Beach Energy Resources (NZ) Kupe Ltd
Kupe Production Station
Monitoring Programme
Annual Report
2017-2018

Technical Report 2018-75

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Executive summary

Beach Energy Resources NZ (Kupe) Ltd (Beach Energy) operates a petrochemical production station located on Inaha Road at Manaia, in the Inaha and Kapuni catchments. The Kupe Production Station processes oil and gas from the offshore Kupe wells. This report for the period July 2017 to June 2018 describes the monitoring programme implemented by the Taranaki Regional Council (the Council) to assess the Company's environmental and consent compliance performance during the period under review. The report also details the results of the monitoring undertaken and assesses the environmental effects of the Company's activities.

Beach Energy holds 14 resource consents in relation to the Kupe facilities, which include a total of 154 conditions setting out the requirements that the Company must satisfy. The Company holds one consent to allow it to take and use groundwater, one consent to discharge stormwater into the Kapuni Stream, one consent to install groundwater bores, two consents to discharge emissions into the air from the production station, four coastal consents relating to the offshore facilities, and five consents which covered activities during the development phase of the Kupe project.

During the monitoring period, Beach Energy Resources NZ (Kupe) Ltd demonstrated an overall high level of environmental performance.

The Council's monitoring programme for the year under review included seven inspections, two biomonitoring surveys of receiving waters, and two ambient air quality analyses. The consent holder provided data on flaring, water abstraction and stormwater discharges.

Site inspections found that the stormwater systems were constructed and maintained in accordance with consent conditions and were operating effectively.

Biomonitoring of the receiving waters did not indicate that the stormwater discharges from the Kupe Production Station had caused adverse effects on the water quality of the Kapuni Stream.

There were no adverse effects on the environment resulting from the exercise of the air discharge consents. The ambient air quality monitoring at the site showed that levels of carbon monoxide, combustible gases, PM_{10} particulates and nitrogen oxides were all below levels of concern at the time of sampling. No offensive or objectionable odours were detected beyond the boundary during inspections and there were no complaints in relation to air emissions from the site.

During the year, the Company demonstrated an overall high level of both environmental performance and administrative compliance with the resource consents. There were no unauthorised incidents recorded by the Council in relation to the Company's activities. The Kupe Production Station was well managed and maintained.

For reference, in the 2017-2018 year, consent holders were found to achieve a high level of environmental performance and compliance for 76% of the consents monitored through the Taranaki tailored monitoring programmes, while for another 20% 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 over the last several years, this report shows that the consent holder's performance remained at a high level.

This report includes recommendations for the 2018-2019 year.

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1 Introduction

1.1 Compliance monitoring programme reports and the Resource Management Act 1991

1.1.1 Introduction

This report is for the period July 2017 to June 2018 by the Taranaki Regional Council (the Council) on the monitoring programme associated with resource consents held by Beach Energy Resources NZ (Kupe) Ltd (the Company). The Company operates a petrochemical production station situated on Inaha Road at Manaia, in the Inaha and Kapuni catchments.

The report includes the results and findings of the monitoring programme implemented by the Council in respect of the consents held by the Company that relate to abstractions and discharges of water within the Inaha and Kapuni catchments, and the air discharge permit held by Beach Energy to cover emissions to air from the site.

One of the intents of the *Resource Management Act 1991* (RMA) is that environmental management should be integrated across all media, so that a consent holder's use of water, air, and land should be considered from a single comprehensive environmental perspective. Accordingly, the Council generally implements integrated environmental monitoring programmes and reports the results of the programmes jointly. This report discusses the environmental effects of the Company's use of water, land and air, and is the ninth combined annual report by the Council for the Kupe Production Station.

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 Company in the Inaha and Kapuni catchments;
- the nature of the monitoring programme in place for the period under review; and
- a description of the activities and operations conducted at the Kupe Production Station.

Section 2 presents the results of monitoring during the period under review, including scientific and technical data.

Section 3 discusses the results, their interpretations, and their significance for the environment.

Section 4 presents recommendations to be implemented in the 2018-2019 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 RMA primarily addresses environmental 'effects' which are defined as positive or adverse, temporary or permanent, past, present or future, or cumulative. Effects may arise in relation to:

a. the neighbourhood or the wider community around an activity, and may include cultural and social-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); and

e. risks to the neighbourhood or environment.

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

1.1.4 Evaluation of environmental and administrative performance

Besides discussing the various details of the performance and extent of compliance by the Company, this report also assigns them a rating for their 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 2017-2018 year, consent holders were found to achieve a high level of environmental performance and compliance for 76% of the consents monitored through the Taranaki tailored monitoring programmes, while for another 20% of the consents, a good level of environmental performance and compliance was achieved.

1.2 Process description

Development of the Kupe Production Station (Photo 1), offshore pipelines and offshore platform began in mid-2006. Natural gas and light oil are extracted from the Kupe Field which is located offshore, approximately 30 km south of Ohawe Beach on the South Taranaki coast. Raw gas and light oil extracted from the field offshore are transported to shore via pipeline and processed at an onshore production station. The location of the Kupe Field and the production station is shown in Figure 1.

The offshore platform is situated in approximately 35 metre deep water and comprises a topside deck supported by four legs fixed to the seabed. Installation of the offshore platform commenced in early 2007. The offshore platform and production wells are outside of the 12 nautical mile coastal marine area (CMA) boundary and therefore outside the jurisdiction of this Council.

The single subsea pipeline enables delivery of the raw natural gas and light oil to the onshore production station. Parallel to the subsea pipeline, utility lines transfer chemicals, power and fibre optic links from the shore to the offshore platform (Figure 2). Horizontal directional drilling (HDD) was used to install the pipelines under the 40 metre high sea cliffs at the end of Inaha Road in order to link the offshore and onshore components. The HDD entry point is 500 metres inland of the coastline and the exit point emerges 1,800 metres offshore.

Photo 1 Kupe Production Station

Figure 1 Location of Kupe Gas Project

Note: Figure 1 sourced from: http://www.originenergy.com.au/1222/Kupe-Gas-Project

The production station is located at the southern end of Inaha Road, occupying roughly 19 hectares of land. It includes storage and truck loading facilities for LPG and condensate export. A low-pressure flare system is located at ground level for operational control and an elevated flare has been installed for use in emergency situations only. A series of ponds provide a natural cleaning system for stormwater before discharging from the site. Commissioning of the production station began in early 2009, with commercial production commencing in November 2009.

Onshore pipelines have been installed to enable the transfer of raw gas from the HDD shore crossing to the production station, and to transfer the sales gas from the production station to the Kapuni Gas Treatment Plant.

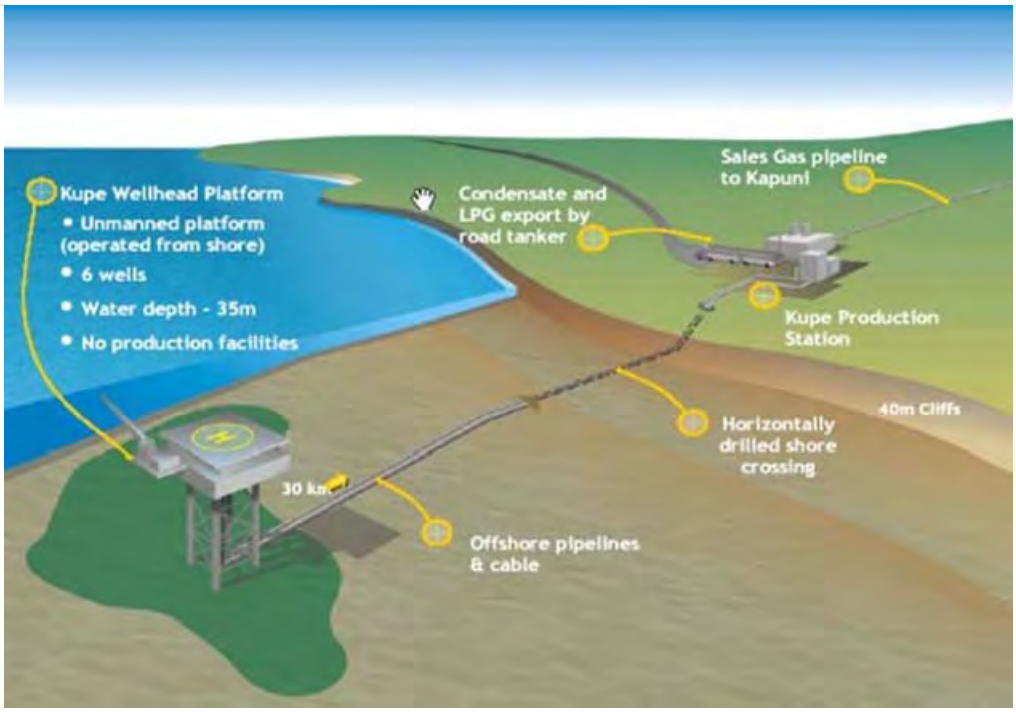

Figure 2 Components of the Kupe Gas Project

Note: Figure 2 sourced from: http://www.originenergy.com.au/1222/Kupe-Gas-Project

1.3 Resource consents

The Company holds 14 resource consents the details of which are summarised in the table below and outlined in sections 1.3.1 to 1.3.6.

Table 1 Summary of resource consents held by Beach Energy for the Kupe Production Station

Consent number	Purpose	Granted	Review	Expires
6543-1	To discharge pipeline hydrotesting water and treated stormwater from the Kupe Production Station via a stormwater/firewater storage pond system, and to discharge stormwater from the Dangerous Goods Storage stormwater system into the Kapuni Stream	June 2005	June 2023	June 2039

Consent number	Purpose	Granted	Review	Expires
6531-1	To disturb the seabed and foreshore of the coastal marine area by the process of erection, placement, use, alteration, extension, maintenance or removal of up to six pipelines and one power/fibre optic cable connecting an offshore wellhead/platform to the foreshore at mean high water spring	December 2005	June 2023	June 2039
6532-1	To erect, place, use, reconstruct, alter, extend and maintain within the coastal marine area up to six pipelines connecting an offshore wellhead/platform to the foreshore at mean high water spring, with structures situated under the seabed from approximately 1,200 metres offshore to mean high water spring, and the related occupation of the seabed	December 2005	June 2023	June 2039
6533-1	To occupy the coastal marine area for a distance of 250 metres either side of the centre-line of a 100 metre wide pipeline corridor, from the outer limit of the territorial sea of New Zealand to mean high water spring, in a manner that will restrict public access	December 2005	June 2023	June 2039
6545-1	To discharge emissions to air from combustion involving the flaring of petroleum products incidental to the treatment of gas at the Kupe Production Station	June 2005	June 2023	June 2039
6546-1	To discharge emissions to air as products of combustion from the Kupe Production Station involving equipment burning natural gas as fuel where the maximum heat release is in excess of 10 megawatts, together with miscellaneous emissions	June 2005	June 2023	June 2039
6629-1	To erect, place, use, reconstruct, alter, extend and maintain within the coastal marine area one power/fibre optic cable connecting an offshore wellhead/platform to the foreshore at mean high water spring, with structures situated under the seabed from approximately 1200 metres offshore to mean high water spring, and the related occupation of the seabed	October 2005	June 2023	June 2039
6979-1	To install, construct and maintain up to seven water bores for horizontal directional drilling, pipeline hydro-testing, and production station operation purposes	November 2006	June 2023	June 2039
7010-1	To take and use up to 3,500 m^3/day groundwater at a maximum rate of 40 L/s as a combined total from up to seven water bores in a bore field for the purpose of horizontal directional drilling, pipeline hydro-testing, production station operation at the Kupe production station and operations at the Manutahi-D, Manutahi-C, and Kauri-F wellsites	November 2006	June 2023	June 2039

1.3.1 Water abstraction permit

Section 14 of the RMA stipulates that no person may take, use, dam or divert any water, unless the activity is expressly allowed for by a resource consent or a rule in a regional plan, or it falls within some particular categories set out in Section 14.

Beach Energy holds water permit **7010-1** to take and use up to 3,500 m^3/day groundwater at a maximum rate of 40 L/s as a combined total from up to seven water bores in a bore field for the purpose of horizontal directional drilling, pipeline hydro-testing, production station operation at the Kupe production station and operations at the Manutahi-D, Manutahi-C, and Kauri-F wellsites. This permit was issued by the Council on 2 November 2006 under Section 87(e) of the RMA. Changes to the conditions of the consent were made on 25 July 2007 and 13 October 2011. It is due to expire on 1 June 2039.

There are 12 special conditions attached to the consent.

Condition 1 requires that the consent be exercised in accordance with the applications.

Condition 2 requires that the consent holder notify Council prior to the exercise of the consent.

Condition 3 requires that details of pump testing are supplied.

Conditions 4 and 5 limit the volume and rate of abstraction.

Condition 6 states that the abstraction shall not cause the intrusion of saltwater into any aquifer.

Condition 7 requires the consent holder to maintain daily records of the abstraction.

Conditions 8, 9 and 10 relate to monitoring.

Conditions 11 and 12 are lapse and review provisions.

The permit is attached to this report in Appendix I.

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.

1.3.2 Water discharge permit

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

Beach Energy holds water discharge permit **6543-1** to discharge pipeline hydrotesting water and treated stormwater from the Kupe Production Station via a stormwater/firewater storage pond system, and to discharge stormwater from the Dangerous Goods Storage stormwater system into the Kapuni Stream. This permit was issued by the Taranaki Regional Council on 21 June 2005 under Section 87(e) of the Resource Management Act. Changes to the conditions of the consent were made on 14 December 2006 and 31 January 2013. A change to the conditions was also made during the current monitoring period, increasing the allowable chloride concentration limit from 50 g/m^3 to 230 g/m^3. It is due to expire on 1 June 2039.

There are 11 special conditions attached to the consent.

Condition 1 requires that the consent is exercised in accordance with the application.

Condition 2 requires the consent holder to provide detailed plans of the stormwater catchment and drainage pathways.

Condition 3 required the consent holder to notify the Council prior to the exercise of the consent.

Condition 4 requires the consent holder to review the contingency plan for the site and include, if necessary, the new Dangerous Goods Store.

Condition 5 requires the consent holder to adopt the best practicable option to prevent or minimise environmental effects.

Condition 6 requires that water discharged is directed for treatment through the stormwater treatment system.

Condition 7 requires that hazardous substance storage areas are bunded.

Condition 8 places limits on various contaminants not to be exceeded in the discharge, while condition 9 limits effects below the mixing zone.

Conditions 10 and 11 are lapse and review provisions.

The permit is attached to this report in Appendix I.

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.

1.3.3 Air discharge permits

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

Beach Energy holds air discharge permit **6545-1** to discharge emissions to air from combustion involving the flaring of petroleum products incidental to the treatment of gas at the Kupe Production Station. This permit was issued by the Council on 21 June 2005 under Section 87(e) of the RMA. Changes to the consent conditions were granted in April 2007. It is due to expire on 1 June 2039.

There are 21 special conditions attached to the consent.

Condition 1 requires that the consent is undertaken in accordance with the application.

Condition 2 requires that the consent holder adopt the best practicable option to prevent or minimise environmental effects.

Condition 3 requires the consent holder to minimise emissions and impacts of contaminants.

Condition 4 requires that the consent holder provide an analysis of a typical gas and/or condensate stream upon request, while condition 5 requires a report be provided in May of each year detailing various aspects of flaring.

Condition 7 requires the consent holder to supply a final site lay-out plan.

Conditions 6 and 8 to 14 deal with flaring, including notification, incidents, and flaring logs.

Conditions 15 and 16 relate to effects beyond the site boundary.

Conditions 17, 18 and 19 limit the discharge of contaminants including carbon monoxide and nitrogen dioxide.

Conditions 20 and 21 are lapse and review provisions.

Beach Energy also holds air discharge permit **6546-1** to discharge emissions to air as products of combustion from the Kupe Production Station involving equipment burning natural gas as fuel where the maximum heat release is in excess of 10 megawatts, together with miscellaneous emissions. This permit was issued by the Council on 21 June 2005 under Section 87(e) of the RMA. It is due to expire on 1 June 2039.

There are 17 special conditions attached to the consent. These are similar to those for consent 6546-1 above.

The permits are attached to this report in Appendix I.

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.

1.3.4 Land use permit

Section 13(1)(a) of the RMA stipulates that no person may in relation to the bed of any lake or river use, erect, reconstruct, place, alter, extend, remove, or demolish any structure or part of any structure in, on, under, or over the bed, unless the activity is expressly allowed for by a resource consent, a rule in a regional plan, or by national regulations.

Beach Energy holds water permit **6979-1** to install, construct and maintain up to seven water bores for horizontal directional drilling, pipeline hydro-testing, and production station operation purposes. This permit was issued by the Council on 1 November 2006 under Section 87(e) of the RMA. It is due to expire on 1 June 2039.

There are eight special conditions attached to the consent.

Condition 1 requires that the consent is exercised in accordance with the application.

Condition 2 requires the consent holder to supply a bore log for each bore.

Condition 3 states that the bores be cased and sealed.

Condition 4 requires the consent holder to mitigate any adverse environmental effects.

Conditions 5 and 6 relate to decommissioning of the bores.

Conditions 7 and 8 are lapse and review provisions.

The permit is attached to this report in Appendix I.

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.

1.3.5 Coastal permits

Section 12(1)(b) of the RMA stipulates that no person may erect, reconstruct, place, alter, extend, remove, or demolish any structure that is fixed in, on, under, or over any foreshore or seabed, unless the activity is expressly allowed for by a resource consent, a rule in a regional plan, or by national regulations.

Beach Energy holds consent **6531-1** to disturb the seabed and foreshore of the coastal marine area by the process of erection, placement, use, alteration, extension, maintenance or removal of up to six pipelines and one power/fibre optic cable connecting an offshore wellhead/platform to the foreshore at mean high water spring. Consent 6531-1 is for a restricted coastal activity where the consent was issued by the Minister of Conservation on 9 December 2005. It is due to expire on 1 June 2039.

There are 12 special conditions attached to the consent.

Condition 1 requires that the consent is exercised in accordance with the application.

Conditions 2, 3 and 5 require the consent holder to provide a detailed pipe laying management plan, a programme of installation and a construction contingency plan.

Condition 4 requires notification prior to maintenance works.

Condition 6 states that the consent holder shall adopt the best practicable option to minimise adverse environmental effects.

Condition 7 requires that disturbance of the seabed is minimised, while condition 8 requires that this disturbance be contained within a 100 metre wide disturbance corridor.

Condition 9 requires that all works shall comply with noise standards.

Condition 10 states that work is to cease should archaeological remains be discovered.

Condition 11 requires the consent holder undertake pre and post-lay surveys of the pipeline corridor.

Conditions 12 and 13 are lapse and review provisions.

Beach Energy also holds consent **6532-1** to erect, place, use, reconstruct, alter, extend and maintain within the coastal marine area up to six pipelines connecting an offshore wellhead/platform to the foreshore at mean high water spring, with structures situated under the seabed from approximately 1,200 metres offshore to mean high water spring, and the related occupation of the seabed. Consent 6532-1 is for a restricted coastal activity where the consent was issued by the Minister of Conservation on 9 December 2005. It is due to expire on 1 June 2039.

There are 12 special conditions attached to the consent.

Condition 1 requires that the consent is exercised in accordance with the application.

Conditions 2, 3 and 5 require the consent holder to provide a detailed pipe laying management plan, a programme of installation and a construction contingency plan.

Condition 4 requires notification prior to maintenance works.

Condition 6 states that the consent holder shall adopt the best practicable option to minimise adverse environmental effects.

Condition 7 requires all works shall comply with noise standards.

Condition 8 requires the consent holder to survey and map the position of the structures.

Condition 9 requires the consent holder undertake pre and post-lay surveys of the pipeline corridor.

Condition 10 states that the structure shall be removed and the area reinstated, if and when it is no longer required.

Conditions 11 and 12 are lapse and review provisions.

Beach Energy also holds consent **6629-1** to erect, place, use, reconstruct, alter, extend and maintain within the coastal marine area one power/fibre optic cable connecting an offshore wellhead/platform to the foreshore at mean high water spring, with structures situated under the seabed from approximately 1200 metres offshore to mean high water spring, and the related occupation of the seabed. This consent was issued by the Council on 28 October 2005 under Section 87(e) of the RMA. It is due to expire in June 2039.

There are 12 special conditions attached to the consent. They are the same as those for consent 6532-1 above.

Beach Energy also holds consent **6533-1** to occupy the coastal marine area for a distance of 250 metres either side of the centre-line of a 100 metre wide pipeline corridor, from the outer limit of the territorial sea of New Zealand to mean high water spring, in a manner that will restrict public access. Consent 6533-1 is for a restricted coastal activity where the consent was issued by the Minister of Conservation on 9 December 2005. It is due to expire on 1 June 2039.

There are six special conditions attached to the consent.

Condition 1 requires that the consent is exercised in accordance with the application.

Condition 2 states that public access shall not be restricted unless required.

Condition 3 requires notification prior to works involving the restriction of public access.

Condition 4 requires the consent holder to survey and map the position of the structure.

Conditions 5 and 6 are lapse and review provisions.

The permits are attached to this report in Appendix I.

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.

1.3.6 Related consents

Beach Energy also holds a number of consents relating to the development phase of the Kupe facilities which did not require active monitoring during the period under review. A summary of these consents is provided in Table 2.

Table 2 Consents related to the development phase of the Kupe facilities

Consent number	Purpose	Issue date	Expiry
6534-1	To discharge up to 1000 cubic metres of contaminants [up to 600 cubic metres of drilling muds, drilling cuttings and aquifer water and up to 400 cubic metres of gauge run water] from two horizontal directional drilling exit points through the seabed approximately 1200 metres from mean high water spring within the coastal marine area	28/10/2005	2039
6535-1	To divert water from aquifers in the coastal marine area likely to be encountered during activities associated with horizontal directional drilling of two drill lines	28/10/2005	2039
6536-1	To discharge stormwater and sediment from earthworks associated with the construction of a horizontal directional drilling site onto and into land	6/11/2006	2023
6537-1	To discharge treated stormwater from a horizontal directional drilling site onto and into land	6/11/2006	2023
6542-1	To discharge stormwater and sediment from earthworks associated with the construction and installation of the Kupe Production Station and associated stormwater treatment facilities onto and into land in the vicinity of the Kapuni Stream	14/12/2006	2023

The permits are attached to this report in Appendix I.

1.4 Monitoring programme

1.4.1 Introduction

Section 35 of the RMA sets obligations upon 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 Kupe Production Station site consisted of four primary components.

