Todd Energy Aquatic Centre Monitoring Programme Annual Report 2017-2018

Technical Report 2018-08

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Executive summary

The New Plymouth District Council (NPDC) operates the Todd Energy Aquatic Centre (Aquatic Centre) located on Tisch Avenue, New Plymouth. This report for the period July 2017 to June 2018 describes the monitoring programme implemented by the Taranaki Regional Council (the Council) to assess NPDC's environmental and consent compliance performance during the period under review. The report also details the results of the monitoring undertaken and assesses the environmental effects of NPDC's activities.

NPDC holds two resource consents relating to the Aquatic Centre, which include a total of thirteen special conditions that NPDC must satisfy. One consent allows NPDC to discharge swimming pool wastewater into the Tasman Sea, and the other allows it to erect, place, use and maintain a discharge pipe at the site.

During the monitoring period, NPDC demonstrated an overall good level of environmental performance.

The Council's monitoring programme for the year under review included four site inspections, two marine ecological inspections, a backwash discharge sample, an outdoor pool water sample, and one sample of the receiving waters collected for physicochemical analysis. One of the two routine samples of the receiving waters was unable to be collected due to reasons beyond the Council's control.

The monitoring showed that the backwash and outdoor pool wastewater discharges were compliant with consent conditions. Neither of the discharges appeared to have any significant effects on the ecology of the Kawaroa Reef outside of the designated mixing zone, although an increase in the cover of *Ulva* sp. up to 10 m away from the outfall may indicate a potential freshwater impact. By comparison with previous years, the monitoring indicated an improvement in NPDC's environmental performance. There were no Unauthorised Incidents recording non-compliance in respect of this consent holder during the period under review. Issues that were identified in relation to unauthorised greywater discharges to the Kawaroa Reef in the 2016-2017 monitoring year had been resolved. The greywater diversion project was completed on 23 September 2017.

During the year, NPDC demonstrated a good level of environmental and high level of administrative performance with the resource consents.

For reference, in the 2017-2018 year, consent holders were found to achieve a high level of environmental performance and compliance for 76% of the consents monitored through the Taranaki tailored monitoring programmes, while for another 20% of the consents, a good level of environmental performance and compliance was achieved.

In terms of overall environmental and compliance performance by the consent holder over the last several years, this report shows that the consent holder's performance is improving.

This report includes recommendations for the 2018-2019 year.

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1 Introduction

1.1 Compliance monitoring programme reports and the Resource Management Act 1991

1.1.1 Introduction

This report is for the period July 2017 to June 2018 by the Taranaki Regional Council (the Council) describing the monitoring programme associated with two resource consents held by the New Plymouth District Council (NPDC). NPDC operates the Todd Energy Aquatic Centre (Aquatic Centre) situated on Tisch Avenue in New Plymouth.

This report covers the results and findings of the monitoring programme implemented by the Council in respect of the consents held by NPDC that relate to discharges of pool and filter water into the Tasman Sea and to erect, place, use and maintain an ocean outfall. This is the 18th annual report to be prepared by the Council to cover the Aquatic Centre's water discharges and their effects.

1.1.2 Structure of this report

Section 1 of this report is a background section. It sets out general information about:

- consent compliance monitoring under the *Resource Management Act 1991* (RMA) and the Council's obligations;
- the Council's approach to monitoring sites though annual programmes;
- the resource consents held by NPDC for the Aquatic Centre;
- the nature of the monitoring programme in place for the period under review; and
- a description of the activities and operations conducted at the Aquatic Centre.

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

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

Section 4 presents recommendations to be implemented in the 2018-2019 monitoring year.

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

1.1.3 The Resource Management Act 1991 and monitoring

The *Resource Management Act 1991* (RMA) primarily addresses environmental 'effects' which are defined as positive or adverse, temporary or permanent, past, present or future, or cumulative. Effects may arise in relation to:

a. the neighbourhood or the wider community around an activity, and may include cultural and social-economic effects;
b. physical effects on the locality, including landscape, amenity and visual effects;
c. ecosystems, including effects on plants, animals, or habitats, whether aquatic or terrestrial;
d. natural and physical resources having special significance (for example recreational, cultural, or aesthetic); and
e. risks to the neighbourhood or environment.

In drafting and reviewing conditions on discharge permits, and in implementing monitoring programmes, the Council is recognising the comprehensive meaning of 'effects' inasmuch as is appropriate for each

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

1.1.4 Evaluation of environmental and administrative performance

Besides discussing the various details of the performance and extent of compliance by NPDC, this report also assigns them a rating for their environmental and administrative performance during the period under review.

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

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

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

Environmental Performance

High: No or inconsequential (short-term duration, less than minor in severity) breaches of consent or regional plan parameters resulting from the activity; no adverse effects of significance noted or likely in the receiving environment. The Council did not record any verified unauthorised incidents involving significant environmental impacts and was not obliged to issue any abatement notices or infringement notices in relation to such impacts.

Good: Likely or actual adverse effects of activities on the receiving environment were negligible or minor at most. There were some such issues noted during monitoring, from self-reports, or in response to unauthorised incident reports, but these items were not critical, and follow-up inspections showed they have been dealt with. These minor issues were resolved positively, co-operatively, and quickly. The Council was not obliged to issue any abatement notices or infringement notices in relation to the minor non-compliant effects; however abatement notices may have been issued to mitigate an identified potential for an environmental effect to occur.

For example:

- High suspended solid values recorded in discharge samples, however the discharge was to land or to receiving waters that were in high flow at the time;
- Strong odour beyond boundary but no residential properties or other recipient nearby.

Improvement required: Likely or actual adverse effects of activities on the receiving environment were more than minor, but not substantial. There were some issues noted during monitoring, from self-reports, or in response to unauthorised incident reports. Cumulative adverse effects of a persistent minor non-compliant activity could elevate a minor issue to this level. Abatement notices and infringement notices may have been issued in respect of effects.

