Wisheart Macnab & Partners
BARRISTERS & SOLICITORS
73 Alfred Street | PO Box 138 | Blenheim 7240 | New Zealand
P: 03 578 7269 | F: 03 578 0173 | E: enquiries@wmp.co.nz | W: www.wisheartmacnab.co.nz

2 March 2015

Marlborough District Council
PO Box 443
Blenheim 7240

BY HAND

Re: **Marlborough Aquaculture Limited – Application for Coastal Permit – Four Fathom Bay Extension**

We act for the abovenamed and enclose the following:

1. Application
2. Assessment of Effects on the Environment
3. Locality Map
4. Site Plan
5. Structures Diagram
6. Ecological Report
7. Application fee $930.00.

Please acknowledge receipt.

Yours faithfully
WISHEART MACNAB & PARTNERS

.....
DJ Clark
david@wmp.co.nz

Encl

n:\wmp\djc\let\marlbaquaculture-fourfathombayappln-mdc.doc

RECEIVED
- 2 MAR 2015
MARLBOROUGH DISTRICT COUNCIL

Resource Consent Application

This application is made under Section 88 of the Resource Management Act 1991

MARLBOROUGH DISTRICT COUNCIL

Please read and complete this form thoroughly and provide all details relevant to your proposal. Feel free to discuss any aspect of your proposal, the words used in this form or the application process with Council staff, who are here to help.

This application will be checked before formal acceptance. If further information is required, you will be notified accordingly. When this information is supplied, the application will be formally received and processed further.

You may apply for more than one consent that is needed for the same activity on the same form.

For Office Use

ISO 9001:2008
Document Number:
RAF0002-CI1248

Lodgement Fee Paid $ 930-00

Receipt No. 1721445

Consent No.

Case Officer:

1. Applicant details *(If a trust, list full names of all trustees.)*

Name: Marlborough Aquaculture Limited

Mailing address: See below

Email Address:

Phone: (Daytime) Phone: (Mobile) Fax:

2. Agent Details *(If different from above or if your agent is dealing with the application.)*

Name: David Clark

Mailing address: PO Box 138
Blenheim 7240

Email Address: david@wmp.co.nz

Phone: (Daytime) 578 7269 Phone: (Mobile) Fax: 578 0173

3. Type of Resource Consent Applied for

☑ **Coastal Permit** ☐ **Discharge Permit** ☐ **Land Use** ☐ **Subdivision** ☐ **Water Permit**

4. Brief Description of the Activity

To extend marine farm permit 8376 by three additional long lines and extending the existing longlines to enable the cultivation of Green Shell Mussels (Perna canliculus), Scallops (Pecten novaezelandiae), Blue Shell Mussels (Mytilus edulis), Flat Oysters (Tiostrea lutaria) and seawee species (Macrocystis pyrifera, Edklonia radiata, Gracilaria, Pterocladia lucida). To disturb the seabed with anchors, to erect the structures, to occupy the space, to cultivate and harvest the above species, including any ancillary and related discharges that occur.

Date Received

RECEIVED
- 2 MAR 2015
MARLBOROUGH DISTRICT COUNCIL

5. Property Details

The location to which the application relates is (address): Four Fathom Bay, Pelorus Sound

Legal description (i.e. Lot 1 DP 1234): not applicable

(Attach a sketch of the locality and activity points. Describe the location in a manner which will allow it to be readily identified e.g. house number and street address, Grid Reference, the name of any relevant stream, river, or other water body to which application may relate, proximity to any well known landmark, DP number, Valuation Number, Property Number.)
(Please attach a copy of the Certificate of Title.)

The names and addresses of the owner and occupier of the land (other than the applicant):	Crown Land - seabed

Please attach the written approval of affected parties/adjoining property owners and

Note: That as a matter of good practice and courtesy you should consult your neighbours about your proposal. If you have not consulted your neighbours, please give brief reasons on a separate sheet why you have not.

6. Assessment of Effects on the Environment (AEE) *(Attach separate sheet detailing AEE.)*

I attach, in accordance with the Fourth Schedule of the Resource Management Act 1991, an assessment of environmental effects in the detail that corresponds with the scale and significance of the effects that the proposed activity may have on the environment.
Note: Failure to submit an AEE will result in return of this application.

7. Other Information

Are additional resource consents required in relation to this proposal? If so, please list and indicate if they have been obtained or applied for.	

I attach any other information required to be included in the application by the relevant Resource Management Plan, Act or regulations.

Declaration

I (*please print name*) David Clark agree

(i) That I am liable for all fees and charges relating to this application.
(ii) The lodgement fee is to be paid at the time of lodging the application for resource consent.
(iii) That payment is due within 30 days of the issue date of any additional charges.
(iv) That Council will charge me interest on any overdue invoices at 15% per annum from the date of issue of the invoice to the date of payment and Council may stop processing my application until an overdue invoice is paid in full. In the event of non-payment the applicant and/or agent will be liable for all legal and other costs of recovery.
(v) That where this application is completed and signed by an agent, all communication regarding this application will be with the agent.
(vi) The information provided in this application and the attachments to it are accurate.

Signature of applicant or authorised agent [signature] Date 2/03/2015

Privacy Information

The information you have provided on this form is required so that your application can be processed and so that statistics can be collected by Council. The information will be stored on a public register and held by Council. Details may be made available to the public about consents that have been applied for and issued by Council. If you would like access to or make corrections to your details, please contact Council .

Reset Form

Marlborough District Council
PO Box 443
Blenheim 7240

Telephone: (03) 520 7400
Website: www.marlborough.govt.nz
mdc@marlborough.govt.nz

MARLBOROUGH DISTRICT COUNCIL

Resource Management Act 1991

FOURTH SCHEDULE

Assessment of Effects on the Environment

1. Matters that should be included in an assessment of effects on the environment

Subject to the provisions of any policy statement or plan, an assessment of effects on the environment for the purposes of section 88 should include:

(a) A description of the proposal:

Application

(i) This is an application to extend existing marine farm 8376 southwards and eastwards. The southern extension is for three additional longlines. The eastern extension is to extend the existing longlines. The southern extension is 60.64 metres measured at the seabed and the eastern extension forms a triangle with the longest extension being the inshore at 76.50 metres.

(ii) The particular permits that are sought are:

1. To cultivate and farm the species identified in the form attached by traditional means.
2. To disturb the seabed to place anchors.
3. To erect the structures.
4. To occupy space in the coastal marine area.
5. To effect discharges that relate to traditional growing and harvesting of the species identified.

(iii) The species are all currently being farmed in the Pelorus Sound and are naturally to be found there. There will be no introduced species and no introduced feed. The original marine farm at Four Fathom Bay was applied for in 1995.

Applicant

(iv) The applicant is Marlborough Aquaculture Limited, a locally based marine farming company operating since the mid-1990s principally in the Pelorus Sound as well as elsewhere.

(v) Product from the farm is processed at Blenheim at Talley's factory.

(vi) The method of the activity is by standard long line method.

Activity Status

(vii) The application site is in the Coastal Marine Zone Two of the Marlborough Sounds Resource Management Plan ("MSRMP"). Extending a farm within 200 metres from mean low water mark is a *discretionary* activity. Extending a farm within 200 metres from mean low water mark is a *non-complying* activity

Location

(viii) The location is Four Fathom Bay in the Pelorus Sound. The proposed extension is within the envelope of the CMZ 2 Zone that is provided for along that part of the coast line of Four Fathom Bay. There is a strip of Sounds Foreshore Reserve which runs around the whole of Four Fathom Bay. The adjoining land (other than the Sounds Foreshore Reserve) is in private ownership and is in commercial forestry. Virtually all of the land surrounding Four Fathom Bay is predominantly in commercial forestry. There is a bach on Lot 2 DP 9828 but that is inshore of the adjoining marine farm, marine farm licence 010. The extension that is sought is to regularise the Applicants existing marine farm with both adjoining marine farms. Marine farm licence 033 which is two away from the Applicants farm is 250 metres out from mean low water mark. This was regularised by a decision of Council granted to the owner of the farm, Sanford Limited on 20 August 2008. The immediately adjoining marine farm has structures out to 250 metres from the mean low water mark but that farms position has not been regularised.

(ix) The adjoining marine farm is as said, marine farm licence 010. That makes it one of the oldest marine farms in New Zealand and dates from the late 1970's.

Ecological Assessment

(x) Attached to this assessment is an ecological report prepared by R J Davidson.

(xi) As can be seen from the report, there is no ecological reason identified in the report not to extend the farm as requested by the application.

(xii) None of that part of Pelorus Sound near to the application site, nor the adjoining land is identified as having any particular area of ecological value as identified in Appendix B of the MSRMP.

