

TWN Ltd Partnership
Waihapa Production Station
Monitoring Programme
Annual Report
2022-2023

Technical Report 2023-42



Working with people | caring for Taranaki



Taranaki Regional Council
Private Bag 713
Stratford

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Executive summary

TWN Ltd Partnership (the Company) operates a hydrocarbon production station located on Bird Road, Stratford in the Patea catchment. The Waihapa Production Station processes oil and gas from numerous associated wellsites.

This report for the period July 2022 to June 2023 outlines the monitoring programme implemented by the Taranaki Regional Council (the Council) to assess the Company's environmental performance and compliance with its resource consents during the period under review. The report also details the results of the monitoring undertaken and assesses the environmental effects of the Company's activities.

There were no complaints received by Council of the Company during the year, and the Company demonstrated a high level of both environmental performance and administrative compliance with the resource consents.

The Company holds three resource consents in relation to the Waihapa Production Station, which include a total of 41 conditions setting out the requirements that the Company must comply with. The Company holds one consent to discharge treated stormwater from the production station into the Ngaere Stream and to discharge treated stormwater from perimeter drains to land where it may enter the Ngaere Stream. Another consent authorises the abstraction of water from the Ngaere Stream, and one consent to discharge emissions related to production activities into the air at the site.

The Council's programme for this monitoring year included five site inspections, an air quality survey, and two biomonitoring surveys of the Ngaere Stream. The Company undertook monitoring of impounded stormwater, abstraction volumes, and flaring data and provided this data to Council. Due to unsuitable weather conditions, sampling of the stormwater discharge and Ngaere Stream water quality by Council was not completed.

There were no significant adverse effects on the ambient air quality as a result of the discharges from the flare during the air survey. The results of the nitrogen oxides monitoring were less than the relevant human health-based assessment criteria, and generally representative of expected background levels. There were no significant odour or dust effects observed during inspections. The biomonitoring survey reports concluded that discharges from the site into the stream did not adversely affect the macroinvertebrate community.

For reference, in the 2022-2023 year consent holders were found to achieve a high level of environmental performance and compliance for 878 (87%) of the 1007 consents monitored through the Taranaki tailored monitoring programmes. Another 96 (10%) of the consents achieved a good level of environmental performance and compliance. A further 27 (3%) of consents monitored required improvement in their performance, while the remaining one (<1%) achieved a rating of poor.

The Company has achieved high environmental and compliance ratings for each year since the 2013-2014 monitoring year. Recommendations for the 2023-2024 monitoring year can be found in Section 4.

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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 2022 to June 2023 by the Taranaki Regional Council (the Council) details the monitoring programme associated with resource consents held by TWN Ltd Partnership (the Company). The Company operates the Waihapa Production Station situated on Bird Road Stratford, in the Patea catchment.

The report details the results and discusses the findings of the programme implemented by the Council to assess the Company's compliance with the resource consents that authorise water abstractions, discharges to surface water within the Patea catchment, and discharges to air from the site. This report is the tenth annual report to be prepared by the Council to cover the Company's air, land and water discharges and their effects.

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 *Resource Management Act 1991* (RMA) and the Council's obligations;
- the Council's approach to monitoring sites through annual programmes;
- the resource consents held by the Company in the Patea catchment;
- the nature of the monitoring programme in place for the period under review; and
- a description of the activities and operations conducted at the Waihapa Production Station.

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

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

Section 4 presents recommendations to be implemented in the 2023-2024 monitoring year.

A glossary of common abbreviations and scientific terms, and a bibliography, are included 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 for discharge consents, and in implementing monitoring programmes, the Council is recognising the comprehensive meaning of 'effects' in as much as is appropriate for each activity. Monitoring programmes are not only based on existing consent 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 of both activities and their impacts 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 performance

As well as discussing the details of the performance and extent of compliance by the consent holder, this report also assigns a rating as to the Company's environmental and administrative performance during the period under review. The rating categories are high, good, improvement required and poor for both environmental and administrative performance. The interpretations for these ratings are found in Appendix II.

For reference, in the 2022-2023 year, consent holders were found to achieve a high level of environmental performance and compliance for 88% of the consents monitored through the Taranaki tailored monitoring programmes, while for another 10% of the consents, a good level of environmental performance and compliance was achieved.¹

1.2 Process description

The Waihapa Production Station (Figure 1) is located on Bird Road approximately 7.5 km east of Stratford in the rohe of Ngāti Ruanui. The surrounding area is predominantly used for dairying. The production station processes oil and gas from wells in the surrounding Tariki, Waihapa, and Ngaere (TWN) fields by separating the oil, gas, condensate and water components of each wellsite's production. The produced oil is temporarily stored on site prior to being piped to the Omata tank farm in New Plymouth. The gas is processed, compressed and piped to end users. The produced water is disposed of by deep well injection.

Stormwater from the production station is collected and discharged at three separate points. The water level in the firewater pond in the north western corner of the site is maintained by an abstraction from the Ngaere Stream. Overflow due to rainfall entering this pond is discharged to land and to the Ngaere Stream to the north of the pond. Stormwater from the process areas is directed to a large API separator system to the north east of the site. The effluent from this separator is discharged to a small unnamed tributary to the east which joins the Ngaere Stream approximately 40 m above its confluence with the Patea River. Stormwater from other areas is directed to retention ponds at the northern perimeter. Overflow from these ponds is discharged to the Ngaere Stream to the north. Figure 1 in Section 2.1.2 shows the location of these systems and the related sampling sites.

¹ The Council has used these compliance grading criteria for more than 19 years. They align closely with the 4 compliance grades in the MfE Best Practice Guidelines for Compliance, Monitoring and Enforcement, 2018



Figure 1 Waihapa Production Station

1.3 Resource consents

The Company holds three resource consents authorising discharges from the production station, the details of which are summarised in the table below. Summaries of the consent conditions 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 consents held by the Company during the period under review.

Table 1 Resource consents held by TWN Ltd Partnership in relation to Waihapa Production Station

Consent number	Purpose	Granted	Review	Expires
<i>Water discharge consent</i>				
3457-2	To discharge treated impounded stormwater (including washdown water and minor quantities of process water subject to potential contamination by hydrocarbons) from the Waihapa Production Station into the Ngaere Stream and to discharge treated stormwater from perimeter drains to land where it may enter the Ngaere Stream	September 2009	-	June 2028
<i>Water abstraction consent</i>				
3767-3	To take water from the Ngaere Stream for utility and firewater purposes at the Waihapa Production Station	March 2016	June 2025	June 2034
<i>Air discharge consent</i>				
4049-3	To discharge emissions into the air from the flaring of hydrocarbons at the Waihapa Production Station in association with production, processing and maintenance activities and in emergency situations, together with miscellaneous emissions	October 2009	-	June 2028

The Company, in conjunction with other related companies, also holds consents for production activities at wellsites associated with the Waihapa Production Station. A summary of these consents is provided in Table 2.

Table 2 Consents for production activities at wellsites associated with Waihapa Production Station

Wellsite	Consent number	Purpose	Issue date	Expiry
Goss-A	6562-1	To discharge treated stormwater and treated produced water from hydrocarbon exploration and production operations at the Goss-A wellsite onto and into land in the vicinity of an unnamed tributary of the Ngaere Stream in the Patea catchment	March 2005	2022*
Ngaere-F	4162-2	To discharge treated stormwater and produced water from hydrocarbon exploration and production operations onto and into land in the vicinity of the Patea River	September 2010	2028
Tariki-A	3679-2	To discharge treated stormwater, uncontaminated treated site water and uncontaminated treated production water from hydrocarbon exploration and production operations at the Tariki-A wellsite onto and into land and into and unnamed tributary of the Mako Stream in the Waitara catchment	June 2003	2033
Tariki-B	3680-2	To discharge treated stormwater, uncontaminated treated site water and uncontaminated treated production water from hydrocarbon exploration and production operations at the Tariki-B wellsite onto and into land and into and unnamed tributary of the Mako Stream in the Waitara catchment	June 2003	2033
Kupara North (Tariki-C)	5273-2	To discharge treated stormwater from hydrocarbon exploration and production operations at the Kupara North wellsite onto land and into an unnamed tributary of Lake Ratapiko	February 1998	2033
Tariki-D	6203-1	To discharge treated stormwater and treated produced water from hydrocarbon exploration and production operations at the Tariki-D wellsite onto and into land and into an unnamed tributary of Lake Ratapiko in the Waitara catchment	September 2003	2021*
Toko-B	4201-2	To discharge treated stormwater and produced water from hydrocarbon exploration and production operations into an unnamed tributary of the Patea River	September 2010	2028
Toko-D	4470-2	To discharge treated stormwater and produced water from hydrocarbon exploration and production operations onto and into land in the vicinity of an unnamed tributary of the Patea River	September 2010	2028
Toko-E	4474-2	To discharge treated stormwater and produced water from hydrocarbon exploration and production operations into an unnamed tributary of the Manawawiri Stream in the Patea catchment	September 2010	2028

