Provision of Statutory Shellfish Monitoring Services for Scotland- Chemical Contaminant Analysis of Shellfish from Classified Harvesting Areas (2025)

Report to Food Standards Scotland



Final Report

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Chemical Contaminant Analysis of Shellfish from Classified Harvesting Areas (2025)

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Quality statement: All results were quality checked and approved prior to release to FSS. Information relating to the origin of the samples (place and date of collection) is as provided by sampling staff and has not undergone verification checks by Fera or Cefas.

Contents

Glossary of Main Terms

Term or Acronym	General Meaning of Term
µg/kg	Microgram per kilogram (part per billion)
FAPAS	Food Analysis Proficiency Assurance Scheme
fat weight	Values based on the assessed fat content of the sample
FSA	Food Standards Agency
FSS	Food Standards Scotland
GC-HRMS	Gas chromatography - high resolution mass spectrometry
GC-MS	Gas chromatography –unit resolution mass spectrometry
ICP-MS	Inductively coupled plasma-mass spectrometry
LIMS	Laboratory Information Management System
LOD	Limit of Detection
LOQ	Limit of Quantification
Lower bound (LB)	Assumes values at less than the limit of detection are zero (e.g.<0.07 = 0)
mg/kg	Milligram per kilogram (part per million)
ng/kg	Nanogram per kilogram (part per trillion)
Non-ortho-PCB	Non-ortho-substituted PCB (co-planar)
Ortho-PCB	Ortho-substituted PCB (non planar)
PAH 4	Sum of 4 PAHs (benzo[a]pyrene, benzo[a]anthracene, benzo[b]fluoranthene, chrysene)
PAHs	Polycyclic aromatic hydrocarbons
PCB	Polychlorinated biphenyl
PCDD/F	Polychlorinated dibenzo-*p*-dioxin/ polychlorinated dibenzofuran (dioxins)
PFAS	Polyfluorinated and perfluorinated alkyl substances
Sum of ICES 6	Sum of PCB28, PCB52, PCB101, PCB138, PCB153 and PCB180
TEF	Toxic Equivalency Factor – toxicity expressed for each dioxin-like compound relative to 2,3,7,8-TCDD (TEF = 1).
TEQ	Toxic Equivalence – product of the congener concentration and the TEF
Total TEQ	Total of the Sum of all the Toxic Equivalences (TEQs) for each group of compounds
Trace Element	An element in a sample that has an average concentration of less than 100 parts per million (< 100 mg/kg)
Upper bound (UB)	assumes values at less than the limit of detection is equal to the limit of detection (e.g. <0.07 = 0.07)
whole weight	Values based on the sample as received
WHO	World Health Organisation
WHO-TEQ 2005	TEQ based on TEF values set by World Health Organisation in 2005

Executive Summary

This study on chemical contaminants in shellfish from Scottish classified shellfish production areas fulfils the requirements of UK legislation to adopt appropriate monitoring measures and carry out compliance checks on shellfish produced for human consumption. Marine shellfish bio-accumulate environmental contaminants because of their inability to metabolise them to easily excreted compounds. The study determines concentrations of regulated environmental contaminants as well as some currently unregulated compounds of interests in the flesh of edible species, with a view to determine current levels of occurrence and to allow estimation of consumer exposure.

The study analysed 9 samples of shellfish including common mussels, pacific oysters, native oysters and surf clams for polycyclic aromatic hydrocarbons (PAHs), trace elements, polychlorinated dibenzo-p-dioxins (PCDDs), polychlorinated dibenzofurans (PCDFs), polychlorinated biphenyls (PCBs) .The methodologies used for the analyses were UKAS accredited to the ISO 17025 standard and follow retained European regulations for data quality criteria.

All measured analytes were below their maximum regulatory levels in the test samples. Contaminant profiles from the this study are similar to the previous year's (2024) data.

1. Background to Study

Marine shellfish are an excellent source of protein, are high in essential minerals and low in fat. In many parts of the UK and in Scotland in particular, the shellfish industry makes a significant contribution to the local economy. Shellfish have a recognised potential for bio-accumulating contaminants and some bivalve species such as mussels, are commonly used as early indicators of local pollution. Bivalves feed by filtering plankton from the surrounding water. This feeding mechanism leads to the bio-accumulation of pollutants of biogenic and anthropogenic origin from the surrounding waters. The bio-accumulation potential of the shellfish species used for food is particularly relevant in the case of environmental contaminants with long half-lives such as polychlorinated dibenzo-p-dioxins (PCDDs), polychlorinated dibenzofurans (PCDFs), polychlorinated biphenyls (PCBs). These contaminants have been the subject of several studies (Garraud et al 2007, Lee et al 2007, Fernandes et al 2009, Fernandes et al 2012) relating to the occurrence and bio-accumulation in marine species and the resulting potential for human exposure arising from the consumption of the edible species.

Due to potential food safety concerns, the European Union has defined limits for the control of these contaminants in a range of foods including shellfish. (European Commission 2006). The European Union (Withdrawal) Act as amended (HMSO 2018) converted directly applicable European legislation as it stood at the end of the transition period (11pm on 31 December 2020) into UK law.

PCDD/Fs and PCBs are recognised environmental and food contaminants that are known to bio-accumulate in fish and shellfish. The extent of this accumulation is evident by the levels of these contaminants detected in various studies. In the UK, Total Diet Studies (TDS) (e.g. FSA 2003) carried out over the last two decades; fish (including shellfish) has consistently been one of the highest PCDD/F and PCB containing food groups. Human dietary exposure can therefore be significantly influenced by the fish and shellfish component of the diet, particularly in high level consumers and low body-weight individuals. Although metabolised in many fish species, PAHs persist in shellfish as they are unable to break down these contaminants. Other than this bio-accumulation pathway, PAHs can also arise in fish and shellfish through some food preparation and processing methods – e.g. smoked fish are known to contain elevated levels of PAHs.

Some trace elements e.g. arsenic, cadmium, mercury and lead, are established toxic contaminants. The methylated forms of Arsenic have a lower level of toxicity, and the principal arsenic species found in fish and crustaceans, arsenobetaine, is considered virtually non-toxic. In shellfish, molluscs and seaweed arsenosugars, are the dominating species. The toxicity of these species is not known in detail but appears to be reasonably low.

Other elements, such as copper, chromium, selenium and zinc are essential to health but may be toxic at high levels of exposure. These elements may enter marine and aquatic environments and bio-accumulate in some species. Some potentially toxic elements occur naturally as part of the local geology, but others may also be found in the location of certain industries, as a result of unauthorised discharge, or as a result of other anthropogenic activity.

