Details of Permit – Contaminants to Air

Purpose for which permit is granted:		To discharge contaminants to air for the purpose of operating a meat processing and export plant and associated activities and all other on-site activities including the disposal of waste.
Location	- site locality	Lorneville
	- map reference	E46:476:182
Term:		This consent will expire on (35 years)

Schedule of Conditions

General Conditions

1. Subject to complying with the conditions of this consent, the activities authorised by this consent shall be undertaken so as to be consistent with the application for this consent and the documents entitled:

   (a) Assessment of Environmental Effects dated November 2015

   (b) Technical Reports:

   - Appendix E - Background Ambient Air Quality Report – Golder Associates
   - Appendix F – Baseline Odour Survey – Golder Associates
   - Appendix G – Process Odour Mitigation – Golder Associates
   - Appendix M – Coal Fired Boiler Assessment – Golder Associates
   - Appendix R – Wastewater Treatment Odour Mitigation – Golder Associates
   - Appendix U – Draft Air Quality Discharge Management Plan

2. No alterations shall be made to the plant or process which may substantially adversely alter the nature or quantity of contaminants emitted, or the effects of the emissions on the environment, without the prior approval of consent authority.

3. Any incident causing abnormal and/or excessive emissions to the atmosphere, including odour, shall be abated as soon as is reasonably practicable. On becoming aware of such an incident, the consent holder shall advise the consent authority and follow-up with a written report on the cause, and the actions taken to prevent a recurrence.

4. Trade wastes may be burnt in the existing concrete lined area designated for this purpose. The wastes to be burned shall be limited to wood or paper waste. There shall be no other open air burning of trade waste on the premises

5. Prior to the commencement of this consent, the consent holder shall prepare and submit to the consent authority an Air Discharge Management Plan. The purpose of the Air Discharge Management Plan shall be to ensure that any air discharges from the activities on site are avoided, remedied or mitigated and that they are appropriately monitored for compliance purposes. The Air Discharge Management Plan shall contain, but not be limited to:

   (a) A description of the air discharges arising from onsite activities and processes including:

      (i) Boiler operations and emissions requirements;

      (ii) Rendering plant operating requirements;

      (iii) Odour management;

      (iv) Methods to manage air discharges from onsite activities and processes including particulate emissions and odours.

   (b) Monitoring and reporting requirements.

Boiler Operating and Emission Requirements

6. The height of the stacks above surrounding ground level shall not be less than:

   (a) 30.9m for the Babcock and Wilcox boiler;

   (b) 34.1m for the Foster-Wheeler boiler.

7. The sulfur content of fuel used for the boilers shall not exceed 0.5 wt% (as-received), based on the results of the following testing:

   (a) A grab sample of the supplied coal for the boilers shall be collected at least once per week and sent to an IANZ accredited laboratory for analysis for combustible sulfur as percent by weight of coal both on an as-received and dry basis.

   (b) If the coal source changes then a representative analysis of the sulfur content shall be carried out to confirm compliance with the 0.5 wt% limit before the new coal source is accepted.

   (c) The preparation of an annual monitoring report which shall summarise grab sample test results including a comparison with the limit specified in this condition. This report shall be submitted to the consent authority on an annual basis no later 30 November.

8. The discharge from the boiler stacks shall be directed vertically into the air and shall not be impeded by any obstruction that could impede the vertical efflux velocity.

9. The opacity of smoke discharged from any boiler shall not exceed Ringelmann Shade 1 as described in New Zealand Standard 5201:1973 except:

   (a) for 60 minutes when lighting a boiler after a shutdown period of up to eight hours; or

   (b) for four hours when lighting a boiler after a shutdown period of longer than eight hours; and

(c) at any other time, to allow for cleaning the fires and manual soot blowing of the boilers, for periods not exceeding two minutes at a time and not exceeding five minutes in any period of 60 minutes.

10. The storage of coal and ash shall be managed so that there is no visible emission of coal and ash dust beyond the boundary of the site.

11. The coal fired boiler(s) used on the site shall be serviced at least once every year and the servicing shall be supervised by a person competent in servicing of such boilers. This servicing shall include:

(a) Internal cleaning and replacement or repair of damaged equipment and services as necessary;

(b) Adjustment of the air to fuel ratio to optimise energy efficiency and to minimise the emission of products of incomplete combustion; and

(c) Calibration and adjustment of boiler monitoring equipment consistent with the intent of this consent.

Servicing reports shall be prepared following each servicing event. Confirmation that this servicing has been undertaken, and a copy of the servicing report shall be supplied to the consent authority by 30 November each year.

12. (a) The exhaust air from the two coal fired boilers shall have a flow weighted PM_{10} concentration of 300 mg/m^3 at standard atmospheric pressure and temperature, (STP) corrected to 12 vol.% CO_2 and dry, which equates to a maximum PM_{10} mass rate of 21.4kg/hr .

(b) By no later than 5 years from the first exercise of this consent, and thereafter the flow weighted PM_{10} concentration from the two coal fired boilers shall not exceed 250 mg/m^3 at STP corrected to 12 vol.% CO_2 and dry, which equates to a maximum PM_{10} mass rate of 17.8kg/hr.

13. The consent holder shall undertake an annual campaign of continuous monitoring and logging of ambient 1-hour and 24-hourly average respirable particulate (PM_{10}) concentrations in conjunction with wind speed and direction. The monitoring location shall be as close as practical to New Zealand Transverse Mercator coordinates (NZTM) 1240.240, 4856.670 (Eastings and Northings in kilometres (km)). The period of each monitoring campaign shall commence either before or by 1 December and operate at least to 1 April for each calendar year. Specific features of the methodology shall include:

(a) The ambient PM_{10} monitoring shall be by Beta Attenuation Monitor (BAM) in accordance with AS/NZ 3580.9.11:2008 'Determination of suspended particulate matter - PM_{10} beta attenuation monitors' or equivalent semi-continuous method. The sampling height shall be 3 metres above ground level.

(b) Concurrent monitoring of wind speed and direction at the monitoring site and logging of 10 minute and hourly averaged data at the same site as the PM_{10} monitoring. Wind speed and direction shall be monitored using industry standard meteorological monitoring instrumentation that is attached to a mast at a height of

6 metres above ground level. Specifically the wind direction and speed monitoring equipment shall meet the following specifications:

Wind Speed Instrumentation:
Range: 0 to ≥ 30m/s
Accuracy: ≤ ±5% @ 3 m/s
Resolution: ≤ 0.1 m/s
Response Time: ≤ 1 second
Wind Speed Threshold: ≤ 0.5 m/s

Wind Direction Instrumentation:
Range: 0-359º
Accuracy: ≤ ±5% @ 3 m/s
Resolution: 1º
Response Time: ≤ 1 second
Wind Speed Threshold: ≤ 0.5 m/s

(c) Ambient PM_{10} concentrations in micrograms per cubic metre shall be recorded in electronic form as 1-hour and 24-hour averages (midnight to midnight). Wind speed in metres per second, and wind direction in degrees clockwise of true north, shall be recorded in electronic form as 1-hour and 10 minute averages.

(d) The consent holder shall report the hourly PM_{10} concentration measurements that occur when the monitoring site is downwind of the boiler stacks. This includes 1-hour average wind directions that are between 245 and 270 degrees from true north (or whichever directions are within 13 degrees of the direction bearing between the monitor sample point and the boiler stacks).

(e) From the downwind ambient 1-hour PM_{10} results, report the maximum, 95th and 50th percentile values (ie. X, Y, Z indicated in Table 1, respectively). The maximum and 95th percentiles (X & Y) shall meet their respective PM_{10} concentration percentile limits listed in Table 1. These are appropriate limits that relate to the applicable coal-fired boiler stack PM_{10} discharge limits of 300 mg/m^3 and 250 mg/m^3 (at 12 vol.% CO2 and dry STP condition). The applicable stack discharge limit for PM_{10} is defined in condition 12.

TABLE 1: AMBIENT PM_{10} PERCENTILE LIMITS FOR OFF-SITE MONITORING

Hourly Downwind PM_{10} Percentile	**Monitored hourly PM_{10} (µg/m^3), downwind conditions**	**Expected Ambient PM_{10} (µg/m^3) for stack concentration of 300 mg/m^3**	**Expected Ambient PM_{10} (µg/m^3) for stack concentration of 250 mg/m^3**
100%	x	**122**	**117**
95%	y	**37**	**35**
50%	z	**18**	**17**

14. Within two months of the end of the monitoring period undertaken in accordance with condition 13 the consent holder shall provide a monitoring report to the consent authority, which shall include the following:

(a) Start and end dates of monitoring;

(b) Electronic data set containing the time series of monitored hourly PM_{10}, wind speed and wind direction;

(c) Table containing the monitored results versus PM_{10} percentiles;

(d) Time series plot of monitored 24-hour average PM_{10} and comparison with the NES criterion for 24-hour PM_{10};

(e) Confirmation of any stack discharge testing being planned, and the testing and reporting schedule in response to either the 95^{th} and/or the 100^{th} PM_{10} concentration percentile limits being exceeded as described in condition 13(e).

15. Should the monitoring and reporting of hourly downwind ambient PM_{10} percentiles undertaken in accordance with conditions 13 and 14 identify that either of the appropriate 95^{th} and/or the 100^{th} percentile PM_{10} limits listed in Table 1 of condition 13(e), are exceeded by 2 $\mu g/m^3$, or more, then testing of coal fired boilers stack PM_{10} discharges from the boiler stacks using US EPA Methods 201A and 202 (or equivalent methods agreed with the consent authority) shall be undertaken no later than post the exceedance. Ambient monitoring will also be extended up to include the time at which stack testing is undertaken.

