Omata 1) to discharge treated stormwater hydrocarbon storage facility into the Herekawe Stream. Both these permits were issued by the Council on 13 November 2015 under Section 87(d) of the RMA and are due to expire in June 2032.

Both consents contain the same conditions:

Condition 1 requires best practice.

Condition 2 limits the catchment area.

Condition 3 requires the consent be exercised in accordance with information supplied.

Condition 4 sets limits of contaminants in the discharge.

Condition 5 requires that the consent holder tests stormwater prior to discharge.

Condition 6 sets out notification requirements.

Condition 7 restricts effects in the receiving waters.

Condition 8 and 9 deal with planning requirements.

Condition 10 sets out requirements for the notification of change of site activity.

Condition 11 is a review condition.

Copies of these permits are attached to this report in Appendix II.

This summary of consent conditions may not reflect the full requirements of each condition. The consent conditions in full can be found in the resource consents which are appended to this report.

3.4.3 Results

3.4.3.1 Inspections

The site was inspected on 7 November and 9 December 2016, 3 May 2017.

Inspections focused on the condition of the bunds, the presence and storage of hazardous substances, evidence of spills, conditions of pipe work and general housekeeping.

During these inspections no issues were noted and the site was found to be compliant.

3.4.3.2 Results of discharge monitoring

No samples were collected from the Methanex Omata 2 site during the period under review. The results of discharge sampling from Methanex Omata 1 are presented in Table 16.

Consent conditions require that Methanex notify Council prior to discharge and provide sampling results as part of that notification. During the period under review the Council received and reviewed these results and found that they complied with the consented contaminant limits and notification requirements.

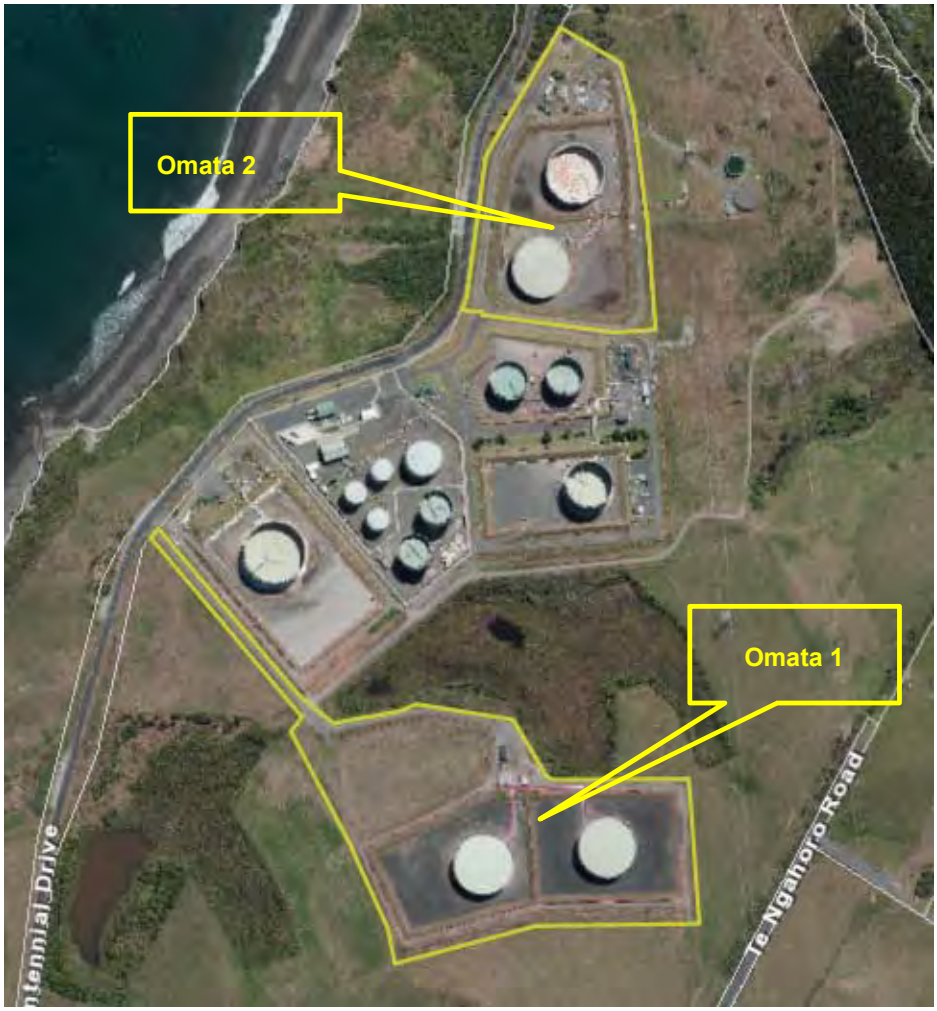

Figure 10 Aerial photograph of the Methanex Omata site

Table 16 Results for Methanex Omata 1 stormwater discharge (STW002039)

Parameter	Chloride	Conductivity @ 20'C	Hydrocarbons	Methanol	pH	Suspended solids
Units	g/m³	mS/m@20C	g/m³	g/m³	pH	g/m³
19 Sep 2016	5.2	2.4	<0.5	<1	6.9	
Consented limit	*50*	-	*15*	*15*	*6.0 - 9.0*	*100*

3.4.4 Evaluation of performance

A tabular summary of the consent holder's compliance record for the year under review is set out in Table 17 and Table 18.

Table 17 Summary of performance for Methanex's consent 9881-1

Purpose: ***To discharge stormwater from a methanol storage facility at the Omata tank farm 1 into the Herekawe Stream***		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Adopt best practice	Inspections	Yes
2. Catchment area not to exceed 3.6 Ha	Inspections	Yes
3. Exercise in accordance with supplied information	Inspections	Yes
4. Limits on contaminants	Council sampling and Methanex sampling	Yes
5. Consent holder test discharge	Results received	Yes
6. Notification of discharge	Notification received	Yes
7. Limits on effects	Inspections and sampling	Yes
8. Contingency plan	Liaison with consent holder	Yes
9. Management planning	Liaison with consent holder	Yes
10. Notification of site changes	Inspection	N/A
11. Review condition	Inspections and sampling of receiving waters	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**

Table 18 Summary of performance for Methanex's consent 9880-1

Purpose: ***To discharge stormwater from a methanol storage facility at the Omata tank farm 2 into the Herekawe Stream***		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Adopt best practice	Inspections	Yes
2. Catchment area not to exceed 2.6 Ha	Inspections	Yes
3. Exercise in accordance with suppled information	Inspections	Yes
4. Limits on contaminants	Council sampling and Methanex sampling	Yes

Purpose: *To discharge stormwater from a methanol storage facility at the Omata tank farm 2 into the Herekawe Stream*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
5. Consent holder test discharge	Results received	Yes
6. Notification of discharge	Notification received	Yes
7. Limits on effects	Inspections and sampling	Yes
8. Contingency plan	Liaison with consent holder	Yes
9. Management planning	Liaison with consent holder	Yes
10. Notification of site changes	Inspection	N/A
11. Review condition	Inspections and sampling of receiving waters	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 year, Methanex demonstrated a high level of environmental and administrative performance with the resource consents as defined in Section 1.1.4.

3.5 Origin Energy Resources (Kupe) Ltd

3.5.1 Process description

Origin Energy Resources (Kupe) Ltd (Origin) operates the Kupe Omata Tank Farm located on Centennial Drive, New Plymouth. The Tank Farm is a hydrocarbon storage facility covering approximately 1.5 hectares of land adjacent to the Chevron storage facility (Figure 9).

The southern part of the site includes two hydrocarbon storage tanks. The northern part of the site, along the road frontage, includes a tanker unloading building, staff facilities and the stormwater treatment system. The stormwater treatment oil separator has a capacity of 9.6 m^3. Stormwater directed to the treatment system includes the bunded area for the tanks and stormwater from the tank roofs. In the unlikely event that there are any spills in the tanker unloading facility, they are directed to an underground storage sump.

3.5.2 Resource consent

Origin holds water discharge permit **7368-1** to discharge treated stormwater into the Herekawe Stream and to discharge hydrotest water to land, where it may enter Lloyd Pond A, and into the Herekawe Stream. This permit was issued by the Council on 22 July 2009 under Section 87(d) of the RMA.

In February 2012 there was a variation to the consent conditions regarding chloride concentration limits in the discharge, and condition 4 was also changed so that only stormwater from process areas was required to be redirected through the stormwater treatment system. Consent **7368-1** is due to expire on 1 June 2026.

Condition 1 requires the consent holder to notify the Council prior to the discharge of hydrotest water.

Condition 2 requires the consent holder to maintain a contingency plan.

Condition 3 requires the consent holder to adopt the best practicable option to prevent or minimise effects on the environment.

Conditions 4 and 5 concern the treatment of stormwater and hydrotest water.

Conditions 6 and 7 set concentration limits for discharges.

Condition 8 concerns effects on the Herekawe Stream.

Condition 9 relates to scour and erosion.

Condition 10 relates to the provision of test results.

Conditions 11 and 12 concern lapse and review of the consent.

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

This summary of consent conditions may not reflect the full requirements of each condition. The consent conditions in full can be found in the resource consent which is appended to this report.

3.5.3 Results

3.5.3.1 Inspections

The site was inspected on 7 November and 6 December 2016, and 4 May 2017.

Inspections focused on the condition of the bunds, the presence and storage of hazardous substances, evidence of spills, conditions of pipe work and general housekeeping.

During these inspections no issues were noted and the site was found to be compliant.

3.5.3.2 Results of discharge monitoring

Two samples were collected by Council during the period under review, the results of the analysis are presented in Table 19 along with a summary of previous results from the site. All results complied with the consented limits. Origin also provides the results of stormwater sampling they undertake prior to discharge from this site, and all the supplied results were found to comply with consent conditions.

Table 19 Results for Origins treated stormwater discharge (IND002041)

Parameter	Chloride	Conductivity @ 20'C	Hydrocarbons	pH	Suspended solids	Temperature
Unit	**g/m³**	**mS/m@20C**	**g/m³**	**pH**	**g/m³**	**Deg.C**
Minimum	6.3	3.5	<0.5	6.7	<2	12.1
Maximum	128	48.9	<0.5	7.4	11	19.2
Median	36.8	17.6	<0.5	7.1	2	14.8
Number	11	14	11	14	11	10
19 Sep 2016	21.9	10.0	<0.5	7.4	<2	-
6 April 2017	10.7	6.3	<0.5	7.5	<2	15.3
Consented Limit	*300*	-	*15*	*6.0 - 9.0*	*100*	-

3.5.4 Evaluation of performance

A tabular summary of the consent holder's compliance record for the year under review is set out in Table 20.

Table 20 Summary of performance for Origin's consent 7368-1

Purpose: ***To discharge treated stormwater into the Herekawe Stream and to discharge hydrotest water to land, where it may enter Lloyd Pond A, and into the Herekawe Stream***		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Notify Council prior to discharging hydrotest water	No notifications received - No hydrotest water discharged during monitoring period	N/A
2. Maintain a contingency plan	Up-to-date as of August 2016	Yes
3. Adopt best practicable option	Inspections	Yes
4. Process area stormwater to be directed for treatment prior to discharge	Inspections	Yes
5. Hydrotest water to be filtered prior to discharge	No hydrotest water discharged during monitoring period	N/A
6. Concentration limits for discharges to water	Sampling	Yes
7. Concentration limits for discharges to land	Not sampled	N/A

Purpose: *To discharge treated stormwater into the Herekawe Stream and to discharge hydrotest water to land, where it may enter Lloyd Pond A, and into the Herekawe Stream*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
8. Discharge not to give rise to certain effects in the receiving waters	Inspections and sampling of receiving waters	Yes
9. Consent holder to remedy erosion or scouring	Inspections - no erosion or scouring noted	N/A
10. Consent holder to provide test results upon request	Results provided monthly	Yes
11. Lapse condition	Consent exercised	N/A
12. Review provision	Next optional review in 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**

During the year, Origin Energy Resources (Kupe) Ltd demonstrated a high level of environmental and administrative performance with the resource consents as defined in Section 1.1.4

3.6 Shell Todd Oil Services (STOS) – Energy Infrastructure Ltd (EIL) site

3.6.1 Process description

The STOS site (Figure 11) includes three crude oil storage tanks and an 18 inch pipeline to the Newton King wharf for load out of product. A road tanker unloading facility, export pumps and a control room are included within the facilities. Crude oil from the McKee, Waihapa, Kaimiro, Maui, Ngatoro and Pohokura fields is collected and stored in the storage tanks prior to shipping through Port Taranaki. Stormwater from the site is sampled to confirm compliance with consent conditions prior to being directed to an oil/water separator for treatment and discharge to the Herekawe Stream.

3.6.2 Resource consent

STOS holds water discharge permit **1316-3** to discharge up to 3,120 m^3 /day of treated and untreated stormwater including bleed-off from tank de-watering and hydrostatic test water from a liquid hydrocarbon storage facility into the Herekawe Stream, and to discharge untreated stormwater onto and into land during periods of bund construction and maintenance works.

This permit was issued by the Council on 10 January 2002 under Section 87(d) of the RMA to Fletcher Challenge Energy Taranaki Ltd. The consent was transferred to STOS on 15 May 2002. It is due to expire on 1 June 2020.

Changes were made to the purpose of the consent in November 2010 in order to allow for discharge of untreated stormwater onto and into land during periods of bund construction and maintenance works.

A change of consent condition 7 to increase the chloride concentration limit for discharge from 50 g/m^3 to 300 g/m^3 was approved on 29 August 2013.

Condition 1 requires the adoption of the best practicable option.

Condition 2 places a limit on the size of the stormwater catchment area.

Conditions 3 and 10 require preparation and maintenance of a contingency plan.

Condition 4 requires all contaminated site water to be treated prior to discharge.

Condition 5 requires the design, management and maintenance of the stormwater system to be in accordance with application information.

Condition 6 requires hazardous substance storage areas be bunded, with drainage to sumps, and not the stormwater system.

Condition 7 places limits on certain chemical parameters in the discharge.

Conditions 8 and 9 list effects which are prohibited in the receiving waters.

Conditions 11 and 12 require the preparation and maintenance of a management plan and the adherence to such management plan.

Condition 13 deals with notification of changes to the operation and management plan.

Condition 14 requires notification prior to reinstatement of the site.

Condition 15 is a review provision.

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

This summary of consent conditions may not reflect the full requirements of each condition. The consent conditions in full can be found in the resource consent which is appended to this report.

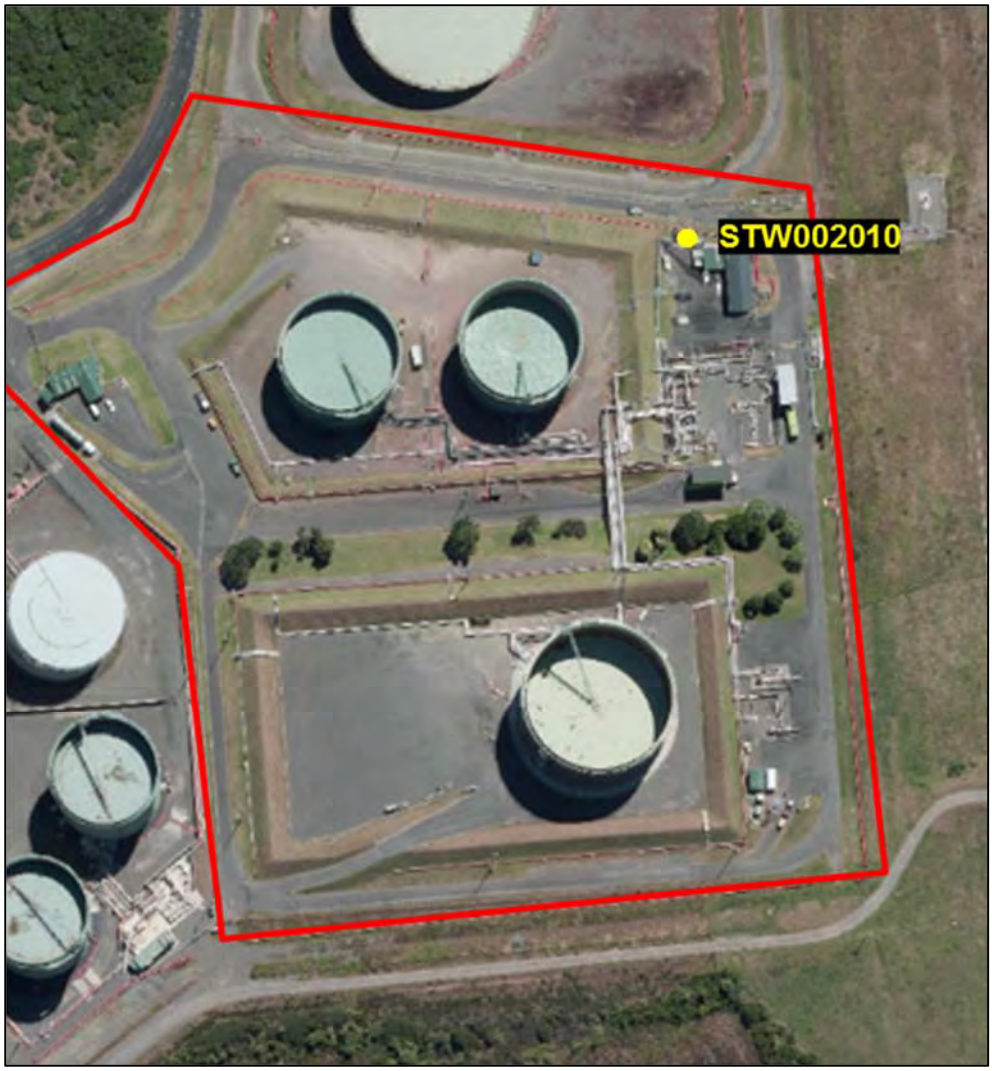

Figure 11 Aerial photograph of the STOS EIL site

3.6.3 Results

3.6.3.1 Inspections

The site was inspected on 6 December 2016, 11 May 2017, and 8 June 2017.

On each occasion the tank bunds, stormwater drains, firewater system, the separator, the nature of any discharges, and the general site condition were checked.

The site was found to be compliant with consent conditions during the inspections.

