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East of Haig Fras MCZ: Sea-pen and Burrowing Megafauna Communities: Quality Assurance

Hawes, J.

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Jon Hawes

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For further information please contact:

Joint Nature Conservation Committee
Monkstone House
City Road
Peterborough PE1 1JY
www.jncc.gov.uk

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Summary

This report presents the findings of an external quality assurance (QA) analysis undertaken on the outputs of the JNCC's recent analysis of camera tow video footage, collected on the CEND0915 survey within East of Haig Fras Marine Conservation Zone.

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1 Introduction

East of Haig Fras (MCZ) is part of a network of sites designed to meet conservation objectives under the Marine and Coastal Access Act (2009). These sites will also contribute to an ecologically coherent network of Marine Protected Areas (MPAs) across the North-east Atlantic, as agreed under the Oslo Paris (OSPAR) Convention and other international commitments to which the UK is signatory.

The Joint Nature Conservation Committee (JNCC) and the Centre for Environment, Fisheries and Aquaculture Science (Cefas) have conducted three surveys aboard RV *Cefas Endeavour* (CEND0312, CEND0513 and CEND0915) to gather evidence and to monitor East of Haig Fras Marine Conservation Zone (MCZ) and to inform assessment of condition of the designated features of the sites (Eggleton & Downie 2017). The 2015 monitoring survey (CEND0915) found indicative evidence of the presence of Sea-pen and burrowing megafauna within the site (Callaway 2015).

Sea-pen and burrowing megafauna communities (SPBMC) is a habitat Feature of Conservation Importance (FOCI) listed on the Ecological Network Guidance for Marine Conservation Zones in England. The feature is defined using the OSPAR definition and consists of plains of fine mud between 15-200m deep "…which are heavily bioturbated by burrowing megafauna with burrows and mounds typically forming a prominent feature of the sediment surface…" (OSPAR 2010). JNCC have suggested additional recommendations which are useful when classifying Sea-pen and burrowing megafauna communities, notably that while burrowing megafauna are essential, sea-pens may or may not be present; the feature can occur in subtidal areas; and the feature can occur in sandy or fine muds (JNCC 2014).

JNCC are in the process of analysing the videos from the CEND0915 survey in house to verify the presence and extent of this habitat. This report presents the findings of an external quality assurance (QA) analysis undertaken on the outputs of JNCC's analysis of camera tow video footage, collected on the CEND0915 survey within East of Haig Fras MCZ. This QA analysis follows the same protocol as developed by JNCC for the assessment of presence/absence and extent of the Sea-pen and burrowing megafauna habitat within this designated MCZ.

1.1 Aims and objectives

1.1.1 Report aims and objectives

The primary aim of this Quality Assurance report is asses the accuracy of the macrofaunal burrow enumeration analysis, undertaken by JNCC on video data acquired on the CEND0915 cruise, within the East of Haigh Fras MCZ.

To meet the overall aim of this request, the objectives are to:

1. Analyse 10% of the video transects data using the JNCC protocol (see Annex I).
2. Compare results with JNCC results using a Bray-Curtis similarity index, noting discrepancies and any comments you may wish to make on the data.
    i. A grade will be applied (Excellent match – Poor match) on a video segment and still image basis using a grading system related to the untransformed Bray-Curtis scores.
    ii. Further investigation to be undertaken on any transect comparisons which score bellow the "Acceptable match" threshold.

2 Methods

2.1 Initial collection and analysis of data

To confirm the presence of the Sea-pens and burrowing megafauna communities (SPBMC) FOCI, video data is required for quantification of burrows, alongside sediment sample data for infaunal analysis and particle size analysis (PSA) (JNCC 2014). Where only video data is available, burrows need to be identified as frequent or higher on the SACFOR scale to qualify as the Sea-pen and burrowing megafauna FOCI. In 2015, a Cefas and JNCC monitoring survey visited East of Haig Fras MCZ and collected video and grab data. The presence of Sea-pen and burrowing megafauna communities on video transects was noted during the survey (Callaway 2015). Subsequent analysis of the data included PSA from grab samples and segmenting the videos into Broadscale habitats, however burrows were not quantified preventing an assessment of the presence and extent of Sea-pen and burrowing megafauna FOCI.

The following outlines the methodology devised by JNCC for quantification of burrows using video data:

Prioritisation approach

Video segments were prioritised based on the broadscale habitats assigned and the result of the particle size analysis (PSA) of the sediment collected at the same station, however a grab sample was not collected at all video stations, which is reflected in the prioritisation categories below.

The priorities were assigned in the following way with 1 being the highest priority:

1. PSA result shows subtidal mud present;
2. Video analysis shows subtidal mud present, and there is either no PSA or the PSA indicates suggests the sediment is Subtidal coarse, sand or mixed sediments;
3. PSA result shows subtidal sand is present;
4. Video analysis shows subtidal sand present but no PSA taken at that station;
5. Video analysis shows subtidal sand present but PSA suggests sediment is coarse or mixed;
6. PSA result shows subtidal mixed sediments present;
7. Video and/or PSA shows subtidal coarse sediment present.

Priorities were assigned to video segments, but videos were analysed as a whole rather than in segments. As such, if a high priority segment is in a video with a lower priority segment, those lower priority segments get analysed at the same time.

Analysis methodology

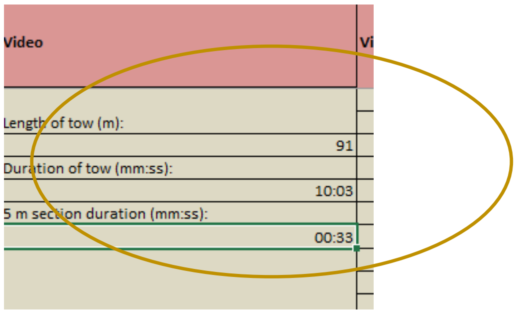
The following methodology was developed considering the guidelines set out in the JNCC paper providing clarification in relation to the habitat definition (JNCC 2014) and should be used to analyse the videos for the presence of the feature Sea-pen and burrowing megafauna. Recording was undertaken using a burrow recording form that automatically calculates the duration (in seconds) of 5 metre segments for analysis, and also the burrow density:

For the video being analysed:

1. The total length of the tow (m) should be calculated using a shapefile (Albers projection) with lines representing the tows. A line measurement tool can be used to calculate an estimate of total tow length.