16. The results of the stack testing and completed ambient monitoring undertaken in accordance with condition 15 shall be reported to the consent authority within 30 working days of its completion. If the monitoring determines that the operation of the boilers is likely to have caused or contributed to an exceedance of the ambient limits set out in condition 13(e), this report shall also identify the likely cause and remedial actions that are necessary to be undertaken in order to prevent such exceedances occurring again, and the appropriate timeframe for implementation. The consent holder shall be required to implement the required action specified in the report.

17. Within ten years of the commencement of this consent and at five yearly intervals thereafter, the consent holder shall conduct a review of:

(a) The results of the monitoring required by the conditions of this consent;

(b) Relevant guidelines or standards for discharges to air; and

(c) Technology for the control of emissions to air from the site.

As part of this review, the consent holder shall identify if there is a need for further mitigation and if so, what is the most appropriate technology to further reduce any adverse effects as a result of air discharges from the combined boilers on the environment. The results of this review shall be provided to the consent authority within one month of the report being completed and the consent holder shall be required to implement any practicable actions set out within the review in agreement with the consent authority.

Rendering Plant Operating Requirements

18. Other than slink carcases or dead stock seasonally in the spring (fallen stock), only fresh or suitably stabilised material shall be processed in the rendering plant. This includes

material from offsite sources. Slink carcases or fallen stock shall be processed as soon as practicable after arrival at Lorneville Plant.

Note:

For the purposes of condition 18: 1) "Fresh" means; for material derived from the slaughter and dressing of stock, no older than 24 hours from the time of slaughter; for chilled or frozen materials derived from the cutting, boning, or further processing operations, no older than 24 hours from the time of delivery to the rendering department.2) "Stabilised" means stabilised by a recognised method which may include acid stabilisation or the use of proprietary stabilisation agents applied at manufacturer's recommended dose. Stabilisation should occur as soon as is practicable but shall be no later than 8 hours from the time of slaughter or 8 hours from the removal of the animal carcase from a chilled facility.

19. Material shall not be left in an uncooked or partially cooked condition overnight in the rendering processing line.

20. No blood older than 48 hours is to be processed.

21. The consent holder shall ensure that an odour control system is installed and functional with respect to the rendering plant activities at all times. The odour control system shall be operated according to an assigned set of protocols which set out:

    (a) A description of the odour extraction, cooling and biofilter systems;

    (b) A description of the operating parameters, the target values, methods and frequency and location of odour control systems;

    (c) Performance monitoring procedures for the odour control systems including daily, weekly, monthly and annual observations and monitoring that is required;

    (d) Methods for managing the biofilter management plan which includes operational parameters and monitoring obligations.

22. The protocols for managing the biofilter prepared in accordance with condition 21(d) shall ensure that the biofilter associated with the rendering plant is operated and maintained to an appropriate standard to minimise odour effects. The following parameters shall be monitored at the frequencies specified below:

    (a) Daily visual observations of the state of the biofilter bed, particular for short circuiting and clogging of the bed;

    (b) Continuous monitoring of the inlet temperature;

    (c) Weekly monitoring of pressure drop across the biofilter bed;

    (d) Monthly monitoring of biofilter bed moisture content;

    (e) Monthly monitoring of biofilter bed pH.

23. The inlet gas temperature to the biofilter shall be maintained at less than 40^{o}C at least 99% of the time.

24. Floors, conveyors, and other equipment shall be kept free of accumulations of raw material which may putrefy and generate odours.

25. The consent holder shall have in place a contingency plan of actions that will be implemented in the event that the rendering plant is inoperative due to equipment failure.

Odour Management

26. The consent holder shall ensure that its activities, including the rendering plant and wastewater treatment facility, are operated in such a way as to ensure that there are no odour discharges to air that are noxious, dangerous, offensive or objectionable to the extent that it causes an adverse effect at or beyond the boundary of the site in the opinion of an officer of the consent authority.

27. Following any non-compliance with condition 26 being identified, the consent holder shall investigate the likely source of the odour and prepare a report identifying the source and the methods to be implemented to reduce or properly manage the odour. The report shall be submitted to the consent authority within 25 days of receiving notice of the odour problem. The methods set out within the report shall be implemented by the consent holder.

28. The consent holder shall keep a log of all odour complaints, which shall include:

    (a) The location where the odour was detected by the complainant;

    (b) The date and time when the odour was detected;

    (c) A description of the odour character, intensity and duration of exposure;

    (d) The most likely cause of the odour detected;

    (e) Note if there were any abnormal activities at or discharges from the Plant that may have resulted in the complaint;

    (f) Weather conditions at the time of the complaint.

    This log shall be provided to the consent authority upon request.

29. Within five years of the commencement of this consent and as required by condition xx of consent XXX (discharge of treated wastewater to water), the consent holder shall prepare and submit to the consent authority a Wastewater Treatment Upgrade Plan. This Plan shall address measures to manage odour from the wastewater treatment upgrade, including the proposed disposal of dewatered biosolids. The objective of this part of the plan shall be to ensure that any adverse effects on sensitive receptors arising from discharges from the existing wastewater treatment plant and the upgraded wastewater treatment plant are appropriately avoided, remedied or mitigated. This part of the plan shall:

    (i) Identify appropriate methods that will be undertaken as part of the overall plant upgrade in order to reduce fugitive odour emissions from the existing wastewater treatment system. This shall include but not be limited to the oxidation of sulphides within the waste lime wash liquors.

(ii) Identify appropriate methods that will be undertaken as part of the overall plant upgrade in order to manage and minimise fugitive odour emissions from the upgraded treatment plant. This shall include but not be limited to:

a. A description of the potential sources of odour associated with the wastewater treatment plant upgrade;

b. Methods to manage or minimise odours arising from the wastewater treatment plant upgrade including the storage and application of biosolids and design and management of the monofill sites;

c. Ongoing monitoring of the wastewater treatment upgrade with respect to potential odour sources and reporting requirements.

30. The consent holder shall be required to implement the measures contained within the Wastewater Treatment Upgrade Plan

31. Once the upgraded wastewater system has been commissioned in accordance with consent XXX, and has been fully operational for twelve months, the consent holder shall be required to undertake a review of the effectiveness of the relevant odour measures and methods contained within the Wastewater Treatment Upgrade Plan and provide a report to the consent authority. Should the report identify that any changes are necessary these shall be implemented in agreement with consent authority within three months following receipt of the report.

Review

32. The consent authority may, in accordance with sections 128 and 129 of the Resource Management Act 1991, serve notice on the consent holder of its intention to review the conditions of this consent during the period 1 February to 30 September each year, or within two months of any enforcement action being taken by the consent authority in relation to the exercise of this consent, or on receiving monitoring results, for the purposes of:

(a) determining whether the conditions of this permit are adequate to deal with any adverse effects on the environment; or

(b) ensuring the conditions of this consent are consistent with any National Environmental Standards Regulations, relevant plans and /or the Southland Regional Policy Statement; or

(c) amending the monitoring programme to be undertaken; or

(d) adding or adjusting compliance limits; or

(e) requiring the consent holder to adopt the best practicable option to remove or reduce any adverse effects.

Details of Permit – Treated Wastewater to Water

Purpose for which permit is granted:		To discharge treated meat processing wastewater and sewage from the township of Wallacetown, to water
Location	- site locality	Lorneville
	- map reference	E46:476:182
	- catchment	Oreti
Legal description of land at the site:		Riverbed, adjacent to Sec 58 Block XIV Invercargill Hundred
Term:		This consent will expire on (35 years post grant)

Schedule of Conditions

General Conditions

1. Subject to complying with the conditions of this consent, the activities authorised by this consent shall be undertaken so as to be consistent with the application for this consent and the documents entitled:
   (a) Assessment of Environmental Effects dated December 2015
   (b) Technical Reports:
   - Appendix D – Assessment of the Receiving Environment for Alliance's Lorneville Wastewater Discharges
   - Appendix I – Summary Report on Alternatives and Proposed Upgrading of the Wastewater Treatment Plant
   - Appendix K – Assessment of Effects of the Wastewater Discharge
   - Appendix L – Makarewa River Water Quality Monitoring Plan
   - Appendix T – Draft Environmental Monitoring Plan

2. This resource consent authorises the discharge of up to 22,730 m^3/day of treated wastewater from the Alliance Lorneville waste water treatment plant to the Makarewa River at the location specified above.

Environmental Monitoring Plan

3. Prior to the commencement of this consent the consent holder shall prepare and submit to the consent authority an Environmental Monitoring Plan (EMP). The EMP shall be prepared in general accordance with the draft plan provided with the documents and information provided as part of the Assessment of Environmental Effects dated November 2015. The purpose of the EMP shall be to describe the methods for monitoring

the physical characteristics and water quality parameters of the discharge, and the physical, water quality and biological characteristics and parameters of the Makarewa River receiving waters as prescribed by this consent. The EMP shall be reviewed by the consent holder on the fifth anniversary of the commencement of this consent, then at five yearly intervals thereafter. The purpose of this review shall be to identify any amendments necessary to the EMP to ensure it remains effective in meeting its purpose. Should amendments to the EMP be made a revised copy shall be submitted to the consent authority.

