

Greymouth Petroleum Limited
Northern Sites
Monitoring Programme
Annual Report
2018-2019

Technical Report 2019-55

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Taranaki Regional Council
Private Bag 713
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Executive summary

Greymouth Petroleum Limited (GPL) operates the Turangi Production Station located on Turangi Road at Motunui, in the Parahaki catchment. The Turangi Production Station processes oil and gas from from GPL's northern Taranaki operations, including the Ohanga, Onaero and Turangi group of wellsites. GPL also operate the Kowhai-A Production Station, located on Ngatimaru Road at Tikorangi. The Kowhai-A Production Station processes product from the Kowhai-A, B, C and D wellsites. This report for the period July 2018 to June 2019 describes the monitoring programme implemented by the Taranaki Regional Council (the Council) to assess GPL'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 GPL's activities.

GPL holds four resource consents in relation to the Turangi and Kowhai-A production stations, which include a total of 80 conditions setting out the requirements that GPL must satisfy. GPL holds two consents to discharge stormwater and two consents to discharge emissions related to production activities into the air. During the year under review two stormwater consents at the Turangi Production Station were surrendered after being combined, with an additional discharge, into one new consent covering the whole site.

During the monitoring period, Greymouth Petroleum Limited demonstrated an overall high level of environmental performance.

The Council's monitoring programme for the year under review included six inspections of the Turangi Production Station, five inspections at the Kowhai-A Production Station, five visits to the Kowhai-D wellsite and an annual inspection of all associated wellsites. Two water samples were collected for physicochemical analysis, two biomonitoring surveys of receiving waters were conducted, and three ambient air quality surveys were undertaken in relation to the Turangi Production Station.

The monitoring showed that the production station site was well managed. Levels of contaminants in samples collected from the site were within limits prescribed by consent conditions, while biomonitoring in the receiving waters did not show any effect from discharges on the communities in the stream.

There were no adverse effects on the environment resulting from the exercise of the air discharge consent. The ambient air quality monitoring at the site showed that levels of carbon monoxide, combustible gases, PM₁₀ particulates, nitrogen oxides and the volatile organic compounds benzene, toluene, ethylbenzene and xylenes were all below levels of concern at the time of sampling. No offensive or objectionable odours were detected beyond the boundary during inspections.

During the year, GPL demonstrated a high level of both environmental performance and administrative compliance with the resource consents.

For reference, in the 2018-2019 year, consent holders were found to achieve a high level of environmental performance and compliance for 83% of the consents monitored through the Taranaki tailored monitoring programmes, while for another 13% 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 GPL's performance remains at a high level.

This report includes recommendations for the 2019-2020 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 2018 to June 2019 by the Taranaki Regional Council (the Council) on the monitoring programme associated with resource consents held by Greymouth Petroleum Limited (GPL). GPL operates the Turangi Production Station situated on Turangi Road at Motunui, in the Parahaki catchment. GPL also operate the Kowhai-A Production Station situated on Ngatimaru Road at Tikorangi, in the Waiau catchment.

The report includes the results and findings of the monitoring programme implemented by the Council in respect of the consents held by GPL that relate to discharges of water within the Parahaki and Waiau catchments, and the air discharge permits held by GPL to cover emissions to air from the sites.

One of the intents of the *Resource Management Act 1991* (RMA) is that environmental management should be integrated across all media, so that a consent holder's use of water, air, and land should be considered from a single comprehensive environmental perspective. Accordingly, the Council generally implements integrated environmental monitoring programmes and reports the results of the programmes jointly. This report discusses the environmental effects of GPL's use of water, land and air, and is the 11th combined annual report by the Council for the Turangi Production Station and its associated sites.

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 through annual programmes;
- the resource consents held by GPL in the Parahaki and Waiau 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 sites.

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 2019-2020 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 GPL, 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 GPL'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 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 during investigations of incidents reported to the Council by a third party 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 during investigations of incidents reported to the Council by a third party. 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 during investigations of incidents reported to the Council by a third party. 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 2018-2019 year, consent holders were found to achieve a high level of environmental performance and compliance for 83% of the consents monitored through the Taranaki tailored monitoring programmes, while for another 13% of the consents, a good level of environmental performance and compliance was achieved.¹

1.2 Process description

1.2.1 Turangi Production Station

The Turangi-A wellsite production facilities were commissioned in late 2006 following the successful drilling and testing of the Turangi-1 well. Two further production wells were drilled on the wellsite in 2008. The site was expanded to the south during the 2013-2014 year. The production facilities currently treat condensate and gas from GPL's northern Taranaki operations, including the Ohanga, Onaero and Turangi group of wellsites.

The primary facilities at the Turangi Production Station consist of:

- Wellhead shutdown systems.
- Sand catcher and heating systems.
- Inlet separator and low temperature separator.

¹ The Council has used these compliance grading criteria for 15 years. They align closely with the 4 compliance grades in the MfE Best Practice Guidelines for Compliance, Monitoring and Enforcement, 2018

- Methanol storage and dosing system.
- A low pressure gas compressor.
- Flare system and flare pit.
- Storage tanks (condensate, methanol, and produced water) and a condensate load-out facility.

Gas is compressed, metered and exported to the national gas network. Condensate storage is located on the wellsite and currently consists of six above ground tanks and a truck load-out facility. Condensate is pumped via pipeline to the Omata tank farm, along with up to two truckloads going to the Waihapa Production Station per day. Produced formation water is stored on the site in bunded tanks prior to being pumped down the Turangi-5 well into the Mt Messenger formation for disposal.

All chemical storage is contained within bunds and isolated from the stormwater system. The stormwater drain system consists of open culverts which capture and drain general surface water run-off from the site and some surrounding farmland. Stormwater from the site passes through three sets of lined skimmer pits before discharging to land and into a tributary of the Parahaki Stream at points north and south of the access road. The separate oily water drainage system consists of a buried pipe which gathers oily water from spill containment areas (i.e. kerbed foundations and tank bunds) and directs these flows into a triple interceptor pit located near the truck loading bay. Oily water drains from the compressor house are collected in a buried fibreglass tank and are routinely pumped out into the storage tanks.



Photo 1 Turangi Production Station

1.2.2 Kowhai-A Production Station

The Kowhai-A Production Station (Photo 2) is located on Ngatimaru Road at Tikorangi. The site was originally developed and drilled by Swift Energy NZ Ltd in 2006. The Kowhai-A Production Station processes (separates) product from the Kowhai A, B, C and D wellsites.



Photo 2 Kowhai-A Production Station

1.3 Resource consents

GPL holds four resource consents the details of which are summarised in the table below. During the year under review two stormwater consents at the Turangi Production Station were surrendered after being combined, with an additional discharge, into one new consent covering the whole site.

Summaries of the conditions attached to each permit are set out in Section 3 of this report.

A summary of the various consent types issued by the Council is included in Appendix I, as are copies of all permits held by GPL during the period under review.

Table 1 Consents held by GPL in relation to Turangi and Kowhai-A Production Stations

Site	Consent number	Purpose	Granted	Review	Expires
Turangi Production Station	6497-1	To discharge emissions to air during flaring from well workovers and in emergency situations and miscellaneous emissions associated with production activities at the Turangi Road wellsite	Dec 2004	-	June 2021
	6498-1	To discharge treated stormwater and treated produced water from hydrocarbon exploration and production operations at the Turangi Production Station onto land, where it may enter into an unnamed tributary of the Parahaki Stream	Dec 2004	-	N/A*

Site	Consent number	Purpose	Granted	Review	Expires
	9674-1	To discharge treated stormwater and produced water from hydrocarbon exploration and production operations at the Turangi Production Station, onto land where it may enter an unnamed tributary of the Parahaki Stream	Sep 2013	-	N/A*
	10703-1	To discharge treated stormwater from hydrocarbon exploration and production operations at the Turangi-A Production Station, onto land and into an unnamed tributary of the Parahaki Stream and into the Parahaki Stream	Jan 2019	June 2021	June 2033
Kowhai-A Production Station	6719-1	To discharge emissions to air during flaring from well workovers and in emergency situations and miscellaneous emissions associated with production activities at the Kowhai-A wellsite	Nov 2005	-	June 2021
	10169-1	To discharge treated stormwater from hydrocarbon exploration and production operations at the Kowhai-A wellsite onto land and into an unnamed tributary of the Waiau Stream	Jan 2016	June 2021	June 2033

* Consents 6498-1 and 9674-1 were surrendered in May 2019, having been replaced by 10703-1 in January 2019

1.3.1 Wellsite consents

GPL also holds consents for production activities at wellsites associated with the Turangi and Kowhai-A production stations. A summary of these consents is provided in Table 2.

Table 2 Consents for production activities at wellsites associated with Turangi and Kowhai-A production stations

Wellsite	Consent number	Purpose	Issue date	Expiry
Epiha	7722-1	To discharge treated stormwater, produced water and surplus drilling water from hydrocarbon exploration and production operations at the Epiha wellsite onto and into land	Nov 2010	June 2027
	7725-1	To discharge emissions to air associated with production activities at the Epiha wellsite, including flaring from well workovers, and in emergency situations, and other miscellaneous activities	Nov 2010	June 2027
Kowhai-B	9203-1	To discharge treated stormwater and produced water from hydrocarbon exploration and production operations at the Kowhai-B wellsite onto and into land	Feb 2012	June 2027
Kowhai-B	9204-1	To discharge emissions to air associated with production activities at the Kowhai-B wellsite, including: flaring associated with emergencies and maintenance; and minor emissions from other miscellaneous activities	Feb 2012	June 2027
Kowhai-C	9474-1	To discharge emissions to air associated with hydrocarbon producing wells at the Kowhai-C wellsite	Feb 2013	June 2027

Well-site	Consent number	Purpose	Issue date	Expiry
	9478-1	To discharge treated stormwater, treated produced water and surplus drilling water from hydrocarbon exploration and production operations at the Kowhai-C well-site onto and into land where it may enter an unnamed tributary of the Waiau Stream	Feb 2013	June 2027
Kowhai-D	10293-1	To discharge emissions to air associated with hydrocarbon producing wells at the Kowhai-D well-site	Mar 2017	June 2033
	10294-1	To discharge treated stormwater from hydrocarbon exploration and production operations at the Kowhai-D well-site onto land and into an unnamed tributary of the Waitara River	May 2016	June 2033
Main-1	7712-1	To discharge treated stormwater from hydrocarbon exploration and production operations at the Main-1 well-site onto and into land	Jul 2015	June 2033
	7714-1	To discharge emissions to air associated with hydrocarbon producing wells at the Main-1 well-site	Jul 2015	June 2033
Ohanga-A	7024-1	To discharge treated stormwater and treated produced water from hydrocarbon exploration and production operations at the Ohanga-A well-site onto and into land and into an unnamed tributary of the Onaero River	Nov 2006	June 2021
	7025-1	To discharge emissions to air from: flaring of hydrocarbons; and miscellaneous activities associated with well clean-up, well testing, and production testing, associated with up to eight wells at the Ohanga-A well-site	Nov 2006	June 2021
Onaero	7555-1	To discharge treated stormwater, treated produced water and treated surplus drilling water from hydrocarbon exploration and production operations onto and into land in circumstances where the discharge may enter an unnamed tributary of the Onaero River at the Onaero well-site	Dec 2009	June 2027
	7558-1	To discharge emissions to air during flaring from well workovers and in emergency situations associated with production activities at the Onaero well-site	Dec 2009	June 2027
Turangi-B	7853-1	To discharge treated stormwater and produced water from hydrocarbon exploration and production operations at the Turangi-B well-site onto and into land	Jun 2011	June 2027
	7854-1	To discharge emissions to air associated with production activities at the Turangi-B well-site, including: flaring from well workovers; flaring in emergency situations; and emissions from other miscellaneous activities	Dec 2011	June 2027
Turangi-C	9415-1	To discharge treated stormwater and produced water from hydrocarbon exploration and production operations at the Turangi-C well-site onto land	Feb 2013	June 2027
	9420-1	To discharge emissions to air associated with hydrocarbon producing wells at the Turangi-C well-site	Feb 2013	June 2027

Wellsite	Consent number	Purpose	Issue date	Expiry
Turangi Metering Station	6807-1	To discharge emissions into the air from flaring of petroleum products in emergency situations, commissioning, and plant shutdowns, together with miscellaneous emissions at the Turangi Metering Station	Sep 2006	June 2021
	6808-1	To discharge treated stormwater from the Turangi Metering Station onto and into land in the vicinity of the Waiau Stream	Mar 2006	June 2021
Urenui-1	7532-1	To discharge treated stormwater, treated surplus drilling water and treated produced water from hydrocarbon exploration and production operations at the Urenui-1 wellsite, onto land where it may enter an unnamed tributary of the Onaero River	Aug 2013	June 2027
	9631-1	To discharge emissions to air associated with hydrocarbon producing wells at the Urenui-1 wellsite	Aug 2013	June 2027

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 Turangi and Kowhai-A production station sites 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;
- 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

Six inspections were carried out at the Turangi Production Station and five at the Kowhai-A Production Station. In addition, the Kowhai-D wellsite was visited five times, along with an annual inspection of all other wellsites associated with the production stations. With regard to consents for the 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 GPL 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

Samples of the northern and southern discharge were collected on one occasion during the monitoring year. These samples were analysed for chloride, conductivity, hydrocarbons, suspended solids, pH and turbidity.

The Council undertook sampling of the ambient air quality outside the boundary of the Turangi Production Station. 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 PM₁₀ 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. Council also measured the concentrations of the volatile organic compounds benzene, toluene, ethylbenzene and xylenes (BTEX) on one occasion during the year as part of a regionwide monitoring programme.

1.4.5 Biomonitoring surveys

A biological survey was performed on two occasions in an unnamed tributary of the Parahaki Stream to determine whether or not the discharge of treated stormwater has had a detrimental effect upon the communities of the stream.

