

ENVIRONMENT MONITORING REPORT **JANUARY - 2026**



ADANI VIZHINJAM PORT PVT. LTD. **VIZHINJAM, KERALA**

Report No.: SEAAL/EMR-AVPPL-2601

Report Date: 03rd February, 2026

This Report presents the discussion and the results of Environmental Monitoring at Adani Vizhinjam Port. The monitoring has been conducted and the report has been prepared & issued by Standards Environmental & Analytical Laboratories, Ernakulum-683110 to M/s Adani Vizhinjam Port Pvt Limited, Thiruvananthapuram-695 014

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EMR-1	Executive Summary
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Background:

As per the Environment Monitoring Plan prescribed in the EIA for Vizhinjam International Deepwater Multipurpose Seaport, continuous environment monitoring is being carried out by Standards Environmental & Analytical Laboratories (NABL Accredited testing laboratory vide certificate number TC12939, MoEF recognized Environmental Laboratory under the Environment (Protection) Act-1986) at specified frequency as mentioned in Service Order vide email dated 11.07.2022 awarded by Adani Vizhinjam Port Private Limited (AVPPL).

Environment Monitoring includes Ambient Air Quality, Ambient Noise, Marine Water (Physical, Chemical and Biological); Sediment (Physical, Chemical and Biological (Benthos), Ground Water (Physical, Chemical and Biological), Surface Water (Physical, Chemical and Biological) and Soil (Physical and Chemical) analysis was carried out at locations shown in following Google maps and co-ordinates as per the table below.

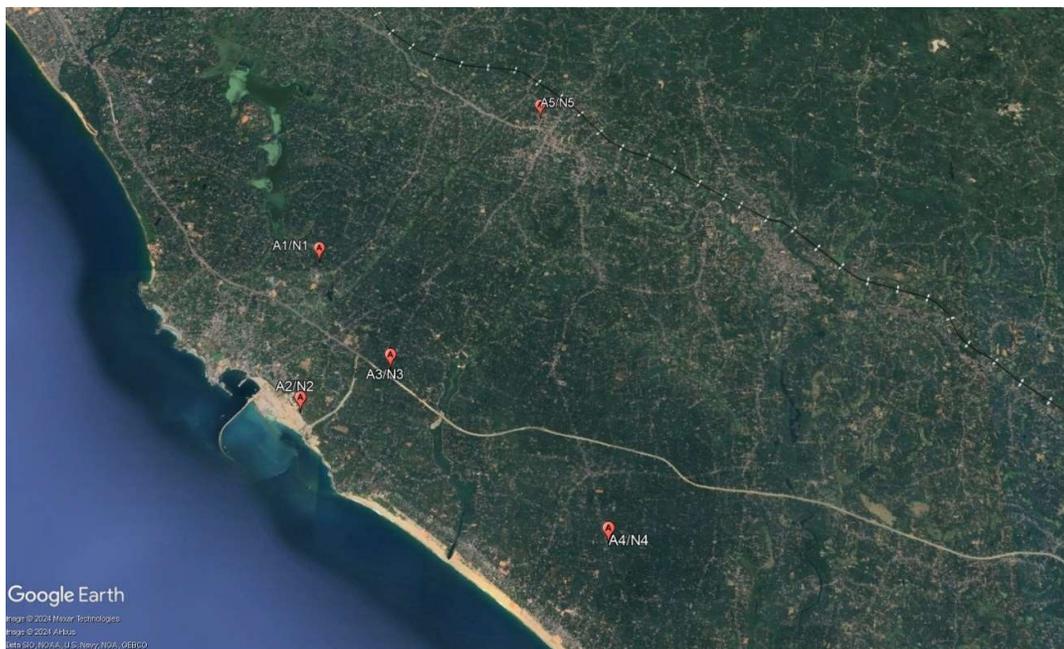
Co-ordinates of the Sampling Locations:

Sl. No.	Matrix	Location Name	Legend	Latitude	Longitude
1.	Ambient Air Quality	Venganoor	A1	8°23'55.10"N	77°00'12.19"E
		Port Site	A2	8°22'13.73"N	77°00'08.39"E
		Proposed Port Estate Area	A3	8°22'41.37"N	77°01'03.17"E
		Chani	A4	8°20'53.49"N	77°03'18.76"E
		Balarampuram	A5	8°25'43.85"N	77°02'38.79"E
2.	Ambient Noise	Venganoor	N1	8°23'55.10"N	77°00'12.19"E
		Port Site	N2	8°22'13.73"N	77°00'08.39"E
		Proposed Port Estate Area	N3	8°22'41.37"N	77°01'03.17"E
		Chani	N4	8°20'53.49"N	77°03'18.76"E
		Balarampuram	N5	8°25'43.85"N	77°02'38.79"E
3.	Marine Water	Near Kovalam Beach	M1	8°22'49.29"N	76°58'40.77"E
		Proposed Dredging Site	M2	8°22'31.11"N	76°58'57.92"E
		Port Basin	M3	8°22'06.96"N	76°59'27.85"E
		South of Breakwater	M4	8°21'51.07"N	77°00'00.21"E
		Inner Approach Channel	M5	8°21'12.68"N	77°00'35.14"E

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Sl. No.	Matrix	Location Name	Legend	Latitude	Longitude
4.	Marine Sediment	Kovalam Beach	M6	8°23'08.16"N	76°58'26.09"E
		Near Kovalam Beach	MS1	8°22'49.29"N	76°58'40.77"E
		Proposed Dredging Site	MS2	8°22'31.11"N	76°58'57.92"E
		Port Basin	MS3	8°22'06.96"N	76°59'27.85"E
		South of Breakwater	MS4	8°21'51.07"N	77°00'00.21"E
		Inner Approach Channel	MS5	8°21'12.68"N	77°00'35.14"E
5.	Ground Water	Kovalam Beach	MS6	8°23'08.16"N	76°58'26.09"E
		Port Site	G1	8°22'03.72"N	77°00'16.92"E
		Proposed Port Estate Area	G2	8°22'24.96"N	77°01'45.84"E
6.	Surface Water	PAF Area	G3	8°22'17.60"N	77°00'11.12"E
		Poovar West Canal	S1	8°19'22.66"N	77°04'31.70"E
		Vizhinjam Branch Canal	S2	8°22'55.59"N	76°59'36.29"E
		Vellayani Lake	S3	8°25'31.91"N	76°59'37.10"E
7.	Soil	Poovar Estuary	S4	8°18'30.71"N	77°04'36.95"E
		Port Site	P	8°22'03.00"N	77°00'16.92"E
		Chani	C	8°21'02.16"N	77°03'15.84"E
		Along with road Network (Mulloor)	M	8°22'23.88"N	77°00'37.08"E
		Along with Rail Network (Balarampuram)	B	8°25'28.92"N	77°02'23.64"E

Locations of Ambient Air Quality & Ambient Noise Monitoring



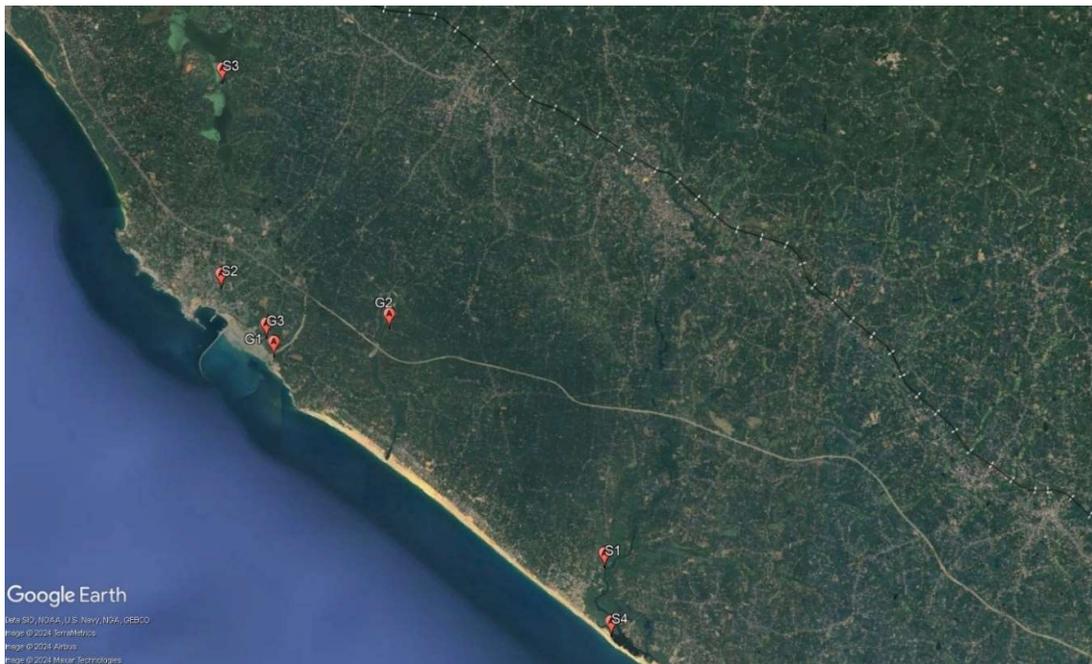
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Marine Water & Marine Sediment Sampling Locations



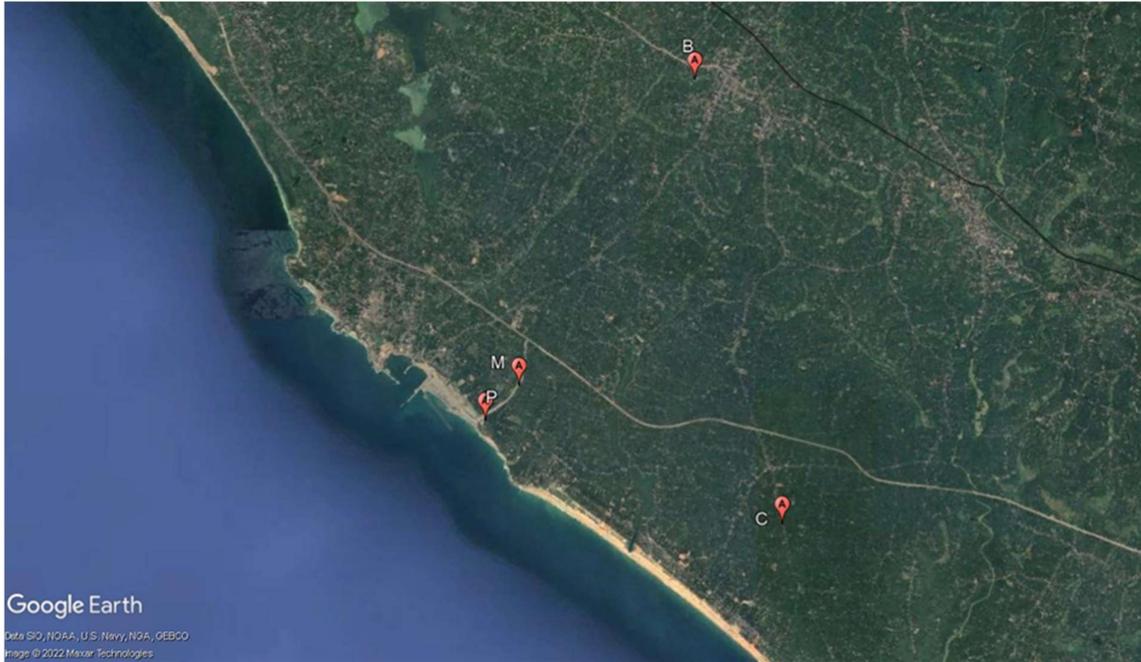
Ground Water & Surface Water Sampling Locations



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Sampling Locations of Soil



Ambient Air Quality Monitoring was carried out at 5 locations i.e., Venganoor, Port Site, Proposed Port Estate Area, Chani and Balarampuram. All 5 locations were monitored as per National Ambient Air Quality Standard (NAAQS), 2009 at a frequency of twice per week. The monitoring was conducted on the 1st, 5th, 8th, 12th, 15th, 19th, 22nd, 26th and 29th of January 2026. Ambient air monitoring started at all 5 locations for 24 hours with the help of programmable timer. After analysis of samples, the obtained results are compared with NAAQS, 2009. All the parameters at all locations were within the NAAQS limits. The results are available under section EMR-2.

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RDS & FPS Under Operation



Preparation for Gaseous Sampling



Installation for PM_{2.5}



Installation for PM₁₀

Ambient Noise Monitoring carried out at Venganoor, Port Site, Proposed Port Estate Area, Chani and Balarampuram. Classification of locations as per the

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Noise Pollution (Regulation & Control) Rules, 2000 (Rules 3 (1) and 4(1)) is given in the following table. The results obtained were compared with Noise Pollution (Regulation & Control) Rules, 2000 (Rule 3(1) and 4(1)). The Leq values in the locations were within the limits except at Proposed Port Estate Area on 21-01-2026 due to the noise played from Loud Speaker on account of Thalakodu Sree Kali Temple Festival. The noise readings are furnished under section EMR-3.

Legend	Location	Area Type
N1	Venganoor	Residential
N2	Port Site	Industrial
N3	Proposed Port Estate Area	Residential
N4	Chani	Residential
N5	Balarampuram	Commercial



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Marine water samples were collected from 6 locations - Kovalam Beach, Near Kovalam Beach, Proposed Dredging Site, South of Break Water, Port Basin, and Inner Approach Chanel. The samples were analysed as per IS/APHA Standard Test Procedures, and the results are provided in Section EMR-4.1.



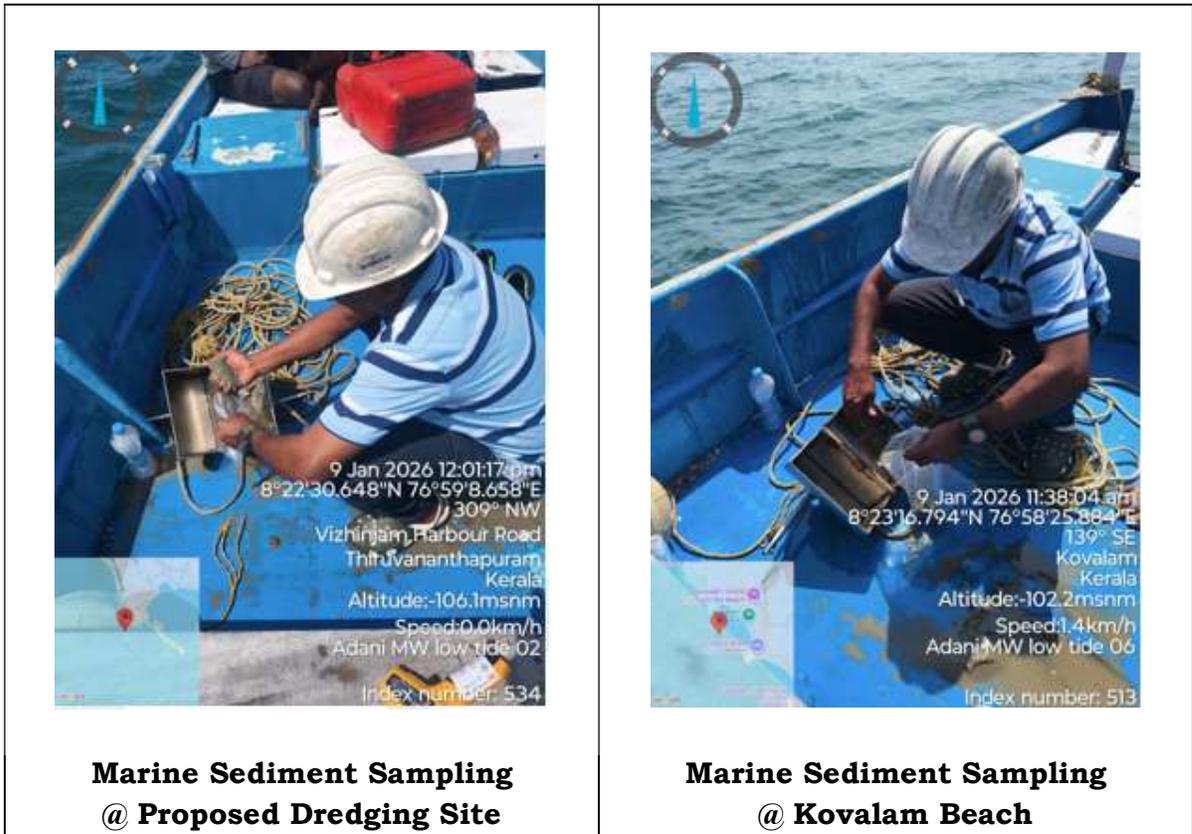


Marine Water Sampling
@ Inner Approach Channel



Marine Water Sampling
@ Port Basin

Sediment samples were collected from 6 locations - Kovalam Beach, Near Kovalam Beach, Proposed Dredging Site, South of Break Water, Port Basin, and Inner Approach Channel. The samples were analysed as per IS/APHA Standard Test Procedures, and the results are provided in Section EMR-4.3.



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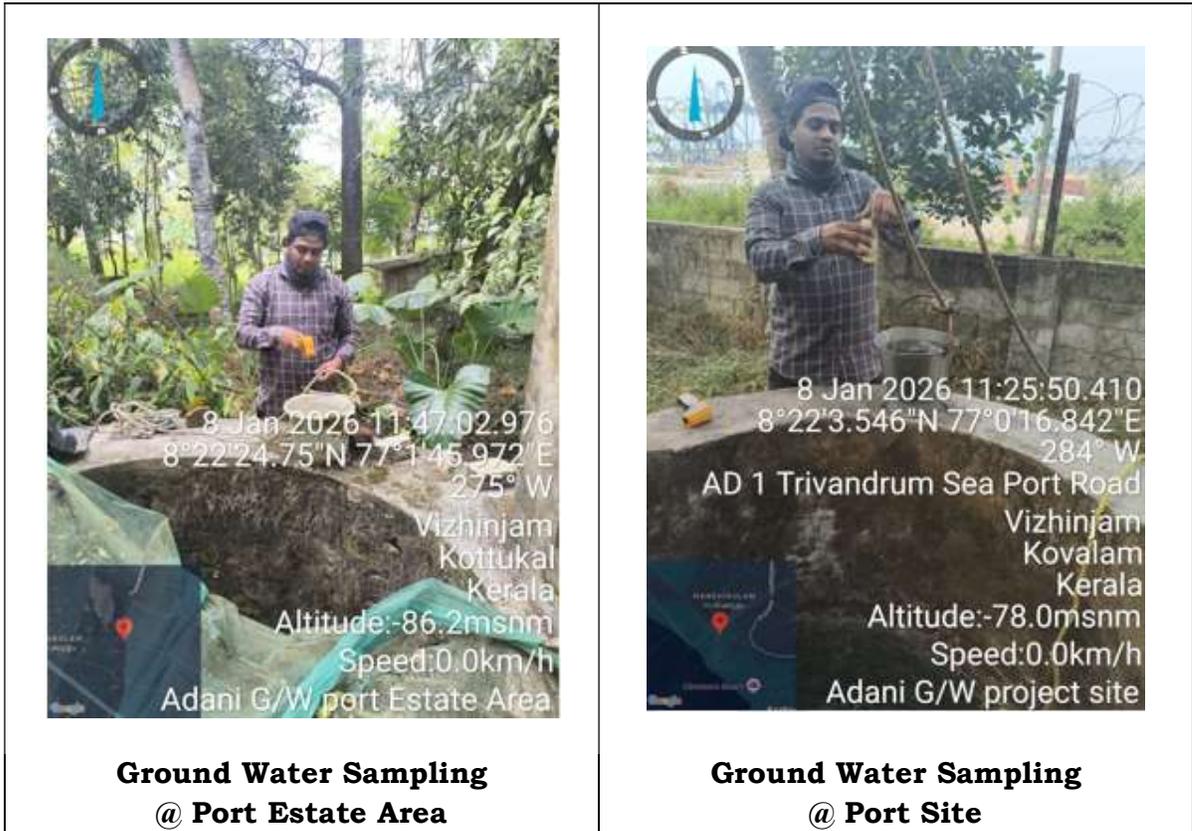
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Ground water samples were collected from 3 locations (open wells) - Port Site, Proposed Port Estate Area, and Port Annex Facility area (PAF). All the parameters at all locations were within the acceptable limits as per IS 10500:2012 except turbidity at Proposed Port Estate Area. However, the water from these locations is not used for drinking purposes. The results are provided in Section EMR-5.



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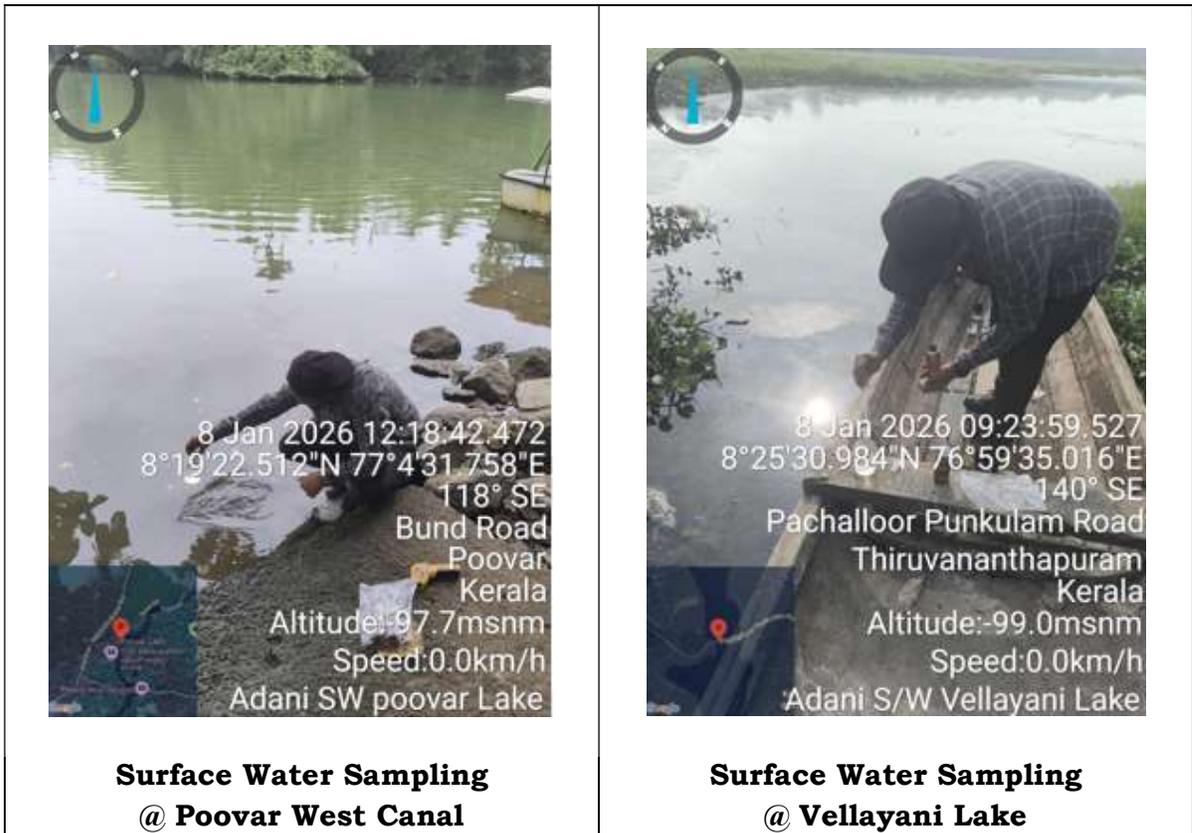
**Ground Water Sampling
@ Port Estate Area**

**Ground Water Sampling
@ Port Site**

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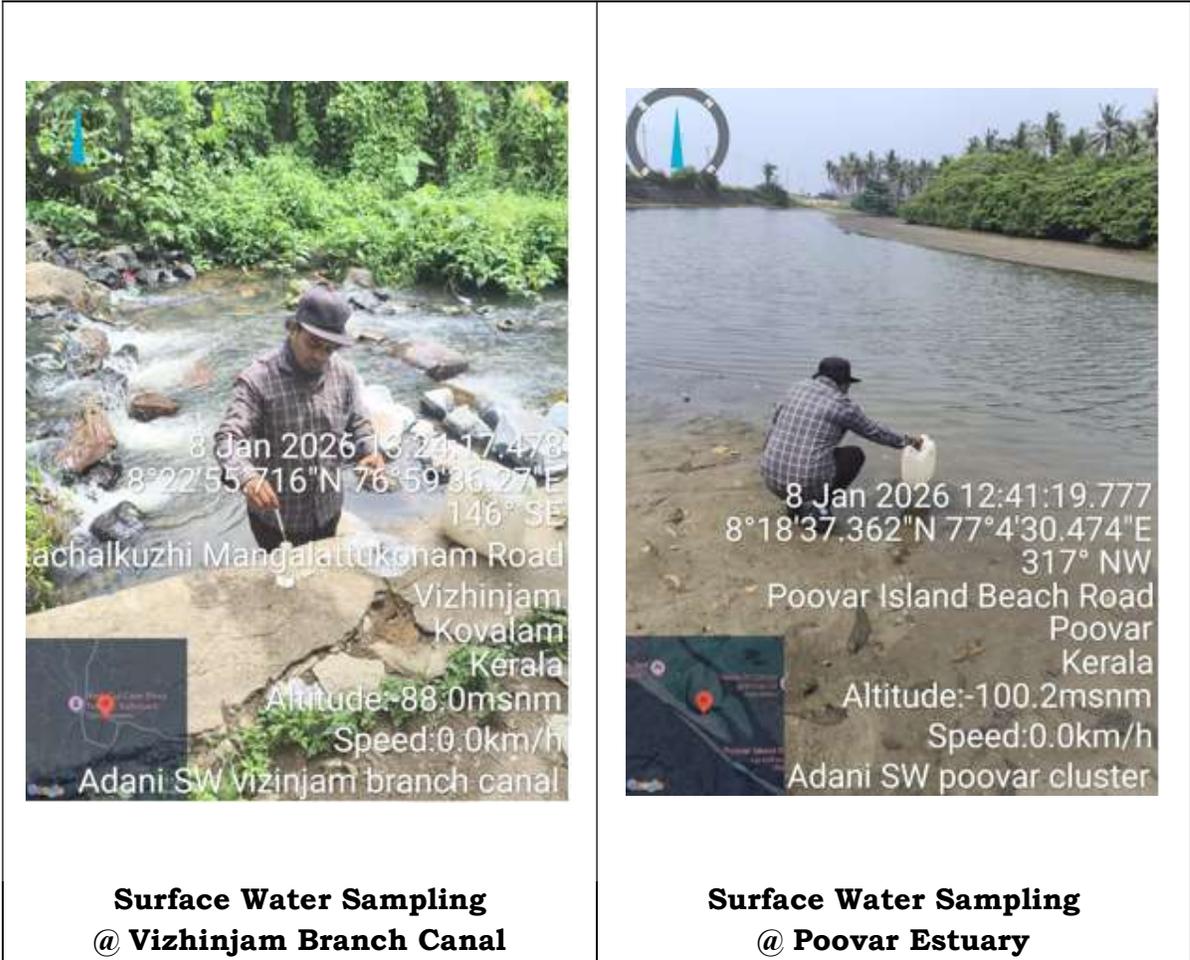
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Surface water samples were collected from 4 locations - Poovar West Canal, Vizhinjam Branch Canal, Vellayani Lake and Poovar Estuary. The samples were analysed as per the standard procedures and the results are provided in Section EMR-6.



