



Environmental Compliance Monitoring Report

2010/11

Report by –
Environment Southland
Compliance Division

Environment Southland Publication No 2011/8

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the Southland Regional Council



Foreword

The past year has ushered in significant changes to the way Environment Southland's Compliance Division performs its functions, as well as the approach it takes towards non-compliance activities in the region.

It has, however, been both frustrating and disappointing that non-compliance with consent conditions has remained high in 2010/11, sentiments not only felt by the Council, but also the general public and the dairy industry.

To answer the general resolve that improvement is needed, Council has recently reviewed the Compliance Action Policy, revoking the requirement that education comes before prosecution. That signals a harder line will be taken towards non-compliance, particularly in the case of repeat offenders. There is also an expectation that, where possible, the costs will lie where they fall.

The Compliance Division has also undergone a review, leading to some operational changes which are providing greater efficiencies. This, along with an increase in staff numbers in the past four years (from seven to 17), will provide the capacity to respond more quickly and more regularly than in the past.

There has been a four-fold increase in the number of infringement notices issued in the past 12 months. The early indications point towards another significant increase in the next year. While the majority of consent holders are doing an excellent job, we are not yet seeing a reduction in the percentage who need to step up to the mark and realise their consents are the minimum requirement and need to be adhered to at all times.

Our pollution hotline received a similar number of calls to the previous year; a clear sign of the public's growing concern regarding activities they perceive as environmental pollution. It is also interesting to note that more than 60 per cent of those were related to non-consented activities.

One of the highlights during the past year has been the Dairy Effluent Reference Group's valuable input into the formulation of new rules for dairy effluent. The rules apply science to dairy farm effluent application best practice guidelines, taking in factors that include soil risk and slope. The rule will be incorporated into the Council's Discharge Plan, which sets the standards that must be met by consent holders with flexibility that allows innovative technology its place.

During the next few years a significant number of consents will come up for renewal, and consent holders need to start the process early to ensure the availability of contractors, weather events and Council staff processing time can all be accommodated before their consent expires.

The Council congratulates the Compliance Division Manager, Mark Hunter, and his team for their dedication and adaptation to change, to ensure high standards this Council has set are achieved in a fair and equitable manner.



A M Timms
Chairman
Environment Southland



N G Horrell
Chairman
Environmental Management Committee

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Part A: Inspection and Audit Activities

1.0 Compliance Monitoring

Consent Compliance Overview

Environment Southland's information systems record that consent holders' compliance with resource consent conditions has fallen slightly from 77 per cent in 2009/10, to 75 per cent in 2010/11. That reduction has come during a corresponding period of an increase in inspections from 6,799, to 7,429.

It is of concern to the Council that the number of consent holders who did not comply with their consent requirements has increased. The variation between the two years shows that in 2009/10, 1,549 inspections (or 22 per cent) found the consent holder was non-compliant, while in 2010/11 that figure increased to 1,840 inspections (or 24 per cent) that found the consent holder was non-compliant.

Although the change in percentage is relatively small, at just two per cent, a better illustration of the challenges the Council faces is that, in real terms, almost 300 more consent holders were found to be non-compliant than the previous year.

The incidence of non-compliance has increased in direct correlation with an increase in the number of inspections. Of significance is that consent non-compliance regarding water has increased from 147 in 2009/10, to 434 in 2010/11. However, the number of inspections had again risen from 1,032, to 1,306 during that time.

This section of the report describes in more detail the results of consent inspections.

1.1 Aerial Monitoring

Three aerial monitoring flights were undertaken between the winter of 2010 and the start of winter 2011. A fixed wing aircraft was used on each occasion. Southland was split into three areas for the flights.

9 June 2010

A flight on 9 June 2010 coincided with a visit to Environment Southland from Labour Party water spokesman, Brendon Burns. The flight incorporated the central area of Southland from the Lower Matura catchment through to Northern Southland, around Mossburn and back down the Oreti River. During the flight, eight serious issues were identified, including the unauthorised drainage of a wetland, degradation of a waterway by stock, mob stocking within 3 m of a waterway and supplementary feeding on the bed of a watercourse. The flight appeared to prove beneficial for Mr Burns in gaining a better understanding that, in Southland conditions,



wintering barns for two months of the year were a good outcome for the environment compared to fodder crops on a hillside.

29 July 2010

A second flight was undertaken on 29 July 2010. Southland Times Editor Fred Tulett accompanied staff on the flight. The aircraft was diverted from the intended path over Eastern Southland to Northern Southland, due to several reported incidents of dirty waterways.

The first was located near Athol and it was confirmed the waterway was discoloured because runoff from a sheep wintering operation. A further 11 incidents were identified between Athol, Mossburn and Tuatapere.

These included:

- six incidents of cows being mob stocked, with what appeared to be unrestricted access to water and what appeared to be supplementary feeding on the bed of a river;
- five incidents where sheep appeared to be mob stocked, with unrestricted access to a waterway and also being supplementary fed on the bed of a river.

Unfortunately, fog prevented the inspection of the Te Anau Basin. This area had an improved record last year.

8 August 2010

This flight concentrated on the central areas of Southland and other selected points of interest. A total of 15 incidents of concern were noted, one gravel take, one wetland drainage and one burning. Areas of concern from mob stocking breaching the 3 m rule included, dairy stock (2), beef (5) and sheep (4).



Figure 1: Photo showing sheep on crop which have unrestricted access to a waterway.



1.2 Truckwashes

There are a number of trucking companies in Southland that primarily support rural industry, but also provide a number of vital services across the region including the transport of:

- stock from one site to another;
- fertilizer to farms;
- raw product to manufacturers;
- products from manufacturer to market.

To maintain the vehicles and avoid contamination of the product being moved, the companies are required to regularly clean the trucks and dispose of the dirty wastewater. Typically this is stored in a pond, then irrigated to land.

To do this each company needs resource consent to operate, so effluent is disposed of correctly in a way that minimises impact on the environment. To monitor this, effluent quality is analysed and truckwash sites are inspected annually.

The quality of the effluent is measured to ensure the quantity of nutrients being applied to the land does not theoretically exceed the consented limit and risk groundwater contamination. This monitoring was completed at a number of sites and most were fully compliant, but some were marginal. When a poor result was brought to the attention of the companies they immediately took action to address the problem.

Concerning issues were detected during site inspections. This year seven out of 23 sites were found to have significant non-compliance with their resource consents (compared to two last year). Several issues were identified, including:

- failure to install equipment;
- ponding of effluent;
- inadequate storage;
- failure to supply records and over application of effluent.

One site was found to have slowed the speed of a travelling irrigator, presumably to reduce the need to regularly move it, resulting in an over application of effluent and ponding in paddocks. This, and a number of the other issues are being followed up by Compliance staff and it is likely enforcement action will result.

1.3 Irrigation Water Takes

During the 2010/11 season there were 80 current irrigation consents throughout the region. Of these consents, 74 were abstractions from groundwater and six from surface water takes. Consent holders were required to submit records specifying the volume of water taken each day to show that



they were compliant with their daily abstraction limit. It was also a condition for consent holders to contact Environment Southland to advise their intention to commence irrigation.

There are a variety of potential irrigation activities that can be undertaken and, as can be seen in Figure 2, the majority of irrigation in Southland is for pasture.

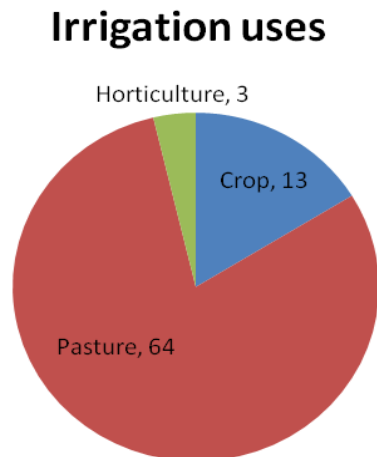


Figure 2: Irrigation activities in Southland.

Reporting compliance

During the 2010/11 monitoring period, Environment Southland received notification of commencement, or that a consent would not be exercised, from 72% of consent holders, which is an improvement of 10% on last year's figures.

Abstraction records were received from 74% of consent holders, which was a slight increase on last year's return. A number of consent holders are now required (and some have chosen) to supply abstraction data electronically. Some consent holders are also taking advantage of the fact that soil moisture monitoring can be set up within the same system. This allows a consent holder to maximise the efficiency of their irrigation system, as well as ensuring compliance with their consent without the need to fill out paperwork.

Of the data that was received, all abstractions were compliant with their annual abstraction limits. However there are still a small number of consent holders that are exceeding their daily limits (Figure 3).



Compliance

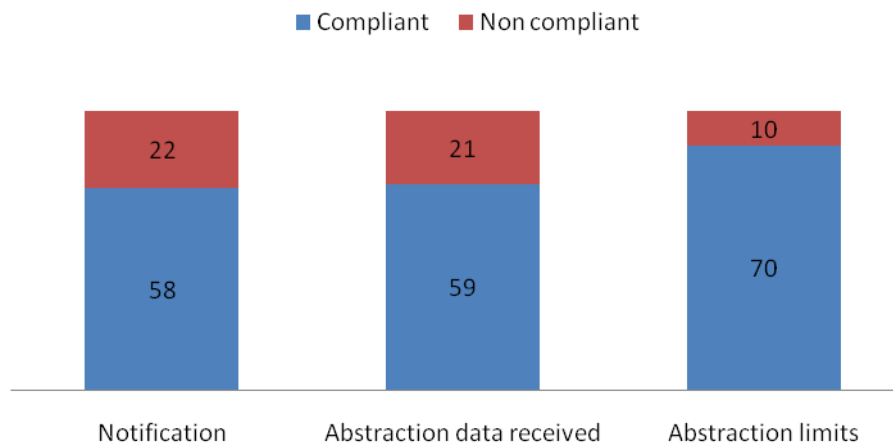


Figure 3: Abstraction compliance.

Compliance with consent conditions

There are still a number of consents requiring telemetry to be installed as part of their conditions. All consents that have breached their conditions have been addressed appropriately.

The supply of full and accurate data is essential for effective management of the region's water resources. The information provided by consent holders is also used when reviewing, renewing and granting consents. A lack of data and a poor performance history during this time may impact on the flexibility of conditions within the consent.

1.4 Cleanfills

Compliance staff inspected 20 cleanfill sites in Southland during 2010/11, with varying results. Of these sites, 10 were graded as fully-compliant, but 10 others were found to have technical non-compliance because information required as part of consent conditions had not been provided. Letters have been issued to those consent holders reminding them of their obligations within their consent and requesting the overdue information. For consent holders that continued to be non-compliant with submitting information regarding infilling, penalties were issued for non-provision of data.

One site has been graded as significantly non-compliant and continues to be an ongoing concern, because materials that do not constitute cleanfill have been allowed at the site. That matter was considered for enforcement action and an infringement notice issued.

Material that can be disposed of within a cleanfill must be inert, including soil, rocks, clay, sand and concrete. A full list of suitable and unsuitable materials that can be accepted in cleanfill sites is sent out to all consent holders, so there is no doubt what does and does not qualify as cleanfill.



2.0 Dairy Monitoring

2.1 Dairy Inspection Overview

Monitoring staff carried out 1,487 inspections on dairy farms during 2010/11. This was a significant increase on the past year's total of 1,293.

All dairy farms with herd sizes greater than 50 cows were inspected for compliance with effluent disposal resource consent. Smaller scale operations are a permitted activity and are, therefore, not generally inspected.

Dairy inspections result in grades being given as follows:

- 1 fully compliant;
- 2 minor non-compliance – potential for adverse effects, system shortcomings;
- 5 marginal – issues with minor adverse effects but problem cleared up on site;
- 7 fail – over consented cow numbers;
- 10 fail – significant non-compliance and re-inspection required.

Further discussion of how grades are assessed is provided later in this report.

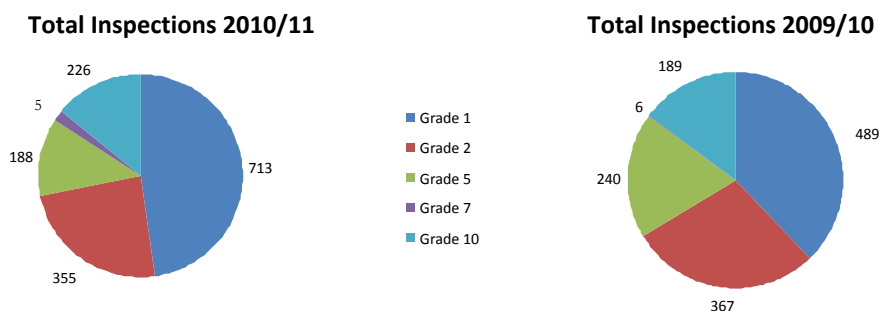


Figure 4: Dairy inspection results 2010/11 compared to 2009/10.

The total amount of grade 1's given across all inspection types were 713 (47%), grade 2 355 (23%), grade 5, 188 (12%), grade 7, 5 (3%) and grade 10 226 (15%) – see Figure 4.

Five of the 37 consents found to be significantly non-compliant during 2010/11 also had significant non-compliance last year. Of those consents found to be significantly non-compliant, 32 are yet to be re-inspected, but of the five that have been re-inspected, the following inspection grades resulted: 1, 2, 2, 2 and 10.



The dairy inspection programme was similar to that of the previous year, with the following strategies being implemented:

- combining surface water sampling and inspections of effluent systems wherever possible;
- targeting historically poor performing farms first and during spring conditions;
- following the guidelines (wherever possible or practical) on nationally agreed criteria for compliance/non-compliance for inspections on dairy farms;
- more extensive consent requirements/follow-ups for new consents such as submission of Environmental Management Plans, new pond construction details and effluent application testing.

Changes to the inspection programme were instigated after discussions with representatives of Federated Farmers, Dairy NZ and Council staff. All significant non-compliance is now reviewed to ensure greater consistency.

During the inspection process, staff are also required to consider national criteria for assigning a grade of significant non-compliance. The criteria are listed in Table 1.

Table 1: National criteria for assigning a grade of significant non-compliance

<i>Criteria</i>	<i>Examples</i>
Unauthorised discharges that have entered water (ground or surface water)	<ul style="list-style-type: none"> ➤ overflowing ponds or sumps into surface water; ➤ overland flow/runoff into surface water; ➤ irrigating over surface water; ➤ race/feedpad/standoff pad runoff into surface water; ➤ sludge or sand trap dumping where runoff has entered water; ➤ discharges in breach of consent or plan rule conditions, and where adverse effects are visible/measurable/likely: <ul style="list-style-type: none"> ◆ S107 considerations e.g. change in colour or clarity after mixing; ◆ exceeding ammonia limits; ◆ exceeding NTU/SS limits; ◆ exceeding BOD limits; ◆ exceeding faecal limits; ◆ exceeding ground water nitrogen concentration limits.
Unauthorised discharges that may enter water (ground or surface water)	<ul style="list-style-type: none"> ➤ significant surface ponding; ➤ irrigating when soil conditions are too wet; ➤ discharge without using an irrigator (e.g. pipe end discharge); ➤ sludge or sand trap dumping where runoff is at high risk of entering water; ➤ discharges in breach of consent or plan rule conditions, and where adverse effects are visible and/or measurable and/or likely: <ul style="list-style-type: none"> ◆ exceeding nutrient application rates; ◆ exceeding effluent application depths/rates.



<i>Criteria</i>	<i>Examples</i>
Breach of abatement notice	➤ any breach of an abatement notice.
Objectionable effects of odour	➤ serious adverse effects of odour have occurred.
System shortcomings (where required by a rule in a plan or a resource consent)	<ul style="list-style-type: none"> ➤ lack of contingency storage or backup plan; ➤ lack of standby equipment; ➤ using a high rate irrigator where low rate irrigator is required by a resource consent.
Multiple non-compliances on site with cumulative effects	➤ multiple discharges into a sensitive environment.

During 2010/11, levels of non-compliance remained similar to the previous year. This has continued to put pressure on monitoring and compliance staff. Staff losses and internal movements could have delayed the completion of the dairy inspection programme. However, a pool of trained casual staff and a new contractor were recruited to help deal with peaks in workloads, resulting in all scheduled dairy inspections being undertaken on time.

For the purpose of this report inspection activities during 2010/11 were separated into categories, including wintering pads, as well as routine and aerial inspections.

Wintering Pad Inspections

Wintering pad inspections were carried out between 1 July 2010 and 1 September 2010.

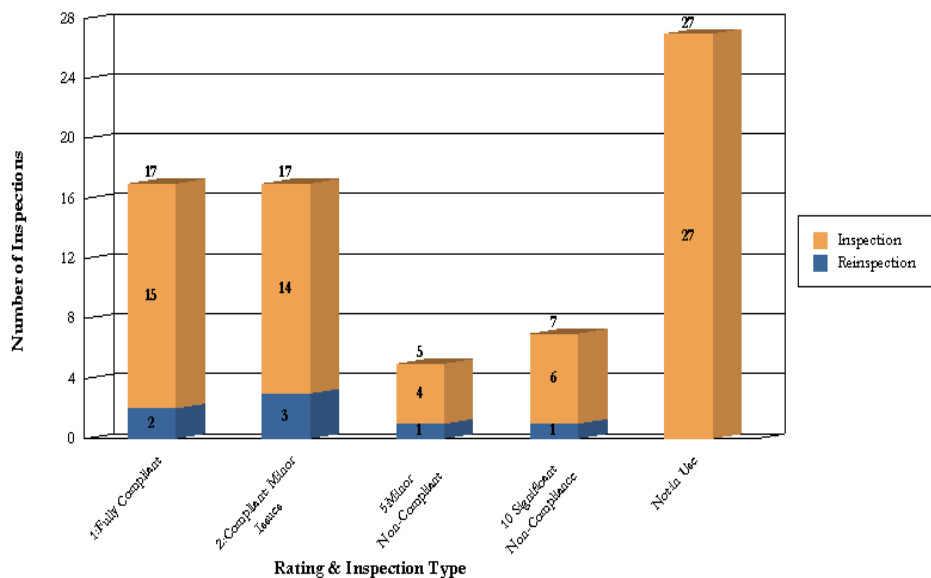


Figure 5: Results of wintering pad inspections.

Staff contacted consent holders prior to any inspection, to establish whether wintering pads were in use. Of the sites physically inspected, 15 per cent significant non-compliance was recorded while undertaking wintering pad inspections (see Figure 5).



Routine and Aerial Inspections

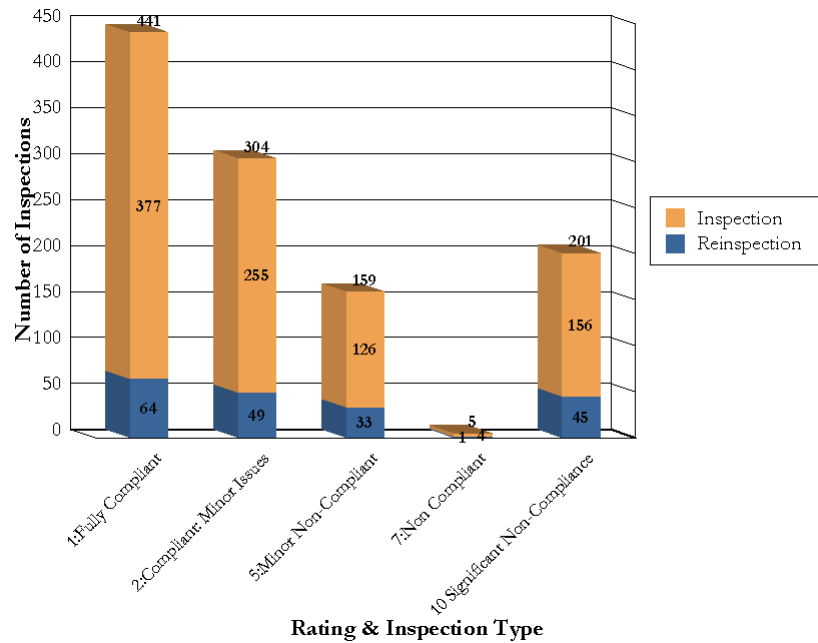


Figure 6: Results of routine dairy inspections.

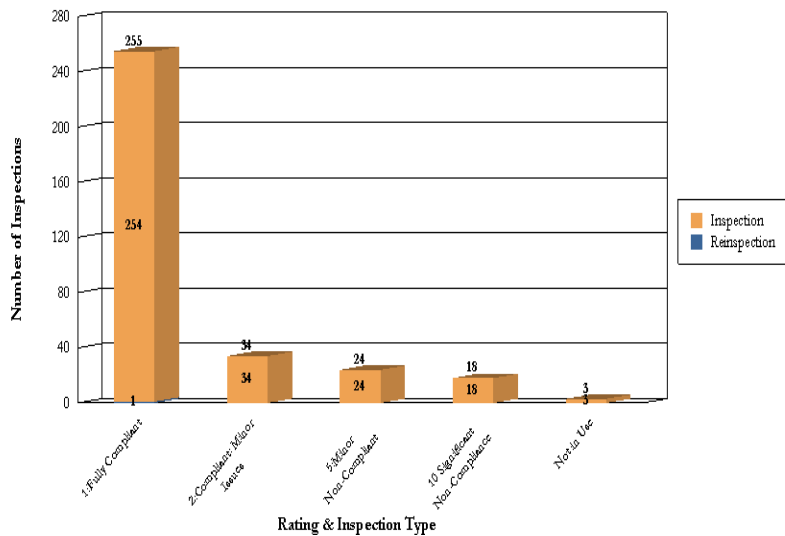


Figure 7: Results of aerial inspections.

In 2010/11, 331 aerial inspections were undertaken by helicopter, resulting in five per cent, or 18, consents being rated as significantly non-compliant and acquiring a grade 10. The vast majority, at 76 per cent, received a grade 1 for full compliance; one more obtained a grade 1 after re-inspection.

Figures 6 and 7 indicate that ground inspections (routine, wintering pad) appear to be more effective at identifying consent related significant non-compliance (15%), compared to the aerial inspections (5%). It is noteworthy that the aerial inspections appear more likely to pick up more plan



related significant non-compliance, such as silage pit leachate and offfal holes, than ground inspections. This information is recorded as an incident, rather than a consent breach, and is discussed elsewhere in this report. It is also likely that conditions during April, when the aerial inspections are being undertaken, have generally been more favourable in terms of applying effluent to land.

Wet soil conditions during certain months, combined with a lack of storage, poor management and travelling irrigators, could contribute to non-compliance.

Significant non-compliance during the six-week period 4 April to 15 May 2011

Data is sourced from R2D2 (database) extracted on 22 May 2011, updated on 7 June 2011. Consequently, not all data may be shown for this period.

This report was undertaken to provide a snapshot of the recent increased frequency of compliance staff identifying significant non-compliance on dairy farms during routine inspections and re-inspections. An analysis was also undertaken of the information held in R2D2 on those significant non-compliance cases. The aim of the analysis was to determine who was responsible for the non-compliance and what the non-compliance related to (see Figure 8).

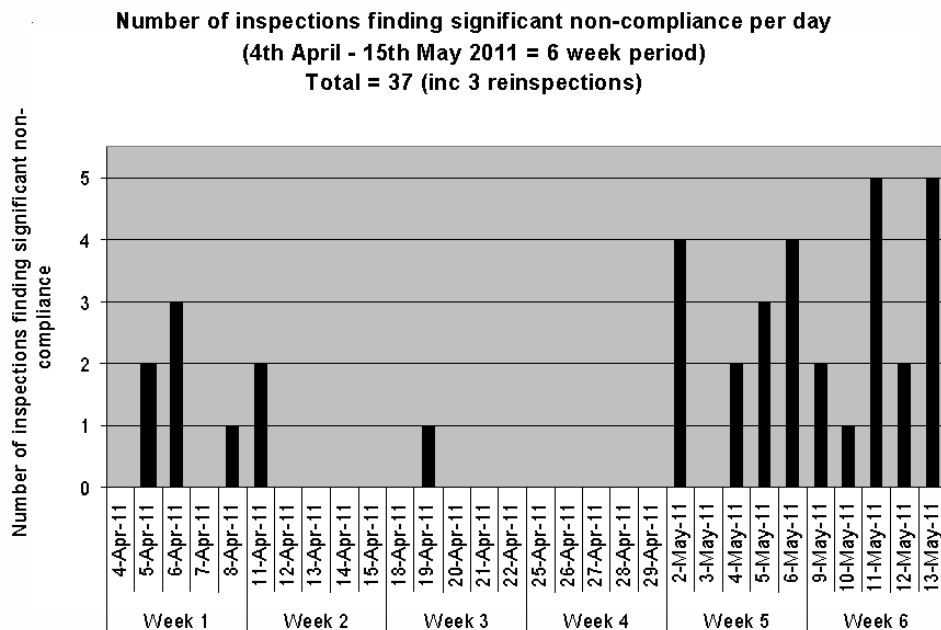


Figure 8: Distribution of significant non-compliance 4 April–15 May 2011.

Of the 35 significant non-compliance cases, 27 were found within the last two weeks of the six-week period.



Determining who is responsible

Identifying the responsible party (e.g. owner, consent holder, farm manager and farm worker) is not possible with current data available in the R2D2 database. Responsibility has, however, been roughly and generally summarised into two categories – the “owner” and the “operator” – by interpreting compliance officers’ comments and the non-compliance descriptions logged in the database.

The owner has been interpreted as responsible where there were technical consent non-compliance issues and any infrastructure issues including repairs and system upgrades needed.

The operator has been deemed the responsible party where non-compliance relates to inadequate operation of effluent systems.

Of the 37 cases involved, 29 were both owner and operator responsibilities, while the remaining eight involved operator responsibilities only.

Why were owners and/or operators responsible?

The most common reasons for owners being responsible for non-compliance were that a sealed area was needed for sludge storage and that equipment needed repairing. Owners responsible for non-compliance could have up to four of the problems shown in the table to address (on average they would have about two).

Reasons for non-compliance:

➤ sealed area for sludge	14
➤ fix equipment, e.g. nozzles/pipes	12
➤ stone trap	2
➤ return person in charge form	6
➤ improve effluent storage	5
➤ cow numbers	1
➤ install fail safe system	3
➤ pond sign-off form needed	1
➤ complete monitoring requirements	1
➤ test irrigator	1

When non-compliance involved operators, the reasons generally related to operation/management of their effluent system. In some cases Council staff made comments such as:

- recommended they seek professional advice;
- keep away from boundaries;
- avoid putting K-Line in hollows where pooling is likely;
- comments around changing settings of irrigator, e.g. to top speed;
- extend application area;
- unblock nozzles;



- pull up the irrigator line to reduce the amount of drag which has caused an over application;
- ensure appropriate sludge storage.

Non-compliance described as per R2D2 (database) selected description fields

The following summarises the types of non-compliance each consent could have. At least 15 different field descriptors exist in R2D2 and these have been partially grouped into four categories, listed below.

1. Application problem
 - over application of effluent;
 - exceeded maximum application rate;
 - soil at field capacity and applying effluent;
 - over application of sludge.

2. Environment problem
 - effluent ponding;
 - runoff/overland flow;
 - discharge to surface water.

3. Effluent storage
 - effluent storage overflow;
 - effluent storage has visible leaks or damage.

4. Technical non-compliance
 - effluent application outside consented area;
 - exceeding cow numbers;
 - person in charge notification not received;
 - automatic switch off system not installed;
 - monitoring requirements.

Irrigator type

Table 2: Significant non-compliance by irrigator type

	<i>Travelling Irrigator</i>	<i>K-Line</i>	<i>Contractor</i>	<i>Other</i>	<i>Total</i>
Number	26	6	3	2	37
Percentage	70.2	16.2	8.1	5.4	≈ 100

Travelling irrigators were the most common system found to be non-complying during inspections, at 70 per cent (Table 2). “Other” types included uni-sprinkler irrigation and a K-Line, travelling irrigator combination.

The results indicate that during wet periods (when soils are at/near field capacity) the main problem has been over application, or effluent ponding from travelling irrigators. This emphasises the need for sufficient storage,



because inadequate storage will require application in all conditions leading to an increased risk of resource consent breaches and causing adverse effects to the environment.

2.2 Dairy Water Take Monitoring

In 2010/11 there has again been a poor response to the requirement for dairy water take consent holders to supply metered data.

During the 2010/11 monitoring period 758 dairy farms held current water take permits. The Regional Water Plan for Southland states that the taking of more than 20,000 L of groundwater or 10,000 L of surface water per landholding per day requires a water permit. For the purpose of this report, there is no distinction made between groundwater takes and surface water takes.

Consent holders are required to install a suitable water meter to continuously record water taken and report this information to Environment Southland. Reporting requirements can vary, but the majority fit into three categories:

- daily readings for a continuous two week period once a season;
- once a month readings for the entire season;
- once a week readings for the entire season.

The appropriate forms for recording water takes are posted annually to all dairy consent holders in the dairy pack, they are also available on the Environment Southland website at: <http://www.es.govt.nz/resource-consent/monitoring-enforcement/compliance-forms/>. A courtesy letter is also issued, prior to the due date to remind consent holders to submit the data on time.

Compliance with dairy water take reporting remains poor, with about 35% of consent holders failing to supply data and a further 2% providing the data late. Figure 9 compares the dairy water take reporting performance with the previous four seasons. The 2007/08 season was exceptionally bad, with 45% failing to report water takes for the season. Full and accurate data is needed for the Council to effectively manage the water resources of the region. A lack of data may also impact future renewals and applications in that the information provided is used by the Consents Division to assist in its decisions.



Supply of Abstraction Data

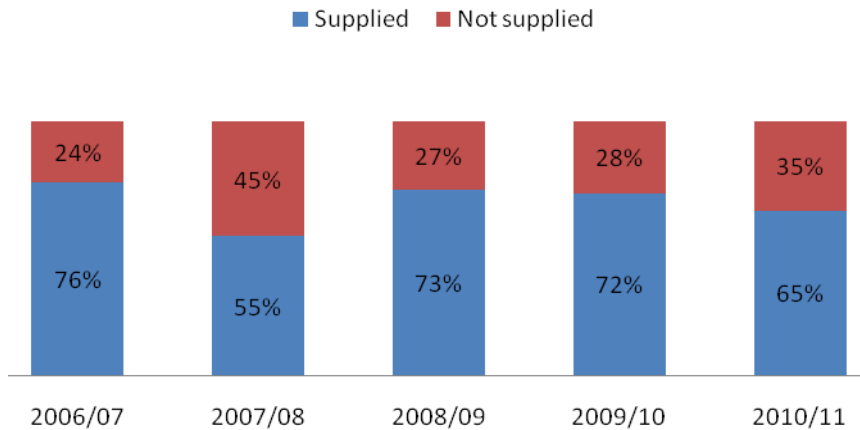


Figure 9: Reporting compliance.