2 Results

2.1 Water

2.1.1 Inspections

During the 2018-2019 year six inspections were carried out at the Turangi Production Station and five at the Kowhai-A Production Station. In addition, the Kowhai-D wellsite was visited five times, along with an annual inspection of all other wellsites associated with the production stations. The following was found during the inspections:

6 September 2018

Turangi Production Station: The site was neat and tidy with all stormwater directed via the ring drains to the skimmer pit systems sited at each side of the main access track. The contents of these pits were relatively clear with no concerns in regard to suspended solid levels. No stormwater discharge was occurring offsite. No smoke or odours were noted around the flare pit or the processing area.

Kowhai-A Production Station: The site was neat and tidy with all stormwater contained appropriately. The site had recently been cleared and graded after the removal of drilling equipment. Subsequent stormwater runoff had discoloured the skimmer pits and staff advised the inspecting officer that arrangements had been made to pump these out rather than allow them to discharge.

9 October 2018

Kowhai-D wellsite: Changes to the stormwater system had been made, with ring drains now containing rock weirs (spaced every 30 metres apart) that are designed to slow the flow of sediment laden stormwater while still allowing flow to prevent ponding. Material filters were to be installed in the concrete drop out pits immediately forward of the skimmer pits. It was also proposed to establish new discharge points to enable further treatment of stormwater. Frogs were present in both sets of skimmer pits indicating relatively good water quality. A drip tray (tarp) had been placed under the mud shaker chutes and this was collecting/catching a lot of mud and preventing discharges to ground. Both liquid and dry chemicals were being stored in the onsite metal bund and these were covered by tarps to prevent rain from falling on product. Appropriate bunding was noted around the rest of the site.

15 October 2018

Kowhai-D wellsite: A new filter sock was being installed within the concrete forebay of the eastern skimmer pits. The skimmer pits contained fine suspended solid but were satisfactory. There were no discharges from the site at the time of inspection.

18 October 2018

Turangi Production Station: Spill kits were observed at the rear of the control room. Temporary bunding was in use for IBC and 44 gallon drums, as well as other dirty equipment. Absorbent rolls had been fixed in place around equipment stored in the yard to soak up hydrocarbon that may leak from them. There was no discharge offsite at the time of the inspection. Most of the process equipment was bunded and the valves were shut.

23 October 2018

Kowhai-D wellsite: The new filter sock had been installed in the forebay to the eastern pits. The clarity of the eastern pits was very good following a dry period, and frogs were observed. It was noted that the site was very dusty. Stormwater was not flowing offsite at the time of inspection. Sediment was being captured within the ring drain, this was observed on top of the coconut matting. The pump bund to contain oil was working well. Tarps were covering dry chemicals and drip trays and bunding were in use. The 200 L fuel tank

was banded. A small leak of oil was noted from a storage container and this was addressed at the time of inspection.

6 November 2018

Kowhai-D wellsite: An extra filter bag had been installed in the eastern drain feeding the eastern skimmer pits. Ponding in the ring drains was not evident, and the stone/rock filtration weirs appeared to be working to remove sediment out of suspension. Frogs were noted in both skimmer pit systems.

The western skimmer pit system was slightly turbid. The concrete forebay to these western pits was clear and filamentous algae was observed growing in it. Some fine silt was noted in the grass around the discharge point from the western pit system. Neither pond system was discharging at the time of the inspection. The stream was running clear, with no adverse effects noted downstream.

The bund separating the D-tank/sawdust area from the onsite roadway was undefined and tracking from this area was noted. The metal bund around the yellow wastewater tanks was holding water, this was clear and no sheens were noted. In general the site was tidy, however there were areas, such as the D tank/mud transfer area and the dry chemical mixing trough (adjacent to the wastewater tanks) where accumulative effects from spillage were noted and this was discussed with staff onsite at the time of inspection.

8 November 2018

Turangi Production Station: Bunds were being drained at the time of inspection and a note on the whiteboard in the office served as a reminder to close the valves. It was noted that the Durawattle filter on the southern side of the site was in need of maintenance. It has worked so well to capture sediment that it had reached capacity in places and was no longer working. The skimmer pits were not discharging at the time of the inspection. It was noted that sediment traps had been installed within the ring drains. These are causing stormwater to pond and therefore need to be lined with an impervious material or removed.

Kowhai-A Production Station: The stormwater discharges appeared clear with low turbidity noted. Good bunding was in place throughout the site. Works had been taking place to install a concrete pad/bund.

No flaring has occurred since the previous inspection and no smoke or odours were noted.

15 January 2019

Turangi Production Station: Sediment retention traps were causing ponding in the ring drain. The consent holder was advised that no enforcement action would be taken at this stage as GPL had advised Council of the issue and had works planned to remedy the situation. These works were required to be undertaken to ensure compliance with resource consent conditions prior to the next inspection.

Kowhai-A Production Station: The site was neat and tidy at the time of the inspection, and in compliance with the consent conditions that were assessed at the time of inspection.

1 February 2019

Kowhai-D Production Station: In general the site was observed to be tidy and clean. The skimmer pits were not discharging offsite. It was noted that two large produced water tanks were not banded with drainage to sumps.

25 March 2019

Turangi Production Station: The site was tidy and in general appeared well managed. Work was being undertaken to install new skimmer pits and re-contour the site to provide for runoff without ponding. It was noted that the DuraWattle along the southern boundary was full of sediment. The site was wet from rain during the previous night, however none of the skimmer pits were discharging at the time of the inspection.

Works were being undertaken to repair a compressor that had succumbed to mechanical failure. Gas was being flared which was smoky as a result of the failure.

Kowhai-A Production Station: The site was neat and tidy and no issues were noted at the time of the inspection.

30 April 2019

An annual inspection of the well sites associated with the Turangi and Kowhai-A production stations was undertaken. The well sites inspected were: Turangi-B and C; Kowhai-B, C and D; Onaero; Ohanga; and Urenui. In general, the sites were tidy and clean with minimal activity occurring. The sites were being maintained with weed spraying evident on the site and in some places within the ring drains. The majority of ring drains were vegetated with grasses that helped with controlling and treating sediment laden stormwater. Other sediment controls were in place within the ring drains such as rock weirs and silt fences.

Hydrocarbon sheens were not observed within the skimmer pits or in puddles on any of the sites. The skimmer pits were all in good order with goose neck pipes functioning as required. Following heavy rainfall the day before, the turbidity of the pits varied from clear to slightly turbid. The majority of the discharges were onto land before flowing to surface water. Some pits were unlined and empty. No effects were noted in surrounding vegetation (such as burnt patches or dead grass) or within the streams.

Flaring was not occurring at any of the sites at the time of the inspection and no visual effects were noted as a result of previous flaring at the sites.

The inspecting officer noted that ponding was occurring in the southern corner of the ring drain at Ohanga and that the contours at the entrance to the site were not well defined making it unclear whether all stormwater was being directed to the ring drain. Flax was growing into the ring drain at Kowhai-B and this may be causing blockage during rainfall events.

Turangi Production Station: Rig activity was occurring at the site, although drilling had not yet commenced. Recent earthworks to install the new set of skimmer pits had been completed. These works combined were contributing to sediment laden stormwater entering the skimmer pits and they were very discoloured. Staff advised that the shut off valve had been activated and the ponds may be pumped out. It was evident that prior to the valve being closed the stormwater had been discharging to the stream. Staff were advised that this pit will need to be closely monitored for the foreseeable future to ensure discharge limits were met.

Rock "rip rap" had been installed from the new skimmer pits along the discharge path to the stream and it was noted by the inspecting officer that this required additional smaller rocks to fill the spaces between the large rocks. Spaces between the rocks was visible, and over time water would scour underneath these rocks and create issues.

Flaring was occurring with onsite smoke noted. This was an ongoing issue, as noted in the previous inspection, with compressor repairs still underway.

Kowhai-A Production Station: The site was neat and tidy with all stormwater being directed to the skimmer pits as required. Flaring was observed with no smoke or odours noted.

2.1.2 Results of discharge monitoring

Chemical water quality sampling of the discharges from the Turangi Production Station was undertaken once during the 2018-2019 period, on 14 June 2019. The locations of the sampling sites (IND002035 and IND002052) are shown in Figure 1, while Table 3 presents the results. The results are indicative of uncontaminated discharges, with all parameters well within the consent limits.



Figure 1 Turangi Production Station and associated sampling sites

Table 3 Results of discharge monitoring from the Turangi Production Station

Parameter	Units	14 June 2019		Consent limits (10703-1)
		Northern discharge IND002035	Southern discharge IND002052	
Chloride	g/m ³	27	12	230
Conductivity	mS/m @25°C	12.2	6.9	-
Hydrocarbons	g/m ³	< 4	< 4	15
Suspended solids	g/m ³	4	10	100
Temperature	Deg. C	11.8	12.3	-
pH		6.9	7.4	6.0 – 9.0
Turbidity	NTU	1.5	13.3	-

2.1.3 Results of receiving environment monitoring

The Councils 'vegetation sweep' and 'kick-sampling' techniques were used at three sites to collect macroinvertebrates from an unnamed tributary of the Parahaki Stream on 21 November 2018 and 18 March 2019. This has provided data to assess whether discharges to nearby land had had any effect on the macroinvertebrate communities of the unnamed tributary. Samples were processed to provide number of taxa (richness), MCI, and SQMCI scores for each site.

Taxa richness is the most robust index when determining whether a macroinvertebrate community has been exposed to toxic discharges. When exposed to toxic discharges, macroinvertebrates may die and be swept downstream or may deliberately drift downstream as an avoidance mechanism (catastrophic drift). The MCI is a measure of the overall sensitivity of the macroinvertebrate community to the effects of organic pollution in stony streams. It is based on the presence/absence of taxa with varying degrees of sensitivity to

environmental conditions. The SQMCI takes into account taxa abundances as well as sensitivity to pollution. It may indicate subtle changes in communities, and therefore be the more relevant index if non-organic impacts are occurring. However, it is also influenced by the 'patchiness' of macroinvertebrates on the streambed, and as such must be considered in the context of all three metrics. Significant differences in either the MCI or the SQMCI scores between sites may indicate the degree of adverse effects (if any) of the discharge being monitored.

The unnamed tributary of the Parahaki Stream recorded moderate (spring) and low (summer) taxa richness, and low SQMCI_s scores (both surveys). MCI scores categorised all sites as having 'poor' to 'very poor' macroinvertebrate community health, but were similar to those recorded in Taranaki lowland coastal streams at a similar altitudes. During the spring survey all macroinvertebrate indices had improved from the previous survey results, with the change attributed to slightly higher flow conditions at the time of the survey. While during the summer survey (with the exception of the MCI score recorded at site 1) all macroinvertebrate indices either decreased or stayed the same when compared to the spring results. This decrease was attributed to the low flow conditions recorded at the time of the summer survey.

Overall, the results of the surveys provided no evidence that discharges from the Turangi Production Station had any significant detrimental impacts on the stream macroinvertebrate communities.

Copies of biomonitoring reports for this site are available from the Council upon request.

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 abstraction and discharge 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 42 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 2.



Figure 2 Air monitoring sites at Turangi Production Station for 2018-2019

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 4 and the data from the sample run are presented graphically in Figure 3.

Table 4 Results of carbon monoxide and LEL monitoring at Turangi Production Station

Period (from-to)		30 Oct to 1 Nov 2018 (42 hours)
Max	CO(ppm)	7.30
	LEL(%)	0.20
Mean	CO(ppm)	0.20
	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/m³
 (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.

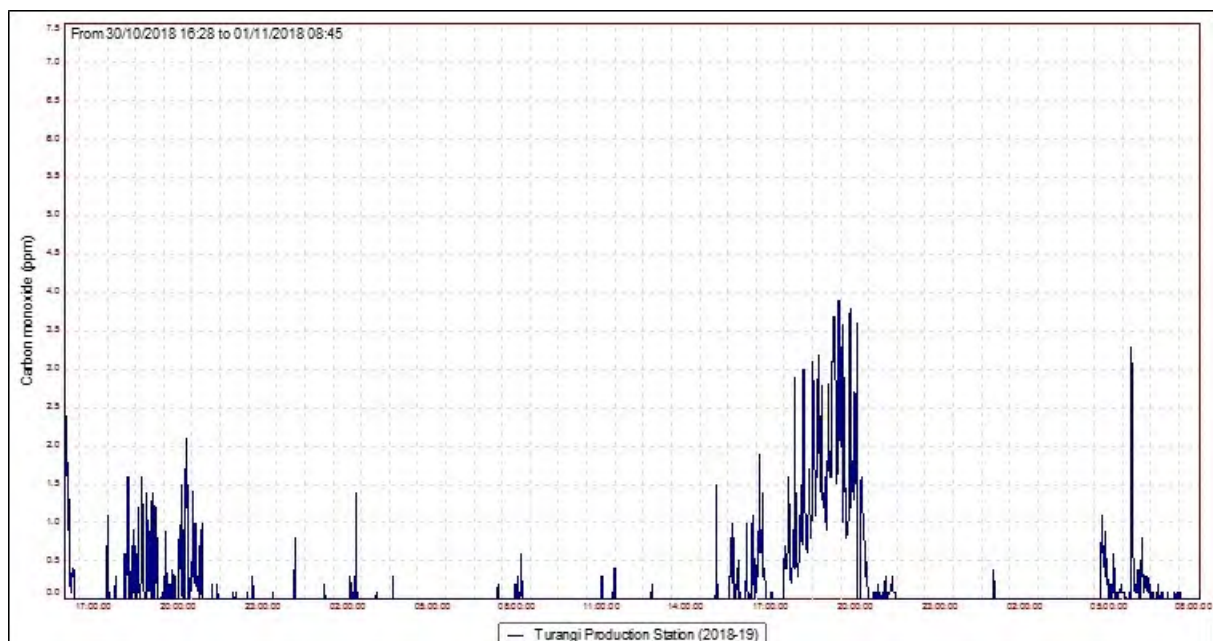


Figure 3 Ambient CO levels in the vicinity of Turangi Production Station

The consent covering air discharges from the Turangi Production Station has specific limits related to particular gases. Special condition 18 of consent 6497-1 sets a limit on the carbon monoxide concentration at or beyond the production station's boundary. The limit is expressed as 10 mg/m³ for an eight hour average or 30 mg/m³ for a one hour average exposure. The maximum concentration of carbon monoxide

found during the monitoring run was 8.3 mg/m^3 while the average concentration for the entire dataset was 0.23 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 Turangi Production Station reach any more than a trivial level.

