RESULTS OF THE PILOTS OF THE MRC RIVERINE PLASTIC MONITORING OF THE WET SEASON IN THAILAND

On

Wet Season Pilots of the Mekong River Commission Protocols on Riverine Plastic Monitoring Programme (RPM)

Submitted by

Faculty of Environment and Resource Studies

Mahidol University

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Pilot National Line Agency

Faculty of Environment and Resource Studies, Mahidol University

Team Members

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Riverine Macroplastic Monitoring: Sampling by fish net at community level

The Result of Riverine Macroplastic Monitoring: Sampling by fish net at community level

Survey Profile		Examples	Input
Name of Community			Wernbuek Village
Location of the fishery community	Latitude:		15.31957
	Longitude		105.55401
Survey Date	From:		9/9/2022
	To:		16/09/2022

Survey Results

Date	Number of collected times and fishing method																	No. of Collected times
1st								G										1
2nd								G	D									2
3rd								G										1
4th								G										1
5th								G										1
6th								G										1
7th								G	D									2
8th	G	G						G				G			G	G		6
9th	G	G	G	G	G	T	G	G	L	G	L	G	G	L	G	G		14
10th	G	G	G	G	G	T	G	G	L	L		G	D	L	G	G		15
11th	G	G	G	G	G	T	G	G	L	L		G	G		G	G		14
12th	G	G	G	G	G		G	G		L		G	G		G	G		12
13th	G	G	G	G	G		G	G		L	G	G	G		G	G		13
14th	G	G	G	G	G	T	G	G		L		G	G		G	G		14
15th	G	G	G	G	G	T	G	G	L	L		G	G		G	G		13
16th	G	G	G	G				G				G	G		G	G		10
17th								G										1
18th								G										2
19th								G										2
20th								G										2
21st								G										2
22nd								G										1
23rd								G	D									2
24th								G	D									2
25th								G										2
26th								G										2
27th								G										1
28th								G										2
29th								G										2
30th								G										1
31st																		
Total Number of colleced times (Monthly Frequency)																		144

Results of Plastic waste found in Wernbuek

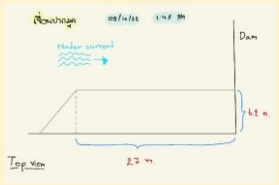
No.	Plastic Product Item	Total Piece (pieces)	Total Weight (g)
MOST LIKELY TO FIND ITEMS:			
1	Food Wrappers (candy, chips, etc.)	86	223.01
2	Take Out/Away Containers (Plastic)	5	26.4
3	Take Out/Away Containers (Foam)	11	21.02
4	Bottle Caps & Lids	2	7.06
5	Straws/Stirrers	15	15.78
6	Forks, Knives, Spoons	4	10.96
7	Beverage Bottles (Plastic)	8	203.36
8	Grocery Bags (Plastic)	7	43.76
9	Other Plastic Bags	5	120.02
10	Cups & Plates (Plastic)	21	99.47
11	Cups & Plates (Foam)	0	0
PACKAGING MATERIALS:			
12	4/6-Pack Holders	0	0
13	Other Plastic/Foam Packaging	10	135.11
14	Other Plastic Bottles (oil, bleach, etc.)	0	0
15	Strapping Bands	8	51.71
FISHING GEAR:			
16	Fishing Buoys, Pots & Traps	0	0
17	Fishing Net & Pieces	9	460.85
18	Fishing Line (1 yard/meter = 1 piece)	0.3	0.24
19	Rope (1 yard/meter = 1 piece)	14.8	903.05
OTHER TRASH:			
20	Appliances (refrigerators, washers, etc.)	0	0
21	E-waste	1	29.54
22	Cigarette Butts/Tips	0	0
23	Construction Materials	0	0
24	Fireworks	1	0.01
25	Tires	0	0
26	Other Plastic Material (Specify:)	286	806.83
PERSONAL HYGIENE:			
27	Condoms	0	0
28	Diapers	0	0
29	Medical Items (syringe, etc.)	1	39.95
30	Tampons/Tampon Applicators	0	0
31	Cotton Bud Sticks	0	0
TINY TRASH LESS THAN 2.5 CM:			
32	Foam Pieces	0	0
33	Plastic Pieces	3	0.01
Total		498.1	3198.14

summary of the result

Location	Wernbuek Village
Starting date	8/9/2022
Duration (day)	7
Collected time (-)	144
Total number (piece)	498.1
Totalweight (g)	3198.14
Average Weight (g/piece)	6.42
Average plastic collected per collection	3.46

Riverine Macroplastic Monitoring: Artificial Barrier

Datasheet Macroplastic Artificial Barrier at Pak Mun Dam

	Value
Name of Artificial Barrier	Pak Mun Dam
Agency Responsible for Maintenance/Cleanup	EGAT
Last cleaning was conducted on	-
Location of Barrier (Latitude)	15.282088
Location of Barrier (Longitude)	105.46706
Length of Barrier	27 m
Date	10/8/2022
Time	13:45
Characteristics of the barrier	Near Dam (ริมเขื่อน)
Total accumulation volume [L] (This is automatically calculated after you enter the necessary data in other sheets)	**(1-2) 40 L / (1-3) 33.48 L**
Sketch of the observed area (photo of hand-drawn sketch, PPT file, etc.)	
Photos (at least 3 (three) from various direction)	  

Estimation the amount by

virtually filling up 20 L garbage bags

	Value	Accumulation Volume [L]
Number of 20 L garbage bags	2	40
Percentage of the area observed [%]	100%	-
Total accumulation volume [L]		**40**

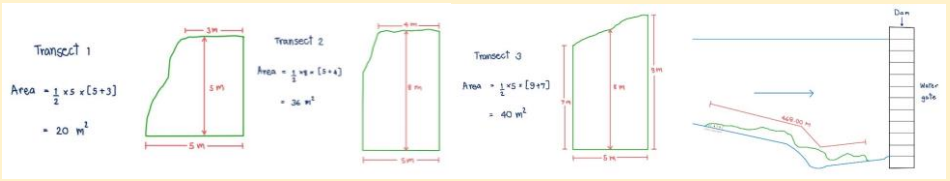
comparison with benchmark photos

Transect ID (For the convinience in counting, you can split the area)	**Level of plastic accumulation**	**Area of accumulation [m^2]**	**Accumulation Volume [L]**
1	3	167.4	33.48
2			0
3			0
4			0
5			0
6			0
7			0
8			0
9			0
10			0
11			0
12			0
13			0
14			0
15			0
SUM [L]			**33.48**
Percentage of the area observed [%]			**100%**
Total accumulation volume [L]			**33.48**

Results of Plastic waste by counting at Pak Mun Dam

No.	Plastic Product Item	Total Piece (pieces)
MOST LIKELY TO FIND ITEMS:		
1	Food Wrappers (candy, chips, etc.)	13
2	Take Out/Away Containers (Plastic)	
3	Take Out/Away Containers (Foam)	1
4	Bottle Caps & Lids	
5	Straws/Stirrers	2
6	Forks, Knives, Spoons	1
7	Beverage Bottles (Plastic)	11
8	Grocery Bags (Plastic)	6
9	Other Plastic Bags	
10	Cups & Plates (Plastic)	2
11	Cups & Plates (Foam)	
PACKAGING MATERIALS:		
12	4/6-Pack Holders	
13	Other Plastic/Foam Packaging	2
14	Other Plastic Bottles (oil, bleach, etc.)	
15	Strapping Bands	1
FISHING GEAR:		
16	Fishing Buoys, Pots & Traps	
17	Fishing Net & Pieces	
18	Fishing Line (1 yard/meter = 1 piece)	
19	Rope (1 yard/meter = 1 piece)	
OTHER TRASH:		
20	Appliances (refrigerators, washers, etc.)	
21	E-waste	
22	Cigarette Butts/Tips	
23	Construction Materials	
24	Fireworks	
25	Tires	
26	Glass bottles	4
27	Rubber materials	
28	Other Plastic Material (Specify:)	16
PERSONAL HYGIENE:		
29	Condoms	
30	Diapers	
31	Medical Items (syringe, etc.)	
32	Tampons/Tampon Applicators	
33	Cotton Bud Sticks	
TINY TRASH LESS THAN 2.5 CM:		
34	Foam Pieces	
35	Plastic Pieces	
Total		59

Datasheet Macroplastic Artificial Barrier at Near bank of Pak Mun Dam

	Value
Name of Artificial Barrier	Pak Mun Dam
Agency Responsible for Maintenance/Cleanup	EGAT
Last cleaning was conducted on	-
Location of Barrier (Latitude)	15.277703 (ริมฝั่งแม่น้ำ) / 15.281557 (ริมเขื่อน)
Location of Barrier (Longitude)	105.469060 (ริมฝั่งแม่น้ำ) /105.469875 (ริมเขื่อน)
Length of Barrier	468 m
Date	9/9/2022
Time	15:30
Characteristics of the barrier	Near Bank (ริมฝั่งแม่น้ำ)
Total accumulation volume [L] (This is automatically calculated after you enter the necessary data in other sheets)	**(1-2) = 34.50 / (1-3) = 4.24**
Sketch of the observed area (photo of hand-drawn sketch, PPT file, etc.)	
Photos (at least 3 (three) from various direction)	

Estimation the amount by

virtually filling up 20 L garbage bags

	Value	Accumulation Volume [L]
Number of 20 L garbage bags	1	20
Percentage of the area observed [%]	58%	-
Total accumulation volume [L]		**34.31**

comparison with benchmark photos

Transect ID (For the convinience in counting, you can split the area)	**Level of plastic accumulation**	**Area of accumulation [m^2]**	**Accumulation Volume [L]**
1	1	20	1
2	1	36	1.8
SUM [L]			**2.8**
Percentage of the area observed [%]			**66%**
Total accumulation volume [L]			**4.24**

Results of Plastic waste by counting at Near bank of Pak Mun Dam

No.	Plastic Product Item	Total Piece (pieces)
MOST LIKELY TO FIND ITEMS:		
1	Food Wrappers (candy, chips, etc.)	
2	Take Out/Away Containers (Plastic)	
3	Take Out/Away Containers (Foam)	
4	Bottle Caps & Lids	
5	Straws/Stirrers	
6	Forks, Knives, Spoons	
7	Beverage Bottles (Plastic)	14
8	Grocery Bags (Plastic)	
9	Other Plastic Bags	
10	Cups & Plates (Plastic)	
11	Cups & Plates (Foam)	1
PACKAGING MATERIALS:		
12	4/6-Pack Holders	
13	Other Plastic/Foam Packaging	
14	Other Plastic Bottles (oil, bleach, etc.)	
15	Strapping Bands	
FISHING GEAR:		
16	Fishing Buoys, Pots & Traps	
17	Fishing Net & Pieces	
18	Fishing Line (1 yard/meter = 1 piece)	2
19	Rope (1 yard/meter = 1 piece)	
OTHER TRASH:		
20	Appliances (refrigerators, washers, etc.)	
21	E-waste	
22	Cigarette Butts/Tips	
23	Construction Materials	
24	Fireworks	
25	Tires	
26	Glass bottles	6
27	Rubber materials	2
28	Other Plastic Material (Specify:)	
PERSONAL HYGIENE:		
29	Condoms	
30	Diapers	
31	Medical Items (syringe, etc.)	
32	Tampons/Tampon Applicators	
33	Cotton Bud Sticks	
TINY TRASH LESS THAN 2.5 CM:		
34	Foam Pieces	10
35	Plastic Pieces	2
Total		37

Riverine Macroplastic Monitoring: Sampling by Tow Net

Datasheet MacroTowNet At DWR #1

The data-input form for riverine macroplastics monitoring.