Failure to report water takes for the season resulted in a charge per occasion for following up the non-supply of data, as well as an Abatement Notice being issued, requiring that the data be continually recorded.

Figure 10 shows the compliance of the information that was provided, demonstrating that the majority of consents were well within their daily limits. Some consent holders are sending inadequate data, making it impossible to judge their compliance against their limits.

Performance

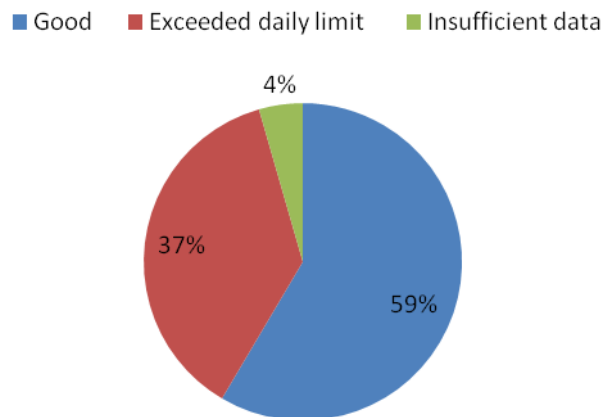


Figure 10: Performance of consent holders.

Environment Southland recommends the use of 50 L of water per cow per day as a maximum in the dairy shed. Reducing the amount of water used will reduce the pump running costs, reduce the quantity of effluent and water to be disposed, and increase the efficiency of storage. Accurate data collection, including the breakdown of water use is a useful tool for resource budgeting. As all consents have an allocated water allowance it is important to know where water is being used to ensure allocation thresholds are not exceeded.



Additionally, an analysis of water use is helpful in identifying where problems may lie when equipment failure goes unnoticed.

Consent holders exceeding abstraction limits appear to be using extra water for activities other than at the dairy shed, such as for stock drinking water or irrigation purposes. Some consent holders hold consents to take water for dairy shed use and irrigation from the same source. For consent holders that are frequently exceeding their consent limit it may mean that their permit is not adequate for their needs. Consent holders may need to apply for a consent amendment to increase their water take allowance, apply for an additional consent (depending on the volume of the additional water required), or arrange for a separate meter to be installed for each use, to demonstrate compliance with their respective consents.

2.3 Dairy – Groundwater Quality Inspection

The percolation of water through soils and into aquifer systems is a crucial source of groundwater replenishment.

Groundwater monitoring can help to identify possible contamination from land use activities, with deficiencies in quality having the potential to impact the suitability of water supplies.

In Southland there are 190 dairy discharge consents where groundwater monitoring is a requirement. Samples are collected from the water table aquifer near effluent disposal fields, with the purpose of detecting contamination. Sampling typically occurs twice a year, in November and April. Groundwater quality does not change as frequently, or as rapidly as surface water quality, so does not need to be sampled as often. Figure 11 shows the results for each monitoring period.

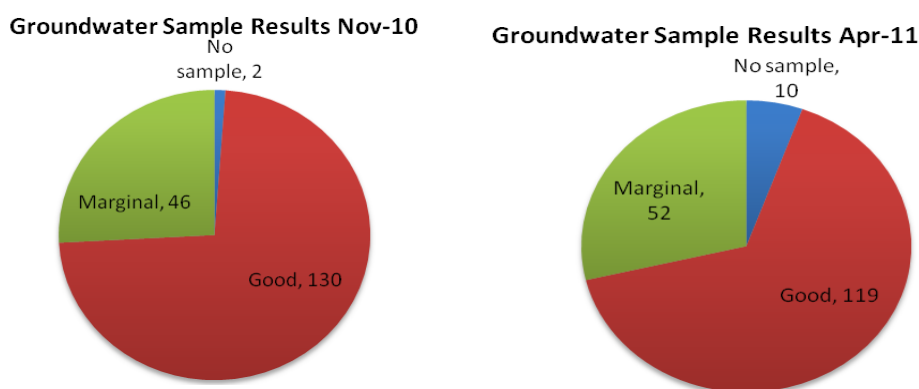


Figure 11: Groundwater monitoring results November 2010 and April 2010.

Samples given a 'marginal' rating are those that returned positive results for *E. coli* and/or Nitrate results >11. There were 29 samples with a high nitrate result and 13 with a high nitrate and high *E. coli* result. These results were forwarded to Environment Southland Groundwater Scientists to assess whether the high results are consistent with background aquifer levels. These consent holders have been notified that Environment Southland is



monitoring the changes in nitrate levels in groundwater. They have been advised that nitrogen inputs on their property need to be carefully managed to avoid losses to groundwater.

There were 56 samples throughout the year with *E. coli* results measuring greater than 1. As insufficient well head protection is a common source of elevated *E.coli* levels, all consent holders with poor *E. coli* results from their bores have been requested to investigate this as a possible source of contamination. Should future groundwater results return elevated levels of *E. coli* from the same bore, staff will consider what enforcement action to take to ensure compliance with their consent conditions. If well head protection appears sufficient, and future samples continue to return unsatisfactory results, the source of contamination will need to be investigated further.

2.4 Surface Water Quality Monitoring

Surface water monitoring is a requirement of 518 current dairy discharge consents in Southland. The location of the sampling is dependent on where the discharge is occurring and whether a waterway is likely to be at risk. Typically, sampling occurs up to three times a year and, where possible, samples are collected in conjunction with a farm inspection, to reduce costs to the consent holder. During this monitoring period it was acknowledged that some consents had no samples recorded in which to judge their history. Therefore, there were a larger number of sample visits during the season in a bid to ensure that good compliance history could be rewarded.

Monitoring Results

In 2010/11, 1,142 site visits were made to properties for sampling purposes. This includes the total number of samples that could potentially be taken for consents, with multiple samples required. The total number of consents requiring samples for the 2010/11 season was 518, an increase of 35 consents on the same period last year. Additionally, a number of sites were looked at for potential sampling to build a measurable history (see Figure 12).

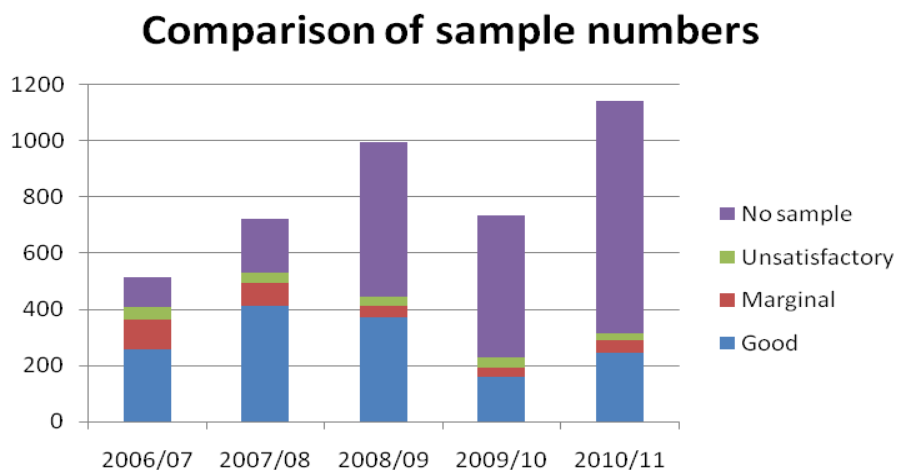


Figure 12: Number of sample visits 2006–2011.



Of the 1,142 sites visited, 314 samples were actually taken. The results are interpreted with reference to national standards and guidelines, trends over time for the property and the receiving waterway, soil, weather and other relevant factors. The samples are then graded as either 'good' 'marginal' or 'unsatisfactory'. It should be noted that these grades are solely based on water quality. Figure 13 shows the breakdown of the results for the season.

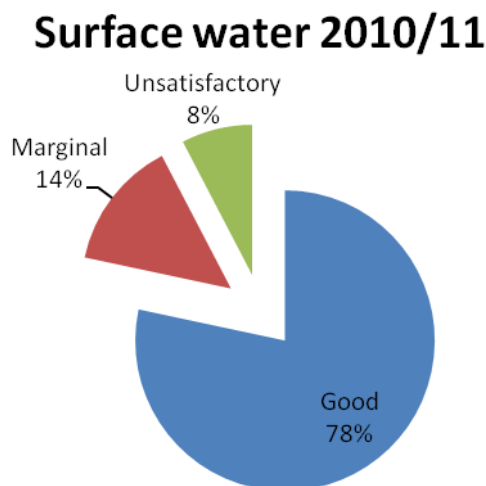


Figure 13: Surface water results 2010/11.

Of the 314 samples taken, 78% of those received a 'good' grade (indicating no or minimal impact on surface water quality), which is an improvement of 8% compared to last year, 14% received a 'marginal' grade (indicating there were some issues on the property), and 8% received an 'unsatisfactory' grade (showing activities on the farm appeared to be impacting on surface water quality), which is also an improvement on last year's 17%.

Surface water results were graphed by month for the 2009/10 and the 2010/11 monitoring periods (see Figures 14 and 15, below). From the samples taken, there were more poor results in the September-October 2009 period and in May 2010. When compared with samples taken this season there were more unsatisfactory or marginal results in October 2010, and in May 2011. It was noted that the results from 2008/09 also showed an increase during these periods, suggesting that there may be a greater risk of surface water contamination in the September-October and April-May period each year. February 2011 did see a spike of poor results, which coincided with a wetter than usual month.



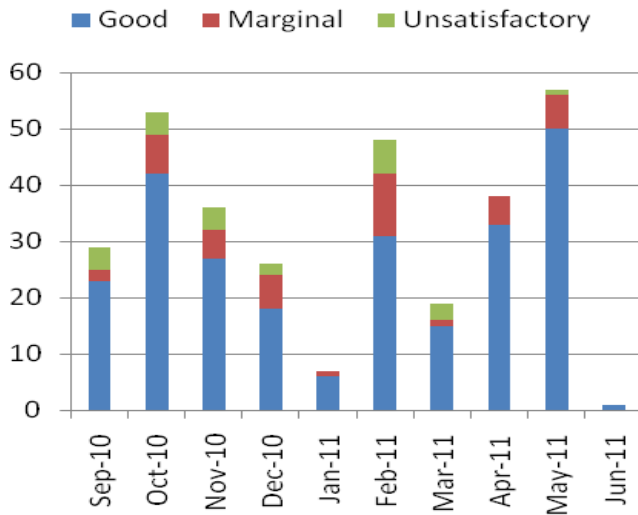


Figure 14: Surface water grades month by month 2010/11.

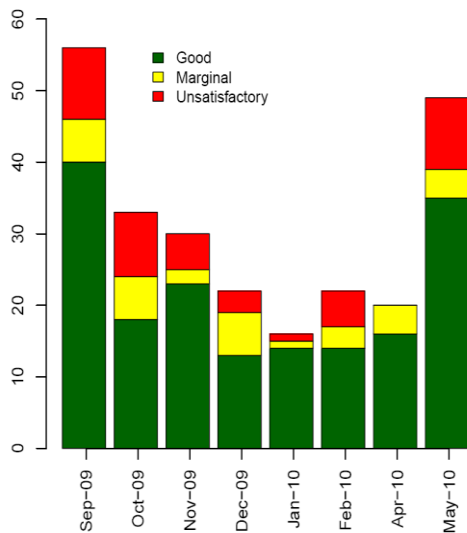


Figure 15: Surface water grades month by month 2009/10 (figure taken from 2009/10 Compliance Monitoring Report).

There are a number of possibilities behind these trends, including the changes that invariably take place at these times of year, such as changes in farm staff and seasonal climatic influences.

The idea behind introducing the minimum storage capacity for effluent is to enable the discharge of effluent to land to be conducted when soil moisture conditions are appropriate, therefore reducing the risk of effluent entering a waterway. If effluent is applied when conditions are suitable, the risk of nutrients leaching out of the root zone is less, thus providing a good source of nutrients for crop growth. However, poor management of these systems (i.e. using storage when conditions are right for irrigating and then having a full pond when a severe weather event occurs) is also leading to poor results.



2.5 Effluent Application Testing

Effluent application testing is a requirement for all new dairy discharge consents processed by Environment Southland. The condition requires consent holders to measure the application rate of the irrigator to confirm that consented rates and depths can be achieved. Environment Southland provides details of methodology to be used on its website. Once the field results have been filed they are then reviewed.

Effluent application testing is generally undertaken by a contractor employed by the council, or by consultants on behalf of the consent holder. Environment Southland also provides testing trays for consent holders wanting to run their own trial before having the test undertaken/audited by a contractor or consultant.

Currently the council has not been requiring consent holders to provide information about low application rate systems. The reason is that there is sufficient information to show that this type of system can comply with consent conditions. In that instance, management is considered to be the cause of issues e.g. irrigator left too long in one place when soil conditions are at, or near field capacity. Some consent holders have been choosing to test their systems regardless.

Travelling irrigators continue to be tested and generally need to meet an average depth of 8 mm an hour (which is one pass of the irrigator across the pasture). The test requires that they be set up in the paddock farthest away in the effluent disposal area.

Council staff review test results and notify the consent holder of the outcome. The test also gives inspection officers a guide to what speed an irrigator needs to be set at to comply with consent requirements. In addition, it gives managers of effluent systems an awareness of what it takes to operate a compliant effluent system.

The results submitted have improved dramatically with a lot of consent holders and/or their managers undertaking tests prior to an audit to establish if they are likely to be compliant, or not.

Application Rate Tests

Table 3 is a list of test results from the Environment Southland contractor for 2010/2011:

A total of 153 application rate tests were undertaken over 97 farms. Many farms have more than one irrigator, therefore requiring a test on every irrigator that is planned to be in use. Of the 153 application rate tests completed, 63 were retests due to the system not meeting minimum requirements.



The following is a breakdown of the different systems tested:

- Larall system (2)
- centre pivot (2)
- experimental systems (3)
- slurry tankers (2)
- pod systems (11)

Travelling irrigators can generally be adapted to get a result below 10 mm of depth, however farmers are often surprised at the true rate and depth being applied. This season has possibly been better for travellers passing on the first go as it appears awareness may be increasing.

Table 3: Type of irrigator in relation to depth of application.

<i>Type</i>	<i>Above 10 mm</i>	<i>Below 10 mm</i>
Briggs 10	4	9
Briggs 15	6	32
Briggs 25/100	3	5
Ecostream	2	1
Envirospreader	0	4
Numedic	11	20
Plucks	5	17
Other (spitfire, trimedec, travelling gun, etc)	4	5
Williams	2	3

3.0 Major Industries

3.1 Meat Industry

3.1.1 Alliance Group - Lorneville

Monitoring

The Alliance Group Lorneville plant requires monitoring for the following resource discharge consents:

- to take surface water from the Oreti River;
- to discharge wastewater to the Makarewa River;
- to discharge wastewater to land;
- to discharge contaminants to air from the meat plant;
- to discharge leachate from two closed landfills;
- to discharge to land via a contingency short-term storage pond; and
- to discharge sheep yard slurry onto land, and the associated emission of contaminants to air.



The operation of a meat processing plant of a size similar to the Lorneville plant requires a plentiful water supply. In order to operate, Alliance has resource consent to take water from the Oreti River, immediately downstream of the Wallacetown Bridge.

This year, as with previous years, the quantity of water taken from this site complied fully with the water take consent.

Water is used in various departments at the plant and for a variety of different applications, including potable water for staff, the sterilisation of equipment and washing down of product and plant. Once used, this water needs to be further treated to remove or reduce any contaminants it has collected prior to disposal. To treat the effluent, the Alliance Group uses an extensive pond system that covers an area of about 34 hectares. The system can treat the effluent to a relatively high standard before being discharged to land or the Makarewa River.

The 2010/11 monitoring results showed that the effluent continued to be of a consistent quality and fully compliant with consent conditions. Figure 16 demonstrates this in the concentration of carbonaceous Biochemical Oxygen Demand (CBOD₅) in the effluent.

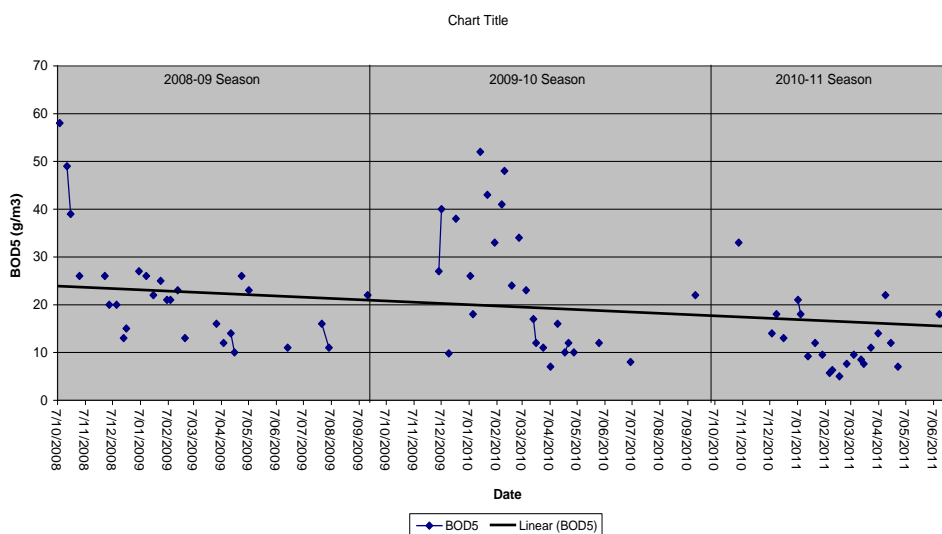


Figure 16: Concentration of carbonaceous Biochemical Oxygen Demand in the Alliance Group Lorneville discharge over the last three seasons.

The results this year were appreciably more consistent than those recorded in 2009/10, with the exception of one sample collected in November 2010, when the CBOD₅ result was 33g/m³. All other results ranged from 5-22g/m³. This is a very good outcome and continues the improving trends of CBOD₅ results over the last three years.

The consistency of the effluent quality can also be observed by the concentration of nutrients in the effluent. Nutrient levels over the last seven



years, including concentrations of nitrogen and phosphorus, have shown seasonal variances, however the concentration of nutrients within these variances have been relatively consistent (see Figure 17).

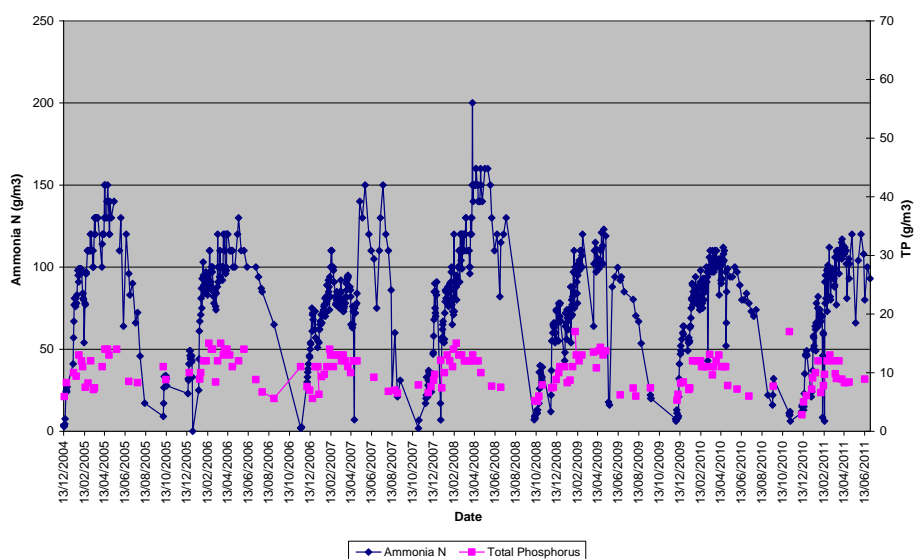


Figure 17: Nutrient levels.

From an operational standpoint this is a good result, but does offer challenges for the company in the future, with this consent expiring in 2016. It is likely that additional treatment will be required to reduce the quantity of both nutrients to meet constraints likely to be imposed on any new consent. To its credit, the environmental team at Alliance Lorneville has been trialling a series of options to improve the nutrient quality of the effluent.

The results indicate the management of the treatment system at the plant has been very good in 2010/11. This is also illustrated in the company’s management of air discharges this season. Every second year the Alliance Group is required to undertake an odour assessment of its pond system. The testing methodology employed has been relatively consistent over the 16 years the assessment has been undertaken, but the results can be variable. The assessment carried out in March 2011 recorded the lowest odour emission levels since testing began. It is an excellent result that is also confirmed by the absence of odour complaints received by Environment Southland during the 2010/11 season.

Complaints and self-reported incidents

No complaints were received by Environment Southland in response to the operation of the Alliance Group Lorneville plant during the 2010/11 year.

Issues

As indicated earlier, the main challenge for the Alliance Group Lorneville plant will be to prepare for the renewal of the current consent to discharge treated wastewater to the Makarewa River. While the company continues to



be fully compliant with current consent conditions, there are improvements that will need to be considered and are being investigated before a new consent can be considered.

Table 4: Alliance Group Limited Lorneville Plant – Consent Performance Summary

<i>Issue</i>	<i>Score</i>	<i>Comments</i>
Provision of data/results	Excellent	Data was reported on time and was complete as required by the consent.
Compliance with consent conditions	Excellent	Good management of the treatment system has resulted in only a few issues.
Responsiveness to issues	Excellent	Alliance management responded promptly and personally to all issues that arose during the year.
Keeping Environment Southland informed of intentions, changes etc.	Excellent	Alliance management responded promptly and personally to all issues that arose during the year.

3.1.2 Alliance Group – Makarewa

Monitoring

Alliance Group Makarewa currently holds the following resource consents that require monitoring:

- to discharge wastewater to the Makarewa River;
- to discharge wastewater to land;
- to discharge contaminants to air from the meat plant;
- to discharge leachate from two closed landfills to land;
- to discharge cooling water to the Makarewa River;
- to take water from the Makarewa River;
- to take groundwater.

Originally established to process sheep, the Alliance plant at Makarewa is now solely a venison processing plant. This has led to major changes at the plant, including the demolition of redundant buildings, leaving a reasonably modern well-serviced plant. The plant has a large pond system that contains and treats the wastewater produced during processing. The storage this system provides allows the environmental team to hold the treated effluent until the river conditions are suitable to receive the discharge. This, together with improved management and reduced loads, has resulted in a better quality of effluent being produced which is well within the limits imposed by the consent.



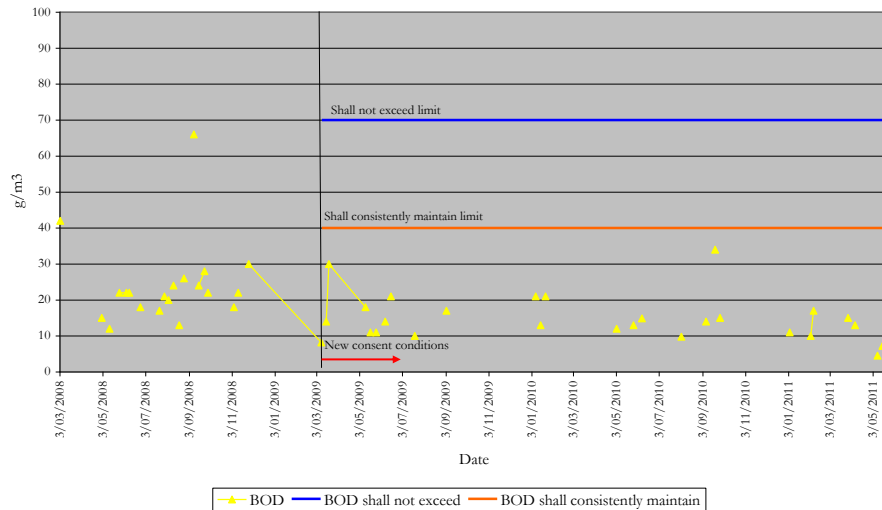


Figure 18: Concentration of carbonaceous Biochemical Oxygen Demand in the Alliance Group Makarewa discharge over the last three seasons.

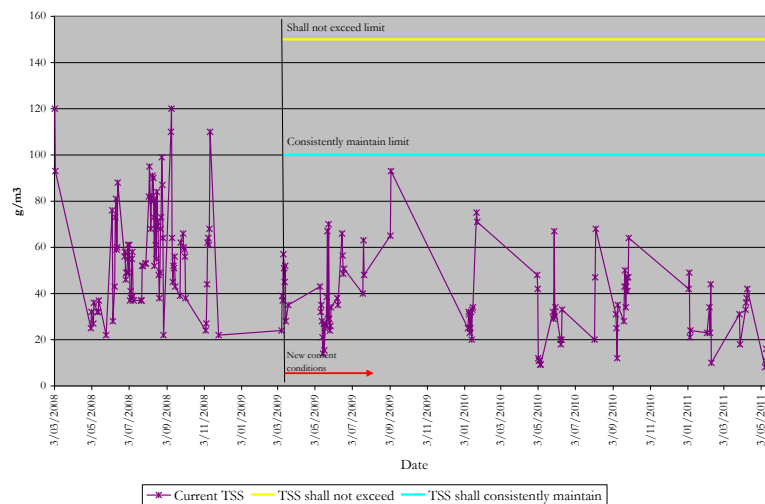


Figure 19: Concentration of total suspended solids in the Alliance Group Makarewa discharge over the last three seasons.

Figures 18 and 19 show that the concentrations of CBOD₅ and total suspended solids in the effluent were well within the limits required in this consent. They also show an improving trend in the quality of the effluent. This, together with the management of the system, was fully compliant with the consent to discharge treated effluent to water.

In addition to the discharge to water consent, the Alliance plant at Makarewa has consent to discharge effluent to land. These consents complement each other in that when the soil moisture and river levels are low, effluent can be applied to land and effluent can be discharged to the river when the river and soil moisture levels are higher.



This year the discharges to land were well managed and generally fully compliant with the consent. The only issue identified was that effluent was applied to land on two occasions when the soil moisture levels were marginal (however no immediate impact on the environment was detected).

Alliance staff identified a significant change in water quality in one of the groundwater monitoring sites. This was suspected to have been impacted by a leaking underground main line. This main line has been isolated and is currently being investigated. No final outcome had been determined when this report was prepared.

Complaints and self-reported incidents

One incident of an objectionable odour was reported to Environment Southland by a member of the public. The odour was investigated and confirmed to be objectionable and to have originated from the rendering plant at Makarewa. Unfortunately, due to a breakdown in communication between Environment Southland and Alliance, the cause of the odour was not able to be established.

Table 5: Alliance Group Limited Makarewa Plant – Consent Performance Summary

<i>Issue</i>	<i>Score</i>	<i>Comments</i>
Provision of data/results	Excellent	Data was reported on time and was completed as required by the consent.
Compliance with consent conditions	Very good	Good management of the treatment system has resulted in no compliance issues with effluent disposal. The only consent breach was one drawn to the attention of Environment Southland by Alliance staff.
Responsiveness to issues	Excellent	Alliance management responded promptly and personally to all issues that arose during the year
Keeping Environment Southland informed of intentions, changes, etc.	Excellent	Alliance staff were very good at communicating their intentions.

Bouquet

During a performance monitoring programme, additional to routine consent requirements, Alliance staff discovered that the level of total particulate matter being discharged from one of the boilers exceeded the consent limits. This was drawn to the attention of Environment Southland and an inspection of the multi-cyclone discovered that some of the cones needed servicing. This has been completed and the boiler will be tested during the season to confirm that it has returned to full compliance.

This level of communication and commitment to consent compliance is applauded and encouraged throughout other industries in Southland.



3.1.3 Alliance Group – Mataura

Monitoring

Alliance Group Mataura holds a number of discharge, water use and land use consents. Listed below are the discharge consents that require regular monitoring:

- to discharge wastewater to the Mataura River;
- to discharge cooling water to the Mataura River;
- to discharge contaminants to air from the meat plant; and
- to discharge sludge to land on selected properties.

The Alliance meat processing plant is situated in the middle of the Mataura township and, because of its location, there is no immediate access to sections of land. The company has developed a physio-chemical treatment system, built on site, to enable it to operate within the land restrictions on site. The treated water is discharged to the Mataura River and the solid waste removed from the treatment system is discharged to land in the Northern Southland area.

This system has evolved with the changing consent requirements and is now beginning to produce reasonably good quality of effluent consistently. This can be demonstrated in the quality of the carbonaceous biochemical oxygen demand (CBOD₅). In the 2004/05, 2005/06 and 2006/07 seasons there were several incidents when the CBOD₅ concentration exceeded the consent limit. Investigations were undertaken and modifications made to isolate and remove contaminants contributing to these incidents. The frequency of non-compliant events reduced in subsequent years, until this year when no incidents were recorded (Figure 20).

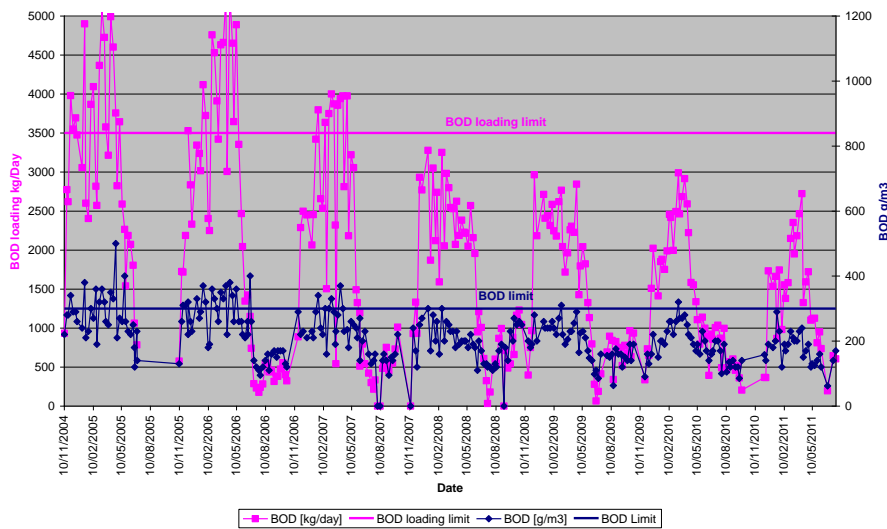


Figure 20: Concentration of carbonaceous Biochemical Oxygen Demand in the Alliance Group Mataura discharge over the last seven seasons.



