

MONITORING PROGRESS REPORT

Port of Mostyn Ltd.				PROGRESS REPORTING		
Project	Maintenance Dredge/Deposition	Period	From	November 2023	To	March 2024
Report prepared by:	ABPmer	Date	09 Apr 2024	Report No.	1	Pg. 1 of 6

1. TRAFFIC LIGHT – MOVING SUMMARY							
Monitoring Task	Monitoring Regime – 2.0m below CD dredge limit						Threshold Exceedance Report
	-5	-4	-3	-2	-1	Current	
EB2 Estuary Transects							N/A
LA1 Channel Bathymetry							N/A

Monitoring Task	Bi-annual			Threshold Exceedance Report
	-2	-1	Current for this report	
EB3 Mid-Hoyle Bathymetry			NA	NA
EB5 Holocene Clay Bank			NA	NA

Monitoring Task	Annual		Threshold Exceedance Report
	Previous	Current for this report	
EB1 Estuary LiDAR		NA	NA
EB4 Mostyn Deep Bathymetry		NA	NA
LA3 Mostyn Deep PSA			NA
LA4 NRW Cockle Report		NA	NA
LA5 Benthic Survey		NA	NA

Monitoring Task	Dredge Campaign – N/A		Threshold Exceedance Report
	Previous Campaign	Current for this report	
LA2	Not required for dredging < 2.0m below CD dredge limit	Not required for dredging < 2.0m below CD dredge limit	NA
LA6	Not required for dredging < 2.0m below CD dredge limit	Not required for dredging < 2.0m below CD dredge limit	NA

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2. TIMETABLE CONCORDANCE													
	Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Task													
EB1 Estuary LiDAR													
EB2 Estuary Transects													
EB3 Mid-Hoyle Bathy													
EB4 Mostyn Deep Bathy													
EB5 Clay Bank													
LA1 Approach Channel Bathy													
LA2		(As appropriate: Not required for dredging < 2.0m below CD dredge limit)											
LA3 Mostyn Deep PSA													
LA4 NRW Cockle Report													
LA5 Benthic Survey													
LA6		(As appropriate: Not required for dredging < 2.0m below CD dredge limit)											
Progress Reports													
Annual Report													

TASKS	
Current	Next
LA1 Channel Bathy surveys completed during Feb 2024. Results included in this Progress Note.	EB1 Estuary LiDAR survey scheduled for April/May 2024, to be included in the next (June) Progress Note.
EB2 Estuary Transect survey completed during Feb 2024. Results included in this Progress Note.	EB3 Mid-Hoyle bathymetry survey scheduled for April 2024, to be included in the next (June) Progress Note.
LA3 Mostyn Deep PSA sampling completed December 2023 with results included in this Progress Note.	EB4 Mostyn Deep bathymetry survey scheduled for April 2024, to be included in the next (June) Progress Note.
March Progress Note - this report.	LA5 Benthic Survey scheduled for Q2 2024.
	June Progress Note

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3. MONITORING PLAN REQUIREMENTS

Task Ref	Description	Reported Here (Y/N)	Status: (Red/Amber/Green)	Threshold Exceedance Report
EB1	Estuary Seabed Level Survey	N	NA	NA
EB2	Estuary Transects	Y	Green	NA
EB3	Mid Hoyle/Welsh Confluence	N	NA	NA
EB4	Mostyn Deep	N	NA	NA
EB5	Holocene Clay Bank	N	NA	NA
LA1	Dredged Channel Survey	Y	Green	NA
LA2	Mostyn Deep Site 'A'	N	Survey Not Required	Survey Not Required
LA3	Mostyn Deep Seabed Samples	Y	Green	NA
LA4	Cockle Survey	N	NA	NA
LA5	Benthic Survey	N	NA	NA
LA6	Berthing Area Survey	N	Survey Not Required	Survey Not Required

4. PROGRESS NARRATIVE

Task Ref	Narrative	Appendix
LA1	Survey carried out in February 2024 and reported in this Progress Note.	A
LA3	Survey carried out in December 2023 and reported in this Progress Note.	B
EB2	Survey carried out in February 2024 and reported in this Progress Note.	C
-	Tabulated details of dredge campaigns and disposals over this monitoring period	D

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5. MONITORING OVERVIEW

Reconciliation of results in this report with 'early-warning' parameters and estuary basis summary as set out in SMP 'Mostyn Channel Monitoring Protocols' (2008).

Monitoring Protocols report (rev. 4.0) December '08 relevant extracts:

EXTRACT 1

Task	Frequency	Spatial Extent	Analysis	Evolution Issues
EB2 Estuary Transects	Bi-monthly	North Middle and South transects as presently defined	Channel/Bank parameters; Datum level area(s) above seabed	A, B, D (part)

Task	Frequency	Spatial Extent	Analysis	Evolution Issues
LA1 Dredged Channel Survey	Bi-monthly	Northern limit = 384000; Southern limit = 382000; Western limit = 250m west of channel centreline; Eastern limit = 316400. Survey lines to be 100m apart except for longitudinal sections A to K to be set 50 m apart (see Figure 3). Survey spatial limits shown on Figures 1&2.	Selected cross-section and longitudinal section profiles overlaid on previous surveys with correlation to dredge campaign locations and volumes.	Local - spatial extent and depth of dredging campaigns; lateral extent of profile changes due to dredging. Ambient - seabed level changes adjacent to channel over the area of impact forecast by the numerical model.

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5. MONITORING OVERVIEW (...cont.)

EB2 – Estuary Transects		
Transect Ref.	Relevant Features	Stage I Threshold exceedance
North	No significant change from previous survey	N
Middle	No significant change from previous survey	N
South	No significant change from previous survey	N
LA1 – Channel surveys and cross-section		
Channel Section Ref.	Relevant Features	Stage I Threshold exceedance
Section 20	Change to 2010: Bathymetric change over the monitoring period continues to show changes in the orientation and alignment of both the Mostyn Channel (west of the Port) and the Salisbury Channel (east of the Port). Change to November 2023: Bathymetric change between the two recent surveys reveal the small, continued changes along the western edge of the Mostyn Channel where erosion continues into the Mostyn Bank, to the west of the Port of Mostyn. Slight changes in the Salisbury Channel are also observed to the east of PoM.	N
Bathymetric surface difference plots	No disposal has been undertaken at the IS103 (Breakwater) disposal site during the present monitoring period, with all dredge material removed to shore.	N

Threshold Exceedance Report

NA

6. ACTIONS

Task Ref	Action Description	To be initiated by
1	Planned surveys for EB1, EB3 and EB4 scheduled for April/May 2024.	Port of Mostyn and ABPmer
2	Additional (beyond scope) Port management surveys to continue, covering Salisbury Channel (on its own), harbour and Hilbre Swash. These are not specifically required by the monitoring conditions but are carried out regularly by the Port of Mostyn in order to understand and manage vessel access.	NA

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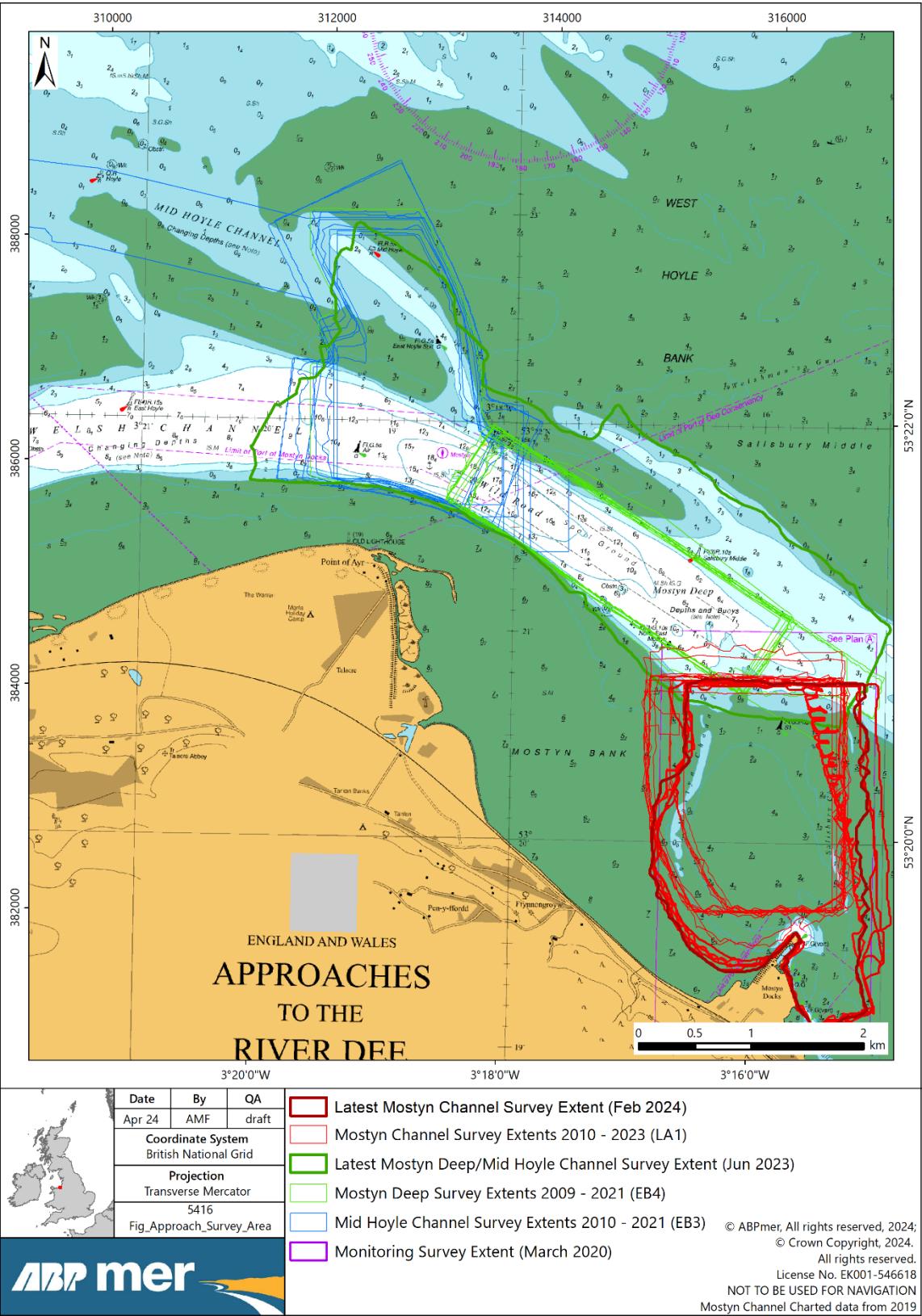
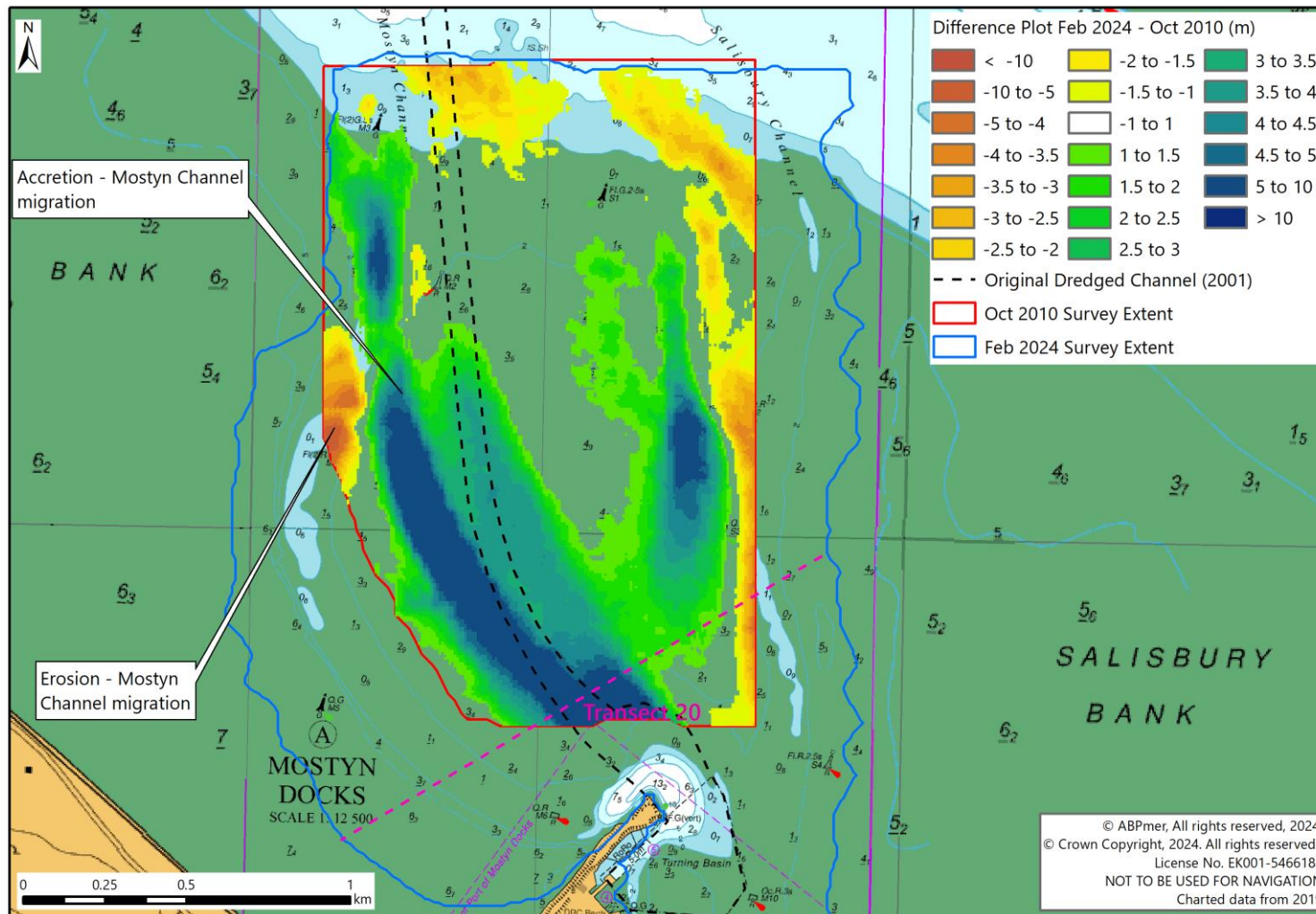