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Soil samples were collected from 4 locations – Port Site, Proposed Port Estate Area, Along with road Network (Mulloor), and Along with Rail Network (Balarampuram). The samples were analysed as per IS/USEPA Standard Test Procedures and the results are provided in Section EMR-7.





The detailed results of Environmental monitoring carried out for the month of January 2026 are presented in subsequent sections.

EMR-2	Ambient Air Quality Monitoring Report
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Location, Legend	Venganoor, A1
Month, Year	January, 2026

Date of Sampling	Results					
	PM ₁₀ µg/m ³	PM _{2.5} µg/m ³	SO ₂ µg/m ³	NO _x µg/m ³	CO mg/m ³	HC ppm
01-01-2026	41.7	21.6	4.16	4.89	BDL	BDL
05-01-2026	46.6	24.3	4.33	5.11	BDL	BDL
08-01-2026	55.8	28.4	4.52	5.72	BDL	BDL
12-01-2026	49.9	25.5	4.20	4.98	BDL	BDL
15-01-2026	54.4	28.7	4.41	5.38	BDL	BDL
19-01-2026	51.1	26.9	4.30	5.22	BDL	BDL
22-01-2026	50.9	26.6	4.42	5.38	BDL	BDL
26-01-2026	45.2	23.4	4.21	4.94	BDL	BDL
29-01-2026	52.5	25.7	4.53	5.28	BDL	BDL
NAAQS 2009 Limits	100	60	80	80	4	-

Note: National Ambient Air Quality Standards (Industrial, Residential, Rural and other Area).
BDL: Below Detectable Limit

Location, Legend	Port Site, A2
Month, Year	January, 2026

Date of Sampling	Results					
	PM ₁₀ µg/m ³	PM _{2.5} µg/m ³	SO ₂ µg/m ³	NO _x µg/m ³	CO mg/m ³	HC ppm
01-01-2026	84.6	43.3	4.58	5.72	BDL	BDL
05-01-2026	79.4	38.5	4.42	5.39	BDL	BDL
08-01-2026	81.1	40.8	4.62	5.69	BDL	BDL
12-01-2026	87.7	44.4	4.76	5.81	BDL	BDL
15-01-2026	77.8	39.9	4.62	5.71	BDL	BDL
19-01-2026	80.5	39.6	4.50	5.36	BDL	BDL
22-01-2026	83.2	42.6	4.53	5.60	BDL	BDL
26-01-2026	75.4	38.4	4.28	5.47	BDL	BDL
29-01-2026	85.3	41.8	4.42	5.59	BDL	BDL
NAAQS 2009 Limits	100	60	80	80	4	-

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Date of Sampling	Results					
	PM ₁₀ µg/m ³	PM _{2.5} µg/m ³	SO ₂ µg/m ³	NO _x µg/m ³	CO mg/m ³	HC ppm
Note: National Ambient Air Quality Standards (Industrial, Residential, Rural and other Area). BDL: Below Detectable Limit						

Location, Legend	Proposed Port Estate Area, A3
Month, Year	January, 2026

Date of Sampling	Results					
	PM ₁₀ µg/m ³	PM _{2.5} µg/m ³	SO ₂ µg/m ³	NO _x µg/m ³	CO mg/m ³	HC ppm
01-01-2026	48.8	25.5	4.36	4.83	BDL	BDL
05-01-2026	55.6	28.1	4.54	5.21	BDL	BDL
08-01-2026	50.3	24.4	4.21	5.69	BDL	BDL
12-01-2026	54.7	27.1	4.30	5.58	BDL	BDL
15-01-2026	49.6	25.3	4.38	4.86	BDL	BDL
19-01-2026	51.4	26.9	4.47	5.41	BDL	BDL
22-01-2026	53.1	26.2	4.35	5.53	BDL	BDL
26-01-2026	52.2	27.4	4.47	5.48	BDL	BDL
29-01-2026	54.8	28.4	4.31	5.28	BDL	BDL
NAAQS 2009 Limits	100	60	80	80	4	-
Note: National Ambient Air Quality Standards (Industrial, Residential, Rural and other Area). BDL: Below Detectable Limit						

Location, Legend	Chani, A4
Month, Year	January, 2026

Date of Sampling	Results					
	PM ₁₀ µg/m ³	PM _{2.5} µg/m ³	SO ₂ µg/m ³	NO _x µg/m ³	CO mg/m ³	HC ppm
01-01-2026	56.6	27.5	4.47	5.71	BDL	BDL
05-01-2026	50.4	24.4	4.38	5.41	BDL	BDL
08-01-2026	55.5	27.1	4.51	5.35	BDL	BDL
12-01-2026	57.2	27.5	4.59	5.54	BDL	BDL
15-01-2026	51.6	24.8	4.61	5.40	BDL	BDL
19-01-2026	48.9	23.3	4.27	5.21	BDL	BDL

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Date of Sampling	Results					
	PM ₁₀ µg/m ³	PM _{2.5} µg/m ³	SO ₂ µg/m ³	NO _x µg/m ³	CO mg/m ³	HC ppm
22-01-2026	52.8	25.4	4.30	5.31	BDL	BDL
26-01-2026	49.6	24.1	4.25	5.11	BDL	BDL
29-01-2026	54.8	26.6	4.53	5.37	BDL	BDL
NAAQS 2009 Limits	100	60	80	80	4	-

Note: National Ambient Air Quality Standards (Industrial, Residential, Rural and other Area).
BDL: Below Detectable Limit

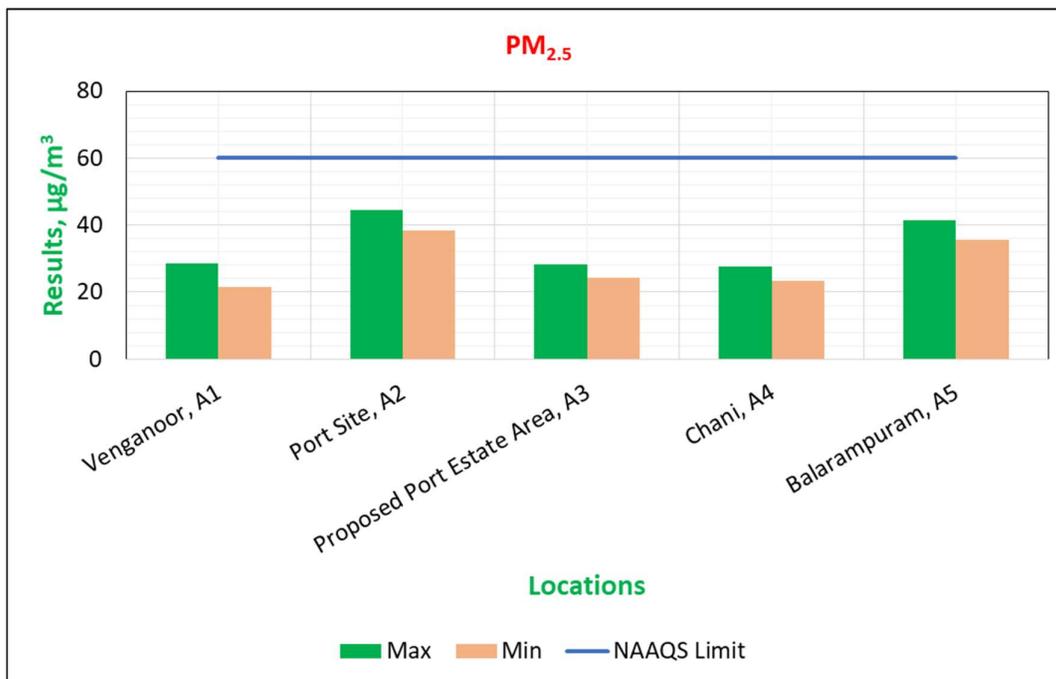
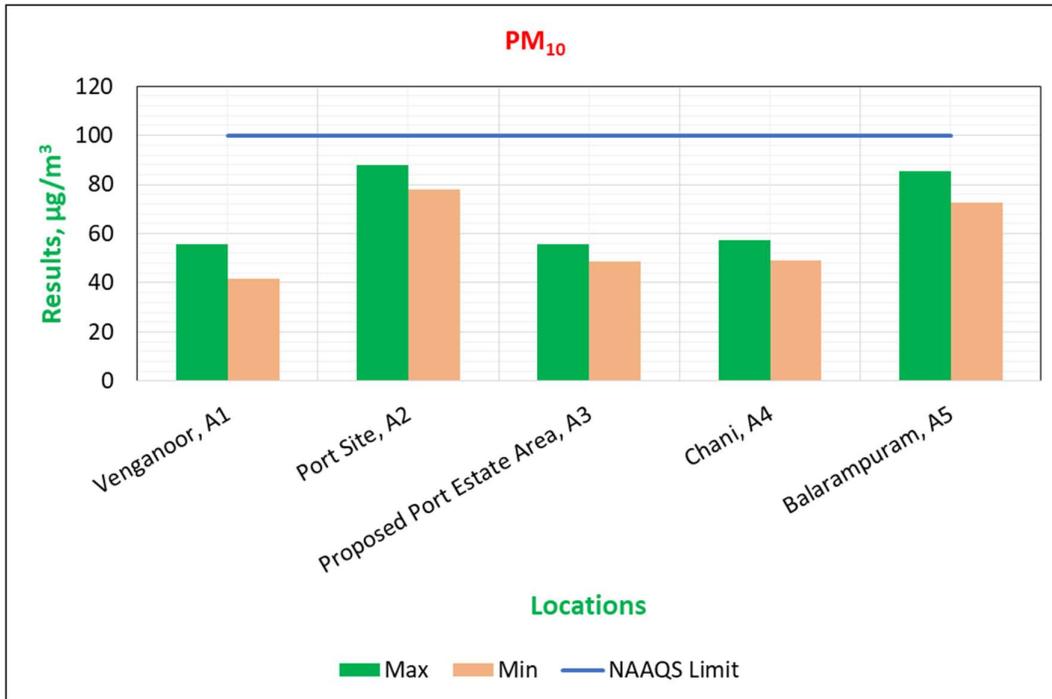
Location, Legend	Balarampuram, A5
Month, Year	January, 2026

Date of Sampling	Results					
	PM ₁₀ µg/m ³	PM _{2.5} µg/m ³	SO ₂ µg/m ³	NO _x µg/m ³	CO mg/m ³	HC ppm
01-01-2026	83.5	40.2	4.61	5.66	BDL	BDL
05-01-2026	76.8	37.1	4.36	5.48	BDL	BDL
08-01-2026	80.3	39.4	4.52	5.60	BDL	BDL
12-01-2026	75.4	35.8	4.47	5.68	BDL	BDL
15-01-2026	84.5	41.1	4.45	5.62	BDL	BDL
19-01-2026	77.7	38.2	4.58	5.64	BDL	BDL
22-01-2026	72.6	35.5	4.38	5.48	BDL	BDL
26-01-2026	81.7	39.8	4.47	5.52	BDL	BDL
29-01-2026	85.4	41.5	4.55	5.71	BDL	BDL
NAAQS 2009 Limits	100	60	80	80	4	-

Note: National Ambient Air Quality Standards (Industrial, Residential, Rural and other Area).
BDL: Below Detectable Limit

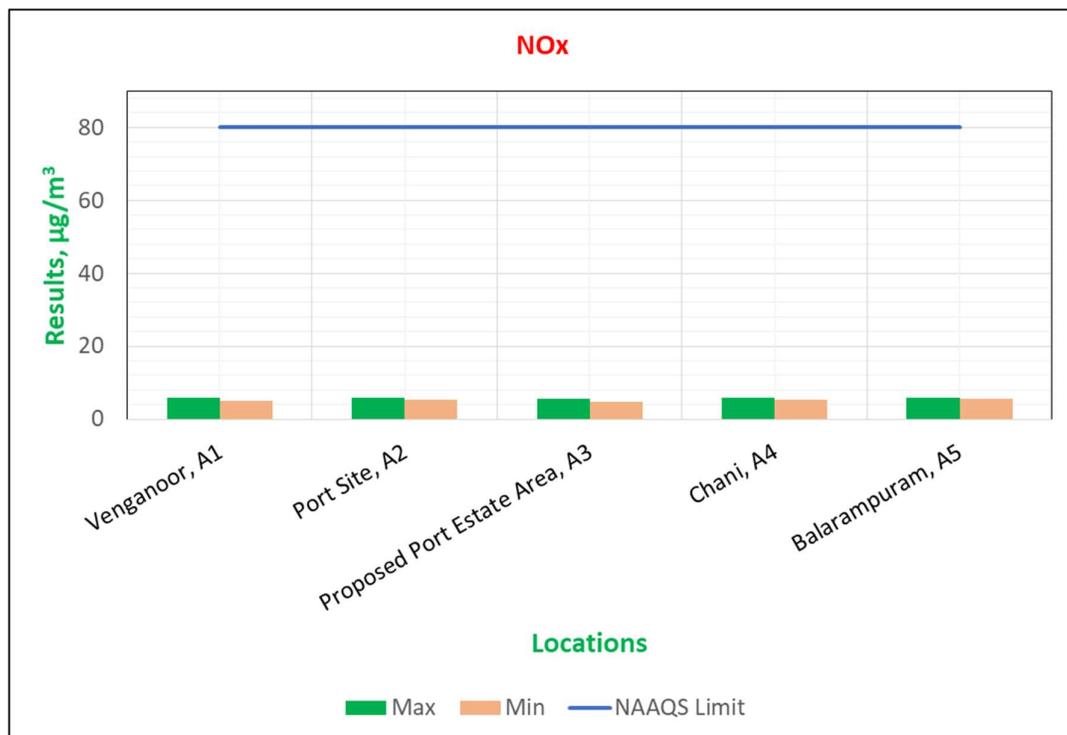
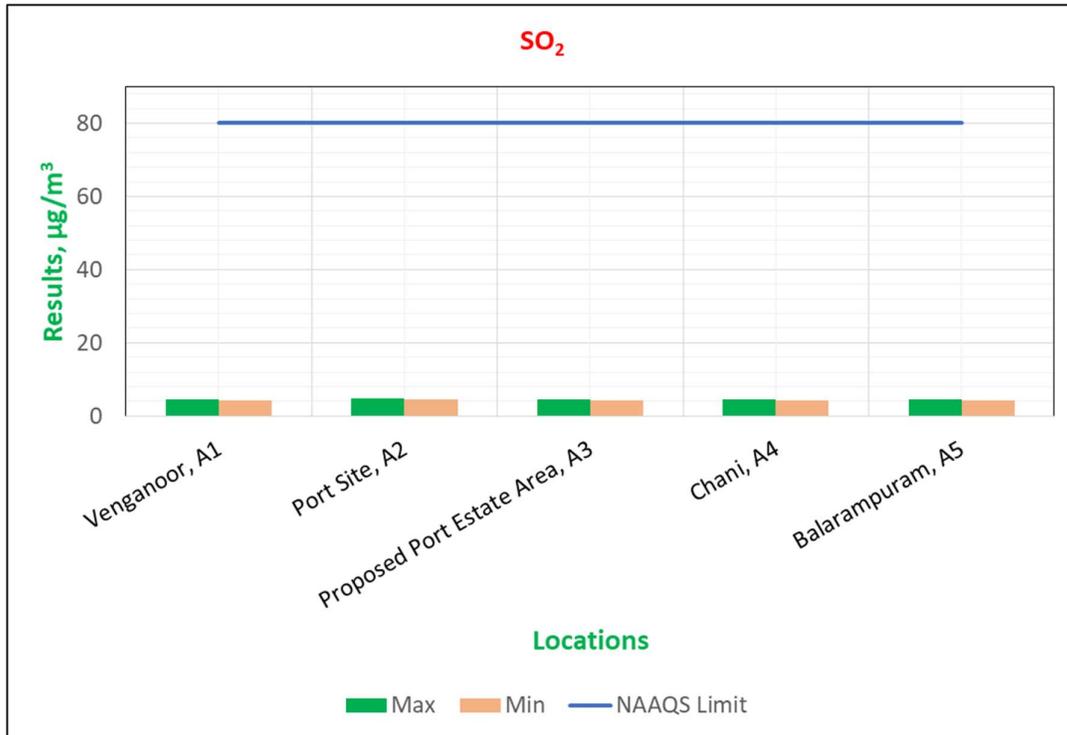
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EMR-2.1 Statistical Analysis of Ambient Air Quality



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EMR-3	Ambient Noise Monitoring Report
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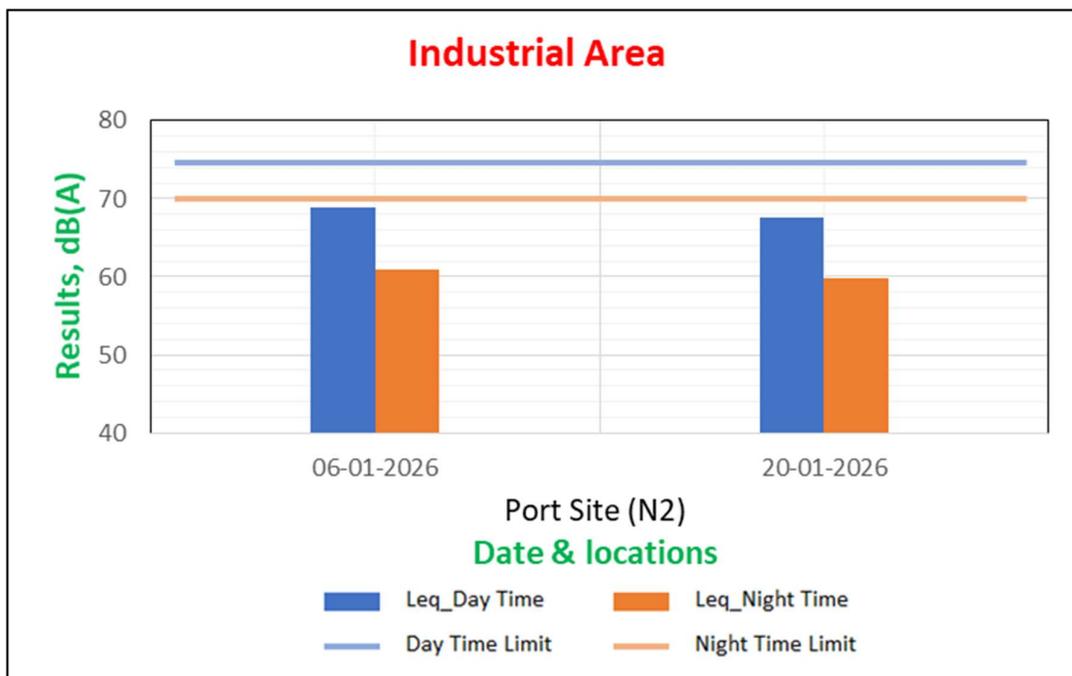
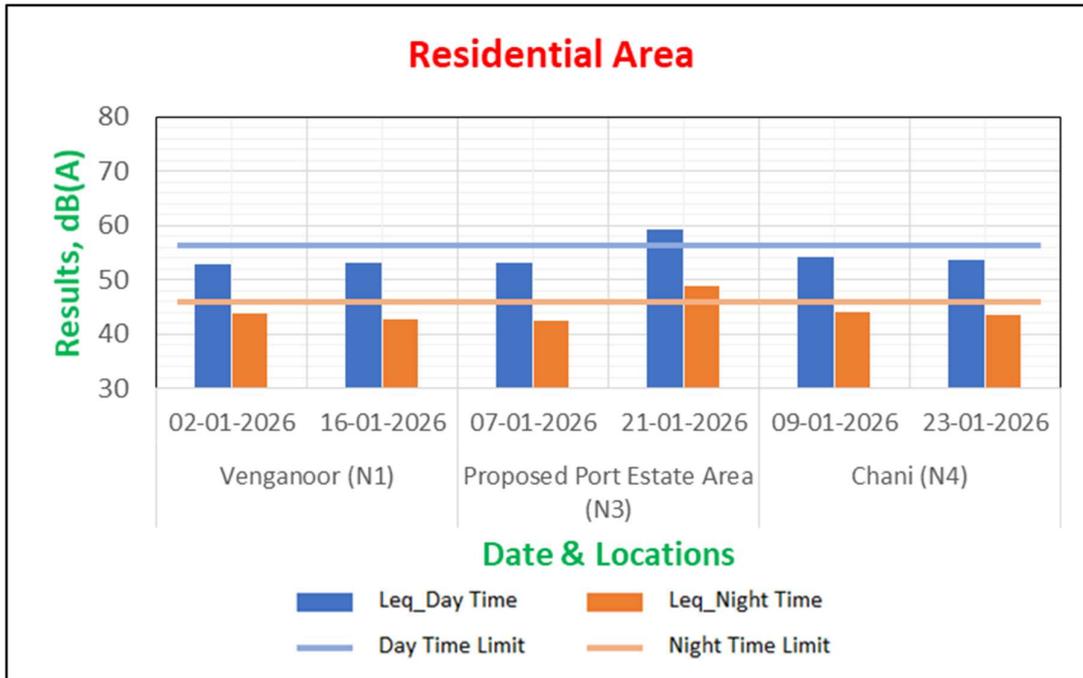
Location & Legend	Date of Sampling	Results (dB(A))					
		L _{max} Day time	L _{max} Night time	L _{min} Day time	L _{min} Night time	Leq Day time	Leq Night time
Venganoor (Residential) N1	02-01-2026	77.2	74.2	31.6	31.2	52.7	43.8
	16-01-2026	75.9	72.9	32.6	32.4	53.1	42.7
Port Site (Industrial) N2	06-01-2026	92.8	87.5	39.8	39.6	68.8	60.9
	20-01-2026	91.8	86.5	39.4	39.1	67.5	59.8
Proposed Port Estate Area (Residential) N3	07-01-2026	76.2	70.5	31.1	30.9	53.1	42.5
	21-01-2026	85.5	71.5	32.5	31.9	59.2	48.9
Chani (Residential) N4	09-01-2026	73.9	72.9	30.8	30.6	54.2	43.9
	23-01-2026	73.1	71.6	32.5	32.6	53.7	43.5
Balarampuram (Commercial) N5	14-01-2026	86.8	74.1	32.8	31.8	59.3	52.1
	28-01-2026	84.9	75.9	32.0	31.9	58.2	49.7

**As per the Noise Pollution (Regulation & Control) Rules, 2000
[Rules 3 (1) and 4(1)]**

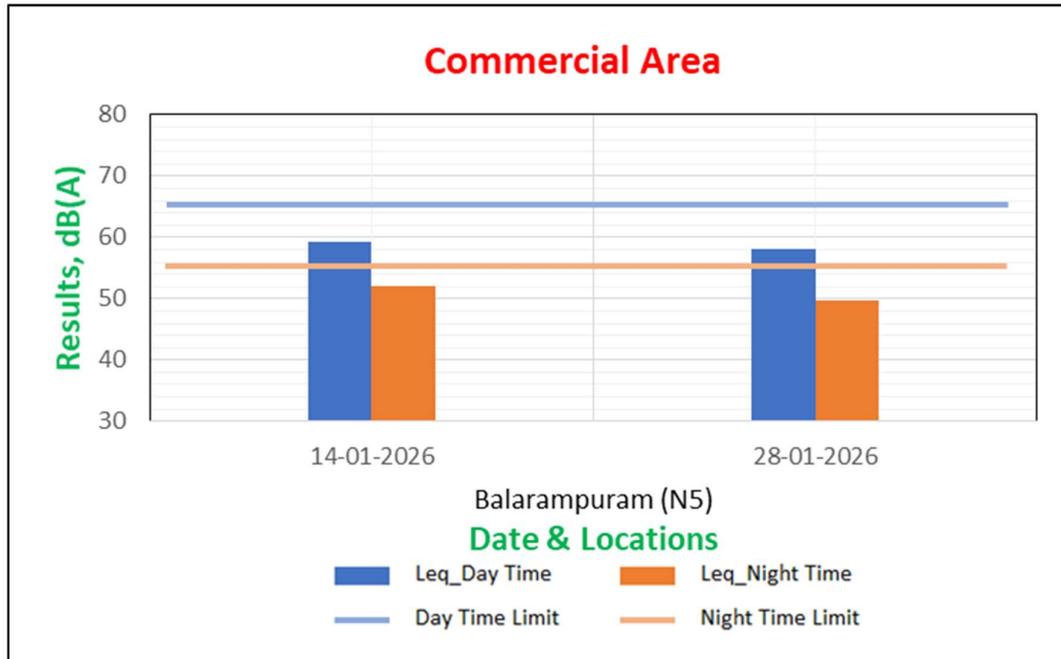
Area Code	Area Type	Limits in dB (A) Leq	
		Day (6 a.m. to 10 p.m.)	Night (10 p.m. to 6 a.m.)
A	Industrial	75	70
B	Commercial	65	55
C	Residential	55	45

EMR-3.1	Statistical Analysis of Ambient Noise Monitoring
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EMR-4	Marine Ecological Survey
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EMR-4.1	Marine Water Analysis Report
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Location, Legend	Near Kovalam Beach, M1
Date of Sampling	09-01-2026

Parameter	Unit	Results	
		High Tide (15:30 – 16:50)	Low Tide (11:30 – 12:50)
Temperature	°C	28.5	27.9
Colour	Hazen	1	1
pH Value	-	7.66	7.77
Turbidity	N.T.U.	1.1	1.8
Electrical Conductivity (at 25°C)	µmho/cm	52900	53200
Total Suspended Solids	mg/L	BDL	BDL
Total Dissolved Solids	mg/L	33856	34050
Dissolved Oxygen	mg/L	6.8	6.9
Biochemical Oxygen Demand (3 days, 27°C)	mg/L	BDL	BDL
Floating Materials (Oil, grease and Scum (Including Petroleum Products)	mg/L	BDL	BDL
Nitrite (as NO ₂)	mg/L	0.034	0.038
Nitrate (as NO ₃)	mg/L	BDL	BDL
Phenolic Compounds (as C ₆ H ₅ OH)	mg/L	BDL	BDL
Ammonical Nitrogen (as NH ₃ -N)	mg/L	BDL	BDL
Total Nitrogen (as N)	mg/L	BDL	BDL
Total Phosphorous (as P)	mg/L	BDL	BDL
Reactive Phosphorous	mg/L	BDL	BDL
Polycyclic Aromatic Hydrocarbon	mg/L	BDL	BDL
Salinity	ppt	34.377	34.597
Total Chlorophyll	mg/m ³	0.4	0.6
Total Coliforms	MPN/100 ml	BDL	BDL
Fecal Coliforms	MPN/100 ml	BDL	BDL