The improved management and understanding of the system has been good, but the mechanical nature of the whole piping network and treatment system increases the risk of breakdowns. Compounding this is the size of the treatment plant, where there is limited containment capacity to hold effluent back in the event of failure. This increases the risk of a consent breach. This was evident this year in the dissolved reactive phosphorus (DRP) loading results in the discharge (DRP loading is calculated by multiplying the DRP concentration by the volume of effluent being discharged and correcting that to read kg of DRP per day). When the plant was operating well, the quality of the effluent was consistently good and well within the consent requirements of maintaining the DRP loading below 14.4 kg/day. This can be seen in Figure 21.

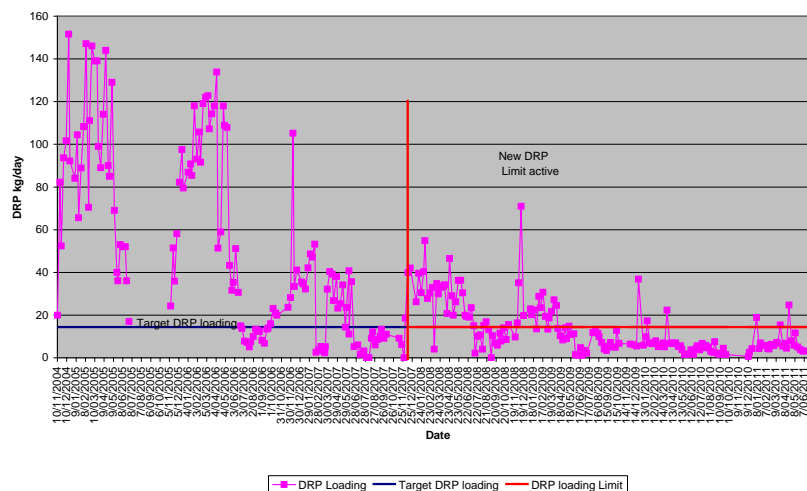


Figure 21: Dissolved Reactive Phosphorus (DRP) loading in the Alliance Group Mataura discharge over the last seven seasons.

This year the quality of the effluent DRP loading was consistently very good, however there were three occasions when the limit was breached. Once identified Alliance staff alerted Environment Southland and investigated the problem. On all but one occasion the cause was traced to mechanical failures:

- one incident could not be identified;
- one was the result of a system blockage in one of the meatworks departments; and
- the other was found to be the result of a failing valve in the treatment system.

The overall performance of the system and action following any incident was good, but non-compliance has been detected which is of concern and needs to be eliminated.

This season the disposal of the solid waste to land in the Northern Southland region was good, with the exception of three minor incidents of non-compliance. Last year these systems were modified and improved,



however Alliance staff need to be vigilant to ensure full compliance when contractors are applying waste to land

The boiler monitoring report was completed this year, with the report finding that the particulate discharge was fully compliant with the air discharge consent. However, it was concerning to note that Environment Southland confirmed two incidents of an objectionable odour being detected beyond the property boundary this season.

Complaints and self-reported incidents

Environment Southland staff investigated an incident of stock damaging a stream bank and causing water quality issues in a small stream. This incident was confirmed and a warning was issued. On notification of the incident Alliance removed the stock from that area.

Table 6: Alliance Group Limited Matura Plant – Consent Performance Summary

<i>Issue</i>	<i>Score</i>	<i>Comments</i>
Provision of data/results	Excellent	Data was reported on time and was completed as required by the consent.
Compliance with consent conditions	Marginal	Generally the compliance was reasonable. However there were a number of non-complying events: 3 DRP loading non-compliances, 2 confirmed objectionable odour incidents and 3 minor incidents of non-compliance in the land application of the sludge.
Responsiveness to issues	Excellent	Alliance management responded promptly and personally to all issue that arose during the year.
Keeping Environment Southland informed of intentions, changes etc.	Excellent	Alliance staff were very good at communicating their intentions.

3.1.4 Blue Sky Meats (NZ) Limited

Blue Sky Meats (NZ) Limited's processing plant has four current discharge consents which require monitoring, they are:

- to discharge meat processing and rendering plant wastewater to land via a spray irrigator:
 - ◆ monthly sampling of waterways;
 - ◆ annual sampling of soil;
 - ◆ annual report summarising monitoring results;
- to discharge offal and wool wastes to ground via an offal pit:
 - ◆ records of offal pit usage;
- to discharge contaminants to the air from a meat processing plant, rendering and blood drying plant and associated boilers:



- ◆ boiler service & maintenance records to be kept;
 - ◆ site management plan;
 - ◆ record of odour complaints;
- to discharge wastewater to land via soakage:
- ◆ groundwater sampling.

Blue Sky Meats (NZ) Limited operates an export meat processing plant at Morton Mains, Southland. During peak season the boning room operates 20 hours per day, seven days a week. Liquid waste from the processing plant is screened to remove large particulate matter and disposed of via irrigation to land.

Monitoring Compliance

As specified in the Regional Water Plan for Southland, the quality of the surface water samples taken at the specified locations at Blue Sky Meats (NZ) Limited are assessed against ANZECC lowland river values, in conjunction with Class D water quality standards. There were four occasions during the 2010/11 monitoring period when the ammoniacal nitrogen levels and three occasions when *E. coli* levels exceeded the maximum acceptable values for water quality. Figures 22 and 23, below, show the difference between the results of the upstream and downstream monthly samples.

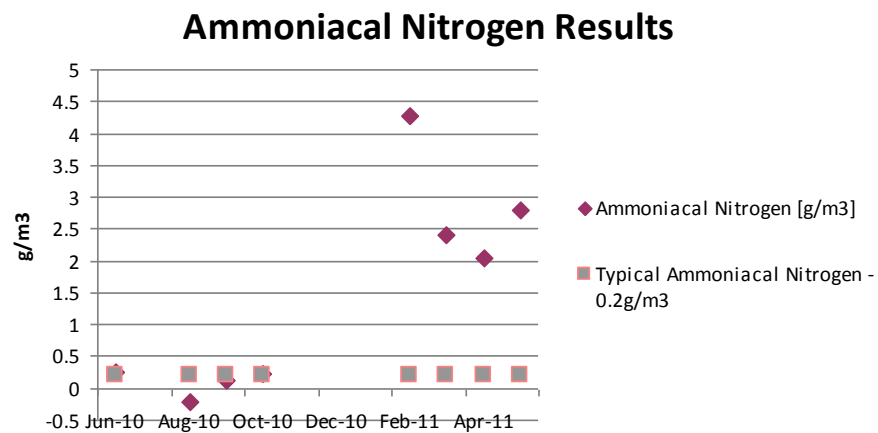


Figure 22: Difference between upstream and downstream ammoniacal nitrogen results



E Coli Results 2010/11

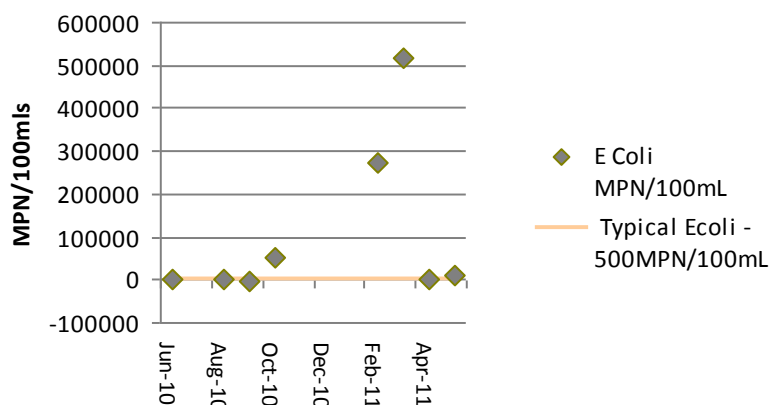


Figure 23: Difference between upstream and downstream *E. Coli* results

Complaints and self-reported incidents

Environment Southland confirmed two incidents at Blue Sky Meats (NZ) Limited during this monitoring period. One of these was a discharge to land, which required no further action from the Council. The second, which was a discharge to water, was more serious and an Enforcement Order is in the process of being imposed.

Table 7: Blue Sky Meats – Consent Performance Summary

Issue	Score	Comments
Provision of data/results	Good	The provision of data and follow up information after has greatly improved.
Compliance with consent conditions	Poor	Poor sample results with several breaches of water quality standards resulting from discharges to water.
Responsiveness to issues	Good	Continued improvements to responsiveness, identified issues to be addressed and provided information regarding poor sample results.
Keeping Environment Southland informed of intentions, changes etc.	Good	Communication with Environment Southland continues to improve.

3.1.5 South Pacific Meats

South Pacific Meats holds the following resource discharge consents that require inspection:

- to discharge stormwater containing contaminants into the New River Estuary:
 - ◆ stormwater discharge quality inspection;



- to discharge contaminants to the air from a rendering plant, wastewater treatment plant, boiler and associated processes:
 - ◆ boiler service reports;
 - ◆ odour complaint records.

Inspection Compliance

The stormwater discharges were sampled in May 2011 after a rainfall event that allowed the sample to be taken (the consent states: *the sample shall be taken no more than 12 hours after a significant rainfall event – that is accumulated rainfall greater than 25 mm in a 48 hour period*). The rainfall was recorded at 28.5 mm, and the results of the sample showed that the dissolved oxygen was slightly suppressed which was likely to be due to the site of the sample, but the other results were satisfactory.

Complaints and self-reported incidents

During the 2010/11 inspection period, Environment Southland received eight complaints with regard to odour escaping beyond the boundary. Although five of these events were not confirmed as being objectionable or offensive, three were. Warning letters were issued and costs recovered. The reason for the breach was that the cover on the pond was damaged. Updates were received from the plant manager during the remedial works and the pond cover is now fully functional. No complaints have been received since the works have been completed.

3.1.6 Prime Range Meats Limited

Prime Range Meats Limited (PRM) is a meat processing and rendering plant in Invercargill on the banks of the Waikiwi Stream. It employs 100-120 people during the processing season. The plant processes a range of livestock including sheep, beef and bobby calves for local and export markets. The company also has a rendering plant that processes the bi-products generated at the site.

Monitoring

Air Discharge Permit

The Prime Range Meats Limited processing plant currently holds a resource consent to discharge contaminants to the air from a meat works and rendering plant, including a wastewater treatment system.

The monitoring data for the bio-filters and anaerobic pond was fully compliant with the consent requirements. Two odour complaints were received this year, however they were unable to be confirmed by the investigating officers.

Monitoring of the discharge from the boiler is required biennially. This monitoring was undertaken during July 2010. The average concentration of



particulate matter was 586 mg/dsm³ and exceeded the consent limit of 500 mg/dsm³. PRM has implemented measures that should make the particulate matter discharge compliant.

Water Discharge Permit

Prime Range Meats Limited is currently operating under Rights of Continuance under Section 124 of the Resource Management Act (RMA) 1991 and holds an expired resource consent to discharge up to 1500 m³/day of treated wastewater to the Waikiwi Stream, approximately 500 metres downstream of the West Plains Road Bridge.

The effluent quality fully complied with the carbonaceous biochemical oxygen demand (cBOD₅) concentration and the total suspended solids (TSS) limits specified in the consent during the year (Figures 24 and 25).

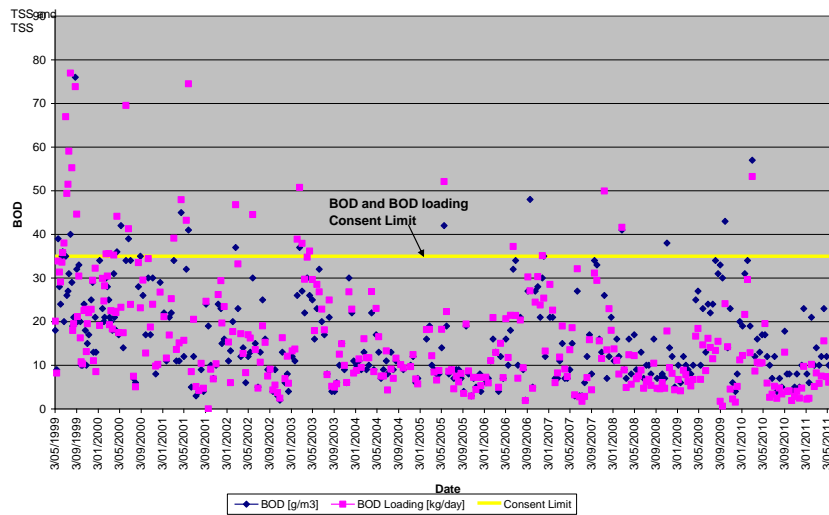


Figure 24: Concentrations of cBOD₅ and BOD loading in the Prime Range Meats effluent (1999 – 2011) and the current consent conditions.

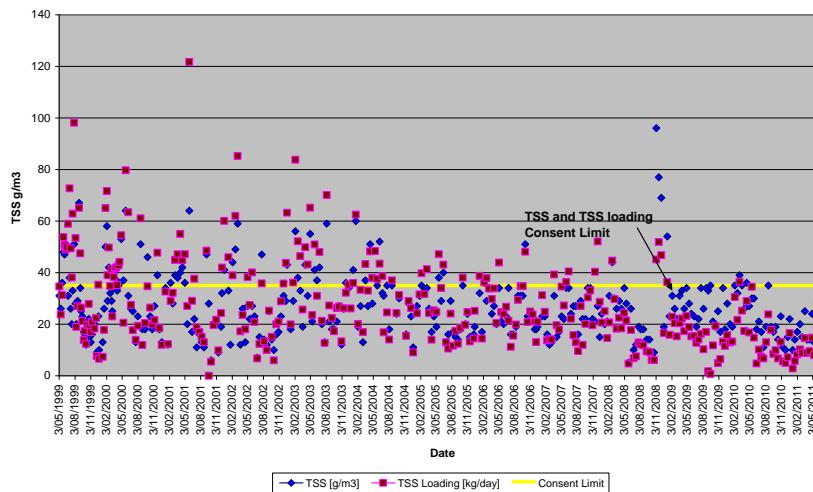


Figure 25: Concentrations of TSS and TSS loading in the Prime Range Meats effluent (1999 – 2011) and the current consent conditions.



The TSS and CBOD₅ limits were imposed on the discharge to minimise the adverse effects that the discharge may have on the receiving environment. Total suspended solids have the potential to smother aquatic life and reduce both the suitable habitat for macroinvertebrates and the ability of light to penetrate water. The CBOD₅ measures the amount of organic material in a waterway which may consume oxygen. A high CBOD₅ means that there is potentially less oxygen available for aquatic life, which can lead to stress, or in extreme situations, suffocation of aquatic life.

When the discharge to water permit was issued to PRM in March 1999 the in-stream monitoring conditions were based on the best information known at the time. PRM is currently compliant with the older standards and has been fully compliant with its in-stream monitoring requirements during the year. However, as new information and facts become established rules, including the ANZECC guidelines, they are updated to reflect the new scientific developments. The current water quality standards started coming into effect around 2000 and the Regional Water Plan that incorporates these standards, was signed off in March 2010. The new standards in the Water Plan require in-stream microbiological monitoring which the expired consent did not. The trigger guidelines for the acceptable in-stream ammonia nitrogen levels are also significantly less than the expired consent allowed for (refer blue line in Figure 26, below).

PRM has looked at options to reduce the levels of ammonia nitrogen in the discharge and the in-stream ammonia nitrogen levels. Ammonia nitrogen in waterways, above the ANZECC guidelines, has the potential to be toxic to aquatic life.

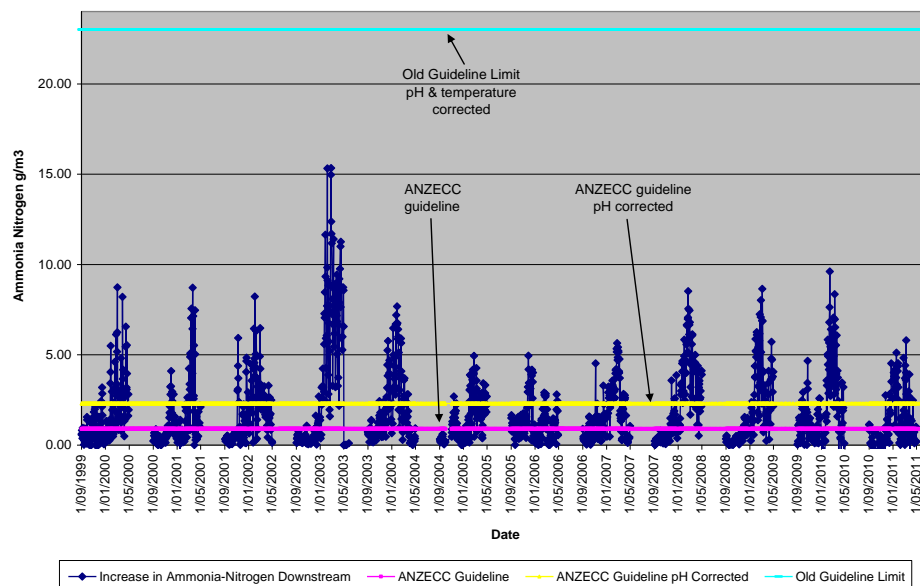


Figure 26: In-stream ammonia nitrogen from PRM discharge with respect to previous seasons and ANZECC guidelines.



The macro invertebrate monitoring report for 2010 was not done because of misunderstanding within PRM. The macroinvertebrate monitoring is required to be undertaken annually, therefore this was a breach of the consent. The purpose of macroinvertebrate monitoring is to determine whether the discharge is having a significant impact on the macroinvertebrate communities in the receiving environment. The 2009 report showed that there had been no significant impact, however the effects of the discharge on the macroinvertebrate community for 2010 have not been able to be determined.

Complaints and self-reported incidents

Two odour complaints were received by Environment Southland from the public during March 2011. However, no odours were able to be confirmed during the investigations.

No complaints or self-reported incidents were reported by PRM during the year.

Consent Issues

A pre-hearing meeting was held with PRM and submitters on 27 January 2011. Since then work has continued on developing conditions to try to resolve the application. There are a number of points that have not been resolved and a hearing is likely to be required. This is expected to happen within the next few months.

Table 8: Prime Range Meats – Consent Performance Summary

<i>Issue</i>	<i>Score</i>	<i>Comments</i>
Provision of data/results	Good	The data for the routine water quality monitoring has been supplied in a timely manner for the discharge to water permit, however there was some delay in the receipt of some of the air discharge permit monitoring results.
Compliance with consent conditions	Good	The discharge was compliant with the old consent conditions. Macroinvertebrate monitoring was not undertaken for the water permit. Only one breach of the air permit was recorded.
Responsiveness to issues	Excellent	Staff have responded to notifications of odour complaints, have been very responsive when dealing with written correspondence and have become proactive at checking results for consent breaches.
Keeping Environment Southland informed of intentions, changes etc.	Very Good	Information has been shared regarding issues that have arisen that may create odour or cause the discharge to exceed consent limits



3.2 Dairy Industry

3.2.1 Fonterra, Edendale

Fonterra's Edendale plant is one of 26 dairy manufacturing sites in New Zealand owned and operated by the Fonterra Co-operative Group Limited. It is currently the largest dairy food manufacturing site in the world.

Fonterra's Edendale plant holds the following resource discharge consents that require inspection:

- to discharge dairy factory wastewater on to land at four farm locations, requiring:
 - ◆ groundwater inspection;
 - ◆ soil inspection;

- to discharge treated dairy processing wastewater, cleaning water, condensate, stormwater and denitrification and demineralisation water to the Mataura River, requiring:
 - ◆ surface water inspection;
 - ◆ macroinvertebrate study;
 - ◆ discharge quality inspection;

- to discharge contaminants and odour to the air from a dairy factory and ancillary operations, requiring:
 - ◆ air discharge inspection.

Inspection Compliance

For the inspection period 2010/11, Fonterra reported that the discharge to the Mataura River occurred on 40 more days than during the same period the previous year. This particular consent is a contingency for when irrigation discharge to land is unsuitable because of weather induced soil saturation. At no point during these occurrences did the discharge exceed the consent limit.

There have been some breaches during the reporting period, including the total suspended solids exceeding the limit set in the consent, as well as nitrogen concentrations exceeding the consent limit for a one week period. On both of these occasions investigations took place to investigate why they happened and why it took the time it did to identify the issue. Measures have been implemented to remedy the situation.

All breaches have been reported to Environment Southland with reasons behind how they happened and explanations of what measures have been put in place to avoid future non-compliance. All monitoring and reporting is being received by Environment Southland in a full and timely manner and Fonterra is regularly providing evidence to show continuous review and improvements that are being undertaken.



Complaints and self-reported incidents

Environment Southland received four complaints relating to Fonterra Edendale from members of the public during the 2010/11 inspection period. Three of these related to milk spills and were cleaned up by Fonterra with little consequence. The fourth was a confirmed objectionable odour, which originated from an irrigator and was stopped as soon as it had been identified.

Table 9: Fonterra, Edendale – Consent Performance Summary

<i>Issue</i>	<i>Score</i>	<i>Comments</i>
Provision of data/results	Excellent	Good processes set up to ensure data is provided on time and in full
Compliance with consent conditions	Marginal	More than one breach of suspended solids and of the nitrogen concentrations, plus the phosphorous levels in the stormwater still needs attention
Responsiveness to issues	Excellent	Fonterra provided timely reports and action plans for issues.
Keeping Environment Southland informed of intentions, changes etc.	Excellent	Environment Southland was kept informed of any activities or maintenance undertaken, when there was the potential for an incident to occur.

3.2.2 Open Country Dairy Limited, Awarua

Open Country Dairy Limited (Open Country) holds the following resource discharge consents which required inspection this year:

- to discharge condensate from a milk powder plant to a farm drain:
 - ◆ discharge quality inspection;
 - ◆ surface water inspection;
- to discharge contaminants to the air from a milk processing plant and boiler.

Inspection Compliance

At Open Country cow water condensate, which is extracted from milk during the evaporation process, is discharged to a farm pond. The condensate from the process is continuously monitored by inline sensors before discharge. If the condensate is compliant it is released to the farm pond then monitored at strategic points as it discharges to the estuary. When results are non-compliant, the condensate is diverted into the main wastewater system for disposal.

During the 2010/11 inspection period there were a number of occasions when the condensate was non-compliant, which were reported to Environment Southland. Open Country described its intended corrective



actions, including installing an auto sampler to take grab samples every hour during the operation. This will enable a complete picture of the whole process to be developed and help guide future improvements to bring quality of the discharge in line with the consent. The company's annual report also includes reference to investigations that it is undertaking for future developments to its operation.

There have been no reports of non-compliance with air discharges from Open Country. Stack testing has been delayed this season and was expected to be done in August 2011. An independent survey was due to be carried out in September 2011. The results of both sets of monitoring will be supplied to Environment Southland on completion. The annual maintenance of the boiler has also been completed and a report on this is included in the annual report.

Complaints and self-reported incidents

During this inspection period Environment Southland received one complaint regarding Open Country. The incident was a small milk spill during a tanker transfer. A warning letter was issued and Open Country was reminded of its responsibility to have procedures in place to prevent any future discharges.

Table 10: Open Country Awarua – Consent Performance Summary

<i>Issue</i>	<i>Score</i>	<i>Comments</i>
Provision of data/results	Very Good	Annual report received. Sample results need to be sent within three months of the sample date.
Compliance with consent conditions	Good	Breaches were addressed by Open Country, further investigation is to be carried out to eliminate the issue as previous corrective actions have not been successful
Responsiveness to issues	Excellent	Issues were addressed in a timely fashion
Keeping Environment Southland informed of intentions, changes etc.	Excellent	Open Country has kept Environment Southland informed of intentions

3.3 Energy Industry

3.3.1 Pioneer Generation Limited

The electricity generation station at Monowai, owned by Pioneer Generation Limited (Pioneer), is a community-owned electricity provider and wholesaler. The station was owned by Trust Power until 2003, when it was sold to Pioneer, which is owned by the Alexandra-based charitable trust, the Central Lakes Trust. The company operates 12 power stations in Central Otago and Southland.



Pioneer holds 18 consents with Environment Southland for its Monowai station, these consist of:

- 11 discharge permits to water;
- 1 discharge permit to land;
- 2 water permits;
- 1 to dam and divert;
- 1 to take;
- 4 land use permits.

The consents are for the ongoing operation and maintenance of the Monowai Power Station. They control the take, use and discharge of water for power generation, while maintaining minimum flows in all of the existing waterways.

Eight of the discharge permits and one land use permit contain no monitoring or reporting conditions. These consents relate mainly to maintenance works or the discharge of cooling water. The remaining three land use permits relate to modifying and maintenance of the fish passage, as well as maintenance of the Monowai outlet. One of the discharge permits relates to the discharge of herbicide to land. These consents have the requirement that Environment Southland is notified prior to the beginning of work and once it is completed. No work was undertaken on these permits during the last reporting period.

Pioneer holds a permit to dam and divert the waters of the Monowai River by means of an existing diversion weir to an existing canal and to take and use water for hydroelectric power generation purposes and maintenance of residual flows.

This consent was issued in March 2003 (to Trust Power) and required that once the restrictions of the Biosecurity Act (for *Didymosphenia geminata* (Didymo)), were lifted the fish passage was to be modified to allow improved migration of fish. A monitoring programme to assess the effectiveness of this was also to be established and the results reported to Environment Southland by 31 July each year. The restrictions under the Biosecurity Act were not removed until May 2007. The fish passage was designed and installed by the end of 2008. Discussions are currently still underway with Fish and Game Southland to determine the most effective monitoring programme.

Pioneer also holds a permit to discharge water to the Waiau River from the tailrace of the power station.

As above, this consent was issued in March 2003 and required that a fish passage was to be installed at the tailrace discharge to improve migration of fish to the lower Monowai River, once the Biosecurity Act restrictions were lifted. Pioneer is in discussions with NIWA and other parties to finalise the design of the fish passage. The passage is expected be installed later in 2011 and the monitoring programme provided to Environment Southland for approval.



Monitoring

NIWA undertakes the monitoring that is required by the consents and this information is reported to Environment Southland on both a quarterly and annual basis.

Pioneer holds a permit to dam by means of an existing earth dam and control structure, and to take and use water for the Monowai hydroelectric power scheme at Monowai, which requires monitoring.

This consent requires that the lake level is maintained to the greatest degree practicable within the main operating range (206.7 m–208.2 m). However, the consent also specifies the maximum period when flows may exceed these levels. At no time between July 2010 and March 2011 did the lake level fall outside of the main operating range (see Figure 27).

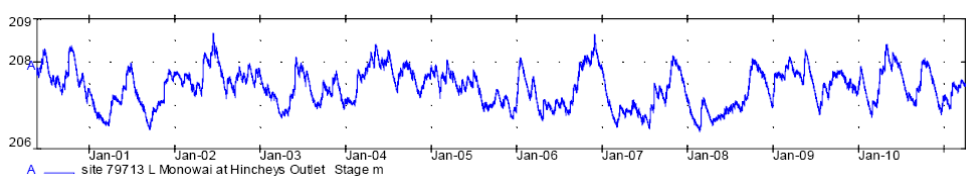


Figure 27: Lake Monowai at Hinchey's Outlet, lake level from 13 May 1977 to 31 March 2011.

Pioneer also holds the following discharge permits that require monitoring:

- to discharge Lake Monowai waters to the Monowai River for hydroelectric power generation and to release residual and flushing flows;
- to discharge water to the Monowai River immediately downstream of the existing diversion weir for the release of residual flows, flood flows and flushing flows.

During the period July 2010–March 2011 the flow from the lake control structure was maintained above the minimum flow (3 cumecs) required by the consents. The flow regimes outlined in the consents were also achieved for this period. The regime outlines what flows are allowed at what lake levels and how many days per year these flows and lake levels are allowed. The minimum flow (0.5 cumecs) from the diversions weir was also achieved between July 2010 and March 2011. The regime of releasing flushing flows down the lower Monowai River as required by the consent was also complied with during the last monitoring period.

Incidents

Environment Southland received no complaints from the public relating to Pioneer during the last year. Pioneer did not self report any incidents to Environment Southland during that time.



3.3.2 Meridian Energy Limited

Meridian Energy Limited (Meridian) holds a series of consents to operate the Manapouri Power Scheme. The following are the main resource consents associated with the power scheme:

- to discharge fresh water and contaminants to the water at Doubtful Sound, Deep Cove by means of the artificial discharge channel;
- to dam and divert the waters of Lake Te Anau by means of a control structure at the lake outlet at Te Anau;
- to discharge the waters of Lake Te Anau to the bed of the Waiau River immediately downstream of the Lake Control Structure at Te Anau;
- to dam and divert the waters of Lake Manapouri and the Waiau and Mararoa rivers by means of a structure near the confluence of the Waiau and Mararoa rivers, and to dam and divert the waters of the Mararoa River;
- to discharge the waters of Lake Manapouri and the Waiau and Mararoa rivers to the bed of the Waiau River below the Manapouri Lake Control Structure at Te Anau;
- to take and use the waters of Lake Manapouri through intake gates at the Manapouri Power Station at West Arm;
- to dam and divert the waters of Lake Manapouri and the Waiau and Mararoa rivers for hydro-electric power generation, as part of the Manapouri power scheme, at the Manapouri Lake Control Structure;
- to take and use water from Lake Manapouri for hydro-electric power generation, as part of the Manapouri power scheme, at the intake gates of the Manapouri Power Station at West Arm;
- to discharge fresh water from hydro-electric power generation at the Manapouri Power Station tailrace to the waters of Doubtful Sound at Deep Cove.

