ATTACHEMNT B TO DECISION – CONDITIONS OF CONSENT

Discharge Permit – AUTH-20191052-01

To discharge agricultural effluent to land on the Woldwide One and Woldwide Two dairy platforms.

1. This resource consent shall not be exercised until:
   (i) Discharge Permit AUTH-301663; and
   (ii) Discharge Permit AUTH-300626-V2; and
   (iii) Discharge Permit AUTH-20171278-01
   have been surrendered or expire.

2. This resource consent shall be exercised in conjunction with Land Use Consents AUTH-20191052-03, AUTH-20191052-05 and AUTH-20191052-06.

3. Except as modified by the conditions of this resource consent, the activities authorised by this resource consent must be carried out in general accordance with the documents listed in Schedule A. In the event of any inconsistency the conditions of this consent shall prevail.

4. The discharge authorised by this consent must only be to land within the discharge area of 428 hectares, as shown on the plan attached as Appendix 1, and as described in the tables below:

   (a) on the Woldwide One Platform:

Legal description of discharge area	Lot 1 DP 10885 Section 418 Taringatura SD Part Lot 18 DP 942 Section 420 Taringatura SD Lot 1 DP 5610 Part Lot 1 DP 4092
Map reference of dairy shed (NZTM 2000)	1225170E, 4888764N
Property address	1354 Hundred Line Road

   (b) on the Woldwide Two Platform as described in the table below:

Legal descriptions of discharge area	Part Lot 1 DP 4092 Part Lot 2 DP 4092 Part Section 417 Taringatura SD Section 419 Taringatura SD Lot 1 DP 14660 Lot 1 DP 14661 Lot 1 DP 9925 Lot 3 DP 4092 Lot 1 DP 10885 Part Lot 18 DP 942
Map reference of dairy shed (NZTM 2000)	1225042E, 4889686N
Property address	1915 Winton Wreys Bush Highway

   (c) where there is inconsistency between the plans attached as Appendix 1 and the conditions of this consent, the conditions of this consent will prevail.

5. The activities authorised by this consent shall be limited to:

(a) for the Woldwide One Platform the discharge of agricultural effluent onto land consisting of:
    (i) dairy shed effluent generated from milking up to 700 cows up to twice per day; and
    (ii) winter barn effluent generated from the use of the barn as authorised by Land Use Consent AUTH-20191052-03;

(b) for the Woldwide Two Platform the discharge of agricultural effluent onto land consisting of:
    (i) dairy shed effluent generated from milking up to 800 cows up to twice per day;
    (ii) winter barn effluent generated from the use of the winter barns as authorised by Land Use Consent AUTH-20191052-04; and
    (iii) silage pad leachate generated from a silage pad with a maximum impervious catchment area of 1,200 m^2;

(c) for both the Woldwide One Platform and Woldwide Two Platform, the incidental discharge of agricultural effluent directly onto or into land from the agricultural effluent storage ponds and treatment facilities, which is within the normal operating parameters of a leak detection system or the Pond Drop Test criteria set out in Appendix P of the proposed Southland Water and Land Plan (Decisions Version 2018) or any subsequent replacement versions.

6. Agricultural effluent may be discharged via:
    (a) low rate pod system;
    (b) low rate cannon/rain gun (or equivalent low rate system);
    (c) high rate travelling irrigator;
    (d) high rate umbilical system; and
    (e) high rate slurry wagon with trailing shoe.

Advice Note:
Routine monitoring inspections of this consent may occur up to five times a year. This number does not include any other required inspections and may be combined with the inspections required by AUTH-20191052-06 (or any subsequent variation versions).

Agricultural Effluent Application

7. The discharge must not exceed:

    (a) for the low rate system(s), a depth of application of 10 millimetres for each individual application, and an instantaneous rate of 10 millimetres per hour;
    (b) for the high rate slurry wagon with trailing shoe, a depth of application of 2.5 millimetres for each individual application;
    (c) for the high rate travelling irrigator(s), a maximum depth for each individual application of 10 millimetres; and
    (d) for the high rate umbilical system, a maximum depth for each individual application of 3 millimetres.

8. Within three months of the first exercise of this consent, a low rate system as described in condition 6 shall be installed at both Woldwide One Platform and Woldwide Two Platform.

9. Where any low rate system described in condition 6 is installed, the Consent Holder must:

   (a) notify the Consent Authority in writing prior to the first use of the low rate system, including which dairy platform the system has been installed on;
   (b) during the initial use of the low rate system, measure the depth and instantaneous rate of application of effluent to demonstrate compliance with condition 7(a); and
   (c) supply the measurements to the Consent Authority within 20 working days of the test being undertaken.

Advice Note
Following installation of any low rate irrigation systems as described in condition 6, the high rate travelling irrigator systems may be operated as required, when soil moisture levels are suitable for high rate irrigation.

10. By 31 May 2024 the Consent Holder must measure the depth of effluent application of all installed travelling irrigators to demonstrate compliance with condition 7(c), and supply the measurements from the individual tests to the Consent Authority within 20 working days of each of the tests being undertaken.

11. At any time that visible over-application of agricultural effluent occurs, the Consent Holder must measure the depth of application of the irrigator within five working days of the over-application being identified. The measurements must be supplied to the Consent Authority within 20 working days of the test being undertaken.

Advice Note
Visible over-application may be evident by the presence of effluent sludges, ponding or pooling on the land surface.

12. The minimum return period for the discharge of agricultural effluent to land shall be 28 days.

13. Nitrogen loading from the discharge of agricultural effluent onto any land area as a result of the exercise of this consent must not exceed 150 kilograms of nitrogen per hectare per year.

Soil Moisture

14. Within the first six months of this consent the Consent Holder must:

   (a) install a soil moisture sensor in a representative area of Braxton Soils on the Woldwide One Platform or Woldwide Two Platform or the Horner Block (legal description Lot 4 DP 399915); and
   (b) within five working days of the installation of the sensor, notify the Consent Authority that the sensor has been installed, and of its location.

15. The discharge of agricultural effluent must not occur to:

   (a) Braxton Soils, as shown on the map attached as Appendix 2, when the soil is at or above field capacity as identified by the Soil Moisture Sensor installed as per condition 14;

   (b) any other soils, when soil moisture is near or at field capacity as identified at the Heddon Bush Soil Moisture Monitoring Site.

Advice Note

"any other soils" refers to all other soil types present on the dairy platforms that are freer draining than the Braxton Soils.

Agricultural Effluent System Management

16. The discharge of agricultural effluent onto land shall occur with the use of the following infrastructure:

    (a) for Woldwide One Platform:
        (i) a concrete block sand trap and a concrete pump sump at the dairy shed;
        (ii) a synthetically-lined effluent storage pond of between 3,257 cubic metres and 4,281 cubic metres capacity; and
        (iii) a concrete effluent collection bunker at the winter barn;

    (b) for Woldwide Two Platform:
        (i) a sand trap and a concrete pump sump at the dairy shed; and
        (ii) until no later than 15 April 2020, a clay-lined effluent storage pond of between 3,203 cubic metres and 3,751 cubic metres capacity; or
        (iii) a synthetically-lined storage pond authorised by land use consent AUTH-20191580; and
        (iv) a concrete effluent collection bunker at the winter barn.

Advice Note:
Only one pond may be used for discharge at any one time, under conditions 16(b)(ii) and 16(b)(iii). The clay-lined pond in 16(b)(ii) must not be used for discharge from 16 April 2020.

17. The Consent Holder shall have and maintain:

    (a) operational automatic switch-off systems that prevent any over-application or spilling of agricultural effluent; and
    (b) an operational alarm that alerts the Person(s) in Charge to any system failure that could cause the over-application, overflow or spilling of agricultural effluent (e.g. sudden pressure drop, irrigator stoppage); and
    (c) an anti-siphon device(s) on all agricultural effluent pipelines to prevent siphoning of effluent when pumping ceases.

Agricultural Effluent System Monitoring

Advice Note
Conditions 18 to 23 relate <u>solely</u> to the Woldwide One Platform effluent storage system described in condition 16(a)(ii).

18. The Consent Holder shall inspect the leak detection chamber not less than weekly to check for any evidence of leakage.

19. A record of the inspections required by condition 18 shall be maintained by the Consent Holder and included in the Collected Agricultural Effluent Management Plan required by condition 35.

20. By 30 December 2027 the Consent Holder shall:

(a) receive written confirmation from a Suitably Qualified Person, in accordance with Appendix P of the proposed Southland Water and Land Plan (Decisions Version 2018) or any subsequent replacement versions, that the synthetically lined effluent storage pond meets the relevant pond drop test criteria in Appendix P;
(b) supply the written confirmation to the Consent Authority within 20 working days of the confirmation being received.

21. The written confirmation required by condition 20 shall be accompanied by photographs (date and time stamped) of the structure during the testing.

22. If the leak detection chamber inspections, visual assessment, pond drop test or any other inspection identifies that:

(a) the incidental discharge is not within the drop test criteria of Appendix P of the proposed Southland Water and Land Plan Decisions Version 2018 (or any subsequent replacement versions); or
(b) there is any leakage outside of the normal operating parameters of the leak detection system; or
(c) there are visible cracks, holes or defects that would allow effluent to leak from the facility;

the Consent Holder must notify the Consent Authority as soon as reasonably practicable following the relevant test or inspection.

23. Within five working days of notifying the Consent Authority under condition 22, the Consent Holder shall advise the Consent Authority in writing of the steps that will be taken to ensure that the structure is made suitable for ongoing use, including:

(a) any additional testing to be undertaken;
(b) an outline of the proposed works to be undertaken to remediate the structure;
(c) the timeframe for completion, which shall be no longer than three months;
(d) where the timeframe is expected to exceed three months:
    (i) the Consent Holder shall notify the Consent Authority that they will exceed the timeframe set out in condition 23(c) and provide an expected date of completion;
    (ii) a Chartered Professional Engineer shall undertake an assessment of the pond and submit a report to the Consent Authority, outlining the defects in the pond and the remedial works to be undertaken, a detailed completion timeframe and the suitability of the pond for use during the remediation works;
    (iii) the Consent Holder shall submit a plan for their temporary operating procedures to the Consent Authority including what is required under condition 23(f) and how they will manage their effluent; and
    (iv) If the pond is deemed not suitable for use under condition 23(d)(ii), the Consent Holder shall empty the pond and not use it for storage or discharge, until the pond has been certified to be within the normal operating parameters of a leak detection system or the pond drop test criteria set out in Appendix P of the proposed Southland Water and Land Plan Decisions Version 2018 (or any subsequent replacement versions) and this certification has been received by the Consent Authority;
(e) identification of whether the works and/or maintenance will require consent for reconstruction of the pond;

(f) the additional mitigation measures that will be employed to minimise the adverse effects of the leaking structure prior to remediation being undertaken; and
(g) testing, certification, or inspections to be completed following the works to demonstrate that the structure complies with the conditions of this consent.

Exclusions

24. This consent does not authorise the discharge to land of dairy shed effluent generated (other than from slipped cows) between 16 June and 31 July ("winter milking").

25. This consent does not authorise the discharge of:

(a) effluent collected by a feed pad, calving pad or wintering pad; and
(b) effluent collected from an underpass.

Advice Note
The underpass has its own independent effluent collection and discharge system and effluent from the underpass should be discharged via this system.

Should the Consent Holder wish to incorporate the underpass into the effluent system as described by this permit, they should apply to the Consent Authority to amend this consent under s127 of the Resource Management Act 1991, or apply for a new consent.

26. The Consent Holder must inspect the discharge area prior to effluent application, and must not discharge agricultural effluent to any specific area of land if that area of land has ponding or pooling of water on the land surface.

27. Prior to effluent application to any area of Braxton soils (as shown on the Appendix 2 Map), the Consent Holder must inspect the discharge area and must not discharge agricultural effluent to any area of Braxton soils if that area has any observable cracking.

28. No discharge shall occur within:

(a) 20 metres of any water body including natural wetlands;
(b) 100 metres of any water abstraction point;
(c) 200 metres of any place of assembly or dwelling not on the subject property; and
(d) 20 metres from any property boundaries.

29. The stored or discharged agricultural effluent shall not:

(a) form ponds or flow on the land surface, or
(b) cause contamination of water.

30. The stored or discharged agricultural effluent shall not enter any surface water.

31. The stored or discharged agricultural effluent shall not cause any odour beyond the boundary of the site (as shown in Appendix 1) that is offensive or objectionable in the opinion of the Council's Compliance Officer.

32. Spray drift beyond the boundary of the site (as shown in Appendix 1) shall not occur.

Consent Management

33. The Consent Holder must notify the Consent Authority:

    (a) of the identity of all Person(s) in Charge of the agricultural effluent ponds and disposal systems for each dairy platform:
        (i) prior to the first exercise of this consent, and
        (ii) no more than five working days following the appointment of any new Person in Charge.

Advice Note
Two separate Person in Charge details must be received by the Consent Authority; one for each dairy platform.

34. In the event of the failure or mismanagement of the agricultural effluent disposal system, or any other event that may result in a discharge of agricultural effluent that may have significant adverse effect on water quality, particularly in the region of the abstraction point of a registered drinking-water supply, the Consent Holder shall notify, as soon as practicable, the following authorities:

    (a) the Consent Authority (ph 03 211 5115 or 03 211 5225 after hours); and
    (b) Southland District Council (ph 0800 732 732);
    (c) Public Health South (on-call Health Protection Officer, ph 03 4740999); and
    (d) Ministry of Education on behalf of Heddon Bush School (ph 03 236 1144).

Collected Agricultural Effluent Management Plan

35. Within three months of the first exercise of this consent, the Consent Holder shall prepare and submit to the Consent Authority a Collected Agricultural Effluent Management Plan. The Collected Agricultural Effluent Management Plan shall:

    (a) detail the operating procedures and management relating to the effluent treatment, transfer and storage systems, including any monitoring devices;
    (b) describe how each component of the agricultural effluent system is maintained and have regard to the information provided in the pond storage calculations provided in the application;
    (c) provide concise and clear direction to the Person(s) in Charge and other staff on the operation of the agricultural effluent system;
    (d) identify environmental risks of agricultural effluent discharges specific to the farm including, but not limited to, locations of drains, surface waterways, sub-surface drainage and critical source areas in the agricultural effluent disposal area;
    (e) identify how the above environmental risks are avoided;
    (f) identify the response to be undertaken in an emergency situation;
    (g) describe how agricultural effluent is managed when soils are at or above field capacity and/or during adverse weather conditions;
    (h) describe how the stormwater diversion on the system is set up and managed;
    (i) include a schedule for the undertaking of any Pond Drop Tests and any monitoring required by the conditions of this discharge permit; and
    (j) provide the record and reporting requirements of any repair, maintenance or monitoring undertaken, including the inspections of the leak detection chamber required by any condition of this discharge permit.

36. A Collected Agricultural Effluent Management Plan must either be prepared for each platform individually, or if a combined plan is prepared, clearly identify which details relate to which dairy platform.

Advice Note
The Collected Agricultural Effluent Management Plan(s) (CAEMP) may be incorporated into the Farm Environmental Management Plan required by Land Use Consent AUTH-20191052-06 provided all the requirements required by condition 35 are met.

37. The Collected Agricultural Effluent Management Plan(s) shall be reviewed at least once each milking season; and either

    (a) an updated version shall be provided to the Consent Authority by 31 May each year; **or**
    (b) the Consent Holder must notify the Consent Authority in writing that no changes have been made by 31 May each year.

38. The Collected Agricultural Effluent Management Plan(s) may be amended at any time, provided each plan includes all the matters listed in condition 35 of this permit.

39. The Consent Holder shall provide the amended version of the Collected Agricultural Effluent Management Plan to the Consent Authority within one month of any amendment being made in accordance with condition 38.

40. Effluent shall be managed in accordance with the current Collected Agricultural Effluent Management Plan. Where there is inconsistency between the Collected Agricultural Effluent Management Plan and the conditions of this consent, the conditions of this consent shall prevail.

Environmental Monitoring Report

41. An Environmental Monitoring Report shall be provided annually to the Manager Compliance, Southland Regional Council, that details the work undertaken by the consent holder in the preceding July to June period to ensure that there is ongoing compliance with the conditions of this resource consent. This report shall be prepared by a Suitably Qualified Person and provided by 30 September each year.

Review of consent

42. 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, for the purposes of:

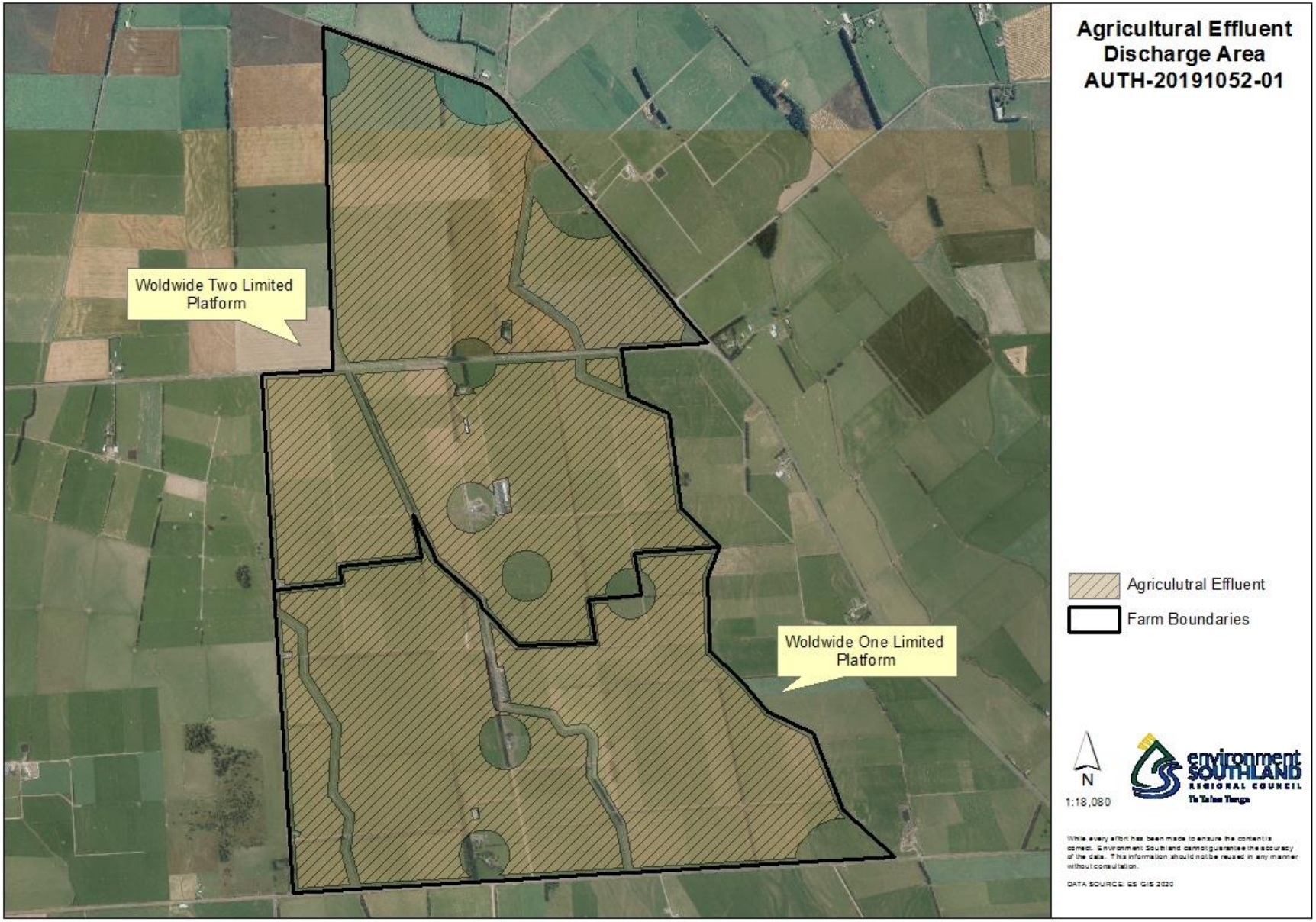
    (a) determining whether the conditions of this permit are adequate to deal with any adverse effect on the environment, including cultural effects on Te Rūnanga o Ōraka Aparima and/or cumulative effects, which may arise from the exercise of the permit, and which it is appropriate to deal with at a later stage, or which become evident after the date of commencement of the permit;

(b) ensuring the conditions of this consent are consistent with any National Environmental Standards, Regulations, relevant plans and/or the Southland Regional Policy Statement;
(c) amending the monitoring programme to be undertaken;
(d) adding or adjusting compliance limits;
(e) ensuring the Aparima Freshwater Management Unit meets the freshwater objectives and freshwater quality limits set in an operative regional plan; and
(f) requiring the Consent Holder to adopt the best practicable option to remove or reduce any adverse effect on the environment arising as a result of the exercise of this permit.