Poor: Likely or actual adverse effects of activities on the receiving environment were significant. There were some items noted during monitoring, from self-reports, or in response to unauthorised incident reports. Cumulative adverse effects of a persistent moderate non-compliant activity could elevate an 'improvement required' issue to this level. Typically there were grounds for either a prosecution or an infringement notice in respect of effects.

Administrative performance

High: The administrative requirements of the resource consents were met, or any failure to do this had trivial consequences and was addressed promptly and co-operatively.

Good: Perhaps some administrative requirements of the resource consents were not met at a particular time; however these were addressed without repeated interventions from the Council staff. Alternatively adequate reason was provided for matters such as the no or late provision of information, interpretation of 'best practical option' for avoiding potential effects, etc.

Improvement required: Repeated interventions to meet the administrative requirements of the resource consents were made by Council staff. These matters took some time to resolve, or remained unresolved at the end of the period under review. The Council may have issued an abatement notice to attain compliance.

Poor: Material failings to meet the administrative requirements of the resource consents. Significant intervention by the Council was required. Typically there were grounds for an infringement notice.

For reference, in the 2017-2018 year, consent holders were found to achieve a high level of environmental performance and compliance for 76% of the consents monitored through the Taranaki tailored monitoring programmes, while for another 20% of the consents, a good level of environmental performance and compliance was achieved.

1.2 Process description

The Aquatic Centre is sited on the foreshore at Tisch Avenue, New Plymouth. The facility consists of outdoor pools (including a main pool, diving pool and children's pools) and an indoor pool complex (Figure 1).

Discharge of wastewater from the outdoor pool complex filtration system takes place via the original discharge pipe which is situated on the foreshore to the east of the facility (Photo 1) and in the vicinity of an intake for water used in heat exchange by the swimming pool.

The discharge pipe consists of a 300 mm diameter encased concrete pipe and discharges at approximately mid-tide level. This structure was constructed in 1962 and has been in use ever since for the purpose of backwashing the outdoor pool filters.

Photo 1 Aquatic Centre marine outfall

During 1993 a heated indoor aquatic centre was constructed next to the existing outdoor facility. The indoor facility consists of a main pool, children's pool and spa pool. The indoor facility has a diatomaceous earth filter which serves the main pool and four upright high pressure sand filters which serve the spa and the children's pools.

At the time of construction, the diatomaceous earth filter waste was discharged into coastal waters. This method was found to be environmentally unsatisfactory and was discontinued in late 1999. Ever since, the solid waste from the diatomaceous earth filter has been removed from the site using an effluent disposal contractor, and disposed of at the New Plymouth landfill.

In 1999, a gas-fired heating system was installed to replace the original 'water to water' heat exchange unit which relied on sea water as the source of heat. The old heat exchange unit was removed from the site when the gas-fired unit was commissioned.

Current wastewater management practice for the indoor pools is that backwash water from the spa and children's pools' sand filtration systems continues to be connected to the outfall and is discharged on a daily basis.

The amount of water discharged is equivalent to approximately 120 litres per minute and the total backwash cycle runs for around 5-10 minutes. The maximum volume of the discharge at 1,200 litres is relatively insignificant in the context of the receiving environment, and the visual change is virtually inconspicuous due to the indoor nature of the pools and the frequency of backwashing, which is daily.

The outdoor pools are served by two large open gravity sand filters, which are located at the eastern end of the outdoor complex. These are air scoured and then backwashed through the outfall at high tide. Volumes of backwash water are significant (generally 22 m^3) and the discharge can be a muddy colour for a short time. In the peak of the season, backwashes may be as frequent as 1-2 per week, but generally it is normal to backwash the outdoor pools approximately every two weeks during the summer season (from Labour weekend to Easter).

The outdoor pools are emptied once per year, generally at the start of May, for the purpose of cleaning and maintenance. The discharge of pool water is free of chlorine, as the pools are not in use for at least a week prior to discharge. The pools are cleaned by mechanical methods, including water blasting, and do not involve the use of chemical cleaners. Mutton cloths are placed over the drains during water blasting and cleaning to catch all loose paint chips. The pool cleanings are discharged via the outfall.

Both the indoor and outdoor complexes are chlorinated using chlorine gas, which is contained in two separate 920 kg cylinders and chlorinator systems; one at the eastern boundary and one at the western boundary of the site. From time to time the chlorine gas is complemented by the manual dosing of calcium or sodium hypochlorite.

During July 2004 a medium pressure UV disinfection system was installed at the Aquatic Centre. This has resulted in savings on chemical, heating, maintenance and water costs. The use of the UV system reduces the level of chloramines (combined chlorine compounds), which are the cause of the unpleasant chlorine smells in pools. Since the installation of the system the chlorine levels in the pool have decreased by 3 to 5 times to a level typically below 0.3 ppm. The water is also clearer and less milky, with bacterial levels dropping from low to nearly zero due to the water going through the UV system several times a day.

Alterations were undertaken on the indoor facility in 2008 with the construction of year-round waterslides.

Figure 1 Location of the Aquatic Centre

1.3 Resource consents

NPDC holds two resource consents, the details of which are summarised in the table below and outlined in sections 1.3.1 and 1.3.2.