As part of its monitoring requirements in support of UK regulations, Food Standards Scotland (FSS) has overseen the collection of shellfish, from classified shellfish production areas within relevant local authority areas. Shellfish from classified production areas are monitored, with the edible tissues analysed for the contaminants described above.

Fera has generated environmental contaminant data on shellfish collected from new and existing shellfish production areas in Scotland since 2007. This report collates the results of the individual analyses for dioxins, PAHs and trace elements in samples of shellfish collected from selected classified Scottish production areas in the first quarter of 2025.

2. Methods

2.1 Sample Collection and Preparation

Sampling officers were required to obtain suitable shellfish samples from designated sampling points within classified shellfish production areas, as defined by FSS. The collection of shellfish and transport logistics were co-ordinated by Cefas. Samples were taken and live shellfish sent to Fera Science Limited (Fera). Nine samples of shellfish, including species of common mussels (4), pacific oysters (3), native oysters (1) and surf clams (1) were collected between January and February 2025. The sampling period was timed to coincide with the period of optimal contaminant concentrations in the shellfish which relates to the period before annual spawning. Details on the locations, with descriptions of the samples and identification are given in Table 1.

On receipt at the laboratory each sample was given a unique laboratory reference number and the sample details were logged into a Nautilus LIMS database. The samples were stored frozen prior to analysis. Sample preparation consisted of shelling followed by thorough homogenisation. Aliquots were then taken for PAH, trace element and dioxin analysis, in line with the monitoring plan determined by FSS. Dioxin sample aliquots underwent additional freeze-drying and were re-homogenised prior to analysis. Table 2 contains information on which analyses were performed on each sample.

2.2 Contaminants measured – Specific Analytes

The following analytes were determined; regulated contaminants are highlighted in **bold,** and summarised regulation limits are listed below:

Analytes	UK Maximum Regulatory Levels (MRL) relevant for live bivalve molluscs (whole weight)
Lead	1.5 mg/kg
Cadmium	1.0 mg/kg
Mercury	0.50 mg/kg
Dioxins and PCBs	Sum of dioxins (WHO PCDD/F-TEQ): 3.5 pg/g Sum of dioxins and dioxin-like PCBs (WHO PCDD/F-PCB-TEQ): 6.5 pg/g Sum of PCB28, PCB52, PCB101, PCB138, PCB153 and PCB180 (ICES 6 Indicator PCBs): 75 ng/g
PAHs	Benzo[a]pyrene: 5.0 µg/kg

	Sum of Benzo[a]pyrene, Benzo[a]anthracene, Benzo[b]fluoranthene and Chrysene): 30 µg/kg

Dioxins **- all 17, 2,3,7,8-Cl substituted PCDDs and PCDFs.**

Dioxin-like PCBs **- IUPAC no. 77, 81, 105, 114, 118, 123, 126, 156, 157, 167, 169 and 189.**

Non dioxin-like PCBs - IUPAC numbers 18, **28**, 31, 47, 49, 51, **52**, 99, **101**, 128, **138**, **153** and **180**.

PAHs - acenaphthene, acenaphthylene, fluorene, phenanthrene, anthracene, fluoranthene, benzo[c]fluorene, pyrene, benzo[e]pyrene, benzo[b]naptho[2,1-d]thiophene, anthanthrene, coronene, benzo[ghi]fluoranthene, **benzo[a]anthracene (BaA)**, **chrysene (Chr)**, **benzo[b]fluoranthene (BbF)**, benzo[j]fluoranthene, benzo[k]fluoranthene, **benzo[a]pyrene (BaP)**, cyclopenta[cd]pyrene, indeno[1,2,3-cd]pyrene, dibenzo[a,h]anthracene, benzo[ghi]perylene, dibenzo[a,l]pyrene, dibenzo[a,e]pyrene, dibenzo[a,i]pyrene, dibenzo[a,h]pyrene and the alkylated PAH, 5-methylchrysene.

Trace elements – chromium (Cr), manganese (Mn), cobalt (Co), nickel (Ni), copper (Cu), Zinc (Zn), total arsenic (As), selenium (Se), silver (Ag), **cadmium** (**Cd), mercury (Hg), lead (Pb)**

2.3 PCDD/F and PCB - Analytical Methodology

(Fera SOPs FSG 401-414)

The method used for the preparation, extraction and analysis of samples has been reported previously (Fernandes et al 2004) and is part of the CEN EN16215:2012 standard. In brief, samples were fortified with ^{13}C-labelled analogues of target compounds and exhaustively extracted using mixed organic solvents. Ortho substituted PCBs were separated from non-ortho substituted PCBs and PCDD/Fs by fractionation on activated carbon. The two fractions were further purified using adsorption chromatography on alumina. Analytical measurement was carried out using GC-HRMS

All analyses were UKAS accredited to ISO17025 standards, with the inclusion of reference material (in-house reference material, LIMS No. S11-018695 crude cod liver oil) and method blanks which were evaluated prior to reporting. Quality control evaluation for the accompanying data follows the criteria specified for chlorinated dioxins and PCBs. In addition, as the National Reference Laboratory (NRL) for dioxins and halogenated

contaminants, Fera participates in proficiency testing (PT) exercises and other inter-laboratory exercises organised by the European Union Reference Laboratory (EU-RL) and achieves consistently good results.

2.4 Polycyclic Aromatic Hydrocarbons (PAH) - Analytical Methodology

(Fera SOP FSG 410)

The analytical methodology for the PAHs has been reported before (Rose et al 2007) and is based on internal standardisation with GC-MS measurement. An aliquot of the homogenised sample was fortified with ^{13}C-labelled analogues of target compounds and saponified with methanolic potassium hydroxide. The extracted PAH solutions were purified in two stages with a dimethylformamide/cyclohexane partition followed by adsorption chromatography on activated silica. Purified extracts were sensitivity standardised and measured using GC-MS.

The analytical procedure for PAHs is UKAS accredited to ISO17025 and includes the assessment of method blanks and reference materials, (e.g. T0658, PAHs in cocoa butter) for compliance with the accreditation criteria. The methodology also meets the criteria required for evaluating data against the maximum permitted limits for benzo[a]pyrene as specified in retained Commission Regulations. Fera regularly participates in Food Analysis Proficiency Assurance Scheme (FAPAS) PT exercises for PAHs in food and achieves consistently good results.