BDL: Below Detectable Limit

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Location, Legend	Proposed Dredging Site, M2
Date of Sampling	09-01-2026

Parameter	Unit	Results	
		High Tide (15:30 – 16:50)	Low Tide (11:30 – 12:50)
Temperature	°C	27.9	27.4
Colour	Hazen	1	1
pH Value	-	8.01	8.04
Turbidity	N.T.U.	0.5	0.9
Electrical Conductivity (at 25°C)	µmho/cm	53210	53500
Total Suspended Solids	mg/L	BDL	BDL
Total Dissolved Solids	mg/L	34050	34240
Dissolved Oxygen	mg/L	7	7.1
Biochemical Oxygen Demand (3 days, 27°C)	mg/L	BDL	BDL
Floating Materials (Oil, grease and Scum (Including Petroleum Products)	mg/L	BDL	BDL
Nitrite (as NO ₂)	mg/L	0.029	0.030
Nitrate (as NO ₃)	mg/L	BDL	BDL
Phenolic Compounds (as C ₆ H ₅ OH)	mg/L	BDL	BDL
Ammonical Nitrogen (as NH ₃ -N)	mg/L	BDL	BDL
Total Nitrogen (as N)	mg/L	BDL	BDL
Total Phosphorous (as P)	mg/L	BDL	BDL
Reactive Phosphorous	mg/L	BDL	BDL
Polycyclic Aromatic Hydrocarbon	mg/L	BDL	BDL
Salinity	ppt	34.604	34.817
Total Chlorophyll	mg/m ³	0.5	0.7
Total Coliforms	MPN/100 ml	BDL	BDL
Fecal Coliforms	MPN/100 ml	BDL	BDL
BDL: Below Detectable Limit			

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Location, Legend	Port Basin, M3
Date of Sampling	09-01-2026

Parameter	Unit	Results	
		High Tide (15:30 – 16:50)	Low Tide (11:30 – 12:50)
Temperature	°C	28.1	27.8
Colour	Hazen	1	1
pH Value	-	8.00	8.01
Turbidity	N.T.U.	0.7	0.8
Electrical Conductivity (at 25°C)	µmho/cm	52600	53150
Total Suspended Solids	mg/L	BDL	BDL
Total Dissolved Solids	mg/L	33660	34020
Dissolved Oxygen	mg/L	6.9	7.0
Biochemical Oxygen Demand (3 days, 27°C)	mg/L	BDL	BDL
Floating Materials (Oil, grease and Scum (Including Petroleum Products)	mg/L	BDL	BDL
Nitrite (as NO ₂)	mg/L	0.028	0.036
Nitrate (as NO ₃)	mg/L	BDL	BDL
Phenolic Compounds (as C ₆ H ₅ OH)	mg/L	BDL	BDL
Ammonical Nitrogen (as NH ₃ -N)	mg/L	BDL	BDL
Total Nitrogen (as N)	mg/L	BDL	BDL
Total Phosphorous (as P)	mg/L	BDL	BDL
Reactive Phosphorous	mg/L	BDL	BDL
Polycyclic Aromatic Hydrocarbon	mg/L	BDL	BDL
Salinity	ppt	34.157	34.560
Total Chlorophyll	mg/m ³	0.4	0.6
Total Coliforms	MPN/100 ml	BDL	BDL
Fecal Coliforms	MPN/100 ml	BDL	BDL
BDL: Below Detectable Limit			

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Location, Legend	South of Breakwater, M4
Date of Sampling	09-01-2026

Parameter	Unit	Results	
		High Tide (15:30 – 16:50)	Low Tide (11:30 – 12:50)
Temperature	°C	28.1	27.2
Colour	Hazen	1	1
pH Value	-	8.06	8.10
Turbidity	N.T.U.	0.5	0.9
Electrical Conductivity (at 25°C)	µmho/cm	52900	53050
Total Suspended Solids	mg/L	BDL	BDL
Total Dissolved Solids	mg/L	33850	33950
Dissolved Oxygen	mg/L	6.9	7.0
Biochemical Oxygen Demand (3 days, 27°C)	mg/L	BDL	BDL
Floating Materials (Oil, grease and Scum (Including Petroleum Products)	mg/L	BDL	BDL
Nitrite (as NO ₂)	mg/L	0.028	0.032
Nitrate (as NO ₃)	mg/L	BDL	BDL
Phenolic Compounds (as C ₆ H ₅ OH)	mg/L	BDL	BDL
Ammonical Nitrogen (as NH ₃ -N)	mg/L	BDL	BDL
Total Nitrogen (as N)	mg/L	BDL	BDL
Total Phosphorous (as P)	mg/L	BDL	BDL
Reactive Phosphorous	mg/L	BDL	BDL
Polycyclic Aromatic Hydrocarbon	mg/L	BDL	BDL
Salinity	ppt	34.377	34.487
Total Chlorophyll	mg/m ³	0.4	0.5
Total Coliforms	MPN/100 ml	BDL	BDL
Fecal Coliforms	MPN/100 ml	BDL	BDL
BDL: Below Detectable Limit			

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Location, Legend	Inner Approach Channel, M5
Date of Sampling	09-01-2026

Parameter	Unit	Results	
		High Tide (15:30 – 16:50)	Low Tide (11:30 – 12:50)
Temperature	°C	27.7	27.5
Colour	Hazen	1	1
pH Value	-	8.02	8.03
Turbidity	N.T.U.	0.4	0.8
Electrical Conductivity (at 25°C)	µmho/cm	53250	53580
Total Suspended Solids	mg/L	BDL	BDL
Total Dissolved Solids	mg/L	34080	34290
Dissolved Oxygen	mg/L	7	7.1
Biochemical Oxygen Demand (3 days, 27°C)	mg/L	BDL	BDL
Floating Materials (Oil, grease and Scum (Including Petroleum Products)	mg/L	BDL	BDL
Nitrite (as NO ₂)	mg/L	BDL	0.029
Nitrate (as NO ₃)	mg/L	BDL	BDL
Phenolic Compounds (as C ₆ H ₅ OH)	mg/L	BDL	BDL
Ammonical Nitrogen (as NH ₃ -N)	mg/L	BDL	BDL
Total Nitrogen (as N)	mg/L	BDL	BDL
Total Phosphorous (as P)	mg/L	BDL	BDL
Reactive Phosphorous	mg/L	BDL	BDL
Polycyclic Aromatic Hydrocarbon	mg/L	BDL	BDL
Salinity	ppt	34.633	34.875
Total Chlorophyll	mg/m ³	0.5	0.7
Total Coliforms	MPN/100 ml	BDL	BDL
Fecal Coliforms	MPN/100 ml	BDL	BDL
BDL: Below Detectable Limit			

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Location, Legend	Kovalam Beach, M6
Date of Sampling	09-01-2026

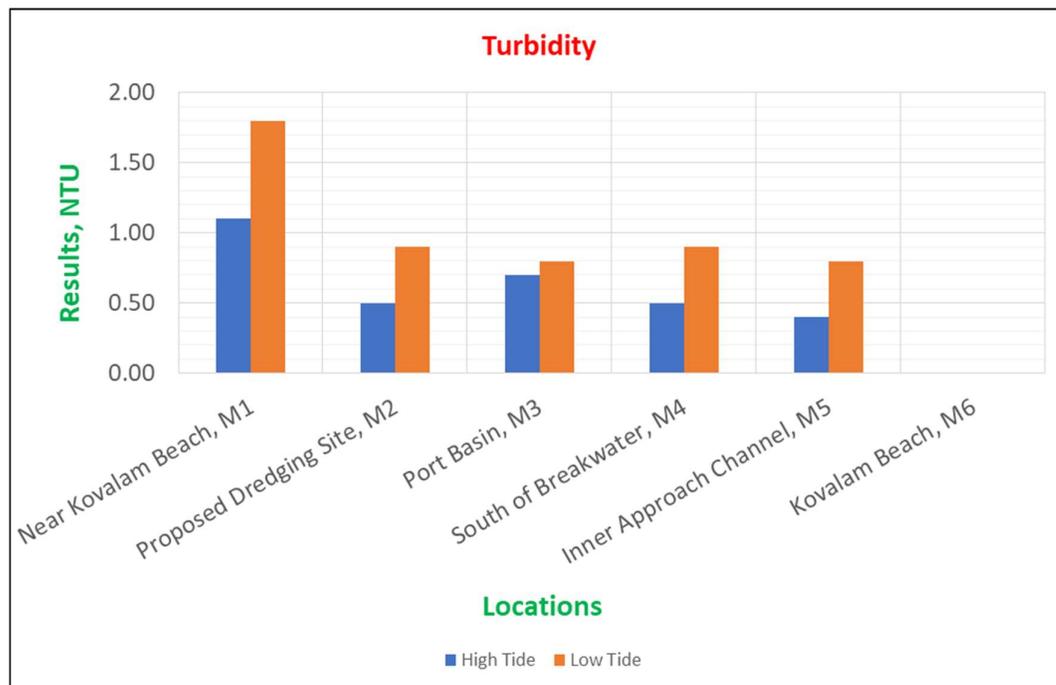
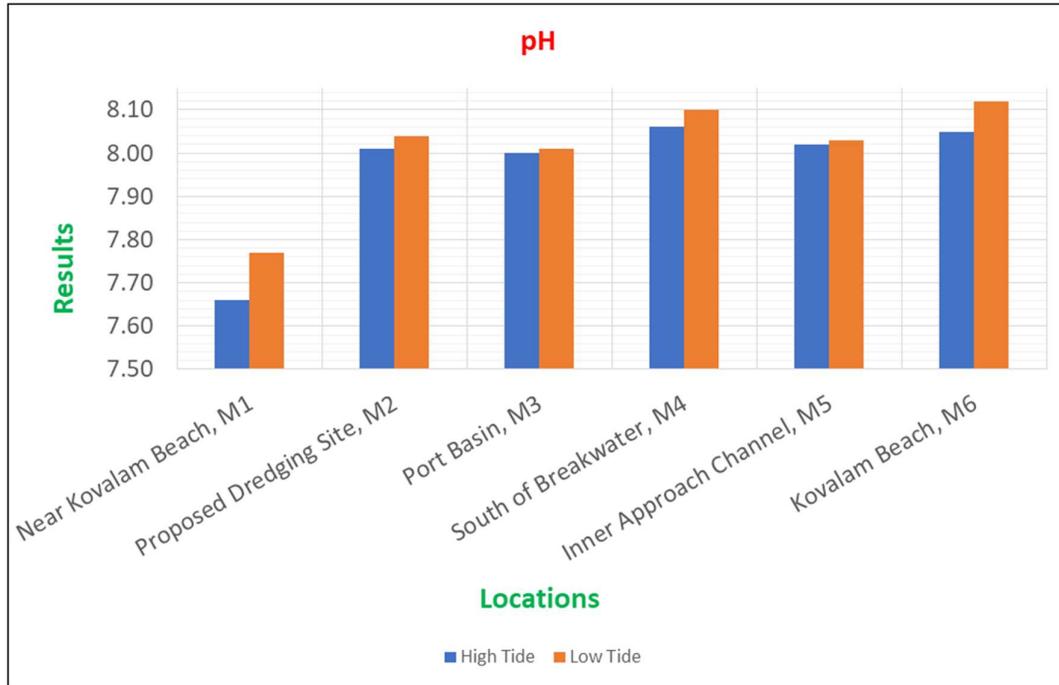
Parameter	Unit	Results	
		High Tide (15:30 – 16:50)	Low Tide (11:30 – 12:50)
Temperature	°C	28.2	27.1
Colour	Hazen	1	1
pH Value	-	8.05	8.12
Turbidity	N.T.U.	BDL	BDL
Electrical Conductivity (at 25°C)	µmho/cm	53100	53300
Total Suspended Solids	mg/L	BDL	BDL
Total Dissolved Solids	mg/L	33980	34110
Dissolved Oxygen	mg/L	6.9	7.1
Biochemical Oxygen Demand (3 days, 27°C)	mg/L	BDL	BDL
Floating Materials (Oil, grease and Scum (Including Petroleum Products)	mg/L	BDL	BDL
Nitrite (as NO ₂)	mg/L	0.028	0.030
Nitrate (as NO ₃)	mg/L	BDL	BDL
Phenolic Compounds (as C ₆ H ₅ OH)	mg/L	BDL	BDL
Ammonical Nitrogen (as NH ₃ -N)	mg/L	BDL	BDL
Total Nitrogen (as N)	mg/L	BDL	BDL
Total Phosphorous (as P)	mg/L	BDL	BDL
Reactive Phosphorous	mg/L	BDL	BDL
Polycyclic Aromatic Hydrocarbon	mg/L	BDL	BDL
Salinity	ppt	34.523	34.670
Total Chlorophyll	mg/m ³	0.5	0.6
Total Coliforms	MPN/100 ml	BDL	BDL
Fecal Coliforms	MPN/100 ml	BDL	BDL
BDL: Below Detectable Limit			

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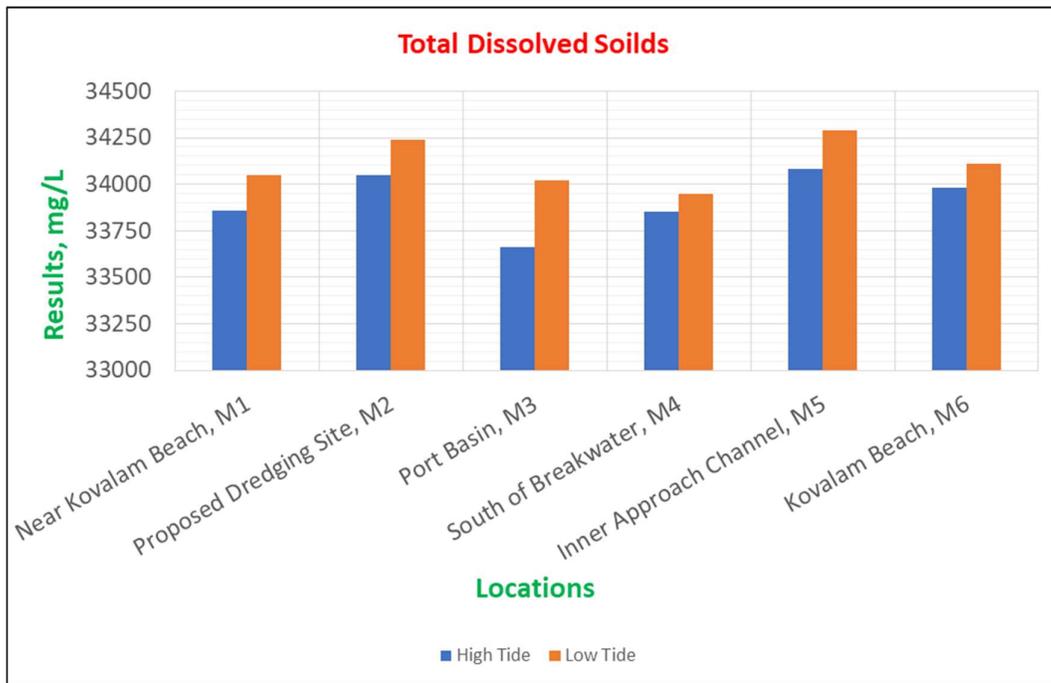
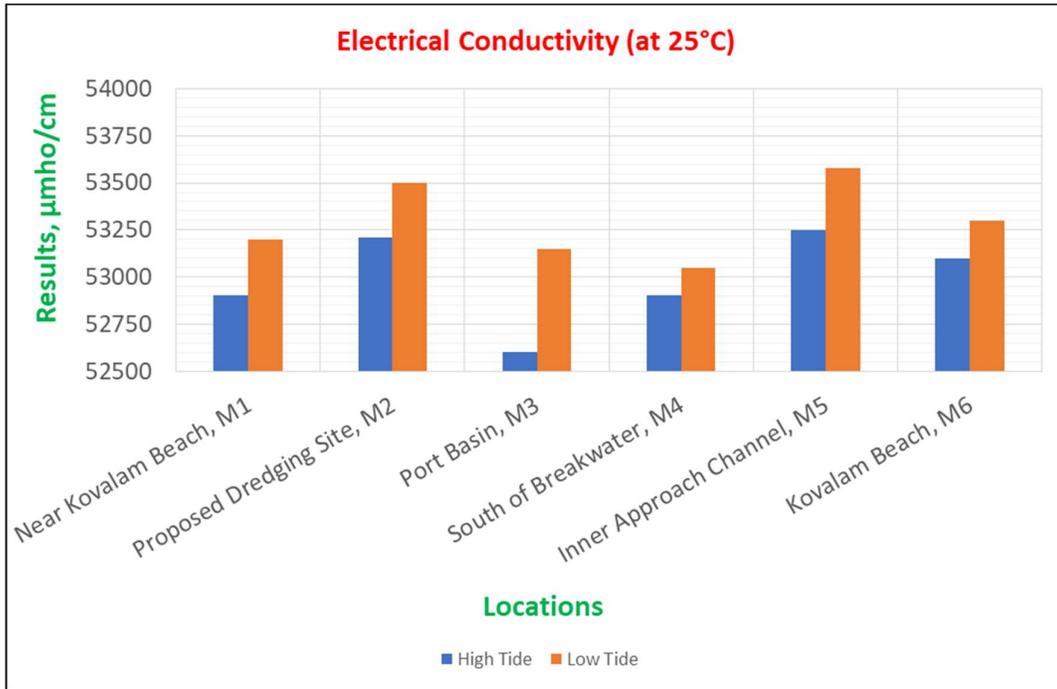
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EMR-4.2

Statistical Analysis of Marine Water

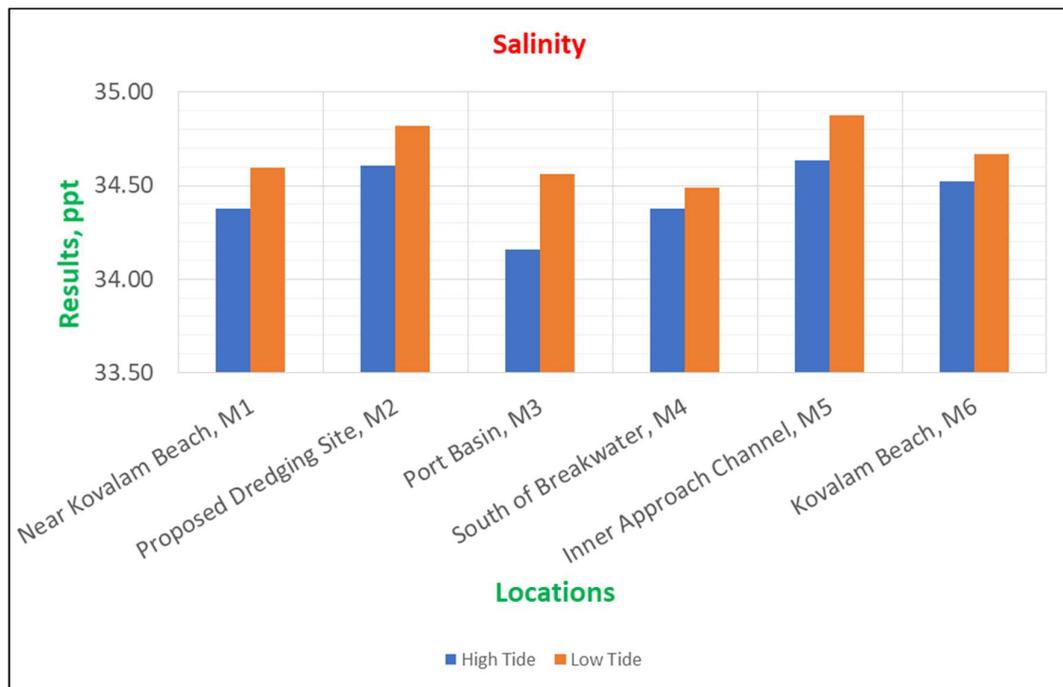
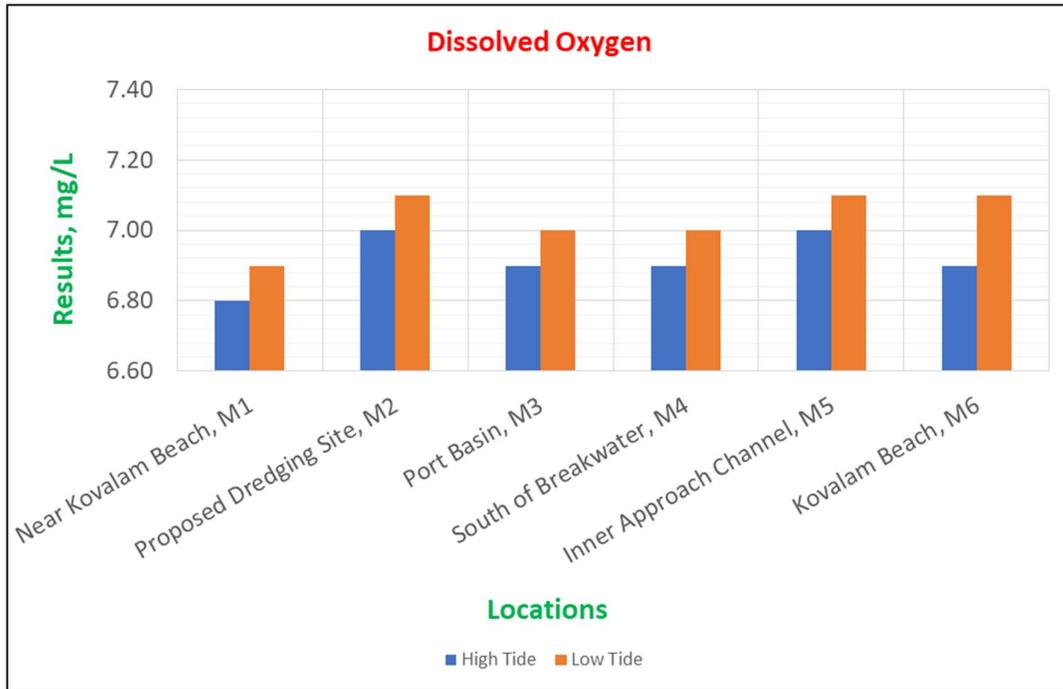


