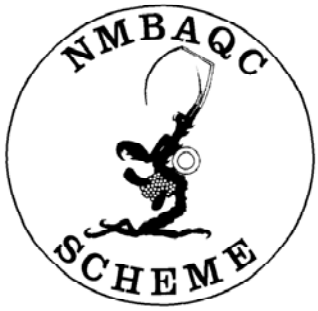

BEQUALM
NATIONAL MARINE BIOLOGICAL ANALYTICAL QUALITY CONTROL SCHEME
Annual Report - Year 14 - 2007/2008

A report prepared by the NMBAQC Coordinating Committee – June 2010

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This Year 14 Annual Report follows the summarised format introduced for Year 13. It provides a synopsis of the scheme activities for Year 14 (2007-08). Most of the detailed information previously incorporated within the Annual Reports is now available as separate reports or bulletins on the scheme's website. The relevant documents are all cited here and the reader is directed via hyperlinks to the NMBAQC website as appropriate.

The NMBAQC coordinating committee held four meetings during the scheme Year 14 on 19th April 2007, 11th July 2007, 24th October 2007 and 31st January 2008. The minutes from these committee meetings are now available on the NMBAQC website.

Committee Membership for Year 14 is shown in Appendix 1.

1 Scheme Review

The scope of the NMBAQC scheme continued to develop in Year 14 to encompass the requirement to provide quality assurance for assessments under the Water Framework Directive (WFD), for which monitoring commenced in the UK in 2007. The scheme still maintains its role to provide Analytical Quality Control for Invertebrate and Particle Size data collected for UK CSEMP (Clean Seas Environment Monitoring Programme – formerly the NMMP). Under the UK Marine Monitoring and Assessment Strategy (UKMMAS) the NMBAQC coordinating committee will now report to the Healthy and Biologically Diverse Seas Evidence Group (HBDSEG).

Year 14 of the scheme involved training and testing exercises for the Invertebrate, Particle Size, Fish, Macroalgae and Phytoplankton Components as have been run in previous years. This year the annual Invertebrate component workshop involved a four-day beginners taxonomic workshop at the Unicomarine Lab in Letchworth.

The Epibiota Component has developed in a rather piece-meal fashion. Previous exercises involved a circulation of digital images of around 100 Epibiota taxa for identification in 2001 and subsequently a similar web based Epibiota Ring Test was developed in conjunction JNCC. Some preliminary investigation of Epifaunal Analysis from Trawl and Video was included in the Fish & Epibenthos Workshop at Millport in November 2004. A follow-up workshop focusing on Epibiota with a view to developing an Epibiota Video Analysis AQC Scheme took place in April 2007.

This year the participation level in the NMBAQC scheme grew compared to Yr 13 (26 participants), with a total of 33 organisations involved in it's training and testing exercises (see Appendix 2).

Summaries of all the component activities are provided below:

1.1 Invertebrate component

Contract Manager: Myles O' Reilly, SEPA
Component Administrator: David Hall, Unicomarine

1.1.1 Summary of activities

The fourteenth year of the Scheme (2007/08) involved a series of four modules under the Invertebrate component:

- Invertebrate Ring Test identification (RT32 and RT34) training exercise.
  Two sets of twenty-five specimens of benthic invertebrates (RT32 general invertebrate ring test, RT 34 'targeted' bivalve specimens) supplied for identification by participating laboratories.

- Macrobenthic invertebrate sample analysis (MB15) training exercise.
  One contractor supplied macrobenthic sample for full laboratory processing (extraction, enumeration and biomass).

- Laboratory Reference (LR) training exercise.
  Participating laboratories submitted twenty-five benthic invertebrate specimens for re-examination by the contractor. The specimens could be either voucher material from their reference collection for confirmation or difficult/problematic taxa about which they are unsure)

- Own Sample (OS35, OS36 and OS37) reanalysis testing exercise, with pass/fail flag for UK NMMP laboratories.
  Participating laboratories were requested to send the contractor their benthic invertebrate data matrices from which three samples were selected. The three chosen samples were submitted and were reanalysed by the contractor. Each 'Own Sample' was assessed on the efficiency of extraction, identification, enumeration and biomass.

An Invertebrate Taxonomic Workshop was held at the Unicomarine Laboratory in November 2007. This workshop was tailored for beginners, and covered sample processing techniques and introduced participants to the key features and terminology used for many Invertebrate Phyla, including the more problematic taxa from: Polychaeta, Oligochaeta and Echinodermata. Please see Appendix 3 for the workshop timetable.

