REPORT

ON THE WATER QUALITY OF RIVERS/STREAMS & AMBIENT NOISE LEVEL QUALITY AT THE IMMERSION SITES OF THE IDOLS OCTOBER, 2021



Meghalaya State Pollution Control Board Shillong 'Arden', Lumpyngngad, Shillong - 793014, Meghalaya

1. MONITORING OF RIVERS USED AS IMMERSION SITES

The Meghalaya State Pollution Control Board, Shillong, in pursuance to the Revised Guidelines for Idol Immersion published by Central Pollution Control Board, Delhi, conducted the monitoring of the rivers located in Shillong, Tura and Jowai where Immersion sites are located. The monitoring was conducted with the aim of assessing the environmental impact due to such immersion.

SAMPLING METHODOLOGY

The sampling procedure used during collection of samples from the selected sites is the 'Grab Sample' method.

The monitoring was conducted in six phases:

- Phase 1 -<u>Pre-immersion monitoring</u>, conducted on the 12th October 2021.
- Phase 2-<u>Immersion Day monitoring</u>, conducted on the 15th October 2021.
- Phase 3-Post-immersion monitoring:
 - > Third day after immersion on18th October 2021
 - ▶ Fifth day after immersion on 20th October 2021
 - Seventh day after immersion on 22nd October 2021
 - > Ninth day after immersion on 24th October 2021

The monitoring was conducted at three Immersion sites:

- i. Shillong, East Khasi Hills District: The Immersion site is located along the river Umkhrah at Polo, Shillong. The three (3) sampling points selected along the stretches of the river for collection of water samples are:
 - (i) 1stsampling point approximately 100 meters upstream of the immersion site
 - (ii) 2ndsampling point Immersion site.
 - (iii) 3rdsampling point approximately 100 meters downstream of the site.
- **ii.** Jowai, West Jaintia Hills District: The Immersion Ghat is located along the river Myntdu at Lynter Archaka, Syntu Ksiar. The three (3) sampling points selected along the stretches of the river for collection of water samples are:
 - (i) 1stsampling point approximately 100 meters upstream of the immersion site
 - (ii) 2ndsampling point Immersion site

(iii) 3rdsampling point - approximately 100 meters downstream of the site.

- iii. Tura, West Garo Hills District: The Immersion Ghat is located along the river Babupara-Rongkhon at Babupara. The three (3) sampling points selected along the stretches of the river for collection of water samples are:
 - (i) 1stsampling point approximately 100 meters upstream of the immersion site
 - (ii) 2ndsampling point Immersion site
 - (iii) 3rdsampling point approximately 100 meters downstream of the site

PARAMETERS ANALYZED

- The quality of water at the selected sampling points have been examined in terms of Temperature, pH, Conductivity, Dissolved Oxygen, Turbidity, Total Dissolved Solids, Bacteriological Oxygen Demand, Chemical Oxygen Demand, Hardness, Alkalinity, Total Suspended Solids, Chromium, Copper, Lead and Zinc among the Physico-Chemical parameters.
- The analysis was carried out in accordance with the standard procedures APHA-AWWA-WEF (American Public Health Association, American Water Works Association, Water Environment Federation) 23rd Edn.
- The analysis result of the rivers Umkhrah, Myntdu and Babupara-Rongkhon is presented in Table1, 2 & 3 respectively.

FINDINGS

From the analysis data **(Table 1, Table 2 & Table 3),** it was observed that there was no significant changes in the concentration of parameters analysed during the three phases of monitoring at the monitored water bodies so as to characterize any alteration in their characteristics as a result of immersion of idols into the water systems.

AMBIENT NOISE LEVEL MONITORING

Ambient noise level monitoring was conducted at the respective immersion ghats/sites at Shillong, Tura and Jowai in order to assess the level of noise during during the festival. The monitoring was conducted on the 15th Oct 2021, i.e., the day of immersion.

The monitoring team was equipped with Envirotech SLM 109 Sound Level Meters and the noise level was measured in dB (A) i.e., the level of sound in decibels on scale – A, as per the human

ear sensitivity requirements. The result was expressed in Leq, denoting the A weighted energy mean of the noise level averaged over the measurement period and compared with the national ambient noise level standard(s).

The noise level was recorded for a total of 1-hour duration wherein Leq readings were monitored for every half-hour interval.