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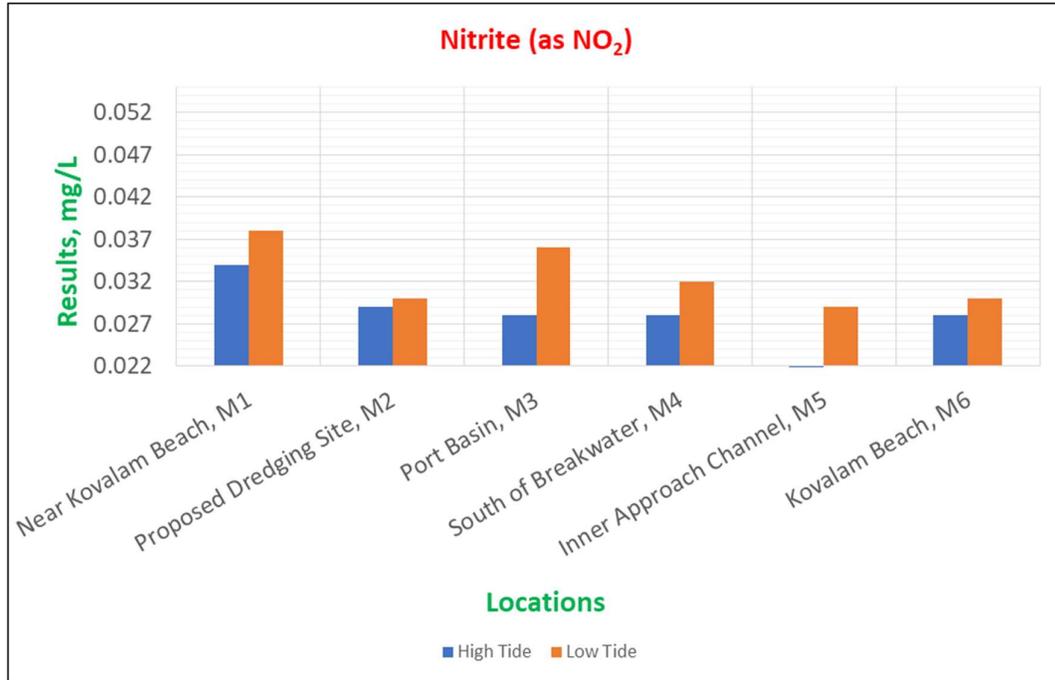
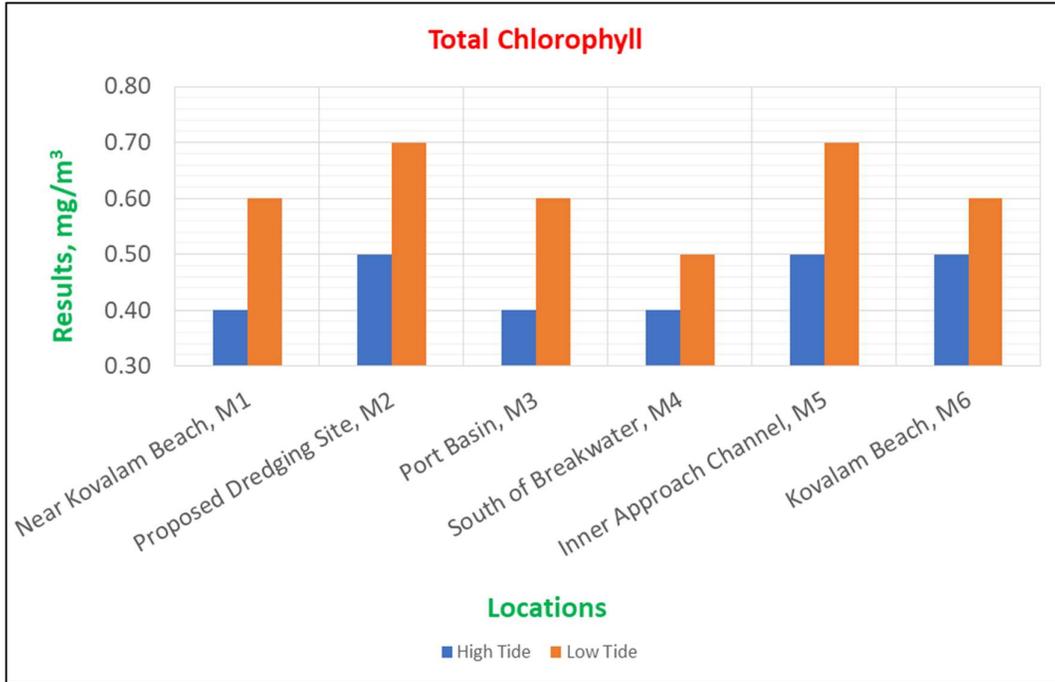
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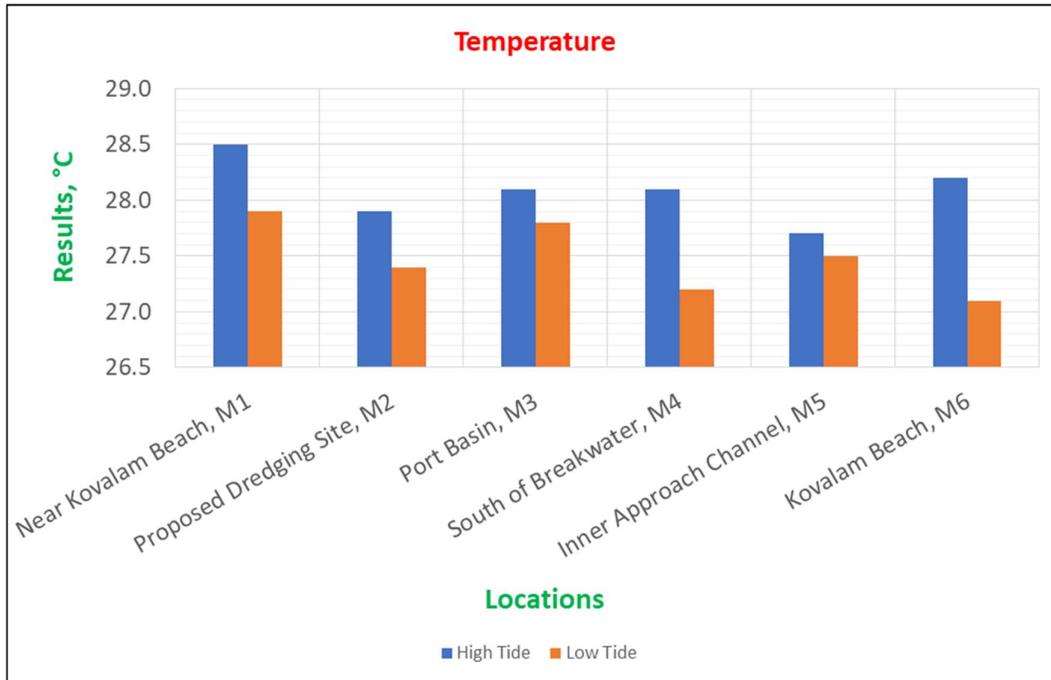
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EMR-4.3	Sediment Analysis Report
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Date of Sampling	09-01-2026
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Parameter	Unit	Results					
		Near Kovalam Beach (MS1)	Proposed Dredging Site (MS2)	Port Basin (MS3)	South of Break Water (MS4)	Inner Approach Channel (MS5)	Kovalam Beach (MS6)
Texture	-	Sand	Sand	Sandy Loam	Sand	Sand	Sand
Organic Matter	%	0.45	0.38	0.35	0.35	0.32	0.41
Total Phosphorus (as P)	mg/kg	280	422	230	190	210	520
Aluminium (as Al)	mg/kg	1412	1120	1962	1320	650	2103
Chromium (as Cr)	mg/kg	BDL	BDL	BDL	BDL	BDL	BDL
Copper (as Cu)	mg/kg	BDL	BDL	BDL	BDL	BDL	BDL
Iron (as Fe)	mg/kg	6952	2500	4805	2213	1236	1210
Lead (as Pb)	mg/kg	BDL	BDL	BDL	BDL	BDL	BDL
Manganese (as Mn)	mg/kg	2.63	2.45	2.22	1.85	1.75	1.38
Mercury (as Hg)	mg/kg	BDL	BDL	BDL	BDL	BDL	BDL
Zinc (as Zn)	mg/kg	1.35	1.58	1.75	1.68	2.88	2.10
Nickel (as Ni)	mg/kg	BDL	BDL	BDL	BDL	BDL	BDL
Benthic Organism							
Micro Benthic Organism	No./m ²	69451	64213	63214	62175	65147	65827
Macro Benthic Organism	No./m ²	62893	60424	60481	59874	61147	62785
Total	No./m²	132344	124637	123695	122049	126294	128612

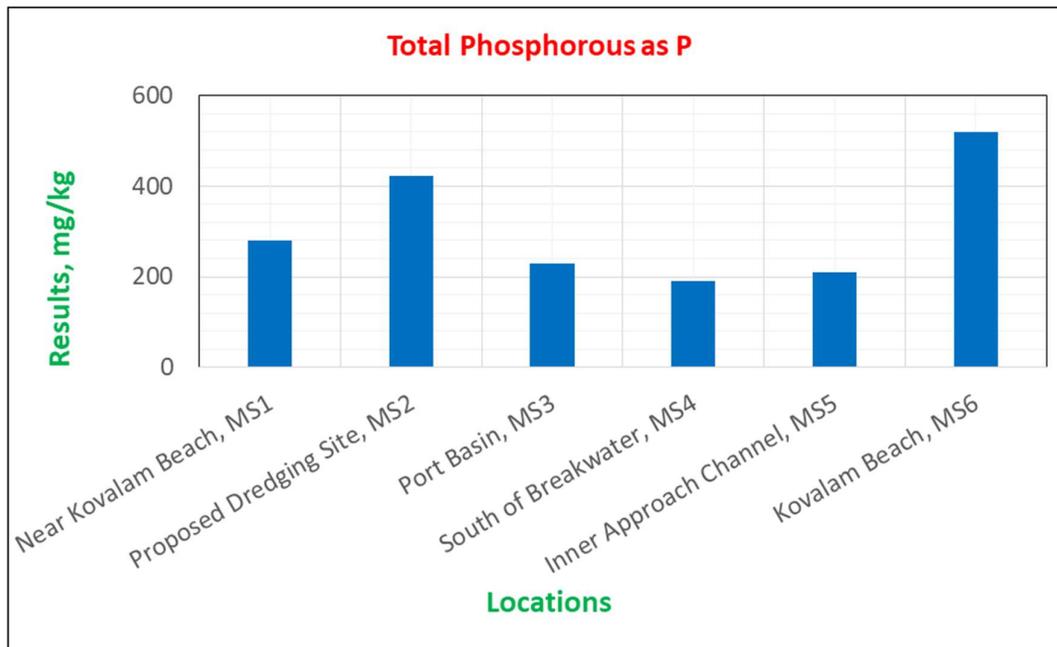
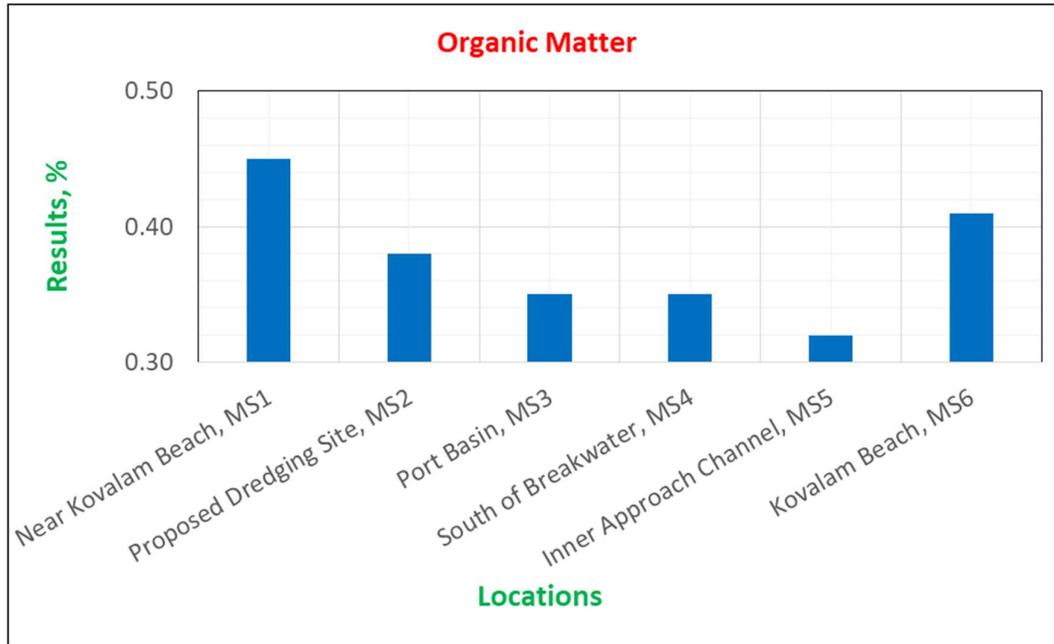
BDL: Below Detectable Limit

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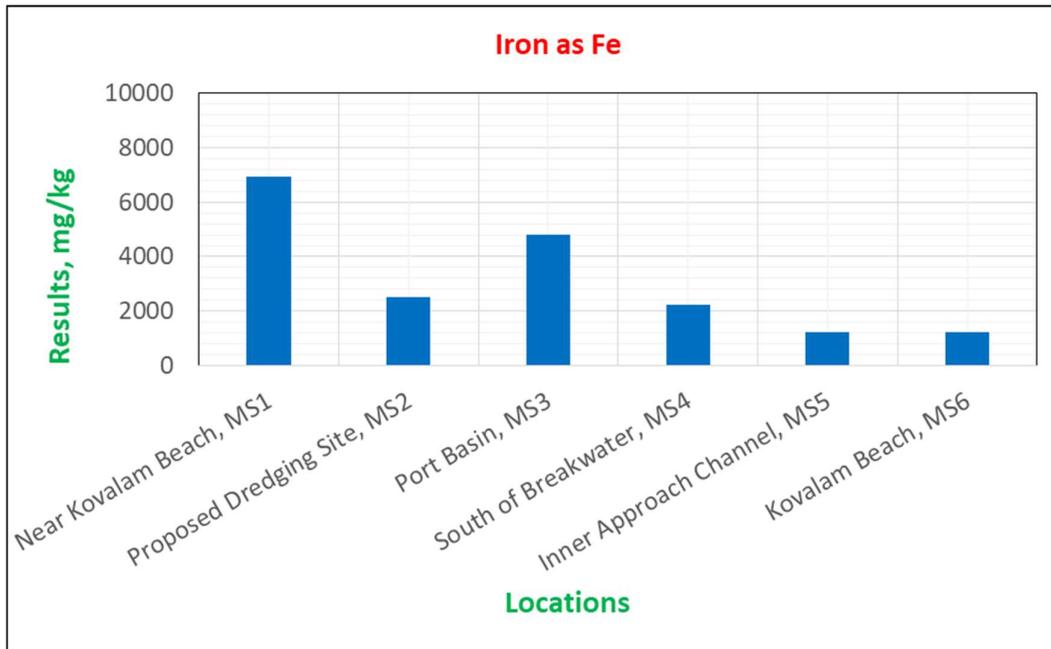
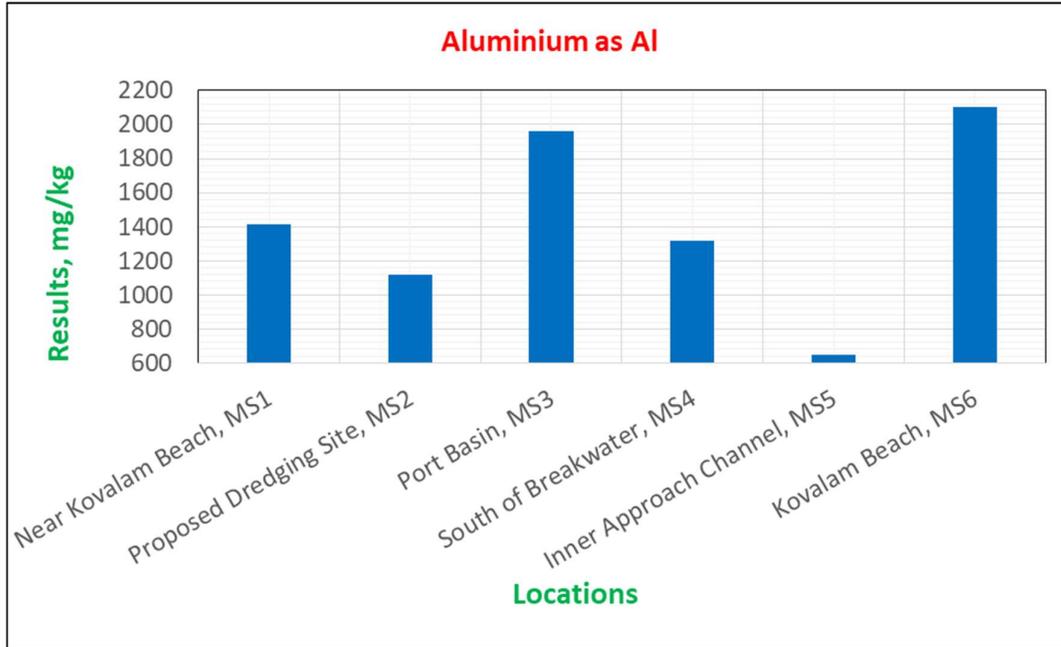
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EMR-4.4

Statistical Analysis of Sediment

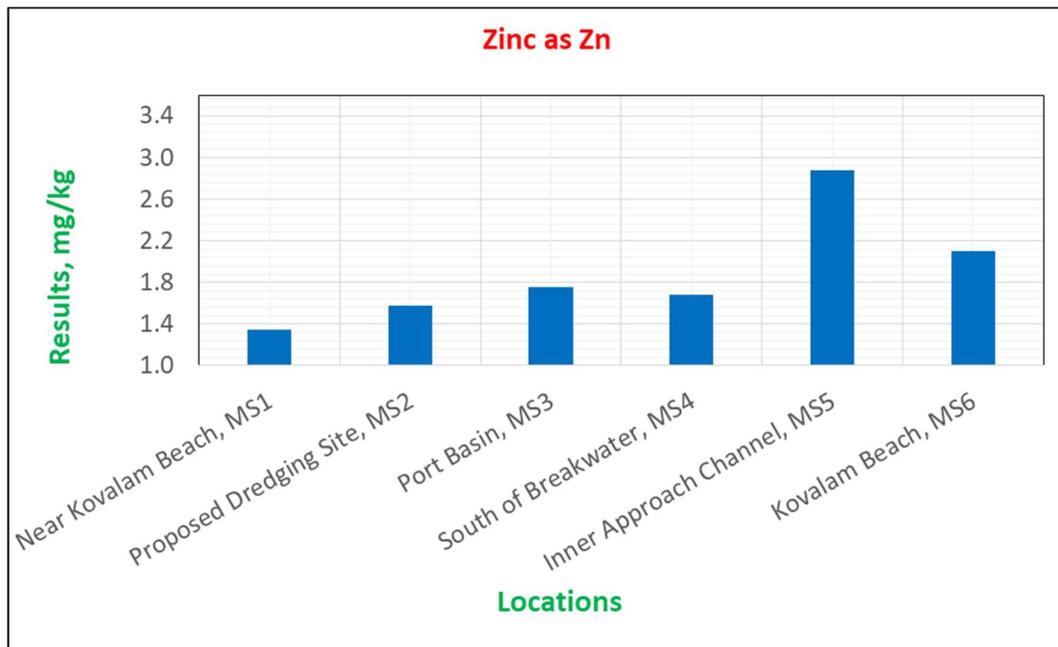
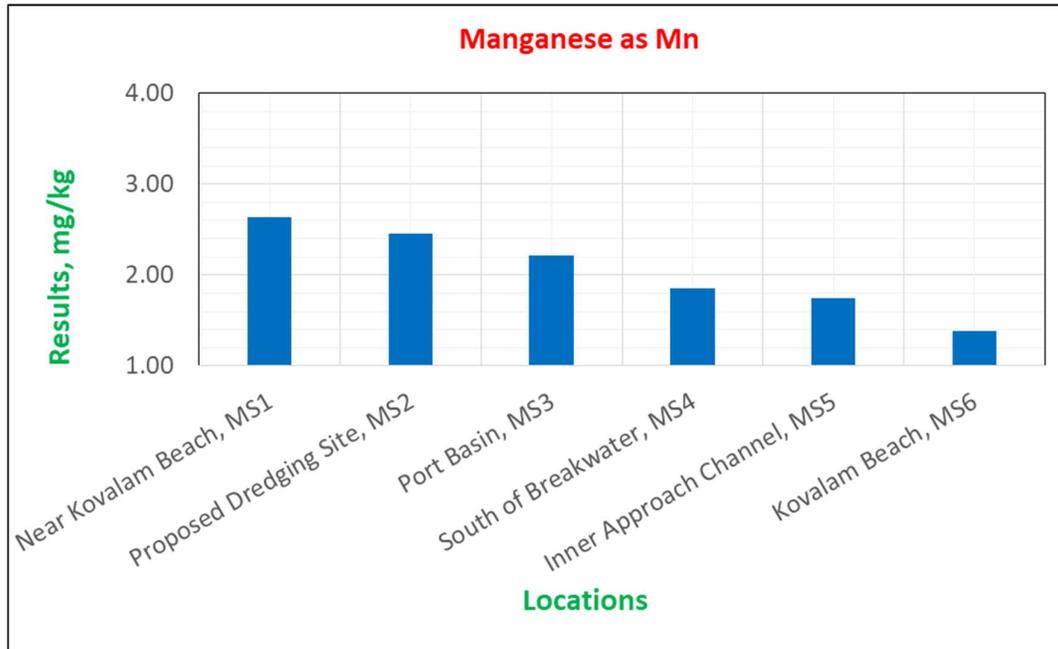


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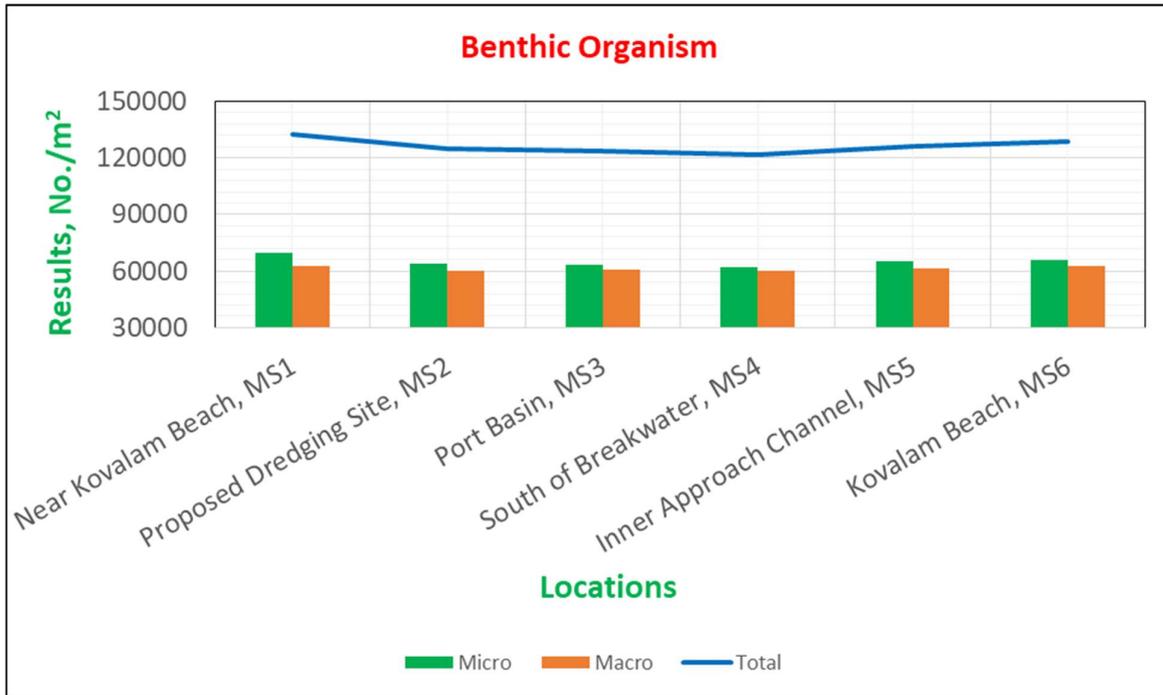
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EMR-4.5	Phytoplankton Analysis from Marine Water Samples
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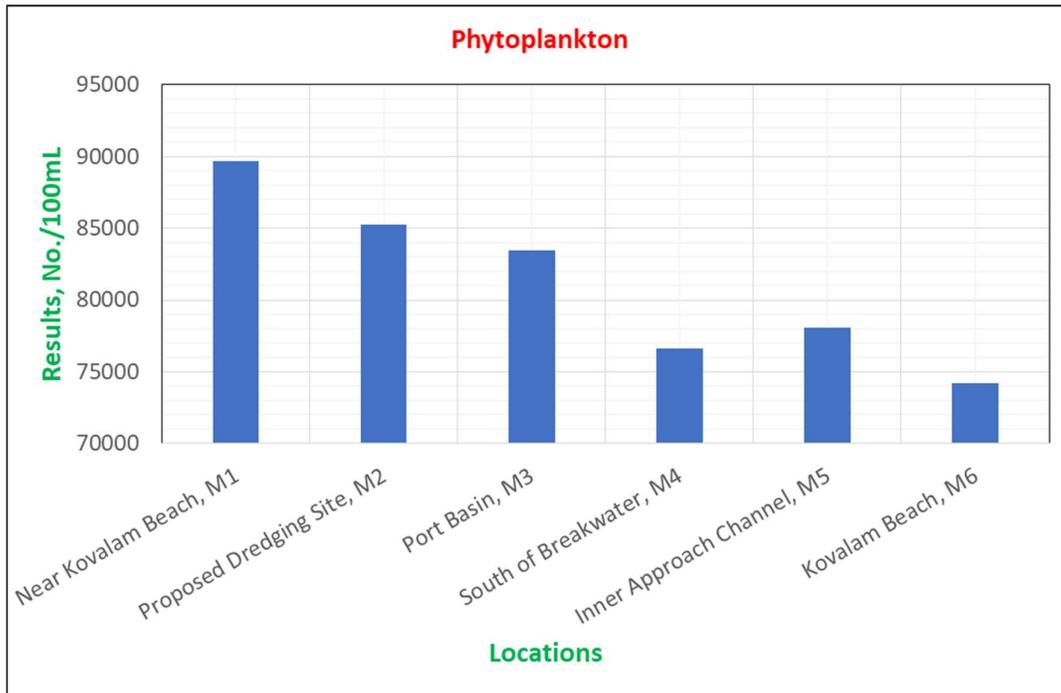
Date of Sampling	09-01-2026
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Parameter	Unit	Results					
		Near Kovalam Beach (M1)	Proposed Dredging Site (M2)	Port Basin (M3)	South of Break Water (M4)	Inner Approach Channel (M5)	Kovalam Beach (M6)
Fragilariaceae	No/100mL	50375	44258	38974	33157	32458	29547
Bacillariophyceae		22134	13897	23147	24453	29354	25145
Cyanophyceae		1758	3985	2589	4721	2045	896
Chlorophyceae		2113	1474	1526	3001	1125	425
<u>Stephanodiscaceae</u>		523	1457	1026	1458	1356	2689
<u>Merismopediaceae</u>		416	875	968	725	782	968
<u>Selenastraceae</u>		0	0	0	0	0	0
<u>Scenedesmaceae</u>		1745	1354	826	993	869	715
Zygnemataceae		189	815	548	420	925	298
Chlorellaceae		1788	9784	7253	1524	1895	9254
<u>Micractiniaceae</u>		2236	2134	1672	1427	1569	1356
<u>Chlorococcaceae</u>		1826	1524	1412	1325	1654	857
<u>Desmidiaceae</u>		0	0	0	0	0	0
<u>Hildenbrandiaceae</u>		0	0	0	0	0	0
Microcystaceae		2214	1249	1024	947	1874	775
Coscinodiscaceae		1847	1125	1612	964	1359	523
Naviculaceae		501	1356	869	878	841	789
Skeletonemataceae		0	0	0	654	0	0
Total			89665	85287	83446	76647	78106

EMR-4.6	Statistical Analysis of Phytoplankton
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EMR-4.7	Zooplankton Analysis from Marine Samples
Date of Sampling	09-01-2026

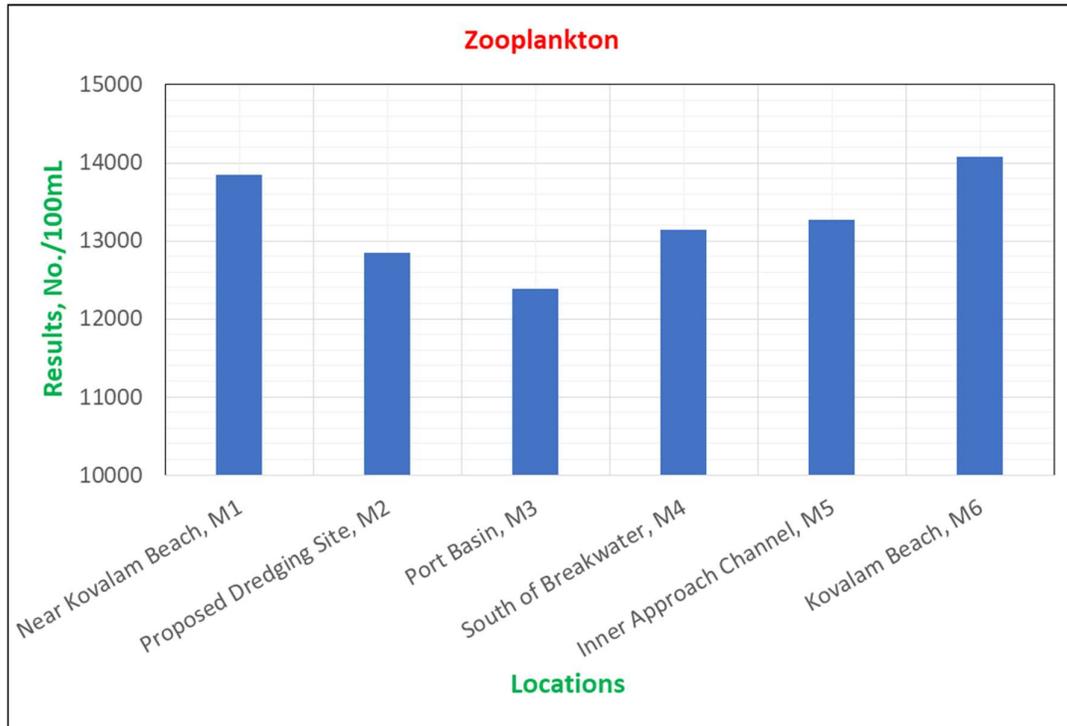
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E-mail : sealab@gmail.com; Ph: 04842546660; Mobile: 9074341443; 9387272402