2.5 Trace Elements - Analytical Methodology

(Fera SOP FSG 461 and 457)

Aliquots of the homogenised sample were weighed into allotted digestion vessels and a mixture (4:1) of nitric acid and hydrochloric acid added. The vessels were capped and the contents digested using a high-pressure microwave digestion system. Reagent blanks, certified reference materials and a spiked sample were also taken through the procedure. The resulting solutions were transferred to pre-marked acid-clean plastic test tubes and diluted to 10 ml with deionised water. The digest solutions together with a set of standards covering the expected concentration range, were internally standardised with indium and rhodium in dilute nitric acid (1 %v/v). Measurements were made using an Agilent 7700x ICP-MS with collision cell.

The analytical procedure is accredited to ISO17025. The criteria used to assess data included checks on instrument drift, spike recovery, replicate agreement, limits of detection and certified reference material (e.g. DORM-5 Fish Muscle, NIST 1566B Oyster Tissue)

values. Regular, successful participation in FAPAS inter-comparison exercises provides further confidence in the data. In addition, as NRL for trace elements, Fera participates in PT exercises and other inter-laboratory exercises organised by the EU-RL and achieves consistently good results.

2.6 Fat analysis

For samples requiring dioxin and PCB analysis, total fat was determined by the Werner-Schmidt method under UKAS accreditation, by Microsearch Laboratories Ltd.

3. Results

Analyte concentrations are presented in Tables 3 to 6. The limits of quantification (LOQ, quoted as "<") for dioxins, PCBs and PAHs are estimated as a dynamic parameter and therefore represent the limits of determination that prevail during the measurement. Data on the reference materials that were analysed concurrently with the samples, were within established acceptable limits, and are available if required. Measurement uncertainty (MU) was calculated and applied to data following guidelines and principals set out in "Measurement Uncertainty For Persistent Organic Pollutants By Isotope-Dilution Mass Spectrometry" (Eppe et al 2014). MU and reference material data can be made available if required.

Nine samples were tested for PCDD/Fs and PCBs. All samples contained PCDD/Fs and PCBs above the LOQ but well within the regulatory limits. Concentrations of individual congeners on a whole and fat weight basis are given in Table 4.

The dioxin-like toxicity of the samples arising from PCDD/Fs and dioxin-like PCBs has also been reported as a toxic equivalent (WHO-TEQ), which is calculated by multiplying the concentration of each congener of interest by its toxicity equivalency factor (WHO-TEF). The TEQs are presented in Tables 3a and 3b in terms of the 2005 TEFs (van den Berg et al 2006) on a whole and fat weight basis respectively.

Additionally, the sum of the ICES-6 Marker PCBs is also provided (Tables 3a and 3b). The regulations for shellfish are based on whole weight concentrations; however, in keeping with previous reports to Food Standards Scotland, the results for PCDD/Fs and PCBs have also been reported on a fat weight basis.

The range for total TEQ (PCDD/F + PCB) on a whole weight, upper bound basis (UB) was 0.05 TEQ ng/kg to 0.21 TEQ ng/kg.
The concentration of ICES-6 PCBs on a whole weight basis (UB) ranged from 0.17 µg/kg to 2.32 µg/kg.
Unlike in 2024, several PCB's (77, 81, 99, 101, 118 126, 138, 153, 169) were detected above LOQ in all samples and PCB's 18, 123, 157, 189 were not detected above LOQ in any of the samples. One sample (S25-003312, Pacific Oysters from Fairlie, Southannan Sands) had both the highest concentration of TEQ (PCDD/F + PCB) and ICES6.

PAH's were detected in all 9 samples analysed. All samples showed levels below the MRL for BaP (5 µg/kg) and PAH4 (30 µg/kg). BaP was detected above LOQ in 44% of the samples. Sum of PAH4 concentrations (UB) ranged from 0.91 µg/kg to 13.97 µg/kg.
The sample containing the highest concentration of PAH4 (13.97 µg/kg) was a pacific oyster sample from Fairlie, Southhannan Sands (S25-003312). In general, PAH4 concentrations were higher in pacific oysters than in any other species tested. Full PAH results are displayed in table 5.

All 9 samples were analysed for heavy metals. The results of which are detailed in Table 6. Concentrations of the regulated heavy metals (Cd, Hg, Pb) were all below the regulatory limit. The concentration ranges for Cd, Hg and Pb were 0.071 mg/kg to 0.523 mg/kg, 0.008 mg/kg to 0.026 mg/kg and 0.031 mg/kg to 0.154 mg/kg respectively. All samples contained quantifiable levels of Cd, Hg and Pb.

The highest concentration of Cd was found in a sample of Native Oysters from Ardmhor 2, Ardmhor (S25-003304). The highest concentration of Pb was found in a sample of common mussels from Clousta Voe, Noonsbrough (S25-004243). The highest concentration of Hg was found in a sample of Pacific Oysters from Colonsay, The Strand East (S25-004245).
All samples contained measurable levels of all 12 metals. Levels of metals varied between sample types with Zn (9.39 mg/kg to 294 mg/kg) and Cu (0.780 mg/kg to 15.5 mg/kg) showing large ranges. One sample (S25-003312 – Pacific Oysters from Fairlie, Southannan Sands) had the highest levels for both Zn and Cu, it also recorded the highest levels for Ag and Mn. Overall, the mean values (2025) were slightly higher for Cd and Hg and slightly lower for Pb when compared to 2024.

One sample (S25-003312 – Pacific Oysters from Fairlie, Southannan Sands) had the highest levels measured for PAH4, TEQ + ICES6 and several trace elements.

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Table 1: Overview of all Samples*

Local Authority	Production Area	Site Name	Site Identification Number	Grid Reference	Species	Date Sample Taken	Date Received at Fera	FERA LIMS No.
Shetland Islands	Urafirth	East of Stuck Clett	SI-287-987-08	HU 2905 7713	Common Mussels	14/01/2025	16/01/2025	S25-001303
Fife	Firth of Forth: North	Pittenweem	FF-068-189-19	NO55370176	Surf Clams	20/01/2025	22/01/2025	S25-001984
Comhairle nan Eilean Siar: Uist and Barra	Ardmhor 2	Ardmhor Native Oysters	UB-905-2478-12	NF70810472	Native Oysters	03/02/2025	05/02/2025	S25-003304
North Ayrshire	Fairlie	Southannan Sands	NA-065-332-13	NS1995154326	Pacific Oysters	04/02/2025	05/02/2025	S25-003312
Highland: Ross and Cromarty	Duilisg 2	Duilisg Pacific Oysters	RC-901-2487-13	NG82923363	Pacific Oysters	05/02/2025	06/02/2025	S25-003456
Highland: Sutherland	Loch Inchard	Loch Inchard – site 1 – D.Ross	HS-162-311-08	NC24825355	Common Mussels	10/02/2025	11/02/2025	S25-003949
Shetland Islands	Vementry South	Clousta Voe – Noonsbrough	SI-321-459-08	HU2951057830	Common Mussels	10/02/2025	12/02/2025	S25-004243
Shetland Islands	Northra Voe	Northra Voe	SI-850-2298-08	HU29156138	Common Mussels	10/02/2025	12/02/2025	S25-004244
Argyll and Bute	Colonsay	The Strand East	AB-041-1199-13	NR37318979	Pacific Oysters	10/02/2025	12/02/2025	S25-004245