2.2.2.2 PM₁₀ particulates

In September 2004 the Ministry for the Environment enacted National Environmental Standards (NESs) relating to certain air pollutants. The NES for PM₁₀ particulates is $50 \text{ } \mu\text{g/m}^3$ (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 Turangi Production Station. The deployment lasted approximately 26 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 2. The results of the sample run are presented in Figure 4 and Table 5.



Figure 4 PM₁₀ concentrations ($\mu\text{g/m}^3$) at Turangi Production Station

Table 5 Daily averages of PM₁₀ results from monitoring at Turangi Production Station

	30 to 31 October 2018 (26 hours)	
24 hr. set	Day 1	Day 2
Daily average	6.6 µg/m ³	N/A
NES	50µg/m ³	

During the 26 hour run, from 30 to 31 October 2018, the average recorded PM₁₀ concentration was 6.6 µg/m³ for the 24 hour period. This daily average equates to 13% of the 50 µg/m³ value that is set by the NES. Background levels of PM₁₀ 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 Turangi 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 Turangi Production Station has specific limits related to particular gases. Special condition 19 of consent 6497-1 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 placed at two locations in the vicinity of the Turangi 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 Turangi Production Station during the year under review equate to 8.7 µg/m³ and 4.6 µg/m³, respectively. The results show that the ambient ground level concentration of NOx is well below the limits set out by consent 6497-1.

2.2.2.4 BTEX

The volatile organic compounds (VOC) benzene, toluene, ethylbenzene and xylenes together are commonly referred to as BTEX. In New Zealand, benzene is the only member of the BTEX group subject to a national guideline value. The Ministry for the Environment (MfE) guideline for long-term exposure (annual average exposure), based on benzene's known mutagenic and carcinogenic properties, is 3.6 µg/m³. There are no national ambient air quality guidelines for toluene, ethylbenzene or xylene. The MfE had prepared an internal technical document "Health Effects of Eleven Hazardous Air Contaminants and Recommended Evaluation Criteria" (October 2000) that suggested a short-term (1 hour) average value of 22 µg/m³ for Benzene, 500 µg/m³ for Toluene and 1000 µg/m³ for Xylene as recommended guidelines values. However, these recommendations were not carried through to the final MfE guidelines published in 2002.

In January 2019 the Council implemented a coordinated monitoring programme to measure the concentrations of BTEX at 20 monitoring sites around the region.

The period of sampling was 502 hours (21 days). A conversion factor was applied to estimate an approximate peak short-term concentration that might have arisen during the full sampling period (assuming a steady-state source). These modelled concentrations are also presented in Table 6, alongside the actual concentrations as detected. Figure 5 presents the regional benzene monitoring results to show how the Turangi Production Station compares with other sites tested.

The results obtained for benzene at the AIR007823 site were 'less than' results, with no difference to the result for the field blank. That is, no benzene was actually detected at this site. The level of benzene at the

AIR007824 site was well below the MfE recommended guideline value, as was the level of toluene detected at both sites. Ethylbenzene or xylene were not detected at either site.

Table 6 Actual and recalculated BTEX results from Turangi Production Station, January 2019

Site ID / Where	Time total Min.	Benzene ($\mu\text{g}/\text{m}^3$)		Toluene ($\mu\text{g}/\text{m}^3$)		Ethyl Benzene	o,m,p – ($\mu\text{g}/\text{m}^3$) Xylene Total	
		Lab. Results	1 hr. Calc.	Lab. Results	1 hr. Calc.	Lab. Results	Lab. Results	1 hr. Calc.
AIR007823 Turangi PS (House)	502	<0.15	<0.5	0.55	1.9	<0.19	<0.43	<1.5
AIR007824 Turangi PS	502	1.78	6.2	1.35	4.6	<0.19	<0.43	<1.5
Blank**		<0.15	<0.5	<0.19	<0.7	<0.19	<0.43	<1.5
MfE recommended guidelines (2000), one -hour average. ($\mu\text{g}/\text{m}^3$)			22		500			1000

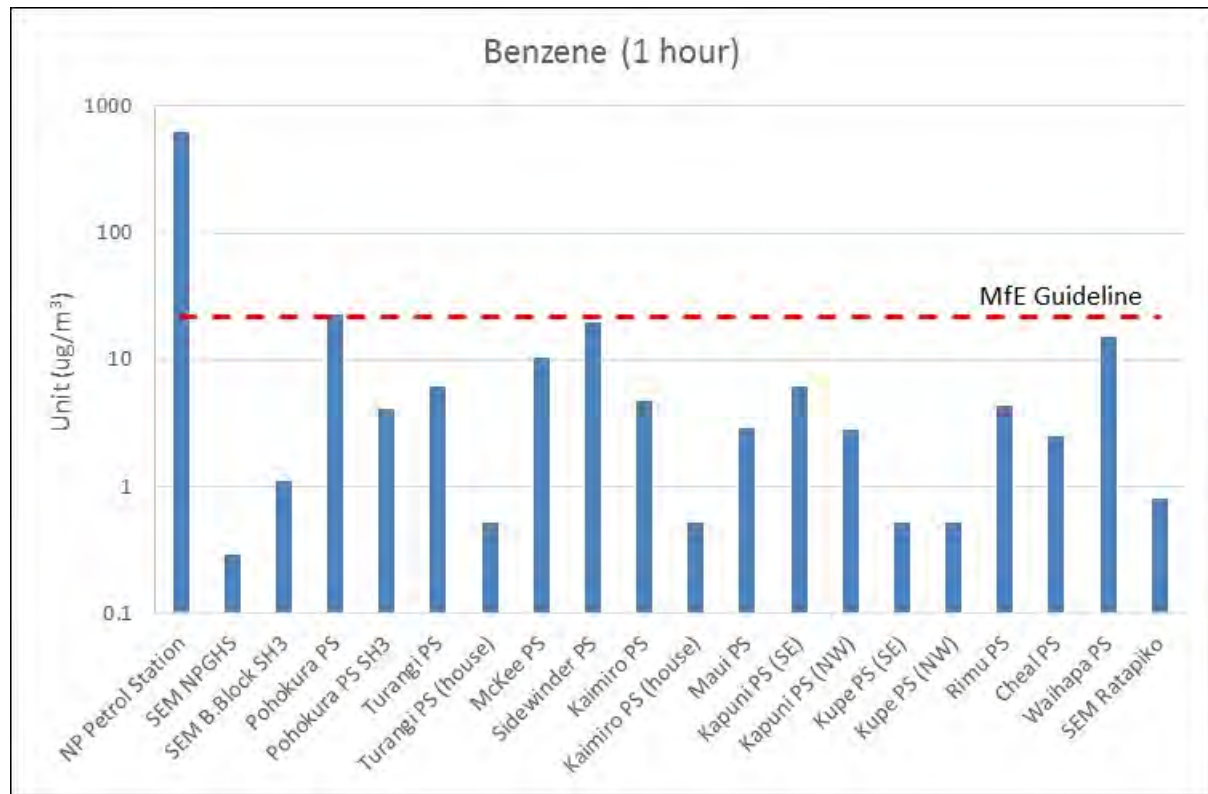


Figure 5 Regional benzene monitoring results 2019

Copies of the full air reports are available from the Council upon request.

2.2.3 Summary of flaring volumes reported by GPL

At Turangi Production Station flaring occurred each month during the year, with the quantities of gas flared at the production station relating to things like plant shutdown, gas compressor issues, plant or well restarts and power cuts. The total volume flared during the monitoring period was approximately 950,850 m^3 , a decrease compared with the 2017-2018 year of 1,134,933 m^3 . The high volume of flaring in March and April 2019 was due to a failure in the engine driver for the low pressure gas compressor which required extensive

repairs with a temporary gas compressor utilised to minimise flaring while the repairs were undertaken. A summary of flaring volumes at Turangi Production Station is provided in Figure 6.

A well workover was undertaken at the Turangi-B wellsite with flaring occurring in August and September 2018 (total gas flared 180,142 m³). There was no flaring at any of the other wellsites associated with the Turangi Production Station as these were either connected to the production station or not producing during the monitoring period.

The total volume of gas flared at the Kowhai-A Production Station during the period was approximately 8,237 m³. Flaring occurred in November and December 2018 and January and June 2019 (Figure 7). The quantities flared each month varied and related to things such as maintenance and tie in work. No complaints were received from the public in relation to flaring at this site.

Two new wells were drilled from the Kowhai-D wellsite, with production testing from flaring resulting in approximately 581,619 m³ flared under consent 10292-1. No flaring occurred at Kowhai-B or C during the year.

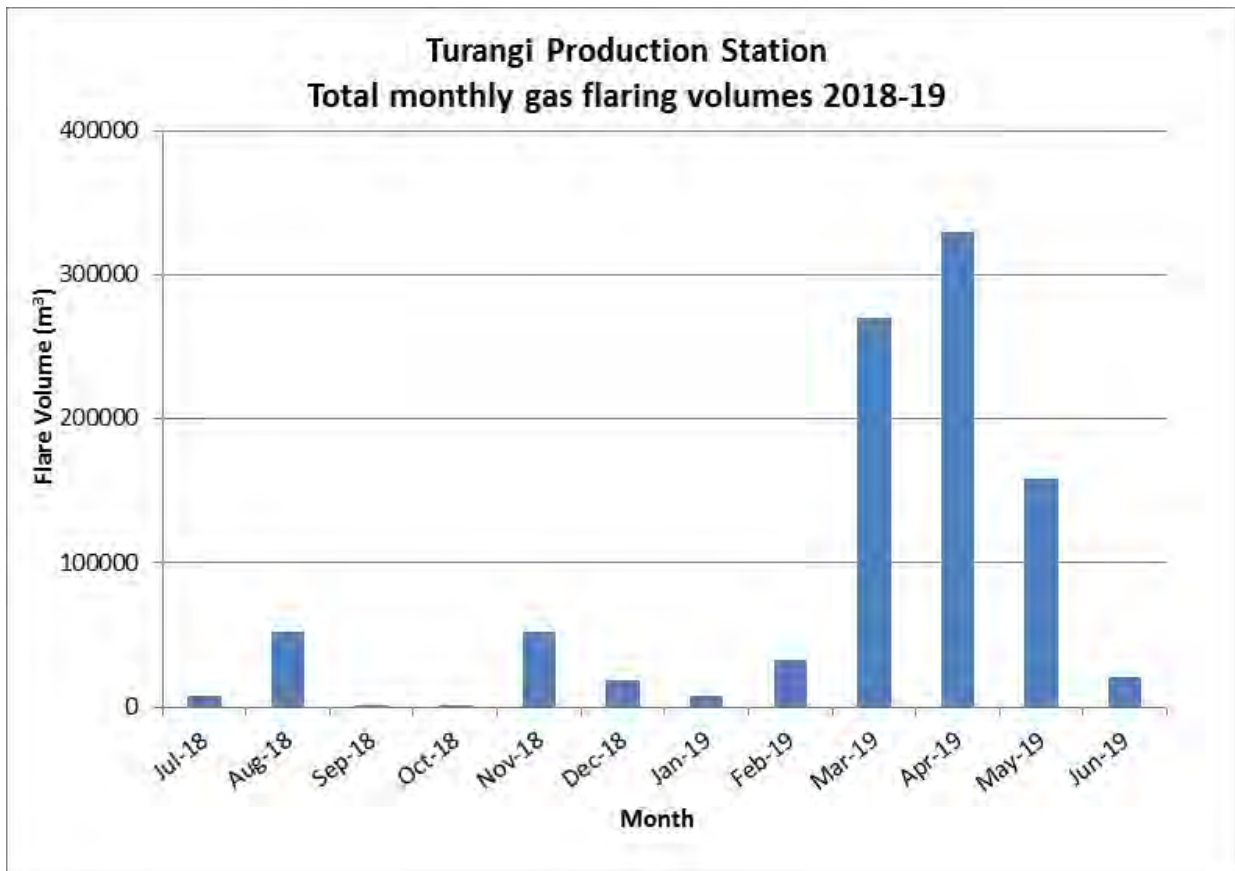


Figure 6 Summary of monthly gas flaring volumes at Turangi Production Station

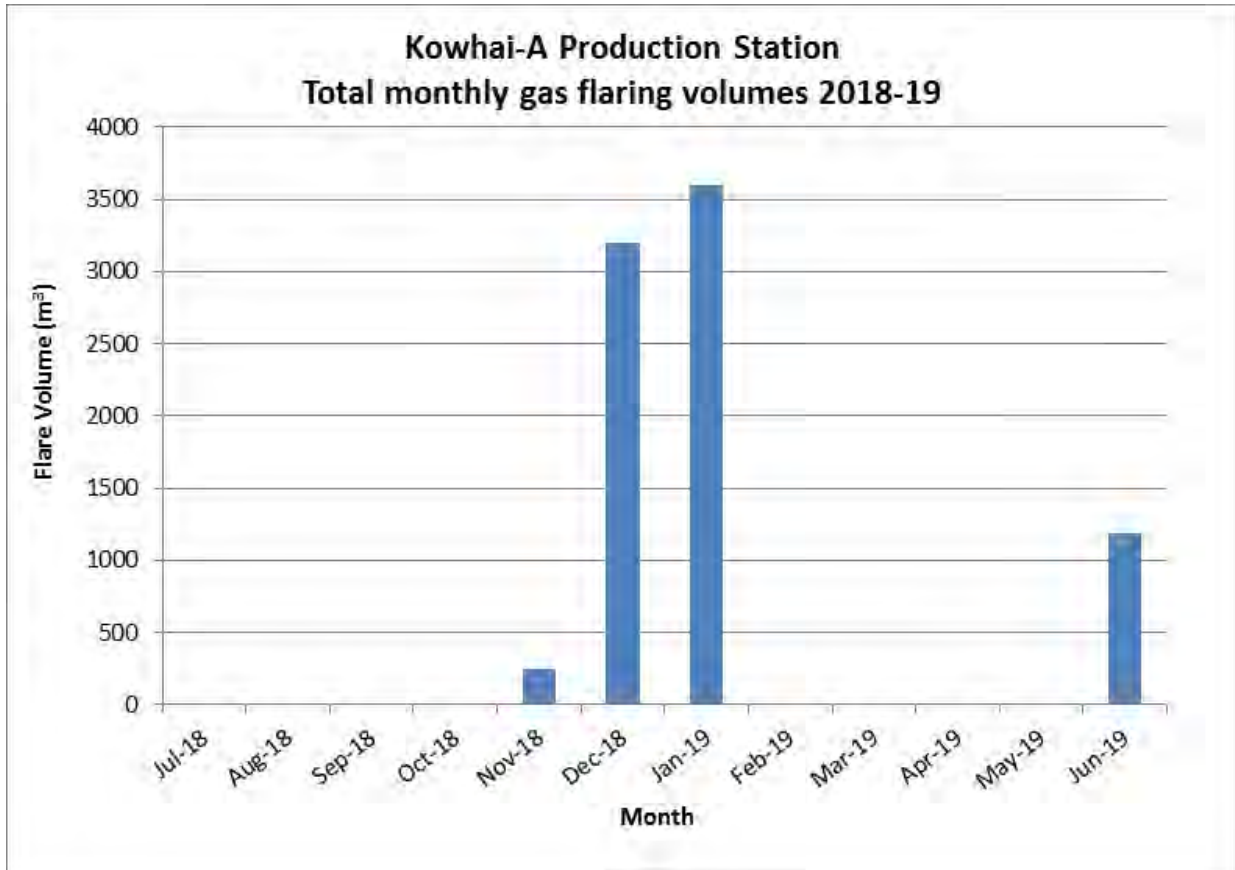


Figure 7 Summary of monthly gas flaring volumes at Kowhai-A Production Station

2.3 Incidents, investigations, and interventions

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 GPL. 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.

