

Bridge Petroleum Limited
Radnor 1(B) Wellsite (Exploration)
Monitoring Programme Report
Technical Report 2010–110

ISSN: 0114-8184 (Print)
ISSN: 1178-1467 (Online)
Document: 722166

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October 2011

Executive summary

During late 2009, Bridge Petroleum Limited re-entered a hydrocarbon exploration site located on Radnor Road, Midhurst, in the Patea catchment. The site is called Radnor 1B (previously Radnor 1A). The drilling operation took place from September 2009 to January 2010, with production testing undertaken during June 2010.

This report describes the monitoring programme implemented by the Taranaki Regional Council to assess the Company's environmental performance in relation to drilling operations at the Radnor 1B well site during the period under review, and the results and environmental effects of the Company's activities.

The Company holds a total of seven resource consents, for the activities relating to exploration at the Radnor 1B site, which include a total of 109 conditions setting out the requirements that the Company must satisfy. The Company holds consent 6393-1 to discharge to air from flaring of hydrocarbons associated with drill stem testing, clean up and production testing; consent 6394-1 to discharge emissions to air during flaring from well workovers and in emergency situations; consent 6395-1 to discharge treated stormwater and treated produced water; consent 6396-1 to discharge stormwater and sediment from earthworks during construction; consent 6397-1 to discharge drilling muds, drilling cuttings, and drilling wastes; consent 6398-1 to take groundwater during hydrocarbon exploration and production operations, and consent 6399-1 to take water from the Piakau Stream.

The Council's monitoring programme for the year under review included seven inspections of the site and surrounding environment, and auditing of information held by the Company. No water samples were collected for physicochemical analysis, as no discharges were observed.

The Company has undertaken a planting regime around the site to shield the site from passing traffic.

The monitoring showed that the site was neat and tidy at all inspections. Ringdrains, skimmer pits and bunds were all secure. The flare pit was well situated to minimise offsite effects. The site was well managed and staff undertook to carry out improvements where necessary. Drilling fluids and cuttings were disposed of off-site by a contractor to a licensed land disposal area at Remediation NZ in the Uruti valley composting facility.

Flaring was carried out on-site during exploration and production testing activities.

The Company demonstrated a high level of environmental performance and compliance with the resource consents.

There was one complaint received relating to operations at the Radnor 1B site. The complaint was found to be unsubstantiated.

This report includes recommendations should any future operations be carried out at the site.

Production testing was undertaken during June 2010. Further exploration and testing is likely to take place.

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1. Introduction

1.1 Compliance monitoring programme reports and the Resource Management Act 1991

1.1.1 Introduction

This report covers the period from September 2009 to October 2010 by the Taranaki Regional Council for monitoring associated with resource consents held by Bridge Petroleum Limited. The Company operates a wellsite situated on Radnor Road at Midhurst, in the Patea catchment.

This report covers the results and findings of the monitoring programme implemented by the Council in respect of the consents held by Bridge Petroleum that relate to abstractions and discharges of water within the Patea catchment, and the air discharge permits held by Bridge Petroleum to cover emissions to air from the site.

One of the intents of the Resource Management Act (1991) is that environmental management should be integrated across all media, so that a consent holder's use of water, air, and land should be considered from a single comprehensive environmental perspective. Accordingly, the Taranaki Regional Council generally implements integrated environmental monitoring programmes and reports the results of the programmes jointly. This report discusses the environmental effects of Bridge Petroleum's use of water, land, and air and is the second report for the Radnor site.

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 Bridge Petroleum 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 Radnor 1B 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 during any future monitoring.

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 (e.g. 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 Bridge Petroleum in the Patea catchment 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 trivial (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 year were negligible or minor at most, items of concern were resolved positively, co-operatively, and quickly, the Council did not record any verified unauthorised incidents involving significant environmental impacts and was not obliged to issue any abatement notices, 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.
- **improvement desirable** indicates that the Council may have been obliged to record against the consent holder a verified unauthorised incident involving

significant environmental impacts, and/or abatement notices may have been issued; there were adverse 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.

- **poor** performance is used when there were grounds for prosecution or infringement notice.

1.2 Process description

The Radnor 1B wellsite is located on the same site as Radnor B (and 1A) which were drilled several years ago. The site is located approximately 1km south of the small settlement of Midhurst. The site is accessed off Radnor Road. The surrounding land is flat to undulating farmland, with the predominant land use being dairy farming.



Figure 1 Approximate location of Radnor 1B Wellsite and proximity to Stratford and Midhurst

1.3 Resource consents

1.3.1 Background

Bridge Petroleum Limited holds seven resource consents related to exploration activities at the Radnor 1B well site. All of the consents were granted on 10 June 2004 (variations to several consents have been granted since 2004). The consent applications were processed on a non-notified basis as Bridge Petroleum had obtained the landowner's approval as an affected party, and the Council was satisfied that the environmental effects of the activity would be minor.

Copies of the consents and the Council reports describing the associated activities are contained in Appendix I to this report.

Site construction was permitted under Rule 25 of the Regional Fresh Water Plan for Taranaki.

1.3.2 Water abstraction permit

Section 14 of the Resource Management Act 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.

Bridge Petroleum Limited holds water permit **6398-1** to take groundwater during hydrocarbon exploration and production operations from up to six wells at the Radnor 1B wellsite. This permit was issued by the Taranaki Regional Council on 10 June 2004 under Section 87(d) of the Resource Management Act. It is due to expire on 1 June 2022.

There are five special conditions attached to this consent.

Condition 1 requires the consent holder to adopt the best practicable option to reduce potential effects.

Condition 2 requires the consent holder to provide information on depth of freshwater/saltwater interface.

Condition 3 requires consent holder to maintain abstraction records.

Condition 4 relates to consent lapse.

Condition 5 allows the Council to review, amend, delete or add to consent conditions.

Bridge Petroleum Limited holds water permit **6399-1** to take water from the Piakau Stream for hydrocarbon exploration purposes. This permit was issued by the Taranaki Regional Council on 10 June 2004 under Section 87(d) of the Resource Management Act. It is due to expire on 1 June 2022.

There are nine special conditions attached to this consent.

Condition 1 requires consent holder to adopt the best practicable option to reduce potential effects.

Condition 2 requires the consent holder to notify the Council prior to any abstraction.

Condition 3 states the abstraction rate limits.

Condition 4 states that abstraction shall cease when flow drops below specified limit.

Condition 5 requires the consent holder to maintain abstraction records.

Condition 6 requires exercise of consent to be in accordance with documentation submitted.

Condition 7 requires the consent holder to ensure the intake structure is properly screened.

Condition 8 relates to consent lapse.

Condition 9 allows the Council to review, amend, delete or add to the conditions of the consent.

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

1.3.3 Water discharge permit (treated stormwater)

Section 15(1)(a) of the Resource Management Act 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.

Bridge Petroleum Limited holds water discharge permit **6395-1** to cover the discharge of treated stormwater and treated produced water. This permit was issued by the Taranaki Regional Council on 10 June 2004 under Section 87(e) of the Resource Management Act. It is due to expire on 1 June 2022.

There are 13 special conditions attached to this consent.