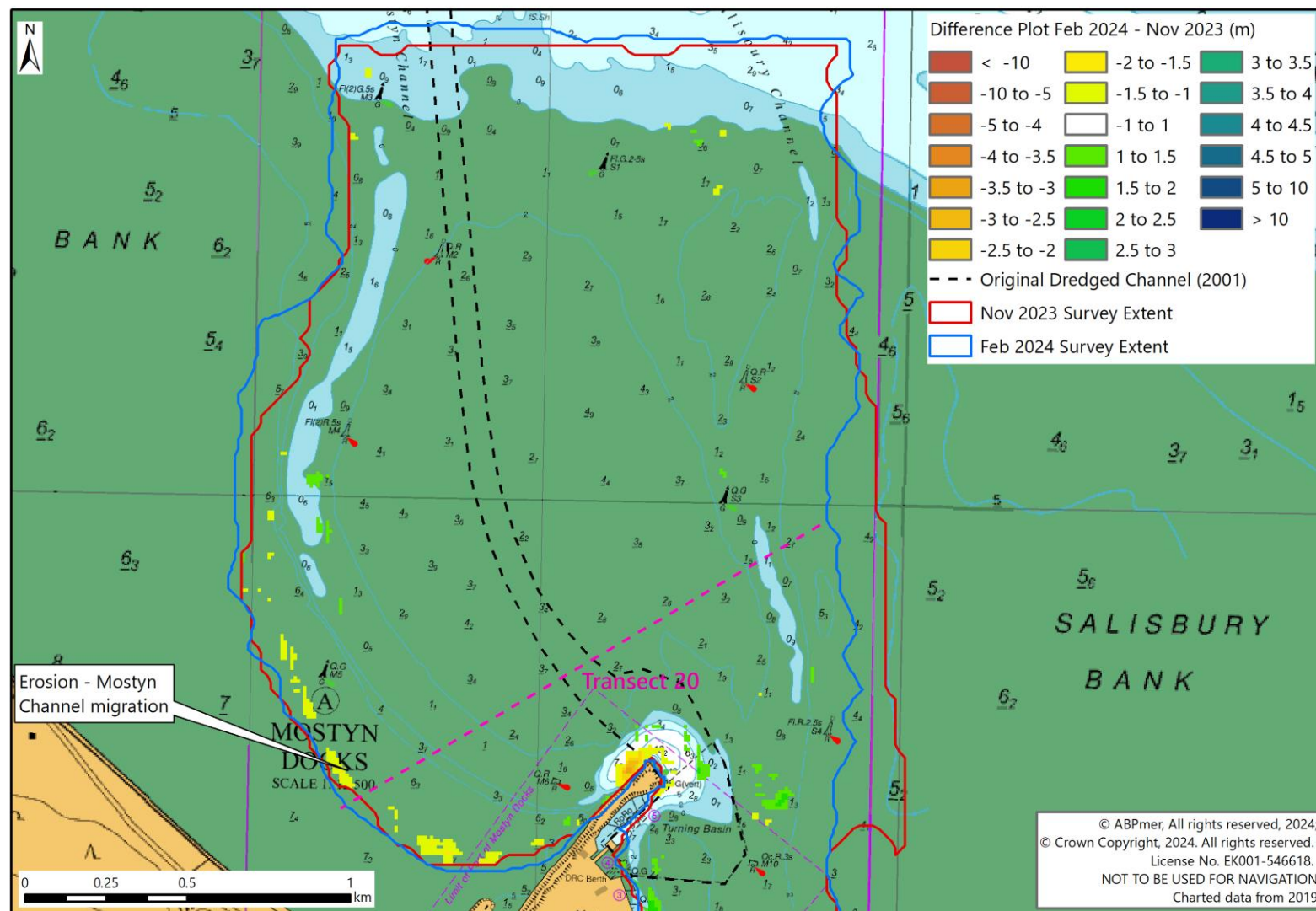
Figure 1. Recent and historic survey extents for LA1, EB3 and EB4 surveys



April 2024 Progress Note: Appendix A – LA1 surveys

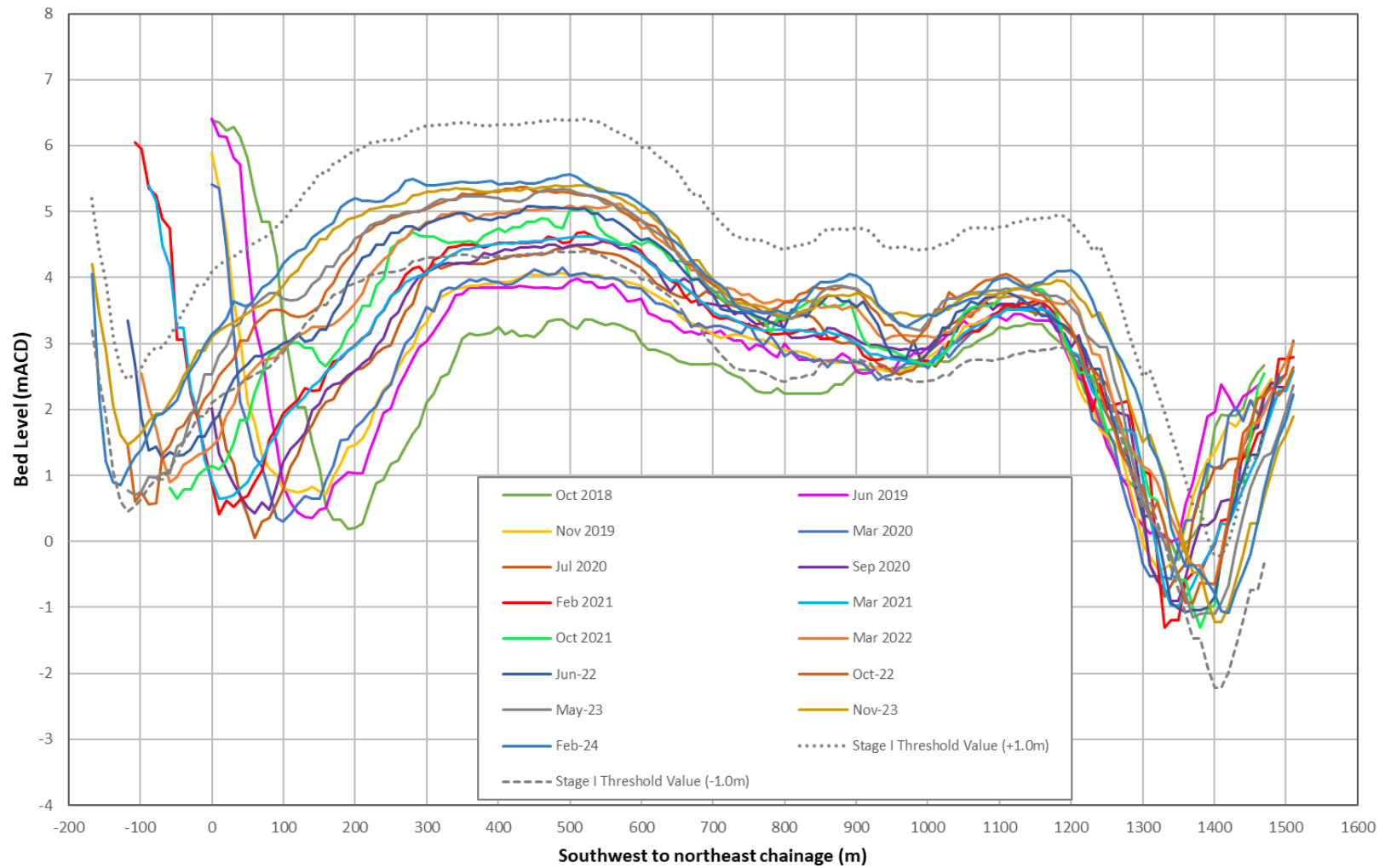


Bathymetric difference plot between October 2010 and February 2024

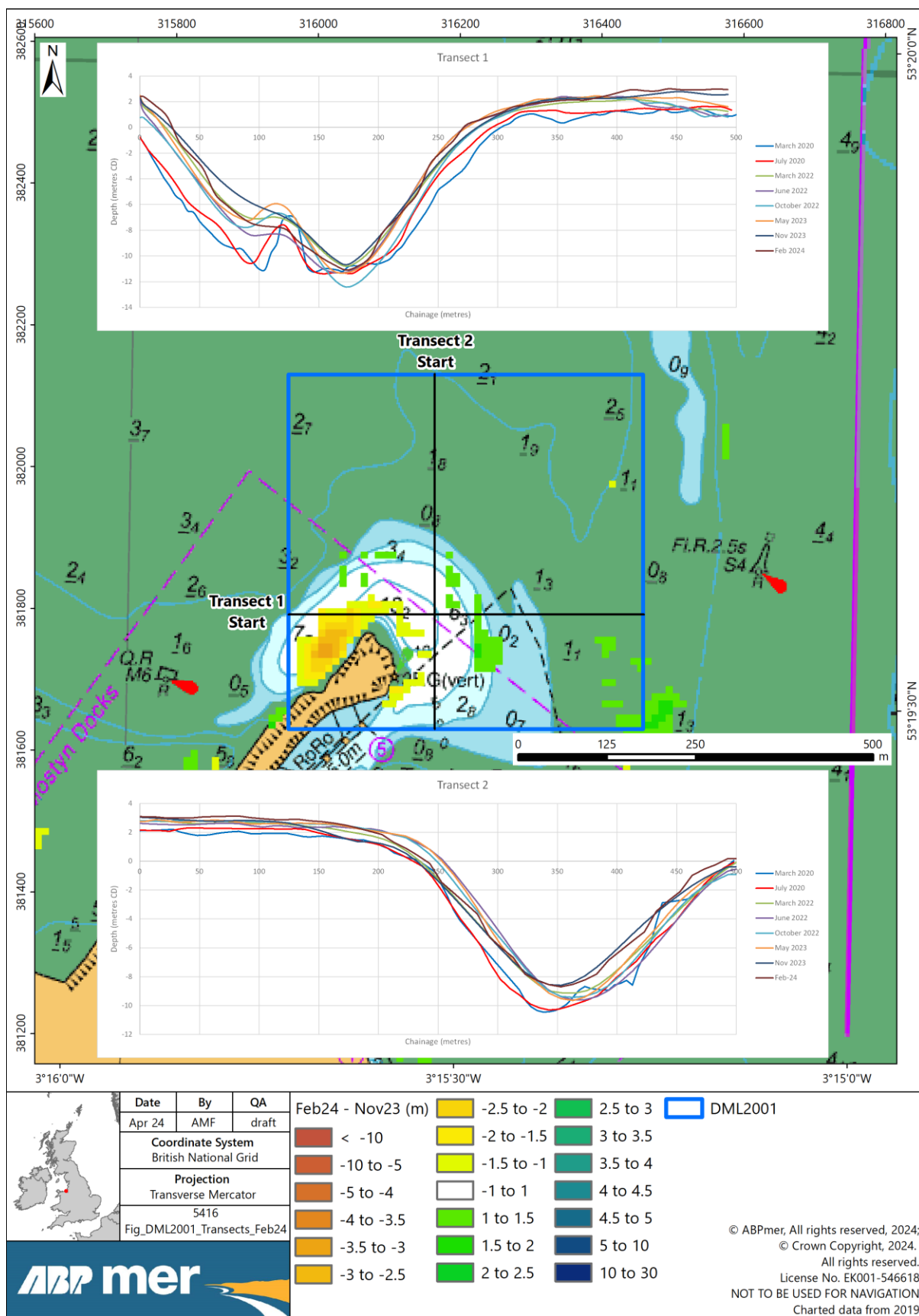


Bathymetric difference plot between February 2024 and November 2023

PORT OF MOSTYN
Inner Channel Sections - Section 20



Bathymetric variation plot along Profile 20 between October 2018 and February 2024