1.1.2 Summary of exercise results

Thirty-two laboratories participated in the benthic invertebrate component of the NMBAQC Scheme in Year 14 (see Appendix 2). Sixteen participants were government laboratories; sixteen were private consultancies. Fourteen of the participants were responsible for CSEMP (Clean Seas Environment Monitoring Programme) sample analysis (excluding subcontracted samples).

The results of the Own Sample (OS35, OS36 and OS37) reanalysis testing exercise were generally consistent with the results from Yr 13 OS exercise. The Bray-Curtis similarity index (between the participating laboratory and the contractor) was greater than 90% (Pass flag) for 95% of samples. All the laboratories with 'Poor' or 'Bad' sample flags for CSEMP samples addressed their 'failing' samples by undertaking remedial action. However, three of the seven laboratories with 'Poor' or 'Bad' sample flags for Non-CSEMP samples did not confirm whether remedial action was completed, therefore are given a 'status unknown' flag. One participating laboratory did not supply their three selected Own Samples, and as a result these samples were deemed to have failed the NMBAQC Scheme standards. For submission and flagging of CSEMP invertebrate sampling sites see Appendix 4.

Of the training exercises, the Macrobenthic exercise MB15 posed some problems associated with faunal extraction and identification of the taxa. The ring test RT32 had fairly good agreement between the identifications made by the participating laboratories and those made by Unicomarine Ltd. The majority of the generic errors can be attributed to three mollusc, one chelicerate and one polychaete taxa. The 'targeted' ring test (RT34 – 'Bivalves'), also posed few problems for species identification. The Laboratory Reference (LR) exercise did not reveal any clear problem areas, however there were differences in the approach to this exercise by the individual laboratories (some laboratories used this to confirm voucher specimens whilst others sought a means of having 'unknowns' identified).

More detailed information on these exercises can be found in the contractors report below. Among the recommendations highlighted by the contractor is the need for NMBAQC to develop standard protocols detailing the processing requirements for macrobenthic invertebrate samples and particle size samples and for participants to utilise the NMBAQC's UK Standard Taxonomic Literature List database to standardise appropriate literature used for identification of invertebrates.

Benthic Invertebrate Component Annual Report, Year 14 (2007/08)
Hall, D., 2010. Benthic Invertebrate component - Report from the contractor. Scheme Operation - Year 14 - 2007/08. A report to the NMBAQC Scheme participants. 22pp, March 2010.

Yr 14 Own Sample Report:
Own Sample Module Summary Report OS35, 36 & 37 - February 2010
Hall, D.J., 2010. National Marine Biological Analytical Quality Control Scheme. Own Sample Module Summary Report OS35, 36 & 37. Report to the NMBAQC Scheme participants. 22pp, February 2010.

Yr 14 Ring Test Bulletins:
RTB 34 - April 2008
Hall, D.J. and Worsfold, T.M., 2008. National Marine Biological Analytical Quality Control Scheme. Ring Test Bulletin: RTB#34. Report to the NMBAQC Scheme participants. Unicomarine Report NMBAQCrtb#34, 30pp, April 2008.

RTB 32 - December 2007
Hall, D.J. and Worsfold, T.M., 2007. National Marine Biological Analytical Quality Control Scheme. Ring Test Bulletin: RTB#32. Report to the NMBAQC Scheme participants. Unicomarine Report NMBAQCrtb#32, 31pp, December 2007.

Yr 14 Macrobenthic Exercise Report:
MB 15 - June 2008
Hall, D.J. and Taylor, J.G., 2007. National Marine Biological Analytical Quality Control Scheme. Macrobenthic Exercise Results - MB15. Report to the NMBAQC Scheme participants. 9pp, June 2008.

1.2 Particle Size Analysis component

Contract Manager: Myles O' Reilly, SEPA
Component Administrator: David Hall, Unicomarine

1.2.1 Summary of activities

The fourteenth year of the Scheme (2007/08) involved one module with two exercises under the Particle Size Analysis component:

- Particle Size Analysis (PS30 and PS31) testing exercises, with pass/fail flag for UK CSEMP laboratories.
  Two marine sediment samples (one coarse, the other much finer) supplied to participating laboratories for Particle Size Analysis.