**Quality statement: Information relating to the origin of the samples (place, date of collection and GR/NGR details) is as provided by sampling staff and has not undergone verification checks by Fera or Cefas*

Table 2: Samples: Chemical contaminant monitoring plan

FERA LIMS No.	Production Area	Sample Site Name	Species	Trace Elements	PAHs	DXN/ PCBs
S25-001303	Urafirth	East of Stuck Clett	Common Mussels	X	X	X
S25-001984	Firth of Forth: North	Pittenweem	Surf Clams	X	X	X
S25-003304	Ardmhor 2	Ardmhor Native Oysters	Native Oysters	X	X	X
S25-003312	Fairlie	Southannan Sands	Pacific Oysters	X	X	X
S25-003456	Duilisg 2	Duilisg Pacific Oysters	Pacific Oysters	X	X	X
S25-003949	Loch Inchard	Loch Inchard – site 1 – D.Ross	Common Mussels	X	X	X
S25-004243	Vementry South	Clousta Voe – Noonsbrough	Common Mussels	X	X	X
S25-004244	Northra Voe	Northra Voe	Common Mussels	X	X	X
S25-004245	Colonsay	The Strand East	Pacific Oysters	X	X	X

Table 3a: PCDD/Fs and PCB - TEQ and ICES6 summary, Whole weight

FERA LIMS No.	S25-001303	S25-001984	S25-003304	S25-003312	S25-003456
Description	Common Mussels, Urafirth, East of Stuck Clett	Surf Clams, Firth of Forth: North, Pittenweem	Native Oysters, Ardmhor 2, Ardmhor Native Oysters	Pacific Oysters, Fairlie, Southannan Sands	Pacific Oysters, Duilisg 2, Duilisg pacific Oysters
PCDD/F TEQ LB (ng/kg)	0.03	0.07	0.19	0.21	0.1
PCDD/F TEQ UB (ng/kg)	0.05	0.07	0.19	0.21	0.11
PCB TEQ LB (ng/kg)	0.02	0.08	0.03	0.14	0.04
PCB TEQ UB (ng/kg)	0.02	0.09	0.03	0.15	0.04
PCDD/F + PCB WHO-TEQ LB (ng/kg)	0.05	0.15	0.22	0.35	0.14
PCDD/F + PCB WHO-TEQ UB (ng/kg)	0.07	0.16	0.22	0.36	0.15
SUM ICES 6 LB (µg/kg)	0.17	0.83	0.18	2.32	0.19
SUM ICES 6 UB (µg/kg)	0.2	0.83	0.2	2.32	0.22

FERA LIMS No.	S25-003949	S25-004243	S25-004244	S25-004245
Description	Common Mussels, Loch Inchard, Loch Inchard – site 1 – D.Ross	Common Mussels, Vementry South, Clousta Voe – Noonsbrough	Common Mussels, Northra Voe, Northra Voe	Pacific Oysters, Colonsay, The Strand East
PCDD/F TEQ LB (ng/kg)	0.06	0.04	0.05	0.13
PCDD/F TEQ UB (ng/kg)	0.08	0.05	0.07	0.13
PCB TEQ LB (ng/kg)	0.03	0.03	0.03	0.05
PCB TEQ UB (ng/kg)	0.03	0.03	0.03	0.05
PCDD/F + PCB WHO-TEQ LB (ng/kg)	0.09	0.07	0.08	0.18
PCDD/F + PCB WHO-TEQ UB (ng/kg)	0.11	0.08	0.1	0.18
SUM ICES 6 LB (µg/kg)	0.21	0.14	0.14	0.18
SUM ICES 6 UB (µg/kg)	0.24	0.17	0.17	0.21

Table 3b: PCDD/Fs and PCB - TEQ and ICES6 summary, Fat weight

FERA LIMS No.	S25-001303	S25-001984	S25-003304	S25-003312	S25-003456
Description	Common Mussels, Urafirth, East of Stuck Clett	Surf Clams, Firth of Forth: North, Pittenweem	Native Oysters, Ardmhor 2, Ardmhor Native Oysters	Pacific Oysters, Fairlie, Southannan Sands	Pacific Oysters, Duilisg 2, Duilisg pacific Oysters
Fat %	0.36	0.74	0.54	1.19	0.86
PCDD/F TEQ LB (ng/kg)	10.56	10.34	33.32	17.68	11.32
PCDD/F TEQ UB (ng/kg)	10.56	10.35	33.91	17.76	12.06
PCB TEQ LB (ng/kg)	6.67	10.21	6.07	12.34	4.55
PCB TEQ UB (ng/kg)	6.67	10.22	6.07	12.35	4.55
PCDD/F + PCB WHO-TEQ LB (ng/kg)	17.23	20.55	39.39	30.02	15.87
PCDD/F + PCB WHO-TEQ UB (ng/kg)	17.23	20.57	39.98	30.11	16.61
SUM ICES 6 LB (µg/kg)	47.01	112.55	36.42	196.05	25.38
SUM ICES 6 UB (µg/kg)	47.01	112.55	36.42	196.05	25.38

FERA LIMS No.	S25-003949	S25-004243	S25-004244	S25-004245
Description	Common Mussels, Loch Inchard, Loch Inchard – site 1 – D.Ross	Common Mussels, Vementry South, Clousta Voe – Noonsbrough	Common Mussels, Northra Voe, Northra Voe	Pacific Oysters, Colonsay, The Strand East
Fat %	0.83	0.76	0.75	0.54
PCDD/F TEQ LB (ng/kg)	9.05	5.53	7.89	23.27
PCDD/F TEQ UB (ng/kg)	9.05	6.03	7.89	23.36
PCB TEQ LB (ng/kg)	4.24	3.65	3.92	9.01
PCB TEQ UB (ng/kg)	4.24	3.66	3.92	9.02
PCDD/F + PCB WHO-TEQ LB (ng/kg)	13.29	9.18	11.81	32.28
PCDD/F + PCB WHO-TEQ UB (ng/kg)	13.29	9.69	11.81	32.38
SUM ICES 6 LB (µg/kg)	26.98	20.94	20.22	36.74
SUM ICES 6 UB (µg/kg)	26.98	20.94	20.22	36.74