Subset of LA1 survey covering the IS103 (Breakwater) disposal site

To: Rob Jackson
From: Adam Fulford
Date: 09 April 2024

Ref: R.4506TN/5416/Apr2024
cc: Ian Davidson

Subject: Mostyn Deep Bed Sample PSA

The Port of Mostyn has commissioned ABPmer to undertake Particle Size Analysis (PSA) of 10 bed sediment samples obtained during Q4 2023 from pre-determined locations throughout Mostyn Deep as part of the required Approach Channel monitoring (i.e. under marine licence reference DML1542v2, Task Ref "LA3 Mostyn Deep Site 'A' Deposition Area Seabed"). The locations of the samples are as below in Table 1 and Figure 1:

Table 1. Sample Coordinates (OSGB36 and WGS84 projections)

Sample No.	Easting	Northing	Latitude (N)	Longitude (W)
1	313900	385700	53°21.653	3°17.636
2	313700	385600	53°21.597	3°17.815
3	313900	385400	53°21.492	3°17.631
4	314200	385300	53°21.440	3°17.359
5	314500	385100	53°21.336	3°17.085
6	314200	385000	53°21.279	3°17.354
7	314900	385000	53°21.286	3°16.723
8	314800	384800	53°21.177	3°16.810
9	315100	384700	53°21.126	3°16.538
10	315400	384700	53°21.129	3°16.268

The results of the PSA carried out in December 2023 can be viewed in Appendix A. The standard output of grain size parameters from ABPmer's PSA is D_{10} , D_{50} , and D_{90} . However, it is noted that a requirement of the ongoing monitoring programme is to also obtain the D_{15} and D_{85} parameters of respective samples. These additional parameters are tabulated in Appendix B.

As laid out within the Port of Mostyn's Monitoring Protocol document (Port of Mostyn Ltd., 2008), any change in the parameters whereby any one of the following relationships between successive sample PSA triggers an exceedance(s) of Stage 1 Thresholds. These are:

- $D_{15} \geq D_{50}$;
- $D_{50} \geq D_{85}$;
- $D_{50} \leq D_{15}$; or
- $D_{85} \leq D_{50}$.

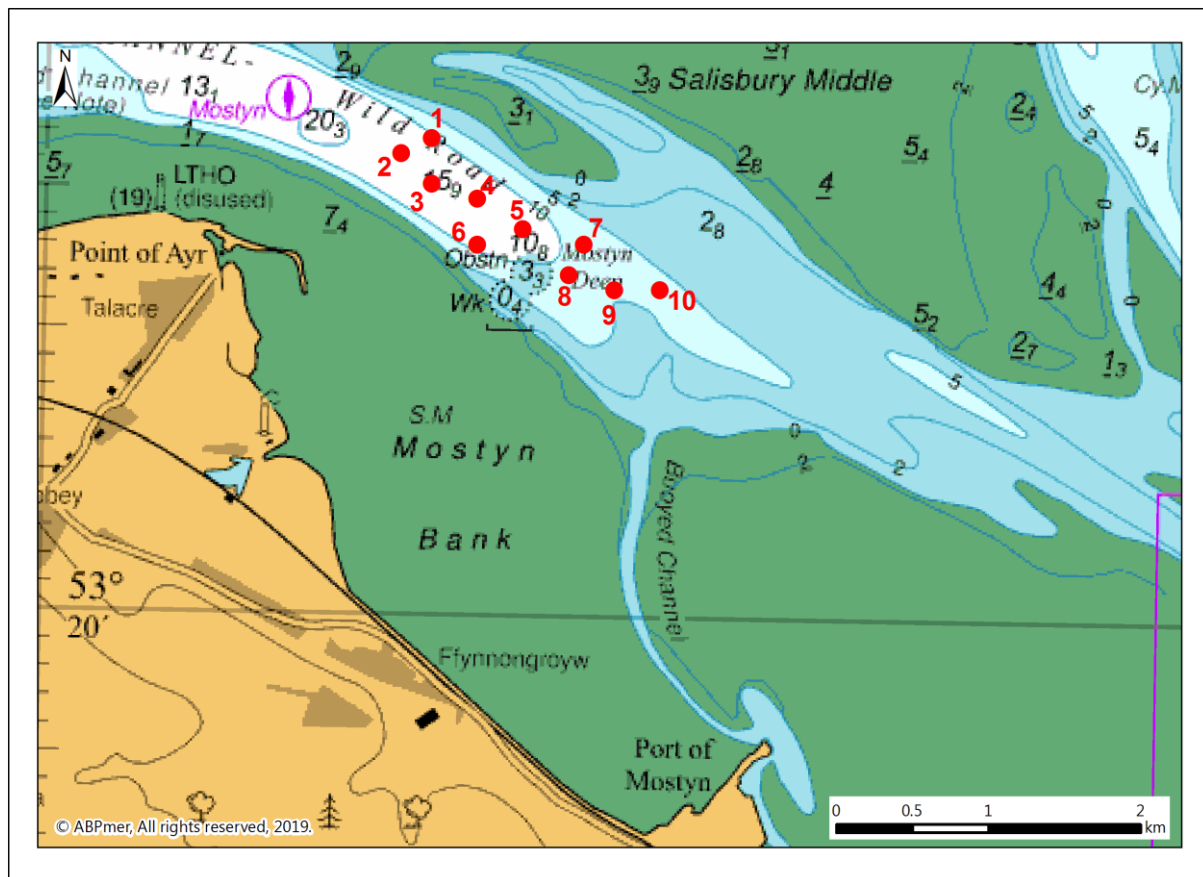


Figure 1. Location map of samples collected within Mostyn Deep

Comparison against PSA results from 2009 to 2015 (ABPmer, 2017) and against the 2022 Q4 sampling results, as described in the ABPmer (2023a) Technical Note, indicates that:

- D_{15} values across the Mostyn Deep area generally exhibit a slight fining trend between 2022 and 2023 samples, although the coarsening that was previously observed at Site 7 has been maintained in the latest sampling, with the site still showing a character similar to that seen pre-2018. Observed changes at all sites remain below the stated thresholds. The fining trends may be attributed to the general lack of large pebbles in the 2023 samples, in contrast to the individual pebbles (some exceeding 20-40 mm) observed during 2022, which resulted in a slight skewing of the mean grain diameter values;
- D_{50} values across the site again remain generally stable, with most sites showing a slight fining and others a slight coarsening since the previous sampling. Site 7 has maintained the previously noted stability to values seen pre-2018 and the observed variance at most sites remains below the stated thresholds. Slight fining at sites 4, 6 and 8 exceed the defined thresholds (by an average of 70 μm), although – as noted above for D_{15} – this fining is the result of single individual pebbles, present in the 2022 samples, skewing the previous mean grain diameter values; and
- Changes in the D_{85} parameter are also relatively small with some fining and some coarsening. Larger changes (fining by an average of around 0.4 mm) are observed to be a result of the individual (larger) pebbles in the gravel fraction in the 2022 samples (as noted above). Overall, results from the latest sampling reflect the mixed-material nature of Mostyn Deep.

It is noted here that the Port of Mostyn has not disposed of any dredge material to the Mostyn Deep site for the whole of 2023 or (to date) during 2024 (see dredge records included in ABPmer, 2023b).

Consequently, any changes observed in the mean grain size of samples (as described above) are entirely natural in their source and are not the result of any dredge or disposal activities being carried out by the Port.

References

ABPmer (2017). Review of Dredge and Disposal Monitoring: Overview of survey work carried out by the Port in the Dee Estuary from 2005 to 2016. Report No. R.2713. A report produced by ABPmer for the Port of Mostyn.

ABPmer (2023a). Mostyn Deep bed sample PSA. Technical Note R.4166TN produced by ABPmer for the Port of Mostyn. February 2023.

ABPmer (2023b). Maintenance dredge and disposal surveys. Year-end annual review of monitoring data during 2023 (DML1542v2 and DML2001). Report R.4412 produced by ABPmer for the Port of Mostyn. December 2023.

Port of Mostyn Ltd. (2008). Maintenance of Navigation: Mostyn Channel Monitoring Protocols.