Condition 1 requires the consent holder to adopt the best practicable option.

Condition 2 states the maximum stormwater catchment area.

Condition 3 requires the consent holder to notify the Council prior to works commencing.

Condition 4 relates to contingency planning.

Condition 5 relates to stormwater treatment.

Condition 6 relates to stormwater treatment systems.

Condition 7 relates to hazardous substance storage.

Condition 8 relates to concentration limits.

Conditions 9 and 10 relate to effects in the discharge mixing zone.

Condition 11 relates to site reinstatement.

Condition 12 relates to consent lapse.

Condition 13 allows the Council to review, amend, delete or add to the conditions of the consent.

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

1.3.4 Water discharge permit (stormwater and sediment –construction)

Section 15(1)(a) of the Resource Management Act 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.

Bridge Petroleum Limited holds water discharge permit **6396-1** to cover the discharge of stormwater and sediment from earthworks during construction of the Radnor 1B site. This permit was issued by the Taranaki Regional Council on 10 June 2004 under Section 87(e) of the Resource Management Act. It is due to expire on 1 June 2022.

There are seven special conditions attached to this consent.

Condition 1 requires the consent holder to adopt the best practicable option.

Condition 2 requires the consent holder to notify the Council prior to access works commencing.

Condition 3 relates to mixing zone effects.

Condition 4 requires the earthworks and control of stormwater to be in accordance with information submitted.

Condition 5 requires all earthworks areas to be stabilised vegetatively following soil disturbance activities.

Condition 6 relates to consent lapse.

Condition 7 allows the Council to review, amend, delete, or add to consent conditions.

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

1.3.5 Air discharge permit

Section 15(1)(c) of the Resource Management Act 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.

Bridge Petroleum Limited holds air discharge permit **6393-1** to cover the discharge of emissions to air from flaring of hydrocarbons and miscellaneous emissions associated with drill stem testing, well clean up, initial well testing, and production testing. This permit was issued by the Taranaki Regional Council on 10 June 2004 (change to conditions 13 April 2005) under Section 87(e) of the Resource Management Act. It is due to expire on 1 June 2022.

There are 24 special conditions attached to this consent.

Condition 1 limits the duration the consent can be exercised.

Condition 2 requires the consent holder to provide Council with a site layout plan.

Condition 3 requires the Council to be notified prior to flaring.

Condition 4 requires the consent holder to notify residents prior to flaring.

Condition 5 states there shall be no alteration to plant or equipment without prior consultation.

Condition 6 requires the consent holder to have regard for predicted and prevailing wind when flaring.

Condition 7 requires all gas flared to be treated.

Condition 8 relates to separation failure.

Condition 9 requires no liquid or solid hydrocarbons be flared.

Condition 10 requires separated gas to be combusted to minimise smoke emissions.

Condition 11 requires the consent holder to adopt best practicable option.

Condition 12 states conditions for combusting substances within flare pit.

Condition 13 relates to discharge of contaminants.

Condition 14 relates to smoke and odour discharges from the site.

Condition 15 relates to opacity of smoke emissions.

Condition 16 relates to emissions of carbon monoxide.

Condition 17 relates to emissions of nitrogen oxides.

Condition 18 relates to emissions of other contaminants to the atmosphere.

Condition 19 requires the consent holder to keep a record of gas and crude oil stream from the field.

Condition 20 requires the consent holder to keep records of all smoke emitting incidents.

Condition 21 requires the consent holder to keep logs of all flaring.

Condition 22 requires the consent holder to provide the Council with efficiency measures report.

Condition 23 relates to consent lapse.

Condition 24 allows the Council to amend, review, delete or add to the conditions of the consent.

Bridge Petroleum Limited holds air discharge permit **6394-1** to cover the discharge of emissions to air during flaring from well workovers, in emergency situations, from a permanent pilot flame and other miscellaneous emission. This permit was issued by the Taranaki Regional Council on 10 June 2004 (change to conditions 31 July 2006) under Section 87(e) of the Resource Management Act. It is due to expire on 1 June 2022.

There are 24 special conditions attached to this consent.

Condition 1 requires the consent holder to notify the Council prior to production operations.

Condition 2 requires the consent holder to notify residents of flaring.

Condition 3 requires the consent holder to notify Council of flaring.

Condition 4 states there are to be no alterations to plant or equipment.

Condition 5 requires consent holder to have regard for predicted and prevailing wind conditions.

Condition 6 requires all gas to be treated prior to flaring.

Condition 7 relates to separation failure.

Condition 8 states there is to be no liquid or solid hydrocarbons combusted through gas flare.

Condition 9 requires all gas to be treated prior to flaring.

Condition 10 requires the consent holder to adopt the best practicable option.

Condition 11 relates to discharge of contaminants.

Condition 12 relates to discharge of offensive odour or smoke.

Condition 13 requires vapour recovery systems to be fitted to all hydrocarbon storage vessels.

Condition 14 relates to opacity of smoke emissions.

Condition 15 relates to emissions of carbon monoxide.

Condition 16 relates to emissions of nitrogen oxide.

Condition 17 relates to emissions of other contaminants.

Condition 18 requires the consent holder to keep records of all smoke emitting incidents.

Condition 19 requires the consent holder to keep log of all flaring.

Condition 20 requires the consent holder to supply Council with a copy of flaring information.

Condition 21 requires the consent holder to provide the Council with efficiency report.

Condition 22 requires the consent holder to keep record of gas and crude oil stream.

Condition 23 relates to consent lapse.

Condition 24 allows the Council to amend, review, delete or add to the conditions of consent.

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

1.3.6 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.

Bridge Petroleum Limited holds discharge permit **6397-1** to cover the discharge of drilling muds, drilling cuttings, and drilling waste. This permit was issued by the Taranaki Regional Council on 10 June 2004 under Section 87(e) of the Resource Management Act. It is due to expire on 1 June 2022.

There are 27 special conditions associated with this consent.

Condition 1 allows discharge of up to 9000m³ of drilling waste.

Condition 2 requires the consent holder to supply a report detailing each mix-bury-cover site.

Condition 3 requires the consent holder to ensure the discharge is carried out in accordance with submitted information.

Condition 4 requires the consent holder to notify Council prior to discharge.

Condition 5 requires the consent holder to keep records of material discharged.

Condition 6 requires the mix-bury-cover zone to be 30 metres from water.

Condition 7 requires all water to be removed from drilling waste receptacle prior to recovery/mixing operation.

Condition 8 states that impermeable liner is to be perforated if used for disposal area.

Condition 9 requires the drilling waste to be incorporated with uncontaminated soil.

Condition 10 requires the placement of solid drilling waste to be above the watertable.

Condition 11 relates to total loadings of trace elements.

Condition 12 relates to total loading for chloride.

Condition 13 relates to total loading for nitrogen.

Condition 14 relates to limit for hydrocarbon content.

Condition 15 states the limit for total dissolved salts.

Condition 16 requires the disposal of solid drilling waste to comply with the heavy metal receiving environment concentration limits.

Condition 17 requires drilling waste mix to be covered by at least 0.5 metres of uncontaminated soil.

Condition 18 requires the consent holder to compact and contour the cover material.

