Case No: 2021-0406 Date of visit: 13/10/2021

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

Site No: FS1010 Site Name: East Tarbert Bay
Business No: FB0169 Business Name: The Scottish Salmon Company

Case Types: 1 DIA 2 3 4 5 6

Water Temp (°C): 13.6 Thermometer No: T146 FHI 045 completed

Observations: Region: ST Water type: S CoGP MA: M-46

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:

All salmon input from Geisgil. Transported in FW. Lump fish input from Ocean Matters and Otterferry,

Morts/site/wk; Wk30 0.32%, Wk31 0.9%, Wk32 1.85%, Wk33 1.07%, Wk34 0.96%, wk35 1.19 %, Wk36 1.3%, Wk37 1.4%, wk38 10.84%, Wk39 20%, Wk40 14.5%, Wk 41 0.95% - part week.

Currently divers are removing about 200 morts/cage/day.

There were a number of mortality disposal methods available for the two sites;

• Billy Bowie- whole in skips to Barkip Biogas (collection docs observed).

• Gogar – Energen Bio Gas- to Dunnswood Road, Cumbernauld (collection docs observed).

• They have a new well boat the Buccaness - hydrolicer and macerator/ensiler. Can hold 1000 cube of morts, current morts on-board of 200 cube. - material ensiled with formic acid. Then it will be pumped off into tankers and used as biofuel but uncertain currently of final destination. The boat was present during our visit.

• Fergusons boat for mort removal had been used but was not on site during our visit.

Collection docs were available for inspection from Billy Bowie and Gogar. Capacity for mort disposal was in my opinion adequate and staff numbers at the sites were increased to deal with the mortalities with staff being brought in from other areas. Divers were also present at the time of our visit for mortality removal.

Lice; caligus peaked wk37 at 10.37. Increased mortality had prevented treatment and there was evidence on site of lice damage on some fish.

Treatments;Hydrolicer 24/6/21- 2/6/21, FW and salmosan 18/7/21-23/7/21, hydrolicer 4/8-14/8, salmosan 28/8, hydroliced 1/9-4/9, hydrolicer 27/9/-4/10, FW panned 13/10/21.

Health surveillance;
AGD- low level. Most resent sample slight higher but not at levels which would be considered to have caused mortality.

PCV - haematocrit levels. Have fallen in last couple of weeks.

CPK -muscle fatigue for PD- have been low levels showing recovery from infection.

Mortality considered to be due to environmental insult but no jellies observed in water samples. Upwell species were observed.

Morts - normally taken by site boat and skipped at shore base. Divers in daily to remove morts. - numbers of fish on site will be reviewed following a fw well boat treatment.

Case No:	2021-0406	Site No:	FS1010
Date of Visit:	13/10/2021	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 (include cleaner fish for all sections)

Total No facilities		12	Facilities stocked		12	No facilities inspected		3
Species	sal	lumps						
Age group	2020 S0							
No Fish	408,113	70,000						
Mean Fish Wt	2.3							
Next Fallow Date (Site)		2022 Q2		Next Input Date (Site)		2022 Q3		
Recent (last 4 wks) disease problems?				Y	Any escapes (since last visit)?			N
If yes, detail:	see additional info							

Movement Records

1. Movement records available for inspection?	Y
2. Date of last inspection:	26/05/2021
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?	Biogas - Barkip
If other detail:	see additional info for further details
3. Mortality records complete and correctly entered?	Y
4. Recent mortality (last 4 wks):	see additional info
5. Evidence of recent increased/atypical mortalities?	Y
If yes, facility nos/no mortality per facility/no stock per facility/reason:	
Across whole site - environmental gill damage and anaemia	
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:	health visits and fw treatments undertaken,
8. Have 'mortality events' been reported to FHI? If no, enter details on mortality events sheet.	Y

Treatments and Medicines Records

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

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).	
Environmental insult - anaemia	
Records checked between:	26/5/21- 13/10/21

Case no:	2021-0406	Site No:	FS1010	Date of visit/ Sampling:	13/10/2021	13/1							
Priority samples:	VI		BA		PA		MG		HI				
Time sampling starts/ends:	12:00:00	13:00:00	Inspector:		VMD No.	0							
Environmental conditions:	1	Indoors	2		3		4		5				
Summary samples	HIST	Y	BA	Y	MG	Y	VI		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	SAL						
	Average weight	3kg	3kg	3kg	3kg	3kg	3kg						
	Sex												
	Water Type	SW	SW	SW	SW	SW	SW						
	Stock Origin	Geisgil	Geisgil	Geisgil	Geisgil	Geisgil	Geisgil						
	Facility No	7	7	9	9	9	7,9						

10/2021 Additional Sample Information:

Gill issues sample put in RNA later. Diag PCR put in DNA later.