3.6.3.2 Results of discharge monitoring

One sample was collected by the Council from the EIL facilities during the period under review. The results of the analysis are presented in Table 21 along with a summary of historical data from the site. Levels of chloride, hydrocarbons, pH, and suspended solids were within consent limits in the samples collected during the monitoring period.

STOS also provides the results of stormwater sampling they undertake prior to discharge from this site, and all the supplied results were found to comply with consent conditions.

Table 21 Results for STOS (EIL site) treated stormwater discharge (STW002010)

Parameter	Chloride	Conductivity @ 20'C	Hydrocarbons	pH	Suspended solids	Temperature
Unit	**g/m³**	**mS/m@20C**	**g/m³**	**pH**	**g/m³**	**Deg.C**
6 April 2017	16.3	8.1	<0.5	7.4	4	15.0
Consented limit	*300*	-	*15*	*6.5 - 8.5*	*100*	-

3.6.4 Evaluation of performance

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

Table 22 Summary of performance for STOS' EIL consent 1316-3

Purpose: ***To discharge up to 3120 m³/day [36 L/sec] of treated and untreated stormwater including bleed-off from tank de-watering and hydrostatic test water from a liquid hydrocarbon storage facility into the Herekawe Stream and onto and into land during bund construction and maintenance***		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Adoption of best practicable option	Inspections	Yes
2. Limit on stormwater catchment area	Inspections	Yes
3. Provision of a contingency plan	Plan received	Yes
4. All contaminated site water to be treated prior to discharge	Inspections	Yes
5. Stormwater system to be designed, managed and maintained in accordance with application documentation	Inspections	Yes
6. Above ground hazardous substances storage areas to be bunded	Inspections	Yes
7. Limits on certain parameters in the discharge	Sampling of discharge	Yes
8. Discharge not to cause increase in temperature or BOD in receiving waters	Temperature measured, BOD not assessed	Yes
9. Discharge not to give rise to certain effects in the receiving waters	Inspections and sampling of receiving waters	Yes
10. Annual preparation and maintenance of a contingency plan	Plan received January 2018	Yes

Purpose: *To discharge up to 3120 m^3/day [36 L/sec] of treated and untreated stormwater including bleed-off from tank de-watering and hydrostatic test water from a liquid hydrocarbon storage facility into the Herekawe Stream and onto and into land during bund construction and maintenance*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
11. Preparation and maintenance of operation and management plan	Up-to-date as of June 2017	Yes
12. Consent to be exercised in accordance with operation and management plan	Inspections	Yes
13. Notification of Council prior to changes to operation and management plan	Not applicable in monitoring year under review	N/A
14. Council to be advised in writing prior to reinstatement of site and reinstatement to be minimise effects on stormwater quality	Site not reinstated in monitoring year under review	N/A
15. Review provision	No further option for review prior to expiry	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent Overall assessment of administrative performance in respect of this consent		**High** **High**

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

3.7 Shell Todd Oil Services (STOS) – T-3500 site

3.7.1 Process description

The site consists of a single 35,000 m^3 condensate storage tank (T-3500) inside an earth bund, ancillary fire-fighting and operating systems and a control building (Figure 12). T-3500 is currently used to store Pohokura condensate. There is equipment on site for loading and unloading condensate from road tankers and for loading glycol-contaminated water for return to the Pohokura Production Station. Facilities also exist for transferring product from T-3500 via the Energy Infrastructure Ltd (EIL) tank farm and to the port.

Uncontaminated stormwater from road drains is discharged directly to the Herekawe Stream. Potentially contaminated stormwater is generated in two areas:

- T-3500 tank bunded area;
- General service area where the loadout pumps and general service pumps are located.

Stormwater from these two areas is sampled to confirm compliance with consent conditions prior to being directed to an oil-water separator for treatment and discharge to the Herekawe Stream.

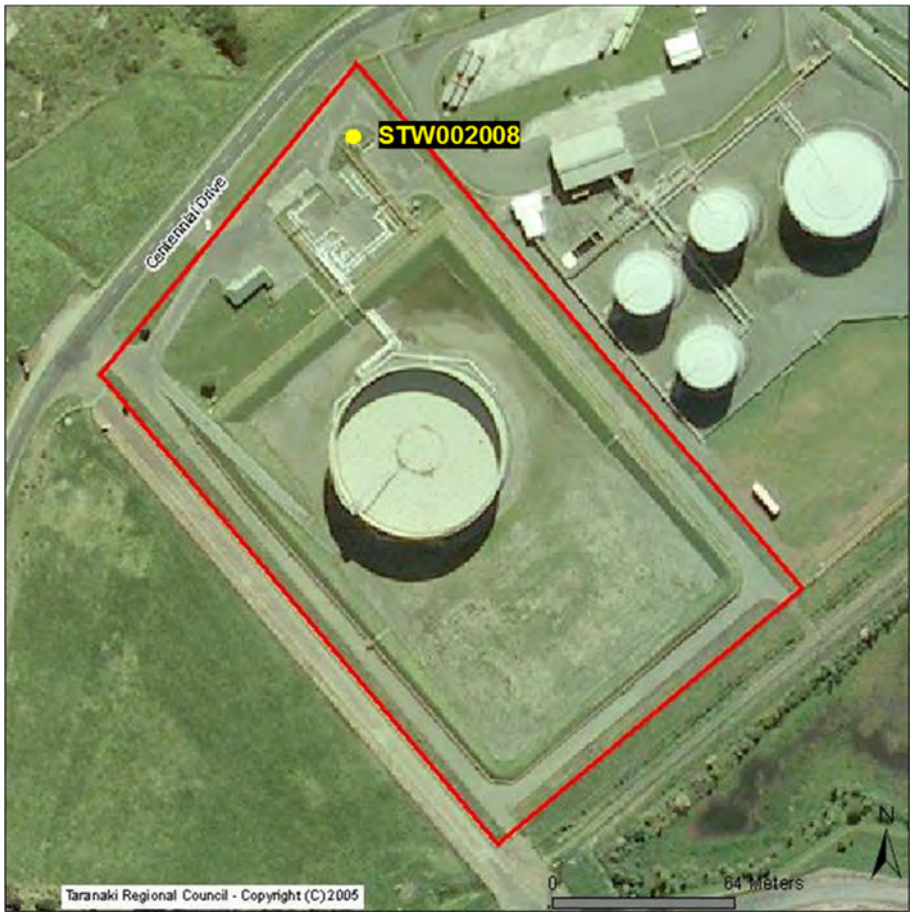

Figure 12 Aerial photograph of the STOS T-3500 site

3.7.2 Resource consent

STOS holds water discharge permit **1944-3** to discharge uncontaminated stormwater and treated stormwater onto land and into the Herekawe Stream, via the existing piped stormwater drain, and wastewater which is a by-product of maintenance activities at the Maui condensate storage facility, including hydrostatic test water and tank dewatering water, onto land.

This permit was issued to STOS by the Council on 16 May 2008 under Section 87(d) of the RMA. It is due to expire on 1 June 2026.

Condition 1 requires consent holder to provide results of discharge analysis.

Condition 2 relates to concentration limits.

Conditions 3 to 11 specify the manner in which discharges to land must occur.

Condition 12 requires consent holder to adopt best practice.

Condition 13 requires that the consent be exercised in accordance with the information provided in the application.

Condition 14 requires the submission and adherence to a stormwater management plan.

Condition 15 requires the submission and adherence to a spill contingency plan.

Condition 16 requires above ground hazardous substance storage areas be bunded, with drainage to sumps, and not to the stormwater system.

Condition 17 requires potentially contaminated stormwater be treated prior to discharge.

Condition 18 is a review provision.

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

This summary of consent conditions may not reflect the full requirements of each condition. The consent conditions in full can be found in the resource consent which is appended to this report.

3.7.3 Results

3.7.3.1 Inspections

The site was inspected on 6 December 2016, and 11 May and 8 June 2017.

On each occasion the tank bunds, stormwater drains, the nature of any discharge, the firewater system, the separator, and the overall site condition were checked.

No issues were noted and the site was found to be compliant with consent conditions during all inspections.

3.7.3.2 Results of discharge monitoring

Two samples were collected by the Council from the T-3500 tank bund site during the period under review. The results of the analysis are presented in Table 23 along with a summary of historical data from the site.

Table 23 Results for STOS' T-3500 site bunded stormwater (STW002008)

Parameter	Chloride	Conductivity @ 20'C	Hydrocarbons	pH	Suspended solids	Temperature
Unit	**g/m³**	**mS/m**	**g/m³**	**pH**	**g/m³**	**Deg.C**
19 Sep 2016	30.8	17.4	<0.5	7.1	2	-
6 April 2017	19.2	11.3	<0.5	7.2	<2	14.6
Consented limit	*300*	-	*15*	*6.5 - 8.5*	*100*	-

All samples taken during the period under review complied with the consented limits. STOS also provides the results of stormwater sampling they undertake prior to discharge from this site, and all the supplied results were found to comply with consent conditions.

3.7.4 Evaluation of performance

A tabular summary of the consent holder's compliance record for the period under review is set out in Table 24.

Table 24 Summary of performance for STOS' T-3500 consent 1944-3

Purpose: ***To discharge uncontaminated stormwater and treated stormwater from the Maui condensate storage facility via the existing piped stormwater drain into the Herekawe Stream***		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Provide sample results	Data provided	Yes
2. Concentration limits in discharge	Sampling and data review	Yes
3. Types of discharges to land permitted	Not exercised	N/A
4. Discharge to land rate limit	Not exercised	N/A
5. Discharges to land to spread evenly over discharge area	Not exercised	N/A
6. No surface ponding to be caused by discharge to land	Not exercised	N/A
7. Notification prior to discharge of wastewater	Not exercised	N/A
8. Concentration limits in land discharge	Not exercised	N/A
9. Test wastewater prior to discharge	Not exercised	N/A
10. Keep record of wastewater discharge	Not exercised	N/A
11. Notification of wastewater spill	Not exercised	N/A
12. Adopt best practice	Inspection	Yes
13. Consent exercised in accordance with information supplied	Programme management and inspection	Yes
14. Provision and adherence to a stormwater management plan	Up-to-date as of June 2017	Yes
15. Provision and adherence to a contingency plan	Plan received	Yes
16. Any above ground hazardous substances storage areas to be bunded	Inspection	Yes

Purpose: *To discharge uncontaminated stormwater and treated stormwater from the Maui condensate storage facility via the existing piped stormwater drain into the Herekawe Stream*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
17. Contaminated stormwater to be directed through treatment system	Inspection	Yes
18. Review condition	Next review option 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**

During the year, Shell Todd Oil Services demonstrated a high level of environmental and high level of administrative performance with the resource consents as defined in Section 1.1.4.

3.8 Herekawe Stream

3.8.1 Inspections

Inspections of the Herekawe Stream were made in conjunction with industrial site inspections, and no conspicuous or adverse environmental effects were noted during these visits.

3.8.2 Results of receiving environment monitoring

The Herekawe Stream was sampled upstream and downstream of the combined Omata Tank Farm discharge on two occasions during the period under review. Results of the sample analysis are presented in Table 25.

Site HRK000085 is upstream of the combined discharges and site HRK000097 is downstream of the combined discharges.

Table 25 Results for the Herekawe Stream (HRK000085 and HRK000097)

Date	Site	Chloride (g/m^3)	Conductivity (mS/m@20C)	Hydrocarbons (g/m^3)	pH	Temp (°C)	Turbidity (NTU)
19 Sep 2016	HRK000085	25.5	15.9	<0.5	7.6	-	4.1
	HRK000097	25.5	15.9	<0.5	7.6	-	3.6
6 April 2017	HRK000085	23.4	14.3	<0.5	7.4	16.0	8.0
	HRK000097	22.2	13.6	<0.5	7.4	16.2	9.1

Results are similar for upstream and downstream sites, indicating little, if any, adverse effects on the stream by stormwater discharging from the Omata Tank Farms.

3.8.3 Biomonitoring

The Council's standard 'kick-sampling' technique was used at two established sites on 16 February and 26 April 2017, to collect streambed macroinvertebrates from the Herekawe Stream. Samples were sorted and identified to provide the number of taxa (richness) and MCI and $SQMCI_s$ scores for each site.

Taxa richness is the most robust index when ascertaining whether a macroinvertebrate community has been exposed to toxic discharges. Macroinvertebrates when exposed to toxic chemicals may die and be swept downstream or deliberately drift downstream as an avoidance mechanism (catastrophic drift). 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. It may be the more appropriate index if non-organic impacts are occurring. Significant differences in either taxa richness, community composition, the MCI or $SQMCI_s$ between sites may indicate the degree of adverse effects (if any) of the discharges being monitored.

During both surveys there was a typical, moderate taxa richness at both sites indicating that stormwater discharges were not having a toxic effect on macroinvertebrate communities. There was a significant decrease in MCI scores from the upstream 'control' site to the downstream 'impact' site, but the indices were not significantly different to historic medians.

The macroinvertebrate surveys indicated that the discharge of treated stormwater and discharges from the Omata Tank Farm or Dow Agro Sciences sites was unlikely to have had a significant effect on the macroinvertebrate communities of the stream. A significant decrease in the MCI scores between the

upstream 'control' site and site downstream of the discharges was more likely attributable to habitat differences between these sites which appeared to be related primarily to flow.

The full biological monitoring reports are attached in Appendix III.

3.9 Investigations, interventions, and incidents

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

In the 2016-2017 period, the Council was not required to undertake significant additional investigations and interventions, or record incidents, in association with the consent holder's conditions in resource consents or provisions in Regional Plans in the Herekawe Catchment.

3.10 Discussion

3.10.1 Discussion of site performance

Activities at the Omata Tank Farm have the potential to cause major pollution events if the operations are not well managed. During the monitoring period, inspections of sites found them to be generally tidy and well managed. No concerns about the operation of site stormwater systems were raised.

3.10.2 Environmental effects of exercise of consents

The Herekawe Stream discharges onto Back Beach, a popular recreational beach located south of Paritutu Rock. As well as the combined discharge from the Omata Tank Farm, it also receives New Plymouth District Council and Dow AgroSciences stormwater from a drain on the true right bank of the Herekawe Stream just below the combined discharge.

In the monitoring period under review, there was evidence to demonstrate that the discharges from the Omata Tank Farm had any adverse effect on the receiving waters of the Herekawe Stream. This is supported by the findings of the biological surveys, inspections and the results obtained from discharge and receiving waters sampling.

3.10.3 Evaluation of performance

Tabular summaries of the compliance records for the period under review are set out in the relevant section for each consent holder.

During the period under review, Chevron, STOS, Methanex and Origin demonstrated a high level of environmental performance and compliance with the resource consents.

3.10.4 Recommendation from the 2015-2016 Annual Report

In the 2015-2016 Annual Report, it was recommended:

1. THAT the monitoring programme of discharges to the Herekawe Stream for the 2016-2017 year is maintained at the same level as in 2015-2016.

This recommendation was implemented.

3.10.5 Alterations to monitoring programmes for 2017-2018

In designing and implementing the monitoring programmes for air/water discharges in the region, the Council has taken into account:

- the extent of information already made available through monitoring or other means to date;
- its relevance under the RMA;
- the Council's obligations to monitor consented activities and their effects under the RMA;
- the record of administrative and environmental performances of the consent holder; and
- 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 exercising resource consents.

It is proposed that for 2017-2018 the programme remains unchanged from that of 2016-2017.

It should be noted that the proposed programme represents a reasonable and risk-based level of monitoring for the sites in question. The Council reserves the right to subsequently adjust the programme from that initially prepared, should the need arise if potential or actual non-compliance is determined at any time during 2017-2018.

4 Other port area coastal marine area discharges

4.1 Resource consents

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

A summary of the consents for discharges to the coastal marine area (CMA) during the monitoring period is given in Table 26.

These consents are discussed in more detail in the following sections. Copies of the consents are attached in Appendix III.

Table 26 Resource consents held for other discharges to the CMA

Consent holder	Consent number	Purpose of consent	Next review	Expiry
New Plymouth District Council	5183-2	To discharge stormwater from an urban area into the coastal marine area of the Tasman Sea across the Ngamotu Beach foreshore	2020	2032
Fonterra Ltd	0671-3	To discharge up to 960 m3 /day of cooling water and 7.2 m3 /day of groundwater seepage from a reservoir at the rear of the company's installation via a stormwater drain onto Ngamotu Beach.	-	2020
Molten Metals	9974-1	To discharge stormwater from scrap metal storage and processing into the New Plymouth District Council reticulated stormwater system (to the CMA).	2018	2032
	9975-1	To discharge contaminants onto and into land associated with scrap metal storage and processing.	2018	2032

Figure 13 Other consented CMA discharges in the port area

4.2 Fonterra Ltd – New Plymouth Coolstores

4.2.1 Site description

Fonterra Ltd (Fonterra) operates a coolstore on a site in New Plymouth where there has been a coolstore since 1896 (Figure 14). Water used for cooling is discharged to a holding pond on the site, which overflows via a stormwater drain onto Ngamotu Beach. Oily water seeping from a disused oil well on the site, that was active between 1910 and 1920, is discharged through a separator to the holding pond.

Figure 14 Aerial photograph of Fonterra New Plymouth Coolstores

4.2.2 Resource consent

Fonterra holds coastal discharge permit **0671-3** to discharge up to 960 m^3 /day of cooling water and 7.2 m^3 /day of groundwater seepage from a reservoir at the rear of the Company's installation via a stormwater drain onto Ngamotu Beach. This permit was issued by the Council to Taranaki Coolstores Ltd on 7 December 2001 as a resource consent under Section 87(c) of the RMA. It was transferred to NZMP New Plymouth Coolstores on 17 April 2003 before being transferred on 4 November 2003 to Fonterra. It is due to expire on 1 June 2020.

Condition 1 requires the adoption of the best practicable option.

Condition 2 requires the exercise of the consent to be in accordance with the application's supporting information.

Condition 3 places a limit on the temperature of the water discharged.

Condition 4 prohibits the discharge of cooling water treatment chemicals without prior permission of Council.

Condition 5 limits the effects of the discharge on Ngamotu Beach.

Condition 6 places limits on concentrations of certain contaminants in the discharge.

Condition 7 is a review provision.

This summary of consent conditions may not reflect the full requirements of each condition. The consent conditions in full can be found in the resource consent which is appended to this report.

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

4.2.3 Results

4.2.3.1 Inspections

The site was inspected on 8 September and 8 December 2016, and 11 May and 13 June 2017.