For all significant compliance issues, as well as complaints from the public, the Council maintains a database record. The record includes events where the individual/organisation concerned has itself notified the Council. Details of any investigation and corrective action taken are recorded for non-compliant events.

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 individual/organisation is indeed the source of the incident (or that the allegation cannot be proven).

In the 2018-2019 period, the Council was not required to undertake significant additional investigations and interventions, or record incidents, in association with GPL's conditions in resource consents or provisions in Regional Plans.

3 Discussion

3.1 Discussion of site performance

Monitoring of the Turangi and Kowhai-A production stations during the 2018-2019 year found that the sites were generally well managed. There were a couple of minor issues noted during inspections and GPL dealt with these in a timely manner.

3.2 Environmental effects of exercise of consents

Site inspections found that the stormwater systems were constructed and maintained in accordance with consent conditions. Biomonitoring in the receiving waters did not show any effect from discharges on the communities in the stream.

There were no adverse effects on the environment resulting from the exercise of the air discharge consent. The ambient air quality monitoring at the site showed that levels of carbon monoxide, combustible gases, PM₁₀ particulates, nitrogen oxides and the volatile organic compounds benzene, toluene, ethylbenzene and xylenes 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 Tables 7-12.

Table 7 Summary of performance for consent 6497-1

Purpose: To discharge emissions to air during flaring from well workovers and in emergency situations and miscellaneous emissions associated with production activities at the Turangi Road wellsite		
Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Flare pit to be lined	Inspection	Yes
2. Flaring shall occur at the designated location	Inspection	Yes
3. Temporary flare pit to be removed upon completion of the new flare pit	Inspection	Yes
4. Notification to Council one month prior to production operations	Production operations commenced early 2006	N/A
5. Notification to neighbours 24 hrs prior to flaring & record of complaints	Inspection and liaison with consent holder	Yes
6. Notification to Council 24 hrs prior to flaring	Notifications received	Yes
7. No alterations without approval	Inspection and liaison with consent holder	Yes
8. Take into account wind speed & direction when flaring	Inspection and Company records	Yes

Purpose: To discharge emissions to air during flaring from well workovers and in emergency situations and miscellaneous emissions associated with production activities at the Turangi Road wellsite		
Condition requirement	Means of monitoring during period under review	Compliance achieved?
9. Effective separation to minimise smoke	Inspection and Company records	Yes
10. Notification to Council of ineffective separation	No incidents during year under review	N/A
11. No liquid or solid hydrocarbons flared	Inspection and liaison with consent holder	Yes
12. Only substances from well stream to be flared	Inspection and Company records	Yes
13. Adoption of the best practicable option	Inspection and liaison with consent holder	Yes
14. No hazardous/toxic/noxious contaminants beyond boundary	Inspection and air monitoring	Yes
15. No offensive odour or smoke beyond boundary	Inspection	Yes
16. Hydrocarbon storage vessels to have vapour recovery systems	Inspection	Yes
17. Specified opacity for smoke emissions	Not assessed	N/A
18. Control of carbon monoxide emissions	Air monitoring	Yes
19. Control of nitrogen oxide emissions	Air monitoring	Yes
20. Control of emissions to achieve specified contaminant concentrations	Air monitoring	Yes
21. Keep & maintain record of smoke emitting incidents	Inspection and annual flaring report	Yes
22. Keep & maintain flaring log	Inspection and annual flaring report	Yes
23. Monthly flaring information supplied	Information received	Yes
24. Provision of annual flaring & air emissions report during May	Received	Yes
25. Analysis of typical gas and crude oil stream	Analysis not requested	N/A
26. Lapse provision	Consent exercised	N/A
27. Optional review provision	No further option for review prior to expiry in June 2021	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		High
Overall assessment of administrative performance in respect of this consent		High

N/A = not applicable

Table 8 Summary of performance for consent 6498-1 (surrendered in May 2019)

Purpose: To discharge treated stormwater and treated produced water from hydrocarbon exploration and production operations at the Turangi Production Station onto land, where it may enter into an unnamed tributary of the Parahaki Stream		
Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. No observable hydrocarbon run-off to perimeter drain	Inspection	Yes
2. Soil conductivity limits	Not assessed	N/A
3. Soil sodium absorption ratio limits	Not assessed	N/A
4. Concentrations in soil not to be exceed prior to expiry/cancellation/ surrender	Site still operational, consent has been combined with 10703-1	N/A
5. Hydrocarbons in soil to comply with MfE guidelines	Not assessed	N/A
6. Treated produced water discharged to land shall be within perimeter drain	All produced water re-injected	Yes
7. Records to be kept and forwarded to Council quarterly	Inspection and company records	Yes
8. Approved management plan	Received and approved	Yes
9. Adoption of the best practicable option	Inspection and liaison with consent holder	Yes
10. Maximum stormwater catchment area	Inspection and company records	Yes
11. Notification to Council 7 days prior to site works and well drilling	No significant site works or well drilling	Yes
12. Approved contingency plan	Plan up-to-date as of November 2017	Yes
13. All stormwater & produced water discharged through treatment system	Inspection	Yes
14. Consent exercised in accordance with application documentation	Inspection and liaison with consent holder	Yes
15. Design of skimmer pits to meet minimum size and hydrocarbon capture requirements	Inspection	Yes
16. Stormwater retention areas to be lined	Inspection	Yes
17. Stormwater system to be installed prior to any site works	Inspection	Yes
18. Bunding and drainage of hazardous substances	Inspection	Yes
19. Concentrations not to be exceeded in the discharge	Not assessed prior to expiry – monitoring during year falling under consent 10703-1	N/A

Purpose: To discharge treated stormwater and treated produced water from hydrocarbon exploration and production operations at the Turangi Production Station onto land, where it may enter into an unnamed tributary of the Parahaki Stream		
Condition requirement	Means of monitoring during period under review	Compliance achieved?
20. Temperature increase of not more than 2 degrees Celsius in receiving waters	Not assessed during monitoring period	N/A
21. No effects upon surface water bodies	Inspections and biomonitoring	Yes
22. No direct discharge to surface water	Inspection	Yes
23. 48 hrs notice prior to reinstatement	Site still active	N/A
24. Lapse provision	Consent exercised	N/A
25. Optional review provision	Consent surrendered in May 2019	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		High
Overall assessment of administrative performance in respect of this consent		High

N/A = not applicable

Table 9 Summary of performance for consent 6719-1

Purpose: To discharge emissions to air during flaring from well workovers and in emergency situations and miscellaneous emissions associated with production activities at the Kowhai-A wellsite		
Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Notification to Council one month prior to production operations	Production operations commenced early 2006	N/A
2. Notification to neighbours 24 hrs prior to flaring & record of complaints	Inspection and liaison with consent holder	Yes
3. Notification to Council 24 hrs prior to flaring	Notifications received	Yes
4. No alterations without approval	Inspection and liaison with consent holder	Yes
5. Take into account wind speed & direction when flaring	Inspection and Company records	Yes
6. Effective separation to minimise smoke	Inspection and Company records	Yes
7. Notification to Council of ineffective separation	No incidents during year under review	N/A
8. No liquid or solid hydrocarbons flared	Inspection and liaison with consent holder	Yes
9. Only substances from well stream to be flared	Inspection and Company records	Yes

Purpose: To discharge emissions to air during flaring from well workovers and in emergency situations and miscellaneous emissions associated with production activities at the Kowhai-A wellsite		
Condition requirement	Means of monitoring during period under review	Compliance achieved?
10. Adoption of the best practicable option	Inspection and liaison with consent holder	Yes
11. No hazardous/toxic/noxious contaminants beyond boundary	Inspection	Yes
12. No offensive odour or smoke beyond boundary	Inspection	Yes
13. Hydrocarbon storage vessels to have vapour recovery systems	Inspection	Yes
14. Specified opacity for smoke emissions	Not assessed	N/A
15. Control of carbon monoxide emissions	Not assessed	N/A
16. Control of nitrogen oxide emissions	Not assessed	N/A
17. Control of emissions to achieve specified contaminant concentrations	Not assessed	N/A
18. Keep & maintain record of smoke emitting incidents	Inspection and annual flaring report	Yes
19. Keep & maintain flaring log	Inspection and annual flaring report	Yes
20. Provision of annual flaring & air emissions report during May	Received	Yes
21. Analysis of typical gas and crude oil stream	Analysis not requested	N/A
22. Lapse provision	Consent exercised	N/A
23. Optional review provision	No further option for review prior to expiry	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		High
Overall assessment of administrative performance in respect of this consent		High

N/A = not applicable

Table 10 Summary of performance for consent 9674-1 (surrendered May 2019)

Purpose: To discharge treated stormwater and produced water from hydrocarbon exploration and production operations at the Turangi Production Station, onto land where it may enter an unnamed tributary of the Parahaki Stream		
Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Adoption of the best practicable option	Inspection and liaison with consent holder	Yes

Purpose: To discharge treated stormwater and produced water from hydrocarbon exploration and production operations at the Turangi Production Station, onto land where it may enter an unnamed tributary of the Parahaki Stream		
Condition requirement	Means of monitoring during period under review	Compliance achieved?
2. Maximum stormwater catchment area	Inspection and company records	Yes
3. Notification to Council 7 days prior to site works and well drilling	No site works or well drilling during the monitoring period	Yes
4. Approved contingency plan	Plan up-to-date as of November 2017	Yes
5. Consent exercised in accordance with application documentation	Inspection and liaison with consent holder	Yes
6. All stormwater and produced water discharged through treatment system	Inspection	Yes
7. Design of skimmer pits to meet minimum size and hydrocarbon capture requirements	Inspection	Yes
8. Minimum skimmer pit storage volume	Inspection	Yes
9. Stormwater retention areas to be lined	Inspection	Yes
10. Stormwater system to be installed prior to any site works	Inspection	Yes
11. Concentrations not to be exceeded in the discharge	Water sampling	Yes
12. Temperature increase of not more than 2 degrees Celsius in receiving waters	Not assessed	Yes
13. No effects upon surface water bodies	Inspection and biomonitoring	Yes
14. 48 hrs notice prior to reinstatement	Site still active	N/A
15. Lapse provision	Consent exercised	N/A
16. Optional review provision	Consent surrendered in May 2019	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		High
Overall assessment of administrative performance in respect of this consent		High

N/A = not applicable

Table 11 Summary of performance for consent 10169-1

Purpose: To discharge treated stormwater from hydrocarbon exploration and production operations at the Kowhai-A wellsite onto land and into an unnamed tributary of the Waiau Stream		
Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Adoption of the best practicable option	Inspection and liaison with consent holder	Yes
2. Maximum stormwater catchment area	Inspection and company records	Yes
3. Notification to Council five days prior to site works and well drilling	Notifications received	Yes
4. Approved contingency plan	Plan up-to-date as of December 2017	Yes
5. Design, management and maintenance of stormwater system in accordance with application	Inspection	Yes
6. All stormwater discharged through treatment system without ponding	Inspection	Yes
7. Minimum skimmer pit capacity and ability to retain hydrocarbons	Inspection and company records	Yes
8. Stormwater retention areas to be lined with a shut off valve	Inspection and company records	Yes
9. Stormwater system to be installed prior to commencing any site works	System installed	Yes
10. Concentrations not to be exceeded in the discharge	Not assessed in year under review	N/A
11. Discharge not to cause an increase of more than 0.5 pH units beyond the mixing zone	Not assessed in year under review	N/A
12. Limitation on effects beyond the mixing zone	Not assessed in year under review	N/A
13. Effects not to be caused in receiving waters	Inspections	Yes
14. 48 hrs notice prior to reinstatement	Site still active	N/A
15. Lapse provision	Consent exercised	N/A
16. Optional review provision	Next option for review in 2021	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		High
Overall assessment of administrative performance in respect of this consent		High

N/A = not applicable

Table 12 Summary of performance for consent 10703-1

Purpose: To discharge treated stormwater from hydrocarbon exploration and production operations at the Turangi-A Production Station, onto land and into an unnamed tributary of the Parahaki Stream and into the Parahaki Stream		
Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Adoption of the best practicable option	Inspection and liaison with consent holder	Yes
2. Stormwater to be collected and discharged through skimmer pits	Inspection	Yes
3. Notification to Council 5 days prior to site works and well drilling	No site works or well drilling during the monitoring period	Yes
4. Approved contingency plan	Plan up-to-date as of November 2017	Yes
5. Design, management and maintenance of stormwater system in accordance with application documentation	Inspection and liaison with consent holder	Yes
6. All discharges to flow to perimeter drain and skimmer pit	Inspection	Yes
7. Skimmer pits to be lined and have a shut off valve	Inspection	Yes
8. Concentrations not to be exceeded in the discharge	Water sampling	Yes
9. Limits on pH of receiving waters if pH is increased in skimmer pits due to photosynthetic activity	Not monitored during period under review	N/A
10. Concentrations not to be exceeded in the receiving waters	Not assessed	N/A
11. No effects upon surface water bodies	Inspection and biomonitoring	Yes
12. 48 hrs notice prior to reinstatement	Site still active	N/A
13. Lapse provision	Consent exercised	N/A
14. Optional review provision	Next option for review in June 2021	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		High
Overall assessment of administrative performance in respect of this consent		High

N/A = not applicable

Table 13 Evaluation of environmental performance over time

Year	Consent no	High	Good	Improvement req	Poor
2009-10	6497-1	1		-	-
	6498-1	-	1	-	-
2010-11	6497-1	1	-	-	-
	6498-1	1	-	-	-
2011-12	6497-1	1	-	-	-
	6498-1	-	1	-	-
2012-14	6497-1	1	-	-	-
	6498-1	-	1	-	-
2014-15	6497-1	1	-	-	-
	6498-1	-	1	-	-
	9674-1	-	1	-	-
2015-16	6497-1	1	-	-	-
	6498-1	1	-	-	-
	9674-1	1	-	-	-
2016-17	6497-1	1	-	-	-
	6498-1	1	-	-	-
	9674-1	1	-	-	-
2017-18	6497-1	1	-	-	-
	6498-1	1	-	-	-
	9674-1	1	-	-	-
Totals		15	5	-	-

During the year, GPL demonstrated a high level of both environmental performance and administrative compliance with the resource consents as defined in Section 1.1.4. The Turangi Production Station and associated wellsites were well managed and maintained.