1.2.2 Summary of results

Twelve laboratories participated in the Particle Size Analysis component (see Appendix 2). Seven laboratories were government laboratories; five were private consultancies. Over half of the participants (7) were responsible for CSEMP (Clean Seas Environment Monitoring Programme) sample analysis.

The Particle Size testing exercise, PS30 (muddy sample) resulted in seven 'fail' and forty-eight 'pass' flags. PS31 (gravely sand sample) resulted in eight 'fail' and forty-seven 'pass' flags. The 'fail' flags were mainly attributed to the difference between the two main techniques employed by participating laboratories for particle size analysis.

More detailed information on this exercise can be found in the contractors report below. Among the recommendations highlighted by the contractor is the need for NMBAQC to develop standard protocols for Particle Size Analysis (sieve and laser technique).

PSA Component Annual Report, Year 14 (2007/08)
Hall, D., 2010. Particle Size component - Report from the contractor. Scheme Operation - Year 14 - 2007/08. A report to the NMBAQC Scheme participants. 9pp, March 2010.

Yr 14 Particle Size Reports:
PS31 - April 2008
Hall, D.J., 2008. National Marine Biological Analytical Quality Control Scheme. Particle Size Results: PS31. Report to the NMBAQC Scheme participants. Unicomarine Report NMBAQCps31, 7pp, April 2008.

PS30 - December 2007
Hall, D.J., 2007. National Marine Biological Analytical Quality Control Scheme. Particle Size Results: PS30. Report to the NMBAQC Scheme participants. Unicomarine Report NMBAQCps30, 7pp, December 2007.

1.3 Fish component

Contract Manager: Steve Coates, Environment Agency
Component Administrator: David Hall, Unicomarine

1.3.1 Summary of activities

The fourteenth year of the Scheme (2007/08) involved one module/exercise under the Fish component:

- Fish Ring Test identification (RT33) training exercise. (This exercise has been subsequently designated as FRT03)
  One set of twenty-five 'targeted' specimens of fish supplied for identification by participating laboratories.

1.3.2 Summary of results

Seventeen laboratories participated in the fish component of the NMBAQC Scheme (see Appendix 2). Thirteen participants were government laboratories; four were private consultancies.

The fish ring test (FRT03) produced good agreement between the identifications made by the participating laboratories and those made by Unicomarine Ltd. However as with FRT02 in Yr 13, this ring test highlighted a significant number of submissions with spelling errors in the taxonomic names.

More detailed information on this exercise can be found in the contractors report below. Among the recommendations highlighted by the contractor is the need for participants to utilise the NMBAQC's UK Standard Taxonomic Literature List database to standardise appropriate literature used for identification of fish.

Fish Component Annual Report, Year 14 (2007/08)
Hall, D., 2010. Fish component - Report from the contractor. Scheme Operation - Year 14 - 2007/08. A report to the NMBAQC Scheme participants. 7pp, March 2010.

Yr 14 Fish Ring Test Report:
RTB 33 - January 2008 (This exercise subsequently designated as FRT03)
Hall, D.J., 2008. National Marine Biological Analytical Quality Control Scheme. Fish Ring Test Bulletin: RTB#33. Report to the NMBAQC Scheme participants. Unicomarine Report NMBAQCrtb#33, 24pp, January 2008.

1.4 Phytoplankton component

Scheme Administrator: Joe Silke, Marine Institute, Galway, Ireland. Registration and fee collecting arranged through BEQUALM Website (based at CEFAS Lab, Lowestoft).

The Marine Institute in Galway have been undertaking Phytoplankton Intercomparison (PHY-ICN) exercises since 2004. The first held under the BEQUALM / NMBAQC banner was in November 2005. The following exercises under the NMBAQC scheme (PHY-ICN-08-MI1) took place in February 2008.

1.4.1 Summary of activities

The phytoplankton inter-comparison exercise comprised two exercises and one workshop:

- Enumeration of cells exercise: Lugol's preserved sample spiked with the armoured dinoflagellate *Prorocentrum micans*.
- Identification exercise: A taxonomic quiz consisting of 8 questions designed to test different identification skills of participants.

- Workshop: Discussion of the results of the intercomparison and future directions of the exercise. Presentations by guest speakers: Professor Jane Lewis, University of Westminster 'Living dinoflagellates: from Theca to Cyst', and Dr. Caroline Cusack, Climate Change Phytoplankton Team 'Diatoms: *Pseudonitzschia spp*. The Basics'.