The inspections focused on the cooling water pond, evidence of spills, stormwater drains, oil separator, and the discharge outlet at Ngamotu Beach. The temperature of the discharge from the cooling pond was also taken.

Wind-blown packaging plastic was noted around the site during the inspections and during the final inspection this was observed beyond the site boundary, staff agreed to recover and dispose of this so it did not enter the sea. No other issues were noted during the inspections and the temperature of the discharge was compliant with consent conditions.

4.2.3.2 Results of discharge monitoring

Two samples were collected from the discharge point of the cooling water reservoir during the period under review; the results are presented below in Table 27. A summary of historical results for the site is also included in the table.

Consent limits were complied with in both samples.

Table 27 Results for Fonterra cooling water and stormwater discharge (STW002053)

Parameter	Conductivity @ 20'C	Oil and Grease	pH	Suspended solids	Temperature
Unit	**mS/m@20C**	**g/m³**	**pH**	**g/m³**	**Deg.C**
Minimum	12.1	<0.5	7.3	3	14
Maximum	39.9	<0.5	8.3	15	25.7
Median	22.7	<0.5	7.7	7	18.8
Number	31	12	28	27	28
14 Oct 2016	26.6	<0.5	7.8	8	19.7
6 April 2017	16.7	<0.5	7.7	4	20.6
Consented limit	-	*15*	*6.0 - 9.0*	*100*	*<25*

4.2.4 Evaluation of performance

A tabular summary of the consent holder's compliance record for the year under review is set out in Table 28.

Table 28 Summary of performance for Fonterra's consent 0671-3

Purpose: ***To discharge up to 960 m³/day of cooling water and 7.2 m³/day of groundwater seepage from a reservoir at the rear of the company's installation via a stormwater drain onto Ngamotu Beach***		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Adoption of best practicable option	Inspections	Yes
2. Exercise of consent in accordance with application	Inspections	Yes
3. Limits temperature of water	Sampling of discharge	Yes
4. Discharge not to contain water treatment chemicals	Inspection, sampling and liaison with consent holder	Yes
5. Discharge not to have adverse effects on Ngamotu Beach	Inspections and sampling	Yes
6. Limits on certain chemical parameters in discharge	Sampling of discharge	Yes
7. Review provision	No further option for review prior to expiry in 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**

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

4.3 Molten Metals Ltd

4.3.1 Site description

Molten Metals receives, stores, and processes scrap metals in various forms. The site is approximately 1.28 hectares and is located on Centennial Drive in New Plymouth (Figure 15). Although the site is classified as being within the Herekawe Stream catchment, stormwater discharges which leave the site enter the NPDC reticulation network along Centennial Drive.

Figure 15 Aerial photograph of the Molten Metals site

Materials are received at the site and stored on an unsealed surface; the materials being stored are not covered and so as they begin to degrade contaminants are discharged onto and into land, which have the potential to become entrained within the stormwater discharges. In most instances the materials brought onto site are processed into smaller pieces to enable easier transport, which can result in contaminants discharging onto and into land, which also have the potential to become entrained within the stormwater discharges.

4.3.2 Resource consent

Molten Metals holds discharge permit **9974-1** to discharge stormwater from scrap metal storage and processing into the New Plymouth District Council reticulated stormwater system. This permit was issued by the Council on 17 September 2014 under Section 87(e) of the RMA. The consent is due to expire on 1 June 2032.

Condition 1 requires that the best practicable option is adopted to prevent or minimise adverse environmental effects.

Condition 2 deals with catchment size.

Condition 3 describes standards that constituents of the discharge must meet.

Conditions 4 and 5 require the consent holder to prepare and maintain contingency and stormwater management plans for the site.

Condition 6 deals with changes to processes or operations at the site.

Condition 7 is a review provision.

Molten Metals holds discharge permit **9975-1** to discharge contaminants onto and into land associated with scrap metal storage and processing. This permit was issued by the Council on 17 September 2014 under Section 87(e) of the RMA. The consent is due to expire on 1 June 2032.

Condition 1 requires that the best practicable option is adopted to prevent or minimise adverse environmental effects.

Condition 2 states that no contaminants shall reach any adjacent property.

Conditions 3 to 5 deal with the concentration of heavy metals and hydrocarbons in the soil around the site boundary.

Condition 6 requires that the standards in condition 5 must be met prior to surrender.

Condition 7 states that groundwater must not be contaminated.

Condition 8 deals with changes to processes or operations at the site.

Condition 9 is a review provision.

Copies of the permits are attached to this report in Appendix III.

This summary of consent conditions may not reflect the full requirements of each condition. The consent conditions in full can be found in the resource consents which are appended to this report.

4.3.3 Results

4.3.3.1 Inspections

Routine inspections of the site were undertaken on 28 October and 19 December 2016, and 3 May 2017.

On each occasion the site surface, interceptor system and discharges were checked.

Sampling undertaken on 14 October 2016 found non-compliance with sediment discharge from the site. During the inspection on 28 October it was noted that silt controls around drains at the northern perimeter had been improved through the use of felt inserts which capture fine sediments and hydrocarbons. Hay bales were in place around the drains also which had been effective at stopping the heavier material, the sediment was approximately 20 cm deep behind the bales and was due to be dug out and disposed of off-site.

During the inspection on 19 December 2016 it was noted that additional felt inserts and hay bales had been installed around drains. There was a discussion regarding the frequency of cleaning of the insert as recent sampling of stormwater discharge (14 December) found that resource consent conditions had again been breached with regards to suspended solids, it was suggested that regular inspection and cleaning of the inserts was undertaken to ensure that the discharges were compliant.

During the inspection on 3 May 2017 it was noted that stormwater treatment devices were being maintained, including new hay bales in place. A discussion was held with the consent holder regarding recent sample results whereby consent conditions were again breached in relation to suspended solids and also hydrocarbons.

4.3.3.2 Results of discharge monitoring

Samples were collected on three occasions during wet weather. The results are given in Table 29.

Table 29 Results for Molten Metal discharge monitoring, site STW001145

Parameter	Unit	Date			*Consent limit*
		14 Oct 16	14 Dec 16	4 Apr 17	
Conductivity @ 20'C	mS/m@20C	26.1	22.5	28.5	-
Copper- Acid Soluble	g/m³	3.03	0.48	0.36	-
Copper - Dissolved	g/m³	0.12	0.22	0.05	-
Hydrocarbons (visual)	g/m³	pass	fail	fail	-
Lead - Acid Soluble	g/m³	1.36	0.15	0.32	-
Oil and Grease	g/m³	2.6	3.3	**69**	*15*
pH	pH	8.3	7.8	8.0	*6-9*
Suspended solids	g/m³	**1630**	**170**	**340**	*100*
Temperature	Deg.C	13.2	14.4	14.8	-
Turbidity	NTU	420	210	540	-
Zinc - Acid Soluble	g/m³	8.10	0.994	3.23	-
Zinc - Dissolved	g/m³	0.173	0.188	0.238	-

The sample collected on 14 October 2016 had an extremely high suspended solids load – well above the 100 g/m³ consent limit. Along with this, high levels of acid soluble zinc, copper, and lead were found in the sample indicated that metal contaminated soils had become entrained in the discharge. The Company had already been issued an abatement notice in early July after a sample collected on 23 June 2016 found a suspended solids value of 1,980 g/m³.

Suspended solids were also high in the samples collected on 14 December 2016 and 4 April 2017, metal levels in these samples were elevated but not as high as in the October sample. Oil and grease was very high at 69 g/m³ in the April sample. The Company was issued an infringement notice (fine) after the results of the April 2017 sample were analysed as a result of not complying with the abatement notice issued in July 2017, and not undertaking adequate works to reduce the suspended solids discharging from the site.

4.3.4 Evaluation of performance

A tabular summary of the consent holder's compliance record for the period under review is set out in Table 30 and Table 31.

Table 30 Summary of performance for Molten Metal's consent 9974-1

Purpose: ***To discharge stormwater from scrap metal storage and processing***		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Best practicable option to prevent or minimise adverse environmental effects	Inspections	No- sediment entrainment not controlled
2. Stormwater catchment not to exceed 1.3 ha	Inspections	Yes

Purpose: *To discharge stormwater from scrap metal storage and processing*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
3. Limits on constituents in discharge	Sampling	No
4. Provision of a contingency plan	Provided	Yes
5. Provision of Stormwater Management Plan	Provided	Yes
6. Notification prior to changes in processes or operations at site	No changes during period under review	N/A
7. Review provision	Next optional review in June 2020	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent Overall assessment of administrative performance in respect of this consent		**Improvement Required** **Good**

Table 31 Summary of performance for Molten Metal's consent 9975-1

Purpose: *To discharge contaminants onto and into land associated with scrap metal storage and processing*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Best practicable option to prevent or minimise adverse environmental effects	Inspections and incident investigations	No- sediment entrainment not controlled
2. Discharge not to result in contaminants on adjacent property	No sampling undertaken during monitoring period	N/A
3. Limits on heavy metal concentrations in soil	No sampling undertaken during monitoring period	N/A
4. Limits on hydrocarbons in soil	No sampling undertaken during monitoring period	N/A
5. Soil standards to be met prior to expiry	N/A	N/A
6. Soil standards to be met prior to surrender	N/A	N/A
7. No contamination of groundwater	No sampling undertaken during monitoring period	N/A
8. Notification prior to changes in processes or operations at site	No changes during period under review	N/A
9. Review provision	Next optional review in June 2018, recommendation attached	N/A

Purpose: *To discharge contaminants onto and into land associated with scrap metal storage and processing*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
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**

During the year an improvement was required in Molten Metals Ltd environmental performance and compliance with the resource consents as defined in Section 1.1.4. During the year it was found that there were non-compliances in regards to the concentration of suspended solids in three samples of the discharge and a non-compliance in regards to the level of oil and grease in one sample. An abatement notice was issued and when this was not complied with an infringement notice (fine) was also issued. Overall Molten Metal's administrative performance was good.

4.4 New Plymouth District Council

4.4.1 Site description

New Plymouth District Council (NPDC) holds consent to discharge stormwater onto Ngamotu Beach. The catchment area for this stormwater is largely from the unnamed catchment 61 and a small area of the adjacent Huatoki Catchment. The catchment is a mix of residential and industrial property and the discharge contains stormwater, Fonterra cooling water, and the remnant flow of an unnamed tributary.

4.4.2 Resource Consent

NPDC holds discharge permit **5183-1** to discharge stormwater onto Ngamotu Beach stormwater system. This permit was issued by the Council on 31 August 2015 under Section 87(e) of the RMA. The consent is due to expire on 1 June 2032.

Condition 1 deals with catchment size.

Condition 2 limits effects on the receiving environment.

Condition 3 describes standards that constituents of the discharge must meet.

Condition 4 is a review condition.

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

4.4.3 Results

4.4.3.1 Inspections

The discharge site was inspected on 14 October 2016 and 4 April 2017. The inspections focused on the presence of odour, discolouration, foams, and sheens at the discharge point. During these inspections no issues were noted.

4.4.3.2 Results of discharge monitoring

Two samples were collected from the discharge point during the period under review; the results are presented below in Table 32 along with a summary of historical data from the site.

It was found that consent limits were being complied with at the time of sampling.

Table 32 Results for NPDC discharge on Ngamotu Beach, site STW001091

Parameter	Conductivity @ 20'C	Oil and Grease	pH	Suspended solids	Temperature
Unit	**mS/m@20C**	**g/m³**	**pH**	**g/m³**	**Deg.C**
Minimum	8	0.5	6.8	2	15.8
Maximum	55.5	96	7.8	52	23.2
Median	24.95	0.2	7.4	6	20.2
Number	68	12	44	40	33
14 Oct 2016	25.2	<0.5	7.6	8	18.3
4 April 2017	14.8	0.8	7.5	11	18.6
Consented limit	-	*15*	*6.0 - 9.0*	*100*	-

4.4.4 Evaluation of performance

A tabular summary of the consent holder's compliance record for the period under review is set out in Table 33.

Table 33 Summary of performance for NPDC's consent 5183-2

Purpose: ***To discharge stormwater from an urban area into the coastal marine area of the Tasman Sea across the Ngamotu Beach foreshore***		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. The stormwater discharged shall be from an area not exceeding 50 ha.	Inspections	Yes
2. Stormwater catchment not to exceed 1.3 ha	Programme management and consent holder liaison	Yes
3. Limits of effects on receiving environment	Inspections	Yes
4. Limits on contaminant concentrations in discharge	Sampling	Yes
5. Review condition	Next review option in June 2020	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**

During the period under review NPDC demonstrated a high level of environmental and administrative performance with the resource consents as defined in Section 1.1.4.

4.5 Discussion

4.5.1 Discussion of performance

Fonterra and NPDC demonstrated a high level of performance with no issues in regard to compliance. Levels of suspended solids in stormwater samples collected from Molten Metals were non-compliant in regards to suspended solids on all occasions (three), and once for levels of oil and grease. During the period an abatement notice was issued and when this was not complied with an infringement notice was also issued. Measures to prevent sediment discharging from the site (felt inserts and hay bales placed in drains) had made some difference in lowering the level of suspended solids but further measures were necessary to ensure consent conditions were being complied with at the site.

4.5.2 Environmental effects of exercise of consents

Fonterra and NPDC discharge to Ngamotu beach with the discharge point at about the high water mark. Inspections and sampling indicate that no adverse effects are occurring as a result of the discharge.

Molten Metals discharge to the CMA on the eastern side of Paritutu. The elevated levels of suspended solids found in this discharge are of concern when viewed in conjunction of the attendant rise in acid soluble copper, lead and zinc. Whilst acid soluble metal is not necessarily the most bioavailable form of these metals, they may accumulate in estuarine sediments. If suspended solids levels are kept to within consented limits, the levels of acid soluble metals would be expected to be in acceptable ranges.

4.5.3 Evaluation of performance

Tabular summaries of the compliance records for the period under review are set out in the relevant section for each consent holder.

During the period under review, NPDC and Fonterra demonstrated a high level of environmental performance and compliance with the resource consents. An improvement is required in Molten Metals environmental performance and compliance with the resource consents.

4.5.4 Recommendation from the 2015-2016 Annual Report

In the 2015-2016 Annual Report the consents in this section of the report were covered under the Hongihongi Stream section and subsequently the recommendation from that section applies;

1. THAT the monitoring programme of discharges to the Hongihongi Stream for the 2016-2017 year is maintained at the same level as in 2015-2016.

This recommendation was implemented.

4.5.5 Alterations to monitoring programmes for 2017-2018

In designing and implementing the monitoring programmes for air/water discharges in the region, the Council has taken into account:

- the extent of information already made available through monitoring or other means to date;
- its relevance under the RMA;
- the Council's obligations to monitor consented activities and their effects under the RMA;
- the record of administrative and environmental performances of the consent holder; and
- 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 exercising resource consents.

It is proposed that for 2017-2018 the programme remains unchanged from that of 2016-2017.

It should be noted that the proposed programme represents a reasonable and risk-based level of monitoring for the sites in question. The Council reserves the right to subsequently adjust the programme from that initially prepared, should the need arise if potential or actual non-compliance is determined at any time during 2017-2018.

4.5.6 Optional review of consent

Resource consent **9975-1** (Molten Metals) provides for an optional review of the consent in June 2018. Condition 9 allows the Council to review the consent, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of the consent.

Based on the results of monitoring in the year under review, and in previous years as set out in earlier annual compliance monitoring reports, it is considered that a review is not required at this time.

5 Summary of Recommendations

1. THAT in the first instance, the monitoring of discharges to the coastal marine area via the Hongihongi Stream for the 2017-2018 year is maintained at the same level as in 2016-2017.
2. THAT in the first instance, the monitoring of discharges to the Herekawe Stream in the 2017-2018 year is maintained at the same level as in 2016-2017.
3. THAT the monitoring of other discharges to the coastal marine and port area in the 2017-2018 year is maintained at the same level as in 2016-2017.
4. THAT should there be issues with environmental or administrative performance in 2017-2018, monitoring may be adjusted to reflect any additional investigation or intervention as found necessary.
5. THAT the option for a review of resource consent 9975-1 (Molten Metals) in June 2018, as set out in condition 9 of the consent, not be pursued on the grounds that the current conditions are adequate to deal with adverse effects on the environment arising from the exercise of the consent.

Glossary of common terms and abbreviations

The following abbreviations and terms may be used within this report:

Biomonitoring	Assessing the health of the environment using aquatic organisms.
bund	A wall around a tank to contain its contents in the case of a leak.
Condy	Conductivity, an indication of the level of dissolved salts in a sample, usually measured at 20°C and expressed in mS/m.
E-Waste	electronic waste
Fresh	Elevated flow in a stream, such as after heavy rainfall.
g/m^3	Grammes per cubic metre, and equivalent to milligrammes per litre (mg/L). In water, this is also equivalent to parts per million (ppm), but the same does not apply to gaseous mixtures.
Incident	An event that is alleged or is found to have occurred that may have actual or potential environmental consequences or may involve non-compliance with a consent or rule in a regional plan. Registration of an incident by the Council does not automatically mean such an outcome had actually occurred.
Intervention	Action/s taken by Council to instruct or direct actions be taken to avoid or reduce the likelihood of an incident occurring.
Investigation	Action taken by Council to establish what were the circumstances/events surrounding an incident including any allegations of an incident.
L/sec	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.
NTU	Nephelometric Turbidity Unit, a measure of the turbidity of water.
O&G	Oil and grease, defined as anything that will dissolve into a particular organic solvent (e.g. hexane). May include both animal material (fats) and mineral matter (hydrocarbons).
pH	A numerical system for measuring acidity in solutions, with 7 as neutral. Numbers lower than 7 are increasingly acidic and higher than 7 are increasingly alkaline. The scale is logarithmic i.e. a change of 1 represents a ten-fold change in strength. For example, a pH of 4 is ten times more acidic than a pH of 5.
Physicochemical	Measurement of both physical properties (e.g. temperature, clarity, density) and chemical determinants (e.g. metals and nutrients) to characterise the state of an environment.
Resource consent	Refer Section 87 of the RMA. Resource consents include land use consents (refer Sections 9 and 13 of the RMA), coastal permits (Sections 12, 14 and 15), water permits (Section 14) and discharge permits (Section 15).