SCHEDULE A

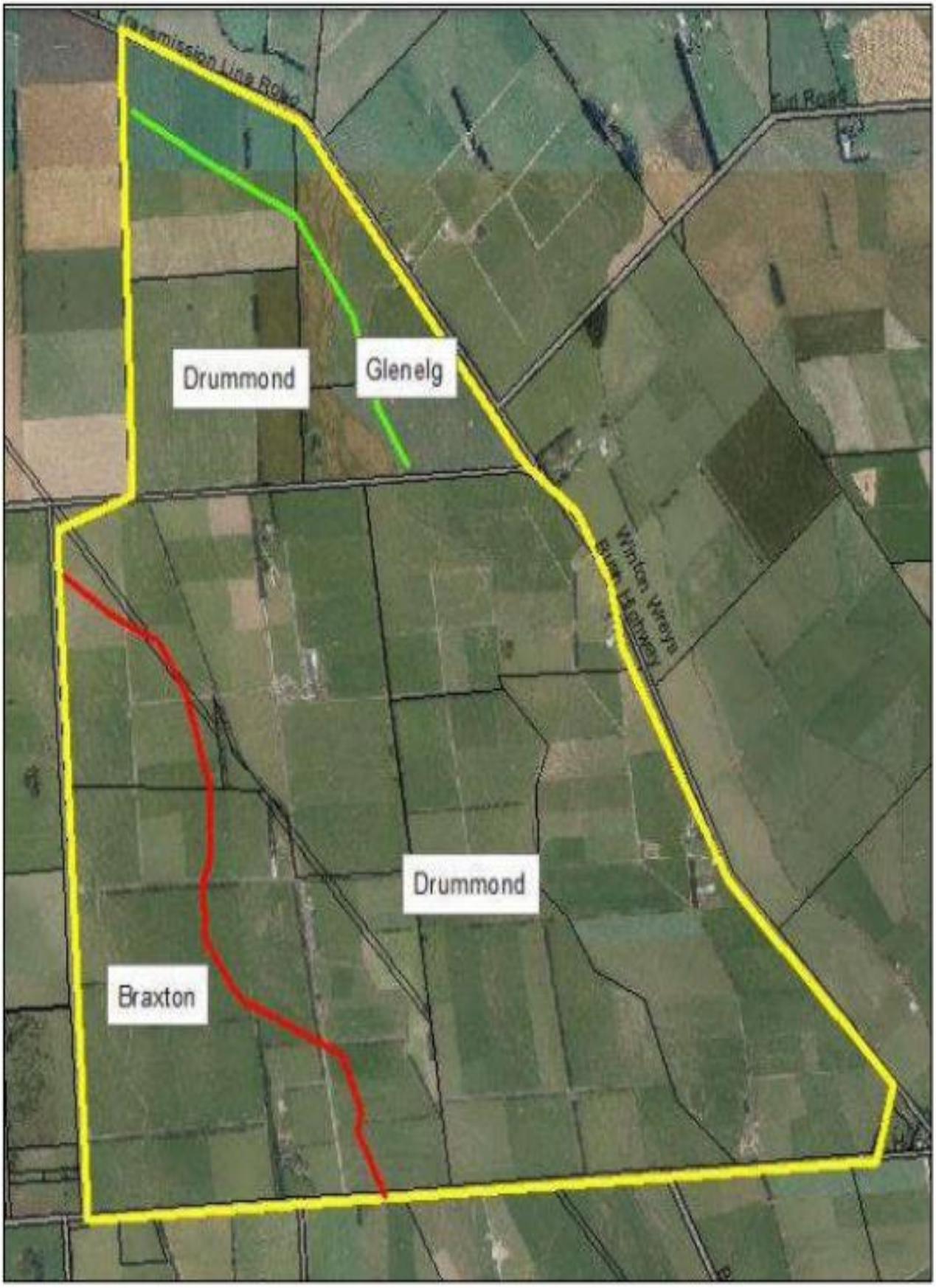
Document Name	Council ID Number
Woldwide One Limited and Woldwide Two Limited Application for Resource Consents – Marked Up Version	A501407
Woldwide One Limited and Woldwide Two Limited Farm Environmental Management Plan – Appendix N (Version 1.4.1)	A501405
Woldwide One Limited and Woldwide Two Limited Effluent Management Plan (Version 2)	A501408
Woldwide Run-off Proposal and AEE	zA43917
Woldwide Runoff (Supplementary Report) (Version 3)	zA43918
Woldwide Runoff Limited Farm Environmental Management Plan – Appendix N (Version 1.2)	zA43919
Woldwide 1, 2, SH96 & Marcel Block (Supplementary Report – Horner Block)	A504131

APPENDIX 1 – Agricultural Effluent Discharge Area



Agricultural Effluent Discharge Area
AUTH-20191052-01

APPENDIX 2 – Braxton Soils



Discharge Permit – Horner Block - AUTH-20191052-02

1. This resource consent must not be exercised until Discharge Permit AUTH-301663 and Discharge Permit AUTH-20171278-01 are surrendered or expire; and

2. This resource consent must be exercised in conjunction with Land Use Consents AUTH-20191052-03, AUTH-20191052-04 and AUTH-20191052-06.

3. Except as modified by the conditions of this resource consent, the activities authorised by this resource consent must be carried out in general accordance with the documents listed in Schedule A. In the event of any inconsistency the conditions of this consent shall prevail.

4. (a) The discharge authorised by this consent must only be to land within the discharge area shown on the plan attached as Appendix 1, known as the "Horner Block" and as described in the table below:

Legal descriptions of discharge area	Lot 4 DP 399915
Size of the discharge area (hectares)	97
Map reference of the property	1223251E, 4887991N

(b) Where there is inconsistency between the plan attached as Appendix 1 and the conditions of this consent, the conditions of this consent will prevail.

5. This consent authorises the discharge of agricultural effluent:

   (a) generated and stored on the "Woldwide One Platform" and "Woldwide Two Platform" in accordance with Discharge Permit AUTH-20191052-01;
   (b) via a high rate slurry tanker with a trailing shoe; and a high rate umbilical system.

Advice Note:
Routine monitoring inspections of this consent may occur up to twice a year. This number does not include any other required inspections and may be combined with the inspections required by AUTH-20191052-01 and/or AUTH-20191052-06, or any subsequent variation versions.

Agricultural Effluent Application

6. The discharge of agricultural effluent must not exceed:

   (a) a depth of application of 2.5 millimetres for each individual application by slurry tanker with the trailing shoe; and
   (b) a depth of 3 millimetres for each individual application by umbilical system.

7. The minimum return period for the discharge of agricultural effluent to land shall be 28 days.

8. Nitrogen loading from the discharge of agricultural effluent onto any land area as a result of the exercise of this consent must not exceed 250 kilograms of nitrogen per hectare per year.

9. The discharge must not occur when the moisture content of the soils is at or above field capacity.

Soil Moisture

10. The discharge of agricultural effluent must not occur to:
    (a) Braxton Soils (as defined by S-maps, smap.landcareresearch.co.nz), when the soil is at or near field capacity, as identified by the Soil Moisture Sensor installed in accordance with Discharge Permit AUTH-20191052-01;
    (b) any other soils, when soil moisture is near or at field capacity as identified at the Heddon Bush Soil Moisture Monitoring Site.

Advice Note
"any other soils" refers to all other soil types present on the dairy platforms that are not Braxton Soils.

Exclusions

11. No discharge shall occur within:

    (a) 20 metres of any water body including natural wetlands;
    (b) 100 metres of any water abstraction point;
    (c) 200 metres of any place of assembly or dwelling not on the subject property; and
    (d) 20 metres from any property boundaries.

12. The Consent Holder must inspect the discharge area prior to effluent application, and must not discharge agricultural effluent to any specific area of land if that area of land has ponding or pooling of water on the land surface.

13. Prior to effluent application to any area of Braxton soils (as defined by S-maps, smap.landcareresearch.co.nz), the Consent Holder must inspect the discharge area and must not discharge agricultural effluent to any specific area of Braxton soils if that area has any observable cracking.

14. The stored or discharged agricultural effluent shall not:

    (a) form ponds or flow on the land surface, or
    (b) cause contamination of water.

15. The discharge of agricultural effluent shall not enter any surface water.

16. The stored or discharged agricultural effluent shall not cause any odour beyond the boundary of the site (as shown in Appendix 1) that is offensive or objectionable in the opinion of the Council's Compliance Officer.

17. Spray drift beyond the boundary of the site (as shown in Appendix 1) shall not occur.

Consent Management

18. The Consent Holder shall notify the Consent Authority of the identity of the Person in Charge of the agricultural effluent disposal system:

    (a) prior to the first exercise of this consent, and
    (b) no more than five working days following the appointment of any new Person in Charge.

19. In the event of the failure or mismanagement of the agricultural effluent disposal system, or any other event that may result in a discharge of agricultural effluent that may have significant adverse effect on water quality, particularly in the region of the abstraction point of a registered drinking-water supply, the Consent Holder shall notify, as soon as practicable, the following:

    (a) the Consent Authority (ph 03 211 5115 or 03 211 5225 after hours); and
    (b) Southland District Council (ph 0800 732 732).

20. An Environmental Monitoring Report shall be provided annually to the Compliance Manager, Southland Regional Council, that details the work done by the consent holder in the preceding July to June period to ensure that there is ongoing compliance with the conditions of this resource consent. This report shall be prepared by a Suitably Qualified Person and provided by 30 September each year.

Review of consent

21. 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, for the purposes of:

    (a) determining whether the conditions of this permit are adequate to deal with any adverse effect on the environment, including including cultural effects on Te Rūnanga o Ōraka Aparima and/or cumulative effects, which may arise from the exercise of the permit, and which it is appropriate to deal with at a later stage, or which become evident after the date of commencement of the permit;
    (b) ensuring the conditions of this consent are consistent with any National Environmental Standards Regulations, relevant plans and/or the Environment Southland Regional Policy Statement;
    (c) amending the monitoring programme to be undertaken;
    (d) adding or adjusting to compliance limits;
    (e) ensuring the Aparima Freshwater Management Unit meets the freshwater objectives and freshwater quality limits set in an operative regional plan; and
    (f) requiring the Consent Holder to adopt the best practicable option to remove or reduce any adverse effect on the environment arising as a result of the exercise of this permit.

SCHEDULE A

Document Name	Council ID Number
Woldwide One Limited and Woldwide Two Limited Application for Resource Consents – Marked Up Version	A501407
Woldwide One Limited and Woldwide Two Limited Farm Environmental Management Plan – Appendix N (Version 1.4.1)	A501405
Woldwide One Limited and Woldwide Two Limited Effluent Management Plan (Version 2)	A501408
Woldwide Run-off Proposal and AEE	zA43917
Woldwide Runoff (Supplementary Report) (Version 3)	zA43918
Woldwide Runoff Limited Farm Environmental Management Plan – Appendix N (Version 1.2)	zA43919
Woldwide 1, 2, SH96 & Marcel Block (Supplementary Report – Horner Block)	A504131

APPENDIX 1 – Slurry Effluent Discharge Area

Land Use Consent (Winter Barn) – Woldwide One – AUTH-20191052-03

1. This consent authorises the use of an existing winter barn at the location as described in the table below:

Legal description	Part Lot 18 DP 942
Map Reference of Winter Barn (NZTM 2000)	1225139E, 4888992N
Property address	1354 Hundred Line, Heddon Bush

2. This consent must be exercised in conjunction with Discharge Permit AUTH-20191052-01, Discharge Permit AUTH-20191052-02 and Land Use Consent AUTH-20191052-06.

3. Except as modified by the conditions of this resource consent, the activities authorised by this resource consent must be carried out in general accordance with the documents listed in Schedule A. In the event of any inconsistency the conditions of this consent shall prevail.

4. The winter barn shall contain no more than 625 cows at any time.

5. Daily use of the winter barn must be monitored by recording:

   (a) the number of cows; and
   (b) the number of hours spent by cows in the barn.

6. The records of winter barn use must be maintained and supplied to the Consent Authority upon request.

7. Effluent generated from the use of the winter barn shall be scraped to the concrete effluent collection bunker from where it shall be pumped to the effluent storage pond system.

8. There shall be no overland or lateral flow, pooling or ponding of effluent beyond the perimeter of the winter barn.

9. 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 effect on the environment, including cumulative effects, which may arise from the exercise of the permit, and which it is appropriate to deal with at a later stage, or which become evident after the date of commencement of the permit;
   (b) ensuring the conditions of this consent are consistent with any National Environmental Standards, Regulations, relevant plans and/or the Environment Southland Regional Policy Statement; or
   (c) ensuring the Aparima Freshwater Management Unit meets the freshwater objectives and freshwater quality limits set in an operative regional plan pursuant to Policy A1 of the National Policy Statement for Freshwater Management.

Advice Notes

1. *Routine monitoring inspections of this consent may occur up to once a year. This number does not include any other required inspections and may be combined with the inspections required by AUTH-20191052-01 and/or AUTH-20191052-06 or any subsequent variation versions.*
2. *Liquid, solid or slurry effluent and vegetative waste produced from the use of the Winter Barns shall be discharged in accordance with one of the following:*
   - *(a) Discharge Permit AUTH-20191052-01 (or any subsequent variation versions); or*
   - *(b) Discharge Permit AUTH-20191052-02 (or any subsequent variation versions); or*
   - *(c) Rule 38 of the proposed Southland Water and Land Plan (Decisions Version 2018) or any subsequent replacement versions.*

SCHEDULE A

Document Name	Council ID Number
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Woldwide One Limited and Woldwide Two Limited Farm Environmental Management Plan – Appendix N (Version 1.4.1)	A501405
Woldwide One Limited and Woldwide Two Limited Effluent Management Plan (Version 2)	A501408
Woldwide Run-off Proposal and AEE	zA43917
Woldwide Runoff (Supplementary Report) (Version 3)	zA43918
Woldwide Runoff Limited Farm Environmental Management Plan – Appendix N (Version 1.2)	zA43919
Woldwide 1, 2, SH96 & Marcel Block (Supplementary Report – Horner Block)	A504131

Land Use Consent (Winter Barn) – Woldwide Two – AUTH20191052-04

1. This consent authorises the use of an existing winter barn at the location as described in the table below:

Legal description	Part Lot 2 DP 4092
Map Reference of Winter Barn (NZTM 2000)	1225128E, 4889730N
Property address	1915 Winton Wreys Bush Highway

2. This consent shall be exercised in conjunction with Discharge Permit AUTH-20191052-01, Discharge Permit AUTH-20191052-02 and Land Use Consent AUTH-20191052-06.

3. Except as modified by the conditions of this resource consent, the activities authorised by this resource consent must be carried out in accordance with the documents listed in Schedule XX. In the event of any inconsistency the conditions of this consent shall prevail.

4. The winter barn shall contain no more than 625 cows at any time.

5. Daily use of the winter barn must be monitored by recording:

   (a) the number of cows; and
   (b) the number of hours spent in the barn.

6. The records of winter barn use must be maintained and supplied to the Consent Authority upon request.

7. Effluent generated from the use of the winter barn shall be scraped to a concrete collection bunker from where it shall be pumped to the effluent pond storage system.

8. There shall be no overland or lateral flow, pooling or ponding of effluent beyond the perimeter of the winter barn.

9. 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 effect on the environment, including cumulative effects, which may arise from the exercise of the permit, and which it is appropriate to deal with at a later stage, or which become evident after the date of commencement of the permit;
   (b) ensuring the conditions of this consent are consistent with any National Environmental Standards, Regulations, relevant plans and/or the Environment Southland Regional Policy Statement; or
   (c) ensuring the Aparima Freshwater Management Unit meets the freshwater objectives and freshwater quality limits set in an operative regional plan pursuant to Policy A1 of the National Policy Statement for Freshwater Management.

Advice Notes

1. *Routine monitoring inspections of this consent may occur up to once a year. This number does not include any other required inspections and may be combined with the inspections required by AUTH-20191052-01 and/or AUTH-20191052-06, or any subsequent variation versions.*

2. *Liquid, solid or slurry effluent and vegetative waste produced from the use of the Winter Barns shall be discharged in accordance with one of the following:*
   (a) Discharge Permit AUTH-20191052-01 (or any subsequent variation versions); or
   (b) Discharge Permit AUTH-20191052-02 (or any subsequent variation versions); or
   (c) Rule 38 of the proposed Southland Water and Land Plan (Decisions Version 2018), or any subsequent replacement versions.

SCHEDULE A

Document Name	Council ID Number
Woldwide One Limited and Woldwide Two Limited Application for Resource Consents – Marked Up Version	A501407
Woldwide One Limited and Woldwide Two Limited Farm Environmental Management Plan – Appendix N (Version 1.4.1)	A501405
Woldwide One Limited and Woldwide Two Limited Effluent Management Plan (Version 2)	A501408
Woldwide Run-off Proposal and AEE	zA43917
Woldwide Runoff (Supplementary Report) (Version 3)	zA43918
Woldwide Runoff Limited Farm Environmental Management Plan – Appendix N (Version 1.2)	zA43919
Woldwide 1, 2, SH96 & Marcel Block (Supplementary Report – Horner Block)	A504131

Water Permit – AUTH-20191052-05

1. The permit authorises the abstraction and use of groundwater on the following dairy platforms:

   (a) Woldwide One Platform, for dairy shed and winter barn washdown and stock drinking water, located as described in the table below:

Legal description	Part Lot 18 DP 9421915
Property address	1354 Hundred Line Road

   (b) Woldwide Two Platform, for dairy shed and winter barn washdown and stock drinking water, located as described in the table below:

Legal description	Part Lot 2 DP 4092
Property address	1915 Winton Wreys Bush Highway

2. The abstraction shall occur from the following bores:

   (a) on the Woldwide One Platform;

Bore Number	Map Reference of Bore (NZTM 2000)
E45/0071	1225145E 4888768N

   (b) on the Woldwide Two Platform;

Bore Number	Map Reference of Bore (NZTM 2000)
E45/0083	1225011E 4889693N
E45/0727	1225014E 4890268N

3. This resource consent cannot be exercised until:

   (a) Water Permit AUTH-301664; and
   (b) Water Permit AUTH-300627-V1; and
   (c) Water Permit AUTH-20171278-02.

   have been surrendered or expire.

4. This resource consent must be exercised in conjunction with Land Use Permits AUTH-20191052-03, AUTH-20191052-04 and AUTH-20191052-06.

5. The rate and volume of abstraction shall not exceed:

   (a) from bore E45/0071:
      (i) 2 litres per second; and
      (ii) 91 cubic metres per day.

   (b) from bores E45/0083 and E45/0727 combined:
      (i) 2 litres per second; and
      (ii) 96 cubic metres per day;

(c) from bores E45/0071, E45/0083 and E45/0727 combined:
    (i) 55,296 cubic metres per year.

Advice Note
Rule 53(c) of the proposed Southland Land and Water Plan requires that all bores from which water is abstracted meet the following requirements:
(a) the bore or well design and headworks prevent:
    (i) the infiltration of contaminants; and
    (ii) the uncontrolled discharge or leakage of water to the ground surface or between aquifers.
Should the bore not meet the above requirements, a Resource Consent is required for the use and maintenance of the bore.

6. Prior to the first exercise of this consent, the Consent Holder shall install and maintain a backflow prevention device(s) or take other appropriate measures to ensure water and/or contaminants cannot return to the water source at any point of groundwater abstraction.

7. Prior to the first exercise of this consent, the Consent Holder shall install and maintain:

    (a) a water meter to record the water take from bore E45/0071; and
    (b) a water meter to record the water take from bore E45/0083; and
    (c) a water meter to record the water take from bore E45/0727.

8. The water meters:

    (a) as installed must be within an error accuracy range of +/-5% over the meter's nominal flow range;
    (b) 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 and have no fittings or 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 ten times the diameter of the pipe and on the downstream side there shall be a distance of five times the diameter of the pipe.

9. The Consent Holder shall ensure the full operation of the water meters at all times during the exercise of this consent. All malfunctions of the water meter 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.

10. The Consent Holder shall:

    (a) if a mechanical insert water meter is installed, have it verified for accuracy on an annual basis from the first exercise of this consent; or
    (b) if an electromagnetic or ultrasonic flow meter is installed, have it verified for accuracy every five years from the first exercise of this consent.

11. 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.

12. The Consent Holder must maintain a record of the total volume of water abstracted each month:

    (a) from bore E45/0071; and
    (b) from bore E45/0083; and
    (c) from bore E45/0727;

    and provide these records to the Consent Authority by 31 May each year and at any other time on request.

13. The Consent Holder must notify the Consent Authority of the identity of the Person(s) in Charge of the operation of this Consent on each dairy platform:

    (a) prior to the first exercise of this consent; and
    (b) no more than five working days following the appointment of any new Person in Charge.