6 Total Tests assigned 5

Case no: 2021-0406 Site No: FS1010 Method of killing: Percussive

Date of visit: 13/10/2021 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	M	M	S	S	S					
	Lethargic	S	S	S	S	S					
	Hanging vertical										
	Spiralling										
	Flashing										
	Loss of equilibrium										
Body	Dark			M	M	M					
	Distended abdomen										
	Anorexic					S					
	Scale Oedema										
Opercula	Shortened										
	Flared										
Haemorrhaging	Throat										
	Ventrum										
	Base of fins										
	Elsewhere										
Eyes	Exophthalmic										
	Enophthalmic (sunken)										
	Cataract										
	Haemorrhagic			S	S	S					
Gills	Pale	M	M	W	W	W					
	Zoned										
	Necrotic	W	W								
Lesions	Flank										
	Elsewhere	S			S						
Vent	Inflamed										
	Trailing faeces										
Lice Load	Estimate numbers	>10	>10	>10	>10	>10					
Internal Signs											
Ascites	Clear										
	Bloody		M								
Oedema	In tissues										
Heart	Pale/anaemic		S								
	Granulomas										
	Deformed										
Liver	Petechial haem										
	Gross haem										
	Tissue breakdown										
	Enlarged										
	Colour number(s)	1	1	6	6	6					
	Granulomas										
	Lesions										
Pyloric caeca	Petechial haem					M					
	Tubules mauve										
	Lack of fat										
Spleen	Enlarged										
	Granulomas										
Gut	No food present	S	S	S	S	S					
	Yellow pseudo-faeces	M	M	M	M	M					
	External haem										
	Internal haem			M							
Body wall	Haemorrhaging										
Swim bladder	Haemorrhaging										
	Fluid filled										
Kidney	Swollen										
	Grey										
	Granular										
	Liquefied										
General	Parasites present										
	Anaemia										

Case no: 2021-0406

Date of visit: 13/10/2021

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:

Eyes from fish 3-5 were missing. Fish 1 and 4 Head lesion - like lice damage. Fish 1-5 tips ragged.

Site No: FS1010

Case No: 2021-0406

Nature of non-compliance: Gill issues sample put in RNA later. Diag PCR put in DNA later.
Action taken (FHI): Labs inform
Non-compliance relevant to (delete): VirologyMolGen/Bacteriology/Histology/Parasitology

Case No: 2021-0406 Date of visit: 13/10/2021

Site No: FS1010 Inspector:

Results Summary	Freq.	Date of Notification						
		Database	Insp	Phone	Insp	Writing	Insp	2nd Insp
MG_AGDQ	5/5	22/10/2021		22/10/2021		13/12/2021		
MG_Para_Thera	5/5	22/10/2021		22/10/2021		13/12/2021		
MG_SAL_POX	5/5	22/10/2021		22/10/2021		13/12/2021		
VSPE - 3 isolates	2/5	17/11/2021		01/12/2021		13/12/2021		
AMGD	1/5	17/11/2021		01/12/2021		13/12/2021		
CGDH	5/5	17/11/2021		01/12/2021		13/12/2021		
EPIT	1/5	17/11/2021		01/12/2021		13/12/2021		
LPAT	4/5	17/11/2021		01/12/2021		13/12/2021		
MPAT	3/5	17/11/2021		01/12/2021		13/12/2021		
SULC	2/5	17/11/2021		01/12/2021		13/12/2021		
ISA	0/1	13/12/2021				13/12/2021		
VHS	o/1	03/12/2021				13/12/2021		
IHN	0/1	03/12/2021				13/12/2021		
IPN	1/1	03/12/2021				13/12/2021		
SAV	0/1	03/12/2021				13/12/2021		

Report Summary			
Case Type	Date	Insp	2nd Insp
Diag	13/12/2021		

FISH HEALTH INSPECTORATE VISIT REPORT

SUMMARY FOR INFORMATION OF SITE OPERATOR

BUSINESS NO	FB0169	**DATE OF VISIT**	13/10/2021
SITE NO	FS1010	**SITE NAME**	East Tarbert Bay
CASE NO	20210406	**INSPECTOR**	[redacted]

Section 1: Summary

East Tarbert Bay was visited for a diagnostic health inspection following reports of significant mortality at the site. Five moribund fish were removed for diagnostic examination.
Histopathology examination revealed mild multifactorial proliferative branchitis. Pathology was also consistent with amoebic gill disease confirmed by PCR positive result for *Neoparamoeba perurans* and epithelyocists were also present. F1 and F5 displayed absence of pancreatic acinar cell and F4 exhibited a mild myositis; possibly associated with salmon alpha virus (SAV).

Due to gill health issues observed on site, samples were screened for salmon gill poxvirus (SPGV) and *Paranucleospora theridion* (syn. *Desmozoon lepeophtherii*) by qPCR and tested positive for both pathogens.