RMA	Resource Management Act 1991 and including all subsequent amendments.
SS	Suspended solids.
SQMCI	Semi quantitative macroinvertebrate community index.
Temp	Temperature, measured in °C (degrees Celsius).
Turb	Turbidity, expressed in NTU.
UI	Unauthorised Incident.

For further information on analytical methods, contact the Council's laboratory.

Bibliography and references

Taranaki Regional Council (2017): *Port Area Industrial Catchments Monitoring Programme Annual Report 2015-2016*. Technical Report 16-97

Taranaki Regional Council (2015): *Hongihongi and Herekawe Streams Joint Monitoring Programme Annual Report 2014-2015*. Technical Report 15-60

Taranaki Regional Council (2013): *Hongihongi and Herekawe Streams Joint Monitoring Programme Biennial Report 2012-2014*. Technical Report 14-60

Taranaki Regional Council (2013): *Hongihongi and Herekawe Streams Joint Monitoring Programme Annual Report 2011-2012*. Technical Report 12-87

Taranaki Regional Council (2012): *Hongihongi and Herekawe Streams Joint Monitoring Programme Annual Report 2010-2011*.Technical Report 11-76

Taranaki Regional Council (2011): *Hongihongi and Herekawe Streams Joint Monitoring Programme Annual Report 2009-2010*. Technical Report 10-77

Taranaki Regional Council (2010): *Hongihongi and Herekawe Streams Joint Monitoring Programme Annual Report 2008-2009*. Technical Report 09-27

Taranaki Regional Council (2008): *Hongihongi and Herekawe Streams Joint Monitoring Programme Annual Report 2007-2008*. Technical Report 08-10

Taranaki Regional Council (2007): *Hongihongi and Herekawe Streams Joint Monitoring Programme Annual Report 2006-2007*.Technical Report 07-115.

Taranaki Regional Council (2006): *Hongihongi and Herekawe Streams Joint Monitoring Programme Annual Report 2005-2006*. Technical Report 06-21

Taranaki Regional Council (2005): *Hongihongi and Herekawe Streams Joint Monitoring Programme Annual Report 2004-2005*. Technical Report 05-56

Taranaki Regional Council (2004): *Hongihongi and Herekawe Streams Joint Monitoring Programme Annual Report 2003-2004*. Technical Report 04-103

Taranaki Regional Council (2003): *Hongihongi and Herekawe Streams Joint Monitoring Programme Annual Report 2002-2003*. Technical Report 03-48.

Taranaki Regional Council (2002): *Hongihongi and Herekawe Streams Joint Monitoring Programme Annual Report 2001-2002*. Technical Report 02-65

Taranaki Regional Council (2001): *Hongihongi and Herekawe Streams Joint Monitoring Programme Annual Report 2000/2001*. Technical Report 01-36

Taranaki Regional Council (2000): *Hongihongi and Herekawe Streams Joint Monitoring Programme Annual Report 1999/2000*. Technical Report 00-11

Taranaki Regional Council (1999): *Hongihongi and Herekawe Streams Joint Monitoring Programme Annual Report 1998/99*. Technical Report 99-41

Taranaki Regional Council (1998): *Hongihongi and Herekawe Streams Joint Monitoring Programme Annual Report 1997/98*. Technical Report 98-13

Taranaki Regional Council (1997): *Hongihongi and Herekawe Streams Joint Monitoring Programme Annual Report 1996/97*. Technical Report 97-22

Taranaki Regional Council (1996): *Hongihongi and Herekawe Streams Joint Monitoring Programme Annual Report 1995/96*. Technical Report 96-30

Taranaki Regional Council (1995): *Hongihongi and Herekawe Streams Joint Monitoring Programme Annual Report 1994/95*.Technical Report 95-16.

Appendix I

Resource consents held by companies in the Hongihongi catchment

Coastal Permit
Pursuant to the Resource Management Act 1991
a resource consent is hereby granted by the
Taranaki Regional Council

Name of Consent Holder:	Bulk Storage Terminals Limited PO Box 9 New Plymouth 4340
Decision Date:	19 November 2015
Commencement Date:	19 November 2015

Conditions of Consent

Consent Granted:	To discharge treated stormwater from a bulk storage site into the coastal marine area of Ngamotu Beach
Expiry Date:	1 June 2032
Review Date(s):	June 2020, June 2026 and in accordance with special condition 8
Site Location:	41 Centennial Drive, New Plymouth
Legal Description:	Lot 1 DP 10656, Lot 1 DP 18842 (Discharge source & site)
Grid Reference (NZTM)	1689258E-5675928N
Catchment:	Hongihongi Tasman

For General, Standard and Special conditions
pertaining to this consent please see reverse side of this document

General condition

a. The consent holder shall pay to the Taranaki Regional Council all the administration, monitoring and supervision costs of this consent, fixed in accordance with section 36 of the Resource Management Act, 1991.

Special conditions

1. The consent holder shall at all times adopt the best practicable option, as defined in section 2 of the Resource Management Act 1991, to prevent or minimise any adverse effects on the environment from the exercise of this consent.

2. The stormwater discharged shall be from an area not exceeding 1.98 ha.

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}

This condition shall apply before entry of the treated stormwater into the receiving waters at a designated sampling point approved by the Chief Executive, Taranaki Regional Council.

4. At the point at which the discharge enters the coastal marine area, the discharge shall not, either by itself or in combination with other discharges, give rise to any or all of the following effects in the receiving water:

   a) the production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials;
   b) any conspicuous change in the colour or visual clarity;
   c) any emission of objectionable odour;
   d) the rendering of fresh water unsuitable for consumption by farm animals;
   e) any significant adverse effects on aquatic life.

5. The consent holder shall maintain and regularly update a 'Contingency Plan' that details measures and procedures that will be undertaken to prevent, and to avoid environmental effects from, a spillage or any discharge of contaminants not authorised by this consent. The plan shall be provided to the Taranaki Regional Council by 1 March 2016, and approved by the Chief Executive, Taranaki Regional Council, acting in a certification capacity.

6. By 1 March 2016, the site shall be operated in accordance with a 'Management Plan' prepared by the consent holder and approved by the Chief Executive, Taranaki Regional Council, acting in a certification capacity. The plan shall detail how the site is to be managed to minimise the contaminants that become entrained in the stormwater and shall include as minimum:

   a) the loading and unloading of materials;
   b) maintenance of conveyance systems;
   c) sampling and analysis of stormwater;
   d) procedures for releasing stormwater;
   e) general housekeeping; and
   f) inspection and maintenance of the interceptor system.

   Note: A Stormwater Management Plan template is available in the Environment section of the Taranaki Regional Council's web site www.trc.govt.nz.

7. The consent holder shall notify the Chief Executive, Taranaki Regional Council, prior to making any changes to the processes or operations undertaken at the site, or the chemicals used or stored on site that could alter the nature of the discharge. Any such change shall then only occur following receipt of any necessary approval under the Resource Management Act 1991. Notification shall include the consent number, a brief description of the activity consented and an assessment of the environmental effects of any changes, and be emailed to consents@trc.govt.nz.

8. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review:

   a) during the month of June 2020 and/or June 2026 and/or
   b) within 3 months of receiving a notification under special condition 7 above;

   for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 19 November 2015

For and on behalf of
Taranaki Regional Council

_____

A D McLay
Director - Resource Management

Coastal Permit
Pursuant to the Resource Management Act 1991
a resource consent is hereby granted by the
Taranaki Regional Council

Name of Consent Holder:	Bulk Storage Terminals Limited PO Box 9 New Plymouth 4340
Decision Date:	19 November 2015
Commencement Date:	19 November 2015

Conditions of Consent

Consent Granted:	To discharge treated stormwater from an industrial chemical storage site into the coastal marine area of Ngamotu Beach
Expiry Date:	1 June 2032
Review Date(s):	June 2020, June 2026 and in accordance with special condition 8
Site Location:	41 Centennial Drive, New Plymouth
Legal Description:	Lot 1 DP 19306 (Discharge source & site)
Grid Reference (NZTM)	1689137E-5675878N
Catchment:	Hongihongi Tasman

For General, Standard and Special conditions
pertaining to this consent please see reverse side of this document

General condition

a. The consent holder shall pay to the Taranaki Regional Council all the administration, monitoring and supervision costs of this consent, fixed in accordance with section 36 of the Resource Management Act, 1991.

Special conditions

1. The consent holder shall at all times adopt the best practicable option, as defined in section 2 of the Resource Management Act 1991, to prevent or minimise any adverse effects on the environment from the exercise of this consent.

2. The stormwater discharged shall be from an area not exceeding 0.485 ha.

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}

This condition shall apply before entry of the treated stormwater into the receiving waters at a designated sampling point approved by the Chief Executive, Taranaki Regional Council.

4. At the point at which the discharge enters the coastal marine area, the discharge shall not, either by itself or in combination with other discharges, give rise to any or all of the following effects in the receiving water:

   a) the production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials;
   b) any conspicuous change in the colour or visual clarity;
   c) any emission of objectionable odour;
   d) the rendering of fresh water unsuitable for consumption by farm animals;
   e) any significant adverse effects on aquatic life.

5. The consent holder shall maintain and regularly update a 'Contingency Plan' that details measures and procedures that will be undertaken to prevent, and to avoid environmental effects from, a spillage or any discharge of contaminants not authorised by this consent. The plan shall be provided to the Taranaki Regional Council by 1 March 2016, and approved by the Chief Executive, Taranaki Regional Council, acting in a certification capacity.

6. By 1 March 2016, the site shall be operated in accordance with a 'Management Plan' prepared by the consent holder and approved by the Chief Executive, Taranaki Regional Council, acting in a certification capacity. The plan shall detail how the site is to be managed to minimise the contaminants that become entrained in the stormwater and shall include as minimum:

   a) the loading and unloading of materials;
   b) maintenance of conveyance systems;
   c) sampling and analysis of stormwater;
   d) procedures for releasing stormwater;
   e) general housekeeping; and
   f) inspection and maintenance of the interceptor system.

   Note: A Stormwater Management Plan template is available in the Environment section of the Taranaki Regional Council's web site www.trc.govt.nz.

7. The consent holder shall notify the Chief Executive, Taranaki Regional Council, prior to making any changes to the processes or operations undertaken at the site, or the chemicals used or stored on site that could alter the nature of the discharge. Any such change shall then only occur following receipt of any necessary approval under the Resource Management Act 1991. Notification shall include the consent number, a brief description of the activity consented and an assessment of the environmental effects of any changes, and be emailed to consents@trc.govt.nz.

8. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review:

   a) during the month of June 2020 and/or June 2026 and/or
   b) within 3 months of receiving a notification under special condition 7 above;

   for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 19 November 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:	Greymouth Petroleum Limited PO Box 3394 New Plymouth 4341
Decision Date:	16 October 2014
Commencement Date:	16 October 2014

Conditions of Consent

Consent Granted:	To discharge stormwater onto and into land from a bulk storage facility
Expiry Date:	01 June 2032
Review Date(s):	June 2020, June 2026
Site Location:	10 Rawinia Street, New Plymouth
Legal Description:	Lot 1 DP 15486 (Discharge source & site)
Grid Reference (NZTM)	1689460E-5675829N
Catchment:	Hongihongi

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 actual or likely adverse effect on the environment associated with the discharge of contaminants from the site.

2. The discharges to land within the bunded area of the site shall not result in any contaminants reaching surface water, any subsurface drainage system or any adjacent property.

3. The exercise of this consent shall not result in any contaminant concentration within groundwater, which after reasonable mixing, exceeds the background concentration for that particular contaminant.

4. The consent holder shall notify the Chief Executive, Taranaki Regional Council, prior to making any changes to the processes or operations undertaken at the site, or the chemicals used or stored on site that could alter the nature of the discharge. Any such change shall then only occur following receipt of any necessary approval under the Resource Management Act 1991. Notification shall include the consent number, a brief description of the activity consented and an assessment of the environmental effects of any changes, and be emailed to consents@trc.govt.nz.

5. The consent holder shall maintain a contingency plan that details measures and procedures to be undertaken to prevent spillage or accidental discharge of contaminants and measures to avoid, remedy or mitigate the environmental effects of such a spillage or discharge. The contingency plan shall be certified by the Chief Executive, Taranaki Regional Council prior to discharging from the site, and after any change to the Plan.

6. 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) general housekeeping.

   A Stormwater Management Plan template is available in the Environment section of the Taranaki Regional Council's web site www.trc.govt.nz.

7. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2020 and/or June 2026, 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 16 October 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:	Liquigas Limited P O Box 450 NEW PLYMOUTH 4340
Consent Granted Date:	3 December 2007

Conditions of Consent

Consent Granted:	To discharge from an LPG storage site: (a) process water from LPG storage tank de-watering; (b) water used to decommission and recommission LPG storage tanks; (c) LPG pipeline flushing water over a two-day period during emergency repairs; and (d) stormwater; into the Hongihongi Stream at or about 2599612E-6237879N
Expiry Date:	1 June 2026
Review Date(s):	June 2014, June 2020
Site Location:	Hutchens Place, New Plymouth
Legal Description:	Lot 1 DP 20289 Sec 221 Fitzroy Dist Lot 2 DP 4961 Lot 1 DP 7383 Lot 1 DP 16190 Lot 1 DP 17440 Lot 2 DP 17441 Lot 1 DP 18065 Lot 1 DP 19494 Lot 1 DP 19698 Lot 1 DP 19917 Sec 1 SO 13626
Catchment:	Hongihongi

For General, Standard and Special conditions
pertaining to this consent please see reverse side of this document

General conditions

a) On receipt of a requirement from the Chief Executive, Taranaki Regional Council the consent holder shall, within the time specified in the requirement, supply the information required relating to the exercise of this consent.

b) Unless it is otherwise specified in the conditions of this consent, compliance with any monitoring requirement imposed by this consent must be at the consent holder's own expense.

c) The consent holder shall pay to the Council all required administrative charges fixed by the Council pursuant to section 36 in relation to:

i) the administration, monitoring and supervision of this consent; and
ii) charges authorised by regulations.

Special conditions

1. The consent holder shall at all times adopt the best practicable option, as defined in section 2 of the Resource Management Act 1991, to prevent or minimise any adverse effects on the environment from the exercise of this consent.

2. The stormwater discharged shall be collected from a catchment area of no more than 20,000 m^2.

3. The volume of process water discharged from LPG storage tank de-watering shall not exceed 30 litres per day.

4. The consent holder shall maintain a contingency plan, approved by the Chief Executive, Taranaki Regional Council, detailing measures and procedures to be undertaken to prevent spillage or accidental discharge of contaminants not licensed by this consent, and measures to avoid, remedy or mitigate the environmental effects of such a discharge.

5. For the pipe flushing water and the water used to decommission and recommission the LPG storage tanks, the consent holder shall keep records of the date and time that the discharges to the Hongihongi Stream begin and end, and the volume of water discharged. These records shall be made available to the Chief Executive, Taranaki Regional Council, upon request.

6. The consent holder shall notify the Chief Executive, Taranaki Regional Council, in writing at least 24 hours prior to discharging either pipe flushing water or the water used to decommission or recommission the LPG storage tanks. Notification shall include the consent number and a brief description of the activity consented and be emailed to worknotification@trc.govt.nz. Notification by fax or post is acceptable only if the consent holder does not have access to email.

7. The consent holder shall provide to the Chief Executive, Taranaki Regional Council, the results of any physicochemical analysis carried out on water which is discharged to the Hongihongi Stream.

8. Concentrations of the following components shall not be exceeded in the discharge:

Component	**Concentration**
pH (range)	6.0 – 9.0
suspended solids	100 gm^{-3}
total recoverable hydrocarbons [infrared spectroscopic technique]	15 gm^{-3}

This condition shall apply prior to the entry of the stormwater and process water into the Hongihongi Stream, at a designated sampling point approved by the Chief Executive, Taranaki Regional Council.

9. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2014 and/or June 2020, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 3 December 2007

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:	New Zealand Oil Services Ltd PO Box 180 New Plymouth 4340
Decision Date:	23 April 2015
Commencement Date:	23 April 2015

Conditions of Consent

Consent Granted:	To discharge stormwater and treated wastewater from a petroleum storage facility into the Coastal Marine Area of Ngamotu Beach
Expiry Date:	1 June 2032
Review Date(s):	June 2020, June 2026 and in accordance with special condition 9
Site Location:	8-22 Ngamotu Road, New Plymouth
Legal Description:	Lots 1 & 2 DP 4742 (Discharge source & site)
Grid Reference (NZTM)	1689410E-5675907N
Catchment:	Tasman Sea
Tributary:	Hongihongi

For General, Standard and Special conditions
pertaining to this consent please see reverse side of this document

General condition

a. The consent holder shall pay to the Taranaki Regional Council all the administration, monitoring and supervision costs of this consent, fixed in accordance with section 36 of the Resource Management Act 1991.

Special conditions

1. The consent holder shall at all times adopt the best practicable option, as defined in section 2 of the Resource Management Act 1991, to prevent or minimise any adverse effects on the environment from the exercise of this consent.

2. The stormwater discharged shall be from an area not exceeding 2.3 ha.

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}

This condition shall apply before entry of the treated stormwater into the receiving waters at a designated sampling point approved by the Chief Executive, Taranaki Regional Council.

4. At the point at which the discharge enters the coastal marine area, the discharge shall not, either by itself or in combination with other discharges, give rise to any or all of the following effects in the receiving water:

   a) the production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials;
   b) any conspicuous change in the colour or visual clarity;
   c) any emission of objectionable odour;
   d) the rendering of fresh water unsuitable for consumption by farm animals;
   e) any significant adverse effects on aquatic life.

5. The consent holder shall maintain and regularly update a 'Contingency Plan' that details measures and procedures that will be undertaken to prevent, and to avoid environmental effects from, a spillage or any discharge of contaminants not authorised by this consent. The plan shall be provided to the Chief Executive, Taranaki Regional Council by 30 June 2015.

6. The site shall be operated in accordance with a 'Management Plan' prepared by the consent holder and provided to the Chief Executive, Taranaki Regional Council, by 30 June 2015. The plan shall detail how the site is managed to minimise the contaminants that become entrained in the stormwater and shall include as minimum:

   a) general housekeeping; and
   b) inspection and maintenance of the interceptor system.

7. The consent holder shall notify the Chief Executive, Taranaki Regional Council, prior to making any changes to the processes or operations undertaken at the site, or the chemicals used or stored on site that could alter the nature of the discharge. Any such change shall then only occur following receipt of any necessary approval under the Resource Management Act. Notification shall include the consent number, a brief description of the activity consented and an assessment of the environmental effects of any changes, and be emailed to consents@trc.govt.nz.

