Greymouth Petroleum Hawera Landfarm Monitoring Programme Annual Report 2012-2013

Technical Report 2013–45

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Executive summary

Greymouth Petroleum Acquisition Company Limited operates a drilling waste landfarm located off Rifle Range Road at Hawera. This report for the period July 2012-June 2013 describes the monitoring programme implemented by the Taranaki Regional Council to assess the Company's environmental performance during the period under review, and the results and environmental effects of the Company's activities.

The Company holds one resource consent, which includes a total of 29 conditions setting out the requirements that the Company must satisfy. This consent allows for the discharge of drilling waste onto and into land.

The Council's monitoring programme for the year under review included one inspection, two receiving soil samples, data review, and on-going liaison with the Company.

The monitoring indicated that there appear to be no adverse environmental effects resulting from past discharges of drilling waste at the site. However, the establishment of permanent pasture over part of the site remains an issue. Additionally, the surrender criteria for total hydrocarbons in the former storage area have not yet been met. This will require action on the part of the Company prior to consent expiry in 2014.

During the year, the Company demonstrated a good level of environmental performance and compliance with the resource consent. There were no unauthorised incidents in relation to the site.

For reference, in the 2012-2013 year, 35% of consent holders in Taranaki monitored through tailored compliance monitoring programmes achieved a high level of environmental performance and compliance with their consents, while another 59% demonstrated a good level of environmental performance and compliance with their consents.

This report includes recommendations for the 2013-2014 year.

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1. Introduction

1.1 Compliance monitoring programme reports and the Resource Management Act 1991

1.1.1 Introduction

This report is the Annual Report for the period July 2012-June 2013 by the Taranaki Regional Council on the monitoring programme associated with a resource consent held by Greymouth Petroleum Acquisition Company Limited [Greymouth]. The Company operates a landfarm situated at the end of Rifle Range Road at Hawera.

This report covers the results and findings of the monitoring programme implemented by the Council in respect of the consent held by Greymouth that relates to the discharge of drilling cuttings, drilling fluids and carbon filter sludge onto and into land. This is the ninth Annual Report to be prepared by the Taranaki Regional Council to cover Greymouth's 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 compliance monitoring under the Resource Management Act and the Council's obligations and general approach to monitoring sites through annual programmes, the resource consents held by Greymouth Petroleum, the nature of the monitoring programme in place for the period under review, and a description of the activities and operations conducted at Greymouth's landfarm site.

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

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

Section 4 presents recommendations to be implemented in the 2013-2014 monitoring year.

A glossary of common abbreviations and scientific terms, and a bibliography, are presented at the end of the report.

1.1.3 The Resource Management Act (1991) and monitoring

The Resource Management Act primarily addresses environmental `effects' which are defined as positive or adverse, temporary or permanent, past, present or future, or cumulative. Effects may arise in relation to:

(a) the neighbourhood or the wider community around a discharger, and may include cultural and socio-economic effects;
(b) physical effects on the locality, including landscape, amenity and visual effects;
(c) ecosystems, including effects on plants, animals, or habitats, whether aquatic or terrestrial;
(d) natural and physical resources having special significance (eg, recreational, cultural, or aesthetic);

(e) risks to the neighbourhood or environment.

In drafting and reviewing conditions on discharge permits, and in implementing monitoring programmes, the Taranaki Regional Council is recognising the comprehensive meaning of `effects' inasmuch as is appropriate for each discharge source. Monitoring programmes are not only based on existing permit conditions, but also on the obligations of the Resource Management Act to assess the effects of the exercise of consents. In accordance with section 35 of the Resource Management Act 1991, the Council undertakes compliance monitoring for consents and rules in regional plans; and maintains an overview of performance of resource users against regional plans and consents. Compliance monitoring, (covering both activity and impact) monitoring, also enables the Council to continuously assess its own performance in resource management as well as that of resource users particularly consent holders. It further enables the Council to continually re-evaluate its approach and that of consent holders to resource management, and, ultimately, through the refinement of methods, and considered responsible resource utilisation to move closer to achieving sustainable development of the region's resources.