Table 4: PCDD/F & PCB concentrations

	FERA LIMS No.	S25-001303		S25-001984	
	Description	Common Mussels, Urafirth, East of Stuck Clett		Surf Clams, Firth of Forth: North, Pittenweem	
	Units	Whole	Fat (%)	Whole	Fat (%)
2,3,7,8-TCDD	ng/kg	<0.01	0.78	0.01	1.44
1,2,3,7,8-PeCDD	ng/kg	0.01	2.98	0.02	3.05
1,2,3,4,7,8-HxCDD	ng/kg	<0.01	1.82	0.01	1.92
1,2,3,6,7,8-HxCDD	ng/kg	0.01	3.75	0.04	5.97
1,2,3,7,8,9-HxCDD	ng/kg	<0.01	2.1	0.01	1.86
1,2,3,4,6,7,8-HpCDD	ng/kg	0.05	12.63	0.22	29.19
OCDD	ng/kg	0.15iR	39.88iR	0.79iR	107.19iR
2,3,7,8-TCDF	ng/kg	0.08	22.65	0.07	9.56
1,2,3,7,8-PeCDF	ng/kg	0.01	3.1	<0.01	<0.31
2,3,4,7,8-PeCDF	ng/kg	0.03	9.52	0.07	8.98
1,2,3,4,7,8-HxCDF	ng/kg	<0.01	1.03	0.02	2.84
1,2,3,6,7,8-HxCDF	ng/kg	<0.01	1.32	<0.01	0.79
1,2,3,7,8,9-HxCDF	ng/kg	<0.01	0.54	<0.01	0.57
2,3,4,6,7,8-HxCDF	ng/kg	0.01	3.6	0.03	3.57
1,2,3,4,6,7,8-HpCDF	ng/kg	0.01	2.8	0.09	12.06
1,2,3,4,7,8,9-HpCDF	ng/kg	<0.01	0.09	<0.01	<0.48
OCDF	ng/kg	0.01	4.05	0.09	12.17
PCB 77	ng/kg	0.74	203.01	3.95	536.21
PCB 81	ng/kg	0.06	15.91	0.4	54.14
PCB 126	ng/kg	0.22	61.35	0.7	94.66
PCB 169	ng/kg	0.06	17	0.17	22.44
PCB 105	µg/kg	<0.01	2.28	0.03	4.36
PCB 114	µg/kg	<0.01	0.09	<0.01	0.19
PCB 118	µg/kg	0.03	7.44	0.11	14.96
PCB 123	µg/kg	<0.01	0.32	<0.01	<0.21
PCB 156	µg/kg	<0.01	0.7	<0.01	1.2
PCB 157	µg/kg	<0.01	0.3	<0.01	0.89
PCB 167	µg/kg	<0.01	0.73	0.01	1.61
PCB 189	µg/kg	<0.01	0.07	<0.01	0.3
PCB 28	µg/kg	<0.01	0.91	0.02	2.23
PCB 52	µg/kg	<0.01	2.09	0.03	3.72
PCB 101	µg/kg	0.03	7.4	0.12	16.16
PCB 138	µg/kg	0.06	15.25	0.28	38.07
PCB 153	µg/kg	0.08	20.65	0.31	42.31
PCB 180	µg/kg	<0.01	0.71	0.07	10.06
PCB 18	µg/kg	<0.01	0.32	<0.01	0.61
PCB 31	µg/kg	<0.01	0.64	0.01	1.53
PCB 47	µg/kg	<0.01	1.23	0.02	2.53
PCB 49	µg/kg	<0.01	1.21	0.02	3.05
PCB 51	µg/kg	<0.01	<0.04	<0.01	0.24
PCB 99	µg/kg	0.02	4.73	0.07	9.15
PCB 128	µg/kg	<0.01	2.25	0.04	5.6

	FERA LIMS No.	S25-003304		S25-003312	
	Description	Native Oysters, Ardmhor 2, Ardmhor Native Oysters		Pacific Oysters, Fairlie, Southannan Sands	
	Units	Whole	Fat (%)	Whole	Fat (%)
2,3,7,8-TCDD	ng/kg	0.03	4.79	0.02	1.63
1,2,3,7,8-PeCDD	ng/kg	0.11	20.07	0.05	4.33
1,2,3,4,7,8-HxCDD	ng/kg	0.02	2.88	0.01	1.25
1,2,3,6,7,8-HxCDD	ng/kg	0.02	4.01	0.05	3.9
1,2,3,7,8,9-HxCDD	ng/kg	0.02	3.66	0.02	2.05
1,2,3,4,6,7,8-HpCDD	ng/kg	0.04	6.69	0.08	6.48
OCDD	ng/kg	0.09	17.14	0.26	22.06
2,3,7,8-TCDF	ng/kg	0.15	28.05	0.62	52.4
1,2,3,7,8-PeCDF	ng/kg	0.02	4.48	0.06	5.02
2,3,4,7,8-PeCDF	ng/kg	0.08	14.62	0.2	16.55
1,2,3,4,7,8-HxCDF	ng/kg	<0.01	<1.31	<0.01	<0.62
1,2,3,6,7,8-HxCDF	ng/kg	<0.01	<0.6	0.02	1.66
1,2,3,7,8,9-HxCDF	ng/kg	<0.01	<0.39	<0.01	<0.21
2,3,4,6,7,8-HxCDF	ng/kg	<0.02	<3.51	0.05	3.96
1,2,3,4,6,7,8-HpCDF	ng/kg	<0.01	0.93	0.01	0.92
1,2,3,4,7,8,9-HpCDF	ng/kg	<0.01	<0.32	<0.01	<0.15
OCDF	ng/kg	<0.01	1.09	0.01	1.12
PCB 77	ng/kg	1.6	293.59	18.19	1534.54
PCB 81	ng/kg	0.16	29.17	0.7	59.42
PCB 126	ng/kg	0.28	51.99	1.24	104.7
PCB 169	ng/kg	0.12	21.48	0.17	14.31
PCB 105	µg/kg	<0.01	1.35	0.11	9.38
PCB 114	µg/kg	<0.01	0.05	<0.01	0.4
PCB 118	µg/kg	0.02	4.41	0.34	28.84
PCB 123	µg/kg	<0.01	<0.04	<0.01	<0.24
PCB 156	µg/kg	<0.01	0.16	0.01	1.26
PCB 157	µg/kg	<0.01	0.12	<0.01	0.72
PCB 167	µg/kg	<0.01	0.26	0.02	1.65
PCB 189	µg/kg	<0.01	0.03	<0.01	0.06
PCB 28	µg/kg	<0.01	1.68	0.04	3.44
PCB 52	µg/kg	0.02	3.2	0.12	10.11
PCB 101	µg/kg	0.03	6.37	0.41	34.96
PCB 138	µg/kg	0.04	7.8	0.52	43.7
PCB 153	µg/kg	0.09	17.03	1.14	96.03
PCB 180	µg/kg	<0.01	0.34	0.09	7.81
PCB 18	µg/kg	<0.01	0.38	<0.01	0.56
PCB 31	µg/kg	<0.01	1.26	0.03	2.78
PCB 47	µg/kg	<0.01	1.65	0.05	4.35
PCB 49	µg/kg	0.01	2.41	0.08	7.07
PCB 51	µg/kg	0	0.3	<0.01	0.65
PCB 99	µg/kg	0.02	4.18	0.25	21.29
PCB 128	µg/kg	<0.01	0.64	0.04	3.35