Background

Built in the 1960s and upgraded during the 1990s, the Manapouri Power Scheme was designed to generate electricity using water fed into lakes Te Anau and Manapouri and the Mararoa River. This water is stored in the lakes and controlled using structures at the outlet of Lake Te Anau (Te Anau Lake Control Structure) and in the Waiau River, downstream of its confluence with the Mararoa River (Manapouri Lake Control Structure). The water is then channelled through the West Arm Power station in Lake Manapouri and is discharged through two tunnels to Deep Cove, Doubtful Sound.

Monitoring

In 2009 Meridian applied for consent to increase the volume of water to be discharged to Doubtful Sound. Referred to as the Manapouri Tailrace Amended Discharge (MTAD) these consents were granted in August 2010. However, at the time of writing this report, these consents had not been exercised and the maximum discharge was fully compliant with the original consents (the volume discharged did not exceed 510 m³/s).



The main resource consents require a series of reports to be compiled. These have been completed in full and on time. The “Meridian Annual Monitoring and Compliance Report - Manapouri, Te Anau and Waiau Catchments” had only recently been received and had not been able to be fully assessed at the time of preparing this report.

In late April, a large flood event occurred in the Fiordland-Waiau River area, when the maximum flow recorded in the lower Waiau River was 1,945 m³/s. This did not trigger the *Post-flood* limit of 2,000 m³/s condition in the resource consent (with respect to the Tuatapere trigger limit), requiring Meridian to undertake an assessment of the character and morphology of the lower Waiau River channel. However, because the flow was within the measurement error for the flow measurements, Meridian chose to undertake this survey. The report has been drafted but not yet completed.

On eight occasions the flow in the lower Waiau River briefly fell slightly below the consented limit. This is electronically recorded and remedied, therefore the impact of these events were no more than minor.

Complaints and self-reported incidents

One incident was reported by Meridian. While undertaking maintenance work at the Manapouri Lake Control Structure the company struck difficulties and discharged a maximum of 0.5 L of hydraulic oil into the river. On discovery of the leak, the machine was immediately removed from the water and remedial action undertaken.

A formal investigation was completed and reported to Environment Southland to minimise the risk of a repeat incident.

Table 11: Meridian Energy Limited – Consent Performance Summary

<i>Issue</i>	<i>Score</i>	<i>Comments</i>
Provision of data/results	Excellent	Data was reported on time and was completed as required by the consent.
Compliance with consent conditions	Very good	Good management of the system resulted in a very high level of performance. The only area of non-compliance noted was when the lower Waiau River flow fell below the minimum levels. The impact was no more than minor
Responsiveness to issues	Excellent	Meridian Energy Ltd management responded promptly and personally to all issues that arose during the year
Keeping Environment Southland informed of intentions, changes etc.	Excellent	Meridian Energy Ltd staff were very good at communicating their intentions.



3.4 Manufacturing Industry

3.4.1 New Zealand Aluminium Smelters Limited

New Zealand Aluminium Smelter Limited (NZAS) is one of New Zealand's largest exporters and is located on the Tiwai peninsula at Awarua, Invercargill. NZAS runs four pot-lines, of which the fourth pot-line produces some of the purest aluminium in the world. With the economy starting to recover from the global economic recession, and all the cells being back on line, NZAS was able to operate between 95 per cent to full production capacity for the 2010/11 period and produced 350 kilotonnes of aluminium.

Monitoring

NZAS holds the following resource discharge consents that require monitoring:

- discharge and coastal permit for discharges from the north, south and west drains;
- discharge permit for treated sewage to land;
- coastal permit for the discharge of treated effluent;
- air discharge consent from the aluminium smelter and related activities;
- discharge consent to land at the smelter's landfill site.

A wide range of monitoring is undertaken to measure the environmental impact the smelter has on the environment. This includes monitoring of:

- the air being discharged from the main stack;
- the air being discharged from the main smelting buildings;
- the ambient air quality at several sites in the Awarua and Bluff areas;
- the vegetation and pine needle quality with respect to fallout from the air;
- water quality in Awarua Bay and Foveaux Strait;
- groundwater quality;
- gaseous emissions.

In addition to the resource consents held by the company, the Regional Coastal Plan for Southland contains a section that allows the company to operate the Tiwai wharf. The wharf is operated under an agreement between Environment Southland and NZAS. This agreement is currently in the process of being renewed. NZAS took over the wharf maintenance from South Port during the fourth quarter of 2010.

Various monitoring is conducted routinely by NZAS, as required by its different resource consents. Environment Southland also regularly undertakes audit monitoring to confirm the validity of the results. Overall, there was good agreement between the audit results for NZAS and Environment Southland. This year all monitoring results were fully compliant with the respective resource consents.



The only issue that arose was in October 2010, when results from the dust monitor reached the “action shall be taken” trigger level. However, these results were brought back to normal operating levels within a few days and the consented limits were not breached.

The gaseous fluoride levels are also now back to the low levels seen before the loss of a transformer in 2008.

Complaints and self-reported incidents

No incidents were self-reported by NZAS to Environment Southland between 1 July 2010 and 30 June 2011.

Environment Southland received one complaint from the public about smoke coming from NZAS in April 2011. However, it was confirmed that the source of the smoke was not NZAS, but a large fire in the Greenhills area.

General

NZAS has been working alongside Taha Asia Pacific Limited to set up the pilot plant on the NZAS site for the processing of aluminium dross. The plant is designed to remove the aluminium from the dross being produced at NZAS and from the dross currently in the NZAS landfill. Taha Asia Pacific Limited was granted an air discharge permit on 1 July 2011 for the processing of the aluminium dross. Work at the plant was expected to begin from 1 August 2011.

Table 12: New Zealand Aluminium Smelters – Consent Performance Summary

Issue	Score	Comments
Provision of data/results	Excellent	Data is provided on time at monthly, quarterly, annually and five yearly intervals
Compliance with consent conditions	Excellent	There were no significant non-compliance issues
Responsiveness to issues e.g. incidents	Excellent	Any issues or incidents are immediately responded to, thoroughly investigated and procedures implemented if necessary. All findings and results are reported back to Council
Keeping Environment Southland informed of intentions, changes etc	Excellent	NZAS staff are very pro-active in communicating with Environment Southland when there is potential for smelter operations to impact on the environment.

3.4.2 Dongwha Patinna New Zealand Limited

Dongwha Patinna New Zealand Limited (Dongwha) is a mixed density fibreboard (MDF) manufacturing plant located south of the Matura township. Dongwha supplies products to the New Zealand market, as well as exports to the United States, Japan, Australia, China, Southeast Asia and Taiwan. It produces standard MDF boards, as well as a low formaldehyde variety which countries like Japan require to meet specific industry standards.



Monitoring

Dongwha Patinna New Zealand Limited (Dongwha) required monitoring of the following resource discharge consents:

- to discharge contaminants to the air from fibreboard processing, including the treatment of wastewater;
- to discharge effluent and treatment pond seepage to land from a fibreboard factory;
- to discharge untreated stormwater and treated wastewater to water;
- to discharge stormwater to land;
- to discharge from a tile drain to a watercourse.

To date Dongwha has still not discharged wastewater to the river. Instead, all irrigation has occurred to land. Dongwha holds a consent that allows it to discharge wastewater to the river during poor weather conditions, or water logging of irrigation area soils. The irrigation of wastewater to land was fully compliant with consent limits.

The Dongwha site has a significant area of sealed yards and rainfall on to these areas is classified as stormwater. The stormwater on this site can collect contaminants, including sediment, during the early stages of a rainfall event. Therefore the stormwater systems at Dongwha have been designed to retain the 'first flush' stormwater for further treatment and only discharge the remaining, relatively clear, stormwater to the Matura River. Monitoring of the stormwater discharge and the Matura River detected no significant impact on the river, therefore Dongwha has been fully compliant with the stormwater discharge to water consent.

The formaldehyde emissions from the drier cyclone, the press and the energy centre are monitored twice a year by an external International Accreditation New Zealand (IANZ) accredited consultant (Table 13). The emissions from both sets of monitoring were well within consented limits. Particulate emissions from the drier cyclones are monitored once a year and the emissions were within consented limits.

Table 13: Formaldehyde concentrations at the drier cyclone and press

	Drier Cyclone		Press	
	West (kg/hr)	East (kg/hr)	Total (kg/hr)	Capture (%)
October 2010	5.5	5.9	0.064	84
April 2011	4.1	6.6	0.22	87
24 Month Average	4.2	5.1	0.15	88
Consent Limit*	8.25	8.25	0.5	>75

* The consent limit is a 24 month moving average

The monitoring of volatile organic compounds (VOC) is required by the consent every two years. This monitoring was undertaken in October 2010. The sampling and testing methodology captures a wide range of compounds and is not restricted to those required by this consent. As expected, the compounds with the highest emission rates were the pinenes, which emit a



pine-like odour. All other compounds identified were of moderate to low concentrations, or near the detection limits of the test method.

Dongwha environmental specialists are IANZ accredited in the use of the aerolaser, which they use to monitor the ambient air quality at six sites around the manufacturing plant. The aerolaser is a real time monitoring instrument that draws in air continuously and measures the formaldehyde concentration. Only results that are obtained when the wind is blowing from the plant towards the aerolaser (i.e. wind positive) are included in the monitoring reports. The aerolaser is mounted on a trailer for easy relocation to the monitoring sites and is at each site for at least one month. The concentrations of formaldehyde measured were all well within the resource consent limits (see Table 14).

Table 14: Summary of the annual air quality results recorded by the aerolaser

Wind Positive (30 minute Average Period)			
	Number of results	Formaldehyde Concentration	
		Average ($\mu\text{g}/\text{m}^3$)	Maximum ($\mu\text{g}/\text{m}^3$)
Perkin's Hill	385	0.4	7.2
Perkin's Deer Shed	275	1.2	13.6
Weatherburn Road	503	0.9	21.5
Johnstone's property	336	0.6	6.3
Duncan's property	169	0.4	1.8
Solid Energy's property	304	0.7	9.0
Resource Consent Requirements (30 minute average)		60	100

Dongwha uses a weather station to continuously monitor weather conditions including wind direction and speed. This data is reported to Environment Southland every three months, annually. Dongwha's consent requires that it collects at least 90% of valid data over any 12 month period. Issues with a damaged sensor in the third quarter of 2009, and having to replace the weather station in the first quarter of 2010, meant that by the third quarter of 2010 the average weather capture over the last 12 month period was still only 86%, despite the weather data capture being 92%. Even if 100% weather capture had been achieved the 12 month average would have only have been 89%. The 12 month average of 90% was achieved by the fourth quarter of 2010 and it has been maintained above 90% weather data capture since.

Complaints and self-reported incidents

Dongwha received three odour complaints during the year. The first was in August 2010, when a strong fume smell was noticed, however this was not reported to Dongwha until five hours after the odour was first detected and once the wind had picked up. The source of the odour was unable to be determined.

The second odour complaint was received during January 2011. An investigation determined that the screws for the burning of the speciality



sander dust were not being correctly operated. Further controls were put in place to ensure that the screws would be operated correctly.

The third complaint was received during May 2011. The source of the odour was unable to be confirmed. The aerolaser was operating in the vicinity of the complaint and the data collected from it showed formaldehyde was still significantly less than the consent limits.

Environment Southland received a call on 10 November 2010, informing us that there had been a fire at the Dongwha site. The fire was out and the scene and clean-up was being well controlled by Dongwha staff and the fire brigade at the time of the call. Foam had been used to put out the fire. The foam that had gone into the stormwater drains was being contained in the first flush basin and pumped into the wastewater. Fibre bunds were also put in place to contain any further foam and water runoff.



Figure 28: Dongwha site with rainbow in the background. One of the paddocks that now contain the irripods is in the foreground.

General

Dongwha conducted four trials of the new low formaldehyde eMDI resin during 2010/11. Two trials were undertaken during August 2010 and one each in November 2010 and April 2011. Isocyanate emissions from the cyclones and press vents (source) were tested in November 2010 so a model could be obtained that would predict what the ambient isocyanate concentrations would be. The actual ambient air isocyanate concentrations downwind of the plant and on the boundaries were also tested during all of the trials. The purpose of the testing was to observe whether ambient isocyanate concentrations complied with the Ontario limits, because



New Zealand does not have ambient air isocyanate limits. All but one of the ambient isocyanate results obtained during 2010 was below detection limits. The result that was determined was right at the detection limit. Therefore, the monitoring shows that use of the eMDI resin would easily comply with the Ontario limits. Further trials are on hold until there is sufficient market demand and price to justify using this resin.

The fourth irrigation paddock was changed over to Irripods in late January 2011. The two remaining blocks will continue to use the existing travelling irrigators, until they are changed to Irripods early in 2012.

Table 15: Dongwha Patinna – Consent Performance Summary

<i>Issue</i>	<i>Score</i>	<i>Comments</i>
Provision of data/results	Excellent	Data is provided within the monitoring report framework and within time requirements. There was one delay reporting a complaint, however consent only specifies “as soon as possible”.
Compliance with consent conditions	Excellent	All weather capture during this period was compliant with the consent however the 3 rd quarter 12 month average was less than 90% due to issues from the 2009/2010 period.
Responsiveness to issues	Excellent	Issues raised with the company have been addressed promptly
Keeping Environment Southland informed of intentions, changes etc	Excellent	Environment Southland is kept well informed.

3.5 Fertiliser Industry

3.5.1 Balance Agri-Nutrients - Awarua

Ballance Agri-Nutrients fertiliser manufacturing plant at Awarua currently holds the following resource discharge consents to:

- discharge stormwater from a fertiliser manufacturing facility to water:
 - ◆ monitor stormwater discharge quality;
 - ◆ monitor the Mokotua Stream;
- discharge contaminants to air from a process for manufacturing phosphatic based fertilisers:
 - ◆ grazing pasture monitoring.

Monitoring Compliance

During the 2010/11 monitoring period, the general compliance of both discharge consents has been excellent, with only one very minor breach (a low pH result) coming from the composite sample during November. The



condition states that the pH shall not be less than 4.5 and, on this occasion, was reported to have been 4.4. The breach was reported at the time and an investigation report was received the following week. The report included how the breach occurred and the measures that have been put in place to avoid a recurrence.

Complaints and self-reported incidents

Environment Southland has not received any complaints relating to the Ballance Agri-Nutrients Awarua site. Notification was received promptly by Environment Southland when the breach of consent was identified.

General

Ballance Agri-Nutrients continues to maintain its ISO 9001 certification, showing its commitment to quality management and continual improvement within the company. It is also working towards achieving ISO 14001 certification for the whole of the Ballance group, with the goal of becoming fully certified within the next financial year.

Table 16: Ballance Agri-Nutrients– Consent Performance Summary

<i>Issue</i>	<i>Score</i>	<i>Comments</i>
Provision of data/results	Excellent	Data is reported in full, within the required time frame.
Compliance with consent conditions	Very Good	Best practice initiatives resulting in emissions maintaining well below consent limits. With one breach of the limits for the stormwater discharge.
Responsiveness to issues	Excellent	Ballance have fully investigated issues as they arise
Keeping Environment Southland informed of intentions, changes etc.	Excellent	Communication remains excellent regarding compliance and consent conditions.

3.5.2 Ravensdown Fertiliser Co-operative Limited

Ravensdown Fertiliser Co-operative Limited (Ravensdown) was first established in 1978 and 33 years on it continues to be 100 per cent farmer-owned. Ravensdown supplies close to half of New Zealand’s agriculture fertiliser and is developing interests in the Australian fertiliser market.

Ravensdown operates two limestone quarries in Southland, one at Dipton and the other at Balfour. It holds three resource consents, which are:

- to discharge stormwater from a limestone quarry at Balfour;
- to discharge treated stormwater to water at Dipton;
- to discharge contaminants to air from the Dipton lime works.



Environment Southland staff undertake an annual inspection at each site, as well as the routine surface water monitoring required by the consents. Surface water sampling is conducted six-monthly at the Dipton site and four-monthly at the Balfour site.

The annual inspection of both the air and discharge permits at the Dipton limestone quarry and the routine surface water monitoring results found the site to be fully compliant with consent conditions.

The Balfour limestone quarry was compliant with the annual inspection. However, two of the last three monitoring results (September 2010 and May 2011) were non-compliant with consent limits. On both occasions the samples showed an increase in suspended solids and, therefore, a decrease in water clarity downstream of the discharge. The temperature in the receiving water was also reduced by more than three degrees Celsius during September 2010 when the temperature was monitored. The impacts on the receiving water from the stormwater discharge are believed to be related to the volume and time taken to release the discharge to the receiving water from the current set up. The company is looking at changing the discharge system at the Balfour site to extend the time that it takes the same volume of stormwater to be discharged to the receiving waters. No impact on the receiving waters was observed from the February 2011 receiving water sampling.

Complaints

Environment Southland has received no public complaints relating directly to the consents or operations at the limestone quarries. However, Environment Southland received one public complaint relating to the receipt and distribution of fertiliser at Bluff during February 2011. The complaint related to trucks transporting the fertiliser from the Bluff wharf to the store being uncovered, and therefore the fertiliser was spilling across the road and into the stormwater because it was raining. Ravensdown used a street sweeper to clean the road and has reminded the transport companies of the requirement to cover all loads.

3.6 Miscellaneous

3.6.1 Sawmill Industry

There are five sawmilling companies in the Southland region that hold discharge permits issued by Environment Southland.

These companies are:

- Bright Wood Sawmill
- Craigpine Timber
- Dongwha Patinna New Zealand Limited
- Findlater Sawmilling
- Lindsay & Dixon Limited



Bright Wood Sawmill

The Bright Wood Sawmill in Otautau holds two discharge permits that require inspection:

- to discharge contaminants to the air from timber processing operation;
- to discharge treated stormwater to an unnamed tributary of the Aparima River.

Bright Wood Sawmill closed for operations during July 2009 and reopened on a significantly reduced scale in October 2009. It now operates approximately four to five days a month. Issues with the timing and locations of the stormwater monitoring are currently being resolved, so no inspections have been undertaken this year.

The monitoring of the boiler is required every two years when it is operating at a minimum of 80 per cent capacity. Because the boiler has not operated at this capacity since the reduction in operations, no emission testing of the boiler stack has been undertaken. Formaldehyde testing is also required every two years, however because the company is operating at a reduced capacity and does not use any formaldehyde products, this monitoring is not currently required.

Craigpine Timber

Craigpine Timber is located in Winton and holds the following discharge permits that require inspection:

- to discharge contaminants to the air from timber processing activities;
- to discharge timber yard storm water and condensate to water.

The monitoring of the boiler is required every two years when it is operating at a minimum of 80 per cent capacity. Craigpine Timber undertook this monitoring in February 2010; therefore the next round of monitoring is not required until 2012.

Craigpine Timber has been fully compliant with the surface water consent requirements during the past year.

Dongwha Patinna New Zealand Limited

Dongwha Patinna's performance over the year is outlined in a separate item in this report (page 43).

Findlater Sawmilling

Findlater Sawmilling in Ryal Bush holds one discharge permit that requires inspection, to discharge treated stormwater and wastewater to a wetland from a sawmilling operation.



Findlater Sawmilling has been fully compliant with its consent requirements during the past year.

Lindsay & Dixon Limited

Lindsay & Dixon Limited is located in Tuatapere and, prior to 13 December 2010, held a discharge permit that required inspection, to discharge stormwater to water from a sawmilling and timber processing site.

The company was compliant with the monitoring requirements of the consent for 2010.

Lindsay & Dixon Limited now also holds a discharge permit to discharge stormwater, boiler blow-down water and sludge to land and to water.

To date, Lindsay & Dixon Limited has been compliant with the monitoring conditions of its consent.

Incidents relating to sawmill companies

Environment Southland has received no complaints from the public relating to any of the sawmilling companies during the last year. Environment Southland has also not received any self-reported incidents from the sawmilling companies.

3.6.2 Mining Industry

All mining operations within Southland require resource consent to function. These sites are inspected by staff, who ensure the conditions imposed as part of the consent are fully complied with, as well as undertaking any required monitoring including the soil, water and air.

Overall Inspections

During 2010/11, 23 mining consents were inspected throughout Southland by Compliance staff (see Figure 29). Compliance performance at the mining sites was generally very good. Only one site was found to be non-compliant with its resource consents, because samples had not been taken and equipment specified in the consent had not been installed.



Mining consents in Southland

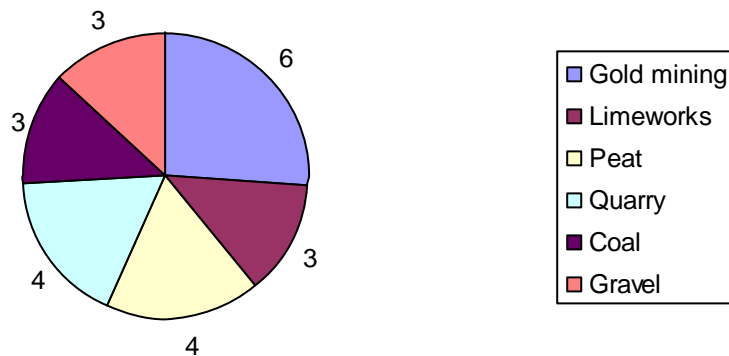


Figure 29: Number and type of mining consents inspected.

Suction Dredging

There have been several consents issued for suction dredging for gold on Southland rivers. Within the consent conditions is the requirement to submit a log indicating dredging dates and locations to Environment Southland's Compliance Manager. Only one out of four consent holders were compliant with this condition and warning letters have been sent out advising that the information must be submitted immediately, or a penalty for non-provision of data was likely to follow.

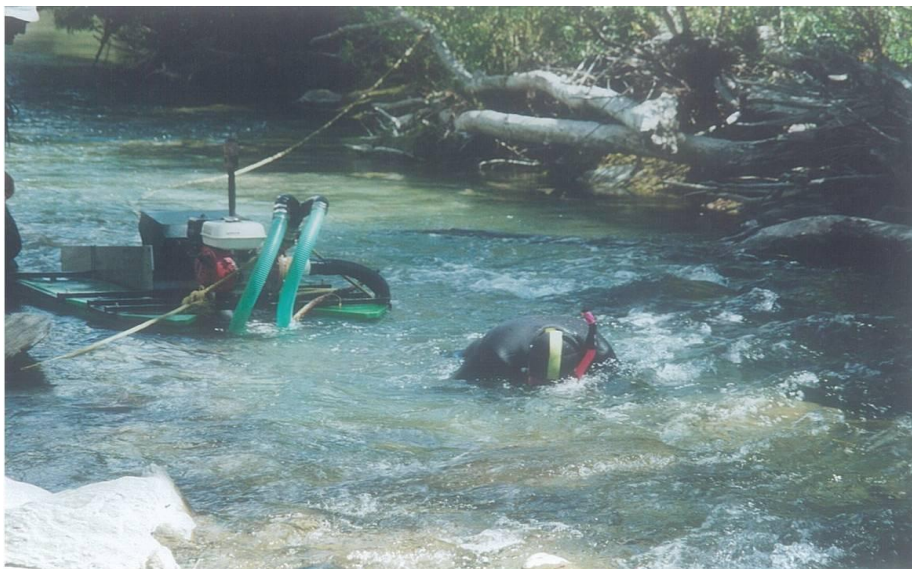


Figure 30: Suction dredge in operation.

4.0 Sewage Treatment Plants

4.1 Invercargill City Council

Listed in Table 17 is the compliance summary for the Invercargill City Council community sewage treatment systems for the period 1 July 2010 to 30 June 2011.

Table 17: Compliance summary for the Invercargill City Council community sewage treatment systems in 2010/11

Community Sewage Treatment Schemes	Consent compliance		
	Fully compliant	Partial non compliance	Significant non compliance
Invercargill sewage (Clifton)	✓		
Bluff sewage	✓		
Omaui Sewage			✓

4.1.1 Invercargill City Council – Bluff Wastewater Treatment Plant

The Invercargill City Council currently holds resource consent at Bluff to discharge treated sewage and wastewater into the coastal and marine area for the purpose of wastewater disposal in Foveaux Strait, Bluff.

The Bluff Wastewater Treatment Plant was commissioned in 2000, replacing a previous discharge of untreated wastewater directly to Foveaux Strait. The plant treats both domestic wastewater for a population of 1850 (as per 2006 census) and industrial waste from local businesses, including fish processing plants. The effluent from the treatment plant is discharged to an active section of Foveaux Strait. The water, seabed and shellfish in this area are monitored.

During this monitoring period Invercargill City Council produced the first of its five-yearly reports reviewing the overall performance of the plant between July 2005 and June 2010. The report included a number of alternative treatment and disposal options which are unlikely to be investigated further given that the plant has a good compliance history and is showing little effect on the receiving waters.

Monitoring Compliance

Figure 31 shows the Carbonaceous Biological Oxygen Demand (CBOD₅) results between June 2005 and April 2011. The results are well below the maximum and the geometric mean is being maintained at less than half the consent requirement.



CBOD₅ 2005/2011

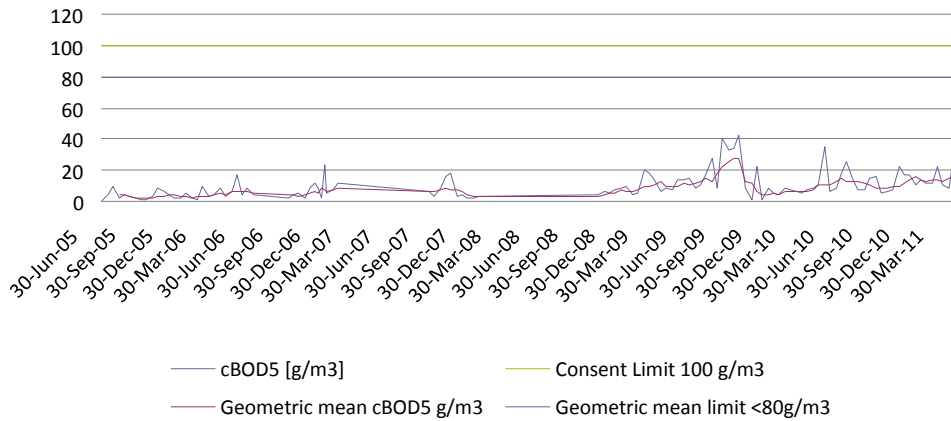


Figure 31: Carbonaceous biological oxygen demand results 2005-2011.

Figure 32 shows the results of the Total Suspended Solids (TSS) monitoring between June 2005 and April 2011. It illustrates that the maximum and the geometric mean are consistently below the limit set in the consent conditions. However, there does appear to be a slight increase over the five year period. The report suggests the increase could be because of increased industrial flows and loads.

TSS 2005/2011

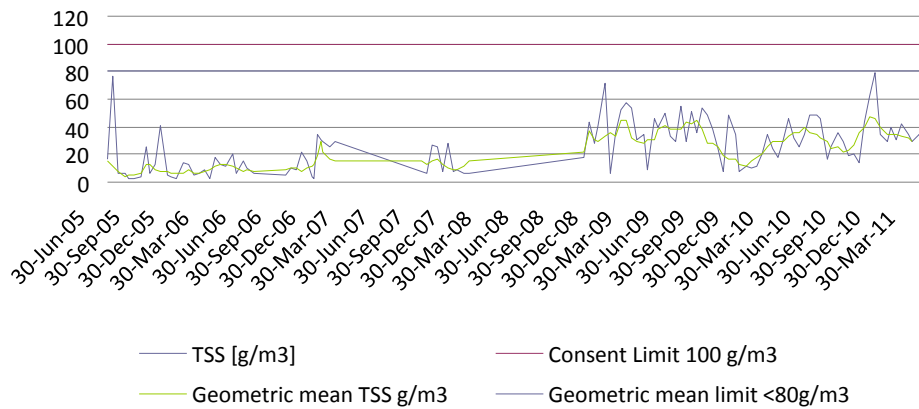


Figure 32: Total Suspended Solids results 2005-2011.

The faecal coliform results remain below both the maximum and the geometric mean limits for the period, as required by the consent (see Figure 33).



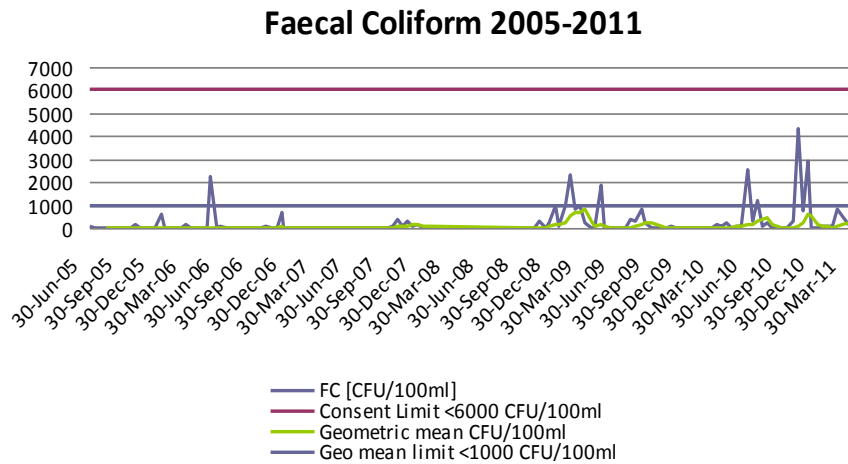


Figure 33: Faecal coliform results 2005-2011.

4.1.2 Invercargill City Council – Invercargill Sewage Treatment Plant, Clifton

The Invercargill City Council currently holds the following resource consents/coastal permits that require inspection:

- to discharge treated wastewater to water;
- to discharge contaminants to land via seepage;
- to sporadically discharge screened wastewater to the New River Estuary, when compliance with the above consents cannot be achieved due to plant mechanical failure or extreme weather;
- to discharge contaminants (including odour) to the air;
- to discharge a deodorising agent to the air to mask odours from the sludge ponds at the sewage treatment plant.