8. This consent shall lapse on 30 June 2020, unless the consent is given effect to before the end of that period or the Taranaki Regional Council fixes a longer period pursuant to section 125(1)(b) of the Resource Management Act 1991.

9. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review:

   a) during the month of June 2020 and/or June 2026 and/or
   b) within 3 months of receiving a notification under special condition 7 above;

   for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 23 April 2015

For and on behalf of
Taranaki Regional Council

_____

B G Chamberlain
Chief Executive

Coastal Permit

Pursuant to the Resource Management Act 1991
a resource consent is hereby granted by the
Taranaki Regional Council

Name of Consent Holder:	Shell Todd Oil Services Limited Private Bag 2035 New Plymouth 4342
Decision Date:	29 October 2015
Commencement Date:	29 October 2015

Conditions of Consent

Consent Granted:	To discharge treated and untreated stormwater from a petrochemical storage tank facility and hydrostatic test water into the coastal marine area of the Hongihongi Stream
Expiry Date:	01 June 2032
Review Date(s):	June 2020, June 2026
Site Location:	68 to 106 Paritutu Road, Spotswood
Legal Description:	Lot 2 DP 13237
Grid Reference (NZTM)	1688837E-5675850N (discharge source) 1688718E-5676021N (discharge site)
Catchment:	Hongihongi

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 stormwater discharged shall be from an area not exceeding 1.7 ha.

2. At any point more than 5 metres from the discharge point (as defined by the outlet culvert grid reference 1689707E, 5676126N), the discharge shall not give rise to any of the following effects in the receiving waters of the Tasman Sea:

   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.

3. Constituents of the stormwater 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 50 gm^{-3}
total recoverable hydrocarbons	Concentration not greater than 15 gm^{-3}
total organic carbon	Concentration not greater than 15 gm^{-3}
Chloride	Concentration not greater than 300 gm^{-3}

4. Prior to the discharge of hydrostatic test water to the stormwater bund, the consent holder shall analyse the test water for SVOC's BTEX, heavy metals, suspended solids, ph, ethylene glycol, and chloride.

5. Constituents in the hydrostatic test water being discharged to the stormwater storage bund shall not exceed the following concentrations:

Constituents	Concentration g/m³
Arsenic	0.001
Cadmium	0.0002
Chromium	0.001
Copper	0.001
Lead	0.001
Mercury	0.0006
Nickle	0.008
Zinc	0.0024
Benzene	0.6
Toluene	0.8
Ethylbenzene	0.3
Xylenes	0.6
Naphthalene	0.0025
Fluoranthene	0.0014
Ethylene glycol	5
Anthracene	0.0004
Suspended solids	100
pH	6-9
Total hydrocarbons	15
Chloride	50

6. The contaminants in hydrostatic test water discharged to the stormwater bund shall only be those listed in condition 5 above, and any other contaminants not listed in condition 5, provided;

   a) Are at concentrations that do not cause environmental effects more adverse than the contaminants allowed by condition 2.

   b) They are reasonably expected to be present in the hydrostatic test water;

   c) A report of test water analysis has been forwarded to the Chief Executive, Taranaki Regional Council;

   d) They have been certified by meeting conditions a) and b) above by the Chief Executive, Taranaki Regional Council;

7. The consent holder shall maintain and regularly update a 'Contingency Plan' that details measures and procedures that will be undertaken to prevent, and to avoid environmental effects from, a spillage or any discharge of contaminants not authorised by this consent. The plan shall be approved by the Chief Executive, Taranaki Regional Council, acting in a certification capacity.

8. By 31 December 2015 the site shall be operated in accordance with a 'Management Plan' prepared by the consent holder and approved by the Chief Executive, Taranaki Regional Council, acting in a certification capacity. The plan shall detail how the site is to be managed to minimise the contaminants that become entrained in the stormwater and shall include as minimum:

    a) procedures for testing and releasing bunded stormwater;
    b) procedures for testing and releasing hydrostatic test water;
    c) general housekeeping; and
    d) management of the interceptor system.

    Note: A Stormwater Management Plan template is available in the Environment section of the Taranaki Regional Council's web site www.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 during the month of June 2020 and/or June 2026 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 29 October 2015

For and on behalf of
Taranaki Regional Council

_____

A D McLay
Director - Resource Management

Appendix II

Resource consents held by companies in the Herekawe catchment

Discharge Permit

Pursuant to the Resource Management Act 1991
a resource consent is hereby granted by the
Taranaki Regional Council

Name of Consent Holder:	Port Taranaki Limited PO Box 348 New Plymouth 4340
Decision Date (Change):	31 March 2009
Commencement Date (Change):	31 March 2009 (Granted Date: 21 September 2007)

Conditions of Consent

Consent Granted:	To discharge treated stormwater and hydrotest water from a hydrocarbon storage facility into the Herekawe Stream
Expiry Date:	1 June 2026
Review Date(s):	June 2020
Site Location:	283 Centennial Drive, New Plymouth
Legal Description:	Lot 2 DP 20912
Grid Reference (NZTM)	1687947E-5674350N
Catchment:	Herekawe

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. 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.

Conditions 2 and 3 – changed

2. The exercise of this consent shall be undertaken generally in accordance with the documentation submitted in support of applications 4755 and 6224. In the case of any contradiction between the documentation submitted in support of applications 4755 and 6224 and the conditions of this consent, the conditions of this consent shall prevail.

3. All stormwater and hydrotest water shall be directed for treatment through the stormwater treatment system for discharge in accordance with the special conditions of this permit.

Conditions 4 and 5 – unchanged

4. 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.

5. There shall be no discharge of wastewater from truck washing operations to the stormwater system.

Condition 6 – changed

6. The following concentrations shall not be exceeded in the discharge:

Component	Concentration
pH (range)	6.0 – 9.0
suspended solids	100 gm^{-3}
total recoverable hydrocarbons [infrared spectroscopic technique]	15 gm^{-3}
chloride	50 gm^{-3}

This condition shall apply prior to the entry of the treated stormwater and hydrotest water into the receiving waters of the Herekawe Stream, at a designated sampling point approved by the Chief Executive, Taranaki Regional Council.

Conditions 7 to 9 – unchanged

7. Within three months of the granting of this consent, the consent holder shall prepare and maintain a contingency plan to be approved by the Chief Executive, Taranaki Regional Council, outlining measures and procedures to be undertaken to prevent spillage or accidental discharge of contaminants not licensed by this consent and measures to avoid, remedy or mitigate the environmental effects of such a spillage or discharge.

8. Within three months of the granting of this consent, the consent holder shall prepare and maintain an operation and management plan to the satisfaction of the Chief Executive, Taranaki Regional Council. This plan shall document how the site is to be managed in order to minimise the contaminants that become entrained in the stormwater. The plan shall cover 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. 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 9 March 2016

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:	Port Taranaki Limited PO Box 348 New Plymouth 4340
Decision Date (Change):	17 March 2017
Commencement Date (Change):	17 March 2017 (Granted Date: 21 September 2007)

Conditions of Consent

Consent Granted:	To discharge treated stormwater and hydrotest water from a hydrocarbon storage facility into the Herekawe Stream
Expiry Date:	1 June 2026
Review Date(s):	June 2020
Site Location:	Omata Tank Farm, Centennial Drive, New Plymouth
Grid Reference (NZTM)	1687925E-5674321N
Catchment:	Herekawe

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 exercise of this consent shall be undertaken in general accordance with the information provided in support of the original application for this consent and with any subsequent application to change consent conditions. Where there is conflict between applications the later application shall prevail, and where there is conflict between an application and consent conditions the conditions shall prevail.

3. The stormwater discharged shall be from an area not exceeding 1.6 ha.

4. Subject to condition 5, all stormwater and hydrotest water from inside bunded areas shall be directed for treatment through the stormwater treatment system for discharge in accordance with the special conditions of this permit.

5. Up to 90% of uncontaminated reticulated water from compound and tank hydrotesting may be discharged through the interceptor bypass.

6. 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.

7. There shall be no discharge of wastewater from truck washing operations to the stormwater system.

8. The following concentrations shall not be exceeded in the discharge:

Component	**Concentration**
pH (range)	6.0 – 9.0
suspended solids	100 gm^{-3}
total recoverable hydrocarbons [infrared spectroscopic technique]	15 gm^{-3}
chloride	50 gm^{-3}
chlorine **(hydrotest water only)**	0.1 gm^{-3}

This condition shall apply prior to the entry of the treated stormwater and hydrotest water into the receiving waters of the Herekawe Stream, at a designated sampling point approved by the Chief Executive, Taranaki Regional Council.

9. The consent holder shall test the concentrations of contaminants in the hydrotest water prior to discharge to the Herekawe Stream to ensure the standards specified in condition 8 above are met.

10. The consent holder shall notify the Chief Executive, Taranaki Regional Council, within 2 hours (before or after) of commencement of any discharges of hydrotest water to the Herekawe Stream. Notification shall include the consent number, a brief description of the activity consented, and test results obtained in accordance with condition 9, and be emailed to worknotification@trc.govt.nz.

11. Within three months of the granting of this consent, the consent holder shall prepare and maintain a contingency plan to be approved by the Chief Executive, Taranaki Regional Council, outlining measures and procedures to be undertaken to prevent spillage or accidental discharge of contaminants not licensed by this consent and measures to avoid, remedy or mitigate the environmental effects of such a spillage or discharge.

12. Within three months of the granting of this consent, the consent holder shall prepare and maintain an operation and management plan to the satisfaction of the Chief Executive, Taranaki Regional Council. This plan shall document how the site is to be managed in order to minimise the contaminants that become entrained in the discharges. The plan shall cover but not necessarily be limited to:

    a) the loading and unloading of materials;
    b) maintenance of conveyance systems;
    c) general housekeeping;
    d) management of the interceptor system, including use of the interceptor bypass.

13. 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 17 March 2017

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:	Methanex Motunui Limited Private Bag 2011 New Plymouth 4342
Decision Date:	13 November 2015
Commencement Date:	13 November 2015

Conditions of Consent

Consent Granted:	To discharge stormwater from a methanol storage facility at the Omata tank farm 2 into the Herekawe Stream
Expiry Date:	1 June 2032
Review Date(s):	June 2020, June 2026 and in accordance with special condition 11
Site Location:	Omata Tank Farm 2, Centennial Drive, New Plymouth
Legal Description:	Lot 1 DP 20912 (Discharge source & site)
Grid Reference (NZTM)	1688157E-5674700N
Catchment:	Herekawe

For General, Standard and Special conditions
pertaining to this consent please see reverse side of this document

General condition

a. The consent holder shall pay to the Taranaki Regional Council all the administration, monitoring and supervision costs of this consent, fixed in accordance with section 36 of the Resource Management Act 1991.

Special conditions

1. The consent holder shall at all times adopt the best practicable option, as defined in section 2 of the Resource Management Act 1991, to prevent or minimise any adverse effects on the environment from the exercise of this consent.

2. The stormwater discharged shall be from an area not exceeding 2.6 ha.

3. The activity shall be undertaken in accordance with the information provided with the application. In the case of any contradiction between the application detail and the conditions of this consent, the conditions of this consent shall prevail.

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}
total recoverable hydrocarbons	Concentration not greater than 15 gm^{-3}
methanol	Concentration not greater than 15 gm^{-3}
chloride	Concentration not greater than 50 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. The consent holder shall test the levels of contaminants in the stormwater prior to discharge to the Herekawe Stream to ensure the standards specified in condition 4 above are met.

6. The consent holder shall notify the Chief Executive, Taranaki Regional Council, within 2 hours (before or after) of commencement of any discharges to the Herekawe Stream. Notification shall include the consent number, a brief description of the activity consented, and test results obtained in accordance with condition 5, and be emailed to worknotification@trc.govt.nz.

7. After allowing for reasonable mixing, within a mixing zone extending 25 metres downstream of the discharge point, the discharge shall not, either by itself or in combination with other discharges, give rise to any or all of the following effects in the receiving water:

   a) the production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials;
   b) any conspicuous change in the colour or visual clarity;
   c) any emission of objectionable odour;
   d) the rendering of fresh water unsuitable for consumption by farm animals;
   e) any significant adverse effects on aquatic life.

8. The consent holder shall maintain and regularly update a 'Contingency Plan' that details measures and procedures that will be undertaken to prevent, and to avoid environmental effects from, a spillage or any discharge of contaminants not authorised by this consent. The plan shall be provided to the Taranaki Regional Council by 1 March 2016, and approved by the Chief Executive, Taranaki Regional Council, acting in a certification capacity.

9. By 1 March 2016, the site shall be operated in accordance with a 'Management Plan' prepared by the consent holder and approved by the Chief Executive, Taranaki Regional Council, acting in a certification capacity. The plan shall detail how the site is to be managed to minimise the contaminants that become entrained in the stormwater and shall include as minimum:

    a) the loading and unloading of materials;
    b) maintenance of conveyance systems;
    c) sampling and analysis of stormwater;
    d) trigger conductivity levels for chloride analysis;
    e) procedures for releasing stormwater;
    f) general housekeeping; and
    g) management of the interceptor system.

    Note: 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 1991. Notification shall include the consent number, a brief description of the activity consented and an assessment of the environmental effects of any changes, and be emailed to consents@trc.govt.nz.

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 2020 and/or June 2026; and/or
    b) within 3 months of receiving a notification under 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 13 November 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:	Methanex Motunui Limited Private Bag 2011 New Plymouth 4342
Decision Date:	13 November 2015
Commencement Date:	13 November 2015

Conditions of Consent

Consent Granted:	To discharge stormwater from a methanol storage facility at the Omata tank farm 1 into the Herekawe Stream
Expiry Date:	1 June 2032
Review Date(s):	June 2020, June 2026 and in accordance with special condition 11
Site Location:	Omata Tank Farm 1, Centennial Drive, New Plymouth
Legal Description:	Lot 3 DP 20912 (Discharge source & site)
Grid Reference (NZTM)	1688136E-5674030N
Catchment:	Herekawe

For General, Standard and Special conditions
pertaining to this consent please see reverse side of this document

General condition

a. The consent holder shall pay to the Taranaki Regional Council all the administration, monitoring and supervision costs of this consent, fixed in accordance with section 36 of the Resource Management Act 1991.

Special conditions

1. The consent holder shall at all times adopt the best practicable option, as defined in section 2 of the Resource Management Act 1991, to prevent or minimise any adverse effects on the environment from the exercise of this consent.

2. The stormwater discharged shall be from an area not exceeding 3.6 ha.

3. The activity shall be undertaken in accordance with the information provided with the application. In the case of any contradiction between the application detail and the conditions of this consent, the conditions of this consent shall prevail.

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}
total recoverable hydrocarbons	Concentration not greater than 15 gm^{-3}
methanol	Concentration not greater than 15 gm^{-3}
chloride	Concentration not greater than 50 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. The consent holder shall test the levels of contaminants in the stormwater prior to discharge to the Herekawe Stream to ensure the standards specified in condition 4 above are met.

6. The consent holder shall notify the Chief Executive, Taranaki Regional Council, within 2 hours (before or after) of commencement of any discharges to the Herekawe Stream. Notification shall include the consent number, a brief description of the activity consented, and test results obtained in accordance with condition 5, and be emailed to worknotification@trc.govt.nz.

7. After allowing for reasonable mixing, within a mixing zone extending 25 metres downstream of the discharge point, the discharge shall not, either by itself or in combination with other discharges, give rise to any or all of the following effects in the receiving water:

   a) the production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials;
   b) any conspicuous change in the colour or visual clarity;
   c) any emission of objectionable odour;
   d) the rendering of fresh water unsuitable for consumption by farm animals;
   e) any significant adverse effects on aquatic life.

8. The consent holder shall maintain and regularly update a 'Contingency Plan' that details measures and procedures that will be undertaken to prevent, and to avoid environmental effects from, a spillage or any discharge of contaminants not authorised by this consent. The plan shall be provided to the Taranaki Regional Council by 1 March 2016, and approved by the Chief Executive, Taranaki Regional Council, acting in a certification capacity.

9. By 1 March 2016, the site shall be operated in accordance with a 'Management Plan' prepared by the consent holder and approved by the Chief Executive, Taranaki Regional Council, acting in a certification capacity. The plan shall detail how the site is to be managed to minimise the contaminants that become entrained in the stormwater and shall include as minimum:

    a) the loading and unloading of materials;
    b) maintenance of conveyance systems;
    c) sampling and analysis of stormwater;
    d) trigger conductivity levels for chloride analysis;
    e) procedures for releasing stormwater;
    f) general housekeeping; and
    g) management of the interceptor system.

    Note: 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 1991. Notification shall include the consent number, a brief description of the activity consented and an assessment of the environmental effects of any changes, and be emailed to consents@trc.govt.nz.

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 2020 and/or June 2026; and/or
    b) within 3 months of receiving a notification under 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 13 November 2015

For and on behalf of
Taranaki Regional Council

_____

A D McLay
Director - Resource Management

Appendix III

Resource consents held by other companies discharging to the CMA

Coastal Permit

Pursuant to the Resource Management Act 1991
a resource consent is hereby granted by the
Taranaki Regional Council

Name of Consent Holder:	New Plymouth District Council Private Bag 2025 New Plymouth 4342
Decision Date:	31 August 2015
Commencement Date:	31 August 2015

Conditions of Consent

Consent Granted:	To discharge stormwater from an urban area into the coastal marine area of the Tasman Sea across the Ngamotu Beach foreshore
Expiry Date:	01 June 2032
Review Date(s):	June 2020 and/or June 2026
Site Location:	Ngamotu Beach, Foreshore, New Plymouth
Legal Description:	Coastal Reserve Blk IV Paritutu (site of discharge)
Grid Reference (NZTM)	1690092E-5675974N
Catchment:	Tasman Sea

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 stormwater discharged shall be from an area not exceeding 50 ha.

2. At any point more than 5 metres from the discharge point (as defined by the outlet culvert), the discharge shall not give rise to any of the following effects in the receiving waters of the Tasman Sea:

    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.