Table 1 Resource consents held by NPDC, in relation to wastewater discharges to the marine environment from the Aquatic Centre

Consent number	Purpose	Granted	Review	Expires
2339-4.0	To discharge public swimming pool wastewater and filter backwash wastewater via an ocean outfall into the Tasman Sea.	6 August 2014	June 2020, June 2026, and in accordance with special condition 10	1 June 2032
4588-3.0	To occupy the Coastal Marine Area with a discharge pipe from the New Plymouth Aquatic Centre.	6 August 2014	June 2020, June 2026	1 June 2032

1.3.1 Water discharge permit

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

NPDC holds water discharge permit **2339-4.0** to cover the discharge of swimming pool wastewater and filter backwash wastewater via an ocean outfall into the Tasman Sea. This permit was first issued by the Council on 1 May 1996 as a resource consent under Section 87(e) of the RMA. It was subsequently renewed on 6 August 2014 and is due to expire on 1 June 2032.

There are ten special conditions attached to this consent.

Condition 1 requires the consent holder to adopt the best practicable option at all times to prevent or minimise any adverse effects on the environment from the exercise of this consent.

Condition 2 specifies the volume and frequency permitted for various pool discharges.

Condition 3 states that no discharge from the emptying of any pool shall occur unless there has been no addition of chemicals to the pool for at least seven days.

Condition 4 specifies the standards which must be met for a range of constituents of the discharge water. This condition applies before entry of the treated wastewater into the receiving waters.

Condition 5 states that on each occasion that a pool is emptied the consent holder shall notify the Chief Executive, Taranaki Regional Council, at least seven working days before any discharge occurs.

Condition 6 states that the discharge is not to have adverse effects on the appearance, odour, and ecology of the receiving environment outside of a 5 m mixing zone.

Condition 7 requires that the discharge shall not give rise to a total residual chlorine level of greater than 0.1 g/m^3 beyond a five metre mixing zone.

Condition 8 requires that any discharge shall only occur two hours either side of high tide.

Condition 9 requires the consent holder to maintain and regularly update a 'Contingency Plan' that details measures and procedures that will be undertaken in the event of a chemical spill.

Condition 10 is a standard condition providing for consent review and amendment.

1.3.2 Coastal structure permit

NPDC holds resource consent **4588-3.0** to erect, place, use and maintain a discharge pipe within the coastal marine area. This permit was first issued by the Council on 1 May 1996. It was subsequently renewed on 6 August 2014 and is next due to expire on 1 June 2032.

The consent has three special conditions attached.

Conditions 1 and 2 require the consent holder to maintain the structure, and to notify the Council prior to any maintenance works.

Condition 3 allows the Council to review any or all of the conditions of this consent for the purpose of ensuring that the conditions adequately deal with any adverse environmental effects arising from the exercise of this consent.

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

This summary of consent conditions may not reflect the full requirements of each condition. The consent conditions in full can be found in the resource consents which are appended to this report.

1.4 Monitoring programme

1.4.1 Introduction

Section 35 of the RMA sets obligations upon the Council to gather information, monitor and conduct research on the exercise of resource consents within the Taranaki region. The Council is also required to assess the effects arising from the exercising of these consents and report upon them.

The Council may therefore make and record measurements of physical and chemical parameters, take samples for analysis, carry out surveys and inspections, conduct investigations and seek information from consent holders.

The monitoring programme for the Aquatic Centre consisted of four primary components.

1.4.2 Programme liaison and management

There is generally a significant investment of time and resources by the Council in:

- ongoing liaison with resource consent holders over consent conditions and their interpretation and application;
- in discussion over monitoring requirements;
- preparation for any consent reviews, renewals or new consent applications;
- advice on the Council's environmental management strategies and content of regional plans; and
- consultation on associated matters.

1.4.3 Site inspections

The Aquatic Centre was visited twice during the monitoring period. With regard to the consent for the discharge to water, the main points of interest were plant processes with potential or actual discharges to receiving watercourses, including contaminated stormwater and process wastewaters. The neighbourhood was surveyed for environmental effects.

1.4.4 Chemical sampling

The Council undertook sampling of the discharges from the site and the water quality in the receiving environment.

Sampling occurred in conjunction with the emptying of the outdoor pool and with one backwash discharge. The collection of the outdoor pool water sample was followed by the collection of a seawater sample. A seawater sample was not collected after the backwash discharge sampling, due to unsafe coastal sampling conditions at the time. All samples were analysed for chlorine, pH, oil and grease, and suspended solids.

1.4.5 Marine ecological inspections

Inspections of the marine low tide biota around the vicinity of the discharge pipe were undertaken after a backwash discharge and the emptying of the outdoor pool, to assess compliance with condition 6(d) of the discharge permit.

2 Results

2.1 Inspections

4 April 2018

On Wednesday 4 April 2018, a Council officer visited the Aquatic Centre at 11:20 (DST) in order to sample the backwash discharge. High tide was at 12:14 (3.3m) and weather conditions were fine. A sample of backwash wastewater was collected from the discharge pipe in the maintenance shed. A shoreline water sample was unable to be collected on this occasion due to unsafe sampling conditions (Photo 2).

Photo 2 Marine swell at outfall pipe at the time of attempted shoreline water sampling (4 April 2018)

The reef inspection was carried out at the next low tide (18:29 on 4 April 2018 at 0.6 m). Upon arrival at the reef at 17:00, a clear, odourless flow was found discharging from the outfall (approximately 0.1-0.2 L/s). There were no objectionable odours, or conspicuous films or scums, at the discharge point. Moderate silt and sediment cover was observed in the vicinity of the outfall (Photo 2). The cover of *Ulva* sp. in the vicinity of the outfall was lower than recorded during the previous inspection on 15 June 2017, possibly due to a reduction in freshwater output from the marine outfall (Photo 2). Since the previous inspection, extensive works had been undertaken at the Aquatic Centre to divert greywater discharge from the stormwater system, leading to the marine outfall, to the sewerage network.

8 May 2017

A Council officer visited the Aquatic Centre on 7 May 2018 in order to test the chlorine concentration of the outdoor pool. A sample of outdoor pool wastewater was collected at 12:40, followed by a sample of the receiving seawater at 13:10, a few minutes after the discharge commenced.