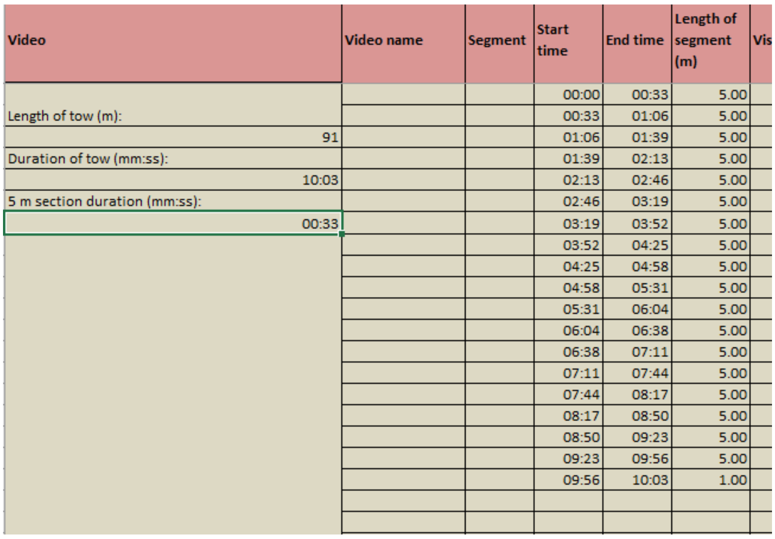
2. The total tow time is equal to the length of the video file and should be inputted using the following format mm:ss.

3. Add the tow length and time information into the relevant cells in the burrow recording form.



Video	Vi
Length of tow (m):	
91	
Duration of tow (mm:ss):	
10:03	
5 m section duration (mm:ss):	
00:33	

4. This will then automatically calculate the duration in seconds of 5 metre segments for analysis. Intervals of this duration can then be added into the recording spreadsheet (see example below)



Video	Video name	Segment	Start time	End time	Length of segment (m)	Vis
			00:00	00:33	5.00	
Length of tow (m):			00:33	01:06	5.00	
91			01:06	01:39	5.00	
Duration of tow (mm:ss):			01:39	02:13	5.00	
10:03			02:13	02:46	5.00	
5 m section duration (mm:ss):			02:46	03:19	5.00	
00:33			03:19	03:52	5.00	
			03:52	04:25	5.00	
			04:25	04:58	5.00	
			04:58	05:31	5.00	
			05:31	06:04	5.00	
			06:04	06:38	5.00	
			06:38	07:11	5.00	
			07:11	07:44	5.00	
			07:44	08:17	5.00	
			08:17	08:50	5.00	
			08:50	09:23	5.00	
			09:23	09:56	5.00	
			09:56	10:03	1.00	

5. The video name should be added into the spreadsheet (column B), and the segments numerically labelled in order (column C), e.g. 1,2,3, *etc*.

6. The tow may not divide exactly into 5m segments, so the final segment may be shorter than the others. The length of segment column automatically calculates the segment length (m), and this is then used in the density calculations.

7. Watch the video at normal speed and if you see a burrow in a given time segment mark with a Y in the Burrows Present column (H). Then pause the video and slow down the video playback speed. The speed required will depend on the video quality, and the towing speed, but start at half speed and adjust as necessary. Go back to the beginning of the time segment and watch again at the reduced speed.

Counts of burrows greater than 3cm in diameter and less than 3cm in diameter should be made (see point below for scale indicators in the video). The counts should then be recorded in columns I and J.

8. The laser pointers in this particular set of videos were 17cm apart and these can be used as an indicator to judge burrow size.

9. The density for each 5 metre segment will automatically calculate once the number of burrows is entered into the spreadsheet.

10. The video width should be set to 1m, this value is based on an average measurement of video widths in this dataset.

The visibility column can be used to indicate how clear the video is in each segment. For example, a video might have good visibility if the water is clear and the camera steady in calm water, or it might be highly turbid water with lots of camera motion due to rough seas, meaning the seabed isn't always visible. There is also a comments column to add any other descriptive information.

2.2 Quality Assurance Analysis

Cefas received the following products from the JNCC prior to commencement of the QA process:

- FOCI presence and extent assessment protocol
- Video data
- Sample data (subset of full analysis)
- Associated metadata
- Cruise Report

The sample data provided comprised a random selection of initial analysis results for eight transects (equating to 10% of the total number of transects analysed). Random selection of the sample transects was carried out by JNCC. Table 1 summarises the video data randomly selected for QA analysis:

Table 1. Imagery data for analysis, transects selected for QA process.

Station code	Video reference
EHGF105	EHGF105_STN_410_A1
EHGF236	EHGF236_STN_372_A1
EHGF238	EHGF238_STN_368_A1
EHGF017	EHGF017_STN_356_A1
EHGF067	EHGF067_STN_215_A1
EHGF048	EHGF048_STN_234_A1
EHGF125	EHGF125_STN_334_A1
EHGF255	EHGF255_STN_289_A1

A copy of the provided sample data spreadsheet was made, and the initial counts for both <3cm burrows and >3cm burrows were removed, alongside the presence/ absence, visibility and comments columns. This done to ensure that the QA analysis would be undertaken using the exact same sample proforma, but removing any chance for bias to be introduced from previous results.

The methodology for video segment analysis was taken directly from the JNCC devised procedure (Step 7. In section 2.1). Each transect was viewed twice, with preliminary viewing for presence/ absence of burrows, and secondary viewing for enumeration. Video data were viewed using VLC media player, with preliminary playback at 1x speed, and secondary (enumerative) playback at 0.5 to 0.7 x speeds (dependent on video quality).

2.2.1 Multivariate statistical comparison of data

The results from the QA analysis, two columns of count data and one of presence/absence data, were then compiled with initial analysis data into a sample matrix. This matrix assigned each video segment a unique identifier - which matched transect, segment and analysis stage (initial or QA) to discrete values (counts and P/A). These data were then exported into Primer v7.

Abundance data, counts of burrows <3cm and counts of burrows >3cm, were taken as variables for the comparison. No transformation or standardisation was applied to these data. A resemblance matrix was then created, using the Bray-Curtis similarity measure (Bray & Curtis 1957), which calculated percentage similarity between each independent sample using both variables (i.e. for individual segments, both initial and QA counts for each burrow size class). An MDS ordination of these similarities was then undertaken, with analysis stage overlain so as to provide an initial, visual, indication of any potential discrepancy.

As the discrete segment data lacks a sufficient number of variables to provide a meaningful comparison (as there are only two variables per sample), the discrete (segment vs segment) similarities were averaged across each transect. This method allowed for retention of comparative power, as the QA process is required to calculate analytical accuracy for each video segment, not simply the average number of burrows counted at each transect. The similarity score was then compared against a series of criteria as follows:

Bray-Curtis similarity index thresholds for comparing presence/absence:

- 90 - 100% BCSI – Excellent match
- 80 - <90% BCSI – Good match
- 70 - <80% BCSI – Acceptable match
- <70% BCSI – Poor match - Remedial action / further investigation required

Should any of the averaged transect similarity scores fall below the “Acceptable” threshold, they will be further investigated using a univariate technique.

It is of note that calculation of a Bray-Curtis similarity matrix within Primer v.7 does not allow for comparison of two “0” count values to result in a 100% similarity, instead resulting in an Undefined! value being presented in the resemblance matrix. As such, the matrix was re-exported to excel, the Undefined! values were checked to confirm 100% similarity and replaced with values of 100.

2.2.2 Univariate statistical comparison

Further investigation of any transects which have similarity scores falling below the 70% (“Acceptable”) threshold will be undertaken using a mean squared error (MSE) based univariate metric.