Parameter	Unit	Results						
		Near Kovalam Beach (M1)	Proposed Dredging Site (M2)	Port Basin (M3)	South of Break Water (M4)	Inner Approach Channel (M5)	Kovalam Beach (M6)	
Amphipods	No/100mL	805	714	220	457	254	847	
Bivalve larvae		489	528	526	256	663	415	
Copepods		6785	6245	5714	9147	6125	5598	
Decapods		1504	214	598	0	1245	2297	
Gastropods		0	0	0	0	0	0	
Chaetognaths		2114	1547	2045	1124	2341	1145	
Polychaetes		0	0	0	0	0	0	
Ciliates		1625	1914	2689	1835	997	3014	
Lucifer		0	687	0	0	984	0	
Siphonophore		528	1002	591	317	667	758	
Total			13850	12851	12383	13136	13276	14074

EMR-4.8
Statistical Analysis of Zooplankton
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EMR-5	Ground Water Analysis Report
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Date of Sampling	08-01-2026
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S. No.	Parameters	Unit	Acceptable Limit as per IS 10500: 2012	Results		
				Port Site (Open well) G1	Proposed Port Estate Area (Open well) G2	PAF Area (Open well) G3
Organoleptic & Physical Parameters						
1.	Colour	Hazen Units	Max. 5	1	1	1
2.	Odour	-	Agreeable	Agreeable	Agreeable	Agreeable
3.	pH Value	-	6.5 to 8.5	7.95	7.18	6.55
4.	Turbidity	N.T.U.	Max. 1	BDL	0.2	0.3
5.	Total Dissolved Solids	mg/L	Max. 500	290	345	260
General Parameters concerning substances undesirable in excessive amounts						
6.	Aluminium (as Al)	mg/L	Max. 0.03	BDL	BDL	BDL
7.	Ammonia (as NH ₃ -N)	mg/L	Max.0.5	BDL	BDL	BDL
8.	Anionic Detergents (as MBAS) Calculated as LAS mol.wt. 288.38	mg/L	Max. 0.2	BDL	BDL	BDL
9.	Barium (as Ba)	mg/L	Max. 0.7	BDL	BDL	BDL
10.	Boron (as B)	mg/L	Max. 0.5	BDL	BDL	BDL
11.	Calcium (as Ca)	mg/L	Max. 75	23.8	18.9	16.4
12.	Chloramines (as Cl ₂)	mg/L	Max. 4.0	BDL	BDL	BDL
13.	Chloride (as Cl)	mg/L	Max.250	73.4	127	92.9
14.	Copper (as Cu)	mg/L	Max.0.05	BDL	BDL	BDL
15.	Fluoride (as F)	mg/L	Max. 1	BDL	BDL	BDL
16.	Iron (as Fe)	mg/L	Max.1.0	BDL	BDL	BDL
17.	Magnesium (as Mg)	mg/L	Max. 30	7.38	5.90	4.92
18.	Manganese (as Mn)	mg/L	Max.0.1	BDL	BDL	BDL
19.	Mineral Oil	mg/L	Max.1.0	BDL	BDL	BDL
20.	Nitrate (as NO ₃)	mg/L	Max.45	BDL	BDL	BDL
21.	Phenolic Compounds (as C ₆ H ₅ OH)	mg/L	Max. 0.001	BDL	BDL	BDL
22.	Selenium (as Se)	mg/L	Max. 0.01	BDL	BDL	BDL
23.	Silver (as Ag)	mg/L	Max. 0.1	BDL	BDL	BDL
24.	Sulphate (as SO ₄)	mg/L	Max. 200	24.1	15.8	20.3
25.	Sulphide (as H ₂ S)	mg/L	Max. 0.05	BDL	BDL	BDL
26.	Total Alkalinity (as CaCO ₃)	mg/L	Max.200	72	19.2	9.6
27.	Total Hardness (as CaCO ₃)	mg/L	Max. 200	88.9	70.7	60.6
28.	Zinc (as Zn)	mg/L	Max. 5	BDL	BDL	BDL
Parameters Concerning Toxic Substances						

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S. No.	Parameters	Unit	Acceptable Limit as per IS 10500: 2012	Results		
				Port Site (Open well) G1	Proposed Port Estate Area (Open well) G2	PAF Area (Open well) G3
29.	Cadmium (as Cd)	mg/L	Max. 0.003	BDL	BDL	BDL
30.	Cyanide (as CN)	mg/L	Max.0.05	BDL	BDL	BDL
31.	Lead (as Pb)	mg/L	Max. 0.01	BDL	BDL	BDL
32.	Mercury (as Hg)	mg/L	Max. 0.001	BDL	BDL	BDL
33.	Molybdenum (as Mo)	mg/L	Max. 0.07	BDL	BDL	BDL
34.	Nickel (as Ni)	mg/L	Max.0.02	BDL	BDL	BDL
35.	Pesticide Residues					
i.	Alachlor	µg/L	20	BDL	BDL	BDL
ii.	Atrazine	µg/L	2	BDL	BDL	BDL
iii.	Aldrin/Dieldrin	µg/L	0.03	BDL	BDL	BDL
iv.	Alpha HCH	µg/L	0.01	BDL	BDL	BDL
v.	Beta HCH	µg/L	0.04	BDL	BDL	BDL
vi.	Butachlor	µg/L	125	BDL	BDL	BDL
vii.	Chlorpyrifos	µg/L	30	BDL	BDL	BDL
viii.	Delta HCH	µg/L	0.04	BDL	BDL	BDL
ix.	2,4D chlorophenoxyacetic acid	µg/L	30	BDL	BDL	BDL
x.	DDT (o,p & p,p- Isomers of DDT, DDE, DDD)	µg/L	1	BDL	BDL	BDL
xi.	Endosulfan (α,β & Sulphate)	µg/L	0.4	BDL	BDL	BDL
xii.	Ethion	µg/L	3	BDL	BDL	BDL
xiii.	γ HCH (Lindane)	µg/L	2	BDL	BDL	BDL
xiv.	Isoproturon	µg/L	9	BDL	BDL	BDL
xv.	Malathion	µg/L	190	BDL	BDL	BDL
xvi.	Methyl Parathion	µg/L	0.3	BDL	BDL	BDL
xvii.	Monocrotophos	µg/L	1	BDL	BDL	BDL
xviii.	Phorate	µg/L	2	BDL	BDL	BDL
36.	Polychlorinated Biphenyls (PCB)	mg/L	Max.0.0005	BDL	BDL	BDL
37.	Polynuclear Aromatic Hydrocarbons (PAH)	mg/L	Max.0.0001	BDL	BDL	BDL
38.	Total Arsenic (as As)	mg/L	Max. 0.01	BDL	BDL	BDL
39.	Total Chromium (as Cr)	mg/L	Max. 0.05	BDL	BDL	BDL
40.	Trihalomethanes					
a)	Bromoform	mg/L	Max. 0.1	BDL	BDL	BDL
b)	Dibromochloromethane	mg/L	Max. 0.1	BDL	BDL	BDL
c)	Bromodichloroethane	mg/L	Max. 0.06	BDL	BDL	BDL
d)	Chloroform	mg/L	Max. 0.2	BDL	BDL	BDL
Bacteriological Analysis						
41.	<i>E. coli</i>	MPN/100 ml	Not Detectable	BDL	BDL	BDL
42.	Total Coliforms	MPN/100 ml	-	BDL	BDL	BDL

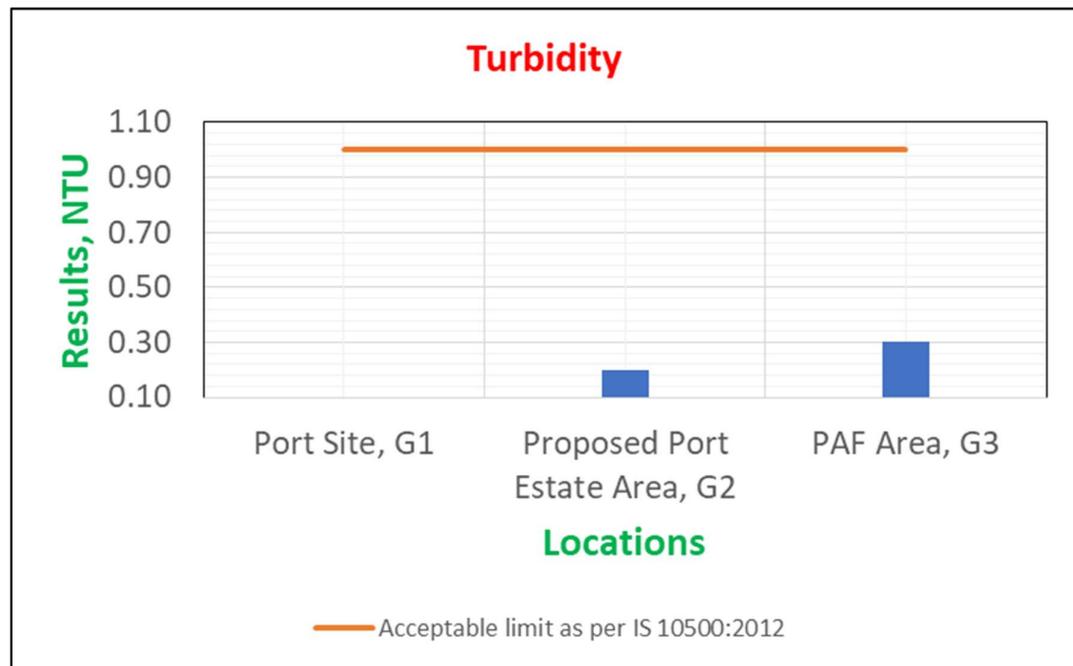
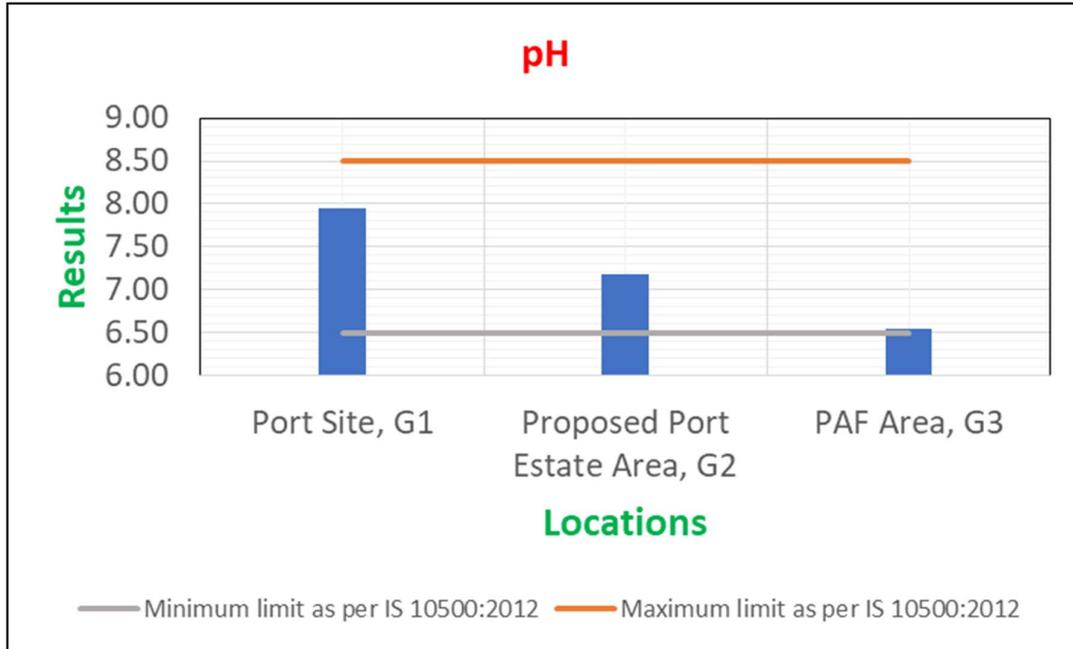
BDL: Below Detectable Limit

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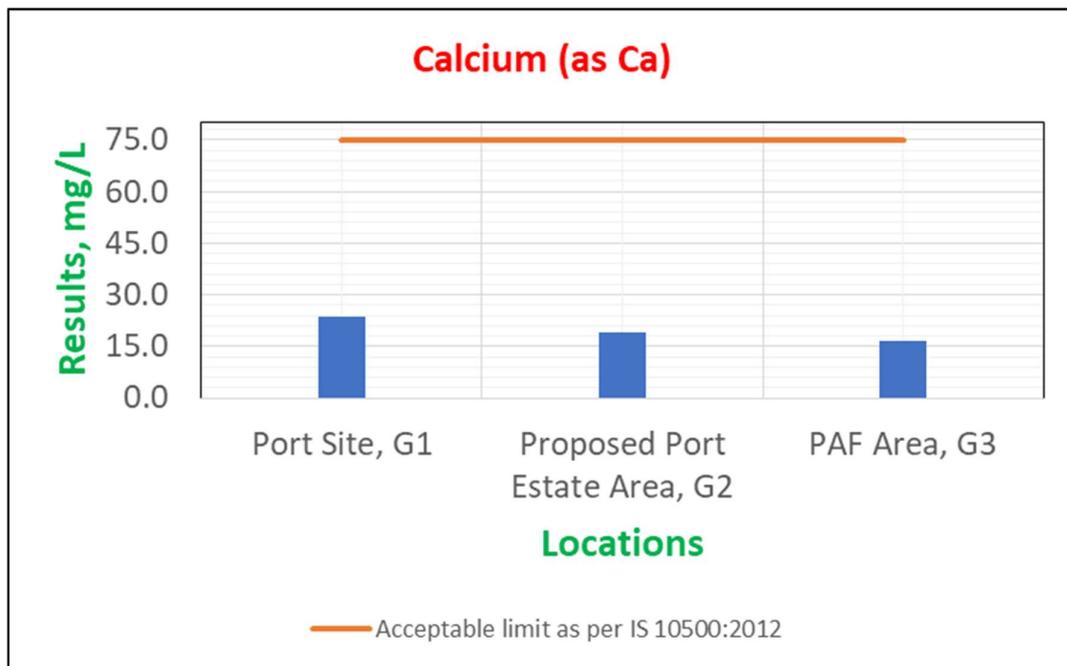
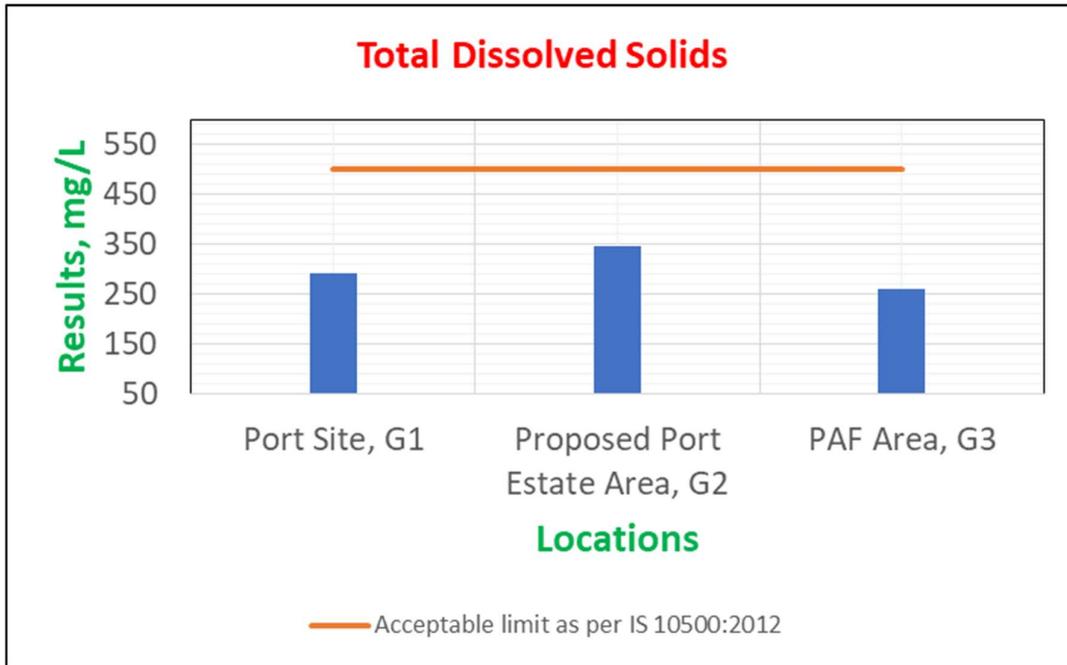
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EMR-5.1

Statistical Analysis of Ground Water

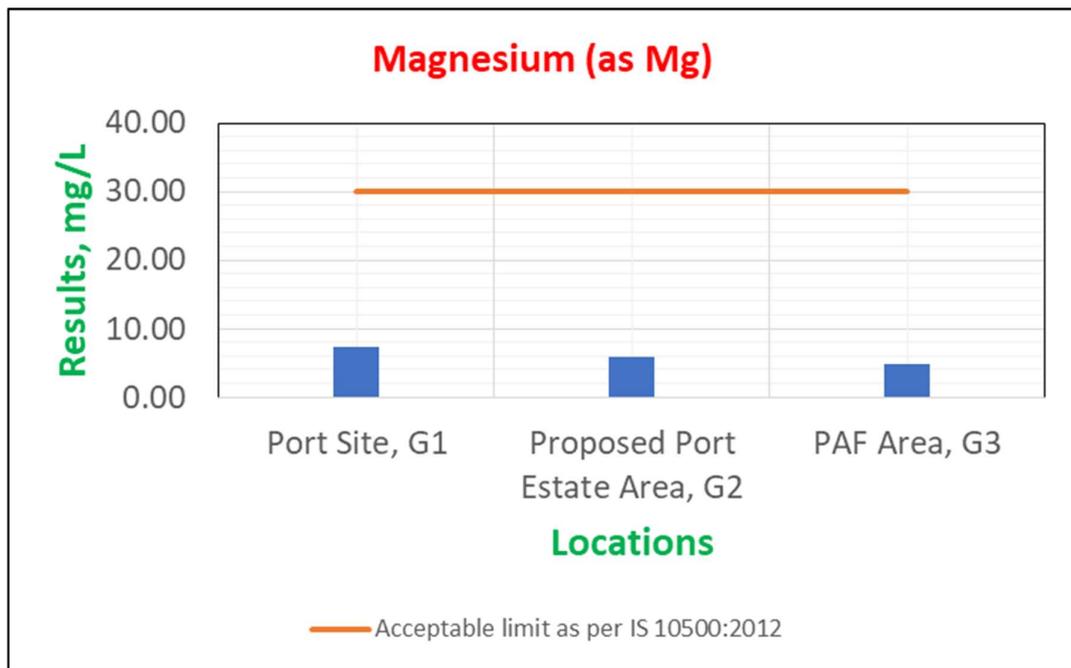
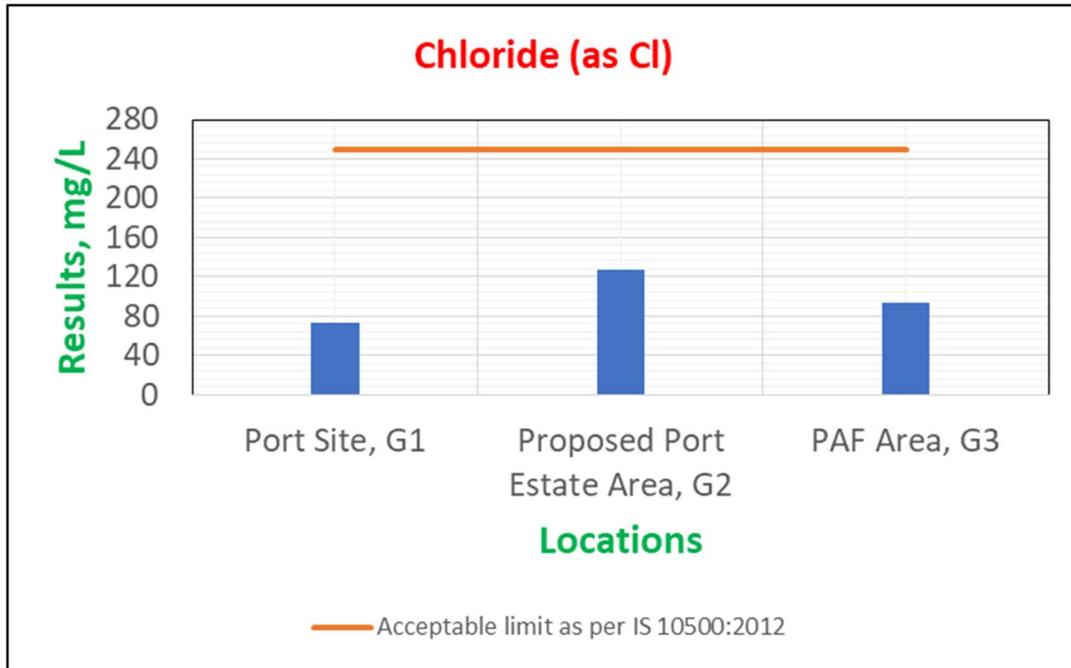


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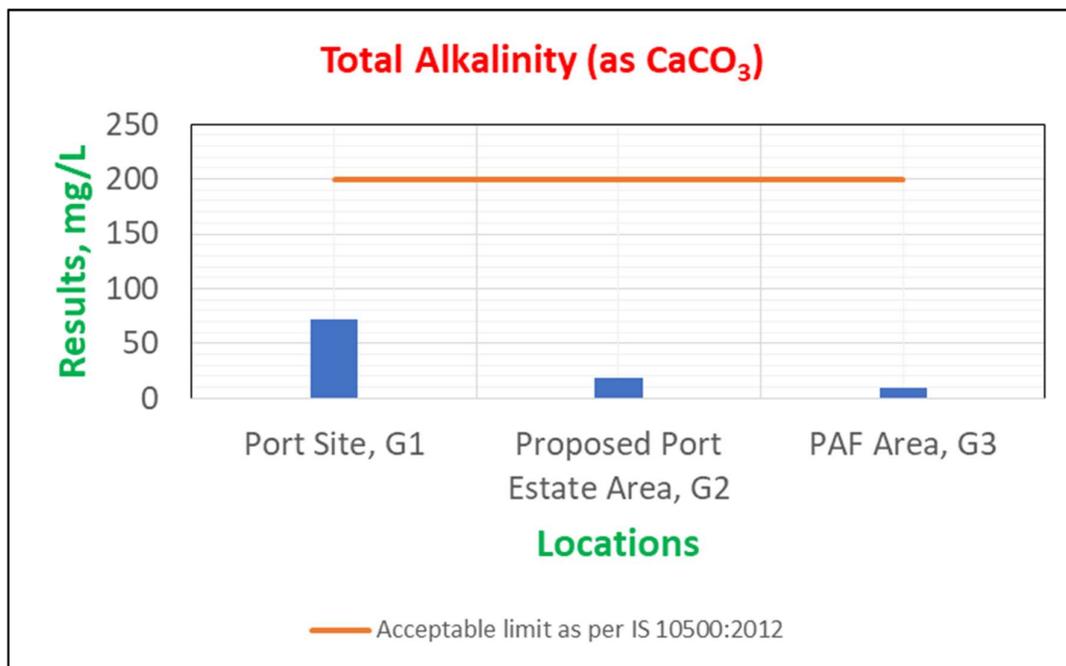
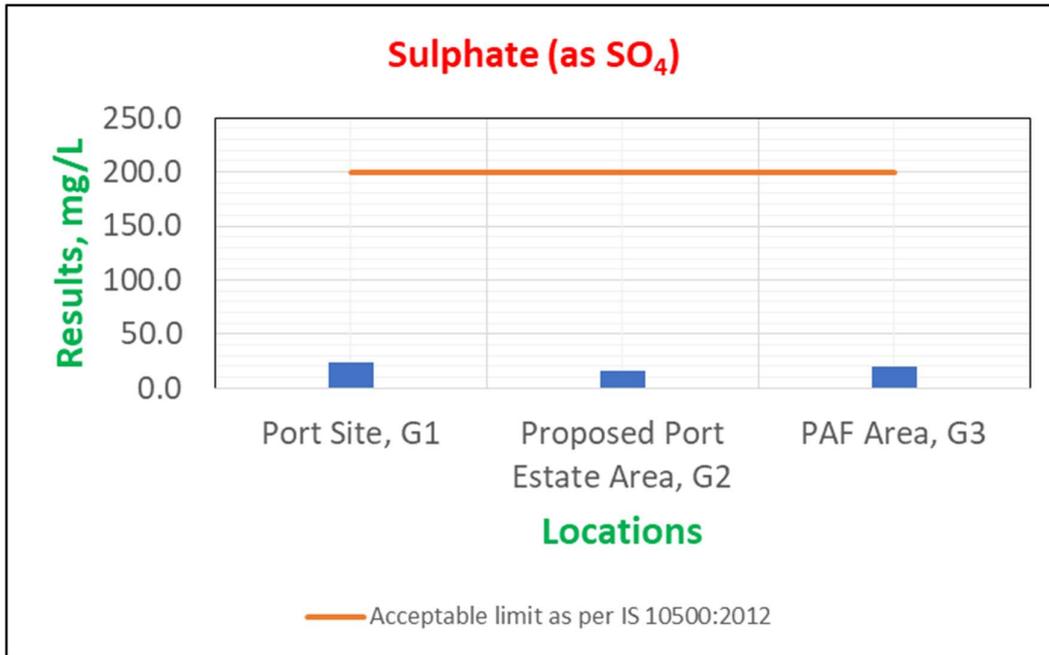
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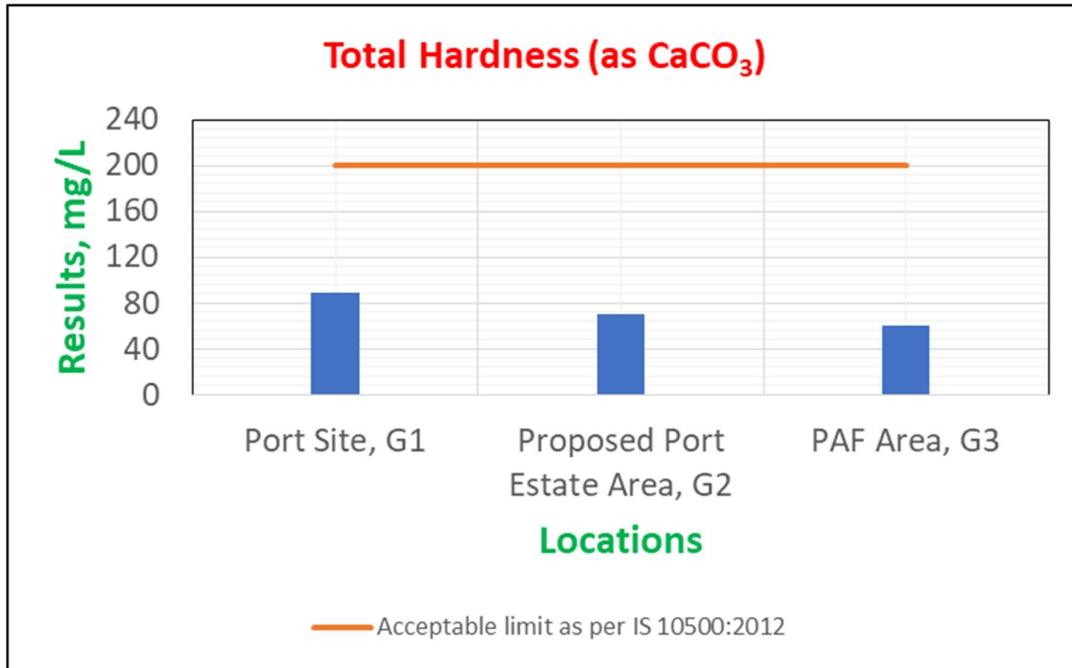