Name of observer	Dr.Achara Ussawaruji kulchai	Organization	Faculty of Environmental and resource study Mahidol University	Cruise name	

Items				Results Input				Unit	Explanation/ Input Examples
Sampling date and location	Sample name/ ID			DWR1				-	
	Enter time difference from GMT.			7:00				-	
	Sampling date			9/10/2022				-	date/ month/ year
	Sampling time (Initial)			13	40	0		-	hour / minute / second
	Sampling time (Final)			14	1	0		-	
	Season			Wet Season				-	
	Sampling Location (Name)			H 013801 : DWR				-	e.g., Tokyo Bay (Tama Riv. estuary)
	GPS Log	• Input style		Decimal				-	Select "sexagesimal (base 60) notation" or "decimal notation" to input coordinates.
		• GPS Log (Initial position)	- Latitude	15 °	19.590 '	0 ″		N	Enter the coordinates in sexagesimal (base 60) or decimal notation.
			- Longitude	105 °	29.640 '	0 ″		E	
		• GPS Log (Final position)	- Latitude	15 °	19.603 '	0 ″		N	
			- Longitude	105 °	29.527 '	0 ″		E	
Sampling equipment	Classification of net frame	• Type of net frame		-				-	Manta, Neuston or other nets.
		• Model number and manufacturer		-				-	e.g., JMA Neuston net, RIGO Co., Ltd., No.5552
	Net aperture	• Shape of net aperture		Rectangle				-	Rectangular, square, circular, others
		• Size of net aperture	- Width	1				m	
			- Height	0.5				m	
			- Area	0.50				m^2	
	Length of net			2				m	
	Mesh	• Openings		2.5				mm	
								-	Select one side length or diagonal length
		• Model number and manufacturer		-				-	
Tow Parameter	Tow distance	• Distance		2308.554				m	Distance relative to water
		• Calculation method		Flow meter				-	Describe the method used to calculate the tow distance, such as: 1: Flow meter, 2: GPS (Recorded only initial and final points), 3: Vessel speed and duration time
		• Calculation formula		Distance=	Rotation rounds*26873/999999			-	
	Trawl sweep area	• Sweep area		0.25				m^2	Report sweep area and the equations used to calculate it.
		• Calculation formula		Area=	width*Submerged Area			-	
	Filtered water volume	• Water volume		577.1385				m^3	Report filtered water volume and the equation used to calculate it
		• Calculation formula		Volume=	Distance*Area				
	Tow duration			20				min	
	Vessel speed			1.9				m/s	Speed relative to water **e.g., 1.5 m/s**
	Tow position			Side					The side of a vessel or the stern of a vessel
	Distance from vessel			1.0				m	
	Net immersion	• Net immersion depth		0.25				m	
		• Percentage of net immersion depth to size of		50				%	
		• Whether or not there was any change in the						-	
	Tow direction			Current → counter Wind →				-	e.g., direction relative to land, wind, ocean current, sources (reverse, etc.)
	Blank tests	• Whether or not blank tests were conducted		-				-	Evaluate the effect of contamination on sea-surface plastic concentrations during onboard sampling.
		• Results		-				particles/ sample	

Results of Plastic waste found in DWR Net Towing #1

No.	Plastic Product Item	Total Piece (pieces)	Total Weight (g)
MOST LIKELY TO FIND ITEMS:			
1	Food Wrappers (candy, chips, etc.)	1	0.1
2	Take Out/Away Containers (Plastic)		
3	Take Out/Away Containers (Foam)		
4	Bottle Caps & Lids	3	10.12
5	Straws/Stirrers	1	0.3
6	Forks, Knives, Spoons		
7	Beverage Bottles (Plastic)	1	15
8	Grocery Bags (Plastic)		
9	Other Plastic Bags		
10	Cups & Plates (Plastic)		
11	Cups & Plates (Foam)		
PACKAGING MATERIALS:			
12	4/6-Pack Holders		
13	Other Plastic/Foam Packaging	1	0.35
14	Other Plastic Bottles (oil, bleach, etc.)		
15	Strapping Bands		
FISHING GEAR:			
16	Fishing Buoys, Pots & Traps		
17	Fishing Net & Pieces	4	0.11
18	Fishing Line (1 yard/meter = 1 piece)		
19	Rope (1 yard/meter = 1 piece)		
OTHER TRASH:			
20	Appliances (refrigerators, washers, etc.)		
21	E-waste		
22	Cigarette Butts/Tips		
23	Construction Materials		
24	Fireworks		
25	Tires		
26	Other Plastic Material (Specify:)	6	0.08
PERSONAL HYGIENE:			
27	Condoms		
28	Diapers		
29	Medical Items (syringe, etc.)		
30	Tampons/Tampon Applicators		
31	Cotton Bud Sticks		
TINY TRASH LESS THAN 2.5 CM:			
32	Foam Pieces	2	0.54
33	Plastic Pieces	4	0.44

Datasheet MacroTowNet At DWR #2

The data-input form for riverine macroplastics monitoring.

Name of observer	Dr.Achara Ussawaruji kulchai	Organization	Faculty of Environmental and resource study Mahidol University	Cruise name	

Items				Results Input				Unit	Explanation/ Input Examples
Sampling date and location	Sample name/ ID			DWR2				-	
	Enter time difference from GMT.			7:00				-	
	Sampling date			9/10/2022				-	date/ month/ year
	Sampling time (Initial)			14	4	0		-	hour / minute / second
	Sampling time (Final)			14	24	0		-	
	Season			Wet Season				-	
	Sampling Location (Name)			H 013801 : DWR				-	e.g., Tokyo Bay (Tama Riv. estuary)
	GPS Log	• Input style		Decimal				-	Select "sexagesimal (base 60) notation" or "decimal notation" to input coordinates.
		• GPS Log (Initial position)	- Latitude	15 °	19.590 '	0 ″		N	Enter the coordinates in sexagesimal (base 60) or decimal notation.
			- Longitude	105 °	29.521 '	0 ″		E	
		• GPS Log (Final position)	- Latitude	15 °	19.697 '	0 ″		N	
			- Longitude	105 °	29.445 '	0 ″		E	
Sampling equipment	Classification of net frame	• Type of net frame		-				-	Manta, Neuston or other nets.
		• Model number and manufacturer		-				-	e.g., JMA Neuston net, RIGO Co., Ltd., No.5552
	Net aperture	• Shape of net aperture		Rectangle				-	Rectangular, square, circular, others
		• Size of net aperture	- Width	1				m	
			- Height	0.5				m	
			- Area	0.50				m^2	
	Length of net			2				m	
	Mesh	• Openings		2.5				mm	
								-	Select one side length or diagonal length
		• Model number and manufacturer		-				-	
Tow Parameter	Tow distance	• Distance		2137.937				m	Distance relative to water
		• Calculation method		Flow meter				-	Describe the method used to calculate the tow distance, such as: 1: Flow meter, 2: GPS (Recorded only initial and final points), 3: Vessel speed and duration time
		• Calculation formula		Distance=	Rotation rounds*26873/999999			-	
	Trawl sweep area	• Sweep area		0.3				m^2	Report sweep area and the equations used to calculate it.
		• Calculation formula		Area=	width*Submerged Area			-	
	Filtered water volume	• Water volume		534.48425				m^3	Report filtered water volume and the equation used to calculate it
		• Calculation formula		Volume=	Distance*Area				
	Tow duration			20				min	
	Vessel speed			1.8				m/s	Speed relative to water **e.g., 1.5 m/s**
	Tow position			Side					The side of a vessel or the stern of a vessel
	Distance from vessel			1.0				m	
	Net immersion	• Net immersion depth		0.25				m	
		• Percentage of net immersion depth to size of		50				%	
		• Whether or not there was any change in the						-	
	Tow direction			Current → counter Wind →				-	e.g., direction relative to land, wind, ocean current, sources (reverse, etc.)
	Blank tests	• Whether or not blank tests were conducted		-				-	Evaluate the effect of contamination on sea-surface plastic concentrations during onboard sampling.
		• Results		-				particles/ sample	

Results of Plastic waste found in DWR Net Towing #2

No.	Plastic Product Item	Total Piece (pieces)	Total Weight (g)
MOST LIKELY TO FIND ITEMS:			
1	Food Wrappers (candy, chips, etc.)		
2	Take Out/Away Containers (Plastic)		
3	Take Out/Away Containers (Foam)		
4	Bottle Caps & Lids	1	2.52
5	Straws/Stirrers		
6	Forks, Knives, Spoons		
7	Beverage Bottles (Plastic)		
8	Grocery Bags (Plastic)		
9	Other Plastic Bags		
10	Cups & Plates (Plastic)		
11	Cups & Plates (Foam)		
PACKAGING MATERIALS:			
12	4/6-Pack Holders		
13	Other Plastic/Foam Packaging		
14	Other Plastic Bottles (oil, bleach, etc.)		
15	Strapping Bands		
FISHING GEAR:			
16	Fishing Buoys, Pots & Traps		
17	Fishing Net & Pieces		
18	Fishing Line (1 yard/meter = 1 piece)	1.3	0.29
19	Rope (1 yard/meter = 1 piece)	0.3	
OTHER TRASH:			
20	Appliances (refrigerators, washers, etc.)		
21	E-waste		
22	Cigarette Butts/Tips		
23	Construction Materials		
24	Fireworks		
25	Tires		
26	Other Plastic Material (Specify:)	15	1.87
PERSONAL HYGIENE:			
27	Condoms		
28	Diapers		
29	Medical Items (syringe, etc.)		
30	Tampons/Tampon Applicators		
31	Cotton Bud Sticks		
TINY TRASH LESS THAN 2.5 CM:			
32	Foam Pieces		
33	Plastic Pieces	6	0.03

Datasheet MacroTowNet At DWR #3

The data-input form for riverine macroplastics monitoring.