Appendix A: PSA Results

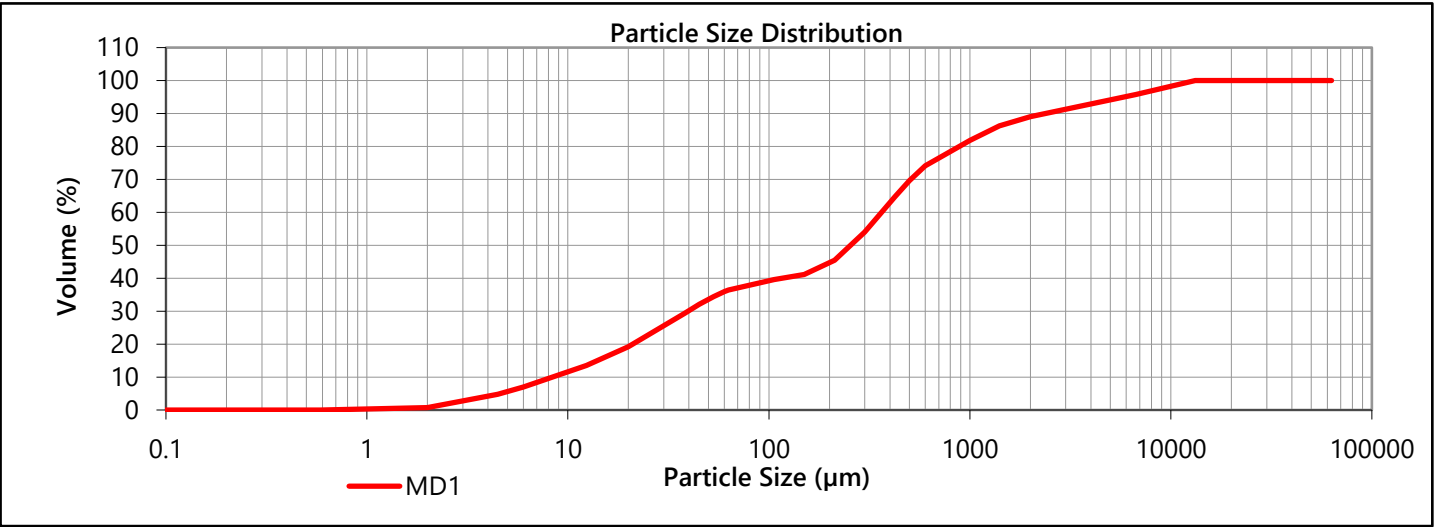


Particle Size Analysis Report

Sample Name: MD1 Measured by: AMF
Sample Source: Mostyn
Sample Collected: Dec-23

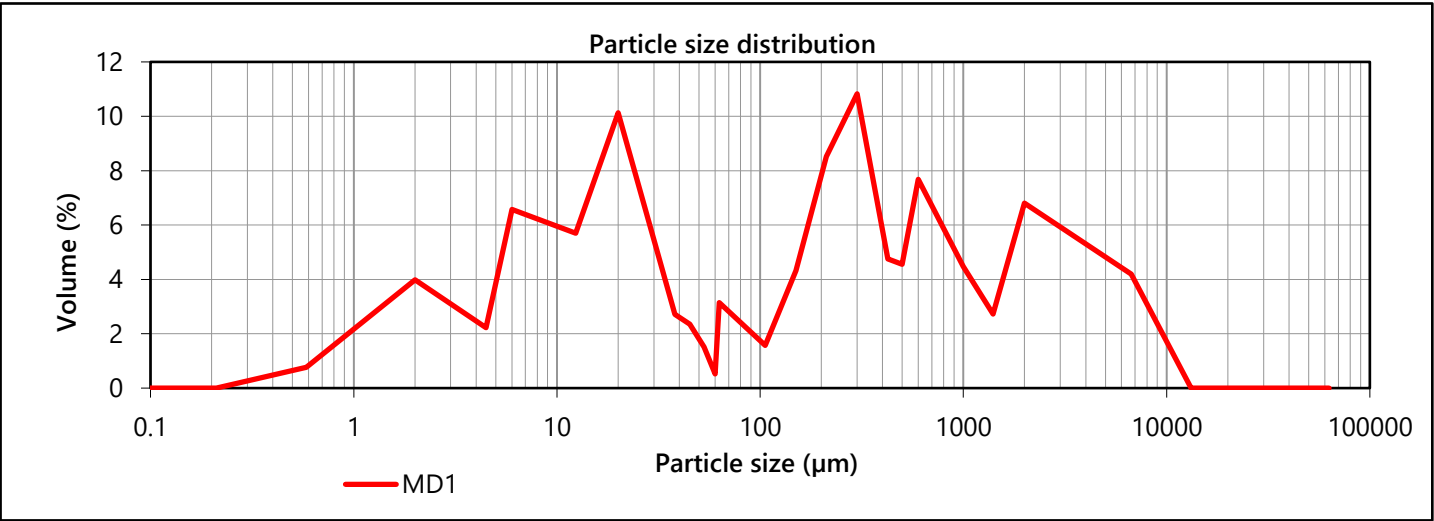
d(0.1): 9.0 μm d(0.5): 258.7 μm d(0.9): 2690.0 μm

Cumulative Frequency Plot



Clay (%)	Silt (%)			Sand (%)			Gravel (%)			Cobble (%)
	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	
0.8	6.2	12.3	16.7	9.6	28.6	14.9	6.8	4.2	0.0	0.0

Frequency Curve



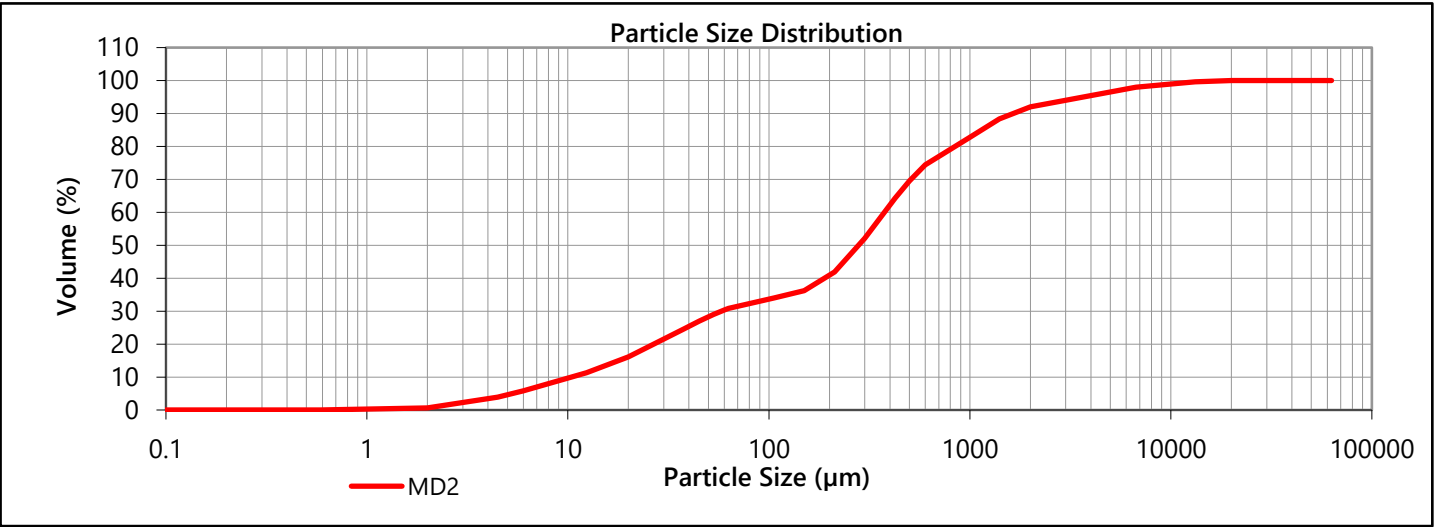


Particle Size Analysis Report

Sample Name: MD2 Measured by: AMF
Sample Source: Mostyn
Sample Collected: Dec-23

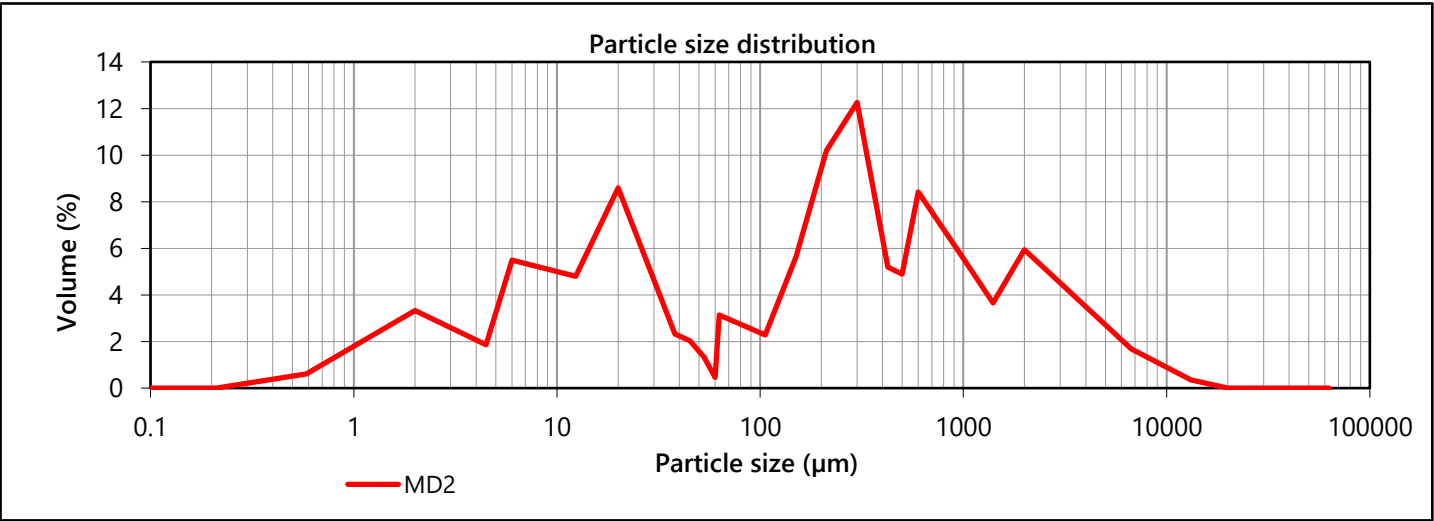
d(0.1): 10.9 μm d(0.5): 282.3 μm d(0.9): 1666.5 μm

Cumulative Frequency Plot



Clay (%)	Silt (%)			Sand (%)			Gravel (%)			Cobble (%)
	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	
0.6	5.2	10.3	14.3	11.5	32.5	17.6	5.9	2.0	0.0	0.0

Frequency Curve



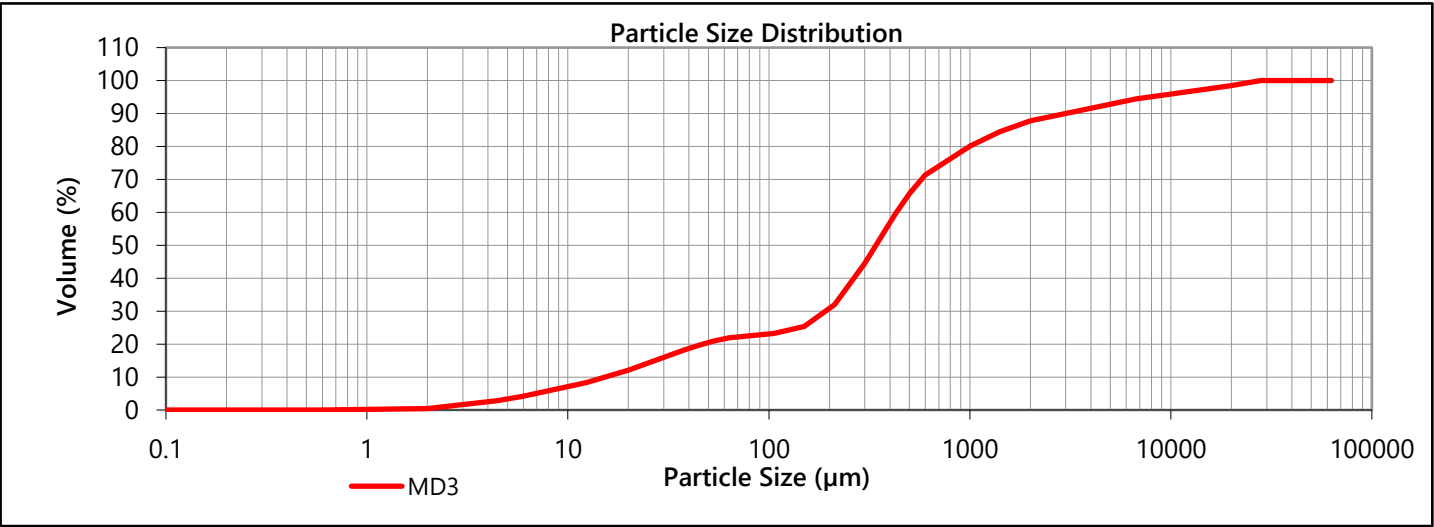


Particle Size Analysis Report

Sample Name: MD3 Measured by: AMF
Sample Source: Mostyn
Sample Collected: Dec-23

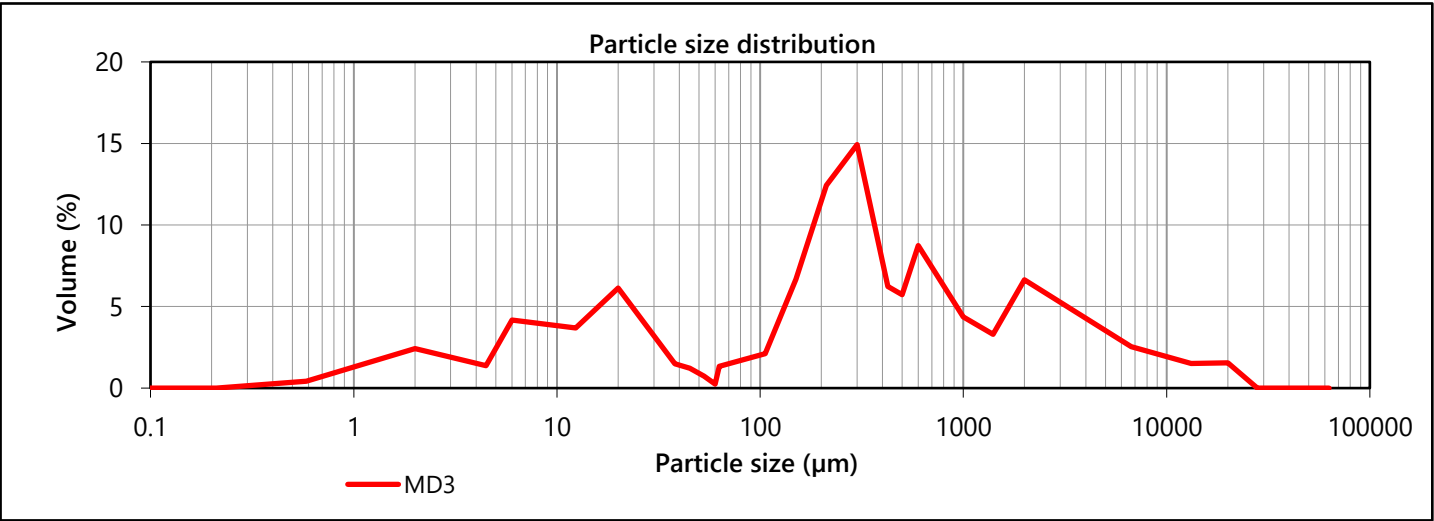
d(0.1): 15.8 μm d(0.5): 346.3 μm d(0.9): 3587.4 μm