Wellsite	Consent number	Purpose	Issue date	Expiry
Waihapa-A	3683-2	To discharge treated stormwater, uncontaminated treated site water and uncontaminated treated production water from hydrocarbon exploration and production operations at the Waihapa-A wellsite onto and into land and into an unnamed tributary of the Waihapa Stream in the Patea catchment	June 2003	2034
Waihapa-B	3684-2	To discharge treated stormwater, uncontaminated treated site water and uncontaminated treated production water from hydrocarbon exploration and production operations at the Waihapa-B wellsite onto and into land and into an unnamed tributary of the Ngaere Stream in the Patea catchment	June 2003	2034
Waihapa-C	3685-2	To discharge treated stormwater, uncontaminated treated site water and uncontaminated treated production water from hydrocarbon exploration and production operations at the Waihapa-C wellsite onto and into land and into an unnamed tributary in the Patea catchment	June 2003	2034
Waihapa-D	3686-2	To discharge treated stormwater, uncontaminated treated site water and uncontaminated treated production water from hydrocarbon exploration and production operations at the Waihapa-D wellsite onto and into land and into an unnamed tributary of the Ngaere Stream in the Patea catchment	June 2003	2034
Waihapa-E	3687-2	To discharge treated stormwater, uncontaminated treated site water and uncontaminated treated production water from hydrocarbon exploration and production operations at the Waihapa-E wellsite onto and into land and into an unnamed tributary of the Ngaere Stream in the Patea catchment	June 2003	2034
Waihapa-F	4093-2	To discharge treated stormwater and produced water from hydrocarbon exploration and production operations onto and into land in the vicinity of the Ngaere Stream	September 2010	2028
Waihapa-G	7846-1	To discharge treated stormwater and production water from hydrocarbon exploration and production operations at the Waihapa-G wellsite onto and into land in the vicinity of an unnamed tributary of the Ngaere Stream	June 2011	2028
Waihapa-H	6855-1	To discharge treated stormwater and treated produced water from hydrocarbon exploration and production operations at the Waihapa-H wellsite onto and into land	April 2006	2022*
	6859-1	To take water from the Ngaere Stream in the Patea catchment for hydrocarbon exploration purposes associated with the Waihapa-H wellsite	April 2006	2022*
Various	7518-1	To discharge emissions to air during flaring from well workovers and in emergency situations associated with production activities at established wellsites (Waihapa-A, B, C, D, E and F; Toko-B, D and E, Tariki-A and Ahuroa-B), together with miscellaneous emissions	October 2009	2028

* application for replacement consent has been received. Discharges continue to be authorised under s.124 (RMA, 1991)

1.4 Monitoring programme

1.4.1 Introduction

Section 35 of the RMA imposes obligations on 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 on 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 Waihapa Production Station 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;
- discussions about monitoring requirements;
- preparation for any consent reviews, renewals or new consent applications;
- advice on the Council's environmental management strategies and content of regional plans; and
- consultation on associated matters.

1.4.3 Site inspections

The Waihapa Production Station and associated wellsites were inspected four times during the monitoring period. With regard to water take and stormwater discharge consents the main points of interest were the ring drain and soakage pits, skimmer pits, the integrity of bunding around plant equipment, and general site tidiness. The air inspections focused on observing the flare for visible emissions or odour and other areas for dust or odour emissions. The receiving environment was surveyed for any actual effects.

1.4.4 Sampling

Water quality sampling and analysis was scheduled to be undertaken twice during each monitoring year. Samples are collected from the treated stormwater discharge, firewater pond, API separator, and from two locations in the Ngaere Stream. Samples are analysed for chlorides, conductivity, hydrocarbons, pH, suspended solids and turbidity. The samples were not collected during this monitoring year because there was insufficient rainfall over May and June when the sampling was scheduled.

The combustion of natural gas results in discharges of hazardous air pollutants (HAP) including nitrogen oxides (NO_x), fine particulate less than 10 µm (PM₁₀), carbon monoxide (CO) and combustible gases. Air quality sampling and analysis was scheduled to be conducted over the course of the year. During the 2022-2023 monitoring survey the only air quality monitoring conducted was for NO_x and the results are presented in section 2.3. Due to equipment malfunctions monitoring of PM₁₀, CO and combustible gases were unable to be conducted. Instead, qualitative assessments of the likely off-site concentrations and potential effects of these pollutants are presented below.

1.4.5 Biomonitoring surveys

Biological surveys were conducted on two occasions, spring and summer, in the Ngaere Stream to assess the impact of stormwater discharges from the production station on in-stream communities.

Using the kick-sampling method samples are collected from three locations in the stream; upstream, and two from near (30 and 10 m) the confluence with the Patea River. The data is used to calculate taxa richness, the Macroinvertebrate Community Index (MCI) and the Semi-Quantitative Macroinvertebrate Community Index (SQMCI) and infer the health of the in-stream biota.

A detailed discussion of the methodology can be found in the *Biomonitoring of the Ngaere Stream in Relation to the Waihapa Production Station, October 2022* (TRC, 2023).

2 Results

2.1 Inspections

Four site inspections were conducted at the Waihapa Production Station and associated wellsites. The following observations were reported by the monitoring officer.

13 July 2022

Inspections of the production station and the wellsites were undertaken on the same day and were found to be in full compliance with the consent conditions. The production stormwater system was noted to be managing the stormwater well in light of heavy rain the night before. No hydrocarbon sheens were observed on the skimmer pits, and there was no smoke or odour from the pilot flare. The well sites were observed to be tidy and in good order. Stormwater discharges were well managed at the time and there were no visible emissions from the pilot flare.

20 October 2022

Inspection of the production station found the site to be fully compliant with the conditions of the consents. The site was in similar condition to the previous inspection, although some maintenance of the stormwater management was necessary to prevent untreated discharges.

10 March 2023

The production station was noted to be tidy and in good condition, in particular, chemical storage tanks were bunded. Upgrades to the stormwater system had not had the desired effect, and stormwater was still able to bypass the barrier. Due to recent storms and flooding the drains contained debris and vegetation, and the site was advised to remove these.

22 May 2023

The inspection deemed the site to be in full compliance with the conditions of the consents. There was no smoke or odour from the pilot flare, and the site was tidy. The drains had been cleared of debris since the last inspection, and the soakage pits contained grass. The bund around the mud shaker and D tank needed minor maintenance.

2.2 Water quality monitoring



Figure 2 Waihapa Production Station stormwater systems and monitoring sites

The consent holder collected samples from the impounded stormwater on a monthly basis to ensure that stormwater water discharged into the Ngaere Stream complied with consent conditions. The samples were sent for laboratory analysis and the results are presented in Table 3 below. The consent holder confirmed that no production water entered the stormwater treatment system.

All samples returned results less than the relevant consent limits. The highest Total Suspended Solids (TSS) result was reported in January 2023 and was less than 50% of the consent limit. High concentrations of TSS can harm aquatic life by clogging their gills which reduces their ability to take up oxygen, and reduce the amount of light available to aquatic plants for photosynthesis. The highest concentration of chloride was 32.1 g/m^3 , or 60% of the consent limit. At concentrations above 250 mg/L chloride can affect the taste of drinking water, otherwise there are no known adverse health effects from exposure to chloride.

Table 3 Monthly monitoring results for impounded stormwater collected by TWNLP 2022-2023

Parameter	Units	Min	Max	Mean	Consent 3457-1 limits	Number of exceedances
Chloride	g/m ³	5.1	32.1	17	50	0
Hydrocarbons	g/m ³	<1	<5	1	15	0
pH		6.5	8.8	7.2	6.0-9.0	0
Suspended solids	g/m ³	6	47	17	100	0

2.2.1 Monitoring results

2.2.1.1 Biomonitoring

The Council's 'kick-sampling' technique was used at three sites (Figure 2) to collect streambed macroinvertebrates from the Ngaere Stream on 25 October 2022 and 28 March 2023, in relation to the Waihapa Production Station. This has provided data to assess any potential impacts the discharges from the production station have had on the macroinvertebrate communities of the stream. Samples were processed to provide number of taxa (richness), MCI, and SQMCI scores for each site.

The MCI is a measure of the overall sensitivity of the macroinvertebrate community to the effects of nutrient pollution in streams. It is based on the presence/absence of taxa with varying degrees of sensitivity to pollution. The SQMCI takes into account taxa abundance as well as sensitivity to pollution, and may reveal more subtle changes in communities. Significant differences in either the MCI or the SQMCI between sites indicate the degree of adverse effects (if any) of the discharges being monitored and enable the overall health of the macroinvertebrate communities to be determined.