4. The EMP shall include a description of the monitoring sites including the location/s where monitoring of the discharge prior to entry into the Boiler Ditch will occur, and monitoring sites within the Makarewa River upstream and downstream of the discharge point to be utilised for control and compliance monitoring. These monitoring sites shall be as follows:

    (a) At a point where the discharge enters the "Boiler Ditch" as described and shown in the EMP.
    (b) The Makarewa River upstream site is located beyond the point in the river which is subject to tidal influences, approximately 2,000 metres above the treated wastewater outfall into the river as shown in the EMP.
    (c) The downstream "compliance" site is located immediately downstream of the zone of reasonable mixing approximately 350 metres below the discharge outfall as shown in the EMP.

Monitoring

5. The monitoring of the discharge and the receiving Makarewa River water quality shall be undertaken at the locations and frequencies specified in the EMP and in accordance with the detail set out within these conditions, including Schedules A and B.

6. Within five years of the consent commencing and again immediately prior to the Wastewater Treatment Upgrade required by conditions 12 and 14 the consent holder shall undertake aquatic biological monitoring. This monitoring shall occur during the period 1 October to 30 April following a period of at least 20 consecutive days below annual median river flow. The method for undertaking this monitoring shall be set out within the EMP. This monitoring shall be used to establish a baseline indication of benthic invertebrate community health in order to enable subsequent comparative analyses to be made post the Wastewater Treatment Upgrade required by conditions 12 and 14.

7. (a) Within five years of the consent commencing and again immediately prior to the Wastewater Treatment Upgrade required by conditions 12 and 14, the consent holder shall undertake a fish health survey within the Makarewa River of resident species such as tuna. A description of the purpose and method for undertaking this monitoring shall be set out within the EMP.

    (b) Within five years of the consent commencing, and every five years thereafter, the consent holder shall sample sediments within the Makarewa River at both the upstream and downstream locations identified within condition 6 in order to

determine levels of TN, TP and TOC. Results shall be compared to those historically obtained during the term of the previous consent.

Treated Wastewater Limits – Pre Wastewater Treatment Plant Upgrade

8. (a) The consent holder shall ensure that the treated wastewater complies with the following limits at the monitoring site at the point of discharge to the Boiler Ditch as identified in the EMP.

Parameter	Limit
Carbonaceous BOD_5	30 g/m^3
Total Suspended Solids	110 g/m^3
Total Nitrogen	180 g/m^3
Total Phosphorous	20 g/m^3
Faecal Coliforms	45,000 cfu/100mls

(b) In circumstances where one or more of the limits set out in Condition 9(a) are exceeded on two consecutive sampling occasions, the consent holder shall report to Environment Southland in accordance with condition 25. Where the Council determines that it is necessary to do so, the consent holder shall adhere to the protocols set out within subsections (a) to (d) of that condition.

Advice Note: The limits contained in Condition 9 are designed to ensure the quality of the wastewater discharge does not deteriorate from the levels existing at the time this consent was granted. The limits have been derived from the 95th%ile of the 5 year dataset derived from 1 October 2010 to 30 June 2015, a period that encompassed a range of climatic and processing variances.

Makarewa River Receiving Water Discharge Limits – Pre Wastewater Treatment Plant Upgrade

9. For the purpose of determining compliance with these conditions the zone of reasonable mixing shall comprise the area of river bounded by the point on the Makarewa River 350 metres downstream of the treated wastewater outfall into the river. Where comparison with upstream receiving water quality or other parameters is required, the results from immediately downstream of the zone of reasonable mixing shall be compared with results from monitoring the river at a point upstream which shall be beyond the point in the river which is subject to tidal influences as set out in condition 4.

10. The consent holder shall ensure that the following standards are complied with as a result of the exercise of this consent, immediately downstream of the zone of reasonable mixing defined in condition 9 above:

(a) Daily maximum temperature of the receiving water shall not be increased by more than 3^{o}C when the natural temperature is <16°C, and not more than 1°C when the

natural temperature is >16°C when compared with the upstream control monitoring site referred to in condition 8, and shall at no time exceed a maximum temperature of 23°C.

(b) The pH of the receiving water shall be within the range of 6.5 – 9.0.

(c) Water clarity tube measurements shall not be reduced by more than 33% when compared with the upstream control monitoring site referred to in condition 8.

(d) There shall be no conspicuous oil or grease films, scums, foams or floatable or suspended materials produced as a result of the discharge.

(e) The dissolved oxygen concentrations of the receiving water shall be consistently maintained at not less than 6g/m^3 and shall not on any occasion be less than 5g/m^3. For the purposes of this condition, the term "consistently maintained" shall mean at the required level for 96% of the samples taken in any year.

(f) The concentration of total oxidised nitrogen within the receiving water shall not exceed an annual median of 2.4 g/m^3 and an annual 95%ile of 3.5 g/m^3.

(g) The concentration of total ammonia nitrogen within the receiving water shall not exceed the following values at the defined pH and temperature:

	Temperature °C						
pH	**0**	**5**	**10**	**15**	**20**	**25**	**30**
6.5	29.0	26.0	25.0	25.0	24.0	16.4	11.8
6.75	26.0	25.0	23.0	22.0	22.0	15.3	10.9
7.0	23.0	21.0	21.0	20.0	18.9	13.5	9.5
7.25	19.0	18.0	16.0	16.2	15.8	11.0	7.8
7.5	14.3	13.4	12.7	12.2	12.0	8.4	6.0
7.75	10.0	9.4	9.0	8.6	8.5	5.9	4.3
8.0	6.6	6.2	5.8	5.7	5.6	4.0	2.9
8.25	3.7	3.5	3.4	3.3	3.2	2.3	1.72
8.5	2.1	2.0	1.89	1.89	1.89	1.41	1.05
8.75	1.21	1.15	1.12	1.13	1.16	0.88	0.68
9.0	0.71	0.68	0.68	0.71	0.75	0.59	0.48

11. The limits set out in condition 10 shall apply until such time as the consent holder has fully implemented the wastewater treatment upgrades in accordance with conditions 12 and 14.

Wastewater Treatment Upgrade

12. Within five years of the commencement of this consent, the consent holder shall prepare and submit to the consent authority a Wastewater Treatment Upgrade Plan. This Plan shall identify the technology and wastewater treatment plant upgrades necessary to improve the quality of the wastewater discharged to the Makarewa River in order to meet the standards and limits set out in condition 15 below.

(a) The Wastewater Treatment Upgrade Plan shall include, but not be limited to, the following matters:

(i) A description of the proposed technology and wastewater plant upgrades to be installed;

(ii) A description of the methodology of how the wastewater plant upgrades will be installed and a staged work plan describing the timing associated with the progressive implementation of these works;

(iii) The monitoring and reporting obligations associated with the wastewater treatment plant upgrades.

13. Once the Wastewater Treatment Upgrade Plan has been prepared and submitted to the consent authority, the consent holder shall commence reporting to the consent authority on a bi-annual basis to identify its progress towards implementation and commissioning of the wastewater treatment plant upgrade (in accordance with the work plan required by condition 12(a)(ii)). This reporting shall describe any interim measures undertaken to improve the quality of the discharge, or physical plant works or operational changes associated with the upgrade.

14. The consent holder shall ensure that the upgrade of the wastewater treatment plant is fully commissioned and operational within fifteen years of the commencement of this consent.

15. Within fifteen years of the commencement of this consent, the consent holder shall ensure that the following receiving water discharge limits are complied with, immediately downstream of the zone of reasonable mixing defined in condition 9 above:

(a) Daily maximum temperature of the receiving water shall not be increased by more than 3^{o}C when the natural temperature is <16°C, and not more than 1°C when the natural temperatures is >16°C when compared with the upstream control monitoring site referred to in condition 8 and shall at no time exceed a maximum temperature of 23^{o}C.

(b) The pH of the receiving water shall be within the range of 6.5 – 9.0.

(c) Water clarity tube measurements shall not be reduced by more than 33% when compared with the upstream control monitoring site referred to in condition 8.

(d) There shall be no conspicuous oil or grease films, scums, foams or floatable or suspended materials produced as a result of the discharge.

(e) The concentration of total ammonia nitrogen within the receiving water shall not exceed the following values at the defined pH:

Total Ammonia Concentration g/m^3			
pH	30 day Rolling Average and Annual Median (1.9 g/m^3 @pH 8.0)	4 day Rolling Average Maximum (4.75 g/m^3 @pH 8.0)	Annual 95th % ile (2.4 g/m^3 @pH 8.0)
6.5	5.2	13.0	6.6
6.6	5.1	12.8	6.5
6.7	5.0	12.6	6.3
6.8	4.9	12.3	6.2
6.9	4.8	11.9	6.0

7.0	4.6	11.5	5.8
7.1	4.4	11.1	5.6
7.2	4.2	10.5	5.3
7.3	4.0	9.9	5.0
7.4	3.7	9.2	4.7
7.5	3.4	8.5	4.3
7.6	3.1	7.8	3.9
7.7	2.8	7.0	3.5
7.8	2.5	6.2	3.1
7.9	2.2	5.5	2.8
8.0	1.9	4.7	2.4
8.1	1.6	4.1	2.1
8.2	1.4	3.5	1.8
8.3	1.2	3.0	1.5
8.4	1.0	2.5	1.3
8.5	0.8	2.1	1.1
8.6	0.7	1.8	0.9
8.7	0.6	1.5	0.8
8.8	0.5	1.3	0.7
8.9	0.4	1.1	0.6
9.0	0.4	0.9	0.5

(f) The concentration of total oxidised nitrogen shall not exceed an annual median of 2.4 g/m^3 and an annual 95%ile of 3.5 g/m^3 within the receiving water.