Assessment Criteria Under ("MSRMP")

(xiii) The proposed activity falls to be considered as a *non-complying* activity. There are no specific assessment criteria in MSRMP for marine farming beyond 200 metres below mean low water mark. There are specific and general assessment criteria at rule 35.4.2.9.1 where the marine farm is within 200 metres from mean low water mark. The application has been assessed utilising the following assessment criteria:

(a) Objectives and Policies of the New Zealand Coastal Policy Statement ("NZCPS")

The NZCPS is now generally supportive of aquaculture and particularly where there has already been significant modification by existing grants of consent. The NZCPS does not distinguish between aquaculture inside or outside of 200 metres from man low water mark. There is nothing that the Applicant believes is in the NZCPS that would militate against consent.

(b) Policies and objectives of the MSRMP

There are no policies and objectives of the MSRMP which suggest that a marine farm application (or extension) should be not given approval simply because it is beyond the 200 metre mark. The MSRMP is generally supportive of marine farming in the Marlborough Sounds. It is a key industry and its vibrancy and vitality is important for the area. The MSRMP considers it a positive use in general terms subject to specific matters which are addressed in the following paragraphs.

(c) Amenity Values

Marine farming in Four Fathom Bay is an activity which has occurred since the earliest time of marine farming in the Pelorus. The adjoining farm dates back to the 1970's. As noted above the applicants existing marine farm which is the subject of the application was originally applied for in 1995. The immediately adjoining land has no house on it. There is a house on Lot 2 DP 9828. This is a bach. The immediately adjoining land (other than Sounds Foreshore Reserve is part of Lot 10 DP 8847 owned by Turn Point Limited. That has a house on it but the house is on the north side of Turn Point. It can be accessed from Yncyca Bay, the beach directly below the house at Four Fathom Bay. The house on Lot 10 DP 8847 is approximately 750 metres away from the existing marine farm. It cannot be seen from the proposed site. The house on Lot 2 DP 9828 is significantly closer but the extensions are on the furthest away sides of the existing marine farm. The existing marine farm is not proposed to go any closer to that existing housing. Apart from the Foreshore Reserve, all the adjoining land is zoned rural one zone under the MSRMP. There is a small area of Sounds Residential land zoned on the south side of Four Fathom Bay but that is on the other side of five existing marine farms.

(d) Demand for Services

The proposed activity will not create a demand for services which is at a cost to the wider community. The base for support and service is at Havelock. Those facilities already exist and this proposal will not generate any necessary expansion demand.

(e) Landscape/Character of the Surrounding Area

The adjoining land is not identified as being an Area of Outstanding Landscape Value under the MSRMP. It lies in the central Sounds area.

The ridgeline in both the northern and southern parts of Four Fathom Bay is not identified as a prominent ridge.

The land is substantially modified from its natural state by the presence of commercial forestry on both sides of Four Fathom Bay.

(f) Significant Environmental Features

There are no special or significant environmental features present at the subject site. There is reference in the Plan to historic Kahikatea. However the commercial forestry has significantly modified the land that surrounds Four Fathom Bay.

(g) Historic Site/Archaeological Site/Wahi Tapu or other Taonga

The Applicant is not aware of any specific or special feature that will be adversely affected by the proposed activity.

(h) Hazardous Substances and Contaminants

The Applicant does not propose the use of any hazardous substances or the discharge of any contaminants other than those that are naturally occurring and biodegradable.

(i) Nature of Seafloor and Species found in the area

As to the sea floor and marine species, see the attached ecological report.

There is no identified King Shag habitat within the area.

(j) Navigational Issues

The boundary between CMZ 2 and CMZ 1 where it runs across the mouths of bays is considered to be the line of navigation. In addition there is a navigation light on Turn Point and another set of lights at One Tree Point and again at Black Point. These are the navigation lights used for vessels travelling along the Hikapu Reach at night that do not have any other form of navigation. The proposed extension lies within a line drawn between the two headlands of Four Fathom Bay. It is not considered that there is any risk to vessels navigating Hikapu Reach.

(k) There is no jetty or log loading site to the land immediately inshore of the proposed marine farm. There is a mooring inshore of the existing farm. It is not considered that the extension (on the opposite side of the farm to this mooring will cause any restriction to the existing mooring.

(l) Aesthetic and Cultural Matters

None of the landscape studies of the Marlborough Sounds (whether adopted by MDC or not) rank this particular are of the Pelorus as being outstanding or even high in landscape values.

(m) Fishing

There is sufficient area between the existing marine farm and the shore for any fishing activity to occur there. The proposed extension is over habitat that is not particularly likely to be targeted by fishermen. It is the type of habitat that marine farms in the Pelorus are generally sited over.

(n) Alienation of Public Space

This is considered to be insignificant in terms of the area and in light of levels of public use.

(o) Precedent Issues

The question here is whether the proposal introduces a new element of marine farming in the area or does something which is not in keeping with the two marine farms that are immediately adjoining the proposed extension. The proposal does not extend the pattern of development further into Four Fathom Bay than is already existing in the Bay.

(p) Term

A coastal permit is sought for the unexpired period of marine farm licence 8376.

(b) Where it is likely that an activity will result in any significant adverse effect on the environment, a description of any possible alternative locations or methods for undertaking the activity:

For the reasons given above there is not considered any significant adverse effect on the environment.

(c) Repealed

(d) An assessment of the actual or potential effect on the environment of the proposed activity:

See above

(e) Where the activity includes the use of hazardous substances and installations, an assessment of any risks to the environment which are likely to arise from such use:

Not applicable.

(f) Where the activity includes the discharge of any contaminant, a description of-

(i) The nature of the discharge and the sensitivity of the proposed receiving environment to adverse effects; and

See above

(ii) *Any possible alternative methods of discharge, including discharge into any other receiving environment:*

Not applicable.

(g) *A description of the mitigation measures (safeguards and contingency plans where relevant) to be undertaken to help prevent or reduce the actual or potential effect:*

(i) Marlborough Aquaculture Limited has adopted the Mussel Environmental Management System which includes an environmental policy and environmental code of practice

(ii) The marine farm is lit by an approved method and that will continue

(iii) The applicant in addition to the Mussel Industry Environmental Management System incorporates its own farming practice which keeps the adverse effects of the operation of the marine farm to a minimum. There have been no breaches to the existing coastal permit.

(h) *An identification of those persons interested in or affected by the proposal, the consultation undertaken, and any response to the views of those consulted:*

Contemporaneously with the application being lodged with Council, those persons considered to have an interest in the application will be provided with a copy of the application and consultation will occur. Those are considered to be the adjoining marine farmer, DOC and the land owner.

(i) *Where the scale or significance of the activity's effect are such that monitoring is required, a description of how, once the proposal is approved, effects will be monitored and by whom.*

(i) Mussel farming by its very nature requires good quality water. There is an active shellfish quality assurance program and a marine bitoxin monitoring program.

(ii) It is anticipated the Council will impose the same or similar conditions to those which applied to the immediately adjoining recent grant of Coastal Permit. The applicant has no objection to those being imposed.

1AA. *To avoid doubt, clause 1(h) obliges an applicant to report as to the persons identified as being affected by the proposal, but does not:*

(q) Oblige the applicant to consult with any person; or

(r) Create any ground for expecting that the applicant will consult with any person.

1A. Matters that must be included in an assessment of effects on the environment.

An assessment of effects on the environment for the purpose of section 88 must include, in a case where a recognised customary activity is, or is likely to be, adversely affected, a description of possible alternative locations or methods for the proposed activity (unless written approval for that activity is given by the holder of the customary rights order).

This is considered by the applicant not to apply.

2. **Matters that should be considered when preparing as assessment of effects on the environment.**

Subject to the provisions of any policy statement or plan, any person preparing an assessment of the effects on the environment should consider the following matters:

(a) Any effect on those in the neighbourhood and, where relevant, the wider community including any socio-economic and cultural effects:

Socioeconomic

There is a distinct benefit to the community from the Applicant's marine farming activity. Marine farming in the Pelorus Sounds provides employment for those in the local area and those in the wider area. Farming mussels provides for employment at Blenheim, Havelock and elsewhere. This is a recognised positive effect of marine farming.

Cultural

It is not considered there will be any cultural effects as a result of the activity being granted.

(b) Any physical effect on the locality, including any landscape and visual effects:

Visual landscape

The MSRMP has recognised the possibility of marine farming at the subject site. It is a controlled activity. The Application is to extend seawards to a modest extent along with changing the existing farm layout.

Effects on Navigation

See above.

(c) Any effect on ecosystems, including effects on plants or animals and any physical disturbance of habitats in the vicinity:

This topic has been dealt with above.

(d) Any effect on natural and physical resources having aesthetic, recreational, scientific, historical, spiritual, or cultural, or other special value for present or future generations:

There is significant recreational use of the Pelorus Sounds. That occurs in many forms: fishing and water sports. Neither of these occur at the subject site. Recreational activity is unlikely to be adversely affected by the proposed change of the structures and the modest extension. There is no issue as to commercial fishing.