25 October 2022

The spring biomonitoring survey was conducted on 25 October 2022 and followed significant rainfall in the Patea catchment. The survey recorded moderately low taxa richness ranging from 13-18 taxa. All three sites (recorded taxa richness lower than long term medians, but higher than previous survey results. The data showed that taxa richness showed a gradual decrease with distance downstream.

MCI scores were indicative of 'fair' to 'good' macroinvertebrate health at the three sites. There were no significant differences between the control site 3 and sites 4 and 5 downstream of the discharge point, but there was a significant improvement of MCI between sites 4 and 5. All sites scored higher than both the previous survey and respective long-term medians. SQMCI scores were indicative of 'fair' to 'good' macroinvertebrate health at the three sites. There were no significant differences in SQMCI scores between any sites.

Overall the results of the survey indicated that discharges from the Waihapa Production Station have not caused any recent significant adverse impacts on the macroinvertebrate communities of the Ngaere Stream.

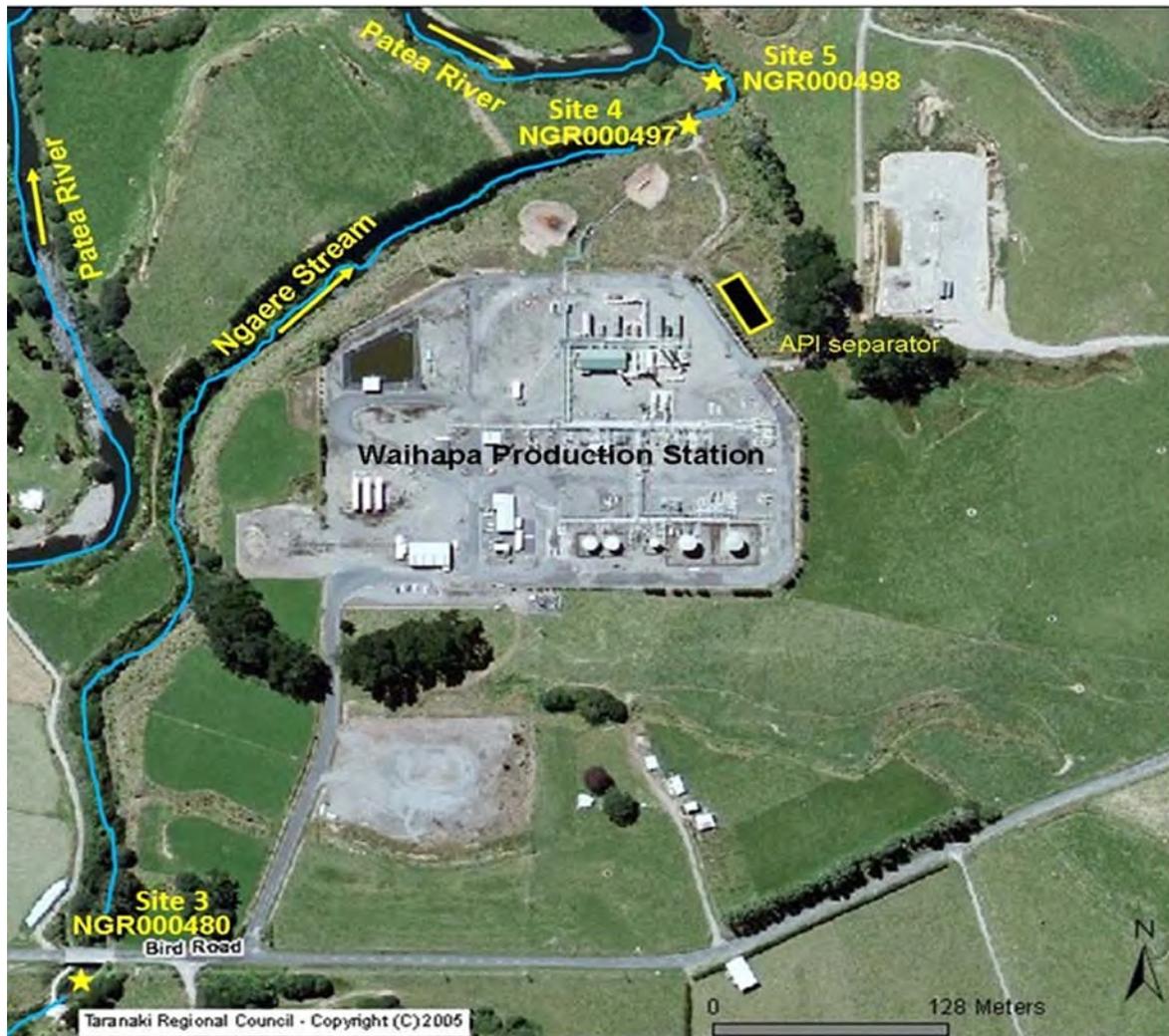


Figure 3 Biomonitoring sites in the Ngaere Stream

28 March 2023

The summer survey was conducted on 28 March 2023 following a significant weather event. Flooding had caused substantial erosion and significant modification of the stream habitat. The survey recorded moderately low taxa richness ranging from 13-16 taxa. All three sites recorded taxa richness lower than long-term median values, and either lower than or equal to results from the previous survey. There was a small gradual decline in taxa richness from the 'control' site 3 to site 5 with distance downstream.

MCI scores were indicative of 'fair' to 'poor' macroinvertebrate health at the three sites. There was a decrease in health in a downstream direction, with sites 4 and 5 recording similar scores, but both significantly lower than site 3. All sites scored significantly lower scores than were recorded in the previous survey.

SQMCI scores were indicative of 'good' to 'very poor' macroinvertebrate health at the three sites. The 'control' site 3 recorded a score similar to both that previously recorded and the site median. The SQMCI score at this site was significantly higher than both sites 4 and 5, however there was also a significant improvement between these downstream sites, with site 5 recording a significantly higher score than site 4. Site 4 recorded the lowest SQMCI score in the survey, which was the lowest recorded at that site to date.

Overall, the results of this survey indicate that the discharges from the Waihapa Production Station have not caused any recent significant detrimental impacts on the macroinvertebrate communities of the Ngaere

Stream, as it is likely that the decreases in macroinvertebrate health of this current survey are due to previous significant flood events and subsequent erosion.

2.2.2 Water abstraction

Resource consent 3767-3 authorises the extraction of water from the Ngaere Stream for use in on-site processes and as firewater for emergencies. The consent limits the abstraction of water to 250 m³/day, at a maximum rate of 2.8 L/s. The abstraction volume and rate are recorded by the Company on a daily basis and submitted to the Council the following month.

Approximately 6574.5 m³ was abstracted from the stream during the monitoring period. The daily abstraction volumes are presented in Figure 4 below. There were three days in which there was no water take; 29 July and 30 August 2022, and 26 February 2023. The maximum volume of water taken was 117.3 m³ on 1 December 2022 and is less than 50% of the consent limit. This was one of three occasions when water take exceeded 100 m³/day. During the monitoring year the average daily water take was 18 m³.

The maximum rate (daily average) of abstraction during the monitoring period was 1.4 L/s which is less than the consent limit. The average daily rate was 0.2 L/s.

No water was abstracted under the water take consent for the Waihapa-H wellsite (consent 6859-1).

