Resource Consent Application

MARLBOROUGH DISTRICT COUNCIL

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

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-CI1579

Lodgement Fee Paid $ 945.00

Receipt No. 1781407.

Consent No.

Case Officer:

Date Received:

RECEIVED
29 AUG 2016
MARLBOROUGH DISTRICT COUNCIL

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

Name: *(full legal name)* Peter Whitelaw Archer

Mailing address: *(including post code)*
Tuna Bay
RD 5
RAI VALLEY

Email Address: bornholm@conect.co.nz

Phone: (Daytime) (03) 576 5081 Phone: (Mobile) _____ Fax: _____

2. Agent Details *(If your agent is dealing with the application, all communication regarding the application will be sent to the agent.)*

Name: R D Sutherland

Mailing address:
Property and Land Management Services Ltd
PO Box 751
BLENHEIM 7240

Email Address: palmsltd@xtra.co.nz

Phone: (Daytime) (03) 578 1733 Phone: (Mobile) 027 220 7299 Fax: (03) 578 1797

3. Consent/Application Details

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

4. Brief Description of the Activity

To renew marine farm site 8184 being MFL 237, MPE 648 and U100403, area of site is 4.32 ha. To remove part of the inshore section of the farm to avoid hard rock and cobble habitat and reposition the farm further offshore.

To cultivate Green Shell mussels (Perna *canaliculus)*, Blue Shell Mussels *(Mytilus edulis)*, Scallops *(Pecten novaezelandiae)*, Flat Oysters *(Toistrea lutaria)* and seaweed *(Macrocystis pyrifera, Ecklonia radiata, Gracilaria, Pterocladia lucida and Undaria pinnatifida).*

To disturb the seabed with anchoring devices and to take and discharge seawater and organic material at harvest.

5. Supplementary Information Provided? ☐ Yes ☐ No

Council has supplementary forms for some activities, such as moorings, water permits, domestic wastewater, discharge permits, to assist applicants with providing the required information.

6. Property Details

The location to which the application relates is (address): Marine farm site 8184 Hallam Cove

Legal description (i.e. Lot 1 DP 1234): _____

(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 that is less than 3 months old (except for coastal or water permits.)

The names and addresses of the owner and occupier of the land (other than the applicant):

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

Note: 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.

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

I attach, in accordance with the Schedule Four of the Resource Management Act 1991, an assessment of environmental effects in a level of detail that corresponds with the scale and significance of the effects that the proposed activity may have on the environment. Applications also have to include consideration of the provisions of the Resource Management Act 1991 and other relevant planning documents.

Note: Failure to submit an AEE will result in return of this application.

8. 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. ☐ **Yes** ☐ **No**

9. Fees

1. The applicable lodgement (base) fee is to be paid at the time of lodging this application. If payment is made into Council's bank account 02-0600-0202861-02, please put Applicant Name and either U-number, property number or consent type as a reference. If you require a GST receipt for a bank payment, please tick ☐
2. The final cost of processing the application will be based on actual time and costs in accordance with Council's charging policy. If actual costs exceed the lodgement fee an invoice will be issued (if actual costs are less, a refund will be made). Invoices are due for payment on the 20th of the month following invoice date. Council may stop processing an application until an overdue invoice is paid in full. Council charges interest on overdue invoices at 15% per annum from the date of issue to the date of payment. In the event of non-payment, legal and other costs of recovery will also be charged.
3. Please make invoice out to: ☑ Applicant ☐ Agent
   (if neither is ticked the invoice will be made out to Applicant)

10. Declaration

I *(please print name)* R D Sutherland

Confirm that the information provided in this application and the attachments to it are accurate.

Signature of ~~applicant~~ or authorised agent: RD Sutherland

Date 29-8-2016

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.

Topomap 50 Sheet: BP28

PROPERTY AND LAND MANAGEMENT SERVICES
PALMS

Prepared
12 February 2016

Locality Map

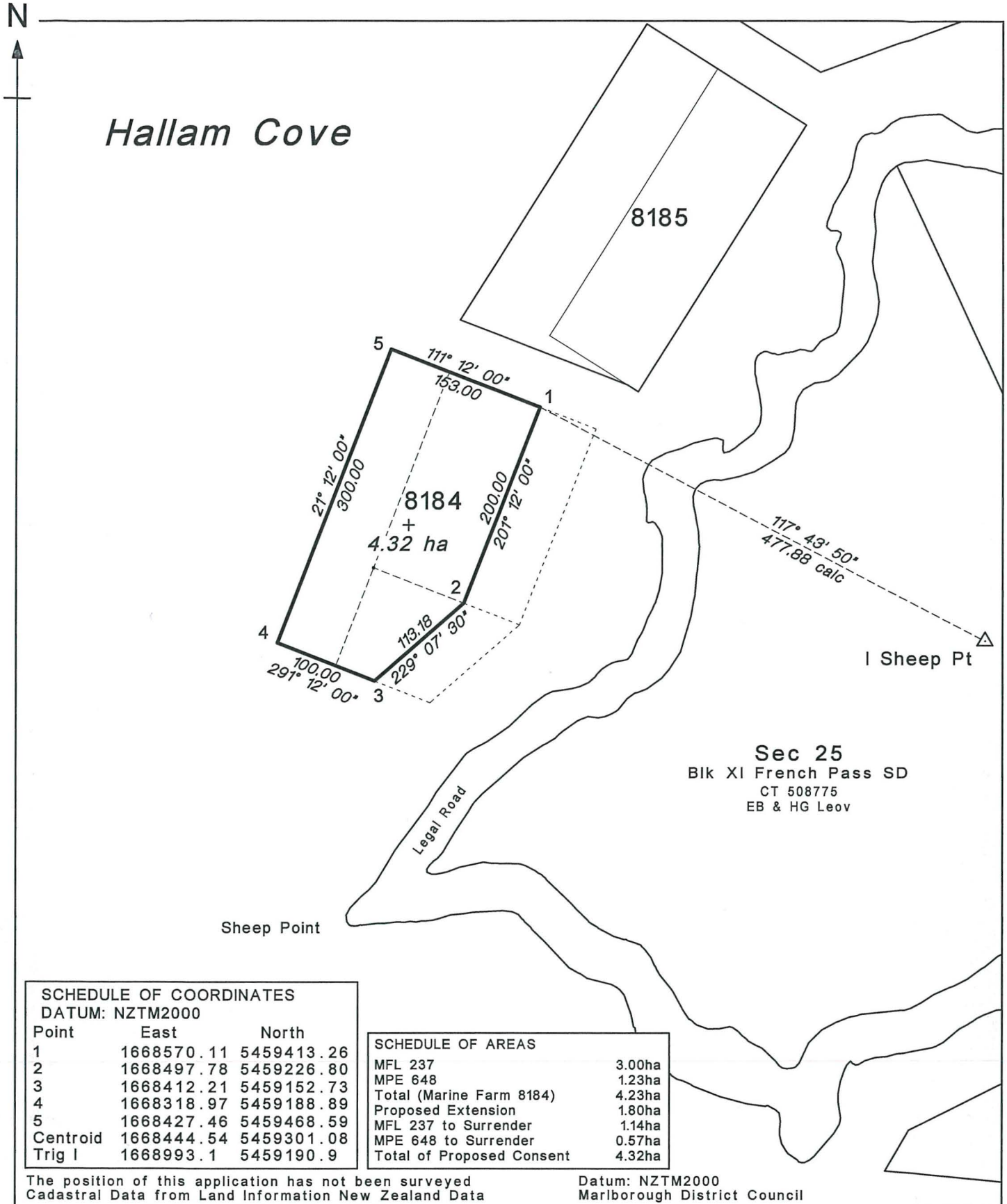
Marine Farm 8184

Hallam Cove - Pelorus Sound

Scale 1:50,000

500 0 500 1000 1500 2000 2500 3000 Meters

MF_2388



SCHEDULE OF COORDINATES
DATUM: NZTM2000

Point	East	North
1	1668570.11	5459413.26
2	1668497.78	5459226.80
3	1668412.21	5459152.73
4	1668318.97	5459188.89
5	1668427.46	5459468.59
Centroid	1668444.54	5459301.08
Trig I	1668993.1	5459190.9

SCHEDULE OF AREAS

MFL 237	3.00ha
MPE 648	1.23ha
Total (Marine Farm 8184)	4.23ha
Proposed Extension	1.80ha
MFL 237 to Surrender	1.14ha
MPE 648 to Surrender	0.57ha
Total of Proposed Consent	4.32ha

The position of this application has not been surveyed
Cadastral Data from Land Information New Zealand Data

Datum: NZTM2000
Marlborough District Council

PROPERTY AND LAND MANAGEMENT SERVICES
PALMS

Proposed Coastal Permit

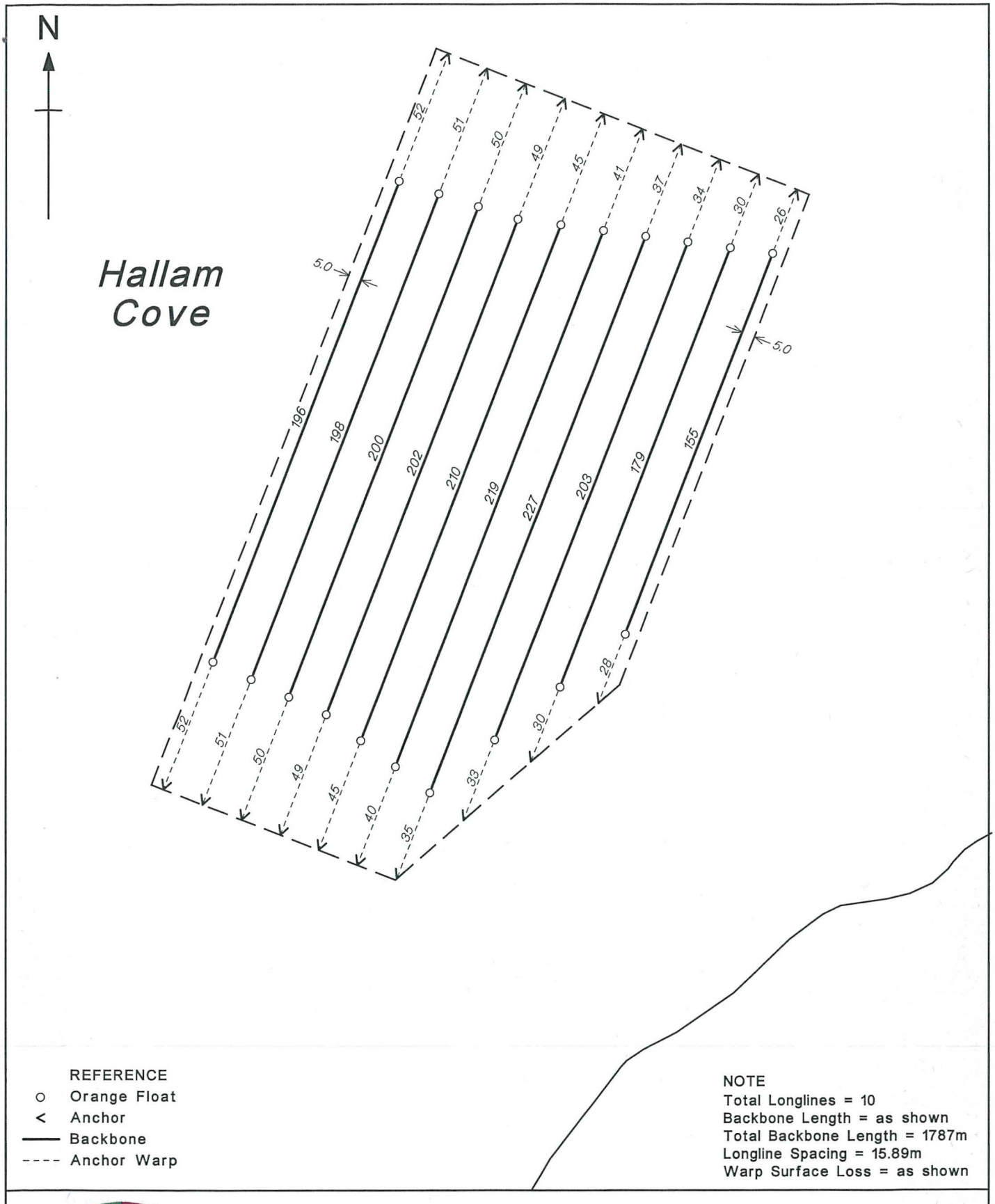
Extension to Marine Farm Site 8184

SCALE 1:5,000

50 0 100 200 300 400 500 metres

12 February 2016

MF_2388



REFERENCE
- o Orange Float
- < Anchor
- —— Backbone
- ---- Anchor Warp

NOTE
Total Longlines = 10
Backbone Length = as shown
Total Backbone Length = 1787m
Longline Spacing = 15.89m
Warp Surface Loss = as shown

PROPERTY AND LAND MANAGEMENT SERVICES
PALMS

Structure Layout

Marine Farm Site 8184

RECEIVED
29 AUG 2016
MARLBOROUGH DISTRICT COUNCIL

SCALE 1:2,000

25 0 50 100 150 200m

12 February 2016

MF_2388

ASSESSMENT OF ENVIRONMENTAL IMPACT FOR A COASTAL PERMIT OCCUPANCY, DISTURBANCE OF THE SEABED AND TO TAKE AND DISCHARGE SEAWATER AND ORGANIC MATTER AT HARVEST

APPLICATION BY PETER WHITELAW ARCHER RENEWAL OF U100403, MFL 237, MPE 648 BEING MARINE FARM SITE 8184 AT HALLAM COVE, CENTRAL PELORUS WEST

1.0 INTRODUCTION

Peter Archer is a marine farmer operating two marine farms, one in Tawhitinui Reach and the other in Hallam Cove. He resides in Tuna Bay, Tennyson Inlet and farms a sheep and cattle pastoral property there. Marine farming is an important part of his, and his family's activities in the Sounds.