Name of observer	Dr.Achara Ussawaruji kulchai	Organization	Faculty of Environmental and resource study Mahidol University	Cruise name	

Items				Results Input				Unit	Explanation/ Input Examples
Sampling date and location	Sample name/ ID			DWR3				-	
	Enter time difference from GMT.			7:00				-	
	Sampling date			9/10/2022				-	date/ month/ year
	Sampling time (Initial)			14	42	0		-	hour / minute / second
	Sampling time (Final)			15	9	0		-	
	Season			Wet Season				-	
	Sampling Location (Name)			H 013801 : DWR				-	e.g., Tokyo Bay (Tama Riv. estuary)
	GPS Log	• Input style		Decimal				-	Select "sexagesimal (base 60) notation" or "decimal notation" to input coordinates.
		• GPS Log (Initial position)	- Latitude	15 °	19.632 '	0 ″		N	Enter the coordinates in sexagesimal (base 60) or decimal notation.
			- Longitude	105 °	29.441 '	0 ″		E	
		• GPS Log (Final position)	- Latitude	15 °	19.682 '	0 ″		N	
			- Longitude	105 °	29.346 '	0 ″		E	
Sampling equipment	Classification of net frame	• Type of net frame		-				-	Manta, Neuston or other nets.
		• Model number and manufacturer		-				-	e.g., JMA Neuston net, RIGO Co., Ltd., No.5552
	Net aperture	• Shape of net aperture		Rectangle				-	Rectangular, square, circular, others
		• Size of net aperture	- Width	1				m	
			- Height	0.5				m	
			- Area	0.50				m^2	
	Length of net			2				m	
	Mesh	• Openings		2.5				mm	
								-	Select one side length or diagonal length
		• Model number and manufacturer		-				-	
Tow Parameter	Tow distance	• Distance		2140.678				m	Distance relative to water
		• Calculation method		Flow meter				-	Describe the method used to calculate the tow distance, such as: 1: Flow meter, 2: GPS (Recorded only initial and final points), 3: Vessel speed and duration time
		• Calculation formula		Distance=	Rotation rounds*26873/999999			-	
	Trawl sweep area	• Sweep area		0.25				m^2	Report sweep area and the equations used to calculate it.
		• Calculation formula		Area=	width*Submerged Area			-	
	Filtered water volume	• Water volume		535.1695				m^3	Report filtered water volume and the equation used to calculate it
		• Calculation formula		Volume=	Distance*Area				
	Tow duration			22				min	
	Vessel speed			1.6				m/s	Speed relative to water **e.g., 1.5 m/s**
	Tow position			Side					The side of a vessel or the stern of a vessel
	Distance from vessel			1.0				m	
	Net immersion	• Net immersion depth		0.25				m	
		• Percentage of net immersion depth to size of		50				%	
		• Whether or not there was any change in the						-	
	Tow direction			Current → counter Wind →				-	e.g., direction relative to land, wind, ocean current, sources (reverse, etc.)
	Blank tests	• Whether or not blank tests were conducted		-				-	Evaluate the effect of contamination on sea-surface plastic concentrations during onboard sampling.
		• Results		-				particles/ sample	

Results of Plastic waste found in DWR Net Towing #3

No.	Plastic Product Item	Total Piece (pieces)	Total Weight (g)
MOST LIKELY TO FIND ITEMS:			
1	Food Wrappers (candy, chips, etc.)		
2	Take Out/Away Containers (Plastic)		
3	Take Out/Away Containers (Foam)		
4	Bottle Caps & Lids	1	2.25
5	Straws/Stirrers		
6	Forks, Knives, Spoons		
7	Beverage Bottles (Plastic)		
8	Grocery Bags (Plastic)		
9	Other Plastic Bags		
10	Cups & Plates (Plastic)		
11	Cups & Plates (Foam)		
PACKAGING MATERIALS:			
12	4/6-Pack Holders		
13	Other Plastic/Foam Packaging		
14	Other Plastic Bottles (oil, bleach, etc.)		
15	Strapping Bands		
FISHING GEAR:			
16	Fishing Buoys, Pots & Traps		
17	Fishing Net & Pieces		
18	Fishing Line (1 yard/meter = 1 piece)		
19	Rope (1 yard/meter = 1 piece)	0.2	0.03
OTHER TRASH:			
20	Appliances (refrigerators, washers, etc.)		
21	E-waste		
22	Cigarette Butts/Tips		
23	Construction Materials		
24	Fireworks		
25	Tires		
26	Other Plastic Material (Specify:)	5	0.03
PERSONAL HYGIENE:			
27	Condoms		
28	Diapers		
29	Medical Items (syringe, etc.)		
30	Tampons/Tampon Applicators		
31	Cotton Bud Sticks		
TINY TRASH LESS THAN 2.5 CM:			
32	Foam Pieces		
33	Plastic Pieces	3	0.01

Summary of the result of Macroplastic Net Towing at DWR

No.	Plastic Product Item	Total Piece (pieces)	Total Weight (g)
MOST LIKELY TO FIND ITEMS:			
1	Food Wrappers (candy, chips, etc.)	1	0.1
2	Take Out/Away Containers (Plastic)	0	0
3	Take Out/Away Containers (Foam)	0	0
4	Bottle Caps & Lids	5	14.89
5	Straws/Stirrers	1	0.3
6	Forks, Knives, Spoons	0	0
7	Beverage Bottles (Plastic)	1	15
8	Grocery Bags (Plastic)	0	0
9	Other Plastic Bags	0	0
10	Cups & Plates (Plastic)	0	0
11	Cups & Plates (Foam)	0	0
PACKAGING MATERIALS:			
12	4/6-Pack Holders	0	0
13	Other Plastic/Foam Packaging	1	0.35
14	Other Plastic Bottles (oil, bleach, etc.)	0	0
15	Strapping Bands	0	0
FISHING GEAR:			
16	Fishing Buoys, Pots & Traps	0	0
17	Fishing Net & Pieces	4	0.11
18	Fishing Line (1 yard/meter = 1 piece)	1.3	0.29
19	Rope (1 yard/meter = 1 piece)	0.5	0.03
OTHER TRASH:			
20	Appliances (refrigerators, washers, etc.)	0	0
21	E-waste	0	0
22	Cigarette Butts/Tips	0	0
23	Construction Materials	0	0
24	Fireworks	0	0
25	Tires	0	0
26	Other Plastic Material (Specify:)	26	1.98
PERSONAL HYGIENE:			
27	Condoms	0	0
28	Diapers	0	0
29	Medical Items (syringe, etc.)	0	0
30	Tampons/Tampon Applicators	0	0
31	Cotton Bud Sticks	0	0
TINY TRASH LESS THAN 2.5 CM:			
32	Foam Pieces	2	0.54
33	Plastic Pieces	13	0.48

Summary of the result of Macroplastic Net Towing at DWR

Survey Results	Abbreviation	Calculation	Value	Unit
Total No. of Plastic Samples	P	To be measured	55.8	piece
No. of Plastic Samples per unit Volume	NPV	= P / Vs	0.034	piece/ m^3
Total Weight of Plastic Samples	W	To be measured	0.034	kg
Weight of Plastic Samples per unit Volume	WPV	= W / Vs	2.1E-05	kg/m^3

Datasheet MacroTowNet At WB #1

The data-input form for riverine macroplastics monitoring.

Name of observer	Dr.Achara Ussawaruji kulchai	Organization	Faculty of Environmental and resource study Mahidol University	Cruise name	

Items				Results Input				Unit	Explanation/ Input Examples
Sampling date and location	Sample name/ ID			WB1				-	
	Enter time difference from GMT.			7:00				-	
	Sampling date			10/10/2022				-	date/ month/ year
	Sampling time (Initial)			13	11	0		-	hour / minute / second
	Sampling time (Final)			13	31	0		-	
	Season			Wet Season				-	
	Sampling Location (Name)			Wernbuek : WB				-	e.g., Tokyo Bay (Tama Riv. estuary)
	GPS Log	• Input style		Decimal				-	Select "sexagesimal (base 60) notation" or "decimal notation" to input coordinates.
		• GPS Log (Initial position)	- Latitude	15 °	19.239 '	0 ″		N	Enter the coordinates in sexagesimal (base 60) or decimal notation.
			- Longitude	105 °	33.206 '	0 ″		E	
		• GPS Log (Final position)	- Latitude	15 °	19.212 '	0 ″		N	
			- Longitude	105 °	33.138 '	0 ″		E	
Sampling equipment	Classification of net frame	• Type of net frame		-				-	Manta, Neuston or other nets.
		• Model number and manufacturer		-				-	e.g., JMA Neuston net, RIGO Co., Ltd., No.5552
	Net aperture	• Shape of net aperture		Rectangle				-	Rectangular, square, circular, others
		• Size of net aperture	- Width	1				m	
			- Height	0.5				m	
			- Area	0.50				m^2	
	Length of net			2				m	
	Mesh	• Openings		2.5				mm	
								-	Select one side length or diagonal length
		• Model number and manufacturer		-				-	
Tow Parameter	Tow distance	• Distance		1806.8				m	Distance relative to water
		• Calculation method		Flow meter				-	Describe the method used to calculate the tow distance, such as: 1: Flow meter, 2: GPS (Recorded only initial and final points), 3: Vessel speed and duration time
		• Calculation formula		Distance=	Rotation rounds*26873/999999			-	
	Trawl sweep area	• Sweep area		0.4				m^2	Report sweep area and the equations used to calculate it.
		• Calculation formula		Area=	width*Submerged Area			-	
	Filtered water volume	• Water volume		722.72				m^3	Report filtered water volume and the equation used to calculate it
		• Calculation formula		Volume=	Distance*Area				
	Tow duration			20				min	
	Vessel speed			1.5				m/s	Speed relative to water **e.g., 1.5 m/s**
	Tow position			Side					The side of a vessel or the stern of a vessel
	Distance from vessel			1.0				m	
	Net immersion	• Net immersion depth		0.4				m	
		• Percentage of net immersion depth to size of		80				%	
		• Whether or not there was any change in the						-	
	Tow direction			Current → counter Wind →				-	e.g., direction relative to land, wind, ocean current, sources (reverse, etc.)
	Blank tests	• Whether or not blank tests were conducted		-				-	Evaluate the effect of contamination on sea-surface plastic concentrations during onboard sampling.
		• Results		-				particles/ sample	