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EMR-6	Surface Water Analysis Report
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Date of Sampling	08-01-2026
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S. No.	Parameters	Unit	Results			
			Poovar West Canal S1	Vizhinjam Branch Canal S2	Vellayani Lake S3	Poovar Estuary S4
Physical Parameters						
1.	Colour	Hazen Units	1	1	1	1
2.	Odour	-	Agreeable	Agreeable	Agreeable	Agreeable
3.	pH Value	-	7.22	7.45	7.21	7.12
4.	Turbidity	N.T.U.	2.5	1.6	0.4	1.1
5.	Electrical Conductivity (at 25°C)	µmho/cm	1380	230	285	5120
6.	Total Dissolved Solids	mg/L	880	145	185	3275
Chemical Parameters						
7.	Dissolved Oxygen	mg/L	7	6.9	7.1	7
8.	Biochemical Oxygen Demand (3 days, 27°C)	mg/L	BDL	BDL	BDL	BDL
9.	Oil & Grease	mg/L	BDL	BDL	BDL	BDL
10.	Free Ammonia	mg/L	BDL	BDL	BDL	1.42
11.	Anionic Detergents (as MBAS) Calculated as LAS mol.wt. 288.38	mg/L	BDL	BDL	BDL	BDL
12.	Barium (as Ba)	mg/L	BDL	BDL	BDL	BDL
13.	Boron (as B)	mg/L	BDL	BDL	BDL	BDL
14.	Calcium (as Ca)	mg/L	72.2	8.20	12.3	82.0
15.	Chloride (as Cl)	mg/L	166	32.3	56.7	610
16.	Copper (as Cu)	mg/L	BDL	BDL	BDL	BDL
17.	Fluoride (as F)	mg/L	BDL	BDL	BDL	BDL
18.	Iron (as Fe)	mg/L	0.59	0.70	BDL	0.62
19.	Magnesium (as Mg)	mg/L	20.7	3.93	3.44	41.8
20.	Manganese (as Mn)	mg/L	BDL	BDL	BDL	BDL
21.	Mineral Oil	mg/L	BDL	BDL	BDL	BDL
22.	Nitrate (as NO ₃)	mg/L	BDL	BDL	BDL	BDL
23.	Phenolic Compounds (as C ₆ H ₅ OH)	mg/L	BDL	BDL	BDL	BDL
24.	Selenium (as Se)	mg/L	BDL	BDL	BDL	BDL
25.	Silver (as Ag)	mg/L	BDL	BDL	BDL	BDL
26.	Sulphate (as SO ₄)	mg/L	21.2	12.5	8.95	185
27.	Total Phosphate (as PO ₄)	mg/L	BDL	BDL	BDL	BDL
28.	Total Alkalinity (as CaCO ₃)	mg/L	19.2	31.2	35.0	43.2
29.	Total Hardness (as CaCO ₃)	mg/L	263	36.4	44.4	374
30.	Calcium Hardness (as CaCO ₃)	mg/L	178	20.2	30.3	202
31.	Zinc (as Zn)	mg/L	BDL	BDL	BDL	BDL
32.	Sodium (as Na)	mg/L	101.0	12.2	32.5	280
33.	Potassium (as K)	mg/L	12.00	2.50	4.80	22.0

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S. No.	Parameters	Unit	Results			
			Poovar West Canal S1	Vizhinjam Branch Canal S2	Vellayani Lake S3	Poovar Estuary S4
34.	Sodium Adsorption Ratio	-	2.694	0.876	2.109	6.270
35.	Salinity	ppt	0.678	0.111	0.136	2.703
36.	Cadmium (as Cd)	mg/L	BDL	BDL	BDL	BDL
37.	Cyanide (as CN)	mg/L	BDL	BDL	BDL	BDL
38.	Lead (as Pb)	mg/L	BDL	BDL	BDL	BDL
39.	Mercury (as Hg)	mg/L	BDL	BDL	BDL	BDL
40.	Pesticide Residues					
i.	Alachlor	µg/L	BDL	BDL	BDL	BDL
ii.	Atrazine	µg/L	BDL	BDL	BDL	BDL
iii.	Aldrin/Dieldrin	µg/L	BDL	BDL	BDL	BDL
iv.	Alpha HCH	µg/L	BDL	BDL	BDL	BDL
v.	Beta HCH	µg/L	BDL	BDL	BDL	BDL
vi.	Butachlor	µg/L	BDL	BDL	BDL	BDL
vii.	Chlorpyrifos	µg/L	BDL	BDL	BDL	BDL
viii.	Delta HCH	µg/L	BDL	BDL	BDL	BDL
ix.	2,4D chlorophenoxyacetic acid	µg/L	BDL	BDL	BDL	BDL
x.	DDT (o,p & p,p- Isomers of DDT, DDE, DDD)	µg/L	BDL	BDL	BDL	BDL
xi.	Endosulfan (α,β & Sulphate)	µg/L	BDL	BDL	BDL	BDL
xii.	Ethion	µg/L	BDL	BDL	BDL	BDL
xiii.	γ HCH (Lindane)	µg/L	BDL	BDL	BDL	BDL
xiv.	Isoproturon	µg/L	BDL	BDL	BDL	BDL
xv.	Malathion	µg/L	BDL	BDL	BDL	BDL
xvi.	Methyl Parathion	µg/L	BDL	BDL	BDL	BDL
xvii.	Monocrotophos	µg/L	BDL	BDL	BDL	BDL
xviii.	Phorate	µg/L	BDL	BDL	BDL	BDL
41.	Polynuclear Aromatic Hydrocarbons (PAH)	mg/L	BDL	BDL	BDL	BDL
42.	Total Arsenic (as As)	mg/L	BDL	BDL	BDL	BDL
43.	Total Chromium (as Cr)	mg/L	BDL	BDL	BDL	BDL
Biological Analysis						
44.	Total Coliforms	MPN/100 ml	BDL	BDL	BDL	BDL
45.	Faecal Coliforms	MPN/100 ml	BDL	BDL	BDL	BDL

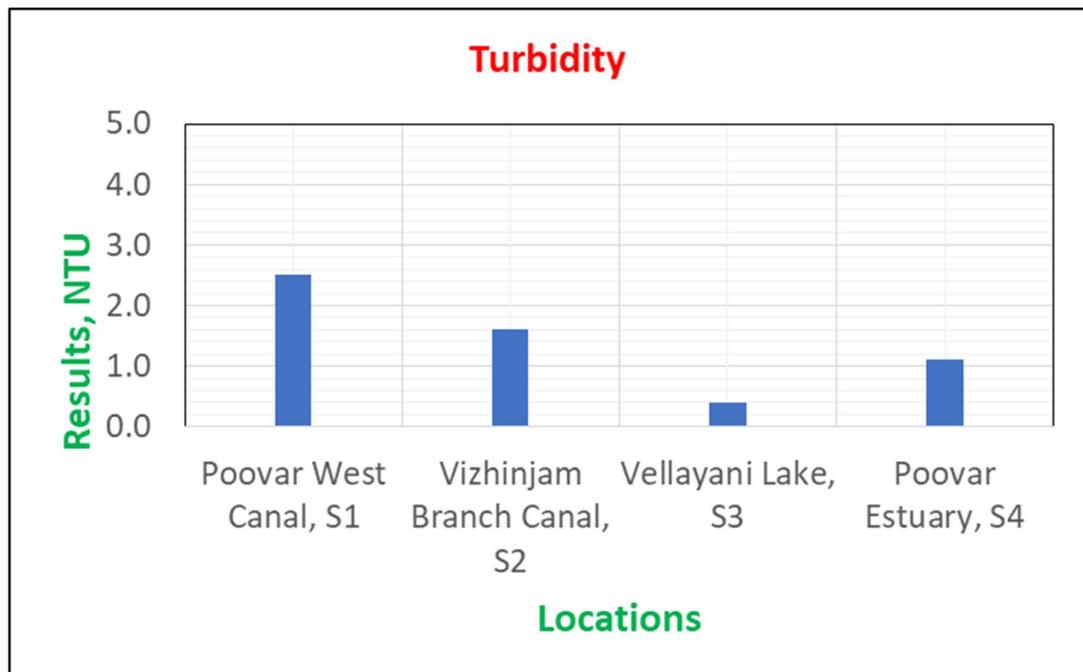
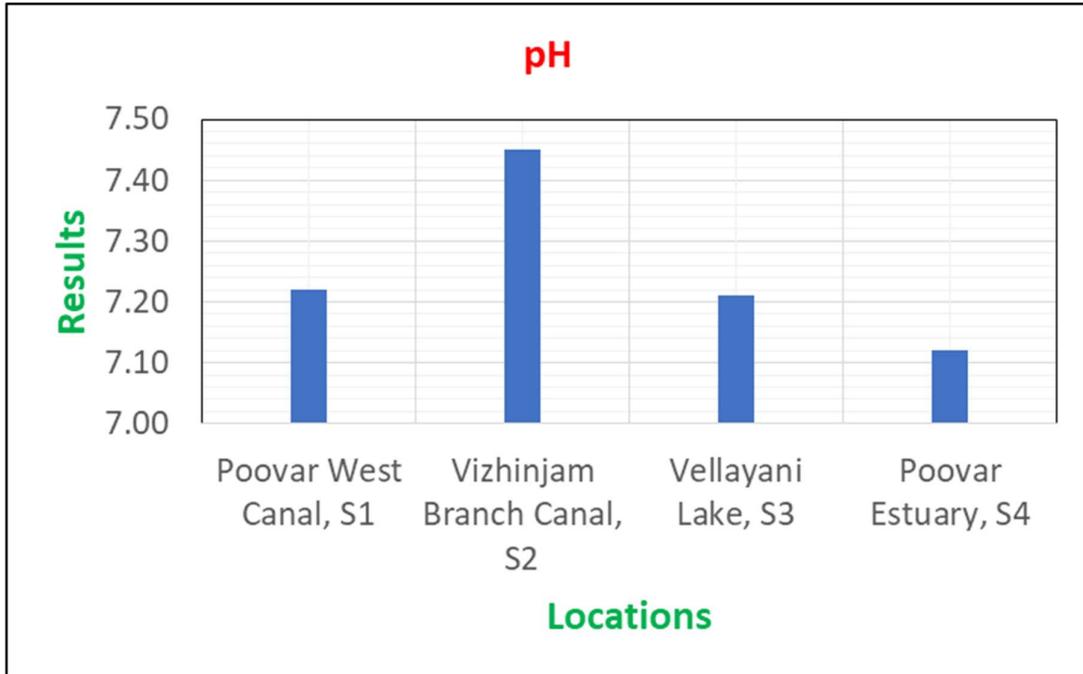
BDL: Below Detectable Limit

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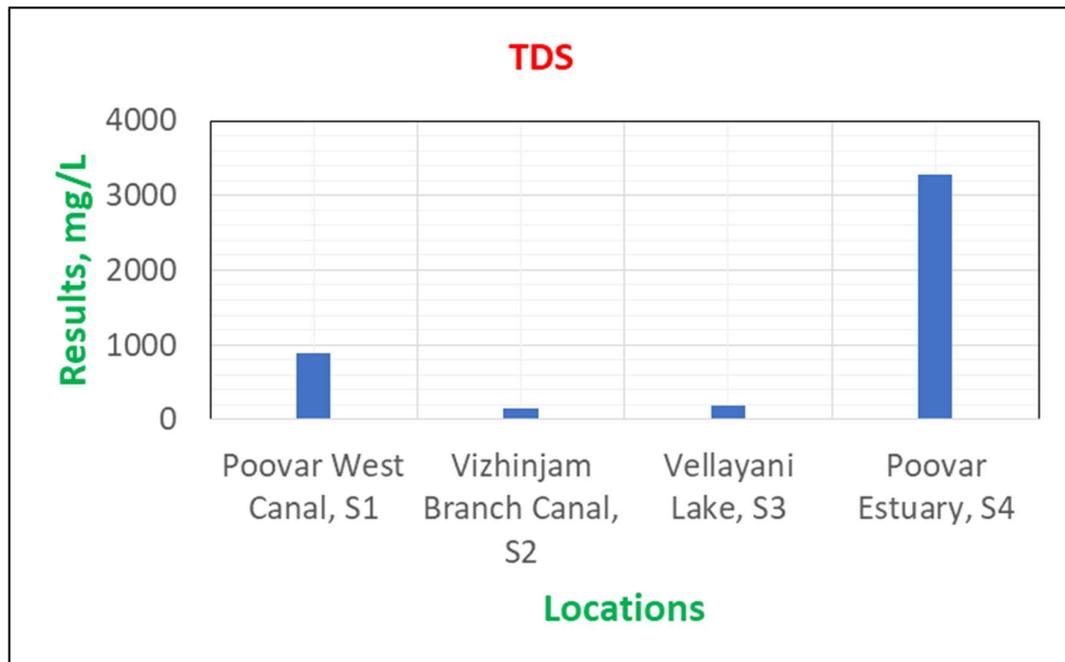
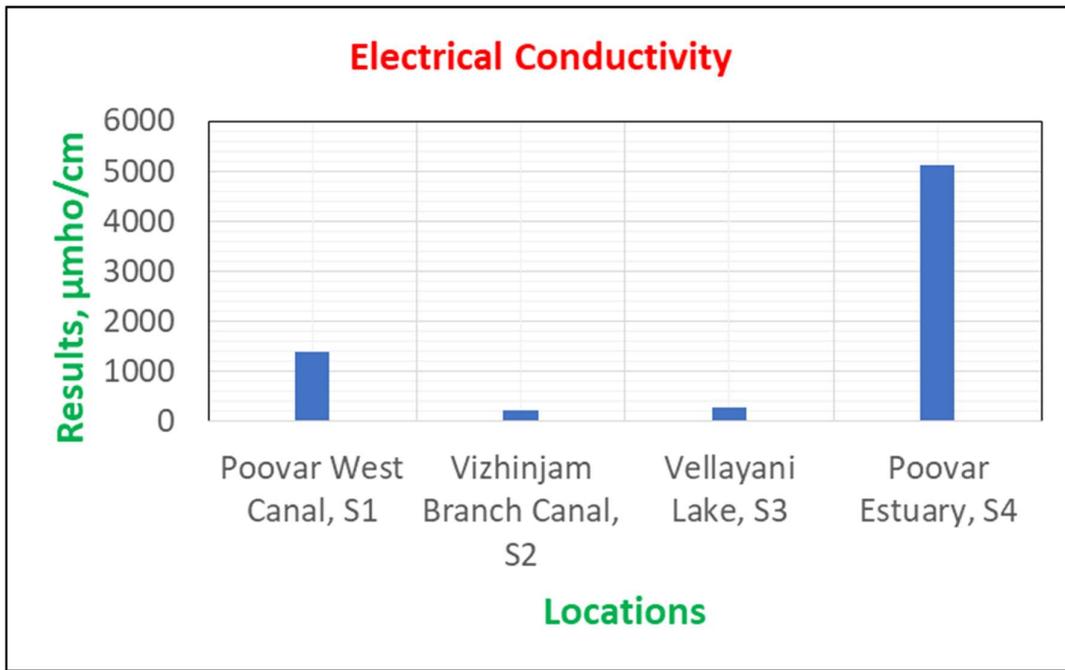
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Statistical Analysis of Surface Water