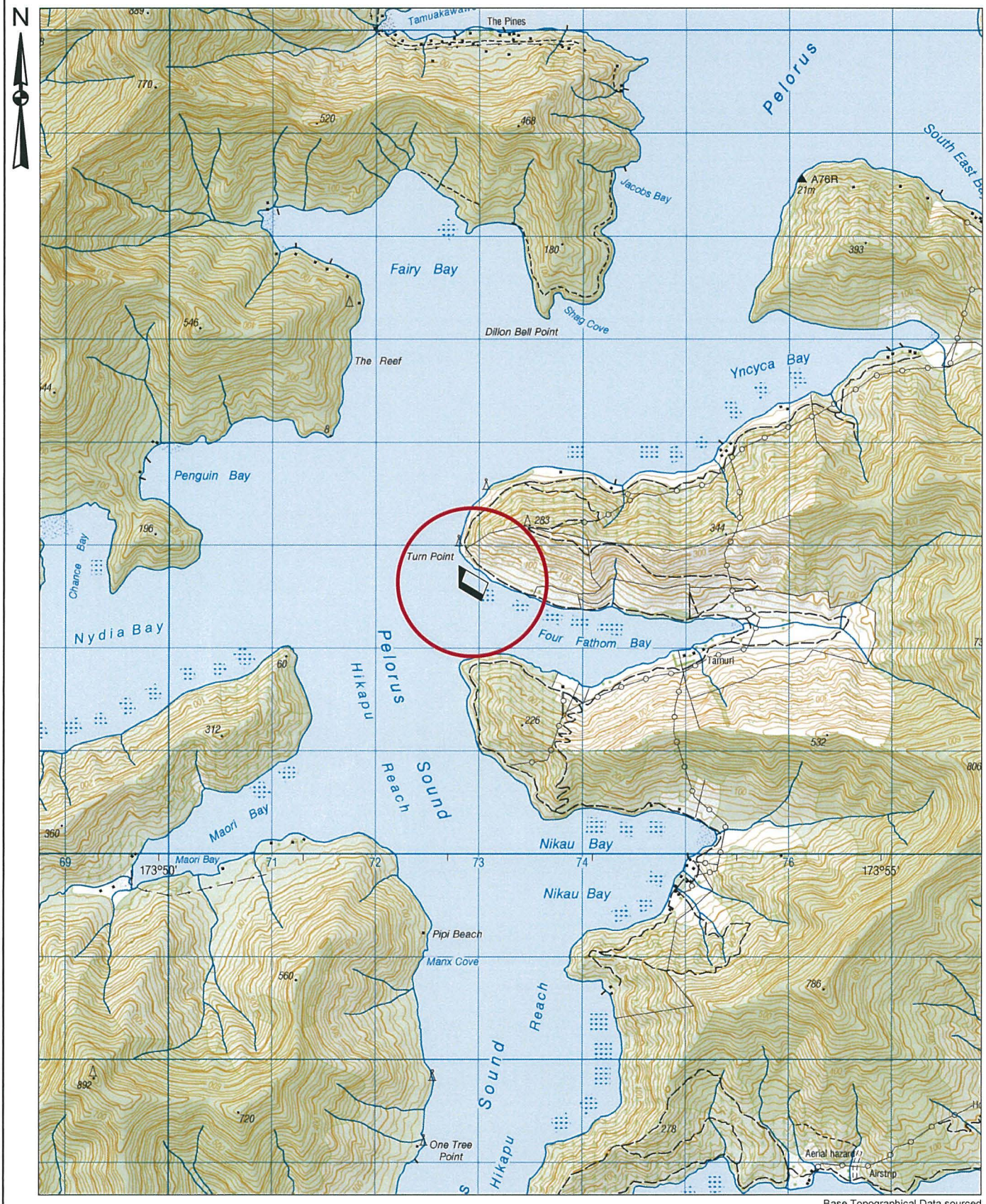
(e) Any discharge of contaminants into the environment, including any unreasonable emission of noise and options for the treatment and disposal of contaminants:

There is no unreasonable emission of noise and treatment of contaminants is not appropriate.

As to the effect of marine farming on the benthos see the attached ecological report.

(f) *Any risk to the neighbourhood, the wider community, or the environment through natural hazards or the use of hazardous substances or hazardous installations:*

This is not considered to be relevant to the current application.



Topomap 50 Sheet: BP28

Locality Map

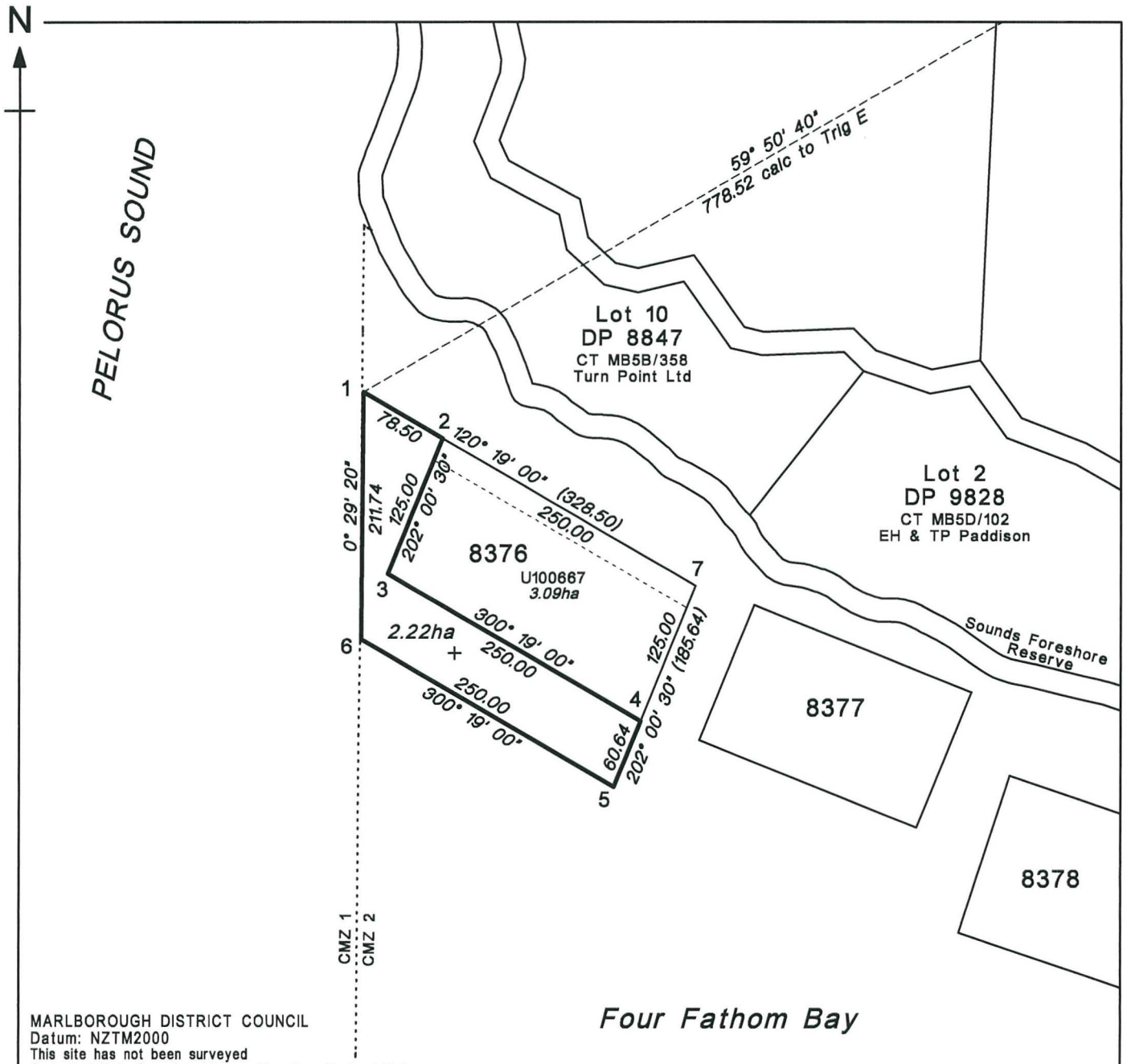
Proposed Extension to Marine Farm 8376
Four Fathom Bay - Pelorus Sound

Scale 1:50,000

500 0 500 1000 1500 2000 2500 3000 3500 Meters

DPL
Draughting Plus Limited

Prepared
21 May 2014



MARLBOROUGH DISTRICT COUNCIL
Datum: NZTM2000
This site has not been surveyed
Cadastral Data from Land Information New Zealand Data

SCHEDULE OF COORDINATES
DATUM: NZTM2000

Point	East	North
1	1672801.45	5444804.89
2	1672869.22	5444765.27
3	1672822.37	5444649.38
4	1673038.18	5444523.18
5	1673015.46	5444466.97
6	1672799.64	5444593.16
7	1673085.03	5444639.07
Centroid	1672879.54	5444581.19
Trig E	1673474.61	5445195.98