3.4 Recommendations from the 2017-2018 Annual Report

In the 2017-2018 Annual Report, it was recommended:

1. THAT in the first instance, monitoring of consented activities at the Turangi and Kowhai-A production stations and associated wellsites 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 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 undertake additional investigation or monitoring as per recommendation two.

3.5 Alterations to monitoring programmes for 2019-2020

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 2019-2020 the programme is altered slightly, with a reduction in inspections from six per year to four.

It should be noted that the proposed programme represents a reasonable and risk-based level of monitoring for the sites in question. The Council reserves the right to subsequently adjust the programme from that initially prepared, should the need arise if potential or actual non-compliance is determined at any time during 2019-2020.

4 Recommendations

1. THAT in the first instance, monitoring of consented activities at the Turangi and Kowhai-A production stations and associated wellsites in the 2019-2020 year be amended from that undertaken in 2018-2019, by reducing the number of inspections from six per year to four.
2. THAT should there be issues with environmental or administrative performance in 2019-2020, 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.
BTEX	Benzene, toluene, ethylbenzene and xylenes (BTEX).
Bund	A wall around a tank to contain its contents in the case of a leak.
CO	Carbon monoxide
Conductivity	Conductivity, an indication of the level of dissolved salts in a sample, usually measured at 25°C and expressed in mS/m.
DuraWattle	A durable, reusable, long-lasting sediment barrier. It is an alternative to straw wattle and silt fence and can be driven over by heavy traffic while maintaining its shape and effectiveness.
g/m ² /day	grams/metre ² /day.
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.
LEL	Lower Explosive Limit (LEL) gives the percentage of the lower explosive limit, expressed as methane, that is detected in the air sampled.
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.
MfE	Ministry for the Environment.
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.
mS/m	Millisiemens per metre.
NES	National Environmental Standard
NOx	Nitrogen oxides
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	<i>Resource Management Act 1991</i> and including all subsequent amendments.
SS	Suspended solids.
SQMCI	Semi quantitative macroinvertebrate community index.
Temp	Temperature, measured in °C (degrees Celsius).
Turb	Turbidity, expressed in NTU.
UI	Unauthorised Incident.
VOC	Volatile organic compounds

For further information on analytical methods, contact a Science Services Manager.

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Appendix I

Resource consents held by Greymouth Petroleum Limited and Petrochem Limited

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

Site	Consent number	Purpose	Granted	Review	Expires
Turangi Production Station	6497-1	To discharge emissions to air during flaring from well workovers and in emergency situations and miscellaneous emissions associated with production activities at the Turangi Road wellsite	Dec 2004	-	June 2021
	6498-1	To discharge treated stormwater and treated produced water from hydrocarbon exploration and production operations at the Turangi Production Station onto land, where it may enter into an unnamed tributary of the Parahaki Stream	Dec 2004	-	N/A*
	9674-1	To discharge treated stormwater and produced water from hydrocarbon exploration and production operations at the Turangi Production Station, onto land where it may enter an unnamed tributary of the Parahaki Stream	Sep 2013	-	N/A*
	10703-1	To discharge treated stormwater from hydrocarbon exploration and production operations at the Turangi-A Production Station, onto land and into an unnamed tributary of the Parahaki Stream and into the Parahaki Stream	Jan 2019	June 2021	June 2033
Kowhai-A Production Station	6719-1	To discharge emissions to air during flaring from well workovers and in emergency situations and miscellaneous emissions associated with production activities at the Kowhai-A wellsite	Nov 2005	-	June 2021
	10169-1	To discharge treated stormwater from hydrocarbon exploration and production operations at the Kowhai-A wellsite onto land and into an unnamed tributary of the Waiau Stream	Jan 2016	June 2021	June 2033

Water abstraction permits

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. Permits authorising the abstraction of water are issued by the Council under Section 87(d) of the RMA.

Water discharge permits

Section 15(1)(a) of the RMA stipulates that no person may discharge any contaminant into water, unless the activity is expressly allowed for by a resource consent or a rule in a regional plan, or by national regulations. Permits authorising discharges to water are issued by the Council under Section 87(e) of the RMA.

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. Permits authorising discharges to air are issued by the Council under Section 87(e) of the RMA.

Discharges of wastes to land

Sections 15(1)(b) and (d) of the RMA stipulate that no person may discharge any contaminant onto land if it may then enter water, or from any industrial or trade premises onto land under any circumstances, unless

the activity is expressly allowed for by a resource consent, a rule in a regional plan, or by national regulations. Permits authorising the discharge of wastes to land are issued by the Council under Section 87(e) of the RMA.

[Land use permits](#)

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. Land use permits are issued by the Council under Section 87(a) of the RMA.

[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. Coastal permits are issued by the Council under Section 87(c) of the RMA.

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

Name of Consent Holder: Greymouth Petroleum Limited
P O Box 3394
NEW PLYMOUTH 4341

Decision Date (Change): 10 September 2013

Commencement Date (Change): 10 September 2013 (Granted: 7 December 2004)

Conditions of Consent

Consent Granted: To discharge emissions to air during flaring from well workovers and in emergency situations and miscellaneous emissions associated with production activities at the Turangi Road wellsite

Expiry Date: 1 June 2021

Review Date(s): June 2015

Site Location: Turangi Production Station, Turangi Road, Motunui
(Property owner: BA & JM McKenzie)

Legal Description: Sec 21 Blk VI Waitara SD (Discharge source & site)

Grid Reference (NZTM) 1713792E-5681411N (temporary flare pit)
1713756E-5681440N

*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

Information and notification

1. Flaring shall only occur over a pit, or similar containment area, lined with impermeable material that prevents any liquid from leaking through its base or sidewalls and discharging to land.
2. Flaring shall only occur within 20 metres of the location defined by NZTM:
 - 1713792E-5681411N (temporary flare pit); and
 - 1713756E-5681440N.
3. The temporary flare pit shall be removed and site reinstated following the completion of the permanent flare pit.
4. The consent holder shall notify the Chief Executive, Taranaki Regional Council, in writing at least one month prior to the establishment of production operations at the Turangi Road wellsite.
5. At least 24 hours prior to any flaring, other than in emergencies, the consent holder shall undertake all practicable measures to notify residents within 1000 metres of the site of the commencement of flaring. The consent holder shall include in the notification a 24-hour contact telephone number for a representative of the consent holder, and shall keep and make available to the Chief Executive, Taranaki Regional Council, a record of all queries and/or complaints received.
6. The consent holder shall, whenever practicable, notify the Chief Executive, Taranaki Regional Council, whenever the continuous flaring of hydrocarbons (other than purge gas) is expected to occur for more than five minutes in duration. Notification shall, as far as practicable, be no less than 24 hours prior to such flaring being commenced.

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7. No alteration shall be made to plant equipment or processes which may substantially alter the nature or quantity of flare emissions or other site emissions, including but not limited to the recovery of produced gas, other than as notified in this consent application, without prior consultation with the Chief Executive, Taranaki Regional Council, and the consent holder shall obtain any necessary approvals under the Resource Management Act 1991.

Emissions from the site

8. Other than for the maintenance of a pilot flare flame, the consent holder shall have regard to the prevailing and predicted wind speed and direction at the time of initiation of any episode of flaring or other combustion of hydrocarbons.
9. All gas being flared, at any time must first be treated by effective liquid and solid separation and recovery, as far as is practicable, to ensure that smoke emission during flaring is minimised.
10. If separation cannot be implemented and/or maintained at any time while there is a flow from the well, whether natural or induced, then the consent holder shall notify the Chief Executive, Taranaki Regional Council, and shall in any case re-establish liquid and solid separation and recovery within three hours.
11. Subject to special conditions 9 and 10, no liquid or solid hydrocarbons shall be combusted through the gas flare system other than in an emergency.
12. Only substances originating from the well stream and treated as outlined by conditions 9, 10, 11 & 13 are to be combusted within the flare pit.
13. The consent holder shall adopt the best practicable option, as defined in section 2 of the Resource Management Act 1991, to prevent or minimise any actual or potential effect on the environment arising from any emission to air from the flare or any other emissions to air from the Turangi Road wellsite. Any adoption of the best practicable option as outlined in this special condition shall be to the satisfaction of the Chief Executive, Taranaki Regional Council.
14. The consent holder shall not discharge any contaminant to air authorised by this consent 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 wellsite, or beyond 100 metres of the flare, whichever distance is greater.
15. There shall not be any offensive odour or smoke, as determined by an enforcement officer of the Taranaki Regional Council, beyond the boundary of the wellsite or beyond 100 metres of the flare, whichever distance is greater, arising from the exercise of this consent.
16. All hydrocarbon storage vessels shall be fitted with vapour recovery systems.
17. The opacity of any smoke emissions shall not exceed a level of 1 as measured on the Ringelmann Scale for more than four minutes cumulative duration in any 60-minute period.
18. The consent holder shall control all emissions of carbon monoxide to the atmosphere from the flare, whether alone or in conjunction with any other emissions from the

wellsite, 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 mg/m³ (eight-hour average exposure), or 30 mg/m³ one-hour average exposure) at or beyond the boundary of the wellsite or beyond 100 metres from the flare, whichever distance is greater.

19. The consent holder shall control all emissions of nitrogen oxides to the atmosphere from the flare, whether alone or in conjunction with any other emissions from the wellsite, 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 100 micrograms per cubic metre (24-hour average exposure), or 200 micrograms per cubic metre (1-hour average exposure) at or beyond the boundary of the wellsite, or beyond 100 metres from the flare, whichever distance is greater.
20. The consent holder shall control emissions to the atmosphere from the wellsite and flare of contaminants other than carbon dioxide, carbon monoxide, and nitrogen oxides, whether alone or in conjunction with any emissions from the flare, 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 wellsite or beyond 100 metres from the flare, whichever distance is greater, is not increased above background levels:
 - a) by more than 1/30th of the relevant Occupational Threshold Value-Time Weighted Average, or by more than the Short Term Exposure Limit at any 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 three times the Time Weighted Average at any time (all terms as defined in Workplace Exposure Standards, 2002, Department of Labour).

Recording and reporting information

21. 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.
22. The consent holder shall keep and maintain a log of all continuous flaring incidents longer than five minutes, and any intermittent flaring lasting for an aggregate of ten minutes or longer in any 120-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 20.
23. The consent holder shall supply to the Taranaki Regional Council each month a copy of flaring information comprising: the type and amount of material flared (including any gas used to maintain a pilot flame), the date this was flared, the reason why flaring was undertaken, and an indication of whether smoke was produced from such flaring events.
24. The consent holder shall provide to the Taranaki Regional Council during May of each year, for the duration of this consent, a report:
 - i) detailing any energy efficiency measures implemented on the site;

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- ii) detailing smoke emissions as required under condition 21;
 - iii) detailing any measures to reduce smoke emissions;
 - iv) detailing any measures to reduce flaring;
 - v) addressing any other issue relevant to the minimisation or mitigation of emissions from the flare;
 - vi) detailing any complaints received and any measures undertaken to address complaints; and
 - vii) reviewing all options and technological advances relevant to the reduction or mitigation of any discharge to air from the site, how these might be applicable and/or implemented at the site, and the benefits and costs of these advances.
25. The consent holder shall make available to the Chief Executive, Taranaki Regional Council, upon request, an analysis of a typical gas and crude oil stream from the field, covering sulphur compound content and the content of carbon compounds of structure C₆ or higher number of compounds.

Lapse and Review

26. This consent shall lapse on the expiry of 16 years after the date of first issue of this consent, unless the consent is given effect to before the end of that period or the Taranaki Regional Council fixes a longer period pursuant to section 125(1)(b) of the Resource Management Act 1991.
27. 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 2009 and/or June 2015, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 10 September 2013

For and on behalf of
Taranaki Regional Council

Director-Resource Management

SURRENDERED

9-05-2019



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

Name of Consent Holder: Greymouth Petroleum Limited
P O Box 3394
NEW PLYMOUTH 4341



Decision Date (Change): 10 September 2013

Commencement Date (Change): 10 September 2013 (Granted: 7 December 2004)

Conditions of Consent



Consent Granted: To discharge treated stormwater and treated produced water from hydrocarbon exploration and production operations at the Turangi Production Station onto land, where it may enter into an unnamed tributary of the Parahaki Stream

Expiry Date: 1 June 2021

Review Date(s): June 2015

Site Location: Turangi Production Station, Turangi Road, Motunui
(Property owner: BA & JM McKenzie)

Legal Description: Sec 21 Blk VI Waitara SD (Discharge source & site)

Grid Reference (NZTM) 1713982E-5681378N

Catchment: Parahaki

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

General conditions

- a) On receipt of a requirement from the Chief Executive, Taranaki Regional Council the consent holder shall, within the time specified in the requirement, supply the information required relating to the exercise of this consent.
- b) Unless it is otherwise specified in the conditions of this consent, compliance with any monitoring requirement imposed by this consent must be at the consent holder's own expense.
- c) The consent holder shall pay to the Council all required administrative charges fixed by the Council pursuant to section 36 in relation to:
 - i) the administration, monitoring and supervision of this consent; and
 - ii) charges authorised by regulations.