Calculation of this metric will be undertaken for each matched pair of segments (initial vs QA) within each transect and for both burrow size classes. An overall MSE value for each size class will be computed, followed by an average MSE for each transect. Comparison of MSE values will allow for specific dissimilarities within transects to be investigated more fully. A relationship between the effect of total abundance per transect on MSE will be investigated, this will be achieved by plotting MSE against cumulative (summed counts from both the initial and the QA analyses) burrow abundance.

3 Results

Figure 1 presents an overview of the segment vs segment similarities between initial analysis (blue) and QA analysis (red) for all samples (i.e. not only matching pairs), using Bray-Curtis similarities and nMDS ordination. The ordination indicates that there is no visually apparent separation between similarities calculated from initial and QA analysis.

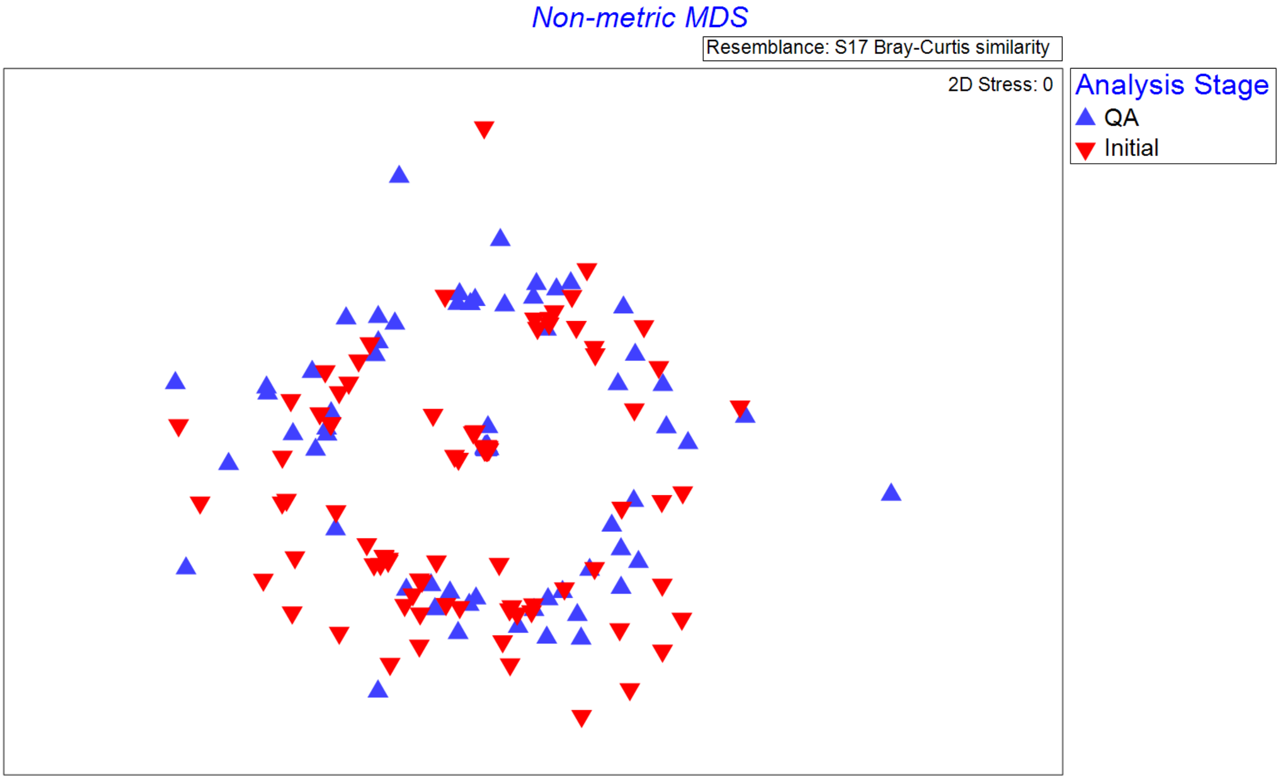


Figure 1. nMDS ordination of segment vs segment Bray-Curtis similarities, with analysis stage overlain.

Figure 1 is of use in determining overall similarity in comparison of initial and QA analyses, however is of limited use in determining accuracy of enumeration by segment and transect. As such, the segment vs segment similarity scores (matching pairs only) were averaged for each transect. The individual segment vs segment scores are displayed in Annex 1., whilst the transect averages (as a more useful metric for assessment of accuracy, are displayed in Table 2.

Table 2. Showing the averaged similarities between transects across Initial and QA analyses (scores of less than "Acceptable – 70%" are displayed in red.

Transect Number	Average Similarity
EHGF105	70.6
EHGF236	81.97
EHGF238	**61.72**
EHGF067	84.82
EHGF048	94.27
EHGF125	85.61
EHGF255	**69.37**
EHGF017	84.46

From Table 2 it can be seen that there was, overall, a good degree of agreement between Initial and QA analyses, with 5 out of the 8 transects showing a “Good” or “Excellent” similarity score. One transect (EHGF105) scored “Acceptable”, and another (EHGF225) scored 69.37% - a value so close to the threshold for “Acceptable” that it is considered within this category.

As such, only one transect (EHGF238) scored significantly lower than the threshold for “Acceptable”, with a score of 61.72%. This discrepancy was further investigated by calculating the mean squared error (MSE) between counts from each analysis stage; both overall (a pooled MSE from all segments) and for each transect. MSE was calculated for each variable (burrow size category).

Table 3. Showing calculated Mean Squared Error values for each transect, for each size category of burrows.

Transect	*Variable*	*Cumulative Count*	*MSE*
EHGF017	Burrows <3cm	339	20
	Burrows >3cm	9	0
EHGF048	Burrows <3cm	104	2
	Burrows >3cm	5	0
EHGF067	Burrows <3cm	14	1
	Burrows >3cm	1	0
EHGF105	Burrows <3cm	181	3
	Burrows >3cm	3	0
EHGF125	Burrows <3cm	19	0
	Burrows >3cm	0	0
EHGF236	Burrows <3cm	53	1
	Burrows >3cm	14	0
EHGF238	Burrows <3cm	354	21
	Burrows >3cm	97	15
EHGF255	Burrows <3cm	21	1
	Burrows >3cm	7	0

Overall, a low overall MSE was calculated for both categories (and MSE of 6 for Burrows <3cm and MSE of 2 for Burrows >3cm). The calculated MSE values for each transect are displayed in Table 3.

The highest MSEs are associated with transect EHGF238, as expected from the Bray-Curtis similarity analysis – however a high MSE of 20 is noted at EHGF017 (which scored an average similarity of 84.46%). This is a notable mis-match. Table 3 also shows the cumulative counts (i.e. summed across both initial and QA analyses) for each burrow size category at each transect. This can be plotted against MSE to provide an indication of loss of accuracy in response to increased abundance in burrows, as displayed in Figure 2.

