Case No: 2019-0547 Date of visit: 25/09/2019

Time spent on site: 3h Main Inspector: [redacted]

Site No: SS0759 Site Name: Fearna
Business No: SB0530 Business Name: Loch Striven Mussel Farms Ltd

Case Types: 1 MOV 2 3 4 5 6

Water Temp (°C): Thermometer No: FHI 045 completed

Observations: Region: ST Water type: S CoGP MA

Dead/weak/abnormally behaving fish present?	n	If yes, see additional information/clinical score sheet.
Clinical signs of disease observed?	n	If yes, see additional information/clinical score sheet.
Gross pathology observed?	n	If yes, see additional information/clinical score sheet.
Diagnostic samples taken?	n	

UNI/REG only - if unable to carry out intended visit detail reason below:

Additional Case Information:

One consignment of mussel spat to Ireland inspected.

Consignment consisted of 16 bags 19.2 tonne in total, no issues noted.

Certificate INTRA.GB.2019.0026586 (local ref:MD19/116) issued

Case No:	2019-0547	Site No:	SS0759
Date of Visit:	25/09/2019	Inspector(s):	[redacted]

Registration/Authorisation Details

1. Business/site details summary checked by site representative?	N
2. Changes made to details?	N/A

Site Details

Total No facilities	30	Facilities stocked	15	No facilities inspected	0		
Species							
Age group							
No Fish	300 tonnes						
Mean Fish Wt							
Next Fallow Date (Site)	no fallow planned		Next Input Date (Site)	natural spat collection			

Recent (last 4 wks) disease problems?	N	Any escapes (since last visit)?	N/A
If yes, detail:			

Movement Records

1. Movement records available for inspection?	Y
2. Date of last inspection:	19/09/2019
3. Are records complete and correctly entered?	Y
4. Are movement records available for dead fish and waste?	N/A
5. Are records complete and correctly entered?	N/A
6. Are health certificates for introductions (outwith GB) available?	N/A

Transport Records

1. Are any movements carried out by (or on behalf) of the business (not using a STB)?	
If yes, is there a system in place for maintenance of transportation records?	

Mortality Records

1. Mortality records available for inspection?	N/A
2. How are mortalities disposed of?	
If other detail:	
3. Mortality records complete and correctly entered?	N/A
4. Recent mortality (last 4 wks):	
5. Evidence of recent increased/atypical mortalities?	N/A
If yes, facility nos/no mortality per facility/no stock per facility/reason:	
6. Any other peaks in mortality during period checked?	N/A
If yes, detail:	
7. Have increased (unexplained) mortalities been reported to vet or FHI?	N/A
If yes, detail action:	
8. Have 'mortality events' been reported to FHI? If no, add MRT case and enter on mortality events sheet.	N/A

1. Recent treatments (last 4 wks)?	
If yes, detail:	
If other, detail:	
2. Medicines records available for inspection?	
3. Are records complete and correctly entered?	
4. Are fish in a withdrawal period?	
5. If yes, what treatment(s)?	
If other, detail:	
6. Are medicines stored appropriately?	

Biosecurity Records

1. Biosecurity records available for inspection?	
2. Has the manner and frequency of mortality removal, recording and safe disposal been considered?	
3. Has the manner and period in which the APB will notify Scottish Ministers or veterinary professional of any *increased* (*unexplained)* mortality at the site been included?	
4. Has the action that will be taken in the event that the presence or suspicion of the presence of a listed disease is detected been included and *how* and *when* that will be notified to Scottish Ministers?	
5. Has the health status of aquaculture animals being stocked on the farm site been covered (equal or higher health status, certification if required)?	
6. Have the husbandry and biosecurity measures implemented between each epidemiological unit to minimise transmission of disease been covered (movement of staff, visitors, equipment, live or dead fish etc.)?	
7. Is documentation available regarding the measures in place to maintain the physical containment of aquaculture animals held on site?	
8. Have the biosecurity procedures been adequately implemented on site?	
If no, detail:	

Results of Surveillance

1. Has any animal health surveillance been carried out by, or on behalf of, the business?	N
2. If yes, are results available for inspection?	
3. Any significant results?	
If yes, detail (if not detailed under recent disease problems).	

Records checked between: 19/9/2019 to 25/9/2019

Case No: 2019-0547 Date of visit: 25/09/2019

Site No: SS0759 Inspector: [redacted]

Results Summary	Freq.	Date of Notification						
		Database	Insp	Phone	Insp	Writing	Insp	2nd Insp

Report Summary			
Case Type	Date	Insp	2nd Insp
MOV	09/10/2019	[redacted]	[redacted]

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Scottish Government
Riaghaltas na h-Alba
gov.scot

[redacted]
Loch Striven Mussel Farms Ltd
The Point Ardtaraig Estate
Loch Striven
Argyll
PA23 8RG
[redacted]

FISH HEALTH INSPECTORATE VISIT REPORT

SUMMARY FOR INFORMATION OF SITE OPERATOR

BUSINESS NO	SB0530	**DATE OF VISIT**	25/09/2019
SITE NO	SS0759	**SITE NAME**	Fearna
INSPECTOR	[redacted]	**CASE NO**	20190547

Inspection for placing on the market in the EU

In accordance with the Trade in Animals and Related Products (Scotland) Regulations 2012 and European Community Council Directive 2006/88/EC, the above site was visited and a consignment of mussel spat (*Mytilus edulis)* for placing on the market in Ireland was inspected. A health certificate was issued which must travel with the consignment to the destination. The official authority in the importing country has been notified.

Please contact myself or the duty inspector should you require any further information or have any queries regarding this report.

Signed: [redacted] Date: 09/10/2019

Fish Health Inspector

The Fish Health Inspectorate Service Charter detailing standards of service is available on the Marine Scotland website at www.gov.scot/Topics/marine/Fish-Shellfish/FHI/charter

Marine Laboratory, 375 Victoria Road, Aberdeen, AB11 9DB
Tel – 0131 244 3498 Fax – 0131 244 0944 Email – ms.fishhealth@gov.scot
Website - www.gov.scot/Topics/marine/science

Case No: 2019-0548 Date of visit: 26/09/2019

Time spent on site: 4h Main Inspector: [redacted]

Site No: SS0759 Site Name: Fearna
Business No: SB0530 Business Name: Loch Striven Mussel Farms Ltd

Case Types: 1 MOV 2 3 4 5 6

Water Temp (°C): Thermometer No: FHI 045 completed

Observations: Region: ST Water type: S CoGP MA

Dead/weak/abnormally behaving fish present?	N/A	If yes, see additional information/clinical score sheet.
Clinical signs of disease observed?	N/A	If yes, see additional information/clinical score sheet.
Gross pathology observed?	N/A	If yes, see additional information/clinical score sheet.
Diagnostic samples taken?	N/A	

UNI/REG only - if unable to carry out intended visit detail reason below:

Additional Case Information:

One consignment of mussels for export to Ireland inspected consisting of 16 bags (19.2 tonnes).

No issues, health certificate INTRA.GB.2019.0026799 (local ref MD19/117) issued.

Case No:	2019-0548	Site No:	SS0759
Date of Visit:	26/09/2019	Inspector(s):	[redacted]

Registration/Authorisation Details

1. Business/site details summary checked by site representative?	N
2. Changes made to details?	N

Site Details

Total No facilities	30	Facilities stocked	15	No facilities inspected	0		
Species							
Age group							
No Fish							
Mean Fish Wt							
Next Fallow Date (Site)	no fallow planned		Next Input Date (Site)	natural spat collection			

Recent (last 4 wks) disease problems?	N	Any escapes (since last visit)?	N/A
If yes, detail:			

Movement Records

1. Movement records available for inspection?	Y
2. Date of last inspection:	25/09/2019
3. Are records complete and correctly entered?	Y
4. Are movement records available for dead fish and waste?	N/A
5. Are records complete and correctly entered?	N/A
6. Are health certificates for introductions (outwith GB) available?	N/A

Transport Records

1. Are any movements carried out by (or on behalf) of the business (not using a STB)?	
If yes, is there a system in place for maintenance of transportation records?	

Mortality Records

1. Mortality records available for inspection?	N/A
2. How are mortalities disposed of?	
If other detail:	
3. Mortality records complete and correctly entered?	N/A
4. Recent mortality (last 4 wks):	
5. Evidence of recent increased/atypical mortalities?	N/A
If yes, facility nos/no mortality per facility/no stock per facility/reason:	
6. Any other peaks in mortality during period checked?	N/A
If yes, detail:	
7. Have increased (unexplained) mortalities been reported to vet or FHI?	N/A
If yes, detail action:	
8. Have 'mortality events' been reported to FHI? If no, add MRT case and enter on mortality events sheet.	N/A

1. Recent treatments (last 4 wks)?
If yes, detail:
If other, detail:
2. Medicines records available for inspection?
3. Are records complete and correctly entered?
4. Are fish in a withdrawal period?
5. If yes, what treatment(s)?
If other, detail:
6. Are medicines stored appropriately?

Biosecurity Records

1. Biosecurity records available for inspection?
2. Has the manner and frequency of mortality removal, recording and safe disposal been considered?
3. Has the manner and period in which the APB will notify Scottish Ministers or veterinary professional of any *increased* (*unexplained)* mortality at the site been included?
4. Has the action that will be taken in the event that the presence or suspicion of the presence of a listed disease is detected been included and *how* and *when* that will be notified to Scottish Ministers?
5. Has the health status of aquaculture animals being stocked on the farm site been covered (equal or higher health status, certification if required)?
6. Have the husbandry and biosecurity measures implemented between each epidemiological unit to minimise transmission of disease been covered (movement of staff, visitors, equipment, live or dead fish etc.)?
7. Is documentation available regarding the measures in place to maintain the physical containment of aquaculture animals held on site?
8. Have the biosecurity procedures been adequately implemented on site?
If no, detail:

Results of Surveillance

1. Has any animal health surveillance been carried out by, or on behalf of, the business? N
2. If yes, are results available for inspection?
3. Any significant results?
If yes, detail (if not detailed under recent disease problems).

Records checked between: 25/9/2019 to 26/9/2019

Case No:	2019-0548	Date of visit:	26/09/2019
Site No:	SS0759	Inspector:	[redacted]

Results Summary	Freq.	Date of Notification						
		Database	Insp	Phone	Insp	Writing	Insp	2nd Insp

Report Summary			
Case Type	Date	Insp	2nd Insp
MOV	09/10/2019	[redacted]	[redacted]

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Scottish Government
Riaghaltas na h-Alba
gov.scot

[redacted]
Loch Striven Mussel Farms Ltd
The Point Ardtaraig Estate
Loch Striven
Argyll
PA23 8RG
[redacted]

FISH HEALTH INSPECTORATE VISIT REPORT

SUMMARY FOR INFORMATION OF SITE OPERATOR

BUSINESS NO	SB0530	**DATE OF VISIT**	26/09/2019
SITE NO	SS0759	**SITE NAME**	Fearna
INSPECTOR	[redacted]	**CASE NO**	20190548

Inspection for placing on the market in the EU

In accordance with the Trade in Animals and Related Products (Scotland) Regulations 2012 and European Community Council Directive 2006/88/EC, the above site was visited and a consignment of mussel spat (*Mytilus edulis)* for placing on the market in Ireland was inspected. A health certificate was issued which must travel with the consignment to the destination. The official authority in the importing country has been notified.

Please contact myself or the duty inspector should you require any further information or have any queries regarding this report.