Condition 19 requires the consent holder to adopt the best practicable option to prevent or minimised any effects.

Condition 20 states that exercise of consent shall not lead to direct discharge to water.

Condition 21 states that exercise of consent shall not have adverse effects on groundwater.

Condition 22 states that hydrocarbon levels in soil shall comply with guideline limits for soil type.

Condition 23 states limits for conductivity, total dissolved salts, sodium, and chloride.

Condition 24 states that the consent holder can apply to Council to change or cancel any conditions.

Condition 25 states that the Council may review any conditions of the consent.

Condition 26 relates to consent lapse.

Condition 27 allows the Council to amend, review, delete, or add to conditions of consent.

A copy of 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 obligations 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 on 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 Bridge Petroleum site consisted of three 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 ongoing 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

The Radnor 1B site was visited ten times during the monitoring period. With regard to consents for the abstraction of or discharge to water, the main points of interest were plant processes with potential or actual discharges to receiving watercourses, including contaminated stormwater and process wastewaters. Air inspections focused on plant processes with associated actual and potential emission sources and characteristics, including potential odour, dust, noxious or offensive emissions. Sources of data being collected by the consent holder were identified and accessed, so that performance in respect of operation, internal monitoring, and supervision could be reviewed by the Council. The neighbourhood was surveyed for environmental effects.



Photograph 1 Radnor 1B wellsite (October 2009)

1.4.4 Chemical sampling

The Taranaki Regional Council did not undertake sampling of the discharge from the site or the water quality upstream and downstream of the discharge point and mixing zone as no discharges from the site were observed during compliance monitoring inspections.

1.4.5 Solid wastes

During exploration activities on the site, drill cuttings were removed from the site by a contractor and disposed of to the licensed disposal area at the Uruti valley composting facility.

1.4.6 Air quality monitoring

Air quality monitoring is usually carried out in association with the well clean-up phase, where flaring can cause smoke emissions, as well as observing any miscellaneous emissions. Special conditions relating to the air discharge permit were complied with, relating to the location of the site and flare pit and distance to the nearest residence. These conditions and provision of specialist separation equipment ensure that no effects occur.

Flaring was undertaken at the Radnor 1B wellsite.

2. Results

2.1 Water

2.1.1 Inspections

Inspections paid special attention to the ring drains, mud sumps, treatment by skimmer pits and the final discharge point from the skimmer pit on to land and then into water. At each visit to the site, an inspection was also made of the water take to ensure that the Council's conditions for abstraction as a permitted activity were adhered to.



Photograph 2 Radnor 1B Rig

During each inspection the following were checked and noted:

- weather;
- flow rate of surface waters in the general vicinity;
- flow rate of water take;
- whether pumping of water was occurring;
- general tidiness of site;
- ring drains;
- hazardous substance bunds;
- treatment by skimmerpits;
- drilling muds;
- drill cuttings;
- mud pit capacity and quantity contained in pit;
- sewage treatment and disposal;

- cementing waste disposal;
- surface works;
- whether flaring was in progress, and if there was a potential for flaring, whether the Council had been advised;
- discharges and surface waters in the vicinity for effects on colour and clarity, aquatic life and odour;
- site records; and
- general observations.

Inspections of the wellsite were undertaken on the following dates (main points noted during each visit are also indicated):

30 September 2009

The site inspection was carried out following prolonged and extensive rainfall. Drilling was underway, ancillary equipment had been laid out in an orderly way. The bunds and ringdrains were neat and tidy. There was some light hydraulic oil that had leaked from a snap lock coupling onto the site, but it had been contained and was being cleaned up. The skimmer pits were being used as a water source for drill mud mixing. The sewage area had been monitored regularly to prevent overflow. The site was neat and tidy and well managed. Some light oil had been contained within the skimmer pits and was being pumped out.

2 October 2009

At the time of inspection the site was neat and tidy. A minor leak from the previous inspection had been cleaned up; additional contingencies (sorbent pads and an additional secondary skimmer pit in the ring drain) have been put in place to further safeguard the skimmer pits. Water had been recycled from skimmer pits for use in mud mixes. The ringdrains and bunds were secure. The flare pit was well sited to prevent or minimise any off-site effects. The site was well managed.

9 October 2009

Drilling ahead at the time of inspection. The site was neat and tidy. The bunds and ringdrains were all secure. All bulk fuel and lubricating oils were contained within a bund. No flaring had occurred, but the flare pit had been cleaned up of residual sludge. Water from skimmer pits was used in the mud mixers. The sewage collection area was regularly monitored and sewage pumped out and removed (it was disposed of to an approved facility) as and when required. The site was neat and tidy. Improvements, when required, were carried out promptly.

21 October 2009

Drilling ahead and well was approaching target depth. The site was neat and tidy. The final skimmer pit was clear of hydrocarbons but there was silty water in the south eastern skimmer pit. The secondary/additional skimmer pit is to have the sorbent pads replaced. The stockpiled drill cuttings that were awaiting removal may be the cause of skimmer pit contamination. No flaring is anticipated at this stage.

3 November 2009

Drilling was nearly complete. The site was neat and tidy. All skimmer pits and ringdrains were secure and clear of any contaminants. It was likely that some flaring will occur through the testing phase, which is to begin shortly.

7 November 2009

All drilling equipment moved to the Waimanu wellsite at New Plymouth. There was still some ancillary gear to be moved. The site was left neat and tidy. There was no stormwater discharge from the site.

13 January 2010

The site was unmanned and non-operational. A full skip bin on-site needed to be removed.

2 June 2010

The production testing phase was underway. Coil tubing was being used to assess the potential viability of the well. All site ringdrains and bunds were secure. There was no discharge of stormwater from site. Notification was received of the intention to flare during the production testing process, but no flaring was occurring at the time of inspection. The eastern flare pit contained drilling fluids and muds and was to be cleaned up as discussed with Tom Crowley (Company Man, Tiger Drilling).

31 August 2010

At the time of inspection no processing was being undertaken on the site. All stormwater was directed for treatment through skimmer pits and there were no effects of this discharge on the adjacent tributary of the Piakau Stream. No flaring had been undertaken for some time.

19 October 2010

At the time of inspection the site was not operational. All stormwater was directed through skimmer pits prior to discharge and no effects were noted.

2.1.2 Results of abstraction and discharge monitoring

No abstraction or discharge monitoring was undertaken by the Council during the period under review. No sampling was undertaken as no discharge was observed from the site during inspections.

2.2 Air**2.2.1 Inspections**

Compliance monitoring inspections at the site found that there were no objectionable or offensive odours, smoke or dust being discharged from the site on any occasion.

2.2.2 Results of discharge monitoring

No air discharge monitoring was undertaken at the Radnor B wellsite. No discharge to air was observed during compliance monitoring inspections.

2.2.3 Results of receiving environment monitoring

No receiving environment monitoring was carried out; no discharges to air were observed.

2.2.3.1 Other ambient monitoring

No other ambient monitoring was undertaken, as the controls implemented by Bridge Petroleum Limited did not give rise to any concerns in regard to air quality.

2.3 Land

2.3.1 Land status

The site has not been reinstated. All drilling equipment had been removed and production facilities were on-site.