**Special Conditions**

1. The consent holder shall ensure that the discharge of treated produced water to land does not result in an observable Hydrocarbon run-off into the perimeter drain.
2. The conductivity of the soil layer containing the discharge shall be maintained at less than 400 mSm^{-1} , or alternatively, if the background soil conductivity exceeds 400 mSm^{-1} , the application of waste shall not increase the soil conductivity by more than 100 mSm^{-1} over the background concentrations established prior to the exercise of this consent.
3. The sodium absorption ratio (SAR) of the soil layer containing the discharge shall be maintained at less than 18.0, or alternatively if the background soil SAR exceeds 18.0, the application of waste shall not increase the SAR by more than 1.0 over the background concentrations established prior to the exercise of this consent.
4. Prior to the expiry, cancellation, or surrender of this consent soil parameters shall not exceed the following limits: conductivity, 290 mSm^{-1} ; total dissolved salts, 2500 gm^{-3} ; sodium, 460 gm^{-3} ; and chloride, 700 gm^{-3} .
5. At all times the levels of hydrocarbons in the soil within the discharge area shall comply with the guideline values for sandy soil type in the surface layer set out in Tables 4.12 and 4.15 of the Guidelines for Assessing and Managing Petroleum Hydrocarbon Contaminated Sites in New Zealand (Ministry for the Environment, 1999), appended to this consent.
6. Any discharge of treated produced water directly to land shall occur within the area enclosed by the perimeter drain

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7. The consent holder shall keep records of the following:
 - a) The results of analysis of a monthly representative sample of the composition of the treated produced water, which is being or will be discharged on the site (including pH level, electro-conductivity, Salinity, and concentration of total hydrocarbons)
 - b) volumes of treated produced water discharged directly to land
 - c) dates and times of commencement and completion of discharge events
 - d) sampling, analysis and results of monitoring undertaken by the consent holderand shall forward these records to the Chief Executive, Taranaki Regional Council, on a quarterly basis, or as requested by the Council.
8. Prior to the exercise of this consent, the consent holder shall provide, to the written satisfaction of the Chief Executive, Taranaki Regional Council, a management plan to confirm that the activity will be conducted to comply with all of the conditions of this consent. The management plan shall be reviewed annually and shall include as a minimum:
 - a. sampling regime
 - b. a representative analysis of the quality of soil within the proposed discharge area;
 - c. procedures for notification to Council of disposal activities;
 - d. contingency procedures;
 - e. site reinstatement and monitoring; and
 - f. control of site access.
9. 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 the environment.
10. The maximum stormwater catchment area shall be no more than 1.8 hectares.
11. The Chief Executive, Taranaki Regional Council, shall be advised in writing at least 7 days prior to any site works commencing, and again in writing at least 7 days prior to any well drilling operation commencing.
12. Prior to the exercise of this consent, the consent holder shall provide for the written approval of the Chief Executive, Taranaki Regional Council, site specific details relating to contingency planning for the wellsite.
13. All discharges from the site, including from any containment pit or hydrocarbon combustion facility (e.g. flare pit, thermal oxidiser), shall flow to a perimeter drain and skimmer pit. Perimeter drains shall be designed, including by having a positive grade and low permeability, to ensure that runoff flows directly to a skimmer pit without ponding.

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14. Subject the other conditions of this consent the design, management and maintenance of the stormwater system shall be undertaken in accordance with the information submitted in support of the consent application 7570, and in particular:
 - Drawing 12364-02, Sheet 1, prepared by BTW Company Limited and dated June 2013;
 - Drawing 12364-02, Sheet 5, prepared by BTW Company Limited and dated June 2013; and
 - Stormwater design report for Turangi Production Station, prepared by BTW Company Limited, referenced 12364-8/2013 and dated 14 August 2013.
15. Skimmer pits shall have a combined capacity of no less than 340 m³, and be designed to retain any hydrocarbons that enter them.
16. All skimmer pits and any other stormwater retention areas shall be lined with an impervious material to prevent seepage through the bed and sidewalls, and all skimmer pits shall have a valve that can be shut off to prevent any discharge from the site.
17. Perimeter drains and skimmer pits necessary to comply with the conditions of this consent shall be installed before any site works commences. Site works includes the introduction of a drilling rig, drilling equipment or any other associated equipment or facilities to the site for any purpose other than for the construction of the site.
18. Any above ground hazardous substances storage areas shall be bunded with drainage to sumps, or other appropriate recovery systems, and not to the stormwater catchment.
19. The following concentrations shall not be exceeded in the discharge from the perimeter drain through the interceptor pit:

Component	Concentration
pH (range)	6.5 - 8.5
suspended solids	100 gm ⁻³
total recoverable hydrocarbons (infrared spectroscopic technique)	15 gm ⁻³
chloride	50 gm ⁻³

This condition shall apply prior to the entry of the treated stormwater and produced water either onto and into land, or into surface water, at a designated sampling point approved by the Chief Executive, Taranaki Regional Council.

20. After allowing for reasonable mixing, within a mixing zone extending seven times the width of the water body downstream of a designated discharge point, the discharge shall not give rise to an increase in temperature of more than 2 degrees Celsius.

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21. After allowing for reasonable mixing, within a mixing zone extending seven times the width of the water body downstream of a designated discharge point, the discharge shall not give rise to any of the following effects in the receiving waters:
 - a) the production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials;
 - b) any conspicuous change in the colour or visual clarity;
 - c) any emission of objectionable odour;
 - d) the rendering of fresh water unsuitable for consumption by farm animals;
 - e) any significant adverse effects on aquatic life.
22. 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.
23. 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.
24. This consent shall lapse on the expiry of five years after the date of first issue of this consent, unless the consent is given effect to before the end of that period or the Taranaki Regional Council fixes a longer period pursuant to section 125(1)(b) of the Resource Management Act 1991.
25. 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 2009 and/or June 2015, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 10 September 2013

For and on behalf of
Taranaki Regional Council


Director-Resource Management

Appendix 1

Tables 4.12 and 4.15 of the Guidelines for Assessing and Managing Petroleum Hydrocarbon Contaminated Sites in New Zealand [Ministry for the Environment, 1999].

Table 4.12 Tier 1 soil acceptance criteria *Agricultural use* ^(1,3,6) ALL PATHWAYS (all values mg/kg)

Soil Type/ Contaminant	Depth of contamination		
	Surface (<1m)	1m - 4m	> 4m
SAND			
MAHs			
Benzene	1.1 ^(v)	1.9 ^(7,v)	2.4 ^(7,v)
Toluene	(68) ^(4,v)	(94) ^(4,m)	(230) ^(4,v)
Ethylbenzene	(53) ^(4,v)	(92) ^(4,7,v)	(120) ^(4,v)
Xylenes	(48) ^(4,v)	(130) ^(4,7,v)	(180) ^(4,v)
PAHs			
Naphthalene	7.2 ^(p)	70 ^(v)	80 ^(v)
Non-carc. (Pyrene)	(160) ^(4,p)	NA ⁽²⁾	NA ⁽²⁾
Benzo(a)pyrene eq. ⁽⁵⁾	0.027 ^(p)	(25) ^(4,m)	NA ⁽²⁾
SANDY SILT			
MAHs			
Benzene	1.1 ^(v)	1.9 ^(v)	2.4 ^(v)
Toluene	(82) ^(4,v)	(170) ^(4,v)	(240) ^(4,v)
Ethylbenzene	(59) ^(4,v)	(92) ^(4,v)	(140) ^(4,v)
Xylenes	(59) ^(4,v)	(130) ^(4,v)	(180) ^(4,v)
PAHs			
Naphthalene	7.2 ^(p)	83 ^(v)	(130) ^(4,v)
Non-carc. (Pyrene)	(160) ^(4,p)	NA ⁽²⁾	NA ⁽²⁾
Benzo(a)pyrene eq. ⁽⁵⁾	0.027 ^(p)	(25) ^(4,m)	NA ⁽²⁾
SILTY CLAY			
MAHs			
Benzene	1.7 ^(v)	4.6 ^(v)	12 ^(v)
Toluene	(210) ^(4,v)	(950) ^(4,v)	(3,000) ^(4,v)
Ethylbenzene	(110) ^(4,v)	(800) ^(4,v)	(2,800) ^(4,v)
Xylenes	(160) ^(4,v)	(710) ^(4,v)	(2,200) ^(4,v)
PAHs			
Naphthalene	7.2 ^(p)	(330) ^(4,v)	(1,100) ^(4,v)
Non-carc. (Pyrene)	(160) ^(4,p)	NA ⁽²⁾	NA ⁽²⁾
Benzo(a)pyrene eq. ⁽⁵⁾	0.027 ^(p)	(25) ^(4,m)	NA ⁽²⁾

NOTES:

1. Based on protection of human health. Refer to Table 4.20 for protection of groundwater. Site-specific consideration of aesthetic and ecological impacts is required.
2. NA indicates contaminant not limiting as estimated health-based criterion is significantly higher than that likely to be encountered on site.
3. Surface soil acceptance criteria are based on the lower value of volatilisation criteria (Table 4.16), other pathway criteria (Table 4.18) and criteria for the protection of maintenance workers (Table 4.19). Criteria for soils at 1 m are based on the lower value of those arising from volatilisation and maintenance criteria. Criteria for soils at 4 m are based on volatilisation only.
4. Brackets denote values exceed threshold likely to correspond to formation of residual separate phase hydrocarbons. For further explanation refer to Appendix 4M.
5. Risk associated with mixture of carcinogenic PAHs assessed by comparison with criteria based on benzo(a)pyrene equivalent concentration. Refer to Section 4.4.3 for details of the calculation of Benzo(a)pyrene equivalent concentrations.
6. The following notes indicate the limiting pathway for each criterion: v - Volatilisation, s - Soil Ingestion, d - Dermal, p - Produce, m - Maintenance/Excavation
7. Due to the nature of boundary conditions in volatilisation model, calculated criteria for sandy soils are higher than that for silt soil type. Therefore, the criteria for sand are set equal to the criteria for silt. Refer Appendix 4D for details.

Table 4.12 (CONTINUED)
Tier 1 soil acceptance criteria Agricultural use ^(1,3,6) ALL PATHWAYS
(all values mg/kg)

Soil Type/ Contaminant	Depth of contamination		
	Surface (<1m)	1m - 4m	> 4m
CLAY			
MAHs			
Benzene	2.7 ^(v)	8.8 ^(v)	(26) ^(4,v)
Toluene	(320) ^(4,v)	(2,400) ^(4,v)	(8,500) ^(4,v)
Ethylbenzene	(160) ^(4,v)	NA ⁽²⁾	NA ⁽²⁾
Xylenes	(250) ^(4,v)	(1,800) ^(4,v)	(6,500) ^(4,v)
PAHs			
Naphthalene	7.2 ^(p)	(360) ^(4,v)	(1,200) ^(4,v)
Non-carc. (Pyrene) ⁽⁵⁾	(160) ^(4,p)	NA ⁽²⁾	NA ⁽²⁾
Benzo(a)pyrene eq.	0.027 ^(p)	(25) ^(4,m)	NA ⁽²⁾
PUMICE			
MAHs			
Benzene	1.2 ^(v)	2.4 ^(v)	3.1 ^(v)
Toluene	(73) ^(4,v)	(240) ^(4,v)	(350) ^(4,v)
Ethylbenzene	(48) ^(4,v)	(140) ^(4,v)	(220) ^(4,v)
Xylenes	(53) ^(4,v)	(180) ^(4,v)	(260) ^(4,v)
PAHs			
Naphthalene	7.2 ^(p)	140 ^(v)	(220) ^(4,v)
Non-carc. (Pyrene) ⁽⁵⁾	(160) ^(4,p)	NA ⁽²⁾	NA ⁽²⁾
Benzo(a)pyrene eq.	0.027 ^(p)	(25) ^(4,m)	NA ⁽²⁾
PEATS AND HIGHLY ORGANIC SOILS			
MAHs			
Benzene	5.7 ^(v)	10 ^(v)	13 ^(v)
Toluene	(2,500) ^(4,v)	(2,900) ^(4,v)	(3,800) ^(4,v)
Ethylbenzene	(2,200) ^(4,v)	(2,500) ^(4,v)	(3,200) ^(4,v)
Xylenes	(1,700) ^(4,v)	(2,000) ^(4,v)	(2,600) ^(4,v)
PAHs			
Naphthalene	7.2 ^(p)	(2,700) ^(4,v)	(3,500) ^(4,v)
Non-carc. (Pyrene) ⁽⁵⁾	(160) ^(4,p)	NA ⁽²⁾	NA ⁽²⁾
Benzo(a)pyrene eq.	0.027 ^(p)	(25) ^(4,m)	NA ⁽²⁾

NOTES:

1. Based on protection of human health. Refer to Table 4.20 for protection of groundwater. Site-specific consideration of aesthetic and ecological impacts is required.
2. NA indicates contaminant not limiting as estimated health-based criterion is significantly higher than that likely to be encountered on site.
3. Surface soil acceptance criteria are based on the lower value of volatilisation criteria (Table 4.16), other pathway criteria (Table 4.18) and criteria for the protection of maintenance workers (Table 4.19). Criteria for soils at 1 m are based on the lower value of those arising from volatilisation and maintenance criteria. Criteria for soils at 4 m are based on volatilisation only.
4. Brackets denote values exceed threshold likely to correspond to formation of residual separate phase hydrocarbons. For further explanation refer to Appendix 4M.
5. Risk associated with mixture of carcinogenic PAHs assessed by comparison with criteria based on benzo(a)pyrene equivalent concentration. Refer to Section 4.4.3 for details of the calculation of Benzo(a)pyrene equivalent concentrations.
6. The following notes indicate the limiting pathway for each criterion: v - Volatilisation, s - Soil Ingestion, d - Dermal, p - Produce, m - Maintenance/Excavation