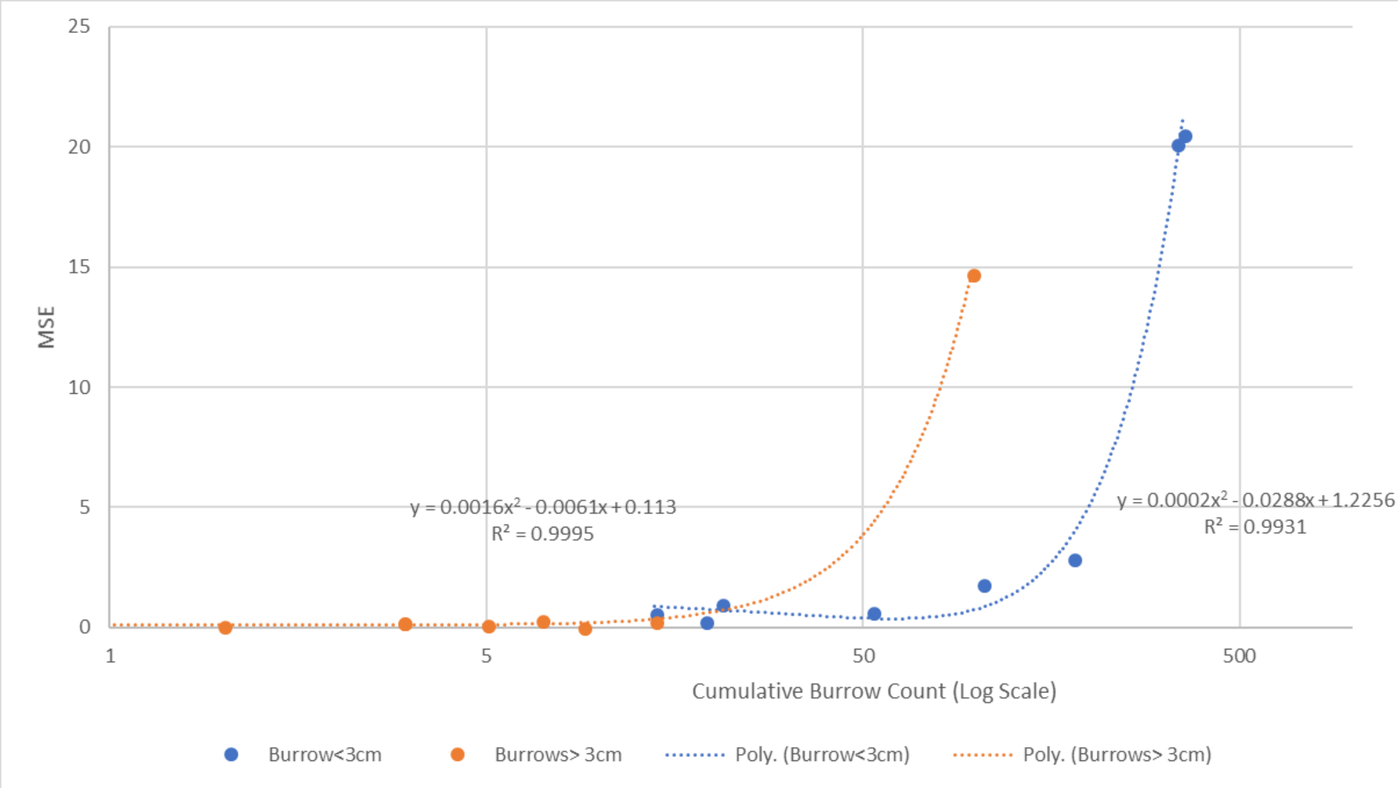


Figure 2. Scatter plot showing cumulative burrow count (Log scale) against MSE. Trendlines have been added using polynomial regression.

The polynomial regression analysis displayed in Figure 2, for each burrow size class, highlights the loss of accuracy in enumeration of both burrow size classes above a cumulative count of ~300 (Burrows <3cm) and above ~100 for the >3cm class. Strong R^2 values of 0.99 are calculated for each of the curves.

4 Discussion

A generally high level of agreement was seen in comparison of the transect averaged count values (for both burrow size classes) between the initial and the QA analysis, with an average Bray-Curtis similarity score of 79.11%.

Two sites scored lower on the similarity metric than the threshold for “Acceptable” (70%), of these two sites, only EHGF238 was significantly below this threshold. Further investigation into this discrepancy was undertaken using the univariate MSE metric. This metric, with a higher value indicative of lower agreement between initial and QA analyses (displayed in Table 3), also highlighted EHGF238 as having limited agreement. The MSE metric also flagged a potential lower similarity between the initial and QA counts for EHGF017 – this was not highlighted by the multivariate approach.

Direct review of the initial and QA count data for both burrow size classes at transect EHGF238 showed a similarity in overall counts, and the scale of those counts, however the QA analysis noted four segments where no burrows were counted in initial analysis. Further investigation using the MSE metric shows that the major source of discrepancy was, in fact, the error between larger counts of the <3cm class in latter segments of the transect. The QA analysis recorded ~ more burrows in segments 12 and 13, a fewer in segments 15, 16 and 18. As regards the >3cm class, the QA analysis determined considerably more burrows of this size to be present in segments 16 and 17, which contribute the majority of the error. As such, it is considered that size estimation and high burrow abundance are the main drivers of discrepancy seen in this transect.

The source of the high MSE observed between the initial and QA analyses of EHGF017 can be traced to substantially fewer burrows of the <3cm class being enumerated by QA analysis. This transect is located over an area of slightly coarser substrate, with large patches of slightly gravelly, shelly, sand present and a comparatively quick camera tow speed noted. It is considered likely that over enumeration of <3cm burrows in initial analysis is a result of difficulty in differentiating small burrows from discrete grains of gravel / very small pebbles – given the attitude of the camera and speed of tow.

Overall, although generally good agreement between initial and QA analyses validates the enumeration methodology, there is some degree of inherent error observed - as emphasised by Figure 2. It is possible to infer a likely limitation in the enumeration method with increasing burrow abundance, which is especially marked in the case of the <3cm burrow size class at counts (cumulative) of greater than ~300.

5 Results

Based upon the above discussion, based upon the analysis method as stipulated by the JNCC and including the further (univariate metric) investigations devised, the following recommendations are made for future consideration in analysis of the SPBMC FOCI, using video data:

- Recommendation to include the use of the univariate MSE metric for further investigation and to validate findings of the multivariate analysis.
- A second assessment (counts of both size classes) of those transects with coarser sediment (gravelly/ shelly sand) and/or moderate video quality.
- The removal of analysis requirement for transects/segments with poor video quality.
- Consideration of the error associated with enumeration of the <3cm burrow class using video analysis. We suggest that enumeration of this size class should be undertaken on still imagery only. We also query the requirement to enumerate this size class, in the context of burrow function within the SPBMC habitat FOCI.