Proposed Coastal Permit

Being Extension to Marine Farm 8376

Four Fathom Bay

50 0 100 200 300 400 metres

SCALE 1:5,000

Prepared by
DRAUGHTING PLUS LTD
21 May 2014

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MF 2339
MARLBOROUGH DISTRICT COUNCIL

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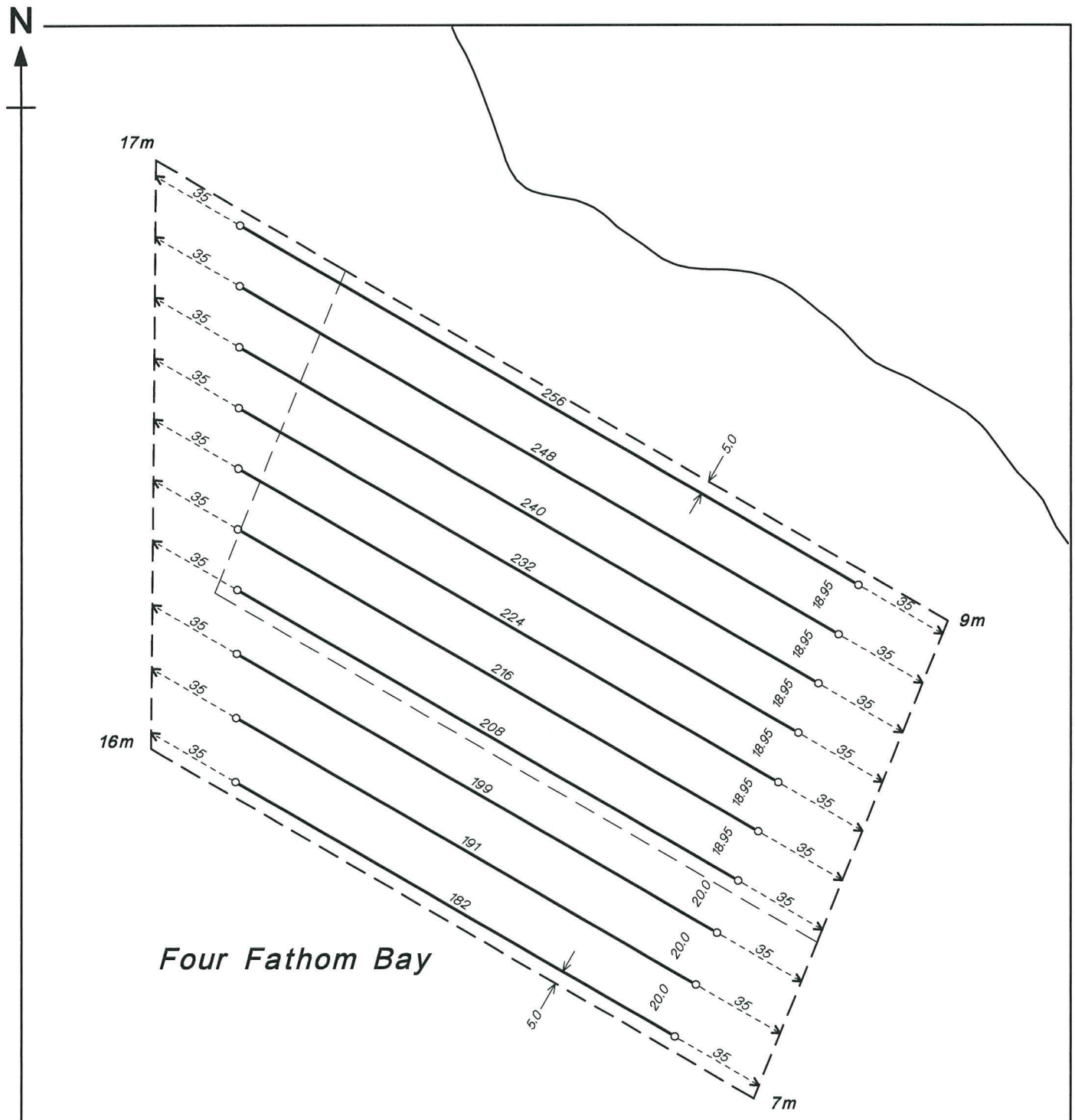

REFERENCE

- Orange Float
- Anchors
- Anchor Warp (32mm Rope)
- Backbone (24-28mm Rope)

NOTE: Longline Spacing = 18.95m & 20.0m
Total Longlines = 10
Total Backbone Length = 2196m
Warp Surface Loss = 35m

Layout Details

MF Site 8376 and Extension

SCALE 1:2,000

20 0 20 40 60 80 100m

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- 2 MAR 2015
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Prepared by
Draughting Plus Ltd
21 May 2014

MF_2339

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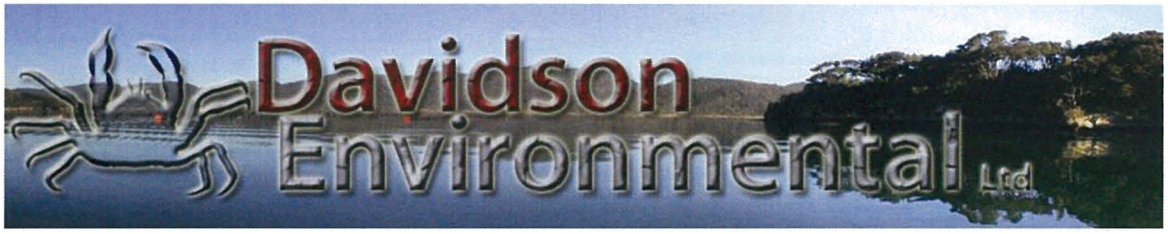

Davidson Environmental Limited

Ecological report for a proposed extension to marine farm 8376 located in Four Fathom Bay, Pelorus Sound

Research, survey and monitoring report number 793

A report prepared for:
Marlborough Aquaculture Limited
C/o Scott Madsen
120 Lindens Road RD 3
Blenheim 7273

March 2014

Bibliographic reference:

Davidson, R.J. 2014. Ecological report for a proposed extension to marine farm 8376 located in Four Fathom Bay, Pelorus Sound. Prepared by Davidson Environmental Ltd. for Marlborough Aquaculture Limited. Survey and monitoring report no. 793.

Prepared by:

Davidson Environmental Limited
P.O. Box 958, Nelson 7040
Phone 03 545 2600
Mobile 027 445 3352
e-mail davidson@xtra.co.nz

March 2014

1.0 Introduction

The aim of the present study was to provide benthic biological information in relation to a proposed extension to an existing marine farm (8376) located along the northern shoreline of Four Fathom Bay, south of Turn Point (Figure 1, Plates 1 and 2). The proposed extension would add approximately 1.8 ha alongshore and offshore to the 3 ha parent farm.

The present investigation describes the benthos, habitats and ecological attributes associated with the extension application. The report provides biological information using GPS with remote sensing technologies (drop camera, side imaging and vertical scan sonar).

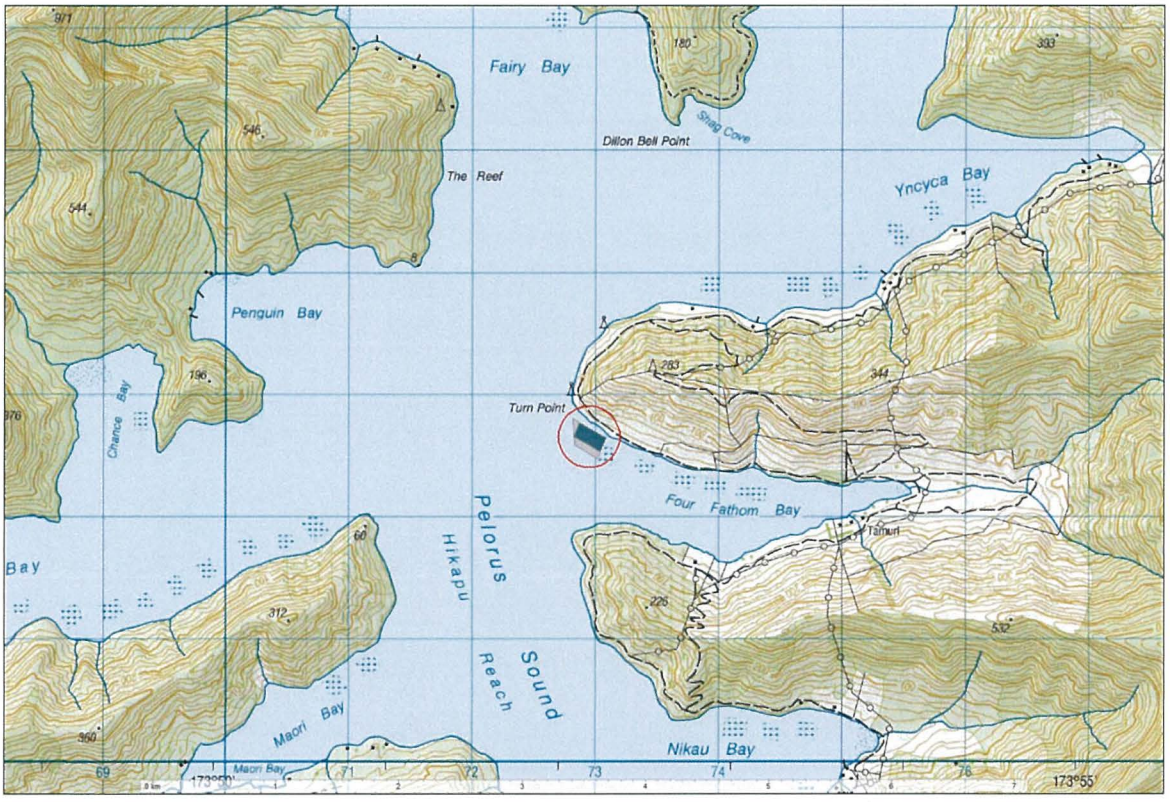

Figure 1. Location of the parent marine farm (teal) and proposed extension (grey) located in Four Fathom Bay, Pelorus Sound.