Results of Plastic waste found in WB Net Towing #1

No.	Plastic Product Item	Total Piece (pieces)	Total Weight (g)
MOST LIKELY TO FIND ITEMS:			
1	Food Wrappers (candy, chips, etc.)		
2	Take Out/Away Containers (Plastic)		
3	Take Out/Away Containers (Foam)		
4	Bottle Caps & Lids		
5	Straws/Stirrers		
6	Forks, Knives, Spoons		
7	Beverage Bottles (Plastic)	1	19.9
8	Grocery Bags (Plastic)		
9	Other Plastic Bags		
10	Cups & Plates (Plastic)		
11	Cups & Plates (Foam)		
PACKAGING MATERIALS:			
12	4/6-Pack Holders		
13	Other Plastic/Foam Packaging		
14	Other Plastic Bottles (oil, bleach, etc.)		
15	Strapping Bands		
FISHING GEAR:			
16	Fishing Buoys, Pots & Traps		
17	Fishing Net & Pieces		
18	Fishing Line (1 yard/meter = 1 piece)		
19	Rope (1 yard/meter = 1 piece)		
OTHER TRASH:			
20	Appliances (refrigerators, washers, etc.)		
21	E-waste		
22	Cigarette Butts/Tips		
23	Construction Materials		
24	Fireworks		
25	Tires		
26	Other Plastic Material (Specify:)	4	0.02
PERSONAL HYGIENE:			
27	Condoms		
28	Diapers		
29	Medical Items (syringe, etc.)		
30	Tampons/Tampon Applicators		
31	Cotton Bud Sticks		
TINY TRASH LESS THAN 2.5 CM:			
32	Foam Pieces		
33	Plastic Pieces	2	0.01

Datasheet MacroTowNet At WB #2

The data-input form for riverine macroplastics monitoring.

Name of observer	Dr.Achara Ussawaruji kulchai	Organization	Faculty of Environmental and resource study Mahidol University	Cruise name	

Items				Results Input				Unit	Explanation/ Input Examples
Sampling date and location	Sample name/ ID			WB2				-	
	Enter time difference from GMT.			7:00				-	
	Sampling date			10/10/2022				-	date/ month/ year
	Sampling time (Initial)			13	44	0		-	hour / minute / second
	Sampling time (Final)			14	5	0		-	
	Season			Wet Season				-	
	Sampling Location (Name)			Wernbuek : WB				-	e.g., Tokyo Bay (Tama Riv. estuary)
	GPS Log	• Input style		Decimal				-	Select "sexagesimal (base 60) notation" or "decimal notation" to input coordinates.
		• GPS Log (Initial position)	- Latitude	15 °	19.286 '	0 ″		N	Enter the coordinates in sexagesimal (base 60) or decimal notation.
			- Longitude	105 °	33.669 '	0 ″		E	
		• GPS Log (Final position)	- Latitude	15 °	19.340 '	0 ″		N	
			- Longitude	105 °	33.595 '	0 ″		E	
Sampling equipment	Classification of net frame	• Type of net frame		-				-	Manta, Neuston or other nets.
		• Model number and manufacturer		-				-	e.g., JMA Neuston net, RIGO Co., Ltd., No.5552
	Net aperture	• Shape of net aperture		Rectangle				-	Rectangular, square, circular, others
		• Size of net aperture	- Width	1				m	
			- Height	0.5				m	
			- Area	0.50				m^2	
	Length of net			2				m	
	Mesh	• Openings		2.5				mm	
								-	Select one side length or diagonal length
		• Model number and manufacturer		-				-	
Tow Parameter	Tow distance	• Distance		1762.816				m	Distance relative to water
		• Calculation method		Flow meter				-	Describe the method used to calculate the tow distance, such as: 1: Flow meter, 2: GPS (Recorded only initial and final points), 3: Vessel speed and duration time
		• Calculation formula		Distance=	Rotation rounds*26873/999999			-	
	Trawl sweep area	• Sweep area		0.3				m^2	Report sweep area and the equations used to calculate it.
		• Calculation formula		Area=	width*Submerged Area			-	
	Filtered water volume	• Water volume		528.8448				m^3	Report filtered water volume and the equation used to calculate it
		• Calculation formula		Volume=	Distance*Area				
	Tow duration			21				min	
	Vessel speed			1.4				m/s	Speed relative to water **e.g., 1.5 m/s**
	Tow position			Side					The side of a vessel or the stern of a vessel
	Distance from vessel			1.0				m	
	Net immersion	• Net immersion depth		0.3				m	
		• Percentage of net immersion depth to size of		60				%	
		• Whether or not there was any change in the						-	
	Tow direction			Current → counter Wind →				-	e.g., direction relative to land, wind, ocean current, sources (reverse, etc.)
	Blank tests	• Whether or not blank tests were conducted		-				-	Evaluate the effect of contamination on sea-surface plastic concentrations during onboard sampling.
		• Results		-				particles/ sample	

Results of Plastic waste found in WB Net Towing #2

No.	Plastic Product Item	Total Piece (pieces)	Total Weight (g)
MOST LIKELY TO FIND ITEMS:			
1	Food Wrappers (candy, chips, etc.)		
2	Take Out/Away Containers (Plastic)		
3	Take Out/Away Containers (Foam)		
4	Bottle Caps & Lids		
5	Straws/Stirrers		
6	Forks, Knives, Spoons		
7	Beverage Bottles (Plastic)		
8	Grocery Bags (Plastic)		
9	Other Plastic Bags		
10	Cups & Plates (Plastic)		
11	Cups & Plates (Foam)		
PACKAGING MATERIALS:			
12	4/6-Pack Holders		
13	Other Plastic/Foam Packaging		
14	Other Plastic Bottles (oil, bleach, etc.)		
15	Strapping Bands		
FISHING GEAR:			
16	Fishing Buoys, Pots & Traps		
17	Fishing Net & Pieces		
18	Fishing Line (1 yard/meter = 1 piece)		
19	Rope (1 yard/meter = 1 piece)		
OTHER TRASH:			
20	Appliances (refrigerators, washers, etc.)		
21	E-waste		
22	Cigarette Butts/Tips		
23	Construction Materials		
24	Fireworks		
25	Tires		
26	Other Plastic Material (Specify:)	1	0.01
PERSONAL HYGIENE:			
27	Condoms		
28	Diapers		
29	Medical Items (syringe, etc.)		
30	Tampons/Tampon Applicators		
31	Cotton Bud Sticks		
TINY TRASH LESS THAN 2.5 CM:			
32	Foam Pieces		
33	Plastic Pieces	4	0.01

Datasheet MacroTowNet At WB #3

The data-input form for riverine macroplastics monitoring.

Name of observer	Dr.Achara Ussawaruji kulchai	Organization	Faculty of Environmental and resource study Mahidol University	Cruise name	

Items				Results Input				Unit	Explanation/ Input Examples
Sampling date and location	Sample name/ ID			WB2				-	
	Enter time difference from GMT.			7:00				-	
	Sampling date			10/10/2022				-	date/ month/ year
	Sampling time (Initial)			14	12	0		-	hour / minute / second
	Sampling time (Final)			14	31	0		-	
	Season			Wet Season				-	
	Sampling Location (Name)			Wernbuek : WB				-	e.g., Tokyo Bay (Tama Riv. estuary)
	GPS Log	• Input style		Decimal				-	Select "sexagesimal (base 60) notation" or "decimal notation" to input coordinates.
		• GPS Log (Initial position)	- Latitude	15 °	19.340 '	0 ″		N	Enter the coordinates in sexagesimal (base 60) or decimal notation.
			- Longitude	105 °	33.595 '	0 ″		E	
		• GPS Log (Final position)	- Latitude	15 °	19.341 '	0 ″		N	
			- Longitude	105 °	33.586 '	0 ″		E	
Sampling equipment	Classification of net frame	• Type of net frame		-				-	Manta, Neuston or other nets.
		• Model number and manufacturer		-				-	e.g., JMA Neuston net, RIGO Co., Ltd., No.5552
	Net aperture	• Shape of net aperture		Rectangle				-	Rectangular, square, circular, others
		• Size of net aperture	- Width	1				m	
			- Height	0.5				m	
			- Area	0.50				m^2	
	Length of net			2				m	
	Mesh	• Openings		2.5				mm	
								-	Select one side length or diagonal length
		• Model number and manufacturer		-				-	
Tow Parameter	Tow distance	• Distance		1653.95				m	Distance relative to water
		• Calculation method		Flow meter				-	Describe the method used to calculate the tow distance, such as: 1: Flow meter, 2: GPS (Recorded only initial and final points), 3: Vessel speed and duration time
		• Calculation formula		Distance=	Rotation rounds*26873/999999			-	
	Trawl sweep area	• Sweep area		0.3				m^2	Report sweep area and the equations used to calculate it.
		• Calculation formula		Area=	width*Submerged Area			-	
	Filtered water volume	• Water volume		413.4875				m^3	Report filtered water volume and the equation used to calculate it
		• Calculation formula		Volume=	Distance*Area				
	Tow duration			19				min	
	Vessel speed			1.5				m/s	Speed relative to water **e.g., 1.5 m/s**
	Tow position			Side					The side of a vessel or the stern of a vessel
	Distance from vessel			1.0				m	
	Net immersion	• Net immersion depth		0.25				m	
		• Percentage of net immersion depth to size of		50				%	
		• Whether or not there was any change in the						-	
	Tow direction			Current → counter Wind →				-	e.g., direction relative to land, wind, ocean current, sources (reverse, etc.)
	Blank tests	• Whether or not blank tests were conducted		-				-	Evaluate the effect of contamination on sea-surface plastic concentrations during onboard sampling.
		• Results		-				particles/ sample	