1.4.2 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.

1.4.3 Site inspections

The Kupe Production Station was visited seven times during the monitoring period. With regard to consents for the abstraction of or discharge to water, the main points of interest were plant processes with potential or actual discharges to receiving watercourses, including contaminated stormwater and process wastewaters. Air inspections focused on plant processes with associated actual and potential emission sources and characteristics, including potential odour, dust, noxious or offensive emissions. Sources of data being collected by the Company 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.

1.4.4 Chemical sampling

The Council undertook sampling of the ambient air quality outside the boundary of the site. A multi-gas meter was deployed on one occasion in the vicinity of the plant, with monitoring consisting of continuous measurements of gas concentrations for the gases of interest (carbon monoxide and combustible gases). A PM_{10} particulate monitor was deployed concurrently with the multi-gas meter. Two nitrogen oxide measuring devices were also deployed in the vicinity of the plant on one occasion during the year under review. The Company supplied data on flaring causes and flare and fuel gas volumes throughout the period.

1.4.5 Biomonitoring surveys

A biological survey was performed on two occasions in the Kapuni Stream to determine whether or not the discharge of treated stormwater and uncontaminated site and process effluent from the site has had a detrimental effect upon the communities of the stream.

2 Results

2.1 Water

2.1.1 Inspections

Seven inspections were carried out at the Kupe Production Station in the 2017-2018 year. The following was found during the inspections:

7 August 2017

The stormwater system was clear of contaminants after significant rainfall over the weeks prior. The wetland area and fire water ponds were clear.

Minimal flaring was occurring at the time of the inspection and the emission controls for flaring were effective with no smoke or odours noted.

2 October 2017

The site was neat and tidy. The ring drains and wetland area were clear of contaminants.

8 November 2018

The ring drains and bunds were all clear. There was abundant aquatic life in the fire water ponds and wetland area indicating good water quality.

A small pilot flare was burning with no smoke or odours noted.

8 January 2018

The site was neat and tidy. The fire water and wetland areas were clear of contaminants, with clear water and abundant frogs present indicating good water quality.

No flaring was being undertaken and no smoke or odours were noted.

25 March 2018

A site inspection was undertaken following heavy rainfall over the weeks prior. The fire water pond and the wetland system were clear of any contaminants. All ring drains and bunds were clear of any debris or contaminants and the water within the systems was clear apart from some algae build up. The water bore areas and all structures were secure.

A pilot flare was operating at the time of the inspection. A down-wind odour survey found no odours or smoke off-site.

30 April 2018

The ring drains and bunds, including the wetland area and fire water pond, were found to be clear of contaminants. Frogs and other aquatic species were in abundance indicating good water quality. The water bore area was neat and tidy.

Minimal flaring was being undertaken and no odours or smoke were noted.

28 June 2018

All stormwater systems were satisfactory, with ring drains and bunds clear.

Minimal flaring was being undertaken and this did not give rise to any off-site effects.

2.1.2 Results of discharge monitoring

Origin Energy records the volume of each discharge which is pumped from the site to the outlet structure adjacent to the Kapuni Stream. A summary of the total volume of stormwater discharged each month is provided in Figure 3.

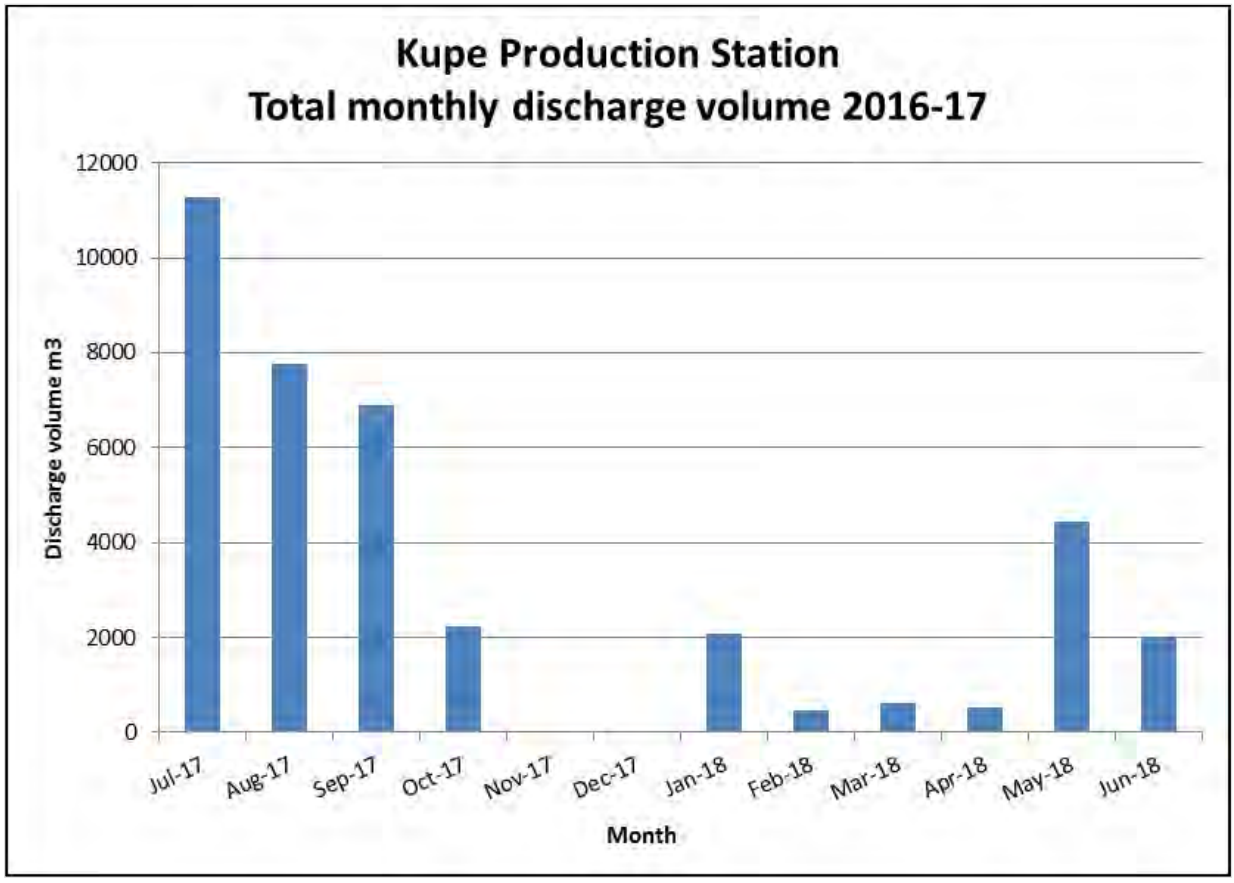

Figure 3 Stormwater discharge volumes for Kupe Production Station

2.1.3 Results of receiving environment monitoring

The Council's standard 'kick-sampling' technique was used at three established sites to collect streambed macroinvertebrates from the Kapuni Stream on 20 October 2017 and 6 March 2018 (Figure 4). Samples were processed to provide number of taxa (richness), MCI and $SQMCI_S$ scores, and EPT taxa for each site.

Taxa richness is the most robust metric when ascertaining whether a macroinvertebrate community has been exposed to toxic discharges. When exposed to toxic discharges, macroinvertebrates 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 differing sensitivity to organic pollution. The $SQMCI_s$ is similar to the MCI, but accounts for relative abundances of the taxa found as well as sensitivity to pollution. Significant differences in taxa richness, MCI or $SQMCI_s$ between sites may indicate the degree of adverse effects (if any) of the discharges being monitored.

The spring survey in October recorded similar taxa richnesses, MCI scores and $SQMCI_s$ scores between sites, with the exception of MCI score at site 2 which was significantly higher than that recorded at sites 1 and 3. Taxa richnesses were similar to both median richnesses and those recorded in the preceding survey. MCI scores were not significantly different from medians for sites 1 and 3. However the score for site 2 was significantly higher than the median score, the previous survey score for this site, and the other two sites in

the current survey. $SQMCI_s$ scores at sites 1 and 3 were insignificantly lower than those recorded in the preceding survey, (while site 2 was insignificantly higher) and similar to median scores. The categorisation of MCI has improved from the previous survey from 'fair' to 'good' at all three sites.

The late summer survey also recorded similar taxa richnesses between sites, which were similar to or lower than medians and preceding scores. MCI scores decreased in a downstream direction, with site 1 recording its highest score to date, which was significantly higher than the score at site 3. Scores were similar to the preceding survey, with the exception of site 2, which decreased significantly. $SQMCI_S$ scores were at sites 1 and 2 were significantly higher than at site 3, and were significantly higher than historic medians. $SQMCI_S$ scores at all three sites were similar to the preceding survey.

Overall, there was no evidence to indicate that the stormwater discharges from the Kupe Production Station had caused adverse effects on the macroinvertebrate communities of the Kapuni Stream.

The full reports are attached in Appendix II.

Figure 4 Location of the Kupe Production Station and associated monitoring sites

2.1.4 Summary of water abstractions reported by Origin Energy

Figure 5 provides a summary of the total daily abstraction volumes for the consented groundwater take from the Kupe bore field for operational purposes at the Kupe Production Station. The abstraction volumes were well below the 3,500 m^3/day allowed by condition 4 of consent 7010-1, with a maximum take volume of 1,047 m^3/day recorded in July 2017. The maximum rate of take recorded was 12 L/s, well below the 40 L/s allowed by the consent. The great majority of the abstraction occurred via the DT-1 bore, with less than 3 percent of the total take coming from the HB-1 bore.

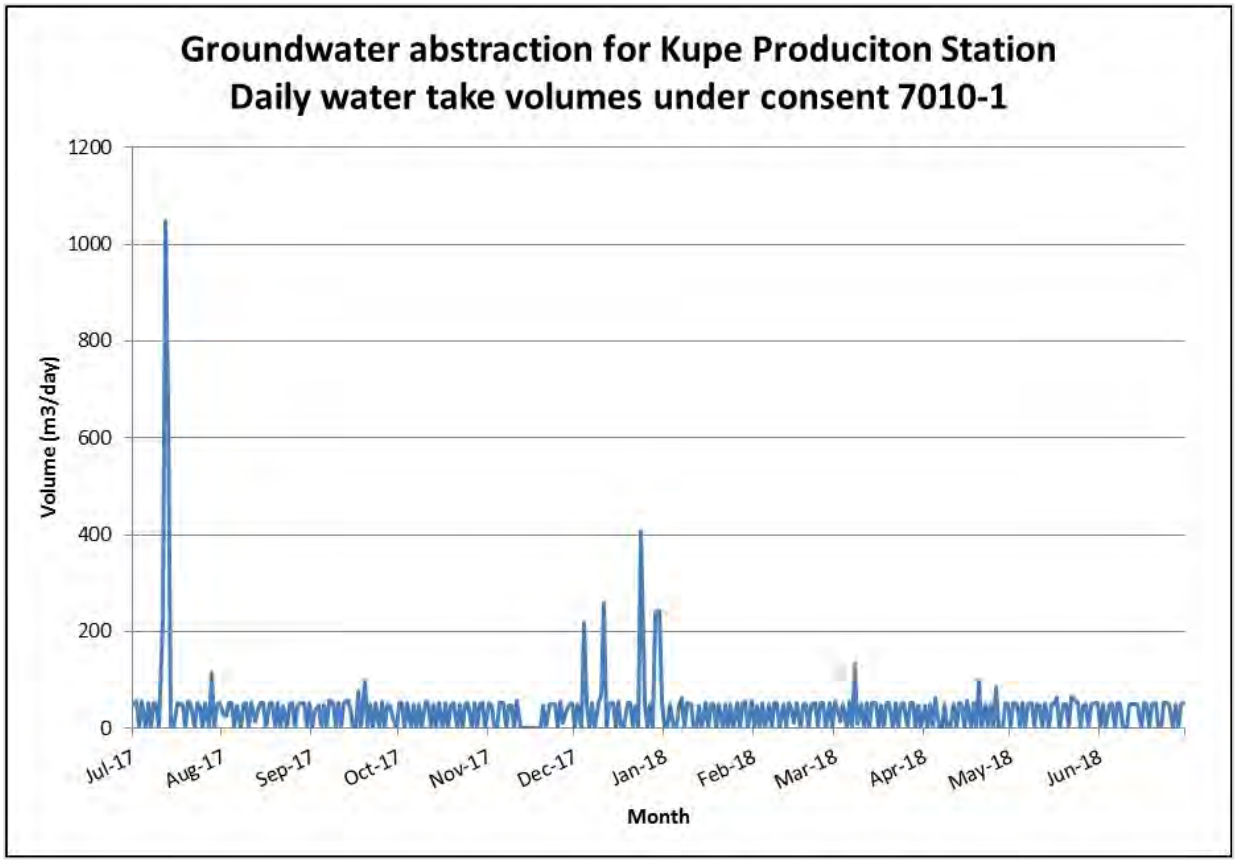

Figure 5 Daily water abstraction volumes for Kupe Production Station under consent 7010-1

2.2 Air

2.2.1 Inspections

Air inspections were carried out in conjunction with site inspections as discussed in section 2.1.1 above. No issues regarding air quality were noted during the monitoring year.

2.2.2 Results of receiving environment monitoring

2.2.2.1 Carbon monoxide and combustible gases

During the monitoring year, a multi-gas meter was deployed on one occasion in the vicinity of the plant. The deployment lasted approximately 24 hours, with the instrument placed in a down-wind position at the start of the deployment. Monitoring consisted of continuous measurements of gas concentrations for the gases of interest (carbon monoxide and combustible gases). The monitoring sites used in the year under review are shown in Figure 6.

Because of the nature of the activities on the site, it was considered that the primary information of interest in respect of gases potentially emitted from the site was the average downwind concentration, rather than any instantaneous peak value. That is, the long-term exposure levels, rather than short-term maxima, are of most interest. The gas meter was therefore set up to create a data set based on recording the average concentration measured during each minute as raw data.

The details of the sample run are summarised in Table 3 and the data from the sample run are presented graphically in Figure 7.

Figure 6 Air monitoring sites at Kupe Production Station for 2017-2018

Table 3 Results of carbon monoxide and LEL monitoring at Kupe Production Station

Period (from-to)		9 to 10 May 2018 24 hours
Max	CO(ppm)	8.10
	LEL(%)	0.10
Mean	CO(ppm)	0.23
	LEL(%)	0.00
Min	CO(ppm)	0.00
	LEL(%)	0.00

Notes: (1) the instrument records in units of ppm. At 25°C and 1 atm, 1ppm CO = 1.145 mg/m^3
(2) because the LEL of methane is equivalent to a mixture of approximately 5% methane in air, then the actual concentration of methane in air can be obtained by dividing the percentage LEL by 20.

The consents covering air discharges from Kupe Production Station have specific limits related to particular gases. Special condition 17 of consent 6545-1 sets limits on the carbon monoxide, nitrogen dioxide and fine particle (PM_{10}) concentrations at or beyond the production station's boundary. The limit on the carbon monoxide is expressed as 10 mg/m^3 for an eight hour average or 30 mg/m^3 for a one hour average exposure. The maximum concentration of carbon monoxide found during the monitoring run was 9.3 mg/m^3 while the average concentration for the entire dataset was 0.26 mg/m^3 which comply with consent conditions. This is consistent with the pattern found in previous years.

Lower Explosive Limit (LEL) gives the percentage of the lower explosive limit, expressed as methane that is detected in the air sampled. The sensor on the instrument reacts to gases and vapours such as acetone, benzene, butane, methane, propane, carbon monoxide, ethanol, and higher alkanes and alkenes, with varying degrees of sensitivity. The Council's Regional Air Quality Plan has a typical requirement that no discharge shall result in dangerous levels of airborne contaminants, including any risk of explosion. At no time did the level of explosive gases downwind of the Kupe Production Station reach any more than a trivial level.

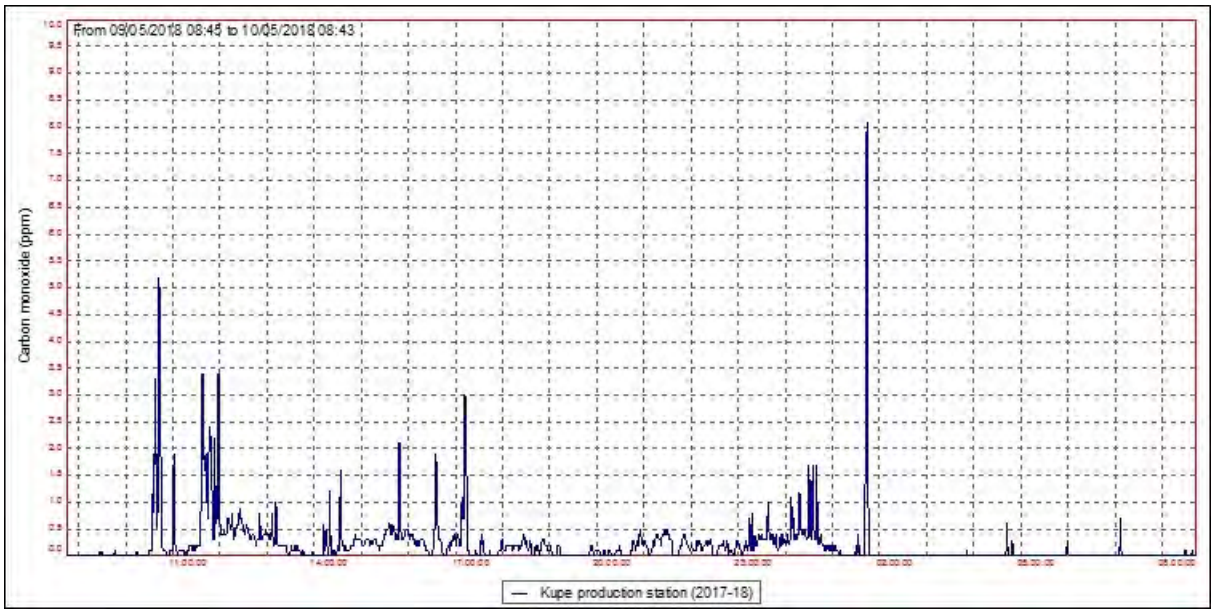

Figure 7 Ambient CO levels in the vicinity of Kupe Production Station

2.2.2.2 PM_{10} particulates

In September 2004 the Ministry for the Environment enacted National Environmental Standards (NESs) relating to certain air pollutants. The NES for PM_{10} particulates is 50 µg/m³ (24 hour average).

Particulates can be derived from many sources, including motor vehicles (particularly diesel), solid and oil-burning processes for industry and power generation, incineration and waste burning, photochemical processes, and natural sources such as pollen, abrasion, and sea spray.

PM_{10} particles are linked to adverse health effects that arise primarily from the ability of particles of this size to penetrate the defences of the human body and enter deep into the lungs, significantly reducing the exchange of gases across the lung walls. Health effects from inhaling PM_{10} include increased mortality and the aggravation of existing respiratory and cardiovascular conditions such as asthma and chronic pulmonary diseases.

During the reporting period, a DustTrak PM_{10} monitor was deployed on one occasion in the vicinity of Kupe Production Station. The deployment lasted approximately 24 hours, with the instrument placed in a down-wind position at the start of the deployment. Monitoring consisted of continual measurements of PM_{10} concentrations. The location of the DustTrak monitor during the sampling run is shown in Figure 6. The results of the sample run are presented in Figure 8 and Table 4.

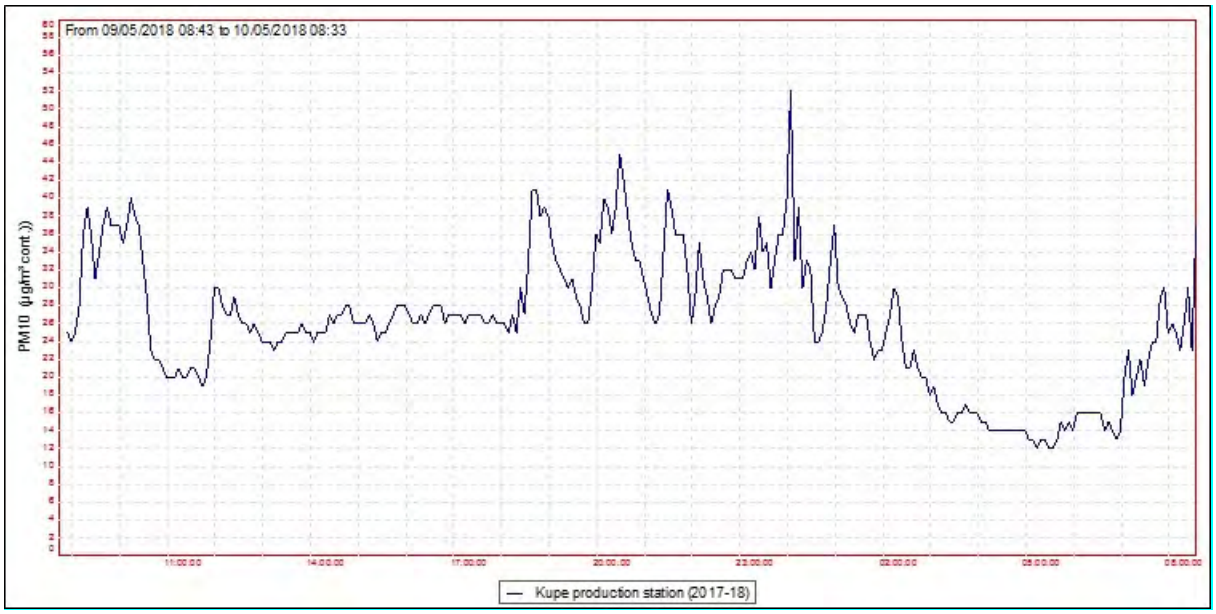

Figure 8 PM_{10} concentrations (µg/m³) at Kupe Production Station

Table 4 Daily averages of PM_{10} results from monitoring at Kupe Production Station

	9 to 10 May 2018 (24 hours)	
24 hr. set	Day 1	Day 2
Daily average	26.2 µg/m³	N/A
NES	50µg/m³	

During the 24 hour run, from 9 to 10 May 2018, the average recorded PM_{10} concentration for the 24 hour period was 26.2 µg/m³. This daily mean equates to 52% of the 50 µg/m³ value that is set by the NES. Background levels of PM_{10} in the region have been found to be typically around 11 µg/m³.