Signed: [redacted] Date: 09/10/2019

Fish Health Inspector

The Fish Health Inspectorate Service Charter detailing standards of service is available on the Marine Scotland website at www.gov.scot/Topics/marine/Fish-Shellfish/FHI/charter

Marine Laboratory, 375 Victoria Road, Aberdeen, AB11 9DB
Tel – 0131 244 3498 Fax – 0131 244 0944 Email – ms.fishhealth@gov.scot
Website - www.gov.scot/Topics/marine/science

Case No: 2019-0558 Date of visit: 30/09/2019

Time spent on site: 5 hours Main Inspector: [redacted]

Site No: FS0489 Site Name: Cole Deep
Business No: FB0440 Business Name: Grieg Seafood Shetland Ltd

Case Types: 1 REP 2 DIA 3 VMD 4 5 6

Water Temp (°C): 11.8 Thermometer No: T274 FHI 045 completed

Observations: Region: SH Water type: S CoGP MA S-8b

Dead/weak/abnormally behaving fish present?	Y	If yes, see additional information/clinical score sheet.
Clinical signs of disease observed?	Y	If yes, see additional information/clinical score sheet.
Gross pathology observed?	Y	If yes, see additional information/clinical score sheet.
Diagnostic samples taken?	Y	

UNI/REG only - if unable to carry out intended visit detail reason below:

Additional Case Information:

Site inspected following notification from operator of increased mortality levels. Mortality levels began to increase in cage 11 at the end of August. Cage 7 has been worst affected cage, losing 23,992 fish from 2-30/9/19 (46%). Total loss on site from 2-30/9/19 has been 100,423 (18%). Three cages (2, 5 and 12) seem to be unaffected with mortality levels low over September (only 0.43% in cage 12). Mortality levels decreased slightly last week.

There was a chaetoceros bloom at the start of August which affected all three sites in the area (Olna South and East of Papa Little). Oxygen has been lower at night. No increase in mortalities at Papa Little and small increase at Olna South last week (see case 2019-0568 for details). Aeration system active at Cole Deep and Olna South (15m depth).

All cages treated with freshwater for lice in July and all (except 1, 8, 9 and 12) treated at start of September. Using Ronja Polaris for treatments. Fish transferred on board and held in freshwater for 10-12 hours. Two cages will be treated before freshwater is discharged (collecting freshwater from tarpaulins near Olna).

Slice used on site for lice. Planning Salmosan/peroxide treatment in tarpaulins for site later this week.

Samples taken last week showed significant mixed gill pathology, probably post acute response to direct waterborne irritant (likely environmental, possibly harmful algae). There was also evidence of AGD, Branchiomonas colonies and suspicion of Desmozoon lepeophtherii . Have had positive PCR samples for PRV.

Due to start harvesting here once completed at Olna South, but company currently discussing whether to bring harvest forward and use the Norwegian Gannet which will allow them to harvest 5-6 cages in one load.

On site, not many moribund fish visible, but 5 removed for further examination and sampling from cages 7, 10 and 11. Also removed one feeding fish from cage 12 (no increased mortalities in this cage) for VMD samples and included in diagnostic sample for comparison.

Case No:	2019-0558	Site No:	FS0489
Date of Visit:	30/09/2019	Inspector(s):	[redacted]

Registration/Authorisation Details

1. Business/site details summary checked by site representative?	Y
2. Changes made to details?	N

Site Details

Total No facilities	12	Facilities stocked	11	No facilities inspected	11		
Species	SAL						
Age group	2018 S0						
No Fish	437,123						
Mean Fish Wt	2.76Kg						
Next Fallow Date (Site)	Mid November 2019	Next Input Date (Site)	October 2020				

Recent (last 4 wks) disease problems?	Y	Any escapes (since last visit)?	N
If yes, detail:	gill issues - AGD, bleeding gills		

Movement Records

1. Movement records available for inspection?	Y
2. Date of last inspection:	28/11/2018
3. Are records complete and correctly entered?	Y
4. Are movement records available for dead fish and waste?	Y
5. Are records complete and correctly entered?	Y
6. Are health certificates for introductions (outwith GB) available?	N/A

Transport Records

1. Are any movements carried out by (or on behalf) of the business (not using a STB)?	
If yes, is there a system in place for maintenance of transportation records?	

Mortality Records

1. Mortality records available for inspection?	Y
2. How are mortalities disposed of?	Whole fish - TWMA (Shetland)
If other detail:	
3. Mortality records complete and correctly entered?	Y
4. Recent mortality (last 4 wks):	w/b 2/9/19 = 9,247 (1.72%), w/b 9/9/19 = 16,187 (3.06%), w/b 16/9/19 = 44,275 (8.64%), w/b 23/9/19 = 29,466 (6.3%)
5. Evidence of recent increased/atypical mortalities?	Y

If yes, facility nos/no mortality per facility/no stock per facility/reason:

Cages 3, 4, 6, 7, 8, 9, 10 and 11. Range from 9.8% to 46.2% from 2/9/19 to 30/9/19.

6. Any other peaks in mortality during period checked?	Y
If yes, detail:	Increased mortality in cage 2 in July 2019 following a freshwater treatment (11,667 for whole month).
7. Have increased (unexplained) mortalities been reported to vet or FHI?	Y
If yes, detail action:	Increased surveillance, aeration in cages and looking at harvesting
8. Have 'mortality events' been reported to FHI? If no, add MRT case and enter on mortality events sheet.	Y

1. Recent treatments (last 4 wks)?	Y
If yes, detail:	TMS
If other, detail:	
2. Medicines records available for inspection?	Y
3. Are records complete and correctly entered?	Y
4. Are fish in a withdrawal period?	Y
5. If yes, what treatment(s)?	TMS
If other, detail:	
6. Are medicines stored appropriately?	Y

Biosecurity Records

1. Biosecurity records available for inspection?	
2. Has the manner and frequency of mortality removal, recording and safe disposal been considered?	
3. Has the manner and period in which the APB will notify Scottish Ministers or veterinary professional of any *increased* (*unexplained*) mortality at the site been included?	
4. Has the action that will be taken in the event that the presence or suspicion of the presence of a listed disease is detected been included and *how* and *when* that will be notified to Scottish Ministers?	
5. Has the health status of aquaculture animals being stocked on the farm site been covered (equal or higher health status, certification if required)?	
6. Have the husbandry and biosecurity measures implemented between each epidemiological unit to minimise transmission of disease been covered (movement of staff, visitors, equipment, live or dead fish etc.)?	
7. Is documentation available regarding the measures in place to maintain the physical containment of aquaculture animals held on site?	
8. Have the biosecurity procedures been adequately implemented on site?	
If no, detail:	

Results of Surveillance

1. Has any animal health surveillance been carried out by, or on behalf of, the business?	Y
2. If yes, are results available for inspection?	Y
3. Any significant results?	Y
If yes, detail (if not detailed under recent disease problems).	Significant mixed gill pathology (see additional info)

Records checked between:	28/11/2018 - 30/9/19

Case no:	2019-0558	Site No:	FS0489	Date of visit/ Sampling:	30/09/2019	01/							
Priority samples:	VI		BA		PA		MG		HI				
Time sampling starts/ends:	10:45:00	11:30:00	Inspector:		VMD No.	5							
Environmental conditions:	1	Indoors	2		3		4		5				
Summary samples	HIST	Y	BA	Y	MG	Y	VI	Y	PA		Total Samples		

Add Fish/Pools - click

	Pool/Fish No	F1	F2	F3	F4	F5	F6	P1					
	Fish nos	1	2	3	4	5	6	1-6					
	Pool Group	P1	P1	P1	P1	P1	P1						
Stock Details	Species	SAL	SAL	SAL	SAL	SAL	SAL	SAL					
	Average weight	2.0000	2.0000	2.5000	1.5000	1.5000	2.5000						
	Sex	N/A	N/A	N/A	N/A	N/A	N/A	N/A					
	Water Type	SW	SW	SW	SW	SW	SW	SW					
	Stock Origin	Girlsta Hatchery	Girlsta Hatchery	Girlsta Hatchery	Girlsta Hatchery	Girlsta Hatchery	Girlsta Hatchery	Girlsta Hatchery					
	Facility No	7	7	11	10	10	12						

10/2019 Additional Sample Information:

7 Total Tests assigned 4

Case no: 2019-0558 Site No: FS0489 Method of killing: Percussive

Date of visit: 30/09/2019 Inspector(s): [redacted] Sheet Relevant: Y

S for strong presence: **M** for medium presence: **W** for weak presence

Fish Number		1	2	3	4	5	6				
Time sampled after death (if > 45 minutes)		40m	40m	75m	100m	100m	100m				
External Signs											
Behaviour	Moribund										
	Lethargic	S	S	M	M	M					
	Hanging vertical										
	Spiralling										
	Flashing										
	Loss of equilibrium										
Body	Dark				M	M					
	Distended abdomen										
	Anorexic				M						
	Scale Oedema										
Opercula	Shortened										
	Flared										
Haemorrhaging	Throat										
	Ventrum										
	Base of fins										
	Elsewhere										
Eyes	Exophthalmic										
	Enophthalmic (sunken)										
	Cataract										
	Haemorrhagic										
Gills	Pale	M									
	Zoned										
	Necrotic										
Lesions	Flank	M									
	Elsewhere										
Vent	Inflamed										
	Trailing faeces										
Lice Load	Estimate numbers										
Internal Signs											
Ascites	Clear				M						
	Bloody										
Oedema	In tissues										
Heart	Pale/anaemic										
	Granulomas										
	Deformed										
Liver	Petechial haem										
	Gross haem										
	Tissue breakdown										
	Enlarged										
	Colour number(s)	3	5	5	5	5	5				
	Granulomas										
	Lesions										
Pyloric caeca	Petechial haem										
	Tubules mauve										
	Lack of fat										
Spleen	Enlarged										
	Granulomas										
Gut	No food present										
	Yellow pseudo-faeces	S	S		S	S					
	External haem										
	Internal haem										
Body wall	Haemorrhaging										
Swim bladder	Haemorrhaging										
	Fluid filled										
Kidney	Swollen										
	Grey										
	Granular										
	Liquefied										
General	Parasites present										
	Anaemia										

Case no: 2019-0558

Date of visit: 30/09/2019

S for strong presence: **M** for medium presence: **W** for w

Fish Number											
Time sampled after death (if > 45 minutes)											
External Signs											
Behaviour	**Moribund**										
	Lethargic										
	Hanging vertical										
	Spiralling										
	Flashing										
	Loss of equilibrium										
Body	**Dark**										
	Distended abdomen										
	Anorexic										
	Scale Oedema										
Opercula	**Shortened**										
	Flared										
Haemorrhaging	**Throat**										
	Ventrum										
	Base of fins										
	Elsewhere										
Eyes	**Exophthalmic**										
	Enophthalmic (sunken)										
	Cataract										
	Haemorrhagic										
Gills	**Pale**										
	Zoned										
	Necrotic										
Lesions	**Flank**										
	Elsewhere										
Vent	**Inflamed**										
	Trailing faeces										
Lice Load	**Estimate numbers**										
Internal Signs											
Ascites	**Clear**										
	Bloody										
Oedema	**In tissues**										
Heart	**Pale/anaemic**										
	Granulomas										
	Deformed										
Liver	**Petechial haem**										
	Gross haem										
	Tissue breakdown										
	Enlarged										
	Colour number(s)										
	Granulomas										
	Lesions										
Pyloric caeca	**Petechial haem**										
	Tubules mauve										
	Lack of fat										
Spleen	**Enlarged**										
	Granulomas										
Gut	**No food present**										
	Yellow pseudo-faeces										
	External haem										
	Internal haem										
Body wall	**Haemorrhaging**										
Swim bladder	**Haemorrhaging**										
	Fluid filled										
Kidney	**Swollen**										
	Grey										
	Granular										
	Liquefied										
General	**Parasites present**										
	Anaemia										