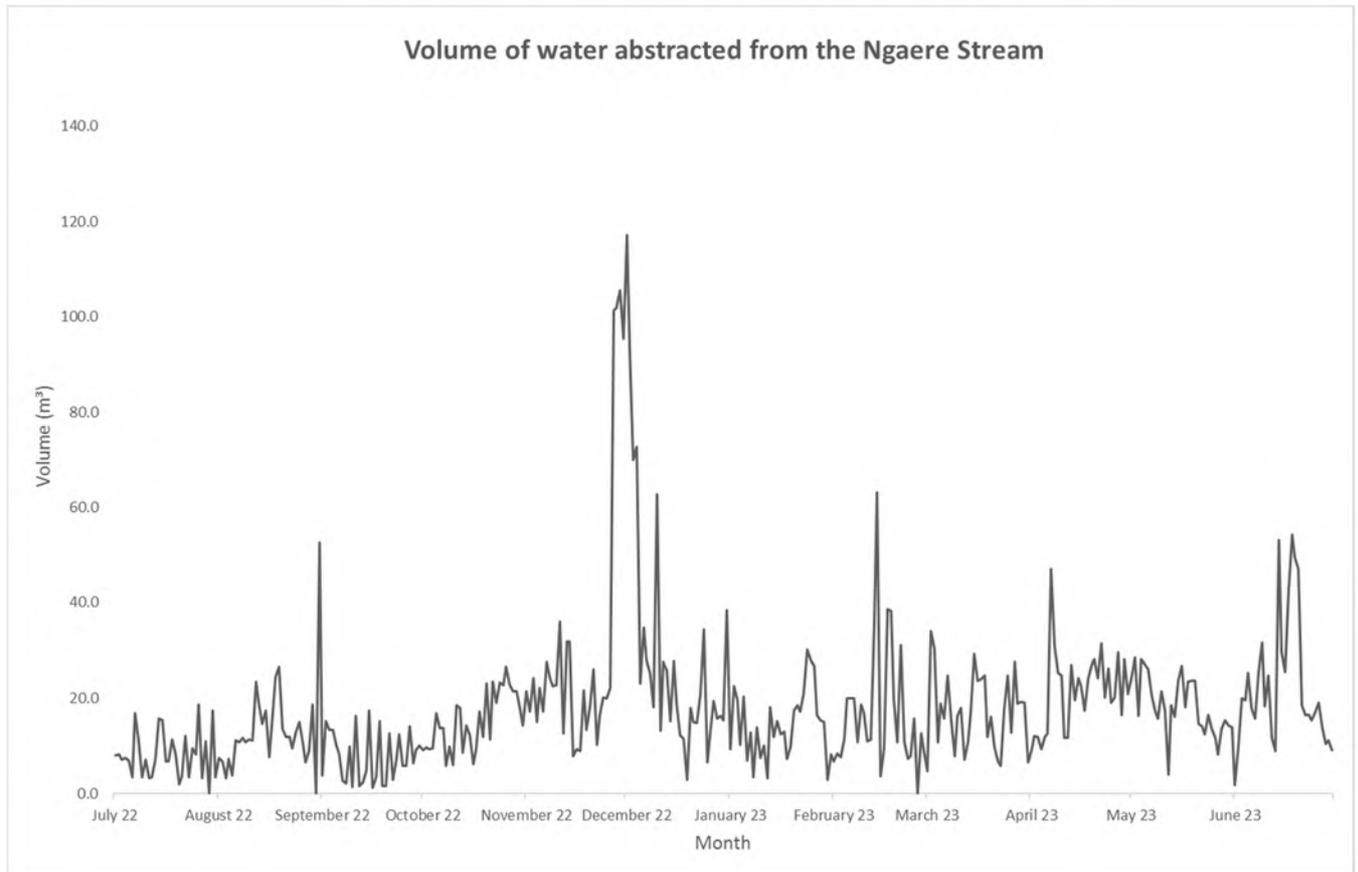


Figure 4 Daily volume of water abstracted from the Ngaere Stream (limit=250 m³)

2.3 Air quality monitoring

2.3.1 Instrumental monitoring

Carbon monoxide and combustible gases

Exposure to low level CO can cause nausea, dizziness, and disorientation. Higher levels of CO can cause coma, collapse and loss of consciousness. The New Zealand Ambient Air Standard (AAQS) for exposure to CO is 10 mg/m³ averaged over an 8-hr period.

Since monitoring began in 2015 the concentration of CO measured at the monitoring locations has never exceeded or even approached the AAQS limit. Last year the maximum CO concentration was 1.2 ppm (1.3 mg/m³), significantly lower than the AAQS limit of 10 mg/m³.

Lower Explosive Limit (LEL) is the concentration of flammable gas, vapour, or mist in ambient air, below which an explosive gas atmosphere will not be formed. In past years methane has been used as a proxy for LEL and is measured using the MultiRae. Last year the instrument recorded methane at 0% of the LEL. This low result is to be expected given that methane will likely readily disperse over the distance between the source and the instrument.

Given that there have not been any significant changes to activities on-site or scale of production it is unlikely that the concentration of CO and percentage LEL at the monitoring site during this monitoring year would be significantly different than last year.

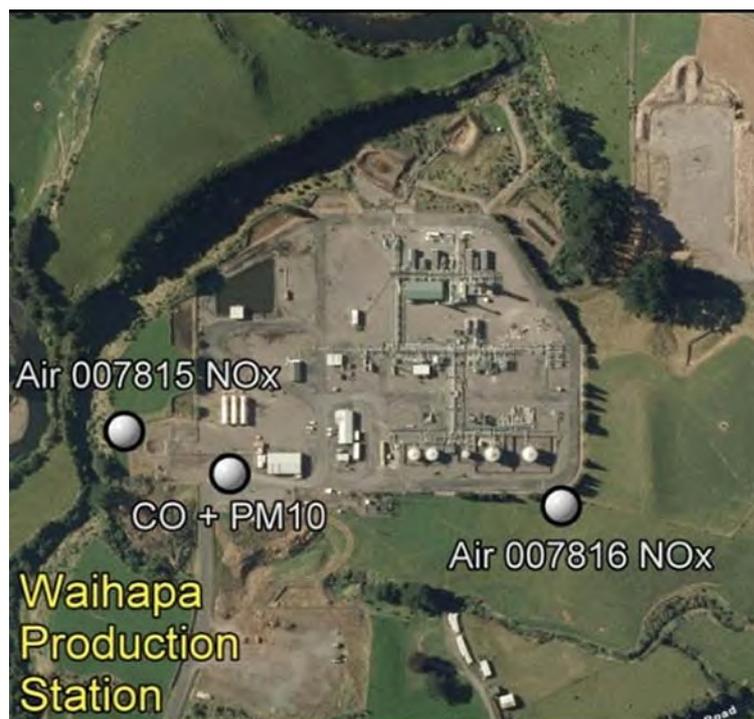


Figure 5 Locations of the air monitoring sites

Fine particulate

Fine particulate less than 10 μm in diameter (PM_{10}) can enter deep into the lungs significantly reducing the exchange of gases across the lung walls. Inhalation of PM_{10} at high concentrations can cause cardiovascular conditions such as asthma and chronic pulmonary diseases.

PM_{10} comes from multiple natural and anthropogenic sources including vehicle emissions, crustal matter and the combustion of fossil fuels. During the previous year's monitoring the 24-hr average PM_{10} concentrations was reported to be 8.9 $\mu\text{g}/\text{m}^3$.

The Waihapa Production Station is located in a rural area and the level of ambient PM_{10} is likely to be a result of vehicle emissions from Bird Road to the south, dust from unsealed surface, and other rural activities such as fertiliser application. On this basis the background concentration of PM_{10} in the area is likely to be low and therefore discharges from the combustion of natural gas at the Waihapa site are not likely to cause ambient concentrations to approach the AAQS limit of 50 $\mu\text{g}/\text{m}^3$ (24-hr average).

Nitrogen oxides

A portion of total NO_x includes nitrogen dioxide (NO_2) which can cause adverse health impacts as a result of short and long-term exposure durations. Short-term exposure to high concentrations can result in the inflammation of airways which may exacerbate asthma and other pre-existing respiratory problems. Long-term exposure to NO_2 may adversely impact lung development in children, and may lead to the development of asthma. The risk of developing certain forms of cancer and premature death also increases with long-term exposure to NO_2 .

Passive sampling devices were deployed at both monitoring locations (Figure 5) from 12 January to 2 February 2023 to measure NO_x . During the deployment non-routine flaring of gas was conducted every day, discharging a total of 66,401.45 m^3 of gas. The samplers absorb NO_x over the duration of the deployment and are then sent for laboratory analysis. The laboratory results are used to calculate 1- and 24-hr time weighted averages (TWA). The NO_x data are used as a proxy for NO_2 and the calculated TWAs are compared to the relevant health-based assessment criteria for NO_2 in Table 4 below.

Table 4 Lab results and calculated TWAs

Monitoring site	NO _x result (µg)	NO _x 1-hr average (µg/m ³)	NO _x 24-hr average (µg/m ³)
AIR007815	0.3	1.04	0.55
AIR007816	1.6	5.55	2.94
NO₂ Assessment criteria		200 (AAQS)	100 (AAQG)

As shown in Table 4 the calculated 1-hr average concentrations of NO_x at the monitoring locations were 5.55 and 1.04 µg/m³. These results are substantially lower than the NO₂ AAQS limit of 200 µg/m³. The result reported from monitoring site AIR007815 is the lowest since monitoring began in 2015.

Similarly, the 24-hr average concentration at the monitoring locations were comparatively low with concentrations calculated to be 2.94 and 0.55 µg/m³ (Table 4). These results are significantly lower than the AAQG of 100 µg/m³ and continue a downward trend in results since 2018.

Only a portion of NO_x is NO₂ and therefore the actual concentration of NO₂ at the monitoring locations will be somewhat less than reported. The 1-hr and 24-hr results are likely to be largely representative of background concentrations in rural areas.