1.4.2 Summary of results

Twenty-nine analysts from thirteen laboratories (from the UK, Ireland and Spain) participated in the Phytoplankton enumeration and identification ring test in 2008 (see Appendix 2).

The enumeration exercise showed good repeatability between participants, the Galway laboratory and the 'Gold standard'. The identification exercise showed that participants did quite well, with over 50% of the participants scoring about 90% in the taxonomic quiz. This exercise highlighted that participants seem to be more knowledgeable on the identification of armoured Dinoflagellates against the identification of Diatoms and naked Dinoflagellates. The results from these two exercises were discussed at the workshop in April 2008 and some recommendations were put forward by the participants to improve and further enhance this proficiency testing scheme.

More detailed information on this exercise can be found in the following contractor report:

Phytoplankton Enumeration and Identification Ring Test, 2008
Salas, R.G., Silke, J., 2008. Phytoplankton enumeration and identification analysis. Ring Test PHY-ICN-08-MI1 Exercise Report. 44pp.

1.5 Macroalgae component

Contract Manager: Alison Miles, Environment Agency
Component Administrator: Emma Wells, Wells Marine

1.5.1 Summary of activities

The macroalgae component exercise involved the identification of twenty-two species of rockyshore macroalgae, where laboratory photos within sorting trays and stereo and compound microscope images were provided to highlight different morphological features.

1.5.2 Summary of results

Twenty-three participants from fourteen laboratories participated in the second macroalgae ring test (RT02) circulated in August 2007 (see Appendix 2).

RT02 gave varying results for participants, with correct identification scores ranging between 26 and 40 (based on 1 point awarded for correct species name and 1 point

awarded for correct genus name). The maximum score possible total was 40. Only 1 species was correctly identified by all twenty-three participants.

More detailed results can be found in the following contractor report:

RT02 - October 2007
Wells, E., 2007. National Marine Biological Analytical Quality Control Scheme, Intertidal Macroalgal Ring Test RT02. Report to the NMBAQC Scheme participants. Wells Marine Surveys, October 2007.

1.6 Epibiota component

A workshop was held at AFBI, Belfast, on the 11-12 April 2007 to discuss Quality Assurance needs for assessment of video footage from epibiota monitoring surveys. The aim of this workshop was to work towards standard assessment methods for video surveys for workers across all monitoring sectors in the UK. It is hoped ultimately to develop QA protocols for video "samples" in a similar manner to those currently undertaken for QA of traditional biological samples. The Workshop Proceedings are available on the NMBAQC website.

Following the workshop, a sub-committee was formed within the NMBAQC to produce a contract specification for a Pilot Ring Test for video "samples" of epibiota. The intention is to contract a component administrator to run the Pilot Ring Test in the next NMBAQC scheme year (Yr 15).

Appendix 1 - NMBAQC Co-ordinating Committee – Year 14 - 2007/2008

Name	Organisation	Position
Tim Mackie	Environment & Heritage Service, NI	Chair
Alison Miles	Environment Agency	Finance Manager
Paolo Pizzolla	Joint Nature Conservation Committee	Secretary
Myles O'Reilly	Scottish Environment Protection Agency	Invertebrate Contract Manager
Steve Coates	Environment Agency	Fish Contract Manager
Joe Silke	Marine Institute, Ireland	Phytoplankton Contract Manager
Matt Service	Agri-Food and Biosciences Institute, NI	CMA Representative
Carol Milner	Scottish Environment Protection Agency	CMA Representative
Keith Cooper	Centre for Environment, Fisheries & Aquaculture Science	CMA Representative
Mike Robertson	Fisheries Research Services, Aberdeen	CMA Representative
Lucie Oliver	Countryside Council for Wales / Environment Agency	Joined from January 2008 CMA Representative
Penny Coad	Ecomaris Ltd.	Contractors representative