Table 4.15 Tier 1 soil acceptance criteria for TPH^(1,3,5,6) Agricultural use ALL PATHWAYS
(all values in mg/kg)

Soil Type/ Contaminant	Depth of contamination		
	Surface (<1m)	1m - 4m	> 4m
SAND			
C ₇ -C ₉ ⁽⁴⁾	120 ^(m)	120 ^(m)	(3,800) ^(7,8,v)
C ₁₀ -C ₁₄	58 ^(x)	(560) ^(7,x)	(650) ^(7,x)
C ₁₅ -C ₃₆	(4,000) ^(7,x)	NA ⁽²⁾	NA ⁽²⁾
SANDY SILT			
C ₇ -C ₉ ⁽⁴⁾	(500) ^(7,m)	(500) ^(7,m)	(3,800) ^(7,v)
C ₁₀ -C ₁₄	58 ^(x)	(670) ^(7,x)	(4,900) ^(7,v)
C ₁₅ -C ₃₆	(4,000) ^(7,x)	NA ⁽²⁾	NA ⁽²⁾
SILTY CLAY			
C ₇ -C ₉ ⁽⁴⁾	(2,700) ^(7,v)	(7,300) ^(7,v)	(19,000) ^(7,v)
C ₁₀ -C ₁₄	58 ^(x)	(2,700) ^(7,x)	(8,900) ^(7,x)
C ₁₅ -C ₃₆	(4,000) ^(7,x)	NA ⁽²⁾	NA ⁽²⁾
CLAY			
C ₇ -C ₉ ⁽⁴⁾	(15,000) ^(7,v)	NA ⁽²⁾	NA ⁽²⁾
C ₁₀ -C ₁₄	58 ^(x)	(2,900) ^(7,x)	(9,700) ^(7,x)
C ₁₅ -C ₃₆	(4,000) ^(7,x)	NA ⁽²⁾	NA ⁽²⁾
PUMICE			
C ₇ -C ₉ ⁽⁴⁾	(810) ^(7,m)	(810) ^(7,m)	(4,800) ^(7,v)
C ₁₀ -C ₁₄	58 ^(x)	(1,100) ^(7,x)	(1,800) ^(7,x)
C ₁₅ -C ₃₆	(4,000) ^(7,x)	NA ⁽²⁾	NA ⁽²⁾
PEATS AND HIGHLY ORGANIC SOILS			
C ₇ -C ₉ ⁽⁴⁾	(6,700) ^(7,m)	(6,700) ^(7,m)	NA ⁽²⁾
C ₁₀ -C ₁₄	58 ^(x)	NA ⁽²⁾	NA ⁽²⁾
C ₁₅ -C ₃₆	(4,000) ^(7,x)	NA ⁽²⁾	NA ⁽²⁾

NOTES:

- Criteria for C₁₀ - C₁₄ and C₁₅ - C₃₆ are based on consideration of aliphatic component of TPH measurement and consideration of TPH as a surrogate measure for PAH, consideration of PAHs completed by extrapolation of PAH content of diesel and PAH criteria (refer Table 4.10)
- NA indicates estimated criterion exceeds 20,000 mg/kg. At 20,000 mg/kg residual separate phase is expected to have formed in soil matrix. Some aesthetic impact may be noted.
- Based on protection of human health only. Site specific consideration of aesthetic and ecological impact is required.
- Based on health effects associated with aliphatic component only. Separate consideration of the health effects associated with the aromatic component (i.e. BTEX) is required.
- Soil acceptance criteria are based on the lower value of criteria based on volatilisation (Table 4.16), other pathways (Table 4.18), criteria for the protection of maintenance workers (Table 4.19) and TPH criteria developed as surrogates for PAHs (Table 4.22). Surface soils criteria are based on all three pathways, criteria for soils at 1 m are based on volatilisation and maintenance workers, and criteria for soils at 4 m are based on volatilisation only. PAH surrogate considerations apply at all depths.
- The following notes indicate the limiting pathway for each criterion: v - Volatilisation, s - Soil Ingestion, d - Dermal, p - Produce, m - Maintenance/Excavation, x - PAH surrogate
- Brackets denote values exceed threshold likely to correspond to formation of residual separate phase hydrocarbons. For further explanation refer to Appendix 4M.
- Due to the nature of boundary conditions in volatilisation model, calculated criteria for sandy soils are higher than that for silt soil type. Therefore, the criteria for sand are set equal to the criteria for silt. Refer Appendix 4D for details.

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

Name of
Consent Holder: Petrochem Limited
P O Box 1394
Shortland Street
AUCKLAND

Consent Granted
Date: 1 November 2005

Conditions of Consent

Consent Granted: To discharge emissions to air during flaring from well workovers and in emergency situations and miscellaneous emissions associated with production activities at the Kowhai-A wellsite at or about (NZTM)
1710907E-5676255N

Expiry Date: 1 June 2021

Review Date(s): June 2009, June 2021

Site Location: Kowhai-A wellsite, Ngatimaru Road, Tikorangi, Waitara
[Property owner: BJ & RN Jupp]

Legal Description: Pt Sec 44 Tikorangi Dist Blks IX & X Waitara SD

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

Information and notification

1. The consent holder shall notify the Chief Executive, Taranaki Regional Council, in writing at least one month prior to the establishment of production operations at the Kowhai-A wellsite.
2. At least 24 hours prior to any flaring, other than in emergencies, the consent holder shall undertake all practicable measures to notify residents within 1000 metres of the site of the commencement of flaring. The consent holder shall include in the notification a 24-hour contact telephone number for a representative of the consent holder, and shall keep and make available to the Chief Executive, Taranaki Regional Council, a record of all queries and/or complaints received.
3. The consent holder shall, whenever practicable, notify the Chief Executive, Taranaki Regional Council, whenever the continuous flaring of hydrocarbons [other than purge gas] is expected to occur for more than five minutes in duration. Notification shall, as far as practicable, be no less than 24 hours prior to such flaring being commenced.
4. No alteration shall be made to plant equipment or processes which may substantially alter the nature or quantity of flare emissions or other site emissions, including but not limited to the recovery of produced gas, other than as notified in this consent application, without prior consultation with the Chief Executive, Taranaki Regional Council, and the consent holder shall obtain any necessary approvals under the Resource Management Act 1991.

Emissions from the site

5. Other than for the maintenance of a pilot flare flame, the consent holder shall have regard to the prevailing and predicted wind speed and direction at the time of initiation of any episode of flaring or other combustion of hydrocarbons.
6. All gas being flared, at any time must first be treated by effective liquid and solid separation and recovery, as far as is practicable, to ensure that smoke emission during flaring is minimised.
7. If separation cannot be implemented and/or maintained at any time while there is a flow from the well, whether natural or induced, then the consent holder shall notify the Chief Executive, Taranaki Regional Council, and shall in any case re-establish liquid and solid separation and recovery within three hours.
8. Subject to special conditions 6 and 7, no liquid or solid hydrocarbons shall be combusted through the gas flare system other than in an emergency.
9. Only substances originating from the well stream and treated as outlined by conditions 6, 7, 8, and 10 shall be combusted within the flare pit.
10. The consent holder shall adopt the best practicable option, as defined in section 2 of the Resource Management Act 1991, to prevent or minimise any actual or potential effect on the environment arising from any emission to air from the flare or any other emissions to air from the Kowhai-A wellsite. Any adoption of the best practicable option as outlined in this special condition shall be to the satisfaction of the Chief Executive, Taranaki Regional Council.
11. The consent holder shall not discharge any contaminant to air authorised by this consent 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 wellsite, or beyond 100 metres of the flare, whichever distance is greater.
12. There shall not be any offensive odour or smoke, as determined by an enforcement officer of the Taranaki Regional Council, beyond the boundary of the wellsite or beyond 100 metres of the flare, whichever distance is greater, arising from the exercise of this consent.
13. All hydrocarbon storage vessels shall be fitted with vapour recovery systems.
14. The opacity of any smoke emissions shall not exceed a level of 1 as measured on the Ringelmann Scale for more than four minutes cumulative duration in any 60-minute period.
15. The consent holder shall control all emissions of carbon monoxide to the atmosphere from the flare, whether alone or in conjunction with any other emissions from the wellsite, 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 mg/m³ [eight-hour average exposure], or 30 mg/m³ one-hour average exposure] at or beyond the boundary of the wellsite or beyond 100 metres from the flare, whichever distance is greater.

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16. The consent holder shall control all emissions of nitrogen oxides to the atmosphere from the flare, whether alone or in conjunction with any other emissions from the wellsite, 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 100 mg/m³ [24-hour average exposure], or 200 mg/m³ [1-hour average exposure] at or beyond the boundary of the wellsite, or beyond 100 metres from the flare, whichever distance is greater.
17. The consent holder shall control emissions to the atmosphere from the wellsite and flare of contaminants other than carbon dioxide, carbon monoxide, and nitrogen oxides, whether alone or in conjunction with any emissions from the flare, 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 wellsite or beyond 100 metres from the flare, whichever distance is greater, is not increased above background levels:
 - a) by more than 1/30th of the relevant Occupational Threshold Value-Time Weighted Average, or by more than the Short Term Exposure Limit at any 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 three times the Time Weighted Average at any time [all terms as defined in Workplace Exposure Standards, 2002, Department of Labour].

Recording and reporting information

18. 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.
19. The consent holder shall keep and maintain a log of all continuous flaring incidents longer than five minutes, and any intermittent flaring lasting for an aggregate of ten minutes or longer in any 120-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 20.
20. The consent holder shall provide to the Taranaki Regional Council during May of each year, for the duration of this consent, a report:
 - i. detailing any energy efficiency measures implemented on the site;
 - ii. detailing smoke emissions as required under condition 18;
 - iii. detailing any measures to reduce smoke emissions;
 - iv. detailing any measures to reduce flaring;
 - v. addressing any other issue relevant to the minimisation or mitigation of emissions from the flare;
 - vi. detailing any complaints received and any measures undertaken to address complaints; and

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- vii. reviewing all options and technological advances relevant to the reduction or mitigation of any discharge to air from the site, how these might be applicable and/or implemented at the site, and the benefits and costs of these advances.
21. The consent holder shall make available to the Chief Executive, Taranaki Regional Council, upon request, an analysis of a typical gas and crude oil stream from the field, covering sulphur compound content and the content of carbon compounds of structure C₆ or higher number of compounds.

Lapse and Review

22. This consent shall lapse on the expiry of 16 years after the date of issue of this consent, unless the consent is given effect to before the end of that period or the Taranaki Regional Council fixes a longer period pursuant to section 125(1)(b) of the Resource Management Act 1991.
23. 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 2009 and/or June 2015, 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 22 July 2008

For and on behalf of
Taranaki Regional Council

Director-Resource Management

SURRENDERED

9-05-2019

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

Name of
Consent Holder: Greymouth Petroleum Limited
P O Box 3394
NEW PLYMOUTH 4341

Decision Date
(Change): 13 February 2014

Commencement Date
(Change): 13 February 2014 (Granted: 6 September 2013)

Conditions of Consent

Consent Granted: To discharge treated stormwater and produced water from hydrocarbon exploration and production operations at the Turangi Production Station, onto land where it may enter an unnamed tributary of the Parahaki Stream

Expiry Date: 1 June 2027

Review Date(s): June 2015, June 2021

Site Location: Turangi Production Station, Turangi Road, Motunui
(Property owner: Ducal Products Limited)

Legal Description: Sec 21 & Lot 1 DP 19476 Blk VI Waitara SD
(Discharge source & site)

Grid Reference (NZTM) 1713988E-5681344N

Catchment: Parahaki

*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 to section 36 of the Resource Management Act 1991.

Special conditions

1. The consent holder shall at all times adopt the best practicable option, as defined in section 2 of the Resource Management Act 1991, to prevent or minimise any actual or likely adverse effect on the environment associated with the discharge of contaminants from the site.
2. Stormwater discharged shall be collected from a catchment area of no more than 1.8 Ha.
3. At least 5 working days prior, the consent holder shall advise the Chief Executive, Taranaki Regional Council of the date of each of the following events:
 - a) commencement of any site works (site works includes the introduction of a drilling rig, drilling equipment or any other associated equipment or facilities to the site for any purpose other than for the construction of the site);
 - b) commencement of any well drilling operation; and
 - c) recommencement of any site works or drilling operations following a period of inactivity exceeding 30 days.

If any of these events is rescheduled or delayed, the consent holder shall immediately provide further notice advising of the new date.

Any advice given in accordance with this condition shall include the consent number and the wellsite name and be emailed to worknotification@trc.govt.nz.

4. The consent holder shall maintain a contingency plan that details measures and procedures to be undertaken to prevent spillage or accidental discharge of contaminants not authorised by this consent and measures to avoid, remedy or mitigate the environmental effects of such a spillage or discharge. The contingency plan shall be certified by the Chief Executive, Taranaki Regional Council prior to discharging from the site, and after any change to the Plan.
5. Subject the other conditions of this consent the design, management and maintenance of the stormwater system shall be undertaken in accordance with the information submitted in support of the consent application 9674 and in particular, the following drawings prepared by BTW Company Limited:
 - a) Drawing 12364-103-GIS, Sheet 1 and dated March 2013;
 - b) Drawing 12364-02, Sheet 1, Revision 2 and dated December 2013;
 - c) Drawing 12364-02, Sheet 2, Revision 3 and dated December 2013;
 - d) Drawing 12364-02, Sheet 3, Revision 2 and dated December 2013;
 - e) Drawing 12364-02, Sheet 4, Revision 3 and dated December 2013;
 - f) Drawing 12364-02, Sheet 5, Revision 3 and dated December 2013;
 - g) Drawing 12364-02, Sheet 6, Revision 3 and dated December 2013;
 - h) Stormwater design report for Turangi-A Production Station, referenced 12364-8/2013, Revision 2 and dated December 2013.