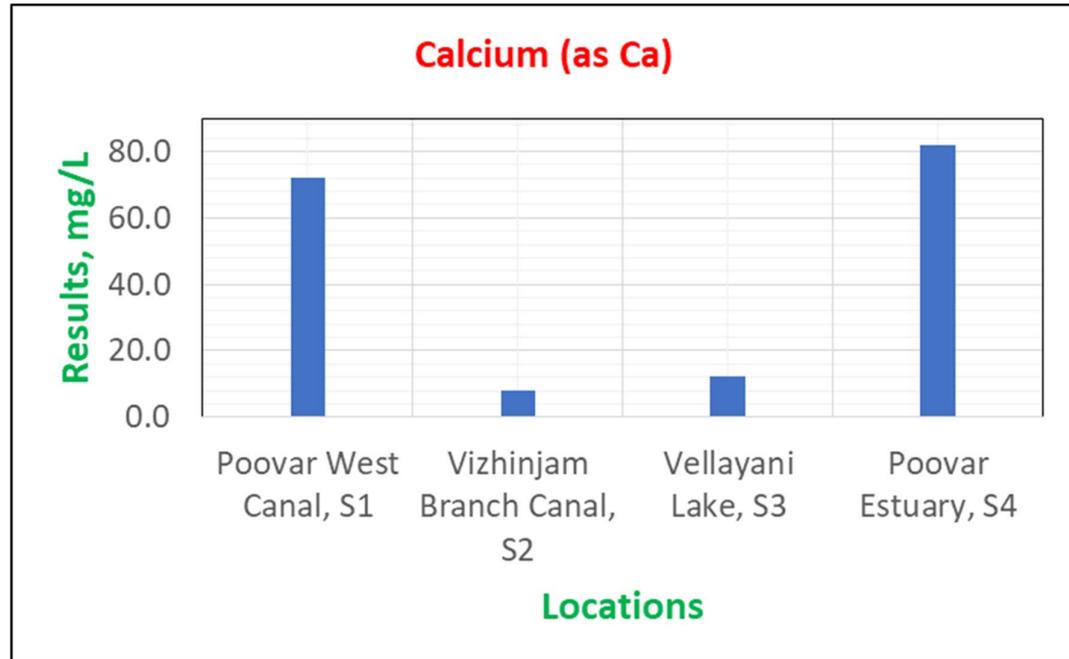
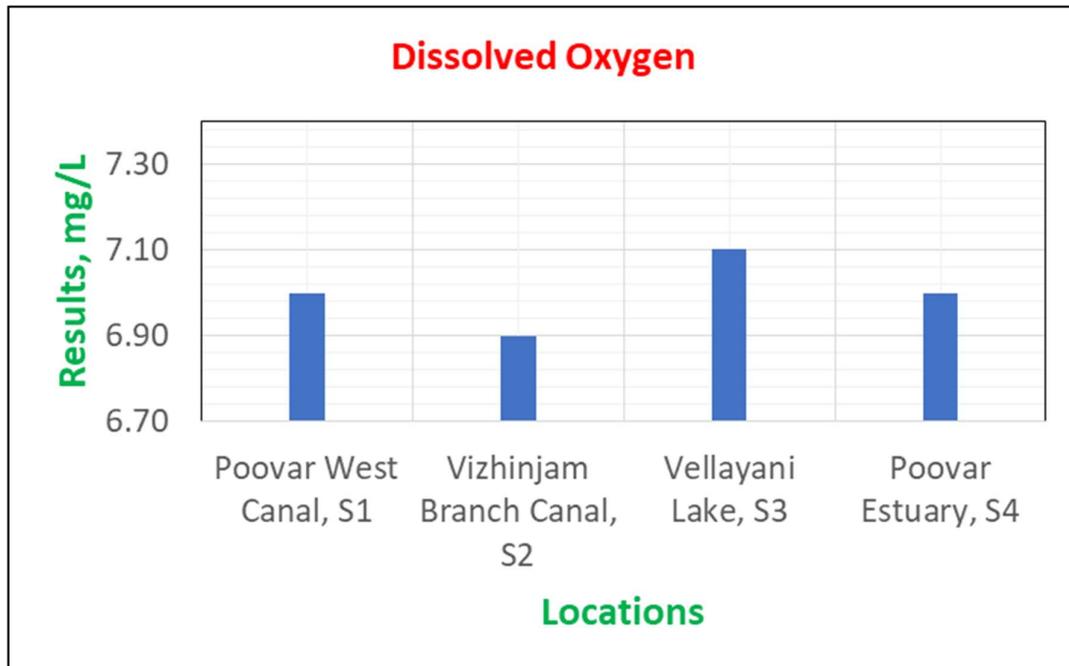
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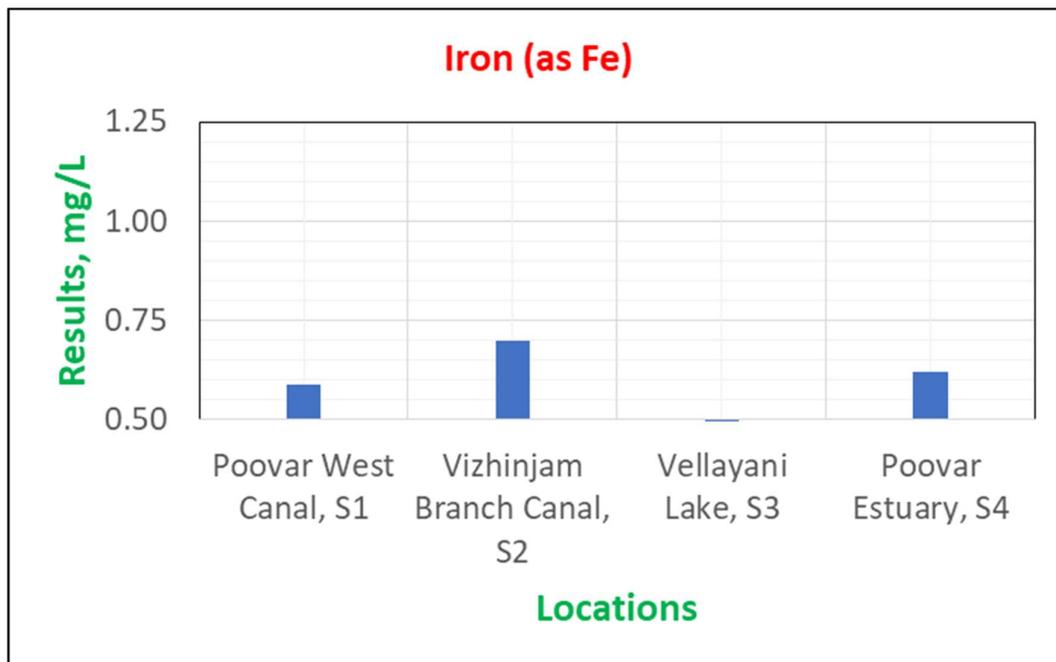
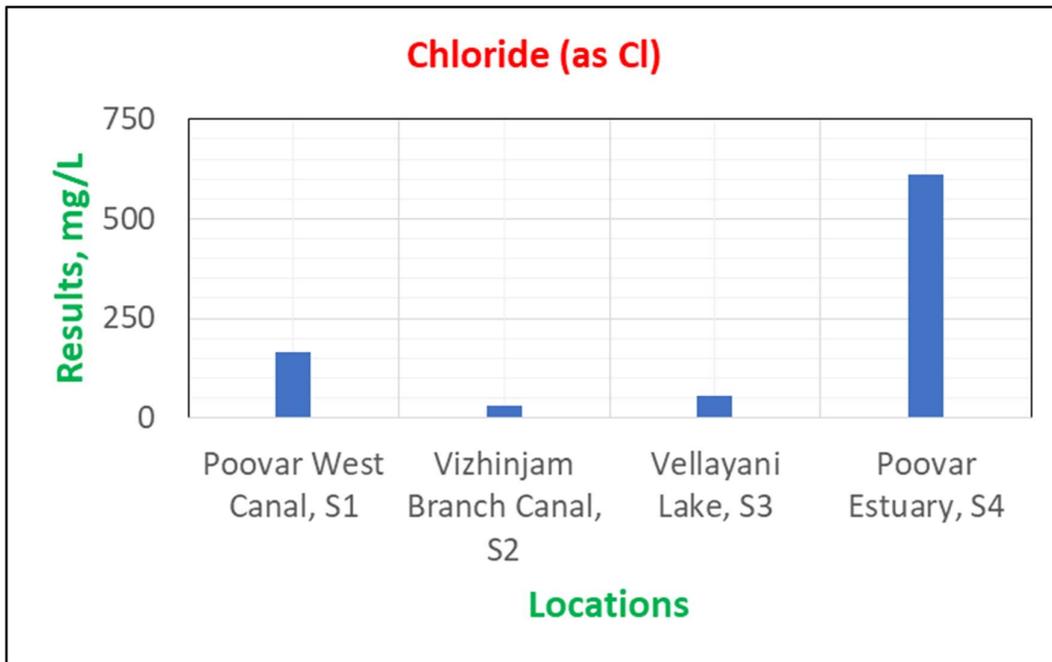
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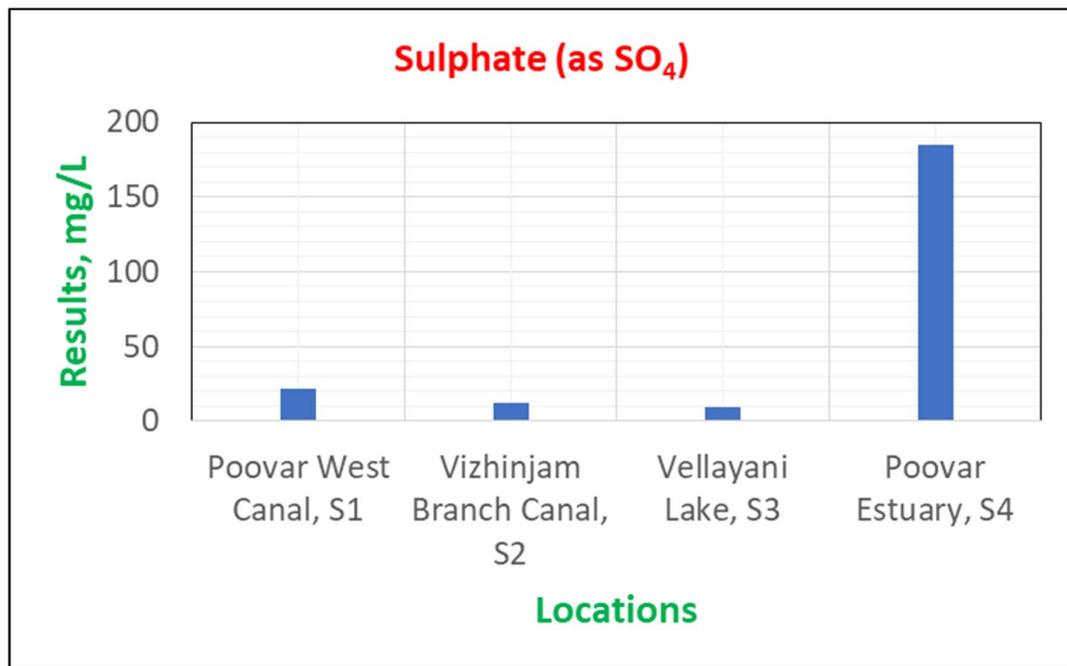
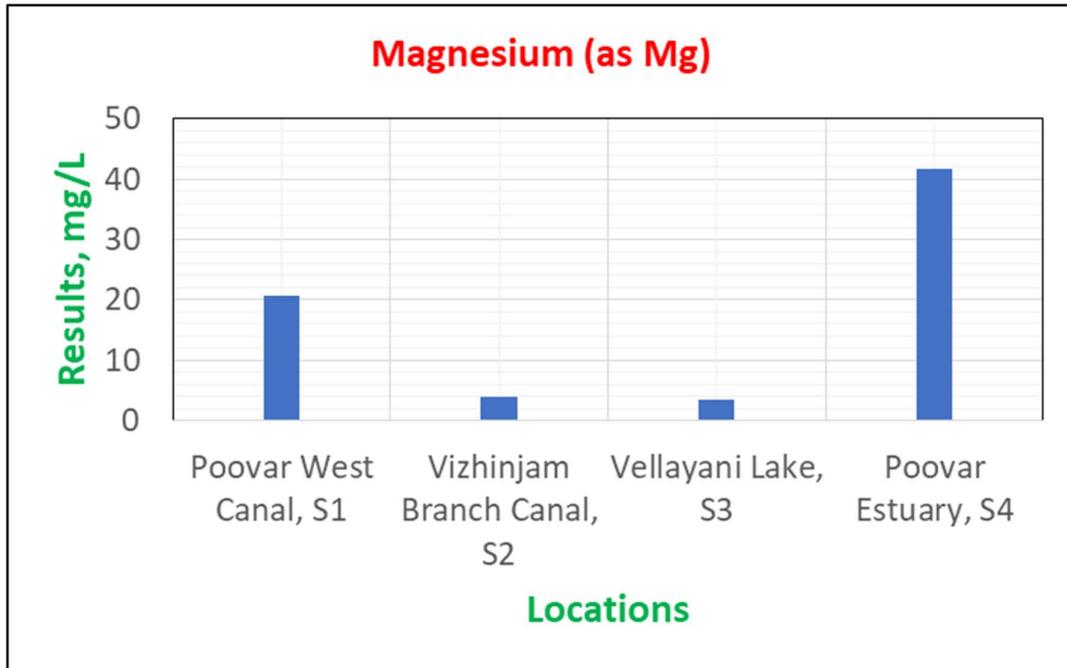
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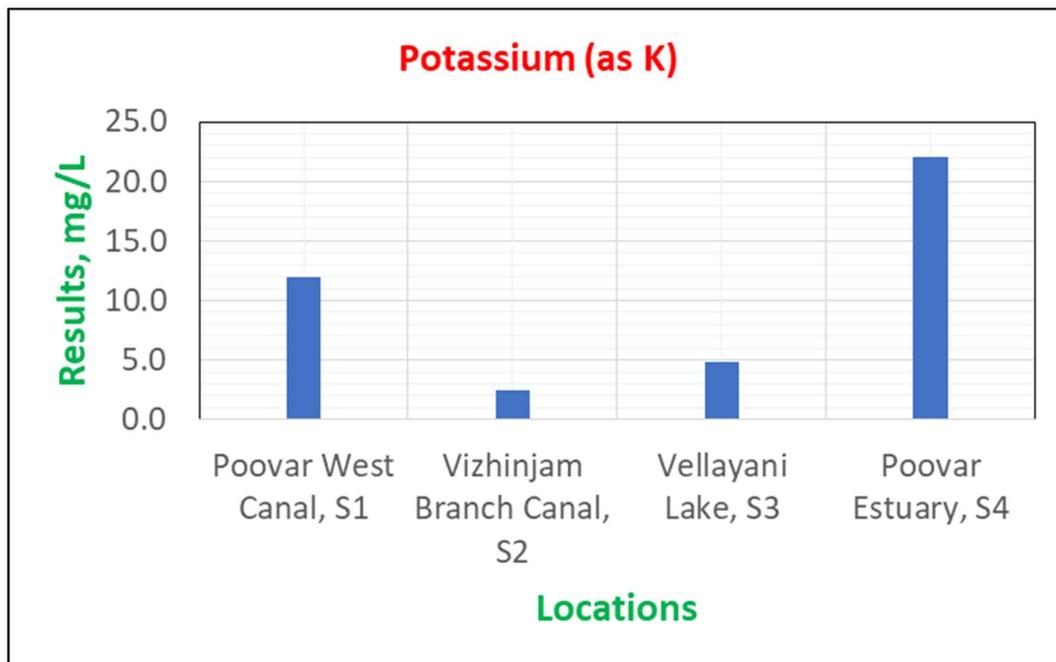
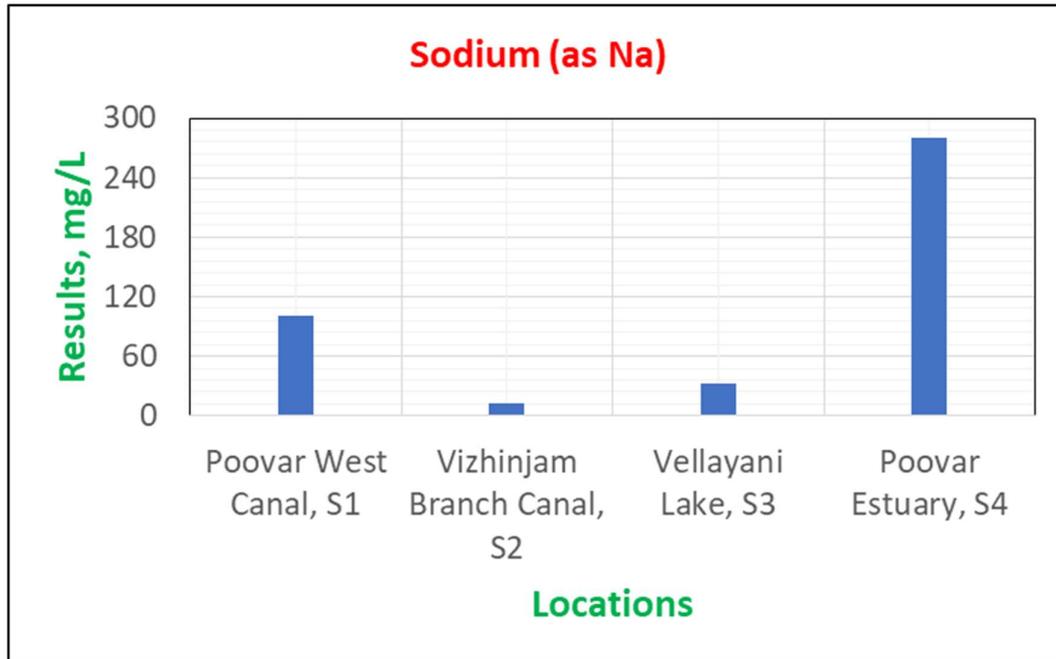
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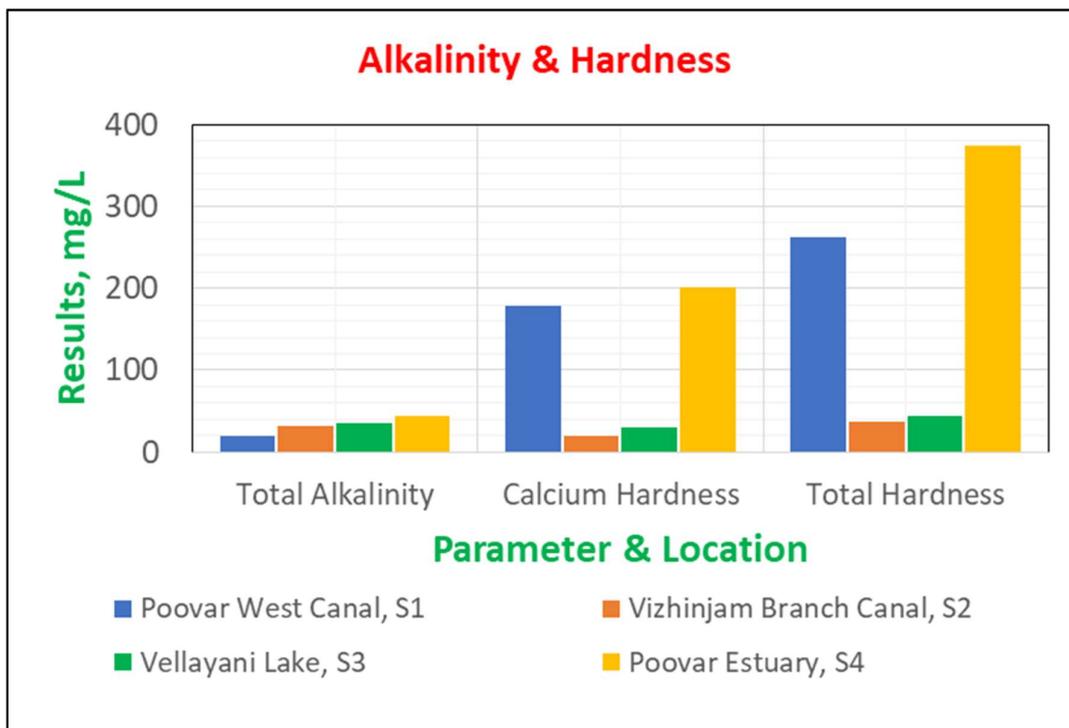
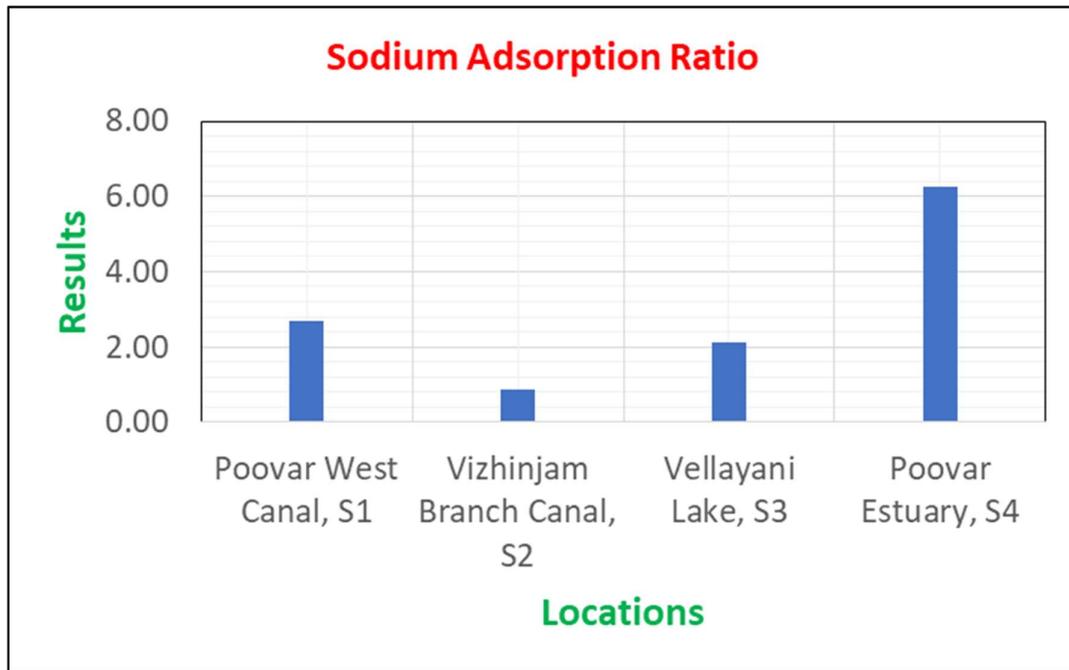
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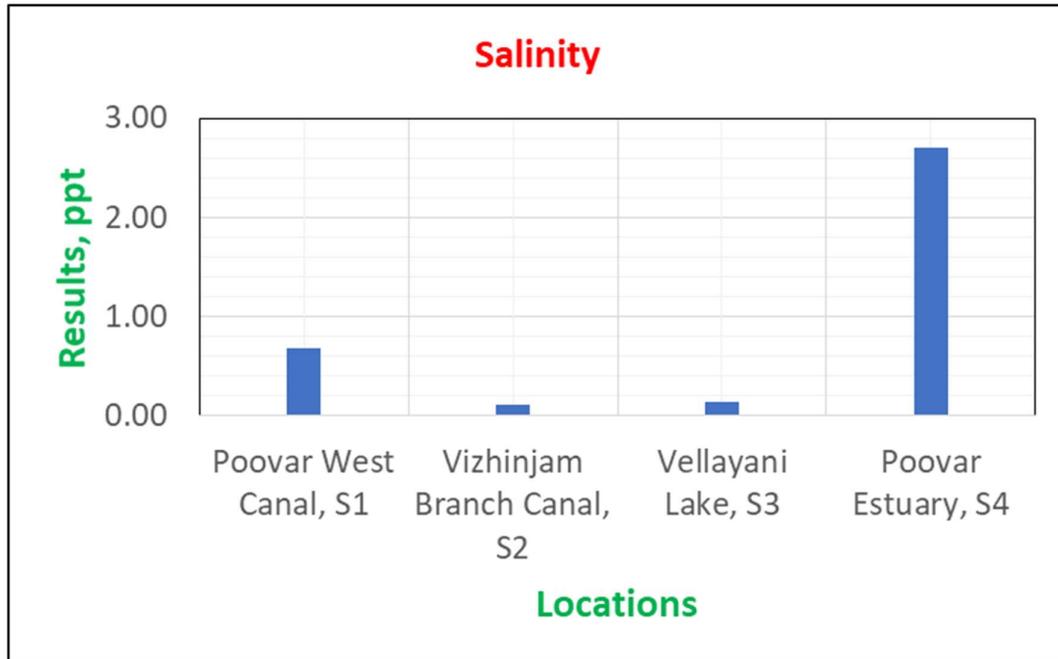
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EMR-7	Soil Analysis Report
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Date of Sampling	08-01-2026
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Parameter	Unit	Results			
		Port Site (P)	Proposed Port Estate Area (C)	Along with road Network (Mulloor) (M)	Along with Rail Network (Balarampuram) (B)
Texture	-	Sandy Loam	Sandy Loam	Sandy Loam	Sandy Loam
Particle Size Distribution - Gravel	%	1.95	2.30	1.65	2.20
Particle Size Distribution - Sand	%	70.51	74.10	72.10	73.50
Particle Size Distribution - Silt	%	19.20	20.50	19.40	18.50
Particle Size Distribution - Clay	%	8.35	3.10	6.85	5.80
pH (1:5 Suspension)	-	7.91	7.33	7.45	6.88
Electrical Conductivity (1:5 Suspension at 25 °C)	µS/cm	510	245	285	480
Porosity	%	32.1	25.4	28.0	36.0
Infiltration (Void Ratio)	-	5.88	6.22	5.77	5.96
Total Kjeldhal Nitrogen (as TKN)	mg/kg	2210	1850	1652	2850
Available Phosphorus (as P)	mg/kg	290	410	294	1240
Available Potassium (as K)	mg/kg	48.5	34.8	30.4	52.5
Total Organic Carbon	%	1.12	2.45	2.11	5.2
Organic Matter	%	0.75	1.25	0.96	2.02
Available Sodium	mg/kg	160	210	185	255
Lead (as Pb)	mg/kg	1.32	1.45	1.58	1.25

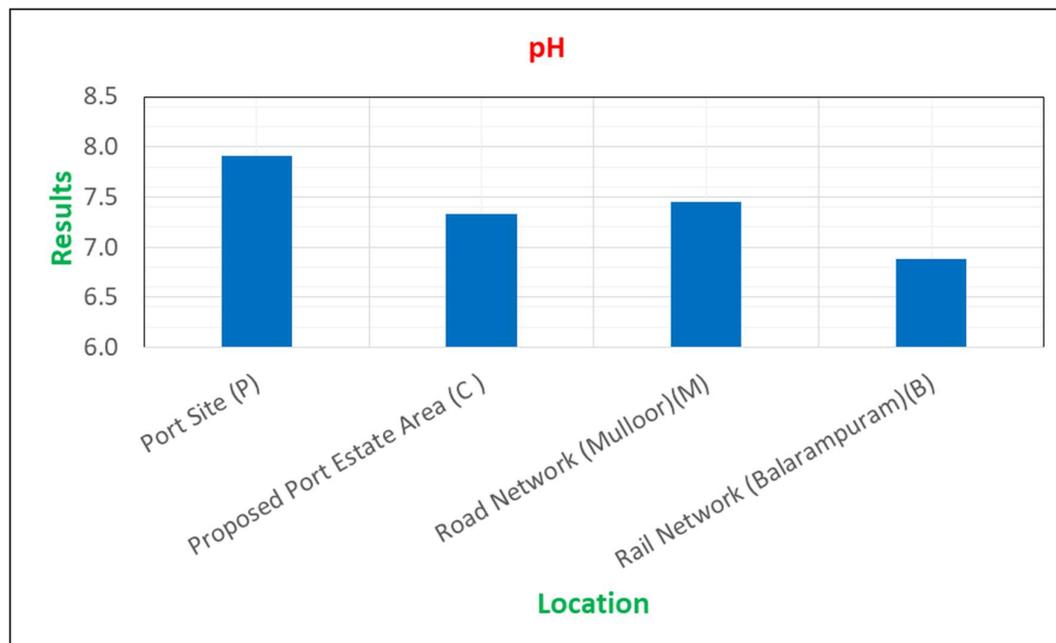
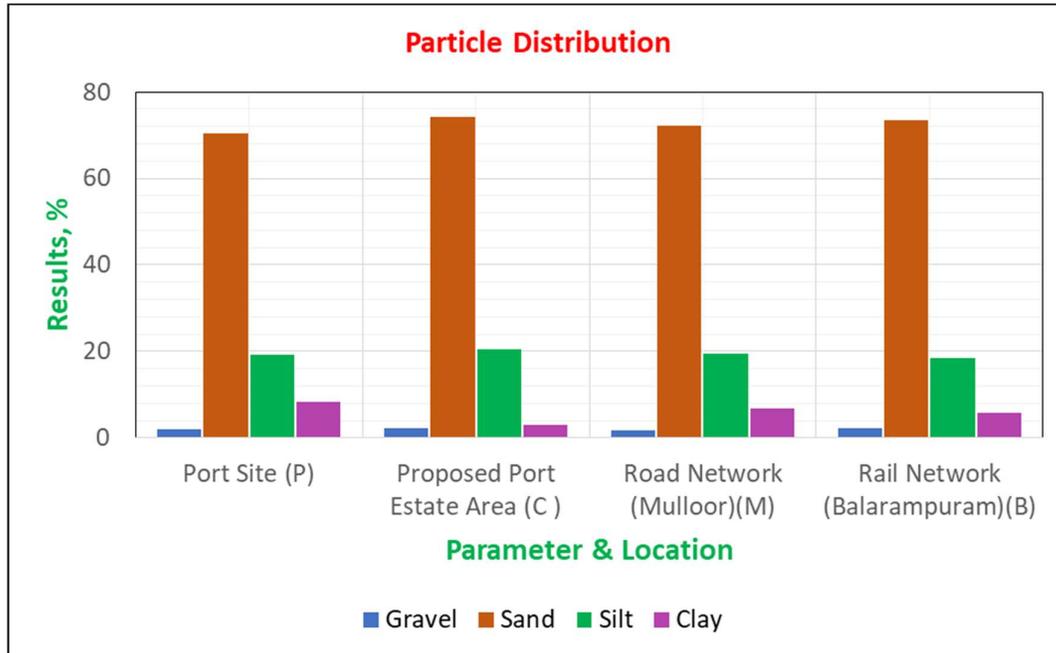
BDL: Below Detectable Limit

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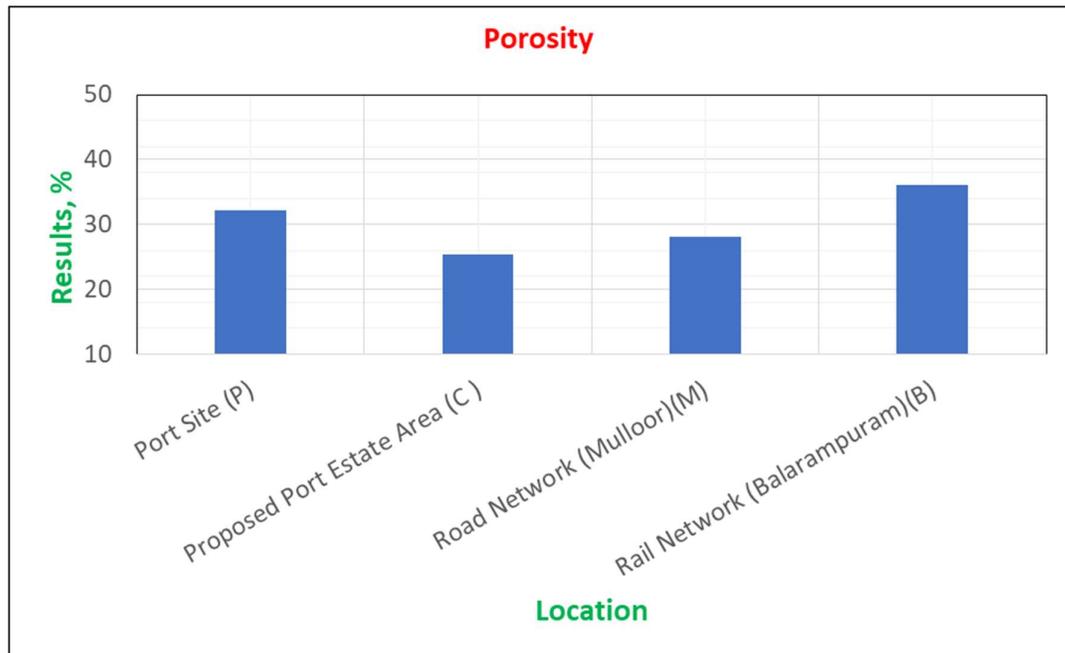
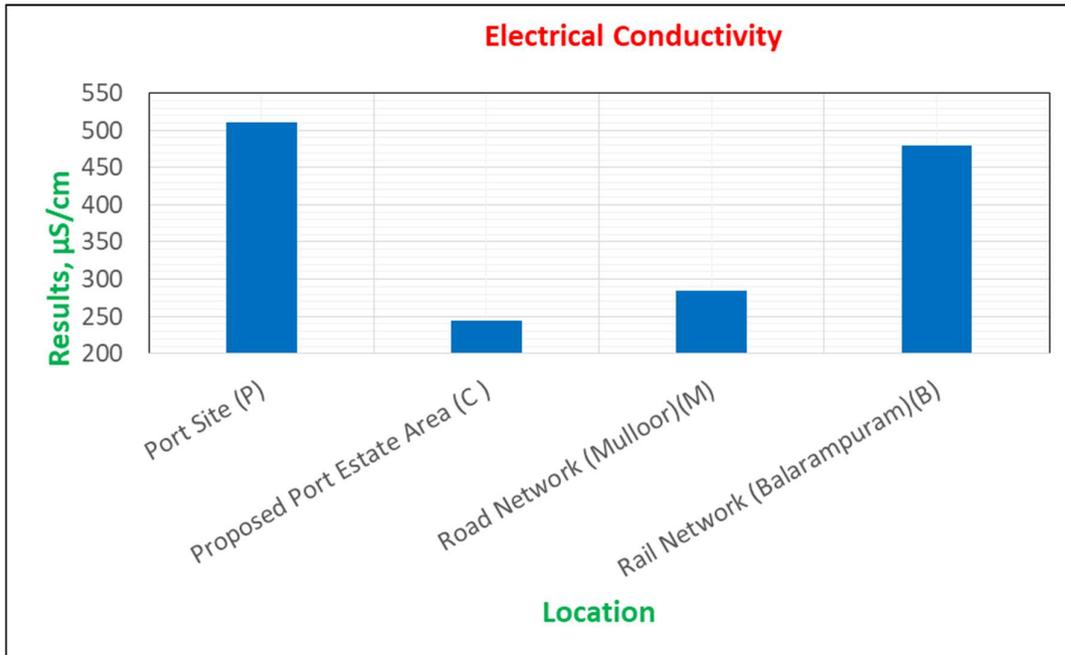
EMR-7.1