Appendix 2 - NMBAQC scheme participation for Year 14

Organisation	Invertebrate	Particle Size	Fish	Phytoplankton	Macroalgae
Agri-Food and Biosciences Institute	✓	✓	✓	✓	✓
APEM Ltd.	✓		✓		
AstraZeneca	✓				
Biotikos	✓				
Centre for Environment, Fisheries & Aquaculture Science	✓	✓	✓	✓	✓
CMACS Ltd.	✓	✓			
Countryside Council for Wales	✓				
Department of Local Government and the Environment, Isle of Man				✓	
Ecomaris Ltd.	✓				
EMU Ltd.	✓	✓	✓		✓
Environment Agency	✓	✓	✓		✓
Environment and Heritage Service	✓	✓	✓	✓	✓
Environmental Protection Agency, Ireland				✓	✓
Environmental Services, Institute of Aquaculture	✓				
ERT (Scotland) Ltd.	✓	✓	✓		✓
Fish Vet Group	✓				
Fisheries Research Services	✓	✓		✓	
Fugro Survey Ltd	✓				
Gardline Environmental	✓	✓			
Hebog Environmental Ltd.	✓				
Institute of Estuarine and Coastal Studies, University of Hull	✓	✓	✓		
Intecmar, Spain				✓	
Jacobs	✓			✓	
Joint Nature Conservation Council	✓(Info only)				
Marine Ecological Surveys Ltd	✓				
Marine Farm Services, Shetland Seafood Quality Council (SSQC)	✓				
Marine Institute, Ireland	✓(Info only)			Contract administrator	
Natural England	✓(Info only)				

Appendix 2 continued - NMBAQC scheme participation for Year 14

Organisation	Invertebrate	Particle Size	Fish	Phytoplankton	Macroalgae
Scottish Association for Marine Science				✓	
Scottish Environment Protection Agency	✓	✓	✓	✓	✓
Scottish Natural Heritage	✓(Info only)				
Unicomarine	Contract administrator	Contract administrator	Contract administrator		✓
Wells Marine					Contract administrator

Appendix 3 - BEQUALM/NMBAQC Scheme Taxonomic Workshop November 2007

BEQUALM / NMBAQC Scheme Taxonomic Workshop for Beginners 12th-16th November 2007 (Unicomarine Ltd., Letchworth Laboratory).

Day	Session	Discussion / Demonstration / Practical	Aims	Session Leader
Monday 12th Nov. 2007	1:00pm	Arrival. Laboratory set-up.	Prepare laboratory equipment for practical sessions.	David Hall
	1:30pm	Introduction. General information. Lab. rules (H&S issues). Q&A session.	Welcome participants. Outline folder / timetable / daily structure. Give history of Unicomarine and facilities. Present pub & food guide.	Martin Dyer & David Hall
	2:00pm	Demonstration / Discussion - Sample Processing.	Requirements, SOP's and best practice for sample analysis.	David Hall
	2:20pm	Practical - Phyla recognition.	Review starting position of knowledge.	David Hall
	pm	Demonstration - Porifera, Cnidaria, Platyhelminthes, Nematoda, Nemertea, Priapulida, Sipuncula & Echiura.	Introduce the major features / terminology used for these Phyla. Show major literature required for identification.	David Hall
	pm	Practical – Examination of reference material.	Obtain familiarity with the major identification features. Gain experience of identification.	David Hall
Tuesday 13th Nov. 2007	9:15am	Demonstration - Annelida.	Introduce the major features / terminology used for this Phylum. Show major literature required for identification.	David Hall
	pm	Practical – Examination of reference material.	Obtain familiarity with the major identification features. Gain experience of identification.	David Hall
	4:30pm	Practical – test specimens.	Allow identification of unnamed material.	David Hall
Wednesday 14th Nov. 2007	9:15am	Demonstration - Mollusca.	Introduce the major features / terminology used for this Phylum. Show major literature required for identification.	Tim Worsfold
	pm	Practical – Examination of reference material.	Obtain familiarity with the major identification features. Gain experience of identification.	Tim Worsfold
	4:30pm	Practical – test specimens.	Allow identification of unnamed material.	Tim Worsfold
Thursday 15th Nov. 2007	9:15am	Demonstration - Crustacea.	Introduce the major features / terminology used for this Phylum. Show major literature required for identification.	Chris Ashelby
	pm	Practical – Examination of reference material.	Obtain familiarity with the major identification features. Gain experience of identification.	Chris Ashelby
	4:30pm	Practical – test specimens.	Allow identification of unnamed material.	Chris Ashelby
Friday 16th Nov. 2007	9:15am	Demonstration – Echinodermata.	Introduce the major features / terminology used for this Phylum. Show major literature required for identification.	David Hall
	am	Practical – Examination of reference material.	Obtain familiarity with the major identification features. Gain experience of identification.	David Hall
	pm	Discussion - Summary of week. Q&A session. Departure.	Distribute / collect workshop feedback forms.	David Hall

Appendix 4 - Submission and Flagging of CSEMP Invertebrate data.