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}

4. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2020 and/or June 2026 for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 31 August 2015

For and on behalf of
Taranaki Regional Council

_____

A D McLay
Director - Resource Management

Coastal Permit

Pursuant to the Resource Management Act 1991
a resource consent is hereby granted by the
Taranaki Regional Council

Name of Consent Holder:	Fonterra Co-operative Group Ltd, New Plymouth Coolstore P O Box 6039 NEW PLYMOUTH
Consent Granted Date:	7 December 2001

Conditions of Consent

Consent Granted:	To discharge up to 960 cubic metres/day of cooling water and 7.2 cubic metres/day of groundwater seepage from a reservoir at the rear of the company's installation via a stormwater drain onto Ngamotu Beach at or about GR: P19:001-376
Expiry Date:	1 June 2020
Review Date(s):	June 2008, June 2014
Site Location:	20 Hakirau Street, New Plymouth
Legal Description:	Lot 1 DP 17360 Blk IV Paritutu SD
Catchment:	Tasman Sea

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 (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. At all times 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.

2. The exercise of this resource consent shall be undertaken in general accordance with the information supplied in support of the application.

3. The temperature of the water discharged must remain below 25 degrees Celsius at all times.

4. The discharge shall not contain any cooling water treatment chemical without the prior written permission of the Chief Executive, Taranaki Regional Council.

5. The discharge shall not give rise to any of the following effects on Ngamotu Beach:

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 of the sea;
c) any emission of objectionable odour;
d) any significant adverse effects on aquatic life.

6. The components of the discharge shall not exceed the following concentrations:

pH [range]	6 - 9
Oil and grease [infrared spectroscopic technique]	15 gm^{-3}
Suspended solids	100 gm^{-3}

This condition shall apply prior to the entry of the stormwater onto Ngamotu Beach at a designated sampling point approved by the Chief Executive, Taranaki Regional Council.

7. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review 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 4 November 2003

For and on behalf of
Taranaki Regional Council

_____

Chief Executive

Discharge Permit

Pursuant to the Resource Management Act 1991
a resource consent is hereby granted by the
Taranaki Regional Council

Name of Consent Holder:	Molten Metals Limited 350 Heads Road Castlecliff Wanganui 4501
Decision Date:	17 September 2014
Commencement Date:	17 September 2014

Conditions of Consent

Consent Granted:	To discharge stormwater from scrap metal storage and processing into the New Plymouth District Council reticulated stormwater system
Expiry Date:	01 June 2032
Review Date(s):	June 2020, June 2026
Site Location:	65 Centennial Drive, New Plymouth
Legal Description:	Lot 1 DP 13237 (Discharge source & site)
Grid Reference (NZTM)	1688844E-5676020N
Catchment:	Herekawe

For General, Standard and Special conditions
pertaining to this consent please see reverse side of this document

General condition

a. The consent holder shall pay to the Taranaki Regional Council all the administration, monitoring and supervision costs of this consent, fixed in accordance with section 36 of the Resource Management Act 1991.

Special conditions

1. The consent holder shall at all times adopt the best practicable option, as defined in section 2 of the Resource Management Act 1991, to prevent or minimise any adverse effects on the environment from the exercise of this consent.

2. The stormwater discharged shall be from a catchment area not exceeding 1.3 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}
oil and grease	Concentration not greater than 15 gm^{-3}
chloride	Concentration not greater than 300 gm^{-3}

This condition shall apply before entry of the stormwater into the reticulation network at a designated sampling point approved by the Chief Executive, Taranaki Regional Council.

4. Within three months of the granting of this consent the consent holder shall prepare and thereafter regularly update a contingency plan that details measures and procedures to be undertaken to prevent spillage or any discharge of contaminants not authorised by this consent. The 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.

5. 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) general housekeeping.

   A Stormwater Management Plan template is available in the Environment Section of the Taranaki Regional Council's web site www.trc.govt.nz.

6. The consent holder shall notify the Chief Executive, Taranaki Regional Council, prior to making any changes to the processes or operations undertaken at the site, or the chemicals or wastes stored and used 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.

7. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2020 and/or June 2026, 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 17 September 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:	Molten Metals Limited 350 Heads Road Castlecliff Wanganui 4501
Decision Date:	17 September 2014
Commencement Date:	17 September 2014

Conditions of Consent

Consent Granted:	To discharge contaminants onto and into land associated with scrap metal storage and processing
Expiry Date:	01 June 2032
Review Date(s):	June 2016 and two yearly thereafter
Site Location:	65 Centennial Drive, New Plymouth
Legal Description:	Lot 1 DP 13237 (Discharge source & site)
Grid Reference (NZTM)	1688868E-5675975N
Catchment:	Herekawe

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 actual or likely adverse effect on the environment associated with the discharge of contaminants from the site.

2. The discharge shall not result in any contaminants reaching any adjacent property.

3. The concentration of heavy metals in any soil at the site boundary shall not exceed the Intervention Values as shown in the following table:

Metal	Intervention Value (mg/kg dry matter)
Antimony	15
Arsenic	55
Barium	625
Cadmium	12
Chromium	380
Cobalt	240
Copper	190
Mercury	10
Lead	530
Molybdenum	200
Nickel	210
Zinc	720

4. The concentration of hydrocarbons in any soil within 1 metre of the site boundary shall not exceed the soil acceptance criteria shown in the following table:

Contaminant		Soil acceptance criteria (mg/kg)
Total Petroleum Hydrocarbons	C_7-C_9	590
	C_{10}-C_{14}	1400
	C_{15}-C_{36}	NA[1]
Monoaromatic Hydrocarbons	Benzene	0.0054
	Toluene	1.0
	Ethylbenzene	1.1
	Xylenes	0.61
Polycyclic Aromatic Hydrocarbons	Naphthalaene	0.043
	Non-carc. (Pyrene)	1.2
	Benzo(a)pyrene	0.85

[1] *NA indicates contaminant not limiting as estimated health-based criterion is significantly higher than that likely to be encountered on site*

5. From 1 March 2032 (three months prior to the consent expiry date), constituents in the soil at any location within the site boundary shall not exceed the standards shown in the following table:

Constituent	Standard
Arsenic	20 mg/kg
Cadmium	1 mg/kg
Chromium	600 mg/kg
Copper	100 mg/kg
Lead	300 mg/kg
Mercury	1 mg/kg
Nickel	60 mg/kg
Zinc	300 mg/kg
chloride	700 mg/kg
sodium	460 mg/kg
total soluble salts	2500 mg/kg
MAHs PAHs TPH	Guidelines for Assessing and Managing Petroleum Hydrocarbon Contaminated Sites in New Zealand (Ministry for the Environment, 1999). Tables 4.12 and 4.15, for soil type sand.

MAHs - benzene, toluene, ethylbenzene, xylenes
PAHs - napthalene, non-carc. (pyrene), benzo(a)pyrene eq.
TPH - total petroleum hydrocarbons (C_7-C_9, C_{10}-C_{14}, C_{15}-C_{36})

The requirement to meet these standards shall not apply if, before 1 March 2032, the consent holder applies for a new consent to replace this consent when it expires, and that application is not subsequently withdrawn.

6. This consent may not be surrendered at any time until the standards in condition 5 have been met.

7. The exercise of this consent shall not result in any contaminant concentration within groundwater, which after reasonable mixing, exceeds the background concentration for that particular contaminant.

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 or wastes stored and used 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.

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 2016, and at 2 yearly intervals thereafter, 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, including but not limited to adverse effects on groundwater.

Signed at Stratford on 17 September 2014

For and on behalf of
Taranaki Regional Council

_____

A D McLay
Director - Resource Management

Appendix IV

Herekawe Stream biomonitoring reports

To	Job Managers, Scott Cowperthwaite & Callum MacKenzie
From	Scientific Officer, Darin Sutherland
Doc No	1849538
Report No	DS073
Date	13 April 2017

Biomonitoring of the Herekawe Stream in relation to the Omata Tank Farm and other stormwater discharges, surveyed in February 2017

Introduction

This biological survey was the first of two scheduled for the Herekawe Stream in the 2016-2017 monitoring year to assess whether there had been any detrimental effects on the Herekawe Stream from stormwater discharges originating from STOS, DowAgro Sciences, Chevron, Origen Energy and NPDC. The first survey was due in spring 2016 but due to rain delays the first survey was instead completed in the summer of 2017 and a second survey is scheduled for the autumn of 2017. The previous survey (DS049) was performed in summer 2016 as scheduled. The results from surveys performed since the 2001-02 monitoring years are discussed in reports referenced at the end of this report.

Methods

The standard '400 ml kick-net' technique was used to collect streambed macroinvertebrates at a 'control' site and another downstream site in the Herekawe Stream (Table 1, Figure 1) on 16 February 2017. The 'kick-sampling' technique is very similar to Protocol C1 (hard-bottomed, semi-quantitative) of the New Zealand Macroinvertebrate Working Group (NZMWG) protocols for macroinvertebrate samples in wadeable streams (Stark et al, 2001).

Table 1 Biomonitoring sites in the Herekawe Stream in relation to stormwater discharges

Site No	Site code	Grid reference	Location
1	HRK000085	E1688283 N5674972	Upstream of Centennial Drive culvert and stormwater discharges
2	HRK000094	E1688201 N5675010	Downstream of stormwater discharges, approx. 75 m above coast

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 abundances scored based on the categories presented in **Table 2.**

Table 2 Macroinvertebrate abundance categories

Abundance category	Number of individuals
R (rare)	1-4
C (common)	5-19
A (abundant)	20-99
VA (very abundant)	100-499
XA (extremely abundant)	500+

Stark (1985) developed a scoring system for macroinvertebrate taxa according to their sensitivity to organic pollution in stony New Zealand streams. Highly `sensitive' taxa were assigned the highest scores of 9 or 10, while the most `tolerant' forms scored 1. Sensitivity scores for certain taxa have been modified in accordance with Taranaki experience. By averaging the scores obtained from a list of taxa collected from one site and multiplying by a scaling factor of 20, a Macroinvertebrate Community Index (MCI) value was obtained. The MCI is a measure of the overall sensitivity of macroinvertebrate communities to the effects of organic pollution. A gradation of biological water quality conditions based upon MCI ranges which has been adapted for Taranaki streams and rivers (TRC, 2013) from Stark's classification (Stark, 1985 and Boothroyd and Stark, 2000) (Table 3). More 'sensitive' communities inhabit less polluted waterways. A difference of 10.83 units or more in MCI values is considered significantly different (Stark 1998).

Table 3 Macroinverbrate health based on MCI ranges which has been adapted for Taranaki streams and rivers (TRC, 2015) from Stark's classification (Stark, 1985 and Boothroyd and Stark, 2000)

Grading	MCI
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), totalling these products, and dividing by the sum of the loading factors (Stark, 1998 & 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, ranging from 0 to 10 $SQMCI_s$ units. A difference of 0.83 units or more in $SQMCI_s$ values is considered significantly different (Stark 1998).

Figure 1 Biomonitoring sites in the Herekawe Stream

Results

Site habitat characteristics and hydrology

This summer survey was performed under low flow conditions, 11 days after a fresh in excess of 3 times and 13 days after a fresh of 7 times median flow (flow gauge at the Mangaoraka Stream at Corbett Rd). The survey followed a relatively dry spring period with only one significant river fresh recorded over the preceding month, which was well in excess of 7 times median flow. The water temperature was 15.3°C at site 1 and 15.9°C at site 2. At site 1 the water speed was steady, water uncoloured and clear while at site 2 the water speed was slow, water colour grey, and cloudy.

There was a light brown coloured dirty discharge coming from a stormwater drain on the true left bank at the time of the survey (Figure 2). There had been no rain recently. The channel at site 1 was narrow and constrained by gabion baskets on the banks and bed of the stream where the substrate was comprised mainly of sand. The stream at this site had no periphyton mats, and patchy filamentous algae, moss and wood on the streambed. Macrophytes were recorded at the edge of this partially shaded site on this occasion.

Figure 2 Light brown discharge from stormwater drain at time of survey

The substrate at site 2 was also comprised mainly of sand. The site can periodically be affected by salt water intrusion under extremely high tide and very low flow conditions. There was no periphyton mats or filamentous algae but there was patchy leaves and wood on the bed during the survey. Macrophytes were recorded along the stream margins.

Macroinvertebrates

A number of surveys have been performed previously at these two sites. Results of the current and past surveys are summarised in Table 4 and the results of the current survey presented in Table 5.

Table 4 Results of the current and previous surveys (since April 1986) performed at sites 1 and 2 in the Herekawe Stream in relation to the Omata Tank Farm and other stormwater discharges

Site No.	N	No of taxa			MCI value			SQMCI$_s$ value		
		Median	Range	Current survey	Median	Range	Current survey	Median	Range	Current survey
1	61	18	11-29	23	87	68-100	92	4.0	1.7-4.7	4.5
2	61	15	9-22	18	72	54-97	69	3.7	1.7-4.5	3.4

Table 5 Macroinvertebrate fauna of the Herekawe Stream in relation to Omata Tank Farm and other stormwater discharges sampled on 16 February 2017

Taxa List	Site Number	MCI score	1	2
	Site Code		HRK000085	HRK000094
	Sample Number		FWB17101	FWB17102
ANNELIDA (WORMS)	Oligochaeta	1	C	A
	Lumbricidae	5	R	-
MOLLUSCA	*Potamopyrgus*	4	XA	XA
	Sphaeriidae	3	-	R
CRUSTACEA	Ostracoda	1	R	A
	Paracalliope	5	VA	A
	Talitridae	5	R	-
	Paratya	3	-	R
	Paranephrops	5	R	-
EPHEMEROPTERA (MAYFLIES)	*Austroclima*	7	A	-
	Coloburiscus	7	C	-
PLECOPTERA (STONEFLIES)	*Megaleptoperla*	9	C	-
	Zelandobius	5	R	-
ODONATA (DRAGONFLIES)	*Xanthocnemis*	4	-	R
HEMIPTERA (BUGS)	*Anisops*	5	-	A
	Microvelia	3	-	R
	Sigara	3	-	VA
COLEOPTERA (BEETLES)	Elmidae	6	VA	-
	Dytiscidae	5	-	R
TRICHOPTERA (CADDISFLIES)	*Hydropsyche (Aoteapsyche)*	4	C	-
	Hydrobiosis	5	C	-
	Oxyethira	2	-	R
	Pycnocentria	7	R	-
	Pycnocentrodes	5	R	-
	Triplectides	5	A	A
DIPTERA (TRUE FLIES)	*Aphrophila*	5	C	-
	Chironomus	1	-	VA
	Maoridiamesa	3	R	-
	Orthocladiinae	2	R	-
	Polypedilum	3	R	-
	Tanypodinae	5	-	R
	Paradixa	4	-	R
	Austrosimulium	3	C	R
	Tanyderidae	4	R	-
ACARINA (MITES)	Acarina	5	-	C
		No of taxa	23	18
		MCI	92	69
		SQMCIs	4.5	3.4
		EPT (taxa)	9	1
		%EPT (taxa)	39	6

'Tolerant' taxa | 'Moderately sensitive' taxa | 'Highly sensitive' taxa

R = Rare C = Common A = Abundant VA = Very Abundant XA = Extremely Abundant

Site 1 (upstream of stormwater discharges)

A moderate macroinvertebrate community richness of 23 taxa was found at site 1 ('control' site) at the time of the summer survey. This was five more than the historical median for this site and nine taxa higher than the previous survey on February 2016 (Table 4, Figure 3).

The MCI score of 92 units indicated a community of 'fair' biological health which was not significantly different (Stark, 1998) to the historical median MCI score of 87 units. The current MCI score was significantly higher (Stark, 1998) than the preceding survey (81 units).

The $SQMCI_S$ score of 4.0 units was not significantly different (Stark, 1998) to the median MCI score of 4.0 units,

preceding survey (3.5 units) and to the median of similar streams (4.0 units, TRC, 2016a) (Stark, 1998) (Table 4).

The community was characterised by one 'tolerant' taxon ['tolerant' snails (*Potamopyrgus*)] and four 'moderately sensitive' taxa [amphipod (*Paracalliope*, mayfly (*Austroclima*), elmid beetles, and caddisfly (*Triplectides*)] (Table 5).

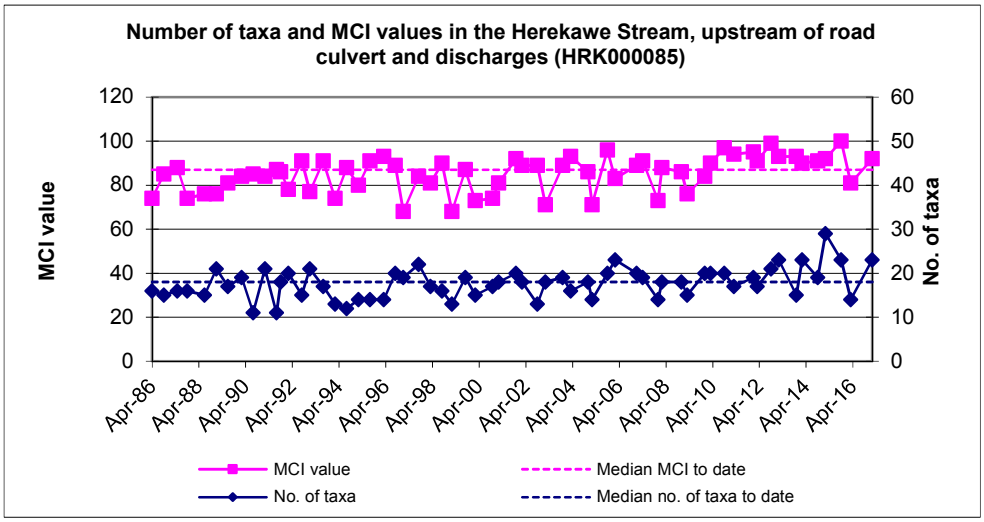

Figure 3 Number of taxa and MCI values in the Herekawe Stream upstream of the Centennial Road culvert since monitoring began in 1986

Site 2 (downstream of stormwater discharges)

A moderate macroinvertebrate community richness of 18 taxa was found at site 2 ('primary impact' site). This was three more than the historical median for this site and one taxon higher than the previous survey on October 2016 (Table 4, Figure 4).

The MCI score of 69 units indicated a community of 'poor' biological health which was not significantly different to the historical median (72 units). The MCI score was also not significantly different (Stark, 1998) to the preceding survey (72 units).