Additional comments:

Fish 4 & 5 - melanisation on pyloric caeca fat
Fish 2 - redness on flank
Fish 1 - abrasions/lesions on both flanks
Fish 4 - a few white patches on gills
Fish 5 - a few white patches on gills and gill damage

Site No: FS0489

Case No: 2019-0558

Nature of non-compliance:

Action taken (FHI):

Non-compliance relevant to (delete): VirologyMolGen/Bacteriology/Histology/Parasitology

Case No: 2019-0558 Date of visit: 30/09/2019

Site No: FS0489 Inspector: [redacted]

Results Summary	Freq.	Date of Notification						
		Database	Insp	Phone	Insp	Writing	Insp	2nd Insp
ISA PCR	0/1	04/10/2019	[redacted]	04/10/2019	[redacted]	12/11/2019	[redacted]	[redacted]
VHS PCR	0/1	04/10/2019	[redacted]	04/10/2019	[redacted]	12/11/2019	[redacted]	[redacted]
IHN PCR	0/1	04/10/2019	[redacted]	04/10/2019	[redacted]	12/11/2019	[redacted]	[redacted]
SAV PCR	0/1	04/10/2019	[redacted]	04/10/2019	[redacted]	12/11/2019	[redacted]	[redacted]
IPN PCR	1/1	04/10/2019	[redacted]	04/10/2019	[redacted]	12/11/2019	[redacted]	[redacted]
AGD PCR	5/6	04/10/2019	[redacted]	04/10/2019	[redacted]	12/11/2019	[redacted]	[redacted]
Para Ther PCR	6/6	04/10/2019	[redacted]	04/10/2019	[redacted]	12/11/2019	[redacted]	[redacted]
Sal Pox PCR	6/6	04/10/2019	[redacted]	04/10/2019	[redacted]	12/11/2019	[redacted]	[redacted]
Vibrio species	6/6	17/10/2019	[redacted]	17/10/2019	[redacted]	12/11/2019	[redacted]	[redacted]
AGD Histology	1/6	24/10/2019	[redacted]	24/10/2019	[redacted]	12/11/2019	[redacted]	[redacted]
Epitheliocystis histology	1/6	24/10/2019	[redacted]	24/10/2019	[redacted]	12/11/2019	[redacted]	[redacted]
Gill pathology	6/6	24/10/2019	[redacted]	24/10/2019	[redacted]	12/11/2019	[redacted]	[redacted]
Complex gill issues	6/6	24/10/2019	[redacted]	24/10/2019	[redacted]	12/11/2019	[redacted]	[redacted]
Carnobacterium species	3/6	08/11/2019	[redacted]			12/11/2019	[redacted]	

Report Summary			
Case Type	Date	Insp	2nd Insp
DIA/REP	12/11/2019	[redacted]	[redacted]
VMD	12/11/2019	[redacted]	[redacted]

[redacted]
Grieg Seafood Shetland Ltd
Gremista
Lerwick
Shetland
ZE1 OPX
[redacted]

FISH HEALTH INSPECTORATE VISIT REPORT

SUMMARY FOR INFORMATION OF SITE OPERATOR

BUSINESS NO	FB0440	**DATE OF VISIT**	30/09/2019
SITE NO	FS0489	**SITE NAME**	Cole Deep
INSPECTOR	[redacted]	**CASE NO**	20190558

Section 1: Summary

The above site was inspected following a report from the company of a recent increase in mortality. During the inspection several lethargic fish were observed across the site and six fish were removed for further examination and subsequent diagnostic sampling.

Histopathology examination revealed multifactorial gill pathology which included the presence of amoebic cells suggestive of amoebic gill disease. Samples tested positive by QPCR for *Neoparamoeba perurans*. Apoptotic cells consistent with the presence of salmon gill poxvirus were observed and samples tested positive by QPCR for salmon gill poxvirus. Epitheliocystis was observed and marked bacterial branchitis was displayed by fish 5. Mild hepatic necrosis was also noted by histology.

Due to the gill health issues reported on site, samples were screened for *Paranucleospora theridion* (syn, *Desmozoon lepeophtherii*) by QPCR. Samples tested positive for this pathogen.

A sample tested positive by QPCR for infectious pancreatic necrosis virus (IPNV), however histopathology results were not consistent with IPN disease.

Vibrio spp. and a *Carnobacterium* sp. were isolated. The level and purity of growth would not suggest these bacteria are implicated in current fish morbidity.

Please contact myself or the duty inspector should you require any further information, have any queries regarding this report or if any problems develop.

Marine Laboratory, 375 Victoria Road, Aberdeen, AB11 9DB
Tel – 0131 244 3498 Fax – 0131 244 0944 Email – ms.fishhealth@gov.scot
Website - www.gov.scot/Topics/marine/science

Section 2: Case Detail

Observations

The above site was inspected following a report from the company of a recent increase in mortality. The site was stocked with 437,123 2018 S0 Atlantic salmon at 2.76 kg average weight.

Mortality levels had increased and the site mortality levels for the previous four weeks were 1.72% in week 36, 3.06% in week 37, 8.64% in week 38 and 6.3% in week 39. Stock in some cages had experienced significantly higher mortality levels with the worst affected cage losing 46.2% of fish over the four week period.

There had been a plankton bloom in August which had affected all of the sites in the area. Fish samples taken at the end of September showed significant mixed gill pathology, with probably a post-acute response to a waterborne irritant (likely environmental, possibly harmful algae).

Several lethargic fish were observed across the site. Six fish (five lethargic and one active) were removed for further examination and subsequent diagnostic sampling.

Externally fish 1 had lesions and abrasions on both flanks and pale gills. Fish 4 had white patches on its gills and was anorexic with dark body colour. Fish 5 also had white patches on its gills along with further gross gill damage and dark body colour.

Internally fish 1, 2, 4 and 5 had yellow pseudo-faeces in their guts. Fish 4 had clear ascites in the body cavity. Fish 4 and 5 had displayed melanisation of the pyloric caeca fat.

Samples

Samples were collected from six fish according to the table below:

Fish number	Pool number	Facility number	Species	Stage	Origin
1 & 2	1	7	Atlantic salmon	2018 S0	Girlsta Hatchery
3	1	11	Atlantic salmon	2018 S0	Girlsta Hatchery
4 & 5	1	10	Atlantic salmon	2018 S0	Girlsta Hatchery
6	1	12	Atlantic salmon	2018 S0	Girlsta Hatchery

Results

Bacteriology: Kidney, gill and lesion material from six fish were inoculated onto appropriate media for the isolation of bacteria.

The following bacteria were isolated:

- Vibrio sp. (isolate A) – Fish 1-4 (kidney), Fish 1-6 (gills) and fish 1 (lesion)
- Vibrio sp. (isolate B) - Fish 2, 3, 4 & 6 (kidney), Fish 1-6 (gills) and fish 1 (lesion)

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DNA from a Gram-positive bacteria colony was extracted and sequenced. Results showed the isolate to be *Carnobacterium* sp..

Virology: Tissue samples were tested for segments of nucleic acid indicative of the presence of the pathogens specified below using real-time PCR (QPCR).

Infectious pancreatic necrosis virus (IPNV)

Pool Number	Endogenous control Cp value	Cp Values			Reported Result (PCR)
P1	15.77	22.01	21.82	21.86	**Positive**

Salmon gill poxvirus (SGPV)

Fish Number	Endogenous control Cp value	Cp Values			Reported Result (PCR)
F1	21.49	28.97	28.97	28.91	**Positive**
F2	23.80	32.05	32.08	31.89	**Positive**
F3	22.06	32.59	32.58	32.33	**Positive**
F4	23.17	28.24	28.09	28.16	**Positive**
F5	21.48	34.34	34.23	34.32	**Positive**
F6	21.32	37.66	39.54	38.42	**Positive**

The samples tested negative for infectious haematopoietic necrosis virus (IHNV), infectious salmon anaemia virus (ISAV), salmonid alphavirus (SAV) and viral haemorrhagic septicemia virus (VHSV).

Parasitology: Tissue samples were tested for segments of nucleic acid indicative of the presence of the parasites specified below using real-time PCR (QPCR).

Neoparamoeba perurans (AGD)

Fish Number	Endogenous control Cp value	Cp Values			Reported Result (PCR)
F1	-	-	-	-	Negative
F2	23.80	34.57	34.91	34.73	**Positive**
F3	22.06	32.26	32.56	32.53	**Positive**
F4	23.17	29.69	29.73	29.73	**Positive**
F5	21.48	31.22	31.16	31.12	**Positive**
F6	21.32	34.01	34.36	34.04	**Positive**

Paranucleospora theridion

Fish Number	Endogenous control Cp value	Cp Values			Reported Result (PCR)
F1	21.49	29.83	29.81	29.85	**Positive**
F2	23.80	30.97	31.03	30.96	**Positive**
F3	22.06	29.93	29.85	29.88	**Positive**
F4	23.17	24.39	24.51	24.50	**Positive**
F5	21.48	27.14	27.13	27.04	**Positive**
F6	21.32	35.06	34.97	35.07	**Positive**

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Histology: Tissue samples of gill, skin and skeletal muscle, heart, pyloric caeca, pancreas, hind gut, liver, spleen and kidney were taken from six fish.

Histopathological examination revealed the following:

Gill: Mild multifocal interlamellar hyperplasia and lamellar fusion (F1, F3, F4). F4 also displayed haemorrhage in the hyperplasic plaques. Multifocal adherence of secondary lamellae (synechiae), ballooning degenerative cells containing pigmented material, cell apoptosis and chloride cell hyperplasia (F3). Occasional basophilic epithelial inclusions (likely epitheliocystis) (F2) and few amoebic cells resembling *Neoparamoeba perurans* (F4). F5 displayed marked presence of filamentous bacteria associated with 2/3 of two gill filaments. These bacteria stained Gram-negative. All fish exhibited cells debris among gill filament. Scattered aneurysmal dilation/telangiectasia and lamellar thrombosis noted in all fish.

Skin & Muscle: Focal regions of partial epithelial loss. Some epidermal inflammatory cell infiltration (F2). Small foci of inflammatory cell infiltration in the skeletal red muscle - no white muscle in section (F6).

Heart: Mild pericarditis and small foci of inflammatory cell infiltration with associated degeneration of myocardial fibre (F6). Several thrombi noted in both spongy layer of ventricle and atrium (F2 & F3).

Gut and pyloric caeca: Within normal range.

Pancreas: Within normal range.

Liver: Mild multifocal hepatic necrosis (F3, F5) and thickness of the hepatic capsule (F5). Two small foci of inflammatory cell infiltration (F6).

Kidney: Kidney: Some increase of melanomacrophage aggregates (F4).

Spleen: Thickness of the splenic capsule (F5), slightly congested (F1).

Signed: 

Date: 12/11/2019

Fish Health Inspector

The Fish Health Inspectorate Service Charter detailing standards of service is available on the Marine Scotland website at www.gov.scot/Topics/marine/Fish-Shellfish/FHI/charter

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Website - www.gov.scot/Topics/marine/science

[redacted]
Grieg Seafood Shetland Ltd
Gremista
Lerwick
Shetland
ZE1 OPX
[redacted]

FISH HEALTH INSPECTORATE VISIT REPORT

SUMMARY FOR INFORMATION OF SITE OPERATOR

BUSINESS NO	FB0440	**DATE OF VISIT**	30/09/2019
SITE NO	FS0489	**SITE NAME**	Cole Deep
INSPECTOR	[redacted]	**CASE NO**	20190558

Inspection under the Animals and Animal Products (Examination for Residues and Maximum Residue Limits) (England and Scotland) Regulations 2015

The above site was visited in accordance with the Animals and Animal Products (Examination for Residues and Maximum Residue Limits) (England and Scotland) Regulations 2015.