The levels recorded during the occasion at the respective immersion sites in Shillong, Tura and Jowai is given in tables below:

	INDEE 1										
Location A	River U	River Umkhrah Immersion Site, Polo, Shillong									
Time duration	Leq dB(A)	Ambient Noise Level Standard									
		(Day time)									
		[Residential Area]									
		Leq dB(A)									
11:50 Hrs. to 12:20 Hrs.	69.5	55.0									
12:20 Hrs. to 12:50 Hrs.	70.6										

TABLE 1-A

The above table (Table 1-A) reveals that the ambient noise level at the immersion ghat along the river Umkhrah at Polo, Shillong, monitored on the 15th of October, 2021, is on the higher side.

The levels recorded at every half-hourly interval from the time duration of 11:50 Hrs. (11:50 am) to 12:20 pm (12:20 pm) and 12:20 Hrs. (12:20 pm) to 12:50 Hrs. (12:50 pm) shows that the level exceeds the daytime Ambient Noise Standard of 55.0 dB(A) Leq (for a Residential area).

The noise, as observed on the above day and duration of monitoring, is due to various activities at the immersion ghat/site viz. shouts of celebration, beating of drums, singing and playing of musical instruments etc. during the immersion process.

However, the monitored data reveals that the level is higher than during Kali Puja 2020.

TABLE 1-B

Location B	River Babupara-Rongkhon Immersion Site, Babupara, Tura								
Time duration	Leq dB(A)	Ambient Noise Level Standard							
		(Day time)							
		[Residential Area]							
		Leq dB(A)							
16:00 Hrs. to 16:30 Hrs.	72.6	55.0							
16:30 Hrs. to 17:00 Hrs.	75.1								

The above table (Table 1-B) reveals that the ambient noise level at the immersion ghat along the river Babupara-Rongkhon at Babupara, Tura, monitored on the 15th Oct 2021, is high.

The levels recorded at every half-hourly interval from the time duration of 16:00 Hrs. (04:00 pm) to 16:30 Hrs. (04:30 pm) and 16:30 Hrs. (04:30 pm) to 17:00 Hrs. (05:00 pm) shows that the level obtained exceeds the daytime Ambient Noise Standard of 55.0 dB(A) Leq (for a Residential area).

The noise, as observed on the above day and duration of monitoring, is due to festive activities during the immersion process. However, here again, the monitored data reveals that the level is much higher than that during Kali Puja 2020.

TABLE :	1-C
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Location: C	River Myntdu Immersion Site, Syntu Ksiar, Jowai									
Time duration	Leq dB(A)	Ambient Noise Level Standard								
		(Day time)								
		[Residential Area]								
		Leq dB(A)								
14:10 Hrs. to 14:40 Hrs.	60.8	55.0								
14:40 Hrs. to 15:10 Hrs.	61.2									

The table above (Table 1-C) displaying the ambient noise level at the immersion ghat along the river Myntdu at Lynter Archaka, Syntu Ksiar, Jowai, monitored on the 15th Oct 2021, reveals that the level is above the daytime Ambient Noise Standard of 55.0 dB(A) Leq (for a Residential area) during both half-hourly monitored time intervals from 14:10 Hrs. (02:10 pm) to 14:40 Hrs. (02:40 pm) and 14:40 Hrs. (02:40 pm) to 15:10 Hrs. (03:10 pm). Once again, the monitored data reveals that the level is significantly higher than that during Kali Puja 2020.

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TABLE 1: WATER QUALITY DATA OF RIVER WAH UMKHRAH DURING PRE-IMMERSSION, IMMERSION & POST-IMMERSION DAY, KALI PUJA FESTIVAL 2021