The applicant is committed to the industry and participation in the Sounds community and wishes to enhance the production opportunities from his farms so that they maintain a sustainable output and to maximise the utilisation of space at each farm.

This application relates to MFL 237, MPE 648 and U100403. It has been found the inshore area is over hard rock and cobble habitat and coarse, soft substratum that extends from the shore well into the existing consented area. This application is to modify the position of the site to avoid that habitat.

It is proposed to shift the inshore farm boundary further from the shore and extend offshore. Some 1.8 ha will be removed from the inshore area 60 m wide, which is replicated offshore. The change is shown on the site plan.

The area of the site will still be 4.32 ha.

2.0 SPECIES TO BE GROWN

It is proposed to continue to farm the following species: -

i) Green Shell Mussels *(Perna canaliculus)*
ii) Blue Shell Mussels *(Mytilus edulis)*
iii) Scallops *(Pecten novaezelandiae)*
iv) Flat Oyster *(Toistrea lutaria)*

It is also proposed to continue to farm the following seaweed and algae species: -

i) *Macrocystis pyrifera*
ii) *Ecklonia radiata*
iii) *Gracilaria sp.*
iv) *Pterocladia lucida*
v) *Undaria pinnatifidia*

Using conventional longline methods.

3.0 SITE DIMENSIONS

The site dimensions are shown on the site plan. The outside boundary is 300 m long, north boundary is 153 m long, southern boundary is 100 m long and inshore boundary is 313.81 m long.

The inshore boundary lies some 125 m from Mean Low Water Springs fix at the southern fix listed in the Davidson Environmental Report and approximately 100 m from the north Mean Low Water Spring fix.

The outer boundary will be some 250 m from the shore in the north and slightly over 200 m from the shore in the south.

3.1 Site Layout

There will be 10 longlines of variable length ranging from 155 m to 227 m. Backbone to anchor warps lengths range from 26 to 52 m depending on water depth at the site.

Longline spacing will be 15.89 m and total backbone length is 1787 m. Screw and block anchors will be employed.

4.0 STATUS OF THE APPLICATION

The site extends beyond 200 m from the shore and is therefore a Non-complying Activity in the Marlborough Sounds Resource Management Plan. The site is one of a number of marine farms in Hallam Cove.

Existing consents will be relinquished on confirmation of consent for the site.

5.0 THE PRESENT ENVIRONMENT

5.1 The Marine Environment

Mr R J Davidson, of Davidson Environmental Ltd has undertaken a study of the ecology of the marine area of the site. The aims of the investigation were to provide a biological description of the benthos within and adjacent to the farm site, and to identify any potential threats to any sub-tidal ecological values posed by the proposed activity. Their conclusions from the report are listed below;

"The existing consent is located over a combination of habitats. Areas of the consent located under backbones are considered preferable for shellfish farming compared to bedrock, cobble and coarse soft substratum.

The farm owner is applying to renew the existing consent, but is also applying to shift the consent further from shore (Figure 6). This 60 m offshore movement would place the whole consent over silt and clay substratum. From a biological perspective, a shift offshore to move farming structures further away from inshore hard substratum and coarse soft substratum represents an improvement on the present situation. The offshore area where new structures would be placed is characterised by silt and clay (i.e. mud) and is the habitat type traditionally targeted for mussel farming activities as it is common and

widespread in the Marlborough Sounds and is the habitat type least modified by farming related impacts."

There are no ecologically significant marine sites nearby.

5.2 The Land Environment

The land adjacent to the site is owned by EB & HG Leov. The land drops steeply to the coast and is predominantly grassland with some coastal flax and fern present. There are stands of *Pinus radiata* to the north of the site. The farmland is well maintained.

There is no road access near the site.

On the western side of Hallam Cove indigenous forest with Reserve status is present.

6.0 NAVIGATION MATTERS

6.1 The Shoreline

The site holds with the conventions established in the Marlborough Sounds Resource Management Plan. That is, the farm beyond 50m from the mean low water mark. The outer boundary is some 250 m of the shore and is therefore a Non-complying Activity in the Marlborough Sounds Resource Management Plan.

6.2 Headlands

From the southern boundary of site 8184, Sheep Point lies in excess of 200 m to the south. There is ample distance to view the farm traversing into Hallam Cove as Sheep Point forces vessels to stand off the Point to avoid the reef at the Point.

6.3 Navigational Routes

The area lies inside of the navigational route along this part of Hallam Cove. Vessels can navigate between the site and the shore, through the farm and on the outside of the site. The navigable area inshore has been substantially increased.

6.4 Anchorages or Moorings Areas

There are no moorings near the site. Vessels from time to time do tie up to the marine farm and may travel inside the marine farm to obtain shelter from wind and waves. There is ample room for vessels to navigate into this area

6.5 Water Ski Lanes

There are no water ski lanes in the vicinity.

6.6 Sub-Aqueous Cables

There are no sub-aqueous cables in the vicinity

7.0 AESTHETIC AND CULTURAL MATTERS

7.1 Land Zoned For Residential Use or Proximity to Residences.

There are no residences in the vicinity. The land has not been subdivided for residential use.

7.2 Landscape Values

The Marlborough Environment Plan does not identify this area as a zone of outstanding natural feature and landscape and is presented as Marlborough Sounds Coastal Landscape. The area is not considered to have a high coastal natural character rating.

It lies within the "working" environment of Hallam Cove where marine farming, traditional pastoral farming and forestry have been practiced in the past.

The site lies adjacent to other marine farms to the north of the site 8184. The effect on the scenic value will not change from present use of this part of Hallam Cove.

8.0 RECREATIONAL VALUE

In terms of recreational use, there is boat access only to the area.

The visual impact of the marine farm will not cause any long term alteration to the physical environment in what is essentially an already commercial marine farming area. The existing visual effects of the area are marine farms.

8.1 Recreational Fishing

It is the applicant's view that the marine farm at the site enhances opportunities for recreational fishing as marine farms generally tend to create an ecosystem which is conducive to the presence of both reef fish, and other fish species such as cod and snapper. Access to the coast for recreationalists is maintained.

9.0 HISTORICAL OR TRADITIONAL VALUES

The New Zealand Historical Places Trust Inventory has been consulted to identify any sites of significance in this location. None appear in published information.

From the applicant's knowledge no sites of historical or traditional value are present in the area. Given that site has had previous consultation and extension approval it is not seen as necessary to undergo further consultation, however should Council determine further discussion with iwi and others is necessary, that will be undertaken

10.0 COMMERCIAL AND RECREATIONAL FISHING

10.1 Commercial Fishing

Commercial fishing is known to occur in Tawhitinui Reach nearby and may occur in Hallam Cove with scallop dredging often occurring in the Reach, however due to the line of marine farms along the coast these areas are not subject to, or affected by that activity

10.2 Recreational Fishing

Recreational fishing does take place along the coastline utilising the small reefs and rubble shore which is inhabited by fish targeted by recreational fishers. The marine farm itself is located offshore and will encourage the presence of fish species over time. In the long run, as with other marine farms in the Pelorus Sound, fish are drawn to marine farm sites. Recreational fishing is an activity encouraged by the applicant

11.0 EFFECTS ON WATER QUALITY AND ECOLOGY

Water quality of the area is high. The site relies on excellent water quality to enable the process of marine farming to flourish. It is a large area with good capacity for mixing of water with tidal current, wind and wave action

12.0 EFFECTS ON PRODUCTIVITY

Water quality is unlikely to be a problem to marine farming. The activity in itself is unlikely to create any significant detrimental effects on water quality. This renewal has no effect on the productivity of existing marine farms in the general vicinity because of the separation distances between farms and large water area of this section of Hallam Cove and nearby in Tawhitinui Reach and the wider expanse of this part of Pelorus Sound

13.0 THE BENTHIC ENVIRONMENT

This is attached as the Davidson Environmental Report.

14.0 ALIENATION OF PUBLIC SPACE

The general area of this zone of the Sounds has been utilised by marine farmers for many years. Recreation and commercial boat owners are aware of marine farms in this area and recreational fishermen have the opportunity to use the sites and transit through them. Given the wider spacing between the longlines there are further opportunities for access by vessels wanting to transit the site.

From time to time, vessels utilise the longlines for mooring and overnighting. This process as far as the applicant is concerned, will continue

15.0 ON SHORE FACILITIES

The applicant does not require onshore marine farm facilities. Farm work is undertaken by the applicant and contractors.

The right to navigate to and from the farm, and to anchor, moor and load crop is preserved by s27 of the Marine and Coastal Area (Takutai Moana) Act 2011. However, consent is required for the amount of organic waste matter which is discharged during the harvesting process and for the take and use of coastal water. No significant historical adverse effects have been recorded or are anticipated and any visual evidence of harvesting quickly dissipates in the coastal environment.

Vessels will be required to service the farm on an irregular basis.

16.0 VALUE OF INVESTMENT

As part of this application to renew site 8184, the applicant is seeking to renew the site and surrender the existing consents when the application is granted for a period of 20 years. As a result, this is an application to which s165AH(1)(c) applies and the Council must, when considering the application, have regard to the value of the investment of the existing consent holder under s104(2A).

The site has been held by the applicants since the 1970s. Equipment costs were estimated at $10,000.00 and installation costs were $6,000.00.

Harvest and growth rates reflect climatic conditions and spat source. Kaitaia spat tends to be slower and has a 20-24 month cycle while Wainui spat has a 15-18 month cycle. Costs of seeding and maintenance per year are $50,000.00 per year cycle.

The farm produces some 25 tonnes per crop line (Green Weight Tonne) and is sold directly to processing companies for processing.

Returns to the grower have averaged in the order of $550 tonne with a range of $450 to $950 tonne is essential to return and to the processor and more recently price per tonne has been as high as $1250 tonne for quality product.

17.0 PART II RESOURCE MANAGEMENT ACT ISSUES

17.1 Section 5

In terms of the enabling provisions in Section 5 of the Resource Management Act the marine farm industry has been, and will continue, to be a source of substantial revenue production and in turn employment in the Sounds and in the Nelson/Marlborough regions.

In addition, export income for the nation is generated. Applications such as this enable a maximisation of use of the marine resource.

Analysis of resources present show the proposal can meet sustainable use and management of the environment criteria. It is in the "working" environment of the Sounds. The site position and distances from other facilities are not detrimental to the use of the area and this proposal meets requirements of Section 5 of the Resource Management Act is giving effect through the New Zealand Coastal Policy Statement Marlborough Regional Policy Statement of Marlborough Sounds Resource Management Plan and the Marlborough Environment Plan.

17.2 Section 6

Matters of national importance have been assessed under the requirements of the Proposed Marlborough Sounds Resource Management Plan.

The proposal recognises the:

(a) *The preservation of the natural character of the coastal environment (including the coastal marine area), wetlands, and lakes and rivers and their margins, and the protection of them from inappropriate subdivision, use, and development:*

The site has been positioned to allow access around the coast without impediment, and access between the shore and structures has been maintained. Section 6(a) is given effect through Policy 15 of New Zealand Coastal Policy Statement which is considered later in this application.

(b) *The protection of outstanding natural features and landscapes from inappropriate subdivision, use, and development:*

The site does not lie in an area identified as "outstanding landscape" or feature. The adjacent land is farm land that is well maintained. There are blocks of exotic conifers also present.