Cumulative Frequency Plot



Clay (%)	Silt (%)			Sand (%)			Gravel (%)			Cobble (%)
	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	
0.4	3.8	7.9	9.6	10.4	39.3	16.4	6.6	4.1	1.5	0.0

Frequency Curve



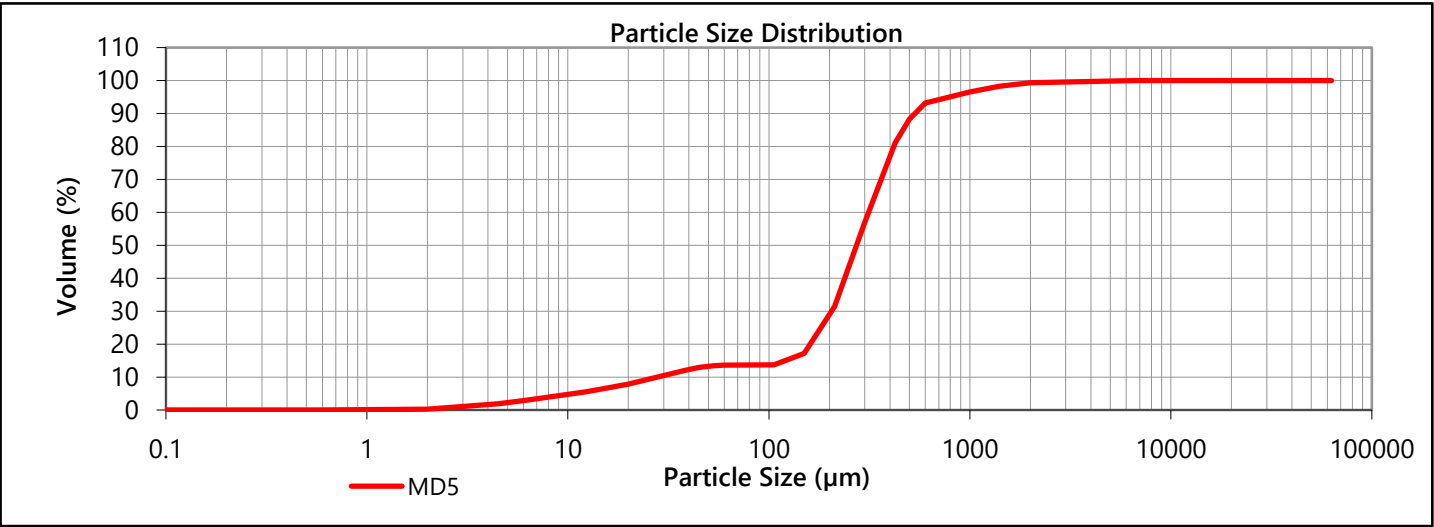


Particle Size Analysis Report

Sample Name: MD5 Measured by: AMF
Sample Source: Mostyn
Sample Collected: Dec-23

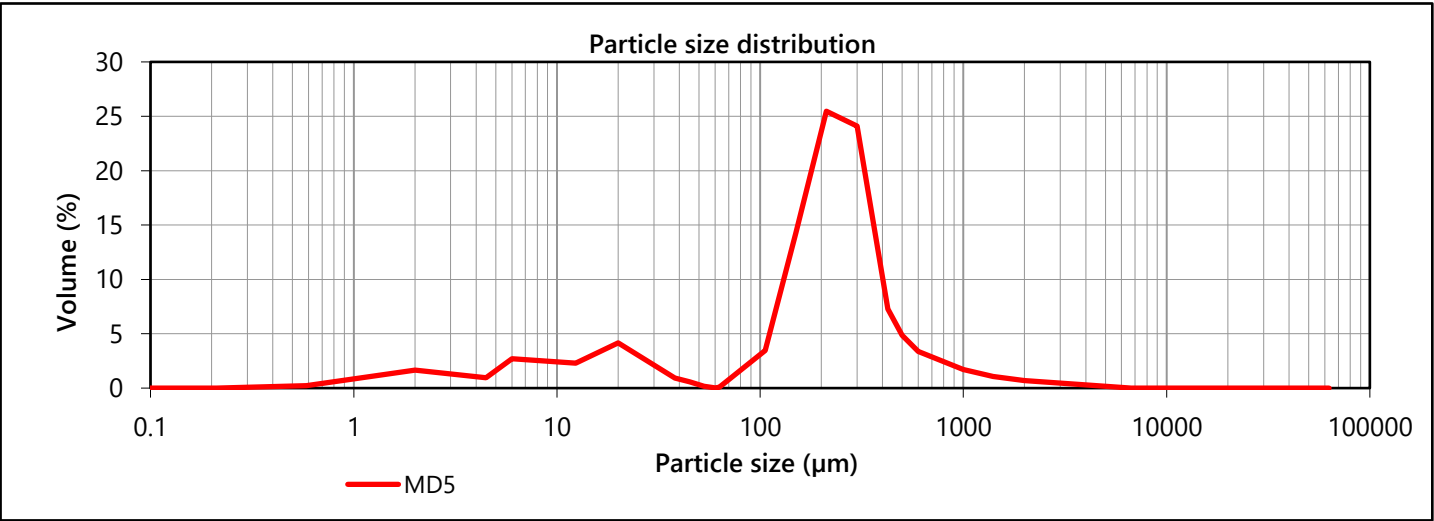
d(0.1): 29.4 μm d(0.5): 276.1 μm d(0.9): 535.2 μm

Cumulative Frequency Plot



Clay (%)	Silt (%)			Sand (%)			Gravel (%)			Cobble (%)
	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	
0.2	2.6	5.0	5.8	17.8	61.7	6.1	0.7	0.0	0.0	0.0

Frequency Curve



Particle Size Analysis Report

Sample Name: MD6 - Average

Measured by: afulford on 28 March 2024

Sample Source: Mostyn

Obscuration: 11.91 %

Sample Collected: Dec 2023

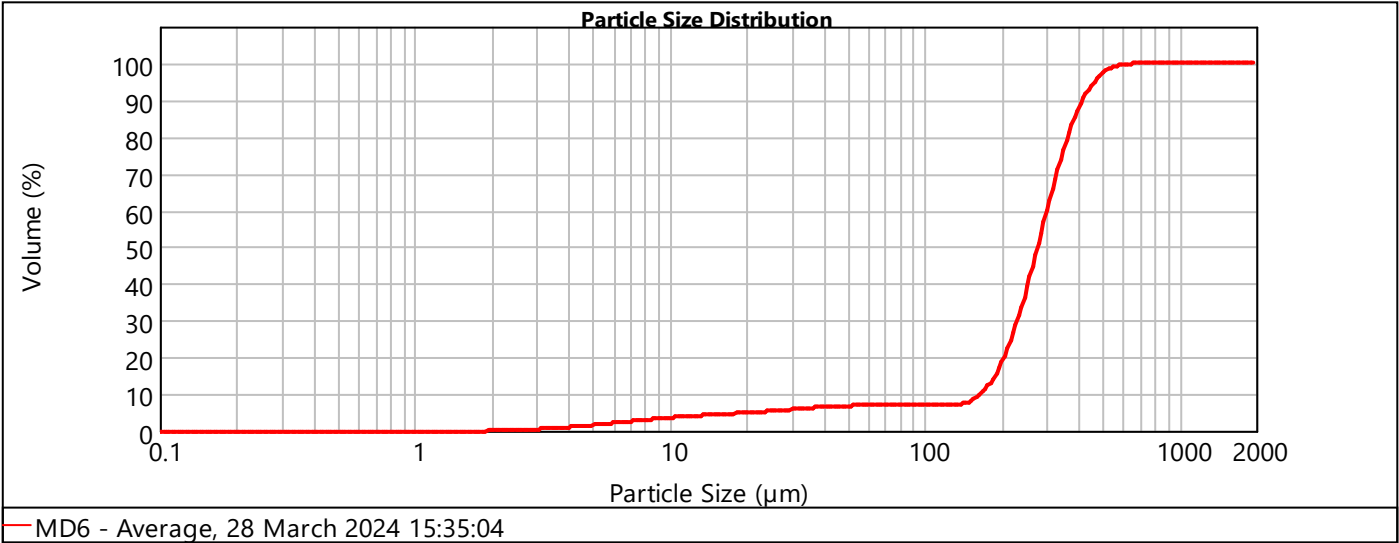
Weighted Residual: 0.834 %

d(0.1): 164.717 μm

d(0.5): 277.400 μm

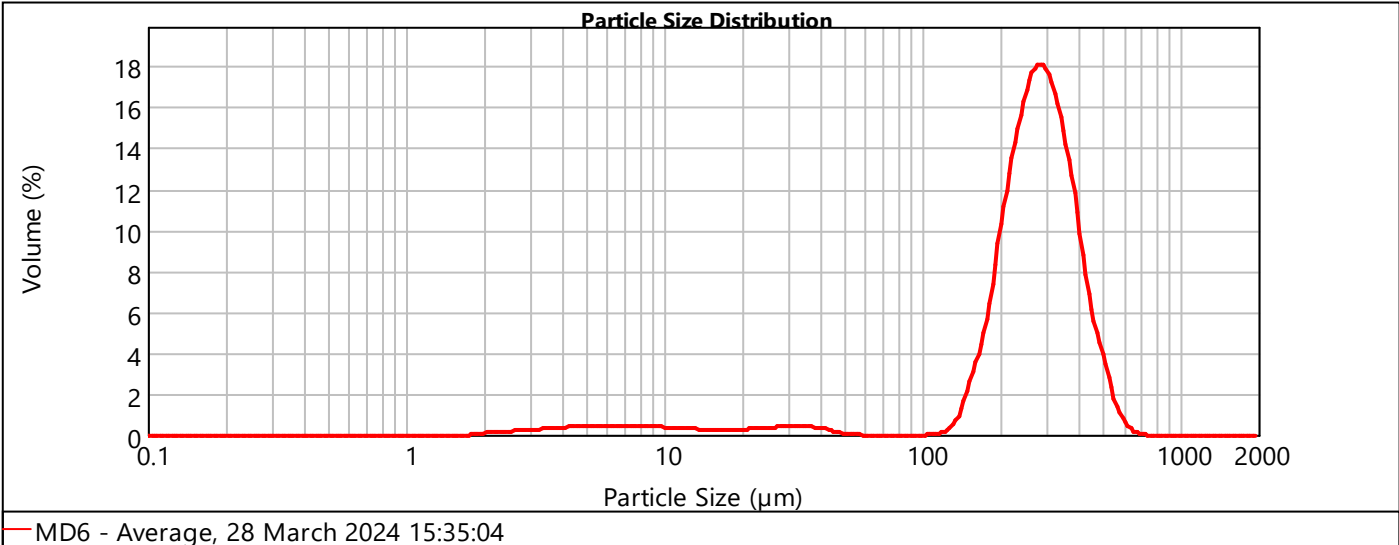
d(0.9): 415.035 μm

Cumulative Frequency Plot



Clay	Silt			Sand		
	Fine	Medium	Coarse	Fine	Medium	Coarse
0 %	2 %	3 %	2 %	11 %	82 %	0 %