During this inspection period the Invercargill City Council produced the first of its five yearly reviews, as required by its consent. The report reviews the overall performance of the plant between July 2005 and June 2010, as well as considering potential options for improvements to wastewater treatment and disposal. The report indicates industrial loading on the treatment plant has significantly reduced during this time and that changes to consent conditions allowing for seasonal variation in pond performance has meant greatly improved compliance. There are several potential improvements considered in the report, with trials being carried out on those considered to be beneficial.

Inspection Compliance

Figure 34 shows the Carbonaceous Biological Oxygen Demand results for the period July 2010 to July 2011. The rolling 12 month geometric mean is less than half its limit and appears to be relatively stable despite there being occasional fluctuations.



CBOD₅ Results 2010/11

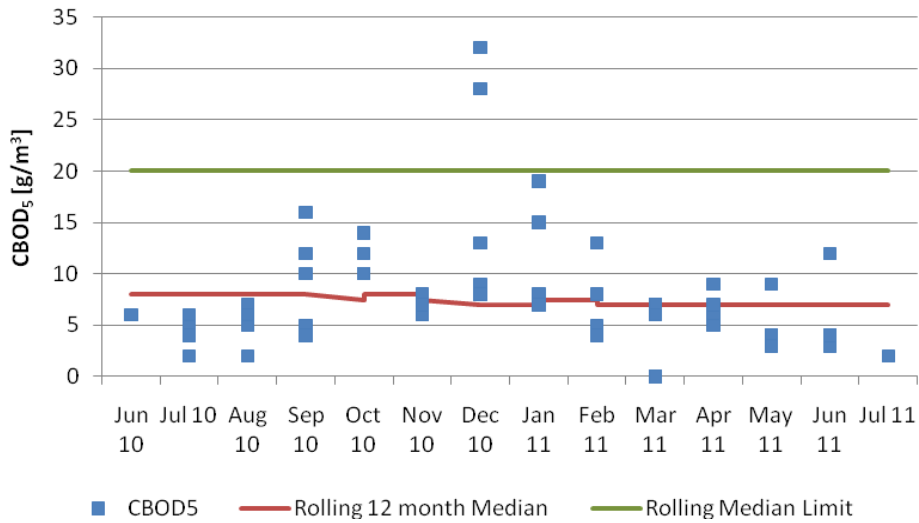


Figure 34: Carbonaceous biological oxygen demand results 2010/11.

Figure 35 shows the Total Suspended Solids results for the period July 2010 to July 2011. The results appear to fluctuate regularly, but the rolling 12 month mean has maintained at less than half the limit set in the consent.

TSS Results 2010/11

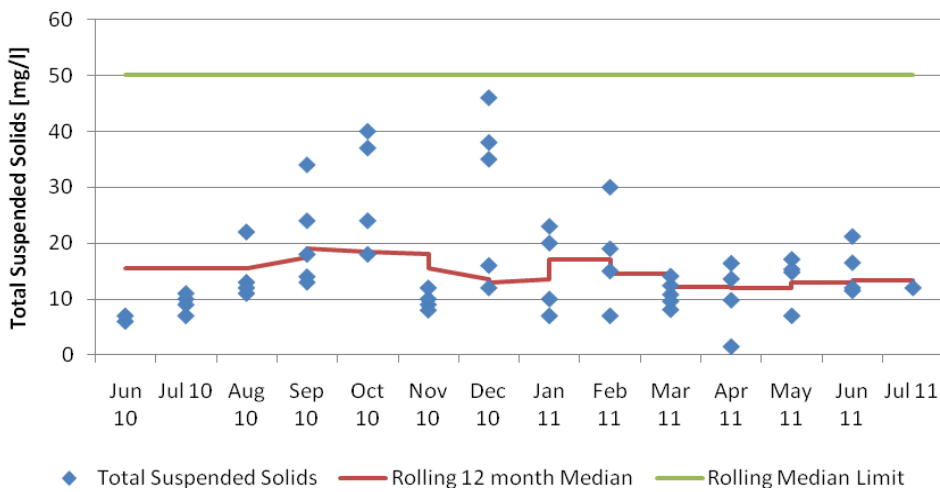


Figure 35: Total suspended solids results 2010/11.

Faecal coliform levels appear to have remained static during the past 12 months (see Figure 36). Even with the occasional spike, the rolling mean has remained well below the consent requirements.



Faecal Coliform Results 2010/11

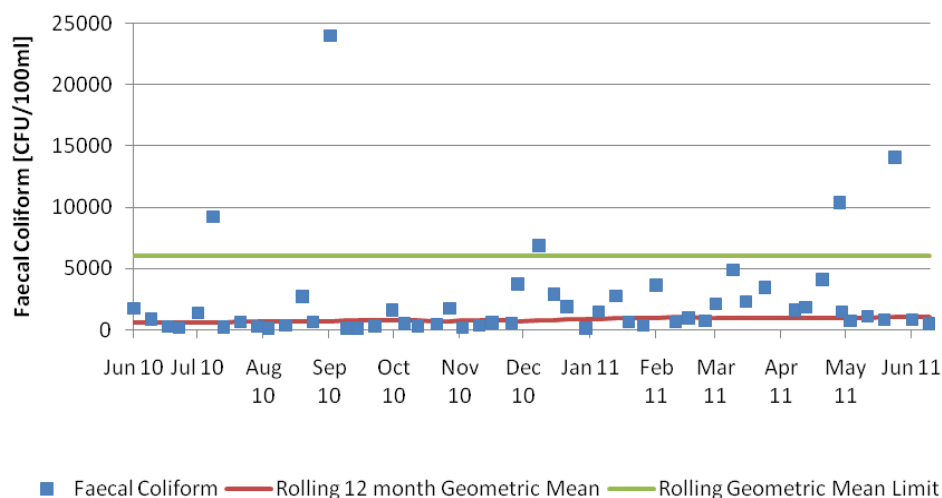


Figure 36: Faecal coliform results 2010/11.

Complaints and self-reported incidents

No complaints have been received by Environment Southland or the Invercargill City Council during this inspection period.

4.2 Gore District Council

Table 18 is a compliance summary for the Gore District Council community sewage treatment systems for the period 1 July 2010 – 30 June 2011.

Table 18: Compliance summary for the Gore District Council community sewage treatment systems in 2009/10

Community Sewage Treatment Schemes	Consent compliance		
	Fully compliant	Partial non compliance	Significant non compliance
Gore sewage			✓
Mataura sewage			✓
Waikaka sewage		✓	

4.2.1 Gore District Council – Gore Wastewater Treatment

The Gore township has a population of 8,000 and is served by a two-pond oxidation system on its southern boundary. Built in 1971, the oxidation ponds were designed to service a population of 12,000. An Actiflo plant that removes dissolved reactive phosphorus from the discharge was added to the wastewater treatment system in October 2008.

The Gore District Council holds consent to discharge treated wastewater to the Mataura River. During dry weather, 1,000-7,000 m³/day of treated wastewater is discharged from the oxidation ponds to the river. However, because stormwater in some parts of Gore also flows into the oxidation



ponds, the amount of treated wastewater discharged to the river can rise to over 20,000 m³/day during periods of wet weather.

The oxidation ponds and the Mataura River are monitored by Gore District Council staff. The frequency of inspection is dependent on river flow, with more regular inspections required when the flow reduces. When the flow falls below 25 m³/s, the sampling frequency becomes once every two weeks. Increased inspections at reduced river flows are required because there is greater potential for nutrients in the discharge to have an impact on the receiving environment, as there is less dilution. Nutrient enriched water poses the potential risk of nuisance weed and periphyton growth on the river bed. These growths can impact on naturally occurring macroinvertebrate communities in the river and affect biodiversity within the river system.

The nutrients most likely to cause nuisance weed and algal growths are dissolved reactive phosphorus (DRP), nitrate nitrogen and ammoniacal nitrogen. If nitrogen levels in the river upstream of the discharge are elevated, the controlled input of phosphorus can reduce the risk of nuisance growth on the river bed. The Actiflo plant was specifically built at the Gore oxidation pond to provide this control of the DRP by reducing the levels in the discharge. The Actiflo plant operates when the flows in the river are medium to low. The significant reduction in the level of DRP in the discharge during low river flows helps reduce the risk of the discharge producing nuisance algae growths (Figure 37).

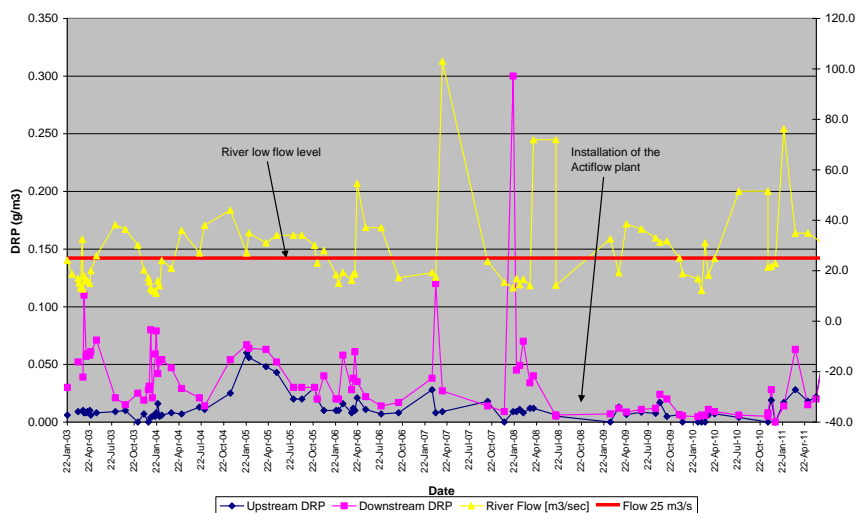


Figure 37: Comparison of the dissolved reactive phosphorus concentration at upstream and downstream sites with the river flow.

Overall, the improvements in the discharge BOD₅ and total suspended solids (TSS) levels have continued since the addition of the Actiflo plant (Figure 38).



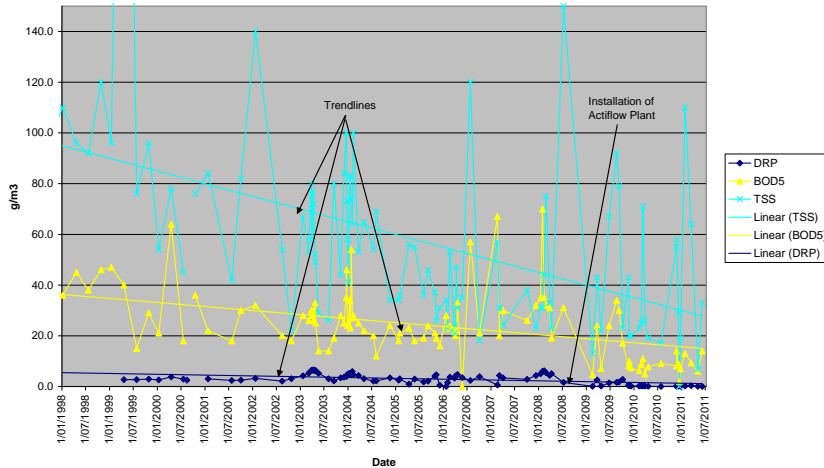


Figure 38: Discharge quality in terms of DRP, TSS and BOD₅

Inspection

The discharge must conform to two sets of consent limits. The first is a set of maximums that help ensure the discharge does not have an acute detrimental effect on the river. For example, a significant change in the sediment or nutrient levels could be acutely toxic to aquatic life.

The second set of limits is a rolling 80 percentile which states that 80 per cent of the time the wastewater discharge must not exceed the specified limits for BOD₅, total suspended solids (TSS), DRP, ammoniacal nitrogen and *E. coli*. The purpose of the rolling percentile is to help ensure that the discharge does not have a long term (chronic) impact on the river.

The discharge BOD₅, ammoniacal nitrogen and DRP results have all complied with both the maximum limits in the discharge and the rolling 80 percentile during the last year.

Because of some high *E. coli* results that were less than the maximum limits, but greater than the rolling 80 percentile limits during 2009/10, the rolling 80 percentile during July 2010 continued to exceed the consent limit. However, low *E. coli* results for the remainder of 2010 brought the *E. coli* rolling 80 percentile results back below the consent limits. Similarly, one TSS result that exceeded the maximum in March 2010, and some high TSS results that were less than the maximum limit, but greater than the rolling 80 percentile limits during 2009/10, meant the rolling percentile during November 2010 exceeded the consent limit. However, low TSS results for the rest of 2010 brought the TSS rolling 80 percentile results back below the consent limits.

In January 2011 both the TSS and *E. coli* results significantly exceeded the maximum discharge limits. This resulted in the corresponding rolling 80 percentiles also increasing above the consent limits. Due to the high value of the exceedances, the rolling 80 percentile values have continued to exceed



the consent limit, despite further TSS and *E. coli* results all complying with the consent limits (Figures 39 and 40).

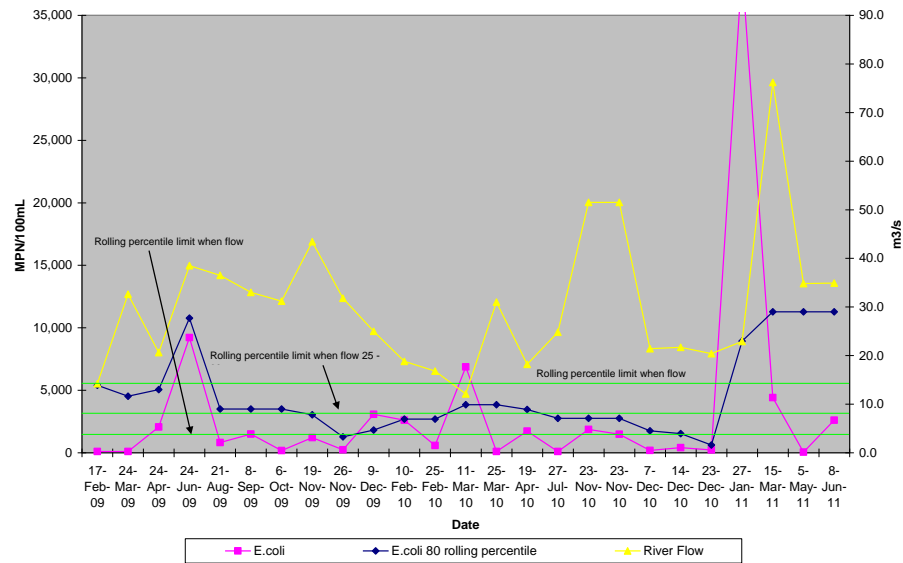


Figure 39: Discharge *E. coli* results compared to the *E. coli* rolling 80 percentile results and the river flow.

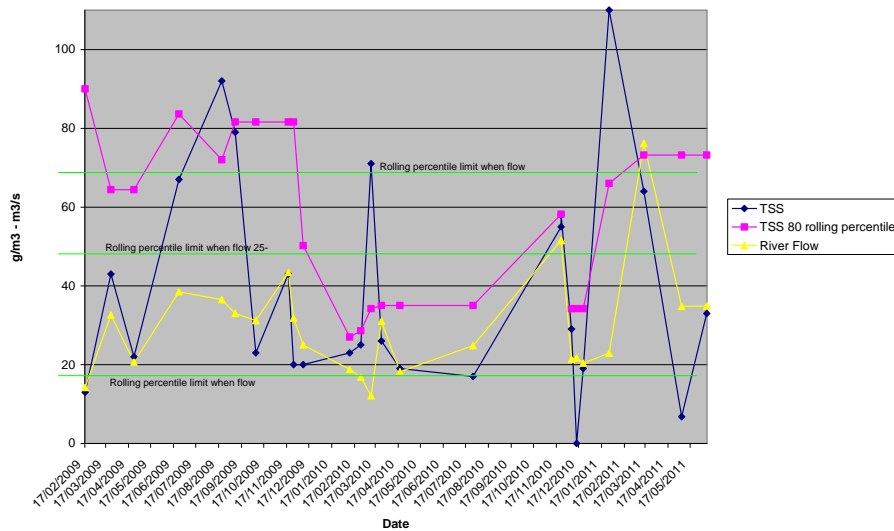


Figure 40: Discharge TSS results compared to the TSS rolling 80 percentile results and the river flow.

The high discharge TSS and *E. coli* results during March 2011 also resulted in an impact on the receiving waters in terms of TSS and *E. coli*, as these parameters exceeded the consented limits. However, all remaining Mataura River receiving water results were fully compliant with the consent limits.

The Mataura River periphyton and macrophyte survey was undertaken during 2010, although only one round of sampling was undertaken because of the



river flows. The survey concluded that the discharges were not adversely affecting periphyton and macrophyte communities of the river.

The Benthic Macro Invertebrate Survey was unable to be undertaken during 2010 due to high river flows and regular flood events meaning that the required river conditions that enable inspection to be undertaken were not reached.

4.2.2 Gore District Council – Mataura Oxidation Pond

The Mataura township has a population of 1,560 (2006 Census) and is served by a single oxidation pond, south west of the township. The pond is designed to receive effluent from a population equivalent of 4,000 people, based on water usage of approximately 500 L/person/day.

The volume of sewage received in the pond is in the order of 2,000 m³, the amount of effluent that would be expected from a population of 4,000 people. This indicates that there is considerable infiltration of water into the system from other sources, including spring and stormwater. This results in some dilution of the organic loading on the system.

The oxidation pond and the Mataura River are monitored a minimum of four times per year. Like the Gore sewage treatment system, additional inspections are required during periods when the river flow drops below 25 m³/s. The increased inspection regime is needed because as the river flow decreases there is greater potential that nutrients in the discharge will impact on the receiving environment. Nutrient enriched water poses the risk of nuisance weed and periphyton growth on the riverbed. These growths can impact on naturally occurring macroinvertebrate communities in the river and affect biodiversity within the river system.

Although it is not required, the Gore District Council has been proactive in undertaking additional inspections of the Mataura oxidation pond when the river flow is between 25–60 m³/s. This additional work is undertaken in conjunction with the sampling at the Gore oxidation pond which is required at that flow rate.

During December 2008, the Gore District Council planted a series of wetlands in an attempt to further filter effluent from the oxidation pond before it was discharged to the river. The wetlands were designed to reduce the total suspended solids (TSS), *E. coli* and carbonaceous biochemical oxygen demand (CBOD₅) concentrations of the discharge. Several issues, including strong winds, contributed to the prevention of most of the plants establishing within the accepted timeframe of July 2009. However, by July 2010 the wetlands became fully established and there are now 7,000 plants in six cells forming the wetlands.

Once the wetlands became fully established, new discharge limits also came into effect that included more parameters and lower concentration levels.



Prior to 30 June 2010, four out of any five consecutive samples could not exceed the limits in Table 19 for BOD₅ and suspended solids concentrations.

Table 19: BOD₅ and suspended solids concentration limits

<i>Parameter</i>	<i>Concentration</i>
BOD ₅ (mg/L)	30
Suspended Solids (mg/L)	70

From 30 June 2010 onward, four out of the five most recent consecutive samples of the treated wastewater discharge could not exceed the limits in Table 20 for BOD₅, suspended solids, dissolved reactive phosphorus, ammoniacal nitrogen and *E. coli*.

Table 20: BOD₅, suspended solids, dissolved reactive phosphorus, ammoniacal nitrogen and *E. coli* concentration limits.

<i>Parameter</i>	<i>Concentration</i>
BOD ₅ (mg/L)	20
Suspended Solids (mg/L)	25
Dissolved Reactive Phosphorus (mg/L)	0.5
Ammonia-N (mg/L)	8
<i>E. coli</i> (cfu/100mL)	5,000

The establishment of the wetlands has resulted in the reduction of the BOD₅ and the *E. coli* bacteria, as expected. All BOD₅ results since 30 June 2010 have been fully compliant with consent limits, while only one *E. coli* result (see Figure 42) out of the nine sampled over the year exceeded the consent limit. However, because only four out of five consecutive samples need to comply with the consent limits there was no breach of the consent.

Overall, the TSS results have been decreasing since the discharge permit was issued in May 2006 (see TSS trend line in Figure 41). However, the wetlands becoming fully established does not appear to have made a significant impact on the TSS results at present. The first TSS result since the full establishment of the wetlands exceeded the consent limit. However, like the *E. coli* result, because the four following results did not exceed the limit, there was not a breach of consent. Two consecutive results in March and May 2011 did exceed the consent limits, which was a breach of the consent.



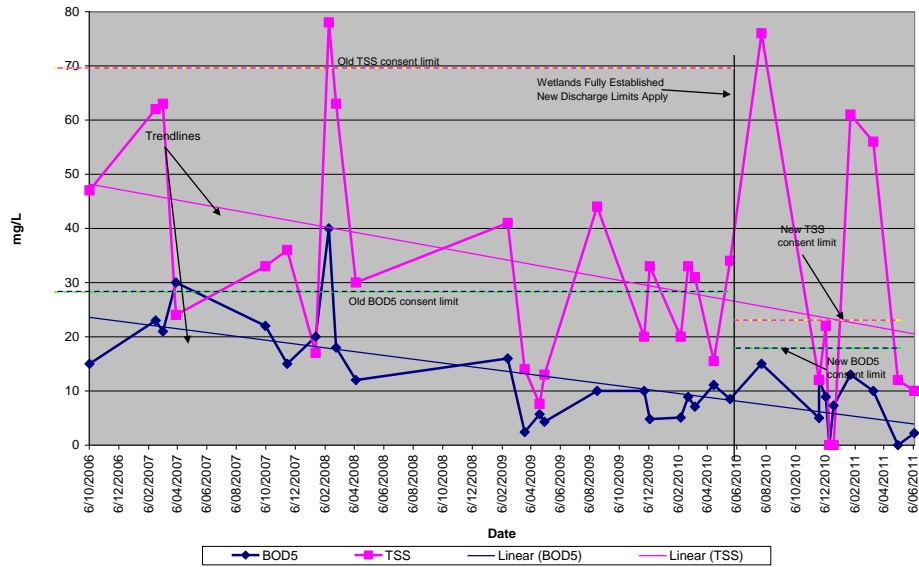


Figure 41: Discharge BOD₅ and TSS results. Note: An improvement in the BOD₅ can be seen since the installation of the wetlands in December 2008 and their full establishment in June 2010.

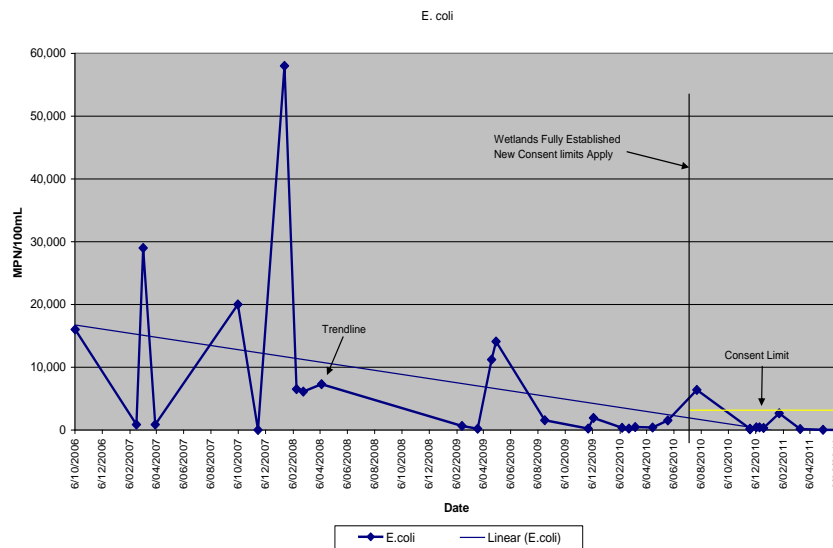


Figure 42: *E. coli* results. Note: An improvement in the *E. coli* can be seen since the installation of the wetlands in December 2008 and their full establishment in June 2010.

Overall there has been an improvement in the total ammoniacal nitrogen (NH₄N) and dissolved reactive phosphorus (DRP) results since the establishment of the wetlands. However, the results have not decreased to a level where they are compliant with the new consent limits. Seven out of the last nine DRP and six out of nine of the last total ammoniacal nitrogen results exceeded the new consent limits. This is a breach of the consent conditions.

The Gore oxidation pond has a mechanical means, the Actiflo plant, for removing the DRP from the discharge, whereas the Mataura pond has only the wetlands as a means of nutrient removal. Despite this, the discharge DRP limit for the Mataura oxidation pond is the equivalent to the 80 rolling



percentile consent limit for the Gore oxidation pond discharge when the river flow is less than 25 m³/s. The Mataura oxidation pond ammoniacal nitrogen limit for the discharge is also significantly lower than any of the Gore limits for the discharge. Due to these factors, and the breaches of consent relating to the DRP and ammoniacal nitrogen concentrations, Gore District Council is currently investigating different measures to enable it to comply with its consent conditions (see Figure 43).

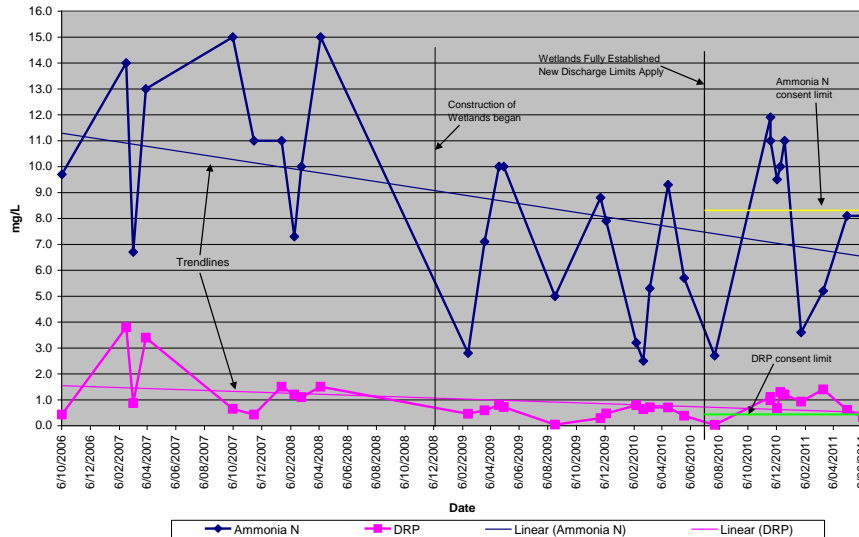


Figure 43: Discharge ammonia nitrogen and DRP results. Note: Overall there has been an improvement in the concentrations since the issuing of this consent in 2006. However the results are frequently over the new consent limits.

The benthic macroinvertebrate and periphyton surveys were unable to be conducted during 2010 because of high river flows and regular flood events.

4.3 Southland District Council

Table 21 is a compliance summary for the Southland District Council community sewage treatment systems for the period 1 July 2010-30 June 2011.

Table 21: Compliance summary for the Southland District Council community sewage treatment systems in 2009/10

Community Sewage Treatment Schemes	Consent Compliance		
	Fully compliant	Partial non compliance	Significant non compliance
Balfour sewage		✓	
Browns sewage		✓	
Gorge Road sewage	✓		
Lumsden sewage	✓		
Manapouri sewage	✓		
Monowai sewage			✓
Nightcaps sewage		✓	
Ohai sewage			✓
Otautau sewage		✓	
Te Anau sewage			✓
Tokonui sewage		✓	



<i>Community Sewage Treatment Schemes</i>	<i>Consent Compliance</i>		
	<i>Fully compliant</i>	<i>Partial non compliance</i>	<i>Significant non compliance</i>
Tuatapere sewage	✓		
Riverton sewage at Havelock Street	✓		
Riverton sewage at Foveaux Strait		✓	
Riversdale sewage			✓
Stewart Island sewage		✓	
Winton sewage			✓
Wyndham sewage			✓

4.3.1 Southland District Council – Riversdale Wastewater Treatment System

Riversdale is a small, rural township located in the Northern Southland area, with a population of 393 people (2006 Census).

In 1974, an oxidation pond was commissioned in a paddock east of the township on the banks of the Meadow Burn. The system was originally set up to discharge treated effluent directly to the Meadow Burn. In 1999, consent was issued for the oxidation pond effluent to be discharged to an infiltration pond. The infiltration/soakage was designed to discharge effluent through its base, into the soil profile. Because the Meadow Burn is recharged by groundwater, effluent disposed via the infiltration/soakage channel will enter the groundwater and ultimately the Meadow Burn. The infiltration/soakage channel was not designed to provide additional treatment. However, because effluent percolates through the soil profile, the system will provide physical filtration.

The water table in the area of the infiltration/soakage pond is estimated to be just 1.5 m below the surface. During wetter periods, and when the water table rises close to the surface, the capacity for the infiltration is reduced and may result in the pond discharging directly to the Meadow Burn. In these exceptional situations, the consent permits discharges directly to the stream for short periods of time.

The infiltration/soakage pond has not always performed as designed and suspended matter in the effluent has blocked the pores in the soil structure, resulting in the base of the pond being substantially sealed off. Because of this sealing effect, the sewage system discharged to the Meadow Burn more frequently than had been authorised by the resource consent.

During an October inspection of the site, a discharge to water was identified. The Southland District Council was notified and a warning issued. A series of improvements were made and a more robust maintenance programme implemented which resulted in increased efficiency and improved performance during 2010/11.

When the consent was granted in 1999, a well located on the property of the nearest neighbour was selected in order to monitor groundwater quality in the



area of the oxidation ponds. Monitoring to date has shown that the *E. coli* concentration in the water has remained consistently low during the past 10 years and fully compliant with the New Zealand Drinking Water Standards. However, it appears that nitrate concentrations are increasing in the groundwater, although they are still compliant with the drinking water standards. The cause of the increase is unknown but is of some concern and will be closely monitored.

4.3.2 Southland District Council – Winton Wastewater Treatment System

The small Southland township of Winton has a population of 2,088 (2006 census). Sewage from the township is piped approximately 2 km (from the centre of Winton) to a 1.96 ha aerated oxidation pond. The treated sewage is then discharged to the Winton Stream via a 1.4 ha wetland. Updated in 2006, the treatment system has struggled to consistently meet conditions of the discharge consent.