(c) The protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna:

The adjacent vegetation is high producing pasture over which sheep and cattle graze.

(d) The maintenance and enhancement of public access to an along the coastal marine area, lakes, and rivers:

Public access is maintained with good separation from the coast and main navigational routes.

(e) The relationship of Maori and their culture and traditions with their ancestral lands, water, sites, waahi tapu, and other taonga.

The site is not known to be of importance to Maori. The applicants are unaware of any historical site on land nearby. The site has been positioned to avoid habitat that may have been important to Maori. This will be confirmed with consultation with Iwi.

17.3 Section 7

In achieving the purpose of this Act, all persons exercising functions and powers under it, in relation to managing the use, development, and protection of natural and physical resources, shall have particular regard to –

(a) Kaitiakitanga:
A number of iwi are identified as having interests in the Hallam Cove area in particular Ngati Koata. The proposal has been developed to avoid offending the guardianship and protection of resources valued by Iwi. The notion of care and protection of the environment and resources is also an important concept in management of resources the applicant also holds as important in their day to day management of water space.

(b) The efficient use and development of natural and physical resources:
The proposal is confined and concentrated in a locality out of the way of normal public use. Being confined and sited together brings efficiencies in applying resources to manage the growing of mussels.

(c) *The maintenance and enhancement of amenity values*:
Amenity values will not change as the site is an existing one and part of the present environment.

(d) *Intrinsic values of ecosystems*:
The values of the ecosystems have been identified in the report prepared, to detail the benthic environment. Importantly no significant resources have been identified on the site but have inshore. The structures are situated over a mud benthos that is widespread in the Marlborough Sounds and is identified as the environment most suited to have aquaculture over it. Species are low in number and diversity.

(e) *Recognition and protection of the heritage values of the sites, buildings, place, or areas*:
There are no heritage sites buildings or places within the near vicinity

(f) Maintenance and enhancement of quality of the environment:

The quality of the environment will not be endangered by the proposal to grow mussels. The process needs high water quality and as a filter feeder mussels will enhance water quality by the filtration process of their feeding.

(g) Any finite characteristics of natural and physical resources:
The are no finite characteristics to the area. Hallam Cove is a large bay with the proposal occupying a small part of it.

(h) *The protection of the habitat of trout and salmon.*
Section (h) is not relevant to this application.

17.4 Treaty of Waitangi

Matters of potential concern in relation to the Treaty of Waitangi have also been considered earlier in the original proposals to the site. No matters of concern were raised at that time.

18.0 NEW ZEALAND COASTAL POLICY STATEMENT 2010 (NZCPS)

Consideration of matters to be addressed within the New Zealand Coastal Policy Statement 2010 (NZCPS) listed below. The policies of immediate relevance to the applications are policies 2, 6, 8, 11, 13, 15, 18, 22 and 23.

The NZCPS 2010 is of general relevance to this application and all policies have been considered in the development of the proposal. Policies of specific relevance are considered below and a table outlining objectives and policies is provided in Appendix C

23.1 Policy

Policy 2 sets out a number of matters which are relevant to the taking into account of the principles of the Treaty of Waitangi and kaitiakitanga, in relation to the coastal environment.

The applicant recognizes that Ngāti Apa ki te Rā Tō, Ngāti Kuia, Rangitāne o Wairau, Ngāti Kōata, Ngāti Rārua, Ngāti Tama ki Te Tau Ihu, Te Ātiawa o Te Waka-a-Māui and Ngati Toa Rangatira have statutory acknowledgements in the area of the application site. Those acknowledgements have been considered during the preparation of this application, as outlined above.

The applicant has also reviewed the Iwi management plans of Ngāti Kōata and Te Ātiawa o Te Waka-a-Māui. No areas of conflict have been identified.

There are no taiāpure or mahinga mātaitai in the area of the application. There are also no established areas of protected customary rights or customary marine title within the meaning of the Marine and Coastal Area (Takutai Moana) Act 2011.

The applicant will discuss the proposal further with relevant Iwi representatives

23.2 Policy 6

Policy 6 of the NZCPS is in two parts, the first dealing with activities in the coastal environment more broadly, and the second with those in the coastal marine area more specifically.

The farm will become part of the existing built environments continuation of the farm would not. No areas of indigenous biodiversity or historic heritage value have been identified in relation to the site, so the farm complies with subpart 1(j).

Subpart 2 of the Policy 6 is particularly relevant. Mussel farming clearly has a functional need to be located in the coastal marine area. It directly contributes to the social and economic wellbeing of people and communities, in accordance with subpart 2(a). This is discussed in relation to Policy 8 below.

23.3 Policy 8

Policy 8 of the NZCPS provides for the recognition of the significant existing and potential contribution of aquaculture to the social, economic and cultural wellbeing of people and communities by:

a) *Including in regional policy statements and regional coastal plans provision for aquaculture activities in appropriate places in the coastal environment, recognizing that relevant consideration may include:*

   i). *The need for high quality water for aquaculture activities; and*
   ii). *The need for land-based facilities associated with marine farming.*

b) *Taking account of the social and economic benefits of aquaculture, including an available assessments of national and regional economic benefits; and*

c) *Ensuring that development in the coastal environment does not make water quality unfit for aquaculture activities in areas approved for that purpose.*

The application will enable production from the site, contributing to the social and economic benefits of aquaculture to the community. No changes to the impact on water quality are anticipated. This application satisfies the requirement of Policy 8.

23.4 Policy 11

Policy 11 relates to protecting the indigenous biological diversity of the coastal environment.

The farm is located over mud habitat and avoids any reef areas of any other areas of significant biodiversity. There will be no adverse modified effects on indigenous biodiversity.

23.5 Policy 13

Policy 13 provides for the avoidance of significant adverse effects on areas of the coastal environment with outstanding natural character and the avoidance, remediation and mitigation of other adverse effects on natural character.

The area of the application sites is not recognized as an area of outstanding natural character in the most recent comprehensive natural character study "Natural Character of the Marlborough Coast" (June 2014) or the recently released Marlborough Environment Plan.

The site lies within a catchment of substantial exotic forestry that dominates the visual environment.

23.6 Policy 15

Policy 15(a) provides for the avoidance of adverse effects of activities on outstanding natural features and outstanding landscapes in the coastal environment. Policy 15(b) provides for the avoidance of significant adverse effects and the avoidance, remediation, and mitigation of other adverse effects of activities on other natural features and natural landscapes in the coastal environment.

This application is not within an area of outstanding landscape value under the Marlborough Sounds Resource Management Plan. There will be no further impact on the landscape than those already occurring under the current consent. The effects of the application on the landscape will be minor and the effects are not likely to impact on the values which contribute to the landscape.

23.7 Policy 18

Policy 18 recognises the need for public open space within and adjacent to the coastal marine area, for public use and appreciation including activities and passive recreation.

There is no access by road. Most of the access to this area is by boat. Nevertheless, the visual impact of the marine farm will not change significantly. The area has a low viewing audience. Access to the coast for recreationalists is maintained.

There are no registered moorings in the immediate vicinity of the site, and no formal water ski lanes. Opportunities for recreational fishing may be enhanced by the presence of the marine farm.

23.8 Policy 22

Policy 22 requires an assessment of sedimentation levels, and that use will not result in a significant increase in those levels. Davidson's biological report, stated that while shell and fine sediment would be deposited under and in proximity to droppers, the farm structures are located over habitat considered suitable for this type of activity. No monitoring appeared to be necessary.

23.9 Policy 23

Subpart 1 of Policy 23, which relates to managing discharges to water in the coastal environment, is relevant to this application. Silts and organic matter released at harvest are readily assimilated into the water column and seabed. The effects of harvesting mussels are only transitory, and quickly become indistinguishable from background sedimentation.

19.0 REGIONAL POLICY STATEMENT/MARLBOROUGH SOUNDS RESOURCE MANAGEMENT PLAN

Certain provisions of the Marlborough Regional Policy Statement have relevance to this application and are considered in Appendix A.

The Marlborough Sounds Resource Management Plan contains a number of provisions that are relevant to this application. An assessment of the application against the requirements of that plan is contained in Appendix B.

Conclusion

Taken overall, the application is consistent with the relevant objectives and policies of the Regional Policy Statement and Marlborough Sounds Resource Management Plan.

20.0 PROPOSED MARLBOROUGH ENVIRONMENT PLAN

Rules applying to marine farming have been specifically excluded from the Plan hence consideration of the proposal under the Marlborough Sounds Resource Management Plan.

The site is located in the Overlay Marlborough Sounds Coastal Landscape. The terrestrial landscape has not been classified or graded as an outstanding natural feature or landscape.

Objectives and policies that emanate from:the Plan including elements within the chapters below

- Chapter 4 – Natural & Physical Resources
- Chapter 5 – Allocation of Public Resources
- Chapter 6 – Natural Character
- Chapter 9 – Public Access and Open Space
- Chapter 13 – Use of the Coastal Environment
- Chapter 15 – Resource Quality

All are considered to be relevant to such applications as this and have been generally outlined in this AEE. In my view the proposal provides for the needs of primary production and tourism.

Infrastructure is protected. The nature and character of the Sounds is protected. Access to coastal water is maintained and exclusive occupation of water space is minimized allowing access between lines and the shore.

Adverse effects in areas of outstanding natural character and natural features have been avoided. As has any effect on ecosystems and biodiversity.

Heritage values are recognized but unaffected including Maori Culture and traditions. Structures and activities are "clustered" in Hallam Cove and do not diminish amenity values.

The character of Hallam Cove is one of developed farm land and marine farming while at the head of the Cove residential housing exits.

21.0 CONSULTATION

An initial letter has been sent to all Iwi listed below identifying the site.

Name	Address	Phone
Ngati Koata Trust	PO Box 1659, Nelson 7040	(03) 548 1639
Te Runanga a Rangitane o Wairau	PO Box 883, Blenheim 7240	(03) 578 6180
Te Runanga O Ngati Kuia	PO Box 1046, Blenheim 7240	(03) 579 4328
Ngāti Apa ki te Rā Tō	PO Box 708, Blenheim 7240	(03) 578 9695
Te Atiawa Manawhenua Ki Te Tau Ihu Trust	PO Box 340, Picton	(03) 573 5170
Ngati Toarangatira Manawhenua Ki Te Tau Ihu Trust	PO Box 5061, Blenheim 7240	(03) 577 8801
Ngati Rarua Trust	PO Box 1026, Blenheim 7240	(03) 577 8468

22.0 CONCLUSION

The applicants considers that the of this area for aquaculture is appropriate, allowing the farming of mussels.

In the applicant's view, the site can be utilised for marine farming and provides the development of the industry and their own activities.

RD Sutherland
Property and Land Management Services Limited,
On behalf of Peter Archer

APPENDIX A: MARLBOROUGH REGIONAL POLICY STATEMENT – POLICY ANALYSIS

Objective	Policy	Assessment
5.3.2: That water quality in the coastal marine area be maintained at a level which provides for the sustainable management of the marine ecosystem.	5.3.5: Avoid, remedy or mitigate the reduction of coastal water quality by contaminants arising from activities occurring within the coastal marine area.	No artificial feed or attractants are added. No chemicals, antibiotics or other therapeutants added. Any discharges of organic matter associated with harvesting will be transitory.
5.3.10: The natural species diversity and integrity of marine habitats be maintained or enhanced.	5.3.11: Avoid, remedy or mitigate habitat disruption arising from activities occurring within the coastal marine area.	Any disruption associated with the existing mooring of the farm is minor in scale and transitory. The seabed is already in a modified state due to terrestrial run off.
7.1.9: To enable present and future generations to provide for their wellbeing by allowing use, development and protection of resources provided any adverse effects of activities are avoided, remedied or mitigated.	7.1.10: To enable appropriate type, scale and location of activities by: • Clustering activities with similar effects; • Ensuring activities reflect the character and facilities available in the communities in which they are located; • Promoting the creation and maintenance of buffer zones (such as stream banks or 'greenbelts'); • Locating activities with noxious elements in areas where adverse environmental effects can be avoided, remedied or mitigated.	The marine farm is consistent with the current Policy and the designated consented area is within a Cove well established for marine farming.
	7.1.12: To ensure that no undue barriers are placed on the establishment of new activities (including new primary production species) provided the life supporting capacity of air, water, soil and ecosystems is safeguarded and any adverse environment effects are avoided, remedied or mitigated.	The marine farm will be located within the consented area which is to be approved for marine farming. There will be no change in activity or structures once the consent is activated.