14. 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) adjusting the consented rate or volume of water under condition 5, should monitoring under condition 12 or future changes in water use indicate that the consented rate or volume is not able to be fully utilised;
    (b) determining whether the conditions of this consent are adequate to deal with any adverse effect on the environment which may arise from the exercise of the consent and which it is appropriate to deal with at a later stage;
    (c) ensuring the conditions of this consent are consistent with any National Environmental Standards Regulations, National Policy Statement, Water Conservation Order, relevant plans and/or any relevant Regional Policy Statement; or
    (d) adjusting or altering the method of water take data recording and transmission.

Land Use (Farming) – AUTH-20191052-06

1.

(a) This consent cannot be exercised until:

(i) Discharge Permit AUTH-301663; and
(ii) Water Permit AUTH-301664; and
(iii) Discharge Permit AUTH-300626-V2; and
(iv) Water Permit AUTH-300627-V1; and
(v) Discharge Permit AUTH-20171278-01; and
(vi) Water Permit AUTH-20171278-02; and
(vii) Land Use Consent AUTH-20171278-03;

have been surrendered or expire; and

(b) This consent shall be exercised in conjunction with Discharge Permits AUTH-20191052-01 and AUTH-20191052-02, Land Use Consents AUTH-20191052-03 and AUTH-20191052-04 and Water permit AUTH-20191052-05.

2. Except as modified by the conditions of this resource consent, the activities authorised by this resource consent must be carried out in general accordance with the documents listed in Schedule A. In the event of any inconsistency the conditions of this consent shall prevail.

Advice Note
Routine monitoring inspections of this consent may occur up to four times a year. This number does not include any other required inspections and may be combined with the inspections required for Discharge Permit AUTH-20191052-01.

3. The use of land for farming purposes shall occur on the land, as shown on the maps attached as Appendix 1 and Appendix 2, consisting of:

(a) a block of land referred to as the "Woldwide One Platform":

Legal Descriptions	Lot 1 DP 10885 Section 418 Taringatura SD Part Lot 18 DP 942 Section 420 Taringatura SD Lot 1 DP 5610 Part Lot 1 DP 4092 Part Section 417 Taringatura SD
Map Reference (NZTM 2000)	1225189E, 4888460N
Property Address	1354 Hundred Line Road

(b) a block of land referred to as the "Woldwide Two Platform":

Legal Descriptions	Part Lot 1 DP 4092 Part Lot 2 DP 4092 Part Section 417 Taringatura SD Section 419 Taringatura SD Lot 1 DP 14660 Lot 1 DP 14661 Lot 1 DP 9925 Lot 3 DP 4092

	Lot 1 DP 10885 Lot 1 DP 13077 Lot 1 DP 451158 Part Lot 18 DP 942
Map Reference (NZTM 2000)	1225042E, 4889686N
Property Address	1915 Winton Wreys Bush Highway

(c) a block of land referred to as the "Horner Block":

Legal Descriptions	Lot 4 DP 399915
Map Reference (NZTM 2000)	1223251E, 4887991N

(d) blocks of land referred to as the "Woldwide Run-off", which consist of:

(i) a block of land referred to as "Merriburn":

Legal Descriptions	Lot 1 DP 302409 Sec 26 Merrivale Settlement No. 1 Sec 27 Merrivale Settlement No. 1
Map Reference (NZTM 2000)	1199794E, 4884531N
Property Address	1711 Otautau Tuatapere Road

(ii) a block of land referred to as "Merrivale":

Legal Descriptions	Part Section 7 Block XII Waiau SD Lot 1 DP 3537
Map Reference (NZTM 2000)	1203284E, 4885339N
Property Address	20 Gill Road

4. The farming activities shall be limited as follows:

(a) the Woldwide One Platform shall be limited to grazing by:
(i) a peak milking herd of no more than 700 cows;
(ii) a maximum of 1,200 milking age cows; and
(iii) a maximum of a further 350 dry stock.

(b) the Woldwide Two Platform shall be limited to grazing by:
(i) a peak milking herd of no more than 800 cows;
(ii) a maximum of 1,200 milking age cows; and
(iii) a maximum of a further 350 dry stock.

(c) the Horner Block shall be limited to the production of silage and supplementary feed and for the discharge of effluent as authorised by Discharge Permit AUTH-20191052-02.

(d) the land use on Woldwide Run-off must be in accordance with the conditions described in the "Land Use on Woldwide Run-off" section of this consent (conditions 47 – 71 (inclusive).

Advice note:
The maximum of 1,200 milking age cows is inclusive of peak milking herd numbers. It is not in addition.

Exclusions – Woldwide One Platform, Woldwide Two Platform and Horner Block

5. The following activities must not occur on the Woldwide One Platform or the Woldwide Two Platform:

    (a) Establishment or growth of winter beet, brassica or root crops;
    (b) intensive winter grazing of stock; or
    (c) grazing of stock on sacrifice paddocks.

6. The following activities must not occur on the Horner Block:

    (a) dairy farming of cows; or
    (b) grazing of animals/stock.

Advice Note
For the purposes of this consent, the following definitions apply:

- *Peak Milking Herd – the maximum number of in-milk cows that make up a herd.*
- *Milking Age Cows – cows that are 2 years of age and older including dry cows and cull cows.*
- *Dry Stock – Cattle that are of mixed age and mixed sex.*
- *Intensive Winter Grazing - Grazing of stock between May and September (inclusive) on forage crops (including brassica, beet and root vegetable crops), excluding pasture and cereal crops*
- *Young Stock – Cattle aged from weaning to rising 1 year olds to rising 2 year olds*
- *Dairy Platform - an area of a landholding where dairy cows being milked on a daily basis are kept during the milking season.*
- *Dairy Farming of Cows - the farming, including grazing, of milking cows on land during the milking season.*

Nutrient Management – Woldwide One Platform, Woldwide Two Platform and Horner Block

7. A soil testing regime shall be implemented to determine the soil fertility status over the land area. Fertiliser recommendations shall reflect soil testing results.

8. Olsen P levels in the soils shall be maintained within a range of 30-33.

9. The Consent Holder shall maintain a record of their soil testing regime, soil testing results and fertiliser recommendations and provide this record to the Consent Authority upon request.

10. The Consent Holder shall:

    (a) manage the application of fertiliser in accordance with:
        (i) "The Code of Practice for Nutrient Management (With Emphasis of Fertiliser Use) Fertiliser Association, 2013, ISBN 978-0-47328345-2"; or
        (ii) any subsequent updates.

    (b) not apply fertiliser:
        (i) to land during the period 1 June–31 July inclusive;
        (ii) within 10 m of a surface water body (where there is no riparian strip/margin);
        (iii) within 10 m of any wetland boundary;
        (iv) within 10 m of any significant indigenous biodiversity site;
        (v) within 20 m of any bore;

(vi) when soil temperature is at or below 6°C;
(vii) when soil moisture capacity is exceeded; and
(viii) directly to land within a riparian strip/margin.

Nutrient Modelling – Woldwide One Platform, Woldwide Two Platform and Horner Block

11. The Consent Holder must ensure that the combined nitrogen and phosphorus losses to water from farming activities undertaken on the Woldwide One Platform and Woldwide Two Platform are maintained at, or below, the baseline contaminant loss rates of:

    (a) 39 kg/ha/yr nitrogen; and
    (b) 0.7 kg/ha/yr phosphorus;

    as estimated by the three-year rolling average loss rates using OVERSEER FM® version 2.9.2.2, undertaken in accordance with the generally accepted best practice modelling including the applicable Best Practice Data Input Standards/OVERSEER FM User Guide. The three-year rolling average is defined as the average of the most recent three consecutive years' results starting three years from the first exercise of this consent.

12. The Consent Holder must ensure that the nitrogen and phosphorus losses to water from the land at Horner Block are maintained at or below the baseline contaminant loss rates of:

    (a) 19 kg/ha/yr nitrogen; and
    (b) 0.1 kg/ha/yr phosphorus;

    as estimated by the three-year rolling average loss rates using OVERSEER FM® version 2.9.2.2, undertaken in accordance with the generally accepted best practice modelling including the applicable Best Practice Data Input Standards/OVERSEER FM User Guide. The three-year rolling average is defined as the average of the most recent three consecutive years' results starting three years from the first exercise of this consent.

Advice Note
The baseline loss rate and the three-year rolling average loss rates for nitrogen and phosphorus will be recalculated with the most current version of OVERSEER FM.

13. Each and every year for the duration of this consent, using the current version of OVERSEER FM and in accordance with the generally accepted best practice modelling and the current Best Practice Data Input Standards, the Consent Holder shall:

    (a) model the nitrogen and phosphorus loss rates for the previous year from 1 July to 30 June;
    (b) model the three-year rolling average of nitrogen and phosphorus loss rates once three consecutive years of modelling data is available;
    (c) re-model the applicable baseline contaminant loss rates; and
    (d) model the predicted nitrogen and phosphorus loss rates for the upcoming year from 1 July to 30 June inclusive.

14. The remodelled baseline nitrogen and phosphorus losses modelled in accordance with condition 13(c) shall replace previous versions of the applicable baseline contaminant loss rates under conditions 11 and 12.

15. A report must be provided to the Consent Authority by 30 September each year summarising the results of OVERSEER nitrogen and phosphorus loss modelling required by condition 13. The report must include:

    (a) a review of the OVERSEER input data to ensure that the annual nutrient budget reflects the farming system;
    (b) an explanation of any differences between that nutrient budget and the annual nutrient budget of all previous years of farming undertaken under this consent;
    (c) a comparison of the three-year rolling average nitrogen and phosphorus losses with the applicable baseline contaminant loss rates; and
    (d) the names and summaries of the relevant qualifications and experience of the person(s) who prepared and (if relevant) reviewed the nutrient budget.

16. If in any year the rolling three-year average nitrogen or phosphorus loss rate as modelled in accordance with condition 13 exceeds the baseline loss rate set under conditions 11 or 12, the Consent Holder must, by 30 November of that year, prepare a report for the Consent Authority that details:

    (a) any reasons or causes of the exceedance; and
    (b) the measures that will be taken to ensure that nutrient losses are reduced to ensure compliance with the baseline contaminant loss rates.

17. The report required by condition 16 must include:

    (a) a detailed description of the measures to be taken; and
    (b) for any mitigations proposed, a detailed mitigation plan (taking into account contaminant loss pathways) that identifies:
        (i) the mitigations to be undertaken;
        (ii) the physical works required to complete the mitigations;
        (iii) the proposed implementation timeframes for each mitigation;
        (iv) the operation of the mitigation; and
        (v) the mitigations' potential effectiveness.

18. The measures, mitigations and timeframes identified in the report required by conditions 16 and 17 must be incorporated into the Farm Environmental Management Plan required by condition 32.

19. Upon completion of the mitigation measures identified in the report required by conditions 16 and 17, the Consent Holder must:

    (a) submit to the Consent Authority, photographs (date and time stamped) of the completed works; and
    (b) supply the Consent Authority the GPS coordinates of the location of the mitigation measures.

20. All OVERSEER modelling required by this consent must be undertaken by a person who is a Certified Nutrient Management Advisor (CNMA) under the Nutrient Management Adviser Certification Programme (NMACP).

21. The Consent Holder may use an alternative model that has been demonstrated to be equivalent to OVERSEER provided:

    (a) the evidence to demonstrate equivalence is provided to the Consent Authority at least six months prior to submitting the relevant annual report as required by condition 15; and
    (b) the use of the alternative model is approved by the Chief Executive of the Consent Authority.

Mitigation – Woldwide One Platform and Woldwide Two Platform

22. The Consent Holder must undertake maintenance of the existing and new dairy lanes as required to ensure they are contoured to ensure that any run-off occurs onto vegetated areas where it will not enter any surface water body.

23. The Consent Holder must manage the dairy lanes so that agricultural effluent and effluent sludges from the lanes does not:

    (a) accumulate in gateways;
    (b) accumulate in paddocks; or
    (c) result in the ponding, pooling, overland or lateral flow of any effluent or sludge beyond the dairy lane.

24. The Consent Holder must not construct any new dairy lanes within 10 metres of a surface waterbody.

25. Supplementary feed must not be placed within 20 metres of a surface waterbody.

26. The Consent Holder must:

    (a) implement the specific mitigation measures as identified in the "*Phosphorus Mitigation Plan"* dated 4 September 2019 attached as Appendix 3 to this consent, within the timeframes detailed in the Plan; and
    (b) by 31 July each year, submit photographs (date and time stamped) to the Consent Authority confirming completion of all mitigations scheduled between the previous 1 July to 30 June; and
    (c) upon completion of mitigation measures detailed in the Plan, ensure the mitigations are properly maintained, continue to function and are not removed or altered for the duration of this consent (and any subsequent variation versions of this consent).

Advice note:
The Phosphorus Mitigation Plan in Appendix 3 forms part of these consent conditions. Any amendment to the Plan will require a change of consent conditions under s127 RMA or a new consent.

Records and Reporting – Woldwide One Platform, Woldwide Two Platform and Horner Block

27. The Consent Holder shall maintain records of the following practices undertaken on Woldwide One Platform, Woldwide Two Platform and Horner Block for each year between 1 July and 30 June:

(a) fertiliser application, including rates;
(b) types of crops and total area of cropping, including winter feed/forage crops;
(c) cultivation methods;
(d) stock units with references to type, age and breed;
(e) effluent application areas;
(f) all other inputs to the OVERSEER® nutrient budgeting model.

28. The records required by condition 26 shall be supplied to the Consent Authority upon request.

Use of winter barn – Woldwide One Platform and Woldwide Two Platform

Advice Note
For the purpose of this consent, one "cow hour" is defined as the housing of one cow in the winter barn for one hour.

29. Cows shall be housed in a winter barn on each dairy platform, as authorised by AUTH-20191052-03 and AUTH-20191052-04, as follows:

Woldwide One Platform:
(a) no less than 625 cows or 95% of the then "Woldwide One Platform" cow herd, whichever is the lesser, shall be housed in the barn from 1 June to 31 July, for no less than 24 hours per day unless cows are temporarily removed to the dairy shed or yard;
(b) the barn shall be used for no less than 281,030 "cow hours" in the period from 1 April to 31 May;
(c) the barn shall be used for no less than 321,375 "cow hours" in the period from 1 August to 30 September;

Woldwide Two Platform:
(a) no less than 625 cows or 95% of the then "Woldwide Two Platform" cow herd, whichever is the lesser, shall be housed in the barn from 1 June to 31 July, for no less than 24 hours per day unless cows are temporarily removed to the dairy shed or yard;
(b) the barn shall be used for no less than 281,030 "cow hours" in the period from 1 April to 31 May;
(c) the barn shall be used for no less than 321,375 "cow hours" in the period from 1 August to 30 September.

30. Daily use of the winter barn must be monitored by recording:

(a) the number of cows; and
(b) the number of cow hours spent in the barn.

31. The records of winter barn use must be maintained and supplied to the Consent Authority upon request.

Farm Environmental Management Plan – Woldwide One Platform, Woldwide Two Platform and Horner Block

32. The Consent Holder shall have and maintain a Farm Environmental Management Plan (FEMP). The FEMP shall, in accordance with Appendix N (Decisions Version) of the Southland Water and Land Plan (or any updated version of the plan), demonstrate how the following outcomes are to be achieved:

(a) nutrients are used efficiently and nutrient loss to water is minimised;
(b) contaminant losses from critical source areas are reduced;
(c) cultivation is undertaken in a manner that minimises the movement of sediment and phosphorus to waterways;
(d) intensive winter grazing occurs in a way that minimises the loss of sediment, phosphorus and microbiological contaminants to waterways; and
(e) agricultural effluent and other discharges are managed in a way that avoids or minimises the loss of contaminants to water. Irrigation water is applied to meet plant demands and minimises the risk of leaching and run-off.

33. The FEMP required by condition 31 shall also include but not be limited to:

(a) a site map showing the location of critical source areas; physiographic zones; permanent or intermittent rivers, streams, lake, drains, ponds or wetlands; where known the location and depth of any subsurface drainage systems including outlets, riparian vegetation and fences adjacent to waterways and stock access points across waterways;

(b) details of the implementation and maintenance of mitigation measures required by the conditions of this consent, where this information is not included in the Phosphorus Mitigation Plan attached as Appendix 3 to this consent;

(c) details of the implementation and maintenance of Good Management Practices, including adoption of changing industry good management practices. This includes where the implementation of these is to avoid, remedy or mitigate any farm specific environmental risks to water quality shown through any monitoring undertaken on the property voluntarily or as required by the conditions of this consent; and

(d) a review of the data obtained from the monitoring undertaken in accordance with the FEMP and any changes made, or to be made, as a consequence of that monitoring.

34. The FEMP must clearly identify the outcomes to be achieved as described in condition 32.

35. The FEMP must be reviewed at least once each milking season and can be modified at any time by the Consent Holder; and either

(a) an updated version shall be provided to the Consent Authority by 31 May each year; **or**
(b) the Consent Holder must notify the Consent Authority in writing that no changes have been made by 31 May each year.

Advice Note
Any updated FEMP will be assessed by the Consent Authority to ensure that it will still achieve the objectives specified in the FEMP and the FEMP has been prepared in accordance with Appendix N of the Southland Water and Land Plan (Decisions Version) (or any updated version of the plan).

36. The Consent Holder must operate in accordance with the FEMP at all times. Where there is inconsistency between the FEMP and the conditions of the consent, the conditions of this consent shall prevail.

Auditing – Woldwide One Platform, Woldwide Two Platform and Horner Block

37. The Consent Authority may require the Consent Holder to have the farming activity independently audited by a Certified Nutrient Management Advisor.

38. The audit required by condition 37 shall:

    (a) assess the performance of the farming activity occurring on the property against:
        (i) the objectives and good management practices specified in the FEMP;
        (ii) any additional mitigation measures implemented on the property either voluntarily or as required by the conditions of this consent; and
        (iii) the applicable baseline contaminant losses specified in conditions 11 and 12.

39. The audit required by condition 36 must determine the level of confidence of achieving each objective set out in the FEMP. This level of confidence shall be categorised into the following:

    - **High** - the objective is probably being achieved
    - **Medium** - the objective is possibly being achieved
    - **Low** - it is unlikely that the objective is being achieved.

40. The audit shall record the justification for each level of confidence assessment, including noting the evidence, or lack of, used to make the determination.

41. Where an objective has received a Medium or Low level of confidence, the audit shall include the actions required for the farm to meet the objective and a timeframe whereby these actions need to be undertaken.

42. Where an objective has received a Medium level of confidence (and the farm has received no Lows), the audit shall also determine whether or not the farm is on-track to achieve the objectives.

43. The audit report shall be provided to the Consent Authority within three months of the date of the Consent Authority issuing a requirement to undertake the audit.

44. The frequency of audit requirements may be annually except where, for two consecutive years, an audit report has concluded that all objectives are probably being achieved (received a high level of confidence). In that situation no further audit will be required for at least three years.

45. Where the audit identifies actions required to be undertaken for the farm to meet the objective, the Consent Holder must implement these actions within the timeframes stated in the audit.

46. Upon completion of any changes made and/or mitigations implemented as required by the audit, the Consent Holder shall confirm in writing, including photographs (date and time stamped) to the Consent Authority that these actions have been completed and implemented.

47. Upon completion of all the changes made and/or mitigations implemented as identified in the audit, the Consent Holder must ensure the measures are properly maintained, continue to function and are not removed or altered for the duration of this consent (and any subsequent variation versions).

Land Use on Woldwide Run-off

Advice Note
For clarity, the following section relates solely to the farming activities undertaken on Woldwide Run-off. The consent-holder has confirmed that Merriburn land forms part of Woldwide Run-off under lease from the owner until at least 2021. If the lease expires in 2021 (or subsequently) and Council is satisfied that the Merriburn land is not part of the same land-holding, then these consent conditions will no longer apply to the Merriburn land.

Routine monitoring inspections of Woldwide Run-off may occur up to two times a year. This number does not include any other required inspections.

48. The total number of stock on Woldwide Run-off authorised under this permit, AUTH-20191140-03 and AUTH20191140-08 combined shall not exceed the following in any year:

    (a) no more than 1,265 R1s from 1 November to 30 June (inclusive); and
    (b) no more than 1,265 R2s from 1 July to 29 February (inclusive); and
    (c) no more than 1,165 R2s from 1 March to 31 May (inclusive); and
    (d) an additional 120 cattle of mixed ages and mixed sex.

Advice note:

The stock numbers listed in Condition 48 are the total combined stock numbers that can be present on land defined as "Woldwide Run-Off" as described in Condition 3(d) and as authorised by this permit and AUTH-20191140-03 and AUTH-20191140-08 held by Woldwide Four Limited and Woldwide Five Limited. For clarity, Condition 48 provides for a total of no more than 2,650 stock at any one time.

49. Woldwide Run-off must not be used for the dairy farming of cows.

50. The Consent Holder shall implement a soil testing regime to determine the soil fertility status over the land area and fertiliser recommendations developed in line with the soil testing results. The results of the soil testing and recommendations shall be maintained and provided to the Consent Authority upon request.