2.4 Contingency plan

An updated contingency plan was received, reviewed and approved prior to commencement of drilling. It was received on 21 September 2009.

2.5 Register of incidents

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.

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

In the period under review, there was one complaint received by the Council associated with operations at the Radnor 1B wellsite. A complaint regarding the disposal of drilling muds was received. The complaint was unsubstantiated.

3. Discussion

3.1 Discussion of plant performance

Bridge Petroleum Limited provided the following plans and information in compliance with the consents:

- contingency plan for accidental spillage or discharge;
- site layout plan; and
- notification of the various stages of activity.

A report detailing air emissions and measures to reduce emissions as required by condition 20 of resource consent 6394-1 was received. Careful management on-site ensured that no effects to the environment occurred. All staff co-operated and if any minor works were requested, it was promptly carried out.

3.2 Environmental effects of exercise of consents

All stormwater was directed to the well constructed skimmer pits where any contaminants were separated before discharge. Extra sorbent pads were placed in the ring drains to reduce silt deposition in the skimmer pits. An additional skimmer pit was constructed within the ringdrain to safeguard skimmer pits following a leak of light hydraulic oil.

There were no environmental effects to water as a result of the drilling. No discharges were observed from the skimmer pits.

The nearest residence was approximately 350 metres away over flat land. Bunding and earthworks around the site helped prevent any visual off-site effects and/or noise problems for neighbours.

One complaint was received during the exercise of these consents; investigation found the complaint was unsubstantiated.

Consent 6397-1 for disposal of drilling muds was not exercised, all drilling waste was disposed of offsite to the licensed composting facility at Uruti.

3.3 Evaluation of performance

A tabular summary of the Company's compliance record for the year under review is set out in Tables 1-6. There is no table for consent 6397-1 discharge of drilling muds as the consent was not exercised. All drilling waste was disposed of to the Uruti composting facility.

Table 1 Summary of performance for Consent 6393-1 to discharge emissions to air from flaring

Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Duration of exercise of consent	Inspections of site and records	Yes
2. Final site layout plan	Plan received	Yes
3. Notify Council prior to flaring	Notifications received	Yes

Condition requirement	Means of monitoring during period under review	Compliance achieved?
4. Notify residents prior to flaring	Undertook to notify	Yes
5. No alteration to plant or equipment	Inspections of site	Yes
6. Regard for prevailing and predicted wind	Inspections of site and records	Yes
7. Treat gas prior to flaring	Inspections of records	Yes
8. Separation failure	N/A	N/A
9. No liquid or solid hydrocarbons flared	Inspections of records, complaints,	Yes
10. Combust separated gas as soon as practicable	Inspections of records	Yes
11. Adopt best practicable option	Inspections of site and records	Yes
12. Substances to be combusted in flare pit	Inspections of site and records	Yes
13. No discharge of contaminants likely to be toxic or noxious at the boundary	Inspections of records, complaints, etc	Yes
14. No offensive smoke or odour beyond boundary	Inspections of site, records, complaints	Yes
15. Opacity of smoke emissions	Inspections of site, records, and complaints	Yes
16. Control emissions of carbon monoxide	Inspections of site and records	Yes
17. Control of emissions of nitrogen oxides	Inspections of site and records	Yes
18. Control other emissions to the atmosphere	Inspections of site and records	Yes
19. Analysis of typical gas and crude oil stream	Inspections of records	Yes
20. Record of all smoke emitting incidents	Inspections of records	Yes
21. Log of all flaring	Inspections of records	Yes
22. Emissions and efficiency report to Council	Report received	Yes
23. Consent lapse	N/A	N/A
24. Review, amend, delete or add to conditions	N/A	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		High

N/A = not applicable

Table 2 Summary of performance for Consent 6394-1 discharge emissions to air

Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Notify Council prior to production testing	Notification received	Yes
2. Notify residents of flaring	Undertook to notify	Yes
3. Notify Council of flaring	Notifications received	Yes
4. No alteration to plant or equipment without consultation	Inspections of site and records – no alteration	Yes
5. Regard for predicted and prevailing wind conditions	Inspections of site and records	Yes
6. Separation prior to flaring	Inspections of records	Yes
7. Separation failure	N/A	N/A
8. No liquid or solid hydrocarbons to be flared	Inspections of records	Yes
9. Substances to be flared	Inspections of records	Yes
10. Adopt best practicable option	Inspections of site and records	Yes
11. No discharge of contaminants likely to be toxic or noxious at boundary	Inspections of site and records	Yes
12. No offensive smoke or odour beyond boundary	Inspections of records	Yes
13. Vapour recovery system	Inspections of site and records	Yes
14. Opacity of smoke emissions	Inspections of site and records	Yes
15. Control emissions of carbon monoxide	Inspections of records	Yes
16. Control emissions of nitrogen oxides	Inspections of records	Yes
17. Control emission of all other contaminants	Inspections of records	Yes
18. Record of all smoke emitting incidents	Inspections of records and site	Yes
19. Log of all flaring	Inspections of records	Yes
20. Flaring information	Report received	Yes
21. Efficiency and emission report	Received	Yes
22. Analysis of typical gas and crude oil	Inspections of records	Yes
23. Consent lapse	N/A	N/A
24. Review, amend, delete, or add to conditions	N/A	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		High

Table 3 Summary of performance for Consent 6395-1 to discharge treated stormwater and treated produced water

Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Adopt best practicable option	Inspections of site and records	Yes
2. Maximum stormwater catchment area	Inspections of site	Yes
3. Advise Council prior to any works commencing	Inspections of site and records	Yes
4. Contingency planning	Received	Yes
5. Stormwater to be treated prior to discharge	Inspections of site	Yes
6. Design, management and maintenance of stormwater system	Inspections of site	Yes
7. Hazardous substance storage	Inspections of site	Yes
8. Concentration limits in the discharge	No discharge observed	N/A
9. Discharge effects	Inspections – no discharge observed	N/A
10. Discharge effects	Inspections – no discharge observed	N/A
11. Site reinstatement	Inspections - site not yet reinstated	N/A
12. Consent lapse	N/A	N/A
13. Review, amend, delete or add to conditions	N/A	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		High

Table 4 Summary of performance for Consent 6396-1 to discharge stormwater and sediment from earthworks during construction

Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Adopt best practicable option	Inspections of site and records	Yes
2. Advise Council prior to undertaking works	Notifications received	Yes
3. Discharge effects	Inspections of site and records – sampling (not required)	Yes
4. Design and management of earthworks	Inspections of records and site	Yes
5. Stabilise earthworks areas	Inspections of site	Yes
6. Consent lapse	N/A	N/A
7. Review, amend, delete or add to conditions	N/A	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		High

Table 5 Summary of performance for Consent 6398-1 to take groundwater during hydrocarbon exploration and production operations

Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Adopt best practicable option	Inspections of records and site	Yes
2. Provide Council with information on freshwater and saline interface	Records not received	No*
3. Maintain abstraction records	Inspections of records	Yes
4. Consent lapse	N/A	N/A
5. Review, amend, delete or add to conditions	N/A	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		Good