APPENDIX A: MARLBOROUGH REGIONAL POLICY STATEMENT – POLICY ANALYSIS

Objective	Policy	Assessment
7.2.7: The subdivision use and development, of the coastal environment, in a sustainable way.	7.2.8: Ensure the appropriate subdivision, use and development of the coastal environment.	The marine farm is within a bay suitable for marine farming. The marine farms activity is biologically sustainable.
	7.2.10(a) – (d)	The marine farm will be located within the consented area when it is approved for marine farming.
7.3.2: Buildings, sites, trees and locations identified as having significant cultural or heritage value are retained for the continued benefit of the community.	7.3.3: Protect identified significant cultural and heritage features.	No sites of cultural or heritage significance have been identified on the area of the application site.
8.1.2: The maintenance and enhancement of the visual character of indigenous, working and built landscapes.	8.1.3: Avoid, remedy or mitigate the damage of identified outstanding landscape features arising from the effects of excavation, disturbance of vegetation, or erection of structures.	The site is not within an area of outstanding natural landscape and will have no additional impact on landscape values. The farm will well managed and will complies with the Aquaculture Environmental Code of Practice for mussels
	8.1.5: Promote enhancement of the nature and character of indigenous, working and built landscapes by all activities which use land and water.	The marine farm will have no additional impact on landscape values.
	8.1.6: Preserve the natural character of the coastal environment.	The site will have no additional impact on the natural character of the coastal environment.

APPENDIX B: MARLBOROUGH SOUNDS RESOURCE MANAGEMENT PLAN – POLICY ANALYSIS

Objective	Policy	Assessment
Ch 2, 2.2, Obj 1: The preservation of the natural character of the coastal environment of the coastal environment, wetlands, lakes, and rivers and their margins and the protection of them from inappropriate subdivision, use and development.	Policy 1.1: Avoid the adverse effects of subdivision, use of development within those areas of the coastal environment and freshwater bodies which are predominantly in their natural state and have natural character which has not been compromised.	This application is set in an area which is dominated by forestry and a small area of Scenic Reserve.
	Policy 1.2: Appropriate use and development will be encouraged in areas where the natural character of the coastal environment has already been compromised, and where the adverse effects of such activities can be avoided, remedied or mitigated.	As above.
	Policy 1.3: To consider the effects on those qualities, elements and features which contribute to natural character, including: a) Coastal and freshwater landforms; b) Indigenous flora and fauna, and their habitats; c) Water and water quality; d) Scenic or landscape values; e) Cultural heritage values, including historic places, sites of early settlement and sites of significance to Iwi; and f) Habitat of trout.	These matters have been considered in the assessment of environmental effects in the Davidson Environment Report.

APPENDIX B: MARLBOROUGH SOUNDS RESOURCE MANAGEMENT PLAN – POLICY ANALYSIS

	Policy 1.4: In assessing the actual or potential effects of subdivision, use or development on natural character of the coastal and freshwater environments, particular regard shall be had to the policies in Chapters, 3, 4, 5, 6, 12, 13 and Sections 9.2.1. 9.3.2 and 9.4.1 in recognition of the components of natural character.	The application will not have any additional impact on the components of these policies which impact natural character values.
	Policy 1.6: In assessing the appropriateness of subdivision, use or development in coastal and freshwater environments regard shall be had to the ability to restore or rehabilitate natural character in the area subject to the proposal.	Any residual impact on natural character will naturally rehabilitate on removal of the farm.
	Policy 1.7: To adopt a precautionary approach in making decisions where the effects on the natural character of the coastal environment, wetlands, makes and rivers (and their margins) are unknown.	The effects of this application are not unknown and are discussed elsewhere in the assessment of environmental effects. A precautionary approach is not justified.
Ch 4, 4.3, Obj 1: The protection of significant indigenous flora and fauna (including trout and salmon) and their habitats from the adverse effects of use and development.	Policy 1.2: Avoid, remedy or mitigate the adverse effects of land and water use on areas of significant ecological value.	The farm is not sited over an area of significant ecological value.
Ch 5, 5.3. Obj 1: Management of the visual quality of the Sounds and protection of outstanding natural features and landscapes from inappropriate subdivision, use and development.	Policy 1.1: Avoid, remedy and mitigate adverse effects of subdivision, use and development, including activities and structures, on the visual quality of outstanding natural features and landscapes, identified according to criteria in Appendix One.	The application site is not within an area of outstanding landscape value identified in the Plan. The effects of the application on the landscape will be the similar to other marine farm sites. The effects are not likely to impact on the values which contribute to the landscape.

APPENDIX B: MARLBOROUGH SOUNDS RESOURCE MANAGEMENT PLAN – POLICY ANALYSIS

Ch 6, 6.1.2, Obj 1: Recognition and provision for the relationship of Marlborough's Maori to their culture and traditions with their ancestral lands, waters, sites, waahi tapu and other taonga.	Policies 1.1 – 1.5:	In preparing this application, the applicants have had regard to the Statutory Acknowledgements and has reviewed the statements of association for each Iwi. No areas of conflict have been identified by the applicants. An initial letter has been sent to all Iwi identifying the site prior to the application being submitted. The applicants understand there are no known wahi tapu, taiapure, mataitai or other areas of significance to Maori in the vicinity of the application.
Ch 8, 8.3, Obj 1: That public access *to and along* the coastal marine area, lakes and rivers be maintained and enhanced.	Policy 1.2: Adverse effects on public access caused by the erection of structures, marine farms, works or activities in or along the coastal marine area should as far as practicable be avoided. Where complete avoidance is not practicable, the adverse effects should be mitigated and provision made for remedying those effects, to the extent practicable.	There are no additional adverse effects on public access caused by the marine farm.
	Policy 1.3: To prevent the erection of structures and marine farms that restrict public access in the coastal marine area where it is subjected to high public usage.	There are no additional adverse effects on public access caused by the marine farm.
	Policy 1.8: Public access to and along the coastal marine area should be maintained and enhanced except where it is necessary to [circumstances do not apply].	There are no additional adverse effects on public access caused by the marine farm.

APPENDIX B: MARLBOROUGH SOUNDS RESOURCE MANAGEMENT PLAN – POLICY ANALYSIS

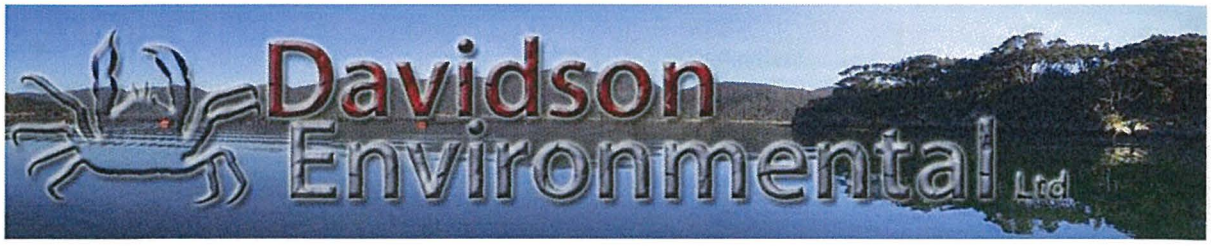
Ch 9, 9.2.1, Obj 1: The accommodation of appropriate activities in the coastal marine area whilst avoiding, remedying or mitigating the adverse effects of those activities.	Policy 1.1: Avoid, remedy and mitigate adverse effects of use and development of resources in the coastal marine area on any of the following: a) Conservation and ecological values; b) Cultural and Iwi values; c) Heritage and amenity values; d) Landscape, seascape and aesthetic values; e) Marine habitats and sustainability; f) Natural character of the coastal environment; g) Navigational safety; h) Other activities, including those on land; i) Public access to and along the coast; j) Public health and safety; k) Recreation values; and l) Water quality.	The way in which adverse effects on the stated values will be avoided, remedied and mitigated is addressed elsewhere in the assessment of environmental effects. Overall, the proposal is consistent with this policy.
	Policy 1.2: Adverse effects of subdivision, use or development in the coastal environment should as far as practicable be avoided. Where complete avoidance is not practicable, the adverse effects should be mitigated and provision made for remedying those effects to the extent practicable.	There are no additional adverse effects on the coastal environment from this proposed farm. The navigational lighting requirements will provide better navigational aids within the Cove.
	Policy 1.3: Exclusive occupation of the coastal marine area or occupation which effectively excludes the public will only be allowed to the extent reasonably necessary to carry out the activity.	Consistent with other marine farms in the Marlborough Sounds, exclusive occupation of the consent area is not sought, other than for the area physically occupied by the lines and anchoring devices.

APPENDIX B: MARLBOROUGH SOUNDS RESOURCE MANAGEMENT PLAN – POLICY ANALYSIS

	Policy 1.6: Ensure recreational interests retain a dominant status over commercial activities that require occupation of coastal space and which preclude recreational use in Queen Charlotte Sound, including Tory Channel, but excluding Port and Marina Zones.	Not applicable.
	Policy 1.7: Avoid adverse effects from the occupation of coastal space in or around recognized casual mooring areas.	Exclusive occupation of the consent area is not sought. The bay is not recognized for causal moorings.
	Policy 1.12: To enable a range of activities in appropriate places in the waters of the Sounds including marine farming, tourism and recreation.	Policy 1.12 enables marine farming in appropriate places. These will be new sites that assessment has shown are biophysically appropriate for the activity. Overall, the application is consistent with this policy.
	Policy 1.13: Enable the renewal as controlled activities of marine farms authorized by applications made prior to 1 August 1996 as controlled activities, apart from exceptions in Appendix D2 in the Plan.	This farm is not a controlled activity enabled by this policy.
Ch 9, 9.3.2, Obj 1: Management of the effects of activities so that water quality in the coastal marine area is at a level which enables the gathering or cultivating of shellfish for human consumption (Class SG).	Policy 1.1 to 1.11:	This application is not anticipated to have any impact on shellfish quality.

APPENDIX B: MARLBOROUGH SOUNDS RESOURCE MANAGEMENT PLAN – POLICY ANALYSIS

Ch 9, 9.4.1, Obj 1:	Policy 1.1: Avoid, remedy or mitigate the adverse effects of activities that disturb or alter the foreshore and/or seabed on any of the following: [criteria specified in Plan].	There will be no additional disturbances of the seabed. The owners of the farm in Hallam Cove will have regular beach clean ups in which the greater percentage of rubbish is from recreational users of the Sounds.
Ch 9, 9.4A.1, Obj 1:	N/A	These policies are no longer relevant due to abolition of AMAs through legislation.
Ch 19, 19.3, Obj 1: Safe, efficient and sustainably managed water transport systems in a manner that avoids, remedies and mitigates adverse effects.	Policy 1.1: Avoid, remedy or mitigate the adverse effects of activities and structures on navigation and safety, within the coastal environment.	There have been no reported navigational incidences in the Cove. There will be no changes to the existing consent conditions regarding the navigational aids placed on the farm.
Ch 22, 22.3, Obj 1: To avoid, remedy and mitigate the adverse effects of unreasonable noise, while allowing for reasonable noise associated with port activites.	Policy 1.1: Avoid, remedy or mitigate community disturbance, disruption or interference by noise within coastal, rural and urban areas.	The farm will be positioned approximately 2 km away from the closest residence in the area to the north. The contractors servicing vessel is estimated to spend approximately 65-90 hours maintaining and harvesting the lines per year. The applicant complies with the 'Code of Practice' to avoid, remedy or mitigate noise from marine farming activities in the Marlborough Sounds on other users and residents.



Davidson Environmental Limited

Ecological report for the proposed renewal and offshore adjustment of marine farm (8184) located in Hallam Cove, Pelorus Sound

Research, survey and monitoring report number 840

A report prepared for:
for Peter Archer
C/o PALMS Limited
P.O. Box 751
Blenheim

August 2016

Bibliographic reference:

Davidson, R.J. 2016. Ecological report for the proposed renewal and offshore adjustment of marine farm (8184) located in Hallam Cove, Pelorus Sound. Prepared by Davidson Environmental Ltd. for Peter Archer. Survey and monitoring report no. 840.

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

Specialists in research, survey and monitoring

Davidson Environmental

Table of Contents

Specialists in research, survey and monitoring

1.0 Introduction

The aim of the present study was to describe the impact zone and biological features associated with a 4.32 ha marine farm site (8184) located along the south-eastern shoreline of Hallam Cove (Figure 1, Plates 1 and 2). The farm owner is applying for a new consent to replace the existing consent that expires on 31 December 2024 (U991561). The farm owner is also applying to move the farm 60 m distance further from shore.

This report was commissioned by Ron Sutherland (PALMS Ltd.) on behalf of the farm owner (Peter Archer).