Vibrio spp. were identified, the level and purity would not suggest it would be implicated as a primary fish pathogen in this case.

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

East Tarbert Bay was visited following reports of significantly increased mortalities starting in August 2021 and peaking at 20% mortality (120,580 fish) for the site in the week beginning 27/09/21. Mortalities have been attributed to environmental and gill health related issues. On inspection moribund fish were observed in the pens and five were removed to diagnostic examination.
Externally fish 3 to 5 were dark and had haemorrhaging in the eyes. All five fish exhibited pale ragged gills and fish 1 and 2 had necrotic gills. Lice numbers were in excess of 10, all stages on all the fish. Fish 1 and 4 had head lesions. Internally fish 5 had petechial haemorrhaging on the pyloric caeca. Fish 2 had bloody ascites within the body cavity and a pale heart. Fish 3 had internal haemorrhaging of the gut.

Samples

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

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

Fish number	Pool number	Facility number	Species	Stage	Origin
1 & 2	1	7	Atlantic salmon	2020 S0 @ 3 Kg	Geasgill
3-5	1	9	Atlantic salmon	2020 S0 @ 3 Kg	Geasgill

Results

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

The following bacterium was isolated:

- *Vibrio* sp. (isolate A) – F5 (kidney), F4 (lesion)
- *Vibrio* sp. (isolate B) - F1 & F4 (lesion)
- *Vibrio* sp. (isolate C) –F1 & F4 (lesion)

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	18.93	23.58	23.76	23.68	POSITIVE
F2	18.84	22.71	22.79	22.82	POSITIVE
F3	18.23	22.3	22.28	22.3	POSITIVE
F4	19.01	23.28	23.26	23.3	POSITIVE
F5	18.65	26.79	26.76	26.68	POSITIVE

Samples were screened for the presence of infectious haematopoietic necrosis virus (IHNV), infectious salmon anaemia virus (ISAV), infectious pancreatic necrosis virus (IPNV), salmonid alphavirus (SAV) and viral haemorrhagic septicemia virus (VHSV) by cell culture.

The samples tested positive for infectious pancreatic necrosis virus (IPNV) by cell culture. PCR and sequencing were performed to determine virulence motif. The IPNV is of low-moderate virulence.

The test results for the other pathogens were negative.

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	18.93	29.32	29.32	29.4	POSITIVE

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

F2	18.84	27.28	28.79	28.53	POSITIVE
F3	18.23	27	27	27.02	POSITIVE
F4	19.01	29.83	29.04	28.61	POSITIVE
F5	18.65	26.13	26.09	26.13	POSITIVE

Paranucleospora theridion

Fish Number	Endogenous control Cp value	Cp Values			Reported Result (PCR)
F1	18.93	24.36	24.39	24.31	POSITIVE
F2	18.84	22.84	22.88	22.88	POSITIVE
F3	18.23	29.69	29.45	29.73	POSITIVE
F4	19.01	24.79	24.76	24.66	POSITIVE
F5	18.65	24.02	24.17	24.16	POSITIVE

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

Histopathological examination revealed the following:

Gill: Minimal to mild multifocal hyperplasia and lamellar fusion, some lacunae (some filled with cell debris) observed on the hyperplastic plaques (F2, F3 & F5). F1 displayed some gill filament bluntness. Few amoeboid cells resembling *Neoparamoeba perurans* (F5) and basophilic epithelial inclusions (likely epitheliocystis) (F2). Several thrombi in the lamellar vessels noted in all fish. F4 displayed autolytic artefacts which hindered the reading.
Skin & Muscle: Absence of epidermal and dermal layer, inflammatory cell infiltration (mainly mononuclear cells) observed in the hypodermis (F1 & F4). F3 displayed mild degeneration of the skeletal red muscle and inflammatory cell infiltration.
Heart: Within normal range.
Gut and pyloric caeca: Within normal range.
Pancreas: Absence of pancreatic acinar cells (F1 & F5).
Liver: Several clusters of hepatocyte displayed pyknotic nuclei (F1). Mild multifocal hepatic necrosis (F2), small area of hepatocyte vacuolation (F5 & F4).
Kidney: some reduction of the haematopoietic tissue (F5).
Spleen: Within normal range.

Signed: [redacted] Date: 13/12/2021

Fish Health Inspector

The Fish Health Inspectorate Service Charter detailing standards of service is available on the Marine Scotland website at https://www.gov.scot/publications/fish-health-inspectorate-service-charter/

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Tel – 0131 244 3498 Fax – 0131 244 0944 Email – ms.fishhealth@gov.scot
Website - www.gov.scot/Topics/marine/science


F2
F1


F2


DB.
F3


f4


DB.
F3
F4
F5