The next practicable low tide during which a reef inspection could be carried out was at 09:41 on 8 May 2018 (1.2m). Upon arrival at the reef at approximately 08:40, a low flow was discharging from the marine outfall (Photo 2). Blue paint chips were found in the immediate vicinity of the outfall (Photo 2). The outdoor pool had only been partly emptied since the previous day; indicating compliance with the consent condition of only discharging in batches within two hours either side of high tide. The reef inspection found no detectable chlorine odour or any visual issues outside of the designated discharge mixing zone. Although

the cover of *Ulva* sp. appeared to be greater during this inspection than the previous inspection carried out on 4 April 2018, there was still a notable decrease in *Ulva* sp. cover, when compared with the inspections carried out in the 2016-2017 monitoring year (TRC, 2017).

2.2 Discharge monitoring

2.2.1 Backwash discharge

A sample of backwash wastewater was collected on 4 April 2018. The backwash sample was collected from the discharge pipe in the maintenance shed. The seawater sample, usually collected from the shoreline approximately five metres east of the outfall, was unable to be collected on this occasion due to unsafe sampling conditions The results of the backwash discharge sample are presented in Table 2.

Table 2 Water quality results of the backwash discharge sample collected at the Aquatic Centre on 4 April 2018

Parameter	Unit	Backwash wastewater [STW001078]		5 m east of discharge pipe [SEA902051]	
		Result	Consent limit	Result	Consent limit
Temperature	ºC	26.3	-	N/D	-
Free chlorine	g/m^3	2.0	-	N/D	-
Total chlorine	g/m^3	2.5	-	N/D	0.1
pH	pH	7.6	-	N/D	-
Suspended solids	g/m^3	170	-	N/D	-
Oil and grease	g/m^3	4.3	-	N/D	-

N/D = no data, as sample not collected

As in previous years, a range of pool water contaminants were detected in the backwash discharge sample. However, these elevated contaminant concentrations are not usually reflected in the receiving environment. Although a shoreline seawater sample was not collected on this occasion for reasons beyond the Council's control, the receiving waters were visually inspected. There was no reason to suspect that the concentration of total chlorine in the seawater sample was above the consent limit. These results do not indicate any adverse effects on the quality of the receiving seawater due to the backwash discharge.

Further details regarding sample collection can be found in Appendix II.

2.2.2 Emptying of the outdoor pool

A sample of outdoor pool wastewater was collected on 7 May 2018, followed by a sample of the receiving seawater. The pool water sample was collected from the main pool directly. The seawater sample was collected from the shoreline approximately five metres east of the outfall. The results of these samples are presented in Table 3.

Table 3 Water quality results of outdoor pool water and receiving seawater samples collected at the Aquatic Centre on 7 May 2018

Parameter	Unit	Outdoor pool wastewater [STW001079]		5 m east of marine outfall [SEA902051]	
		Result	Consent limit	Result	Consent limit
Temperature	°C	16.5	-	17.4	-
Free chlorine	g/m^3	<0.1	-	<0.1	-
Total chlorine	g/m^3	<0.1	0.5	<0.1	0.1
pH	pH	7.9	6.0 - 9.0	8.6	-
Suspended solids	g/m^3	<2	100	71	-
Oil and grease	g/m^3	<0.5	15	<0.5	-

Contaminants in the pool water sample were only present in very low concentrations, if at all. Concentrations of chlorine and oil and grease were below the limits of detection. Neither of the samples exceeded any of the consent limits. These results did not indicate any adverse effects on the quality of the receiving seawater due to the emptying of the outdoor pool.

Further details regarding sample collection can be found in Appendix III.

2.3 Marine ecological inspections

Two marine ecological inspections were conducted on Kawaroa Reef in the vicinity of the outfall during the 2017-2018 monitoring year. The first inspection, undertaken on 4 April 2018, was conducted during low tide on the evening the sampled backwash discharge was sampled. The second inspection, undertaken on 8 May 2018, was conducted during low tide on the morning following the first batch release of outdoor pool water.

Pool water appeared to have only been released in batches within the designated windows around high tide, as per special condition 8 in the coastal permit.

In summary, the two reef inspections found that the range of intertidal species identified during both inspections was considered normal for that environment. The extensive cover of *Ulva* sp. up to 10 m from the outfall may however indicate a freshwater influence.

Inspection reports can be found in their entirety in Appendices II and III.

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

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

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

In the 2017-2018 monitoring period, the Council was not required to undertake additional investigations and interventions, or record incidents, in association with NPDC's conditions in resource consents or provisions in Regional Plans.

3 Discussion

3.1 Discussion of site performance

The Aquatic Centre was well managed throughout the period under review, ensuring that compliance with consent conditions was upheld. Issues that were identified in relation to unauthorised greywater discharges to the marine environment in the 2016-2017 monitoring year had been resolved. The greywater diversion project was completed on 23 September 2017.

3.2 Environmental effects of exercise of consents

Sample results from the backwash discharge revealed elevated concentrations of contaminants including chlorine, suspended solids, and oil and grease. Although there are no consent limits relating to the constituents of the backwash discharge, the effects of this are regulated through the permitted timing of the discharge and by monitoring the receiving environment. The high concentrations of different contaminants in the backwash water highlight the importance of scheduling this process to occur within two hours either side of high tide.

Sample results from the outdoor pool water and coastal waters adjacent to the outfall were compliant with consent limits.

Neither of the routine wastewater discharges that were monitored in the period under review appeared to have any significant effects on the ecology of the Kawaroa Reef, outside of the designated mixing zone. The denser cover of *Ulva* sp. observed up to 10 m away from the outfall may indicate a freshwater influence, however.