2.2.2.3 Nitrogen oxides

From 2014 onwards, the Council implemented a coordinated region-wide compliance monitoring programme to measure nitrogen oxides (NOx). The programme involves deploying measuring devices at 24 NOx monitoring sites (including two sites in the vicinity of Kupe Production Station) on the same day, with retrieval three weeks later. This approach assists the Council in further evaluating the effects of local and regional emission sources and ambient air quality in the region.

The consent covering air discharges from the Kupe Production Station has specific limits related to particular gases. Special condition 18 of consent 6545-1 sets a limit on the nitrogen dioxide concentration at or beyond the production station's boundary. The limit is expressed as 200 µg/m³ for a one hour average or 100 µg/m³ for a 24 hour average exposure.

NOx passive adsorption discs were place at two locations in the vicinity of the Kupe Production Station on one occasion during the year under review. The discs were left in place for a period of 21 days. The calculated one hour and 24 hour theoretical maximum NOx concentrations found at Kupe Production Station during the year under review equate to 8.3 µg/m³ and 4.4 µg/m³, respectively. The results show that the ambient ground level concentration of NOx is well below the limits set out by consent 6545-1.

The full air monitoring report is attached to this report in Appendix III.

2.2.3 Summary of flaring volumes reported by Origin Energy

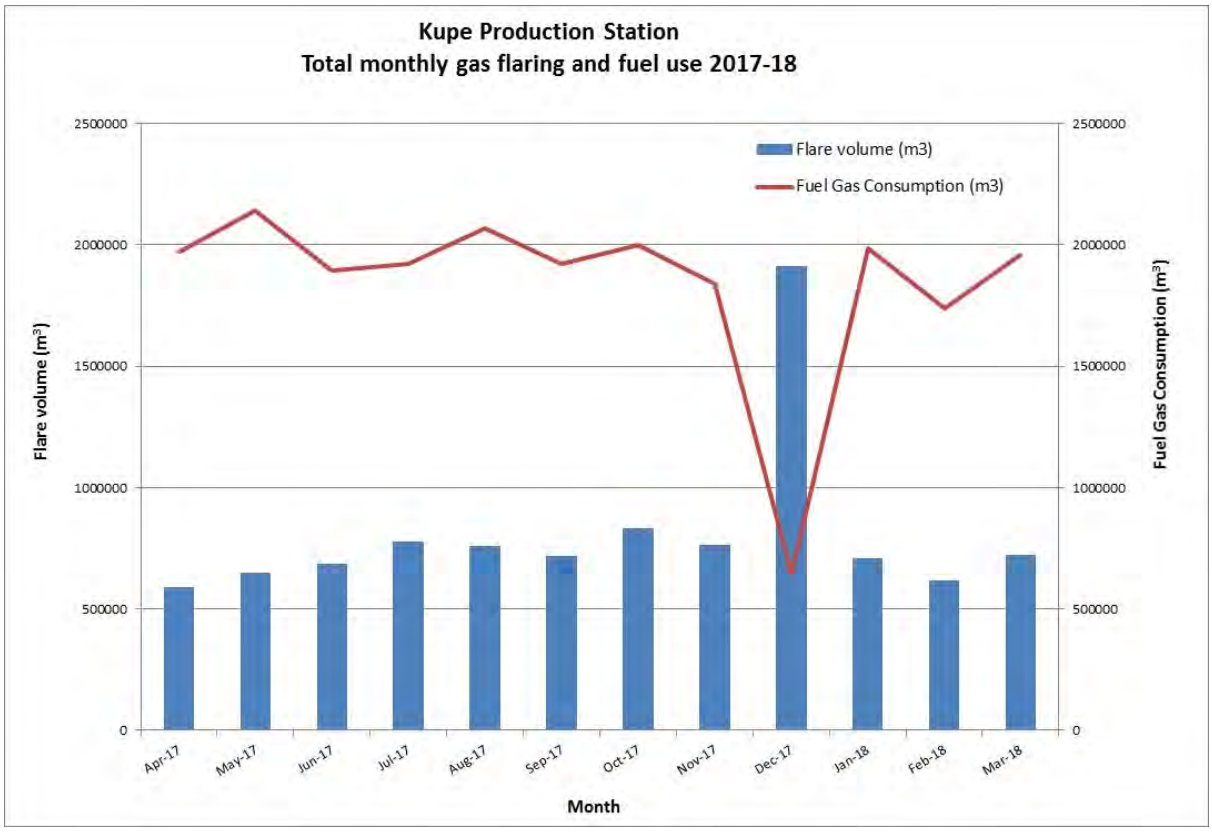

Figure 9 Monthly gas flaring and fuel use for Kupe Production Station

A summary of gas flaring and fuel use at Kupe Production Station under consents 6545-1 and 6546-1 is provided in Figure 9.

The total volume flared over the period (April 2017 – March 2018) was 9,735,190 m^3, a significant increase compared with the previous 12 months (5,343,870 m^3). The quantities flared each month vary and most flaring is related to process incidents, for example: compressor trips, compressor maintenance activities, weather events affecting power supply, and when gas flows are off-specification. De-pressuring and purging of LPG bullets and isolation of mono-ethlyene glycol tanks, and produced water tanks for the ten-year inspections also contributed to the increased flaring during the period. No visible smoke events were recorded and no complaints regarding flaring or other air emissions at the production station were received by the Company or the Council during the 2017-2018 period.

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

The Council operates and maintains a register of all complaints or reported and discovered excursions from acceptable limits and practices, including non-compliance with consents, which may damage the environment. The incident register 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 2017-2018 period, the Council was not required to undertake significant additional investigations and interventions, or record incidents, in association with the Company's conditions in resource consents or provisions in Regional Plans.

3 Discussion

3.1 Discussion of site performance

Monitoring of the Kupe Production Station during the 2017-2018 year found that the site was well managed. All consent conditions relating to site operations and management were complied with.

3.2 Environmental effects of exercise of consents

Site inspections found that the stormwater systems were constructed and maintained in accordance with consent conditions and operating effectively.

Biomonitoring of the receiving waters did not indicate that the stormwater discharges from the Kupe Production Station had caused adverse effects on the water quality of the Kapuni Stream.

There were no adverse effects on the environment resulting from the exercise of the air discharge consents. The ambient air quality monitoring at the site showed that levels of carbon monoxide, combustible gases, PM_{10} particulates and nitrogen oxides were all below levels of concern at the time of sampling. No offensive or objectionable odours were detected beyond the boundary during inspections and there were no complaints in relation to air emissions from the site.

3.3 Evaluation of performance

A tabular summary of the consent holder's compliance record for the year under review is set out in Table 5 to Table 13.

Table 5 Summary of performance for consent 6531-1

Purpose: ***To disturb the seabed and foreshore of the coastal marine area by the process of erection, placement, use, alteration, extension, maintenance or removal of up to six pipelines and one power/fibre optic cable connecting an offshore wellhead/platform to the foreshore at mean high water spring***		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Exercise of consent in accordance with application	Inspection and liaison with consent holder	Yes
2. Pipe laying management plan to be provided	Provided February 2007	Yes
3. Programme of installation to be provided	Provided February 2007	Yes
4. Notification prior to maintenance work	No maintenance work during monitoring period	Yes
5. Contingency plan to be provided	Latest update received August 2016	Yes
6. Best practicable option to prevent or minimise adverse effects	Inspection and liaison with consent holder	Yes
7. Seabed disturbance to be minimised	No disturbance during monitoring period	N/A
8. Disturbance to be within a 100 m corridor	No disturbance during monitoring period	N/A

Purpose: *To disturb the seabed and foreshore of the coastal marine area by the process of erection, placement, use, alteration, extension, maintenance or removal of up to six pipelines and one power/fibre optic cable connecting an offshore wellhead/platform to the foreshore at mean high water spring*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
9. Disturbance to comply with noise standards	No disturbance during monitoring period	N/A
10. Work to cease on discovery of archaeological remains	No remains discovered	N/A
11. Consent holder to undertake pre and post lay monitoring surveys	Surveys complete	Yes
12. Lapse of consent	Consent exercised	N/A
13. Optional review provision re environmental effects	Next optional review scheduled in June 2023	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**

N/A = not applicable

Table 6 Summary of performance for consent 6532-1

Purpose: *To erect, place, use, reconstruct, alter, extend and maintain within the coastal marine area up to six pipelines connecting an offshore wellhead/platform to the foreshore at mean high water spring, with structures situated under the seabed from approximately 1,200 metres offshore to mean high water spring, and the related occupation of the seabed*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Exercise of consent in accordance with application	Inspection and liaison with consent holder	Yes
2. Pipe laying management plan to be provided	Provided February 2007	Yes
3. Programme of installation to be provided	Provided February 2007	Yes
4. Notification prior to maintenance work	No maintenance during period under review	N/A
5. Contingency plan to be provided	Latest update received August 2016	Yes
6. Best practicable option to prevent or minimise adverse effects	No maintenance during period under review	N/A
7. Disturbance to comply with noise standards	No maintenance during period under review	N/A
8. Survey and map of position of pipeline to be provided	Provided by consent holder	Yes

Purpose: *To erect, place, use, reconstruct, alter, extend and maintain within the coastal marine area up to six pipelines connecting an offshore wellhead/platform to the foreshore at mean high water spring, with structures situated under the seabed from approximately 1,200 metres offshore to mean high water spring, and the related occupation of the seabed*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
9. Consent holder to undertake pre and post lay monitoring surveys	Surveys complete	Yes
10. Structures to be removed and area reinstated if and when no longer required	Structures still in use	N/A
11. Lapse of consent	Consent exercised	N/A
12. Optional review provision re environmental effects	Next optional review scheduled in June 2023	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**

Table 7 Summary of performance for consent 6533-1

Purpose: *To occupy the coastal marine area for a distance of 250 metres either side of the centre-line of a 100 metre wide pipeline corridor, from the outer limit of the territorial sea of New Zealand to mean high water spring, in a manner that will restrict public access*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Exercise of consent in accordance with application	Inspection and liaison with consent holder	Yes
2. Public access to be maintained	Inspection and liaison with consent holder	Yes
3. Notification prior to works involving restriction of public access	No works requiring restriction carried out during period	N/A
4. Consent holder to survey and map position of the structure	Provided by consent holder	Yes
5. Lapse of consent	Consent exercised	N/A
6. Optional review provision re environmental effects	Next optional review scheduled in June 2023	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**

Table 8 Summary of performance for consent 6543-1

Purpose: *To discharge pipeline hydrotesting water and treated stormwater from the Kupe Production Station via a stormwater/firewater storage pond system, and to discharge stormwater from the Dangerous Goods Storage stormwater system into the Kapuni Stream*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Exercise of consent in accordance with application	Inspection and liaison with consent holder	Yes
2. Plans of stormwater catchment and drainage pathways to be provided on completion of site	Plans received on completion	Yes
3. Notification prior to exercise of consent	Notifications received	Yes
4. Consent holder to review contingency plan for the site to include Dangerous Goods Store (DGS)	Latest update received August 2016	Yes
5. Consent holder to adopt best practicable option	Inspection and liaison with consent holder	Yes
6. All discharges to be treated through stormwater treatment system (excluding DGS)	Inspection	Yes
7. All hazardous substance storage areas to be bunded	Inspection	Yes
8. Limits on contaminants in discharge	Not sampled during period under review	N/A
9. Effects in receiving water	Inspections and biomonitoring	Yes
10. Lapse of consent	Consent exercised	N/A
11. Optional review provision re environmental effects	Next optional review scheduled in June 2023	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**

Table 9 Summary of performance for consent 6545-1

Purpose: *To discharge emissions to air from combustion involving the flaring of petroleum products incidental to the treatment of gas at the Kupe Production Station*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Exercise of consent in accordance with application	Inspection and liaison with consent holder	Yes
2. Consent holder to adopt best practicable option	Inspection and liaison with consent holder	Yes

Purpose: *To discharge emissions to air from combustion involving the flaring of petroleum products incidental to the treatment of gas at the Kupe Production Station*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
3. Most appropriate process equipment to minimise emissions	Inspection and liaison with consent holder	Yes
4. Consent holder to provide analysis of typical gas stream on request	Not requested during period under review	N/A
5. Consent holder to supply Council with report in May each year	Received May 2018	Yes
6. Consent holder to consult with Council prior to significantly altering equipment or processes	Inspection and liaison with consent holder	Yes
7. Consent holder to provide a final site layout prior to commencement of production	Plans received	Yes
8. Notification to neighbours prior to commissioning	Letter sent by Origin Energy in October 2009	Yes
9. Notification of incidents	No incidents reported	Yes
10. Consent holder to supply record of all smoke emitting incidents upon request	Flaring report received	Yes
11. Consent holder to maintain a log of all continuous flaring incidents	Flaring report received	Yes
12. All practicable steps undertaken to minimise flaring	Measures discussed in flaring report	Yes
13. Prevention of dense black smoke from being discharged from flare	Inspection and liaison with consent holder	Yes
14. Consent holder to notify Council of continuous flaring	Notifications received	Yes
15. Discharge not to give rise to odour, dust or smoke beyond the boundary	Inspection	Yes
16. Discharge not to give rise to hazardous, toxic or noxious contaminant beyond the boundary	Inspection and ambient air monitoring	Yes
17. Limits on carbon monoxide in the discharge	Air monitoring	Yes
18. Limits on nitrogen dioxide in discharge	Air monitoring	Yes

Purpose: *To discharge emissions to air from combustion involving the flaring of petroleum products incidental to the treatment of gas at the Kupe Production Station*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
19. Limits on other contaminants	Air monitoring	Yes
20. Lapse of consent	Consent exercised	N/A
21. Optional review of consent	Next optional review scheduled in June 2023	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**

Table 10 Summary of performance for consent 6546-1

Purpose: *To discharge emissions to air as products of combustion from the Kupe Production Station involving equipment burning natural gas as fuel where the maximum heat release is in excess of 10 megawatts, together with miscellaneous emissions*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Exercise of consent in accordance with application	Inspection and liaison with consent holder	Yes
2. Consent holder to adopt best practicable option	Inspection and liaison with consent holder	Yes
3. Most appropriate process equipment to minimise emissions	Inspection and liaison with consent holder	Yes
4. Consent holder to provide analysis of typical gas stream on request	Not requested during period under review	N/A
5. Consent holder to supply Council with report in May each year	Received May 2018	Yes
6. Consent holder to consult with Council prior to significantly altering equipment or processes	Inspection and liaison with consent holder	Yes
7. Consent holder to provide a final site layout prior to commencement of production	Plans received	Yes
8. Notification of incidents	No incidents reported	Yes
9. Consent holder to supply record of all smoke emitting incidents upon request	Flaring report received	N/A

Purpose: *To discharge emissions to air as products of combustion from the Kupe Production Station involving equipment burning natural gas as fuel where the maximum heat release is in excess of 10 megawatts, together with miscellaneous emissions*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
10. Discharge not to give rise to dangerous levels of contaminants at or beyond boundary	Air monitoring	Yes
11. Discharge not to give rise to odour, dust or smoke beyond the boundary	Inspection and ambient air monitoring	Yes
12. Discharge not to give rise to hazardous, toxic or noxious contaminant beyond the boundary	Air monitoring	Yes
13. Limits on carbon monoxide in the discharge	Air monitoring	Yes
14. Limits on nitrogen dioxide in discharge	Air monitoring	Yes
15. Limits on other contaminants	Air monitoring	Yes
16. Lapse of consent	Consent exercised	N/A
17. Optional review of consent	Next optional review scheduled in June 2023	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**

Table 11 Summary of performance for consent 6629-1

Purpose: *To erect, place, use, reconstruct, alter, extend and maintain within the coastal marine area one power/fibre optic cable connecting an offshore wellhead/platform to the foreshore at mean high water spring, with structures situated under the seabed from approximately 1,200 metres offshore to mean high water spring, and the related occupation of the seabed*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Exercise of consent in accordance with application	Inspection and liaison with consent holder	Yes
2. Pipe laying management plan to be provided	Provided in 2007	Yes
3. Programme of installation to be provided	Provided in 2007	Yes
4. Notification prior to maintenance work	No maintenance during period under review	Yes
5. Contingency plan to be provided	Latest update received August 2016	Yes

Purpose: *To erect, place, use, reconstruct, alter, extend and maintain within the coastal marine area one power/fibre optic cable connecting an offshore wellhead/platform to the foreshore at mean high water spring, with structures situated under the seabed from approximately 1,200 metres offshore to mean high water spring, and the related occupation of the seabed*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
6. Best practicable option to prevent or minimise adverse effects	Inspection and liaison with consent holder	Yes
7. Works to comply with noise standards	Inspection and liaison with consent holder	Yes
8. Consent holder to survey and map position of structures	Plans received	Yes
9. Pre-lay and post-lay monitoring surveys of pipeline corridor	Surveys completed	Yes
10. Structures removed and area reinstated when no longer required	Structures still in use	N/A
11. Lapse of consent	Consent exercised	N/A
12. Review of consent	Next optional review scheduled in June 2023	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**

Table 12 Summary of performance for consent 6679-1

Purpose: *To install, construct and maintain up to seven water bores for horizontal directional drilling, pipeline hydro-testing, and production station operation purposes*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Exercise of consent in accordance with application	Inspection and liaison with consent holder	Yes
2. Consent holder to supply bore completion log	Provided in 2007	Yes
3. Bores to be cased and sealed	Inspection and bore logs	Yes
4. Consent holder to mitigate any adverse environmental effects	Inspection and liaison with consent holder	Yes
5. Consent holder to decommission bores when no longer required	Bores still in use	N/A
6. Written notification of decommission	Bores still in use	N/A
7. Lapse of consent	Consent exercised	N/A

Purpose: *To install, construct and maintain up to seven water bores for horizontal directional drilling, pipeline hydro-testing, and production station operation purposes*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
8. Review of consent	Next optional review scheduled in June 2023	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**

Table 13 Summary of performance for consent 7010-1

Purpose: *To take and use up to 3,500 m3/day groundwater at a maximum rate of 40 L/s as a combined total from up to seven water bores in a bore field for the purpose of horizontal directional drilling, pipeline hydro-testing, production station operation and operations at the Manutahi-D, Manutahi-C, and Kauri-F wellsites*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Exercise of consent in accordance with application	Review of abstraction data	Yes
2. Notification prior to exercise of consent	Notification received in October 2006	Yes
3. Results of pump test to be provided	Provided in March 2007	Yes
4. Volume of abstraction not to exceed 3500 m^3 day and 40 L/s	Review of abstraction data	Yes
5. Abstraction not to cause more than 10% lowering of static water level	Not monitored during period under review	N/A
6. Abstraction not to cause the intrusion of saltwater	Review of abstraction data	Yes
7. Consent holder to maintain daily records of abstraction	Records received	Yes
8. Consent holder to install groundwater monitoring piezometers	Piezometers installed into groundwater bores only extracting from an unconfined aquifer. Piezometers not required for the two bores installed into the confined aquifer.	Yes
9. Consent holder to install and maintain a water meter	Installed in 2007. Passed flow test in October 2014	Yes
10. Consent subject to monitoring by Council	Records reviewed and meter inspected	Yes
11. Lapse of consent	Consent exercised	N/A
12. Review of consent	Next optional review scheduled in June 2023	N/A

Purpose: *To take and use up to 3,500 m3/day groundwater at a maximum rate of 40 L/s as a combined total from up to seven water bores in a bore field for the purpose of horizontal directional drilling, pipeline hydro-testing, production station operation and operations at the Manutahi-D, Manutahi-C, and Kauri-F wellsites*		
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		**High** **High**

Table 14 Evaluation of environmental performance over time

Year	Consent no	High	Good	Improvement req	Poor
2010-11	6531-1, 6532-1, 6533-1, 6543-1, 6545-1, 6546-1, 6629-1, 6979-1, 7010-1	8			
	6546-1		1		
2011-12	6531-1, 6532-1, 6533-1, 6543-1, 6545-1, 6546-1, 6629-1, 6979-1, 7010-1	9			
2012-13	6531-1, 6532-1, 6533-1, 6543-1, 6545-1, 6546-1, 6629-1, 6979-1, 7010-1	9			
2013-14	6531-1, 6532-1, 6533-1, 6543-1, 6545-1, 6546-1, 6629-1, 6979-1, 7010-1	9			
2014-15	6531-1, 6532-1, 6533-1, 6543-1, 6545-1, 6546-1, 6629-1, 6979-1, 7010-1	9			
2015-16	6531-1, 6532-1, 6533-1, 6543-1, 6545-1, 6546-1, 6629-1, 6979-1, 7010-1	9			
2016-17	6531-1, 6532-1, 6533-1, 6543-1, 6545-1, 6546-1, 6629-1, 6979-1, 7010-1	9			
Totals		53	1	0	0

During the year, the Company demonstrated a high level of both environmental performance and administrative compliance with the resource consents as defined in Section 1.1.4. There were no unauthorised incidents recorded by the Council in relation to the Company's activities. The Kupe Production Station was well managed and maintained.

3.4 Recommendations from the 2016-2017 Annual Report

In the 2016-2017 Annual Report, it was recommended:

1. THAT in the first instance, monitoring of consented activities at the Kupe Production Station and associated facilities in the 2017-2018 year continue at the same level as in 2016-2017.

2. 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.

Recommendation one was implemented, while it was not considered necessary to conduct additional monitoring as per recommendation two.

3.5 Alterations to monitoring programmes for 2018-2019

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 2018-2019 monitoring of consented activities at the Kupe Production Station and associated facilities continue at a similar level to that of 2017-2018, with the addition of a one-off round of BTEX (benzene toluene, ethylbenzene and total xylenes) monitoring. This is in response to public concerns regarding benzene emissions from petroleum facilities, and this monitoring will be added to all petroleum industry compliance programmes in the 2018-2019 year.

It should be noted that the proposed programme represents a reasonable and risk-based level of monitoring for the site 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 2018-2019.

4 Recommendations

1. THAT in the first instance, monitoring of consented activities at the Kupe Production Station and associated facilities in the 2018-2019 year continue at a similar level as in 2017-2018, with the addition of a one-off round of BTEX monitoring.
2. THAT should there be issues with environmental or administrative performance in 2018-2019, monitoring may be adjusted to reflect any additional investigation or intervention as found necessary.