Samples were taken to be analysed for veterinary residues.

In addition, samples were taken for diagnostic purposes. A separate report will be issued detailing the results of these tests.

Records

The information required for the public record of aquaculture production businesses regarding this site was verified and where necessary updated.

Medicine records were inspected and found to be adequately maintained.

Aquaculture animal and aquaculture animal product movement records were inspected and appeared to be adequately maintained.

Mortality records were inspected and found to be adequately maintained.

Please contact myself or the duty inspector should you require any further information or have any queries regarding this report.

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Website - www.gov.scot/Topics/marine/science

Signed: [redacted] Date: 12/11/2019

Fish Health Inspector

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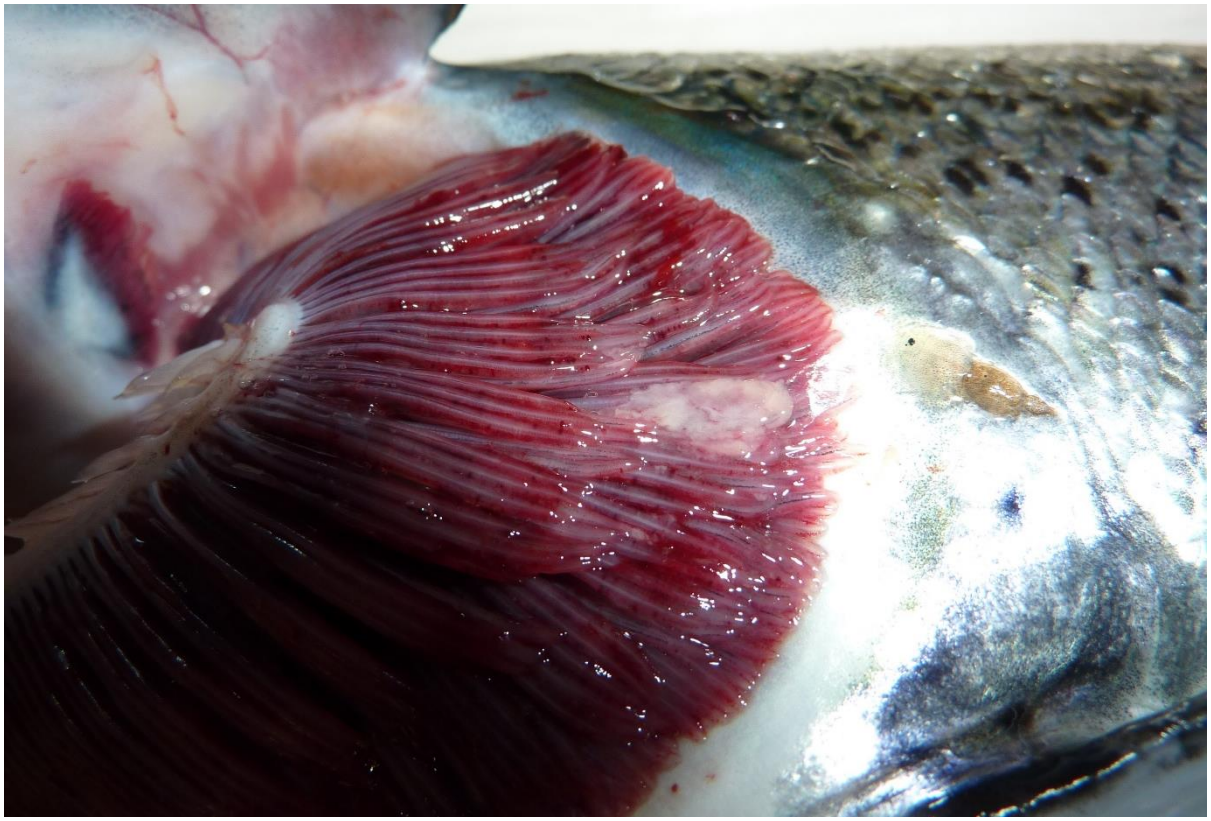
2019-0558 Cole Deep

Fish 1 – lesions and abrasions on flank



Fish 4 - gills

Case No: 2019-0560 Date of visit: 30/09/2019

Time spent on site: 6 hours Main Inspector: [redacted]

Site No: FS0805 Site Name: Bagh Dail Nan Cean
Business No: FB0119 Business Name: Mowi Scotland Ltd

Case Types: 1 DIA 2 REP 3 4 5 6

Water Temp (°C): 14.2 Thermometer No: FHI 045 completed Y

Observations: Region: ST Water type: S CoGP MA M-40

Dead/weak/abnormally behaving fish present?	Y	If yes, see additional information/clinical score sheet.
Clinical signs of disease observed?	Y	If yes, see additional information/clinical score sheet.
Gross pathology observed?	Y	If yes, see additional information/clinical score sheet.
Diagnostic samples taken?	Y	

UNI/REG only - if unable to carry out intended visit detail reason below:

Additional Case Information:

some fish have been moved to ornish island (FS0531). The fish that were moved to ornish are planned to be harvested out by end of week 40.

morts are being transported to Denmark - to be used as biofuel.

Fish that went to ornish were large fish that were passively graded.

Outside pens affected worse than inside pens.

Site thermometer was used as FHI thermometer was left at the shorebase by accident. FHI 45 was completed and submitted to

Pen 1, 3 and 9 have had consistently lower mortality but has been rising slowly over last few weeks.

Doesn't appear that morts have slowed down yet. Harvesting plan in place to empty site.

Mortality event in week 39 was collected during site inspection but was also reported by company in week 40.

BDNC had both Wrasse and Lumpsucker fish on site.

Cleanerfish mortality

2nd-8th September - Wrasse -1.29%/462 Lumpfish - 2.8%/440
9th-15th September - Wrasse - 196 - 0.49% - Lumpfish - 221 - 1.45%
16th - 22nd September - Wrasse - 286 - 0.72% Lumpfish - 208 - 1.38%
23rd - 29th September - Wrasse - 148 - 0.38% Lumpfish - 106 - 0.71%

All cleanerfish on site will be culled as the site is harvested out.

Inspection and paperwork completed by [redacted] supervised by [redacted]

Case No:	2019-0560	Site No:	FS0805
Date of Visit:	30/09/2019	Inspector(s):	[redacted]

Registration/Authorisation Details

1. Business/site details summary checked by site representative?	y
2. Changes made to details?	y

Site Details

Total No facilities		12	Facilities stocked		8	No facilities inspected		8
Species	SAL	WRS	LUM					
Age group	18Q3 /4	Mix	2018					
No Fish	418,000	39,293	14,729					
Mean Fish Wt	4.1 kilos	Mix	150g					
Next Fallow Date (Site)		mid October		Next Input Date (Site)		July 2020		

Recent (last 4 wks) disease problems?	Y	Any escapes (since last visit)?	N
If yes, detail:	Confirmed P.skyensis on site. Mass mortality.		

Movement Records

1. Movement records available for inspection?	Y
2. Date of last inspection:	02/08/2019
3. Are records complete and correctly entered?	N
4. Are movement records available for dead fish and waste?	Y
5. Are records complete and correctly entered?	Y
6. Are health certificates for introductions (outwith GB) available?	N/A

Transport Records

1. Are any movements carried out by (or on behalf) of the business (not using a STB)?	
If yes, is there a system in place for maintenance of transportation records?	

Mortality Records

1. Mortality records available for inspection?	Y
2. How are mortalities disposed of?	Ensiled - on site
If other detail:	Norwegian equiped with on-board ensiler. Three other boats are removing morts are storing them on the Norwegian boat.
3. Mortality records complete and correctly entered?	Y
4. Recent mortality (last 4 wks):	2nd-8th (4240 0.56%) 9th-15th(10651 - 1.35%)16th-22nd(27866 - 3.68%) 23rd-29th - (74060 - 17.05%)
5. Evidence of recent increased/atypical mortalities?	Y

If yes, facility nos/no mortality per facility/no stock per facility/reason:

pen 10 was first affected - followed by pen 6

6. Any other peaks in mortality during period checked?	N
If yes, detail:	
7. Have increased (unexplained) mortalities been reported to vet or FHI?	Y
If yes, detail action:	Vet has been on site, reported to FHI, FHI visited
8. Have 'mortality events' been reported to FHI? If no, add MRT case and enter on mortality events sheet.	Y

1. Recent treatments (last 4 wks)?	Y
If yes, detail:	Peroxide TMS
If other, detail:	All pens
2. Medicines records available for inspection?	Y
3. Are records complete and correctly entered?	Y
4. Are fish in a withdrawal period?	Y
5. If yes, what treatment(s)?	TMS
If other, detail:	
6. Are medicines stored appropriately?	Y

Biosecurity Records

1. Biosecurity records available for inspection?	
2. Has the manner and frequency of mortality removal, recording and safe disposal been considered?	
3. Has the manner and period in which the APB will notify Scottish Ministers or veterinary professional of any *increased* (*unexplained*) mortality at the site been included?	
4. Has the action that will be taken in the event that the presence or suspicion of the presence of a listed disease is detected been included and *how* and *when* that will be notified to Scottish Ministers?	
5. Has the health status of aquaculture animals being stocked on the farm site been covered (equal or higher health status, certification if required)?	
6. Have the husbandry and biosecurity measures implemented between each epidemiological unit to minimise transmission of disease been covered (movement of staff, visitors, equipment, live or dead fish etc.)?	
7. Is documentation available regarding the measures in place to maintain the physical containment of aquaculture animals held on site?	
8. Have the biosecurity procedures been adequately implemented on site?	
If no, detail:	

Results of Surveillance

1. Has any animal health surveillance been carried out by, or on behalf of, the business?	Y
2. If yes, are results available for inspection?	Y
3. Any significant results?	Y
If yes, detail (if not detailed under recent disease problems).	see notes

17/9/19 Patogen report PCR results Pasteurella skyensis 2/3, CMS 1/3, PRV 3/3; Clinical signs of bacterial infection observed and samples taken.

Records checked between: 02/08/2019 - 30/09/2019

Case no:	2019-0560	Site No:	FS0805	Date of visit/ Sampling:	30/09/2019	30/(							
Priority samples:	VI		BA		PA		MG		HI				
Time sampling starts/ends:	17:40:00	20:00:00	Inspector:		VMD No.								
Environmental conditions:	1	Indoors	2		3		4		5				
Summary samples	HIST	Y	BA	Y	MG	Y	VI	Y	PA		Total Samples		

Add Fish/Pools - click

	Pool/Fish No	F1	F2	F3	F4	F5	P1						
	Fish nos	1	2	3	4	5	1-5						
	Pool Group	P1	P1	P1	P1	P1							
Stock Details	Species	SAL	SAL	SAL	SAL	SAL							
	Average weight	4.1 kg	4.1 kg	4.1 kg	4.1 kg	4.1 kg							
	Sex	N/A	N/A	N/A	N/A	N/A							
	Water Type	SW	SW	SW	SW	SW							
	Stock Origin	Loch Ness (FS0434)	Loch Ness (FS0434)	Loch Ness (FS0434)	Loch Ness (FS0434)	Loch Ness (FS0434)	Loch Ness (FS0434)						
	Facility No	9	9	8	8	7							

09/2019 Additional Sample Information:

5 individual samples taken from kidney into dry universal tubes for P.skyensis. Individual samples and pooled sample taken for Molgen P.skyensis testing.