The $SQMCI_S$ score of 3.4 units was not significantly different (Stark, 1998) to the median MCI score of 3.7 units, preceding survey (3.8 units), and to the median for similar streams (4.0 units, TRC, 2016a) (Stark, 1998) (Table 4).

The community was characterised by four 'tolerant' taxa [snails (*Potamopyrgus*), seed shrimp (Ostracoda), true bug (*Sigara*) and blood worms (*Chironomus*))] and one 'moderately sensitive' taxon [caddisfly (*Triplectides*)] (Table 5).

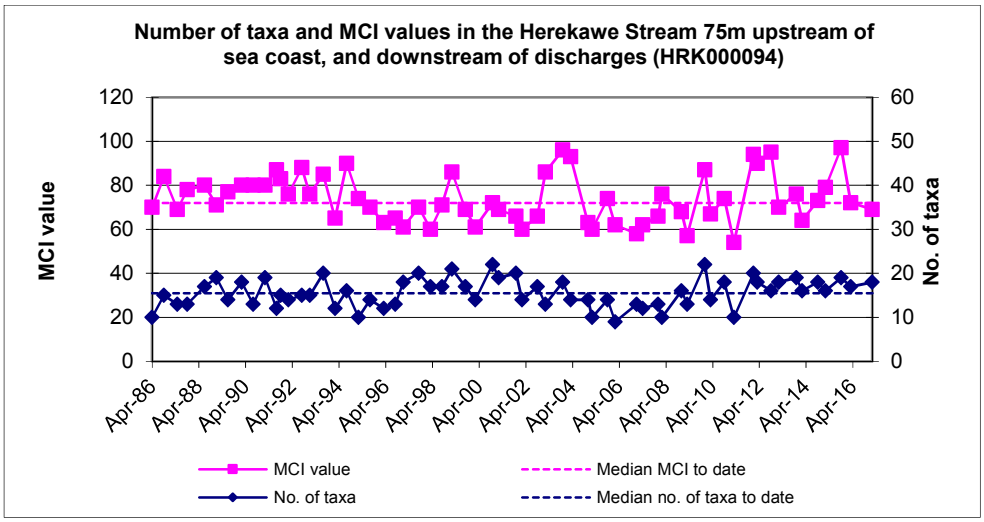

Figure 4 Number of taxa and MCI values in the Herekawe Stream downstream of industrial stormwater discharges since monitoring began in 1986

Discussion and conclusions

Macroinvertebrate richness at the 'control' site (site 1) was five taxa higher than the 'impact' site (site 2) but both sites had moderate levels of taxa richness indicating that there had been no significant toxic charges occurring preceding the survey. Furthermore, taxa richness at both sites was higher than the historical medians. Taxa richness is the most robust index when ascertaining whether a macroinvertebrate community has been exposed to toxic discharges such as petrochemicals that could be discharged by the Omata Tank Farm. Macroinvertebrates when exposed to toxic chemicals may die and be swept downstream or deliberately drift downstream as an avoidance mechanism (catastrophic drift). The lack of any discernible impact on taxa richness at site 2 strongly indicates that no toxic discharges have been occurring.

Site 2 had a MCI score of 69 units which was a significant (Stark, 1998) 23 units lower than site 1 but only three units lower than the historical median. Site 1 had a historical median MCI score 15 units higher than site 2 indicating that the 'control' site usually had a healthier macroinvertebrate community compared with the 'impact' site. The 'control' site had a significant increase in MCI score (11 units) compared with the previous survey while the 'impact' site had a non-significant decrease (3 units) which might reflect better water quality above site 1 but not site 2.

The $SQMCI_s$ can be more sensitive to organic pollution compared with the MCI. Site 2 had a $SQMCI_s$ score of 3.4 units which was significantly lower (Stark, 1998) to site 1 (by 0.9 units) but was not significantly lower than what was normal for lowland coastal streams (4.0 units, TRC, 2016a). It was a typical score for the site as it was close to the historic median (within 0.3 units). Site 1 had a slightly higher than normal score (by 0.5 units). The significant difference between the 'control' and 'primary impact' sites was congruent with the MCI results but was not as strong result (0.9 units is the cut off for being significant).

The community composition between the two sites had some similarities such as high numbers of snails and amphipods as would be expected given there proximity to each other but also suggests that site 2 is more lentic (pond like) than site 1 as evidenced by the slow/ still water favouring species at site 2 (e.g. all three true bug species *Anisops*, *Microvelia* and *Sigara*). Unfortunately, taxa that prefer slower moving water typically have lower tolerance values which can distort MCI and $SQMCI_s$ scores and therefore it can be difficult to distinguish between water quality and habitat type in such cases.

There is no evidence that stormwater discharges have been having a toxic effect on the macroinvertebrate community at site 2 and highly significant differences in MCI score are probably due to habitat differences, particularly the more pond-like nature at site 2. However, very fine suspended sediment can have a deleterious effect on macroinvertebrates (such as what was discharging at the time of the survey but no silt was noted on the streambed at site 2) and therefore it cannot be ruled out that a combination of habitat and water quality differences produced the recorded results. However, given that there is usually a significant difference between

site 1 and 2 for MCI scores, this would indicate that either stormwater discharges were having a chronic (long term) effect which persistently lowered the health of the macroinvertebrate community at site 2 or that more likely habitat quality (which has been relatively stable and therefore a long term influence in all the surveys), is the overriding factor structuring macroinvertebrate communities in the lower Herekawe Stream.

Summary

The Council's standard 'kick-sampling' technique was used at two established sites, to collect streambed macroinvertebrates from the Herekawe Stream. Samples were sorted and identified to provide the number of taxa (richness) and MCI and $SQMCI_s$ scores for each site.

Taxa richness is the most robust index when ascertaining whether a macroinvertebrate community has been exposed to toxic discharges. Macroinvertebrates when exposed to toxic chemicals may die and be swept downstream or deliberately drift downstream as an avoidance mechanism (catastrophic drift). 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. It may be the more appropriate index if non-organic impacts are occurring. Significant differences in either taxa richness, community composition, the MCI or $SQMCI_s$ between sites may indicate the degree of adverse effects (if any) of the discharges being monitored.

There was a typical, moderate taxa richness at both sites indicating that stormwater discharges were not having a toxic effect on macroinvertebrate communities. There was a highly significant decrease in MCI scores from 'fair' (upstream) to 'poor' health at the downstream site, but the scores were typical for both sites.

This summer macroinvertebrate survey indicated that the discharge of treated stormwater and discharges from the Omata Tank Farm or Dow Agro Sciences sites was unlikely to have had a significant effect on the macroinvertebrate communities of the stream. A significant decrease in the MCI scores between the upstream 'control' site and site downstream of the discharges was more likely attributable to habitat differences between these sites which appeared to be related primarily to flow.

References

Colgan BG and Fowles CR, 2003: Biomonitoring of the Herekawe Stream in relation to the Omata Tank Farm and other stormwater discharges, November 2003. TRC report CF 298.

Dunning KD, 2002a: Biomonitoring of the Herekawe Stream in relation to the Omata Tank Farm and other stormwater discharges, November 2001. TRC report KD89.

Dunning KD, 2002b: Biomonitoring of the Herekawe Stream in relation to the Omata Tank Farm and other stormwater discharges, February 2002. TRC report KD104.

Dunning KD, 2002c: Biomonitoring of the Herekawe Stream in relation to the Omata Tank Farm and other stormwater discharges, October 2002. TRC report KD134.

Fowles, CR 2005: Biomonitoring of the Herekawe Stream in relation to the Omata Tank Farm and other stormwater discharges, December 2004. TRC report CF350.

Fowles, CR 2008: Biomonitoring of the Herekawe Stream in relation to the Omata Tank Farm and other stormwater discharges, December 2008. TRC report CF474.

Fowles CR, 2009: Baseline biomonitoring of two sites in the Herekawe Stream in relation to the establishment of the Herekawe walkway, surveyed in December 2008 and March 2009. TRC report CF485.

Fowles CR, 2009: Biomonitoring of the Herekawe Stream in relation to the Omata Tank Farm and other stormwater discharges, surveyed in March 2009. TRC report CF484.

Fowles CR, 2010: Biomonitoring of the Herekawe Stream in relation to the Omata Tank Farm and other stormwater discharges, surveyed in December 2009. TRC report CF498.

Fowles CR, 2010: Biomonitoring of the Herekawe Stream in relation to the Omata Tank Farm and other stormwater discharges, surveyed in March 2010. TRC report CF507.

Fowles CR, 2010: Biomonitoring of the Herekawe Stream in relation to the Omata Tank Farm and other stormwater discharges, surveyed in October 2010. TRC report CF513.

Fowles CR, 2011: Biomonitoring of the Herekawe Stream in relation to the Omata Tank Farm and other stormwater discharges, surveyed in March 2011. TRC report CF532.

Fowles CR, 2012: Biomonitoring of the Herekawe Stream in relation to the Omata Tank Farm and other stormwater discharges, surveyed in January 2012. TRC report CF540.

Fowles CR, 2012: Biomonitoring of the Herekawe Stream in relation to the Omata Tank Farm and other stormwater discharges, surveyed in March 2012. TRC report CF550.

Fowles CR, 2012: Biomonitoring of the Herekawe Stream in relation to the Omata Tank Farm and other stormwater discharges, surveyed in October 2012. TRC report CF559.

Fowles CR, 2013: Biomonitoring of the Herekawe Stream in relation to the Omata Tank Farm and other stormwater discharges, surveyed in February 2013. TRC report CF569.

Fowles CR, 2013: Biomonitoring of the Herekawe Stream in relation to the Omata Tank Farm and other stormwater discharges, surveyed in November 2013. TRC report CF596.

Fowles CR, 2014: Biomonitoring of the Herekawe Stream in relation to the Omata Tank Farm and other stormwater discharges, surveyed in February 2014. TRC report CF603.

Fowles CR, 2014: Biomonitoring of the Herekawe Stream in relation to the Omata Tank Farm and other stormwater discharges, surveyed in October 2014. TRC report CF626.

Fowles CR, 2015: Biomonitoring of the Herekawe Stream in relation to the Omata Tank Farm and other stormwater discharges, surveyed in February 2015. TRC report CF643.

Fowles CR, 2015: Biomonitoring of the Herekawe Stream in relation to the Omata Tank Farm and other stormwater discharges, surveyed in October 2015. TRC report CF646.

Fowles CR & Hope KJ, 2005: Biomonitoring of the Herekawe Stream in relation to the Omata Tank Farm and other stormwater discharges, February 2005. TRC report CF424.

Fowles CR & Jansma B, 2007: Biomonitoring of the Herekawe Stream in relation to the Omata Tank Farm and other stormwater discharges, January 2007. TRC report CF424.

Fowles CR & Jansma B, 2007: Biomonitoring of the Herekawe Stream in relation to the Omata Tank Farm and other stormwater discharges, April 2007. TRC report CF427.

Hope KJ, 2006: Biomonitoring of the Herekawe Stream in relation to the Omata Tank Farm and other stormwater discharges, October 2005. TRC report KH052.

Hope KJ, 2006: Biomonitoring of the Herekawe Stream in relation to the Omata Tank Farm and other stormwater discharges, February 2006. TRC report KH080.

Jansma B, 2008: Biomonitoring of the Herekawe Stream in relation to the Omata Tank Farm and other stormwater discharges, December 2007. TRC report BJ038.

Jansma B, 2008: Biomonitoring of the Herekawe Stream in relation to the Omata Tank Farm and other stormwater discharges, February 2008. TRC report BJ039

Moore SC and Fowles CR, 2003: Biomonitoring of the Herekawe Stream in relation to the Omata Tank Farm and other stormwater discharges, February 2003. TRC report CF281.

Moore SC and Fowles CR, 2004: Biomonitoring of the Herekawe Stream in relation to the Omata Tank Farm and other stormwater discharges, March 2004. TRC report CF314.

Stark JD, 1985: A macroinvertebrate community index of water quality for stony streams. *Water and Soil* Miscellaneous Publication No. 87.

Stark JD, 1998: SQMCI: a biotic index for freshwater macroinvertebrate coded abundance data. *New Zealand Journal of Marine and Freshwater Research 32(1*): 55-66.

Stark JD, 1999: An evaluation of Taranaki Regional Council's SQMCI biomonitoring index. Cawthron Institute, Nelson. Cawthron Report No. 472.

Stark JD, Boothroyd IKG, Harding JS, Maxted JR, Scarsbrook MR, 2001: Protocols for sampling macroinvertebrates in wadeable streams. New Zealand Macroinvertebrate Working Group Report No. 1. Prepared for the Ministry for the Environment. Sustainable Management Fund Project No. 5103. 57p.

Sutherland DL, 2016: Biomonitoring of the Herekawe Stream in relation to the Omata Tank Farm and other stormwater discharges, surveyed in October 2016. TRC report DS049.

TRC, 2014: Fresh water macroinvertebrate fauna biological monitoring programme annual State of the Environment monitoring report 2012-2013. TRC Technical Report 2013-48.

TRC, 2015: Fresh water macroinvertebrate fauna biological monitoring programme annual State of the Environment monitoring report 2013-2014. TRC Technical Report 2014-20.

TRC, 2015a: Some statistics from the Taranaki Regional Council database (Esam) of freshwater macroinvertebrate surveys performed during the period from January 1980 to 30 September 2014 (SEM reference report). TRC Technical Report 2014-105.

To	Job Managers, Scott Cowperthwaite & Callum MacKenzie
From	Scientific Officer, Darin Sutherland
Doc No	1902689
Report No	DS075
Date	21 July 2017

Biomonitoring of the Herekawe Stream in relation to the Omata Tank Farm and other stormwater discharges, surveyed in April 2017

Introduction

This biological survey was the second of two scheduled for the Herekawe Stream in the 2016-2017 monitoring year to assess whether there had been any detrimental effects on the Herekawe Stream from stormwater discharges originating from STOS, DowAgro Sciences, Chevron, Origen Energy and NPDC. The first survey was due in spring 2016 but due to rain delays the first survey was instead completed in the summer of 2017 and this second survey was completed in autumn of 2017. The results from surveys performed since the 2001-02 monitoring years are discussed in reports referenced at the end of this report.

Methods

The standard '400 ml kick-net' technique was used to collect streambed macroinvertebrates at a 'control' site and another downstream site in the Herekawe Stream (Table 1, Figure 1) on 26 April 2017. The 'kick-sampling' technique is very similar to Protocol C1 (hard-bottomed, semi-quantitative) of the New Zealand Macroinvertebrate Working Group (NZMWG) protocols for macroinvertebrate samples in wadeable streams (Stark et al, 2001).

Table 1 Biomonitoring sites in the Herekawe Stream in relation to stormwater discharges

Site No	Site code	Grid reference	Location
1	HRK000085	E1688283 N5674972	Upstream of Centennial Drive culvert and stormwater discharges
2	HRK000094	E1688201 N5675010	Downstream of stormwater discharges, approx. 75 m above coast

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 abundances scored based on the categories presented in Table 2.

Table 2 Macroinvertebrate abundance categories

Abundance category	Number of individuals
R (rare)	1-4
C (common)	5-19
A (abundant)	20-99
VA (very abundant)	100-499
XA (extremely abundant)	500+

Stark (1985) developed a scoring system for macroinvertebrate taxa according to their sensitivity to organic pollution in stony New Zealand streams. Highly `sensitive' taxa were assigned the highest scores of 9 or 10, while the most `tolerant' forms scored 1. Sensitivity scores for certain taxa have been modified in accordance with Taranaki experience. By averaging the scores obtained from a list of taxa collected from one site and multiplying by a scaling factor of 20, a Macroinvertebrate Community Index (MCI) value was obtained. The MCI is a measure of the overall sensitivity of macroinvertebrate communities to the effects of organic pollution. A gradation of biological water quality conditions based upon MCI ranges which has been adapted for Taranaki streams and rivers (TRC, 2013) from Stark's classification (Stark, 1985 and Boothroyd and Stark, 2000) (Table 3). More 'sensitive' communities inhabit less polluted waterways. A difference of 10.83 units or more in MCI values is considered significantly different (Stark 1998).

Table 3 Macroinverbrate health based on MCI ranges which has been adapted for Taranaki streams and rivers (TRC, 2015) from Stark's classification (Stark, 1985 and Boothroyd and Stark, 2000)

Grading	MCI
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), totalling these products, and dividing by the sum of the loading factors (Stark, 1998 & 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, ranging from 0 to 10 $SQMCI_s$ units. A difference of 0.83 units or more in $SQMCI_s$ values is considered significantly different (Stark 1998).

Figure 1 Biomonitoring sites in the Herekawe Stream

Results

Site habitat characteristics and hydrology

This autumn survey was performed under moderate flow conditions (approximately median flow), 10 days after a fresh in excess of 3 times median flow and 12 days after a fresh in excess of 7 times median flow (flow gauge at the Mangaoraka River at Corbett Rd). The survey followed a relatively wet summer period with several freshes recorded over the preceding month. The water temperature was 12.3°C at site 1 and 11.8°C at site 2. At site 1 the water speed was steady, water uncoloured and clear while at site 2 the water speed was slow, water uncoloured and clear.

The channel at site 1 was narrow and constrained by gabion baskets on the banks and bed of the stream where the substrate was comprised mainly of sand. The stream at this site had no periphyton mats or filamentous algae. Macrophytes were recorded on the bed of this partially shaded site during the survey.

The substrate at site 2 was also comprised mainly of sand but more silt was evident that at site 1. The site can periodically be affected by salt water intrusion under extremely high tide and very low flow conditions. There was no periphyton mats or filamentous algae. Macrophytes were recorded on the streambed.

Macroinvertebrates

A number of surveys have been performed previously at these two sites. Results of the current and past surveys are summarised in Table 4 and the results of the current survey presented in Table 5.