2.3.2 Non-routine flaring

Routine operational flaring of process gas at Waihapa Production Station is continuous and occurs under normal conditions in a low pressure flare. Non-routine flaring may be required under certain circumstances and the Company is required to report this to the Council on a monthly basis. This year, non-routine flaring due to a plant shutdown was undertaken on two occasions, while non-routine flaring due to well start-ups occurred on 342 occasions.

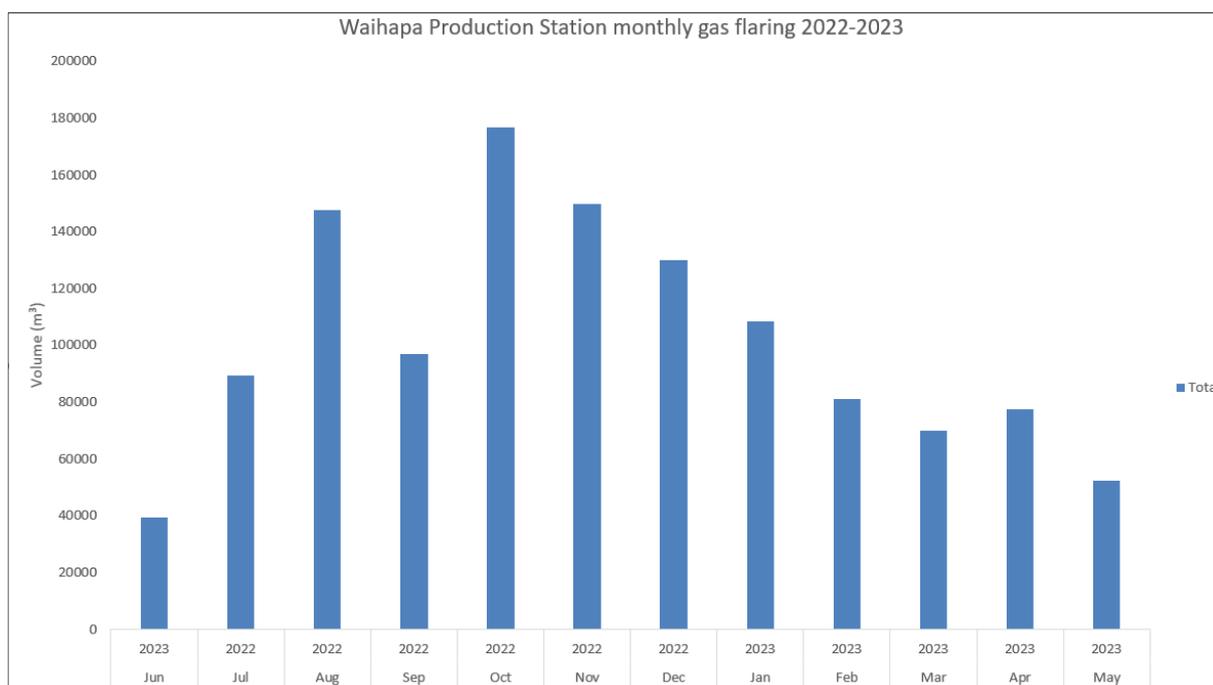


Figure 6 Monthly non-routine flaring volumes as reported by TWNLP

A summary of the monthly non-routine flaring volumes at Waihapa Production Station is provided in Figure 6. The total amount of gas flared during the monitoring year was 1,218,545 m³ which is the second highest annual volume reported in five years. During the previous four monitoring periods the annual

volume of gas flared has ranged between 299,651 and 1,281,335 m³. No smoke complaints were received by Council in relation to the flaring, and the Company did not report any smoke discharges.

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

For all significant compliance issues, as well as complaints from the public, the Council maintains a database. The database 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.

In the 2022-2023 period, the Council was not required to undertake significant additional investigations and interventions, or record incidents, in association with the Company's conditions in resource consents or provisions in Regional Plans.

3 Discussion

3.1 Discussion of site and environmental performance

Site inspections of the Waihapa Production Station and associated well sites during the 2022-2022 year found that the sites were generally well managed. Several minor 'housekeeping' issues were identified and the Company addressed these promptly. None of these resulted in adverse environmental effects. All submitted information was provided on request.

The air quality monitoring survey determined that the concentration of NO_x at the boundary was low and likely representative of background concentrations. The results are consistent with instrumental monitoring at other production stations. All other HAP were likely to be at or close to background levels, and well below any human health-based assessment criteria. In addition, there are no people living nearby who might be at risk of health effects from exposure to these HAP.

Water quality sampling of the stormwater discharge and Ngaere Stream was not conducted this year. The results of the Company's analysis of the impounded stormwater complied with the consent conditions, and were comparable to the results reported in 2021-2022. Throughout the monitoring year the site inspections noted that the stormwater ring drain was generally in good condition. On this basis it is unlikely that there were any significant adverse effects on the receiving environment as a result of any discharges. The biomonitoring report concluded that, overall, the results of the surveys indicated that discharges from the Waihapa Production Station have not caused any recent significant adverse impacts on the macroinvertebrate community of the Ngaere Stream.

3.2 Evaluation of performance

A summary of the consent holder's compliance record for each consent for the year under review is set out in Table 5 to Table 7. The Company was fully compliance with all relevant consent conditions and is rated high for both environmental and compliance performance. The Company has received a high rating each year since the programme began in 2013-2014 (Table 8).

Table 5 Summary of performance for consent 3457-2

Purpose: To discharge treated impounded stormwater [including washdown water and minor quantities of process water subject to potential contamination by hydrocarbons] from the Waihapa Production Station into the Ngaere Stream and to discharge treated stormwater from perimeter drains to land where it may enter the Ngaere Stream		
Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Adoption of best practicable option	Site inspection	Yes
2. Catchment area not to exceed 5 ha	Site inspection and liaison with consent holder	Yes
3. Maintenance of a contingency plan	Plan up to date as of July 2020	Yes
4. Maintenance and management of the stormwater system in accordance with application documentation	Site inspection and liaison with consent holder	Yes
5. All stormwater and produced water to be treated	Site inspection	Yes
6. Bunding of hazardous substances	Site inspection	Yes

Purpose: To discharge treated impounded stormwater [including washdown water and minor quantities of process water subject to potential contamination by hydrocarbons] from the Waihapa Production Station into the Ngaere Stream and to discharge treated stormwater from perimeter drains to land where it may enter the Ngaere Stream		
Condition requirement	Means of monitoring during period under review	Compliance achieved?
7. Limits on contaminants in the discharge	Sampling by Council and consent holder	N/A
8. Limit on temperature increase in receiving water	Sampling	N/A
9. Discharge shall not have certain effects on the receiving water	Observations	Yes
10. Monitoring data to be made available upon request	Data received	Yes
11. Consent holder to remedy any erosion	Site inspections - no erosion noted	Yes
12. Optional review provision re environmental effects	No further option for review prior to expiry	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		High
Overall assessment of administrative performance in respect of this consent		High

N/A = not applicable

Table 6 Summary of performance for consent 3767-3

Purpose: To take water from the Ngaere Stream for utility and firewater purposes at the Waihapa Production Station		
Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Limit on abstraction rate and volume	Review of abstraction data	Yes
2. Water meter to be installed and maintained	Inspections and liaison with consent holder	Yes
3. Provision of water meter certification within 30 days and then every 5 years	Verified March 2020, next due 2025	Yes
4. Notify Council of recording equipment failure	Liaison with consent holder, no issues during monitoring period	Yes
5. Consent holder to provide access to water meter	Site inspections	Yes
6. Abstraction records to be provided to Council by 31 July annually	Records received	Yes
7. Take to cease when Ngaere Stream flow is below 20 l/s	Ratings curve to be established	N/A
8. Intake to be screened	Site inspections	Yes
9. Installation of staff gauge to determine flow	Installed in November 2016	Yes
10. Lapse of consent	Consent exercised	N/A

Purpose: To take water from the Ngaere Stream for utility and firewater purposes at the Waihapa Production Station		
Condition requirement	Means of monitoring during period under review	Compliance achieved?
11. Review of consent	Next option for review in June 2025	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		High
Overall assessment of administrative performance in respect of this consent		High