6 Total Tests assigned 5

Case no: 2019-0560 Site No: FS0805 Method of killing:

Date of visit: 30/09/2019 Inspector(s): [redacted] Sheet Relevant: Y

S for strong presence: **M** for medium presence: **W** for weak presence

Fish Number		1	2	3	4	5					
Time sampled after death (if > 45 minutes)											
External Signs											
Behaviour	Moribund	S	S	S	S	S					
	Lethargic	S	S	S	S	S					
	Hanging vertical										
	Spiralling										
	Flashing										
	Loss of equilibrium										
Body	Dark										
	Distended abdomen										
	Anorexic										
	Scale Oedema										
Opercula	Shortened										
	Flared										
Haemorrhaging	Throat										
	Ventrum				W	W					
	Base of fins										
	Elsewhere										
Eyes	Exophthalmic										
	Enophthalmic (sunken)										
	Cataract										
	Haemorrhagic										
Gills	Pale										
	Zoned	W	W	W	W	W					
	Necrotic										
Lesions	Flank										
	Elsewhere										
Vent	Inflamed										
	Trailing faeces										
Lice Load	Estimate numbers										
Internal Signs											
Ascites	Clear										
	Bloody		S								
Oedema	In tissues										
Heart	Pale/anaemic										
	Granulomas										
	Deformed										
Liver	Petechial haem			S							
	Gross haem										
	Tissue breakdown										
	Enlarged										
	Colour number(s)										
	Granulomas										
	Lesions										
Pyloric caeca	Petechial haem			M							
	Tubules mauve										
	Lack of fat										
Spleen	Enlarged			S	S						
	Granulomas										
Gut	No food present										
	Yellow pseudo-faeces	M	M	M	M	M					
	External haem			S							
	Internal haem										
Body wall	Haemorrhaging	M	W	S	S	W					
Swim bladder	Haemorrhaging										
	Fluid filled										
Kidney	Swollen										
	Grey			M							
	Granular										
	Liquefied										
General	Parasites present										
	Anaemia										

Case no: 2019-0560

Date of visit: 30/09/2019

S for strong presence: **M** for medium presence: **W** for w

Fish Number											
Time sampled after death (if > 45 minutes)											
External Signs											
Behaviour	**Moribund**										
	Lethargic										
	Hanging vertical										
	Spiralling										
	Flashing										
	Loss of equilibrium										
Body	**Dark**										
	Distended abdomen										
	Anorexic										
	Scale Oedema										
Opercula	**Shortened**										
	Flared										
Haemorrhaging	**Throat**										
	Ventrum										
	Base of fins										
	Elsewhere										
Eyes	**Exophthalmic**										
	Enophthalmic (sunken)										
	Cataract										
	Haemorrhagic										
Gills	**Pale**										
	Zoned										
	Necrotic										
Lesions	**Flank**										
	Elsewhere										
Vent	**Inflamed**										
	Trailing faeces										
Lice Load	**Estimate numbers**										
Internal Signs											
Ascites	**Clear**										
	Bloody										
Oedema	**In tissues**										
Heart	**Pale/anaemic**										
	Granulomas										
	Deformed										
Liver	**Petechial haem**										
	Gross haem										
	Tissue breakdown										
	Enlarged										
	Colour number(s)										
	Granulomas										
	Lesions										
Pyloric caeca	**Petechial haem**										
	Tubules mauve										
	Lack of fat										
Spleen	**Enlarged**										
	Granulomas										
Gut	**No food present**										
	Yellow pseudo-faeces										
	External haem										
	Internal haem										
Body wall	**Haemorrhaging**										
Swim bladder	**Haemorrhaging**										
	Fluid filled										
Kidney	**Swollen**										
	Grey										
	Granular										
	Liquefied										
General	**Parasites present**										
	Anaemia										

Additional comments:

F4 haemorrhaging on hind gut. Membrane between body cavity and kidney on all fish was very swollen and thick.

Site No: FS0805

Case No: 2019-0560

Nature of non-compliance:

Action taken (FHI):

Non-compliance relevant to (delete): VirologyMolGen/Bacteriology/Histology/Parasitology

Case No: 2019-0560 Date of visit: 30/09/2019

Site No: FS0805 Inspector: [redacted]

Results Summary	Freq.	Date of Notification						
		Database	Insp	Phone	Insp	Writing	Insp	2nd Insp
MG AGD	3/5	03/10/2019	[redacted]	03/10/2019	DJM			
MG PARA THER	5/5	03/10/2019	[redacted]	03/10/2019	[redacted]			
MG SAL POX	5/5	03/10/2019	[redacted]	03/10/2019	[redacted]			
MG IHN	0/1	03/10/2019	[redacted]	03/10/2019	[redacted]			
MG IPN	0/1	03/10/2019	[redacted]	03/10/2019	[redacted]			
MG ISA	0/1	03/10/2019	[redacted]	03/10/2019	[redacted]			
MG SAV	0/1	03/10/2019	[redacted]	03/10/2019	[redacted]			
MG VHS	0/1	03/10/2019	[redacted]	03/10/2019	[redacted]			
BA PASS	5/5	11/10/2019	[redacted]	11/10/2019	[redacted]			
BA NSIG	3/5	11/10/2019	[redacted]	11/10/2019	[redacted]			
ADHE	2/5	29/10/2019	[redacted]	31/10/2019	[redacted]			
AMGD	1/5	29/10/2019	[redacted]	31/10/2019	[redacted]			
CGDH	5/5	29/10/2019	[redacted]	31/10/2019	[redacted]			
EPIT	1/5	29/10/2019	[redacted]	31/10/2019	[redacted]			
HPAT	2/5	29/10/2019	[redacted]	31/10/2019	[redacted]			
KPAT	5/5	29/10/2019	[redacted]	31/10/2019	[redacted]			
LPAT	2/5	29/10/2019	[redacted]	31/10/2019	[redacted]			
SPAT	5/5	29/10/2019	[redacted]	31/10/2019	[redacted]			

Report Summary			
Case Type	Date	Insp	2nd Insp
REP DIA	24/10/2019	[redacted]	[redacted]

[redacted]
Mowi Scotland Ltd
Stob Ban House
Glen Nevis Business Park
Fort William
PH33 6RX
[redacted]

FISH HEALTH INSPECTORATE VISIT REPORT

SUMMARY FOR INFORMATION OF SITE OPERATOR

BUSINESS NO	FB0119	**DATE OF VISIT**	30/09/2019
SITE NO	FS0805	**SITE NAME**	Bagh Dail Nan Cean
INSPECTOR	[redacted]	**CASE NO**	20190560

Section 1: Summary

An inspection was conducted to follow up mortality event reports. Gill issues and *Pasteurella skyensis* were reported. Five moribund and lethargic fish were removed for diagnostic sampling.

Histopathology examination revealed mild multifactorial gill pathology which included the presence of amoebic cells suggestive of amoebic gill disease (AGD). Epitheliocystis and some apoptotic cells likely associated with salmon gill pox virus (SGPV) were also observed. These observations were confirmed by QPCR positive results for AGD (3/5) and SGPV (5/5). Histopathology further observed mild myocarditis, nephritis and splenitis. Minor non-specific signs of systemic inflammation were also noted likely associated with the presence of gram negative bacteria suspected to be *Pasteurella skyensis*. This observation was confirmed by bacterial isolation and molecular genetic speciation.

Due to gill health issues observed on site, samples were screened for *Paranucleospora theridion* (syn, *Desmozoon lepeophtherii*). Samples tested positive for the pathogen.

Please contact myself or the duty inspector should you require any further information, have any queries regarding this report or if any problems develop.

Section 2: Case Detail

Observations

Following mortality above the reporting threshold reported to the FHI on the 20/09/2019. The site confirmed that mortality had more than doubled from the previous week and that *Pasteurella skyensis* had been identified on site. When inspectors attended on the 30/09/2019 the site was being harvested out. The week previous had seen 74,060 (17.05%) mortality loss, attributed to environmental insult and *Pasteurella skyensis.*

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Severally moribund and lethargic fish were observed in most pens and five were removed for diagnostic sampling.

Externally the fish looked very healthy, with no visible lice burden and a good weight and size for the age of fish. Fish 4 and 5 had some haemorrhaging around the ventrum and all five fish showed zoning of the gills.

Internally F1 had a large amount of bloody ascites in the body cavity and F3 had strong petechial haemorrhaging of the liver and a medium amount of petechial haemorrhaging on the pyloric caeca. F3 and 4 had enlarged spleens. All five fish had yellow pseudo faeces present in the hind gut. F3 had external haemorrhaging on the gut wall. All five fish showed haemorrhaging of the body wall and the kidney in F3 appeared grey.

Samples

Samples were collected from five fish according to the table below:

Fish number	Pool number	Facility number	Species	Stage	Origin
F1-2	P1	9	Atlantic salmon	4.1kg 2018Q3's	Loch Ness (FS0434)
F3-4	P1	8	Atlantic salmon	4.1kg 2018Q3's	Loch Ness (FS0434)
F5	P1	7	Atlantic salmon	4.1kg 2018Q3's	Loch Ness (FS0434)

Results

Bacteriology: Kidney and gill material from five fish were inoculated onto appropriate media for the isolation of bacteria.

The following bacteria were isolated from fish:

- *Pasteurella* sp. found in F1-5 (Kidney)

Isolates were sent for molecular genetic testing and sequenced using 16s primers, the isolates were identified as *Pasteurella skyensis* with 99.34% identity to 98B1 serotype 2.

Virology: Tissue samples were tested for segments of nucleic acid indicative of the presence of the pathogens specified below using real-time PCR (QPCR).

Salmon gill poxvirus (SGPV)

Fish Number	**Endogenous control Cp value**	**Cp Values**			**Reported Result (PCR)**
F1	21.69	29.77	29.82	29.68	**Positive**
F2	21.85	27.81	27.91	27.78	**Positive**
F3	21.51	29.96	30.12	29.95	**Positive**
F4	21.60	30.69	30.92	30.84	**Positive**
F5	21.26	26.39	26.71	26.55	**Positive**

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The samples tested negative for infectious haematopoietic necrosis virus (IHNV), infectious pancreatic necrosis virus (IPNV), infectious salmon anaemia virus (ISAV), salmonid alphavirus (SAV) and viral haemorrhagic septicemia virus (VHSV).

Parasitology:

Tissue samples were tested for segments of nucleic acid indicative of the presence of the parasites specified below using real-time PCR (QPCR).

Neoparamoeba perurans (AGD)

Fish Number	Endogenous control Cp value	Cp Values			Reported Result (PCR)
F1	21.69	33.71	33.75	34.00	**Positive**
F3	21.51	34.78	34.85	34.85	**Positive**
F4	21.60	36.29	36.30	35.82	**Positive**

Paranucleospora theridion

Fish Number	Endogenous control Cp value	Cp Values			Reported Result (PCR)
F1	21.69	29.53	29.54	29.56	**Positive**
F2	21.85	34.35	34.36	34.94	**Positive**
F3	21.51	33.52	33.70	33.47	**Positive**
F4	21.60	36.17	36.90	36.95	**Positive**
F5	21.26	35.04	34.76	34.94	**Positive**

Histology: Tissue samples of gill, skin and skeletal muscle, heart, pyloric caeca, pancreas, hind gut, liver, spleen and kidney were taken from F1-5 The tissue samples were fixed in 10% neutral buffered formalin.

Histopathological examination by light microscopy revealed the following:

Gill: Mild multifocal interlamellar hyperplasia with occasional spaces (lacunae) and several amoebic cells resembling *Neoparamoeba peruans* among cell debris (F1) and F5 exhibited in two gill filament some tip bluntness. Several individual lamellae displaying epithelial hyperplasia (lamellar thickness) in all fish and F2 displayed some apoptotic cells and some rod shaped bacteria. Occasional presence basophilic epithelial inclusions (likely epitherliocystis) were noted in F1. Several scattered aneurysmal dilation/telangiectasia and lamellar thrombosis noted in all fish.