The shortening of the outfall pipe, identified during the 2016-2017 monitoring year, has resulted in wastewater being discharged in shallower areas, higher up the rocky intertidal shore of the Kawaroa Reef. Ecological monitoring in the vicinity of the outfall indicates that the shortening of the pipe has not adversely affected the ecology of the Kawaroa Reef.

3.3 Evaluation of performance

A tabular summary of the consent holder's compliance record for the year under review is set out in Tables 4 and 5.

Table 4 Summary of performance for consent 2339-4.0

Purpose*: Discharge swimming pool wastewater and filter backwash wastewater*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Best practice to prevent or minimise adverse effects	Inspections and correspondence	Yes
2. Limits on volume and frequency of discharge	Not assessed during period under review	N/A
3. No chemicals added to pool within seven days prior to discharge	Samples collected	Yes
4. Limits on discharge constituents	Samples collected	Yes

Purpose: *Discharge swimming pool wastewater and filter backwash wastewater*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
5. Council notified by the Aquatic Centre seven days prior to discharge	Aquatic Centre communicating with the Council via email and phone	Yes
6. Effects not observed beyond mixing zone	Inspection	Undetermined – *Ulva* sp. cover >10 m from the outfall may indicate freshwater influence
7. Chlorine concentration limit beyond mixing zone	Samples collected	Yes
8. Discharge to occur within two hours of high tide	Inspection	Yes
9. Contingency plan	Plan reviewed in June 2016	Yes
10. Option for review of consent	Next consent review date June 2020	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent Overall assessment of administrative performance in respect of this consent		**Good** **High**

During the year, NPDC demonstrated a good level of environmental performance and a high level of administrative performance with regard to resource consent 2339-4.0 as defined in Section 1.1.4. Compliance with consent conditions was upheld throughout the period of review. This year's monitoring revealed a demonstrable improvement in environmental and administrative performance from the previous year.

Table 5 Summary of performance for consent 4588-3.0

Purpose: *To erect, place and maintain a discharge pipe*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Notification prior to changes to nature or scale of structure	Inspection	Yes
2. Maintenance of structure	Inspection	Yes
3. Review of consent conditions	Next consent review date June 2020	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent Overall assessment of administrative performance in respect of this consent		**Good** **High**

During the year, NPDC demonstrated a good level of environmental performance and a high level of administrative performance with regard to resource consent 4588-3.0 as defined in Section 1.1.4.

Compliance with consent conditions was upheld throughout the period of review, as the integrity of the structure had not changed from the previous monitoring period.

3.4 Recommendations from the 2016-2017 Annual Report

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

1. THAT monitoring of discharges from the Aquatic Centre in the 2017-2018 year continues at the same level as in 2016-2017.

This recommendation was implemented in full.

3.5 Alterations to monitoring programmes for 2017-2018

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

- the extent of information already made available through monitoring or other means to date;
- its relevance under the RMA;
- the Council's obligations to monitor consented activities and their effects under the RMA;
- the record of administrative and environmental performances of the consent holder; and
- reporting to the regional community.

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

It is proposed that for 2018-2019, the programme remains unaltered from that for 2017-2018. A recommendation to this effect is attached to this report.

It should be noted that the proposed programme represents a reasonable and risk-based level of monitoring for the site(s) in question. The Council reserves the right to subsequently adjust the programme from that initially prepared, should the need arise if potential or actual non-compliance is determined at any time during 2018-2019.

4 Recommendations

1. THAT monitoring of consented activities at the Aquatic Centre in the 2018-2019 year continues at the same level as in 2017-2018.

Glossary of common terms and abbreviations

The following abbreviations and terms may be used within this report:

Biota	Flora and fauna of a particular place.
Bund	A wall around a tank to contain its contents in the case of a leak.
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 has actually occurred.
Intervention	Action/s taken by the Council to instruct or direct actions to be taken to avoid or reduce the likelihood of an incident occurring.
Investigation	Action taken by the Council to establish the circumstances/events surrounding an incident including any allegations of an incident.
Incident Register	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.
L/s	Litres per second.
Mixing zone	The zone below a discharge point where the discharge is not fully mixed with the receiving environment. For a stream, conventionally taken as a length equivalent to 7 times the width of the stream at the discharge point.
NTU	Nephelometric Turbidity Unit, a measure of the turbidity of water.
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 subsequent amendments.
SS	Suspended solids.
Temp	Temperature, measured in degrees Celsius (°C).
Turb	Turbidity, expressed in NTU.
UI	Unauthorised Incident.

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

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Appendix I

Resource consents held by New Plymouth District Council

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

Coastal Permit

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

Name of Consent Holder:	New Plymouth District Council Private Bag 2025 New Plymouth 4342
Decision Date	06 August 2014
Commencement Date	06 August 2014

Conditions of Consent

Consent Granted:	To discharge public swimming pool wastewater and filter backwash wastewater via an ocean outfall into the Tasman Sea
Expiry Date:	01 June 2032
Review Date(s):	June 2020, June 2026, and in accordance with special condition 10
Site Location:	Tisch Avenue, New Plymouth
Legal Description:	Adjacent to Pt Sec E Tn of New Plymouth
Grid Reference (NZTM)	1692028E-5676596N (point of discharge)
Catchment:	Tasman Sea

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

General condition

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

Special conditions

1. The 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.

2. The consent authorises the following discharges:

   a) up to 20 cubic metres per fortnight of outdoor pool treated filter backwash,
   b) up to 1.2 cubic metres per day of indoor children's pool and spa sand treated filter backwash,
   c) up to 1000 cubic metres of pool wastewater on two occasion per year for the purpose of emptying the indoor or outdoor swimming pool systems.

3. No discharge from the emptying of any pool shall occur unless there has been no addition of chemicals to the pool for at least seven days.