Table 7 Summary of performance for consent 4049-3

Purpose: To discharge emissions into the air from the flaring of hydrocarbons at the Waihapa Production Station in association with production, processing and maintenance activities and in emergency situations, together with miscellaneous emissions		
Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Adoption of best practicable option	Site inspection	Yes
2. Provision of monthly flaring information	Information received	Yes
3. Annual report on flaring and emissions	Report received	Yes
4. Maintenance of a flaring log	Site inspection	Yes
5. Record of smoke emitting incidents and complaints	Site inspection and liaison with consent holder	Yes
6. Analysis of typical gas/condensate stream to be made available	Not requested	N/A
7. Consultation prior to plant alterations	Liaison with consent holder	Yes
8. Notification of hazardous situations beyond the site boundary	Liaison with consent holder	Yes
9. Notification prior to flaring	Notifications received	Yes
10. Minimise emissions	Site inspection and liaison with consent holder	Yes
11. Minimise flaring	Site inspection and liaison with consent holder	Yes
12. Control of plant depressurisation rate	Site inspection and liaison with consent holder	Yes
13. No offensive/ objectionable/obnoxious odour/dust/smoke at or beyond the site boundary	Site inspection and air monitoring	Yes
14. Discharged contaminants shall not be hazardous/ toxic/noxious at or beyond the site boundary	Site inspections and air monitoring	Yes

Purpose: To discharge emissions into the air from the flaring of hydrocarbons at the Waihapa Production Station in association with production, processing and maintenance activities and in emergency situations, together with miscellaneous emissions		
Condition requirement	Means of monitoring during period under review	Compliance achieved?
15. Limit on carbon monoxide at or beyond the site boundary	Air monitoring	Yes
16. Limit on nitrogen dioxide at or beyond the site boundary	Air monitoring	Yes
17. Limit on contaminants at or beyond the site boundary	Air monitoring	Yes
18. Optional review of consent	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

Table 8 Evaluation of environmental performance over time

Year	Consent no	High	Good	Improvement req	Poor
2013-14	3457-2, 3767-2, 4049-3	3	-	-	-
2014-15	3457-2, 3767-2, 4049-3	3	-	-	-
2015-16	3457-2, 3767-2/ 3767-3, 4049-3	3	-	-	-
2016-17	3457-2, 3767-3, 4049-3	3	-	-	-
2017-18	3457-2, 3767-3, 4049-3	3	-	-	-
2018-19	3457-2, 3767-3, 4049-3	3	-	-	-
2019-20	3457-2, 3767-3, 4049-3	3	-	-	-
2020-21	3457-2, 3767-3, 4049-3	3	-	-	-
Totals		24	0	0	0

During the year, the Company demonstrated an overall high level of both environmental performance and administrative compliance with the resource consents as defined in Appendix II.

3.3 Recommendations from the 2021-2022 Annual Report

In the 2021-2022 Annual Report, it was recommended:

1. THAT in the first instance, monitoring of consented activities at Waihapa Production Station and associated facilities in the 2022-2023 year continue at the same level as in 2021-2022.
2. THAT should there be issues with environmental or administrative performance in 2022-2023, monitoring may be adjusted to reflect any additional investigation or intervention as found necessary.

The monitoring schedule for this monitoring year was the same as the previous year. Most of the monitoring was completed, with the exception of the sampling from the discharge and the Ngaere Stream. There were no issues which arose during the year that required additional work.

3.4 Alterations to monitoring programmes for 2023-2024

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

- the extent of information 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;
- the record of administrative and environmental performance of the consent holder; and
- reporting to the Taranaki community.

The Council also takes into account the scope of assessments required at the time of replacement of consents, and the need to maintain a sound understanding of industrial processes within Taranaki exercising resource consents.

No changes have been made to the 2023-2024 monitoring programme.

It should be noted that the proposed programme represents a reasonable and risk-based level of monitoring for the site in question. The Council reserves the right to subsequently adjust the programme from that initially prepared, should the need arise if potential or actual non-compliance is determined at any time during 2023-2024.

4 Recommendations

1. THAT monitoring of consented activities at Waihapa Production Station and associated facilities in the 2023-2024 year shall continue at the same level as in 2022-2023.
2. THAT should there be issues with environmental or administrative performance in 2023-2024 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 a stream by monitoring the in-stream macroinvertebrate community.
Bund	A wall around a tank to contain its contents in the case of a leak.
Conductivity	Indicator of the level of dissolved salts in a sample, usually measured at 25°C and expressed in mS/m.
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.
LEL	Lower Explosive Limit. 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 measure 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 Standards.
NO _x	Nitrogen oxides.
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	Particulate matter with an aerodynamic diameter of less than 10 micrometre).
Resource consent	Refer Section 87 of the RMA. Resource consents include land use consents (refer Sections 9 and 13 of the RMA), coastal consents (Sections 12, 14 and 15), water consents (Section 14) and discharge consents (Section 15).
RMA	<i>Resource Management Act 1991</i> and including all amendments.
SQMCI	Semi quantitative macroinvertebrate community index.
Temp	Temperature, measured in °C (degrees Celsius).
TSS	Total suspended solids.

Turb Turbidity, expressed in NTU.

For further information on analytical methods, contact the Environment Quality Manager.

Bibliography and references

- Ministry for the Environment. 2018. *Best Practice Guidelines for Compliance, Monitoring and Enforcement under the Resource Management Act 1991*. Wellington: Ministry for the Environment.
- Taranaki Regional Council (2023): *Biomonitoring of the Ngaere Stream in relation to the Waihapa Production Station, March 2023*. Internal Memorandum FK016.
- Taranaki Regional Council (2023): *Biomonitoring of the Ngaere Stream in relation to the Waihapa Production Station, October 2022*. Internal Memorandum FK015.
- Taranaki Regional Council (2022): *Biomonitoring of the Ngaere Stream in relation to the Waihapa Production Station, February 2022*. Internal Memorandum BZ196.
- Taranaki Regional Council (2022): *Biomonitoring of the Ngaere Stream in relation to the Waihapa Production Station, November 2021*. Internal Memorandum BZ178.
- Taranaki Regional Council (2022): *Ambient Gas (PM10, NOx, CO and LEL) Monitoring at Waihapa Production Station during the 2021-2022 monitoring year*, Internal Memorandum.
- Taranaki Regional Council (2021): *TWN Limited Partnership Waihapa Production Station Monitoring Programme Annual Report 2020-2021*. Technical Report 2021-35.
- Taranaki Regional Council (2020): *TWN Limited Partnership Waihapa Production Station Monitoring Programme Annual Report 2019-2020*. Technical Report 2020-60.
- Taranaki Regional Council (2020): *TWN Limited Partnership Waihapa Production Station Monitoring Programme Annual Report 2018-2019*. Technical Report 2019-47.
- Taranaki Regional Council (2019): *NZEC Deep Well Injection Monitoring Programme Annual Report 2018-2019*. Technical Report 2019-32.
- Taranaki Regional Council (2019): *TWN Limited Partnership Waihapa Production Station Monitoring Programme Annual Report 2017-2018*. Technical Report 2018-43.
- Taranaki Regional Council (2017): *TWN Limited Partnership Waihapa Production Station Monitoring Programme Annual Report 2016-2017*. Technical Report 2017-53.
- Taranaki Regional Council (2016): *TWN Limited Partnership Waihapa Production Station Monitoring Programme Annual Report 2015-2016*. Technical Report 2016-20.
- Taranaki Regional Council (2016): *TWN Limited Partnership Waihapa Production Station Monitoring Programme Annual Report 2014-2015*. Technical Report 2015-96.
- Taranaki Regional Council (2015): *TWN Limited Partnership Waihapa Production Station Monitoring Programme Annual Report 2013-2014*. Technical Report 2014-49.
- Taranaki Regional Council (2013): *Origin Energy Resources NZ Ltd Rimu and Waihapa Production Stations Monitoring Programmes Biennial Report 2011-2013*. Technical Report 2013-55.
- Taranaki Regional Council (2011): *Origin Energy Resources NZ Ltd, Rimu and Waihapa Production Stations Monitoring Programmes Annual Report 2010-2011*. Technical Report 2011-77.
- Taranaki Regional Council (2010): *Origin Energy Resources NZ Ltd Rimu and Waihapa Production Stations Monitoring Programmes Annual Report 2009-2010*. Technical Report 2010-94.
- Taranaki Regional Council (2009): *Origin Energy Resources NZ Ltd Rimu and Waihapa Production Stations Monitoring Programmes Annual Report 2008-2009*. Technical Report 2009-29.
- Taranaki Regional Council (2008): *Swift Energy NZ Ltd Monitoring Report 2007-2008*. Technical Report 08-13.