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.
Conductivity	Conductivity, an indication of the level of dissolved salts in a sample, usually measured at 20°C and expressed in mS/m.
Fresh	Elevated flow in a stream, such as after heavy rainfall.
g/m^3	Grams per cubic metre, and equivalent to milligrams per litre (mg/L). In water, this is also equivalent to parts per million (ppm), but the same does not apply to gaseous mixtures.
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.
Incident Register	The Incident Register contains a list of events recorded by the Council on the basis that they may have the potential or actual environmental consequences that may represent a breach of a consent or provision in a Regional Plan.
L/s	Litres per second.
m^2	Square Metres.
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.
PM_{10}	Relatively fine airborne particles (less than 10 micrometre diameter, respectively).

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.
Sm^3	Standard cubic metre
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 a Science Services Manager.

Bibliography and references

Taranaki Regional Council (2018): *Origin Energy Resources (Kupe) Limited Kupe Production Station Monitoring Programme Annual Report 2016-2017*. Technical Report 2017-51.

Taranaki Regional Council (2016): *Origin Energy Resources (Kupe) Limited Kupe Production Station Monitoring Programme Annual Report 2015-2016*. Technical Report 2016-21.

Taranaki Regional Council (2016): *Origin Energy Resources (Kupe) Limited Kupe Production Station Monitoring Programme Annual Report 2014-2015*. Technical Report 2015-98.

Taranaki Regional Council (2015*): Origin Energy Resources (Kupe) Limited Kupe Production Station Monitoring Programme Annual Report 2013-2014*. Technical Report 2014-125.

Taranaki Regional Council (2013): *Origin Energy Resources (Kupe) Limited Kupe Production Station Monitoring Programme Annual Report 2012-2013*. Technical Report 2013-26.

Taranaki Regional Council (2012): *Origin Energy Resources (Kupe) Limited Kupe Production Station Monitoring Programme Annual Report 2011-2012*. Technical Report 2012-24.

Taranaki Regional Council (2011): *Origin Energy Resources (Kupe) Limited Kupe Production Station Monitoring Programme Annual Report 2010-2011*. Technical Report 2011-19.

Taranaki Regional Council (2010): *Origin Energy Resources (Kupe) Limited Kupe Production Station Monitoring Programme Annual Report 2009-2010*. Technical Report 2010-27.

Taranaki Regional Council (2010): *Origin Energy Resources (Kupe) Limited Kupe Gas Project Monitoring Programme Report (Development Phase) 2006-2009*. Technical Report 2009-09.

Appendix I

Resource consents held by Beach Energy Resources (Kupe) Ltd

(For a copy of the signed resource consent
please contact the TRC Consents department)

Coastal Permit

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

Name of Consent Holder:	Beach Energy Resources NZ (Kupe) Limited Private Bag 2022 New Plymouth 4342
Decision Date (Change):	7 March 2012
Commencement Date (Change):	7 March 2012 (Granted Date: 9 December 2005)

Conditions of Consent

Consent Granted:	To disturb the seabed and foreshore of the coastal marine area by the process of erection, placement, use, alteration, extension, maintenance or removal of up to six pipelines and one power/fibre optic cable connecting an offshore wellhead/platform to the foreshore at mean high water spring
Expiry Date:	1 June 2039
Review Date(s):	June 2023, June 2029, June 2034
Site Location:	Kupe Production Station, Kupe Project, offshore pipelines, from mean high water spring directly south of Inaha Road, Inaha, Manaia, to the coastal marine area boundary 22 km further south
Grid Reference (NZTM)	1699850E-5617662N
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 exercise of this consent shall be undertaken generally in accordance with the documentation submitted in support of applications 3501 and 6970, and special condition 2. In the case of any contradiction between the documentation submitted in support of applications 3501 and 6970, and the conditions of this consent, the conditions of this consent shall prevail.

2. At least one month prior to the exercise of this consent the consent holder shall provide, to the written satisfaction of the Chief Executive, Taranaki Regional Council, detailed plans of the activity to confirm that the proposal is generally in accordance with the application and supporting documentation and will comply with all of the conditions of this consent.

3. At least 10 working days prior to the commencement of works the consent holder shall provide the Taranaki Regional Council with a programme for the disturbance associated with installation/construction (or removal) of the pipeline(s) including: a schedule of proposed start dates and an estimation of the duration of the works, and details of the contractor including contact information for the project manager.

4. The consent holder shall notify the Chief Executive, Taranaki Regional Council, in writing at least 48 hours prior to commencement and upon completion of any subsequent maintenance works which would involve disturbance of, or deposition or discharge to, the coastal marine area.

5. Prior to the exercise of this consent the consent holder shall provide to the satisfaction of the Chief Executive, Taranaki Regional Council, a written contingency plan outlining measures to be undertaken in the event of a spill as a result of works authorised by this consent.

6. The consent holder shall at all times adopt the best practicable option, as defined in section 2 of the Resource Management Act 1991, to avoid or minimise the discharge of silt, sediments or any other contaminants into coastal water or onto the foreshore or seabed and to avoid or minimise the disturbance of the foreshore or seabed and any adverse effects on coastal water quality or ecosystems.

7. The consent holder shall ensure that the duration, area and volume of seabed disturbance shall, so far as is practicable, be minimised to the satisfaction of the Chief Executive, Taranaki Regional Council.

8. The consent holder shall ensure that all disturbance, including the placement of displaced boulders, shall be contained within a 100 metre wide disturbance corridor. Outside of the 100 metre wide disturbance corridor the exercise of this consent shall not give rise to any significant adverse ecological effects including effects to kaimoana.

9. The disturbance authorised by this consent shall comply with the noise standards as outlined within section 4.4.3 of the Regional Coastal Plan for Taranaki.

10. In the event that any archaeological remains are discovered as a result of works authorised by this consent, the works shall cease immediately at the affected site and tangata whenua and the Chief Executive, Taranaki Regional Council, shall be notified within one working day. Works may recommence at the affected area when advised to do so by the Chief Executive, Taranaki Regional Council. Such advice shall be given after the Chief Executive has considered: tangata whenua interest and values, the consent holder's interests, the interests of the public generally, and any archaeological or scientific evidence. The New Zealand Police, Coroner, and Historic Places Trust shall also be contacted as appropriate, and the work shall not recommence in the affected area until any necessary statutory authorisations or consent have been obtained.

11. The consent holder shall undertake pre-lay and post-lay monitoring surveys of the pipeline corridor, to the satisfaction of the Chief Executive, Taranaki Regional Council. The monitoring shall include one survey prior to disturbance, one survey immediately following laying of the pipelines, and one survey approximately 1 year following laying of the pipelines. The results of the monitoring shall be provided to the Chief Executive, Taranaki Regional Council, upon request.

12. This consent shall lapse on the expiry of five (5) years after the date of commencement of this consent, unless the consent is given effect to before the end of that period or the Taranaki Regional Council fixes a longer period pursuant to section 125(1)(b) of the Resource Management Act 1991.

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 2011 and/or June 2017 and/or June 2023 and/or June 2029 and/or June 2034, 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 17 April 2018

For and on behalf of
Taranaki Regional Council

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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:	Beach Energy Resources NZ (Kupe) Limited Private Bag 2022 New Plymouth 4342
Decision Date (Change):	7 March 2012
Commencement Date (Change):	7 March 2012 (Granted Date: 9 December 2005)

Conditions of Consent

Consent Granted:	To erect, place, use, reconstruct, alter, extend and maintain within the coastal marine area up to six pipelines connecting an offshore wellhead/platform to the foreshore at mean high water spring, with structures situated under the seabed from approximately 1200 metres offshore to mean high water spring, and the related occupation of the seabed
Expiry Date:	1 June 2039
Review Date(s):	June 2023, June 2029, June 2034
Site Location:	Kupe Project, offshore pipelines, from mean high water spring directly south of Inaha Road, Inaha, Manaia, to the coastal marine area boundary 22 km further south
Grid Reference (NZTM)	1699850E-5617662N
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 exercise of this consent shall be undertaken generally in accordance with the documentation submitted in support of applications 3502 and 6971, and special condition 2. In the case of any contradiction between the documentation submitted in support of applications 3502 and 6971, and the conditions of this consent, the conditions of this consent shall prevail.

2. At least one month prior to the exercise of this consent the consent holder shall provide, to the written satisfaction of the Chief Executive, detailed plans of the activity to confirm that the proposal is generally in accordance with the application and supporting documentation and will comply with all of the conditions of this consent.

3. At least 10 working days prior to the commencement of works the consent holder shall provide the Taranaki Regional Council with a programme for the installation/construction of the pipeline(s), including: a schedule of proposed start dates and an estimation of the duration of the works, and details of the contractor including contact information for the project manager.

4. The consent holder shall notify the Chief Executive, Taranaki Regional Council, in writing at least 48 hours prior to commencement and upon completion of any subsequent maintenance works which would involve disturbance of, or deposition, or discharge to, the coastal marine area.

5. Prior to the exercise of this consent the consent holder shall provide, to the satisfaction of the Chief Executive, Taranaki Regional Council, a written construction contingency plan, outlining measures to be undertaken in the event of a spill as a result of works authorised by this consent. Further, prior to the exercise of this consent the consent holder shall provide to the Chief Executive, Taranaki Regional Council, written confirmation of the acceptance by the Maritime Safety Authority of a New Zealand Offshore Installation Site Marine Oil Spill Contingency Plan.

6. The consent holder shall at all times adopt the best practicable option, as defined in section 2 of the Resource Management Act 1991, to avoid or minimise the discharge of any contaminants into coastal water or onto the foreshore or seabed and to avoid or minimise any adverse effects on coastal water quality or ecosystems.

7. The construction, use, maintenance and removal of the structure(s) authorised by this consent shall comply with the noise standards as outlined within section 4.4.3 of the Regional Coastal Plan for Taranaki.

8. The consent holder shall survey and map the position of the pipeline(s), (including details of the pipeline(s) position in relation to the seabed), within 90 days of the completion of their construction, and shall provide a copy of the plan showing the precise location (to within plus or minus 5 metres) of the structure(s) on/in the seabed, to the Taranaki Regional Council, the Hydrographic Office, Royal New Zealand Navy, and the Maritime Safety Authority.

9. The consent holder shall undertake pre-lay and post-lay monitoring surveys of the pipeline corridor, to the satisfaction of the Chief Executive, Taranaki Regional Council. The monitoring shall include one survey prior to disturbance, one survey immediately following laying of the pipelines, and one survey approximately 1 year following laying of the pipelines. The results of the monitoring shall be provided to the Chief Executive, Taranaki Regional Council, upon request.

10. Except with the written agreement of the Chief Executive, Taranaki Regional Council, all structures authorised by this consent shall be removed and the area(s) reinstated, if and when the structure(s) are no longer required. The consent holder shall notify the Chief Executive, Taranaki Regional Council in writing at least 1 month prior to any structure(s) removal. Reinstatement shall be to the satisfaction of the Chief Executive, Taranaki Regional Council.

11. This consent shall lapse on the expiry of five (5) years after the date of commencement of this consent, unless the consent is given effect to before the end of that period or the Taranaki Regional Council fixes a longer period pursuant to section 125(1)(b) of the Resource Management Act 1991.

12. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2011 and/or June 2017 and/or June 2023 and/or June 2029 and/or June 2034, 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 17 April 2018

For and on behalf of
Taranaki Regional Council

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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:	Beach Energy Resources NZ (Kupe) Limited Private Bag 2022 New Plymouth 4342
Decision Date:	9 December 2005
Commencement Date:	9 December 2005

Conditions of Consent

Consent Granted:	To occupy the coastal marine area for a distance of 250 metres either side of the centre-line of a 100 metre wide pipeline corridor, from the outer limit of the territorial sea of New Zealand to mean high water spring, in a manner that will restrict public access
Expiry Date:	1 June 2039
Review Date(s):	June 2023, June 2029, June 2034
Site Location:	Kupe Project, offshore pipelines, from mean high water spring directly south of Inaha Road, Inaha, Manaia, to the coastal marine area boundary 22 km further south
Grid Reference (NZTM)	1699850E-5617660N
Catchment:	Tasman Sea

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

General conditions

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

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

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

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

Special conditions

1. The exercise of this consent shall be undertaken generally in accordance with the documentation submitted in support of application 3503. In the case of any contradiction between the documentation submitted in support of application 3503 and the conditions of this consent, the conditions of this consent shall prevail.

2. With the exception of the area required for safety purposes during: construction, inspection, maintenance or removal, of the structure(s) licensed by coastal permit 6532 and 6629; or the disturbance licensed by coastal permit 6531, the exercise of this consent shall not prevent the free passage of any member of the public through the coastal marine area (subject however to any restrictions imposed under the Submarine Cables and Pipelines Protection Act 1996 in relation to fishing operations).

3. The consent holder shall notify the Chief Executive, Taranaki Regional Council in writing at least 48 hours prior to commencement and upon completion of any subsequent maintenance works which would involve restriction of public access within the coastal marine area.

4. The consent holder shall survey and map the position of the structure(s) within 90 days of the completion of their construction, and shall provide a copy of the plan showing the precise location (to within plus or minus 5 metres) of the structure(s) on the seabed, and the location of the occupied areas to the Taranaki Regional Council, the Hydrographic Office, Royal New Zealand Navy, and the Maritime Safety Authority.

5. This consent shall lapse on the expiry of five (5) years after the date of commencement of this consent, unless the consent is given effect to before the end of that period or the Taranaki Regional Council fixes a longer period pursuant to section 125(1)(b) of the Resource Management Act 1991.

6. 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 2011 and/or June 2017 and/or June 2023 and/or June 2029 and/or June 2034, 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 17 April 2018

For and on behalf of
Taranaki Regional Council

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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:	Beach Energy Resources NZ (Kupe) Limited Private Bag 2022 New Plymouth 4342
Decision Date:	28 October 2005
Commencement Date:	28 October 2005

Conditions of Consent

Consent Granted:	To discharge up to 1000 cubic metres of contaminants (up to 600 cubic metres of drilling muds, drilling cuttings and aquifer water and up to 400 cubic metres of gauge run water) from two horizontal directional drilling exit points through the seabed approximately 1200 metres from mean high water spring within the coastal marine area
Expiry Date:	1 June 2039
Review Date(s):	June 2023, June 2029, June 2034
Site Location:	Kupe Project, offshore pipelines, from mean high water spring directly south of Inaha Road, Inaha, Manaia, to the coastal marine area boundary 22 km further south
Grid Reference (NZTM)	1699850E-5617661N
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 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 exercise of this consent shall be undertaken generally in accordance with the documentation submitted in support of application 3504. In the case of any contradiction between the documentation submitted in support of application 3504 and the conditions of this consent, the conditions of this consent shall prevail.

2. The consent holder shall notify the Chief Executive, Taranaki Regional Council, in writing at least 48 hours prior to the commencement and upon completion of the discharge.

3. The consent holder shall maintain a record of the discharge, including date, duration, and volume discharged, and shall provide the information to the Chief Executive, Taranaki Regional Council, upon request.

4. The consent holder shall at all times adopt the best practicable option, as defined in section 2 of the Resource Management Act 1991, to avoid or minimise the discharge of silt, sediments or any other contaminants into coastal water or onto the foreshore or seabed and to avoid or minimise the disturbance of the foreshore or seabed and any adverse effects on coastal water quality or ecosystems.

5. This consent shall lapse on the expiry of five (5) years after the date of commencement of this consent, unless the consent is given effect to before the end of that period or the Taranaki Regional Council fixes a longer period pursuant to section 125(1)(b) of the Resource Management Act 1991.

6. 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 2011 and/or June 2017 and/or June 2023 and/or June 2029 and/or June 2034, 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 17 April 2018

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:	Beach Energy Resources NZ (Kupe) Limited Private Bag 2022 New Plymouth 4342
Decision Date:	28 October 2005
Commencement Date:	28 October 2005

Conditions of Consent

Consent Granted:	To divert water from aquifers in the coastal marine area likely to be encountered during activities associated with horizontal directional drilling of two drill lines
Expiry Date:	1 June 2039
Review Date(s):	June 2023, June 2029, June 2034
Site Location:	Kupe Project, offshore pipelines, from mean high water spring directly south of Inaha Road, Inaha, Manaia, to the coastal marine area boundary 22 km further south
Grid Reference (NZTM)	1699850E-5617661N
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 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 exercise of this consent shall be undertaken generally in accordance with the documentation submitted in support of application 3505. In the case of any contradiction between the documentation submitted in support of application 3505 and the conditions of this consent, the conditions of this consent shall prevail.

2. This consent shall lapse on the expiry of five [5] years after the date of commencement of this consent, unless the consent is given effect to before the end of that period or the Taranaki Regional Council fixes a longer period pursuant to section 125(1)(b) of the Resource Management Act 1991.

3. 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 2011 and/or June 2017 and/or June 2023 and/or June 2029 and/or June 2034, 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 17 April 2018

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:	Beach Energy Resources NZ (Kupe) Limited Private Bag 2022 New Plymouth 4342
Decision Date (Change):	6 November 2006
Commencement Date (Change):	6 November 2006 (Granted Date: 21 June 2005)

Conditions of Consent

Consent Granted:	To discharge stormwater and sediment from earthworks associated with the construction of a horizontal directional drilling site onto and into land
Expiry Date:	1 June 2023
Site Location:	Kupe Project, west of Inaha Road, east of Kapuni Road (being a paper road) and south of Siggs Road (being a paper road), Inaha, Manaia
Grid Reference (NZTM)	1699950E-5617961N
Catchment:	Inaha

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

General condition

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

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

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

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

Special conditions

Condition 1 – changed

1. The exercise of this consent shall be undertaken generally in accordance with the documentation submitted in support of application 3506 and 4421. In the case of any contradiction between the documentation submitted in support of application 3506 and 4421 and the conditions of this consent, the conditions of this consent shall prevail.

Conditions 2 to 10 – unchanged

2. At least 10 working days prior to the commencement of works the consent holder shall provide the Taranaki Regional Council with a programme for the installation of the horizontal directional drilling site, including: a schedule of proposed start dates and an estimation of the duration of the works, and details of the contractor including contact information for the project manager.

3. Prior to the exercise of this consent, the consent holder shall provide to the satisfaction of the Chief Executive, Taranaki Regional Council, a site erosion and sediment control management plan.

4. Prior to the exercise of this consent, the consent holder shall provide to the satisfaction of the Chief Executive, Taranaki Regional Council, a written contingency plan, outlining measures to be undertaken in the event of a spill as a result of works authorised by this consent.

5. 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 the discharge of stormwater and sediment to any surface water body and to prevent or minimise any adverse effects of the discharge on any surface water body.

6. All earthwork areas shall be stabilised vegetatively or otherwise as soon as is practicable immediately following completion of soil disturbance activities to the satisfaction of the Chief Executive, Taranaki Regional Council.

7. The discharge onto and into land shall occur a minimum of 20 metres from any surface water body. Discharge shall be onto and into land and there shall be no direct discharge to surface water.

8. In the event that any archaeological remains are discovered as a result of works authorised by this consent, the works shall cease immediately at the affected site and tangata whenua and the Chief Executive, Taranaki Regional Council, shall be notified within one working day. Works may recommence at the affected area when advised to do so by the Chief Executive, Taranaki Regional Council. Such advice shall be given after the Chief Executive has considered: tangata whenua interest and values, the consent holder's interests, the interests of the public generally, and any archaeological or scientific evidence. The New Zealand Police, Coroner, and Historic Places Trust shall also be contacted as appropriate, and the work shall not recommence in the affected area until any necessary statutory authorisations or consents have been obtained.

9. This consent shall lapse on the expiry of five (5) years after the date of commencement of this consent, unless the consent is given effect to before the end of that period or the Taranaki Regional Council fixes a longer period pursuant to section 125(1)(b) of the Resource Management Act 1991.

10. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2011 and/or June 2017, 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 17 April 2018

For and on behalf of
Taranaki Regional Council

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A D McLay
Director - Resource Management

Discharge Permit

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

Name of Consent Holder:	Beach Energy Resources NZ (Kupe) Limited Private Bag 2022 New Plymouth 4342
Decision Date (Change):	6 November 2006
Commencement Date (Change):	6 November 2006 (Granted Date: 21 June 2005)

Conditions of Consent

Consent Granted:	To discharge treated stormwater from a horizontal directional drilling site onto and into land
Expiry Date:	1 June 2023
Site Location:	Kupe Project, west of Inaha Road, east of Kapuni Road (being a paper road) and south of Siggs Road (being a paper road), Inaha, Manaia
Grid Reference (NZTM)	1699950E-5617961N
Catchment:	Inaha

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

General conditions

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

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

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

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

Special conditions

Condition 1 – changed

1. The exercise of this consent shall be undertaken generally in accordance with the documentation submitted in support of application 3507 and 4432. In the case of any contradiction between the documentation submitted in support of application 3507, 4432, and the conditions of this consent, the conditions of this consent shall prevail.

Conditions 2 to 5 – unchanged

2. The consent holder shall notify the Chief Executive, Taranaki Regional Council, in writing at least seven days prior to any horizontal directional drilling operation commencing.

3. Prior to the exercise of this consent, the consent holder shall provide to the satisfaction of the Chief Executive, Taranaki Regional Council, a stormwater management plan.

4. Prior to the exercise of this consent, the consent holder shall provide to the satisfaction of the Chief Executive, Taranaki Regional Council, site specific details relating to contingency planning for the horizontal directional drilling site.

5. The consent holder shall at all times adopt the best practicable option, as defined in section 2 of the Resource Management Act 1991, to prevent or minimise any adverse effects of the discharge on any water body.

Conditions 6 and 7 – changed

6. The maximum stormwater catchment area shall be no more than 36,000 square metres (m^2).

7. All stormwater to be discharged from the HDD pad area shall be directed for treatment through the stormwater treatment system for discharge in accordance with the special conditions of this consent.

Conditions 8 to 13 – unchanged

8. Any above ground hazardous substances storage areas shall be bunded with drainage to sumps, or other appropriate recovery systems, and not directly to the stormwater catchment.

9. 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 onto and into land at a designated sampling point approved by the Chief Executive, Taranaki Regional Council.

10. The discharge onto and into land shall occur a minimum of 20 metres from any surface water body. Discharge shall be onto and into land and there shall be no direct discharge to surface water.

11. The Chief Executive, Taranaki Regional Council, shall be advised in writing at least 48 hours prior to the reinstatement of the site and the reinstatement shall be carried out so as to minimise effects on stormwater quality.

12. This consent shall lapse on the expiry of five (5) years after the date of commencement of this consent, unless the consent is given effect to before the end of that period or the Taranaki Regional Council fixes a longer period pursuant to section 125(1)(b) of the Resource Management Act 1991.