			Si	te I										Site III							
		(100m Upstream of Immersion Ghat)							Sit	e II			(100 m downstream of Immersion Ghat)								
								n	(Site of Imm	ersion Ghat)											
	Pre-	Immersion	Post		Post Immersion	ı	Pre-	Immersion	Post		Post Immersio	n	Pre-	Immersion	Post		Post Immersio	1			
	Day	Day	immersion				Day	Day	immersion				Day	Day	Immersion						
Date of Sampling	12.10.2021	15.10.2021	18.10.2021	20.10.2021	22.10.2021	24.10.2021	12.10.2021	15.10.2021	18.10.2021	20.10.2021	22.10.2021	24.10.2021	12.10.2021	15.10.2021	18.10.2021	20.10.2021	22.10.2021	24.10.2021			
				(5 th)	(7 th)	(9 th)				(5 th)	(7 th)	(9 th)				(5 th)	(7 th)	(9 th)			
Time	12:30	3:50	1:05	1:00	2:05	1:10	12:45	4:40	1:20	1:20	2:20	1:15	12:55	4:20	1:30	1:35	2:50	1:35			
Weather	Clear	Cloudy	Clear	Raining	Clear	Cloudy	Clear	Cloudy	Clear	Raining	Clear	Cloudy	Clear	Cloudy	Clear	Raining	Clear	Cloudy			
Colour	Clear	Brown	Clear	Brown	Clear	Clear	Clear	Brown	Clear	Brown	Clear	Clear	Clear	Brown	Clear	Brown	Clear	Clear			
Temperature (°C)	15.0	14.0	15.0	15.0	15.0	15.0	15.0	14.	15.0	15.0	15.0	15.0	15.0	14.0	15.0	15.0	15.0	15.0			
pН	7.0	7.1	7.0	7.1	7.2	7.2	7.1	7.1	7.1	7.0	7.2	7.3	7.0	7.2	7.1	7.1	7.1	7.3			
Conductivity µS/cm	267.0	228.0	277.0	246.0	256.0	267.0	286.0	247.0	292.0	248.0	272.0	282.0	289.0	244.0	298.0	247.0	268.0	280.0			
Chloride mg/L	33.0	28.0	32.0	29.0	30.0	30.0	31.0	27.0	33.0	27.0	32.0	34.0	30.0	25.0	34.0	29.0	30.0	32.0			
Total Hardness mg/L	78.0	70.0	70.0	74.0	76.0	82.0	80.0	84.0	82.0	82.0	88.0	86.0	80.0	76.0	82.0	82.0	86.0	84.0			
Alkalinity mg/L	52.0	64.0	50.0	56.0	50.0	44.0	58.0	58.0	56.0	46.0	54.0	48.0	56.0	66.0	56.0	52.0	52.0	46.0			
Dissolved Oxygen mg/L	2.0	2.8	3.4	2.8	3.2	1.9	1.2	2.8	2.2	2.9	1.4	2.6	2.0	2.2	2.4	2.2	2.6	1.8			
BOD (mg/L)	34.0	28.0	20.0	25.0	18.0	33.0	42.0	24.0	32.0	27.0	35.0	26.0	32.0	28.0	29.0	30.0	25.0	34.0			
COD (mg/L)	70.0	43.0	40.0	60.0	30.0	60.0	80.0	50.0	51.0	50.0	50.0	50.0	60.0	55.0	50.0	70.0	50.0	70.0			
Turbidity (NTU)	6.9	12.5	6.5	9.0	10.6	10.9	5.2	17.5	6.9	10.5	9.8	11.7	5.5	13.9	6.0	8.7	9.5	8.8			
Total Dissolved Solids mg/L	184.0	157.0	191.0	170.0	177.0	184.0	197.0	170.0	201.0	171.0	188.0	194.0	199.0	168.0	206.0	170.0	185.0	193.0			
Total Suspended Solids mg/L	14.0	20.0	14.0	13.0	16.0	18.0	12.0	22.0	18.0	17.0	18.0	22.0	10.0	16.0	11.0	20.0	17.0	16.0			
Chromium mg/L	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL			
Lead mg/L	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL			
Zinc mg/L	0.03	0.01	0.02	0.07	0.06	0.02	BDL	0.02	0.04	0.06	0.04	0.05	0.01	0.08	0.08	0.03	0.03	BDL			
Copper mg/L	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL			
Cadmium mg/L	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL			
Mercury mg/L																					
Antimony mg/L																					
Barium mg/L																					
Cobalt mg/L																					
Manganese mg/L	0.11	0.06	0.09	0.05	0.07	0.10	0.04	0.08	0.16	0.05	0.12	0.11	0.10	0.15	0.08	0.11	0.06	0.09			
Strontium mg/L																					

(Scientist 'C')

TABLE 2: WATER QUALITY DATA OF RIVER MYNTDU DURING PRE-IMMERSSION, IMMERSION & POST-IMMERSION DAY, KALI PUJA FESTIVAL 2021