The organic loading and level of suspended solids in the discharge have been relatively stable, particularly during the last two years. This was clearly shown in the carbonaceous biochemical oxygen demand results; with the exception of one occasion (35 g/m³ in December 2010) the carbonaceous biochemical oxygen demand has consistently been less than 30 g/m³. This is a vast improvement on some of the historical results (Figure 44).

A similar trend was apparent within the total suspended solids results. Again, with the exception of the December 2010 result, all other results since 2009 were less than 40 g/m³. The improved quality and consistency in these results appears to have been the result of the installation of the wetland system, built in 2006.

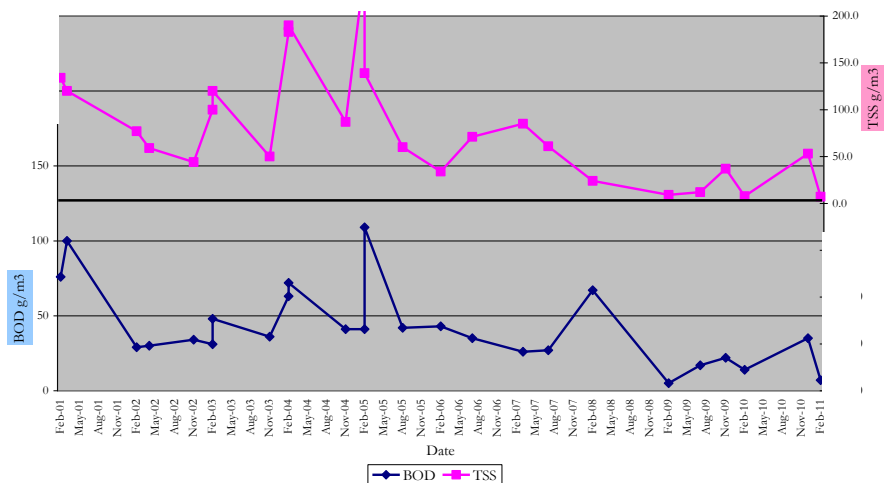


Figure 44: Effluent BOD and TSS results.

The main issue with this system continues to be the elevated concentration of nutrients being discharged to the Winton Stream. While the concentration of



ammonia nitrogen and total phosphorus in the discharge remained relatively stable, the level of total ammoniacal nitrogen downstream of the treatment plant exceeded the trigger level for 95 per cent protection of aquatic life (Australia and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC)) on all four occasions since November 2009 (see Figure 45).

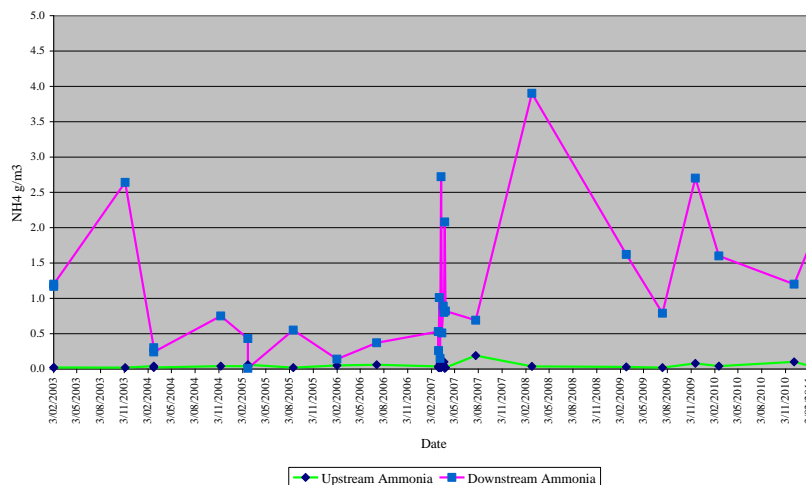


Figure 45: River NH4 2003-11.

This significant non-compliance has been recognised by the Southland District Council and, in a report to the Community Board, a number of improvements have been proposed that will require significant expenditure.

While there are few practical limits that can be applied for dissolved reactive phosphorus (DRP), the discharge appears to be having a significant impact on the level of phosphorus in the Winton Stream, downstream of the treatment plant (see Figure 46). A survey in 2007 did not show that there had been a significant increase in the level of periphyton on the stream bed downstream of the discharge. This is possibly due to the slightly elevated levels of DRP measured at the upstream site. The elevated level of phosphorus in the water column is of concern because it increases the potential to further increase the growth of nuisance weed and algae on the streambed, which, in turn can have an impact on the macroinvertebrate communities in the stream.



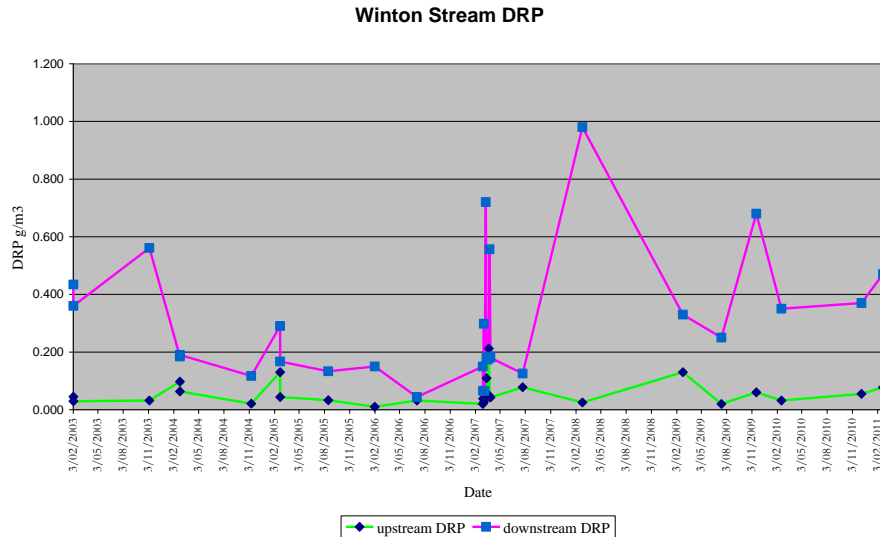


Figure 46: River DRP 2003-11.

4.3.3 Southland District Council – Te Anau Wastewater Treatment System

On the doorstep of Fiordland National Park, Te Anau is a small township that focuses largely on tourism and farming for much of its economic activity. With a permanent population of 1,899 (2006 census) the town is relatively small, however during peak holiday season this can reportedly increase significantly to about 10,000 (FiordlandNZ.com). Sewage from the township is piped to a series of ponds, comprising a 3.3 ha facultative pond with aerators, two 0.74 ha maturation ponds and a six-cell wetland, before being discharged to the Upukeroa River which then flows to Lake Te Anau.

The organic quality in terms of carbonaceous biochemical oxygen demand has been reasonable throughout the year, consistently less than 20 g/m³. However, the total suspended solids results were slightly more variable. This is not unexpected, as the seasonal changes will influence the algal growth and impact on the total suspended matter in the pond (Figure 47).



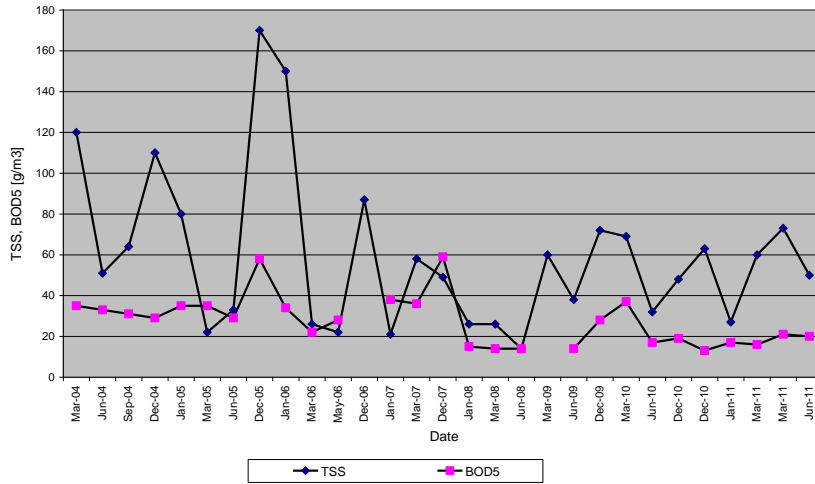


Figure 47: Total suspended solids and carbonaceous biochemical oxygen demand concentrations in the wastewater discharged to the Upukerora River.

The total phosphorus concentration in the discharge was relatively consistent with all results ranging between 5.5 g/m³ and 8 g/m³. The total nitrogen concentration was noticeably more variable (Figure 48).

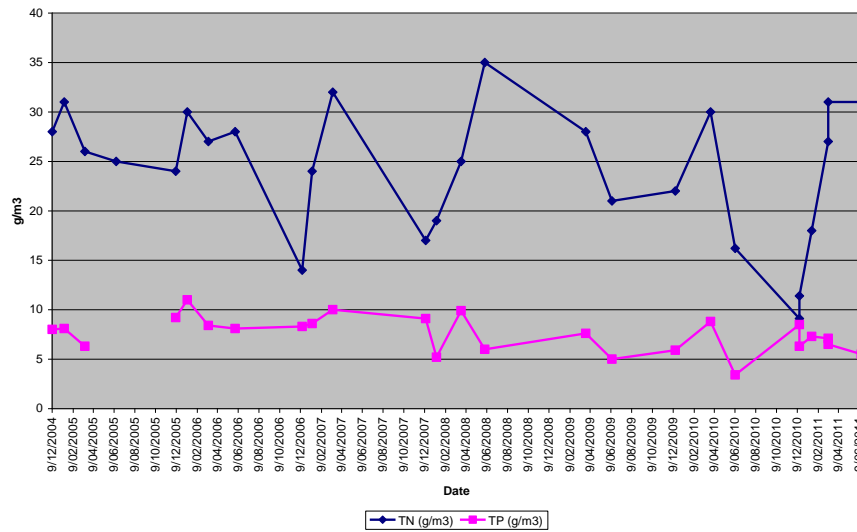


Figure 48: Total phosphorus and total nitrogen concentrations in the wastewater discharged to the Upukerora River.

While there are no limits on the concentration of nutrients in the discharge, there are limits on dissolved reactive phosphorus and soluble inorganic nitrogen concentrations in the receiving waters.



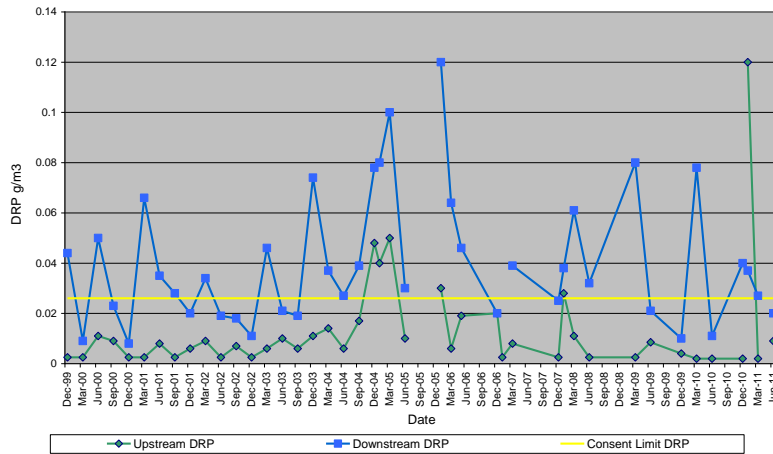


Figure 49: Comparison of up and downstream dissolved reactive phosphorus concentrations.

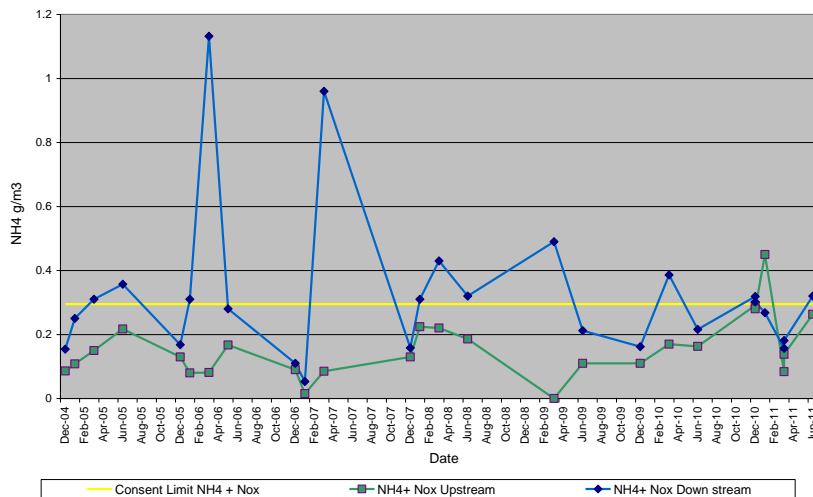


Figure 50: Comparison of up and downstream soluble inorganic nitrogen concentrations.

Figures 49 and 50 show that on three occasions dissolved reactive phosphorus (DRP) levels downstream of the discharge exceeded the consent limit (note: there was one unexplained high upstream DRP result in January 2011). Soluble inorganic nitrogen (SIN) levels downstream of the discharge exceeded the consent limit twice (note: there was one unexplained high upstream DRP result in January 2011). These incidents were breaches of the consent. An increase in nutrients in the water column increases the potential for increases in nuisance periphyton and macrophyte growth in the river and/or the lake foreshore. An in-depth macroinvertebrate and periphyton study is not required for this consent, however photographs are taken of the stream bed on each sampling occasion to provide a general assessment of the in-stream periphyton growths at both sites. It is difficult to make an accurate quantitative assessment, however the photographs did not show any significant changes in weed and algal growth on the streambed,



therefore no enforcement action has been taken to date, however this is being closely monitored.

The existing consent expires in October 2014 and the Southland District Council is in the process of establishing an alternative treatment system. Progress towards developing and implementing the long-term wastewater and disposal system for the Te Anau township is required to be reported to Environment Southland annually. The Southland District Council has failed to meet this condition during the 2010/11 year.

5.0 Quarrying

5.1 Gravel Extraction Report

Gravel extraction consents come under the responsibility of Environment Southland's Compliance Division for the auditing of inspections.

Compliance staff work closely with the Catchment Division, which is tasked with the on-site introduction to the consent, with the consent holder and with conducting field inspections.



Figure 51: Gravel Extraction to construct a sediment trap on the Hamilton Burn.

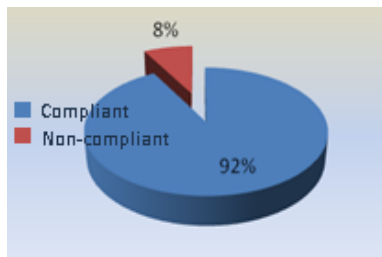
A brief audit was recently conducted on the 208 current land use gravel extraction consents and it was identified that only 136 (65%) consents were fully compliant with consent conditions and 72 (35%) were non-compliant.

Of the 136 fully compliant consents, 26 consent holders have advised that they are not currently exercising their consents, 19 consent holders have not yet begun exercising the consent and three consents have only recently been granted.

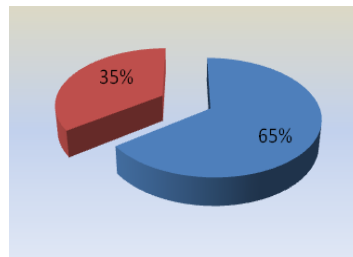
This significant reduction in compliance can be attributed to a lack of resources within the Compliance Division in the last financial year. The Compliance Division did not have the resources required to deal with non-compliance as it was detected. Other forms of non-compliance were



deemed to have greater potential impact on the environment and dealt with as a priority.



2009/10 Financial Year



2010/11 Financial Year

Figure 52: Compliance rates for gravel consent holders - 2009/10 compared to 2010/11.

The Compliance Division has now recruited two Compliance Administrators and will be in a position to work with the Catchment Division and continually inspect and follow-up non-compliant activities within the next three months.

6.0 Landfills

6.1 Timpany Landfill

S J Timpany has two discharge permits to operate both a cleanfill and a landfill on Coggins Road in Otatara, near Invercargill. The landfill is one of only two landfills in Southland that have discharge permits allowing them to accept asbestos (AB Lime is the other landfill).

The consent for the discharge of cleanfill to land has no monitoring requirements, but inspections are undertaken every six months in conjunction with landfill inspections. The inspections have been fully compliant with consent conditions.

The consent for the discharge of landfill to land was granted in July 2009. Environment Southland staff undertake six-monthly inspections of the site, which has been found to be tidy and well-operated. All appropriate paper work is being filled out and the inspections have shown the site operator to be fully compliant with the consent. Groundwater monitoring is also undertaken by Environment Southland staff every six months and the nearby Lake Murihiku is sampled annually. The sampling results have all been within the Australian and New Zealand Environment and Conservation Council guidelines.

Incidents

There have been no official incidents reported to Environment Southland regarding the landfill or cleanfill operations. A concern about access to the site was raised with Environment Southland, however the site was found to



be locked at all times except when authorised material was being deposited on site.

6.2 AB Lime Limited Landfill

AB Lime Limited operates an agricultural lime and landfill business about 4 km east of the Winton township. The mining of lime in some areas at the AB Lime site leaves a large open pit. These pits are lined and prepared to accept domestic and some industrial waste. Once the pit has been filled to the level of the surrounding land, the area is capped and a new pit is opened. AB Lime has been accepting waste from the Southland region since 2004. It is one of two landfills in the region which can accept asbestos and it can also accept some “special wastes” for disposal at the site.

The final stages of filling in Area 10 are ongoing and only minimal filling of Area 11 has occurred. A third section of the site, Area 12, is currently in the final stages of being prepared to receive waste (see Figure 53).



Figure 53: View from edge of Area 12 which is being prepared to accept waste and looking towards Area 11 and Area 10.

AB Lime Limited’s landfill operation requires regular monitoring of its resource discharge consents, which are:

- to discharge stormwater to a tributary of the Lochiel Stream;
- to discharge solid waste onto or into land, and;
- to discharge contaminants to air discharge from a landfill.



Monitoring

The groundwater and surface water monitoring was consistent with historical data and there were no issues arising from this information.

Abnormally high dissolved oxygen (DO) results were being recorded for the leachate, however it was determined that the source of these was due to the incorrect unit being assigned. Once the unit was corrected the DO results returned to within the expected range and there were no further issues.

The non-methane organic compound (NMOC) monitoring at the permanent gas flare is currently required to be undertaken on a six-monthly basis. The May 2010 monitoring was compliant with the consent condition which requires that the flare burns off at least 98% of the NMOC. However, the October 2010 and April 2011 monitoring did not show that this had occurred.

The consent also requires that the permanent gas flare operates continuously at a minimum combustion temperature of 750° Celsius and a residence time in the combustion zone of 0.5 seconds. The temperature of the flare is measured via a thermocouple and recorded every five minutes by a data logger. Because the landfill is currently either not producing enough gas, or enough gas is not being captured by the wells, the permanent flare has not continuously operated at the required temperature, but instead at temperatures around 600-700°. To enable the flare to operate at the required temperature the flare would have to be turned on and off and only operated when there was enough gas build up. Continuous operation of the flare would result in the most gas possible being burnt off from the landfill.

Because the environmental impacts of the flare operating at temperatures of 600-700° Celsius, instead of over 750° were negligible, Environment Southland agreed to allow AB Lime to operate the flare at 600-700°, until the landfill could produce enough gas. One of the conditions of the agreement was that the flare temperature could not drop below 500°.

The flare temperature was compliant with this agreement until February 2011, when the temperature dropped below 500° for four readings. This also happened in March 2011. However, from April 2011 the flare temperature has been regularly dropping below 500°, which is a breach of the agreement. Therefore AB Lime is currently investigating options, such as modifying the flare, to increase the flare temperature to the required 750°.





Figure 54: AB Lime permanent gas flare

The hand held gas monitoring equipment (GEM) required maintenance during November 2010. The replacement did not come with all the required equipment, therefore the methane, carbon dioxide, oxygen, carbon monoxide and hydrogen sulphide gas monitoring was unable to be done during November 2010. AB Lime has addressed the issue of inadequate replacements, therefore future loss of this monitoring data is not expected.

General

Once a year, a landfill management specialist conducts an audit of operations at AB Lime's landfill, on behalf of Environment Southland. The audit found that the landfill was a generally tidy and well run operation and no rodent, bird or fly activity was noticed on site.

The main issues arising from the peer review report were:

- the fill slope of Area 10 continued to be too steep;
- construction of Area 12 started in advance of the designs and QA documentation being approved;
- the QA testing was not undertaken in accordance with the specifications;
- the permanent gas flare was not currently operating in accordance with the National Environmental Standards for Air Quality.

AB Lime is gradually reducing the steepness of the Area 10 fill face by carefully managing where new fill is placed, by undertaking some filling from the base of Area 10.

AB Lime is currently putting in place measures to ensure that all designs and QA documentation is approved before construction is undertaken.



The QA specifications are being amended to reflect the testing that can practically occur.

AB Lime is currently investigating options for operating the flare in accordance with the National Environmental Standards for Air Quality.

Complaints and self-reported incidents

Environment Southland received no odour complaints from the public regarding AB Lime Limited over the last year. The company also did not directly receive any odour complaints from the public during the last year.

The significant reduction in the odours has been attributed to the continuous operation of the permanent gas flare.

Table 22: AB Lime – Consent Performance Summary

<i>Issue</i>	<i>Score</i>	<i>Comments</i>
Provision of data/results	Good	Delays in receiving the groundwater, surface water & landfill gas monitoring data.
Compliance with consent conditions	Good	The last two rounds of NMOC monitoring have not complied with consent limits. The permanent gas flare monitoring data frequently exceeded either the consent or the agreement limits.
Responsiveness to issues	Very Good	Overall feedback to issues raised has been very good. Still awaiting responses to issues with the trial cap and the permanent gas flare.
Keeping Environment Southland informed of intentions, changes etc.	Very Good	There have been some delays in informing Environment Southland about issues that have affected monitoring. Overall though Management has actively engaged Council staff in proposals that could affect the operation of the landfill.

7.0 Coastal Marine Area

7.1 Coastal Patrol

During April 2011, Environment Southland, Department of Conservation (DOC), MAF Biosecurity and Ministry of Fisheries staff undertook a joint four day patrol of the sounds in Fiordland on the DOC vessel the *Southern Winds*. The patrol covered five fiords including Doubtful, Thomson, Dagg, Breaksea and Dusky sounds and six marine reserves within the fiords.

During the patrol 18 vessels were inspected. This included five recreational, four charter boats, five commercial fishing vessels and three unmanned



recreational vessels. Ministry of Fisheries staff inspected all lobster and fish caught on each of the vessels, while DOC staff checked for hunting permits. Environment Southland staff checked the logs and consent compliance of the commercial vessels and, together with MAF staff, determined when the vessels last had hull inspections. MAF inspectors were also checking where the vessels had been, prior to coming into the fiords.

Structures were also inspected during the patrol. Environment Southland staff inspected six barges and one helicopter landing pad, while DOC staff checked three DOC huts and campers' hut passes.

Nine mooring lines and surface floats for underwater moorings were also checked by Environment Southland staff during the patrol.

Ministry of Fisheries staff examined eight random crayfish pots for compliance with fisheries rules and MAF Biosecurity, along with DOC staff, dived one area of the fiords to check for the presence of the invasive pest *Undaria*.

Overall contact was made with about 84 people during the patrol. In addition, a call was received by the *Southern Winds* that a vessel had hit a rock and was taking on water. As a result, the patrol was postponed and staff aboard the *Southern Winds* went to the aid of the vessel. A bucket chain was set up to bail out the hull of the vessel until a pump could be put in place to extract the water. The crew also found the holes in the hull and assisted with temporary repairs, enabling the vessel to travel to Bluff for further repairs.



Figure 55: Staff coming ashore in Supper Cove to check the DOC hut, *Southern Winds* is in the background.



Figure 56: Boarding of a recreational vessel by Ministry of Fisheries, DOC and Environment Southland staff.





Figure 57: The *Southern Winds* from Astronomer's Point, Pickersgill Harbour, Dusky Sound.



Figure 58: First Arm, Doubtful Sound during sunset -the views are one of the reasons that people make the trip into the fiords.



Figure 59: Underwater camera inspection of the hull.



7.2 Fiordland Inspections

During 2010/11, 34 consented structures throughout Fiordland were inspected by Compliance staff as part of a three-yearly inspection programme. The types of structures inspected included wharves, jetties, helipads, barges and moorings.

Of the structures inspected, 20 were found to be fully compliant with their resource consents while 14 had varying levels of non-compliance. This included five consents that had not filed or recorded information, as was required by consent conditions, three required minor repairs and maintenance, five did not have any identification and one was found to be significantly non-compliant with multiple issues found. It was also noted during inspections that one of the structures had a lockable gate and a sign trying to restrict access. That consent holder was informed that having consent for the structure did not give exclusive occupation rights to the coastal marine area. The consent holder was asked to remove the sign and locked gate and to allow public access.

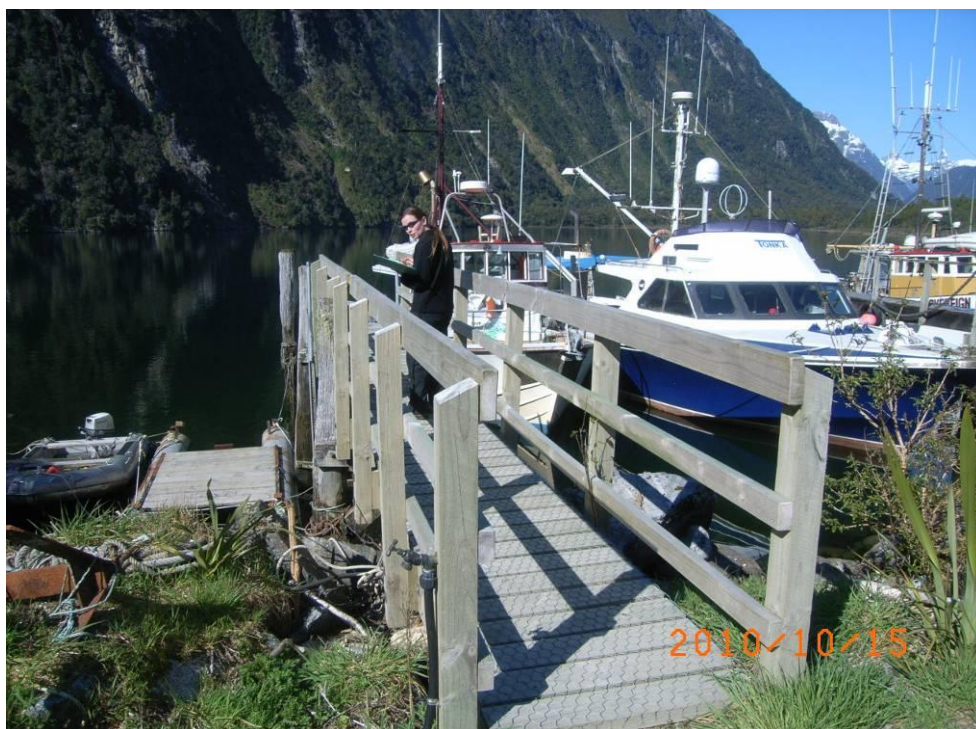


Figure 60: Compliance Officer Ruth Williamson inspecting a wharf in Milford Sound.

7.3 South Port and NZAS Coastal Plan Agreements

The main shipping port in Southland is the port in Bluff Harbour. Shipping services two main areas of operation:

- South Port near, the township of Bluff; and
- New Zealand Aluminium Smelters (NZAS), off the Tiwai peninsula.



When the Regional Coastal Plan was developed, it allowed the two port occupiers to function under individual agreements similar in nature to a consent. The agreements are intended to set out the operating and discharge limits that each party is to abide by and ensures the management of the port activities are compliant with the Resource Management Act (1991). Individual agreements were established between Environment Southland and NZAS in 2004, and with South Port in 2006.

A review of both agreements is currently being undertaken by Environment Southland's Policy and Planning Division staff. The NZAS agreement is close to being finalised, while the South Port agreement is still being addressed.

The South Port agreement has taken longer to finalise because of the significantly more varied nature of the activities carried out around its facilities and the number of different parties that operate under its agreement. Environment Southland staff are currently assessing how the range of activities can best be covered under the South Port agreement.

7.4 Whitebait Stands

During the 2010 whitebait season inspections were carried out at 645 consented whitebait stands on the banks of the Aparima, Maitara, Waikawa, Titiroa, Pourakino, Awarua and Hollyford rivers.

Whitebait stands require resource consent, with the majority being located within the Coastal Marine area (CMA). However, 10 whitebait stands are outside of the Coastal Marine Area and are consented as land use structures. These are situated upstream of the Pourakino River bridge, at Centre Road and upstream of the Aparima bridge, at Gummies Bush. It is the responsibility of Environment Southland to inspect structures that are under the coastal plan and span over a waterway and up to the mean high water spring mark.

The compliance inspection grading criteria is based on the following:

Good

- stand was fully compliant.

Minor issues (minor non-compliance)

- damage to the structure, including loose/broken boards, rotten timber or flood damage;
- structure was weakened;
- structure number was not displayed/missing;
- number was unreadable or needed highlighting;
- ropes/buoys that have been left out and were partially across the river.



Unsatisfactory (significant non-compliance)

- old structures that have not been removed;
- additional structures built on that are not included in the plan on file;
- stands that are in need of considerable repair or reconstruction;
- unauthorised bank protection;
- illegal deposition of materials within the CMA including tyres, white ware, metals, etc;
- ropes/buoys that have been left out and are completely across the river;
- stands where work had been requested in previous inspections and not completed;
- stand missing/not in place (excludes Hollyford and Awarua rivers);
- structure exceeded length/width or did not match the plan on file.

During the 2010 season it was found that, of the 645 whitebait stands inspected, 376 stands were fully compliant, but 269 had compliance issues (Figure 61).

Of those, 143 stands required minor repairs and 126 were in an unsatisfactory condition.