	FERA LIMS No.	S25-003456		S25-003949	
	Description	Pacific Oysters, Duilisg 2, Duilisg pacific Oysters		Common Mussels, Loch Inchard, Loch Inchard – site 1 – D.Ross	
	Units	Whole	Fat (%)	Whole	Fat (%)
2,3,7,8-TCDD	ng/kg	<0.01	<0.64	<0.01	0.87
1,2,3,7,8-PeCDD	ng/kg	0.04	4.74	0.02	2.67
1,2,3,4,7,8-HxCDD	ng/kg	0.02	1.81	0.02	2.01
1,2,3,6,7,8-HxCDD	ng/kg	0.03	3.06	0.02	2.99
1,2,3,7,8,9-HxCDD	ng/kg	0.02	2.09	0.02	1.94
1,2,3,4,6,7,8-HpCDD	ng/kg	0.05	6.29	0.13	15.14
OCDD	ng/kg	0.13	15.65	0.66iR	78.98iR
2,3,7,8-TCDF	ng/kg	0.21	24.06	0.14	17.45
1,2,3,7,8-PeCDF	ng/kg	0.03	3.44	0.02	3
2,3,4,7,8-PeCDF	ng/kg	0.08	9.59	0.06	7.4
1,2,3,4,7,8-HxCDF	ng/kg	<0.01	<0.75	0.01	1.39
1,2,3,6,7,8-HxCDF	ng/kg	0.01	1.64	0.01	1.33
1,2,3,7,8,9-HxCDF	ng/kg	<0.01	<0.22	<0.01	0.5
2,3,4,6,7,8-HxCDF	ng/kg	0.02	2.61	0.02	2.29
1,2,3,4,6,7,8-HpCDF	ng/kg	<0.01	0.91	0.03	3.24
1,2,3,4,7,8,9-HpCDF	ng/kg	<0.01	<0.22	<0.01	0.33
OCDF	ng/kg	0.01	1.19	0.04iR	4.48iR
PCB 77	ng/kg	1.85	214.09	1.13	135.94
PCB 81	ng/kg	0.12	13.9	0.1	12.13
PCB 126	ng/kg	0.34	39.23	0.31	36.73
PCB 169	ng/kg	0.13	14.7	0.11	13.43
PCB 105	µg/kg	<0.01	7.3	<0.01	1.05
PCB 114	µg/kg	<0.01	0.27	<0.01	<0.05
PCB 118	µg/kg	0.03	24.3	0.03	3.26
PCB 123	µg/kg	<0.01	<0.23	<0.01	<0.05
PCB 156	µg/kg	<0.01	3.08	<0.01	0.28
PCB 157	µg/kg	<0.01	1.54	<0.01	0.13
PCB 167	µg/kg	<0.01	2.22	<0.01	0.27
PCB 189	µg/kg	<0.01	0.59	<0.01	0.04
PCB 28	µg/kg	<0.01	5.44	<0.01	0.48
PCB 52	µg/kg	0.01	8.07	<0.01	0.96
PCB 101	µg/kg	0.04	28.16	0.03	3.4
PCB 138	µg/kg	0.07	55.68	0.06	7.06
PCB 153	µg/kg	0.08	66.83	0.12	14.4
PCB 180	µg/kg	0.02	17.73	<0.01	0.68
PCB 18	µg/kg	<0.01	2.4	<0.01	0.2
PCB 31	µg/kg	<0.01	3.85	<0.01	0.34
PCB 47	µg/kg	<0.01	3.26	0.11	13.62
PCB 49	µg/kg	<0.01	5.98	<0.01	0.78
PCB 51	µg/kg	<0.01	0.41	0.01	1.74
PCB 99	µg/kg	0.02	18.04	0.02	2.02
PCB 128	µg/kg	<0.01	6.53	<0.01	0.75