51. The Consent Holder shall:

    (a) manage the application of fertiliser in accordance with:
        (i) "The Code of Practice for Nutrient Management (With Emphasis of Fertiliser Use) Fertiliser Association, 2013, ISBN 978-0-47328345-2"; or
        (ii) any subsequent updates.

(b) not apply fertiliser:
    (i) to land during the period 1 June–31 July inclusive;
    (ii) within 10 m of a surface water body (where there is no riparian strip/margin);
    (iii) within 10 m of any wetland boundary;
    (iv) within 10 m of any significant indigenous biodiversity site;
    (v) within 20 m of any bore;
    (vi) where the soil temperature is at or below 6°C;
    (vii) when soil moisture capacity is exceeded; and
    (viii) directly to land within a riparian strip/margin.

52. Olsen P levels in the soils shall be maintained at the agronomic optimum of 25.

53. The Consent Holder must cultivate:

    (a) with the contour of the land being used for cultivation and shall not cultivate up and down the slope; and
    (b) in accordance with Rule 25(a) of the Proposed Southland Water and Land Plan (Decisions Version), or any subsequent replacement versions.

54. The Consent Holder shall crop no more than 78 hectares of Woldwide Run-off annually.

55. When stock are being break-fed and/or intensively winter grazed on the Woldwide Run-off as, the Consent Holder must:

    (a) back fence the stock to prevent stock entering previously grazed areas;
    (b) use portable feeders when supplementary feed is used;
    (c) ensure critical source areas and swales within the area being grazed are grazed last; and
    (d) maintain a vegetated strip and exclude stock from the outer edge of the bed of any surface waterbody (excluding ephemeral rivers) and any wetland for a distance of at least 5 metres.

56. The Consent Holder must exclude stock from areas where erosion of the paddocks is evident.

57. The Consent Holder shall undertake regular checks of culverts on Woldwide Run-off and clear the culverts of debris and sediment where required.

58. The Consent Holder shall maintain records of the following practices undertaken on Woldwide Run-off for each year between 1 July and 30 June:

    (a) fertiliser application, including rates;
    (b) types of crops and total area of cropping, including winter feed/forage crops;
    (c) cultivation methods;
    (d) stock units with references to type, age and breed; and
    (e) all other inputs to the OVERSEER® nutrient budgeting model.

59. The records required by condition 58 shall be supplied to the Consent Authority upon request.

60. The Consent Holder must:

(a) implement the specific mitigation measures as identified in the "*Woldwide Run-off Phosphorus Mitigation Plan"* dated 5 September 2019 attached as Appendix 4 of this consent, within the timeframes detailed in the Plan; and
(b) by 31 July each year, submit photographs (date and time stamped) to the Consent Authority confirming completion of all mitigations scheduled from 1 July to 30 June in the previous year; and
(c) upon completion of the mitigation measures, ensure the mitigations are properly maintained, continue to function and are not removed or altered for the duration of this consent (and any subsequent variation versions).

61. The Consent Holder shall have and maintain a Farm Environmental Management Plan (FEMP) for Woldwide Run-off. The FEMP shall, in accordance with Appendix N of (Decisions Version) the Southland Water and Land Plan (or any updated version of the plan), demonstrate how the following outcomes are to be achieved:

(a) nutrients are used efficiently and nutrient loss to water is minimised;
(b) contaminant losses from critical source areas are reduced;
(c) cultivation is undertaken in a manner that minimises the movement of sediment and phosphorus to waterways;
(d) intensive winter grazing occurs in a way that minimises the loss of sediment, phosphorus and microbiological contaminants to waterways; and
(e) agricultural effluent and other discharges are managed in a way that avoids or minimises the loss of contaminants to water. Irrigation water is applied to meet plant demands and minimises the risk of leaching and run-off.

62. The FEMP required by condition 61 shall also include but not be limited to:

(a) a site map showing the location of critical source areas; physiographic zones; permanent or intermittent rivers, streams, lake, drains, ponds or wetlands; where known the location and depth of any subsurface drainage systems including outlets, riparian vegetation and fences adjacent to waterways and stock access points across waterways;

(b) details of the implementation and maintenance of mitigation measures required by the conditions of this consent, where this information is not included In the Phosphorus Mitigation Plan identified in condition 60;

(c) details of the implementation and maintenance of Good Management Practices, including adoption of changing industry good management practices. This includes where the implementation of these is to avoid, remedy or mitigate any farm specific environmental risks to water quality shown through any monitoring undertaken on the property voluntarily or as required by the conditions of this consent;

(d) a property specific environmental risk assessment, including:
    (i) a description of the risks to water quality, prepared by a suitably qualified person; and
    (ii) identification of any farm specific environmental risks, along with measures to mitigate the identified risks; and

(e) a review of the data obtained from the monitoring undertaken in accordance with the FEMP and any changes made, or to be made, as a consequence of that monitoring.

63. The FEMP must be reviewed at least once each season and can be modified at any time by the Consent Holder; and either

    (a) an updated version shall be provided to the Consent Authority by 31 May each year; **or**
    (b) the Consent Holder must notify the Consent Authority in writing that no changes have been made by 31 May each year.

Advice Note
The results from the review of the FEMP will be assessed by the Consent Authority to ensure that the FEMP will still achieve the objectives specified in the FEMP and the FEMP has been prepared in accordance with Appendix N of the Southland Water and Land Plan (Decisions Version) (or any updated version of the plan).

64. The Consent Holder must operate in accordance with the FEMP at all times. Where there is inconsistency between the FEMP and the conditions of the consent, the conditions of this consent shall prevail.

65. The Consent Holder must ensure that nitrogen and phosphorus losses to water from farming activities undertaken on Woldwide Run-off, are maintained at, or below the baseline contaminant loss rates of:

    (a) 25 kg/ha/yr nitrogen; and
    (b) 0.5 kg/ha/yr phosphorus;

    as estimated by the three-year rolling average loss rates using OVERSEER FM® version 2.9.2.2, undertaken in accordance with the generally accepted best practice modelling including the applicable Best Practice Data Input Standards/OVERSEER FM User Guide. The three-year rolling average is defined as the average of the most recent three consecutive years' results starting from 1 July 2021.

66. Each and every year for the duration of this consent, using the current version of OVERSEER FM and in accordance with the generally accepted best practice modelling and the current Best Practice Data Input Standards, the Consent Holder shall:

    (a) model the nitrogen and phosphorus loss rates for the previous year from 1 July to 30 June;
    (b) model the three-year rolling average of nitrogen and phosphorus loss rates;
    (c) remodel the applicable baseline contaminant loss rates; and
    (d) model the predicted nitrogen and phosphorus loss rates for the upcoming year from 1 July to 30 June.

67. The remodelled baseline nitrogen and phosphorus losses modelled in accordance with condition 66 shall replace the baseline contaminant loss rates under condition 65.

68. A report must be provided to the Consent Authority by 30 September each year summarising the results of OVERSEER nitrogen and phosphorus loss modelling required by condition 66. The report shall include:

    (a) a review of the OVERSEER input data to ensure that the annual nutrient budget reflects the farming system;

(b) an explanation of any differences between that nutrient budget and the annual nutrient budget of all previous years of farming undertaken under this consent;
(c) a comparison of the three-year rolling average nitrogen and phosphorus losses in that budget with the baseline contaminant loss rate in condition 65; and
(d) the names and summaries of the relevant qualifications and experience of the person(s) who prepared and (if relevant) reviewed the nutrient budget.

69. If any estimated three-year rolling average nitrogen or phosphorus loss rate as modelled in accordance with condition 66 exceeds the baseline nitrogen and phosphorus loss rate set under condition 65, the Consent Holder must, by 30 November of that year, prepare a report for the Consent Authority that details the measures that will be taken to ensure that nutrient losses are reduced to ensure compliance with the baseline contaminant loss rates.

70. The report required by condition 69 must include:

(a) a detailed description of the measures to be taken; and
(b) for any mitigations proposed a detailed mitigation plan (taking into account contaminant loss pathways) that identifies:
(i) the mitigations to be undertaken;
(ii) the physical works required to complete the mitigations;
(iii) the proposed implementation timeframes for each mitigation;
(iv) the operation of the mitigation; and
(v) the mitigations' potential effectiveness.

71. All OVERSEER modelling required by this consent must be undertaken by:

(a) a person who is a Certified Nutrient Management Advisor (CNMA) under the Nutrient Management Adviser Certification Programme (NMACP).

72. The Consent Holder may use an alternative model that has been demonstrated to be equivalent to OVERSEER provided:

(a) the evidence to demonstrate equivalence is provided to the Consent Authority at least six months prior to submitting the relevant annual report as required by condition 68; and
(b) the use of the alternative model is approved by the Chief Executive of the Consent Authority.

Heddon Bush School Water Supply

73.

(a) The consent holder shall make a payment to the Heddon Bush School that would provide for an increase in the frequency of existing microbiological water testing from the current quarterly frequency to monthly, and an increase in the frequency of UV maintenance, during each and every school term for the duration of this resource consent, unless not required as specified in condition 72 (d).

(b) The consent holder shall make a payment to the Heddon Bush School for two water samples to be tested for nitrate-nitrogen with one sample taken in early November and one sample taken in March each year for the duration of this resource consent.

(c) The payment specified in conditions 72(a) and (b) shall be made once an invoice is provided to the consent holder signed by the principal of the Heddon Bush School with adequate evidence that the invoice reflects the actual and reasonable costs involved in the specified sampling, testing and maintenance.

(d) If after five years of continuous additional maintenance and monitoring undertaken in accordance with conditions 72 (a) and (b), there have been no breaches during that period of the NZ Drinking Water Maximum Acceptable Values for Escherichia coli (as specified in the "Drinking-water Standards for New Zealand 2005 (Revised 2008)" then conditions 72(a) and (b) shall cease to apply.

Advice Note
The Heddon Bush School Water Supply condition (condition 73) has been offered by the resource consent applicant.

Advice Note
The sampling required under condition 73(a) and (b) should be undertaken by a suitably qualified person and tested in a laboratory with IANZ accreditation for the relevant analysis and a copy of the results shall be provided to the consent holder and Consent Authority (Attention: Compliance Manager).

Groundwater Quality Monitoring

74. Within three months of the commencement of this consent, the Consent Holder must install a minimum of two 50-millimetre diameter PVC groundwater monitoring bores located as described below:

(a) Bore 1 at or about NZTM 2000 1224431E 4891582N; and
(b) Bore 2 at or about NZTM 2000 1223497E 4886933N.

75. The bores are to be screened to a depth of 2 metres below the static groundwater level.

76. Representative samples of groundwater shall be taken from bore ID E45/0622, and bores 1 and 2 as described in condition 74, as follows:

(a) all samples shall be taken by a suitably qualified and experienced person using methods described in the Ministry for the Environment 2006 report entitled, "A National Protocol for State of the Environment Groundwater Sampling in New Zealand";

(b) The water temperature and dissolved oxygen concentration of the groundwater at the bore shall be measured at the time of sampling using a calibrated portable meter.

(c) Samples shall be taken at least twice a year, once in September and once in March, and analysed by an IANZ accredited laboratory for:
(i) *Escherichia coli* and
(ii) Nitrate + nitrite nitrogen.

77. The results of the groundwater monitoring shall be provided to the Southland Regional Council, attention Compliance Manager, within five working days of receipt of results.

78. Within three months of the commencement of this consent, the applicant shall submit a management plan for the approval of Environment Southland which shall include but not be limited to:

    (a) details of the monitoring regime as described in conditions 74-77;
    (b) appropriate trigger levels for the measurements of the samples;
    (c) further actions to be taken if the trigger levels are breached, including but not limited to:
        (i) additional groundwater sampling;
        (ii) notification of potentially affected parties; and
        (iii) any practicable measures to be undertaken by the Consent Holder to address any breaches of the trigger levels, where a breach of the trigger levels can reasonably be determined to result from the Consent Holder's farming activities.

79. An Environmental Monitoring Report shall be provided annually to the Manager Compliance, Southland Regional Council, that detailed the work done by the consent holder in the preceding July to June period to ensure that there is ongoing compliance with the conditions of this resource consent. This report shall be prepared by a Suitably Qualified Person and provided by 30 September each year.

Lapse and Review

80. 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:

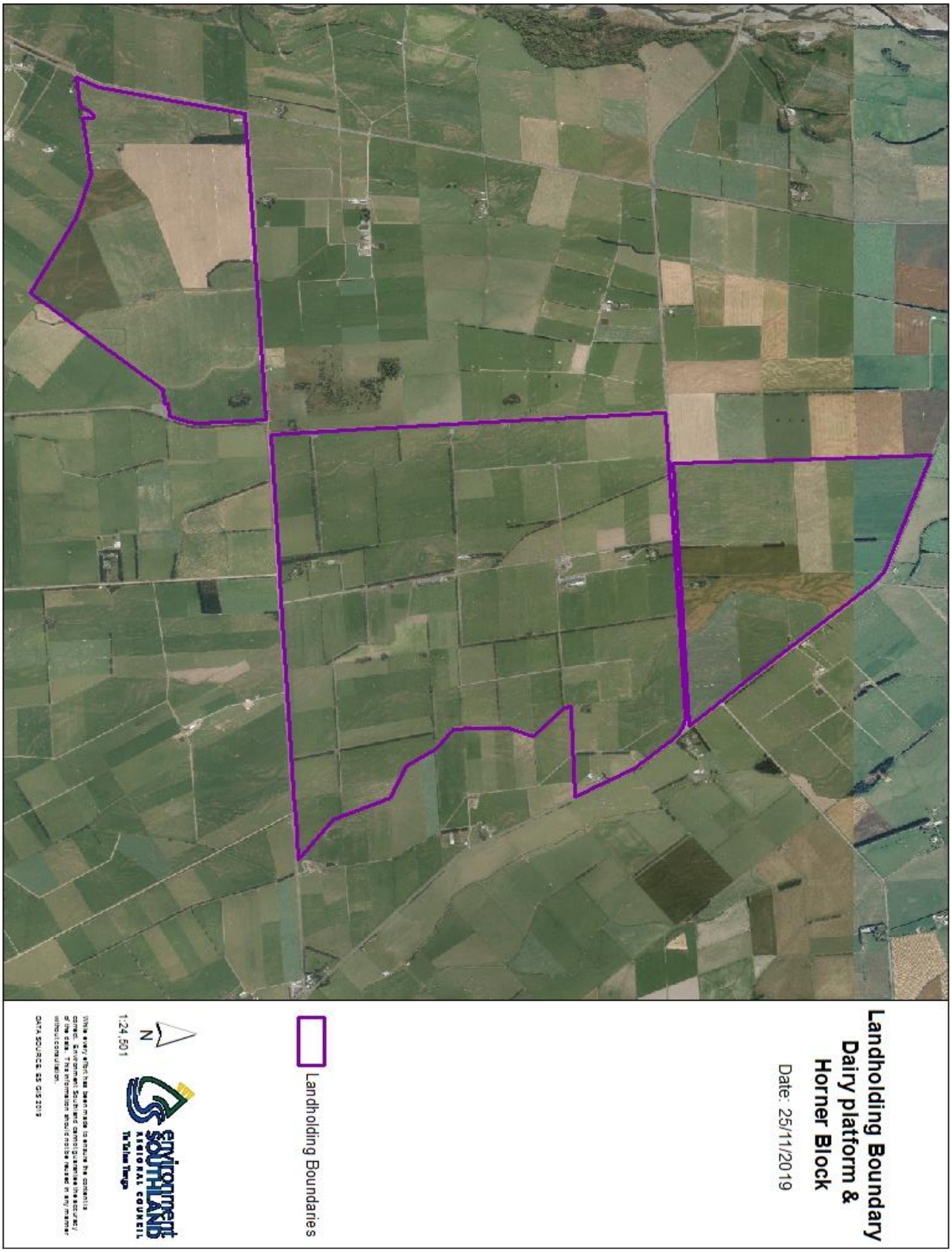
    (a) determining whether the conditions of this permit are adequate to deal with any adverse effect on the environment, including cultural effects on Te Rūnanga o Ōraka Aparima and/or cumulative effects, which may arise from the exercise of the permit, and which it is appropriate to deal with at a later stage, or which become evident after the date of commencement of the permit; or

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

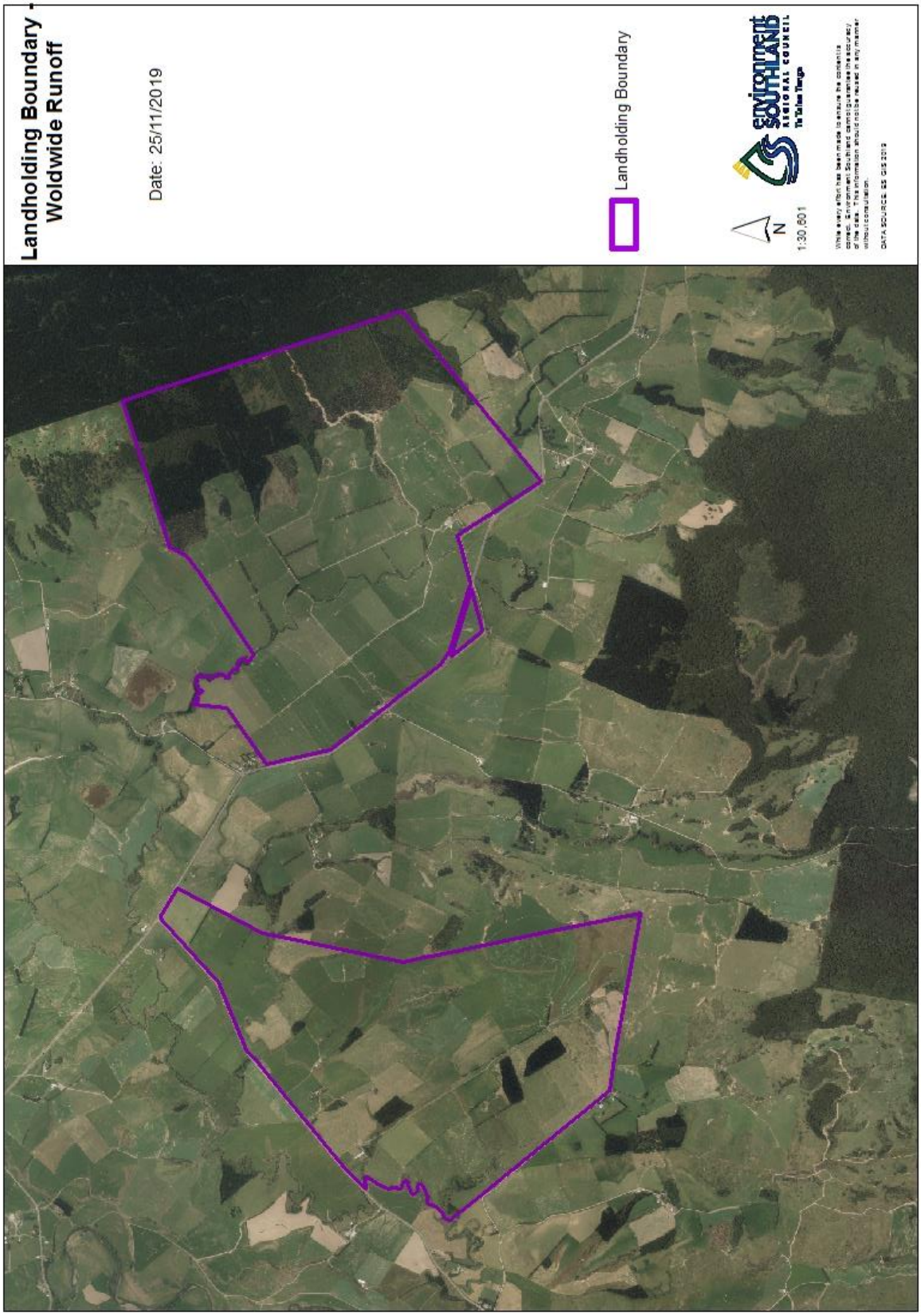
SCHEDULE A

Document Name	Council ID Number
Woldwide One Limited and Woldwide Two Limited Application for Resource Consents – Marked Up Version	A501407
Woldwide One Limited and Woldwide Two Limited Farm Environmental Management Plan – Appendix N (Version 1.4.1)	A501405
Woldwide One Limited and Woldwide Two Limited Effluent Management Plan (Version 2)	A501408
Woldwide Run-off Proposal and AEE	zA43917
Woldwide Runoff (Supplementary Report) (Version 3)	zA43918
Woldwide Runoff Limited Farm Environmental Management Plan – Appendix N (Version 1.2)	zA43919
Woldwide 1, 2, SH96 & Marcel Block (Supplementary Report – Horner Block)	A504131

APPENDIX 1 – Landholding Boundary – Woldwide One and Two Platforms and Horner Block



APPENDIX 2 – Landholding Boundary – Woldwide Run-Off



APPENDIX 3 – Phosphorous Mitigation Plan – Dairy Platforms

TIAKI

FARM SOURCE SUSTAINABLE DAIRYING

PHOSPHORUS MITIGATION PLAN

Version 3 - 04/09/19

FARM SOURCE

Fonterra

Dairy for life

ABOUT YOUR FARM PLAN

This Farm Plan document is the result of a tailored farm environment planning service provided to you through Tiaki Sustainable Dairying. It's part of the advantage you get through Farm Source as a member of the Fonterra Co-Operative. The purpose of this plan is to describe the environmental conditions present on your farm and the management of these conditions. From this, mitigations to potential impacts to water quality are documented and additional mitigations maybe planned, with sensible timeframes. Underpinning this plan, are the agreed national Good Farming Practices that are supported by the agricultural and horticultural sectors. Industry bodies along with Regional Councils and Central Government have developed the Good Farming Practice: Action Plan for Water Quality 2018 in a commitment to swimmable rivers and improving the ecological health of our waterways. The Dairy Industry Strategy (Dairy Tomorrow), as well as the Good Farming Practice: Action Plan for Water Quality 2018, both align with the goal for all dairy farms to have a Farm Environment Plan by 2025. Now that this plan has been created it's the plan owner's responsibility to ensure it is put into action and kept up to date as actions are completed or conditions on farm change. Tiaki Sustainable Dairying is here to help with that implementation and ongoing management through our team of Sustainable Dairying Advisors who can be contacted via the details below.