4. Constituents of the discharge from the emptying of either pool shall meet the standards shown in the following table.

Constituent	**Standard**
pH	Within the range 6.0 to 9.0
suspended solids	Concentration not greater than 100 gm^{-3}
Oil and grease	Concentration not greater than 15 gm^{-3}
Total residual chlorine	Concentration not greater than 0.5 gm^{-3}

   This condition shall apply before entry of the treated wastewater into the receiving waters at a designated sampling point approved by the Chief Executive, Taranaki Regional Council.

5. On each occasion that a pool is emptied the consent holder shall notify the Chief Executive, Taranaki Regional Council, at least 7 working days before any discharge occurs. Notification shall include the consent number and a brief description of the activity consented, and shall be emailed to worknotification@trc.govt.nz.

6. After allowing for reasonable mixing, within a mixing zone extending 5 metres of the discharge point, the discharge shall not, either by itself or in combination with other discharges, give rise to any or all of the following effects in the receiving water:

   a) the production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials;
   b) any conspicuous change in the colour or visual clarity;
   c) any emission of objectionable odour;
   d) any significant adverse effects on aquatic life.

7. Beyond a mixing zone of 5 metres the discharge shall not give rise to a total residual chlorine level of greater than 0.1 gm-3

8. Any discharge shall only occur two hours either side of high tide.

9. The consent holder shall maintain and regularly update a 'Contingency Plan' that details measures and procedures that will be undertaken in the event of a chemical spill. The plan shall be approved by the Chief Executive, Taranaki Regional Council, acting in a certification capacity as being adequate to avoid, remedy or mitigate the environmental effects of such an event.

10. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review:

    a) during the month of June 2020 and/or June 2026, 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; and/or
    b) annually during the month of June for the purpose of including conditions requiring provision of records necessary to check compliance with condition 2.

Signed at Stratford on 06 August 2014

For and on behalf of
Taranaki Regional Council

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A D McLay
Director - Resource Management

Coastal Permit

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

Name of Consent Holder:	New Plymouth District Council Private Bag 2025 New Plymouth 4342
Decision Date	06 August 2014
Commencement Date	06 August 2014

Conditions of Consent

Consent Granted:	To occupy the Coastal Marine Area with a discharge pipe from the New Plymouth Aquatic Centre
Expiry Date:	01 June 2032
Review Date(s):	June 2020, June 2026
Site Location:	Tisch Avenue, New Plymouth
Legal Description:	Adjacent to Pt Sec E Tn of New Plymouth
Grid Reference (NZTM)	1692028E-5676596N
Catchment:	Tasman Sea

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

General condition

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

Special conditions

1. This consent authorises the occupation of space in the Coastal Marine Area by the outlet structure existing at the time the application for this consent was lodged, and as described in the application. Any change to the nature or scale of the structure may therefore need to be authorised by a formal process in accordance with the Resource Management Act, 1991.

2. The consent holder shall maintain the structure in a safe and sound condition such that it continues to function effectively as an outlet structure.

3. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2020 and/or June 2026 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 06 August 2014

For and on behalf of
Taranaki Regional Council

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A D McLay
Director - Resource Management

Appendix II

Marine ecological inspection
4 April 2018

File note

19 April 2018

Document: 2032866

Todd Energy Aquatic Centre intertidal reef inspection – 4 April 2018

On Wednesday 4 April 2018, the Taranaki Regional Council (the Council) visited the Todd Energy Aquatic Centre (Aquatic Centre) at 11:20 (DST) in order to sample the backwash discharge. High tide was at 12:14 (3.3 m). The backwash commenced at 11:30 and discharged for approximately five minutes. The backwash discharge sample was slightly grey-green in colour, turbid and odourless. A shoreline water sample was unable to be collected on this occasion due to unsafe sampling conditions.

The results of the backwash discharge sample are presented in Table 1.

Table 1 Results of the backwash discharge sample (STW001078) collected on 4 April 2018. The shoreline water sample (SEA902051) was unable to be collected due to unsafe sampling conditions.

Parameter	Unit	Backwash discharge [STW001079]	5 m east of outfall [SEA902051]	
		Result	Result	Consent limit
Temperature	ºC	26.3	N/D	-
Free chlorine	g/m^3	2.0	N/D	-
Total chlorine	g/m^3	2.5	N/D	0.1
pH	pH	7.6	N/D	-
Suspended solids	g/m^3	170	N/D	-
Oil and grease	g/m^3	4.3	N/D	-

N/D = no data

The backwash discharge sample contained elevated concentrations of chlorine, oil and grease, and suspended solids (Table 1). Although a shoreline seawater sample was not collected on this occasion for reasons beyond the Council's control, the outfall was visually inspected and appeared to be compliant with consent conditions; no discolouration or other observable effects were noted beyond the mixing zone of 5 m (Photo 1). Furthermore, the Aquatic Centre has an excellent history of compliance with this consent condition, with no breaches in chlorine concentration recorded for the site to date.

The inshore waters appeared slightly turbid along the coast at the time of inspection, indicative of the turbulent conditions (Photo 1).

Photo 1 Outfall pipe at the time of attempted shoreline water sampling (4 April 2018)

The reef inspection was carried out at the next low tide (18:29 on 4 April 2018 at 0.6 m). Upon arrival at the reef at 17:00, a clear, odourless flow was found discharging from the outfall (approximately 0.1-0.2 L/s). There were no objectionable odours, or conspicuous films or scums, at the discharge point. Moderate silt and sediment cover was observed in the vicinity of the outfall (Photo 2). The cover of *Ulva* sp. in the vicinity of the outfall was lower than recorded during the previous inspection on 15 June 2017, possibly due to a reduction in freshwater output from the marine outfall (Photo 2). Since the previous inspection, extensive works had been undertaken at the Aquatic Centre to divert greywater discharge from the stormwater system, leading to the marine outfall, to the sewerage network.