Results of Plastic waste found in WB Net Towing #3

No.	Plastic Product Item	Total Piece (pieces)	Total Weight (g)
MOST LIKELY TO FIND ITEMS:			
1	Food Wrappers (candy, chips, etc.)		
2	Take Out/Away Containers (Plastic)		
3	Take Out/Away Containers (Foam)		
4	Bottle Caps & Lids		
5	Straws/Stirrers		
6	Forks, Knives, Spoons		
7	Beverage Bottles (Plastic)		
8	Grocery Bags (Plastic)		
9	Other Plastic Bags		
10	Cups & Plates (Plastic)		
11	Cups & Plates (Foam)		
PACKAGING MATERIALS:			
12	4/6-Pack Holders		
13	Other Plastic/Foam Packaging		
14	Other Plastic Bottles (oil, bleach, etc.)		
15	Strapping Bands		
FISHING GEAR:			
16	Fishing Buoys, Pots & Traps		
17	Fishing Net & Pieces		
18	Fishing Line (1 yard/meter = 1 piece)		
19	Rope (1 yard/meter = 1 piece)	0.15	0.01
OTHER TRASH:			
20	Appliances (refrigerators, washers, etc.)		
21	E-waste		
22	Cigarette Butts/Tips		
23	Construction Materials		
24	Fireworks		
25	Tires		
26	Other Plastic Material (Specify:)	1	0.01
PERSONAL HYGIENE:			
27	Condoms		
28	Diapers		
29	Medical Items (syringe, etc.)		
30	Tampons/Tampon Applicators		
31	Cotton Bud Sticks		
TINY TRASH LESS THAN 2.5 CM:			
32	Foam Pieces		
33	Plastic Pieces	4	0.02

Summary of the result of Macroplastic Net Towing at WB

No.	Plastic Product Item	Total Piece (pieces)	Total Weight (g)
MOST LIKELY TO FIND ITEMS:			
1	Food Wrappers (candy, chips, etc.)	0	0
2	Take Out/Away Containers (Plastic)	0	0
3	Take Out/Away Containers (Foam)	0	0
4	Bottle Caps & Lids	0	0
5	Straws/Stirrers	0	0
6	Forks, Knives, Spoons	0	0
7	Beverage Bottles (Plastic)	1	19.9
8	Grocery Bags (Plastic)	0	0
9	Other Plastic Bags	0	0
10	Cups & Plates (Plastic)	0	0
11	Cups & Plates (Foam)	0	0
PACKAGING MATERIALS:			
12	4/6-Pack Holders	0	0
13	Other Plastic/Foam Packaging	0	0
14	Other Plastic Bottles (oil, bleach, etc.)	0	0
15	Strapping Bands	0	0
FISHING GEAR:			
16	Fishing Buoys, Pots & Traps	0	0
17	Fishing Net & Pieces	0	0
18	Fishing Line (1 yard/meter = 1 piece)	0	0
19	Rope (1 yard/meter = 1 piece)	0.15	0.01
OTHER TRASH:			
20	Appliances (refrigerators, washers, etc.)	0	0
21	E-waste	0	0
22	Cigarette Butts/Tips	0	0
23	Construction Materials	0	0
24	Fireworks	0	0
25	Tires	0	0
26	Other Plastic Material (Specify:)	6	0.04
PERSONAL HYGIENE:			
27	Condoms	0	0
28	Diapers	0	0
29	Medical Items (syringe, etc.)	0	0
30	Tampons/Tampon Applicators	0	0
31	Cotton Bud Sticks	0	0
TINY TRASH LESS THAN 2.5 CM:			
32	Foam Pieces	0	0
33	Plastic Pieces	10	0.04

Summary of the result of Macroplastic Net Towing at WB

Survey Results	Abbreviation	alculatio	Value	Unit
Total No. of Plastic Samples	P	To be measured	17.15	piece
No. of Plastic Samples per unit Volume	NPV	= P / Vs	0.010	piece/m^3
Total Weight of Plastic Samples	W	To be measured	0.020	kg
Weight of Plastic Samples per unit Volume	WPV	= W / Vs	1.2E-05	kg/m^3

Riverine Macroplastic Monitoring: Sampling by Tow Net

Datasheet Microplastic Tow Net at DWR

Name of observer	Dr.Achara Ussawarujikulchai	Organization	Faculty of Environmental and resource study Mahidol University	Cruise name	

Items				Results Input				Unit	Explanation/ Input Examples
Sampling date and location	Sample name/ ID			DWR2-Mic				-	
	Enter time difference from GMT.			7:00				-	
	Sampling date			9/10/2022				-	date/ month/ year
	Sampling time (Initial)			10	38			-	hour / minute / second
	Sampling time (Final)			10	50			-	
	Season			Wet Season				-	
	Sampling Location (Name)			H 013801 : DWR				-	e.g., Tokyo Bay (Tama Riv. estuary)
	GPS Log	• Input style		Decimal				-	Select sexagesimal (base 60) notation or decimal notation to input coordinates.
		• GPS Log (Initial	- Latitude	15 °	19.555 '			N	Enter the coordinates in sexagesimal (base 60) or decimal notation.
			- Longitude	105 °	29.445 '			E	
		• GPS Log (Final	- Latitude	15 °	19.455 °			N	
			- Longitude	105 °	29.670 °			E	
Sampling equipment	Classification of net frame	• Type of net frame		Neuston				-	Manta, Neuston or other nets.
		• Model number and manufacturer		-				-	e.g., JMA Neuston net, RIGO Co., Ltd., No.5552
	Net aperture	• Shape of net aperture		Rectangle				-	Rectangular, square, circular, others
		• Size of net aperture	- Width	1				m	
			- Height	0.5				m	
			- Area	0.50				m^2	
	Length of net			2				m	
	Mesh	• Openings		0.2				mm	
				-				-	Select one side length or diagonal length
		• Model number and		-				-	
Tow Parameter	Tow distance	• Distance		278.136				m	Distance relative to water
		• Calculation method		Flow meter				-	Describe the method used to calculate the tow distance such as: 1: Flow meter, 2: GPS (Recorded only initial and final points), 3: Vessel speed and duration time
		• Calculation formulas		Distance=	Rotation rounds*26873/999999			-	
	Trawl sweep area	• Sweep area		0.4				m^2	Report sweep area and the equations used to calculate it.
		• Calculation formulas		Area=	width*Submerged Area			-	
	Filtered water volume	• Water volume		102.91				m^3	Report filtered water volume and the equation used to calculate it
		• Calculation formulas		Volume=	Distance*Area				
	Tow duration			12				min	
	Vessel speed			1.8				m/s	Speed relative to water **e.g., 1.5 m/s**
	Tow position			Side					The side of a vessel or the stern of a vessel
	Distance from vessel			1.0				m	
	Net immersion	• Net immersion depth		0.37				m	
		• Percentage of net		74				%	
		• Whether or not there						-	
	Tow direction			Current → Counter Wind →				-	e.g., direction relative to land, wind, ocean current, sources (reverse, etc.)
	Blank tests	• Whether or not blank						-	Evaluate the effect of contamination on sea-surface plastic concentrations during
		• Results						particles / sample	

Name of observer	Dr.Achara Ussawarujikulchai	Organization	Faculty of Environmental and resource study Mahidol University	Cruise name	

Items			Results Input	Unit	Explanation/ Input Examples
Laboratory analysis					
Density separation	Whether or not density separation was conducted		Conducted	-	Record "Conducted" or "Not conducted".
	Type of solution used for density separation		NaCl	-	e.g., NaCl, $ZnCl_2$
	Concentration of solution used for density		30	%	
	Processing Time.		1440	min	Optional.
Biological digestion and chemical treatment	Whether or not biological digestion or chemical treatment was conducted		-	-	Record "Conducted" or "Not conducted".
	Methods used for digesting organic matter .		-	-	Acid treatment, alkali treatment, enzyme treatment, oxidation treatment, etc.
	Temperature during processing		75	°C	
	Reaction time		1920	min	
Sample splitting	Whether or not sample splitting was conducted		Conducted	-	Record "Conducted" or "Not conducted".
	Method or equipment of splitting			-	e.g., Folsom
	Estimated relative error range caused by your			%	
Picking of microplastic particles	Whether or not pretreatment before picking out particles conducted		Conducted	-	Record "Conducted" or "Not conducted".
	Type of pretreatment		removing non-plastic particles, size classification of plastics using sieves	-	e.g., removing non-plastic particles, size classification of plastics using sieves
	Whether or not picking was conducted under		Used	-	Record "Used" or "Not used"
Counting and measuring sizes of particles	Method of size fractionation		Sieves	-	Whether maximum diameter was measured or sieves were used
Identification of microplastics	Whether or not composition analysis was conducted		Conducted	-	"Conducted" or "Not conducted".
	Method of composition analysis		FTIR	-	e.g., FTIR, Raman spectroscopy, etc. ※When using methods other than spectroscopy to check the material (pricking with a heated needle, grinding with a forceps, etc.), describe them.
	Percentage of the particles subjected to		100	%	
Weight measurement	Temperature of sample drying		80	°C	
	Humidity of sample drying			%	
	Processing time of sample drying		48	min	
	Methods of weight measurements		-	-	e.g., weighing the particles directly on a scale, weighing the mass of the vial and microplastics together and subtracting the mass of the tared vial to provide the mass of the microplastics.
QA/QC	Blank tests	● Whether or not blank tests were conducted	-	-	"Conducted" or "Not conducted".
		● Results	-	particles/ sample	Outline procedure and results of blank tests in the laboratory analysis.
	Spiked recovery tests	● Whether or not spiked recovery tests were	-		"Conducted" or "Not conducted".
		● Results	-	particles/ sample	Outline procedure and results of spiked recovery tests in the laboratory analysis.