- Taranaki Regional Council (2007): *Swift Energy NZ Ltd Monitoring Report 2006-2007*. Technical Report 07-108.
- Taranaki Regional Council (2006): *Swift Energy NZ Ltd Monitoring Report 2005-2006*. Technical Report 06-54.
- Taranaki Regional Council (2005): *Swift Energy NZ Ltd Monitoring Report 2004-2005*. Technical Report 05-58.
- Taranaki Regional Council (2004): *Swift Energy NZ Ltd Monitoring Report 2003-2004*. Technical Report 04-73.
- Taranaki Regional Council (2003): *Swift Energy NZ Ltd Monitoring Report 2002-2003*. Technical Report 03-79.
- Taranaki Regional Council (2002): *Swift Energy NZ Ltd Monitoring Report 2001-2002*. Technical Report 02-66.
- Taranaki Regional Council (2002): *Fletcher Challenge Energy Taranaki Ltd Monitoring Programme Annual Report 2001-2002*. Technical Report 02-47.
- Taranaki Regional Council (2001): *Fletcher Challenge Energy Taranaki Ltd Monitoring Programme Annual Report 2000-2001*. Technical Report 01-83.
- Taranaki Regional Council (2000): *Fletcher Challenge Energy Taranaki Ltd Monitoring Programme Annual Report 1999-2000*. Technical Report 00-24.
- Taranaki Regional Council (1999): *Fletcher Challenge Energy Taranaki Ltd Monitoring Programme Annual Report 1998-1999*. Technical Report 99-16.
- Taranaki Regional Council (1998): *Fletcher Challenge Energy Taranaki Ltd Air and Water Monitoring Report 1997/98*. Technical Report 98-61.
- Taranaki Regional Council (1997): *Fletcher Challenge Energy Taranaki Ltd Air and Water Monitoring Report 1996/97*. Technical Report 97-51.
- Taranaki Regional Council (1996): *Petrocorp Exploration Ltd Air and Water Monitoring Report 1995/96*. Technical Report 96-60.
- Taranaki Regional Council (1995): *Petrocorp Exploration Ltd Air and Water Monitoring Report 1994/95*. Technical Report 95-54.
- Taranaki Regional Council (1994): *Petrocorp Exploration Ltd Air and Water Monitoring Report 1993/94*. Technical Report 94-73.
- Taranaki Regional Council (1993): *Petrocorp Exploration Ltd Air and Water Monitoring Report 1992/93*. Technical Report 93-35A.
- Taranaki Regional Council (1992): *Petrocorp Exploration Ltd Air and Water Monitoring Report 1991/92*. Technical Report 92-25.
- Taranaki Regional Council (1991): *Petrocorp Exploration Ltd Air and Water Monitoring Report 1990/91*. Technical Report 91-25.
- Taranaki Regional Council (1990): *Petrocorp Exploration Ltd Air and Water Monitoring Report 1989/90*. Technical Report 90-14.

Appendix I

Resource consents held by TWN Ltd Partnership

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

Water abstraction consents

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

Water discharge consents

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

Air discharge consents

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. Consents 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. Consents authorising the discharge of wastes to land are issued by the Council under Section 87(e) 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: TWN Limited Partnership
P O Box 8440
NEW PLYMOUTH 4342

Decision Date: 27 July 2009

Commencement Date: 27 July 2009

Conditions of Consent

Consent Granted: To discharge treated impounded stormwater [including washdown water and minor quantities of process water subject to potential contamination by hydrocarbons] from the Waihapa Production Station into the Ngaere Stream and to discharge treated stormwater from perimeter drains to land where it may enter the Ngaere Stream at or about (NZTM) 1717334E-5642168N

Expiry Date: 1 June 2028

Review Date(s): June 2016, June 2022

Site Location: Waihapa Production Station, Bird Road, Stratford

Legal Description: Sec 10 Blk III Ngaere SD

Catchment: Patea

Tributary: Ngaere

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

Consent 3457-2

General conditions

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

Special conditions

1. Notwithstanding any other condition of this consent, the consent holder shall at all times adopt the best practicable option, as defined in section 2 of the Resource Management Act 1991, to prevent or minimise any 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 5 hectares.
3. The consent holder shall maintain a contingency plan outlining measures and procedures to be undertaken to prevent spillage or accidental discharge of contaminants not licensed by this consent and measures to avoid, remedy or mitigate the environmental effects of such a spillage or discharge. No changes shall be made to the contingency plan without the prior approval of the Chief Executive, Taranaki Regional Council.
4. The management and maintenance of the stormwater treatment system shall be undertaken in general accordance with the information submitted in support of consent application 5217.
5. All stormwater and produced water shall be directed for treatment through the stormwater treatment system, identified under condition 4 of this consent, before being discharged.
6. Any above ground hazardous substances storage areas shall be bunded with drainage to an appropriate treatment system.

7. Constituents of the discharge shall meet the standards shown in the following table.

<u>Constituent</u>	<u>Standard</u>
pH	Within the range 6.0 to 9.0
suspended solids	Concentration not greater than 100 gm ⁻³
total recoverable hydrocarbons	Concentration not greater than 15 gm ⁻³
chloride	Concentration not greater than 50 gm ⁻³

This condition shall apply before entry of the treated stormwater into the receiving waters of the Ngaere Stream, or onto/into land, at a designated sampling point(s) approved by the Chief Executive, Taranaki Regional Council.

8. After allowing for a mixing zone of 25 metres, the discharge shall not give rise to an increase in temperature of more than 2 degrees Celsius within the Ngaere Stream.
9. After allowing for a mixing zone of 25 metres, the discharge shall not give rise to any of the following effects in the Ngaere Stream:
- a) the production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials;
 - b) any conspicuous change in the colour or visual clarity;
 - c) any emission of objectionable odour;
 - d) the rendering of fresh water unsuitable for consumption by farm animals;
 - e) any significant adverse effects on aquatic life.
10. Results of the water samples taken from the firewater pond [undertaken prior to the release of stormwater from the facility] shall be made available to the Chief Executive, Taranaki Regional Council, on request.
11. Any erosion, scour or instability of the bed or banks of the Ngaere Stream that is attributable to the discharges authorised by this consent shall be remedied by the consent holder.
12. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2016 and/or June 2022, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 1 November 2013

For and on behalf of
Taranaki Regional Council



Director-Resource Management

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

Name of
Consent Holder: TWN Limited Partnership
PO Box 8440
New Plymouth 4342

Decision Date: 17 March 2016

Commencement Date: 17 March 2016

Conditions of Consent

Consent Granted: To take water from the Ngaere Stream for utility and firewater purposes at the Waihapa Production Station

Expiry Date: 1 June 2034

Review Date(s): June 2019 and 3 yearly thereafter

Site Location: Waihapa Production Station, 593 Bird Road, Stratford

Grid Reference (NZTM) 1717395E-5642260N

Catchment: Patea

Tributary: Ngaere

*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 rate of taking shall not exceed 2.8 litres per second, and the volume taken in any 24 hour period ending at midnight (New Zealand Standard Time) shall not exceed 240 cubic metres.
2. Before exercising this consent the consent holder shall install, and thereafter maintain a water meter at the site of taking (or a nearby site in accordance with Regulation 10 of the *Resource Management (Measurement and Reporting of Water Takes) Regulations 2010*. The water meter shall be tamper-proof and shall measure and record the rate and volume of water taken to an accuracy of $\pm 5\%$.

Note: Water meters must be installed, and regularly maintained, in accordance with manufacturer's specifications in order to ensure that they meet the required accuracy. Even with proper maintenance water meters have a limited lifespan.

3. The consent holder shall provide the Chief Executive, Taranaki Regional Council with a document from a suitably qualified person certifying that water measuring and recording equipment required by the conditions of this consent ('the equipment'):
 - (a) has been installed and/or maintained in accordance with the manufacturer's specifications; and/or
 - (b) has been tested and shown to be operating to an accuracy of $\pm 5\%$.

The documentation shall be provided:

- (i) within 30 days of the installation of a water meter;
 - (ii) at other times when reasonable notice is given and the Chief Executive, Taranaki Regional Council has reasonable evidence that the equipment may not be functioning as required by this consent; and
 - (iii) no less frequently than once every five years.
4. If any measuring or recording equipment breaks down, or for any reason is not operational, the consent holder shall advise the Chief Executive, Taranaki Regional Council immediately. Any repairs or maintenance to this equipment must be undertaken by a suitably qualified person and a maintenance report provided to the Chief Executive, Taranaki Regional Council within 30 days of the work occurring.

Consent 3767-3.0

5. Any water meter shall be accessible to Taranaki Regional Council officers at all reasonable times for inspection and/or data retrieval.
6. The records of water taken shall:
 - (a) be in a format that, in the opinion of the Chief Executive, Taranaki Regional Council, is suitable for auditing;
 - (b) be maintained by the consent holder by recording the meter reading and the date of the reading at daily intervals.
 - (c) specifically record the water taken as 'zero' when no water is taken; and
 - (d) for each 12-month period ending on 30 June, be provided to the Chief Executive, Taranaki Regional Council within one month after end of that period.
7. No taking shall occur when the flow in the Ngaere Stream/River immediately downstream of the intake point is less than 20 litres per second.