1.1.4 Evaluation of environmental performance

Besides discussing the various details of the performance and extent of compliance by the consent holder(s) during the period under review, this report also assigns an overall rating. The categories used by the Council, and their interpretation, are as follows:

- a **high** level of environmental performance and compliance indicates that essentially there were no adverse environmental effects to be concerned about, and no, or inconsequential (such as data supplied after a deadline) non-compliance with conditions.

- a **good** level of environmental performance and compliance indicates that adverse environmental effects of activities during the monitoring period were negligible or minor at most, or, the Council did not record any verified unauthorised incidents involving significant environmental impacts and was not obliged to issue any abatement notices or infringement notices, or, there were perhaps some items noted on inspection notices for attention but these items were not urgent nor critical, and follow-up inspections showed they have been dealt with, and any inconsequential non compliances with conditions were resolved positively, co-operatively, and quickly.

- **improvement desirable (environmental)** or **improvement desirable (compliance)** (as appropriate) indicates that the Council may have been obliged to record a verified unauthorised incident involving measurable environmental impacts, and/or, there were measurable environmental effects arising from activities and intervention by Council staff was required and there were matters that required urgent intervention, took some time to resolve, or remained unresolved at end of the period under review, and/or, there were on-going issues around meeting resource consent conditions even in the absence of environmental effects. Abatement notices may have been issued.

- **poor performance (environmental)** or **poor performance (compliance)** indicates generally that the Council was obliged to record a verified unauthorised incident involving significant environmental impacts, or there were material failings to comply with resource consent conditions that required significant intervention by the Council even in the absence of environmental effects. Typically there were grounds for either a prosecution or an infringement notice.

For reference, in the 2012-2013 year, 35% of consent holders in Taranaki monitored through tailored compliance monitoring programmes achieved a high level of environmental performance and compliance with their consents, while another 59% demonstrated a good level of environmental performance and compliance with their consents.

1.2 Process description

Greymouth operates a drilling waste landfarm off Rifle Range Road, Hawera. The site is owned by Fonterra and serves as part of their research farm. The site location is given in Figure 1.

The coastal area consists largely of sand dunes subject to wind erosion and areas of poor grass growth. The site is in close proximity to Nowell Lakes, two coastal lakes that have regional significance and feed a seasonal stream running along the eastern site boundary. The primary Hawera sewage outfall pipeline also passes through the site.