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 2011 and/or June 2017, 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 17 April 2018

For and on behalf of
Taranaki Regional Council

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A D McLay
Director - Resource Management

Discharge Permit

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

Name of Consent Holder:	Beach Energy Resources NZ (Kupe) Limited Private Bag 2022 New Plymouth 4342
Decision Date (Change):	14 December 2006
Commencement Date (Change):	14 December 2006 (Granted Date: 21 June 2005)

Conditions of Consent

Consent Granted:	To discharge stormwater and sediment from earthworks associated with the construction and installation of the Kupe Production Station and associated stormwater treatment facilities onto and into land in the vicinity of the Kapuni Stream
Expiry Date:	1 June 2023
Site Location:	Kupe Project, west of Inaha Road, east of Kapuni Road (being a paper road) and south of Siggs Road (being a paper road), Inaha, Manaia (Kupe Production Station)
Grid Reference (NZTM)	1699750E-5618461N
Catchment:	Kapuni Inaha

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

General conditions

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

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

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

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

Special conditions

Condition 1 – changed

1. The exercise of this consent shall be undertaken in general accordance with the documentation submitted in support of application 3512 and 4467. In the case of any contradiction between the documentation submitted in support of application 3512 and 4467 and the conditions of this consent, the conditions of this consent shall prevail.

Conditions 2 to 10 – unchanged

2. At least 10 working days prior to the commencement of works the consent holder shall provide the Taranaki Regional Council with a programme for the installation of the Kupe Production Station, including: a schedule of proposed start dates and an estimation of the duration of the works, and details of the contractor including contact information for the project manager.

3. Prior to the exercise of this consent, the consent holder shall provide for the written approval of the Chief Executive, Taranaki Regional Council, a site erosion and sediment control management plan.

4. Prior to the exercise of this consent, the consent holder shall provide to the satisfaction of the Chief Executive, Taranaki Regional Council, a written contingency plan, outlining measures to be undertaken in the event of a spill as a result of works authorised by this consent.

5. 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 the discharge of stormwater and sediment to any surface water body and to prevent or minimise any adverse effects of the discharge on any surface water body.

6. All earthwork areas shall be stabilised vegetatively or otherwise as soon as is practicable immediately following completion of soil disturbance activities to the satisfaction of the Chief Executive, Taranaki Regional Council.

7. The discharge onto and into land shall occur a minimum of 20 metres from any surface water body. Discharge shall be onto and into land and there shall be no direct discharge to surface water.

8. In the event that any archaeological remains are discovered as a result of works authorised by this consent, the works shall cease immediately at the affected site and tangata whenua and the Chief Executive, Taranaki Regional Council, shall be notified within one working day. Works may recommence at the affected area when advised to do so by the Chief Executive, Taranaki Regional Council. Such advice shall be given after the Chief Executive has considered: tangata whenua interest and values, the consent holder's interests, the interests of the public generally, and any archaeological or scientific evidence. The New Zealand Police, Coroner, and Historic Places Trust shall also be contacted as appropriate, and the work shall not recommence in the affected area until any necessary statutory authorisations or consents have been obtained.

9. This consent shall lapse on the expiry of five (5) years after the date of commencement of this consent, unless the consent is given effect to before the end of that period or the Taranaki Regional Council fixes a longer period pursuant to section 125(1)(b) of the Resource Management Act 1991.

10. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2011 and/or June 2017, 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 17 April 2018

For and on behalf of
Taranaki Regional Council

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A D McLay
Director - Resource Management

Discharge Permit

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

Name of Consent Holder:	Beach Energy Resources NZ (Kupe) Limited Private Bag 2022 New Plymouth 4342
Decision Date (Change):	8 December 2016
Commencement Date (Change):	8 December 2016 (Granted Date: 21 June 2005)

Conditions of Consent

Consent Granted:	To discharge pipeline hydrotesting water and treated stormwater from the Kupe Production Station via a stormwater/firewater storage pond system, and to discharge stormwater from the Dangerous Goods Storage stormwater system into the Kapuni Stream
Expiry Date:	1 June 2039
Review Date(s):	June 2023, June 2029, June 0034
Site Location:	Kupe Production Station, 192 Lower Inaha Road, Inaha
Grid Reference (NZTM)	1699150E-5618660N
Catchment:	Kapuni

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 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 and special condition 2. In the case of any contradiction between applications the later application shall prevail, and where there is conflict between an application and the conditions of this consent, the conditions of this consent shall prevail.

2. Within one month of the completion of the development of the site the consent holder shall provide, to the written satisfaction of the Chief Executive, Taranaki Regional Council, detailed plans of stormwater catchment and drainage pathways, including clean areas, potentially contaminated areas, and bunded areas, and the containment, treatment and discharge systems put into place.

3. The consent holder shall notify the Chief Executive, Taranaki Regional Council, in writing at least seven days prior to the exercise of this consent.

4. The consent holder shall review the contingency plan for the site and include, if necessary, the new Dangerous Goods Store. The consent holder shall provide the plan for the written approval of the Chief Executive, Taranaki Regional Council. The plan shall include site specific details relating to contingency planning for the site.

5. The consent holder shall at all times adopt the best practicable option, as defined in section 2 of the Resource Management Act 1991, to prevent or minimise any adverse effects of the discharge on any water body.

6. All stormwater and hydrotest water to be discharged under this permit shall be directed for treatment through the stormwater treatment system for discharge, excluding the stormwater discharge from the Dangerous Goods Storage stormwater system, which shall be discharged into the Kapuni Stream, in accordance with the special conditions of this consent.

7. Any above ground hazardous substances storage areas shall be bunded with drainage to sumps, or other appropriate recovery systems, and not directly to the stormwater catchment.

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	230 gm^{-3}

This condition shall apply prior to the entry of the treated stormwater into the Kapuni Stream at a designated sampling point(s) approved by the Chief Executive, Taranaki Regional Council.

9. After allowing for reasonable mixing, within a mixing zone extending 50 metres downstream of the discharge point, the discharge shall not give rise to any of the following effects in the receiving waters of the Kapuni Stream:

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

10. This consent shall lapse on the expiry of five (5) years after the date of commencement of this consent, unless the consent is given effect to before the end of that period or the Taranaki Regional Council fixes a longer period pursuant to section 125(1)(b) of the Resource Management Act 1991.

11. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2011 and/or June 2017 and/or June 2023 and/or June 2029 and/or June 2034, 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 17 April 2018

For and on behalf of
Taranaki Regional Council

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A D McLay
Director - Resource Management

Discharge Permit

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

Name of Consent Holder:	Beach Energy Resources NZ (Kupe) Limited Private Bag 2022 New Plymouth 4342
Decision Date (Change):	2 April 2007
Commencement Date (Change):	2 April 2007 (Granted Date: 21 June 2005)

Conditions of Consent

Consent Granted:	To discharge emissions to air from combustion involving the flaring of petroleum products incidental to the treatment of gas at the Kupe Production Station
Expiry Date:	1 June 2039
Review Date(s):	June 2023, June 2029, June 2034
Site Location:	Kupe Project, west of Inaha Road, east of Kapuni Road (being a paper road) and south of Siggs Road (being a paper road), Inaha, Manaia (Production Station)
Grid Reference (NZTM)	1699750E-5618461N

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

General conditions

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

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

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

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

Special conditions

Condition 1 – changed

1. The exercise of this consent shall be undertaken in general accordance with the documentation submitted in support of applications 3515 and 4498. In the case of any contradiction between the documentation submitted in support of application 3515 and 4498 and the conditions of this consent, the conditions of this consent shall prevail.

Conditions 2 to 5 – unchanged

2. 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 effects on the environment associated with the discharge of contaminants into the environment arising from the emissions to air from the flare.

3. The consent holder shall minimise the emissions and impacts of air contaminants discharged from the flare by the selection of the most appropriate process equipment, process control equipment, emission control equipment, methods of control, supervision and operation, and the proper and effective operation, supervision, control and maintenance of all equipment and processes.

4. The consent holder shall make available to the Chief Executive upon request an analysis of a typical gas and/or condensate stream from the Kupe field, covering sulphur compound content and the content of compounds containing six or more carbon atoms in their molecular structure.

5. The consent holder shall provide to the Taranaki Regional Council during May of each year, for the duration of this consent, a report:

   a) detailing gas combustion at the production station flares, including but not restricted to routine operational flaring and flaring logged as per condition 11;
   b) detailing any measures that have been undertaken by the consent holder to improve the energy efficiency of the production station;
   c) detailing any measures to reduce smoke emissions;
   d) detailing any measures to reduce flaring,
   e) addressing any other issue relevant to the minimisation or mitigation of emissions from the production station flare; and
   f) detailing any complaints received and any measures undertaken to address complaints.

Condition 6 – changed

6. Prior to undertaking any alterations to the plant equipment, processes or operations, which may substantially alter the nature or quantity of flare emissions other than as notified in consent applications 3515 and 4498, the consent holder shall first consult with the Chief Executive, Taranaki Regional Council, and shall obtain any necessary approvals under the Resource Management Act 1991.

Conditions 7 to 21 – unchanged

7. Prior to the commencement of production, the consent holder shall supply to the Chief Executive, Taranaki Regional Council, a final site lay-out plan, demonstrating configuration of the facilities and equipment so as to avoid or mitigate the potential effects of air emissions.

8. At least 3 days before the commissioning of the plant, the consent holder shall undertake all practicable measures to notify owners or occupiers of properties within 1 kilometre of the boundary of the property on which the production station flare is located, of the possibility of flaring and smoke emissions. The consent holder shall include in the notification a 24-hour contact telephone number for a representative of the consent holder.

9. Any incident having an environmental effect or potential effect which has caused or is liable to cause substantiated complaint or a hazardous situation beyond the boundary of the property on which the production station flare is located, shall be notified to the Taranaki Regional Council, as soon as possible, followed by a written report to the Chief Executive, Taranaki Regional Council, within one week of the incident, with comment about the measures taken to minimise the impact of the incident and to prevent re-occurrence.

10. The consent holder shall keep and make available to the Chief Executive, Taranaki Regional Council, upon request, a record of all smoke emitting incidents, noting time, duration and cause. The consent holder shall also keep, and make available to the Chief Executive, upon request, a record of all complaints received as a result of the exercise of this consent.

11. The consent holder shall keep and maintain a log of all continuous flaring incidents longer than 5 minutes and any intermittent flaring lasting for an aggregate of 10 minutes or longer in any 60-minute period. Such a log shall contain the date, the start and finish times, the quantity and type of material flared, and the reason for flaring. This log shall be made available to the Chief Executive, Taranaki Regional Council, upon request, and summarised annually in the report required under condition 5. Flaring, under normal operation in the low pressure flare, of rich mono-ethylene glycol degasser vapour, condensate tank vapours, non-condensibles from tri-ethylene glycol/mono-ethylene glycol regeneration and purge gas shall be excluded from this requirement.

12. All practicable steps shall be taken to minimise flaring.

13. Other than in emergencies, the rate of depressurisation of the plant, or sections of the plant, shall be managed to prevent dense black smoke from being discharged from the flare.

14. The consent holder shall, whenever practicable, notify the Chief Executive, Taranaki Regional Council, whenever the continuous flaring of hydrocarbons (other than the flaring of rich mono-ethylene glycol degasser vapour, condensate tank vapours, non-condensibles from tri-ethylene glycol/mono-ethylene glycol regeneration and purge gas) is expected to occur for more than five minutes in duration.

15. The discharges authorised by this consent shall not, whether alone or in conjunction with any other emissions from the site arising through the exercise of any other consent, give rise to any levels of odour or dust or smoke that are offensive or obnoxious or objectionable at or beyond the site boundary in the opinion of an enforcement officer of the Taranaki Regional Council.

16. The consent holder shall not discharge any contaminant to air from the site at a rate or a quantity such that the contaminant, whether alone or in combination with other contaminants, is or is liable to be hazardous or toxic or noxious at or beyond the boundary of the property where the production station is located, or at any dwellinghouse.

17. The consent holder shall control all discharges of carbon monoxide to the atmosphere from the flare, whether alone or in conjunction with any other emissions from the site arising through the exercise of any other consent, in order that the maximum ground level concentration of carbon monoxide arising from the exercise of this consent measured under ambient conditions does not exceed 10 milligrams per cubic metre (eight-hour average exposure), or 30 milligrams per cubic metre (one-hour average exposure) at or beyond the boundary of the property on which the production station flare is located.

18. The consent holder shall control all discharges of nitrogen dioxide or its precursors to the atmosphere from the flare, whether alone or in conjunction with any other discharges to the atmosphere from the site arising through the exercise of any other consent, in order that the maximum ground level concentration of nitrogen dioxide arising from the exercise of this consent measured under ambient conditions does not exceed 200 micrograms per cubic metre (one hour average exposure), or 100 micrograms per cubic metre (twenty-four hour average exposure), at or beyond the boundary of the property on which the production station flare is located.

19. The consent holder shall control discharges to the atmosphere from the flare of contaminants other than carbon dioxide, carbon monoxide, and nitrogen oxides, whether alone or in conjunction with any other emissions from the site arising through the exercise of any other consent, in order that the maximum ground level concentration for any particular contaminant arising from the exercise of this consent, measured at or beyond the boundary of the property on which the production station flare is located, is not increased above background levels:

    a) by more than 1/30th of the relevant Workplace Exposure Standard-Time Weighted Average (exposure averaged over a duration as specified for the Workplace Exposure Standard-Time Weighted Average), or by more than 1/10th of the Workplace Exposure Standard-Short Term Exposure Limit over any short period of time (all terms as defined in Workplace Exposure Standards, 2002, Department of Labour); or
    b) if no Short Term Exposure Limit is set, by more than the General Excursion Limit at any time (all terms as defined in Workplace Exposure Standards, 2002, Department of Labour).

20. This consent shall lapse on the expiry of five (5) years after the date of commencement of this consent, unless the consent is given effect to before the end of that period or the Taranaki Regional Council fixes a longer period pursuant to section 125(1)(b) of the Resource Management Act 1991.

21. 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 within six months of receiving a report prepared by the consent holder pursuant to condition 5 of this consent, or by giving notice of review during the month of June 2007 and/or June 2009 and/or June 2011 and/or June 2017 and/or June 2023 and/or June 2029 and/or June 2034, for the purposes of:

    a) dealing with any significant adverse effect on the environment arising from the exercise of the consent which was not foreseen at the time the application was considered or which it was not appropriate to deal with at the time; and/or
    b) requiring the consent holder to adopt the best practicable option to remove or reduce any adverse effect on the environment caused by the discharge; and/or
    c) to alter, add or delete limits on mass discharge quantities or discharge or ambient concentrations of any contaminant or contaminants; and/or
    d) taking into account any Act of Parliament, regulation, national policy statement or national environmental standard which relates to limiting, recording, or mitigating emissions of carbon dioxide and/or nitrogen dioxide, and which is relevant to the air discharge from the Kupe Production Station.

Transferred at Stratford on 17 April 2018

For and on behalf of
Taranaki Regional Council

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A D McLay
Director - Resource Management

Discharge Permit

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

Name of Consent Holder:	Beach Energy Resources NZ (Kupe) Limited Private Bag 2022 New Plymouth 4342
Decision Date:	21 June 2005
Commencement Date:	21 June 2005

Conditions of Consent

Consent Granted:	To discharge emissions to air as products of combustion from the Kupe Production Station involving equipment burning natural gas as fuel where the maximum heat release is in excess of 10 megawatts, together with miscellaneous emissions
Expiry Date:	1 June 2039
Review Date(s):	June 2023, June 2029, June 2034
Site Location:	Kupe Production Station, west of Inaha Road, east of Kapuni Road (being a paper road) and south of Siggs Road (being a paper road), Inaha, Manaia
Grid Reference (NZTM)	1699750E-5618461N

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 exercise of this consent shall be undertaken generally in accordance with the documentation submitted in support of application 3516. In the case of any contradiction between the documentation submitted in support of application 3516 and the conditions of this consent, the conditions of this consent shall prevail.

2. 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 effects on the environment associated with the discharge of contaminants into the environment arising from the emissions to air from the site.

3. The consent holder shall minimise the emissions and impacts of air contaminants discharged from the site by the selection of the most appropriate process equipment, process control equipment, emission control equipment, methods of control, supervision and operation, and the proper and effective operation, supervision, control and maintenance of all equipment and processes.

4. The consent holder shall make available to the Chief Executive, Taranaki Regional Council, upon request an analysis of a typical gas and/or condensate stream from the Kupe field, covering sulphur compound content and the content of compounds containing six or more carbon atoms in their molecular structure.

5. The consent holder shall provide to the Taranaki Regional Council during May of each year, for the duration of this consent, a report:

   a) detailing gas combustion at the production station;
   b) detailing any measures that have been undertaken by the consent holder to improve the energy efficiency of the production station;
   c) detailing any measures to reduce smoke emissions;
   d) detailing any measures to reduce flaring;
   e) addressing any other issue relevant to the minimisation or mitigation of emissions from the production station; and
   f) detailing any complaints received and any measures undertaken to address complaints.

6. Prior to undertaking any alterations to the plant, processes or operations, which may significantly change the nature or quantity of contaminants emitted to air from the site, the consent holder shall first consult with the Chief Executive, Taranaki Regional Council, and shall obtain any necessary approvals under the Resource Management Act 1991.

7. Prior to the commencement of production, the consent holder shall supply to the Chief Executive, Taranaki Regional Council, a final site lay-out plan, demonstrating configuration of the facilities and equipment so as to avoid or mitigate the potential effects of air emissions.

8. Any incident having an environmental impact or potential environmental impact which has caused or is liable to cause substantiated complaint or a hazardous situation beyond the boundary of the property on which the production station is located, shall be notified to the Taranaki Regional Council, as soon as possible, followed by a written report to the Chief Executive, Taranaki Regional Council, within one week of the incident, with comment about the measures taken to minimise the impact of the incident and to prevent re-occurrence.

9. The consent holder shall keep and make available to the Chief Executive, Taranaki Regional Council, upon request, a record of all smoke emitting incidents and all relief valve releases, noting time, duration and cause. The consent holder shall also keep, and make available to the Chief Executive, upon request, a record of all complaints received as a result of the exercise of this consent.

10. The discharges authorised by this consent shall not, whether alone or in conjunction with any other emissions from the site arising through the exercise of any other consent, give rise to any dangerous levels of airborne contaminants at or beyond the boundary of the property including but not limited to any risk of fire or explosion.

11. The discharges authorised by this consent shall not, whether alone or in conjunction with any other emissions from the site arising through the exercise of any other consent, give rise to any levels of odour or dust or smoke that are offensive or obnoxious or objectionable at or beyond the boundary of the property on which the production station is located in the opinion of an enforcement officer of the Taranaki Regional Council.

12. The consent holder shall not discharge any contaminant to air from the site at a rate or a quantity such that the contaminant, whether alone or in conjunction with any other emissions from the site arising through the exercise of any other consent, is or is liable to be hazardous or toxic or noxious at or beyond the boundary of the property where the production station is located, or at any dwellinghouse.

13. The consent holder shall control all discharges of carbon monoxide to the atmosphere from the site, whether alone or in conjunction with any other emissions from the site arising through the exercise of any other consent, in order that the maximum ground level concentration of carbon monoxide arising from the exercise of this consent measured under ambient conditions does not exceed 10 milligrams per cubic metre (eight-hour average exposure), or 30 milligrams per cubic metre (one-hour average exposure) at or beyond the boundary of the property on which the production station is located.

14. The consent holder shall control all discharges of nitrogen dioxide or its precursors to the atmosphere from the site, whether alone or in conjunction with any other discharges to the atmosphere from the site arising through the exercise of any other consent, in order that the maximum ground level concentration of nitrogen dioxide arising from the exercise of this consent measured under ambient conditions does not exceed 200 micrograms per cubic metre (one hour average exposure), or 100 micrograms per cubic metre (twenty-four hour average exposure), at or beyond the boundary of the property on which the production station is located.

15. The consent holder shall control discharges to the atmosphere from the site of contaminants other than carbon dioxide, carbon monoxide, and nitrogen oxides, whether alone or in conjunction with any other emissions from the site arising through the exercise of any other consent, in order that the maximum ground level concentration for any particular contaminant arising from the exercise of this consent, measured at or beyond the boundary of the property on which the production station is located, is not increased above background levels:

    a) by more than 1/30th of the relevant Workplace Exposure Standard-Time Weighted Average (exposure averaged over a duration as specified for the Workplace Exposure Standard-Time Weighted Average), or by more than 1/10th of the Workplace Exposure Standard-Short Term Exposure Limit over any short period of time (all terms as defined in Workplace Exposure Standards, 2002, Department of Labour); or

    b) if no Short Term Exposure Limit is set, by more than the General Excursion Limit at any time (all terms as defined in Workplace Exposure Standards, 2002, Department of Labour).

16. This consent shall lapse on the expiry of five (5) years after the date of commencement of this consent, unless the consent is given effect to before the end of that period or the Taranaki Regional Council fixes a longer period pursuant to section 125(1)(b) of the Resource Management Act 1991.

17. 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 within six months of receiving a report prepared by the consent holder pursuant to condition 5 of this consent, or by giving notice of review during the month of June 2007 and/or June 2009 and/or June 2011 and/or June 2017 and/or June 2023 and/or June 2029 and/or June 2034, for the purposes of:

    a) dealing with any significant adverse effect on the environment arising from the exercise of the consent which was not foreseen at the time the application was considered or which it was not appropriate to deal with at the time; and/or
    b) requiring the consent holder to adopt the best practicable option to remove or reduce any adverse effect on the environment caused by the discharge; and/or
    c) to alter, add or delete limits on mass discharge quantities or discharge or ambient concentrations of any contaminant or contaminants; and/or
    d) taking into account any Act of Parliament, regulation, national policy statement or national environmental standard which relates to limiting, recording, or mitigating emissions of carbon dioxide and/or nitrogen dioxide, and which is relevant to the air discharge from the Kupe Production Station.

Transferred at Stratford on 17 April 2018

For and on behalf of
Taranaki Regional Council

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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:	Beach Energy Resources NZ (Kupe) Limited Private Bag 2022 New Plymouth 4342
Decision Date:	28 October 2005
Commencement Date:	28 October 2005

Conditions of Consent

Consent Granted:	To erect, place, use, reconstruct, alter, extend and maintain within the coastal marine area one power/fibre optic cable connecting an offshore wellhead/platform to the foreshore at mean high water spring, with structures situated under the seabed from approximately 1200 metres offshore to mean high water spring, and the related occupation of the seabed
Expiry Date:	1 June 2039
Review Date(s):	June 2023, June 2029, June 2034
Site Location:	Kupe Project, offshore pipelines, from mean high water spring directly south of Inaha Road, Inaha, Manaia, to the coastal marine area boundary 22 km further south
Grid Reference (NZTM)	1699850E-5617660N
Catchment:	Tasman Sea

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

General conditions

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

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

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

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

Special conditions

1. The exercise of this consent shall be undertaken generally in accordance with the documentation submitted in support of application 3502, and special condition 2. In the case of any contradiction between the documentation submitted in support of application 3502 and the conditions of this consent, the conditions of this consent shall prevail.