	Site I (100m Upstream of Immersion Ghat)								Site II (Site of Ir	nmersion Ghat)	Site III							
												(100 m downstream of Immersion Ghat)							
	Pre-	Immersion	Post		Post Immersion	1	Pre-	Immersion	Post		Post Immersion	1	Pre-	Immersion	Post	Post Immersion			
	Immersion	Day	Immersion			-	Immersion	Day	Immersion			•	Immersion	Day	Immersion				
	Day	-					Day	-					Day						
Date of Sampling	20.10.2021	15.10.2021	18.10.2021	20.10.2021	22.10.2021	24.10.2021	20.10.2021	15.10.2021	18.10.2021	20.10.2021	22.10.2021	24.10.2021	20.10.2021	15.10.2021	18.10.2021	20.10.2021	21.10.2021	24.10.2021	
F				(5 th)	(7 th)	(9 th)				(5 th)	(7 th)	(9 th)				(5 th)	(7 th)	(9 th)	
Time	1:10	3:15	1:10	1:40	1:05	1:10	1:15	3:32	1:25	1:54	1:20	1:25	1:50	3:50	1:36	2:05	1:45	1:40	
Weather	Cloudy	Cloudy	Cloudy	Cloudy	Cloudy	Cloudy	Cloudy	Cloudy	Cloudy	Cloudy	Cloudy	Cloudy	Cloudy	Cloudy	Cloudy	Cloudy	Cloudy	Cloudy	
Colour	Clear	Brown	Clear	Clear	Clear	Clear	Clear	Brown	Clear	Clear	Clear	Clear	Clear	Brown	Clear	Clear	Clear	Clear	
Temperature (°C)	14.0	21.0	20.9	20.3	20.4	20.1	14.0	20.7	20.1	20.1	20.5	20.3	14.0	20.9	21.0	20.2	20.4	20.5	
pН	7.4	7.3	7.1	7.3	7.2	7.1	7.2	7.3	7.2	7.2	7.3	7.3	7.1	7.4	7.3	7.2	7.2	7.2	
Chloride mg/L	7.0	8.0	10.0	10.0	10.0	10.0	9.0	8.0	11.0	9.0	10.0	10.0	9.0	8.0	10.0	10.0	8.0	8.0	
Total Hardness mg/L	20.0	30.0	36.0	26.0	20.0	20.0	22.0	34.0	30.0	22.0	22.0	24.0	22.0	26.0	24.0	30.0	20.0	22.0	
Alkalinity mg/L	14.0	12.0	22.0	24.0	20.0	18.0	14.0	14.0	20.0	18.0	20.0	20.0	14.0	14.0	20.0	18.0	18.0	16.0	
Conductivity µS/cm	40.0	41.0	38.0	38.0	35.0	41.0	38.0	46.0	37.0	39.0	37.0	43.0	37.0	43.0	35.0	37.0	38.0	45.0	
Dissolved Oxygen mg/L	6.3	6.5	6.7	6.9	7.2	7.2	7.6	6.2	7.0	7.0	7.1	7.7	6.7	6.3	7.6	7.0	7.1	7.8	
BOD (mg/L)	2.0	1.9	1.9	1.8	1.5	1.6	1.6	2.0	1.8	1.7	1.7	1.5	1.8	2.0	1.5	1.5	1.9	2.0	
COD (mg/L)	8.0	5.0	6.0	6.0	5.0	7.0	5.0	9.0	5.0	6.0	6.0	6.0	5.0	8.0	5.0	4.0	7.0	8.0	
Turbidity (NTU)	3.0	3.5	2.9	4.5	3.3	2.9	2.7	7.2	2.5	4.8	3.0	2.8	2.5	5.5	2.7	3.9	2.8	3.3	
Total Dissolved Solids mg/L	29.0	32.0	26.0	26.0	24.0	28.0	24.0	28.0	25.0	27.0	25.0	30.0	25.0	24.0	24.0	25.0	26.0	31.0	
Total Suspended Solids mg/L	9.0	7.0	9.0	10.0	8.0	6.0	8.0	13.0	7.0	13.0	7.0	5.0	5.0	12.0	6.0	18.0	6.0	8.0	
Chromium mg/L	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	
Lead mg/L	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	
Zinc mg/L	BDL	BDL	BDL	0.05	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	
Copper mg/L	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	
Cadmium mg/L	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	
Mercury mg/L																			
Antimony mg/L																			
Barium mg/L																			
Cobalt mg/L																			
Manganese mg/L	0.05	0.05	0.03	0.03	BDL	BDL	0.06	0.02	0.03	0.05	BDL	BDL	0.09	0.03	0.03	0.05	BDL	BDL	
Strontium mg/L																			

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(Scientist 'C')

TABLE 3: WATER QUALITY DATA OF RIVER BABUPARA-RONGKHON DURING PRE-IMMERSSION, IMMERSION & POST-IMMERSION DAY, KALI PUJA FESTIVAL 2021