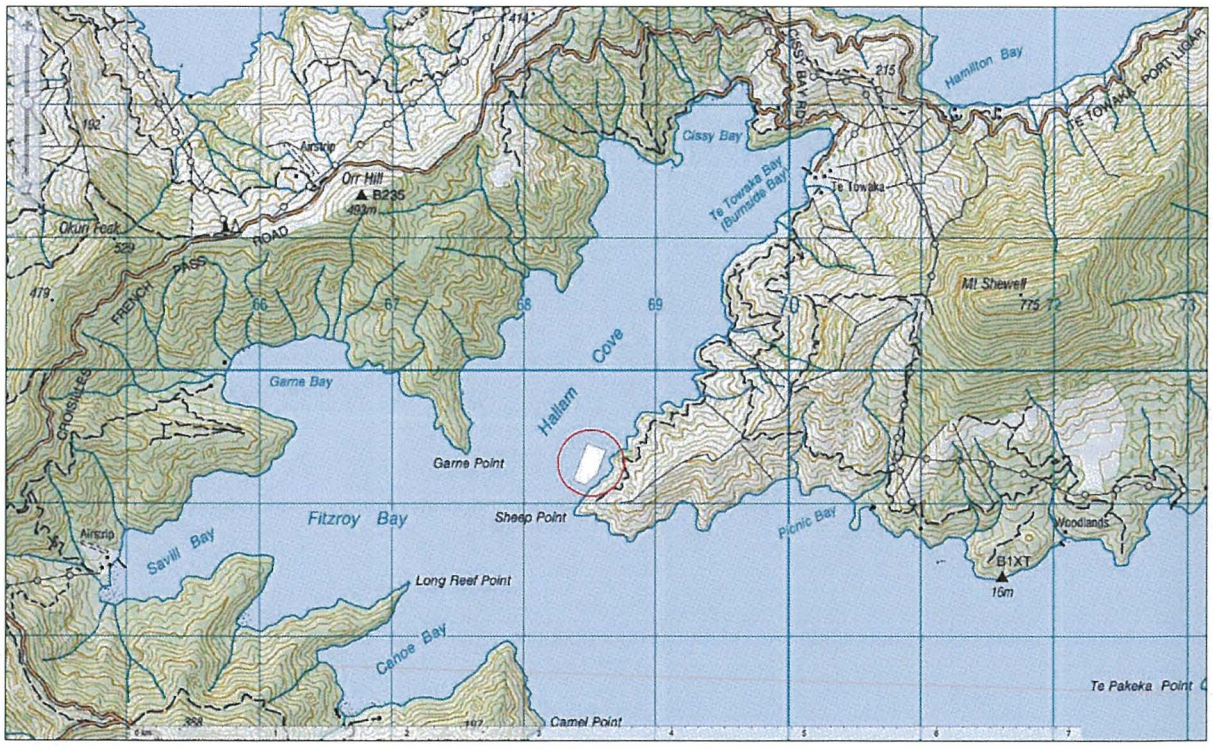


Figure 1. Location of marine farm site 8184 (red circle) in Hallam Cove.

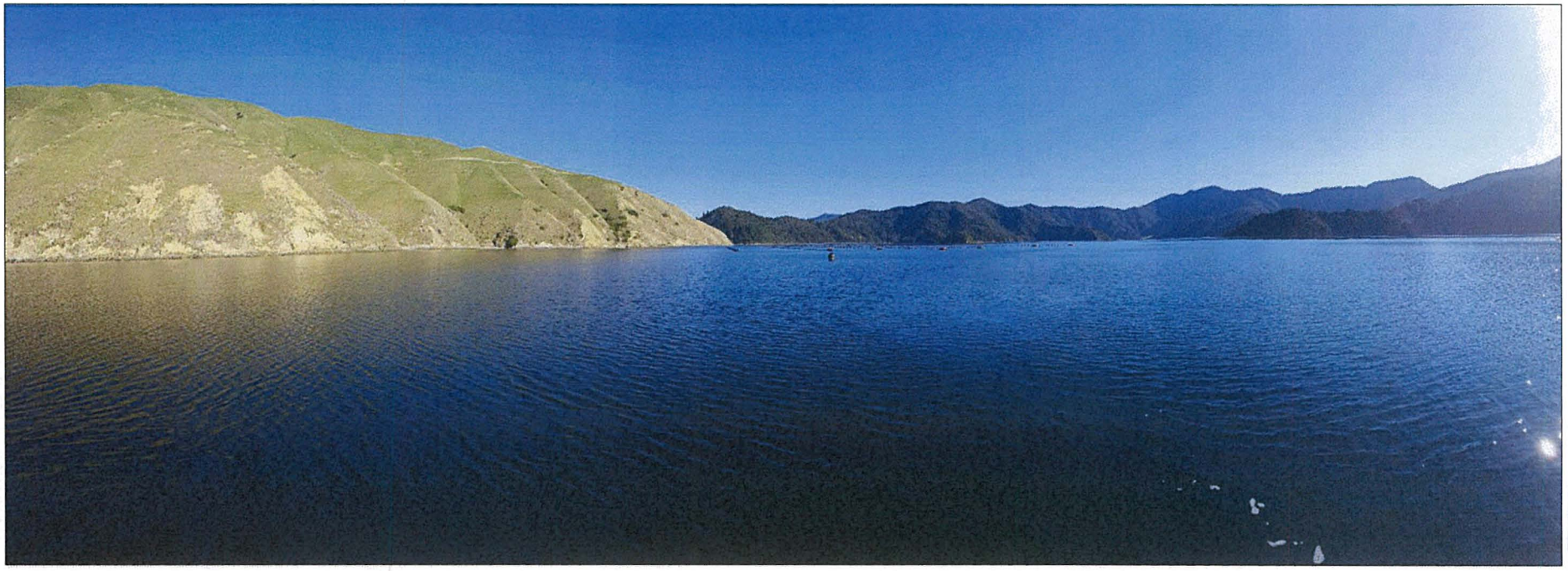


Plate 1. Marine farm site 8184, taken from a location north and alongshore of the present farm structures southwards towards Fitzroy Bay.

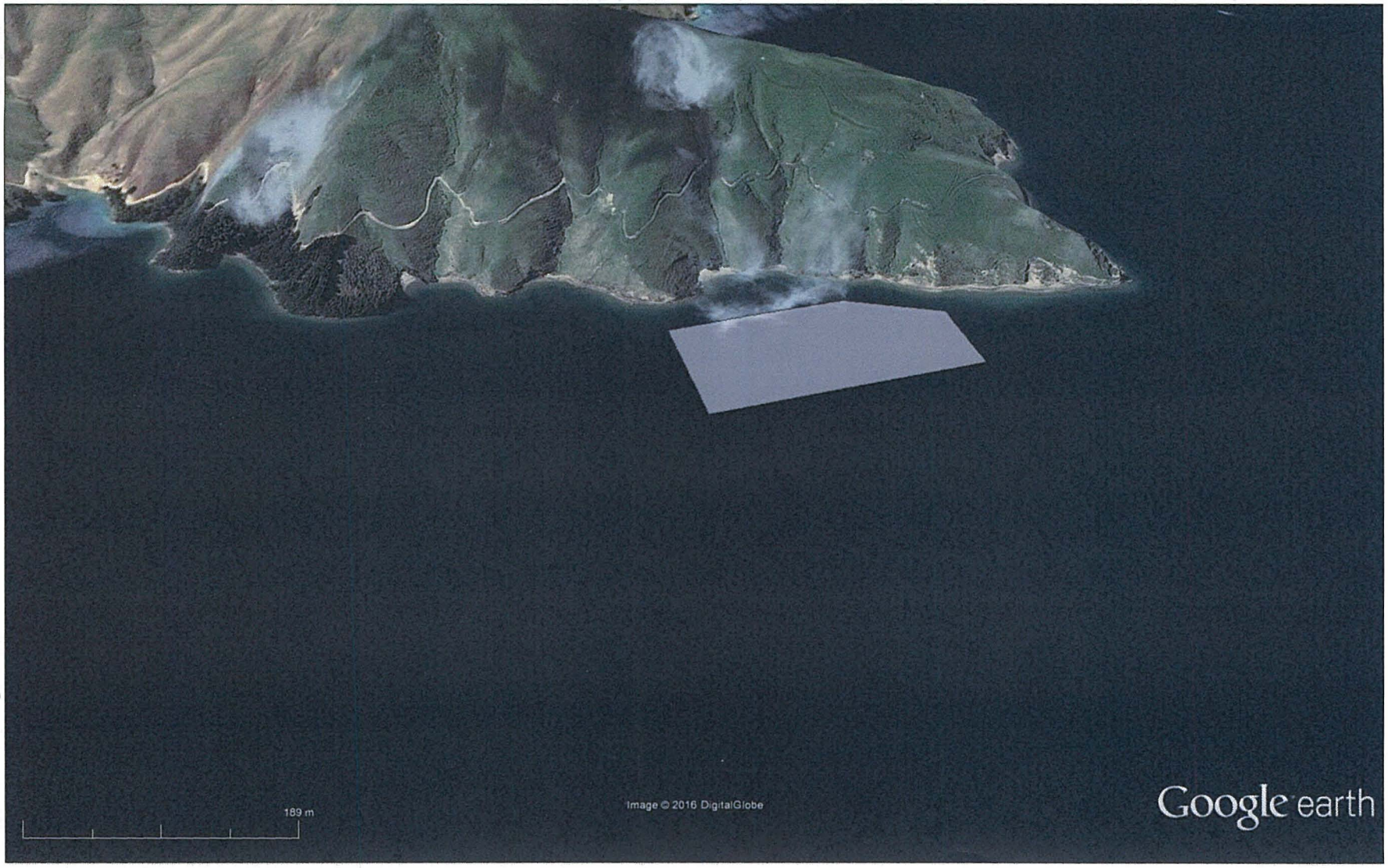


Plate 2. Oblique view of existing consent in Hallam Cove (grey).

2.0 Background information

2.1 Study area

Marine farm 8184 is located along the south-eastern shoreline of Hallam Cove (Figure 2). Hallam Cove makes up the northeast arm of Fitzroy Bay, situated at the western end of Tawhitinui Reach, Pelorus Sound. Hallam Cove is located some 48 km by water from Havelock. The Cove has a coastline length of approximately 11.2 km, and covers an area of sea of approximately 390 ha. Hallam Cove is approximately 3.5 km long, and up to 1.5 km wide.

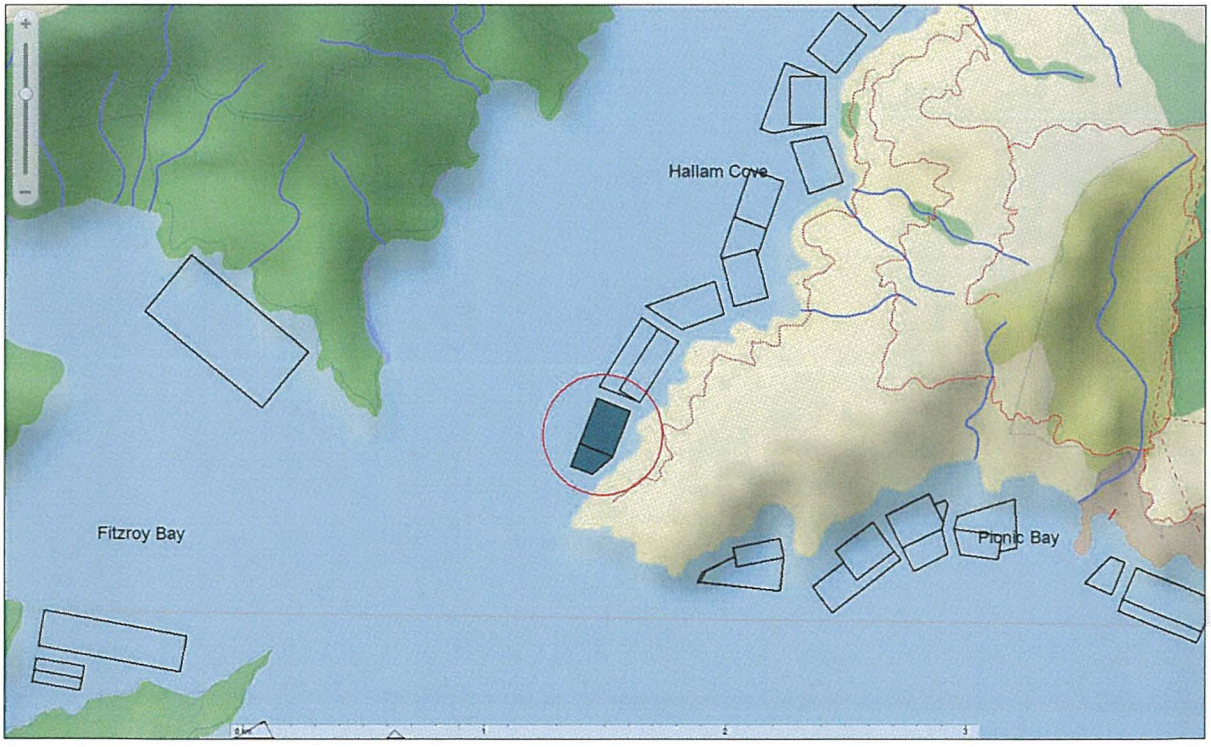


Figure 2. Location of study site and other marine farm consents in the area.