2. At least one month prior to the exercise of this consent the consent holder shall provide, to the written satisfaction of the Chief Executive, Taranaki Regional Council, a detailed pipe laying management plan. The purpose of the management plan is to set out the investigations to be undertaken and the procedure to be adopted to minimise the disturbance to the seabed as a result of laying the pipelines. The management plan shall include, as a minimum:

   a) a description of the results of the investigations undertaken by remotely operated vehicle to determine the optimum pipeline route;
   b) a description of the method to be used to remove boulders from the pipeline route;
   c) the timeframe over which the boulder clearing will be undertaken;
   d) confirmation that the proposed activity is generally in accordance with the application and supporting documentation, and will comply with all the conditions of this consent; and
   e) an outline of the measures to be used to ensure that consent conditions will be met.

   The management plan shall be prepared in consultation with interested submitters to the application. However, the consent holder shall not be in breach of this condition if any party choses not to comment on the draft management plan. Nor is the consent holder under any obligation to incorporate any particular suggestions or proposals advanced by any party.

3. At least 10 working days prior to the commencement of works the consent holder shall provide the Taranaki Regional Council with a programme for the installation/construction of the structure[s], including: a schedule of proposed start dates and an estimation of the duration of the works, and details of the contractor including contact information for the project manager.

4. The consent holder shall notify the Chief Executive, Taranaki Regional Council, in writing at least 48 hours prior to commencement and upon completion of any subsequent maintenance works which would involve disturbance of, or deposition, or discharge to, the coastal marine area.

5. Prior to the exercise of this consent the consent holder shall provide, to the satisfaction of the Chief Executive, Taranaki Regional Council, a written construction contingency plan, outlining measures to be undertaken in the event of a spill as a result of works authorised by this consent. Further, prior to the exercise of this consent the consent holder shall provide to the Chief Executive, Taranaki Regional Council, written confirmation of the acceptance by the Maritime Safety Authority of a New Zealand Offshore Installation Site Marine Oil Spill Contingency Plan.

6. The consent holder shall at all times adopt the best practicable option, as defined in section 2 of the Resource Management Act 1991, to avoid or minimise the discharge of any contaminants into coastal water or onto the foreshore or seabed and to avoid or minimise any adverse effects on coastal water quality or ecosystems.

7. The construction, use, maintenance and removal of the structure[s] authorised by this consent shall comply with the noise standards as outlined within section 4.4.3 of the Regional Coastal Plan for Taranaki.

8. The consent holder shall survey and map the position of the structure[s], [including details of the structure[s] position in relation to the seabed], within 90 days of the completion of their construction, and shall provide a copy of the plan showing the precise location [to within plus or minus 5 metres] of the structure[s] on/in the seabed, to the Taranaki Regional Council, the Hydrographic Office, Royal New Zealand Navy, and the Maritime Safety Authority.

9. The consent holder shall undertake pre-lay and post-lay monitoring surveys of the pipeline corridor, to the satisfaction of the Chief Executive, Taranaki Regional Council. The monitoring shall include one survey prior to disturbance, one survey immediately following laying of the pipelines, and one survey approximately 1 year following laying of the pipelines. The results of the monitoring shall be provided to the Chief Executive, Taranaki Regional Council, upon request.

10. Except with the written agreement of the Chief Executive, Taranaki Regional Council, all structures authorised by this consent shall be removed and the area[s] reinstated, if and when the structure[s] are no longer required. The consent holder shall notify the Chief Executive, Taranaki Regional Council in writing at least 1 month prior to any structure[s] removal. Reinstatement shall be to the satisfaction of the Chief Executive, Taranaki Regional Council.

11. This consent shall lapse on the expiry of five [5] years after the date of commencement of this consent, unless the consent is given effect to before the end of that period or the Taranaki Regional Council fixes a longer period pursuant to section 125(1)(b) of the Resource Management Act 1991.

12. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2011 and/or June 2017 and/or June 2023 and/or June 2029 and/or June 2034, 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 17 April 2018

For and on behalf of
Taranaki Regional Council

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A D McLay
Director - Resource Management

Land Use Consent

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

Name of Consent Holder:	Beach Energy Resources NZ (Kupe) Limited Private Bag 2022 New Plymouth 4342
Decision Date:	1 November 2006
Commencement Date:	1 November 2006

Conditions of Consent

Consent Granted:	To install, construct and maintain up to seven water bores for horizontal directional drilling, pipeline hydro-testing, and production station operation purposes
Expiry Date:	1 June 2039
Review Date(s):	June 2023, June 2029, June 2034
Site Location:	Lower Inaha Road, Inaha
Grid Reference (NZTM)	1699850E-5618461N
Catchment:	Inaha

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 exercise of this consent shall be undertaken in general accordance with the documentation submitted in support of application 4392. In the case of any contradiction between the documentation submitted in support of application 4392 and the conditions of this consent, the conditions of this consent shall prevail.

2. The consent holder shall, within 28 days of the completion of each bore, provide a bore completion log to the satisfaction of the Chief Executive, Taranaki Regional Council.

3. The bores shall be cased and sealed to prevent the potential for aquifer cross-contamination and/or leakage from the surface.

4. The consent holder shall take all reasonable steps to mitigate any adverse environmental effects that may be caused by structural failure in any of the bores.

5. The consent holder shall properly decommission any bore no longer required.

6. The consent holder shall provide written notification to the Chief Executive, Taranaki Regional Council following the decommissioning of any bore, within 28 days of completion.

7. This consent shall lapse on the expiry of five years after the date of commencement of this consent, unless the consent is given effect to before the end of that period or the Taranaki Regional Council fixes a longer period pursuant to section 125(1)(b) of the Resource Management Act 1991.

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 2011 and/or June 2017 and/or 2023 and/or 2029 and/or 2034 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 17 April 2018

For and on behalf of
Taranaki Regional Council

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A D McLay
Director - Resource Management

Water Permit

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

Name of Consent Holder:	Beach Energy Resources NZ (Kupe) Limited Private Bag 2022 New Plymouth 4342
Decision Date (Change):	13 October 2011
Commencement Date (Change):	13 October 2011 (Granted Date: 2 November 2006)

Conditions of Consent

Consent Granted:	To take and use up to 3,500 m^3/day groundwater at a maximum rate of 40 l/s as a combined total from up to seven water bores in a bore field for the purpose of horizontal directional drilling, pipeline hydro-testing, production station operation and operations at the Manutahi-D, Manutahi-C, and Kauri-F wellsites
Expiry Date:	1 June 2039
Review Date(s):	June 2023, June 2029, June 2034
Site Location:	Lower Inaha Road, Inaha (Kupe Production Station/Manutahi-D/Manutahi-C/Kauri-F)
Grid Reference (NZTM)	1699935E-5618466N
Catchment:	Inaha

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 exercise of this consent shall be undertaken in general accordance with the documentation submitted in support of applications 4430, 4585 and 6908 and shall ensure the efficient and effective use of water. In the case of any contradiction between the documentation submitted in support of applications 4430, 4585, and 6908 and the conditions of this consent, the conditions of this consent shall prevail.

2. The consent holder shall notify the Chief Executive, Taranaki Regional Council, in writing at least seven days prior to the exercise of this consent.

3. Prior to the exercise of this consent, the consent holder shall provide a report to Chief Executive, Taranaki Regional Council, detailing the results of pump testing (24-hour constant discharge at 40 l/s and recovery tests) of the bores used for water supply to show (1) that the abstraction is sustainable, and (2) the effects of the abstraction on flows in the Inaha Stream and the Kapuni Stream.

4. The volume of groundwater abstracted shall not exceed 3,500 cubic metres per day at a rate not exceeding 40 litres per second as a combined total from the bores in the bore field.

5. The abstraction shall not cause more than a 10% lowering of the static water level by interference in any adjacent registered bore located beyond the boundary of the bore field.

6. The abstraction shall not cause the intrusion of saltwater into any freshwater aquifer.

7. The consent holder shall maintain daily records of the abstraction from each bore including date, abstraction rate and daily volume, and pumping hours, and make these records available to the Chief Executive, Taranaki Regional Council, no later than 31 July of each year, or upon request.

8. Prior to the exercise of this consent for any groundwater bore extracting water from an unconfined aquifer, the consent holder shall install groundwater monitoring piezometers between the Kapuni Stream and Inaha Stream and the bore for the purposes of monitoring groundwater levels.

9. The consent holder shall install and maintain a water meter approved by the Chief Executive, Taranaki Regional Council, on each bore for the purposes of accurately recording the abstraction of water.

10. This consent shall be subject to monitoring by the Taranaki Regional Council and the consent holder shall meet all reasonable costs associated with the monitoring.

11. This consent shall lapse on the expiry of five years after the date of commencement of this consent, unless the consent is given effect to before the end of that period or the Taranaki Regional Council fixes a longer period pursuant to section 125(1)(b) of the Resource Management Act 1991.

12. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2011 and/or June 2017 and/or 2023 and/or 2029 and/or 2034, 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 17 April 2018

For and on behalf of
Taranaki Regional Council

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A D McLay
Director - Resource Management

Appendix II

Biomonitoring reports

To	Job Manager, Callum MacKenzie
From	Environmental Scientists, Alex Connolly and Katie Blakemore
Document	1998378
Report No	KB053
Date	30 January 2018

Biomonitoring of the Kapuni Stream in relation to stormwater discharges from the Kupe Production Station, October 2017

Introduction

This was the first of two scheduled biomonitoring surveys relating to the Kupe Production Station, owned by Beach Energy Resources NZ Limited, for the 2017-2018 monitoring year. The Production Station discharges treated stormwater into the Kapuni Stream under Consent 6543-1. Special condition 9e of this consent requires:

"that after allowing for reasonable mixing over 50 metres downstream of the discharge point, 'there shall be no significant adverse effects on aquatic life'."

Stormwater discharges had occurred on four occasions in the month prior to this survey, with the last discharge nine days prior to this survey being carried out.

Methods

The standard '400 ml kick-sampling' technique was used to collect streambed macroinvertebrates from riffle habitats at three established sites (sites 1, 2 and 3) in the Kapuni Stream (Table 1, Figure 1) on 20 October 2017. This '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 Kapuni Stream, sampled in relation to the Kupe Production Station

Site No.	Site code	GPS location	Location
1	KPN000488	E1699156 N5618688	Upstream of Production Station stormwater discharge
2	KPN000490	E1699158 N5618595	50 m downstream of Production Station stormwater discharge
3	KPN000492	E1699237 N5618533	200 m downstream of Production Station stormwater discharge

Samples were preserved with Kahle's Fluid and ethanol for later sorting and identification under a stereomicroscope according to Taranaki Regional Council methodology using protocol P1 of NZMWG protocols for sampling macroinvertebrates in wadeable streams (Stark et al. 2001). Macroinvertebrate taxa found in each sample were recorded based on the abundance categories 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)	>499

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 taken 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. More 'sensitive' communities inhabit less polluted waterways. A difference of 11 or more MCI units is considered significantly different (Stark 1998). 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; Boothroyd and Stark, 2000) (Table 3).

Table 3 Macroinvertebrate community health based on MCI ranges which has been adapted for Taranaki streams and rivers (TRC, 2013) 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 and 1999). The loading factors were 1 for rare (R), 5 for common (C), 20 for abundant (A), 100 for very abundant (VA) and 500 for extremely abundant (XA). Unlike the MCI, the $SQMCI_s$ is not multiplied by a scaling factor of 20, so that its corresponding range of values is 20x lower.

Figure 1 Biomonitoring sites in the Kapuni Stream in relation to the Kupe Production Station

Results

At the time of this survey there was a swift, moderate flow in the Kapuni Stream at all sites surveyed. The water was clear and uncoloured at all three sites. The survey was carried out nine days after a fresh in excess of 3x median stream flow and ten days after a fresh in excess of 7x median stream flow. Flows had been relatively unstable in the months prior to this survey, with a number of small freshes and four significant freshes in excess of 7x median flow in just the one month period prior to this survey. Water temperature at the three sites ranged from 14.2 – 15.1 °C at the time of this survey. Substrate was predominantly cobble at all sites, with varying amounts of boulder, coarse gravel, fine gravel and sand also present.

At the time of the survey, there was no stormwater discharge from the Production Station occurring. Stormwater had been discharged on four occasions in the month prior to the survey, with the stormwater discharge volume for this period totalling 3773 cubic metres. In The most recent stormwater discharge had occurred on 11 October 2017, nine days prior to this survey being carried out.

Periphyton mats were slippery and filamentous periphyton was patchy at sites 1 and 2, while site 3 had patchy mats and patchy filaments. All sites had patchy moss on the streambed. Sites 2 and 3 had patches of leaves on the streambed, and no macrophytes or woody debris were present at any of the sites. There was some overhanging vegetation present, providing partial shading of the streambed at all sites.

Macroinvertebrate communities

Sixteen previous macroinvertebrate surveys had been undertaken at these 3 sites. Data from these surveys is summarised in Table 4 for comparative purposes. The results of the current survey are provided in Table 5 and are also summarised in Table 4 with the past results.

Table 4 Summary of previously recorded number of taxa, MCI values and SQMCIs values together with results from the October 2017 survey

Site	Number of previous surveys	Numbers of taxa			MCI values			$SQMCI_s$ values		
		Median	Range	Current Survey	Median	Range	Current Survey	Median	Range	Current Survey
1	16	20	12-27	16	104	96-107	105	6.2	5.2-7.8	6.9
2	16	19	14-28	15	102	93-116	119	6.3	5.0-7.4	6.6
3	16	20	15-27	23	98	91-113	106	6.4	5.3-7.8	6.3

Table 5 Macroinvertebrate communities of the Kapuni Stream sampled in relation to the Kupe Production Station stormwater discharge sampled on 20 October 2017

Taxa List	Site Number	MCI score	1	2	3
	Site Code		KPN000488	KPN000490	KPN000492
	Sample Number		FWB17297	FWB17298	FWB17299
ANNELIDA (WORMS)	Oligochaeta	1	R	-	R
	Lumbricidae	5	-	-	R
MOLLUSCA	*Potamopyrgus*	4	R	R	R
CRUSTACEA	Paraleptamphopidae	5	-	-	R
EPHEMEROPTERA (MAYFLIES)	*Austroclima*	7	R	-	R
	Coloburiscus	7	C	R	R
	Deleatidium	8	VA	VA	VA
	Zephlebia group	7	-	-	R
PLECOPTERA (STONEFLIES)	*Zelandobius*	5	A	C	A
HEMIPTERA (BUGS)	*Anisops*	5	-	R	-
COLEOPTERA (BEETLES)	Elmidae	6	C	R	C
	Hydraenidae	8	-	R	-
	Scirtidae	8	-	R	-
MEGALOPTERA (DOBSONFLIES)	*Archichauliodes*	7	C	R	R
TRICHOPTERA (CADDISFLIES)	*Hydropsyche (Aoteapsyche)*	4	R	R	R
	Costachorema	7	R	R	R
	Hydrobiosis	5	R	-	R
	Beraeoptera	8	C	A	A
	Olinga	9	-	-	R
	Pycnocentrodes	5	A	VA	VA
DIPTERA (TRUE FLIES)	*Aphrophila*	5	R	R	R
	Eriopterini	5	-	-	R
	Maoridiamesa	3	R	-	C
	Orthocladiinae	2	C	R	C
	Ephydridae	4	-	-	R
	Tabanidae	3	-	-	R
		No of taxa	16	15	23
		MCI	105	119	106
		SQMCIs	6.9	6.6	6.3
		EPT (taxa)	9	7	11
		%EPT (taxa)	56	47	48

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

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

Site 1: upstream of Production Station discharge

Results to date for this site are illustrated in Figure 2.

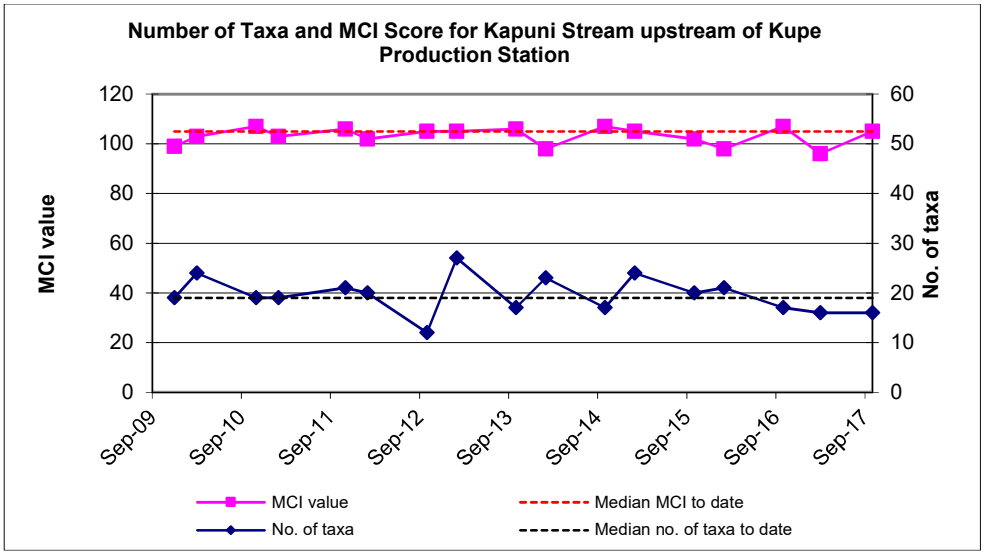

Figure 2 Number of taxa and MCI scores for site 1, Kapuni Stream upstream of Kupe Production Station

A moderate taxa richness of 16 taxa was recorded on this sampling occasion. This is similar to the median for this site (median taxa richness 20; Table 4) and the same as the preceding survey (taxa richness 16; Figure 2). The macroinvertebrate community was characterised by one 'highly sensitive' taxon [mayfly (*Deleatidium*)] and two 'moderately sensitive' taxa [stonefly (*Zelandobius*) and caddisfly (*Pycnocentrodes*)] (Table 5).

The recorded MCI score was 105, which is not significantly different (Stark 1998) to the median score for this site (median MCI score 104; Table 4), and the score of 96 units recorded in the preceding survey (Figure 2). The MCI score categorises this site as having 'good' macroinvertebrate community health. The $SQMCI_s$ score calculated from this sample was 6.9 units, which is not significantly higher (Stark 1998) than the median for this site (median $SQMCI_s$ score 6.2; Table 4) but is not significantly lower than the previously recorded score of 7.6 units.

Site 2: 50m downstream of Production Station discharge

Results to date for this site are illustrated in Figure 3.

A moderate taxa richness of 15 taxa was recorded at this site. This is similar to the median for this site (median taxa richness 19; Table 4) but substantially lower than the previously recorded score of 24 taxa (Figure 3). The macroinvertebrate invertebrate community was characterised by two 'highly sensitive' taxa [mayfly (*Deleatidium*) and caddisfly (*Beraeoptera)*] and one 'moderately sensitive' taxon [caddisfly (*Pycnocentrodes*)] (Table 5).

The recorded MCI score for this site was 119, which is significantly higher (Stark 1998) than the median score for this site (median MCI score 102; Table 4) and the previously recorded score of 93 units (Figure 3). This score is the highest recorded MCI score at this site to date (Table 4; Figure 3). The MCI score categorises the site as having 'good' macroinvertebrate community health. The $SQMCI_s$ score recorded was 6.6 units, insignificantly higher (Stark 1998) than the median $SQMCI_s$ score of 6.3 (Table 4) and the previously recorded score of 6.5 units.

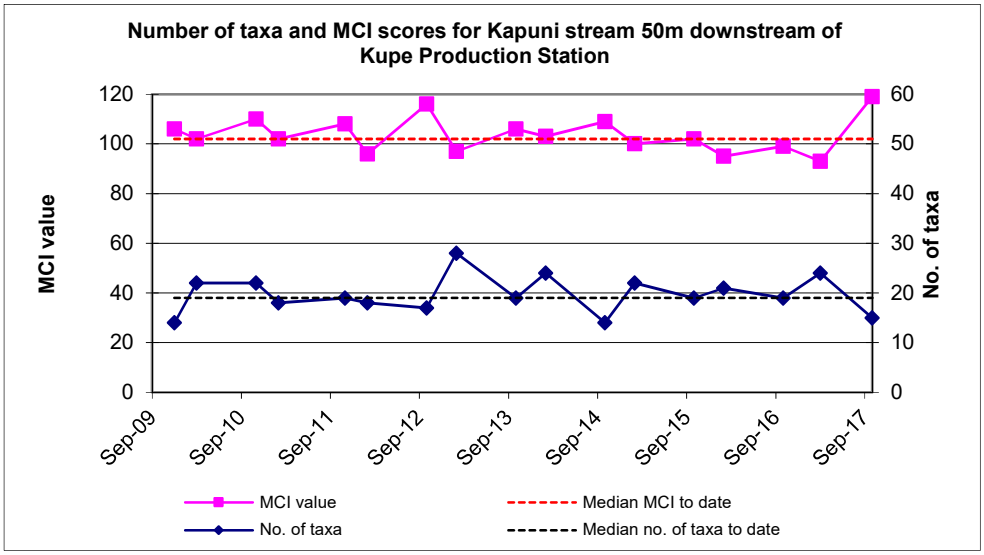

Figure 3 Number of taxa and MCI scores for site 2, Kapuni Stream 50m downstream of Kupe Production Station

Site 3: 200m downstream of Production Station discharge

Results to date for this site are illustrated in Figure 4.