			Sit	te I				:	Site II (Site of Ir	nmersion Ghat	:)	Site III							
	(100m Opstream of Immersion Gnat)											(100 m downstream of immersion Ghat)							
	Pre-	Immersion	Post		Post Immersior	ı	Pre -	Immersion	Post		Post Immersion	ı	Pre-	Immersion	Post	Post Immersion			
	Immersion	Day	Immersion				Immersion	Day	Immersion				Immersion	Day	Immersion	1			
	Day				1	r	Day				1		Day						
Date of Sampling	12.10.2021	15.10.2021	18.10.2021	20.10.2021	22.10.2021	24.10.2021	12.10.2021	15.10.2021	18.10.2021	20.10.2021	22.10.2021	24.10.2021	12.10.2021	15.10.2021	18.10.2021	20.10.2021	22.10.2021	24.10.2021	
				(5 th)	(7 ^{tn})	(9 th)				(5 th)	(7 th)	(9 th)				(5 th)	(7 ^{tn})	(9 ^{tri})	
Time	11:00	6:00	10:00	9:30	10:30	9:15	11:15	6:15	10:15	9:45	10:00	9:45	4:30	6:30	10:30	10:00	11:00	10:00	
Weather	P. Clear	P. Cloudy	P. Rainy	P. Rainy	P. Clear	P. Cloudy	P. Clear	P. Cloudy	P. Rainy	Raining	P. Clear	P. Cloudy	P. Clear	P. Cloudy	P. Rainy	Raining	P. Clear	P. Cloudy	
Colour	Clear	Clear	Brownish	Brownish	Clear	Clear	Brownish	Brownish	Brownish	Clear	Clear	Clear	Clear	Brownish	Brownish	Brownish	Clear	Clear	
Temperature (°C)	26.4	26.1	26.2	24.6	26.4	25.9	26.4	26.1	26.2	24.6	24.6	25.9	26.4	26.1	26.2	24.6	26.4	25.9	
pН	7.0	7.2	7.3	7.2	7.3	7.2	7.1	6.9	7.1	7.3	7.3	7.2	6.9	6.8	7.1	7.3	7.2	7.3	
Conductivity µS/cm	92.0	99.0	99.0	93.0	88.0	92.0	96.0	125.0	101.0	88.0	95.0	95.0	98.0	141.0	100.0	92.0	93.0	96.0	
Chloride mg/L	9.0	9.0	10.0	10.0	10.0	12.0	11.0	10.0	11.0	9.0	12.0	14.0	8.0	14.0	12.0	9.0	10.0	16.0	
Total Hardness mg/L	50.0	40.0	46.0	46.0	42.0	40.0	42.0	42.0	46.0	44.0	46.0	44.0	44.0	50.0	44.0	46.0	44.0	46.0	
Alkalinity mg/L	36.0	38.0	38.0	38.0	30.0	32.0	42.0	38.0	38.0	36.0	32.0	30.0	38.0	56.0	38.0	38.0	30.0	32.0	
Dissolved Oxygen mg/L	7.3	7.1	6.0	7.1	7.8	8.0	7.4	6.9	6.6	7.0	8.0	8.0	7.2	6.9	7.2	7.2	8.0	7.9	
BOD (mg/L)	1.6	1.7	2.0	1.7	1.5	1.2	1.7	1.8	1.8	1.8	1.3	1.3	1.7	1.8	1.6	1.5	1.4	1.4	
COD (mg/L)	4.0	5.0	6.0	5.0	4.0	4.0	5.0	7.0	5.0	6.0	8.0	4.0	4.0	8.0	4.0	4.0	8.0	5.0	
Turbidity (NTU)	3.5	4.5	4.5	5.5	5.0	4.4	3.7	13.8	5.5	4.9	4.3	3.9	3.7	10.2	5.0	5.0	4.7	4.9	
Total Dissolved Solids mg/L	63.0	68.0	68.0	34.0	61.0	63.0	96.0	88.0	69.0	61.0	65.0	65.0	98.0	97.0	69.0	63.0	64.0	66.0	
Total Suspended Solids mg/L	9.0	10.0	10.0	13.0	11.0	11.0	11.0	18.0	13.0	11.0	9.0	9.0	10.0	14.0	11.0	12.0	10.0	12.0	
Chromium mg/L	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	
Lead mg/L	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	
Zinc mg/L	BDL	BDL	0.02				0.01	BDL	0.02				BDL	0.03	BDL				
Copper mg/L	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	
Cadmium mg/L	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	
Mercury mg/L																			
Antimony mg/L																			
Barium mg/L																			
Cobalt mg/L																			
Manganese mg/L	0.03	BDL	BDL				BDL	0.26	BDL				BDL	0.09	BDL				
Strontium mg/L																			

Man

(Scientist 'C')