Frequency Curve



Particle Size Analysis Report

Sample Name: MD7 - Average

Measured by: afulford on 28 March 2024

Sample Source: Mostyn

Obscuration: 10.23 %

Sample Collected: Dec 2023

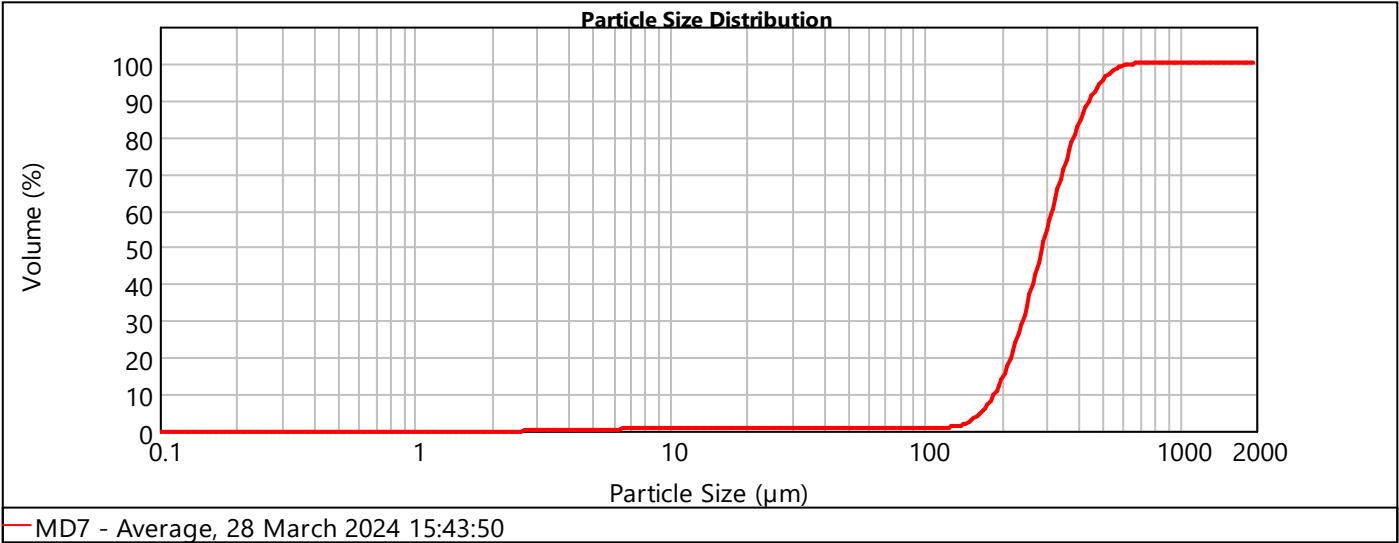
Weighted Residual: 1.349 %

d(0.1): 188.137 μm

d(0.5): 289.986 μm

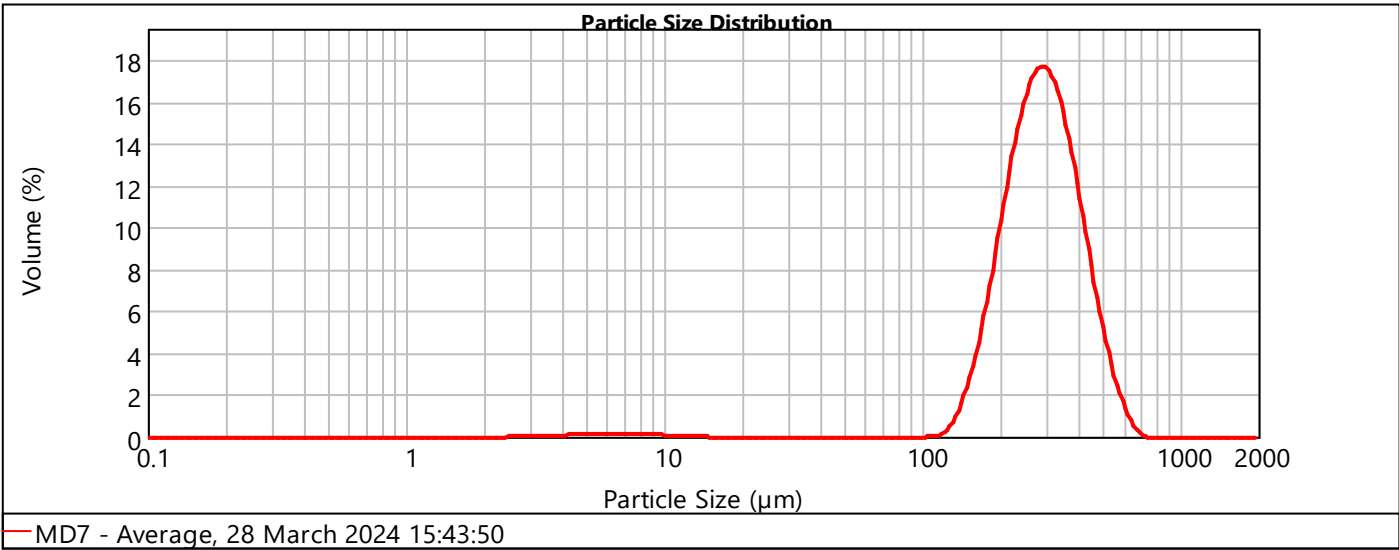
d(0.9): 442.362 μm

Cumulative Frequency Plot



Clay	Silt			Sand		
	Fine	Medium	Coarse	Fine	Medium	Coarse
0 %	0 %	1 %	0 %	13 %	86 %	1 %

Frequency Curve



Particle Size Analysis Report

Sample Name:MD8 - Average

Sample Source:Mostyn

Sample Collected:Dec 2023

Measured by:afulfordon 28 March 2024

Obscuration:9.27 %

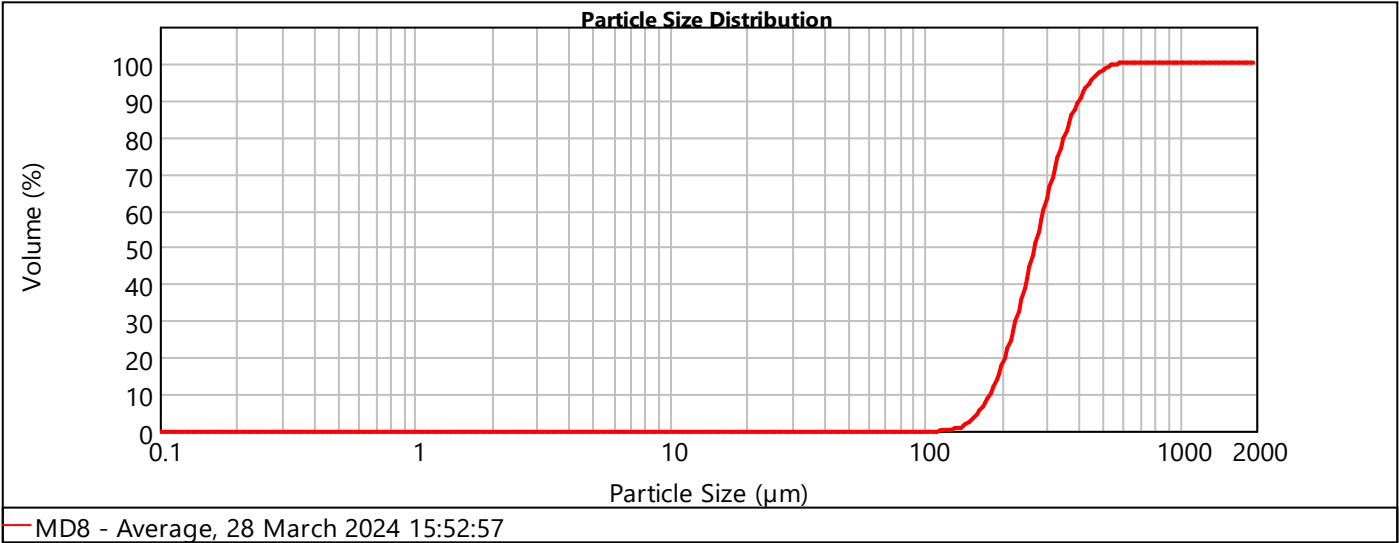
Weighted Residual:0.541 %

d(0.1):180.651 μm

d(0.5):270.403 μm

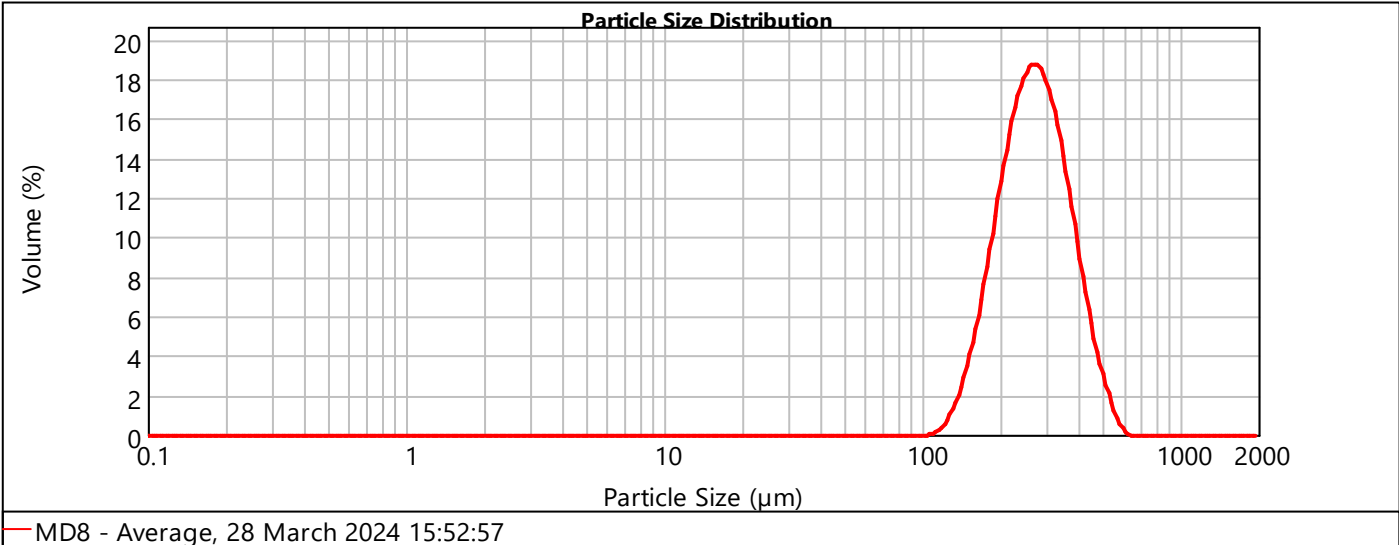
d(0.9):402.408 μm

Cumulative Frequency Plot



Clay	Silt			Sand		
	Fine	Medium	Coarse	Fine	Medium	Coarse
0 %	0 %	0 %	0 %	17 %	83 %	0 %