*breach due to previous consent holder failing to provide information within one month of exercise of the consent

Table 6 Summary of performance for Consent 6399-1 to take water from the Piakau Stream for hydrocarbon exploration purposes

Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Adopt best practicable option	Inspections of records and site	Yes
2. Notify Council prior to abstractions	Notification received	Yes
3. Abstraction limits	Inspections of records	Yes
4. Abstraction ceases when flow is less than 45 l/s	Inspections of records	Yes
5. Maintain abstraction records	Inspections of records	Yes
6. Exercise of consent to be in accordance with information submitted	Inspections of site and records	Yes
7. Intake structure must be properly screened	Inspections of site	Yes
8. Consent lapse	N/A	N/A
9. Review, amend, delete, or add to conditions	N/A	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		High

During the year, the Company demonstrated a high level of environmental performance and compliance with the resource consents. During the year under review there was one unsubstantiated complaint received and recorded by the Council in relation to operations at the Radnor 1B wellsite. The site was well managed and generally neat and tidy at compliance monitoring inspections. The bunds, ringdrains, and skimmer pits were well constructed. Any requests to undertake maintenance or cleanups were carried out. A minor spill of light hydraulic oil was contained and cleaned up; following this additional sorbent pads etc were

placed to safeguard skimmer pits. The Company has undertaken a planting regime around the site to shield the site from passing traffic.

4. Recommendations

1. THAT the current level of monitoring undertaken during exploratory drilling be continued for any future operations at the site; and
2. THAT this report be forwarded to the Company, and to any interested parties upon request; and
3. THAT the Company be asked to inform the Council of the intention to either drill, test or undertake reinstatement.

Glossary of common terms and abbreviations

The following abbreviations and terms may have been used within this report:

Al*	aluminium
As*	arsenic
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 to nitrate
BODF	biochemical oxygen demand of a filtered sample
bund	a wall around a tank to contain its contents in the case of a leak
CBOD	carbonaceous biochemical oxygen demand. A measure of the presence of degradable organic matter, excluding the biological conversion of ammonia to nitrate
cfu	colony forming units. A measure of the concentration of bacteria usually expressed as per 100 millilitre sample
COD	chemical oxygen demand. A measure of the oxygen required to oxidise all matter in a sample by chemical reaction
Condy	conductivity, an indication of the level of dissolved salts in a sample, usually measured at 20°C and expressed in mS/m
Cu*	copper
Cumec	A volumetric measure of flow- 1 cubic metre per second (1 m ³ s ⁻¹)
DO	dissolved oxygen
DRP	dissolved reactive phosphorus
<i>E.coli</i>	<i>escherichia coli</i> , an indicator of the possible presence of faecal material and pathological micro-organisms. Usually expressed as colony forming units per 100 millilitre sample
Ent	enterococci, an indicator of the possible presence of faecal material and pathological micro-organisms. Usually expressed as colony forming units per 100 millilitre of sample
F	fluoride
FC	faecal coliforms, an indicator of the possible presence of faecal material and pathological micro-organisms. Usually expressed as colony forming units per 100 millilitre sample
fresh	elevated flow in a stream, such as after heavy rainfall
g/m ³	grams per cubic metre, and equivalent to milligrams per litre (mg/L). In water, this is also equivalent to parts per million (ppm), but the same does not apply to gaseous mixtures
l/s	litres per second
MCI	macroinvertebrate community index; a numerical indication of the state of biological life in a stream that takes into account the sensitivity of the taxa present to organic pollution in stony habitats
mS/m	millisiemens per metre
mixing zone	the zone below a discharge point where the discharge is not fully mixed with the receiving environment. For a stream, conventionally taken as a length equivalent to 7 times the width of the stream at the discharge point
NH ₄	ammonium, normally expressed in terms of the mass of nitrogen (N)

NH ₃	unionised ammonia, normally expressed in terms of the mass of nitrogen (N)
NO ₃	nitrate, normally expressed in terms of the mass of nitrogen (N)
NTU	Nephelometric Turbidity Unit, a measure of the turbidity of water
O&G	oil and grease, defined as anything that will dissolve into a particular organic solvent (e.g. hexane). May include both animal material (fats) and mineral matter (hydrocarbons)
Pb*	lead
pH	a numerical system for measuring acidity in solutions, with 7 as neutral. Numbers lower than 7 are increasingly acidic and higher than 7 are increasingly alkaline. The scale is logarithmic i.e. a change of 1 represents a ten-fold change in strength. For example, a pH of 4 is ten times more acidic than a pH of 5
Physicochemical	measurement of both physical properties (e.g. temperature, clarity, density) and chemical determinants (e.g. metals and nutrients) to characterise the state of an environment
PM ₁₀	relatively fine airborne particles (less than 10 micrometre diameter)
resource consent	refer Section 87 of the RMA. Resource consents include land use consents (refer Sections 9 and 13 of the RMA), coastal permits (Sections 12, 14 and 15), water permits (Section 14) and discharge permits (Section 15)
RMA	Resource Management Act 1991 and including all subsequent amendments
SS	suspended solids
SQMCI	semi quantitative macroinvertebrate community index;
Temp	temperature, measured in °C (degrees Celsius)
Turb	turbidity, expressed in NTU
UI	Unauthorised Incident
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
Zn*	zinc

*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.

Appendix I

**Resource consents held by
Bridge Petroleum Limited
Radnor 1B wellsite**




**TARANAKI
REGIONAL
COUNCIL**

CHIEF EXECUTIVE
PRIVATE BAG 713
47 CLOTEN ROAD
STRATFORD
NEW ZEALAND
PHONE 06-765 7127
FAX 06-765 5097

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:	Bridge Petroleum Limited	New Address:
	P O Box 112341	P O Box 3394
	Penrose	Fitzroy
	AUCKLAND	New Plymouth 4341

Change To
Conditions Date:  13 April 2005 [Granted: 10 June 2004]

Conditions of Consent

Consent Granted: To discharge emissions to air from flaring of hydrocarbons and miscellaneous emissions associated with drill stem testing, well clean-up, initial well testing and production testing associated with six wells at the Radnor-B wellsite at or about GR: Q20:192-109

Expiry Date: 1 June 2022

Review Date(s): June 2010, June 2016

Site Location: Radnor-B Wellsite, Radnor Road, Midhirst
[Property owner: A B & L H Crofskey]

Legal Description: Lot 18 DP 18 Sec 47 Manganui Dist Blk XIII Huiroa SD

Catchment: Patea

Tributary: Piakau

*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

Duration

1. This consent shall not be exercised for more than an accumulated duration of 45 days per zone, allowing four zones to be tested per well, from up to six wells. The time interval specified in this condition refers to that period during which this consent is exercised and is not regarded as continuous elapsed time from the first exercise of this consent.

Information and notification

2. Prior to the commencement of testing, the consent holder shall supply to the Chief Executive, Taranaki Regional Council, a final site layout plan, demonstrating configuration of the facilities and equipment so as to avoid or mitigate the potential effects of air emissions.
3. The Taranaki Regional Council shall be notified within 24 hours prior to the initial flaring of each zone being commenced.
4. At least 24 hours prior to any flaring, the consent holder shall undertake all practicable measures to notify residents within 1000 metres of the wellsite of the commencement of flaring. The consent holder shall include in the notification a 24-hour contact telephone number for a representative of the consent holder, and shall keep and make available to the Chief Executive, Taranaki Regional Council, a record of all queries and/or complaints received.