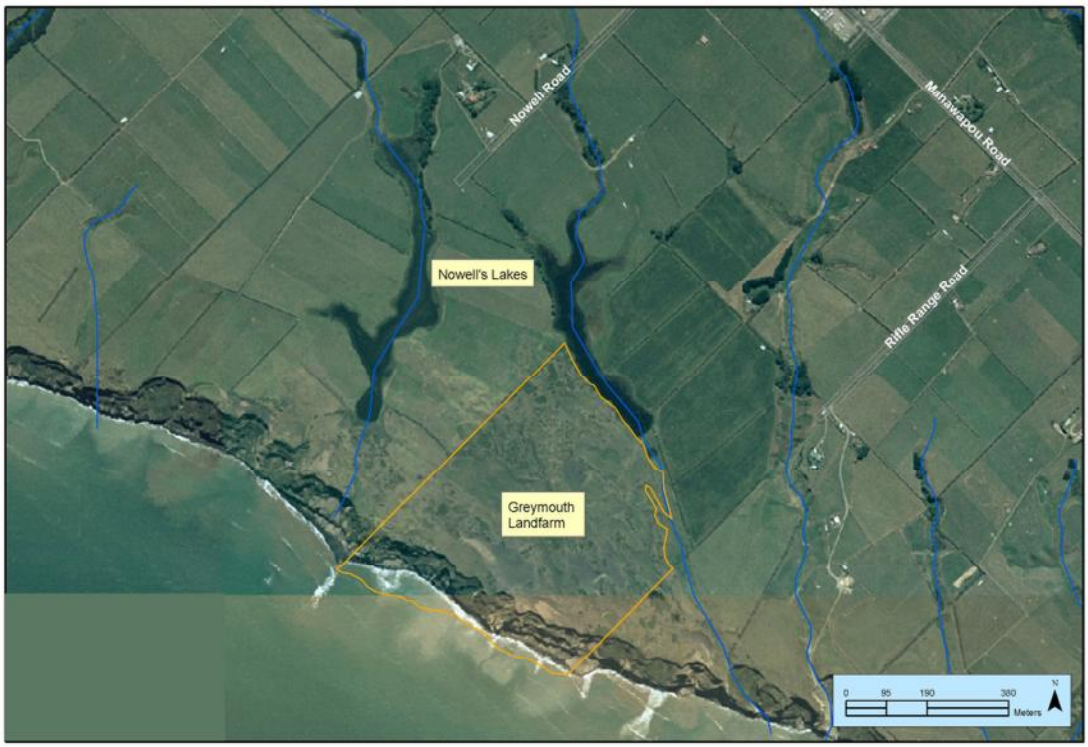

Figure 1 Aerial photograph of Greymouth landfarm site

Waste drilling material is produced during well drilling for hydrocarbon exploration. Various types of waste may be produced during drilling operations,

with different disposal options available depending on waste type. The most common wastes discharged to land are drilling fluids (mud) and rock cuttings. Drilling fluids transport cuttings from the drill bit to the well surface for disposal; control in-well pressures; support the sides of the hole and prevent the ingress of formation fluids; and lubricate and cool the drill bit and drill pipe in the hole.

Cuttings are produced as the drill bit penetrates the underlying geological formations. They are brought to the surface in the drilling fluid where they pass over a shaker screen that separates the cuttings and drilling fluids. The drilling fluids are recycled for reuse within the drilling process, but small quantities of drilling fluids remain adhered to the cuttings. The cuttings and smaller particle material from the drill fluid treatment units drain into sumps. If sumps cannot be constructed corrals or special bins are used. During drilling this material is the only continuous discharge. Drilling fluids may be intentionally discharged in bulk, for changes to the drilling fluid programme.

Oil and gas wells may be drilled with either synthetic based mud [SBM] or water based mud [WBM]. More than one type may be used to drill an individual well. In the past, oil based muds (diesel/crude oil based) have also been used. Their use has declined since the 1980s due to their ecotoxicity, they have been replaced by SBM. Barite clay is added to most drilling muds as a wetting and weighting agent.

The landfarming process has typically been used in the Taranaki region to assist the conversion of sandy coastal sites prone to erosion into productive pasture. Landfarming uses natural and assisted bioremediation to reduce the concentration of petroleum compounds through degradation. Basic steps in the landfarming process:

1. Drilling waste is transported from wellsites by truck (cuttings) or tanker (liquids). It may be discharged directly to land or placed in a dedicated storage pit.
2. The required area is prepared by scraping back and stockpiling existing pasture/topsoil and leveling out uneven ground.
3. Waste is transferred to the prepared area by excavator and truck and spread out with a bulldozer. Liquids may be discharged by tanker or a spray system.
4. Waste is allowed to dry sufficiently before being tilled into the soil to the required depth with a tractor and discs.
5. The disposal area is leveled with chains or harrows.
6. Stockpiled or brought in topsoil/clay is applied to aid stability and assist in grass establishment.
7. Fertiliser may be applied and the area is sown in crop or pasture at a suitable time of year.

When disposal is complete, the area will continue to be used for grazing following stabilisation by the permanent establishment of pasture.

1.3 Resource consent

1.3.1 Discharges of wastes to land

Sections 15(1)(b) and (d) of the Resource Management Act 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.

Greymouth holds discharge permit **6236-1** - To discharge drilling cuttings and fluids from hydrocarbon exploration drilling operations with water based muds, and drilling cuttings from hydrocarbon exploration drilling operations with synthetic based muds, and carbon filter sludge from Fonterra Kapuni, onto and into land via land farming. This permit was issued by the Taranaki Regional Council on 8 January 2004 under Section 87(e) of the Resource Management Act. The consent was varied on 4 April 2006, 8 December 2006, and 22 October 2009. It is due to expire on 1 June 2014.

Conditions 1 and 2 relate to exercise of the consent in accordance with the application and adoption of the best practicable option.

Conditions 3 to 7 are notification, monitoring and reporting requirements.

Conditions 8 to 15 are operational requirements.

Conditions 16 to 19 specify discharge limits and loading rates.