6 References

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Annex 1. Bray-Curtis Similarity Matrices

Sample	EHGF017_QA_1	EHGF017_QA_2	EHGF017_QA_3	EHGF017_QA_4	EHGF017_QA_5	EHGF017_QA_6	EHGF017_QA_7	EHGF017_QA_8	EHGF017_QA_9	EHGF017_QA_10	EHGF017_QA_11	EHGF017_QA_12	EHGF017_QA_13	EHGF017_QA_14	EHGF017_QA_15	EHGF017_QA_16	EHGF017_QA_17	EHGF017_QA_18	EHGF017_QA_19
EHGF017_RAW_1	88.89	88.89	71.43	90.91	90.91	88.89	76.92	71.43	100.00	83.33	83.33	50.00	58.82	83.33	57.14	76.92	45.45	52.63	76.92
EHGF017_RAW_2	72.73	72.73	87.50	76.92	92.31	72.73	93.33	87.50	83.33	100.00	100.00	63.64	73.68	100.00	44.44	93.33	58.33	66.67	93.33
EHGF017_RAW_3	50.00	50.00	85.71	55.56	66.67	50.00	70.00	85.71	58.82	73.68	73.68	88.89	100.00	73.68	28.57	80.00	82.76	92.31	80.00
EHGF017_RAW_4	66.67	66.67	82.35	85.71	85.71	66.67	100.00	82.35	76.92	93.33	93.33	60.87	70.00	93.33	40.00	87.50	64.00	72.73	87.50
EHGF017_RAW_5	80.00	80.00	80.00	83.33	100.00	80.00	85.71	80.00	90.91	92.31	92.31	57.14	66.67	92.31	50.00	85.71	52.17	60.00	85.71
EHGF017_RAW_6	53.33	53.33	90.00	58.82	70.59	53.33	73.68	90.00	62.50	77.78	77.78	84.62	95.65	77.78	30.77	84.21	78.57	88.00	84.21
EHGF017_RAW_7	38.10	38.10	69.23	52.17	52.17	38.10	64.00	69.23	45.45	58.33	58.33	93.75	82.76	58.33	21.05	64.00	94.12	90.32	64.00
EHGF017_RAW_8	50.00	50.00	85.71	55.56	66.67	50.00	70.00	85.71	58.82	73.68	73.68	88.89	100.00	73.68	28.57	80.00	82.76	92.31	80.00
EHGF017_RAW_9	57.14	57.14	94.74	62.50	75.00	57.14	77.78	94.74	66.67	82.35	82.35	80.00	90.91	82.35	33.33	88.89	74.07	83.33	88.89
EHGF017_RAW_10	33.33	33.33	62.07	38.46	46.15	33.33	50.00	62.07	40.00	51.85	51.85	85.71	75.00	51.85	18.18	57.14	81.08	76.47	57.14
EHGF017_RAW_11	72.73	72.73	87.50	76.92	92.31	72.73	93.33	87.50	83.33	100.00	100.00	63.64	73.68	100.00	44.44	93.33	58.33	66.67	93.33
EHGF017_RAW_12	44.44	44.44	78.26	50.00	60.00	44.44	63.64	78.26	52.63	66.67	66.67	96.55	92.31	66.67	25.00	72.73	90.32	92.86	72.73
EHGF017_RAW_13	61.54	61.54	100.00	66.67	80.00	61.54	82.35	100.00	71.43	87.50	87.50	75.00	85.71	87.50	36.36	94.12	69.23	78.26	94.12
EHGF017_RAW_14	72.73	72.73	87.50	76.92	92.31	72.73	93.33	87.50	83.33	100.00	100.00	63.64	73.68	100.00	44.44	93.33	58.33	66.67	93.33
EHGF017_RAW_15	66.67	66.67	36.36	50.00	50.00	66.67	40.00	36.36	57.14	44.44	44.44	23.53	28.57	44.44	100.00	40.00	21.05	25.00	40.00
EHGF017_RAW_16	53.33	53.33	90.00	58.82	70.59	53.33	73.68	90.00	62.50	77.78	77.78	84.62	95.65	77.78	30.77	84.21	78.57	88.00	84.21
EHGF017_RAW_17	36.36	36.36	66.67	50.00	50.00	36.36	61.54	66.67	43.48	56.00	56.00	90.91	80.00	56.00	20.00	61.54	91.43	87.50	61.54
EHGF017_RAW_18	50.00	50.00	85.71	66.67	66.67	50.00	80.00	85.71	58.82	73.68	73.68	81.48	91.67	73.68	28.57	80.00	82.76	92.31	80.00
EHGF017_RAW_19	66.67	66.67	94.12	71.43	85.71	66.67	87.50	94.12	76.92	93.33	93.33	69.57	80.00	93.33	40.00	100.00	64.00	72.73	100.00

Sample	EHGF048_QA_1	EHGF048_QA_2	EHGF048_QA_3	EHGF048_QA_4	EHGF048_QA_5	EHGF048_QA_6	EHGF048_QA_7	EHGF048_QA_8	EHGF048_QA_9	EHGF048_QA_10	EHGF048_QA_11	EHGF048_QA_12	EHGF048_QA_13	EHGF048_QA_14	EHGF048_QA_15	EHGF048_QA_16	EHGF048_QA_17	EHGF048_QA_18	EHGF048_QA_19	EHGF048_QA_20
EHGF048_RAW_1	100.00	100.00	100.00	100.00	100.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	100.00	100.00	100.00	100.00
EHGF048_RAW_2	100.00	100.00	100.00	100.00	100.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	100.00	100.00	100.00	100.00
EHGF048_RAW_3	100.00	100.00	100.00	100.00	100.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	100.00	100.00	100.00	100.00
EHGF048_RAW_4	100.00	100.00	100.00	100.00	100.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	100.00	100.00	100.00	100.00
EHGF048_RAW_5	100.00	100.00	100.00	100.00	100.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	100.00	100.00	100.00	100.00
EHGF048_RAW_6	0.00	0.00	0.00	0.00	0.00	100.00	0.00	66.67	40.00	25.00	50.00	15.38	13.33	40.00	40.00	0.00	0.00	0.00	0.00	0.00
EHGF048_RAW_7	100.00	100.00	100.00	100.00	100.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	100.00	100.00	100.00	100.00
EHGF048_RAW_8	0.00	0.00	0.00	0.00	0.00	66.67	0.00	100.00	66.67	44.44	80.00	28.57	25.00	66.67	66.67	0.00	0.00	0.00	0.00	0.00
EHGF048_RAW_9	0.00	0.00	0.00	0.00	0.00	40.00	0.00	66.67	100.00	72.73	85.71	50.00	44.44	100.00	75.00	0.00	0.00	0.00	0.00	0.00
EHGF048_RAW_10	0.00	0.00	0.00	0.00	0.00	15.38	0.00	28.57	50.00	73.68	40.00	91.67	92.31	50.00	37.50	0.00	0.00	0.00	0.00	0.00
EHGF048_RAW_11	0.00	0.00	0.00	0.00	0.00	33.33	0.00	57.14	88.89	83.33	75.00	58.82	52.63	88.89	66.67	0.00	0.00	0.00	0.00	0.00
EHGF048_RAW_12	0.00	0.00	0.00	0.00	0.00	15.38	0.00	28.57	50.00	73.68	40.00	91.67	92.31	50.00	37.50	0.00	0.00	0.00	0.00	0.00
EHGF048_RAW_13	0.00	0.00	0.00	0.00	0.00	13.33	0.00	25.00	44.44	66.67	35.29	92.31	92.86	44.44	44.44	0.00	0.00	0.00	0.00	0.00
EHGF048_RAW_14	0.00	0.00	0.00	0.00	0.00	50.00	0.00	80.00	85.71	60.00	100.00	40.00	35.29	85.71	85.71	0.00	0.00	0.00	0.00	0.00
EHGF048_RAW_15	0.00	0.00	0.00	0.00	0.00	33.33	0.00	57.14	88.89	83.33	75.00	58.82	52.63	88.89	66.67	0.00	0.00	0.00	0.00	0.00
EHGF048_RAW_16	100.00	100.00	100.00	100.00	100.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	100.00	100.00	100.00	100.00
EHGF048_RAW_17	100.00	100.00	100.00	100.00	100.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	100.00	100.00	100.00	100.00
EHGF048_RAW_18	100.00	100.00	100.00	100.00	100.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	100.00	100.00	100.00	100.00
EHGF048_RAW_19	100.00	100.00	100.00	100.00	100.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	100.00	100.00	100.00	100.00
EHGF048_RAW_20	100.00	100.00	100.00	100.00	100.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	100.00	100.00	100.00	100.00