2.2 Historical reports

Two historical biological reports were found in relation to the present site (Davidson 1999, Davidson and Richards 2010).

Farm extension

Observations from within the proposed farm area suggested that:

1) depths were relatively consistent in offshore areas (i.e. 27 m to 28 m), while the proposed inshore boundary was approximately 11 m depth;
2) offshore substrata was silt and clay with pebble and shell/sand, fine sand and dead whole shell material present on the shore slope;
3) cobble sized substrata were not recorded offshore within the proposed marine farm area;
4) no reef structures were recorded within the proposed farm area;
5) horse mussels and scallops were relatively uncommon from the proposed marine farm area;
6) lampshells were recorded between 80 m to 120 m distance from shore.

A light northward along-shore tidal current was observed during the present study. Based on the species observed from the site, it is expected that tidal currents remain predominantly light for much of the time.

The shore was characterised by bedrock reef, cobble, small boulder and pebble substrata that extended offshore to approximately 45 m distance. Beyond the hard shore zone, a zone of pebble, shell and fine sand was recorded 45 m to 80 m distance from shore. Further from shore, a silt base with dead whole and broken shell material was observed between 80 m and 140 m distance from low water. Beyond 140 m distance, the shell/silt zone graded into silt and clay substrata with a small component of shell material. Silt and clay substratum extended to the offshore boundary of the proposed marine farm.

From the transect and free swims, a total of 26 conspicuous surface dwelling species of invertebrate, 3 ascidians, 6 species of algae and 6 species of bony fish were observed. The

number and composition of fish species were representative of cobble and reef areas in the sheltered shores of central Pelorus Sound. Reef fish were restricted to the rubble bank and reef habitats. An occasional blue cod was observed from the reef and rubble bank, while other reef species were absent during the inspection (e.g. blue moki, tarakihi). A variety of triplefins were common from the rubble bank.

Offshore mud habitats were dominated by opal fish. No fish feeding holes in the substratum were observed during the present study. Scallop density recorded from the site was: mean = 0.043 individuals per m^{-2}, SE = 0.03. This density is below the Department of Conservation trigger level (> 0.1 individuals per m^{-2}). All scallops were observed within 120 m distance from shore. Horse mussel density recorded from the site was: mean = 0.03 individuals per m^{-2}, SE = 0.016. This density is below the Department of Conservation trigger level (> 0.2 individuals per m^{-2}). All horse mussels were observed within 130 m distance from shore. Lampshells (*Terebratella sanguinea*) were observed between 80 m to 120 m distance from shore. Lampshells did not form a dense bed or zone in this area. No conspicuous hydroids were observed during the present study. No bryozoans mounds were observed within the study area. No tubeworm mounds were observed during the present study.

Soft bottom substrata and associated communities dominated the area under the proposed marine farm. This relatively uniform silt and clay substratum recorded offshore of 140 m distance from shore supported a low variety of species often in low abundance.

Renewal of southern extension area (Davidson and Richards 2010)

The authors concluded:

Mussel shell debris under backbones was recorded at low to moderate levels. This level of shell debris is representative of many marine farms in the Marlborough Sounds. Relatively little mussel shell debris was recorded in association with the warps. Mussel shell debris was highest under and directly adjacent to backbones. This shell debris declined relatively quickly with increasing distance from backbones. Overall the levels of mussel shell impact at this site are moderate and representative of many marine farms in the Sounds.

The benthos under the extension was characterised by silt and clay (mud) and natural shell in deeper areas under backbones. This substratum is regarded as suitable for consideration for marine farming activities in Marlborough. In areas inshore of the structures a greater proportion of fine sand and natural shell were observed. No mussel shell debris was observed from these inshore areas. No hard substratum in the form of cobbles or bedrock were observed from the extension area or from along the inshore boundary of the parent farm.

All surface marine farm structures were located within the consent boundaries during the present survey. No biological features with recognised high scientific or conservation importance were recorded during the present study Based on the present findings of the present study, no adjustment or modifications to the present consent area are suggested.

3.0 Methods for present study

The area was investigated on 10 August 2016. Prior to fieldwork, the consent corners were plotted onto mapping software (TUMONZ Professional). The laptop running the mapping software was linked to a Lowrance HDS-12 Gen2 with an external Lowrance Point 1 high sensitivity GPS 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 corners of the existing marine farm surface structures were surveyed by positioning the survey vessel immediately adjacent to the corner floats and the position plotted. 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-12 Gen 2 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. A Lowrance HDS 10 Gen 1 unit fitted with a high definition Airmar transducer was used to collect traditional sonar data from the site.

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 and site depths

Drop camera photographs were collected from the marine farm site during the present study. A total of 21 photographs have been collected from the farm area (droppers, warps, offshore and inshore of structures) as well as areas inshore of the consent. At each drop camera station, 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 cover of benthic mussel shell from drop camera photographs were ranked as: None = no benthic mussel shell, Low = 1-30%, Moderate = 31-50%, Moderate to High = 51-75%, and High = 76-100% cover. This assessment is displayed in Table 2 of the present report.

The location of photograph stations was selected in an effort to obtain a representative range of habitats within consent. Additional photographs were taken when any features of particular interest (e.g. mussel shell, reef structures, cobbles) were observed on the remote monitor on-board the survey vessel. All photographs collected during the survey have been included in Appendix 1.

The position of low water mark at two locations was also plotted by positioning the survey vessel over the point where subtidal and intertidal species overlapped.

4.0 Results

During the survey the tide was high at 1.54 pm (2.3 m height) and low at 4.46 pm (0.8 m height). During the survey period the tide was outgoing. The weather was calm and sunny, however, water visibility was reduced due to algae in the water column giving a characteristic green appearance.

4.1 Consent corners and surface structures

Corner depths of the existing marine farm consent ranged from: inshore 6.1 m to 10.1 m, and offshore 28.9 to 29.6 m depth (Figure 3). The bottom topography under the consent comprised a gently sloping shore that increased gradually from inshore areas to offshore areas and from north to south. A shallow area was recorded at the southern inshore edge of the consent. This shallow area continued southwards and formed a relatively large underwater structure southward from the consent.

Existing surface structures consisted of one block of backbones covering 1.8 ha. All backbone surface structures were located inside the existing consent (Figure 3, Plate 3).

The distance between low tide and the consent boundary was measured from positions established by positioning the survey vessel over low water. Separation distances between the farm and the low tide mark were: northern = 42 m and southern 33 m distance (Figure 3, Plate 3).

Table 1. Depths recorded from the corners of mussel farming surface structures, proposed consent corners and low tide positions. Depths adjusted to datum. Coordinates = NZTM (Northing/Easting).

Type	No. & Depth (m)	Coordinates
Consent corner	A, 7.3m	1668623.1,5459393.1
Consent corner	B, 10.1m	1668550.9,5459206.6
Consent corner	C, 6.1m	1668465.1,5459132.5
Consent corner	D, 29m	1668374.9,5459167.1
Consent corner	E, 28.9m	1668483.6,5459447.0
Low tide (north)		1668653.4,5459354.3
Low tide (south)		1668578.3,5459187.4
Structure corner	A, 28.9m	1668464.6,5459390.3
Structure corner	B, 29.6m	1668396.3,5459214.9
Structure corner	C, 19.6m	1668448.9,5459195.0
Structure corner	D, 19.6m	1668516.9,5459228.9
Structure corner	E, 21.6m	1668562.5,5459352.9

4.2 Substratum, benthic mussel shell and flora and fauna

Substratum and habitat distribution relative to the consent area were based on drop camera images (Table 2, Figure 4, Appendix 1) and sonar.

4.2.1 Under existing marine farm structures within the consent

Substratum under existing mussel farm backbones structures located in the consent was dominated by a base of silt and clay (Plates 4 and 5, Table 3). Very little natural shell material was observed from this area. Mussel shell was either absent or observed at high levels (Plates 4 and 5). No hard substratum was observed under backbones.

Few surface dwelling species were recorded from under backbones. Species observed were sea cucumber, cushion seastar and 11 arm sea star. Scallops were not recorded from drop camera images in this area.

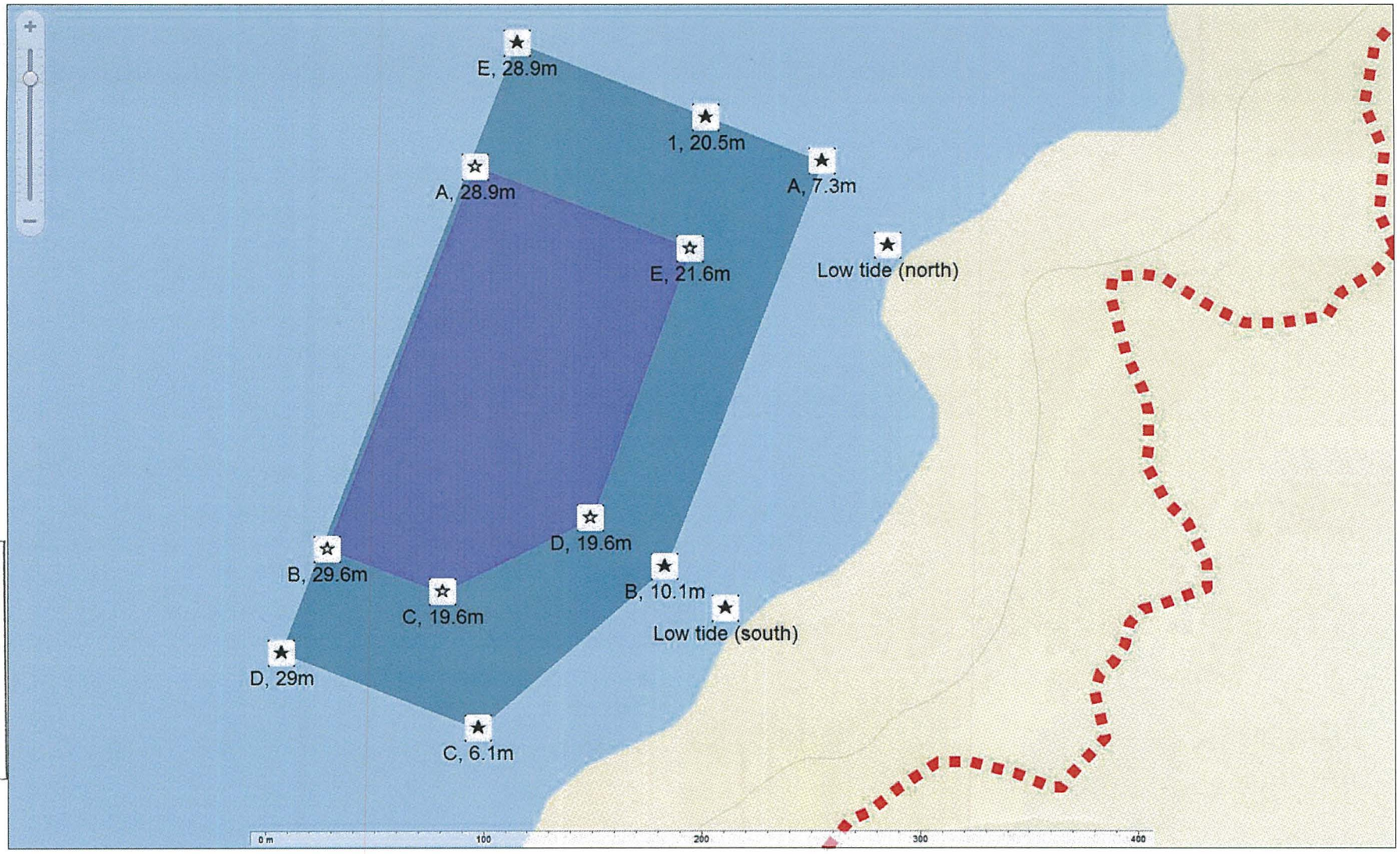


Figure 3. Depths of the existing consent area (teal) and extent of existing surface structures (purple). Low tide mark is also indicated.