Conditions 20 to 27 specify receiving environment limits.

Conditions 28 and 29 are lapse and review conditions.

The permit is attached to this report in Appendix I.

1.4 Monitoring programme

1.4.1 Introduction

Section 35 of the Resource Management Act sets out obligation/s upon the Taranaki Regional Council to gather information, monitor, and conduct research on the exercise of resource consents, and the effects arising, within the Taranaki region and report upon these.

The Taranaki Regional 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 Greymouth landfarm site consisted of two primary components.

1.4.2 Programme liaison and management

There is generally a significant investment of time and resources by the Taranaki Regional Council in on-going liaison with resource consent holders over consent

conditions and their interpretation and application, in discussion over monitoring requirements, preparation for any reviews, renewals, or new consents, advice on the Council's environmental management strategies and the content of regional plans, and consultation on associated matters.

1.4.3 Site inspections

Greymouth Petroleum's Hawera site was visited twice during the monitoring period. Inspections focussed on assessing the integration of drilling muds and cuttings into the soil, pasture establishment, land stabilisation, any emissions of objectionable odours, and impact on surface water bodies present.

1.4.4 Chemical sampling

During the monitoring year two soil samples were taken from the area formerly used for storage and analysed for total petroleum hydrocarbons and the BTEX range of monocyclic aromatic hydrocarbons.

2. Results

2.1 Inspections

2 February 2013

The following was found to be occurring: No objectionable odours or visible emissions were found during the inspection. No recent disposal activities had occurred and all pits remained empty. Vegetation cover of exposed areas around Moturoa 6F and Goldie F wastes disposal areas remained patchy, however exposed sandy soil appeared stable. Nowell Lake showed no impacts from site activities.

2 May 2013

The following was found to be occurring: No objectionable odours or visible emissions were found during the inspection. No disposal activities have taken place in recent years. All pits remained free of drilling muds. There had been no changes in the level of vegetation cover between inspections with areas around Moturoa 6F disposal area remaining patchy. Other application areas had stable pasture cover. Nowell Lake was inspected and no effects from site activities were observed.

2.2 Receiving environment monitoring

Two composite soil samples were collected by sub-sampling to a depth of 250mm in landfarmed areas, and were sent to R J Hill Laboratories. The results of this sampling are presented in Table 1.

Table 1 Soil samples taken on 22 January 2013 at Greymouth Petroleum Hawera Landfarm.

Parameter	Unit	Pit 1	Pit 2	Guideline Value (soil)*
Total Petroleum Hydrocarbons	mg/100g	**4800**	<70	1620**
Benzene	g/m3	<0.05	<0.05	1.1
Ethylbenzene	g/m3	<0.05	<0.05	53
Toluene	g/m3	<0.05	<0.05	68
meta-Xylene	g/m3	<0.10	<0.10	48 (combined)
ortho-Xylene	g/m3	<0.05	0.05	

*Guideline for assessing soil acceptance criteria Table 4.12 for sand based soils.
**Value is a total provided from the Guideline for assessing soil acceptance criteria Table 4.15 for sand based soils.

The hydrocarbon concentration sampling results remain in excess of the consent surrender criteria at the base of former storage pit 1. These criteria do not currently apply to the site activities, as they come into effect at the time of surrender or lapse of the resource consent. The sample taken from storage pit 2 shows total hydrocarbons to be effectively at baseline levels. No BTEX compounds were detected in either the soil samples. The implications of the results for pit 1 are discussed further in section 3.2.

No surface water sample was taken from Nowell Lake. No activity had been occurring at the site, and previous results have indicated there was no effect of discharges to land on this body of water.

Further sampling requirements at the Greymouth Landfarm site are described in section 3.1 and in the recommendations section (section 4).

2.3 Investigations, interventions, and incidents

The monitoring programme for the year was based on what was considered to be an appropriate level of monitoring, review of data, and liaison with the consent holder. During the year matters may arise which require additional activity by the Council eg provision of advice and information, or investigation of potential or actual causes of non-compliance or failure to maintain good practices. A pro-active approach that in the first instance avoids issues occurring is favoured.