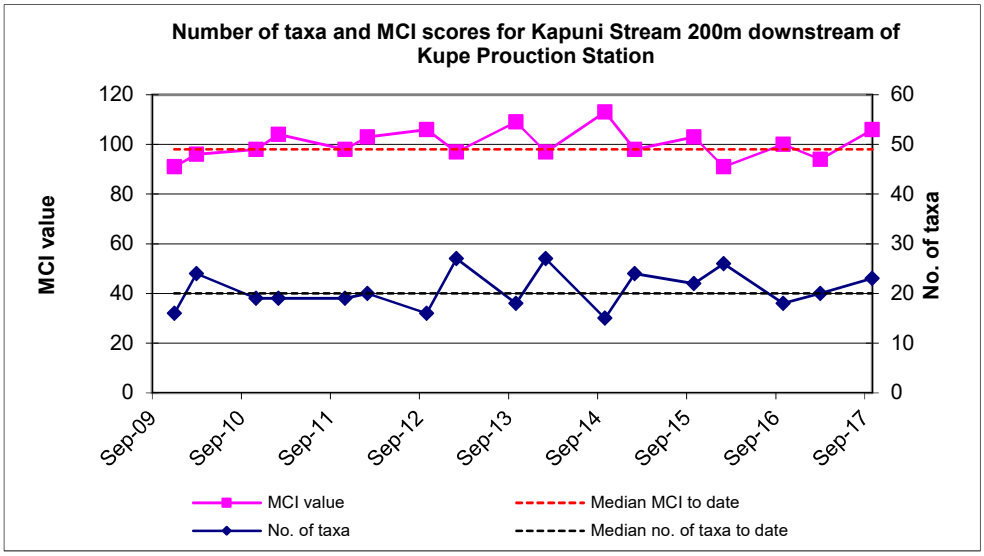

Figure 4 Number of taxa and MCI scores for site 3, Kapuni Stream 200m downstream of Kupe Production Station

A moderate taxa richness of 23 taxa was recorded at this site. This is similar to the median recorded for this site (median taxa richness 20; Table 4) and is three taxa more than the previously recorded score (20 taxa; Figure 4). The macroinvertebrate invertebrate community was characterised by two 'highly sensitive' taxa [mayfly (*Deleatidium*) and caddisfly (*Beraeoptera*)] and two 'moderately sensitive' taxa [stonefly (*Zelandobius*) and caddisfly (*Pycnocentrodes*)] (Table 5).

The recorded MCI score for this site was 106, insignificantly higher (Stark 1998) than the median MCI score for this site (median MCI score 98; Table 4) and significantly higher than the previous score of 94 units (Figure 4). This score categorises the site as having 'good' macroinvertebrate community health. The $SQMCI_s$ score was 6.3 units, insignificantly lower (Stark 1998) than the previously recorded score (6.6 units) and lower than the median $SQMCI_s$ (6.4 units; Table 4) for this site.

Discussion and conclusions

The Council's 'kick-sampling' technique was used at three sites to collect streambed macroinvertebrates from the Kapuni Stream in relation to the stormwater discharge from the Kupe Production Station. This has provided data to assess any potential impacts the discharge has had on the macroinvertebrate communities of the stream. Samples were processed to provide number of taxa (richness), MCI, and $SQMCI_s$ scores for each site.

Taxa richness is the most robust metric when ascertaining whether a macroinvertebrate community has been exposed to toxic discharges. When exposed to toxic discharges, macroinvertebrates 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 differing sensitivity to organic pollution. The $SQMCI_s$ is similar to the MCI, but accounts for relative abundances of the taxa found as well as sensitivity to pollution. Significant differences in taxa richness, MCI or $SQMCI_s$ between sites may indicate the degree of adverse effects (if any) of the discharges being monitored.

At the time of the survey, there were no significant differences in taxa richness between sites, and taxa richnesses were similar to median richnesses at all three sites, and to richnesses recorded in the preceding survey at sites 1 and 3, while the richness at site 2 decreased substantially. The survey recorded MCI scores of 105, 119 and 106 for sites 1-3 respectively, categorising all three sites as having 'good' macroinvertebrate community health. The score at site 2 is significantly higher than those at sites 1 and 3 (which are not significantly different scores), and all three scores were higher than those recorded in the preceding survey, although this difference was significant (Stark 1998) for sites 2 and 3 only. The previous (summer) survey recorded the lowest MCI scores to date at both sites 1 and 2, while site 2 recorded its highest MCI score to date in the current survey. This survey has seen some improvement in MCI score at all sites, which was significant at sites 2 and 3. It is common for spring surveys to have higher MCI scores than summer surveys, due to lower periphyton biomasses and lower water temperatures in spring compared to summer. $SQMCI_s$ scores were only slightly lower than in the preceding summer survey, and were similar to historic medians at all sites. Furthermore, there were no significant differences in $SQMCI_s$ scores between any of the three sites.

Overall, these metrics provide no evidence that the stormwater discharge from the Kupe Production Station is causing any adverse effects on the macroinvertebrate communities of the Kapuni Stream. Taxa richnesses and MCI scores were similar to median for all three sites, while $SQMCI_s$ scores were similar to or higher than medians at all three sites.

Summary

A macroinvertebrate survey was carried out at three sites in the Kapuni Stream to determine whether stormwater discharges from the Kupe Production Station had caused any adverse effects on the stream macroinvertebrate communities.

The survey recorded similar taxa richnesses, MCI scores and $SQMCI_s$ scores between sites, with the exception of MCI score at site 2 which was significantly higher than that recorded at sites 1 and 3. Taxa richnesses were similar to both median richnesses and those recorded in the preceding survey. MCI scores were not significantly different from medians for sites 1 and 3. However the score for site 2 was significantly higher than the median score, the previous survey score for this site, and the other two sites in the current survey. $SQMCI_s$ scores at sites 1 and 3 were insignificantly lower than those recorded in the preceding survey, (while site 2 was insignificantly higher) and similar to median scores. The categorisation of MCI has improved from the previous survey from 'fair' to 'good' at all three sites.

Overall, there is no evidence to indicate that the stormwater discharges from the Kupe Production Station had caused adverse effects on the macroinvertebrate communities of the Kapuni Stream.

References

Blakemore, KS 2017: Biomonitoring of the Kapuni Stream in relation to stormwater discharges from the Kupe Production Station, March 2017. TRC Internal report KB016.

Blakemore, KS 2016a: Biomonitoring of the Kapuni Stream in relation to stormwater discharges from the Kupe Production Station, October 2016. TRC Internal report KB012.

Blakemore, KS 2016b: Biomonitoring of the Kapuni Stream in relation to stormwater discharges from the Kupe Production Station, February 2016. TRC Internal report KB003.

Fowles CR, 2009: Biomonitoring of the Kapuni Stream in relation to stormwater discharges from the Kupe Production Station of Origin Energy Resources Ltd, December 2009. TRC Internal report CF497.

Fowles CR, 2010a: Biomonitoring of the Kapuni Stream in relation to stormwater discharges from the Kupe Production Station of Origin Energy Resources Ltd, March 2010.TRC Internal report CF508.

Fowles CR, 2010b: Biomonitoring of the Kapuni Stream in relation to stormwater discharges from the Kupe Production Station of Origin Energy Resources Ltd, November 2010.TRC Internal report CF516.

Fowles CR, 2011a: Biomonitoring of the Kapuni Stream in relation to stormwater discharges from the Kupe Production Station of Origin Energy Resources Ltd, February 2011.TRC Internal report CF529.

Fowles CR, 2011b: Biomonitoring of the Kapuni Stream in relation to stormwater discharges from the Kupe Production Station of Origin Energy Resources Ltd, November 2011.TRC Internal report CF536.

Fowles CR, 2012a: Biomonitoring of the Kapuni Stream in relation to stormwater discharges from the Kupe Production Station of Origin Energy Resources Ltd, February 2012.TRC Internal report CF544.

Fowles CR, 2012b: Biomonitoring of the Kapuni Stream in relation to stormwater discharges from the Kupe Production Station of Origin Energy Resources Ltd, October 2012.TRC Internal report CF561.

Fowles CR, 2013a: Biomonitoring of the Kapuni Stream in relation to stormwater discharges from the Kupe Production Station of Origin Energy Resources Ltd, February 2013.TRC Internal report CF574.

Fowles CR, 2013b: Biomonitoring of the Kapuni Stream in relation to stormwater discharges from the Kupe Production Station of Origin Energy Resources Ltd, October 2013.TRC Internal report CF591.

Fowles CR, 2014a: Biomonitoring of the Kapuni Stream in relation to stormwater discharges from the Kupe Production Station of Origin Energy Resources Ltd, February 2014.TRC Internal report CF600.

Fowles CR, 2014b: Biomonitoring of the Kapuni Stream in relation to stormwater discharges from the Kupe Production Station of Origin Energy Resources Ltd, October 2014.TRC Internal report CF623.

Fowles CR, 2014c: Macroinvertebrate biomonitoring of the Kapuni Stream – a possible ringplain reference stream. TRC Internal report CF554.

Fowles CR, 2015a: Biomonitoring of the Kapuni Stream in relation to stormwater discharges from the Kupe Production Station of Origin Energy Resources Ltd, February 2015.TRC Internal report CF637.

Fowles, CR 2015b: Biomonitoring of the Kapuni Stream in relation to stormwater discharges from the Kupe Production Station of Origin Energy Resources Ltd, October 2015.TRC Internal Report CF645.

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.

Stark JD, Fowles CR, 2009: Relationships between MCI, site altitude, and distance from source for Taranaki ring plain streams. Stark Environmental Report 2009-01. 47p.

Stark JD, 2014: Kapuni macroinvertebrate biomonitoring (28 July 2014). Stark Environmental Report 2014-12. 26p.

Stark JD, 2015a: Kapuni macroinvertebrate biomonitoring (27 January 2015). Stark Environmental Report 2015-02. 24p.

Stark JD, 2015b: A re-appraisal of MCI tolerance values for macroinvertebrates in Taranaki ringplain streams. Stark Environmental report 2015-03, 38p.

TRC, 2015: Freshwater 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 2015(SEM reference report).

Winterbourn MJ, Gregson KLD, Dolphin CH, 2006. Guide to the aquatic insects of New Zealand. [4th edition]. *Bulletin of the Entomological Society of New Zealand 14*, 108p.

To	Job Manager, Callum MacKenzie
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Report No	KB054
Date	29 May 2018

Biomonitoring of the Kapuni Stream in relation to stormwater discharges from the Kupe Production Station, March 2018

Introduction

This was the second of two scheduled biomonitoring surveys relating to the Kupe Production Station, owned by Beach Energy Resources NZ Limited, for the 2017-2018 monitoring year. The Production Station discharges treated stormwater into the Kapuni Stream under Consent 6543-1. Special condition 9e of this consent requires:

"that after allowing for reasonable mixing over 50 metres downstream of the discharge point, 'there shall be no significant adverse effects on aquatic life'."

Stormwater discharges had occurred on four occasions since the previous survey was carried out, with the last discharge eight days prior to this survey being carried out.

Methods

The standard '400 ml kick-sampling' technique was used to collect streambed macroinvertebrates from riffle habitats at three established sites (sites 1, 2 and 3) in the Kapuni Stream (Table 1, Figure 1) on 6 March 2018. This '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 Kapuni Stream, sampled in relation to the Kupe Production Station

Site No.	Site code	GPS location	Location
1	KPN000488	E1699156 N5618688	Upstream of Production Station stormwater discharge
2	KPN000490	E1699158 N5618595	50 m downstream of Production Station stormwater discharge
3	KPN000492	E1699237 N5618533	200 m downstream of Production Station stormwater discharge

Samples were preserved with Kahle's Fluid and ethanol for later sorting and identification under a stereomicroscope according to Taranaki Regional Council methodology using protocol P1 of NZMWG protocols for sampling macroinvertebrates in wadeable streams (Stark et al. 2001). Macroinvertebrate taxa found in each sample were recorded based on the abundance categories 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)	>499

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 taken 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. More 'sensitive' communities inhabit less polluted waterways. A difference of 11 or more MCI units is considered significantly different (Stark 1998). 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; Boothroyd and Stark, 2000) (Table 3).

Table 3 Macroinvertebrate community health based on MCI ranges which has been adapted for Taranaki streams and rivers (TRC, 2013) 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 and 1999). The loading factors were 1 for rare (R), 5 for common (C), 20 for abundant (A), 100 for very abundant (VA) and 500 for extremely abundant (XA). Unlike the MCI, the $SQMCI_s$ is not multiplied by a scaling factor of 20, so that its corresponding range of values is 20x lower.

Figure 1 Biomonitoring sites in the Kapuni Stream in relation to the Kupe Production Station

Results

At the time of this survey there was a swift, low flow in the Kapuni Stream at all sites surveyed. The water was clear and uncoloured at all three sites. The survey was carried out 13 days after a fresh in excess of 3x median stream flow and 33 days after a fresh in excess of 7x median stream flow. Flows had been relatively unstable since the preceding survey, with a six freshes in excess of 3x median flow and three freshes in excess of 7x median flow since the previous survey. Water temperatures were 19.3 °C at all three sites at the time of this survey. Substrate comprised predominantly cobble at sites 1 and 3, with some boulder, gravel and sand present. Site 2 had substrate dominated by gravels, with cobble boulder and sand present in smaller amounts.

At the time of the survey, there was no stormwater discharge from the Production Station occurring. Stormwater had been discharged on four occasions since the previous spring survey, with the stormwater discharge volume for this period totalling 2560 cubic metres. In The most recent stormwater discharge had occurred on 26 February 2018, eight days prior to this survey being carried out.

Periphyton mats were slippery and filamentous periphyton was patchy at sites 1 and 2, while site 3 had patchy mats and patchy filaments. All sites had patchy moss on the streambed. Sites 1 and 3 had patches of leaves on the streambed, and no woody debris were present at any of the sites. There were macrophytes on the stream margins at site 2, and no macrophytes at sites 1 and 3. There was some overhanging vegetation present, providing partial shading of the streambed at all sites.

Macroinvertebrate communities

Sixteen previous macroinvertebrate surveys had been undertaken at these 3 sites. Data from these surveys is summarised in Table 4 for comparative purposes. The results of the current survey are provided in Table 5 and are also summarised in Table 4 with the past results.

Table 4 Summary of previously recorded number of taxa, MCI values and SQMCIs values together with results from the March 2018 survey

Site	Number of previous surveys	Numbers of taxa			MCI values			$SQMCI_s$ values		
		Median	Range	Current Survey	Median	Range	Current Survey	Median	Range	Current Survey
1	17	19	12-27	17	105	96-107	112	6.2	5.2-7.8	7.5
2	17	19	14-28	13	102	93-119	108	6.3	5.0-7.4	7.4
3	17	20	15-27	15	98	91-113	100	6.4	5.3-7.8	6.3

Table 5 Macroinvertebrate communities of the Kapuni Stream sampled in relation to the Kupe Production Station stormwater discharge sampled on 6 March 2018

Taxa List	Site Number	MCI score	1	2	3
	Site Code		KPN000488	KPN000490	KPN000492
	Sample Number		FWB18151	FWB18152	FWB18153
NEMERTEA	Nemertea	3	C	R	C
ANNELIDA (WORMS)	Oligochaeta	1	-	-	R
MOLLUSCA	*Potamopyrgus*	4	R	R	C
EPHEMEROPTERA (MAYFLIES)	*Austroclima*	7	-	R	C
	Coloburiscus	7	R	-	R
	Deleatidium	8	XA	VA	VA
PLECOPTERA (STONEFLIES)	*Megaleptoperla*	9	-	R	-
COLEOPTERA (BEETLES)	Elmidae	6	A	R	C
MEGALOPTERA (DOBSONFLIES)	*Archichauliodes*	7	R	R	C
TRICHOPTERA (CADDISFLIES)	*Hydropsyche (Aoteapsyche)*	4	C	R	C
	Costachorema	7	R	-	-
	Hydrobiosis	5	R	R	-
	Beraeoptera	8	R	-	R
	Olinga	9	R	-	-
	Pycnocentria	7	R	-	-
	Pycnocentrodes	5	A	C	A
DIPTERA (TRUE FLIES)	*Aphrophila*	5	C	R	C
	Eriopterini	5	C	R	C
	Maoridiamesa	3	R	-	-
	Orthocladiinae	2	A	C	A
	Tanytarsini	3	-	-	R
		No of taxa	17	13	15
		MCI	112	108	100
		SQMCIs	7.5	7.4	6.3
		EPT (taxa)	9	6	6
		%EPT (taxa)	53	46	40
'Tolerant' taxa	'Moderately sensitive' taxa		'Highly sensitive' taxa		

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

Site 1: upstream of Production Station discharge

Results to date for this site are illustrated in Figure 2.

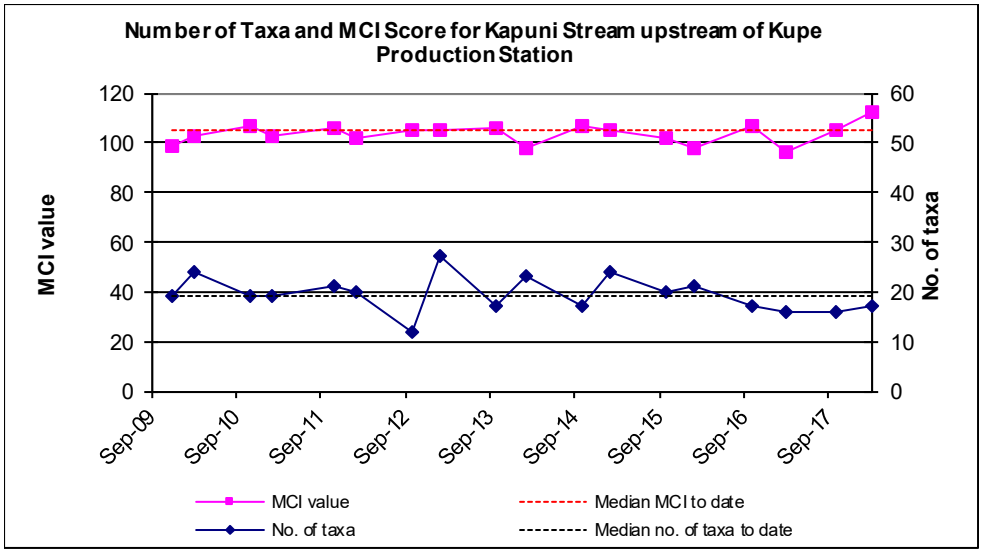

Figure 2 Number of taxa and MCI scores for site 1, Kapuni Stream upstream of Kupe Production Station

A moderate taxa richness of 17 taxa was recorded on this sampling occasion. This is similar to the median for this site (median taxa richness 19; Table 4) and one taxon more than the preceding survey (taxa richness 16; Figure 2). The macroinvertebrate community was characterised by one 'highly sensitive' taxon [mayfly (*Deleatidium*)], two 'moderately sensitive' taxa [beetle (Elmidae) and caddisfly (*Pycnocentrodes*)] and one 'tolerant' taxon [midge larvae (Orthocladiinae)] (Table 5).

The recorded MCI score was 112, which is not significantly different (Stark 1998) to the median score for this site (median MCI score 105; Table 4), and the score of 105 units recorded in the preceding survey (Figure 2). This score is the highest score recorded at this site to date (Table 4). The MCI score categorises this site as having 'good' macroinvertebrate community health. The $SQMCI_s$ score calculated from this sample was 7.5 units, which is significantly higher (Stark 1998) than the median for this site (median $SQMCI_s$ score 6.2; Table 4) but is not significantly higher than the previously recorded score of 6.9 units.

Site 2: 50m downstream of Production Station discharge

Results to date for this site are illustrated in Figure 3.

A moderately low taxa richness of 13 taxa was recorded at this site. This is six taxa lower than the median for this site (median taxa richness 19; Table 4) but similar to the previously recorded score of 15 taxa (Figure 3). However, this is the lowest taxa richness recorded at this site to date (by only one taxon). The macroinvertebrate invertebrate community was characterised by only one 'highly sensitive' taxon [mayfly (*Deleatidium*)] (Table 5).

The recorded MCI score for this site was 108, which is not significantly higher (Stark 1998) than the median score for this site (median MCI score 102; Table 4) but is significantly lower (Stark 1998) than the previously recorded score of 119 units (Figure 3). The MCI score categorises the site as having 'good' macroinvertebrate community health. The $SQMCI_s$ score recorded was 7.4 units, significantly higher (Stark 1998) than the median $SQMCI_s$ score of 6.3 (Table 4) but not significantly higher than the previously recorded score of 6.6 units.

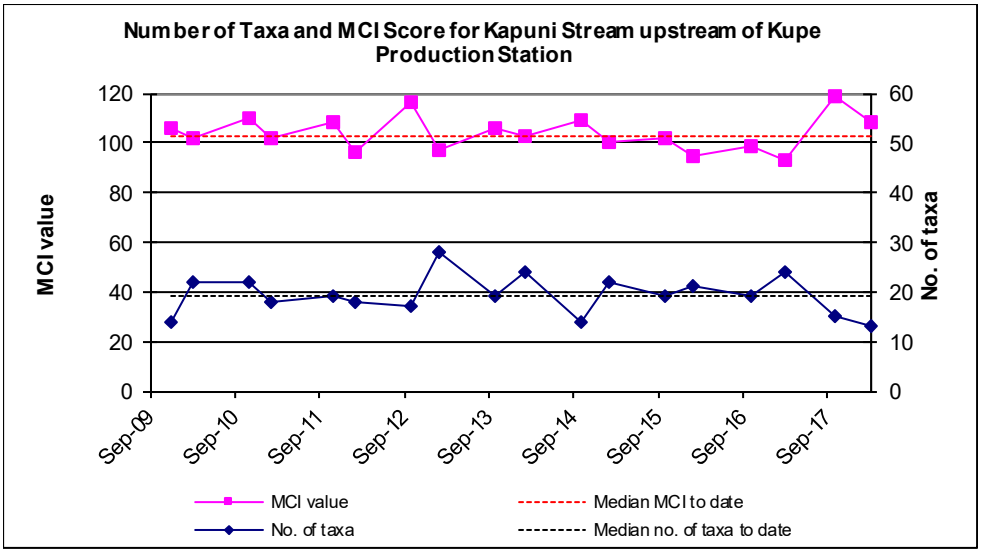

Figure 3 Number of taxa and MCI scores for site 2, Kapuni Stream 50m downstream of Kupe Production Station

Site 3: 200m downstream of Production Station discharge

Results to date for this site are illustrated in Figure 4.