	FERA LIMS No.	S25-004243		S25-004244	
	Description	Common Mussels, Vementry South, Clousta Voe – Noonsbrough		Common Mussels, Northra Voe, Northra Voe	
	Units	Whole	Fat (%)	Whole	Fat (%)
2,3,7,8-TCDD	ng/kg	<0.01	<0.31	<0.01	0.74
1,2,3,7,8-PeCDD	ng/kg	0.01	1.58	0.02	2.37
1,2,3,4,7,8-HxCDD	ng/kg	<0.01	<0.68	<0.01	1.3
1,2,3,6,7,8-HxCDD	ng/kg	0.01	1.66	0.02	2.4
1,2,3,7,8,9-HxCDD	ng/kg	<0.01	1.25	0.01	1.68
1,2,3,4,6,7,8-HpCDD	ng/kg	0.05	6.6	0.07	9.24
OCDD	ng/kg	0.17iR	21.99iR	0.21iR	27.71iR
2,3,7,8-TCDF	ng/kg	0.1	12.89	0.12	15.33
1,2,3,7,8-PeCDF	ng/kg	0.01	1.86	0.02	2.61
2,3,4,7,8-PeCDF	ng/kg	0.05	6.33	0.05	6.46
1,2,3,4,7,8-HxCDF	ng/kg	<0.01	<0.93	<0.01	1.07
1,2,3,6,7,8-HxCDF	ng/kg	<0.01	0.89	<0.01	1.21
1,2,3,7,8,9-HxCDF	ng/kg	<0.01	<0.28	<0.01	0.4
2,3,4,6,7,8-HxCDF	ng/kg	0.02	2.26	0.02	2.87
1,2,3,4,6,7,8-HpCDF	ng/kg	0.02	2.34	0.03	3.49
1,2,3,4,7,8,9-HpCDF	ng/kg	<0.01	0.34	<0.01	0.48
OCDF	ng/kg	0.02iR	2.68iR	0.03iR	4.19iR
PCB 77	ng/kg	0.58	77.03	0.65	86.33
PCB 81	ng/kg	0.05	6.21	0.05	6.99
PCB 126	ng/kg	0.24	31.87	0.26	34.36
PCB 169	ng/kg	0.08	11.07	0.09	11.67
PCB 105	µg/kg	<0.01	0.8	<0.01	0.73
PCB 114	µg/kg	<0.01	0.03	<0.01	0.03
PCB 118	µg/kg	0.02	2.77	0.02	2.73
PCB 123	µg/kg	<0.01	<0.02	<0.01	<0.03
PCB 156	µg/kg	<0.01	0.21	<0.01	0.21
PCB 157	µg/kg	<0.01	0.09	<0.01	0.1
PCB 167	µg/kg	<0.01	0.22	<0.01	0.22
PCB 189	µg/kg	<0.01	<0.03	<0.01	0.03
PCB 28	µg/kg	<0.01	0.37	<0.01	0.34
PCB 52	µg/kg	<0.01	0.91	<0.01	0.67
PCB 101	µg/kg	0.02	2.87	0.02	2.44
PCB 138	µg/kg	0.04	5.7	0.04	5.68
PCB 153	µg/kg	0.08	10.72	0.08	10.69
PCB 180	µg/kg	<0.01	0.37	<0.01	0.4
PCB 18	µg/kg	<0.01	0.17	<0.01	0.17
PCB 31	µg/kg	<0.01	0.3	<0.01	0.26
PCB 47	µg/kg	<0.01	0.4	<0.01	0.3
PCB 49	µg/kg	<0.01	0.54	<0.01	0.35
PCB 51	µg/kg	<1	0.03	<0.01	<0.01
PCB 99	µg/kg	0.01	1.76	0.01	1.46
PCB 128	µg/kg	<0.01	0.68	<0.01	0.65

	FERA LIMS No.	S25-004245	
	Description	Pacific Oysters, Colonsay, The Strand East	
	Units	Whole	Fat (%)
2,3,7,8-TCDD	ng/kg	0.02	3.13
1,2,3,7,8-PeCDD	ng/kg	0.05	9.08
1,2,3,4,7,8-HxCDD	ng/kg	0.01	2.44
1,2,3,6,7,8-HxCDD	ng/kg	0.03	5.51
1,2,3,7,8,9-HxCDD	ng/kg	0.02	4.04
1,2,3,4,6,7,8-HpCDD	ng/kg	0.05	8.6
OCDD	ng/kg	0.17iR	31iR
2,3,7,8-TCDF	ng/kg	0.25	46.97
1,2,3,7,8-PeCDF	ng/kg	0.03	5.05
2,3,4,7,8-PeCDF	ng/kg	0.08	14.43
1,2,3,4,7,8-HxCDF	ng/kg	<0.01	<0.86
1,2,3,6,7,8-HxCDF	ng/kg	<0.01	1.7
1,2,3,7,8,9-HxCDF	ng/kg	<0.01	0.29
2,3,4,6,7,8-HxCDF	ng/kg	0.02	3.77
1,2,3,4,6,7,8-HpCDF	ng/kg	<0.01	1.43
1,2,3,4,7,8,9-HpCDF	ng/kg	<0.01	<0.21
OCDF	ng/kg	<0.01iR	1.7iR
PCB 77	ng/kg	1.8	334.84
PCB 81	ng/kg	0.13	24.58
PCB 126	ng/kg	0.44	81.08
PCB 169	ng/kg	0.11	20.45
PCB 105	µg/kg	<0.01	1.64
PCB 114	µg/kg	<0.01	0.06
PCB 118	µg/kg	0.03	5.78
PCB 123	µg/kg	<0.01	<0.07
PCB 156	µg/kg	<0.01	0.25
PCB 157	µg/kg	<0.01	0.19
PCB 167	µg/kg	<0.01	0.57
PCB 189	µg/kg	<0.01	<0.01
PCB 28	µg/kg	<0.01	0.66
PCB 52	µg/kg	<0.01	1.83
PCB 101	µg/kg	0.03	5.2
PCB 138	µg/kg	0.05	9.45
PCB 153	µg/kg	0.1	18.89
PCB 180	µg/kg	<0.01	0.71
PCB 18	µg/kg	<0.01	0.26
PCB 31	µg/kg	<0.01	0.54
PCB 47	µg/kg	<0.01	0.62
PCB 49	µg/kg	<0.01	0.91
PCB 51	µg/kg	<0.01	0.07
PCB 99	µg/kg	0.02	3.13
PCB 128	µg/kg	<0.01	0.59

NOTE: where shown i = indicative; iR = indicative, reference material result out of range

Table 5: PAH concentrations (µg/kg Whole weight)