The Taranaki Regional Council operates and maintains a register of all complaints or reported and discovered excursions from acceptable limits and practices, including non-compliance with consents, which may damage the environment. The Unauthorised Incident Register (UIR) includes events where the company concerned has itself notified the Council. The register contains details of any investigation and corrective action taken.

Complaints may be alleged to be associated with a particular site. If there is potentially an issue of legal liability, the Council must be able to prove by investigation that the identified company is indeed the source of the incident (or that the allegation cannot be proven).

During the 2012-2013 monitoring period, it was not necessary for the Council to undertake significant additional investigations and interventions, or record incidents, in association with Greymouth Landform's conditions in resource consents or provisions in Regional Plans in relation to the Company's activities. This reflects the lack of recent activity at this site.

3. Discussion

3.1 Discussion of site performance

The site was not active during the monitoring year under review; there were no disposals of drilling waste, and it is unlikely the site will continue receiving drilling waste in the future.

All spreading areas sampled previously have been shown to be within surrender criteria for the parameters tested for. The areas which were previously used to house the storage pits were also sampled in the 2009-2010 monitoring year, and were found to be above surrender criteria for hydrocarbons. The hydrocarbon concentrations at these sites are expected to naturally reduce over time to within surrender criteria. It will be necessary to retest these areas in the 2013-2014 monitoring year, which is included in the recommendations section of this report, to inform any decision as to whether consent renewal and on-going site management is required.

The permanent establishment of pasture on parts of the site remains an issue. While not a breach of consent conditions, the permanent establishment of pasture is an expected outcome of landfarming activities. Greymouth's Site Management Plan states that an objective for the site is "to convert unstable sandy soils to productive pasture…", and the general actions section includes "the disposal area(s) shall be tilled and sown as soon as is practical following completion of the disposal, and re-worked as necessary thereafter to achieve the satisfactory establishment of pasture."

3.2 Environmental effects of exercise of consents

The monitoring, together with previous sampling of soils and surface waters, indicated that there were no on-going adverse environmental effects resulting from past discharges of drilling waste at the site. Aside from the areas where pasture establishment has struggled, there are no visual or odour indications remaining from the activity. Soil quality has been shown to be improving over time in the previous soil sample results, with the spreading areas now meeting consent surrender criteria, and having been successfully reinstated with pasture and grazed with no significant issues. The former storage area has yet to meet surrender criteria for hydrocarbon concentrations in the soil. These concentrations will likely reduce through bioremediation over time. However, in light of the impending expiry date, to assist this process, it is recommended that the consent holder reinstate the storage pit area. A recommendation to this effect is included in section 4.

Monitoring of the discharge from Nowell Lake in previous years has indicated that the landfarming operation is unlikely to be having an adverse effect on lake water quality. Previous sampling of the Nowell Lake has been used as an indicator of any potential effects on both ground and surface water from activities at the site, as it is a coastal lake with contributions from both surface and groundwater. Water samples taken previously have shown no effects of the landfarming activities, the site has not been used to dispose of any additional waste for several years, and the 25m buffer zone was maintained throughout previous operations at the site.

3.3 Evaluation of performance

A tabular summary of the consent holder's compliance record for the year under review is set out in Table 2.

Table 2 Summary of performance for Consent 6236-1 - Discharge of drilling waste

Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Comply with application documentation	Inspection, sampling and liaison with consent holder	Yes
2. Adoption of the best practicable option	Inspection, sampling and liaison with consent holder	Yes
3. Notify Council 48 hours prior to transfer of waste to disposal site	No disposals during monitoring period	N/A
4. Notify Council 12 hours prior to discharging stockpiled material onto or into land	No discharges during monitoring period	N/A
5. Notification of discovery of archaeological remains	Inspection/ notification	N/A
6. Provide chemical analysis of waste material for each at time of disposal	No disposals during monitoring period	N/A
7. Record all details, compositions, treatments and movements of waste and stockpiled material	No disposals during monitoring period	N/A
8. Keep areas for stockpiling and disposal of water based drilling wastes separate from synthetic mud based drilling waste. Keep stockpile and disposal areas for individual wells separate	No disposals during monitoring period	N/A
9. Disposal area corresponds with information supplied in application	Inspection	Yes
10. No discharge within 25 m of surface water	No discharges during monitoring period	N/A
11. No destabilisation of neighbouring land	Inspection	Yes
12. Consent applies only to wastes generated in Taranaki	No disposals during monitoring period	N/A
13. Disposal of all wastes must be incorporated into the soil as soon as practicable	No disposals during monitoring period	N/A
14. Discharge area shall be tilled and resown to pasture/crop as soon as possible after completion	No discharges during monitoring period	N/A
15. Maximum stockpiling volume of 1,000 m^3, discharge within two months of arrival on site	No stockpiling during monitoring period	N/A
16. Discharge depth limited to 150mm for waste with less than 5% hydrocarbons, or 50mm for waste with greater than 5% hydrocarbons	No discharges during monitoring period	N/A