Plate 3. Farm 8184 consent boundaries (yellow) relative to the shoreline (Photo taken January 2011).

4.2.2 Areas located around inshore parts of the consent

Two areas located around the inshore boundaries of the existing consent were relatively shallow (Figures 3 and 4). No farm structures were presently located in these areas, however, lines had been historically positioned in these areas. Shallow areas were however, occupied by anchors and warps regarded to have low impact levels (see Davidson and Richards 2014). A small amount of mussel shell was observed at one photo located in these inshore shallow areas of the consent (Photo 3, In: Appendix 1).

4.2.3 Benthos offshore of the consent

Four photo stations were established offshore of the present consent. This area was characterised by a deep flat benthos dominated by silt and clay (Plate 8). No shell or hard substratum was recorded. No mussel shell was observed from these photos, however, it is likely that some mussel shell from the adjacent consent will be present close to backbones.

4.3 Sonar

The sonar runs revealed a number of areas comprising rocky substrata located inshore of the consent (Figure 5). No reef structures were observed within the consent or areas offshore of the consent.

The sonar also detected rows of shell on the seafloor originating from the activity of shellfish farming. Shell was observed under and in close proximity to backbones.

Table 2. Coordinates of drop camera stations showing depths, substratum and level of benthic mussel shell. Depths adjusted to datum. None = no benthic mussel shell, Low = 1-30%, Moderate = 31-50%, Moderate to High = 51-75%, and High = 76-100% cover.

No. & Depth (m)	Coordinates	Location	Substratum	Shell debris
1, 15.1m	1668593.8,5459378.2	In consent, no structures	Fine sand, silt, shell hash, occasional cobbles	None
2, 9.5m	1668616.1,5459379.0	In consent, no structures	Fine sand, silt, shell hash	None
3, 12.1m	1668601.0,5459348.3	In consent, no structures	Pebbles, silt, fine sand, mussel shell	Low
4, 18.7m	1668571.7,5459274.4	In consent, no structures	Silt and clay, mussel shell	High
5, 11.8m	1668547.7,5459209.0	In consent, no structures	Bedrock, fine sand natural shell	None
6, 9m	1668501.4,5459172.5	In consent, no structures	Fine sand, silt, shell hash, occasional cobbles	None
7, 6.9m	1668464.4,5459138.9	In consent, no structures	Fine sand, natural shell, silt	None
8, 12.9m	1668509.8,5459203.8	In consent, under warps	Fine sand, natural shell, silt	None
9, 17.8m	1668527.0,5459236.8	In consent, no structures	Silt, fine sand, natural shell & mussel shell	Low
10, 24.3m	1668546.1,5459291.1	In consent, no structures	Silt and clay, mussel shell	High
11, 20.4m	1668570.0,5459354.5	In consent, no structures	Silt and clay, mussel shell	Moderate to high
12, 26.7m	1668517.7,5459361.2	In consent, under backbones	Silt and clay, mussel shell	High
13, 26.6m	1668484.1,5459296.0	In consent, under backbones	Silt and clay	None
14, 20.6m	1668450.0,5459205.2	In consent, under backbones	Silt and clay, mussel shell	High
15, 22m	1668402.8,5459168.7	In consent, under warps	Silt mand clay, natural shell hash	None
16, 28.9m	1668419.2,5459249.1	In consent, under backbones	Silt and clay	None
17, 27.4m	1668458.0,5459347.3	In consent, under backbones	Silt and clay, mussel shell	Low
18, 28m	1668430.5,5459423.8	Offshore of consent, no structures	Silt and clay	None
19, 28m	1668415.0,5459348.6	Offshore of consent, no structures	Silt and clay	None
20, 28.4m	1668389.3,5459268.0	Offshore of consent, no structures	Silt and clay	None
21, 29.4m	1668363.8,5459195.8	Offshore of consent, no structures	Silt and clay	None

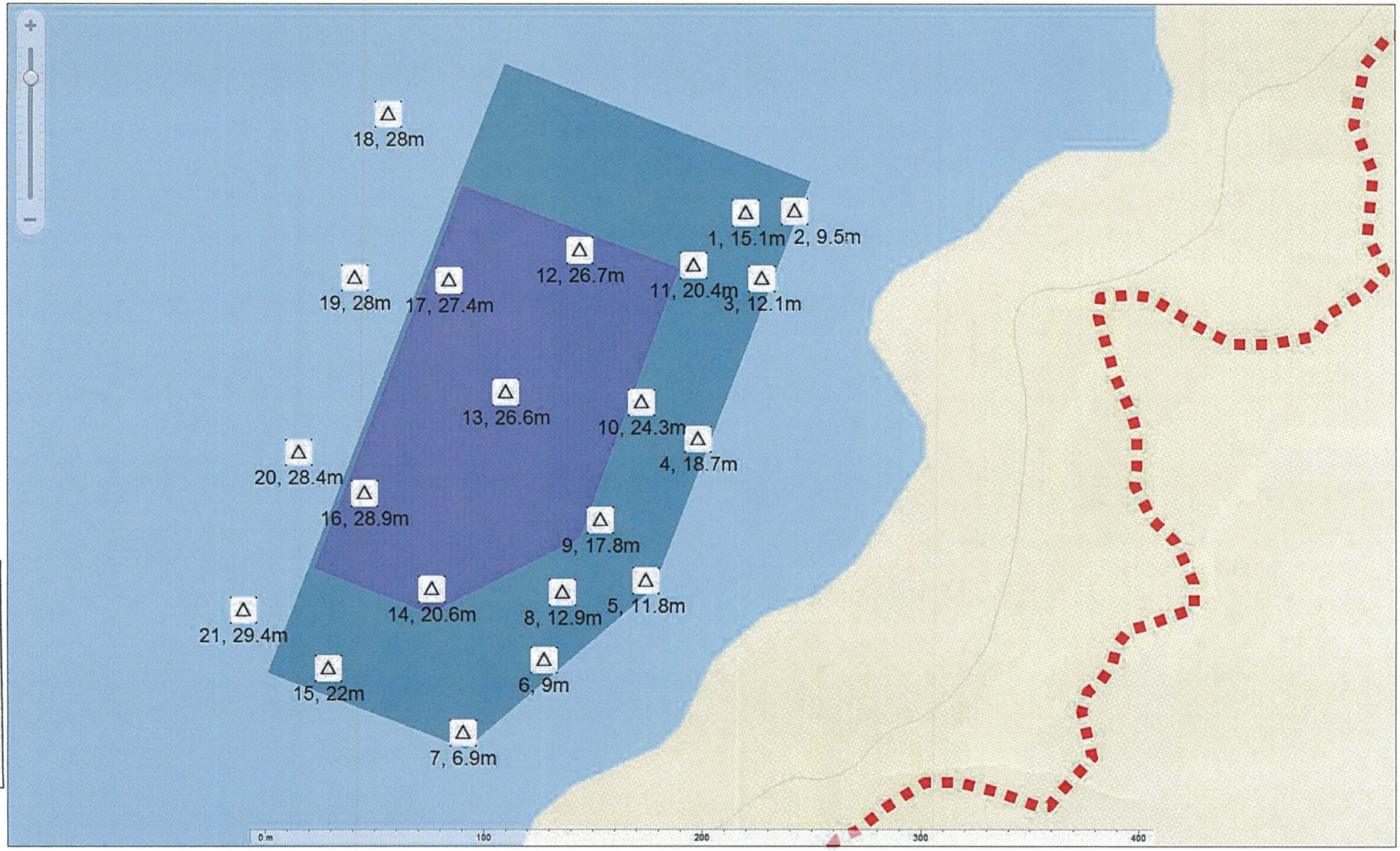


Figure 4. Existing consent (teal), surface structures (purple) and drop camera stations with depths (triangles).

Plate 4. Silt and clay substratum located under backbones (Photo 13, 26.6 m depth).

Plate 5. Silt and clay with mussel shell under backbones (photo 14, 20.6 m depth).

Plate 6. Bedrock, dine sand and silt located along the inshore area of the consent (Photo 5, 11.8 m depth).

Plate 7. Fine sand, natural shell, silt and occasional cobbles located along the inshore areas of the consent (Photo 1, 9.5 m depth).

Plate 8. Silt and clay substratum located offshore the consent (Photo 21, 29.4 m depth).

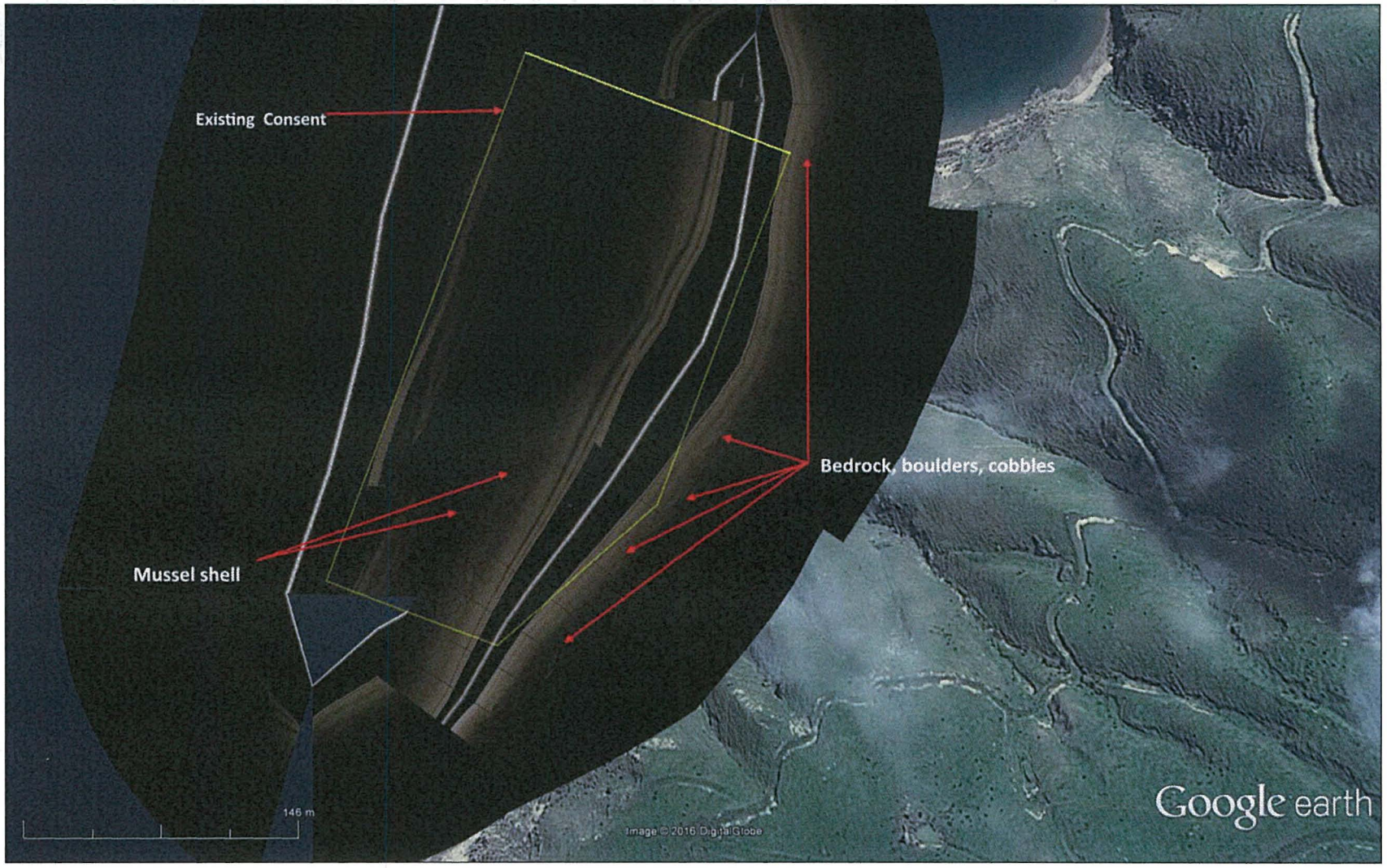


Figure 5. Sonar run at farm 8184. Yellow polygon = consent boundary.

5.0 Conclusions

5.1 Benthos

The benthos under mussel farming structures located within the existing consent was dominated by silt and clay with little or no natural shell. Silt and clay is the dominant substratum from offshore areas of most of Pelorus Sound including Fitzroy and Hallam Cove.

Bedrock, boulders and cobbles were observed inshore of the consent boundary with isolated parts of this hard substratum being recorded near the consent edges.

5.2 Species and communities

Relatively few invertebrate species were observed under the consent. Species present were characteristic of mud shores in sheltered locations in the Sounds (McKnight and Grange 1991). No species or communities of scientific, conservation or ecological importance were observed during the present study (see Davidson *et al.*, 2011 for criteria and biological features). An occasional scallop was seen in the consent along the shallow inshore edges.