6. All discharges from the site, including from any containment pit or hydrocarbon combustion facility (e.g. flare pit, thermal oxidiser), shall flow to a perimeter drain and skimmer pit. Perimeter drains shall be designed, including by having a positive grade and low permeability, to ensure that runoff flows directly to a skimmer pit without ponding.
7. Skimmer pits shall have a combined capacity of no less than 370 m³, and be designed to retain any hydrocarbons that enter them.
8. Skimmer pits shall have a combined capacity of no less than 370 m³ including a 'dead storage' of no less than 106 m³, and be designed to retain any hydrocarbons that enter them.
9. All skimmer pits and any other stormwater retention areas shall be lined with an impervious material to prevent seepage through the bed and sidewalls, and all skimmer pits shall have a valve that can be shut off to prevent any discharge from the site.
10. Perimeter drains and skimmer pits necessary to comply with the conditions of this consent shall be installed before any site works commences. Site works includes the introduction of a drilling rig, drilling equipment or any other associated equipment or facilities to the site for any purpose other than for the construction of the site.
11. Constituents in the discharge shall meet the standards shown in the following table.

Constituent	Standard
pH	Within the range 6.0 to 9.0
suspended solids	Concentration not greater than 100 gm-3
total recoverable hydrocarbons	Concentration not greater than 15 gm-3 [as determined by infrared spectroscopic technique]
chloride	Concentration not greater than 50 gm-3

12. After allowing for a mixing zone of 25 metres, the discharge shall not give rise to an increase in the temperature of the receiving waters of more than 2 degrees Celsius.
13. After allowing for a mixing zone of 25 metres, the discharge shall not give rise to any of the following effects in the receiving water:
 - a) the production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials;
 - b) any conspicuous change in the colour or visual clarity;
 - c) any emission of objectionable odour;
 - d) the rendering of fresh water unsuitable for consumption by farm animals;
 - e) any significant adverse effects on aquatic life.
14. The consent holder shall advise the Chief Executive, Taranaki Regional Council, in writing at least 48 hours prior to the reinstatement of the site and the reinstatement shall be carried out so as to minimise adverse effects on stormwater quality. Notification shall include the consent number and a brief description of the activity consented and be emailed to worknotification@trc.govt.nz.

SURRENDERED

Consent 9674-1.1

15. This consent shall lapse on 30 September 2018, unless the consent is given effect to before the end of that period or the Taranaki Regional Council fixes a longer period pursuant to section 125(1)(b) of the Resource Management Act 1991.
16. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2015 and/or June 2021, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 13 February 2014

For and on behalf of
Taranaki Regional Council



A D McLay
Director-Resource Management

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

Name of
Consent Holder: Petrochem Limited
PO Box 3394
New Plymouth 4341

Decision Date: 15 January 2016

Commencement Date: 15 January 2016

Conditions of Consent

Consent Granted: To discharge treated stormwater from hydrocarbon exploration and production operations at the Kowhai-A wellsite onto land and into an unnamed tributary of the Waiau Stream

Expiry Date: 1 June 2033

Review Date(s): June 2021, June 2027

Site Location: Kowhai-A wellsite, Ngatimaru Road, Tikorangi
(Property owner: RN & BJ Jupp)

Legal Description: Pt Sec 44 Tikorangi Dist Blks IX & X Waitara SD
(Discharge source & site)

Grid Reference (NZTM) 1710907E-5676255N

Catchment: Waiau

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

General condition

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

Special conditions

1. The consent holder shall at all times adopt the best practicable option, as defined in section 2 of the Resource Management Act 1991, to prevent or minimise any actual or likely adverse effect on the environment associated with the discharge of contaminants from the site.
2. Stormwater discharged shall be collected from a catchment area of no more than 1.2 Ha.
3. At least 5 working days prior, the consent holder shall advise the Chief Executive, Taranaki Regional Council of the date of each of the following events:
 - a) commencement of any site works (site works includes the introduction of a drilling rig, drilling equipment or any other associated equipment for the purpose of drilling, testing, well stimulation or well workover that may introduce contaminants to the site);
 - b) commencement of any well drilling operation; and
 - c) recommencement of any site works or drilling operations following a period of inactivity exceeding 30 days.

If any of these events is rescheduled or delayed, the consent holder shall immediately provide further notice advising of the new date.

Any advice given in accordance with this condition shall include the consent number and the wellsite name and be emailed to worknotification@trc.govt.nz.

4. The consent holder shall maintain and regularly update a contingency plan that details measures and procedures to be undertaken to prevent spillage or accidental discharge of contaminants not authorised by this consent and measures to avoid, remedy or mitigate the environmental effects of such a spillage or discharge. The plan shall be approved by the Chief Executive, Taranaki Regional Council, acting in a certification capacity prior to any discharge from the site.
5. Subject to the other conditions of this consent the design, management and maintenance of the stormwater system shall be undertaken in accordance with the information submitted in support of the application for this consent, in particular the Stormwater Management Plan.
6. All discharges from the site, including from any containment pit or hydrocarbon combustion facility (e.g. flare pit, thermal oxidiser), shall flow to a perimeter drain and skimmer pit. Perimeter drains shall be designed, including by having a positive grade and low permeability, to ensure that runoff flows directly to a skimmer pit without ponding.

Consent 10169-1.0

7. The skimmer pit system shall have a combined capacity of no less than 280 m³ including a 'freeboard' of no less than 147 m³, and be designed to retain any hydrocarbons that enter it.
8. All skimmer pits and any other stormwater retention areas shall be lined with an impervious material to prevent seepage through the bed and sidewalls, and all skimmer pits shall have a valve that can be shut off to prevent any discharge from the site.
9. Perimeter drains and skimmer pits necessary to comply with the conditions of this consent shall be installed before any site works commences. Site works includes the introduction of a drilling rig, drilling equipment or any other associated equipment or facilities to the site for any purpose other than for the construction of the site.
10. Subject to condition 11 the constituents in the discharge shall meet the standards shown in the following table before discharging to land.

Constituent	Standard
pH	Within the range 6.0 to 9.0
suspended solids	Concentration not greater than 100 gm ⁻³
total recoverable hydrocarbons	Concentration not greater than 15 gm ⁻³ (as determined by infrared spectroscopic technique)
chloride	Concentration not greater than 230 gm ⁻³

11. The pH may exceed 9.0 if the exceedance is a result photosynthetic activity within the skimmer pits, but in any case the discharge shall not result in the pH of the receiving water increasing by more than 0.5 pH units after allowing for a mixing zone of 20 metres from the confluence of the receiving water with the tributary of the Waiiau Stream.
12. After allowing for a mixing zone of 20 metres from the confluence of the receiving water with the tributary of the Waiiau Stream, the discharge shall not cause any of the following effects in the receiving water:
 - a) an increase in the temperature of more than 2 degrees Celsius;
 - b) the filtered carbonaceous biochemical oxygen demand to exceed 2 gm⁻³; or
 - c) the chloride concentration to exceed 50 gm⁻³.
13. After allowing for a mixing zone of 20 metres from the confluence of the receiving water with the tributary of the Waiiau Stream, the discharge shall not give rise to any of the following effects in the receiving water:
 - a) the production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials;
 - b) any conspicuous change in the colour or visual clarity;
 - c) any emission of objectionable odour;
 - d) the rendering of fresh water unsuitable for consumption by farm animals;
 - e) any significant adverse effects on aquatic life.

Consent 10169-1.0

14. The consent holder shall advise the Chief Executive, Taranaki Regional Council, in writing at least 48 hours prior to the reinstatement of the site and the reinstatement shall be carried out so as to minimise adverse effects on stormwater quality. Notification shall include the consent number and a brief description of the activity consented and be emailed to worknotification@trc.govt.nz.
15. This consent shall lapse on 31 March 2021, unless the consent is given effect to before the end of that period or the Taranaki Regional Council fixes a longer period pursuant to section 125(1)(b) of the Resource Management Act 1991.
16. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2021 and/or June 2027, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 15 January 2016

For and on behalf of
Taranaki Regional Council

A D McLay
Director - Resource Management

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

Name of
Consent Holder: Greymouth Petroleum Turangi Limited
PO Box 3394
Fitzroy
New Plymouth 4341

Decision Date 9 January 2019

Commencement Date 9 January 2019

Conditions of Consent

Consent Granted: To discharge treated stormwater from hydrocarbon exploration and production operations at the Turangi-A Production Station, onto land and into an unnamed tributary of the Parahaki Stream and into the Parahaki Stream

Expiry Date: 1 June 2033

Review Date(s): June 2021, June 2027

Site Location: Turangi-A Production Station, 126 Turangi Road, Motunui
(Property owner: BA & JM McKenzie & Ducal Products Limited)

Grid Reference (NZTM) 1713970E-5681327N
1713982E-5681378N
1713728E-5681343N

Catchment: Parahaki

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

General condition

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

Special conditions

1. The consent holder shall at all times adopt the best practicable option, as defined in section 2 of the Resource Management Act 1991, to prevent or minimise any actual or likely adverse effect on the environment associated with the discharge of contaminants from the site.
2. Stormwater discharged shall be collected and discharged through skimmer pits as detailed below:

Skimmer pit location co-ordinates	Skimmer pit reference	Catchment area	Approximate total volume	Discharge co-ordinates	Stream discharging into
1713945E-5681379N	Original dual skimmer pits installed in 2004	9665 m ²	370 m ³	1713970E-5681327N	Unnamed tributary of the Parahaki Stream
1713907E-5681337N	Skimmer Pits installed in 2014 as part of the site expansion	10970 m ²	170 m ³	1713982E-5681378N	Unnamed tributary of the Parahaki Stream
1713779E-5681357N	Proposed new skimmer pits	8745 m ²	96 m ³	1713728E-5681343N	Parahaki Stream

3. At least 5 working days prior, the consent holder shall advise the Chief Executive, Taranaki Regional Council of the date of each of the following events:
 - a) commencement of any site works (site works includes the introduction of a drilling rig, drilling equipment or any other associated equipment or facilities to the site for any purpose other than for the construction of the site);
 - b) commencement of any well drilling operation; and
 - c) recommencement of any site works or drilling operations following a period of inactivity exceeding 30 days.

If any of these events is rescheduled or delayed, the consent holder shall immediately provide further notice advising of the new date.

Any advice given in accordance with this condition shall include the consent number and the wellsite name and be emailed to worknotification@trc.govt.nz.

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

Consent 10703-1.0

5. Subject to the other conditions of this consent the design, management and maintenance of the stormwater system shall be undertaken in accordance with the information submitted in support of the application for this consent, in particular the:
 - a) Stormwater Design Report, Revision 2 and dated December 2013;
 - b) Drawing 12364-02, Sheet 1, Revision 2 and dated December 2013;
 - c) Drawing 12364-02, Sheet 2, Revision 3 and dated December 2013;
 - d) Drawing 12364-02, Sheet 3, Revision 2 and dated December 2013;
 - e) Drawing 12364-02, Sheet 4, Revision 3 and dated December 2013;
 - f) Drawing 12364-02, Sheet 5, Revision 3 and dated December 2013;
 - g) Drawing 12364-02, Sheet 6, Revision 3 and dated December 2013;
 - h) Stormwater Design Report, Revision B and dated May 2018;
 - i) Drawing 180768, Sheet 1, Revision A and dated September 2018 ;
 - j) Drawing 180768, Sheet 2, Revision A and dated September 2018; and
 - k) Drawing 180768, Sheet 3, Revision A and dated September 2018.
6. All discharges from the site, including from any containment pit or hydrocarbon combustion facility (e.g. flare pit, thermal oxidiser), shall flow to a perimeter drain and skimmer pit. Perimeter drains shall be designed, including by having a positive grade and low permeability, to ensure that runoff flows directly to a skimmer pit without ponding.
7. All skimmer pits and any other stormwater retention areas shall be lined with an impervious material to prevent seepage through the bed and sidewalls, and all skimmer pits shall have a valve that can be shut off to prevent any discharge from the site.
8. Constituents in the discharge shall meet the standards shown in the following table.

Constituent	Standard
pH	Within the range 6.0 to 9.0
suspended solids	Concentration not greater than 100 gm ⁻³
total recoverable hydrocarbons	Concentration not greater than 15 gm ⁻³ [as determined by infrared spectroscopic technique]
chloride	Concentration not greater than 230 gm ⁻³

9. The pH may exceed 9.0 if the exceedance is a result of photosynthetic activity within the skimmer pits, but in any case, the discharge shall not result in the pH of the receiving water increasing by more than 0.5 pH units after allowing for a mixing zone of 20 metres from the confluence of the receiving waters with the unnamed tributary and Parahaki Stream.
10. After allowing for a mixing zone of 20 metres from the confluence of the receiving water with the unnamed tributary and the Parahaki Stream, the discharge shall not cause any of the following effects in the receiving water:
 - a) an increase in the temperature of more than 2 degrees Celsius;
 - b) the filtered carbonaceous biochemical oxygen demand to exceed 2 gm⁻³; or
 - c) the chloride concentration to exceed 50 gm⁻³.

Consent 10703-1.0

11. After allowing for a mixing zone of 20 metres, the discharge shall not give rise to any of the following effects in the receiving water:
 - a) the production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials;
 - b) any conspicuous change in the colour or visual clarity;
 - c) any emission of objectionable odour;
 - d) the rendering of fresh water unsuitable for consumption by farm animals;
 - e) any significant adverse effects on aquatic life.
12. The consent holder shall advise the Chief Executive, Taranaki Regional Council, in writing at least 48 hours prior to the reinstatement of the site and the reinstatement shall be carried out so as to minimise adverse effects on stormwater quality. Notification shall include the consent number and a brief description of the activity consented and be emailed to worknotification@trc.govt.nz.
13. This consent shall lapse on 31 March 2024, 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.
14. 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 2021 and/or June 2027, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 9 January 2019

For and on behalf of
Taranaki Regional Council

A D McLay
Director - Resource Management