5. No alteration shall be made to plant equipment or processes which may substantially alter the nature or quantity of flare emissions or other wellsite emissions, including but not limited to the recovery of produced gas, other than as notified in this consent application, without prior consultation with the Chief Executive, Taranaki Regional Council.

Flaring

6. Other than for the maintenance of a pilot flare flame, the consent holder shall have regard to the prevailing and predicted wind speed and direction at the time of initiation of any episode of flaring or other combustion of hydrocarbons.
7. All gas being flared, at any time during well clean-up, drill stem testing, initial testing, or production testing, or at any other time, must first be treated by effective liquid and solid separation and recovery, as far as is practicable to ensure that smoke emission during flaring is minimised.
8. If separation cannot be implemented and/or maintained at any time while there is a flow from the well, whether natural or induced, then the consent holder shall notify the Chief Executive, Taranaki Regional Council, and shall in any case re-establish liquid separation and recovery within three hours.
9. No liquid or solid hydrocarbons shall be combusted through the gas flare system.
10. As soon as is practicable after flow commences, the separated gas shall be combusted so that emissions of smoke are minimised.
11. The consent holder shall adopt the best practicable option, as defined in section 2 of the Resource Management Act 1991, to prevent or minimise any actual or potential effect on the environment arising from the flare emission, emissions from the flare pit, or any other emissions from the wellsite [including use of a separator during well clean-up]. This requirement applies in addition to any of the specific requirements set out in conditions 1, 6, 7, 8, 9 and 10.
12. Only substances originating from the well stream and treated as outlined by conditions 7, 8, 9, 10 and 11 are to be combusted within the flare pit.
13. The consent holder shall not discharge any contaminant to air authorised by this consent at a rate or a quantity such that the contaminant, whether alone or in combination with other contaminants, is or is liable to be hazardous or toxic or noxious at or beyond the boundary of the wellsite, or beyond 100 metres of the flare, whichever distance is greater.
14. There shall not be any offensive odour or smoke, as determined by an enforcement officer of the Taranaki Regional Council, beyond the boundary of the wellsite or beyond 100 metres of the flare, whichever distance is greater, arising from the exercise of this consent
15. The opacity of any smoke emissions shall not exceed a level of 1 as measured on the Ringelmann Scale for more than four minutes cumulative duration in any 60-minute period.

16. The consent holder shall control all emissions of carbon monoxide to the atmosphere from the flare, whether alone or in conjunction with any other emissions from the wellsite, in order that the maximum ground level concentration of carbon monoxide arising from the exercise of this consent measured under ambient conditions does not exceed 10 mg/m^3 [eight-hour average exposure], or 30 mg/m^3 one-hour average exposure] at or beyond the boundary of the wellsite or beyond 100 metres from the flare, whichever distance is greater.
17. The consent holder shall control all emissions of nitrogen oxides to the atmosphere from the flare, whether alone or in conjunction with any other emissions from the wellsite, in order that the maximum ground level concentration of nitrogen dioxide arising from the exercise of this consent measured under ambient conditions does not exceed 100 micrograms per cubic metre [24-hour average exposure], or 200 micrograms per cubic metre [1-hour average exposure] at or beyond the boundary of the wellsite, or beyond 100 metres from the flare, whichever distance is greater.
18. The consent holder shall control emissions to the atmosphere from the wellsite and flare of contaminants other than carbon dioxide, carbon monoxide, and nitrogen oxides, whether alone or in conjunction with any emissions from the flare, in order that the maximum ground level concentration for any particular contaminant arising from the exercise of this consent measured at or beyond the boundary of the wellsite or beyond 100 metres from the flare, whichever distance is greater, is not increased above background levels:
 - a) by more than $1/30^{\text{th}}$ of the relevant Occupational Threshold Value-Time Weighted Average, or by more than the Short Term Exposure Limit at any time [all terms as defined in Workplace Exposure Standards, 2002, Department of Labour]; or
 - b) if no Short Term Exposure Limit is set, by more than three times the Time Weighted Average at any time [all terms as defined in Workplace Exposure Standards, 2002, Department of Labour].

Recording and reporting information

19. The consent holder shall make available to the Chief Executive, Taranaki Regional Council, upon request, an analysis of a typical gas and crude oil stream from the field, covering sulphur compound content and the content of carbon compounds of structure C_6 or higher number of compounds.
20. 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.
21. The consent holder shall keep and make available to the Chief Executive, Taranaki Regional Council, logs of all flaring, including time, duration and [as far as is practicable] volumes of substances flared.



22. The consent holder shall provide to the Taranaki Regional Council during May of each year, for the duration of this consent, a report:
- i) detailing gas combustion in the flare;
 - ii) detailing smoke emissions as required under condition 20;
 - iii) detailing any measures to reduce smoke emissions;
 - iv) detailing any measures to reduce flaring;
 - v) addressing any other issue relevant to the minimisation or mitigation of emissions from the flare; and
 - vi) detailing any complaints received and any measures undertaken to address complaints.

Lapse and Review

23. 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.
24. 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 2010 and/or June 2016, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 13 April 2005

For and on behalf of
Taranaki Regional Council



Director Resource Management



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

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

Name of Consent Holder:	Bridge Petroleum Limited General Manager P O Box 112341 Penrose AUCKLAND	New Address: P O Box 3394 Fitzroy New Plymouth 4341
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Change To Conditions Date: 31 July 2006 [Granted: 10 June 2004]

Conditions of Consent

Consent Granted:	To discharge emissions to air during flaring from well workovers, in emergency situations, from a permanent pilot flame and other miscellaneous emissions associated with production activities at the Radnor-B wellsite at or about GR: Q20:192-109
Expiry Date:	1 June 2022
Review Date(s):	June 2010, June 2016
Site Location:	Radnor-B Wellsite, Radnor Road, Midhirst [Property owner: AB & LH Crofskey]
Legal Description:	Lot 23 DP 18 Sec 47 Manganui Dist Blk XIII Huiroa 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

Conditions 1 to 12 – unchanged

Information and notification

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

Emissions from the site

5. Other than for the maintenance of a pilot flare flame, the consent holder shall have regard to the prevailing and predicted wind speed and direction at the time of initiation of any episode of flaring or other combustion of hydrocarbons.
6. All gas being flared, at any time must first be treated by effective liquid and solid separation and recovery, as far as is practicable, to ensure that smoke emission during flaring is minimised.
7. If separation cannot be implemented and/or maintained at any time while there is a flow from the well, whether natural or induced, then the consent holder shall notify the Chief Executive, Taranaki Regional Council, and shall in any case re-establish liquid and solid separation and recovery within three hours.
8. Subject to special conditions 6 and 7, no liquid or solid hydrocarbons shall be combusted through the gas flare system other than in an emergency.
9. Only substances originating from the well stream and treated as outlined by conditions 6, 7, 8, and 10 are to be combusted within the flare pit.
10. The consent holder shall adopt the best practicable option, as defined in section 2 of the Resource Management Act 1991, to prevent or minimise any actual or potential effect on the environment arising from any emission to air from the flare or any other emissions to air from the Radnor-B wellsite. Any adoption of the best practicable option as outlined in this special condition shall be to the satisfaction of the Chief Executive, Taranaki Regional Council.
11. The consent holder shall not discharge any contaminant to air authorised by this consent at a rate or a quantity such that the contaminant, whether alone or in combination with other contaminants, is or is liable to be hazardous or toxic or noxious at or beyond the boundary of the wellsite, or beyond 100 metres of the flare, whichever distance is greater.
12. There shall not be any offensive odour or smoke, as determined by an enforcement officer of the Taranaki Regional Council, beyond the boundary of the wellsite or beyond 100 metres of the flare, whichever distance is greater, arising from the exercise of this consent.