Skin and muscle: within normal range.

Heart: Small foci of inflammatory cell infiltration with degeneration of myocardial fibre at the vicinity (F2) and occasional thickness of the endocardial membrane (F2) at the compact layer. F2 atrium also displayed a focal area with mild infiltration of inflammatory cells. F3 atrium displayed focal fibrous pericarditiis which also affected focally the spongy layer of atrium at the vicinity.

Gut and pyloric caeca: Several small foci of haemorrhage noted in abdominal adipose tissue of F1-F4. Some fibrous adhesions likely associated with vaccine administration (F1 & F3). Moderate cell sloughing likely associated with post mortem artefacts (all fish).
Pancreas: Within normal range.

Liver: Mild multifocal hepatic necrosis (F1 & F2)

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Kidney: Small foci of inflammatory cell infiltration and some necrosis noted in the hematopoietic tissue and few glomeruli displayed neutrophil like cells infiltration (F1 and F2) and presence of rod shaped gram negative bacteria (F1-F5).

Spleen: Small foci of infiltration of inflammatory cells, mainly surrounding the vessels (F2). Marked congestion in all fish.

Signed: [redacted] Date: 18/11/2019

Fish Health Inspector

The Fish Health Inspectorate Service Charter detailing standards of service is available on the Marine Scotland website at www.gov.scot/Topics/marine/Fish-Shellfish/FHI/charter

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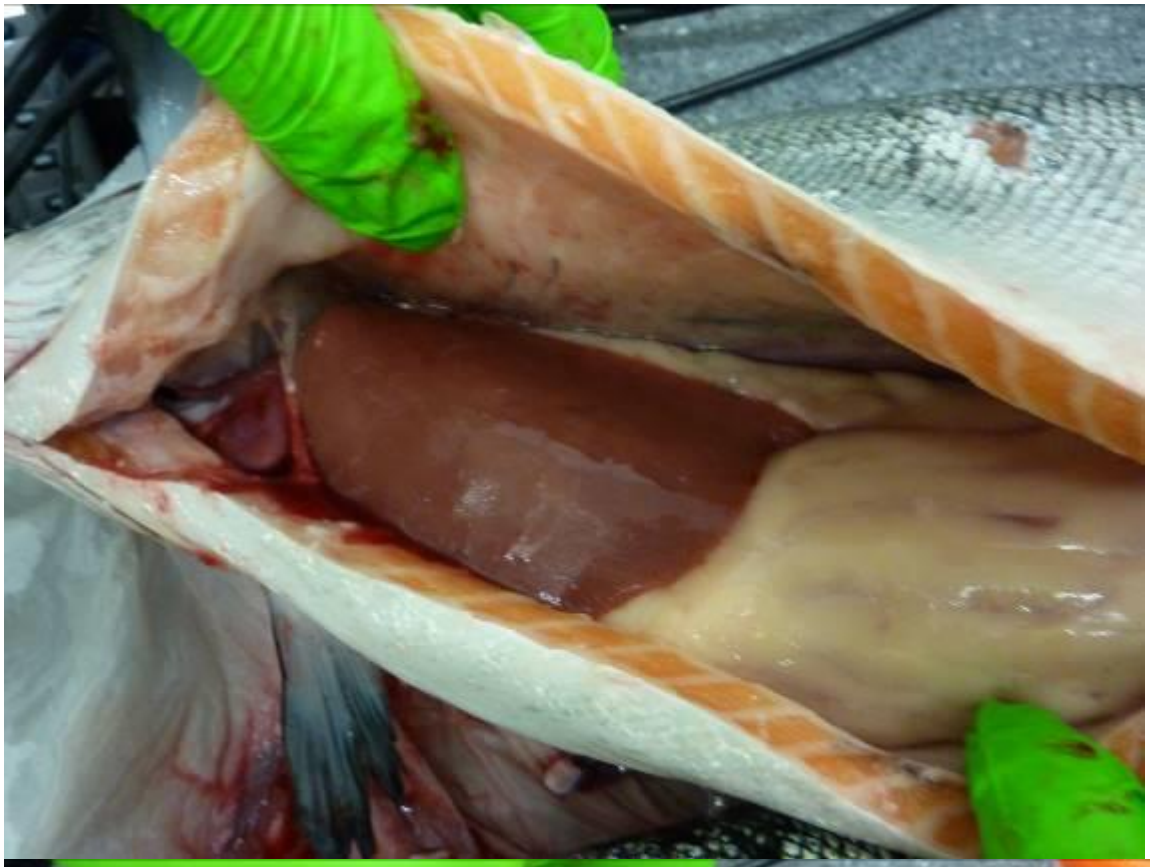
Website - www.gov.scot/Topics/marine/science

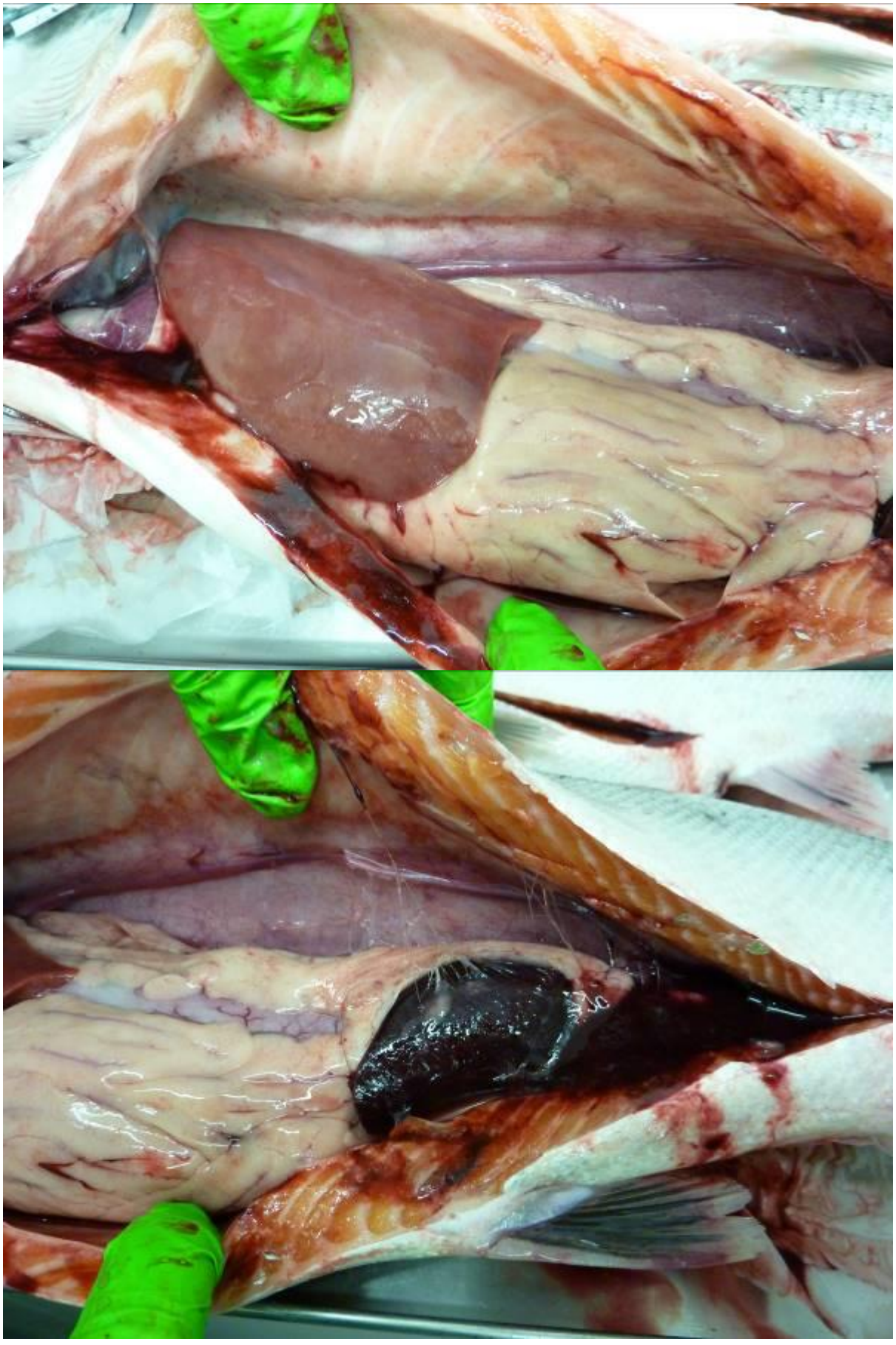
2019-0560

F1 Internal



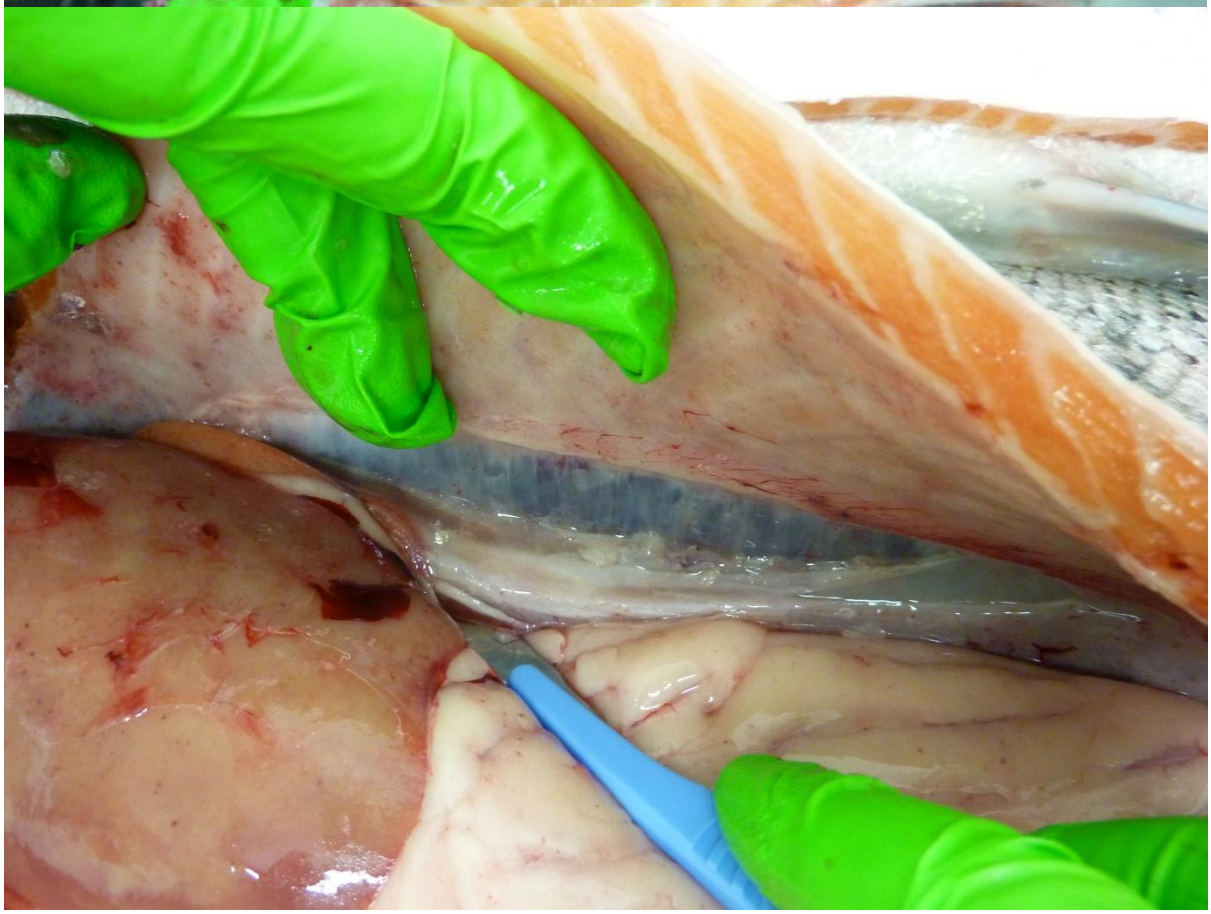
F2 internal

F3 Internal



F4 Internal

F5 Internal



Case No: 2019-0568 Date of visit: 30/09/2019

Time spent on site: 4 hours Main Inspector: [redacted]