5.3 Mussel farming impacts

5.3.1 Benthic impacts

Mussel shell debris was present under and close to backbones. The level of benthic shell was either low or high. Compared to mussel farms established for periods >10 years in sheltered locations, this farm can be regarded as typical of the impact level.

It is probable that the impact of continued shellfish farming at this site will result in the deposition of more shell and fine sediment under and in close proximity to droppers. Based on the literature and assuming the present level of activity remains relatively consistent, it is very unlikely that the surface sediments would become anoxic (Hartstein and Rowden 2004, Keeley *et al.* 2009, Davidson and Richards 2014). Tidal flows are expected to be relatively low; however, winds are likely to be an important driver of water movement in this area.

The farm owner has recently removed inshore growing lines. It is expected that these areas will recover over a period of approximately 10 years (Davidson and Richards 2014).

5.3.2 Productivity

Mussel farms can influence adjacent farms by slowing water flow to farms located in downstream positions. This is particularly pronounced in quiescent areas of the Sounds. However, published work by Zeldis *et al.* (2008, 2013) suggests that the major factors

influencing productivity in the Marlborough Sounds relate to cyclical weather patterns in the summer (El Nino and La Nina) and river derived nutrient inputs in winter. Slow crop cycles in some years are therefore a reflection of a particular weather cycle and much less about the number of farms.

There has been no data presented to show that the ecological carrying capacity of the Sounds has been reached. There is considerable evidence that shows the major drivers of the Pelorus system for example, naturally lead to large within and between year variability. Relative to this, the impact of mussel farms appears to be material, but relatively small compared to major environmental drivers.

Hallam Cove has some of the longest water residency times for any embayment in the Sounds. Despite this fact, data on a cockle bed located in Fitzroy Bay presented by Ken Grange in a recent Environment Court Hearing (RJ Davidson Family Trust) showed that the cockles at this bed showed no indications of an adverse effect due to lack of food brought on by too many mussel farms.

5.3.3 11 arm seastars

Inglis and Gust (2013) raised a concern that because 11 arm sea stars can reach densities 39 times those outside farms, this elevated population could lead to recruitment of these predators into the wider population. In a long term investigation of the recovery of a mussel farm, Davidson and Richards (2014) sampled sites under retired backbones, retired warps and four control sites located away from mussel farms. The 11 arm sea star population was indeed elevated under the retired backbones, but their numbers quickly declined to background levels and remained low and stable throughout the remainder of the study after the farm was removed.

Data from this long term study suggests that 11 arm seastar numbers increase under farms (most likely in response to food availability), however, their densities at control sites and under retired warps remained at low levels throughout the study despite concerns that seastars recruit into adjacent areas by either migration or juvenile settlement.

5.4 Boundary adjustments, recommendations and monitoring

The existing consent is located over a combination of habitats. Areas of the consent located under backbones are considered preferable for shellfish farming compared to bedrock, cobble and coarse soft substratum.

The farm owner is applying to renew the existing consent, but is also applying to shift the consent further from shore (Figure 6). This 60 m offshore movement would place the whole

consent over silt and clay substratum. From a biological perspective, a shift offshore to move farming structures further away from inshore hard substratum and coarse soft substratum represents an improvement on the present situation. The offshore area where new structures would be placed is characterised by silt and clay (i.e. mud) and is the habitat type traditionally targeted for mussel farming activities as it is common and widespread in the Marlborough Sounds and is the habitat type least modified by farming related impacts.

Based on the substratum located under structures and the impact levels of the existing activity, no monitoring is suggested.

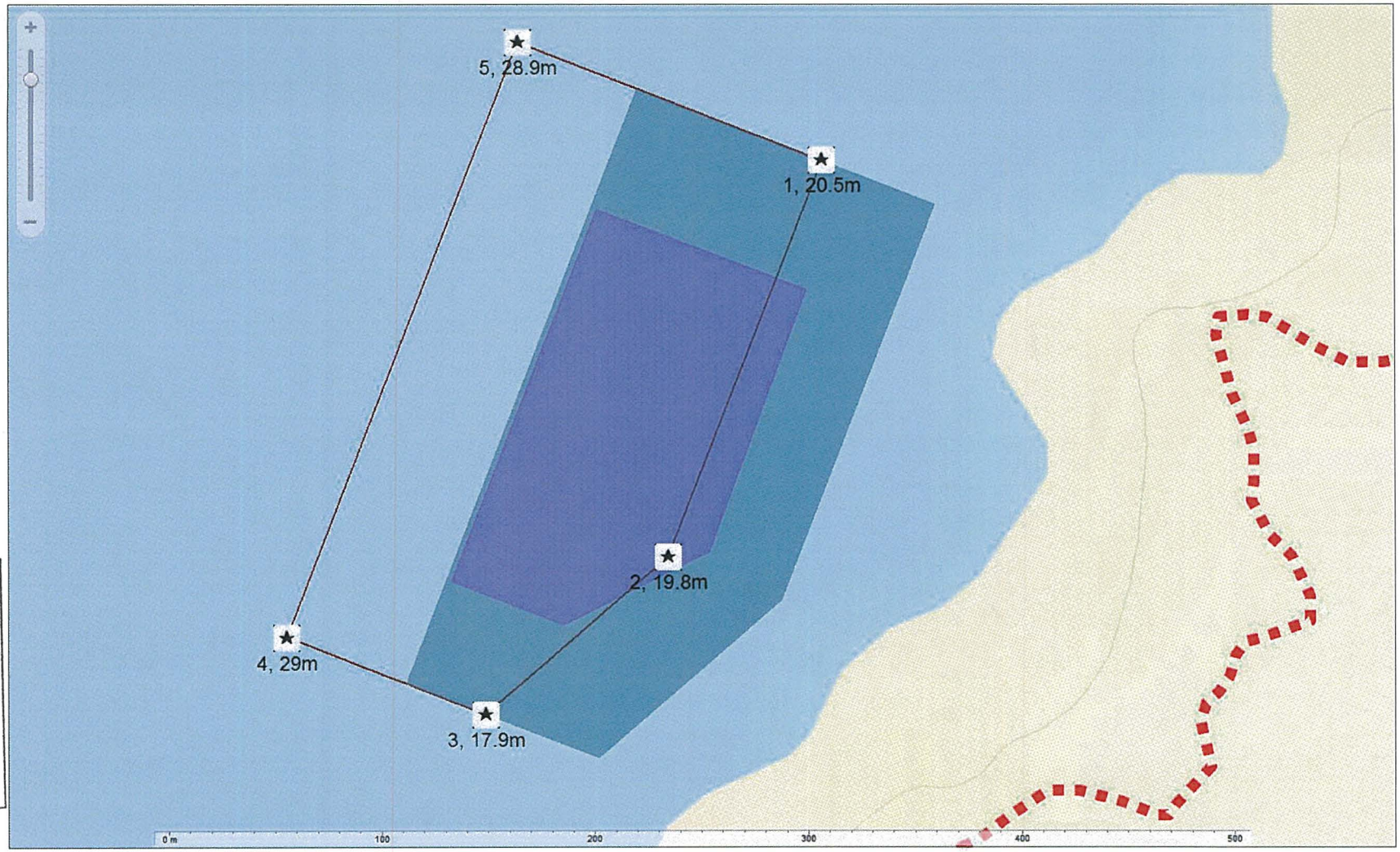


Figure 6. Existing consent (teal) and backbones (purple) relative to the proposed offshore site (red solid line).

References

Davidson, R.J.; Richards L.A. 2014. Recovery of a mussel farm in Otanerau Bay, East Bay, Marlborough Sounds: 2002-2013. Prepared by Davidson Environmental Limited for Marlborough District Council. Survey and Monitoring Report No. 788.

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

Davidson, R.J. & Richards, L.A. 2010. Ecological report for the proposed renewal of part of marine farm site 8184 located in outer Hallam Cove, Pelorus Sound. Prepared by Davidson Environmental Ltd. for P. Archer. Survey and monitoring report no. 645.

Davidson, R. J. 1999: Biological report on a proposed marine farm extension located in Hallam Cove, Pelorus Sound. Prepared by Davidson Environmental Limited for Peter Archer. Survey and Monitoring Report No. 292.

Hartstein, N.D.; Rowden, A.A. 2004. Effect of biodeposits from mussel culture on macroinvertebrate assemblages at sites of different hydrodynamic regime. Mar Environ Res. 2004;57(5):339-57.

Inglis, G.T.; Gust, N. 2003. Potential indirect effects of shellfish culture on the reproductive success of benthic predators. Journal of Applied Ecology 40: 1077–1089.

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.

McKnight, D.G.; Grange, K.R. 1991: Macrobenthos sediment-depth relationships in Marlborough Sounds. Report prepared for Department of Conservation by Oceanographic Institute, DSIR. No. P692. 19 p

Appendix 1. Drop camera photographs

Photo site 1

Photo 2

Photo site 3

Photo 4

Photo site 5

Photo site 6

Photo site 7

Photo 8

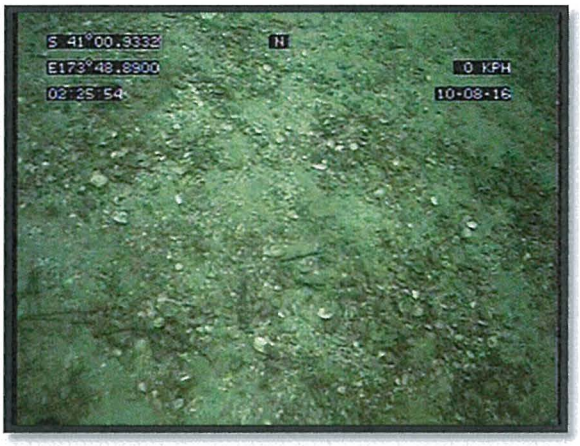


Photo site 9

Photo site 10

Photo site 11

Photo site 12

Photo site 13

Photo 14

Photo site 15

Photo site 16

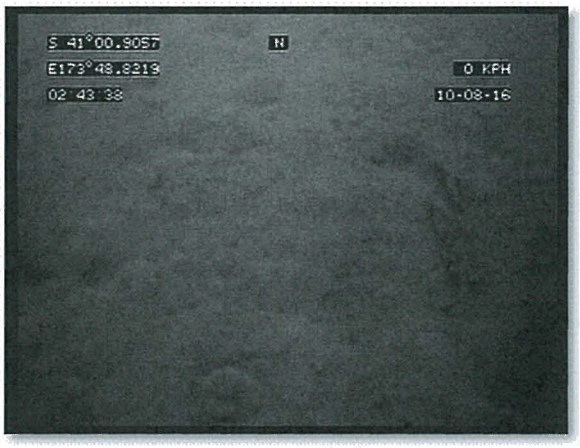


Photo site 17

Photo site 18

Photo site 19

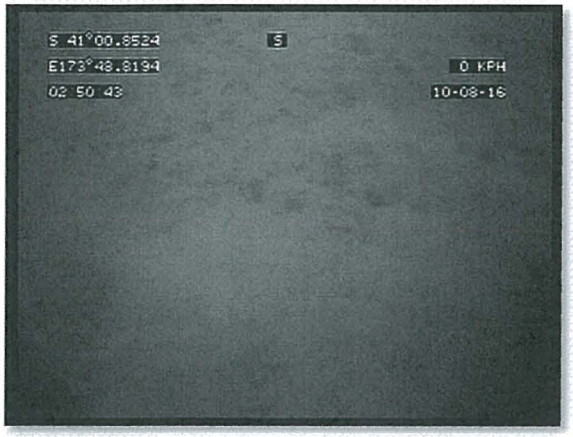


Photo 20

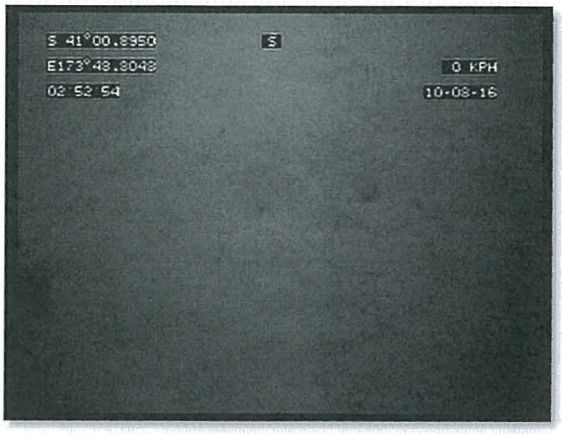


Photo site 21