Name of observer	Dr.Achara Ussawarujikulchai	Organization	Faculty of Environmental and resource study Mahidol University	Cruise name	

Items				Results Input					Unit	Explanation/ Input Examples
Result										
Weight and number of plastic particles	Maximum Feret's diameter 1.0≤d<5.0	● Number of particles		33					particles/ sample	Record data in at least one of the three units given on the left, and provide information for converting data, if possible.
		● Particle density (per filtered water volume)		0.32					particles/m^3	
		● Particle density (per trawl swept area)		89.19					particles/m^2	
		● Total weight							g	
	Maximum Feret's diameter d<1.0	● Number of particle		150					particles/ sample	Please note that for particles less than 1 mm, final results could be regarded as underestimated (See pp.15~18, pp 47~48 in the Guidelines).
		● Particle density (per filtered water volume)		1.46					particles/m^3	
		● Particle density (per trawl swept area)		405.41					particles/m^2	
		● Total weight							g	
	Maximum Feret's diameter d≥5.0	● Number of particle		0					particles/ sample	
		● Particle density (per filtered water volume)		0.00					particles/m^3	
		● Particle density (per trawl swept area)		0.00					particles/m^2	
		● Total weight							g	
	Total	● Number of particle		183					particles/ sample	
		● Particle density (per filtered water volume)		1.78					particles/m^3	
		● Particle density (per		494.59					particles/m^2	
		● Total weight							g	
Properties of the plastic particles	1.0≤d<5.0	● Shapes of microplastic	- Category	Fragment	Fiber	Film			Total	Please input the top five categories in descending order of the observed characteristics of the collected plastic particles in each sample. When entering, please also enter the percentage (%) data. <Shape> Fragments, beads, foam, pellets and fibers are classification categories by shape commonly seen in many studies that currently perform classification by shape. <Material> e.g., PP, HDPE, LDPE, PU. <Color> Black, blue, white, transparent, red, green, multicolors and others are introduced as the most common classification categories.
			- Percentage	31.0%	33.0%	36.0%			100.0%	
		● Material of microplastic	- Category	PP	Polyester	Acrylic	LDPE		Total	
			- Percentage	73.0%	22.0%	0.0%	5.0%		100.0%	
		● Colors of microplastic	- Category	Blue	Green	White	Black	Red	Total	
			- Percentage	45.0%	18.0%	18.0%	18.0%	1.0%	100.0%	
	d<1.0	● Shapes of microplastic	- Category	Fragment	Fiber	Film			Total	
			- Percentage	91.0%	7.0%	2.0%			100.0%	
		● Material of microplastic	- Category	PP	Polyester	Acrylic	LDPE		Total	
			- Percentage	96.0%	2.0%	0.0%	2.0%		100.0%	
		● Colors of microplastic	- Category	Blue	Green	White	Orange	Red	Total	
			- Percentage	60.0%	17.0%	7.0%	2.0%	2.0%	88.0%	
	d≥5.0	● Shapes of microplastic	- Category						Total	
			- Percentage						0.0%	
		● Material of microplastic	- Category						Total	
			- Percentage						0.0%	
		● Colors of microplastic	- Category						Total	
			- Percentage						0.0%	
	Total	● Shapes of microplastic	- Category	Fragment	Fiber	Film			Total	
			- Percentage	73.0%	15.0%	12.0%			100.0%	
		● Material of microplastic	- Category	PP	Polyester	Acrylic	LDPE		Total	
			- Percentage	88.2%	8.8%	1.5%	1.5%		100.0%	
		● Colors of microplastic	- Category	Blue	Green	White	Black	Red	Total	
			- Percentage	56.0%	17.0%	12.0%	6.0%	6.0%	97.0%	
Notes										

Results of Microplastic waste found in DWR Net Towing #1

DWR2									
Sample name	Sample Derial Number	Image No.	Serial No. within image	Longest length [mm]	Shortest length [mm]	Dimen-sions [mm2]	Materials	Shape/ Form	Color
DWR-Up	1.1	1	1	1.449	0.418	0.039	Polyester	Fiber	Blue
DWR-Up	1.2	1	2	0.463	0.289	0.073	PP	Fragment	Blue
DWR-Up	1.3	1	3	1.377	0.516	0.099	PP	Fiber	Black
DWR-Up	2	2	2	0.629	0.078	0.029	PP	Fragment	Blue
DWR-Up	3.1	3	1	0.023	1.006	0.048	PP	Fragment	Green
DWR-Up	3.1	3	1	0.006	0.183	0.039	PP	Fragment	Green
DWR-Up	3.1	3	1	0.003	0.142	0.035	PP	Fragment	Green
DWR-Up	3.1	3	1	0.003	0.177	0.023	PP	Fragment	Green
DWR-Up	3.2	3	2	0.01	0.151	0.103	PP	Fragment	Green
DWR-Up	3.3	3	3	0.029	0.362	0.15	PP	Fragment	Blue
DWR-Up	3.4	3	4	0.067	0.63	0.167	PP	Fragment	Green
DWR-Up	4.1	4	1	0.231	0.081	0.009	PP	Fiber	Blue
DWR-Up	4.1	4	1	0.216	0.027	0.003	PP	Fiber	Blue
DWR-Up	4.2	4	2	0.5	0.338	0.039	PP	Fiber	Blue
DWR-Up	5.1	5	1	0.305	0.189	0.046	PP	Fragment	Blue
DWR-Up	5.1	5	1	0.555	0.33	0.103	PP	Fragment	Blue
DWR-Up	5.2	5	2	0.507	0.161	0.055	PP	Fragment	Blue
DWR-Up	5.3	5	3	0.544	0.221	0.065	PP	Fragment	Blue
DWR-Up	6.1	6	1	0.622	0.216	0.019	Polyester	Fiber	Blue
DWR-Up	6.2	6	2	1.843	0.264	0.058	Polyester	Fiber	Blue
DWR-Up	6.3	6	3	1.084	0.149	0.036	Cotton	Fiber	Transparent
DWR-Up	7.1	7	1	1.763	0.37	0.06	Polyester	Fiber	Black
DWR-Up	7.2	7	2	0.287	0.194	0.034	PP	Fragment	Green
DWR-Up	7.3	7	3	0.057	0.038	0.006	PP	Fragment	Green
DWR-Up	7.4	7	4	0.388	0.23	0.051	PP	Fragment	Blue
DWR-Up	8.1	8	1	0.313	0.221	0.038	PP	Fragment	Green
DWR-Up	8.2	8	2	0.213	0.124	0.02	Non P	Fragment	White
DWR-Up	8.3	8	3	2.798	0.789	0.116	Polyester	Fiber	Black
DWR-Up	9.1	9	1	0.476	0.179	0.061	PP	Fragment	Blue
DWR-Up	9.1	9	1	0.474	0.144	0.048	PP	Fragment	Blue
DWR-Up	9.1	9	1	0.709	0.223	0.105	PP	Fragment	Blue
DWR-Up	9.2	9	2	1.331	0.321	0.279	PP	Fragment	Blue
DWR-Up	9.3	9	3	0.418	0.285	0.072	PP	Fragment	Blue
DWR-Up	10.1	10	1	1.549	0.556	0.063	Rayon	Fiber	Blue
DWR-Up	10.2	10	2	0.496	0.252	0.08	PP	Fragment	Orange
DWR-Up	11.1	11	1	0.36	0.308	0.078	PP	Fragment	White
DWR-Up	11.2	11	2	0.294	0.128	0.029	Non P	Fragment	White
DWR-Up	12.1	12	1	0.24	0.185	0.028	PP	Fragment	White
DWR-Up	12.2	12	2	0.688	0.117	0.047	PP	Fragment	Blue
DWR-Up	12.3	12	3	0.662	0.307	0.091	PP	Fragment	White
DWR-Up	13	13	13	0.11	0.051	0.015	PP	Fragment	White
DWR-Up	14.1	14	1	0.328	0.251	0.047	Non P	Fragment	White
DWR-Up	14.2	14	2	0.293	0.128	0.02	PP	Fragment	Red
DWR-Up	14.3	14	3	0.805	0.164	0.067	PP	Fragment	Red
DWR-Up	15	15	15	0.28	0.183	0.018	PP	Fragment	Blue
DWR-Up	16.1	16	1	0.127	0.028	5.956E-05	Rayon	Fiber	Transparent
DWR-Up	16.2	16	2	0.14	0.013	5.802E-05	Silk	Fiber	Transparent
DWR-Up	17.1	17	1	0.011	0.005	3.427E-05	PP	Fragment	Yellow
DWR-Up	17.2	17	2	0.009	0.006	3.541E-05	Non P	Foam	White
DWR-Up	17.3	17	3	0.007	0.006	2.998E-05	PP	Fragment	Blue
DWR-Up	18.1	18	1	0.017	0.005	0.0000495	PP	Fragment	Blue
DWR-Up	18.2	18	2	0.012	0.006	0.000046	PP	Fragment	Blue
DWR-Up	18.2	18	2	0.012	0.006	3.717E-05	PP	Fragment	Blue
DWR-Up	18.3	18	3	0.008	0.006	3.214E-05	PP	Fragment	Blue
DWR-Up	19.1	19	1	0.015	0.004	0.0000379	PP	Fragment	Blue
DWR-Up	19.2	19	2	0.015	0.007	0.000064	Alumina Silicate	Fragment	Black
DWR-Up	19.3	19	3	0.009	0.007	0.0000446	Polyester	Fiber	Black
DWR-Up	19.4	19	4	0.023	0.008	0.0000211	PP	Fragment	Blue
DWR-Up	20.1	20	1	0.005	0.003	8.895E-06	PP	Fragment	Blue
DWR-Up	20.2	20	2	0.005	0.004	1.328E-05	PP	Fragment	Blue
DWR-Up	20.3	20	3	0.005	0.003	9.918E-06	PP	Fragment	Blue
DWR-Up	21.1	21	1	0.599	0.412	0.155	Non P	Fragment	Black
DWR-Up	21.1	21	1	0.388	0.278	0.058	Non P	Fragment	Black
DWR-Up	21.2	21	2	0.013	0.005	4.078E-05	PP	Fragment	Blue
DWR-Up	21.3	21	3	0.028	0.003	5.759E-05	PP	Fragment	Blue
DWR-Down	D1.1	D1	D1	0.864	0.129	0.029	Acrylic	Fiber	Pink
DWR-Down	D1.2	D1	2	0.665	0.278	0.135	Non P	Fragment	Black
DWR-Down	D1.3	D1	3	0.309	0.252	0.047	Non P	Fragment	White
DWR-Down	D1.3	D1	3	0.264	0.213	0.039	Non P	Fragment	White
DWR-Sieving	s1	s1	s1	5.241	2.362	10.065	PP	Film	White
DWR-Sieving	s11	s11	s11	1.274	0.116	0.11	PP	Fragment	Green
DWR-Sieving	s12	s12	s12	4.033	0.845	2.553	PP	Film	Blue
DWR-Sieving	s13	s13	s13	4.205	0.483	1.503	PP	Film	Blue
DWR-Sieving	s14	s14	s14	0.771	0.316	0.133	PP	Fragment	Blue
DWR-Sieving	s2	s2	s2	5.346	2.163	7.73	PP	Film	White
DWR-Sieving	s3	s3	s3	5.513	3.368	10.457	PP	Film	White
DWR-Sieving	s4	s4	s4	5.46	3.28	10.744	LDPE	Film	White
DWR-Sieving	s5	s5	s5	1.151	0.354	0.344	PP	Fragment	Blue
DWR-Sieving	s6	s6	s6	2.163	0.541	0.681	PP	Fragment	Green
DWR-Sieving	s7	s7	s7	2.131	0.661	0.838	PP	Fragment	Green
DWR-Sieving	s8	s8	s8	3.703	2.236	5.837	PP	Film	Blue
DWR-Sieving	s9	s9	s9	3.908	3.144	7.048	PP	Film	Blue