PHONE: 0800 65 65 68

EMAIL: sustainable.dairying@fonterra.com

CONTENTS:

FARM DETAILS

FARM NAME

Woldwide 1 & 2

SUPPLIER NUMBER

32650 & 32651

PLAN OWNER

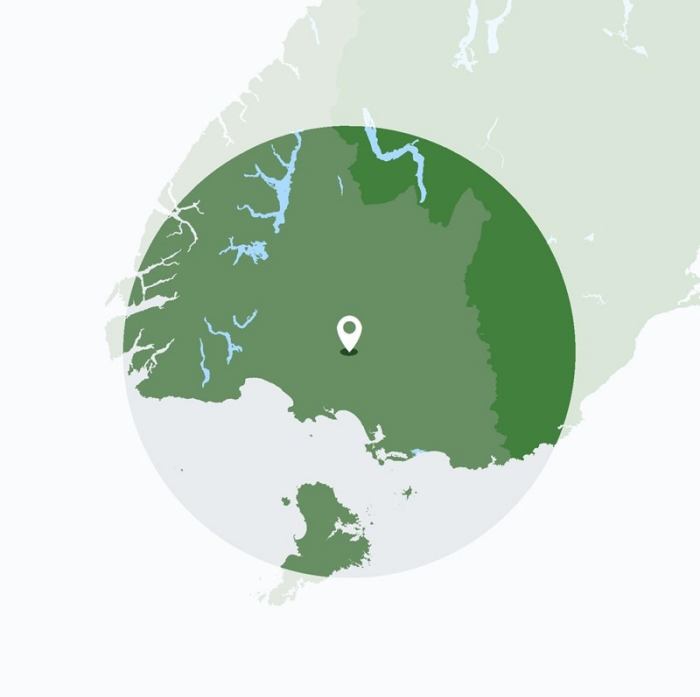
Albert De Wolde

+64 27 2272537
dewolde@farmside.co.nz

FARM ADDRESS

HUNDRED LINE RD, Winton

LOCATION



REGIONAL COUNCIL

Southland

PLAN LAST EDITED DATE

31 July 2019

POINTS OF NOTE

FARM OVERVIEW MAP

The map below presents the land on which the farming operations covered in this document occur and identifies some key points of interest. More detailed maps looking at specific environmental management topics are contained throughout the document.

- Accord Defined Stock Excluded Waterway
- Accord Defined Stock Not Excluded Waterway
- Non-Accord Defined Stock Excluded Waterway
- Non-Accord Defined Stock Not Excluded Waterway
- Farm Boundary
- Compliant Crossing
- Non-Compliant Crossing
- Non-Compliant Non-Regular Crossing
- Dispensation Crossing
- Dairy Shed

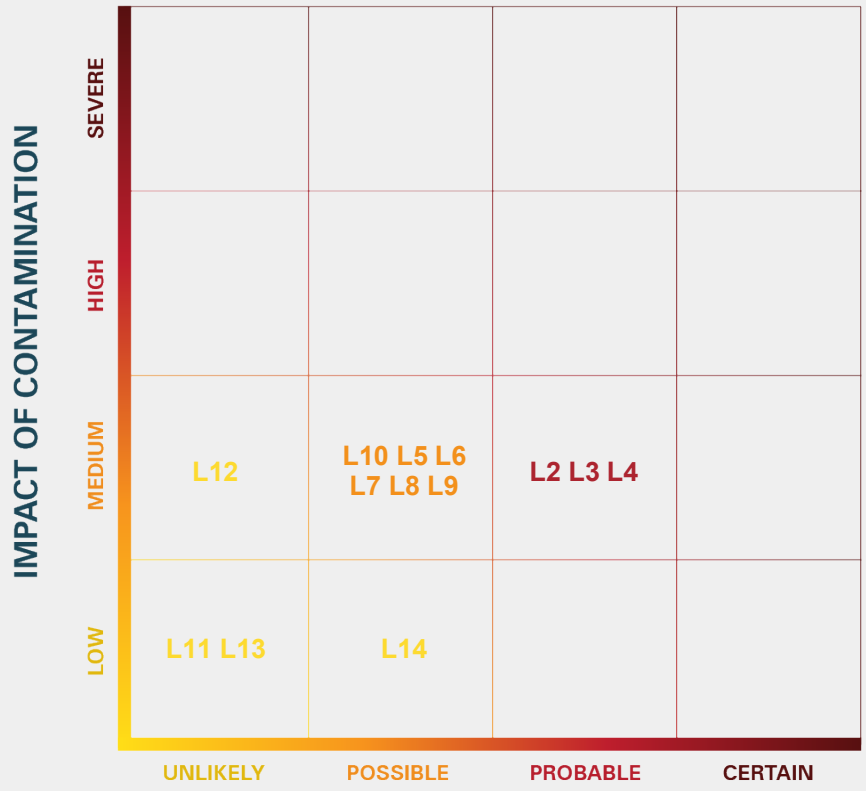
SUMMARY OF OPEN ACTIONS

This table includes all open or ongoing actions that have been agreed as part of this Phosphorus Mitigation Plan. They are organized by their target due date. **Where a target date is underlined it is a mandatory action that contributes to the calculated P loss reduction.**

CATEGORY	FEATURE TYPE & NAME	ACTION REQUIRED	TARGET DATE
L2	Race Maintenance & Management - Lane Adjacent Waterway (West of Wintering Barn)	Establish Vegetated Riparian Margin (Beside Barn)	1st August 2020
L3	Critical Source Area - Critical Source Area (Paddocks 14-15)	Increase riparian buffer (triangle paddock)	1st August 2020
L3	Critical Source Area - Critical Source Area (Paddocks 14-15)	Protect Critical Source Area (Paddocks 14-15)	1st August 2020
L4	Race Maintenance & Management - Central Lane (between WOL and WTL)	Reduction in Use of Central Dairy Lane	New Consent
L4	Race Maintenance & Management - Central Lane (between WOL and WTL)	Slope Lane and Extend Riparian Buffer-Central Lane	1st August 2020
L5	Race Maintenance & Management - Lane Beside Waterway (Paddocks 18 & 19)	Extend Riparian Margin & Slope Lane	1st February 2021
L6	Culvert Management	Build up sides of culvert (South of Paddock 34)	1st February 2021
L7	Critical Source Area - Main Culvert (South of Wintering Barn)	Install Kerb - Main Culvert South Wintering Barn	1st February 2021
L8	Overland Flow Path - Overland Flow Path (Paddock 15)	Move Temporary Lane (Paddock 15)	1st February 2021
L9	Overland Flow Path - Critical Source Area (Paddock Marcel #1)	Extend Riparian Margin (Marcel #1)	1st February 2021
L10	Race Maintenance & Management - Lane Adjacent Waterway (Paddock 34)	Modify Lane beside Creek (Paddock 34)	1st February 2021
L11	Overland Flow Path - Overland Flow Path (Paddock 34)	Extend Riparian Margin (Paddock 34)	1st August 2021
L12	Critical Source Area - Culvert - Woldwide Two Dairy Shed	Build up Culvert Sides (Beside WTL Dairy Shed)	1st August 2021
L13	Critical Source Area - Culvert (Paddock Marcel #9)	Raise sides of culvert (Marcel #9)	1st August 2021
L14	Overland Flow Path - Critical Source Area (Paddock 21)	Extend Riparian Buffer (Paddock 21)	1st August 2021

UNDERSTANDING THE RISKS ON YOUR FARM

This section provides some context to help understand the relative impact and likelihood of environmental risks that have been identified on your farm. The chart on this page together with the map on the following page can be useful when thinking about what environmental risk areas on your farm need the most focus.



HOW ARE RISK RATINGS MEASURED?

The issues plotted on the chart above have been done so based upon two measures that are assigned to a specific area of your farm where an environmental risk has been identified. 1. Impact of contamination (on the vertical axis, or the first dial) is a measure of the potential scale or significance of contaminants that may be lost from this area of your farm. It's about quantifying how bad could the outcome for the environment be; 2. Likelihood of contamination (on the horizontal axis, or the second dial) is about the chance of the contamination actually occurring from that area of your farm. It takes into account things like how far the area might be from waterways as well as the slope or aspect of the area; When combined together the two measures also give an overall 'risk rating'. The measures and the combined rating are presented for each risk area along with other descriptive information about the risk area on the subsequent pages of this document.

Example:

RISK RATING

The map below shows the location of the risk areas identified on your farm. The Risk Rating presented here is a combined measure of the impact and likelihood of contamination occurring from each risk area.

LOW MEDIUM HIGH SEVERE

L2 Race Maintenance & Management - Lane Adjacent Waterway (West of Wintering Barn)

L3 Critical Source Area - Critical Source Area (Paddocks 14-15)

L4 Race Maintenance & Management - Central Lane (between WOL and WTL)

L5 Race Maintenance & Management - Lane beside Waterway (Paddocks 18 & 19)

L6 Culvert Management

L7 Critical Source Area - Main Culvert (South of Wintering Barn)

L8 Overland Flow Path - Overland Flow Path (Paddock 15)

L9 Overland Flow Path - Critical Source Area (Paddock Marcel #1)

L10 Race Maintenance & Management - Lane Adjacent Waterway (Paddock 34)

L11 Overland Flow Path - Overland Flow Path (Paddock 34)

L12 Critical Source Area - Culvert - Woldwide Two Dairy Shed

L13 Critical Source Area - Culvert (Paddock Marcel#9)

L14 Overland Flow Path - Critical Source Area (Paddock 21)

LAND MANAGEMENT

L1 Phosphorus Loss Overview

DESCRIPTION:

The overall property comprised of Woldwide One and Woldwide Two (as proposed) has three waterways passing through it and two tributaries to these waterways. The topography of the farm is flat, resulting in very few critical source areas that would facilitate the overland flow of contaminants into adjacent waterways. The main areas likely to be responsible for phosphorus losses are laneways that run adjacent to waterways and waterway crossing points (culverts).

Overseer is not spatially explicit and is unable to take into account landscape features. It assumes a hydrological connection exists to second order streams and that there is a transport mechanism to get phosphorus to those streams. The model will over estimate phosphorus loss if a significant portion of the block is hydrologically isolated from a second order stream (Gray, 2016).

The initiation and transport of phosphorus from the landscape requires conditions conducive to either overland or subsurface flow. In many situations, P loss to the stream is dominated by overland flow since soil will sorb most phosphorus from subsurface flow, unless, as with mole-pipe drainage, there is a direct conduit to the stream (McDowell et al. 2001). In general, more P is lost from soils with increasing slope, largely as particulate phosphorus.

Critical source areas are included in the model in general terms as the model was calibrated against catchment studies where losses from critical source areas would have occurred (Gray, 2016). On this basis, protecting critical source areas is a mitigation that needs to be applied outside of Overseer and will reduce phosphorus losses further from those modelled.

The estimated reductions in phosphorus referenced in this report are derived from the following calculations and research:

Phosphorus Loss – Culverts

There will be a reduction in phosphorus loss from mitigations applied around culverts but there is no robust research information to base an estimate on. On this basis estimated reductions in phosphorus have been referenced as >0 Kg/P.

Phosphorus Loss – Lanes

Overseer automatically estimates that there will be phosphorus loss from lanes to waterways. It assumes that all excreted phosphorus ends up as dung and that 30% of the phosphorus deposited on lanes is lost to water with the remaining 70% expected to remain on the lane or return to the adjacent paddock. This is a significant assumption and a major component of modelled phosphorus loss, reported as part of "other sources" in the Overseer phosphorus report.

Table 1.4 The fate of minerals ingested by a lactating dairy cow (ingesting 15.5 kg DM/day) (adapted from During 1984).

Element	Consumption	Percentage in			
	Kg /week	Faeces	Urine	Milk	Retained
N	5.1	26	53	17	4
P	0.4	66	-	26	8
K	2.9	11	81	5	3
Mg	0.2	80	12	3	5
Ca	0.4	77	3	11	9
Na	0.4	30	56	8	6

(Fertiliser and Lime Research Centre, 2014)

From Table 1.4 above, a cow eating 15.5 kg/DM/day will consume approximately 0.4kg of phosphorus per week, of which 66% is excreted in dung. For a cow with a 290 day lactation (assume not walking on lanes outside of the milking season) this equates to 10.9 kg/P/cow/yr. Cows are conservatively walking on the farm lanes for 1 hour per day as they move to and from the dairy shed. This means 4% (1 hour is 4% of a day) of phosphorus excreted is deposited on a lane. Overseer assumes 30% of this phosphorus is then lost to water via run-off.

((10.9 x 1500 cows) x 0.04) x 0.3 = 196 kg/P/yr lost to water from dairy lanes.

In total there are 10.8km of lanes on the farm of which 1.5km are adjacent to waterways and present a risk of contaminant runoff. This represents 14% of the lanes on the farm and proportionally 28kg of the total phosphorus losses from lanes. In reality this figure is likely to be higher as many of the other lanes on the property have no hydraulic connection to waterways. On this basis, lanes beside waterways are likely to make up a much larger proportion of the total phosphorus losses from the dairy lanes on the farm.

Assuming the conservative figure of 28 kg/yr of phosphorus loss from lanes adjacent waterways and the actions contained in this plan are carried out (improved vegetative buffer strips and lane management) then phosphorus losses from these areas are estimated to reduce by 40% (conservatively based on the lower end of the range of 38-59% of the data summarised in Figure 2 below). The exception to this is at site L12 where the use of the main cow lane is to be reduced significantly (by at least 50%) due to the changes in cow flow if consent is granted. This is in addition to the management and vegetation buffer improvements. At this site a 60% reduction phosphorus reduction factor has been used.

Overall phosphorus loss from lanes is estimated to reduce by 13.1kg/P/yr as outlined in the Table 1 below:

Site and Lane Length (m)	% of Total Lanes	P Loss (kg)	Mitigations (% Reduction)	Reduction in P Loss (kg)
L5 – 207	1.9	3.7	40	1.5
L2 – 241	2.2	4.3	40	1.7
L10 – 356	3.3	6.5	40	2.6
L4 – 553	5	9.8	60	5.9
L8 - 190	1.8	3.5	40	1.4
				13.1

Table 1 – Phosphorus Loss – Lanes

Phosphorus Loss – Critical Source Areas

Overseer predicts 101kg of phosphorus will be lost to water from paddocks (effective area of 478.9ha). Assuming phosphorus loss occurs evenly over the effective area of the farm, then critical source areas and their associated catchments would account for 2.5% of the phosphorus loss from blocks on the property. This equated to 2.5kg of phosphorus.

Assuming a 50% reduction in phosphorus loss occurs through the implementation of wider, vegetated riparian buffers (at locations where critical source areas enter waterways) and better management of critical source areas then a further reduction of 1.2kg of phosphorus is estimated to occur beyond that modelled in Overseer. See Table 2 below.

Site and Catchment Area	% of Total Catchment	P Loss (kg)	Mitigations (% Reduction)	Reduction in P Loss (kg)
L11 – 0.6ha	0.13	0.13	50	0.06
L3 – 0.7ha	0.15	0.14	50	0.07
L14 – 2.7ha	0.56	0.57	50	0.29
L9 – 7.5ha	1.57	1.9	50	0.79
				1.2

Table 2 – Phosphorus Loss – Critical Source Areas

The 50% reduction is based on research that shows management of critical source areas and vegetated buffers can reduce phosphorus loss by 38-59% (Figure 1). A midpoint reduction figure of 50% has been used to account for the likelihood of more phosphorus loss occurring in critical source areas than the rest of the farm and as such, more potential for phosphorus loss reductions.

It is acknowledged by McDowell et al, 2005 in the original design of the Overseer sub-model that, in some areas, 90% of phosphorus loss may come from only 10% of the catchment area (Sharpley et al, 1999). McDowell states that defining and isolating critical source areas, combined with adaptive management over the farm is the best approach to decreasing phosphorus loss.

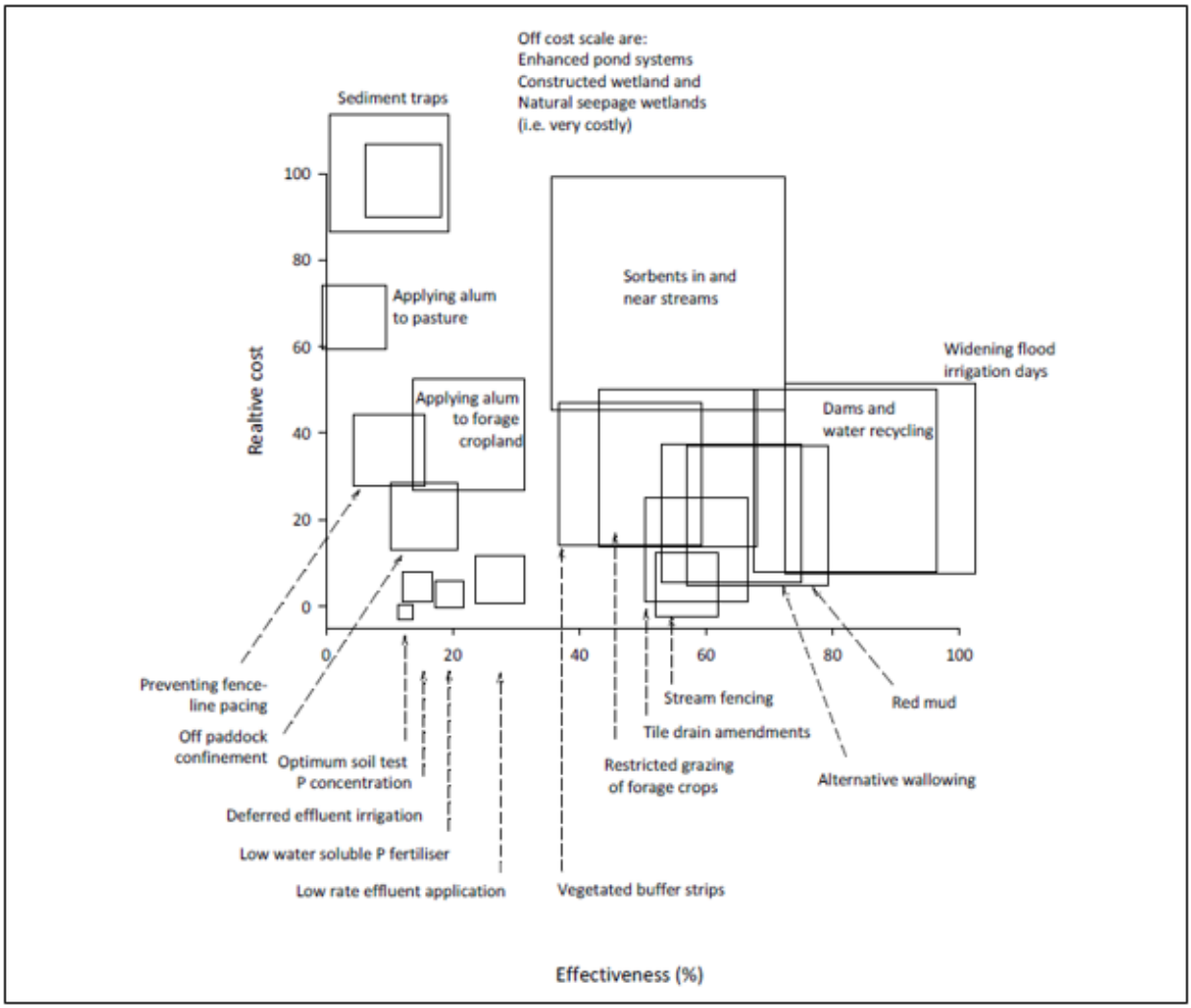


Figure 1 - Cost and effectiveness of strategies to mitigate phosphorus losses (McDowell et al, 2013)

Based on the topography of the property, it is likely that significantly more phosphorus will be lost through a small number of critical source areas rather than evenly over the property. On this basis, the estimated phosphorus loss from critical source areas is likely to be underestimated and thus the overall reductions achieved from implementing riparian buffers and better management of critical source areas.