Photo 2 *Ulva* sp. distribution in the vicinity of the marine outfall, before (A, 15 June 2017) and after (B, 4 April 2018) the diversion of greywater from the stormwater system to sewerage network.

Midshore species diversity within the influence of the outfall also appeared to be slightly higher than recorded in recent surveys, indicative of a possible improvement in reef health since the completion of works at the Aquatic Centre on 23 September 2017 (Photo 3).

Photo 3 A range of invertebrate species identified within the influence of the outfall during the intertidal reef inspection (4 April 2018)

The following invertebrates were present on the upper shore in the vicinity of the pipe: molluscs *Diloma aethiops*, *Diloma zealandica*, *Cellana radians, Cellana ornata* and the barnacles *Chamaesipho columna* and *Chamaesipho brunnea*. The green algal species *Ulva sp.* was present with low cover, and the red and brown algal species *Gelidium caulacantheum* and *Ralfsia sp.,* respectively, were also present.

Further down on the shore, still within the influence of the pipe discharge, the following species were identified: molluscs *Haustrum scobina* (very abundant)*, D. aethiops, D. zealandica, Lunella smaragdus, Chiton glaucus, Notoacmea* sp. and *C. radians,* the barnacles *C. columna* and *C. brunnea*, the polychaete worm *Spirobranchus cariniferus*, and the sea anemone *Isactinia tenebrosa.* The bivalve *Xenostrobus pulex* and the crustaceans *Pagarus* sp., *Hemigrapsus sexdentatus* and *Palaemon affinis*, as well as amphipods, were also identified. Red algae included encrusting coralline algae and *Corallina officinalis*, and the brown algae included *Hormosira banksia* and *Ralfsia* sp. The green algae *Ulva* sp. and *Chaetomorpha aerea* was also present.

In comparison with the intertidal community further down the shore, the area surrounding the pipe supported very little biomass and diversity. However, this assemblage was similar to that found on previous inspections, and upshore intertidal reef environments generally support less biomass and diversity than downshore environments. The assemblage of species found downshore from the outfall was similar to what would be expected at this elevation on the shore and was comparable with previous inspections.

In summary, despite the high concentration of contaminants discharged during the backwash, no environmental effects were detected and the composition of intertidal species identified during this inspection was considered normal for this type of environment. It was also encouraging to see a decrease in *Ulva* sp. cover in the vicinity of the outfall, and an increase in the diversity of species identified within the influence of the outfall, since the diversion of greywater from the stormwater to sewerage network. Despite no adverse

effects being detected, it is recommended that the backwash discharge is redirected to sewer as soon as practicable.

Angela Smith

Technical Officer

Thomas McElroy

Marine Ecologist

Appendix III

Marine ecological inspection
8 May 2018

File note

28 May 2018

Document: 2047042

Todd Energy Aquatic Centre intertidal ecological inspection – 8 May 2018

On Thursday 5 April 2018, the Taranaki Regional Council (the Council) received notification from Todd Energy Aquatic Centre (the Aquatic Centre) staff that they were intending to empty the outdoor swimming pool on Monday 7 May 2018. A Council Officer visited the Aquatic Centre at 12:40 on 7 May 2018 in order to test the chlorine concentration of the outdoor pool and collect samples.

Pool water testing found that the concentrations of both free and total chlorine were below the detectable limit (<0.1 g/m^3). Following this, Aquatic Centre staff were advised that the chlorine concentration was in compliance with condition 4 of resource consent 2339-4, and that they could begin emptying their pool within 2 hours of the next high tide (providing compliance with condition 8). High tide was at 14:48 (NZST) on the day of the inspection. Samples were collected from the Tasman Sea at approximately 13:10 (Photo 1).

Photo 1 Shoreline seawater sampling adjacent to the marine outfall (7 May 2018)

The results of the pool discharge and shoreline seawater samples are listed in Table 1. Neither sample exceeded any of the consent limits.

Table 1 Results of pool discharge and shoreline seawater samples (7 May 2018)

Parameter	Unit	7 May 2018			
		Outdoor pool prior to emptying [STW001079]		5 m east of outfall [SEA902051]	
		Result	Consent limit	Result	Consent limit
Temperature	ºC	16.5	-	17.4	-
Free chlorine	g/m^3	<0.1	-	<0.1	-
Total chlorine	g/m^3	<0.1	0.5	<0.1	0.1
pH	pH	7.9	6.0 – 9.0	8.6	-
Suspended solids	g/m^3	<2	100	71	-
Oil and grease	g/m^3	<0.5	15	<0.5	-

The next practicable low tide during which a reef inspection could be carried out was at 09:41 on 8 May 2018 (1.2m). Upon arrival at the reef at approximately 08:40, a low flow was discharging from the marine outfall (Photo 2). Blue paint chips were found in the immediate vicinity of the outfall (Photo 2). The outdoor pool had only been partly emptied since the previous day; indicating compliance with the consent condition of only discharging in batches within two hours either side of high tide. The reef inspection found no detectable chlorine odour or any visual issues outside of the designated discharge mixing zone.

Photo 2 (A) Low flow discharging from outfall at 08:40 (8 May 2018), with blue paint chips visible in the immediate vicinity;
(B) Close-up of paint chips

The following invertebrates were present on the upper shore in the vicinity of the pipe: molluscs *Diloma aethiops* (relatively abundant), *Diloma arida, Austrolittorina antipodum* and *Cantharidus purpureus,* the barnacles *Chamaesipho columna, Chamaesipho brunnea* and *Epopella plicata,* the whelk *Haustrum scobina,* limpets *Cellana radians, Cellana denticulata, Cellana ornata and Siphonaria* sp., the chiton *Sypharochiton pelliserpentis* and the mussel *Xenostrobus pulex*. The polychaete tubeworm *Spirobranchus cariniferus* and

crab *Petrolisthes elongatus* were also present. The brown alga *Ralfsia* sp., and the red algal species *Gelidium caulacantheum,* were present within 5 m of the outfall. Additionally, the green alga *Ulva intestinalis*, a known indicator of freshwater influence, moderately covered a stretch of the upper shore that extended up to approximately 10 m eastwards of the outfall.