16. (a) Within fifteen years of the commencement of this consent, the consent holder shall ensure that the treated wastewater complies with the following limits at the monitoring site at the point of discharge to the Boiler Ditch as identified in the EMP.

Parameter	Limit
Carbonaceous BOD_5	30 g/m^3
Total Suspended Solids	110 g/m^3
Total Nitrogen	45 g/m^3
Total Phosphorous	11 g/m^3
Faecal Coliforms	45,000 cfu/100mls

(b) In circumstances where one or more of the limits set out in Condition 17(a) are exceeded on two consecutive sampling occasions, the consent holder shall report to Environment Southland in accordance with condition 25. Where the Council determines that it is necessary to do so, the consent holder shall adhere to the protocols set out within subsections (a) to (d) of that condition.

17. Once the upgraded Wastewater Treatment Plant required by conditions 12 and 14, has been commissioned and has been fully operational for twelve months, the consent holder shall review the post upgrade limits for Total Nitrogen and Total Phosphorous set out in accordance with condition 16. The purpose of this review shall be to evaluate whether the limits for Total Nitrogen and Total Phosphorous are achievable and appropriate, and make a recommendation for changes should this be identified as being required. The outcome of this review shall be submitted to the consent authority.

18. Within 10 years of the commencement of this consent the consent holder shall undertake a review as to whether it is practicable and necessary to further treat the discharge stream in order to reduce its microbial load. The results of this assessment shall be provided to the consent authority. If the assessment concludes that further treatment and a revised Faecal Coliform or *E.coli* limit is required then the review requirements set out in condition 33 shall be implemented. If the assessment determines that it is not necessary to implement additional treatment measures as part of the progressive wastewater plant upgrade to further reduce the microbial load within the discharge stream, then the consent holder shall be required to reassess this requirement every five years thereafter for the duration of this consent.

19. Following the commissioning and operation of the wastewater plant upgrade required by conditions 12 and 14 the consent holder shall undertake aquatic biological monitoring. This monitoring shall occur on an annual basis for a period of not less than three consecutive years during the period 1 October to 30 April following a period of at least 20 consecutive days below annual median river flow. The method for undertaking this monitoring shall be set out within the EMP. This monitoring shall be used to establish any changes that have occurred between the baseline assessment undertaken in accordance with condition 7 and the state of benthic invertebrate community health post the Wastewater Treatment Upgrade. The results of this monitoring shall be reported to the consent authority upon completion of this three year period of monitoring.

20. Within two years of the commissioning and operation of the wastewater plant upgrade the consent holder shall repeat the fish health monitoring survey undertaken in accordance with condition 7. The purpose of the survey shall be to determine what if any improvement in fish health has occurred post upgrade of the wastewater treatment plant. The results of this monitoring shall be compared to the results of the monitoring carried out prior to the wastewater treatment upgrade and shall be reported to the consent authority upon completion of this survey.

21. Within ten years of the commissioning and operation of the wastewater plant upgrade the consent holder shall conduct a review of:

    (a) The performance of the up-graded wastewater treatment plant;

    (b) The effects of the discharge of wastewater within the receiving waters of the Makarewa River;

    (c) The improvements to water quality that have occurred within the Oreti River catchment as a result of the policy and management imperatives undertaken by the consent authority and resource users to progressively improve water quality in response to national policy relating to freshwater management;

    (d) The current state of wastewater treatment technology and opportunities to make further improvements to the wastewater treatment plant to further improve the quality of the discharge.

    The results of this review shall be provided to the consent authority.

Habitat Enhancement Plan

22. Within one year of the commencement of this consent, the consent holder shall prepare and submit to the consent authority a Habitat Enhancement Plan which identifies habitat enhancement priorities to be carried out within the Plant's property. This Plan shall be prepared in consultation with Te Ao Marama. The Habitat Enhancement Plan shall incorporate, but not be limited to the following:

    (a) The methods to ensure ongoing liaison between the consent holder and Te Ao Marama in the development and maintenance of the Habitat Enhancement Plan.

    (b) The protocols to be followed to identify areas for habitat enhancement and the development of a prioritised work programme over the first 15 years of the consent term.

    (c) Details about the work programme and habitat enhancement priorities and how these will be implemented over a series of defined stages and adapted over time. Likely habitat enhancement priorities will include planting and ecological restoration work at the ox-bow area, riparian planting at appropriate places on the margin of the Makarewa River and at other surface water bodies on the consent holder's site.

    (d) Specific monitoring that is required to ensure that the habitat enhancement work is successful.

    (e) Reporting and review protocols.

Reporting

23. The following additional reporting requirements shall apply both before and after the wastewater upgrade required by conditions 12 and 14.

24. The monthly results of the discharge and receiving water monitoring carried out in accordance with the conditions of this consent shall be supplied to the consent authority no later than 20 working days after the laboratory analytical data has been received by the consent holder.

25. The consent authority shall be notified within 24 hours of the identification of any exceedance of a limit prescribed by the conditions of this consent. This notification shall include advice of any corrective actions taken by the consent holder. An incident report shall be provided to the consent authority within 20 working days of the notification of the exceedance. This report shall include:

    (a) Identification of the likely cause of the limit exceedance;

    (b) The resulting effects on the receiving environment likely to arise because of the limit exceedance;

    (c) The management responses undertaken or which may be necessary to prevent any further limit exceedances occurring;

    (d) Remedial action undertaken or which may be necessary.

26. On an annual basis the consent holder shall prepare and submit an Annual Monitoring Report to the consent authority. The report shall cover the 1 October to 30 September period and shall be provided to the consent authority by 30 November each year. It shall include:

    (a) A summary of receiving water monitoring results and assessment of compliance with the limits prescribed by this consent;

    (b) An assessment of the annual median and 95%ile of the total ammonia nitrogen concentrations in the receiving water against an annual median of 1.9 g/m^3 and an annual 95%ile of 2.4g/m^3 (both at pH 8.0);

    (c) An assessment of the annual median and 95%ile of the total oxidised nitrogen concentrations in the receiving water against an annual median of 2.4 g/m^3 and an annual 95%ile of 3.5 g/m^3

    (d) A calculation of the annual discharged loads of ammonia nitrogen, total oxidised nitrogen, total nitrogen and total phosphorous and a comparative analysis of these loads against preceding seasons.

Technical Working Party Consultation

27. The consent holder shall facilitate the continuation of the Lorneville Wastewater Technical Working Party and shall distribute the annual monitoring report described in condition 26 to the members of the working party.

28. The Lorneville Wastewater Technical Working Party shall comprise representatives from the consent holder, the Southland Fish and Game Council, the Department of Conservation, Te Ao Marama Incorporated, Public Health South, Invercargill City Council, Southland District Council and the consent authority. The consent holder shall be responsible for convening meetings, the provision of a venue for meetings and providing any necessary administrative support to the working party.

29. Should any of the external parties referred to in condition 28 chose not to continue to be part of the Lorneville Wastewater Technical Working Party then the consent holder shall not be deemed to be in breach of these conditions.

30. The purpose of the Lorneville Wastewater Technical Working Party shall be to receive reports, review results, initiate meetings as required and identify any required reviews of consent conditions. The consent holder shall consult with the Lorneville Wastewater Technical Working Party as part the reviews required by Conditions 3 and 17.

Review Conditions

31. In accordance with section 127 of the Resource Management Act 1991, the consent holder may, within two years of the commissioning of the wastewater treatment upgrade undertaken pursuant to conditions 12 and 14, apply to change or cancel the conditions

of this consent to reflect the measured performance and ongoing monitoring and reporting obligations associated with the wastewater treatment system upgrade.

32. The consent authority may, within three months of receiving a report required by condition 26 of this consent, serve notice on the consent holder under section 128 of the Resource Management Act 1991 of its intention to review the conditions of this consent. The purpose of such a review is to assess the significance of any exceedance of the discharge limits set out in conditions 8 and 16, and to determine whether these limits should be altered, or whether the exceedance has resulted in significant adverse effects.

33. The consent authority may, within three months following the review required by condition 18 serve notice on the consent holder under section 128 of the Resource Management Act 1991 of its intention to review the conditions of this consent for the express purpose of imposing a revised Faecal Coliform or *E.coli* limit necessary to complement additional treatment measures arising from actions to give effect to that condition and in particular to further reduce the microbial load within the discharge stream.

34. The consent authority may, within three months of receiving the recommendations from the review of the post upgrade limits of Total Nitrogen and Total Phosphorous required by condition 17 of this consent serve notice on the consent holder under section 128 of the Resource Management Act 1991 of its intention to review the limits for Total Nitrogen and Total Phosphorous stipulated in condition 16 to ensure that they remain appropriate or whether any changes to these limits are necessary.

35. The consent authority may, within three months of receiving a report required by condition 21 of this consent, serve notice on the consent holder under section 128 of the Resource Management Act 1991 of its intent to review the conditions of this consent. The purpose of such a review is to assess the improvements made to the quality of the discharge arising from the wastewater treatment upgrade while having regard to improvements that have been made to the overall quality of water in the Makarewa River as a result of the consent authority's programme of catchment improvement and to require any amendments to the discharge and/or receiving water limits.