References:

Fertiliser and Lime Research Centre. (2014). *Sustainable Nutrient Management Introductory Notes and Mastery Test*. Massey University.

Gray, C.W., Wheeler, D.M. and McDowell, R. (2016). *Review of the phosphorus loss submodel in OVERSEER®.* Report prepared for OVERSEER® owners under AgResearch core funding contract A21231(A). AgResearch. Report RE500/2015/050.

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McDowell, RW; Sharpley, AN; Beegle, D and Weld J. (2001). *Comparing phosphorus management strategies at the watershed scale*. Journal of Soil and Water Conservation 56: 306-315.

McDowell, R; Wilcock, B and Hamilton, D. (2013). *Assessment of Strategies to Mitigate the Impact or Loss of Contaminants from Agricultural Land to Fresh Waters.* Report prepared for MfE. AgResearch. Report RE500/2013/066.

Sharpley, AN; Gburek, WJ; Folmar G and Pionke, HB. (1999). *Sources of phosphorus exported from an agricultural watershed in Pennsylvania*. Agricultural Water Management 41: 77-89.

LAND MANAGEMENT

L2

Race Maintenance & Management

Lane Adjacent Waterway (West of Wintering Barn)

IMPACT OF CONTAMINATION + LIKELIHOOD OF CONTAMINATION = HIGH RISK RATING

DESCRIPTION:

Main lane to the west of the Woldwide One wintering barn running adjacent to a waterway. There is 1-2m riparian buffer, which is wider to the north. Due to the location of farm infrastructure there is minimal opportunity to extend the riparian margin wider. There is minimal vegetation cover in the riparian margin to filter any run-off.

This area will be planted in low native grasses such as red tussock and carex secta (1m intervals) to filter any run-off and utilise the associated nutrients. Between plantings the riparian buffer will be maintained in a healthy sward of rank grass. In addition to this, any areas of the lane that slope towards the waterway will be modified to slope in the opposite direction.

Estimated Reduction in Phosphorus: 1.7 Kg/P

GPS Co-ordinates: 1225117, 4889012

IMAGES:

OPEN ACTIONS:

Establish Vegetated Riparian Margin (Beside Barn) (MANDATORY ACTION)

The riparian margin between the main dairy lane and the waterway to the west of the Woldwide One wintering barn will be maintained in a healthy vegetative cover of native grasses (1m spacings) to filter run-off and utilise any associated nutrients.

TARGET DATE: **1st August 2020**

LAND MANAGEMENT

L3

Critical Source Area

Critical Source Area (Paddocks 14-15)

IMPACT OF CONTAMINATION + LIKELIHOOD OF CONTAMINATION = HIGH RISK RATING

DESCRIPTION:

Low lying area at the eastern end of paddocks 14 and 15 on either side of the dairy lane. At times this area holds water which subsequently enters the creek at either end of the CSA. The area is partly fenced off but is still grazed.

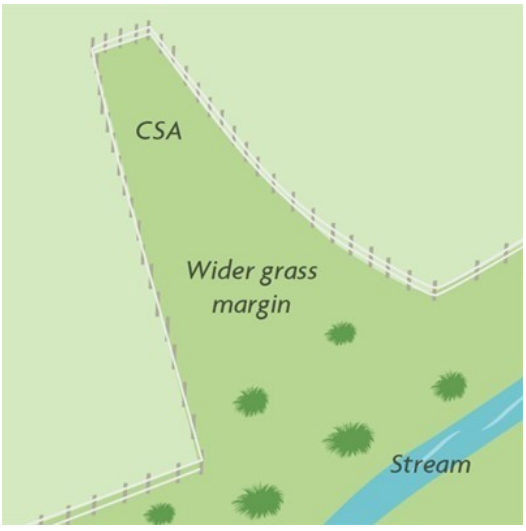
Being one of the few critical source areas on the farm means this area is likely to have a disproportionately high loss of sediment and phosphorus compared to other areas of the farm.

The riparian margin where the gully enters the adjacent waterway will be extended and maintained as a minimum in rank grass (or planted in native grasses such as carex secta or red tussock) to filter any overland flow that may occur under normal rainfall conditions.

Estimated Reduction in Phosphorus: 0.07 Kg/P

GPS Co-ordinates: 1224779, 4889616

IMAGES:



OPEN ACTIONS:

Increase riparian buffer (triangle paddock) (MANDATORY ACTION)
The riparian margin where the gully (Critical Source Area) enters the waterway will be extended to a minimum of 5m and maintained in rank grass (or planted in native grasses such as carex secta or red tussock) to filter any overland flow that may occur under normal rainfall conditions. See photo above.
TARGET DATE: 1st August 2020

LAND MANAGEMENT

L4

Race Maintenance & Management

Central Lane (between WOL and WTL)

IMPACT OF CONTAMINATION  +  LIKELIHOOD OF CONTAMINATION = HIGH RISK RATING

DESCRIPTION:

Main dairy lane running between Woldwide One and Woldwide Two. Currently this is used frequently by stock from Woldwide Two to access paddocks to the south, south east and south west of the dairy shed. Changes in cow flow will result in a number of these paddocks being accessed by different lanes. This will significantly reduce the frequency of stock movements along this section of the central lane (minimum of 50% reduction in stock movements) and the corresponding amount of dung (and associated phosphorus) deposited on the lane. In addition to the reduction in lane usage the lane will be sloped away from the adjoining waterway and the riparian buffer extended by 1m and maintained as a minimum in rank grass (or planted in native grasses such as carex secta or red tussock).

Estimated Reduction in Phosphorus: 9.8 Kg/P

GPS Co-ordinates: 1225043, 4889449

IMAGES:

OPEN ACTIONS:

Reduction in Use of Central Dairy Lane (MANDATORY ACTION)
Reduce the use of the central dairy lane between Woldwide One and Woldwide Two by a minimum of 50%.
TARGET DATE: New Consent Issued

Slope Lane and Extend Riparian Buffer-Central Lane (MANDATORY ACTION)
The lane will be sloped away from the adjoining waterway and the riparian buffer extended by 1m and maintained as a minimum in rank grass (or planted in native grasses such as carex secta or red tussock).
TARGET DATE: 1st August 2020

LAND MANAGEMENT

L5

Race Maintenance & Management

Lane beside Waterway (Paddocks 18 & 19)

IMPACT OF CONTAMINATION  +  LIKELIHOOD OF CONTAMINATION = MEDIUM RISK RATING

DESCRIPTION:

Main dairy lane running adjacent to a waterway. There is a small riparian buffer but this is not well vegetated and provides minimal opportunity for filtering contaminants off the lane. The lane is relatively wide in this area and as such the fence will be moved out 1m and a rank grass (or native plants such carex secta and red tussock) established to assist in filtering any run-off.

In a number of places, the lane does slope away from the adjacent waterway but during upcoming lane maintenance the entire lane will be sloped away from the creek.

Estimated Reduction in Phosphorus: 1.5 Kg/P

GPS Co-ordinates: 1225522, 4888560

IMAGES:

OPEN ACTIONS:

Extend Riparian Margin & Slope Lane (MANDATORY ACTION)
Extend the riparian margin by a minimum of 1m and establish a good sward of rank grass (or plant native grass such as carex secta and/or red tussock) to assist with filtering run-off from the lane. In addition to this the lane will be sloped away from the waterway.
TARGET DATE: 1st February 2021

LAND MANAGEMENT

L6 Culvert Management

IMPACT OF CONTAMINATION + LIKELIHOOD OF CONTAMINATION = MEDIUM RISK RATING

DESCRIPTION:

Culvert crossing the waterway to the south of paddock 34. The culvert has no raised sides which allows any runoff to flow off the side into the underlying water. Building up the sides of the culvert and directing run-off back into the paddock or at a minimum into a grass riparian area will assist with filtering sediment and associated phosphorus.

Estimated Reduction in Phosphorus: >0 Kg

GPS Co-ordinates: 1225572, 4888488

IMAGES:

OPEN ACTIONS:

Build up sides of culvert (South of Paddock 34)
Build up the sides of the culvert crossing the waterway to the south of paddock 34. This will prevent the direct deposition of sediment and associated phosphorus into the underlying waterway and allow for filtering via a grass buffer.
TARGET DATE: 1st February 2021

LAND MANAGEMENT

L7

Critical Source Area

Main Culvert (South of Wintering Barn)

IMPACT OF CONTAMINATION + LIKELIHOOD OF CONTAMINATION = MEDIUM RISK RATING

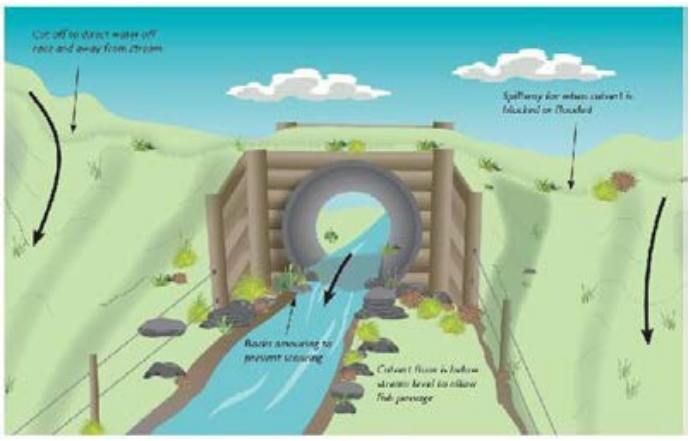
DESCRIPTION:

The main lane culvert to the south of the wintering barn on Woldwide One. A kerb will be installed on the sides of the concrete lane going over the culvert to prevent direct run-off into the underlying waterway. The kerb will direct run-off back into the adjacent paddocks.

Estimated Reduction in Phosphorus: >0 Kg/P

GPS Co-ordinates: 1225140, 4888897

IMAGES:



OPEN ACTIONS:

Install Kerb - Main Culvert South Wintering Barn
Install a kerb on the concrete lane at the point it goes over the main culvert. This will direct run-off into the adjacent paddock.
TARGET DATE: 1st February 2021

LAND MANAGEMENT

L8

Overland Flow Path

Overland Flow Path (Paddock 15)

IMPACT OF CONTAMINATION + LIKELIHOOD OF CONTAMINATION = MEDIUM RISK RATING

DESCRIPTION:

Fenced off strip at the southern end of paddock 15. Area used as an unformed lane to reach paddock 35. There is an overland flow path down to the south west corner of paddock 15 where run-off can exit into the adjacent waterway. The proximity of the unformed lane to the adjacent waterway also results in a high risk of run-off directly into the creek. The temporary lane will be moved 2-3m back from the waterway when in use and the resulting area left as rank grass to filter any run-off. The riparian buffer at the south west corner of paddock 15 will be extended and maintained in rank grass (or planted in native grasses such as carex secta, red tussock and toetoe).

Estimated Reduction in Phosphorus: 1.4 Kg/P

GPS Co-ordinates: 1225270, 4888883

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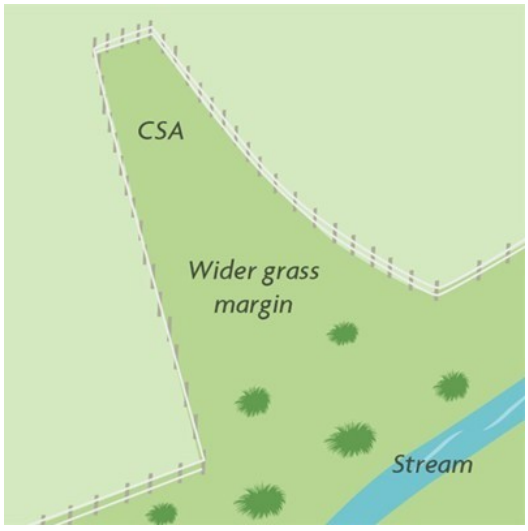


OPEN ACTIONS:

Move Temporary Lane (Paddock 15) (MANDATORY ACTION)
Move the temporary lane so it is at least 2m back from the waterway. Leave the resulting area in rank grass to filter any run-off. The riparian buffer at the low point at the south west corner of paddock 15 will be extended and maintained in rank grass (or planted in native grasses such as carex secta, red tussock and toetoe).
TARGET DATE: 1st February 2021

LAND MANAGEMENT

L9

Overland Flow Path

Critical Source Area (Paddock Marcel #1)

IMPACT OF CONTAMINATION + LIKELIHOOD OF CONTAMINATION = MEDIUM RISK RATING

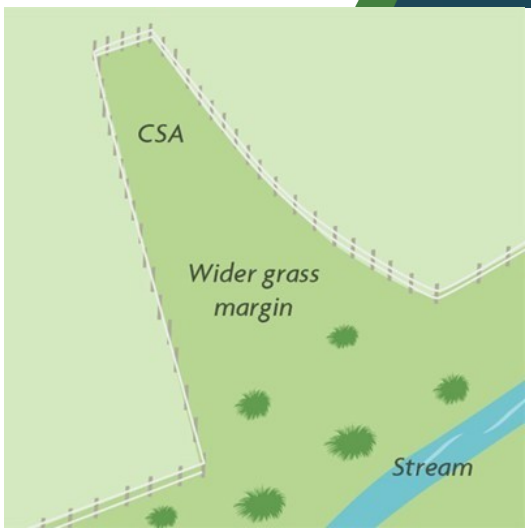
DESCRIPTION:

Swale/low area running through Marcel paddock 1. Overland flow will be concentrated in this area following heavy rain and make its way down into the adjacent waterway. The riparian margin will be increased to a minimum of 5m where the swale enters the adjoining waterway and maintained in rank grass or planted in native grasses such as red tussock, carex secta or toetoe.

Estimated Reduction in Phosphorus: 0.79 Kg/P

GPS Co-ordinates: 1225180, 4890863

IMAGES:



OPEN ACTIONS:

Extend Riparian Margin (Marcel #1) (MANDATORY ACTION)
Extend the riparian margin in Marcel Paddock 1 to a minimum of 5m where the critical source area enters the adjoining waterway. This area will be left in rank grass or planted in native grasses such as carex secta, red tussock or toetoe.
TARGET DATE: 1st February 2021

LAND MANAGEMENT

L10

Race Maintenance & Management

Lane Adjacent Waterway (Paddock 34)

IMPACT OF CONTAMINATION + LIKELIHOOD OF CONTAMINATION = MEDIUM RISK RATING

DESCRIPTION:

Dairy lane on the boundary of Woldwide One and Woldwide Two, south of paddock 34. The lane is lined on the southern side with a row of tall gum trees, which will impact on the ability of the lane to dry out. There is a 1-1.5m riparian buffer between the lane and the creek, which is maintained in rank grass. Some re-contouring of the lane will occur to ensure it slopes away from the waterway along its full length. In addition to this the large gum trees will be removed and replaced with low growing native plantings such as flax, toetoe and red tussock. This will still provide stock shelter, aesthetic and biodiversity outcomes but not impact on the drying out of the lane.

Estimated Reduction in Phosphorus: 2.6 Kg/P

GPS Co-ordinates: 1225279, 4889150

IMAGES:

OPEN ACTIONS:

Modify Lane beside Creek (Paddock 34) (MANDATORY ACTION)
Re-contour the dairy lane at the southern end of paddock 34 (between Woldwide One and Woldwide Two) so it slopes away from the dairy lane. In addition to this the gum trees will be removed to prevent shading of the lane, allowing it to dry out (reducing the likelihood of water ponding and running off). This area will be replanted in low natives such as flax, toetoe and red tussock to maintain biodiversity and aesthetic values.
TARGET DATE: 1st February 2021 (Tree removal to occur up until 2023)

LAND MANAGEMENT

L11

Overland Flow Path

Overland Flow Path (Paddock 34)

IMPACT OF CONTAMINATION + LIKELIHOOD OF CONTAMINATION = LOW RISK RATING

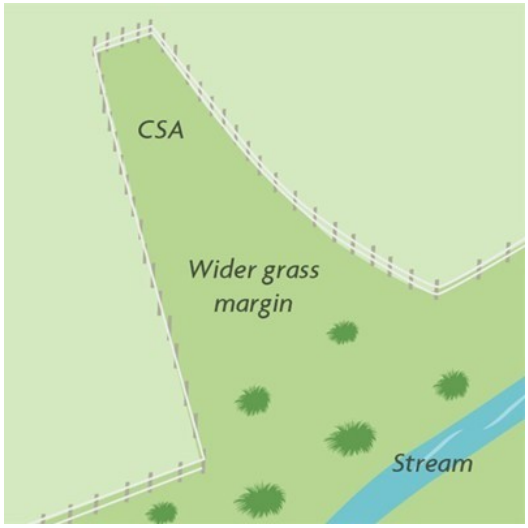
DESCRIPTION:

Small gully/swale running through paddock 34. In heavy rainfall events this will collect rainwater and associated contaminants from the surrounding land and direct them down to the waterway. Extending the riparian buffer and maintaining it in rank grass (or plant with native grasses such as Carex Secta or Red Tussock) in the location where the swale enters the creek will assist with filtering sediment and associated phosphorus.

Estimated Reduction in Phosphorus: 0.06 Kg/P

GPS Co-ordinates: 1225520, 4888729

IMAGES:



OPEN ACTIONS:

Extend Riparian Margin (Paddock 34) (MANDATORY ACTION)
Extend the riparian margin where the small swale in paddock 34 enters the adjacent waterway. Maintain this area in rank grass or plant in native grass species such as red tussock or carex secta.
TARGET DATE: 1st August 2021

LAND MANAGEMENT

L12

Critical Source Area

Culvert - Woldwide Two Dairy Shed

IMPACT OF CONTAMINATION  +  LIKELIHOOD OF CONTAMINATION = LOW RISK RATING

DESCRIPTION:

Main culvert to the west of the dairy shed at Woldwide Two. The culvert will be improved to reduce the risk of contaminants off the lane flowing into the underlying waterway by building up the sides of the culvert and creating a wider buffer on the north side of the culvert where there is un-utilised space. Run-off will be directed off the culvert into adjacent paddocks or as a minimum into a grassed riparian area.

Estimated Reduction in Phosphorus: >0 Kg/P

GPS Co-ordinates: 1224995, 4889689

IMAGES:

OPEN ACTIONS:

Build up Culvert Sides (Beside Woldwide Two Dairy Shed)
Build up the sides of culvert and create a wider riparian buffer on the north side of the culvert where there is un-utilised space. Direct run-off into adjacent paddocks or as a minimum into a vegetated riparian margin.
TARGET DATE: 1st August 2021

LAND MANAGEMENT

L13

Critical Source Area

Culvert (Paddock Marcel#9)

IMPACT OF CONTAMINATION + LIKELIHOOD OF CONTAMINATION = LOW RISK RATING

DESCRIPTION:

Lane culvert into Marcel Paddock #9. The culvert is in good condition along with the lane overlying it. The sides of the culvert will be raised to prevent contaminants off the lane running directly into the underlying waterway. Run-off will be directed out into the adjacentpaddocks.

Estimated Reduction in Phosphorus: >0 Kg/P

GPS Co-ordinates: 1225248, 4890530

IMAGES:

OPEN ACTIONS:

Raise sides of culvert (Marcel #9)
Raise the sides of the culvert to prevent contaminants off the lane running directly into the underlying waterway. Run-off will be directed out into the adjacent paddocks.
TARGET DATE: 1st August 2021

LAND MANAGEMENT

L14

Overland Flow Path

Critical Source Area (Paddock 21)

IMPACT OF CONTAMINATION + LIKELIHOOD OF CONTAMINATION = LOW RISK RATING

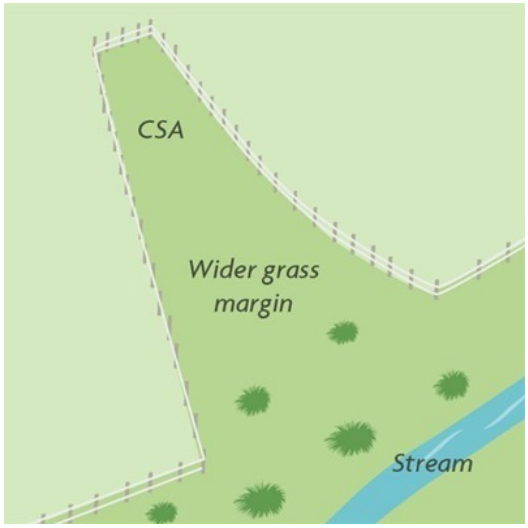
DESCRIPTION:

Shallow swale through paddock 21 that slopes down to the adjacent waterway. The swale will be a conduit for overland flow off the surrounding paddock during heavy rainfall events. Due to the flat topography of the farm and the small number of critical source areas, small swales as identified in paddock 21 are likely to carry a disproportionately high level of contaminants compared to the rest of the farm. On this basis having a wider riparian buffer where the swale enters the adjoining waterway and maintaining the buffer in rank grass or native grasses such as carex secta or red tussock will filter contaminants and reduce losses to surface waterways.