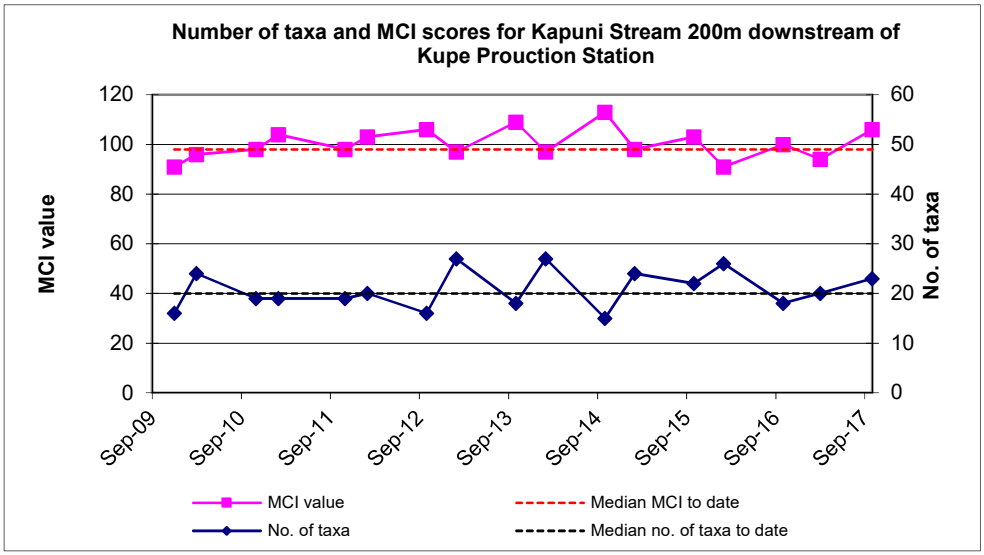

Figure 4 Number of taxa and MCI scores for site 3, Kapuni Stream 200m downstream of Kupe Production Station

A moderate taxa richness of 15 taxa was recorded at this site. This is similar to the median recorded for this site (median taxa richness 20; Table 4) and is a substantial eight taxa less than the previously recorded score (23 taxa; Figure 4). The macroinvertebrate invertebrate community was characterised by one 'highly sensitive' taxon [mayfly (*Deleatidium*)], one 'moderately sensitive' taxon [caddisfly (*Pycnocentrodes*)] and one 'tolerant' taxon [midge larvae (Orthocladiinae)] (Table 5).

The recorded MCI score for this site was 100, insignificantly higher (Stark 1998) than the median MCI score for this site (median MCI score 98; Table 4) and insignificantly lower than the previous score of 106 units (Figure 4). This score categorises the site as having 'good' macroinvertebrate community health. The $SQMCI_s$ score was 6.3 units, slightly lower than the previously recorded score (6.6 units) and the median $SQMCI_s$ (6.4 units; Table 4) for this site.

Discussion and conclusions

The Council's 'kick-sampling' technique was used at three sites to collect streambed macroinvertebrates from the Kapuni Stream in relation to the stormwater discharge from the Kupe Production Station. This has provided data to assess any potential impacts the discharge has had on the macroinvertebrate communities of the stream. Samples were processed to provide number of taxa (richness), MCI, and $SQMCI_s$ scores for each site.

Taxa richness is the most robust metric when ascertaining whether a macroinvertebrate community has been exposed to toxic discharges. When exposed to toxic discharges, macroinvertebrates 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 differing sensitivity to organic pollution. The $SQMCI_s$ is similar to the MCI, but accounts for relative abundances of the taxa found as well as sensitivity to pollution. Significant differences in taxa richness, MCI or $SQMCI_s$ between sites may indicate the degree of adverse effects (if any) of the discharges being monitored.

At the time of the survey, there were no significant differences in taxa richness between sites, and taxa richnesses were similar to or slightly lower than median scores and richnesses recorded in the preceding survey for all sites. The survey recorded MCI scores of 112, 108 and 100 for sites 1-3 respectively, categorising all three sites as having 'good' macroinvertebrate community health. These score at site 1 is significantly higher than site 3, while there are no other significant differences between sites. These scores were similar to those recorded in the preceding survey at sites 1 and 3, but significantly lower at site 2.The MCI score recorded at 2 was the highest score recorded to date in the previous survey, while site 1 recorded its highest MCI score to date in the current survey.

$SQMCI_s$ scores were only slightly higher than in the preceding survey but were significantly higher than historic medians at sites 1 and 2. Sites 1 and 2 recorded similar $SQMCI_S$ scores, both of which were significantly higher than the score at site 3.

Overall, these metrics provide no evidence that the stormwater discharge from the Kupe Production Station is causing any adverse effects on the macroinvertebrate communities of the Kapuni Stream. Taxa richnesses were similar to or lower than medians and did not change substantially between sites, MCI scores were similar to median for all three sites, and $SQMCI_s$ scores were similar to or higher than medians at all three sites. MCI and $SQMCI_s$ scores were significantly lower at site 3 compared to site 1, but had no other significant differences between sites.

Summary

A macroinvertebrate survey was carried out at three sites in the Kapuni Stream to determine whether stormwater discharges from the Kupe Production Station had caused any adverse effects on the stream macroinvertebrate communities.

The survey recorded similar taxa richnesses between sites, which were similar to or lower than medians and preceding scores. MCI scores decreased in a downstream direction, with site 1 recording its highest score to date, which was significantly higher than the score at site 3. Scores were similar to the preceding survey, with the exception of site 2, which decreased significantly. $SQMCI_S$ scores were at sites 1 and 2 were significantly higher than at site 3, and were significantly higher than historic medians. $SQMCI_S$ scores at all three sites were similar to the preceding survey.

Overall, there is no evidence to indicate that the stormwater discharges from the Kupe Production Station had caused adverse effects on the macroinvertebrate communities of the Kapuni Stream.

References

Blakemore, KS and Connolly, A 2018. Biomonitoring of the Kapuni Stream in relation to stormwater discharges from the Kupe Production Station, October 2017.TRC Internal report KB053.

Blakemore, KS 2017: Biomonitoring of the Kapuni Stream in relation to stormwater discharges from the Kupe Production, March 2017. TRC Internal report KB016.

Blakemore, KS 2016: Biomonitoring of the Kapuni Stream in relation to stormwater discharges from the Kupe Production Station, October 2016. TRC Internal report KB012.

Blakemore, KS 2016: Biomonitoring of the Kapuni Stream in relation to stormwater discharges from the Kupe Production Station, February 2016. TRC Internal report KB003.

Fowles CR, 2009: Biomonitoring of the Kapuni Stream in relation to stormwater discharges from the Kupe Production Station of Origin Energy Resources Ltd, December 2009. TRC Internal report CF497.

Fowles CR, 2010a: Biomonitoring of the Kapuni Stream in relation to stormwater discharges from the Kupe Production Station of Origin Energy Resources Ltd, March 2010.TRC Internal report CF508.

Fowles CR, 2010b: Biomonitoring of the Kapuni Stream in relation to stormwater discharges from the Kupe Production Station of Origin Energy Resources Ltd, November 2010.TRC Internal report CF516.

Fowles CR, 2011a: Biomonitoring of the Kapuni Stream in relation to stormwater discharges from the Kupe Production Station of Origin Energy Resources Ltd, February 2011.TRC Internal report CF529.

Fowles CR, 2011b: Biomonitoring of the Kapuni Stream in relation to stormwater discharges from the Kupe Production Station of Origin Energy Resources Ltd, November 2011.TRC Internal report CF536.

Fowles CR, 2012a: Biomonitoring of the Kapuni Stream in relation to stormwater discharges from the Kupe Production Station of Origin Energy Resources Ltd, February 2012.TRC Internal report CF544.

Fowles CR, 2012b: Biomonitoring of the Kapuni Stream in relation to stormwater discharges from the Kupe Production Station of Origin Energy Resources Ltd, October 2012.TRC Internal report CF561.

Fowles CR, 2013a: Biomonitoring of the Kapuni Stream in relation to stormwater discharges from the Kupe Production Station of Origin Energy Resources Ltd, February 2013.TRC Internal report CF574.

Fowles CR, 2013b: Biomonitoring of the Kapuni Stream in relation to stormwater discharges from the Kupe Production Station of Origin Energy Resources Ltd, October 2013.TRC Internal report CF591.

Fowles CR, 2014a: Biomonitoring of the Kapuni Stream in relation to stormwater discharges from the Kupe Production Station of Origin Energy Resources Ltd, February 2014.TRC Internal report CF600.

Fowles CR, 2014b: Biomonitoring of the Kapuni Stream in relation to stormwater discharges from the Kupe Production Station of Origin Energy Resources Ltd, October 2014.TRC Internal report CF623.

Fowles CR, 2014c: Macroinvertebrate biomonitoring of the Kapuni Stream – a possible ringplain reference stream. TRC Internal report CF554.

Fowles CR, 2015a: Biomonitoring of the Kapuni Stream in relation to stormwater discharges from the Kupe Production Station of Origin Energy Resources Ltd, February 2015.TRC Internal report CF637.

Fowles, CR 2015b: Biomonitoring of the Kapuni Stream in relation to stormwater discharges from the Kupe Production Station of Origin Energy Resources Ltd, October 2015.TRC Internal Report CF645.

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.

Stark JD, Fowles CR, 2009: Relationships between MCI, site altitude, and distance from source for Taranaki ring plain streams. Stark Environmental Report 2009-01. 47p.

Stark JD, 2014: Kapuni macroinvertebrate biomonitoring (28 July 2014). Stark Environmental Report 2014-12. 26p.

Stark JD, 2015a: Kapuni macroinvertebrate biomonitoring (27 January 2015). Stark Environmental Report 2015-02. 24p.

Stark JD, 2015b: A re-appraisal of MCI tolerance values for macroinvertebrates in Taranaki ringplain streams. Stark Environmental report 2015-03, 38p.

TRC, 2015: Freshwater 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 2015(SEM reference report).

Winterbourn MJ, Gregson KLD, Dolphin CH, 2006. Guide to the aquatic insects of New Zealand. [4th edition]. *Bulletin of the Entomological Society of New Zealand 14*, 108p.

Appendix III

Air monitoring report

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Document	2100072
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Ambient Gas (PM10, NOx, CO and LEL) Monitoring at Kupe Production Stations during 2017-2018 monitoring year

Introduction

In January 2018 and May 2018 as part of the compliance monitoring programme for the Kupe production station, a survey of ambient air quality sampling was carried out by the Taranaki Regional Council (the Council) in the vicinity of the plant. The main objectives were to measure:

- The concentrations of PM10 using a portable data logging TSI 'DustTrak';
- To measure the concentrations of the nitrogen oxides (NOx) using a passive sampling method, that gives a result for average exposure;
- And to measure carbon monoxide (CO) using a portable multi gas meter that provides instantaneous data throughout the monitoring period.

The findings of this study are presented in this memorandum, together with the locations of the monitoring sites which are provided in Figure 1.

Carbon monoxide (CO) and Lower explosive limit (LEL)

During the monitoring year, a multi-gas meter was deployed on one occasion in the vicinity of the plant. The deployment lasted approximately 24 hours, with the instrument placed in a down-wind position at the start of the deployment. Monitoring consisted of continuous measurements of gas concentrations for the gases of interest (carbon monoxide and combustible gases).

Because of the nature of the activities on the site, it was considered that the primary information of interest in respect of gases potentially emitted from the site was the average downwind concentration, rather than any instantaneous peak value. That is, the long-term exposure levels, rather than short-term maxima, are of most interest. The gas meter was therefore set up to create a data set based on recording the average concentration measured during each minute as raw data.

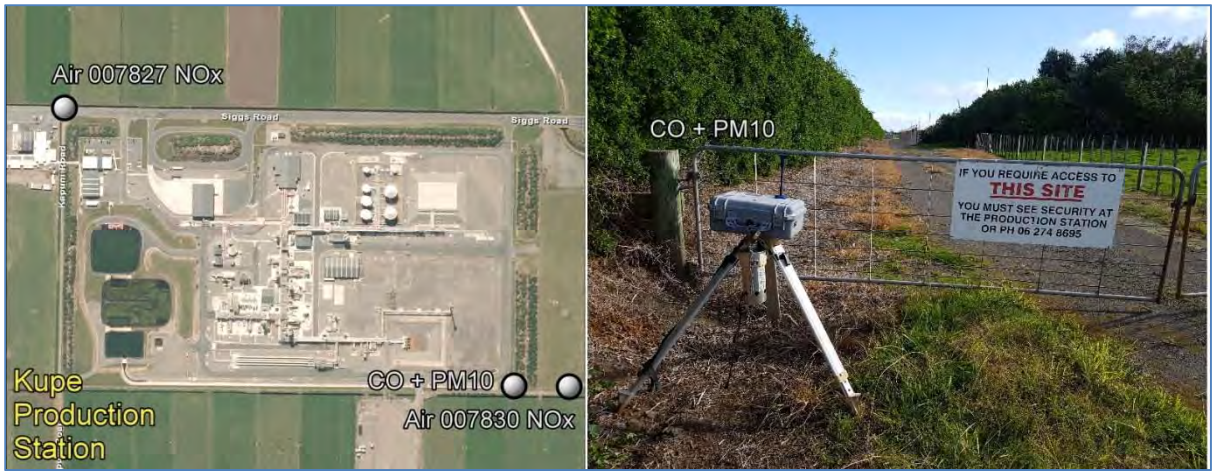

Figure 1 Air monitoring sites at Kupe production station (2017-2018)

The details of the sample run are summarised in Table 1 and the data from the sample run are presented graphically in Figure 2**.**

The consents covering air discharges from the Kupe production station have specific limits related to particular gases. Special condition 17 of consent 6545-1 set a limit on the carbon monoxide concentration at or beyond the production station's boundary. The limit is expressed as 10 mg/m^3 for an eight hour average or 30 mg/m^3 for a one hour average exposure. The maximum concentration of carbon monoxide found during the monitoring run was 9.3 mg/m^3 with average concentration for the entire dataset was only 0.23 mg/m^3 which comply with consent conditions. This is in line with the pattern found in previous years.

Table 1 Results of carbon monoxide and LEL monitoring at Kupe production station

Period (from-to)		09/05/2018 08:45 to 10/05/2018 08:43
Max	CO(ppm)	8.10
	LEL(%)	0.10
Mean	CO(ppm)	0.23
	LEL(%)	0.00
Min	CO(ppm)	0.00
	LEL(%)	0.00

Note: (1) the instrument records in units of ppm. At 25°C, 1 atm.
1ppm CO = 1.145 mg/m^3

(2) See text for explanation of LEL. Because the LEL of methane is equivalent to a mixture of approximately 5% methane in air, then the actual concentration of methane in air can be obtained by dividing the percentage LEL by 20.

LEL gives the percentage of the lower explosive limit, expressed as methane that is detected in the air sampled. The sensor on the instrument reacts to gases and vapours such as acetone, benzene, butane, methane, propane, carbon monoxide, ethanol, and higher alkanes and alkenes, with varying degrees of sensitivity. The Council's Regional Air Quality Plan has a typical requirement that no discharge shall result in dangerous levels of airborne contaminants, including any risk of explosion. At no time did the level of explosive gases downwind of the Kupe production station reach any more than a trivial level.

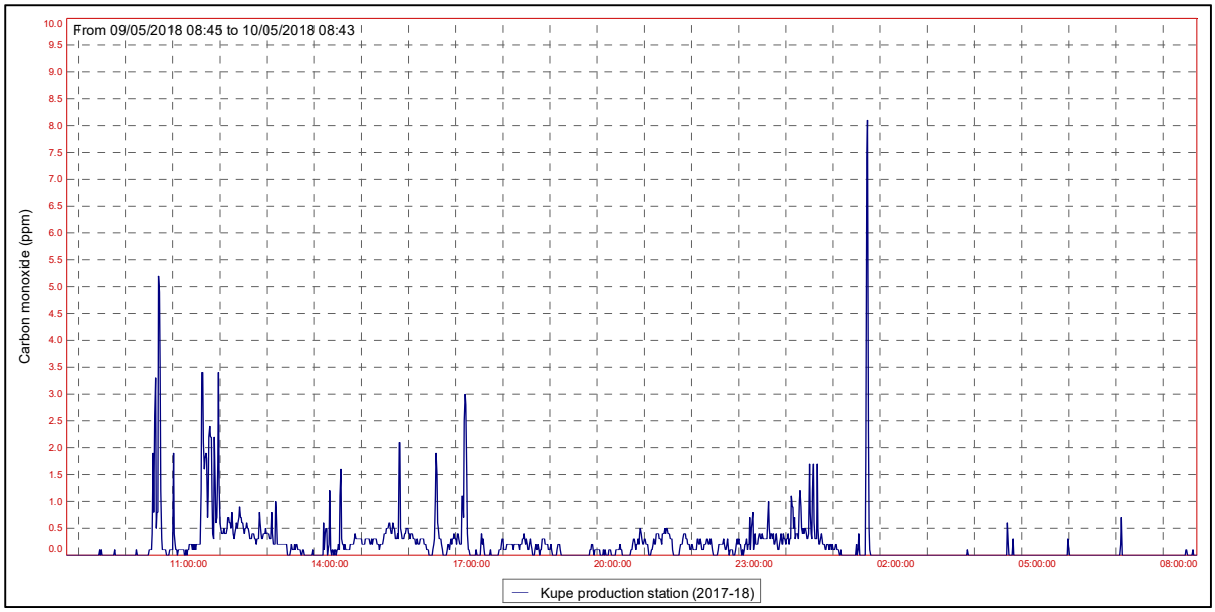

Figure 2 Graph of ambient CO levels in the vicinity of the Kupe Production Station (2017-18)

PM10

In September 2004 the Ministry for the Environment made public National Environmental Standards (NESs) relating to certain air pollutants. The NES for PM10 is 50 µg/m^3 (24-hour average).

Particulates can be derived from many sources, including motor vehicles (particularly diesel), solid and oil-burning processes for industry and power generation, incineration and waste burning, photochemical processes, and natural sources such as pollen, abrasion, and sea spray.

PM10 particles are linked to adverse health effects that arise primarily from the ability of particles of this size to penetrate the defences of the human body and enter deep into the lungs significantly reducing the exchange of gases across the lung walls. Health effects from inhaling PM10 include increased mortality and the aggravation of existing respiratory and cardiovascular conditions such as asthma and chronic pulmonary diseases.

During the reporting period, a "DustTrak" PM10 monitor was deployed on one occasion in the vicinity of the Kupe production station. The deployment lasted approximately 24 hours, with the instrument placed in a down-wind position at the start of the deployment. Monitoring consisted of continual measurements of PM10 concentrations. The location of the "DustTrak" monitor during the sampling run is shown in Figure 1.

The details of the sample run are presented in Figure 3 and Table 2.

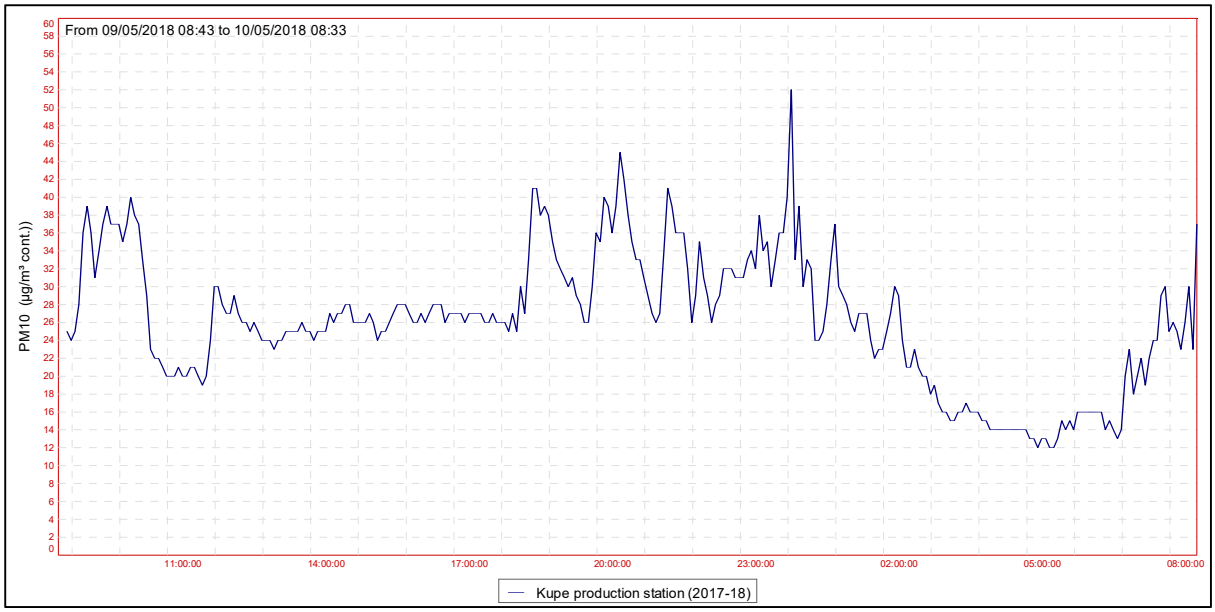

Figure 3 PM10 concentrations (µg/m³ cont.) at the Kupe production station (2017-18)

Table 2 Daily mean of PM10 results at Kupe production station

	(24 hours) (09-10/05/2018)	
24 hr. set	Day 1	Day 2
Daily average	26.2 µg/m³	N/A
NES	50µg/m³	

During the 24-hour run, from 9th to 10th of May 2017, the average recorded PM_{10} concentration for the 24 hour period was 26 µg/m³. This daily mean equate to 52% of the 50 µg/m³ value that is set by the National Environmental Standard.

Background levels of PM_{10} in the region have been found to be typically around 11 µg/m³.

Nitrogen oxides (NOx)

From 2014 onwards, the Council has implemented a coordinated region-wide compliance monitoring programme to measure NOx. The programme involves deploying all measuring devices at 30 NOx monitoring sites (including two sites in the vicinity of the Kupe production station) on the same day, with retrieval three weeks later. This approach assists the Council in further evaluating the effects of local and regional emission sources and ambient air quality in the region.

The complete report covering region-wide NOx monitoring is attached in the Appendix to this memorandum (TRC #2089257).

The consents covering air discharges from the Kupe production station have specific limits related to particular gases. Special condition 18 of consent 6545-1 set a limit on the nitrogen dioxide concentration at or beyond the production station's boundary. The limit is expressed as 100 µg/m³ for a 24 hour average or 200 µg/m³ for a one hour average exposure.

NOx passive adsorption discs were place at two locations in the vicinity of the Kupe production station on one occasion during the year under review. The discs were left in place for a period of 21 days.

The calculated 1-hour and 24-hour theoretical maximum NOx concentrations found at the Kupe production station during the year under review equates to 8.25µg/m^3 and 4.4µg/m^3 respectively. The results show that the ambient ground level concentration of NO_x is well below the limits set out by consent 6545-1.