Plate 1. Proposed marine farm extension (grey) and parent farm (teal) in Four Fathom Bay.

Plate 2. Looking north-westward towards the existing long-lines of 8376. Photo taken at the south eastern offshore end of the proposed extension.

2.0 Background information

2.1 Study area

Four Fathom Bay is a small, west-facing bay on the eastern shore of inner Pelorus Sound, between Hikapu and Popoure Reaches. Four Fathom Bay has a coastline length of approximately 6.1 km and covers an area of sea of approximately 146.5 ha. The mouth of Four Fathom Bay is approximately 1150 m wide. Four Fathom Bay is approximately 21.5 km by sea from Havelock.

A number of existing consented marine farms are located west and north of the present farm (Figure 2).

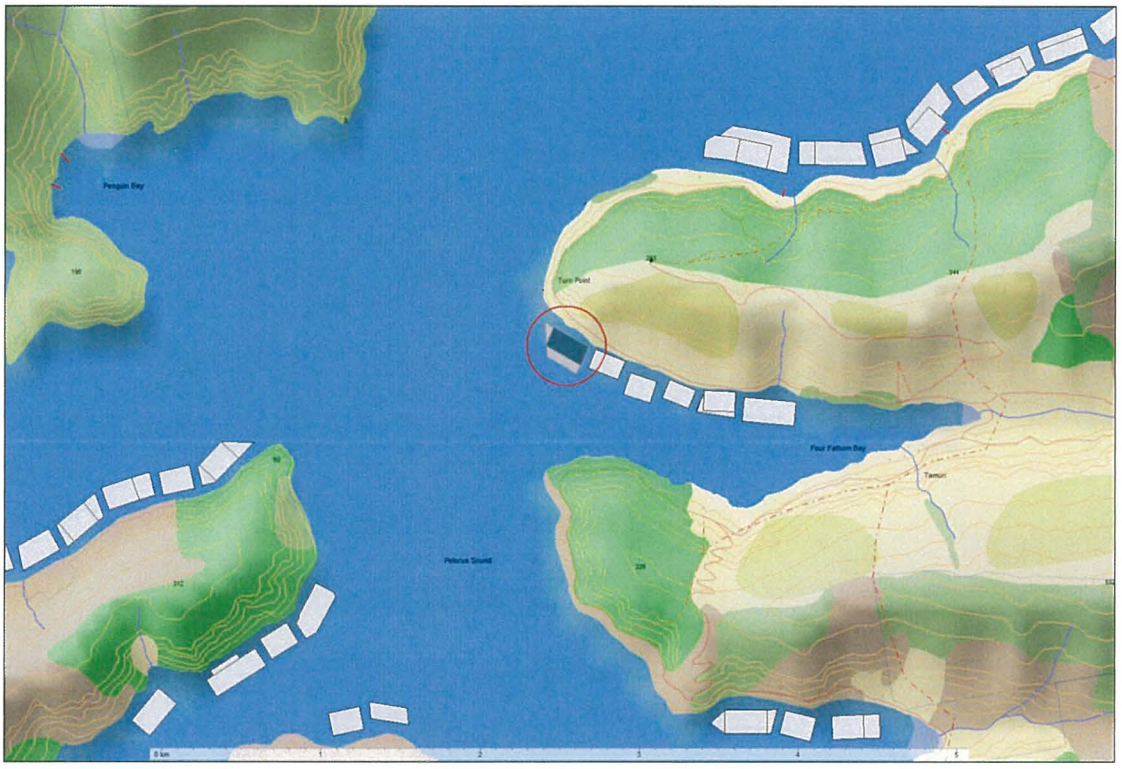

Figure 2. Location of the application and consented marine farms in the vicinity (white).

2.2 Historical reports

One biological report was found in relation to the application for the parent farm (U951214) (Bolton and Richie 1995). The authors of the report stated:

"Immediately below the intertidal zone, the substrate is either small cobbles or broken rock with occasional patches of soft substrate (sand with broken shell) interspersed amongst it. With an increase in both the depth and the distance from shore, there is an increase in the amount of soft substrate interspersed amongst the rocks and cobbles. There is a fine covering of silt on the hard substrate and on the larger brown seaweeds.

The rocky substrate supports 33 species (7 plant and 26 animal) species that were seen. Overall, this inshore area does not support a high diversity of species. This could be, in part attributed to the fact that there is a layer of silt covering the brown algae and the substrate, making this area unsuitable for some species to colonise.

The soft substrate in this area supports 25 species. Most species present have a very patchy distribution and are low in abundance, however red seaweeds (consisting of 3 predominant species) have a moderate abundance in this area.

On the mud/silt substrate were cushion stars (mean density of 1.6 m^2), red seaweed sp. (mean density of 5%; of this 80% is *Iridaea* sp. and 20% Rhodymenia dichtoma) and hydroid sp. (mean density of 0.4 m^2).

Where the mud/silt substrate was mixed with some dead shell material were cushion stars (mean density of 1/m^2), red seaweed sp. (mean density of 9.5%; of this 50% is *Rhodymenia dichotoma*, 45% *Aeodes* sp. and 5% *Iridaea* sp), hermit crabs (mean density of 16.4 m^2), and sea cucumbers (mean density of 0.3 m^2).

There is a noticeable difference in species occurrence along the transects. Along transect 2 (outer most transect), there are more hydroids present than on transect 1. As a consequence of their being more hydroids, the nudibranch species *Jason mirabilis* is also present (3 individuals). This beautiful animal is always found in association with hydroids, as it feeds on the hydroid polyps. It is postulated that the greater abundance of hydroids along

the outermost transect is due to the fact that this area is swept by tidal currents; these currents would bring in the nutrients for the hydroid polyps to feed on. An overall total of 50 species (11 plant and 39 animals) species were found in the survey area. These species are widespread and common species.

None of the ecological trigger species/communities present in this his area occurred at densities that are considered to be ecologically important (based on guidelines outlined by the Department of Conservation, 1995).

It should be noted that during the survey two *Hydrodendron* trees were seen; the trigger level for this species is the sighting of more than 3 individuals.

Red algae species were also present in the area, they had a moderate abundance (mean densities of 5% on the mud/silt substrate and 9.4% on the shell/mud substrate), and a random pattern to their distribution. The trigger level for a macroalgae bed, is a bed with greater than 10% cover in a distinct zone. There was no such distinct zone in this area."

3.0 Methods

A benthic biological survey for the proposed extension was conducted on 20th January 2014 Prior to fieldwork, the proposed marine farm application and parent farm corners were plotted onto mapping software (TUMONZ Professional). The laptop running the mapping software was linked to a Lowrance LC X-15_{MT} GPS receiver allowing real-time plotting of the corners of marine farm surface structures and to pinpoint drop camera stations in the field. This GPS system has a maximum error of +/- 5 m.

The depth at each corner of the proposed marine farm was surveyed using real-time GPS. The corner positions of marine farm surface structures associated with the parent farm were also plotted by positioning the vessel adjacent to corner floats. It should be noted that surface structures can move due to environmental variables such as tidal current and wind. The plot of surface structures is variable from day to day and over the duration of tidal cycles. These data should not therefore be regarded as a precise measurement of the position of surface structures, but rather an approximate position.

3.1 Sonar imaging

Sonar investigations of the area were conducted using a Lowrance HDS-10 Gen 1 and HDS-8 Gen2 linked with a Lowrance StructureScan™ Sonar Imaging LSS-1 Module. These units provide right and left side imaging as well as DownScan Imaging™. The unit also allows real time plotting of StructureMap ™ overlays onto the installed Platinum underwater chart.

Prior to the collection of underwater photographs, the boundaries of both the consent area and the marine farm surface structure area were investigated using the sonar. Any bottom abnormalities such as reefs, hard substrata or abrupt changes in depth were noted for inspection using the drop camera (see section 3.2).