Estimated Reduction in Phosphorus: 0.29 Kg/P

GPS Co-ordinates: 1224876, 4889610

IMAGES:



OPEN ACTIONS:

Extend Riparian Buffer (Paddock 21) (MANDATORY ACTION)
Extend the riparian margin in the location where the low area through paddock 21 enters the adjoining waterway. This will be maintained in rank grass or planted in native grasses such as Carex Secta, Red Tussock or Toetoe.
TARGET DATE: 1st August 2021

APPENDIX 4 – Phosphorous Mitigation Plan – Woldwide Run-Off

TIAKI

FARM SOURCE SUSTAINABLE DAIRYING

PHOSPHORUS MITIGATION PLAN

Version 2 - 05/09/19

FARM SOURCE

Fonterra

Dairy for life

ABOUT YOUR PLAN

This Phosphorus Mitigation Plan document is the result of a tailored farm environment planning service provided to you through Tiaki Sustainable Dairying. It's part of the advantage you get through Farm Source as a member of the Fonterra Co-Operative. The purpose of this plan is to describe the environmental conditions present on your farm and the management of these conditions. From this, mitigations to potential impacts to water quality are documented and additional mitigations maybe planned, with sensible timeframes. Underpinning this plan, are the agreed national Good Farming Practices that are supported by the agricultural and horticultural sectors. Industry bodies along with Regional Councils and Central Government have developed the Good Farming Practice: Action Plan for Water Quality 2018 in a commitment to swimmable rivers and improving the ecological health of our waterways. The Dairy Industry Strategy (Dairy Tomorrow), as well as the Good Farming Practice: Action Plan for Water Quality 2018, both align with the goal for all dairy farms to have a Farm Environment Plan by 2025. Now that this plan has been created it's the plan owner's responsibility to ensure it is put into action and kept up to date as actions are completed or conditions on farm change. Tiaki Sustainable Dairying is here to help with that implementation and ongoing management through our team of Sustainable Dairying Advisors who can be contacted via the details below.

PHONE: 0800 65 65 68

EMAIL: sustainable.dairying@fonterra.com

CONTENTS:

FARM DETAILS

FARM NAME

Woldwide Runoff

SUPPLIER NUMBER

Merrivale & Merriburn

PLAN OWNER

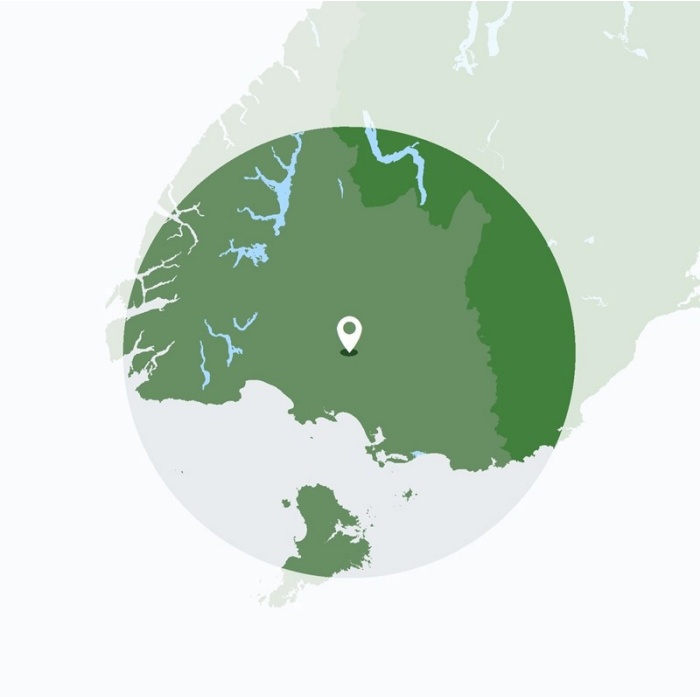
Albert De Wolde

+64 27 2272537
dewolde@farmside.co.nz

FARM ADDRESS

20 Gill Road & 1711 Otautau-Tuatapere Road

LOCATION



REGIONAL COUNCIL

Southland

PLAN LAST EDITED DATE

02 August 2019

POINTS OF NOTE

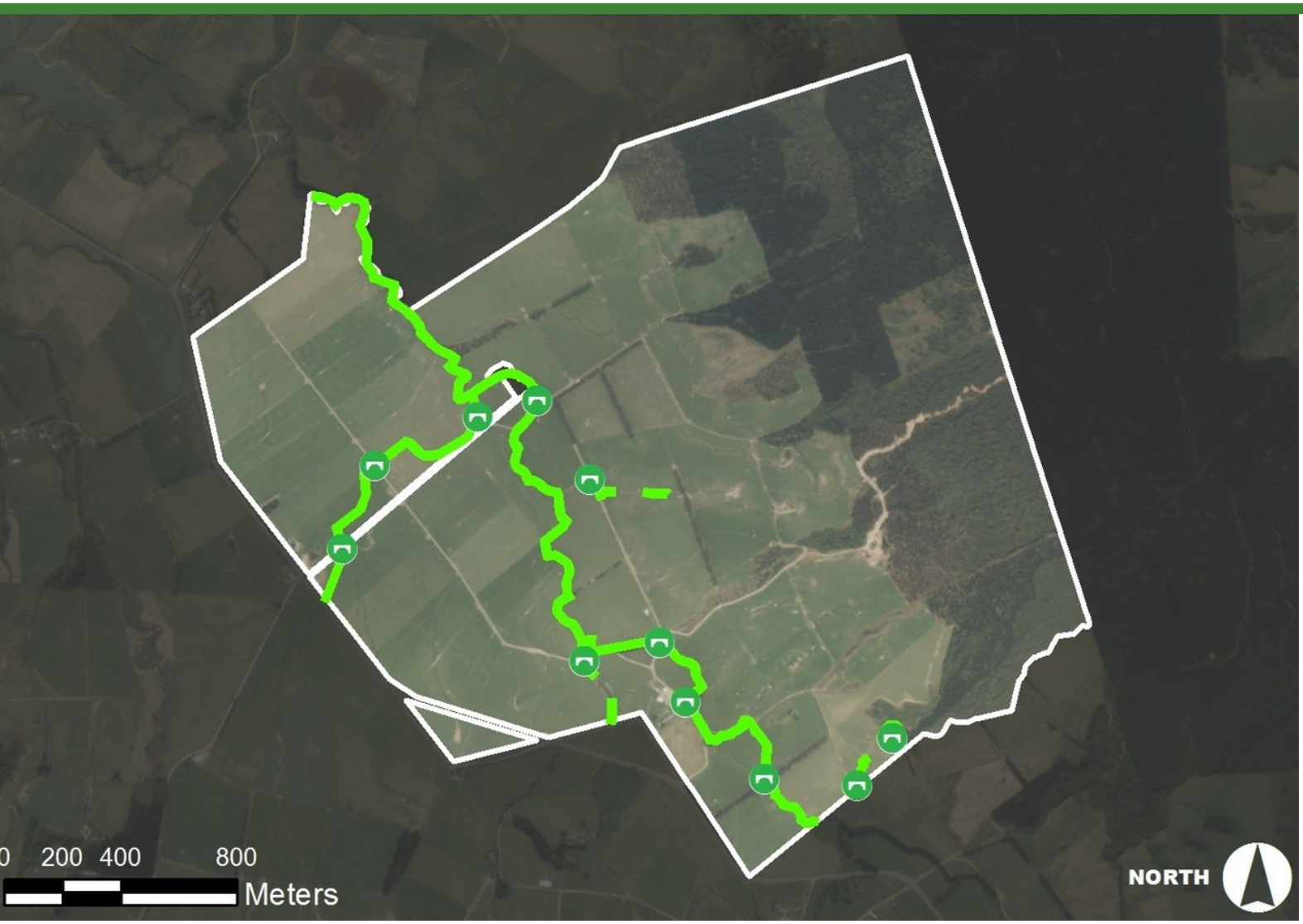
MERRIBURN FARM OVERVIEW MAP

The map below presents the land on which the farming operations covered in this document occur and identifies some key points of interest. More detailed maps looking at specific environmental management topics are contained throughout the document.

- Accord Defined Stock Excluded Waterway
- Accord Defined Stock Not Excluded Waterway
- Non-Accord Defined Stock Excluded Waterway
- Non-Accord Defined Stock Not Excluded Waterway
- Farm Boundary
- Compliant Crossing
- Non-Compliant Crossing
- Non-Compliant Non-Regular Crossing
- Dispensation Crossing
- Dairy Shed

MERRIVALE FARM OVERVIEW MAP

The map below presents the land on which the farming operations covered in this document occur and identifies some key points of interest. More detailed maps looking at specific environmental management topics are contained throughout the document.



- Accord Defined Stock Excluded Waterway
- Accord Defined Stock Not Excluded Waterway
- Non-Accord Defined Stock Excluded Waterway
- Non-Accord Defined Stock Not Excluded Waterway
- Farm Boundary
- Compliant Crossing
- Non-Compliant Crossing
- Non-Compliant Non-Regular Crossing
- Dispensation Crossing
- Dairy Shed

MERRIVALE SUMMARY OF OPEN ACTIONS

This table includes all open or ongoing actions that have been agreed as part of this Phosphorus Mitigation Plan. They are organized by their target due date. **Where a target date is underlined it is a mandatory action that contributes to the calculated P loss reduction.**

CATEGORY	FEATURE TYPE & NAME	ACTION REQUIRED	TARGET DATE
L5	Culvert Management - Culvert (Paddock 101)	Unblock Culvert - Paddock 101	**Completed**
L1	Critical Source Area - Fenham Creek Tributary (Northern Section)	Extend Riparian Margin (Fenham Creek North)	**1 Aug 21**
L2	Critical Source Area - Critical Source Areas - Overland Flow	Extend Riparian Buffers - Critical Source Areas	**1 Aug 21**
L6	Erosion Control - Gully Paddock 27	Exclude Stock from Hill Face (Paddock 27)	**1 Aug 22**
L7	Critical Source Area - Crossing - Paddocks 6& 7	Extend Riparian Margin (Drain Paddock 6& 7)	**1 Aug 22**
L4	Critical Source Area - Gully Paddocks 10 & 15	Exclude Stock from Erosion Areas (Pad 10 & 15)	**1 Aug 25**
L8	Sediment Trap - Sediment Trap (Paddock 58)	Sediment Trap Installation (Paddock 58)	**1 Aug 25**
L3	Critical Source Area - Gully Paddock 9	Re-fence Gully - Paddock 10	**1 Aug 21**

MERRIBURN SUMMARY OF OPEN ACTIONS

This table includes all open or ongoing actions that have been agreed as part of this Phosphorus Mitigation Plan. They are organized by their target due date. **Where a target date is underlined it is a mandatory action that contributes to the calculated P loss reduction.**

CATEGORY	FEATURE TYPE & NAME	ACTION REQUIRED	TARGET DATE
W1	Waterway Fencing - Foats Stream - Fencing	Fence Foats Stream - 2m Buffer	**1 Aug 20**
W2	Waterway Fencing - Fenham Creek Tributary Fencing	Fence off Fenham Creek (Central Section)	**1 Aug 21**
W3	Waterway Fencing - Buckton Creek Tributary Fencing	Fence off Buckton Creek Tributary	**1 Aug 21**

LAND MANAGEMENT

L1

Phosphorus Overview (Merriburn & Merrivale)

DESCRIPTION:

Woldwide Runoff (WRO) is comprised of two farm in close proximity to each other. The Merrivale block is owned by WRO and the Merriburn block is leased. The properties have numerous waterways flowing through them and the topography is generally rolling with some area of flat land and some areas of steeper hill country. Due to the topography of the farms there are many critical source areas and these are likely to be the conduit for the majority of the farms phosphorus losses.

Overseer is not spatially explicit and is unable to take into account landscape features. It assumes a hydrological connection exists to second order streams and that there is a transport mechanism to get phosphorus to those streams (Gray, 2016).

The initiation and transport of phosphorus from the landscape requires conditions conducive to either overland or subsurface flow. In many situations, P loss to the stream is dominated by overland flow since soil will sorb most phosphorus from subsurface flow, unless, as with mole-pipe drainage, there is a direct conduit to the stream (McDowell et al. 2001). In general, more P is lost from soils with increasing slope, largely as particulate phosphorus.

Critical source areas are included in the model in general terms as the model was calibrated against catchment studies where losses from critical source areas would have occurred (Gray, 2016). On this basis, protecting critical source areas is a mitigation that needs to be applied outside of Overseer and will reduce phosphorus losses further from those modelled.

The estimated reductions in P referenced in this report are derived from the following calculations and research:

Phosphorus Loss – Culverts & Small Riparian Margin Increases

There will be a reduction in phosphorus loss from mitigations applied around culverts but there is no robust research information to base an estimate on, however experience indicates these areas can result in significant losses of sediment (and associated P) to water. On this basis estimated reductions in phosphorus have been referenced as >0 Kg/P. In addition to this, small increases in riparian margins to include areas of erosion or unproductive land have also been referenced as >0 Kg/P and are not included in the overall phosphorus reduction figure.

Phosphorus Loss – Critical Source Areas & Waterway Fencing

Overseer predicts 425kg of phosphorus will be lost to water from paddocks (effective area of 647ha). Assuming phosphorus loss occurs evenly over the effective area of the farm, then the critical source areas and unfenced waterways and their associated catchments identified in this report would account for 24% of the phosphorus loss from blocks on the property. This equated to 102kg of phosphorus.

Assuming a 30-40% reduction in phosphorus loss occurs through waterway fencing and the implementation of wider, vegetated riparian buffers (at locations where critical source areas enter waterways) and better management of critical source areas, then a further reduction of 34.7kg of phosphorus is estimated to occur beyond that modelled in Overseer (with all mitigations implemented). See Table 1 and 2 below.

Site and Fencing Length (m)	Catchment Area (% of Catchment)	P Loss (kg)	Mitigations (% Reduction)	Reduction in P Loss (kg)
W1 (L2) – 1900	78 (12)	51	30*	15.3
W2 – 800	10.5 (1.6)	6.9	30*	2.1
W3 – 420	4.5 (0.7)	2.9	30*	0.9
L1 – 1000 (Merrivale)	7 (1.1)	4.6	30**	1.4
				19.7

Table 1 – Phosphorus Loss – Unfenced Waterways (*30% as no expansion of riparian margins where critical source areas enter waterways is proposed on the lease block; **30% as already small riparian margin in place)

Site and Catchment Area	% of Total Catchment	P Loss (kg)	Mitigations (% Reduction)	Reduction in P Loss (kg)
L2 – 57ha (Merrivale)	8.8	37.4	40	15
				15

Table 2 – Phosphorus Loss – Critical Source Areas

The 40% reduction is based on research that shows management of critical source areas and vegetated buffers can reduce phosphorus loss by 38-59% (Figure 1). A lower range reduction figure of 40% has been used to try and ensure the impact of the proposed mitigations is not over estimated.

It is acknowledged by McDowell et al, 2005 in the original design of the Overseer sub-model that, in some areas, 90% of phosphorus loss may come from only 10% of the catchment area (Sharpley et al, 1999). McDowell states that defining and isolating critical source areas, combined with adaptive management over the farm is the best approach to decreasing phosphorus loss. For the purposes of this analysis, it has been assumed that phosphorus loss occurs evenly over the farm as there is insufficient data to quantify phosphorus losses to a critical source area level. This means mitigations centered on critical source areas are likely to have more of an impact than stated in this report and as such result in a larger reduction in phosphorus losses to those outlined above.

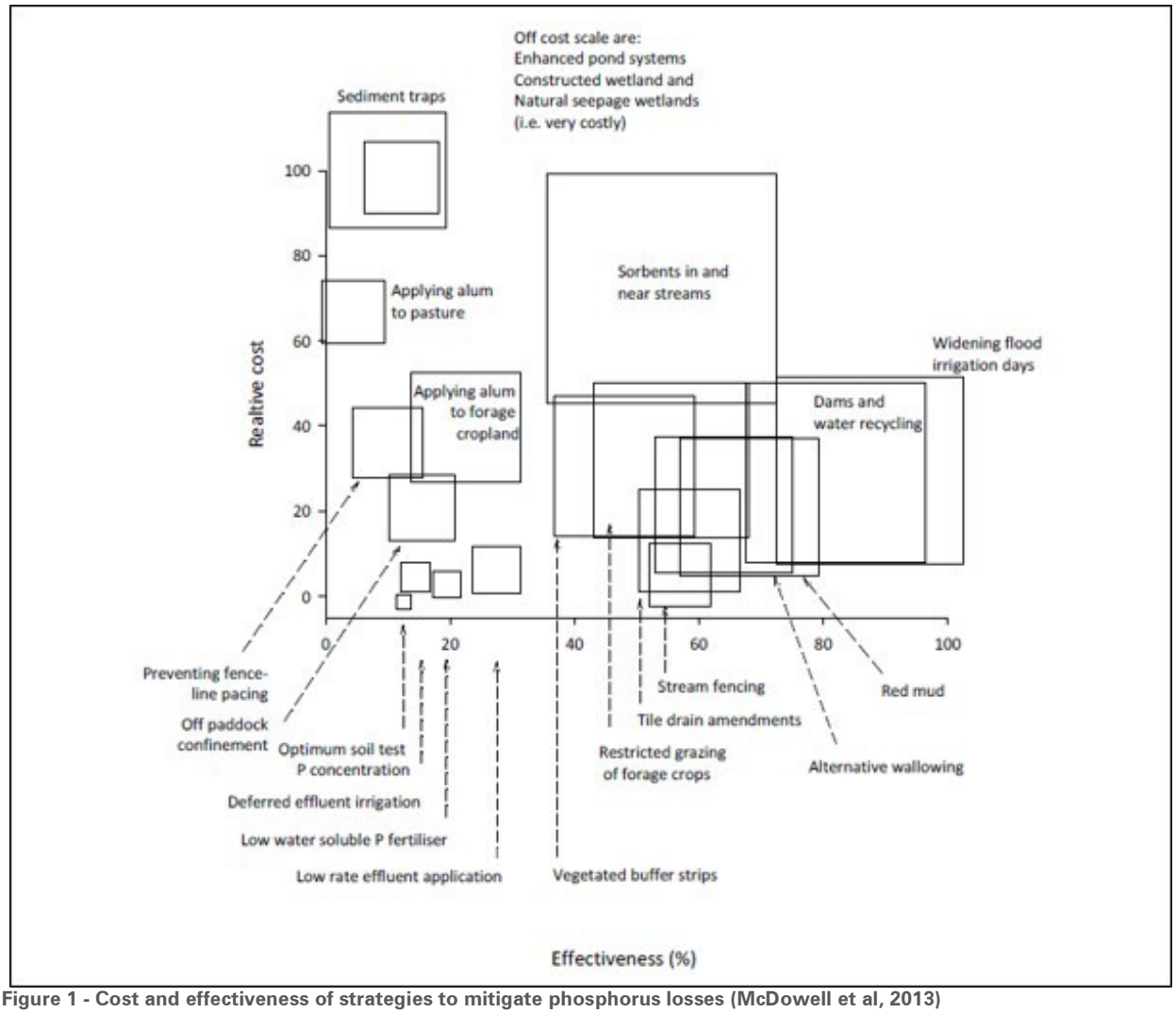


Figure 1 - Cost and effectiveness of strategies to mitigate phosphorus losses (McDowell et al, 2013)

References:

Fertiliser and Lime Research Centre. (2014). *Sustainable Nutrient Management Introductory Notes and Mastery Test*. Massey University.

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McDowell, R; Monaghan, R and Wheeler, D. (2005). *Modelling phosphorus losses from pastoral farming systems in New Zealand*, New Zealand Journal of Agricultural Research, 48:1, 131-141.

McDowell, RW; Sharpley, AN; Beegle, D and Weld J. (2001). *Comparing phosphorus management strategies at the watershed scale*. Journal of Soil and Water Conservation 56: 306-315.

McDowell, R; Wilcock, B and Hamilton, D. (2013). *Assessment of Strategies to Mitigate the Impact or Loss of Contaminants from Agricultural Land to Fresh Waters.* Report prepared for MfE. AgResearch. Report RE500/2013/066.