The cover of *Ulva* sp. appeared to track the flow path of discharge from the outfall (Photo 3). Although the cover of *Ulva* sp. appeared to be greater during this inspection than the previous inspection carried out on 4 April 2018, there was still a notable decrease in *Ulva* sp. cover, when compared with the inspections carried out during the previous monitoring period. In comparison with the intertidal community further down the shore, the area surrounding the pipe supported very little biomass and was less diverse (Photo 4). However, this assemblage was similar to that found on previous inspections in the vicinity of the pipe, and is typical for this height on the shore. It was also noted that some gastropods (e.g. *Diloma aethiops*) found within 5 m of the marine outfall were more weakly attached to the substrate than gastropods found outside of the mixing zone. Attachment strength is a key determinant of gastropod survival on the rocky shore, as weakly attached individuals are more likely to be dislodged by predation and wave action, leading to higher mortality rates (O'Dwyer, Lynch & Poulin, 2014). However, these adverse effects were not detected outside of the 5 m mixing zone.

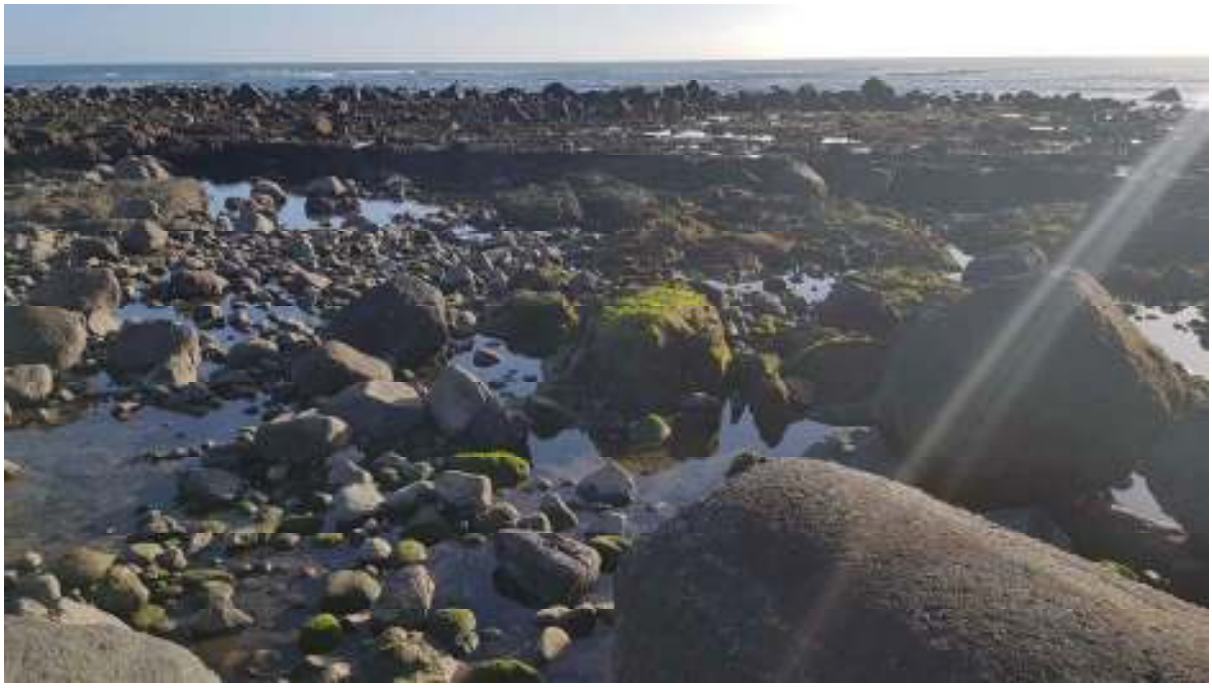

Photo 3 *Ulva* sp. cover extending up to 10 m east of the marine outfall.

Further down on the shore, still within the influence of the pipe discharge, the following species were identified: molluscs *H. scobina* (very abundant), *D. aethiops* (very abundant) and *Lunella smaragdus,* the chitons *Ischnochiton maorianus* and *S. pelliserpentis,* limpets *C. radians* and *C. ornata,* the urchin *Evechinus chloroticus,* sea anemone *Isactinia olivacea*, barnacles *C. columnar* and *C. brunnea*, and the polychaete worms *S. cariniferus, Spirobis* sp. and *Neosabellaria kaiparaensis.* Red algae included *Corallina officinalis,* encrusting coralline algae and *Gelidium* sp. Brown algae included *Hormosira banksii* and *Ralfsia* sp., and the green algae *Chaetomorpha aerea* and *Ulva* sp. were also present. Overall, these species are similar to what would be expected at this elevation on the shore.

Photo 4 (A) Species (*Haustrum scobina, Cellana ornata, Chamaesipho columna)* characteristic of the exposed upper shore, within 5 m of the outfall;
(B) Greater abundance and biodiversity in a rockpool approximately 15 m away from the outfall

In summary, the composition of intertidal species identified during this inspection was considered normal for this type of environment. However, the extent of *Ulva* sp. cover eastwards of the outfall, up to 10 m from the structure, may indicate a fresh water influence.

Angela Smith

Technical Officer

Thomas McElroy

Marine Ecologist