East of Haig Fras MCZ: Sea-pen and Burrowing Megafauna Communities: Quality Assurance

Sample	EHGF067_QA_1	EHGF067_QA_2	EHGF067_QA_3	EHGF067_QA_4	EHGF067_QA_5	EHGF067_QA_6	EHGF067_QA_7	EHGF067_QA_8	EHGF067_QA_9	EHGF067_QA_10	EHGF067_QA_11	EHGF067_QA_12	EHGF067_QA_13	EHGF067_QA_14	EHGF067_QA_15	EHGF067_QA_16
EHGF067_RAW_1	100.00	0.00	0.00	0.00	0.00	100.00	66.67	0.00	66.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EHGF067_RAW_2	0.00	100.00	0.00	100.00	100.00	0.00	0.00	100.00	0.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
EHGF067_RAW_3	0.00	100.00	0.00	100.00	100.00	0.00	0.00	100.00	0.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
EHGF067_RAW_4	0.00	100.00	0.00	100.00	100.00	0.00	0.00	100.00	0.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
EHGF067_RAW_5	0.00	100.00	0.00	100.00	100.00	0.00	0.00	100.00	0.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
EHGF067_RAW_6	0.00	100.00	0.00	100.00	100.00	0.00	0.00	100.00	0.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
EHGF067_RAW_7	66.67	0.00	0.00	0.00	0.00	66.67	100.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EHGF067_RAW_8	0.00	100.00	0.00	100.00	100.00	0.00	0.00	100.00	0.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
EHGF067_RAW_9	33.33	0.00	0.00	0.00	0.00	33.33	57.14	0.00	57.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EHGF067_RAW_10	0.00	100.00	0.00	100.00	100.00	0.00	0.00	100.00	0.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
EHGF067_RAW_11	0.00	100.00	0.00	100.00	100.00	0.00	0.00	100.00	0.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
EHGF067_RAW_12	0.00	100.00	0.00	100.00	100.00	0.00	0.00	100.00	0.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
EHGF067_RAW_13	0.00	100.00	0.00	100.00	100.00	0.00	0.00	100.00	0.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
EHGF067_RAW_14	0.00	100.00	0.00	100.00	100.00	0.00	0.00	100.00	0.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
EHGF067_RAW_15	0.00	100.00	0.00	100.00	100.00	0.00	0.00	100.00	0.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
EHGF067_RAW_16	0.00	100.00	0.00	100.00	100.00	0.00	0.00	100.00	0.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Sample	EHGF105_QA_1	EHGF105_QA_2	EHGF105_QA_3	EHGF105_QA_4	EHGF105_QA_5	EHGF105_QA_6	EHGF105_QA_7	EHGF105_QA_8	EHGF105_QA_9	EHGF105_QA_10	EHGF105_QA_11	EHGF105_QA_12	EHGF105_QA_13	EHGF105_QA_14	EHGF105_QA_15	EHGF105_QA_16	EHGF105_QA_17	EHGF105_QA_18	EHGF105_QA_19	EHGF105_QA_20	EHGF105_QA_21
EHGF105_RAW_1	88.89	76.92	62.50	57.14	33.33	57.14	33.33	88.89	100.00	75.00	100.00	75.00	0.00	0.00	57.14	0.00	88.89	88.89	100.00	50.00	38.46
EHGF105_RAW_2	72.73	93.33	77.78	44.44	25.00	44.44	25.00	72.73	83.33	60.00	83.33	60.00	0.00	0.00	44.44	0.00	72.73	72.73	83.33	63.64	50.00
EHGF105_RAW_3	80.00	85.71	70.59	50.00	28.57	50.00	28.57	80.00	90.91	66.67	90.91	66.67	0.00	0.00	50.00	0.00	80.00	80.00	90.91	57.14	44.44
EHGF105_RAW_4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	100.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00
EHGF105_RAW_5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	100.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00
EHGF105_RAW_6	40.00	22.22	16.67	66.67	100.00	66.67	100.00	40.00	33.33	50.00	33.33	50.00	0.00	0.00	66.67	0.00	40.00	40.00	33.33	12.50	9.09
EHGF105_RAW_7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	100.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00
EHGF105_RAW_8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	100.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00
EHGF105_RAW_9	88.89	76.92	62.50	57.14	33.33	57.14	33.33	88.89	100.00	75.00	100.00	75.00	0.00	0.00	57.14	0.00	88.89	88.89	100.00	50.00	38.46
EHGF105_RAW_10	85.71	54.55	42.86	80.00	50.00	80.00	50.00	85.71	75.00	100.00	75.00	100.00	0.00	0.00	80.00	0.00	85.71	85.71	75.00	33.33	25.00
EHGF105_RAW_11	80.00	85.71	70.59	50.00	28.57	50.00	28.57	80.00	90.91	66.67	90.91	66.67	0.00	0.00	50.00	0.00	80.00	80.00	90.91	57.14	44.44
EHGF105_RAW_12	85.71	54.55	42.86	80.00	50.00	80.00	50.00	85.71	75.00	100.00	75.00	100.00	0.00	0.00	80.00	0.00	85.71	85.71	75.00	33.33	25.00
EHGF105_RAW_13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	100.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00
EHGF105_RAW_14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	100.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00
EHGF105_RAW_15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	100.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00
EHGF105_RAW_16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	100.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00
EHGF105_RAW_17	100.00	66.67	53.33	66.67	40.00	66.67	40.00	100.00	88.89	85.71	88.89	85.71	0.00	0.00	66.67	0.00	100.00	100.00	88.89	42.11	32.00
EHGF105_RAW_18	100.00	66.67	53.33	66.67	40.00	66.67	40.00	100.00	88.89	85.71	88.89	85.71	0.00	0.00	66.67	0.00	100.00	100.00	88.89	42.11	32.00
EHGF105_RAW_19	72.73	93.33	77.78	44.44	25.00	44.44	25.00	72.73	83.33	60.00	83.33	60.00	0.00	0.00	44.44	0.00	72.73	72.73	83.33	63.64	50.00
EHGF105_RAW_20	42.11	69.57	84.62	23.53	12.50	23.53	12.50	42.11	50.00	33.33	50.00	33.33	0.00	0.00	23.53	0.00	42.11	42.11	50.00	93.33	83.33
EHGF105_RAW_21	36.36	61.54	75.86	20.00	10.53	20.00	10.53	36.36	43.48	28.57	43.48	28.57	0.00	0.00	20.00	0.00	36.36	36.36	43.48	84.85	92.31