Condition requirement	Means of monitoring during period under review	Compliance achieved?
17. If waste has greater than 5% hydrocarbons, incorporate waste into the soil so that the surface 250mm contains less than 5% hydrocarbons	No discharges during monitoring period	N/A
18. Chloride loading shall not exceed 800 kg/ha	No discharges during monitoring period	N/A
19. Nitrogen loading shall not exceed 200 kg/ha	No discharges during monitoring period	N/A
20. Conductivity must be less than 400 mSm^{-1}. If background soil has an conductivity greater than 400 mSm^{-1}, then conductivity after disposal shall not exceed original conductivity by more than 100 mSm^{-1}	No discharges during monitoring period	N/A
21. Sodium absorption ratio [SAR] must be less than 18.0.	No discharges during monitoring period	N/A
22. Levels of metals in soil must comply with guidelines	Analysis	Yes
23. Prior to expiry/cancellation/surrender, soil hydrocarbon content must comply with Ministry for the Environment guidelines	Analysis	N/A
24. Levels not to be exceeded in soil prior to expiry/cancellation/surrender a) conductivity, 290 mSm^{-1} b) dissolved salts, 2500 g/m^3 c) sodium, 460 g/m^3 d) chloride, 700 g/m3	Analysis	N/A
25. Total dissolved salts in surface or groundwater not to exceed 2500 g/m^3	Analysis	N/A
26. Disposal of waste shall not lead to contamination of any surface water	Inspection & analysis	Yes
27. Disposal of waste shall not result in any adverse effects on surface groundwater	Inspection & analysis	Yes
28. Consent lapses after 5 years unless exercised	Consent exercised	N/A
29. Optional review provision re environmental effects	No option for review prior to expiry in 2014	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		**Good**

N/A = not applicable

During the year, the Company demonstrated a good level of environmental performance and compliance with the resource consents. In previous monitoring reports it was suggested that the Company re-sow the areas where pasture establishment has been patchy. This work has yet to be completed. Additionally, in the receiving soil sampling results, the pit area samples are still showing hydrocarbon concentrations above eventual surrender criteria. It is recommended the Company consider remediating the pit area soils via landfarming.

3.4 Recommendations from the 2011-2012 Annual Report

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

1. THAT monitoring of consented activities at the Greymouth Hawera site in the 2012-2013 year is modified from monitoring conducted in 2011-2012. Composite soil sampling should continue but be focused on the former pit areas identified in section 3.1, to confirm whether hydrocarbon levels have reduced to within consent surrender criteria. Surface water sampling of the Nowell Lake has not shown any impacts of the activities at the site during the exercise of this consent. It is recommended that this surface water sampling be suspended.

This recommendation was implemented.

4. Recommendation

1. THAT the monitoring programme for consented activities at the Greymouth Petroleum Hawera Landfarm in the 2013-2014, remain unchanged from that for 2012-2013.

2. THAT the consent holder considers the reinstatement of the former pit area to ensure surrender criteria is met for hydrocarbons prior to the consent expiry date of 1 June 2014.