The grading and flagging process for CSEMP(NMMP) samples and data is described and discussed in the Benthic Invertebrate Component Scheme Standards (2010) on the NMBAQC website. CSEMP data is submitted on an annual basis by the relevant Competent Monitoring Authority (CMA) to the Merman database. The CMAs are also required to submit information indicating whether Analytical Quality Control has been successfully completed for their own NMMP sites. The relevant CSEMP data remains flagged until confirmation is received that audited samples have passed according to the NMBAQC criteria. Where samples fail to achieve acceptable standards it is mandatory for CMAs to undertake appropriate remedial action in order to achieve a "remedial action pass". Guidelines for undertaking remedial action and for amending CSEMP(NMMP)data following completion of analytical quality control are available in the Year 12 Annual Report. A flowchart summarising the Own Sample data amendment and submission process is shown below in Figure 1.

Collection and analysis of CSEMP samples is very expensive. It is unacceptable if data subsequently remains flagged due to failure of labs to ensure that samples are processed properly or to complete remedial actions.
CMA Laboratories must:

a. Ensure samples are not compromised
b. Provide requested NMMP data sets to the NMBAQC Scheme
c. Supply requested Own Samples and residues for audit
d. Complete all required remedial action
e. Complete post-audit data amendments
f. Ensure the amended data is submitted to the Merman database
g. Confirm completion of AQC to the Merman database

For Year 14 the CSEMP data matrices submitted and sample flagging for Own Sample audits are shown below in the Table1. Data is derived from the previous sampling year, 2006, except for Lab K which is ahead of schedule and has submitted 2007 data. Data was presented for 65 CSEMP sites Labs A, B, and B2 in the Scottish sector revised there monitoring strategies for CSEMP in 2006 in order to increase representativeness of the respective strata. Rather than five replicate grabs being collected at each site (as in 2005) the five grabs were dispersed over a named stratum (water body). For Labs A, and B these sites were spread at random and will then remain fixed for subsequent years (assuming each selected site has suitable sediment). For Lab B2 the locations of the five grabs in each water body will be re-randomised each year. Different modifications of the CSEMP sampling programmes by CMAs are likely over the coming years. These along with internal re-organisations within CMA labs, subcontracting analysis of samples to external labs can make the sample auditing and flagging process more complicated. It is evident that not all the relevant CSEMP data gathered by CMAs is presented to the scheme for audit. Moreover application of Pass status to a single lab that may have actually subcontracted analysis to one or more other labs who also participate in the scheme can be a little confusing. On the positive side it is good to see that in Year 14 most of the CSEMP labs are achieving Good or Excellent grades first time around and those that don't are ensuring remedial action is completed and a Remedial Action Pass is achieved.