Site No: FS0764 Site Name: Olna South
Business No: FB0440 Business Name: Grieg Seafood Shetland Ltd

Case Types: 1 REP 2 DIA 3 4 5 6

Water Temp (°C): 11.8 Thermometer No: T274 FHI 045 completed

Observations: Region: SH Water type: S CoGP MA S-8b

Dead/weak/abnormally behaving fish present?	Y	If yes, see additional information/clinical score sheet.
Clinical signs of disease observed?	Y	If yes, see additional information/clinical score sheet.
Gross pathology observed?	Y	If yes, see additional information/clinical score sheet.
Diagnostic samples taken?	Y	

UNI/REG only - if unable to carry out intended visit detail reason below:

Additional Case Information:

Site inspected following notification from operator of increased mortality levels for previous week while at shorebase to inspect Cole Deep. Mortality level increased to 1.62% for the site.
Have just started harvesting site and should be complete by mid October. Cage with highest mortality level last week (cage 2) has been harvested.
There was a chaetoceros bloom at the start of August which affected all three sites in the area (Cole Deep and East of Papa Little). Oxygen has been lower at night. No increase in mortalities at Papa Little and large increase at Cole Deep over last month (see case 2019-0558 for details). Aeration system active at Olna South and Cole Deep (15m depth).
All cages treated with freshwater for lice at the end of August. Using Ronja Polaris for treatments. Fish transferred on board and held in freshwater for 10-12 hours. Two cages will be treated before freshwater is discharged (collecting freshwater from tarpaulins near Olna). Slice treatment in July.
Fish transferred onto Olna South from Cole Deep in May/June.
Only one lethargic fish seen during inspection, removed for sampling.

Case No: 2019-0568 Site No: FS0764

Date of Visit: 30/09/2019 Inspector(s): [redacted]

Registration/Authorisation Details

1. Business/site details summary checked by site representative?	N
2. Changes made to details?	N/A

Site Details

Total No facilities	8	Facilities stocked	6	No facilities inspected	8		
Species	SAL						
Age group	2018 S0						
No Fish	248,909						
Mean Fish Wt	3.6Kg						
Next Fallow Date (Site)	Mid October 2019		Next Input Date (Site)	May 2021			

Recent (last 4 wks) disease problems? Y Any escapes (since last visit)? N

If yes, detail: Increase in mortalities previous week - gill issues

Movement Records

1. Movement records available for inspection?	Y
2. Date of last inspection:	18/07/2019
3. Are records complete and correctly entered?	Y
4. Are movement records available for dead fish and waste?	Y
5. Are records complete and correctly entered?	Y
6. Are health certificates for introductions (outwith GB) available?	N/A

Transport Records

1. Are any movements carried out by (or on behalf) of the business (not using a STB)?	
If yes, is there a system in place for maintenance of transportation records?	

Mortality Records

1. Mortality records available for inspection?	Y
2. How are mortalities disposed of?	Whole fish - TWMA (Shetland)
If other detail:	
3. Mortality records complete and correctly entered?	Y
4. Recent mortality (last 4 wks):	w/b 2/9/19 = 1,899, w/b 9/9/19 = 1,267, w/b 16/9/19 = 563, w/b 23/9/19 - 4,120
5. Evidence of recent increased/atypical mortalities?	Y

If yes, facility nos/no mortality per facility/no stock per facility/reason:

Increased across site, but highest in cage 2 last week - 1,208 (3.24%) / 37,242 / gill damage

6. Any other peaks in mortality during period checked?	N
If yes, detail:	
7. Have increased (unexplained) mortalities been reported to vet or FHI?	Y
If yes, detail action:	Harvesting
8. Have 'mortality events' been reported to FHI? If no, add MRT case and enter on mortality events sheet.	Y

1. Recent treatments (last 4 wks)?	Y
If yes, detail:	TMS
If other, detail:	
2. Medicines records available for inspection?	Y
3. Are records complete and correctly entered?	Y
4. Are fish in a withdrawal period?	Y
5. If yes, what treatment(s)?	TMS
If other, detail:	
6. Are medicines stored appropriately?	Y

Biosecurity Records

1. Biosecurity records available for inspection?	
2. Has the manner and frequency of mortality removal, recording and safe disposal been considered?	
3. Has the manner and period in which the APB will notify Scottish Ministers or veterinary professional of any *increased* (*unexplained)* mortality at the site been included?	
4. Has the action that will be taken in the event that the presence or suspicion of the presence of a listed disease is detected been included and *how* and *when* that will be notified to Scottish Ministers?	
5. Has the health status of aquaculture animals being stocked on the farm site been covered (equal or higher health status, certification if required)?	
6. Have the husbandry and biosecurity measures implemented between each epidemiological unit to minimise transmission of disease been covered (movement of staff, visitors, equipment, live or dead fish etc.)?	
7. Is documentation available regarding the measures in place to maintain the physical containment of aquaculture animals held on site?	
8. Have the biosecurity procedures been adequately implemented on site?	
If no, detail:	

Results of Surveillance

1. Has any animal health surveillance been carried out by, or on behalf of, the business?	N
2. If yes, are results available for inspection?	
3. Any significant results?	
If yes, detail (if not detailed under recent disease problems).	

Records checked between:	18/07/2019

Case no:	2019-0568	Site No:	FS0764	Date of visit/ Sampling:	30/09/2019	01/							
Priority samples:	VI		BA		PA		MG		HI				
Time sampling starts/ends:	11:45:00	12:00:00	Inspector:		VMD No.	0							
Environmental conditions:	1	Indoors	2		3		4		5				
Summary samples	HIST	Y	BA	Y	MG	Y	VI	Y	PA		Total Samples		

Add Fish/Pools - click

	Pool/Fish No	F1	P1										
	Fish nos	1	1										
	Pool Group	P1	P1										
Stock Details	Species	SAL	SAL										
	Average weight	3.6000	3.6000										
	Sex	N/A	N/A										
	Water Type	SW	SW										
	Stock Origin	Girlsta Hatchery (via Cole Deep)	Girlsta Hatchery (via Cole Deep)										
	Facility No	3	3										

10/2019 Additional Sample Information:

2 Total Tests assigned 3

Case no: 2019-0568 Site No: FS0764 Method of killing: Percussive

Date of visit: 30/09/2019 Inspector(s): [redacted] Sheet Relevant: Y

S for strong presence: **M** for medium presence: **W** for weak presence

Fish Number											
Time sampled after death (if > 45 minutes)		2.5 hours									
External Signs											
Behaviour	**Moribund**										
	Lethargic	**W**									
	Hanging vertical										
	Spiralling										
	Flashing										
	Loss of equilibrium										
Body	**Dark**										
	Distended abdomen										
	Anorexic										
	Scale Oedema										
Opercula	**Shortened**										
	Flared										
Haemorrhaging	**Throat**										
	Ventrum										
	Base of fins										
	Elsewhere										
Eyes	**Exophthalmic**										
	Enophthalmic (sunken)										
	Cataract										
	Haemorrhagic										
Gills	**Pale**										
	Zoned										
	Necrotic										
Lesions	**Flank**										
	Elsewhere										
Vent	**Inflamed**										
	Trailing faeces										
Lice Load	**Estimate numbers**										
Internal Signs											
Ascites	**Clear**										
	Bloody	**S**									
Oedema	**In tissues**										
Heart	**Pale/anaemic**										
	Granulomas										
	Deformed										
Liver	**Petechial haem**										
	Gross haem										
	Tissue breakdown										
	Enlarged										
	Colour number(s)										
	Granulomas										
	Lesions										
Pyloric caeca	**Petechial haem**	**S**									
	Tubules mauve										
	Lack of fat										
Spleen	**Enlarged**										
	Granulomas										
Gut	**No food present**	**M**									
	Yellow pseudo-faeces										
	External haem										
	Internal haem										
Body wall	**Haemorrhaging**										
Swim bladder	**Haemorrhaging**										
	Fluid filled	**S**									
Kidney	**Swollen**										
	Grey										
	Granular										
	Liquefied										
General	**Parasites present**										
	Anaemia										

Case no: 2019-0568

Date of visit: 30/09/2019

S for strong presence: **M** for medium presence: **W** for w

Fish Number											
Time sampled after death (if > 45 minutes)											
External Signs											
Behaviour	**Moribund**										
	Lethargic										
	Hanging vertical										
	Spiralling										
	Flashing										
	Loss of equilibrium										
Body	**Dark**										
	Distended abdomen										
	Anorexic										
	Scale Oedema										
Opercula	**Shortened**										
	Flared										
Haemorrhaging	**Throat**										
	Ventrum										
	Base of fins										
	Elsewhere										
Eyes	**Exophthalmic**										
	Enophthalmic (sunken)										
	Cataract										
	Haemorrhagic										
Gills	**Pale**										
	Zoned										
	Necrotic										
Lesions	**Flank**										
	Elsewhere										
Vent	**Inflamed**										
	Trailing faeces										
Lice Load	**Estimate numbers**										
Internal Signs											
Ascites	**Clear**										
	Bloody										
Oedema	**In tissues**										
Heart	**Pale/anaemic**										
	Granulomas										
	Deformed										
Liver	**Petechial haem**										
	Gross haem										
	Tissue breakdown										
	Enlarged										
	Colour number(s)										
	Granulomas										
	Lesions										
Pyloric caeca	**Petechial haem**										
	Tubules mauve										
	Lack of fat										
Spleen	**Enlarged**										
	Granulomas										
Gut	**No food present**										
	Yellow pseudo-faeces										
	External haem										
	Internal haem										
Body wall	**Haemorrhaging**										
Swim bladder	**Haemorrhaging**										
	Fluid filled										
Kidney	**Swollen**										
	Grey										
	Granular										
	Liquefied										
General	**Parasites present**										
	Anaemia										

Additional comments:

A few white patches on gills, membrane over heart

Case No: 2019-0568 Date of visit: 30/09/2019

Site No: FS0764 Inspector: [redacted]

Results Summary	Freq.	Date of Notification						
		Database	Insp	Phone	Insp	Writing	Insp	2nd Insp
ISA PCR	0/1	04/10/2019	[redacted]	04/10/2019	[redacted]	31/10/2019	[redacted]	[redacted]
VHS PCR	0/1	04/10/2019	[redacted]	04/10/2019	[redacted]	31/10/2019	[redacted]	[redacted]
IHN PCR	0/1	04/10/2019	[redacted]	04/10/2019	[redacted]	31/10/2019	[redacted]	[redacted]
SAV PCR	0/1	04/10/2019	[redacted]	04/10/2019	[redacted]	31/10/2019	[redacted]	[redacted]
IPN PCR	01	04/10/2019	[redacted]	04/10/2019	[redacted]	31/10/2019	[redacted]	[redacted]
AGD PCR	1/1	04/10/2019	[redacted]	04/10/2019	[redacted]	31/10/2019	[redacted]	[redacted]
Para Ther PCR	1/1	04/10/2019	[redacted]	04/10/2019	[redacted]	31/10/2019	[redacted]	[redacted]
Sal Pox PCR	1/1	04/10/2019	[redacted]	04/10/2019	[redacted]	31/10/2019	[redacted]	[redacted]
Gill pathology	1/1	17/10/2019	[redacted]	17/10/2019	[redacted]	31/10/2019	[redacted]	[redacted]
Heart Pathology	1/1	17/10/2019	[redacted]	17/10/2019	[redacted]	31/10/2019	[redacted]	[redacted]
Liver pathology	1/1	17/10/2019	[redacted]	17/10/2019	[redacted]	31/10/2019	[redacted]	[redacted]

Report Summary			
Case Type	Date	Insp	2nd Insp
DIA/REP	31/10/2019	[redacted]	[redacted]

[redacted]
Grieg Seafood Shetland Ltd
Gremista
Lerwick
Shetland
ZE1 OPX
[redacted]

FISH HEALTH INSPECTORATE VISIT REPORT

SUMMARY FOR INFORMATION OF SITE OPERATOR

BUSINESS NO	FB0440	**DATE OF VISIT**	30/09/2019
SITE NO	FS0764	**SITE NAME**	Olna South
INSPECTOR	[redacted]	**CASE NO**	20190568

Section 1: Summary

The above site was inspected following a report from the company of a recent increase in mortality. During the inspection one lethargic fish was observed and removed for further examination and subsequent diagnostic sampling.