East of Haig Fras MCZ: Sea-pen and Burrowing Megafauna Communities: Quality Assurance

Sample	EHGF125_QA_1	EHGF125_QA_2	EHGF125_QA_3	EHGF125_QA_4	EHGF125_QA_5	EHGF125_QA_6	EHGF125_QA_7	EHGF125_QA_8	EHGF125_QA_9	EHGF125_QA_10	EHGF125_QA_11	EHGF125_QA_12	EHGF125_QA_13	EHGF125_QA_14	EHGF125_QA_15	EHGF125_QA_16	EHGF125_QA_17	EHGF125_QA_18	EHGF125_QA_19
EHGF125_RAW_1	100.00	100.00	100.00	100.00	0.00	0.00	100.00	100.00	0.00	0.00	0.00	100.00	0.00	100.00	100.00	100.00	100.00	100.00	0.00
EHGF125_RAW_2	100.00	100.00	100.00	100.00	0.00	0.00	100.00	100.00	0.00	0.00	0.00	100.00	0.00	100.00	100.00	100.00	100.00	100.00	0.00
EHGF125_RAW_3	100.00	100.00	100.00	100.00	0.00	0.00	100.00	100.00	0.00	0.00	0.00	100.00	0.00	100.00	100.00	100.00	100.00	100.00	0.00
EHGF125_RAW_4	100.00	100.00	100.00	100.00	0.00	0.00	100.00	100.00	0.00	0.00	0.00	100.00	0.00	100.00	100.00	100.00	100.00	100.00	0.00
EHGF125_RAW_5	0.00	0.00	0.00	0.00	100.00	100.00	0.00	0.00	100.00	100.00	66.67	0.00	50.00	0.00	0.00	0.00	0.00	0.00	50.00
EHGF125_RAW_6	100.00	100.00	100.00	100.00	0.00	0.00	100.00	100.00	0.00	0.00	0.00	100.00	0.00	100.00	100.00	100.00	100.00	100.00	0.00
EHGF125_RAW_7	100.00	100.00	100.00	100.00	0.00	0.00	100.00	100.00	0.00	0.00	0.00	100.00	0.00	100.00	100.00	100.00	100.00	100.00	0.00
EHGF125_RAW_8	100.00	100.00	100.00	100.00	0.00	0.00	100.00	100.00	0.00	0.00	0.00	100.00	0.00	100.00	100.00	100.00	100.00	100.00	0.00
EHGF125_RAW_9	100.00	100.00	100.00	100.00	0.00	0.00	100.00	100.00	0.00	0.00	0.00	100.00	0.00	100.00	100.00	100.00	100.00	100.00	0.00
EHGF125_RAW_10	0.00	0.00	0.00	0.00	100.00	100.00	0.00	0.00	100.00	100.00	66.67	0.00	50.00	0.00	0.00	0.00	0.00	0.00	50.00
EHGF125_RAW_11	0.00	0.00	0.00	0.00	100.00	100.00	0.00	0.00	100.00	100.00	66.67	0.00	50.00	0.00	0.00	0.00	0.00	0.00	50.00
EHGF125_RAW_12	100.00	100.00	100.00	100.00	0.00	0.00	100.00	100.00	0.00	0.00	0.00	100.00	0.00	100.00	100.00	100.00	100.00	100.00	0.00
EHGF125_RAW_13	0.00	0.00	0.00	0.00	66.67	66.67	0.00	0.00	66.67	66.67	100.00	0.00	80.00	0.00	0.00	0.00	0.00	0.00	80.00
EHGF125_RAW_14	100.00	100.00	100.00	100.00	0.00	0.00	100.00	100.00	0.00	0.00	0.00	100.00	0.00	100.00	100.00	100.00	100.00	100.00	0.00
EHGF125_RAW_15	100.00	100.00	100.00	100.00	0.00	0.00	100.00	100.00	0.00	0.00	0.00	100.00	0.00	100.00	100.00	100.00	100.00	100.00	0.00
EHGF125_RAW_16	100.00	100.00	100.00	100.00	0.00	0.00	100.00	100.00	0.00	0.00	0.00	100.00	0.00	100.00	100.00	100.00	100.00	100.00	0.00
EHGF125_RAW_17	100.00	100.00	100.00	100.00	0.00	0.00	100.00	100.00	0.00	0.00	0.00	100.00	0.00	100.00	100.00	100.00	100.00	100.00	0.00
EHGF125_RAW_18	100.00	100.00	100.00	100.00	0.00	0.00	100.00	100.00	0.00	0.00	0.00	100.00	0.00	100.00	100.00	100.00	100.00	100.00	0.00
EHGF125_RAW_19	0.00	0.00	0.00	0.00	66.67	66.67	0.00	0.00	66.67	66.67	100.00	0.00	80.00	0.00	0.00	0.00	0.00	0.00	80.00

Sample	EHGF236_QA_1	EHGF236_QA_2	EHGF236_QA_3	EHGF236_QA_4	EHGF236_QA_5	EHGF236_QA_6	EHGF236_QA_7	EHGF236_QA_8	EHGF236_QA_9	EHGF236_QA_10	EHGF236_QA_11	EHGF236_QA_12	EHGF236_QA_13	EHGF236_QA_14	EHGF236_QA_15	EHGF236_QA_16	EHGF236_QA_17	EHGF236_QA_18	EHGF236_QA_19	EHGF236_QA_20
EHGF236_RAW_1	66.67	60.00	66.67	60.00	100.00	100.00	100.00	85.71	0.00	50.00	50.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EHGF236_RAW_2	90.91	83.33	90.91	83.33	75.00	75.00	75.00	88.89	0.00	33.33	33.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EHGF236_RAW_3	90.91	83.33	90.91	83.33	75.00	75.00	75.00	66.67	0.00	33.33	33.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EHGF236_RAW_4	80.00	72.73	80.00	72.73	57.14	57.14	57.14	50.00	0.00	40.00	40.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EHGF236_RAW_5	50.00	44.44	50.00	44.44	80.00	80.00	80.00	66.67	0.00	66.67	66.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EHGF236_RAW_6	50.00	44.44	50.00	44.44	80.00	80.00	80.00	66.67	0.00	66.67	66.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EHGF236_RAW_7	50.00	44.44	50.00	44.44	80.00	80.00	80.00	66.67	0.00	66.67	66.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EHGF236_RAW_8	66.67	60.00	66.67	60.00	100.00	100.00	100.00	85.71	0.00	50.00	50.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EHGF236_RAW_9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.00	0.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
EHGF236_RAW_10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.00	0.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
EHGF236_RAW_11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.00	0.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
EHGF236_RAW_12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.00	0.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
EHGF236_RAW_13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.00	0.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
EHGF236_RAW_14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.00	0.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
EHGF236_RAW_15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.00	0.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
EHGF236_RAW_16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.00	0.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
EHGF236_RAW_17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.00	0.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
EHGF236_RAW_18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.00	0.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
EHGF236_RAW_19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.00	0.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
EHGF236_RAW_20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.00	0.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