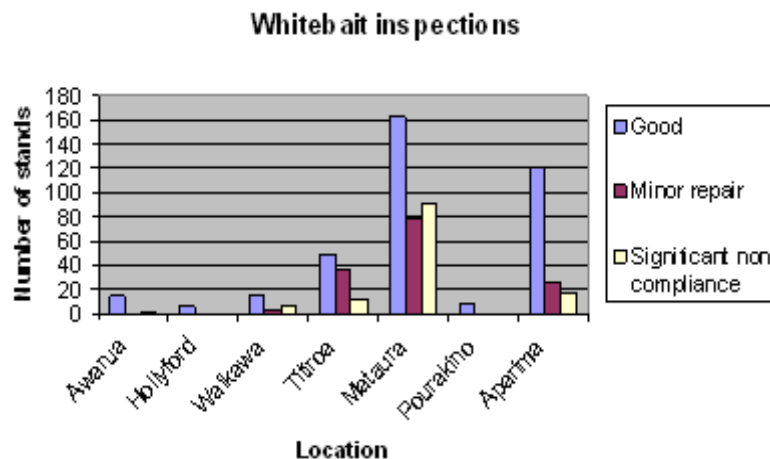


Figure 61: Whitebait inspections

Of the 143 stands that required minor repairs, 25 had multiple minor issues, 49 were missing identification (or the identification was illegible), 13 had ropes/buoys (partially across the river) unattended and 55 required repairs for rotten/missing boards (Figure 62).



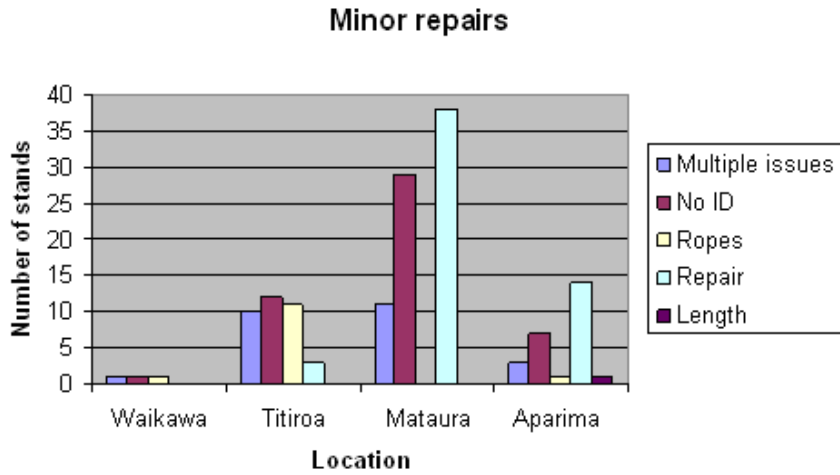


Figure 62: Minor repairs

Of the 126 stands that were in an unsatisfactory condition, 39 had numerous issues, 21 required considerable repair or reconstruction, 36 had unauthorised bank protection work, eight had remnants of old stands that need to be removed, five had rope/buoys completely across the river unattended and one exceeded the length that was on its plan. In addition, 14 were missing identification, or the identification was illegible and had been warned on previous inspections, and two were missing stands completely (Figure 63).

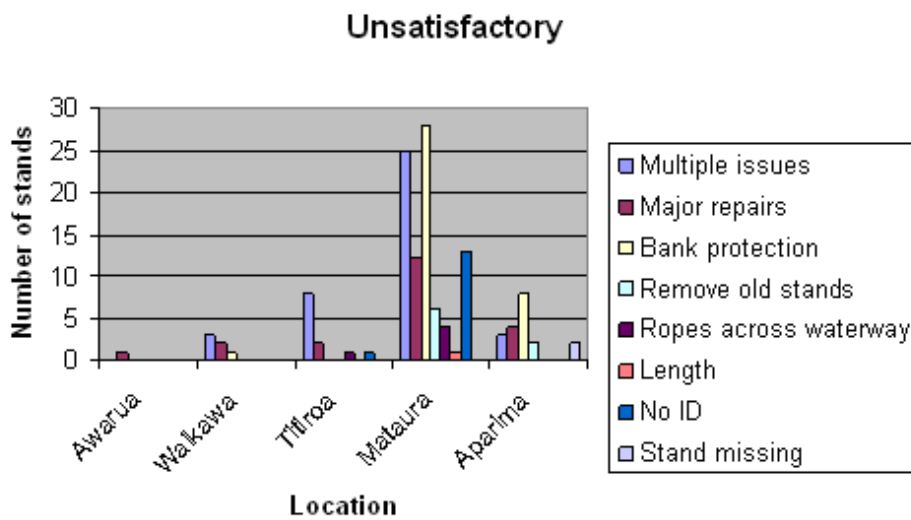


Figure 63: Unsatisfactory stands



8.0 Crown Agencies

8.1 Department of Conservation

8.1.1 Cleddau Workers' Village Redevelopment, Milford

In 2010/11, the Department of Conservation was granted several consents for the redevelopment of the flood-prone Cleddau Workers' Village in Milford Sound. Consents ranged from rock and gravel extraction permits, to construct flood protection barriers and raise the height of the village platform, through to discharges of stormwater associated with the site construction works and the ongoing village operation.

Photographs showing some of the work undertaken are included in this report (Figures 64 to 70).



Figure 64: Clearance of Cleddau Village platform, March 2011.





Figure 65: Blasting area for rock rip rap extraction, March 2011.



Figure 66: Existing rip rap river bank protection behind Milford Lodge, March 2011.

Site visits were carried out in March and June 2011 to inspect the work associated with the operation of the consents. Although there had generally been good controls in place during the works period, two matters arose that required some rectification:

- water sample collection was found to be happening at locations unsuitable for full data interpretation. However, this matter was corrected after meeting with the contractor responsible for on-site



sample collection, and through the provision of training and instructions about what was required to meet consent requirements;

- in May 2011, a blockage to the Milford main sewer line occurred as a result of a manhole cover being displaced during the works, with the sump being filled with debris. Sewage had backed up the main sewer line and emerged from a manhole further up the line. Steps were taken to mitigate the spill and no sewage entered the Milford Sound environment. An infringement notice was subsequently issued to the contractor by Environment Southland.

Overall, a high degree of care has been evident in how the consents have been exercised and the relationship of the activities to the sensitive environment. The construction portion of the project is expected to be completed by October 2011, but further inspections will be required in the future to monitor stormwater discharges and manage the newly constructed flood banks.



Figure 67: Cleddau backwater mouth, 15 June 2011.





Figure 68: CMA gravel extraction area, 15 June 2011.



Figure 69: Sediment control at borrow area, 15 June 2011.





Figure 70: Newly constructed rip rap flood wall behind Milford Lodge, 15 June 2011.

8.1.2 Discharge of Brodifacoum

In June 2010 the Department of Conservation was granted a consent to “discharge cereal bait containing brodifacoum to land in circumstances where it may enter water” to eradicate mice and rats from Indian Island in Dusky Sound, Fiordland.

The operation began in June 2010, however during the transport bait to Anchor Island an incident occurred resulting in a box carrying 700 kg of bait falling from the helicopter into Lake Kirirua.

This is a potentially deep, predominantly rain-fed lake, located in a mainly peaty area surrounded by mature forest. The lake is known to contain koaro, longfin eel, shortfin eel, common bully species and giant kokapu. There is also a shag colony in the area that feed on the fish in Lake Kirirua.

An investigation was conducted to examine the sediment and water quality in the lake and an assessment of the wildlife in the surrounding area was undertaken.

No brodifacoum was detected in the sediment or water samples collected on two occasions immediately after the incident. Two deceased Pied Shags (*Phalacrocorax varius*) were found and sent for examination. An autopsy found that both birds died of natural causes. Five adult longfin eels (*Anguilla dieffenbachia*) were also euthanized for autopsy. All five eels were found to contain no trace of brodifacoum and sampling staff reported they appeared very healthy at the time of collection.



8.1.3 Consent to Discharge 1080 Poison in Waitutu Forest

On 26 February 2010 the Department of Conservation (DOC) was granted consent to aerially discharge baits containing 1080 poison to land in the Waitutu Forest for pest control. Conditions in the consent were established to ensure that the bait was applied in a strictly controlled manner that would minimise the impact on both non-target species and the environment.

The consent required:

- the bait to meet certain specifications;
- identification of the area that the bait could be applied and how that would be measured;
- areas where the aerial application of the bait was excluded;
- a series of operational safeguards;
- pre and post-bait application monitoring to be undertaken;
- relevant organisations and the public to be notified of each phase of the operation;
- a number of monitoring programmes to be undertaken.

The pre-feed stage of this operation was undertaken on 8 and 9 September 2010, with the application of the toxic bait completed on 4 October 2010.

Environment Southland staff conducted an on-site inspection of the operation on the day that the toxic bait was laid. Staff observed no non-compliance with the consent at that time. All relevant information has been supplied to Environment Southland, indicating that the operation was fully compliant with the conditions set out in the consent.

8.2 New Zealand Transport Agency

The New Zealand Transport Agency (NZTA) holds 14 resource consents. These consents consist of:

- three discharge permits to land;
- eight land use permits;
- one land use and water permit;
- one land use and discharge permit; and
- one land use, water and discharge permit.

Discharge Permits

The NZTA holds three discharge permits:

- *To discharge contaminants to land in circumstances where it may enter water, or the coastal marine area.*

This consent is for the discharge of Calcium Magnesium Acetate to land in circumstances where it may enter fresh or coastal water for de-icing



roads throughout the Southland region. The consent requires that Environment Southland is notified within two working days of the consent being exercised. The NZTA has been compliant with the reporting conditions of this consent.

- *To discharge cleanfill to land.*

The location of this consent is the Seven Mile disposal site, near Te Anau Downs. The consent requires that an annual report outlining the previous year's operations is submitted to Environment Southland by the end of December each year. However, to date, Environment Southland has not received any of these reports.

- *To discharge cleanfill (road debris) to land.*

This consent was issued in March 2011 for the Cascade Creek area, in the Fiordland National Park. However, commencement of the consent did not occur until June 2011. Records of operations only need to be supplied to Environment Southland on request.

Land Use and Air Discharge Permits

The NZTA holds one land use and air discharge permit:

- *To repair and maintain an existing bridge over the Waimeamea River.*

The NZTA is required to notify Environment Southland of commencement or completion of works. To date Environment Southland has not received any notification regarding this consent, however the consent only commenced in January 2009, therefore maintenance works may not have occurred yet.

Land Use and Water and Discharge Permits

The NZTA holds one land use and water and discharge permit:

- *To alter structures in, on, or over the bed of rivers, to disturb the bed of rivers, to dam and divert water, to remove gravel, and to discharge contaminants to water while carrying out maintenance on bridges and culverts.*

This consent is exercised along State Highway 94, from Te Anau to Milford and was issued in May 2006. The consent requires an annual work plan to be submitted to Environment Southland by March each year. Environment Southland has only received the work plan for 2008, no other work plans have been received to date.

Land Use and Water Permit

The NZTA holds the following land use and water permit:

- *To carry out channel clearance works in the bed of a watercourse.*



This consent is to carry out channel clearance works, including diverting the flow temporarily and gravel extraction from Princhester Creek at State Highway 94, The Key. This consent was not exercised often; therefore it was put on hold in March 2010.

Land Use Permits

The NZTA holds eight land use permits.

- *two consents are for the extraction of gravel from the Mararoa and Eglinton River - these consents were not exercised often, therefore they were put on hold in March 2010;*
- *one consent is to place rock rip-rap along the banks and in the bed of the Mataura River at State Highway 6, Athol, for erosion protection - this consent appears to have been last exercised in May 2008;*
- *to disturb the bed of the Whitestone River to inspect the piles of the Whitestone River Bridge and undertake repairs to the piles if required - this consent appears to have last been exercised in March 2008;*
- *two consents for widening the existing bridge 104 over the Cleddau River and the bridge over the Dome Creek - these consents were issued in April 2008, however work on these consents does not appear to have started because Environment Southland has received no notification of commencement, a requirement of the consent conditions;*
- *one consent is to disturb the bed of Falls Creek near Falls Creek Bridge on State Highway 94 to undertake geotechnical investigations - this consent appears to have last been exercised in July 2009;*
- *to construct a new sump, soak-pit and culvert headwall and to discharge stormwater to water as part of highway rehabilitation at Lochiel Corner, State Highway 6 - this consent was issued in May 2011 and does not appear to have been exercised.*

Complaints and self-reported incidents

Environment Southland received no complaints from the public relating to the NZTA over the last year. The NZTA also did not self-report any incidents to Environment Southland over the year.



Part B: Incident Response

9.0 Incidents

There were 980 incidents attended by Environment Southland staff during 2010/11.

Incidents are identified in three ways:

- issues found by Environment Southland staff during inspection activities;
- incidents reported by any third party; and
- self-reported issues by the responsible party.

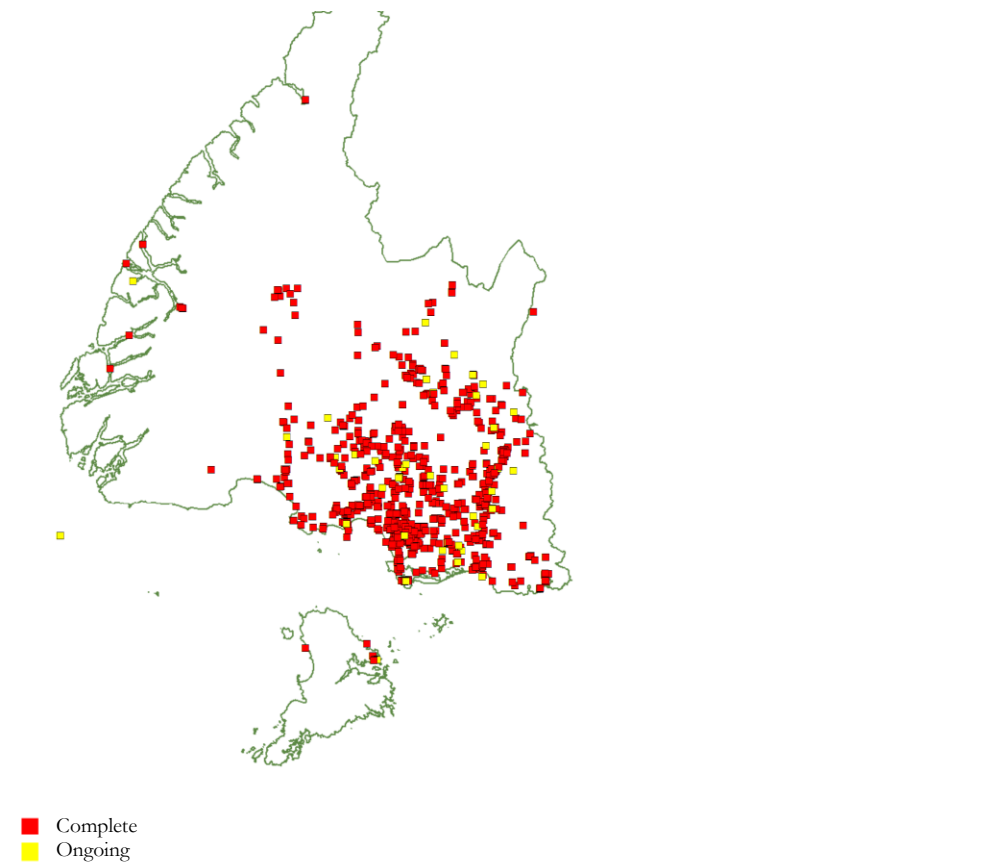


Figure 71: Location of incidents in Southland 2010/11.

These results are almost identical to the 2009/10 results (981). Most of these are reported to Environment Southland by members of the public, or by Council staff. However, there were several self-reports received from consent holders.



Incident response

There are several acceptable response types, or methods that an enforcement officer can use to deal with incidents. Inspections are traditionally used for matters that will have, or have the potential to cause a significant impact on the environment (Figure 72).

Of the 980 incidents, 620 incidents required an inspection to measure environmental effects.

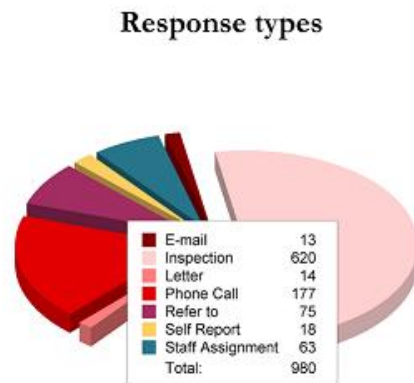


Figure 72: Response types

Fifty-three per cent of complaints were responded to within the specified timeframe. This is a slight increase in performance from the previous year (49%).

Incident Numbers

The number of incidents dealt with by staff was 851 in 2008/09, this increased to the highest level of 981 in 2009/10 and was 980 for 2010/11 (Figure 73).



All Incidents Received by Environment Southland

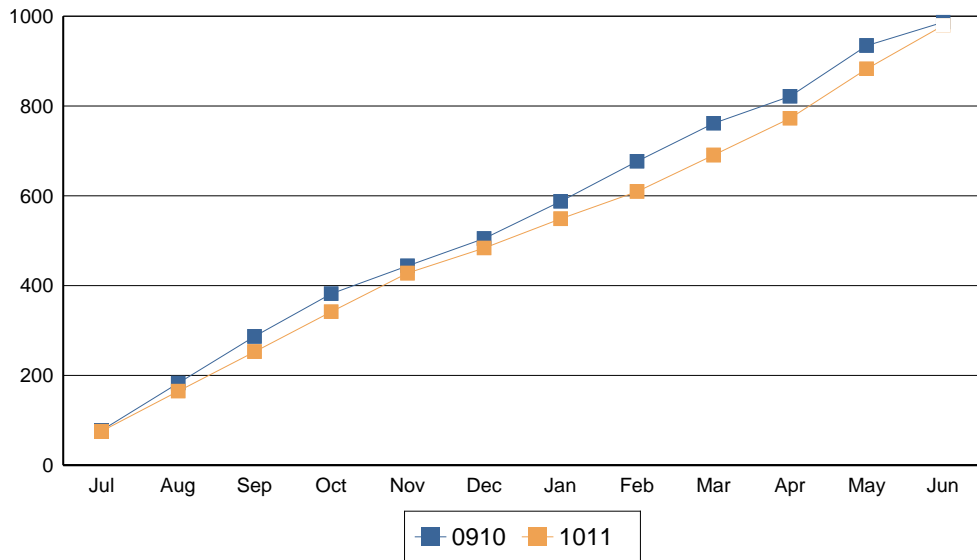


Figure 73: Comparison of incidents received during 2009/10 and 2010/11

When members of the public report an incident to Environment Southland they can opt to remain anonymous, or have their contact details recorded.

Although essential for public confidence, anonymity can increase response and field time because there is less opportunity for a compliance officer to extract more details, including an exact location or other vital information from the complainant.

Generally, reported incidents have complainant details allowing officers to advise them of the action taken by the officer and that the incident has been dealt with.

Incident Types

Table 23: All incidents are categorised as being related to air, coast, land, or water

	<i>2007/08</i>	<i>2008/09</i>	<i>2009/10</i>	<i>2010/11</i>
Air	353	214	255	228
Land	138	262	286	343
Water	272	344	375	330
Coast	22	27	65	79

Seasons have a major role in the type and frequency of incidents reported by the public. For example, the whitebait season correlates with an increase in complaints relating to coast. The extended daylight hours of summer correspond with increased complaints relating to air, and land complaints peak in May (Figure 74).



Monthly Incidents Received by Type

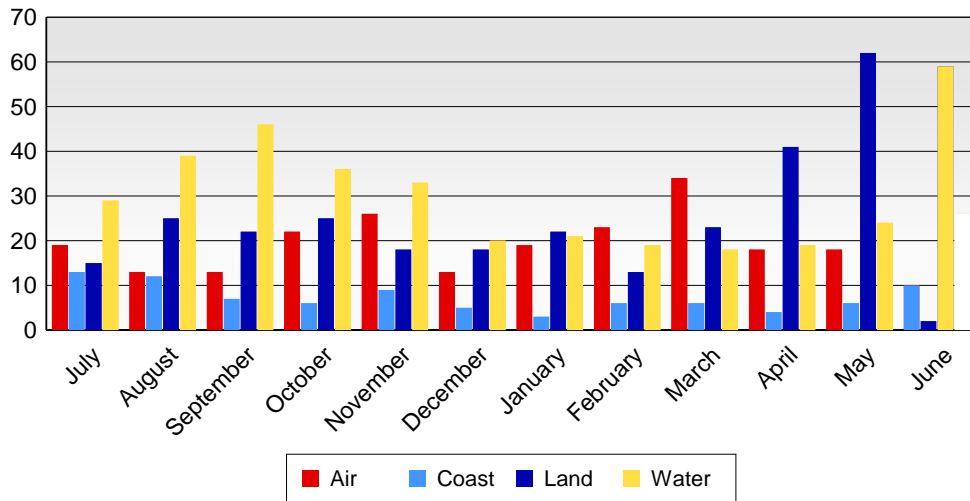


Figure 74: Monthly incidents received by type.

9.1 Search Warrants

Two search warrants were executed in the 2010/11 year:

- one to gather evidence relating to the unlawful burning of tyres on a private residence;
- one to gather evidence to determine the number of cows being milked on a dairy farm, in excess of the resource consent.



Part C: Enforcement Actions

10.0 Infringement Notices

Infringement notices are punitive measures that are considered a cost effective and fair form of punishment for those who have committed an offence, but one that trends towards the lower end of the scale and is not considered serious enough to warrant prosecution.

The decision to issue an infringement notice is delegated to Environment Southland's Director of Environmental Management, supported by an infringement panel made up of two senior managers. This has recently changed with the adoption of the Compliance Action Policy, which gives senior compliance staff the authority to issue infringement notices.

Penalties are prescribed by the Resource Management (Infringement Offences) Act 1999 and vary, depending on the section of the Resource Management Act 1991 contravened.

There were 57 infringement notices issued during 2010/11 (Table 24). They are in the following categories:

- **Water** - 47 infringements related to effluent being discharged in circumstances where it may reach water, two relating to silage leachate and seven other discharges;
- **Air** - one infringement, relating to smoke;
- **Land** - no infringements for land;
- **Coast** - no infringements for coast.

Table 24: Infringement notices issued 2010/11 (information obtained from enforcer data base, infringements settled in financial year)

<i>Issued to</i>	<i>Offence</i>	<i>RMA Section</i>
John Dowdle	Allowed a contaminant, namely effluent, to be discharged into or onto land in circumstances which may result in that contaminant entering water when that discharge was not expressly allowed for by a national environmental standard or other regulations.	Contravention of Section 15(1)(a)
AA Dipping & Spraying Ltd	Allowed a contaminant, namely smoke and other vapour to be discharged to air from an industrial and trade premises when that discharge was not expressly allowed for by a national environmental standard or other regulations.	Contravention of Section 15(1)(a)
Andrew Dennis Gunn	Allowed a contaminant, namely silage leachate, to be discharged into or onto land in circumstances which may result in that contaminant entering water when that discharge was not expressly allowed for by a	Contravention of Section 15(1)(a)



<i>Issued to</i>	<i>Offence</i>	<i>RMA Section</i>
	national environmental standard or other regulation.	
Robert John Flett	Allowed a contaminant, namely effluent, to be discharged into or onto land in circumstances which may result in that contaminant entering water when that discharge was not expressly allowed for by a national environmental standard or other regulations.	Contravention of Section 15(1)(a)
Robert John Flett	Hole in the wall made in wintering containment pond and other section of holding sump is overflowing to land. Allowed a contaminant, namely effluent, to be discharged into or onto land in circumstances which may result in that contaminant entering water when that discharge was not expressly allowed for by a national environmental standard or other regulations.	Contravention of Section 15(1)(a)
Shane O'Donnell	Allowed a contaminant, namely effluent, to be discharged into or onto land in circumstances which may result in that contaminant entering water when that discharge was not expressly allowed for by a national environmental standard or other regulations.	Contravention of Section 15(1)(a)
Scott Christensen	Allowed a contaminant, namely effluent, to be discharged into or onto land in circumstances which may result in that contaminant entering water when that discharge was not expressly allowed for by a national environmental standard or other regulations.	Contravention of Section 15(1)(b)
Bret Baynes	Allowed a contaminant, namely effluent, to be discharged into or onto land in circumstances which may result in that contaminant entering water when that discharge was not expressly allowed for by a national environmental standard or other regulations.	Contravention of Section 15(1)(b)
Gold Creek Dairy Limited	Allowed a contaminant, namely effluent, to be discharged into or onto land in circumstances which may result in that contaminant entering water when that discharge was not expressly allowed for by a national environmental standard or other regulations.	Contravention of Section 15(1)(b)
Allan Marshall	Stock having unrestricted access to a waterway resulting in a breach of Rule 42 (a)(iii) of the Regional Water Plan for Southland.	Contravention of Section 15(1) (b)
Andrew Howden	Allowed a contaminant, namely effluent, to be discharged into or onto land in circumstances which may result in that contaminant entering water when that discharge was not expressly allowed for by a national environmental standard or other regulations.	Contravention of Section 15(1) (b)
Lowedown Trust	Allowed a contaminant, namely effluent, to be discharged into or onto land in circumstances which may result in that contaminant entering water when that discharge was not expressly allowed for by a national environmental standard or other regulations.	Contravention of Section 15(1) (b)
Paul Michael Clinton	Allowed stock to graze in such a manner that caused effluent and sediment runoff to adversely affect the water quality.	Contravention of Section 15(1) (b)
Alexander Hunter	Stock having unrestricted access to a waterway	Contravention of



<i>Issued to</i>	<i>Offence</i>	<i>RMA Section</i>
Holms	resulting in a breach of Rule 42 (a)(iii) of the Regional Water Plan for Southland.	Section 15(1) (b)
Fonterra Co-operative Group Limited	Discharge of contaminants, namely milk, to land in circumstances where those contaminants may enter water.	Contravention of Section 15(1) (b)
Dynes Transport Tapanui Limited	Discharge of contaminants, namely milk, to land in circumstances where they may enter water.	Contravention of Section 15(1) (b)
Bruski Farms 2001 Limited	Allowed a contaminant, namely effluent, to be discharged into or onto land in circumstances which may result in that contaminant entering water when that discharge was not expressly allowed for by a national environmental standard or other regulations.	Contravention of Section 15(1) (b)
Gavin Keenan	Allowed a contaminant, namely effluent, to be discharged into or onto land in circumstances which may result in that contaminant entering water when that discharge was not expressly allowed for by a national environmental standard or other regulations.	Contravention of Section 15(1) (b)
Campbell David McManaway	Allowed a contaminant, namely effluent, to be discharged into or onto land in circumstances which may result in that contaminant entering water when that discharge was not expressly allowed for by a national environmental standard or other regulations.	Contravention of Section 15(1) (b)
Douglas John Gollan	Allowed a contaminant, namely effluent, to be discharged into or onto land in circumstances which may result in that contaminant entering water when that discharge was not expressly allowed for by a national environmental standard or other regulations.	Contravention of Section 15(1) (b)
David Philp	Allowed a contaminant, namely effluent, to be discharged into or onto land in circumstances which may result in that contaminant entering water when that discharge was not expressly allowed for by a national environmental standard or other regulations.	Contravention of Section 15(1) (b)
Strathallen Farms Limited C/- Harrex Group Limited	Allowed a contaminant, namely silage leachate, to be discharged into or onto land in circumstances which may result in that contaminant entering water when that discharge was not expressly allowed for by a national environmental standard or other regulations.	Contravention of Section 15(1) (b)
P I & R E Hartley & R Rai	Allowed a contaminant, namely effluent, to be discharged into or onto land in circumstances which may result in that contaminant entering water when that discharge was not expressly allowed for by a national environmental standard or other regulations.	Contravention of Section 15(1) (b)
Layton Hartley	Allowed a contaminant, namely effluent, to be discharged into or onto land in circumstances which may result in that contaminant entering water when that discharge was not expressly allowed for by a national environmental standard or other regulations.	Contravention of Section 15(1) (b)
Lester Howden	A routine farm inspection identified a travelling irrigator operating without a fail-safe system, and in breach of the consent and its application. There	Contravention of Section 15(1) (b)



<i>Issued to</i>	<i>Offence</i>	<i>RMA Section</i>
	was an over application of effluent to land.	
William Du Plessis	During a routine inspection, dairy shed effluent was noted to be over applied to saturated soils and was running overland and into a water way.	Contravention of Section 15(1) (b)
Neville Harrison	Allowed a contaminant to discharge to land in circumstances where it got to water.	Contravention of Section 15(1) (b)
Peter Condon	Allowed a contaminant to discharge to land in circumstances where it could get to water.	Contravention of Section 15(1) (b)
Euan Shearing Contracting Limited	Allowed a contaminant, namely effluent, to be discharged into or onto land in circumstances which may result in that contaminant entering water when that discharge was not expressly allowed for by a national environmental standard or other regulations.	Contravention of Section 15(1) (b)
Tuapeka Transport Limited	Allowed a contaminant, namely effluent, to be discharged into or onto land in circumstances which may result in that contaminant entering water when that discharge was not expressly allowed for by a national environmental standard or other regulations.	Contravention of Section 15(1) (b)
Murray John Forde	Allowed a contaminant, namely effluent, to be discharged into or onto land in circumstances which may result in that contaminant entering water when that discharge was not expressly allowed for by a national environmental standard or other regulations.	Contravention of Section 15(1) (b)
Neal Richard Forsyth	Allowed a contaminant, namely effluent, to be discharged into or onto land in circumstances which may result in that contaminant entering water when that discharge was not expressly allowed for by a national environmental standard or other regulations.	Contravention of Section 15(1) (b)
Shaun Richard Jones	Allowed a contaminant, namely effluent, to be discharged into or onto land in circumstances which may result in that contaminant entering water when that discharge was not expressly allowed for by a national environmental standard or other regulations.	Contravention of Section 15(1) (b)
Allan George Pulley	Allowed a contaminant, namely effluent, to be discharged into or onto land in circumstances which may result in that contaminant entering water when that discharge was not expressly allowed for by a national environmental standard or other regulations.	Contravention of Section 15(1) (b)
Moonlight Farms Trust Partnership	Allowed a contaminant, namely effluent, to be discharged into or onto land in circumstances which may result in that contaminant entering water when that discharge was not expressly allowed for by a national environmental standard or other regulations.	Contravention of Section 15(1) (b)
Marshall Road Farm Trustee Limited	Allowed a contaminant, namely effluent, to be discharged into or onto land in circumstances which may result in that contaminant entering water when that discharge was not expressly allowed for by a national environmental standard or other regulations.	Contravention of Section 15(1) (b)
Reza Abdul-Jabbar	Allowed a contaminant, namely effluent, to be discharged into or onto land in circumstances which	Contravention of Section 15(1) (b)