Sharpley, AN; Gburek, WJ; Folmar G and Pionke, HB. (1999). *Sources of phosphorus exported from an agricultural watershed in Pennsylvania*. Agricultural Water Management 41: 77-89.

MERRIBURN RISK RATING

The map below shows the location of the risk areas identified on your farm. The Risk Rating presented here is a combined measure of the impact and likelihood of contamination occurring from each risk area.

LOW MEDIUM HIGH SEVERE

W1 Waterway Fencing - Foats Stream - Fencing

W2 Waterway Fencing - Fenham Creek Tributary Fencing

W3 Waterway Fencing - Buckton Creek Tributary Fencing

WATERWAYS MANAGEMENT

W1

Waterway Fencing

Foats Stream - Fencing

IMPACT OF CONTAMINATION  +  LIKELIHOOD OF CONTAMINATION = HIGH RISK RATING

DESCRIPTION:

A tributary of Foats Stream flows along the western side of the Merriburn Lease Block adjacent to Sim Road. Run-off from the steeper hill country to the east all flows down into the stream via a multitude of critical source areas. The stream is currently not fenced to exclude stock and there is no vegetated riparian margin. Fencing of the waterway will reduce phosphorus losses from the farm by preventing direct deposition into the stream by stock and filtering run-off from surrounding paddocks. Foats Stream Tributary has a catchment of approximately 78ha (located on the farm).

Estimated Reduction in Phosphorus: 15.3 Kg/P

IMAGES:

OPEN ACTIONS:

Fence Foats Stream - 2m Buffer (MANDATORY ACTION)

Fence off the Foats Stream tributary running along the western side of the farm. A minimum 2m rank grass riparian buffer will be established on both sides of the creek.

TARGET DATE: 1 Aug 2020

W2

Waterway Fencing

Fenham Creek Tributary Fencing

IMPACT OF CONTAMINATION + LIKELIHOOD OF CONTAMINATION = MEDIUM RISK RATING

DESCRIPTION:

A tributary of Fenham Creek flows down from the higher elevations of the farm out to Otautau-Tuatapere Road. The upper and lower reaches of the Creek are permanently fenced to exclude stock (although the riparian buffers will be extended when adjacent paddocks are being winter grazed). In the middle section a small forestry block has recently been removed and the creek flows down through a gully to the bottom of the farm. Run-off from surrounding paddocks flows down into the stream via the general topography of the land and critical source areas.

Fencing of the central section of the waterway will reduce phosphorus losses from the farm by preventing direct deposition into the stream by stock and filtering run-off from surrounding paddocks.

The unfenced section of the Fenham Creek Tributary has a catchment of approximately 10.5ha.

Estimated Reduction in Phosphorus: 2.1 Kg/P

IMAGES:

OPEN ACTIONS:

Fence off Fenham Creek (Central Section) (MANDATORY ACTION)
Fence off the central section of the waterway. A minimum 2m rank grass riparian buffer will be established on both sides of the creek.
TARGET DATE: 1 Aug 2021

W3

Waterway Fencing

Buckton Creek Tributary Fencing

IMPACT OF CONTAMINATION  +  LIKELIHOOD OF CONTAMINATION = MEDIUM RISK RATING

DESCRIPTION:

Small ephemeral waterway that runs between paddocks 6, 7 and 8. The waterway is not currently permanently fenced, however there is a variable riparian margin due to the slope of the bank and the fact the stream flows through a gully. Fencing will prevent stock access and allow rank grass to better establish within the riparian margin, assisting with filtering of run-off. A permanent fence will be installed at the top of the bank/gully.

The catchment area draining into the unfenced section of the Buckton Creek Tributary is approximately 4.5ha.

Estimated Reduction in Phosphorus: 0.9 Kg/P

IMAGES:

OPEN ACTIONS:

Fence off Buckton Creek Tributary (MANDATORY ACTION)

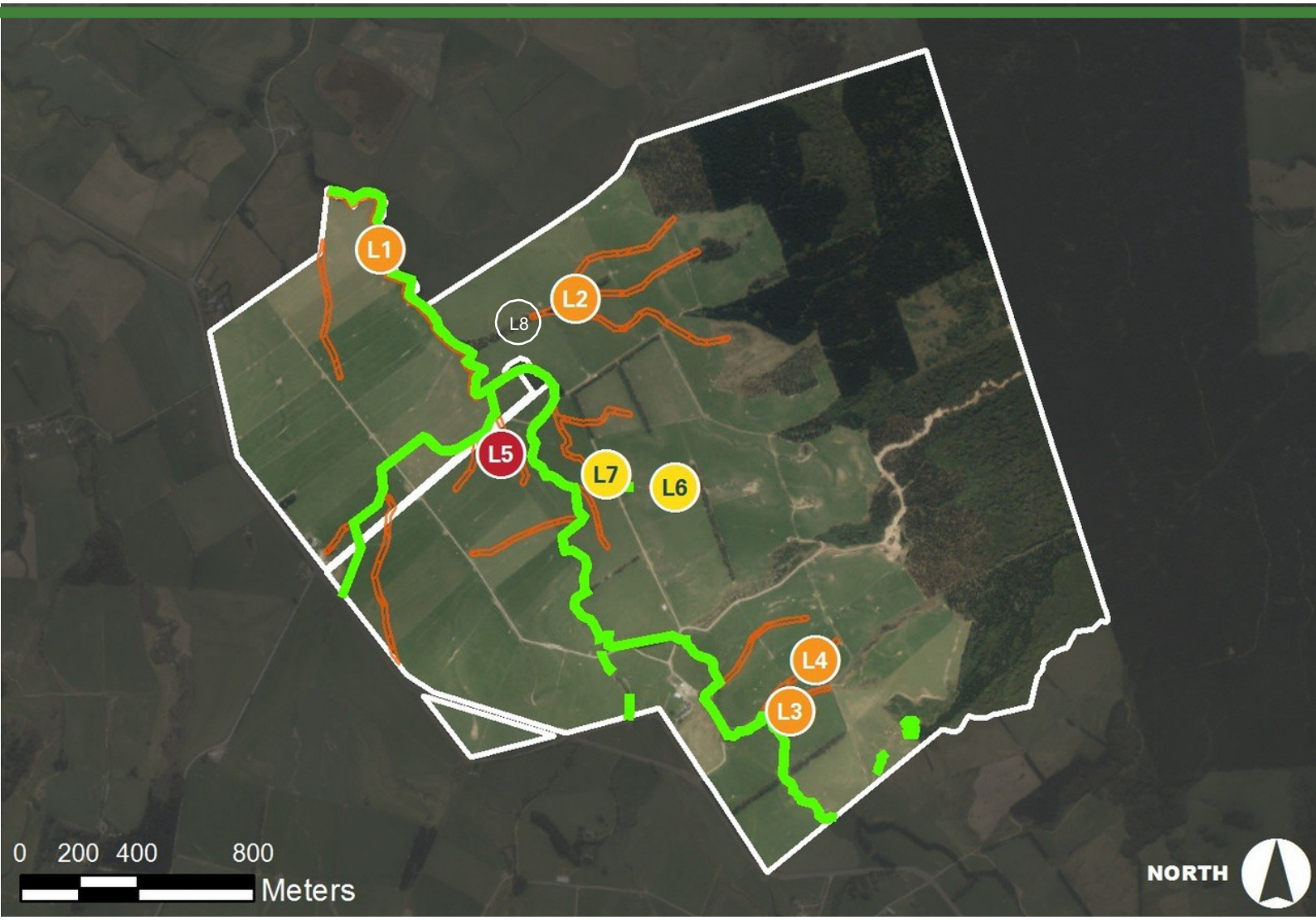
Permanently fence off the waterway that runs between paddocks 6, 7 and 8. There is a natural riparian buffer due to the topography of the land of approximately 2-4m. The fence line will follow this natural contour.

TARGET DATE: **1 Aug 2021**

MERRIVALE RISK RATING

The map below shows the location of the risk areas identified on your farm. The Risk Rating presented here is a combined measure of the impact and likelihood of contamination occurring from each risk area.

LOW MEDIUM HIGH SEVERE



L1 Critical Source Area - Fenham Creek Tributary (Northern Section)

L2 Critical Source Area - Critical Source Areas - Overland Flow

L3 Critical Source Area - Gully Paddock 9

L8 Sediment Trap - Sediment Trap (Paddock 58)

L4 Critical Source Area - Gully Paddocks 10 & 15

L5 Culvert Management - Culvert (Paddock 101)

L6 Erosion Control - Gully Paddock 27

L7 Critical Source Area - Crossing - Paddocks 6 & 7

LAND MANAGEMENT

L1

Critical Source Area

Fenham Creek Tributary (Northern Section)

IMPACT OF CONTAMINATION + LIKELIHOOD OF CONTAMINATION = MEDIUM RISK RATING

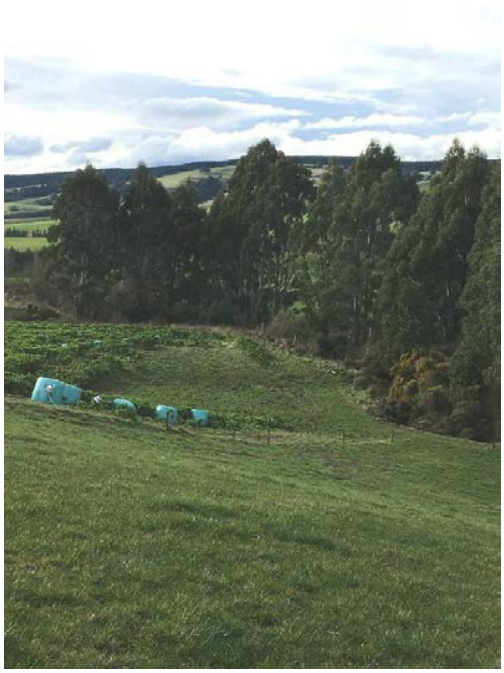
DESCRIPTION:

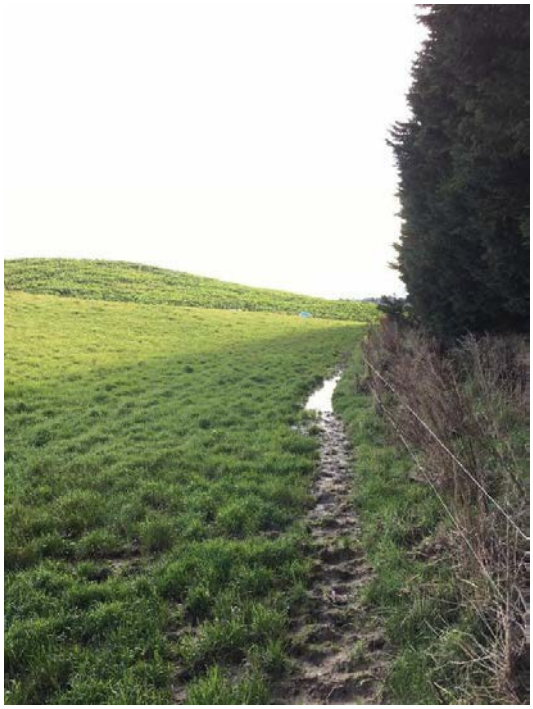
Northern end of the Fenham Creek Tributary flowing along the bottom of paddocks 88, 90, 92, 94, 96 and 98. The riparian buffer on the western side is approximately 1-1.5m yet there is a significant slope from the adjoining paddocks down to the creek. A 3m grass buffer will be fenced off to allow for filtering of overland flow and associated contaminants off the surrounding paddocks. This is especially important when adjacent paddocks are being winter grazed (buffer will be temporarily extended to at least 5m).

The catchment flowing into the riparian buffer is approximately 7 ha over a length of approximately 1km.

Estimated Reduction in Phosphorus: 1.4 Kg/P

IMAGES:





OPEN ACTIONS:

Extend Riparian Margin (Fenham Creek North) (MANDATORY ACTION)
The riparian margin of the Fenham Creek Tributary flowing below paddocks 88, 90, 92, 94, 96 and 98 will be extended to 3m and maintained in rank grass.
TARGET DATE: 1 Aug 2021

LAND MANAGEMENT

L2

Critical Source Area

Critical Source Areas - Overland Flow

IMPACT OF CONTAMINATION + LIKELIHOOD OF CONTAMINATION = MEDIUM RISK RATING

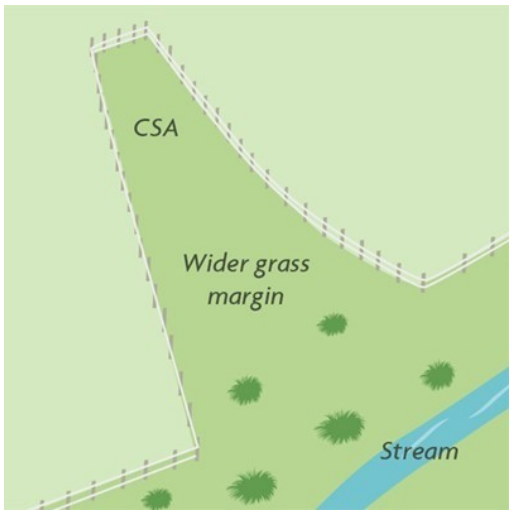
DESCRIPTION:

There are a number of critical source areas (overland flow paths) on the farm as identified on the map at the start of this section. Those shown are not an exhaustive list but form a guide to the areas that should be investigated further. The critical source areas across the farm are areas where water and contaminants off surrounding paddocks are concentrated and transported over the land surface to nearby waterways. Where these areas enter waterways a larger riparian buffer will be provided to filter sediment and associated contaminants (such as phosphorus). Buffers will be appropriately sized for the catchment area of the critical source area (5m minimum).

The approximate catchment area of the critical source areas identified (not including specific areas identified elsewhere in this plan) is 57ha.

Estimated Reduction in Phosphorus: 15 Kg/P

IMAGES:


CSA
Wider grass margin
Stream

OPEN ACTIONS:

Extend Riparian Buffers - Critical Source Areas (MANDATORY ACTION)

Extend the riparian buffers where critical source areas such as gullies and swales enter waterways. Buffers will be a minimum of 5m or larger depending on the size of the critical source area catchment. Buffer areas will be left in rank grass or planted in native grasses such as carex secta, red tussock and toetoe.

TARGET DATE: 1 Aug 2021

LAND MANAGEMENT

L3

Critical Source Area

Gully Paddock 9

IMPACT OF CONTAMINATION  +  LIKELIHOOD OF CONTAMINATION = MEDIUM RISK RATING

DESCRIPTION:

The gully through paddock 9 has previously been fenced off (posts in place). This will be re-fenced to exclude stock. The area is of low production potential and having stock in this area is likely to cause pugging and sediment (and associated phosphorus) loss to the nearby waterway.

Estimated Reduction in Phosphorus: None - Area was previously fenced (will prevent an increase)

GPS Co-ordinates: 1203678, 4884309

IMAGES:

OPEN ACTIONS:

Re-fence Gully - Paddock 10
Reinstate the fence around the gully in Paddock 10.
TARGET DATE: Ongoing

LAND MANAGEMENT

L4

Critical Source Area

Gully Paddocks 10 & 15

IMPACT OF CONTAMINATION + LIKELIHOOD OF CONTAMINATION = MEDIUM RISK RATING

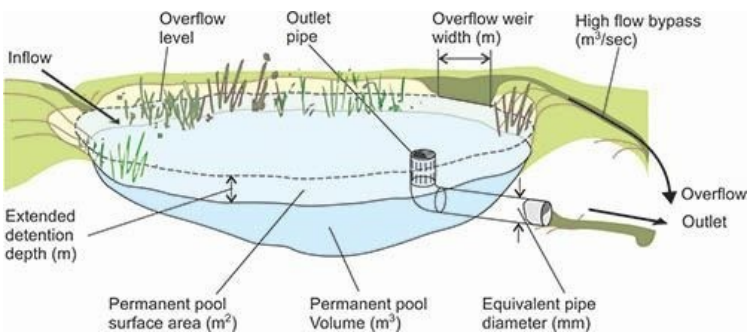
DESCRIPTION:

Gully through the center of paddocks 10 and 15. In some places erosion is occurring. These areas will be fenced off to avoid further damage (consider planting with natives to stabilise). In addition to this, the gully is a conduit for overland flow down to the waterway at the bottom. Due to the location of the lane there is minimal opportunity to extend the riparian margin, however long term there is an opportunity to install a sediment trap at the bottom of the gully with an overflow into the creek.

Estimated Reduction in Phosphorus: None Attributed - Long Term Project

GPS Co-ordinates: 1203657, 4884403

IMAGES:



OPEN ACTIONS:

Exclude Stock from Erosion Areas (Pad 10 & 15)
Fence off areas of the gully that are eroding. Long term consider the installation of a sediment trap at the bottom of the gully to remove sediment and associated phosphorus from overland flow off the adjacent paddocks.
TARGET DATE: 1 Aug 2025

LAND MANAGEMENT

L5

Culvert Management

Culvert (Paddock 101)

IMPACT OF CONTAMINATION + LIKELIHOOD OF CONTAMINATION = HIGH RISK RATING

DESCRIPTION:

The culvert joining paddocks 101 and 86 is blocked resulting in the build-up of water in the surrounding paddocks. This will result in contaminants including phosphorus and sediment being washed off the adjacent paddocks in the flood waters. Unblock the culvert and ensure it is adequately sized.

Estimated Reduction in Phosphorus: >0 Kg/P

GPS Co-ordinates: 1202642, 4885331

IMAGES:

OPEN ACTIONS:

Unblock Culvert - Paddock 101
Unblock the culvert and ensure it is adequately sized.
TARGET DATE: 1 Aug 2019

LAND MANAGEMENT

L6

Erosion Control

Gully Paddock 27

IMPACT OF CONTAMINATION + LIKELIHOOD OF CONTAMINATION = LOW RISK RATING

DESCRIPTION:

Fencing of the gully/ephemeral waterway through paddock 27 has taken place. There is a section of hill above the fence line that is steep and suffers from erosion. This area has minimal productive value and will be fenced out to reduce sediment and subsequent phosphorus loss. Planting of the area in low natives such as red tussock and toetoe would help prevent erosion and filter run-off from the adjacent paddock.

Estimated Reduction in Phosphorus: >0 Kg/P

GPS Co-ordinates: 1203246, 4885068

IMAGES:

OPEN ACTIONS:

Exclude Stock from Hill Face (Paddock 27)

Extend the fence around the waterway flowing through Paddock 27 so it excludes stock out of the steep gully face that is beginning to erode. This area could be planted in red tussock and toetoe to help with stabilisation and for aesthetic reasons.

TARGET DATE: **1 Aug 2022**

LAND MANAGEMENT

L7

Critical Source Area

Crossing - Paddocks 6 & 7

IMPACT OF CONTAMINATION  +  LIKELIHOOD OF CONTAMINATION = LOW RISK RATING

DESCRIPTION:

Crossing and low point in paddock between paddocks 6 and 7. Water and contaminants can flow of this area into the adjacent drain. The riparian buffer will be moved out at the top of the drain to allow for filtration of overland flow. Maintain this area in rankgrass.

Estimated Reduction in Phosphorus: >0 Kg/P

GPS Co-ordinates: 1203014, 4885107

IMAGES:

OPEN ACTIONS:

Extend Riparian Margin (Drain Paddock 6 & 7)

Extend the riparian margin of the drain, below the crossing from Paddocks 6 & 7. Keep the riparian margin in rank grass to filter run-off from the adjacent crossing and paddocks.

TARGET DATE: 1 Aug 2022

L8

Sediment Trap

Sediment Trap (Paddock 58)

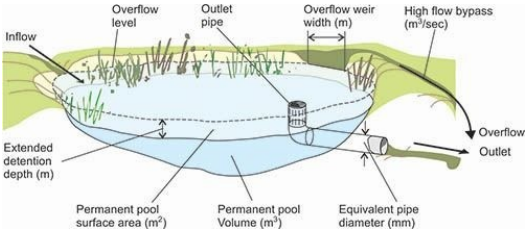
DESCRIPTION:

A number of critical source areas enter into a small waterway running down the side of the pine trees on the boundary of paddock 58. There is the potential to construct a sediment trap in the upper section of this area following the harvesting of the pine trees. This will assist in trapping sediment and any sediment bound phosphorus, preventing it reaching the main surface waterways on the farm. This is an aspirational, long term project and has not been factored into current phosphorus reductionfigures.

Estimated Reduction in Phosphorus: Not Calculated - Long Term Project

GPS Co-ordinates: 1202743, 4885650

IMAGES:



OPEN ACTIONS:

Sediment Trap Installation (Paddock 58)

There is potential to construct a sediment trap in the upper section of the pine plantation on the boundary of paddock 58, following the harvesting of the trees. This will assist in trapping sediment and any sediment bound phosphorus, preventing it reaching the main surface waterways on the farm. Long term, aspirational project.

TARGET DATE: **1 Aug 2025**