Schedule A1. Treated Wastewater Discharge Monitoring Schedule for the Period 1 October to 31 May each year when discharging

Parameter	Daily (When discharging)	Weekly (when discharging)
Volume	X	
Electrical Conductivity	X	
pH	X	
Temperature	X	
Dissolved oxygen concentration*	X	
Total ammoniacal nitrogen	X	
Total nitrogen		X
Total oxidised nitrogen		X
Total phosphorus		X
Dissolved reactive phosphorous		X
Total suspended solids		X
Volatile suspended solids		X
Carbonaceous BOD		X
Faecal coliforms		X
E-coli		X

Schedule A2. Treated Wastewater Discharge Monitoring Schedule for the Period 1 June to 30 September each year when discharging

Parameter	Daily (When discharging)	Weekly (when discharging)	Monthly (when discharging)
Volume	X		
Electrical Conductivity		X	
pH		X	
Temperature*		X	
Dissolved oxygen concentration		X	
Total ammoniacal nitrogen		X	
Total nitrogen		X	
Total oxidised nitrogen		X	
Total phosphorus		X	
Dissolved reactive phosphorous			X
Total suspended solids			X
Volatile suspended solids			X
Carbonaceous BOD			X
Faecal coliforms			X
E-coli			X

Schedule B1. Receiving Water Monitoring Schedule for the Period 1 October to 31 May each year: Upstream Control site and Compliance site

Parameter	Daily	Weekly	Weekly	Monthly
	When discharging		No discharge	
Electrical Conductivity	X		X	
pH	X		X	
Temperature	X		X	
Dissolved oxygen concentration	X		X	
Foams and scums	X		X	
Total ammoniacal nitrogen	X		X	
Total oxidised nitrogen		X	X	
Total nitrogen		X	X	
Total phosphorous		X	X	
Dissolved reactive phosphorous		X		X
Total suspended solids		X		X
Carbonaceous BOD		X		X
Soluble carbonaceous BOD		X		X
Faecal coliforms		X		X
E-coli		X		X
Turbidity		X		X
Clarity Tube		X		X

Schedule B2. Receiving Water Monitoring Schedule for the Period 1 June to 30 September each year: Upstream Control site and Compliance site

Parameter	Weekly	Monthly
	Discharge / No discharge	
Electrical Conductivity	X	
pH	X	
Temperature	X	
Dissolved oxygen concentration	X	
Foams and scums	X	
Total ammoniacal nitrogen	X	
Total oxidised nitrogen	X	
Total nitrogen	X	
Total phosphorous	X	
Dissolved reactive phosphorous		X
Total suspended solids		X

Carbonaceous BOD		X
Soluble carbonaceous BOD		X
Faecal coliforms		X
E-coli		X
Turbidity		X
Clarity Tube		X

Details of Permit – Wastewater to land (irrigation)

Purpose for which permit is granted:		To discharge treated wastewater to land via irrigation
Location	- site locality	Crowe Road, Lorneville
	- map reference	E46:490:176
	- catchment	Oreti
Legal description of land at the site:		Lots 32 and 33 Block II DP 64 and Lot 3 DP 10900 and Part Sections 35 and 36 Block XIV Invercargill Hundred
Term:		This consent will expire on XXXX (35 years)

Schedule of Conditions

A. General Conditions

1. Subject to complying with the conditions of this consent, the activities authorised by this consent shall be undertaken so as to be consistent with the application for this consent and the documents titled:
   (a) Assessment of Environmental Effects dated November 2015
   (b) Technical Reports:
   - Appendix I – Wastewater to Land Annual Monitoring Report

2. This resource consent: authorises the discharge of up to 3,000 m^3/day of treated wastewater (including treated sewage from Wallacetown) from Alliance Group Limited's Lorneville Plant Wastewater Treatment System preferentially onto Zone 1 soils as shown on the Map A via spray irrigation using K-Line irrigation methods. Treated wastewater (including treated sewage from Wallacetown) may also be discharged to Zone 2 soils as shown on Map A but this will be avoided as far as practicable.

B. Irrigation Limits

3. The irrigation of treated wastewater onto land shall comply with the following:
   (a) No irrigation or spray-fall is to occur within:
      (i) 100m of any residential dwelling (excluding those owned by the consent holder) except where the owner or occupier of the dwelling has given written approval to the consent holder to use a smaller buffer distance;

(ii) 50m of any surface watercourse;

(iii) 20m of any property boundary;

(b) Only wastewater with a positive dissolved oxygen concentration, and with a sodium adsorption ratio less than 17, shall be discharged onto land.

(c) No irrigation is to occur when the soils are at or above 80% water filled pores as recorded at the Wallacetown- Price Road soil moisture monitoring site as shown on the Environment Southland website.

4. Irrigation of treated wastewater shall comply with the following operational parameters:

(a) The average irrigation rate shall not exceed 5mm per hour, and the depth of application shall not exceed 50mm, to any area in any 24 hour period;

(i) The return period between applications of treated wastewater to an area of land shall not be less than 15 days;

(ii) The annual nitrogen loading rate for wastewater and fertilisers on the area available for irrigation shall not exceed 250kg / hectare.

5. There shall be no surface run off, significant ponding of an area greater than 50m^2 24 hours after being irrigated, or contamination of surface water, resulting from the application of wastewater to pasture, nor shall the disposal system be operated in such a way that offensive odours or any other nuisances are created at or beyond the boundary of the site as assessed by an officer of the consent authority.

Monitoring

6. The consent holder shall:

(a) record, in writing or electronically, all activities associated with the wastewater irrigation system including, but not limited to the following:

(i) irrigation blocks sprayed and the return period between successive irrigation events for each block;

(ii) hours of operation on each irrigation block;

(iii) volume discharged to each irrigation block;

(iv) volume discharged per day;

(v) weather conditions, including rainfall and an estimate of wind direction and strength; and

(vi) soil moisture.

(b) record the details of any complaints received about the irrigation of the wastewater, including:

(i) the name and address of the complainant;

(ii) the date and time of the complaint;

(iii) the location of the complaint;

(iv) the weather conditions at the time;

(v) any events in the management of the irrigation system which may have resulted in increased odour emissions; and

(vi) the actions, if any, taken in response to each complaint.

(c) Make the records available for inspection by the consent authority's staff upon request. The cost of such inspections shall be borne by the consent holder.

(d) Advise the consent authority in writing, in the event of a malfunction of an item of plant or equipment which may result in emissions of offensive odour beyond the boundary of the plant, as soon as practicable after the malfunction occurs, followed by a report in writing to the consent authority on the cause of the malfunction and the action taken, or proposed to be taken, by the consent holder to avoid recurrence of the problem. This report is to be lodged with the consent authority no later than 5 working days from the time of the malfunction.

7. The consent holder shall monitor the discharge by taking representative samples of wastewater discharge stream:

(a) Each week while irrigating and analysing those samples for:

(i) Suspended solids concentration;

(ii) BOD5 concentration;

(iii) Ammoniacal nitrogen concentration;

(iv) (nitrate + nitrite) nitrogen concentration;

(v) Total phosphorous concentration;

(vi) E coli concentrations.

(b) Each month while irrigating and analysing those samples for:

(i) The cations calcium, sodium and magnesium and the SAR (sodium adsorption ratio) will be calculated.

8. The consent holder shall monitor groundwater in two bores on the site, one of which shall be a control site (upstream of the irrigation area), and the other shall be at the downstream end of the wastewater disposal area.

(a) By measuring and recording the depth to groundwater at the two monitoring bores immediately before purging the bores and extracting the samples under condition 8(b);

(b) By taking representative samples of the groundwater at each site at monthly intervals while irrigating and three monthly for the remainder of the year, and analysing those samples for the following parameters:

(i) pH;

(ii) chloride concentration;

(iii) electrical conductivity;

(iv) (nitrate + nitrite) nitrogen concentrations;

(v) Ammoniacal nitrogen concentration;

(vi) *E.coli* concentrations.

9. In the event that the groundwater monitoring undertaken in accordance with condition 8 show that any two consecutive samples in the downstream bore record a nitrate-nitrogen concentration of greater than 6.9 g/m^3 when that was not exceeded in the upstream control bore, the consent holder shall be required to notify the consent authority and investigate the likely cause of the exceedance. If the investigation determines that the irrigation is likely to have caused or contributed to the exceedance, then the consent holder shall be required to implement appropriate remedial action. The results of this investigation and any mitigation or remedial action undertaken or to be implemented shall be reported to the consent authority within 30 working days of the exceedance being reported.

10. The consent holder shall monitor the effects of the discharge on Bateman's Drain at the point that it exits the irrigation area, or at another point agreed in writing by the consent authority, by taking representative grab samples of water from the drain, at monthly intervals during the period 1 December to 31 May, and analysing those samples for:

    (a) Electrical conductivity;

    (b) Total nitrogen concentration;

    (c) Dissolved reactive phosphorus concentration.

11. For the purpose of monitoring the effects of irrigation of treated wastewater, the consent holder shall:

    (a) Carry out sampling, at a minimum of four irrigated sites within Zone 1 (Edendale/Waikiwi/Woodlands/Mokotua soils) and one non-irrigated control site (i.e. a site on which no effluent is sprayed), in June each year. The samples are to be analysed for:

        (i) Infiltration rate;

        (ii) Hydraulic conductivity.