Figure 1 - Own Sample (OS) data amendment and submission for CSEMP Samples

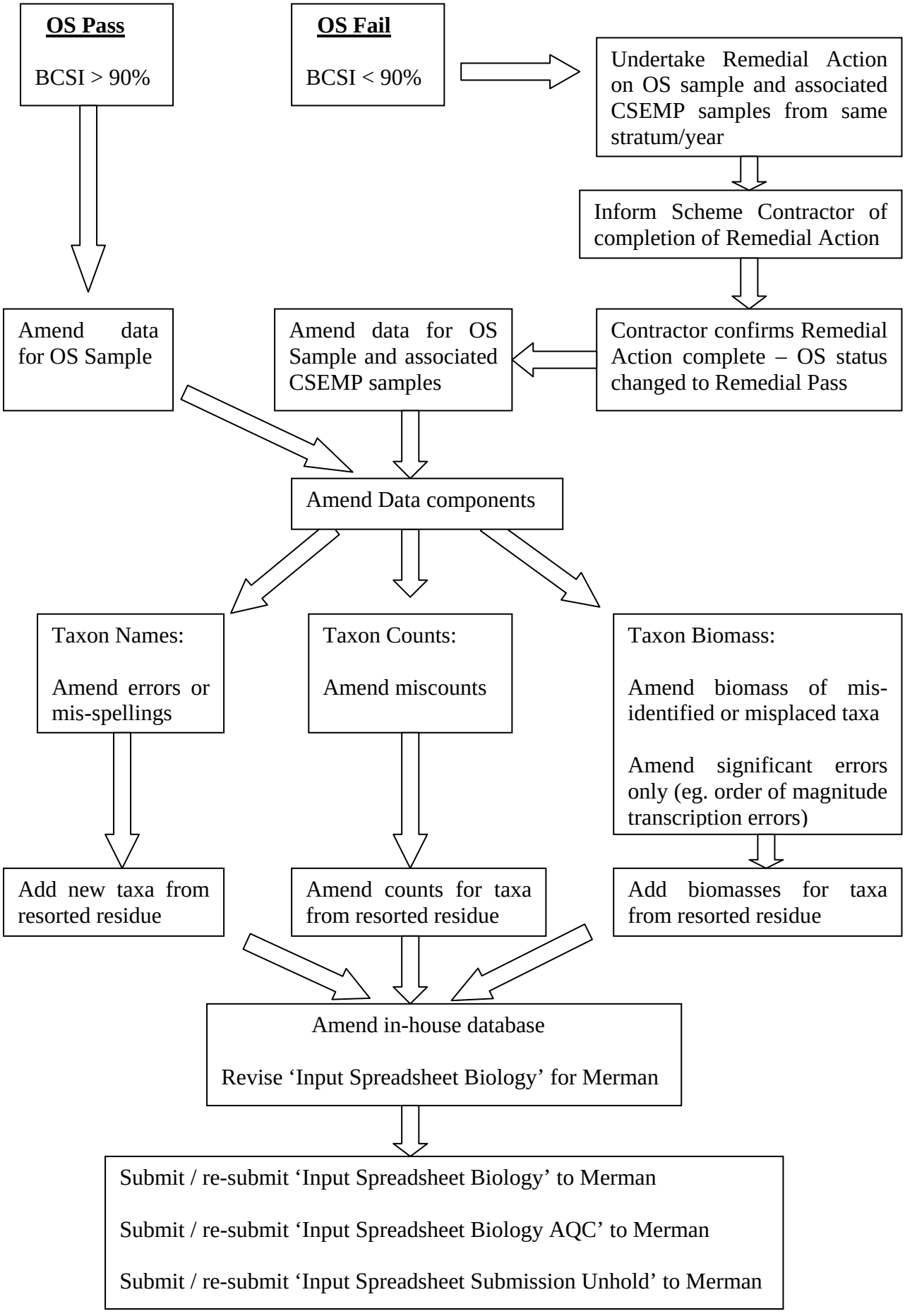

TABLE 1. - CSEMP SAMPLE FLAGGING - YEAR 14

Lab	CSEMP Data Matrices Submitted	Own Samples Selected	Initial Grade	Flag status
A	2006 CSEMP Firth of Clyde, (Inner - Stratum A)	Firth of Clyde @ CMT 7, NW of Cloch Point (OS35)	Good	PASS
	2006 CSEMP Firth of Clyde, (Middle - Stratum B)	-	-	PASS
	2006 CSEMP Firth of Clyde, (Outer - Stratum C)	Firth of Clyde @ 10km E of Johnston's Point (OS36)	Fail - Poor	PASS - RA
	2006 CSEMP Sound of Jura	Sound of Jura 11km W of Glenacardoch Point (OS37)	Fail - Bad	PASS - RA
B	2006 CSEMP Cromarty Firth	Cromarty Firth Rep. E (OS37)	Excellent	PASS
	2006 CSEMP Firth of Forth	Stn. 49, Firth of Forth Outer (KH) (OS36)	Fail - Poor	PASS - RA
	2006 CSEMP Forth Estuary	Rep. C, Lower Forth Estuary (KC) (OS35)	Good	PASS
B2	2006 CSEMP Fladen	Fladen_FlaOpenSea_se02 (OS36)	Excellent	PASS
	2006 CSEMP Minches	MinchMalin_TheMinchSouth_se01 (OS37)	Excellent	PASS
	2006 CSEMP Moray Firth (Intermediate)	-	-	PASS
	2006 CSEMP Moray Firth (offshore)	-	Excellent	PASS
	2006 CSEMP Forth/Tay Offshore	East Scotland_Scurdieness_se01	Good	PASS
	2006 CSEMP Solway Offshore	-	-	PASS
C	2006 CSEMP 210 Yarrow Slake	-	-	PASS
	2006 CSEMP 220 Budle Bay	-	-	PASS
	2006 CSEMP 225 Hebburn	-	-	PASS
	2006 CSEMP 235 Ferry Crossing	-	-	PASS
	2006 CSEMP 265 Alex. Bridge	-	-	PASS
	2006 CSEMP 270 Off Seaham	-	-	PASS
	2006 CSEMP 275 Sandy Point	Rep.C (OS35)	Good	PASS
	2006 CSEMP 305 Bamlett's Bight	-	-	PASS
	2006 CSEMP 315 No23 Buoy	Rep. E (OS36)	Good	PASS
	2006 CSEMP 325 Phillips Buoy	Rep. A (OS37)	Excellent	PASS
C1	2006 CSEMP 755 Seacombe Ferry, Mersey	Rep. A (OS36)	Excellent	PASS
	2006 CSEMP 765 Ch. C1 Buoy	-	-	PASS
	2006 CSEMP 766 u/s 11 mile post, Ribble	Rep. E (OS37)	Excellent	PASS
	2006 CSEMP 767 North Bay, Morecambe Bay	Rep. D (OS35)	Good	PASS
	2006 CSEMP 768 St. Bees	-	-	PASS
D	2006 CSEMP 356 Inside Spurn	Rep. D (OS35)	Good	PASS
	2006 CSEMP 357 Grimsby Roads	Rep. B (OS36)	Good	PASS
	2006 CSEMP 358 Sunk Island	Rep. C (OS37)	Excellent	PASS
F	2006 CSEMP 435 Woolwich	Rep. A(OS35) Rep. B (OS36)	Fail-Poor Good	RA- PASS PASS
	2006 CSEMP 455 Mucking	Rep. C (OS37)	Good	PASS