3.2 Drop camera stations, site depths

A total of 18 drop camera photographs were collected during the survey. Photographs were collected from within the proposed extension area and along the inshore boundary of the parent farm (Figure 3).

At each site, a Sea Viewer underwater splash camera fixed to an aluminium frame was lowered to the benthos and an oblique still photograph was collected where the frame landed. The location of photograph stations was selected in an effort to obtain good coverage of the proposed application area. Additional photographs were taken when any features of particular interest (e.g. shell debris, reef structures, and cobbles) that were observed on the remote monitor on-board the survey vessel or from sonar and depth soundings. All photographs collected during the survey have been included in Appendix 1.

4.0 Results

4.1 Application corner depths

The depths along the inshore proposed extension boundary ranged from 7.2 m to 17 m (Figure 3). The offshore corner depths of the proposed extension ranged from 7.3 to 16 m (Table 1, Figure 3). Depths and locations of all drop camera stations have been listed in Table 2 and plotted in Figure 4. Presently the outer boundary of the proposed extension aligns with the outer line of backbones positioned on the adjacent farm to the east of 8376 (Figure 3).

Depths in the proposed extension increased from inshore to offshore and from east to west. Deepest areas were located along the western boundary closest to the main channel of Hikapu Reach.

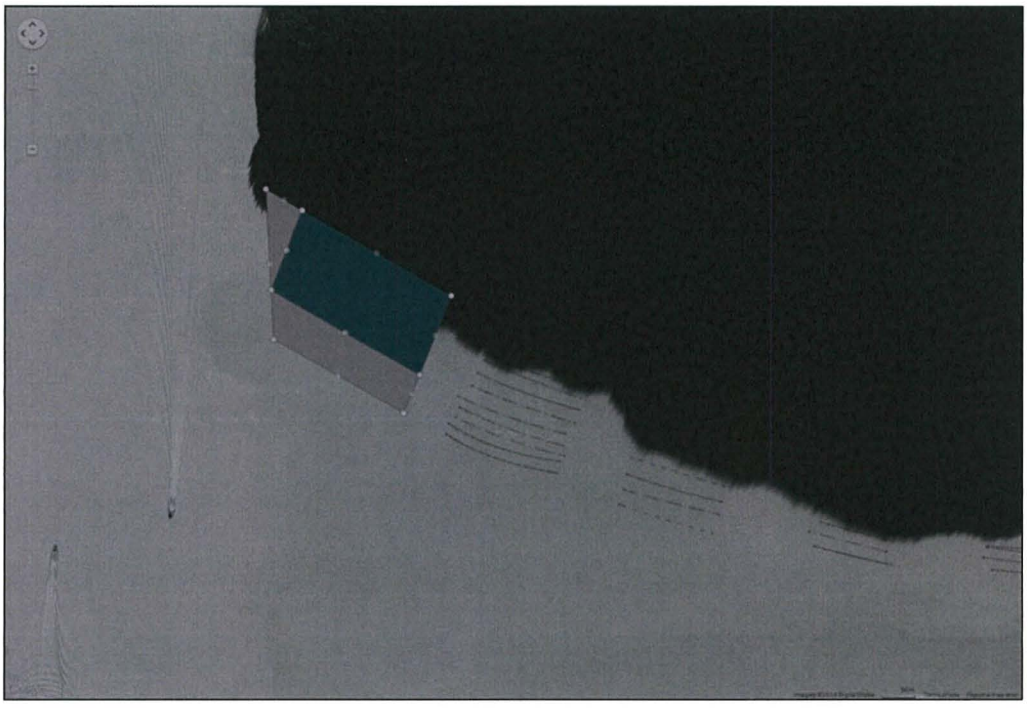

Figure 3. Location of parent farm (teal), proposed extension (grey) and backbone lines of adjacent farms.

Presently there is one block of farm structures associated with the parent farm. The offshore backbone line is presently located offshore of the consent within the proposed extension. All other surface structures were located within the parent farm (Figure 4).

Table 1. Depths recorded from the corners of proposed extension and the extent of surface farm structures. Depths adjusted to datum. Coordinates = NZTM (Northing/Easting).

Type	No. & Depth (m)	Coordinates
Consent corner	D, 8.5m	1673085.0,5444639.1
Extension corner	1, 17m	1672816.7,5444796.7
Extension corner	2, 16m	1672825.3,5444577.9
Extension corner	3, 7.3m	1673014.6,5444468.3
Extension corner	4, 7.2m	1673038.2,5444523.3
Extension corner	5, 15.7m	1672822.4,5444649.5
Extension corner	6, 12.8m	1672869.1,5444765.5
Structure corner	A, 13m	1672836.9,5444615.3
Structure corner	B, 11.4m	1672900.8,5444744.7
Structure corner	C, 7.2m	1673072.8,5444621.8
Structure corner	D, 7.2m	1672999.9,5444532.6

4.2 Substratum, habitats and species

Substratum and habitat distribution relative to the proposed marine farm application were based on 18 drop camera images combined with depth soundings and sonar scans (Table 2, Appendix 1).

The proposed extension area was dominated by silt and clay sized particles (Plate 3). Silt and clay with isolated clumps of red algae were observed in a small number of photographs (Table 2, Plate 4). An occasional finger sponge was also observed from the proposed extension (Appendix 1). Low levels of mussel shell debris were observed form two photos in the extension (Plates 4 and 5).

The area inshore of the parent farm was characterised by coarser substratum in the form of shell hash or silt and natural shell (Plate 6). In this area natural shell was abundant and

supported a greater variety of surface dwelling species compared to offshore areas. Area within the extension supported relatively few surface dwelling (epibenthic) species. Occasional finger sponges, red algae clumps were observed from photos. No horse mussels or scallops were recorded from drop camera photos collected from the proposed extension area during the present study. It is however, probable that occasional horse mussels and scallops will be present, but their absence from photos suggests they are uncommon.

4.3 Mussel shell debris

Photos collected from areas under and close to existing backbones showed mussel debris levels were relatively low compared to many mussel farms in the Sounds (Appendix 1, Table 2). Levels of shell debris were either none or low (Plates 4 and 5, Table 2).

4.4 Sonar

The side imaging sonar run from along the inshore boundary of the parent farm and extension showed a relatively featureless benthos. No reef structures extended into the proposed extension (Figure 6).

A small area of mussel shell debris was observed form the proposed extension. This was also observed form photo 8 (Plate 4). Natural shell areas observed inshore and close to the parent farm boundary were also observed from the sonar run. Cobble areas were located well inshore of the parent farm.

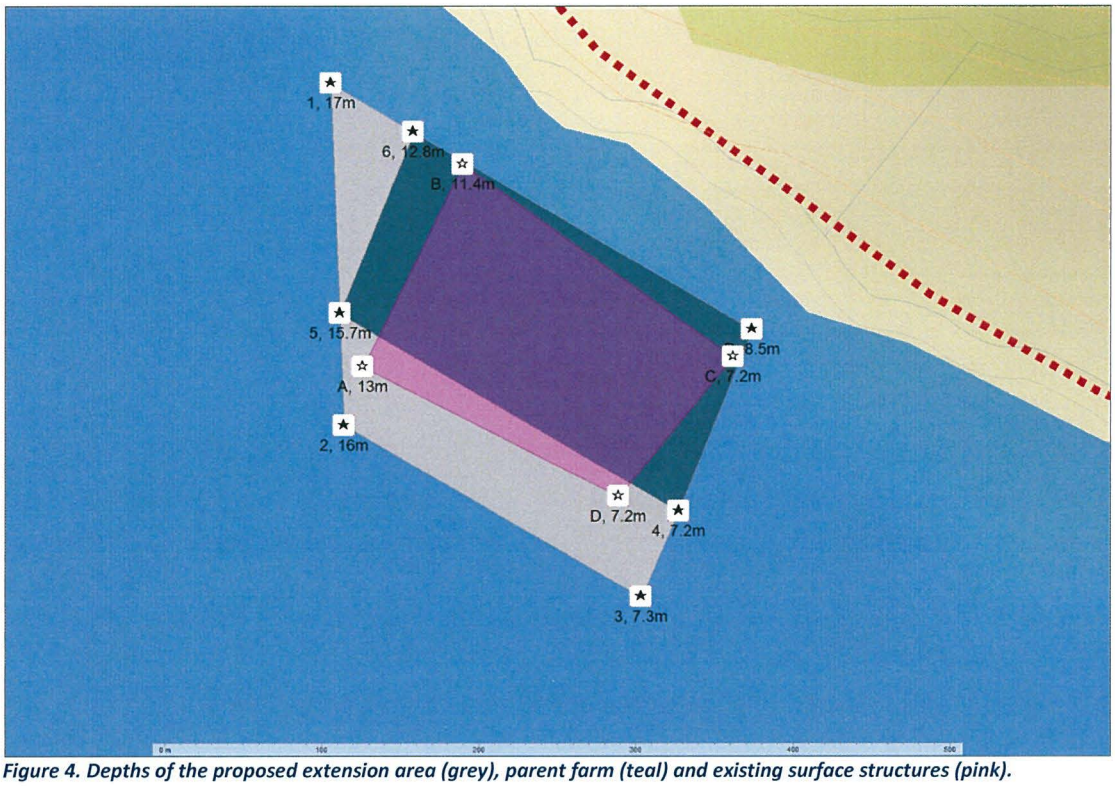

Figure 4. Depths of the proposed extension area (grey), parent farm (teal) and existing surface structures (pink).