    (b) Carry out sampling (from the 0-7.5 cm soil depth) of Zone 1 soils in October, January, April and July each year at a minimum of four sites, one of which shall be a non-irrigated control site. The remaining sites shall be irrigated. The samples shall be analysed for:

        (i) pH

        (ii) exchangeable calcium

        (iii) exchangeable magnesium

        (iv) exchangeable potassium

        (v) exchangeable sodium

        (vi) phosphorous

    (c) Estimates of nitrate leaching using lysimeters are to be made monthly at four Zone 1 (Edendale/Waikiwi/Woodlands/Mokotua soils) sites, one of which shall be a non-irrigated control site, and four Zone 2 sites (Dacre/Tisbury/Makarewa soils), three of which shall be in Zone 2 soil areas surrounded by the Zone 1 irrigated area and one of which shall be a non-irrigated control, to assess

nitrate losses. Nitrate-N concentrations are to be measured on leachate samples, and estimates are to be made using a daily water balance model for the periods between sampling dates. Nitrate leaching is to be calculated monthly using the nitrate-N concentrations and drainage data and reported within the company's six monthly reports.

(d) A soil water balance should be prepared annually for each irrigated block and a non-irrigated block comprising Zone 1 soil.

12. By 30 September each year, the consent holder shall supply to the consent authority an annual monitoring report that assesses the performance of the spray irrigation system. This report shall be prepared by a suitably qualified person and shall include, but not be limited to:

(a) trends in analytical results;

(b) results of lysimeter studies;

(c) effects on the soil or groundwater system and any mitigation measures applied to reduce contaminants;

(d) recommendations for improvements in the system;

(e) summary information on return periods and applications of effluent on each block;

(f) estimates of annual nitrogen loading including from fertiliser to each irrigation zone;

(g) water budget, detailing water inputs; rainfall, irrigation volume, and daily estimate of water losses (drainage, evapotranspiration) and daily estimate of soil water contents for each irrigation area and a non-irrigation area.

13. Should the report prepared in accordance with condition 12 recommend any improvements to be undertaken to the system then these shall be implemented by the consent holder prior to commencing the following irrigation season.

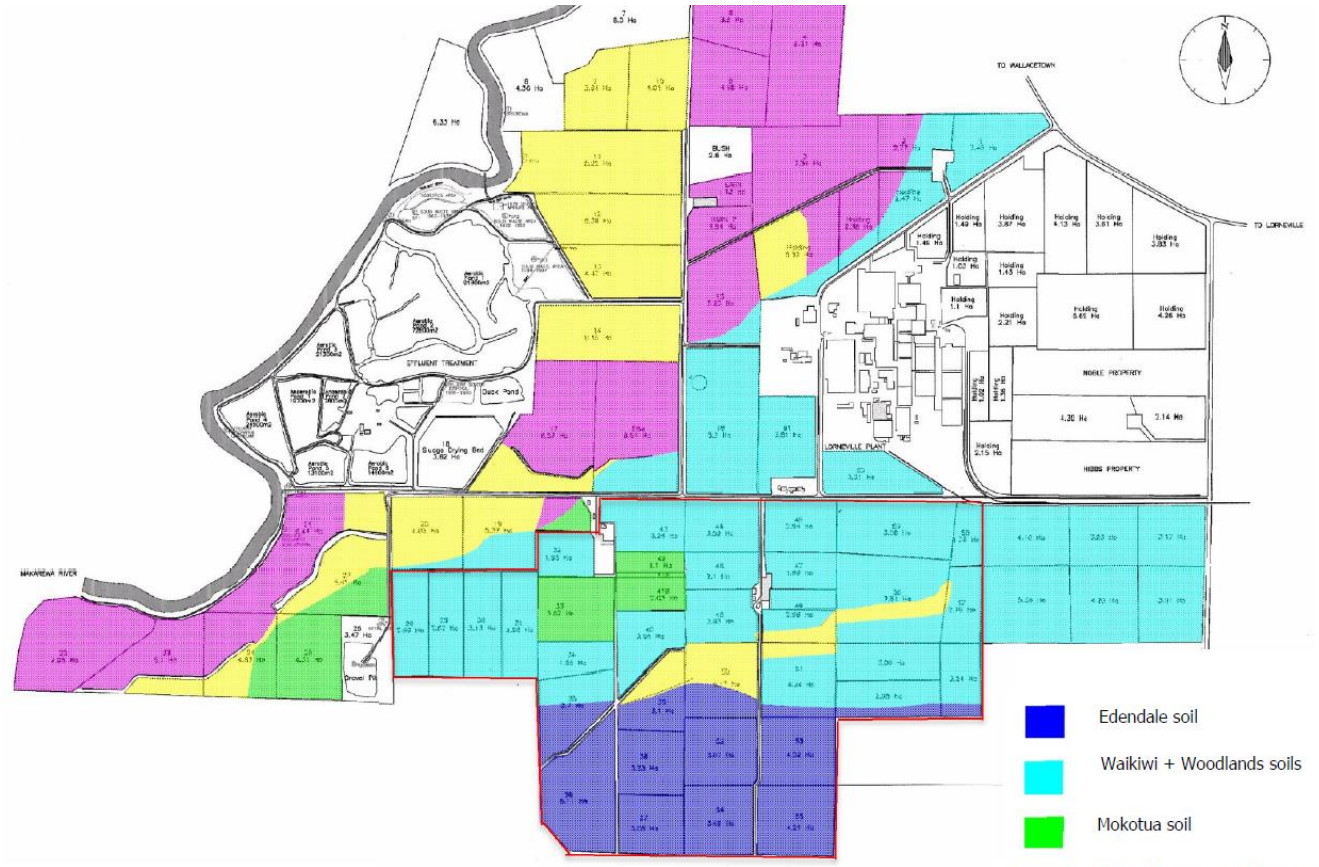
14. For the purpose of this consent, the analyses and preservation of all aqueous samples shall be carried out in accordance with the latest edition of APHA "Standard Methods for the Analysis of Water and Wastewater" or by methods approved by the consent authority.

15. The monitoring and analyses specified in these conditions are to be carried out by a laboratory with IANZ registration or equivalent, or as agreed to in writing by the consent authority.

Review

16. The Consent Authority may, within three months of receiving the report required by condition 13 of this consent, serve notice on the consent holder under section 128 of the Resource Management Act 1991 of its intent to review the conditions of this consent. The purpose of such a review is to assess the significance of any of the groundwater and soil monitoring result which may be causing adverse effects on the receiving environment.

MAP A



Alliance Group Lorneville Farm soil map. Current wastewater irrigation area is outlined in red.

Irrigation is to occur within the red outline area on Zone 1 soils. Zone 2 soils within this area are to be avoided, as far as practicable. Zone 1 soils are those represented in blues and greens. Zone 2 soils are those areas represented in yellow.

Details of Permit – Water Take

Purpose for which permit is granted:		To take surface water for a meat processing operation
Location	- site locality	Lorneville
	- map reference	E46:458-204
	- catchment	Oreti
Legal description of land at the site:		Sec 93 Blk XVI New River Hundred and Lot 1 DP 8017
Term:		This consent will commence once consent 203358 has been surrended by the consent holder and will expire on xx (35 years).

Schedule of Conditions

1. This consent authorises abstraction of up to 22,500 cubic metres of water per day at a maximum rate of 260 litres per second from the Oreti River, at or about the location specified within the map reference above.

2. (a) Prior to the exercise of this consent, the consent holder shall install a water meter to record the water take, within an error accuracy range of +/-5% over the meter's nominal flow range, a datalogger with at least 24 months data storage capacity and a telemetry unit to record the rate and volume of take, and the date and time this water was taken. The consent holder shall forward a copy of the installation certificate to the Consent Authority within one month of installing the water meter and datalogger.

   (b) The water meter shall be installed in a straight length of pipe, before any diversion of water occurs. The straight length of pipe shall be part of the pump outlet plumbing, easily accessible, have no fittings and obstructions in it. There shall be a straight length of pipe on either side of the water meter, on the upstream side there shall be a distance that is 10 times the diameter of the pipe and on the downstream side there shall be a distance of 5 times the diameter of the pipe.

   (c) The consent holder shall ensure the full operation of the water meter and datalogger at all times during the exercise of this consent. All malfunctions of the water meter and/or datalogger during the exercise of this consent shall be reported to the Consent Authority within five working days of observation and appropriate repairs shall be performed within five working days. Once the malfunction has been remedied, a Water Measuring Device Verification Form completed with photographic evidence must be submitted to the Consent Authority within five working days of the completion of repairs.

   (d) (i) If a mechanical insert water meter is installed it shall be verified for accuracy each and every year from the exercise of this consent.

   (ii) Any electromagnetic or ultrasonic flow meter shall be verified for accuracy every five years from the exercise of this consent.

(iii) Each verification shall be undertaken by a Consent Authority approved operator and a Water Measuring Device Verification Form shall be completed and supplied to the Consent Authority with receipts of service. These shall be supplied within five working days of the verification, and at any time upon request.

(e) The consent holder shall record adequate data to demonstrate compliance with Condition 1. Data from the datalogger shall be provided once daily to the Consent Authority by means of telemetry. The consent holder shall ensure data is compatible with the Consent Authority's time-series database.