Glossary of common terms and abbreviations

The following abbreviations and terms are used within this report:

Biomonitoring	assessing the health of the environment using aquatic organisms
BOD	biochemical oxygen demand. A measure of the presence of degradable organic matter, taking into account the biological conversion of ammonia
bund	a wall around a tank to contain its contents in the case of a leak
DO	dissolved oxygen
DRP	dissolved reactive phosphorus
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
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
pH	a numerical system for measuring acidity in solutions, with 7 as neutral. Numbers lower than 7 are increasingly acidic and higher than 7 are increasingly alkaline. The scale is logarithmic i.e. a change of 1 represents a ten-fold change in strength. For example, a pH of 4 is ten times more acidic than a pH of 5
Physicochemical	measurement of both physical properties (e.g. temperature, clarity, density) and chemical determinants (e.g. metals and nutrients) to characterise the state of an environment
resource consent	refer Section 87 of the RMA. Resource consents include land use consents (refer Sections 9 and 13 of the RMA), coastal permits (Sections 12, 14 and 15), water permits (Section 14) and discharge permits (Section 15)
RMA	Resource Management Act 1991 and including all subsequent amendments
SAR	sodium absorption ratio
SS	suspended solids
SQMCI	semi quantitative macroinvertebrate community index;
Temp	temperature, measured in °C (degrees Celsius)
Turb	turbidity, expressed in NTU
UI	Unauthorised Incident

UIR	Unauthorised 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

*an abbreviation for a metal or other analyte may be followed by the letters 'As', to denote the amount of metal recoverable in acidic conditions. This is taken as indicating the total amount of metal that might be solubilised under extreme environmental conditions. The abbreviation may alternatively be followed by the letter 'D', denoting the amount of the metal present in dissolved form rather than in particulate or solid form.

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

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Appendix I

Resource consent held by Greymouth Petroleum Acquisition Company Ltd

Consent 6236-1

TARANAKI REGIONAL COUNCIL
CHIEF EXECUTIVE
PRIVATE BAG 713
47 CLOTEN ROAD
STRATFORD
NEW ZEALAND
PHONE: 06-765 7127
FAX: 06-765 5097
www.trc.govt.nz

Please quote our file number on all correspondence

Discharge Permit

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

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

Change To Conditions Date: 22 October 2009 [Granted: 8 January 2004]

Conditions of Consent

Consent Granted: To discharge drilling cuttings and fluids from hydrocarbon exploration drilling operations with water based muds, and drilling cuttings from hydrocarbon exploration drilling operations with synthetic based muds, and carbon filter sludge from Fonterra Kapuni, onto and into land via land farming at or about (NZTM) 1710710E-5613550N

Expiry Date: 1 June 2014

Review Date(s): June 2010

Site Location: Rifle Range Road, Hawera
[Property owner: Kiwi Co-operative Dairies Limited]

Legal Description: Lot 12 DP 2625 Hawera SD

Catchment: Unnamed catchment 19
Unnamed catchment 20

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

General conditions

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

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

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

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

Special conditions

1. The exercise of this consent shall be undertaken generally in accordance with the documentation submitted in support of applications 2726, 4147, 4447 and 6340. In particular, Drawing No. 929-31-0002 (Revision A) provided with application 6340, which shows the disposal area boundary. In the case of any contradiction between the documentation submitted in support of applications 2726, 4147, 4447 and 6340 and the conditions of this consent, the conditions of this consent shall prevail.

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

Notification, monitoring and reporting

3. The consent holder shall notify the Taranaki Regional Council in writing at least 48 hours prior to commencement per well of transfer of wastes from the hydrocarbon exploration wellsite, to the disposal property for discharge onto or into land via stockpiling, spreading, tilling, and/or layering. Notification shall include the consent number, a brief description of the activity consented and be emailed to worknotification@trc.govt.nz.

4. The consent holder shall notify the Taranaki Regional Council in writing at least 12 hours prior to discharging stockpiled material onto or into land [for the purpose of this condition 'discharging' means spreading, tilling or layering].

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

6. The consent holder shall provide the Chief Executive, Taranaki Regional Council, with a chemical analysis of a representative sample of the drilling wastes per well, including the results of leachate testing, within two weeks of the initial disposal of wastes per well, at the disposal site.

7. The consent holder shall keep records of the following:

   a) wastes from each individual well [including records of all additives used at the wellsite during the drilling process];
   b) stockpiling area[s];
   c) disposal area[s];
   d) composition of material [including concentrations of nitrogen, chloride and hydrocarbons];
   e) volumes of material stockpiled;
   f) volumes of material disposed;
   g) dates and times of commencement and completion of stockpiling and discharge events; and
   h) treatments applied;

   and shall make the records available to the Chief Executive, Taranaki Regional Council upon request.