Histopathology examination revealed very mild gill pathology, myocarditis and hepatic necrosis.

Samples were screened for salmon gill poxvirus, *Noeparamoeba perurans* (the causative agent of amoebic gill disease) and *Paranucleospora theridion* (syn, *Desmozoon lepeophtherii*) by QPCR. Samples tested positive for all three pathogens.

Please contact myself or the duty inspector should you require any further information, have any queries regarding this report or if any problems develop.

Section 2: Case Detail

Observations

The above site was inspected following a report from the company of a recent increase in mortality. The site was stocked with 248,909 Atlantic salmon at 3.6 kg average weight.

Mortality levels had been low in the previous few weeks, but had risen to 1.62% in week 39, with the highest mortality level in cage 2 (3.24%). There had been a plankton bloom in August which had affected all of the sites in the area.

One lethargic fish was observed and removed for further examination and subsequent diagnostic sampling. Externally the fish had a few white patches on the gills. Internally there was a significant

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volume of bloody ascites, petechial haemorrhaging across the pyloric caeca, fluid in the swim bladder, a membrane over the heart and there was no food present in the gut.

Samples

Samples were collected from one fish according to the table below:

Fish number	Facility number	Species	Stage	Origin
1	3	Atlantic salmon	2018 S0	Girlsta Hatchery (via Cole Deep)

Results

Bacteriology: Kidney and gill material was inoculated onto appropriate media for the isolation of bacteria.

No significant bacteria were isolated.

Virology: Tissue samples were tested for segments of nucleic acid indicative of the presence of the pathogens specified below using real-time PCR (QPCR).

Salmon gill poxvirus (SGPV)

Fish Number	**Endogenous control Cp value**	**Cp Values**			**Reported Result (PCR)**
F1	21.58	33.97	34.0	35.98	**Positive**

The samples tested negative for infectious haematopoietic necrosis virus (IHNV), infectious pancreatic necrosis virus (IPNV), infectious salmon anaemia virus (ISAV), salmonid alphavirus (SAV) and viral haemorrhagic septicemia virus (VHSV).

Parasitology: Tissue samples were tested for segments of nucleic acid indicative of the presence of the parasites specified below using real-time PCR (QPCR).

Neoparamoeba perurans (AGD)

Fish Number	**Endogenous control Cp value**	**Cp Values**			**Reported Result (PCR)**
F1	21.58	34.86	34.94	35.86	**Positive**

Paranucleospora theridion

Fish Number	**Endogenous control Cp value**	**Cp Values**			**Reported Result (PCR)**
F1	21.58	33.02	33.09	34.64	**Positive**

Histology: Tissue samples of gill, skin and skeletal muscle, heart, pyloric caeca, pancreas, hind gut, liver, spleen and kidney were taken. The tissue samples were fixed in 10% neutral buffered formalin.

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Histopathological examination revealed the following:

Gill: Mild focal interlamellar hyperplasia, lamellar fusion and some hyperplasia of goblet cells. Several scattered aneurysmal dilation/telangiectasia and lamellar thrombosis. Generalized post-mortem artefact.

Skin & Muscle: Within normal range.

Heart: Moderate pericarditis and mild inflammatory cell infiltration at the compact layer of ventricle.

Gut and pyloric caeca: Small foci of haemorrhage noted in the abdominal adipose tissue.

Pancreas: Within normal range.

Liver: Marked multifocal to coalescing hepatic necrosis, some cuffing and hepatocyte vacuolation.

Kidney: Some focal depletion of the haematopoietic tissue.

Spleen: Within normal range.

Signed: [redacted] Date: 31/10/2019

Fish Health Inspector

The Fish Health Inspectorate Service Charter detailing standards of service is available on the Marine Scotland website at www.gov.scot/Topics/marine/Fish-Shellfish/FHI/charter

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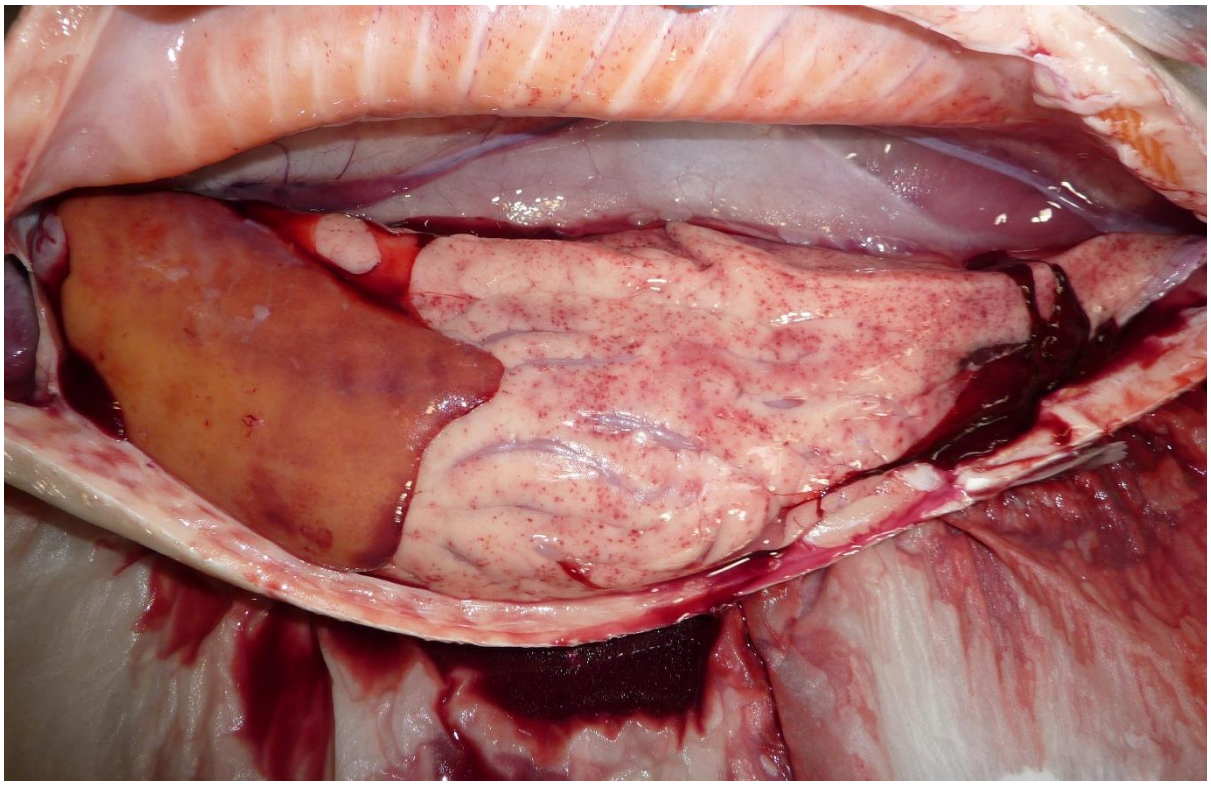
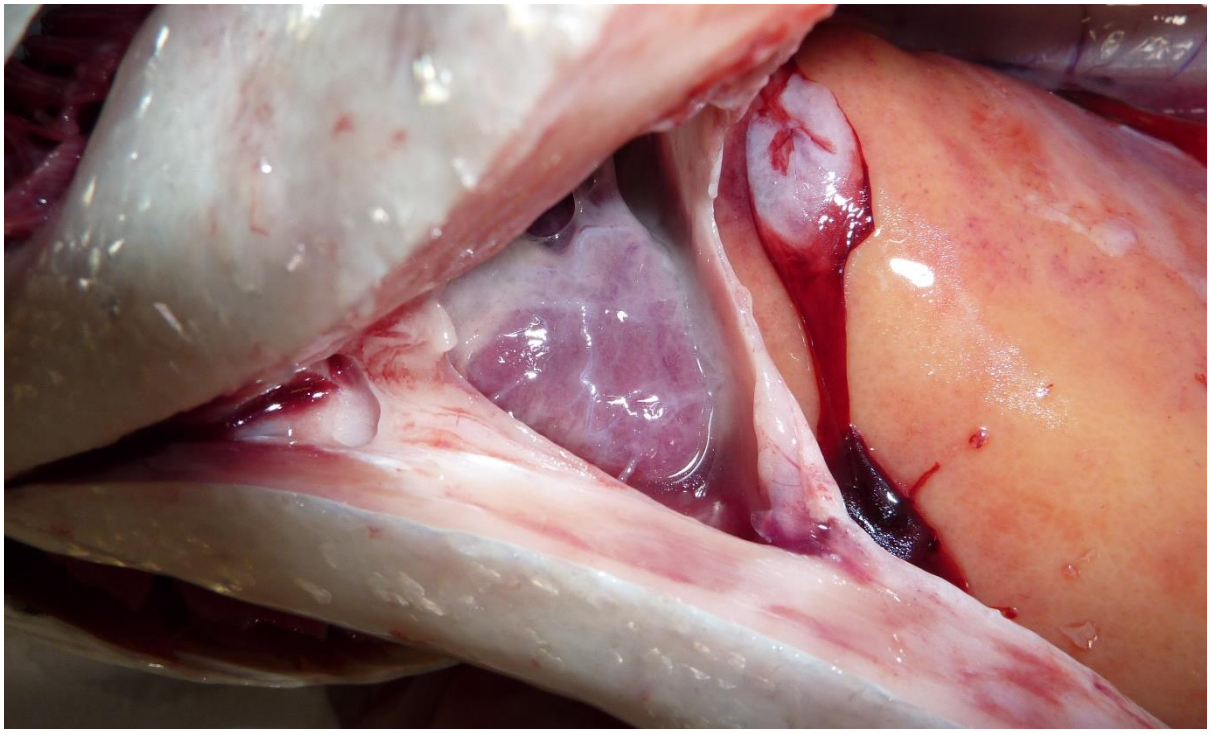
Website - www.gov.scot/Topics/marine/science

20190568 – Olna South



Fish 1 – Haemorrhaging across pyloric caeca fat and bloody ascites



Fish 1 - heart

Fish 1 - heart