3. The consent holder shall implement, as necessary, the measures detailed in its *Low Flow Contingency Plan for Abstraction from the Oreti River*. In accordance with this plan the following shall apply:

Oreti River Trigger Levels	**Conservation Measures**
4.2m^3/sec	i. Notify all plant personnel of low flow conditions and the need to reduce water use. ii. Cease supplementary supply of potable water to Wallacetown iii. Commission an independent audit to identify specific water conservation measures iv. Establish a Water Conservation Task Force to implement water conservation measures including those identified by the water use audit v. Redirect stock and / or redirect further processing to other Alliance plants if practicable vi. Participate in Environment Southland drought response measures including daily reporting on achievements in water conservation
3.3m^3/sec	i. Adopt the measures that apply at 4.2 m3/sec listed above ii. Redirect partially processed products to other Alliance plants or independent processors where this will reduce water use. iii. Reduce water use in conveyance of products between departments

4. For no longer than the first five years of this consent the consent holder shall maintain a fish screen on the abstraction intake which shall comprise of two fish screens, one a 50mm x 13mm galvanised bar screen at 40mm centres, for screening of large debris, and the second a screen with 12mm diameter holes at 18mm centres.

5. Prior to the fifth anniversary of the commencement of this consent the consent holder shall be required to upgrade the second fish screen referred to in condition 4 to a 2mm bar screen with an approach velocity not exceeding 0.12m/s. The first fish screen referred in condition 4 (or another screen which provides at least the same level of intake screening) shall be maintained.

6. The consent holder shall pay an annual administration charge to the consent authority, collected in accordance with Section 36 if the Resource Management Act, payable in advance on the first day of July each year.

7. The consent authority may serve notice of its intention to review the conditions of this consent, in accordance with the conditions of this resource consent and Sections 128 and 129 of the Resource Management Act 1991, during the period March to July each year for the purposes of:

   (i) requiring the monitoring of the rate of, and/or the effect of the abstraction;

   (ii) requiring efficiency of water use;

   (iii) addressing the effects of the abstraction of the river and/or estuary;

   (iv) complying with the requirements of a regional plan.

Details of Permit – Land Use Consent

Purpose for which permit is granted:		To disturb the bed of a river during sediment removal and general maintenance of an intake channel
Location	- site locality	Kirkbride Street, Wallacetown
	- map reference	E46:458:204
	- catchment	Oreti
Legal description of land at the site:		Section 93 Block XVI New River Hundred and Lot 1 DP 8017
Term:		This consent will commence once consent 201227 has been surrended by the consent holder and will expire on xx (35 years).

Schedule of Conditions

1. This consent authorises the following activities associated with maintaining a water abstraction intake channel at the location specified above:
   (a) removal of riverbed sediments at the mouth of the intake channel;
   (b) taking water associated with sediment removal;
   (c) discharge of contaminants (sediment and associated water) into water;
   (d) discharge of contaminants (sediments and associated water) onto the nearby riverbank in circumstances which may result in those contaminants entering water; and
   (e) temporary discoloration of the river due to sediments released during the disturbance of the riverbed authorised by this resource consent.

2. Sediments may be removed from the bed of the Oreti River to a horizontal distance of 5 metres from the mouth of the intake channel.

3. The consent holder shall notify the consent authority at least five working days prior to commencing maintenance of the channel on each occasion.

4. The consent holder shall schedule planned maintenance work to occur on an annual basis, outside the period 1 October to 31 August. This does not apply to channel maintenance work that might be necessary to clear material and debris following flood events or other emergency work that might be required.

5. In undertaking the channel maintenance works the consent holder shall:
   (a) Keep the affected working area to a practicable minimum and ensure that all plant and machinery working in the river is in good working order and is cleaned so as to be free of weeds or other pest plants prior to entering the water.

(b) Ensure that any reinstatement of works after floods are, as far as is practicable undertaken during the recession of the flood, while the river flow is still naturally turbid.

(c) Ensure that all disturbed vegetation, soil or other material is deposited, stockpiled or contained to prevent the movement of the material so that it does not result in:

i. The diversion, damming or blockage of any river or stream;

ii. The passage of fish to the main stem of the Oreti River being impeded, or fish or eel stranding within the channel or on the riverbanks;

iii. The destruction of any significant habitat in a waterbody;

iv. Flooding or erosion.

(d) Ensure that prior to the maintenance works occurring the channel is inspected for the presence of eels. If eels are present within the channel, then the consent holder shall ensure that prior to any work commencing they are removed (trap and transfer) and returned to the main stem of the Oreti River.

(e) Ensure that there shall be no washing or refuelling of machinery in the bed of the watercourse.

(f) Ensure that all construction equipment, machinery, plant, and debris is removed from the site on completion of the works.

6. There shall be no discharge to the Oreti River during the channel maintenance works that may cause or result in any of the following to occur after a zone of reasonable mixing, being 150m downstream of the confluence of the channel embayment and the main stem of the Oreti River:

(a) Conspicuous oil or grease films, scums or foams, or floatable or suspended materials;

(b) Conspicuous change in the colour or visual clarity;

(c) Emission of objectionable odour; or

(d) Rendering of river water unsuitable for consumption by farm animals.

7. The consent authority may serve notice of its intention to review the conditions of this consent, in accordance with the conditions of this resource consent and Sections 128 and 129 of the Resource Management Act 1991, during the period March to July each year for the purposes of addressing any adverse effects on the environment which may arise from the exercise of this consent, and which it is appropriate to deal with at a later stage, or which become evident after the date of commencement of the consent.

Details of Permit – Wastewater to land (temporary storage)

Purpose for which permit is granted:		To discharge treated wastewater to land in circumstances that any result in contaminants entering water, from a contingency short term storage area
Location	- site locality	Crowe Road, Lorneville
	- map reference	E46:478-181
	- catchment	Oreti
Legal description of land at the site:		Part Section 45 Block XIV Invercargill Hundred
Term:		This consent will expire on xxxx (35 years)

General Conditions

1. Subject to complying with the conditions of this consent, the activities authorised by this consent shall be undertaken so as to be consistent with the application for this consent and the documents titled:

   (a) Assessment of Environmental Effects dated November 2015

2. This resource consent authorises the discharge of treated wastewater onto land, which may result in contaminants entering water via seepage, for contingency short term storage of wastewater in an 8.3 hectare area of land at the location specified above.

3. The consent holder shall advise Environment Southland, Invercargill City Council, and the landowners and or occupiers adjacent to part Section 45 Block XIV Invercargill Hundred (the lagoon site), prior to each period of discharge of treated wastewater into the lagoon.

4. The maximum continuous period of storage in any one storage event shall not exceed three months.

5. The wastewater discharged to land shall be of a quality sufficient to comply with conditions xx and xx of Consent XXXX (*referring to the wastewater discharge to water consent*) the discharge of wastewater into the Makarewa River.

6. At least once each week while wastewater is stored within the temporary storage area the consent holder shall inspect the area around the site, and the northern end of Leonard Road, to assess odour effects. The following observations are to be noted during each inspection.

   (a) Date, time, wind direction and a description of wind strength;

   (b) Whether or not odour was detected and, if detected, the location;

   (c) The offensiveness and intensity of the odour; and

(d) Whether or not the odour was, in the opinion of the consent holder, attributable to the wastewater in the storage area.

A copy of the latest inspection report is to be forwarded to the consent authority each week while monitoring occurs under this condition.

7. The consent authority, may service notice of its intention to review the conditions of this consent, in accordance with sections 128 and 129 of the Resource Management Act 1991, within five working days of receiving the report prepared in accordance with condition 6 for the purposes of dealing with any adverse odour effects on the environment which may arise from the exercise of this consent.

Details of Permit – Dewatered Biosolids to Land

Purpose for which permit is granted:		To discharge dewatered biosolids to land where contaminants might enter groundwater.
Location	- site locality	Crowe Road, Lorneville
	- map reference	E46:490:176
	- catchment	Oreti
Legal description of land at the site:		Lots 32 and 33 Block II DP 64 and Lot 3 DP 10900 and Part Sections 35 and 36 Block XIV Invercargill Hundred
Term:		This consent will commence once consent XXX (wastwater irrigation) has been been surrendered by the consent holder and will expire on xxx (35 years)

Schedule of Conditions

General Conditions

1. Subject to complying with the conditions of this consent, the activities authorised by this consent shall be undertaken so as to be consistent with the application for this consent and the documents titled:
   (a) Assessment of Environmental Effects dated November 2015
   (b) Technical Reports:
   - Appendix I – Summary Report on Alternatives and Proposed Upgrading of the Wastewater Treatment Plant
   - Appendix J – Biosolids Land Disposal Assessment
   - Appendix Q – Groundwater and Surface Water Monitoring Report
   - Appendix S – Proposed Contingency Biosolids Monofill

2. This resource consent authorises the land application of dewatered biosolids on Alliance Group Limited farmland and to an onsite monofill at the locations shown on Map A attached to this consent. For the purposes of this consent the term “dewatered solids” and “biosolids” refers to any material originating from the stock yards and wastewater treatment plant which is of at least 12% solids content.

3. Prior to the commencement of this consent the consent holder shall prepare and submit to the consent authority a Biosolids Management Plan. The purpose of this plan shall be to describe the operational management associated with the disposal of dewatered biosolids and the application of other nutrients to land. It shall also describe the operational management associated with the disposal of dewatered biosolids to an onsite monofill, if such a facility is deemed by the consent holder to be necessary. The objective of this plan shall be to ensure that the actual and potential adverse effects

arising from the disposal of dewatered biosolids and application of other nutrients to land and to an onsite monofill are appropriately avoided, remedied or mitigated. The Biosolids Management Plan shall include but not be limited to:

(a) Description of the likely generation and volume of dewatered biosolids from the wastewater treatment plant and the stock yards;

(b) Details of the nitrogen loads to be applied to land as a result of land disposal of dewatered biosolids on a per hectare per annum basis including an assessment of nitrogen loading from any fertiliser sources;

(c) Managerial procedures and physical mechanisms to be implemented to avoid, remedy or mitigate adverse effects on the receiving environment including the management of odour;

(d) A description of any required onsite contingency monofill including but not limited to:

  (i) Details of each monofill cell, its location and capacity

  (ii) Methods for recording and reporting biosolids deposition rate and annual loads to the monofill

  (iii) Methods for measuring and reporting biosolids characteristics

  (iv) Methods for managing leachate

4. The consent holder shall ensure that the disposal and management of biosolids is undertaken in accordance with the Biosolids Management Plan.