Condition 13 – changed

13. All hydrocarbon storage vessels shall be fitted with vapour recovery systems as soon as practicable, but no later than 6th May 2007.

Conditions 14 to 24 – unchanged

14. The opacity of any smoke emissions shall not exceed a level of 1 as measured on the Ringelmann Scale for more than four minutes cumulative duration in any 60-minute period.
15. The consent holder shall control all emissions of carbon monoxide to the atmosphere from the flare, whether alone or in conjunction with any other emissions from the wellsite, in order that the maximum ground level concentration of carbon monoxide arising from the exercise of this consent measured under ambient conditions does not exceed 10 mg/m³ [eight-hour average exposure], or 30 mg/m³ one-hour average exposure] at or beyond the boundary of the wellsite or beyond 100 metres from the flare, whichever distance is greater.
16. The consent holder shall control all emissions of nitrogen oxides to the atmosphere from the flare, whether alone or in conjunction with any other emissions from the wellsite, in order that the maximum ground level concentration of nitrogen dioxide arising from the exercise of this consent measured under ambient conditions does not exceed 100 micrograms per cubic metre [24-hour average exposure], or 200 micrograms per cubic metre [1-hour average exposure] at or beyond the boundary of the wellsite, or beyond 100 metres from the flare, whichever distance is greater.
17. The consent holder shall control emissions to the atmosphere from the wellsite and flare of contaminants other than carbon dioxide, carbon monoxide, and nitrogen oxides, whether alone or in conjunction with any emissions from the flare, in order that the maximum ground level concentration for any particular contaminant arising from the exercise of this consent measured at or beyond the boundary of the wellsite or beyond 100 metres from the flare, whichever distance is greater, is not increased above background levels:
 - a) by more than 1/30th of the relevant Occupational Threshold Value-Time Weighted Average, or by more than the Short Term Exposure Limit at any time [all terms as defined in Workplace Exposure Standards, 2002, Department of Labour]; or
 - b) if no Short Term Exposure Limit is set, by more than three times the Time Weighted Average at any time [all terms as defined in Workplace Exposure Standards, 2002, Department of Labour].

Recording and reporting information

18. The consent holder shall keep and make available to the Chief Executive, Taranaki Regional Council, upon request, a record of all smoke-emitting incidents noting time, duration and cause.

19. The consent holder shall keep and maintain a log of all continuous flaring incidents longer than five minutes, and any intermittent flaring lasting for an aggregate of ten minutes or longer in any 120-minute period. Such a log shall contain the date, the start and finish times, the quantity and type of material flared, and the reason for flaring. This log shall be made available to the Chief Executive, Taranaki Regional Council, upon request, and summarised annually in the report required under condition 20.
20. The consent holder shall 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.
21. The consent holder shall provide to the Taranaki Regional Council during May of each year, for the duration of this consent, a report:
 - i) detailing gas combustion in the flare;
 - ii) detailing smoke emissions as required under condition 18;
 - iii) detailing any measures to reduce smoke emissions;
 - iv) detailing any measures to reduce flaring;
 - v) addressing any other issue relevant to the minimisation or mitigation of emissions from the flare;
 - vi) detailing any complaints received and any measures undertaken to address complaints; and
 - vii) reviewing all options and technological advances relevant to the reduction or mitigation of any discharge to air from the site, particularly but without limitation to gas capture and transfer, how these might be applicable and/or implemented at the site, and the benefits and costs of these advances.
22. The consent holder shall make available to the Chief Executive, Taranaki Regional Council, upon request, an analysis of a typical gas and crude oil stream from the field, covering sulphur compound content and the content of carbon compounds of structure C₆ or higher number of compounds.


Lapse and Review

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

24. 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 2010 and/or June 2016, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 31 July 2006

For and on behalf of
Taranaki Regional Council



Director Resource Management



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

CHIEF EXECUTIVE
PRIVATE BAG 713
47 CLOTEN ROAD
STRATFORD
NEW ZEALAND
PHONE 06-765 7127
FAX 06-765 5097

Please quote our file number
on all correspondence

Name of Consent Holder: Bridge Petroleum Limited
P O Box 38187
Howick
AUCKLAND

New Address:
P O Box 3394
Fitzroy
New Plymouth 4341

Consent Granted Date: 10 June 2004

Conditions of Consent

Consent Granted: To discharge treated stormwater and treated produced water from hydrocarbon exploration and production operations at the Radnor-B wellsite onto and into land and into an unnamed tributary of the Piakau Stream in the Patea catchment at or about GR: Q20:192-109

Expiry Date: 1 June 2022

Review Date(s): June 2010, June 2016

Site Location: Radnor-B Wellsite, Radnor Road, Midhirst
[Property owner: A B & L H Crowskey]

Legal Description: Lot 23 DP 18 Sec 47 Manganui Dist Blk XIII Huiroa SD

Catchment: Patea

Tributary: Piakau South

General conditions

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

Special conditions

- 1. The consent holder shall at all times adopt the best practicable option, as defined in section 2 of the Resource Management Act 1991, to prevent or minimise any adverse effects of the discharge on any water body.
- 2. The maximum stormwater catchment area shall be no more than 16,000 m².
- 3. The Chief Executive, Taranaki Regional Council, shall be advised in writing at least 7 days prior to any site works commencing, and again in writing at least 7 days prior to any well drilling operation commencing.
- 4. Prior to the exercise of this consent, the consent holder shall provide for the written approval of the Chief Executive, Taranaki Regional Council, site specific details relating to contingency planning for the wellsite.
- 5. All stormwater and produced water to be discharged under this permit shall be directed for treatment through the stormwater treatment system for discharge in accordance with the special conditions of this permit.
- 6. The design, management and maintenance of the stormwater system shall be generally undertaken in accordance with the information submitted in support of the application.
- 7. Any above ground hazardous substances storage areas shall be bunded with drainage to sumps, or other appropriate recovery systems, and not to the stormwater catchment.
- 8. The following concentrations shall not be exceeded in the discharge:

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

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

9. After allowing for reasonable mixing, within a mixing zone extending seven times the width of the waterbody downstream of a designated discharge point, the discharge shall not give rise to any of the following effects in the receiving waters:
 - a) an increase in temperature of more than 2 degrees Celsius;
 - b) an increase in biochemical oxygen demand of more than 2.00 gm^{-3} .
10. After allowing for reasonable mixing, within a mixing zone extending seven times the width of the waterbody downstream of a designated discharge point, the discharge shall not give rise to any of the following effects in the receiving waters:
 - a) the production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials;
 - b) any conspicuous change in the colour or visual clarity;
 - c) any emission of objectionable odour;
 - d) the rendering of fresh water unsuitable for consumption by farm animals;
 - e) any significant adverse effects on aquatic life.
11. The Chief Executive, Taranaki Regional Council, shall be advised in writing at least 48 hours prior to the reinstatement of the site and the reinstatement shall be carried out so as to minimise effects on stormwater quality.
12. This consent shall lapse on the expiry of five 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.
13. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2010 and/or June 2016, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 10 June 2004

For and on behalf of
Taranaki Regional Council



Director-Resource Management



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

CHIEF EXECUTIVE
PRIVATE BAG 713
47 CLOTEN ROAD
STRATFORD
NEW ZEALAND
PHONE 06-765 7127
FAX 06-765 5097

Please quote our file number
on all correspondence

Name of Consent Holder: Bridge Petroleum Limited
P O Box 38187
Howick
AUCKLAND
New Address:
P O Box 3394
Fitzroy
New Plymouth 4341

Consent Granted Date: 10 June 2004

Conditions of Consent

Consent Granted: To discharge stormwater and sediment from earthworks during construction of the Radnor-B wellsite onto and into land and into an unnamed tributary of the Piakau Stream in the Patea catchment at or about GR: Q20:192-109

Expiry Date: 1 June 2022

Review Date(s): June 2010, June 2016

Site Location: Radnor-B Wellsite, Radnor Road, Midhirst
[Property owner: A B & L H Crowskey]

Legal Description: Lot 23 DP 18 Sec 47 Manganui Dist Blk XIII Huiroa SD

Catchment: Patea

Tributary: Piakau South

General conditions

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

Special conditions

1. The consent holder shall at all times adopt the best practicable option, as defined in section 2 of the Resource Management Act 1991, to prevent or minimise the discharge of sediment to any surface water body and to prevent or minimise any adverse effects of the discharge on any surface water body.
2. The Chief Executive, Taranaki Regional Council, shall be advised in writing at least 7 days prior to wellsite and access works commencing.
3. After allowing for reasonable mixing, being a mixing zone extending seven times the width of the surface water body at the point of discharge, the discharge shall not give rise to any of the following effects in any surface water body:
 - 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.
4. The design and management of the earthworks and control of the stormwater discharge shall be generally undertaken in accordance with the information submitted in support of application 3089, and to the satisfaction of the Chief Executive, Taranaki Regional Council.
5. All earthwork areas shall be stabilised vegetatively or otherwise as soon as is practicable immediately following completion of soil disturbance activities to the satisfaction of the Chief Executive, Taranaki Regional Council.
6. 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.

7. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2010 and/or June 2016, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 10 June 2004

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

CHIEF EXECUTIVE
PRIVATE BAG 713
47 CLOTEN ROAD
STRATFORD
NEW ZEALAND
PHONE 06-765 7127
FAX 06-765 5097

Please quote our file number
on all correspondence

Name of Consent Holder: Bridge Petroleum Limited
P O Box 38187
Howick
AUCKLAND

New Address:
P O Box 3394
Fitzroy
New Plymouth 4341

Consent Granted Date: 10 June 2004

Conditions of Consent

Consent Granted: To take groundwater during hydrocarbon exploration and production operations from up to six wells at the Radnor-B wellsite at or about GR: Q20:192-109

Expiry Date: 1 June 2022

Review Date(s): June 2010, June 2016

Site Location: Radnor-B Wellsite, Radnor Road, Midhirst
[Property owner: A B & L H Crofskey]

Legal Description: Lot 23 DP 18 Sec 47 Manganui Dist Blk XIII Huiroa SD

Catchment: Patea

Tributary: Piakau South

General conditions

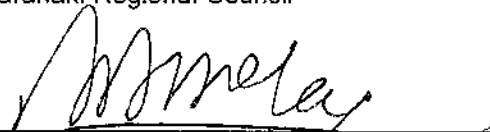
- a) On receipt of a requirement from the Chief Executive, Taranaki Regional Council the consent holder shall, within the time specified in the requirement, supply the information required relating to the exercise of this consent.
- b) Unless it is otherwise specified in the conditions of this consent, 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. At all times the consent holder shall adopt the best practicable option, as defined in section 2 of the Resource Management Act 1991, to prevent or minimise any actual or likely adverse effect on the environment associated with the abstraction of groundwater encountered during drilling and production from up to six wells at the Radnor-B wellsite.
- 2. Within one month of the exercise of this consent the consent holder shall provide the Chief Executive, Taranaki Regional Council, with information of the depth below ground level of the freshwater and saline groundwater interface.
- 3. The consent holder shall maintain records of abstraction including date, volume of groundwater abstracted per day, and shall make these records available to the Chief Executive, Taranaki Regional Council, upon request.
- 4. 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.
- 5. 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 2010 and/or June 2016, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 10 June 2004

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

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Please quote our file number
on all correspondence

Name of Consent Holder: Bridge Petroleum Limited
P O Box 38187
Howick
AUCKLAND

New Address:
P O Box 3394
Fitzroy
New Plymouth 4341

Consent Granted Date: 10 June 2004

Conditions of Consent

Consent Granted: To take water from the Piakau Stream for hydrocarbon exploration purposes associated with the Radnor-B wellsite at or about GR: Q20:192-109

Expiry Date: 1 June 2022

Review Date(s): June 2010, June 2016

Site Location: Radnor-B Wellsite, Radnor Road, Midhurst
[Property owner: A B & L H Crofskey]

Legal Description: Lot 23 DP 18 Sec 47 Manganui Dist Blk XIII Huiroa SD

Catchment: Patea

Tributary: Piakau South

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. At all times the consent holder shall adopt the best practicable option, as defined in section 2 of the Resource Management Act 1991, to prevent or minimise any actual or likely adverse effects on the environment associated with the abstraction of water from the Piakau Stream, including, but not limited to, the efficient and conservative use of water.
2. The consent holder shall notify the Taranaki Regional Council in writing at least 48 hours prior to any abstraction activity.
3. The volume of water abstracted shall not exceed 100 cubic metres/day at a rate not exceeding 25 litres/second.
4. The abstraction authorised by this consent shall cease when the flow in the Piakau Stream immediately below the abstraction site is less than 45 litres/second.
5. The consent holder shall maintain records of abstraction including date, pumping rates and volume abstracted, and shall make these records available to the Chief Executive, Taranaki Regional Council, upon request.
6. The exercise of this consent shall be undertaken generally in accordance with the documentation submitted in support of application 3092.
7. The consent holder shall ensure that the intake structure is appropriately screened to avoid the entrainment of freshwater fauna.
8. 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.

9. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2010 and/or June 2016, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 10 June 2004

For and on behalf of
Taranaki Regional Council

A handwritten signature in black ink, appearing to read 'M. Melan', is written over a horizontal line.

Director-Resource Management