Datasheet Microplastic Tow Net at WB

Name of observer	Dr.Achara Ussawarujikulchai	Organization	Faculty of Environmental and resource study Mahidol University	Cruise name	

Items				Results Input				Unit	Explanation/ Input Examples
Sampling date and location	Sample name/ ID			WB2				-	
	Enter time difference from GMT.			7:00				-	
	Sampling date			#########				-	date/ month/ year
	Sampling time (Initial)			10	14			-	hour / minute / second
	Sampling time (Final)			10	24			-	
	Season			Wet Season				-	
	Sampling Location (Name)			WB				-	e.g., Tokyo Bay (Tama Riv. estuary)
	GPS Log	• Input style		Decimal				-	Select sexagesimal (base 60) notation or decimal notation to input coordinates.
		• GPS Log (Initial position)	- Latitude	15 °	19.246 '			N	Enter the coordinates in sexagesimal (base 60) or decimal notation.
			- Longitude	105 °	33.315 '			E	
		• GPS Log (Final position)	- Latitude	15 °	19.287 °			N	
			- Longitude	105 °	33.463 °			E	
Sampling equipment	Classification of net frame	• Type of net frame		Neuston				-	Manta, Neuston or other nets.
		• Model number and manufacturer		-				-	e.g., JMA Neuston net, RIGO Co., Ltd., No.5552
	Net aperture	• Shape of net aperture		Rectangle				-	Rectangular, square, circular, others
		• Size of net aperture	- Width	1				m	
			- Height	0.5				m	
			- Area	0.50				m^2	
	Length of net			2				m	
	Mesh	• Openings		0.2				mm	
				-				-	Select one side length or diagonal length
		• Model number and		-				-	
Tow Parameter	Tow distance	• Distance		588.385				m	Distance relative to water
		• Calculation method		Flow meter				-	Describe the method used to calculate the tow distance such as: 1: Flow meter, 2: GPS (Recorded only initial and final points), 3: Vessel speed and duration time
		• Calculation formulas		Distance=	Rotation rounds*26873/999999			-	
	Trawl sweep area	• Sweep area		588.4				m^2	Report sweep area and the equations used to calculate it.
		• Calculation formulas		Area=	width*Submerged Area			-	
	Filtered water volume	• Water volume		176.52				m^3	Report filtered water volume and the equation used to calculate it
		• Calculation formulas		Volume=	Distance*Area				
	Tow duration			10				min	
	Vessel speed			1.8				m/s	Speed relative to water **e.g., 1.5 m/s**
	Tow position			Side					The side of a vessel or the stern of a vessel
	Distance from vessel			1.0				m	
	Net immersion	• Net immersion depth		0.3				m	
		• Percentage of net		60				%	
		• Whether or not there was						-	
	Tow direction			Current → Counter Wind →				-	e.g., direction relative to land, wind, ocean current, sources (reverse, etc.)
	Blank tests	• Whether or not blank tests were conducted		conducted				-	Evaluate the effect of contamination on sea-surface plastic concentrations during onboard sampling.
		• Results						particles / sample	

Name of observer	Dr.Achara Ussawarujikulchai	Organization	Faculty of Environmental and resource study Mahidol University	Cruise name	

Items			Results Input	Unit	Explanation/ Input Examples
Laboratory analysis					
Density separation	Whether or not density separation was conducted		Conducted	-	Record "Conducted" or "Not conducted".
	Type of solution used for density separation		NaCl	-	e.g., NaCl, $ZnCl_2$
	Concentration of solution used for density		30	%	
	Processing Time.		1440	min	Optional.
Biological digestion and chemical treatment	Whether or not biological digestion or chemical treatment was conducted		-	-	Record "Conducted" or "Not conducted".
	Methods used for digesting organic matter .		-	-	Acid treatment, alkali treatment, enzyme treatment, oxidation treatment, etc.
	Temperature during processing		75	°C	
	Reaction time		1920	min	
Sample splitting	Whether or not sample splitting was conducted		Conducted	-	Record "Conducted" or "Not conducted".
	Method or equipment of splitting			-	e.g., Folsom
	Estimated relative error range caused by your			%	
Picking of microplastic particles	Whether or not pretreatment before picking out particles conducted		Conducted	-	Record "Conducted" or "Not conducted".
	Type of pretreatment		removing non-plastic particles, size classification of plastics using sieves	-	e.g., removing non-plastic particles, size classification of plastics using sieves
	Whether or not picking was conducted under stereomicroscope.		Used	-	Record "Used" or "Not used"
Counting and measuring sizes of particles	Method of size fractionation		Sieves	-	Whether maximum diameter was measured or sieves were used
Identification of microplastics	Whether or not composition analysis was conducted		Conducted	-	"Conducted" or "Not conducted".
	Method of composition analysis		FTIR	-	e.g., FTIR, Raman spectroscopy, etc. ※When using methods other than spectroscopy to check the material (pricking with a heated needle, grinding with a forceps, etc.), describe them.
	Percentage of the particles subjected to		100	%	
Weight measurement	Temperature of sample drying		80	°C	
	Humidity of sample drying			%	
	Processing time of sample drying		48	min	
	Methods of weight measurements		-	-	e.g., weighing the particles directly on a scale, weighing the mass of the vial and microplastics together and subtracting the mass of the tared vial to provide the mass of the microplastics.
QA/QC	Blank tests	• Whether or not blank tests were conducted	-	-	"Conducted" or "Not conducted".
		• Results	-	particles/ sample	Outline procedure and results of blank tests in the laboratory analysis.
	Spiked recovery tests	• Whether or not spiked recovery tests were	Cconducted		"Conducted" or "Not conducted".
		• Results	-	particles/ sample	Outline procedure and results of spiked recovery tests in the laboratory analysis.

Name of observer	Dr.Achara Ussawarujikulchai	Organization	Faculty of Environmental and resource study Mahidol University	Cruise name	

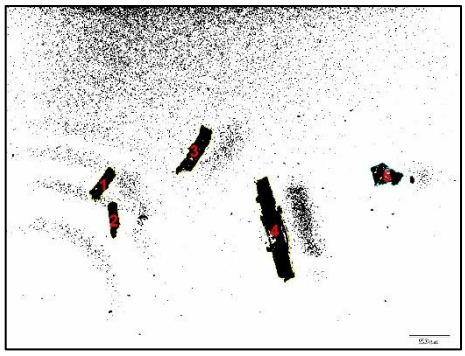
Items				Results Input					Unit	Explanation/ Input Examples
Result										
Weight and number of plastic particles	Maximum Feret's diameter 1.0≤d<5.0	• Number of particles		40					particles / sample	Record data in at least one of the three units given on the left, and provide information for converting data, if possible.
		• Particle density (per filtered water volume)		0.23					particles /m^3	
		• Particle density (per trawl swept area)		0.07					particles /m^2	
		• Total weight							g	
	Maximum Feret's diameter d<1.0	• Number of particle		17					particles / sample	Please note that for particles less than 1 mm, final results could be regarded as underestimated (See pp.15~18, pp 47~48 in the Guidelines).
		• Particle density (per filtered water volume)		0.10					particles /m^3	
		• Particle density (per trawl swept area)		0.03					particles /m^2	
		• Total weight							g	
	Maximum Feret's diameter d≥5.0	• Number of particle		0					particles / sample	
		• Particle density (per filtered water volume)		0.00					particles /m^3	
		• Particle density (per trawl swept area)		0.00					particles /m^2	
		• Total weight							g	
	Total	• Number of particle		57					particles / sample	
		• Particle density (per filtered water volume)		0.32					particles /m^3	
		• Particle density (per trawl swept area)		0.10					particles /m^2	
		• Total weight							g	
Properties of the plastic particles	1.0≤d<5.0	• Shapes of microplastic	- Category	Fragment	Fiber	Film			Total	Please input the top five categories in descending order of the observed characteristics of the collected plastic particles in each sample. When entering, please also enter the percentage (%) data. <Shape> Fragments, beads, foam, pellets and fibers are classification categories by shape commonly seen in many studies that currently perform classification by shape. <Material> e.g., PP, HDPE, LDPE, PU. <Color> Black, blue, white, transparent, red, green, multicolors and others are introduced as the most common classification categories.
			-	11.0%	56.0%	33.0%			100.0%	
		• Material of microplastic	- Category	PP	Polyeste	Acrylic	LDPE	PET	Total	
			-	56.0%	33.0%	0.0%	0.0%	1.0%	90.0%	
		• Colors of microplastic	- Category	Blue	Green	White	Trans	Red	Total	
			-	33.0%	0.0%	33.0%	11.0%	0.0%	77.0%	
	d<1.0	• Shapes of microplastic	- Category	Fragment	Fiber	Film			Total	
			-	92.0%	8.0%	0.0%			100.0%	
		• Material of microplastic	- Category	PP	Polyeste	Acrylic	LDPE		Total	
			-	75.0%	17.0%	0.0%	8.0%		100.0%	
		• Colors of microplastic	- Category	Blue	Green	Trans	Orange	Red	Total	
			-	83.0%	9.0%	0.0%	0.0%	8.0%	100.0%	
	d≥5.0	• Shapes of microplastic	- Category						Total	
			-						0.0%	
		• Material of microplastic	- Category						Total	
			-						0.0%	
		• Colors of microplastic	- Category						Total	
			-						0.0%	
	Total	• Shapes of microplastic	- Category	Fragment	Fiber	Film			Total	
			-	55.0%	27.0%	18.0%			100.0%	
		• Material of microplastic	- Category	PP	Polyeste	PET	LDPE		Total	
			-	64.0%	28.0%	4.0%	4.0%		100.0%	
		• Colors of microplastic	- Category	Blue	Green	White	Trans	Red	Total	
			-	73.0%	5.0%	18.0%	3.0%	1.0%	100.0%	