Disposal of Biosolids to Farm Land

5. Dewatered biosolids may be applied to the areas of farmland shown on Map A, at an annual loading rate of no greater than the plant available nitrogen (PAN) rate of 140kg N/ha/yr or 250kg N/ha/yr.

   Note:

   A loading rate of 250 kg total nitrogen per hectare per year (kg N/ha.yr) is approximately 23 tonnes / ha /yr of dewatered biosolids at 18% solids content. This shall be applied in no less than two applications per year.

6. No spreading of dewatered biosolids onto land shall occur within:

   (a) 100m of any residential dwelling (excluding those owned by the consent holder);

   (b) 50m of any surface watercourse;

   (c) 20m of any property boundary.

7. The consent holder shall ensure that there is no direct discharge or runoff of dewatered biosolids to any open water courses.

8. The consent holder shall ensure that the dewatered biosolids are applied to land as evenly as possible and shall be undertaken using specialised bio solid spreading equipment.

9. The dewatered biosolids shall not be applied to land if:
   (a) There has been a weather forecast predicting 20mm or more of rainfall within the subsequent 24 hours, and/or
   (b) There has been a rainfall event of 20 mm or more, within 24 hours of the planned application.

Monofill

10. The consent holder shall discharge dewatered biosolids to an onsite monofill only in accordance with the requirements set within the Biosolids Management Plan prepared in accordance with condition 3. The monofill shall be used as a contingency disposal site available to receive dewatered solids from the stockyards and dewatered biosolids from the Wastewater Treatment Plant when one or more of the following events (or similar) arise:
    (a) When the land is unsuitable to receive the dewatered biosolids as determined by condition 9 above and with an additional allowance for the drying of the land of 1-2 days as necessary;
    (b) The requirement of the consent holder to accept stock from its suppliers in the event there is an increase in the destocking rates by those supplier farmers, usually as a result of drought;
    (c) The use of the machinery required to discharge dewatered biosolids will result in land damage within the discharge area;
    (d) Non acceptance of the stockyard solids at an offsite composting facility; or
    (e) Breakdown of the machinery associated with the land spreading of the stock yards waste and biosolids.

11. The consent holder shall ensure that the monofill only receives dewatered solids produced at the site from the stockyards and dewatered biosolids from the Wastewater Treatment Plant.

12. The consent holder shall ensure that once each monofill cell has reached capacity, it is rehabilitated including with the use of a capping of a 0.3m thick clay/soil layer, or such other capping as may be agreed with the consent authority in writing.

Monitoring

13. The consent holder shall keep records of the following:
    (a) The date of each application of dewatered biosolids;
    (b) The daily location of the biosolids disposal area, and the size of the land area in hectares;
    (c) The weight of dewatered biosolids applied;

(d) Document contingency actions undertaken when dewatered biosolids could not be discharged to land, including the use, volume and rate of discharge to onsite monofill cells.

14. At all times when dewatered biosolids are being applied to land, a representative sample of the applied material shall be taken monthly and analysed for:

(a) Total solids;

(b) Total nitrogen;

(c) Total ammoniacal nitrogen;

(d) Total oxidised nitrogen;

(e) Total phosphorus;

(f) Total potassium;

(g) Total calcium;

(h) Total magnesium;

(i) Total sodium.

Once per year a dewatered biosolids sample collected as above shall be analysed for the following in addition to those parameters above:

(a) Total copper;

(b) Total lead;

(c) Total zinc;

(d) Total nickel;

(e) Total sulphur.

15. For the purpose of monitoring the effects of dewatered biosolids applications the consent holder shall:

(a) carry out assessments of the soils within the application areas, in June each year, at a minimum of four sites, one of which shall be a control site, i.e. a site on which application of dewatered biosolids does not occur. The remaining monitoring sites shall be in areas where dewatered biosolids application has occurred in the previous year. The assessments are to include infiltration rate, soil structure (0-20 cm soil depth), and soil aeration status (0-20 cm soil depth).

(b) Carry out sampling (from the 0-7.5cm soil depth) of the soils in December and June each year at a minimum of three sites, one of which shall be a control site where dewatered biosolids application does not occur. The remaining monitoring sites shall be in areas where dewatered biosolids application has occurred in the previous year. The samples shall be analysed for:

(i) pH;

(ii) exchangeable calcium;

(iii) exchangeable magnesium;

(iv) exchangeable potassium;

(v) exchangeable sodium;

(vi) Total Phosphorous;

(vii) Total organic carbon;

(viii) Total nitrogen;

(ix) Anaerobically mineralisable nitrogen;

(x) Nitrate nitrogen.

(c) Estimates of nitrate leaching using lysimeters are to be made monthly, at eight sites throughout the application area, to assess nitrate losses. Nitrate-N concentrations are to be measured on leachate samples, and estimates are to be made using a daily water balance model for the periods between sampling dates. Nitrate leaching is to be calculated monthly using the nitrate-N concentrations and drainage data and reported as part of the annual monitoring report prepared in accordance with condition 22.

16. The consent holder shall monitor the effects of the discharge on Bateman's Drain at the point that it exits the dewatered biosolids application area, or at another point agreed in writing by the consent authority, by taking representative grab samples of water from the drain, at monthly intervals, and analysing those samples for:

(a) Electrical conductivity;

(b) Total nitrogen concentration;

(c) Dissolved reactive phosphorus concentration.

17. The consent holder shall monitor groundwater in two bores on the site, one of which shall be a control site (upstream of the dewatered biosolids application area), and the other shall be at the downstream end of the dewatered biosolids application area located at about map reference NZMS XXXX:

(a) By measuring and recording the depth to groundwater at the two on-site monitoring bores immediately before purging the bores and extracting the samples under condition 17(b);

(b) By taking representative samples of the groundwater at each site at three monthly intervals, and analysing those samples for the following parameters:

(i) pH;

(ii) chloride concentration;

(iii) electrical conductivity;

(iv) nitrate + nitrite nitrogen concentrations;

(v) Ammoniacal nitrogen concentration;

(vi) E coli concentrations.

18. In the event that the groundwater monitoring undertaken in accordance with condition 17 show that any two consecutive samples in the downstream bore record a nitrate-nitrogen concentration of greater than 6.9 g/m^3 when that was not exceeded in the upstream control bore the consent holder shall be required to notify the consent authority and investigate the likely cause of the exceedance. If the investigation determines that the irrigation is likely to have caused or contributed to the exceedance, then the consent holder shall be required to implement appropriate remedial action. The results of this investigation and any mitigation or remedial action undertaken or to be implemented

shall be reported to the consent authority within 30 working days of the exceedance being reported.

19. In order to determine the volume of dewatered biosolids within the monofill cells, the consent holder shall record the number of truck and disposal movements to each monofill cell. Periodic weight per volume validations of waste shall also be undertaken and this shall be reported to the consent authority as part of the annual monitoring report prepared in accordance with condition 21.

20. Once each monofill cell has reached capacity, it shall be capped in accordance with condition 12. Once the cell has been decommissioned for a period of three years a final capping survey shall be undertaken to ensure that land contouring is undertaken over the surface to avoid any seepage of rain into the monofill.

Reporting

21. By the 15 December each year of operation, the consent holder shall prepare a monitoring report relating to the activities authorised by this consent over the preceding 1 October to 30 September period. This report shall be submitted to consent authority. The monitoring report shall include but not be limited to:

    (a) Detailed assessment of the nitrogen loading rates and an assessment of compliance with condition 5 of this consent;

    (b) Summation and discussion of all data collected as required under the conditions of this consent as relating to both disposal of dewatered biosolids to land and to monofill;

    (c) Description of the effects on soil and groundwater resources arising from the application of dewatered biosolids, any breaches of the trigger identified in condition 18 and the mitigation measures undertaken;

    (d) Report and discuss any complaints received regarding the application of dewatered biosolids;

    (e) Critically evaluate the performance of any managerial procedures and physical mechanisms in place to avoid, remedy or mitigate adverse effects on the environment, identify any improvements undertaken and make recommendations on any additional improvements needed;

    (f) After any monofill cell has been decommissioned for a period of three years, the monitoring report shall include a description of the contour and stability of the cover, an assessment of any on-going effects and any recommendations for further remediation.

22. Should the report prepared in accordance with condition 21 recommend any improvements to be undertaken to the system then these shall be implemented by the consent holder prior to commencing discharge of dewatered biosolids the following season.

Review

23. The consent authority may, within three months of receiving the report required by condition 21 of this consent, serve notice on the consent holder under section 128 of the Resource Management Act 1991 of its intent to review the conditions of this consent. The purpose of such a review is to deal with any adverse effect on the environment which may arise from the exercise of this consent; and/or requiring the adoption of the best practicable option to remove or reduce any adverse effect on the environment.