TABLE 1. Contd. - CSEMP SAMPLE FLAGGING - YEAR 14

Lab	Data Matrices Submitted	Own Samples Selected	Grade	Flag status
G	2006_CSEMP 505 Dock Head	Rep. A (OS35)	Good	PASS
	2006 CSEMP 526 Burham	Rep. A (OS36)	Fail - Bad	PASS - RA
	2006 CSEMP 527 Sun Pier	Rep. A (OS37)	Good	PASS
H	2006 CSEMP 245 NSTF14	-	-	PASS
	2006 CSEMP 345 NSTF53	Rep. A (OS35) Rep. D (OS36)	Good Good	PASS PASS
	2006 CSEMP 536 Lyme Bay	Rep.C (OS37)	Good	PASS
	2006 CSEMP 605 Celtic Deep	-	-	PASS
	2006 CSEMP 805 SE IOM	-	-	PASS
I	2006 CSEMP 555 Warren Point	Rep. B (OS36)	Good	PASS
	2006 CSEMP 565 Hamoaze	Rep. C (OS37)	Good	PASS
	2006 CSEMP 566 Upper South Deep	Rep. A (OS35)	Good	PASS
	2006 CSEMP 567 Wytch	-	-	PASS
	2006 CSEMP 576 Jennycliffe	-	-	PASS
J	2006 CSEMP Purton	Rep. D (OS35)	Good	PASS
	2006 CSEMP 635 Bedwin	Rep.A (OS36)	Good	PASS
	2006 CSEMP 645 Peterstone	-	-	PASS
	2006 CSEMP 646 Cosheston Point	-	-	PASS
	2006 CSEMP 647 Ynys-hir	-	-	PASS
	2006 CSEMP 648 Bontddu	-	-	PASS
	2006 CSEMP 690 Mostyn	Rep. E (OS37)	Good	PASS
K	2007 CSEMP 809 SAC (Green I.)	Rep. D (OS35)	Good	PASS
	2007 CSEMP 845 BL5	Rep.A (OS36)	Good	PASS
	2007 CSEMP BL7	-	-	PASS
	2007 CSEMP 820 BR3	-	-	PASS
	2007 CSEMP 880 Kilderry	Rep. A (OS37)	Good	PASS
	2007 CSEMP 825 IS1	-	-	PASS
L	2006 CSEMP 806 NMP4	-	-	PASS
	2006 CSEMP 807 NMP5	-	-	PASS
	2006 CSEMP 808 Buoy(NMP6)	Rep. E (OS37)	Excellent	PASS
	2006 CSEMP 815 Buoy(NMP3)	Rep. B (OS36)	Good	PASS
	2006 CSEMP 865 NC2(NMP2)	Rep. B (OS35)	Good	PASS
	2006 CSEMP 875 NC1(NMP1)	-	-	PASS