FERA LIMS No.	S25-001303	S25-001984	S25-003304	S25-003312	S25-003456
Description	Common Mussels, Urafirth, East of Stuck Clett	Surf Clams, Firth of Forth: North, Pittenweem	Native Oysters, Ardmhor 2, Ardmhor Native Oysters	Pacific Oysters, Fairlie, Southannan Sands	Pacific Oysters, Duilisg 2, Duilisg pacific Oysters
acenaphthylene	<0.5	0.86	1.08	1.29	<0.42
acenaphthene	<0.73	<0.81	<0.82	<0.82	<0.84
fluorene	<0.8	<0.97	<0.98	<0.98	<1.07
phenanthrene	<1.18	1.57	<2.52	2.53	1.41
anthracene	0.04	0.39	0.11	1.17	0.17
fluoranthene	<0.73	1.78	1.05	7.47	1.97
benzo[c]fluorene	0.01	0.13	0.08	0.46	0.09
pyrene	<0.77	1.63	<1.31	7.59	1.85
benzo[ghi]fluoranthene	0.13	0.64	0.41	3.45	0.9
benzo[a]anthracene	0.12	0.81	0.31	2.64	0.46
benzo[b]naphtho[2,1-d]thiophene	<0.05	0.15	0.17	0.76	0.25
cyclopenta[cd]pyrene	<0.01	<0.03	<0.02	0.07	<0.04
chrysene	0.21	0.85	0.58	2.83	0.73
5-methylchrysene	<0.01	<0.02	<0.01	<0.22	<0.06
benzo[b]fluoranthene	0.47	1.2	1.25	6.86	1.75
benzo[j]fluoranthene	0.14	0.46	0.35	1.7	0.44
benzo[k]fluoranthene	0.17	0.61	0.85	3.21	0.69
benzo[e]pyrene	0.21	1.48	0.62	7.46	1.6
benzo[a]pyrene	<0.21	0.73	0.22	1.64	0.24
indeno[1,2,3-cd]pyrene	<0.26	0.51	0.4	1.14	<0.26
dibenz[a,h]anthracene	<0.13	<0.12	<0.13	0.36	<0.12
benzo[ghi]perylene	0.29	0.77	0.28	1.7	0.36
anthanthrene	<0.1	<0.1	<0.1	<0.1	<0.1
dibenzo[a,l]pyrene	<0.35	<0.36	<0.36	<0.36	<0.35
dibenzo[a,e]pyrene	<0.23	<0.25	<0.26	<0.26	<0.25
dibenzo[a,i]pyrene	<0.1	<0.1	<0.1	<0.1	<0.1
dibenzo[a,h]pyrene	<0.1	<0.1	<0.1	<0.1	<0.1
coronene	<0.1	0.29	<0.1	0.21	<0.1
PAH 4 Sum LB	0.8	3.59	2.36	13.97	3.18
PAH 4 Sum UB	1.01	3.59	2.36	13.97	3.18

FERA LIMS No.	S25-003949	S25-004243	S25-004244	S25-004245
Description	Common Mussels, Loch Inchard, Loch Inchard – site 1 – D.Ross	Common Mussels, Vementry South, Clousta Voe – Noonsbrough	Common Mussels, Northra Voe, Northra Voe	Pacific Oysters, Colonsay, The Strand East
acenaphthylene	<0.09	<0.09	<0.09	<0.08
acenaphthene	<0.19	<0.19	<0.19	<0.19
fluorene	<0.69	<0.7	<0.69	<0.67
phenanthrene	1.13	<0.98	<0.96	1.04
anthracene	<0.06	<0.04	<0.03	0.09
fluoranthene	0.79	<0.77	<0.76	1.79
benzo[c]fluorene	<0.04	<0.01	<0.01	0.06
pyrene	<1.06	<1.07	<1.05	<1.02
benzo[ghi]fluoranthene	0.52	0.13	0.14	0.58
benzo[a]anthracene	0.21	0.09	0.08	0.19
benzo[b]naphtho[2,1-d]thiophene	0.13	0.04	0.05	0.12
cyclopenta[cd]pyrene	<0.01	<0.01	<0.01	<0.01
chrysene	0.41	0.19	<0.19	0.84
5-methylchrysene	<0.01	<0.01	<0.01	<0.01
benzo[b]fluoranthene	0.75	0.51	0.44	0.76
benzo[j]fluoranthene	0.29	0.18	0.16	0.2
benzo[k]fluoranthene	0.24	0.17	0.16	0.27
benzo[e]pyrene	0.96	0.46	0.46	0.91
benzo[a]pyrene	0.23	<0.21	<0.2	<0.2
indeno[1,2,3-cd]pyrene	<0.27	<0.26	<0.25	<0.15
dibenzo[ah]anthracene	<0.14	<0.14	<0.14	<0.13
benzo[ghi]perylene	0.36	0.32	0.3	0.17
anthanthrene	<0.1	<0.1	<0.1	<0.1
dibenzo[a,l]pyrene	<0.18	<0.17	<0.16	<0.15
dibenzo[a,e]pyrene	<0.13	<0.13	<0.13	<0.12
dibenzo[a,i]pyrene	<0.1	<0.1	<0.1	<0.1
dibenzo[a,h]pyrene	<0.1	<0.1	<0.1	<0.1
coronene	0.14	0.11	0.1	<0.1
PAH 4 Sum LB	1.6	0.79	0.52	1.79
PAH 4 Sum UB	1.6	1	0.91	1.99

Table 6: Trace Element Concentrations (mg/kg whole weight)

FERA LIMS No.	S25-001303	S25-001984	S25-003304	S25-003312	S25-003456
Description	Common Mussels, Urafirth, East of Stuck Clett	Surf Clams, Firth of Forth: North, Pittenweem	Native Oysters, Ardmhor 2, Ardmhor Native Oysters	Pacific Oysters, Fairlie, Southannan Sands	Pacific Oysters, Duilisg 2, Duilisg pacific Oysters
Chromium	0.21	0.15	0.07	0.12	0.04
Manganese	0.74	1.53	1.48	3.44	3.37
Cobalt	0.034	0.117	0.021	0.033	0.020
Nickel	0.17	0.26	0.05	0.07	0.04
Copper	0.78	1.21	4.90	15.5	4.50
Zinc	25.0	9.39	294	252	128
Arsenic	1.85	1.50	1.57	2.28	2.54
Selenium	0.33	0.34	0.39	0.35	0.33
Silver	0.005	0.186	0.784	0.968	0.393
Cadmium	0.139	0.071	0.523	0.263	0.276
Mercury	0.012	0.011	0.016	0.021	0.008
Lead	0.148	0.060	0.044	0.118	0.031

FERA LIMS No.	S25-003949	S25-004243	S25-004244	S25-004245
Description	Common Mussels, Loch Inchard, Loch Inchard – site 1 – D.Ross	Common Mussels, Vementry South, Clousta Voe – Noonsbrough	Common Mussels, Northra Voe, Northra Voe	Pacific Oysters, Colonsay, The Strand East
Chromium	0.15	0.09	0.10	0.05
Manganese	2.06	0.75	0.87	2.10
Cobalt	0.033	0.025	0.027	0.021
Nickel	0.13	0.09	0.11	0.06
Copper	0.80	0.79	0.82	8.36
Zinc	11.5	21.0	20.3	206
Arsenic	1.95	1.96	2.00	2.42
Selenium	0.45	0.33	0.35	0.25
Silver	0.008	0.005	0.006	0.617
Cadmium	0.072	0.173	0.160	0.188
Mercury	0.009	0.008	0.008	0.026
Lead	0.071	0.154	0.143	0.079