<i>Issued to</i>	<i>Offence</i>	<i>RMA Section</i>
	may result in that contaminant entering water when that discharge was not expressly allowed for by a national environmental standard or other regulations.	
Woldwide Three Limited	Allowed a contaminant, namely effluent, to be discharged into or onto land in circumstances which may result in that contaminant entering water when that discharge was not expressly allowed for by a national environmental standard or other regulations.	Contravention of Section 15(1) (b)
Albert de Wolde	Allowed a contaminant, namely effluent, to be discharged into or onto land in circumstances which may result in that contaminant entering water when that discharge was not expressly allowed for by a national environmental standard or other regulations.	Contravention of Section 15(1) (b)
Janita Julia de Wolde	Allowed a contaminant, namely effluent, to be discharged into or onto land in circumstances which may result in that contaminant entering water when that discharge was not expressly allowed for by a national environmental standard or other regulations.	Contravention of Section 15(1) (b)
Bradley Alan Cook	Allowed a contaminant, namely effluent, to be discharged into or onto land in circumstances which may result in that contaminant entering water when that discharge was not expressly allowed for by a national environmental standard or other regulations.	Contravention of Section 15(1) (b)
Paul Fahey	Allowed a contaminant, namely effluent, to be discharged into or onto land in circumstances which may result in that contaminant entering water when that discharge was not expressly allowed for by a national environmental standard or other regulations.	Contravention of Section 15(1) (b)
Nigel Colvin	Allowed a contaminant, namely effluent, to be discharged into or onto land in circumstances which may result in that contaminant entering water when that discharge was not expressly allowed for by a national environmental standard or other regulations.	Contravention of Section 15(1) (b)
TSK White Limited	Allowed a contaminant, namely effluent, to be discharged into or onto land in circumstances which may result in that contaminant entering water when that discharge was not expressly allowed for by a national environmental standard or other regulations.	Contravention of Section 15(1) (b)
Robert Lindsay David Elder	Allowed a contaminant, namely effluent, to be discharged into or onto land in circumstances which may result in that contaminant entering water when that discharge was not expressly allowed for by a national environmental standard or other regulations.	Contravention of Section 15(1) (b)
James Michael Daly	Allowed a contaminant, namely effluent, to be discharged into or onto land in circumstances which may result in that contaminant entering water when that discharge was not expressly allowed for by a national environmental standard or other regulations.	Contravention of Section 15(1) (b)



<i>Issued to</i>	<i>Offence</i>	<i>RMA Section</i>
Bates Transport Limited	Allowed a contaminant, namely effluent, to be discharged into or onto land in circumstances which may result in that contaminant entering water when that discharge was not expressly allowed for by a national environmental standard or other regulations.	Contravention of Section 15(1) (b)
Lance Raymond Peters	Allowed a contaminant, namely effluent, to be discharged into or onto land in circumstances which may result in that contaminant entering water when that discharge was not expressly allowed for by a national environmental standard or other regulations.	Contravention of Section 15(1) (b)
Luke Cosgrove	Allowed a contaminant, namely effluent, to be discharged into or onto land in circumstances which may result in that contaminant entering water when that discharge was not expressly allowed for by a national environmental standard or other regulations.	Contravention of Section 15(1) (b)
Kevin James Heads	Allowed a contaminant, namely effluent, to be discharged into or onto land in circumstances which may result in that contaminant entering water when that discharge was not expressly allowed for by a national environmental standard or other regulations.	Contravention of Section 15(1) (b)
Matthew Ivor Richards	Allowed a contaminant, namely effluent, to be discharged into or onto land in circumstances which may result in that contaminant entering water when that discharge was not expressly allowed for by a national environmental standard or other regulations.	Contravention of Section 15(1) (b)
Leondale Limited	Allowed a contaminant, namely effluent, to be discharged into or onto land in circumstances which may result in that contaminant entering water when that discharge was not expressly allowed for by a national environmental standard or other regulations.	Contravention of Section 15(1) (b)
Dougal Alexander Anderson	Allowed a contaminant, namely effluent, to be discharged into or onto land in circumstances which may result in that contaminant entering water when that discharge was not expressly allowed for by a national environmental standard or other regulations.	Contravention of Section 15(1) (b)
Foveaux Investments 2008 Limited	Allowed a contaminant, namely effluent, to be discharged into or onto land in circumstances which may result in that contaminant entering water when that discharge was not expressly allowed for by a national environmental standard or other regulations.	Contravention of Section 15(1) (b)
Craig Williams	Allowed a contaminant, namely effluent, to be discharged into or onto land in circumstances which may result in that contaminant entering water when that discharge was not expressly allowed for by a national environmental standard or other regulations.	Contravention of Section 15(1) (b)
Ernest David Byars	Allowed a contaminant, namely effluent, to be discharged into or onto land in circumstances which may result in that contaminant entering water when that discharge was not expressly allowed for by a	Contravention of Section 15(1) (b)



<i>Issued to</i>	<i>Offence</i>	<i>RMA Section</i>
	national environmental standard or other regulations.	
Scully's Transport Limited	Allowed a contaminant, namely effluent, to be discharged into or onto land in circumstances which may result in that contaminant entering water when that discharge was not expressly allowed for by a national environmental standard or other regulations.	Contravention of Section 15(1) (b)

11.0 Abatement Notices

The Resource Management Act 1991 (Section 322) provides regulation allowing the issuing of an abatement notice. Abatement notices are issued with the express directive to the recipient (individual or company) to:

- cease an activity; or
- prohibit them from commencing an activity; or
- take an action.

Abatement notices are a useful tool to ensure the recipient of the notice avoids, remedies or mitigates any actual or likely adverse effect on the environment.

The timeframe set out in the abatement notice must be reasonable, to allow the parties to whom the notice is issued to comply with the content of the notice.

A recipient of an abatement notice must comply with its contents, but has the right to appeal to the Environment Court against the whole or any part of the notice. However, an appeal does not automatically stay the notice. To obtain a stay, both an appeal and an application must be lodged with the Environment Court.

Abatement notices for the 2010/11 year were issued for the following activities:

Coastal issues	12
Air quality issues	11
Unauthorised discharges to land/water (dairy shed effluent)	10
Unauthorised discharges to land/water (silage leachate)	4
Unauthorised discharges to land/water (other liquid effluent)	2
Unauthorised discharges to land/water (solid waste)	2
Over consented cow numbers	1
Consent issues	14
Other	13
Total issues	69



12.0 Prosecutions

Prosecution involves taking the defendant through the court process. This can take many months and span between financial years. Table 25, below, includes some cases before the court, but without result.

Table 25: Prosecutions

<i>Defendant</i>	<i>Case</i>	<i>Decision</i>
Hughes Crowley	Charge: contamination of a waterway, elevated levels of <i>E. coli</i> , B.O.D., phosphorus and total ammoniacal nitrogen.	Manager: Fine \$22000 Worker: Fine \$5000 + 75 hours community service
Talisker Farms	Charge: five charges of unlawful discharge of dairy shed effluent, from pond, irrigator, wintering shed and sludge bed.	Company: Fine \$110,000. Contract share-milker: Fine \$26,000
HKT Holdings	Charge: construction of an earthen dam in the bed of a stream without consent, after being issued with an abatement notice to return creek to original state (did not comply with the notice).	Company: Fine \$10,000
Niagara Sawmilling Limited	Charge: 15 charges arising out of activities connected with sawmilling and timber processing plant.	Company: Fine \$60,000
407 Dairies and Brian Adams and David Bowman	Charge: the company and Mr Adams pleaded guilty to the charge of unlawful discharge of effluent.	Matter ongoing
McKenzie and Twin Peaks Farming Limited	Charge: four charges relating to the unlawful discharge of sediment to water. The company has pleaded guilty to the disturbing the bed charge.	Matter ongoing



Part D: Education and Outreach

13.0 Pollution Prevention

The Pollution Prevention programme has experienced mixed fortunes during the past year. Although the programme has undergone further development and continues to meet most of its targets, the planned increase in resourcing needed to sustain that level of service did not transpire.

As a result, there were several changes to how the service is delivered, leading to an emphasis on reactive responses.

Resourcing pressures have been applied across the entire Compliance Division, which has led to more collaborative efforts between staff to achieve results.

13.1 Prestonville Industrial Area Study

The study to identify existing industrial land uses within the Prestonville industrial area was not progressed this year because of the aforementioned resourcing gaps.

However, liaison with the Living Streams team continued to provide input into sampling regimes, and the Prestonville stormwater catchment was fully identified as a result of this.

Prestonville's stormwater pond remains an input of faecal coliforms to the Waihopai River system and, as such, will continue to be a priority for pollution prevention in Invercargill.

13.2 Pollution Prevention Guide

Nine additional businesses received copies of the Pollution Prevention Guide in 2010/11. The emphasis this year has been on making information available to businesses, but most staff effort has been focussed on regional issues such as wash-water and hazardous substances storage.

Bouquet – Sims Pacific Metals

Sims Pacific Metals began participating in pollution prevention in 2010, after a raft of issues were discovered on its Invercargill site. These included persistent stormwater and sediment runoff from the site, dust discharges and occasional fires to burn waste. Combined with the site's legacy issues from historical land filling and its longstanding operation as a scrap merchant, a number of highly technical and complex factors had to be considered when attempting to improve the situation.



During 2010 and 2011, Environment Southland and Sims Pacific Metals' staff worked closely with consultants, contractors and the Invercargill City Council to redesign the site. Initial environmental considerations were to retain contaminated runoff and treat it before it was discharged to the City Council's stormwater system and then to the New River Estuary. The redesign also allowed the company to construct new purpose built facilities on site and improve its vehicle tracking for better health and safety.

Environment Southland councillors visited the site in May 2011 and were impressed to see the significant improvement in appearance and operations. We look forward to seeing this work progress through the company's commitment to improvement.



Figure 75: Ponding at Sims Pacific Metals at an early site visit, 2010.



Figure 76: Councillors visiting the redeveloped site in May 2011 (stormwater treatment in the background).





Figure 77: Stormwater treatment system prior to installation, February 2011 (photo supplied by Sims Pacific Metals).

13.3 Challenges/Looking Ahead

Stormwater

During 2010/11, several stormwater drains in Invercargill were identified as being subject to periodic human faecal contamination, most likely because of plumbing misconnections on individual properties. Advice was given to the Living Streams team in respect of these issues. The discharge of human sewage into surface water is a prohibited activity in the Regional Water Plan.

As with stormwater matters identified in last year's report, this is a critical matter requiring urgent action. Environment Southland will continue to attempt to work with stakeholders to remove such sources of pollution.

Permitted activity monitoring will be implemented in the 2011/12 year for the first time.

Vehicle and Equipment Wash-water

Some progress was made with the Motor Trade Association on this matter during the year. Car sales yards have been put on notice that any washing of vehicles using detergents without a compliant wash system, or wash pad is unacceptable and likely to result in enforcement action.

The Motor Trade Association has been open to this change in practice and has actively encouraged innovation in meeting Environment Southland's requirements in this respect.



14.0 Listed Land Uses

14.1 Listed Land Use Register

Work has continued on building up the register in accordance with Environment Southland’s functions under the Resource Management Act 1991 and the Ministry for the Environment’s Guidelines for Assessing and Managing Contaminated Land. As at 1 July 2011, registered sites were classified as shown in Figure 78.

Registered Sites by Classification

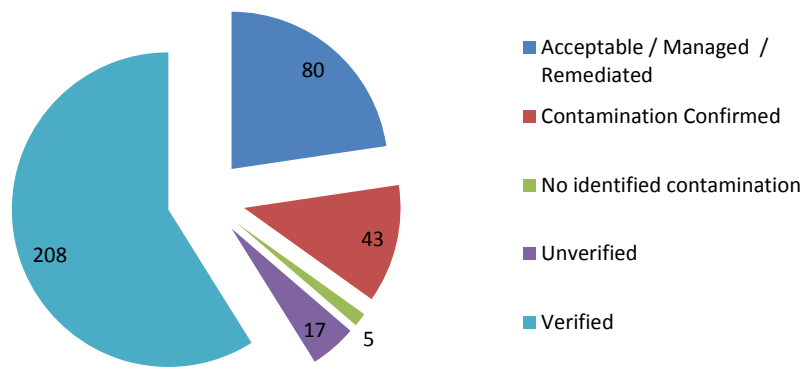


Figure 78: Registered sites by classification.

Sites are also classified as belonging to one of 53 listed activities contained within the Ministry for the Environment’s Guidelines. Current site registrations and their listed land use are displayed in Figure 79.

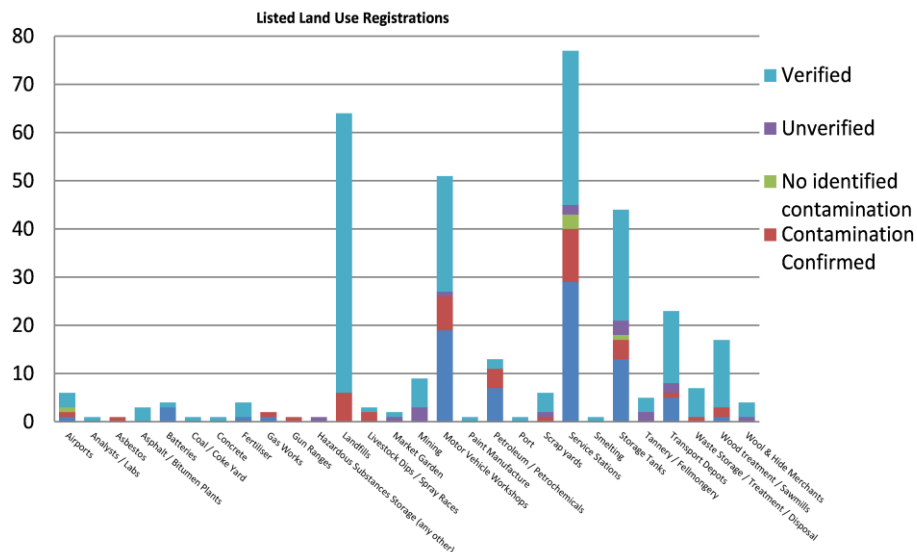


Figure 79: Listed land use registrations.



As some sites are subject to more than one land use, Figure 79 displays more than the 262 records on the register. The activity captions have been simplified to broadly describe the activities contained on the Hazardous Activities and Industries List (HAIL). The majority of unverified records are awaiting landowner input, or were recorded prior to the current database being activated. Records are continuously updated to ensure sites are current, verified and fully documented. The number of unverified sites dropped from 18 to 17 during this year, however the proportion of unverified sites overall has improved. It is important to note that only a small proportion of qualifying HAIL sites and activities have yet been identified on the register – for example, there are approximately 74 cemeteries in Southland which may qualify for inclusion on the register and are yet to be assessed.

Locations of sites are displayed in Figure 80.

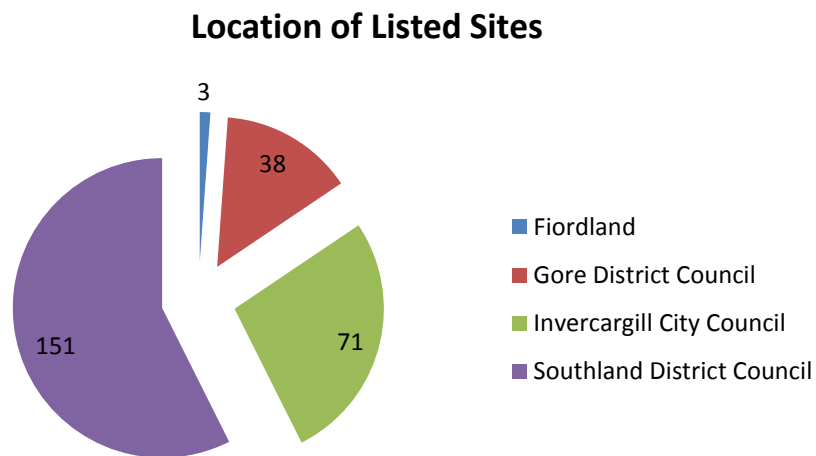


Figure 80: Location of listed sites.

Enquiries relating to the listed land use register continued to be strong during the year (Figure 81).



Enquiries 2010/11

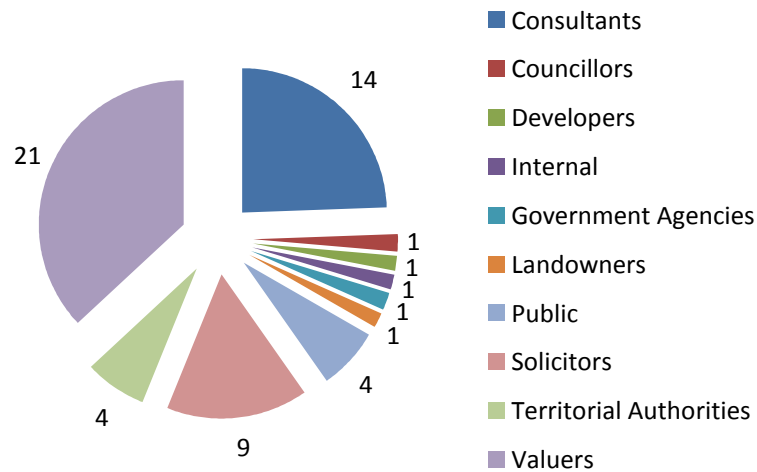


Figure 81: Enquiries 2010/11.

The type of work generated by the Listed Land Use Register changed in 2011, with the notification of Proposed Plan Change 10 to the Regional Water Plan for Southland. From February, resource consent was required to conduct intrusive investigations of potentially contaminated land and to carry out earthworks on contaminated land. The plan change notification immediately switched the focus of this work programme from basic information gathering to populate the register, towards more in-depth investigation and liaison with landowners and consultants as they obtained resource consents to investigate and subsequently develop historically impacted land. This has improved the quality of information which council holds relating to these particular sites.

Five intrusive investigations consents were granted by council between February and July 2011, with four given effect to by the end of June 2011. Environment Southland staff were also closely involved in five other projects that did not require consent, or took place before consenting requirements were imposed.

Of the four consents that were exercised during the reporting period, all were compliant with their conditions on audit or inspection.

14.2 Contaminated Sites Remediation Fund Project

The Contaminated Sites Remediation Fund is a public fund administered by the Ministry for the Environment. It is a contestable fund which is designed to subsidise the investigation and remediation of contaminated sites where the landowners have not been responsible for the polluting activity, or the activity which led to the pollution, was lawful prior to the enactment of the Resource Management Act 1991. Regional councils are responsible for making applications on behalf of landowners to ensure those sites are prioritised within regions.



In 2010, Environment Southland obtained funds towards investigation of a HAIL site on behalf of its owner and on site investigative works began in April 2010. Unfortunately, because of changes occurring on the site during the planning stages of this project, an anticipated “hot spot” for polychlorinated biphenyls (PCBs) was unable to be definitively located. While no other major contamination issues were discovered, Environment Southland continues to work with the landowner on managing environmental impacts from ongoing activities at the site.

No further applications to the fund were made in the 2010/11 funding rounds. One site has emerged which may require funding and an application is likely to be made in 2011.

14.3 Emerging Issues

Off Site Soil Disposal

This matter was reported in last year’s Compliance Monitoring Report. Since then, the introduction of Plan Change 10 and the announcement of the National Environmental Standard for Assessing and Managing Contaminants in Soil have helped raise awareness of soil disposal issues.

Further work is being done on an ad hoc basis with landfill and cleanfill operators to ensure they are aware of the types of materials they can accept. While this includes matters such as contaminated soil disposal, materials such as road sweepings and sump cleanings are also included.

Groundwater Impacts

In 2011, a Southland well was identified as being subject to dieldrin contamination, possibly because of its proximity to an abandoned sheep dip/spray race.

This matter is indicative of several areas in Southland where contamination may pose a risk to groundwater use, or surface water ecology. Of particular concern is the historical New River Estuary reclamation in west Invercargill, which involved municipal landfilling over many years. Sites are now frequently being identified as subject to historical landfilling involving mixed materials in this area. Wastes identified include gas works sludges, foundry waste and clinker, and organic waste.

Closed Landfill Management

Proposed Plan Change 10A of the Regional Water Plan for Southland covers the potential for contaminant release from closed landfills. No closed landfill inspections were carried out during the year, however preparation for potential new rules was initiated by the three territorial authorities. Southland District Council is the most affected by the potential new rules and has started reviewing the status of all its closed landfills.



Information generated by this project will inform the Listed Land Use Register and allow appropriate management of more impacted sites which are creating more adverse effects.

14.4 Underground Tank Removals

Environment Southland continues to receive reports relating to a mix of historical and recent underground tank removals.

Two tank removals were attended by Environment Southland staff and these are reported in more detail below.

Shell Dee Street

An underground diesel storage tank to the rear of this site was identified as having a puncture during routine maintenance and was immediately decommissioned and replaced by Shell. Investigation found no contamination of the surrounding soils – most likely because of groundwater entering through the hole and providing a valve effect on any diesel leakage.

Shell Gladstone

Shell Gladstone was completely redeveloped during the 2010/11 year, requiring closure for about eight weeks. Environment Southland is still awaiting investigative reports for these works.



Part E: National Policy Developments

15 National Environmental Standards

15.1 NES for Assessing and Managing Contaminants in Soil

Under the Resource Management Act, the government can implement legally binding National Environmental Standards (NES). The Ministry for the Environment released the proposed NES for Assessing and Managing Contaminants in Soil in February 2010. After a consultation process in which some toxicological guidelines were revisited, the Minister for the Environment announced the NES in May 2011, to be gazetted into regulation from 1 September 2011.

The NES provides direction for territorial authorities to give effect to their land management functions under the Resource Management Act 1991.

While the NES does not directly affect regional councils' roles or responsibilities in the management of listed land use sites, there will be flow on impacts in terms of Environment Southland's workloads. This is because:

- awareness of land issues will be raised and territorial authorities will be required to consider potential contamination at the time of development, land use consent, or subdivision of sites;
- this will lead to further enquiries of regional councils, coupled with more time required for onsite investigation and/or analysis of information provided under the NES;
- there may not be existing capacity to deal with some of this workload in the private sector in Southland;
- there will be a strong need for joint sharing of information between territorial and regional authorities.

Environment Southland's response to these issues is to continue to give effect to its functions under Section 30 of the Resource Management Act 1991 – to investigate, identify and monitor potentially contaminated land, and to manage its effects on air and water quality. At the same time, territorial authorities will be encouraged to continue to manage and control inappropriate development of contaminated land and promote remediation of significantly impacted land, in accordance with the provisions of the Southland Regional Policy Statement. We also hope to provide more education to sectors within the property industry, to heighten awareness of requirements and responsibilities. Work has started in this respect, with a presentation to the Southland valuing profession made in the year under report.



15.2 Draft Code of Practice for Secondary Containment Systems

The Environmental Risk Management Authority (ERMA) notified consultation of a draft code of practice for secondary containment systems in June 2011. The proposed code of practice aims to address the secondary containment needs a person is likely to face when developing a new site or making significant changes to an existing site. The code provides options to meet the requirements for secondary containment of hazardous substances under the Hazardous Substances and New Organisms (HSNO) Act 1996.

Environment Southland does not currently administer HSNO provisions and did not make a submission on the draft code of practice. The code of practice does not affect requirements to comply with provisions of the Resource Management Act 1991, Building Act 2005 or any other legislation. Consequently it does not interfere with existing secondary containment requirements in the Regional Water Plan for Southland, which are in excess of those required by HSNO. However, the code of practice, if published, will allow for better design of secondary containment on sites which use and store hazardous substances, which will assist in meeting environmental requirements in Southland.

15.3 National Policy Statement for Freshwater Management

On 9 May 2011, the government announced a series of reforms for freshwater management which will trickle through into compliance requirements in the coming years. The reforms include a National Policy Statement for Freshwater Management that came into effect from 1 July 2011. From that date, local government must have reference to the National Policy Statement in consenting decisions and must update regional policy statements, plans, proposed plans, and variations to plans to give effect to the National Policy Statement.

This is likely to mean some changes in consent conditions and regional rules which will feed through into new or updated compliance requirements.

15.4 NES for Measurement of Water Takes

This previously proposed National Environmental Standard has now been gazetted as regulations under the Resource Management Act 1991.

The regulations apply to holders of water permits which allow fresh water to be taken at a rate of greater than 5 litres/second.



They do not apply to:

- people who do not require a resource consent for their water take (permitted takes), including:
 - ◆ individual households or businesses that take water from a reticulated supply;
 - ◆ takes that are specifically permitted in Section 14 of the RMA, including takes for an individual's domestic purposes, for animals' drinking water, or for fire fighting;
 - ◆ any takes which are permitted by a rule in a regional plan;
- holders of permits for water takes that only allow water to be taken at a rate of less than 5 litres/second.

The regulations also **do not** apply to:

- holders of permits for non-consumptive takes;
- holders of permits for takes of coastal or geothermal water.¹

The regulations provide a staged process to comply with the requirements for metering of water use. Environment Southland's Compliance staff are working through these requirements with consent holders, including investigating best practicable options for telemetry of water take information directly to Environment Southland.



¹ Ministry for the Environment, <http://www.mfe.govt.nz/rma/central/measuring-reporting-water-takes.html>, 2010

Glossary

AFDW	Ash free dry weight - used for periphyton monitoring to remove any sediment included in the sample.
ANZECC	The Australia New Zealand Environmental Conservation Council. This organisation is developing guidelines similar to the USEPA but applicable to the Australian and New Zealand situations.
BOD ₅	Biochemical Oxygen Demand - this is a measure of the ability the waste has to remove Dissolved Oxygen from a receiving water or waterway by decomposition.
CFU	Colony Farming Units.
Chl <i>a</i>	Chlorophyll <i>a</i> - the pigment in plant cells which captures light energy for photosynthesis.
DAF Unit	Dissolved Air Flotation unit where air is pumped into the effluent under pressure. When it discharges into the unit under atmospheric pressure the dissolved air comes out of suspension and forms bubbles on any particulate matter. This then floats and is removed as a sludge.
DRP	Dissolved Reactive Phosphorus - DRP is a subgroup of the Total Phosphorus and is an arbitrary measure of the phosphorus that is readily available to the plants to sustain growth.
dsm ³	Dry standard cubic metre - this is used for determining the contaminant levels in exhaust gases by standardising temperature and pressure, and removing the effect of variable water contents.
<i>E. coli</i>	Escherichia coli - these are a subset of the Faecal Coliform group and are regarded as a more specific indicator of faecal contamination and hence the presence of pathogenic bacteria.
EC	Electrical Conductivity - the ability of a water to conduct electricity. This gives a conservative measure of the mineral content of a water. Generally, the greater the conductivity of the water the greater the mineral content of the water.
Faecal Coliforms (FC)	Faecal Coliforms - these are organisms that are present in the gut and faeces of warm blooded animals and are used as indicators of the presence of pathogenic organisms.
g/m ³	A measure of concentration in a liquid or gas. Grams of material in 1 cubic metre of water.



HFA	Hydrofluoric Acid.
IANZ	International Accreditation New Zealand.
ISO	International Organisation of Standardisation.
ISO 1400 1	A standard produced by ISO defining the requirements for an environmental management system.
LTCCP	Long-term Council Community Plan. This is a document projecting Council activities, as required by the Local Government Act 2002.
mg/kg	Unit to measure concentration in a solid (equivalent to ppm (parts per million) or g/m ³ the unit used to measure concentrations in liquids).
MLTR	Makarewa Low Temperature Rendering plant.
MPN	Most Probable Number – a statistical estimate of the mean density of bacteria in a water sample.
N	Nitrogen - Nitrogen is an important element in the growth of plant material. It is required for protein formation and consequently animals have a significant N content.
NH ₄ -N	Ammoniacal Nitrogen, ionised ammonia - a reduced form of nitrogen. Ammonia is rarely found at high levels in natural waters. Its presence is an excellent means of detecting pollution.
NH ₃	Unionised ammonia, ammonia - this form of ammonia is significantly more toxic than the ionised form as above. The relationship between the ionised and unionised forms is dependant on temperature and pH of the water.
Nitrate-N	An oxidised form of Nitrogen - Nitrate Nitrogen is soluble and is therefore readily available to plant life to sustain growth.
Odour Units (OU)	This is the unit for measuring odour. This unit does not refer to weight or volume as with g/m ³ etc, it is essentially based on the group of people being used, to establish the number of dilutions required before an odour cannot be detected.
PAH	Polycyclic Aromatic Hydrocarbons - a class of over 100 different organic molecules composed of only carbon and hydrogen. PAHs are flat molecules with each carbon having three adjacent carbon atoms similar to the structure of graphite. The USEPA has listed 16 of these as priority chemicals due to their potential health effects.
PM ₁₀	Particulate Matter with the aerodynamic particle size of 10 Micrometers or less.
TP	Total Phosphorus - Phosphorus is an important element in the growth of plant material. Total Phosphorus is a measure of all phosphorus present, including all forms of



phosphorous whether it is tightly bound to particulate matter or potentially available to plant life.

TSS Total suspended solids.

$\mu\text{g}/\text{m}^3$ A measure of concentration in a liquid or gas. Micrograms of material in 1 cubic metre of water.
1 gram = 1,000,000 micrograms.

USEPA United States Environmental Protection Agency. The USEPA provides the environmental regulation within the United States. Its data and standards are frequently used as the internal standards by other countries such as New Zealand.



Contributors

Compliance Monitoring Report Authors

David Connor
Graeme McKenzie
Helen Meintjes
Jodi Thompson
Lisa Evans
Michelle Smith
Ruth Williamson

Production/Editing

Mark Hunter
Sam McKnight
Deborah O'Donnell