Frequency Curve



Particle Size Analysis Report

Sample Name: MD9 - Average

Measured by: afulford on 28 March 2024

Sample Source: Mostyn

Obscuration: 10.44 %

Sample Collected: Dec 2023

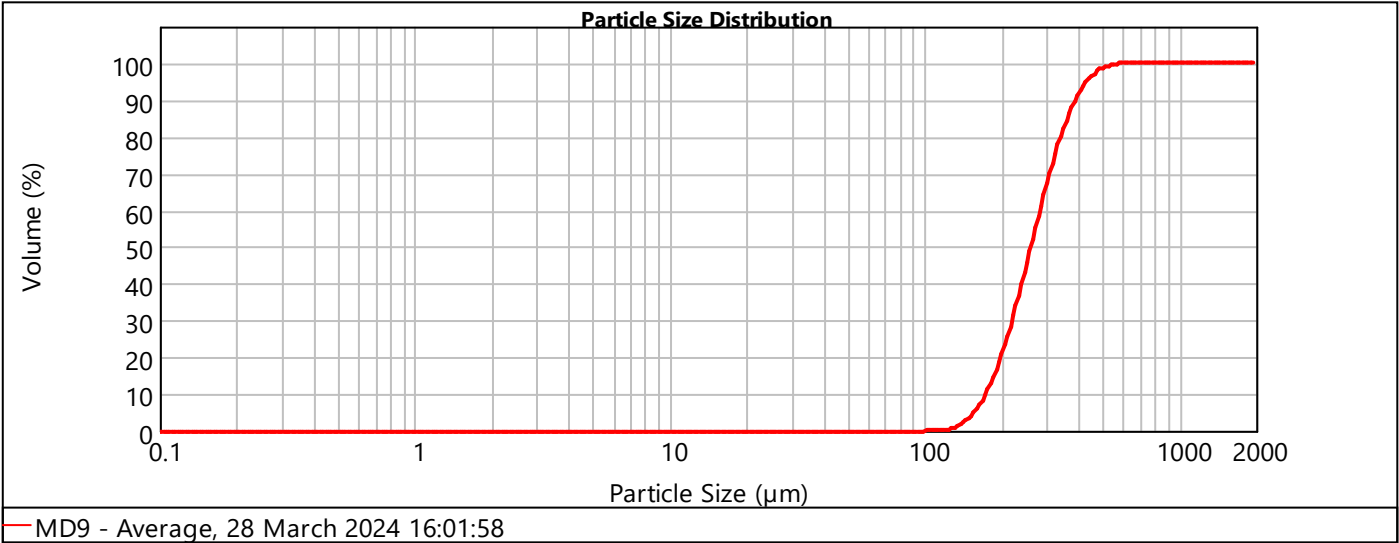
Weighted Residual: 0.881 %

d(0.1): 173.756 μm

d(0.5): 261.095 μm

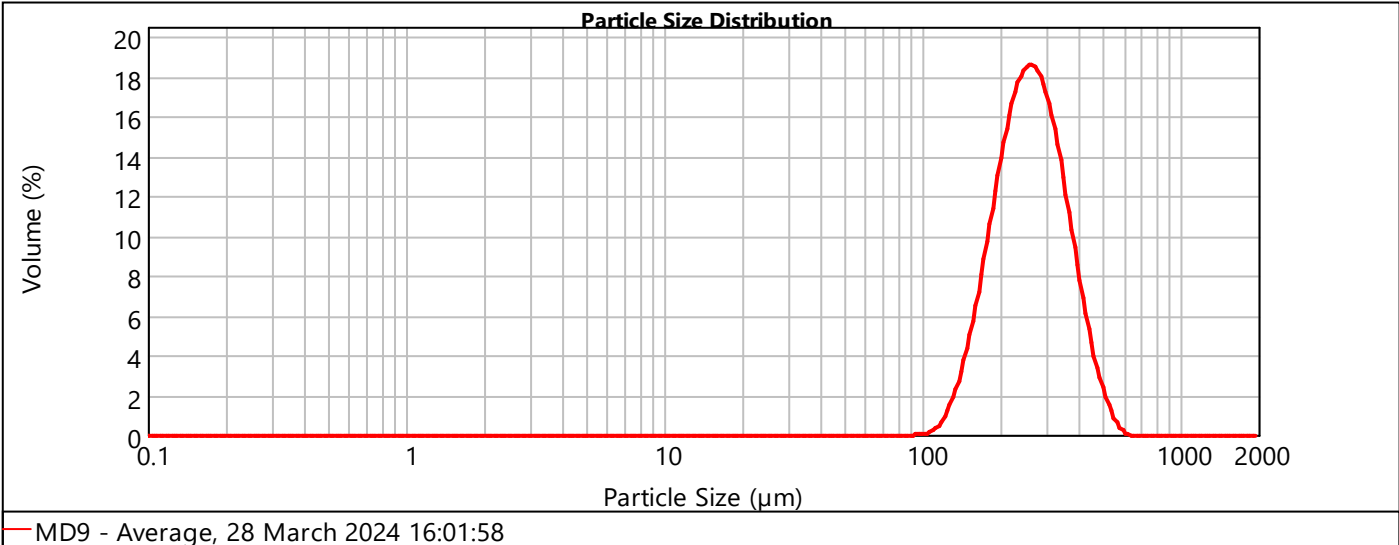
d(0.9): 389.455 μm

Cumulative Frequency Plot



Clay	Silt			Sand		
	Fine	Medium	Coarse	Fine	Medium	Coarse
0 %	0 %	0 %	0 %	20 %	80 %	0 %

Frequency Curve



Particle Size Analysis Report

Sample Name:MD10 - Average

Measured by:afulfordon 28 March 2024

Sample Source:Mostyn

Obscuration:10.26 %

Sample Collected:Dec 2023

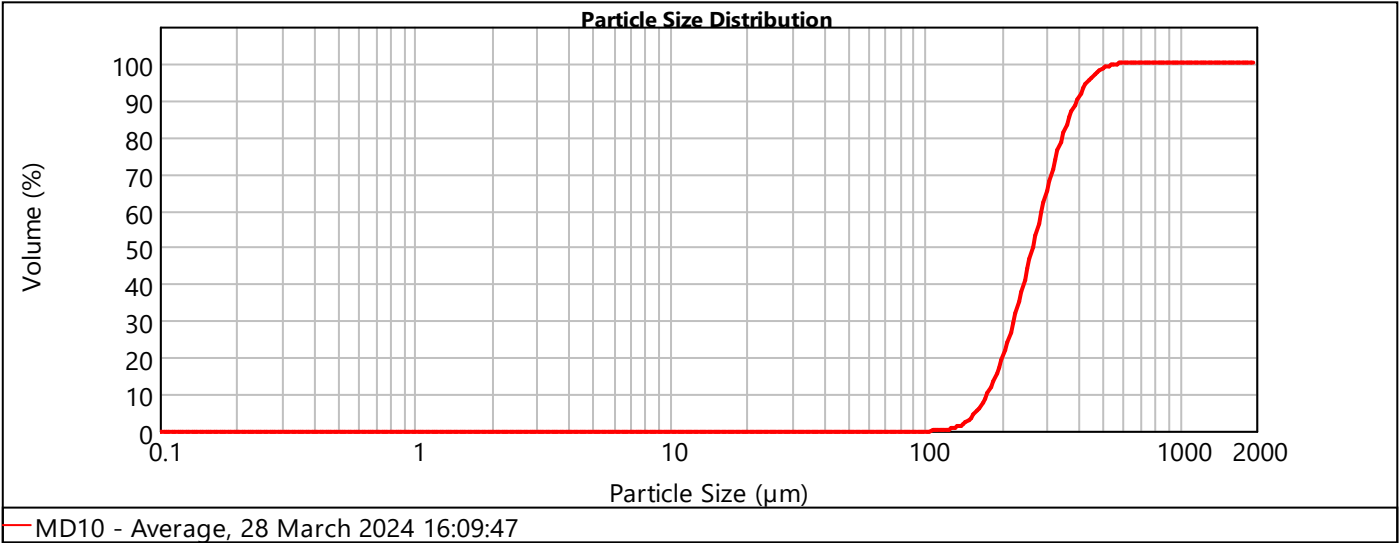
Weighted Residual:0.800 %

d(0.1):176.802 μm

d(0.5):265.505 μm

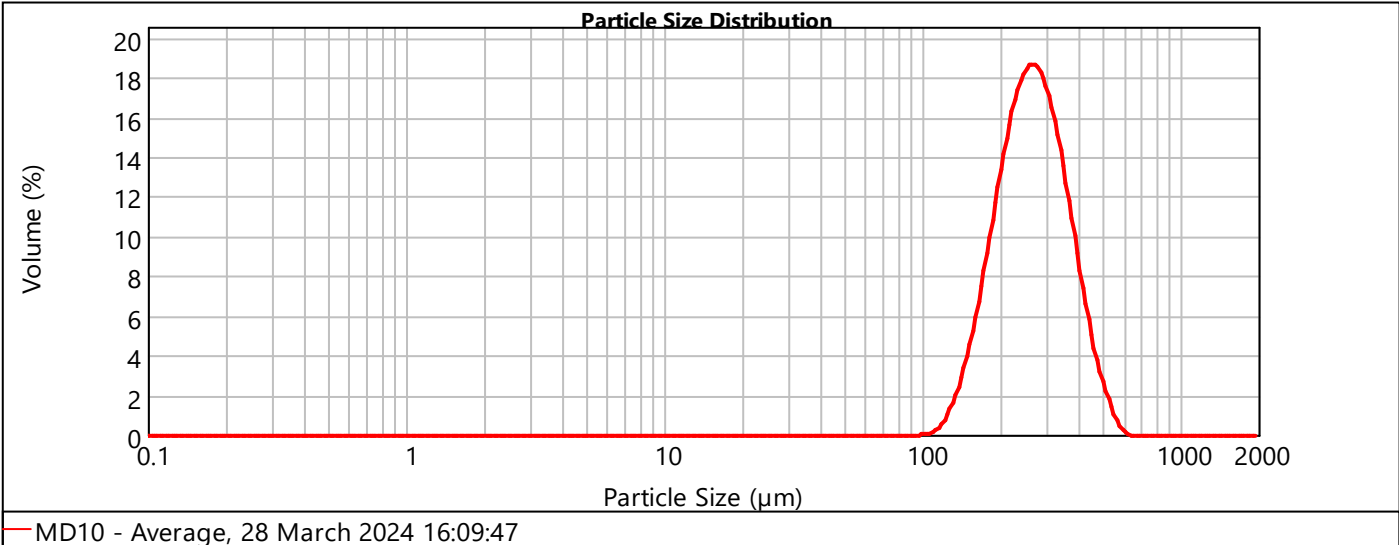
d(0.9):395.596 μm

Cumulative Frequency Plot



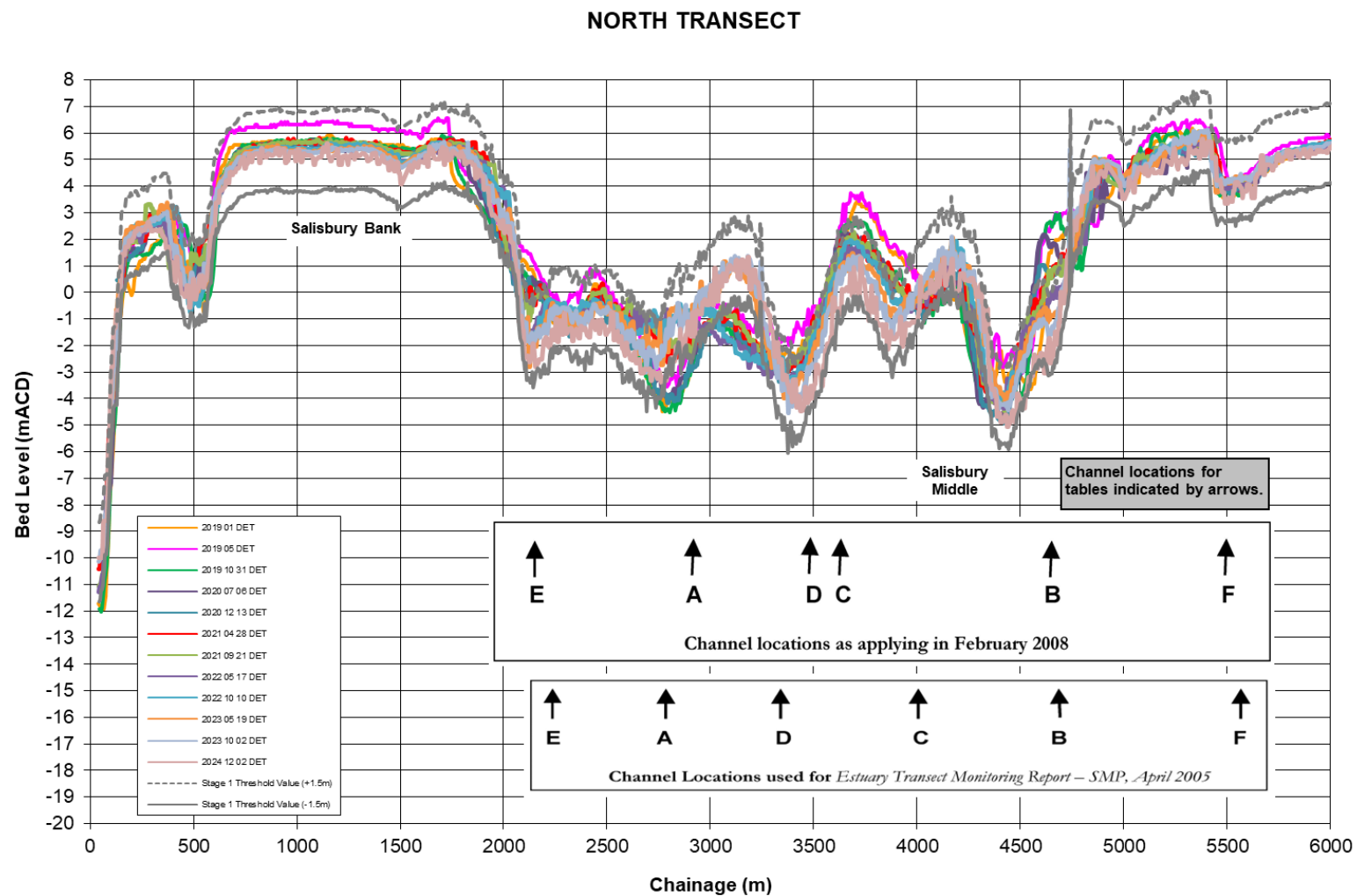
Clay	Silt			Sand		
	Fine	Medium	Coarse	Fine	Medium	Coarse
0 %	0 %	0 %	0 %	19 %	81 %	0 %