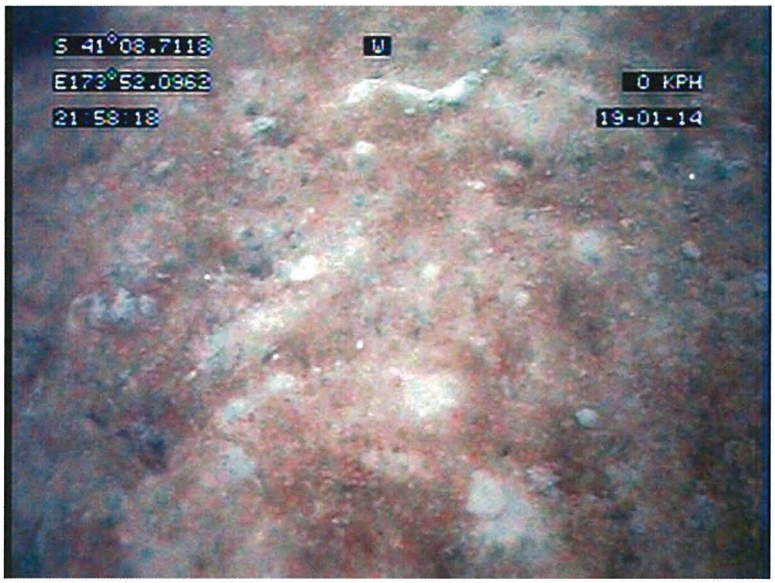

Plate 3. A representative example of silt and clay substratum recorded from the proposed extension (photo 2, 12.2 m).

Plate 4. Silt with isolated clumps of red algae in extension (photo 8, 12 m).

Plate 5. Silt and clay with low level mussel shell debris in extension (photo 9, 12 m).

Plate 6. Silt and clay with a natural shell and red algae recorded inshore of the parent farm boundary (photo 17, 7.7 m).

Table 2. Coordinates of drop camera stations showing location relative to the marine farm application (NZTM). Colours are: blue = outside application and no farm structures, grey = inside application (under warps or in areas with no structures) teal = parent farm. Depth, substratum and biological feature data are also listed. Mussel debris in photos is ranked as: None = no mussel shell debris, Low = 1-30%, Moderate = 31-50%, Moderate to High = 51-75%, and High = 76-100% cover.

No. & Depth (m)	Coordinates	Location	Position	Substratum	Shell debris
1, 16.1m	1672822.6,5444776.6	In proposed extension	No structures	Silt and clay	None
2, 12.2m	1672862.0,5444758.2	In proposed extension	No structures	Silt and clay	None
3, 14.3m	1672835.5,5444716.1	In proposed extension	No structures	Silt and clay	None
4, 18.2m	1672814.8,5444742.9	Alongshore of proposed extension	No structures	Silt and clay	None
5, 17.4m	1672808.1,5444675.8	Alongshore of proposed extension	No structures	Silt and clay	None
6, 16m	1672816.4,5444638.0	Alongshore of proposed extension	No structures	Silt and clay	None
7, 16m	1672803.2,5444607.3	Alongshore of proposed extension	No structures	Silt and clay	None
8, 12m	1672853.7,5444588.5	In proposed extension	No structures	Silt and clay, mussel shell	Low
9, 9.2m	1672907.0,5444576.3	In proposed extension	Close to backbones	Silt and clay, mussel shell	Low
10, 8.2m	1672935.2,5444539.9	In proposed extension	No structures	Silt and clay	None
11, 7.4m	1672996.0,5444501.4	In proposed extension	No structures	Silt and clay	None
12, 7.3m	1673023.3,5444480.6	Alongshore of proposed extension	No structures	Silt and clay	None
13, 7.7m	1672967.0,5444559.6	In proposed extension	Under backbones	Silt and clay	None
14, 9.5m	1672887.7,5444606.9	In proposed extension	Under backbones	Silt and clay, mussel shell	Low
15, 10.2m	1672905.2,5444754.4	Inshore of parent farm	Close to backbones	Silt, natural shell hash	None
16, 8.9m	1672967.1,5444714.5	Inshore of parent farm	Close to backbones	Silt, mussel shell	Low
17, 7.7m	1673021.9,5444694.4	Inshore of parent farm	No structures	Silt, natural shell, red algae	None
18, 8.5m	1673077.4,5444645.5	Inshore of parent farm	No structures	Silt, natural shell, red algae	None

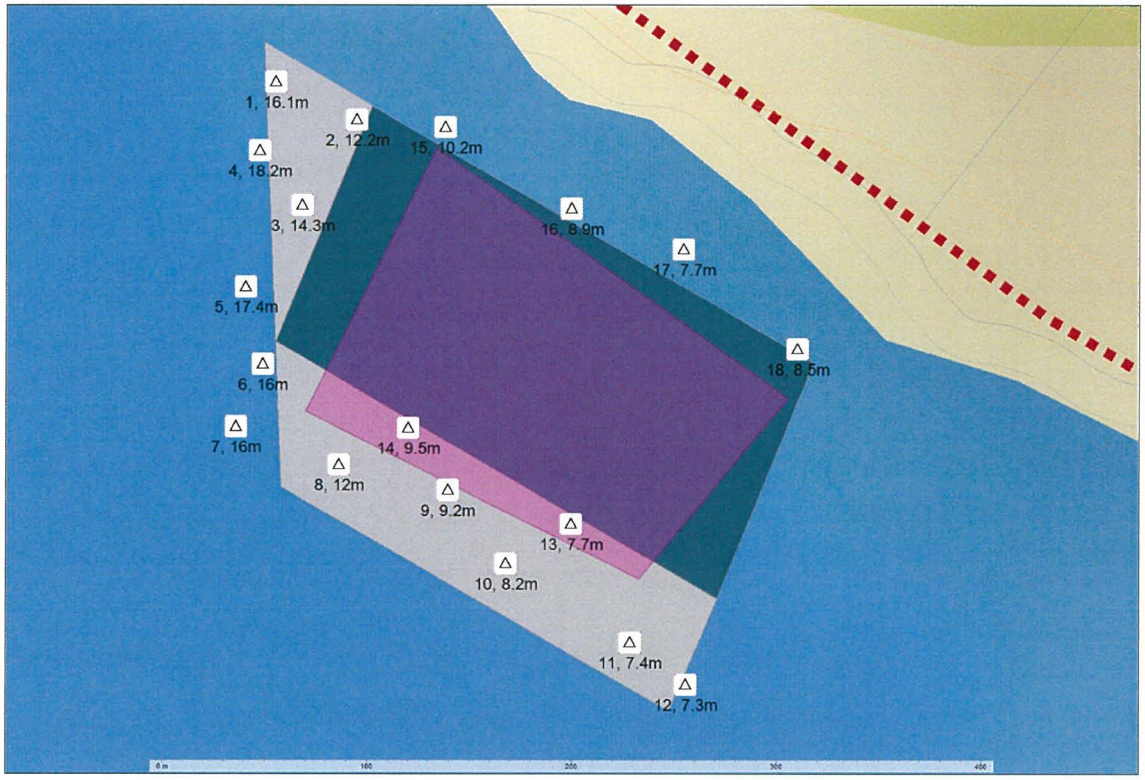

Figure 5. Drop camera stations (triangles). Numbers are the photo number and water depth (m).