Note: Taking water required for fire fighting purposes is not restricted by this condition.

8. The consent holder shall ensure that the intake is screened to avoid fish (in all stages of their life-cycle) entering the intake or being trapped against the screen.
9. A staff gauge shall be installed and a low flow rating curve established and maintained that determines the flow in the Ngaere Stream immediately downstream of the take site. The cost of the installation, and the establishment and maintenance of the rating shall be met by the consent holder.

Note: The installation of the staff gauge and establishment of the rating will be undertaken by the Council and included in the monitoring programme.

10. 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.

Consent 3767-3.0

11. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2019 and at 3 yearly intervals thereafter for the purposes of:
- (a) 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; and/or
 - (b) requiring continuous measuring and recording of the flow immediately downstream of the take site; and/or
 - (c) requiring any data collected in accordance with the conditions of this consent to be transmitted directly to the Taranaki Regional Council's computer system, in a format suitable for providing a 'real time' record over the internet.

Signed at Stratford on 17 March 2016

For and on behalf of
Taranaki Regional Council

A D McLay
Director - Resource Management

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

Name of
Consent Holder: TWN Limited Partnership
P O Box 8440
NEW PLYMOUTH 4342

Decision Date: 6 October 2009

Commencement Date: 6 October 2009

Conditions of Consent

Consent Granted: To discharge emissions into the air from the flaring of hydrocarbons at the Waihapa Production Station in association with production, processing and maintenance activities and in emergency situations, together with miscellaneous emissions at or about (NZTM) 1717334E-5642168N

Expiry Date: 1 June 2028

Review Date(s): June 2011, June 2016, June 2022

Site Location: Waihapa Production Station, Bird Road, Stratford

Legal Description: Sec 10 Blk III Ngaere SD

*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

Exercise of consent

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

Recording and submitting information

2. 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.
3. The consent holder shall provide to the Taranaki Regional Council during May of each year, for the duration of this consent, a report:
 - a) detailing gas combustion at the production station flare, including but not restricted to routine operational flaring and flaring logged in accordance with condition 4;
 - b) detailing any measures that have been undertaken by the consent holder to improve the energy efficiency of the production station;
 - c) detailing any measures to reduce smoke emissions;
 - d) detailing any measures to reduce flaring,
 - e) addressing any other issue relevant to the minimisation or mitigation of emissions from the production station flare; and
 - f) detailing any complaints received and any measures undertaken to address complaints.

Consent 4049-3

4. The consent holder shall keep and maintain a log of all continuous flaring incidents lasting longer than 5 minutes and any intermittent flaring lasting for an aggregate of 10 minutes or longer in any 60-minute period. The log shall contain the date, the start and finish times, the quantity and type of material flared, and the reason for flaring. The log shall be made available to the Chief Executive, Taranaki Regional Council, upon request, and summarised annually in the report required under condition 3. Flaring, under normal operation in the low pressure flare, of rich mono-ethylene glycol degasser vapour, condensate tank vapours, non-condensibles from tri-ethylene glycol/mono-ethylene glycol regeneration and purge gas shall be excluded from this requirement.
5. The consent holder shall keep and make available to the Chief Executive, Taranaki Regional Council, upon request, a record of all smoke emitting incidents, noting time, duration and cause. The consent holder shall also keep, and make available to the Chief Executive, upon request, a record of all complaints received as a result of the exercise of this consent.

Information and notification

6. The consent holder shall make available to the Chief Executive, Taranaki Regional Council upon request, an analysis of a typical gas and/or condensate stream from the Waihapa field, covering sulphur compound content and the content of compounds containing six or more carbon atoms in their molecular structure.
7. Prior to undertaking any alterations to the plant equipment, processes or operations, which may substantially alter the nature or quantity of flare emissions other than as described in the consent application, the consent holder shall first consult with the Chief Executive, Taranaki Regional Council, and shall obtain any necessary approvals under the Resource Management Act 1991.
8. Any incident whereby the discharge of emissions to air has potential or actual adverse environmental effects which has caused or is liable to cause a substantiated complaint, or a hazardous situation beyond the boundary of the property on which the production station flare is located, shall be notified to the Taranaki Regional Council, as soon as possible, followed by a written report to the Chief Executive, Taranaki Regional Council, within one week of the incident, with comment about the measures taken to minimise the impact of the incident and to prevent re-occurrence.
9. The consent holder shall notify the Chief Executive, Taranaki Regional Council, as soon as practicable, whenever the continuous flaring of hydrocarbons [other than the flaring of rich mono-ethylene glycol degasser vapour, condensate tank vapours, non-condensibles from tri-ethylene glycol/mono-ethylene glycol regeneration and purge gas] is expected to occur for more than five minutes in duration.

Preventing and minimising emissions

10. The consent holder shall minimise the emissions and impacts of air contaminants discharged from the flare by the selection of the most appropriate process equipment, process control equipment, emission control equipment, methods of control, supervision and operation, and the proper and effective operation, supervision, control and maintenance of all equipment and processes.
11. All practicable steps shall be taken to minimise flaring.
12. Other than in emergencies, the rate of depressurisation of the plant, or sections of the plant, shall be managed to prevent dense black smoke from being discharged from the flare.
13. The discharges authorised by this consent shall not, whether alone or in conjunction with any other emissions from the site arising through the exercise of any other consent, give rise to any levels of odour or dust or smoke that are offensive or obnoxious or objectionable at or beyond the property boundary.
14. The consent holder shall not discharge any contaminant to air from the site at a rate or a quantity such that the contaminant, whether alone or in combination with other contaminants, is or is liable to be hazardous or toxic or noxious at or beyond the boundary of the property where the production station is located.
15. The consent holder shall control all discharges of carbon monoxide to the atmosphere from the flare, whether alone or in conjunction with any other emissions from the site arising through the exercise of any other consent, in order that the maximum ground level concentration of carbon monoxide arising from the exercise of this consent measured under ambient conditions does not exceed 10 milligrams per cubic metre [eight-hour average exposure], or 30 milligrams per cubic metre [one-hour average exposure] at or beyond the boundary of the property on which the production station flare is located.
16. The consent holder shall control all discharges of nitrogen dioxide or its precursors to the atmosphere from the flare, whether alone or in conjunction with any other discharges to the atmosphere from the site arising through the exercise of any other consent, in order that the maximum ground level concentration of nitrogen dioxide arising from the exercise of this consent measured under ambient conditions does not exceed 200 micrograms per cubic metre [one hour average exposure], or 100 micrograms per cubic metre [twenty-four hour average exposure], at or beyond the boundary of the property on which the production station flare is located.

Consent 4049-3

17. The consent holder shall control discharges to the atmosphere from the flare of contaminants other than carbon dioxide, carbon monoxide, and nitrogen oxides, whether alone or in conjunction with any other emissions from the site arising through the exercise of any other consent, in order that the maximum ground level concentration for any particular contaminant arising from the exercise of this consent, measured at or beyond the boundary of the property on which the production station flare is located, is not increased above background levels:
- a) by more than 1/30th of the relevant Workplace Exposure Standard-Time Weighted Average [exposure averaged over a duration as specified for the Workplace Exposure Standard-Time Weighted Average], or by more than 1/10th of the Workplace Exposure Standard-Short Term Exposure Limit over any short period of time [all terms as defined in Workplace Exposure Standards, 2002, Department of Labour]; or
 - b) if no Short Term Exposure Limit is set, by more than the General Excursion Limit at any time [all terms as defined in Workplace Exposure Standards, 2002, Department of Labour].

Review

18. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2011 and/or June 2016 and/or June 2022, for the purposes of:
- a) dealing with any significant adverse effect on the environment arising from the exercise of the consent which was not foreseen at the time the application was considered or which it was not appropriate to deal with at the time; and/or
 - b) requiring the consent holder to adopt the best practicable option to remove or reduce any adverse effect on the environment caused by the discharge; and/or
 - c) to alter, add or delete limits on mass discharge quantities or discharge or ambient concentrations of any contaminant or contaminants.

Signed at Stratford on 1 November 2013

For and on behalf of
Taranaki Regional Council



Director-Resource Management

Appendix II

Categories used to evaluate environmental and administrative performance

Categories used to evaluate environmental and administrative performance

Environmental performance is concerned with actual or likely effects on the receiving environment from the activities during the monitoring year. Administrative performance is concerned with the Company's approach to demonstrating consent compliance in site operations and management including the timely provision of information to Council (such as contingency plans and water take data) in accordance with consent conditions.

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

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

Environmental Performance

High: No or inconsequential (short-term duration, less than minor in severity) breaches of consent or regional plan parameters resulting from the activity; no adverse effects of significance noted or likely in the receiving environment. The Council did not record any verified unauthorised incidents involving 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.