Frequency Curve



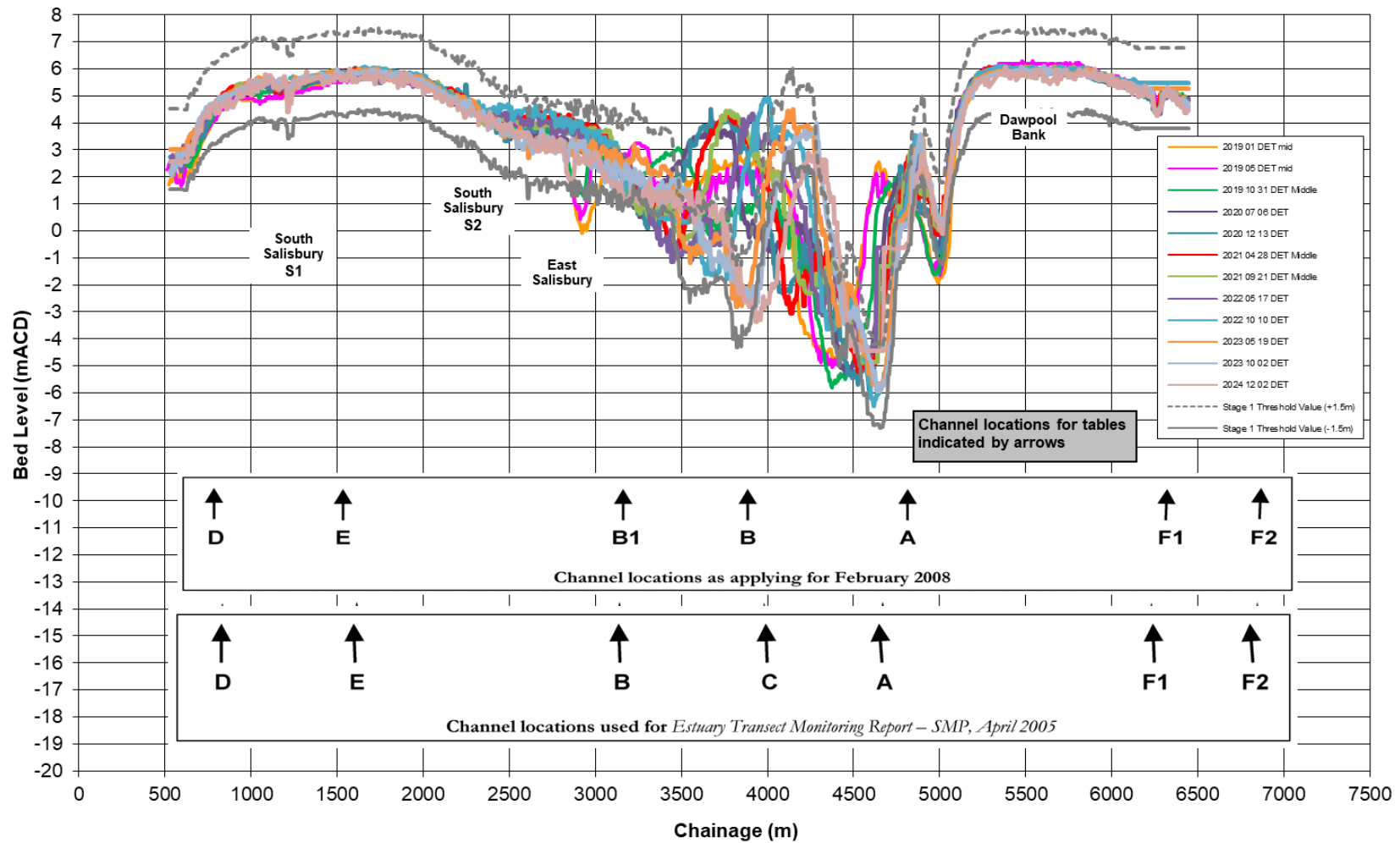
Appendix B: Additional Grain Size Parameters

Site Number	D ₁₅ (µm)	D ₈₅ (µm)
1	14	1,286
2	18	1,158
3	29	1,498
4	38	461
5	123	466
6	180	400
7	201	416
8	189	392
9	181	383
10	185	387

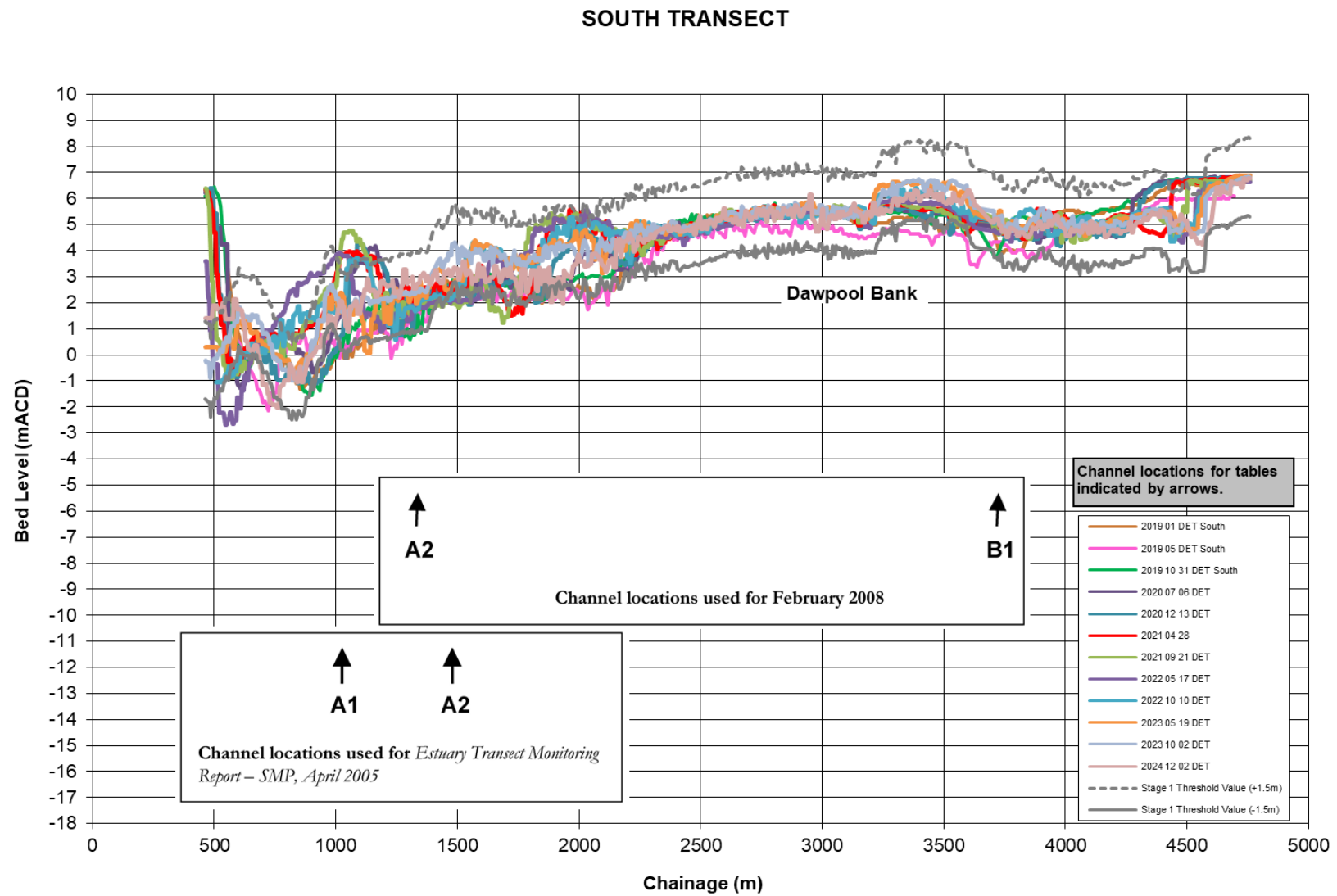


Dee Estuary Transect (North) between January 2019 and February 2024

MIDDLE TRANSECT



Dee Estuary Transect (Middle) between January 2019 and February 2024



Dee Estuary Transect (South) between January 2019 and February 2024

**Appendix D – Log of dredging and disposal activity during this monitoring period
(January to March 2024)**

Campaign (Licence)	Dates	Ref#	Location	Disposal volume (tonnes)		Total volume (tonnes)
				To shore	Offshore	
Jan-24a (DML1542v2)	4th Jan – 9th Jan	A24	Approaches to pontoons/quay	520	0	520
Jan-24b (DML1542v2)	19th Jan – 23rd Jan	B24		Cancelled due to weather		
Feb-24a (DML1542v2)	2nd Feb - 7th Feb	C24	Approaches to pontoons/quay	1,150	0	1,150
Feb-24b (DML1542v2)	19th Feb - 22nd Feb	D24	Approaches to pontoons/quay	1,550	0	1,550
Mar-24a (DML1542v2)	4th Mar - 7th Mar	E24	Approaches to pontoons/quay	1,305	0	1,305
Mar-24b (DML1542v2)	18th Mar – 22nd Mar	F24	Approaches to pontoons/quay	1,100	0	1,100
TOTAL				5,625	0	5,625

During each campaign, dredge depths of up to 2 m below Chart Datum were achieved, although in some cases finished bed levels were shallower than this (as determined by vessel access requirements).

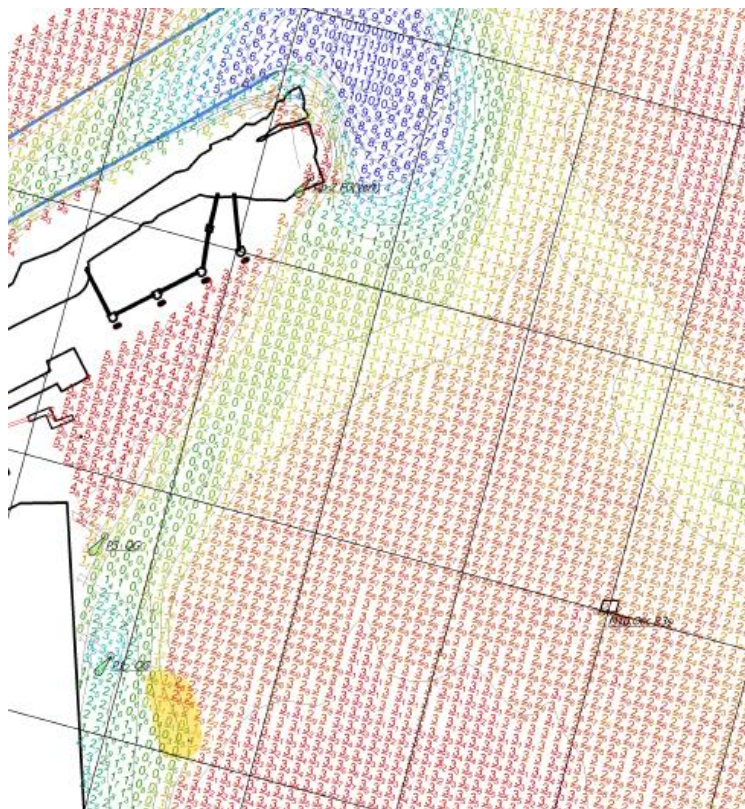


Figure D.1. Dredge area for January to March 2024 dredge campaigns