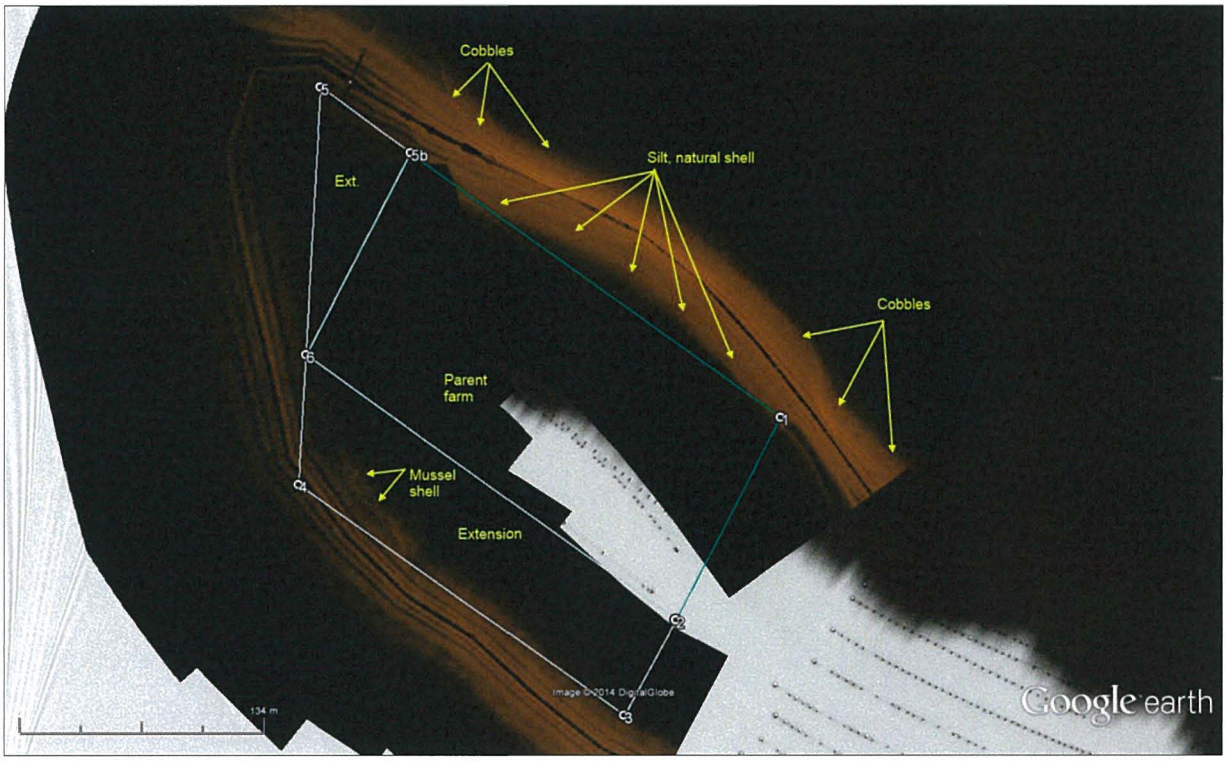

Figure 5. Sonar imaging run from the extension and inshore of the parent farm.

5.0 Summary and conclusions

5.1 Substratum and biological values

All of the proposed extension area was characterised by soft substratum composed primarily of silt and clay (mud). Very little natural shell material was also observed from the proposed extension. Silt and clay is widespread and common in the Marlborough Sounds. Mud (silt and clay) has been traditionally targeted by marine farming activities. No biological communities of particular interest such as red algae beds or horse mussels were recorded from the proposed extension area.

No hard substratum was located within the proposed extension. No known species or habitats considered ecologically significant were observed from within the application area (see Davidson *et al*. 2011 for significant areas in Marlborough).

Silt and shell hash communities, red algae as well as cobbles were recorded from inshore of the parent farm. These communities support a wider range of surface dwelling species than were observed form the extension.

5.2 Impact

The applicant proposes to farm a variety of shellfish and the likely species farmed will be mussels. The impact of a mussel farm in the Marlborough Sounds has been well documented (see Keeley *et al*. 2009 for review) and it is probable that the present extensions, if established, will conform to the known range of impacts for this activity.

Based on existing studies on the impact of mussel farms in the Marlborough Sounds and around New Zealand, it is unlikely that impacts would be detectable beyond 10-20 m from the droppers. Based on the existing knowledge base on mussel farms impacts, it is unlikely the inshore habitats located along this shoreline would be impacted should the extension be granted.

5.3 Boundary modifications and monitoring

Based on ecological data collected during the present study, no adjustments to the proposed extension boundaries or the parent farm are suggested. Further, based on substratum and habitats found in the proposed extension area, no monitoring or staging is suggested.

References

Bolton, L.A. and Ritchie, A.D. 1995. Ecological assessment of a site in Four Fathom Bay, Pelorus Sound. Unpublished report prepared for Marlborough Aquaculture Ltd.

Davidson R. J.; Duffy C.A.J.; Gaze P.; Baxter, A.; DuFresne S.; Courtney S.; Hamill P. 2011. Ecologically significant marine sites in Marlborough, New Zealand. Co-ordinated by Davidson Environmental Limited for Marlborough District Council and Department of Conservation.

Keeley, N.; Forrest, B.; Hopkins, G.; Gillespie, P.; Clement, D.; Webb, S.; Knight, B.; Gardner, J. 2009. Sustainable aquaculture in New Zealand: Review of the ecological effects of farming shellfish and other non-finfish species. Cawthron Report No. 1476. 150p.

Appendix 1. Drop camera photographs

Photo site 1

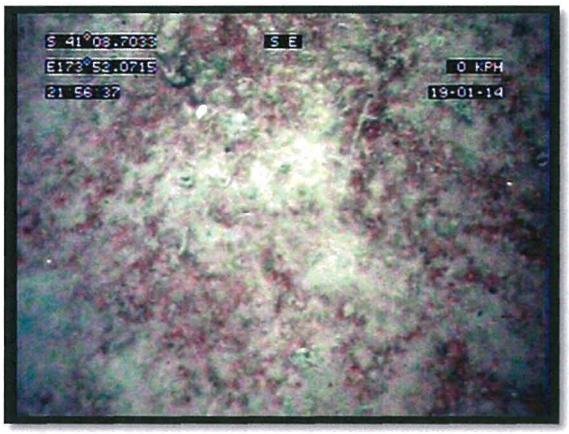

Photo 2

Photo site 3

Photo 4

Photo site 5

Photo 6

Photo site 7

Photo 8

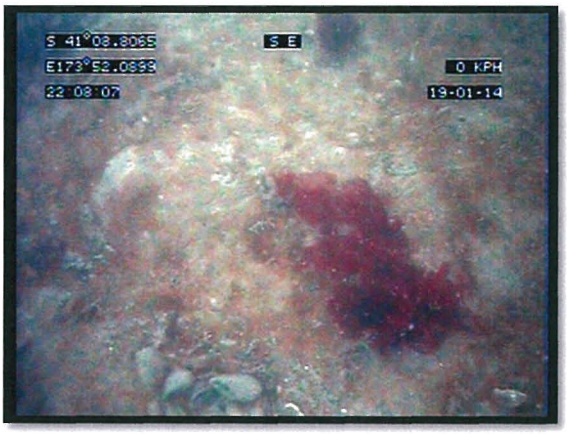

Photo 9

Photo 10

Photo site 11

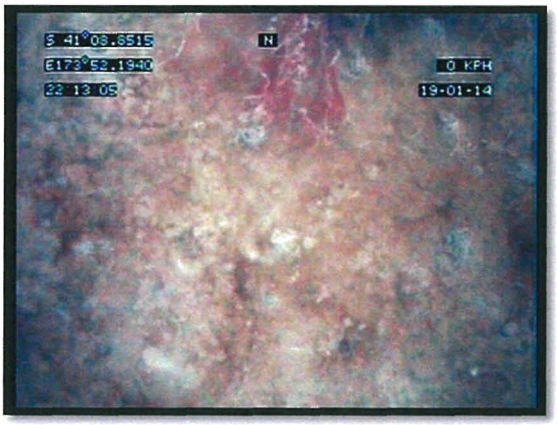

Photo 12

Photo 13

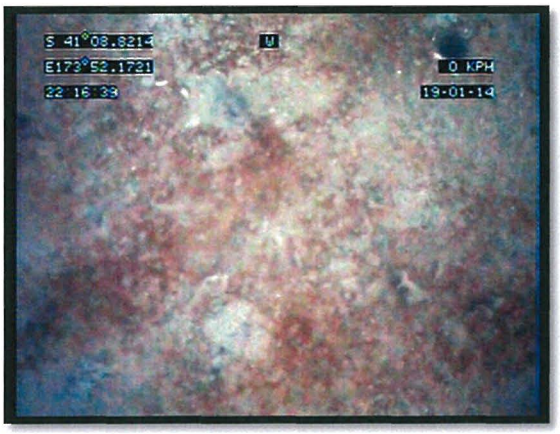

Photo 14

Photo 15

Photo 16

Photo 17

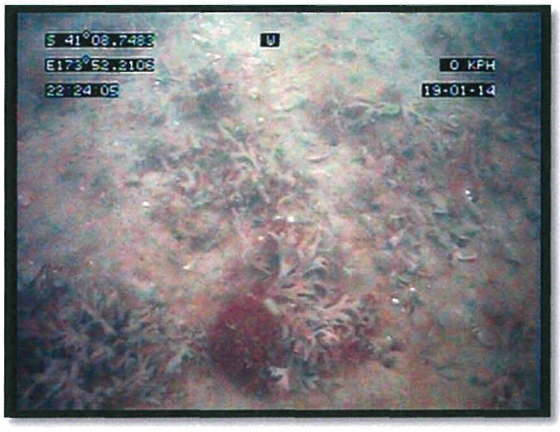

Photo 18