Table 4 Results of the current and previous surveys (since April 1986) performed at sites 1 and 2 in the Herekawe Stream in relation to the Omata Tank Farm and other stormwater discharges

Site No.	N	No of taxa			MCI value			$SQMCI_s$ value		
		Median	Range	Current survey	Median	Range	Current survey	Median	Range	Current survey
1	61	18	11-29	15	88	68-100	97	4.0	1.7-4.7	4.8
2	61	16	9-22	17	72	54-97	84	3.7	1.7-4.5	3.7

Table 5 Macroinvertebrate fauna of the Herekawe Stream in relation to Omata Tank Farm and other stormwater discharges sampled on 26 April 2017

Taxa List	Site Number	MCI score	1	2
	Site Code		HRK000085	HRK000094
	Sample Number		FWB17219	FWB17220
PLATYHELMINTHES (FLATWORMS)	*Cura*	3	-	R
ANNELIDA (WORMS)	Oligochaeta	1	C	VA
MOLLUSCA	*Potamopyrgus*	4	A	XA
	Sphaeriidae	3	-	R
CRUSTACEA	Ostracoda	1	-	C
	Paracalliope	5	VA	VA
	Paranephrops	5	R	R
EPHEMEROPTERA (MAYFLIES)	*Austroclima*	7	R	-
	Zephlebia group	7	R	-
PLECOPTERA (STONEFLIES)	*Megaleptoperla*	9	C	R
HEMIPTERA (BUGS)	*Sigara*	3	-	A
COLEOPTERA (BEETLES)	Elmidae	6	R	R
TRICHOPTERA (CADDISFLIES)	*Hydropsyche (Aoteapsyche)*	4	R	-
	Polyplectropus	6	-	R
	Psilochorema	6	-	R
	Triplectides	5	C	A
DIPTERA (TRUE FLIES)	*Paralimnophila*	6	R	-
	Chironomus	1	-	A
	Tanypodinae	5	-	R
	Tanytarsini	3	R	-
	Sciomyzidae	3	R	-
	Austrosimulium	3	C	R
ACARINA (MITES)	Acarina	5	R	C
		No of taxa	15	17
		MCI	97	84
		SQMCIs	4.8	3.7
		EPT (taxa)	5	4
		%EPT (taxa)	33	24
'Tolerant' taxa	'Moderately sensitive' taxa	'Highly sensitive' taxa		

R = Rare C = Common A = Abundant VA = Very Abundant XA = Extremely Abundant

Site 1 (upstream of stormwater discharges)

A moderate macroinvertebrate community richness of 15 taxa was found at site 1 ('control' site) at the time of the autumn survey. This was three less than the historical median for this site (18 taxa) and eight taxa less than the previous survey (23 taxa) on February 2016(Table 4, Figure 2).

The MCI score of 97 units indicated a community of 'fair' biological health which was not significantly different (Stark, 1998) to the historical median MCI score of 88 units and to the preceding survey (92 units). The score of 97 units was only three units off the maximum score ever recorded for the site (100 units).

The $SQMCI_S$ score of 4.8 units was not significantly different (Stark, 1998) to the median MCI score of 4.0 units, and to the preceding survey (4.0 units) (Stark, 1998) (Table 4).

The community was characterised by one 'tolerant' taxon ['tolerant' snails (*Potamopyrgus*)] and one 'moderately sensitive' taxon [amphipod (*Paracalliope*)] (Table 5).

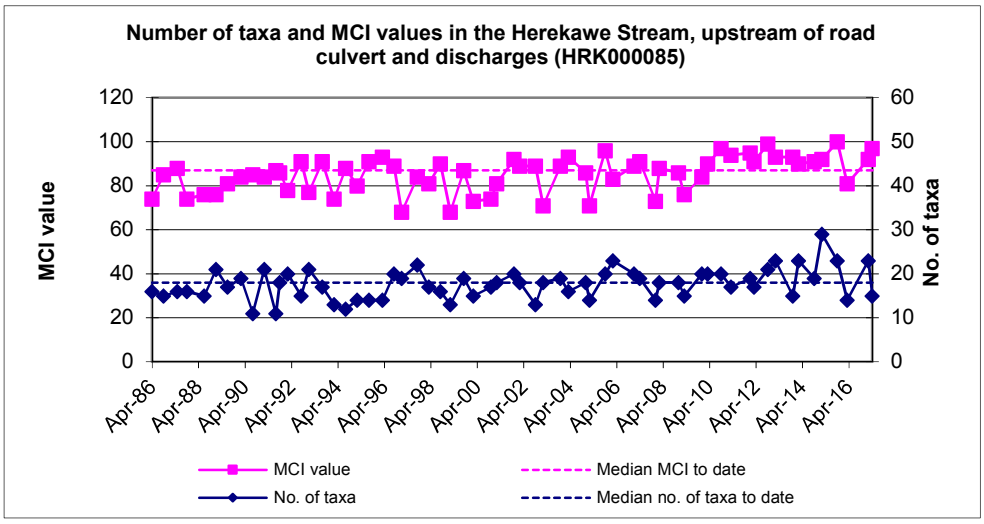

Figure 2 Number of taxa and MCI values in the Herekawe Stream upstream of the Centennial Road culvert since monitoring began in 1986

Site 2 (downstream of stormwater discharges)

A moderate macroinvertebrate community richness of 17 taxa was found at site 2 ('primary impact' site). This was one more than the historical median (16 taxa) for this site and one taxon lower than the previous survey (18 taxa) (Table 4, Figure 3).

The MCI score of 84 units indicated a community of 'fair' biological health which was significantly higher (Stark, 1998) than the historical median (72 units) by 12 units and to the preceding survey (69 units).

The $SQMCI_S$ score of 3.7 units was the same as the median MCI score of 3.7 units and not significantly different to the preceding survey (3.4 units) (Stark, 1998) (Table 4).

The community was characterised by four 'tolerant' taxa [oligochaete worms, snails (*Potamopyrgus*), true bug (*Sigara*) and blood worms (*Chironomus*)] and two 'moderately sensitive' taxa [amphipod (*Paracalliope*) and caddisfly (*Triplectides*)] (Table 5).

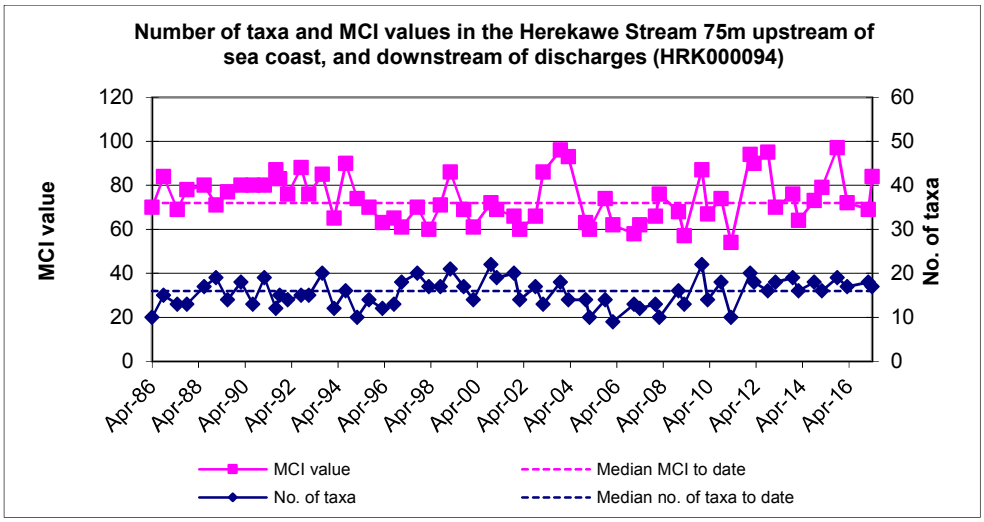

Figure 3 Number of taxa and MCI values in the Herekawe Stream downstream of industrial stormwater discharges since monitoring began in 1986

Discussion and conclusions

Macroinvertebrate richness at the 'control' site (site 1) was only two taxa higher than the 'impact' site (site 2) and both sites had moderate levels of taxa richness indicating that there had been no significant toxic charges occurring preceding the survey. Furthermore, taxa richness at both sites was similar to the historical medians (1-3 taxa). Taxa richness is the most robust index when ascertaining whether a macroinvertebrate community has been exposed to toxic discharges such as petrochemicals that could be discharged by the Omata Tank Farm. Macroinvertebrates when exposed to toxic chemicals may die and be swept downstream or deliberately drift downstream as an avoidance mechanism (catastrophic drift). The lack of any discernible impact on taxa richness at site 2 strongly indicates that no toxic discharges have been occurring.

MCI scores indicated that both sites had 'fair' macroinvertebrate health which was higher than historical medians and the preceding survey. For site 2 ('impact' site) the MCI score was significantly higher than the historical median (by 12 units) and to the preceding survey (by 12 units), indicating better than normal macroinvertebrate health at the site. However, there was a significant decrease in MCI from the 'control' site to the 'impact' site indicating a deterioration in macroinvertebrate health.

The $SQMCI_s$ can be more sensitive to organic pollution compared with the MCI. Both sites had $SQMCI_s$ scores not significantly different from historic medians but there was a significant deterioration from site 1 to site 2, congruent with the MCI result.

The community composition between the two sites had some similarities such as high numbers of snails and amphipods as would be expected given there proximity to each other and similar to previous survey results (see DS073). Also, in keeping with previous results, the community composition also suggests that site 2 is more lentic (pond like) than site 1, as evidenced by the different water speeds recorded at the sites (steady vs slow), and by the presence of slow/ still water favouring species at site 2 such as the water bug, *Sigara*, which was abundant at site 2 but not recorded at site 1. Unfortunately, taxa that prefer slower moving water typically have lower tolerance values which can distort MCI and $SQMCI_s$ scores and make it difficult to distinguish between water quality impacts and habitat differences. The slower water speed will also enable increased deposition of fine sediment (e.g. silt), confounding attempts to elucidate whether stormwater discharges for example are

There is no evidence that stormwater discharges have been having a toxic effect on the macroinvertebrate community at site 2. Significant differences in MCI and $SQMCI_s$ scores are probably due to habitat differences, particularly the more pond-like nature at site 2. However, fine suspended and deposited sediment can have a deleterious effect on macroinvertebrates (there was 10% silt on the streambed at site 1 and 25% silt at site 2) and therefore it cannot be ruled out that a combination of habitat and water quality differences produced the recorded results. However, given that there is usually a significant difference between site 1 and 2 for MCI scores, this would indicate that either stormwater discharges were having a chronic (long term) effect which persistently lowered the health of the macroinvertebrate community at site 2 or that more likely habitat quality (which has

been relatively stable and therefore a long term influence in all the surveys), is the overriding factor structuring macroinvertebrate communities in the lower Herekawe Stream.

Summary

The Council's standard 'kick-sampling' technique was used at two established sites, to collect streambed macroinvertebrates from the Herekawe Stream. Samples were sorted and identified to provide the number of taxa (richness) and MCI and $SQMCI_s$ scores for each site.

Taxa richness is the most robust index when ascertaining whether a macroinvertebrate community has been exposed to toxic discharges. Macroinvertebrates when exposed to toxic chemicals may die and be swept downstream or deliberately drift downstream as an avoidance mechanism (catastrophic drift). 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. It may be the more appropriate index if non-organic impacts are occurring. Significant differences in either taxa richness, community composition, the MCI or $SQMCI_s$ between sites may indicate the degree of adverse effects (if any) of the discharges being monitored.

There was a typical, moderate taxa richness at both sites indicating that stormwater discharges were not having a toxic effect on macroinvertebrate communities.

There was a significant decrease in MCI and $SQMCI_s$ scores from the upstream 'control' site to the downstream 'impact' site, but the indices were either not significantly different to historic medians, or for the 'impact' site, significantly higher than the historic median suggesting better than normal macroinvertebrate health at the site.

This autumn macroinvertebrate survey indicated that the discharge of treated stormwater and discharges from the Omata Tank Farm or Dow Agro Sciences sites was unlikely to have had a significant effect on the macroinvertebrate communities of the stream. A significant decrease in the MCI and $SQMCI_s$ scores between the upstream 'control' site and site downstream of the discharges was more likely attributable to habitat differences between these sites which appeared to be related primarily to flow.

References

Colgan BG and Fowles CR, 2003: Biomonitoring of the Herekawe Stream in relation to the Omata Tank Farm and other stormwater discharges, November 2003. TRC report CF 298.

Dunning KD, 2002a: Biomonitoring of the Herekawe Stream in relation to the Omata Tank Farm and other stormwater discharges, November 2001. TRC report KD89.

Dunning KD, 2002b: Biomonitoring of the Herekawe Stream in relation to the Omata Tank Farm and other stormwater discharges, February 2002. TRC report KD104.

Dunning KD, 2002c: Biomonitoring of the Herekawe Stream in relation to the Omata Tank Farm and other stormwater discharges, October 2002. TRC report KD134.

Fowles, CR 2005: Biomonitoring of the Herekawe Stream in relation to the Omata Tank Farm and other stormwater discharges, December 2004. TRC report CF350.

Fowles, CR 2008: Biomonitoring of the Herekawe Stream in relation to the Omata Tank Farm and other stormwater discharges, December 2008. TRC report CF474.

Fowles CR, 2009: Baseline biomonitoring of two sites in the Herekawe Stream in relation to the establishment of the Herekawe walkway, surveyed in December 2008 and March 2009. TRC report CF485.

Fowles CR, 2009: Biomonitoring of the Herekawe Stream in relation to the Omata Tank Farm and other stormwater discharges, surveyed in March 2009. TRC report CF484.

Fowles CR, 2010: Biomonitoring of the Herekawe Stream in relation to the Omata Tank Farm and other stormwater discharges, surveyed in December 2009. TRC report CF498.

Fowles CR, 2010: Biomonitoring of the Herekawe Stream in relation to the Omata Tank Farm and other stormwater discharges, surveyed in March 2010. TRC report CF507.

Fowles CR, 2010: Biomonitoring of the Herekawe Stream in relation to the Omata Tank Farm and other stormwater discharges, surveyed in October 2010. TRC report CF513.

Fowles CR, 2011: Biomonitoring of the Herekawe Stream in relation to the Omata Tank Farm and other stormwater discharges, surveyed in March 2011. TRC report CF532.

Fowles CR, 2012: Biomonitoring of the Herekawe Stream in relation to the Omata Tank Farm and other stormwater discharges, surveyed in January 2012. TRC report CF540.

Fowles CR, 2012: Biomonitoring of the Herekawe Stream in relation to the Omata Tank Farm and other stormwater discharges, surveyed in March 2012. TRC report CF550.

Fowles CR, 2012: Biomonitoring of the Herekawe Stream in relation to the Omata Tank Farm and other stormwater discharges, surveyed in October 2012. TRC report CF559.

Fowles CR, 2013: Biomonitoring of the Herekawe Stream in relation to the Omata Tank Farm and other stormwater discharges, surveyed in February 2013. TRC report CF569.

Fowles CR, 2013: Biomonitoring of the Herekawe Stream in relation to the Omata Tank Farm and other stormwater discharges, surveyed in November 2013. TRC report CF596.

Fowles CR, 2014: Biomonitoring of the Herekawe Stream in relation to the Omata Tank Farm and other stormwater discharges, surveyed in February 2014. TRC report CF603.

Fowles CR, 2014: Biomonitoring of the Herekawe Stream in relation to the Omata Tank Farm and other stormwater discharges, surveyed in October 2014. TRC report CF626.

Fowles CR, 2015: Biomonitoring of the Herekawe Stream in relation to the Omata Tank Farm and other stormwater discharges, surveyed in February 2015. TRC report CF643.

Fowles CR, 2015: Biomonitoring of the Herekawe Stream in relation to the Omata Tank Farm and other stormwater discharges, surveyed in October 2015. TRC report CF646.

Fowles CR & Hope KJ, 2005: Biomonitoring of the Herekawe Stream in relation to the Omata Tank Farm and other stormwater discharges, February 2005. TRC report CF424.

Fowles CR & Jansma B, 2007: Biomonitoring of the Herekawe Stream in relation to the Omata Tank Farm and other stormwater discharges, January 2007. TRC report CF424.

Fowles CR & Jansma B, 2007: Biomonitoring of the Herekawe Stream in relation to the Omata Tank Farm and other stormwater discharges, April 2007. TRC report CF427.

Hope KJ, 2006: Biomonitoring of the Herekawe Stream in relation to the Omata Tank Farm and other stormwater discharges, October 2005. TRC report KH052.

Hope KJ, 2006: Biomonitoring of the Herekawe Stream in relation to the Omata Tank Farm and other stormwater discharges, February 2006. TRC report KH080.

Jansma B, 2008: Biomonitoring of the Herekawe Stream in relation to the Omata Tank Farm and other stormwater discharges, December 2007. TRC report BJ038.

Jansma B, 2008: Biomonitoring of the Herekawe Stream in relation to the Omata Tank Farm and other stormwater discharges, February 2008. TRC report BJ039

Moore SC and Fowles CR, 2003: Biomonitoring of the Herekawe Stream in relation to the Omata Tank Farm and other stormwater discharges, February 2003. TRC report CF281.

Moore SC and Fowles CR, 2004: Biomonitoring of the Herekawe Stream in relation to the Omata Tank Farm and other stormwater discharges, March 2004. TRC report CF314.

Stark JD, 1985: A macroinvertebrate community index of water quality for stony streams. *Water and Soil* Miscellaneous Publication No. 87.

Stark JD, 1998: SQMCI: a biotic index for freshwater macroinvertebrate coded abundance data. *New Zealand Journal of Marine and Freshwater Research 32(1*): 55-66.

Stark JD, 1999: An evaluation of Taranaki Regional Council's SQMCI biomonitoring index. Cawthron Institute, Nelson. Cawthron Report No. 472.

Stark JD, Boothroyd IKG, Harding JS, Maxted JR, Scarsbrook MR, 2001: Protocols for sampling macroinvertebrates in wadeable streams. New Zealand Macroinvertebrate Working Group Report No. 1. Prepared for the Ministry for the Environment. Sustainable Management Fund Project No. 5103. 57p.

Sutherland DL, 2016: Biomonitoring of the Herekawe Stream in relation to the Omata Tank Farm and other stormwater discharges, surveyed in October 2016. TRC report DS049.

Sutherland DL, 2017: Biomonitoring of the Herekawe Stream in relation to the Omata Tank Farm and other stormwater discharges, surveyed in February 2017. TRC report DS073.

TRC, 2014: Fresh water macroinvertebrate fauna biological monitoring programme annual State of the Environment monitoring report 2012-2013. TRC Technical Report 2013-48.

TRC, 2015: Fresh water macroinvertebrate fauna biological monitoring programme annual State of the Environment monitoring report 2013-2014. TRC Technical Report 2014-20.

TRC, 2015a: Some statistics from the Taranaki Regional Council database (Esam) of freshwater macroinvertebrate surveys performed during the period from January 1980 to 30 September 2014 (SEM reference report). TRC Technical Report 2014-105.