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Sample	EHGF238_QA_1	EHGF238_QA_2	EHGF238_QA_3	EHGF238_QA_4	EHGF238_QA_5	EHGF238_QA_6	EHGF238_QA_7	EHGF238_QA_8	EHGF238_QA_9	EHGF238_QA_10	EHGF238_QA_11	EHGF238_QA_12	EHGF238_QA_13	EHGF238_QA_14	EHGF238_QA_15	EHGF238_QA_16	EHGF238_QA_17	EHGF238_QA_18
EHGF238_RAW_1	0.00	100.00	0.00	100.00	0.00	0.00	0.00	100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EHGF238_RAW_2	0.00	100.00	0.00	100.00	0.00	0.00	0.00	100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EHGF238_RAW_3	0.00	100.00	0.00	100.00	0.00	0.00	0.00	100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EHGF238_RAW_4	0.00	100.00	0.00	100.00	0.00	0.00	0.00	100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EHGF238_RAW_5	66.67	0.00	88.89	0.00	40.00	85.71	40.00	0.00	40.00	57.14	0.00	36.36	34.78	50.00	28.57	17.02	13.33	13.56
EHGF238_RAW_6	57.14	0.00	100.00	0.00	33.33	75.00	33.33	0.00	33.33	50.00	0.00	43.48	41.67	58.82	34.48	20.83	16.39	16.67
EHGF238_RAW_7	100.00	0.00	57.14	0.00	66.67	80.00	66.67	0.00	66.67	80.00	0.00	20.00	19.05	28.57	15.38	8.89	6.90	7.02
EHGF238_RAW_8	0.00	100.00	0.00	100.00	0.00	0.00	0.00	100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EHGF238_RAW_9	0.00	100.00	0.00	100.00	0.00	0.00	0.00	100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EHGF238_RAW_10	0.00	100.00	0.00	100.00	0.00	0.00	0.00	100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EHGF238_RAW_11	0.00	100.00	0.00	100.00	0.00	0.00	0.00	100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EHGF238_RAW_12	40.00	0.00	76.92	0.00	22.22	54.55	22.22	0.00	22.22	36.36	0.00	61.54	59.26	70.00	50.00	31.37	25.00	25.40
EHGF238_RAW_13	40.00	0.00	76.92	0.00	22.22	54.55	22.22	0.00	22.22	54.55	0.00	61.54	59.26	80.00	50.00	31.37	25.00	25.40
EHGF238_RAW_14	50.00	0.00	72.73	0.00	28.57	66.67	28.57	0.00	28.57	66.67	0.00	50.00	48.00	66.67	40.00	24.49	19.35	19.67
EHGF238_RAW_15	11.76	0.00	27.03	0.00	6.06	17.14	6.06	0.00	6.06	17.14	0.00	72.00	74.51	54.55	82.14	85.33	72.73	73.56
EHGF238_RAW_16	8.89	0.00	20.83	0.00	4.55	13.04	4.55	0.00	4.55	13.04	0.00	59.02	61.29	40.00	56.72	86.05	78.79	87.76
EHGF238_RAW_17	9.52	0.00	22.22	0.00	4.88	13.95	4.88	0.00	4.88	13.95	0.00	62.07	64.41	46.15	68.75	96.39	83.33	84.21
EHGF238_RAW_18	6.45	0.00	15.38	0.00	3.28	9.52	3.28	0.00	3.28	9.52	0.00	46.15	48.10	33.33	57.14	83.50	77.59	90.43

Sample	EHGF255_QA_1	EHGF255_QA_2	EHGF255_QA_3	EHGF255_QA_4	EHGF255_QA_5	EHGF255_QA_6	EHGF255_QA_7	EHGF255_QA_8	EHGF255_QA_9	EHGF255_QA_10	EHGF255_QA_11	EHGF255_QA_12	EHGF255_QA_13	EHGF255_QA_14	EHGF255_QA_15
EHGF255_RAW_1	100.00	100.00	100.00	0.00	0.00	100.00	100.00	0.00	100.00	0.00	100.00	100.00	0.00	0.00	0.00
EHGF255_RAW_2	100.00	100.00	100.00	0.00	0.00	100.00	100.00	0.00	100.00	0.00	100.00	100.00	0.00	0.00	0.00
EHGF255_RAW_3	100.00	100.00	100.00	0.00	0.00	100.00	100.00	0.00	100.00	0.00	100.00	100.00	0.00	0.00	0.00
EHGF255_RAW_4	100.00	100.00	100.00	0.00	0.00	100.00	100.00	0.00	100.00	0.00	100.00	100.00	0.00	0.00	0.00
EHGF255_RAW_5	100.00	100.00	100.00	0.00	0.00	100.00	100.00	0.00	100.00	0.00	100.00	100.00	0.00	0.00	0.00
EHGF255_RAW_6	100.00	100.00	100.00	0.00	0.00	100.00	100.00	0.00	100.00	0.00	100.00	100.00	0.00	0.00	0.00
EHGF255_RAW_7	100.00	100.00	100.00	0.00	0.00	100.00	100.00	0.00	100.00	0.00	100.00	100.00	0.00	0.00	0.00
EHGF255_RAW_8	100.00	100.00	100.00	0.00	0.00	100.00	100.00	0.00	100.00	0.00	100.00	100.00	0.00	0.00	0.00
EHGF255_RAW_9	100.00	100.00	100.00	0.00	0.00	100.00	100.00	0.00	100.00	0.00	100.00	100.00	0.00	0.00	0.00
EHGF255_RAW_10	0.00	0.00	0.00	100.00	50.00	0.00	0.00	50.00	0.00	50.00	0.00	0.00	50.00	75.00	50.00
EHGF255_RAW_11	100.00	100.00	100.00	0.00	0.00	100.00	100.00	0.00	100.00	0.00	100.00	100.00	0.00	0.00	0.00
EHGF255_RAW_12	100.00	100.00	100.00	0.00	0.00	100.00	100.00	0.00	100.00	0.00	100.00	100.00	0.00	0.00	0.00
EHGF255_RAW_13	0.00	0.00	0.00	85.71	40.00	0.00	0.00	40.00	0.00	40.00	0.00	0.00	66.67	88.89	40.00
EHGF255_RAW_14	0.00	0.00	0.00	80.00	66.67	0.00	0.00	66.67	0.00	66.67	0.00	0.00	28.57	57.14	66.67
EHGF255_RAW_15	0.00	0.00	0.00	80.00	66.67	0.00	0.00	66.67	0.00	66.67	0.00	0.00	28.57	57.14	66.67

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