Operational requirements

8. The consent holder shall ensure that areas used for the stockpiling and disposal of water based drilling wastes are kept separate and distinct from areas utilised for the stockpiling and disposal of cuttings from wells drilled with synthetic based muds. Stockpile and disposal areas for individual wells shall be kept separate and distinct. For the purpose of this condition 'disposal' means spreading, tilling or layering.

9. The area shown on Drawing No. 929-31-0003 Revision A [provided with application 6340] where "Future Disposal Area A" and "Area C" overlap, may receive one further disposal of drilling wastes only, after 1 November 2009.

10. No discharge [including but not limited to stockpiling on land and/or application onto or into land] shall take place within 25 metres of surface water [including the Tasman Sea and Nowell's Lakes].

11. The exercise of this consent shall not result in the destabilisation of neighbouring land.

12. The exercise of this consent is limited to wastes generated within the Taranaki region.

13. As soon as practicable following discharge of drill cutting from any well all wastes from that well shall be incorporated [whether by tillage or soakage] into the soil to meet the conditions of this consent.

14. The discharge area shall be tilled and resown to pasture [or into crop] as soon as practicable following completion of the discharge.

15. The stockpiling of material authorised by this consent shall be limited to a maximum volume of 1000 cubic metres at any one time on the property. In any case all stockpiled material must be discharged onto and into land within two months of being brought onto the site [for the purpose of this condition 'discharge' means spreading, tilling or layering].

Discharge limits and loading rates

16. The rate of discharge shall be limited to an application spread depth of 150 mm prior to the wastes being incorporated into soil for waste solids with hydrocarbon content less than 5%, or, if hydrocarbon content of waste solids is equal or greater than 5% the application spread depth shall be limited to 50 mm of waste solids prior to incorporation into soil.

17. The hydrocarbon content in the waste prior to discharge at the site shall be less than 5%, or if hydrocarbon level in the waste is equal or greater than 5% the waste shall be incorporated into the soil so that the hydrocarbon content in the soil/waste mix shall be less than 5% anywhere in the surface 250 mm of soil after mixing in accordance with special condition 13.

18. Following incorporation into the soil the discharge shall not result in a chloride loading exceeding 800 kg/ha.

19. Following incorporation into the soil the discharge shall not result in a nitrogen loading exceeding 200 kg /ha.

Receiving environment limits

20. The conductivity of the soil/waste layer after application shall be 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 within the upper 20 cm by more than 100 mSm-1.

21. The sodium absorption ratio [SAR] of the soil/waste layer after application shall be 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.

22. The levels of metals in the soil shall comply with the guidelines for heavy metals in soil set out in Table 7.1, Section 7 of the Ministry for the Environment and New Zealand Water & Wastes Assoication's Guidelines for the safe application of biosolids to land in New Zealand [2003].

23. Prior to the expiry, cancellation, or surrender of this consent the levels of hydrocarbons in the soil shall comply with the guideline values for sandy soil in the surface layer [less than 1 metre depth] 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].

24. Prior to the expiry, cancellation, or surrender of this consent soil levels shall not exceed the following limits: conductivity, 290 mS/m; total soluble salts, 2500 mg/kg; sodium, 460 mg/kg; and chloride, 700 mg/kg.

25. The exercise of this consent shall not result in a level of total dissolved salts within any surface or groundwater of more than 2500 gm-3.

26. The exercise of this consent, including the design, management and implementation of the discharge shall not lead or be liable to lead to contaminants entering a surface water body by direct surface overland flow.

27. The exercise of this consent shall not result in any adverse impacts on groundwater as a result of leaching, or on surface water including aquatic ecosystems, and/or result in a change to the suitability of use of the receiving water as determined by the Chief Executive, Taranaki Regional Council.

Lapse and review

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

29. 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 2005 and/or June 2006 and/or June 2010, 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 22 October 2009

For and on behalf of
Taranaki Regional Council

~~Director~~-Resource Management