Results of Microplastic waste found in DWR Net Towing #1

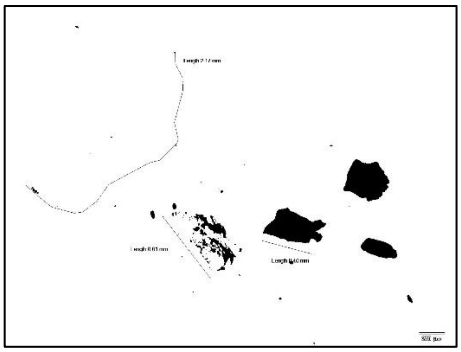
WB2									
Sample name	Sample Derial Number	Image No.	Serial No. within image	Longest length [mm]	Shortest length [mm]	Dimen-sions [mm2]	Materials	Shape/ Form	Color
WB-Up	1.3	1	3	0.487	0.292	0.084	PP	Fragment	Green
WB-Up	2	2	2	0.286	0.217	0.042	Non P	Foam	White
WB-Up	3.1	3	1	0.485	0.189	0.065	PP	Fragment	Blue
WB-Up	3.2	3	2	0.304	0.213	0.041	PP	Fragment	Red
WB-Up	3.3	3	3	0.322	0.193	0.027	PP	Fragment	Blue
WB-Up	3.4	3	4	0.207	0.186	0.017	PP	Fragment	Blue
WB-Up	3.5	3	5	0.449	0.264	0.064	PP	Fragment	Blue
WB-Up	3.6	3	6	0.457	0.273	0.068	PP	Fragment	Blue
WB-Up	4.2	4	2	1.011	0.285	0.02	Polyester	Fiber	Blue
WB-Up	5.1	5	1	0.599	0.404	0.018	Polyester	Fiber	Blue
WB-Up	5.2	5	2	0.479	0.186	0.029	Rayon	Fiber	Transparent
WB-Up	5.3	5	3	0.183	0.145	0.02	Non P	Foam	White
WB-Up	6.1	6	1	0.875	0.396	0.025	Polyester	Fiber	Blue
WB-Up	6.2	6	2	0.285	0.033	0.003	Polyester	Fiber	Blue
WB-Up	6.3	6	3	0.323	0.07	0.003	Polyester	Fiber	Blue
WB-Up	7.1	7	1	0.39	0.506	0.003	Cellulose	Fiber	Transparent
WB-Up	7.2	7	2	1.657	0.507	0.132	Cellulose	Fiber	Transparent
WB-Up	7.3	7	3	1.809	0.751	0.094	Cellulose	Fiber	Transparent
WB-Up	9	9	9	0.31	0.108	0.011	Polyester	Fragment	Blue
WB-Up	12.1	12	1	0.376	0.313	0.074	LDPE	Fragment	Blue
WB-Up	12.2	12	2	0.364	0.292	0.066	Non P	Fragment	Black
WB-Up	12.3	12	3	0.288	0.06	0.006		Fiber	Black
WB-Up	13.1	13	1	0.145	0.104	0.01	PP	Fragment	Blue
WB-Up	13.2	13	2	0.054	0.046	0.001	PP	Fragment	Blue
WB-Down	D3.1	D3	1	0.711	0.361	0.025	PET	Fiber	Blue
WB-Sieving	S2	S2	2	3.464	2.009	4.763	PP	Film	White
WB-Sieving	S3	S3	3	4.821	2.158	6.704	PP	Film	White
WB-Sieving	S4	S4	4	4.034	2.609	7.784	PP	Film	White
WB-Sieving	s8	S8	8	1.366	0.639	0.422	PP	Fragment	Transparent
WB-Sieving	s9	S9	9	4.195	1.453	2.932	PP	Film	White

Some of Samples after used Image J for image processing

DWR – 9

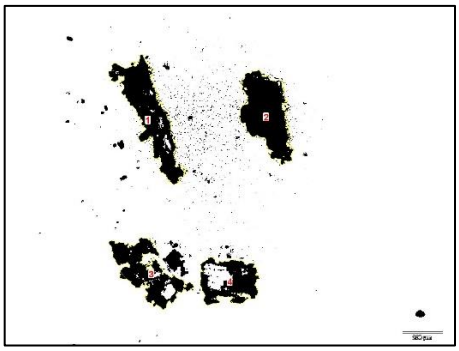


DWR – 9

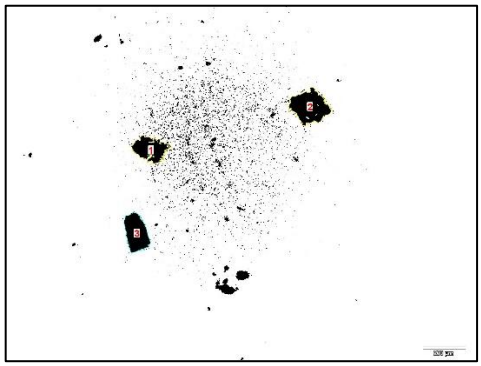


DWR – 14

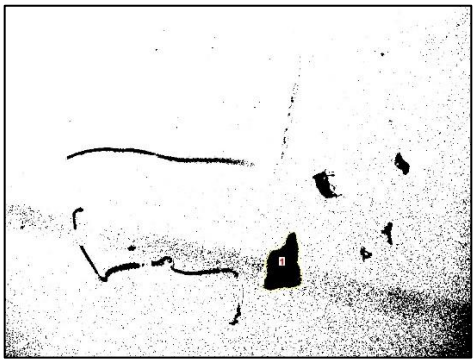
DWR – 18



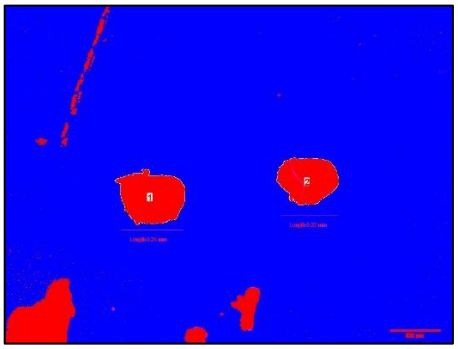
DWR – 20



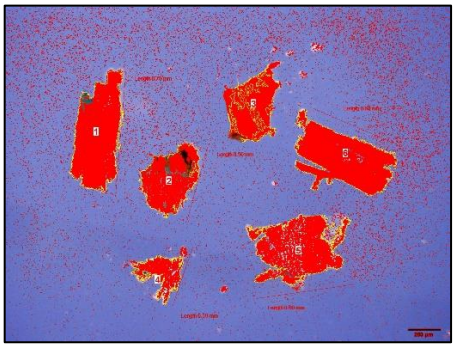
WB – 1



WB – 2



WB – 3

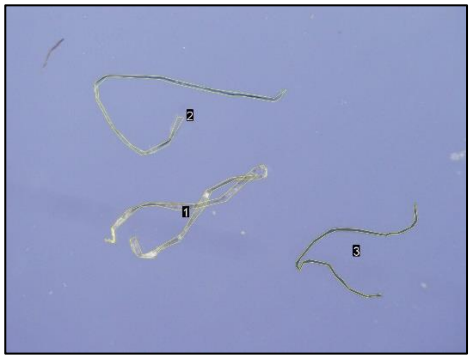


WB – 4

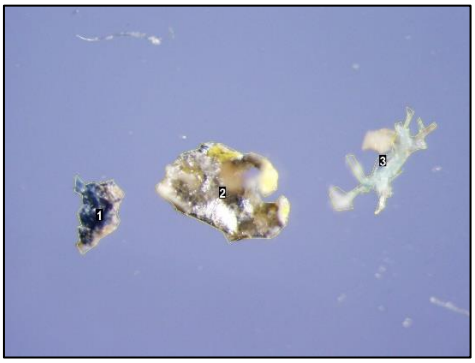
WB – 5

WB – 6

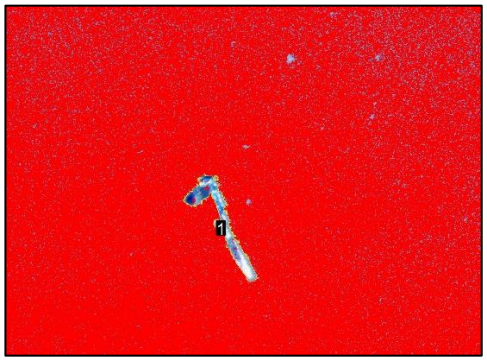
WB – 7



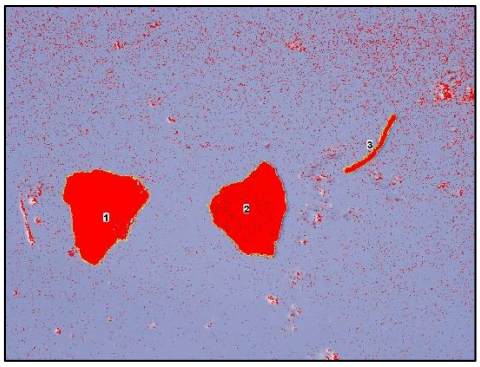
WB – 8



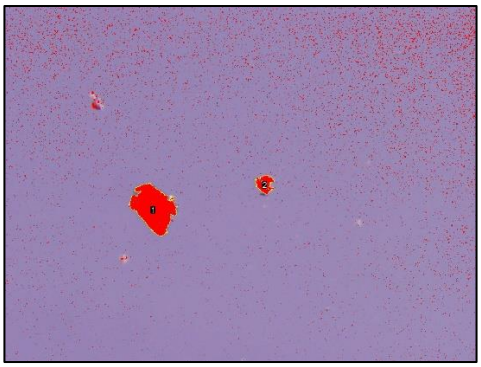
WB – 7



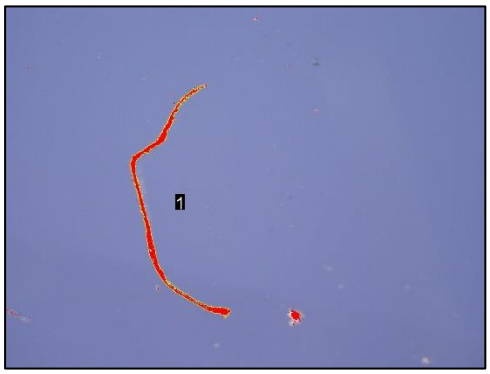
WB – 8



WB – 7



WB – 8



WB – 7