Statistical Analysis of Soil



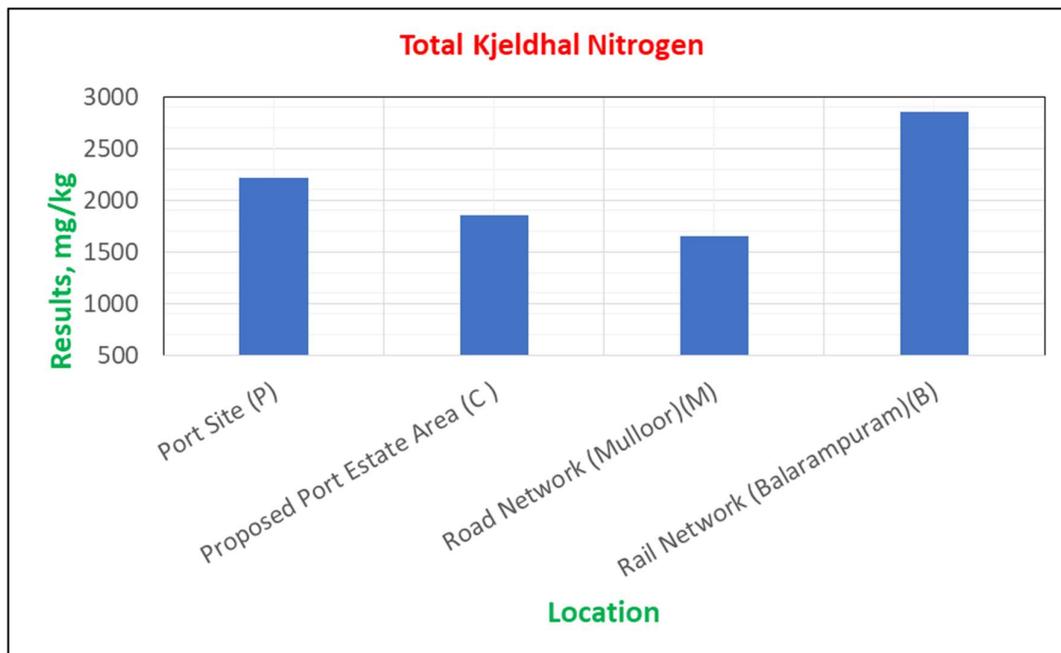
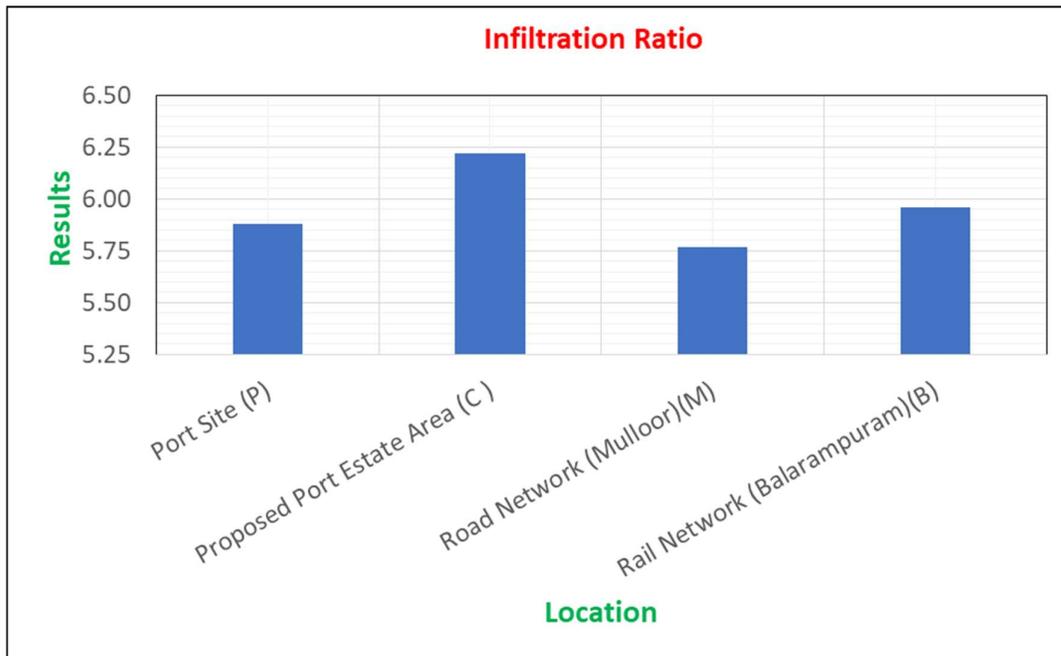
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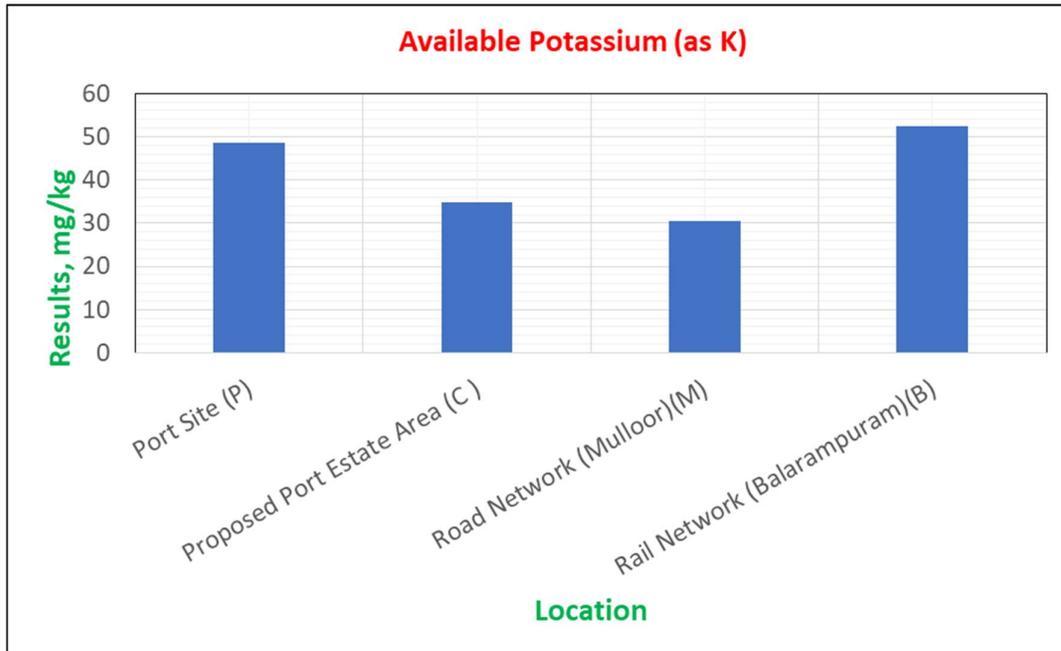
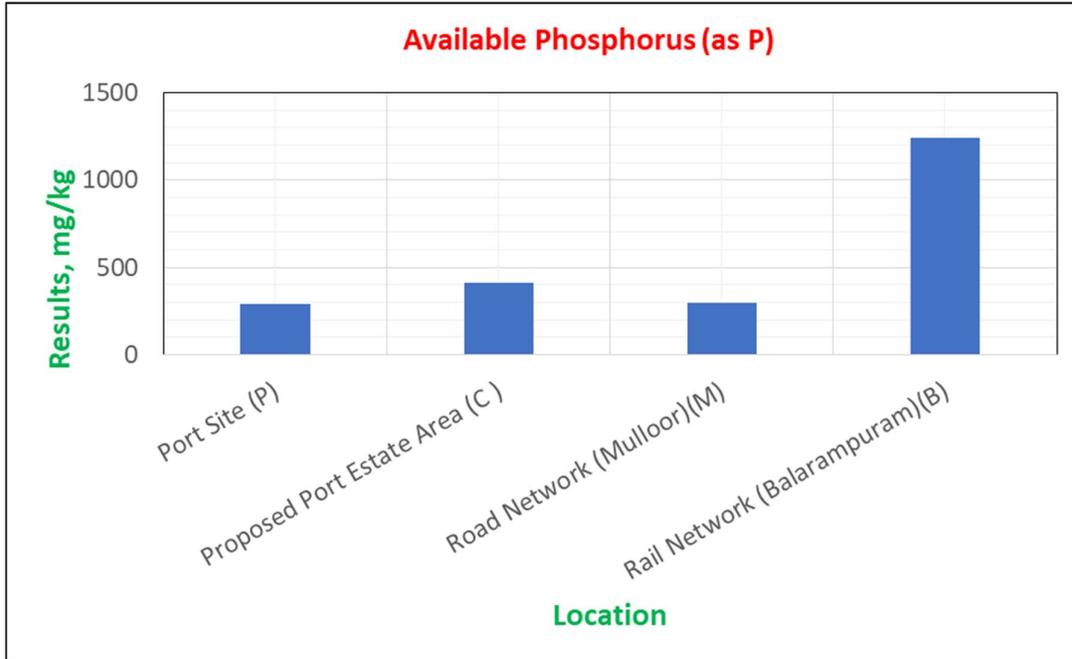
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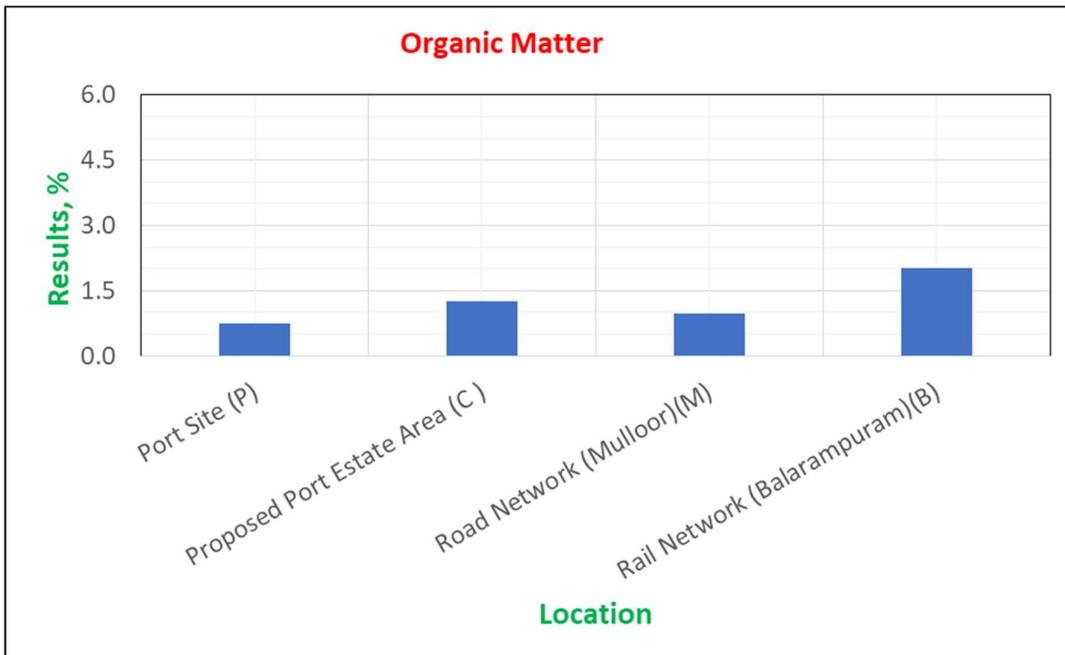
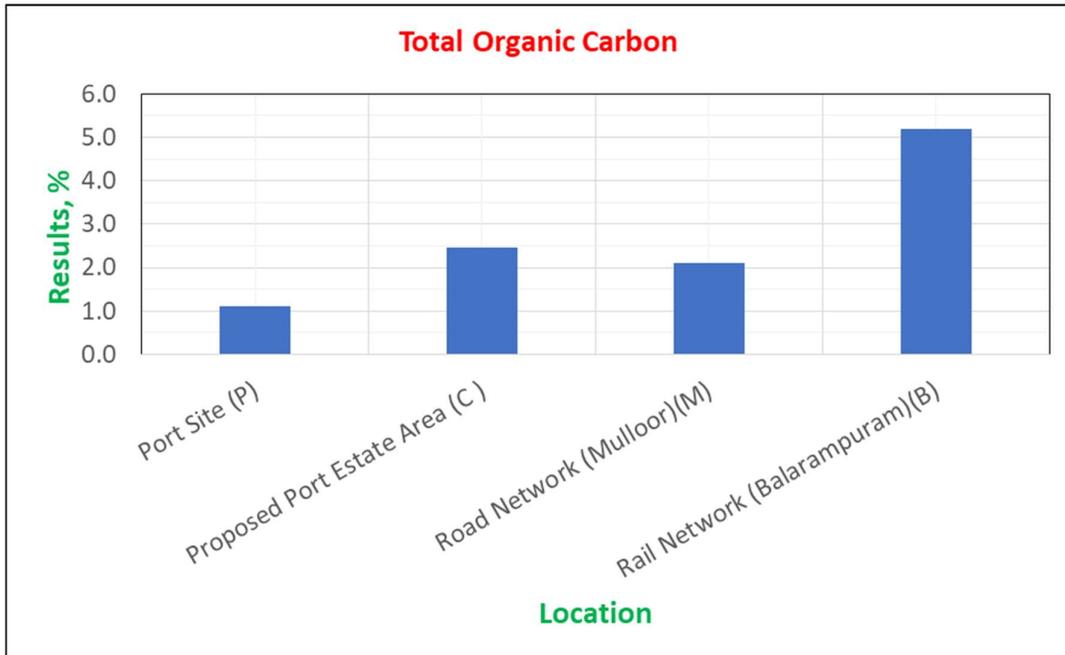
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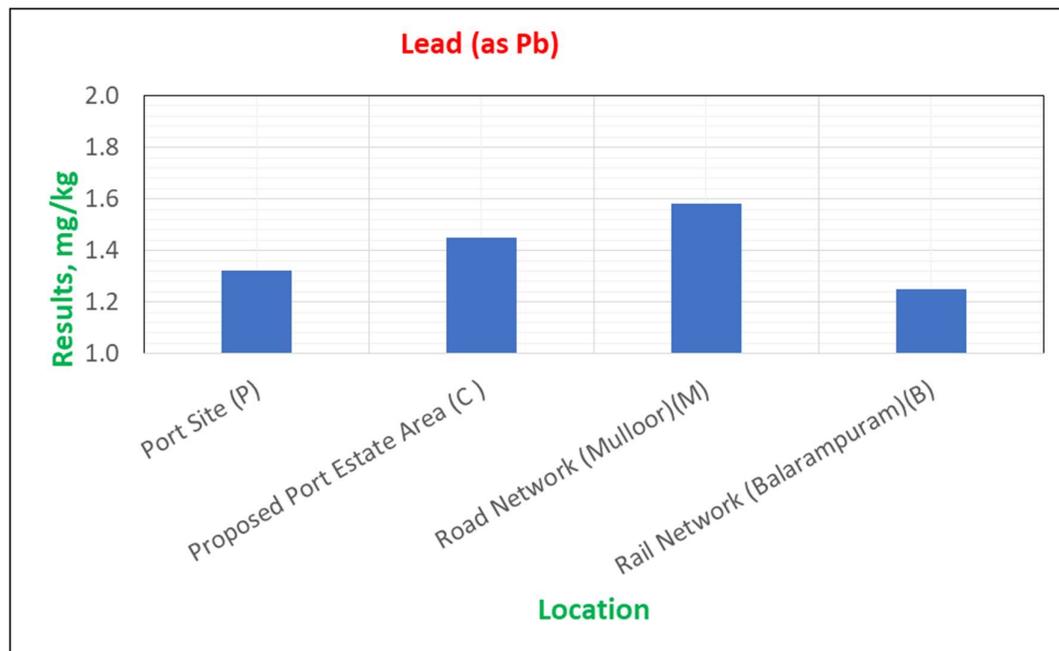
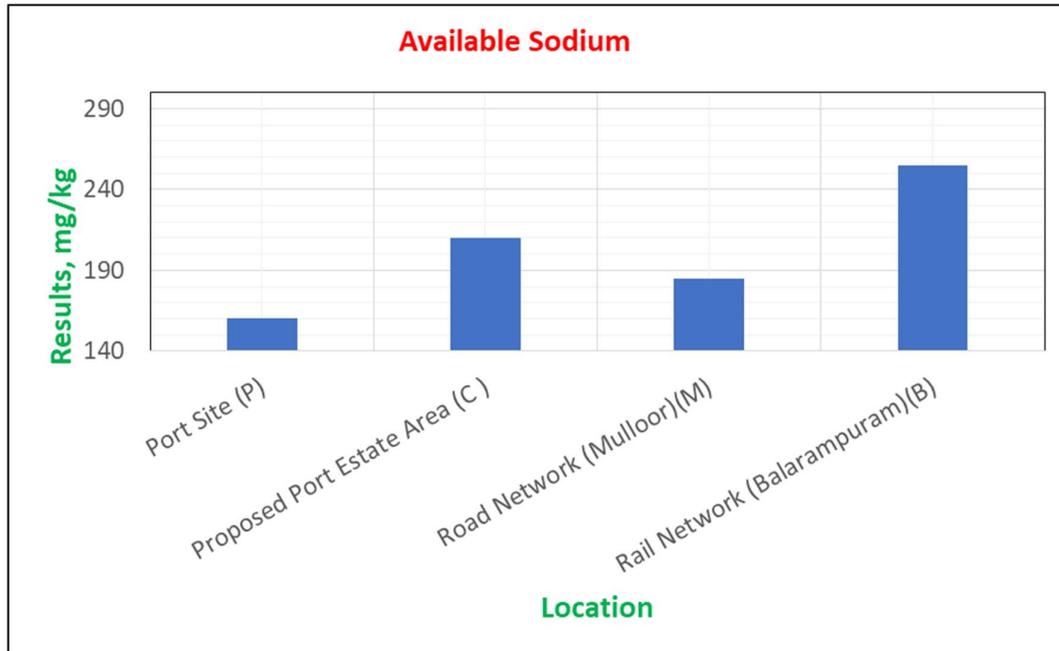
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EMR-8	List of Parameters, Detection Limits and Methodology of Analysis
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Sr. No.	Parameter	Unit	Detection Limit	Method Reference
Ambient Air Analysis				
1.	Particulate Matter (size less than 10 µm) or PM ₁₀	µg/m ³	5.0	IS 5182 (Part 23) : 2006
2.	Particulate Matter (size less than 2.5 µm) or PM _{2.5}	µg/m ³	2.0	IS 5182 (Part 24): 2019
3.	Sulphur Dioxide (SO ₂)	µg/m ³	4.0	IS 5182 Part 2: 2001 RA 2017
4.	Nitrogen Dioxide (NO ₂)	µg/m ³	4.0	IS 5182 Part 6: 2006 RA 2017
5.	Carbon Monoxide (CO)	mg/m ³	0.1	IS 5182: Part 10:1999 (NDIR Method)
6.	Hydrocarbon (HC)	ppm	1.0	IS 5182 Part 17: 1979
Surface and Ground Water Analysis				
7.	Colour	Hazen Units	1	IS 3025 (Part 4): 2021
8.	Odour	-	--	IS 3025 (Part 5): 2018
9.	pH Value	-	2	IS 3025 (Part 11): 2022
10.	Turbidity	N.T.U.	0.1	IS 3025 (Part 10): 2023
11.	Electrical Conductivity (at 25°C)	µs/cm	1.0	IS 3025 (Part 14): 2013
12.	Total Dissolved Solids	mg/L	5	IS 3025 (Part 16): 2023
13.	Dissolved Oxygen	mg/L	0.2	IS 3025 (Part 38) : 1989
14.	Biochemical Oxygen Demand (3 days, 27°C)	mg/L	2	IS 3025 (Part 44) : 2023
15.	Oil & Grease	mg/L	1	IS 3025 Part 39: 2021
16.	Aluminium (as Al)	mg/L	0.2	IS 3025 Part 55:2003
17.	Ammonia (as NH ₃ - N)	mg/L	0.1	IS 3025 (Part 34): 1998
18.	Anionic Detergents (as MBAS) Calculated as LAS mol.wt. 288.38	mg/L	0.1	IS 13428 Annex K:2005
19.	Barium (as Ba)	mg/L	0.5	APHA (24th Edn) 3111-D : 2023
20.	Boron (as B)	mg/L	0.2	IS 3025 (Part 57): 2021
21.	Calcium (as Ca)	mg/L	1	IS 3025 Part 40: 1991
22.	Chloramines (as Cl ₂)	mg/L	1	APHA (24th Edn) 4500-Cl G : 2023
23.	Chloride (as Cl)	mg/L	1	IS 3025 Part 32: 1988
24.	Copper (as Cu)	mg/L	0.05	IS 3025 Part 42: 1992
25.	Fluoride (as F)	mg/L	0.1	APHA (24th Edn) 4500-F- B, D: 2023
26.	Iron (as Fe)	mg/L	0.1	IS 3025 Part 53: 2003
27.	Magnesium (as Mg)	mg/L	1	IS 3025 (Part 46): 2023
28.	Manganese (as Mn)	mg/L	0.05	IS 3025 Part 59: 2006 RA 2017

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Sr. No.	Parameter	Unit	Detection Limit	Method Reference
29.	Mineral Oil	mg/L	0.50	IS 3025 Part 39: 1991 RA 2019
30.	Nitrate (as NO ₃)	mg/L	1	APHA (24th Edn) 4500-NO3 B: 2023
31.	Phenolic Compounds (as C ₆ H ₅ OH)	mg/L	0.01	IS 3025 (Part 43/Sec 1): 2022
32.	Selenium (as Se)	mg/L	0.002	APHA (24th Edn) 3114C : 2023
33.	Silver (as Ag)	mg/L	0.1	APHA (24th Edn) 3111-B : 2023
34.	Sulphate (as SO ₄)	mg/L	1	IS 3025 (Part 24/Sec 1): 2022
35.	Sulphide (as H ₂ S)	mg/L	0.01	IS 3025 (Part 29): 2022
36.	Total Phosphate (as PO ₄)	mg/L	0.1	IS 3025 (Part 31/Sec 1): 2022
37.	Total Alkalinity (as CaCO ₃)	mg/L	1	IS 3025 (Part 23): 2023
38.	Total Hardness (as CaCO ₃)	mg/L	1	IS 3025 Part 21: 2009
39.	Calcium Hardness (as CaCO ₃)	mg/L	1	IS 3025 Part 40: 1991
40.	Zinc (as Zn)	mg/L	0.025	APHA (24th Edn) 3111-B : 2023
41.	Sodium (as Na)	mg/L	1	IS 3025 Part 45: 1993
42.	Potassium (as K)	mg/L	0.5	IS 3025 Part 45: 1993
43.	Sodium Absorption Ratio	-	0.1	IS 11624: 1986
44.	Cadmium (as Cd)	mg/L	0.03	IS 3025 (Part 41) : 2023
45.	Cyanide (as CN)	mg/L	0.01	IS 3025 (Part 27/Sec 1): 2021
46.	Lead (as Pb)	mg/L	0.2	IS 3025 Part 47: 1994 RA 2019
47.	Mercury (as Hg)	mg/L	0.002	IS 3025 Part 48: 1994 RA 2019
48.	Molybdenum (as Mo)	mg/L	0.25	APHA (24th Edn) 3111-D : 2023
49.	Nickel (as Ni)	mg/L	0.1	IS 3025 Part 54: 2003
50.	Pesticide Residues			
i.	Alachlor	µg/L	0.005	SEAAL/INS/SOP/7.2/03
ii.	Atrazine	µg/L	0.005	SEAAL/INS/SOP/7.2/03
iii.	Aldrin/Dieldrin	µg/L	0.005	SEAAL/INS/SOP/7.2/03
iv.	Alpha HCH	µg/L	0.005	SEAAL/INS/SOP/7.2/03
v.	Beta HCH	µg/L	0.005	SEAAL/INS/SOP/7.2/03
vi.	Butachlor	µg/L	0.005	SEAAL/INS/SOP/7.2/03
vii.	Chlorpyrifos	µg/L	0.005	SEAAL/INS/SOP/7.2/03
viii.	Delta HCH	µg/L	0.005	SEAAL/INS/SOP/7.2/03
ix.	2,4D chlorophenoxyacetic acid	µg/L	0.005	SEAAL/INS/SOP/7.2/03
x.	DDT (o,p & p,p- Isomers of DDT, DDE, DDD)	µg/L	0.005	SEAAL/INS/SOP/7.2/03
xi.	Endosulfan (α, β & Sulphate)	µg/L	0.005	SEAAL/INS/SOP/7.2/03
xii.	Ethion	µg/L	0.005	SEAAL/INS/SOP/7.2/03
xiii.	γ HCH (Lindane)	µg/L	0.005	SEAAL/INS/SOP/7.2/03
xiv.	Isoproturon	µg/L	0.005	SEAAL/INS/SOP/7.2/03
xv.	Malathion	µg/L	0.005	SEAAL/INS/SOP/7.2/03

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Sr. No.	Parameter	Unit	Detection Limit	Method Reference
xvi.	Methyl Parathion	µg/L	0.005	SEAAL/INS/SOP/7.2/03
xvii.	Monocrotophos	µg/L	0.005	SEAAL/INS/SOP/7.2/03
xviii.	Phorate	µg/L	0.005	SEAAL/INS/SOP/7.2/03
51.	Polychlorinated Biphenyls (PCB)	mg/L	0.000005	SEAAL/INS/SOP/7.2/04
52.	Polynuclear Aromatic Hydrocarbons (PAH)	mg/L	0.000005	SEAAL/INS/SOP/7.2/05
53.	Total Arsenic (as As)	mg/L	0.002	IS 3025(Part 37) : 2022
54.	Total Chromium (as Cr)	mg/L	0.4	IS 3025 Part 52 :2003
55.	Volatile organic Compounds			
a)	Bromoform	mg/L	0.005	SEAAL/INS/SOP/7.2/02
b)	Dibromochloromethane	mg/L	0.005	SEAAL/INS/SOP/7.2/02
c)	Bromodichloroethane	mg/L	0.005	SEAAL/INS/SOP/7.2/02
d)	Chloroform	mg/L	0.005	SEAAL/INS/SOP/7.2/02
56.	<i>E.coli</i>	MPN/100 ml	2	IS 1622: 1981
57.	Total Coliforms	MPN/100 ml	2	IS 1622: 1981
58.	Faecal Coliforms	MPN/100 ml	2	IS 1622: 1981
Marine Water Analysis				
1.	Temperature	°C	15	IS 3025 (Part 9): 2023
2.	pH Value	-	2	IS 3025 (Part 11): 2022
3.	Turbidity	N.T.U.	0.1	IS 3025 (Part 10) : 2023
4.	Electrical Conductivity (at 25°C)	µmhos/cm	10	IS 3025 Part 14: 2013
5.	Total Suspended Solids	mg/L	5	IS 3025 (Part 17): 2022
6.	Total Dissolved Solids	mg/L	10	IS 3025 (Part 16): 2023
7.	Dissolved Oxygen	mg/L	0.2	IS 3025 Part 38 : 1989
8.	Biochemical Oxygen Demand (3 days, 27°C)	mg/L	2	IS 3025 (Part 44): 2023
9.	Floating Materials – Oil, Grease and Scum (Including Petroleum Products)	mg/L	1	IS 3025 Part 39: 2021
10.	Nitrite (as NO ₂)	mg/L	0.02	IS 3025 Part 34: 1998
11.	Nitrate (as NO ₃)	mg/L	1	APHA (24th Edn) -4500 - NO3- B : 2023
12.	Phenolic Compounds (as C ₆ H ₅ OH)	mg/L	0.01	APHA (24th Edn) 5530 - B,C,D: 202319
13.	Ammonical Nitrogen (as NH ₃ -N)	mg/L	1	IS 3025 Part 34 : 1988
14.	Total Nitrogen (as N)	mg/L	1	IS 3025 Part 34 : 1988
15.	Total Phosphorous (as P)	mg/L	0.01	IS 3025 (Part 31/Sec 1): 2022
16.	Reactive Phosphorous	mg/L	0.01	IS 3025 (Part 31/Sec 1): 2022
17.	Polycyclic Aromatic Hydrocarbon	mg/L	0.000005	SEAAL/INS/SOP/7.2/05
18.	Salinity	ppt	0.0036	APHA (24th Edn) 2520 - B: 2023

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Sr. No.	Parameter	Unit	Detection Limit	Method Reference
19.	Total Chlorophyll	mg/m ³	0.1	APHA 24th Edn:10200. H
20.	Total Coliforms	MPN/100 ml	2	IS 1622: 1981
21.	Faecal Coliforms	MPN /100ml	2	IS 1622: 1981
22.	Phytoplanktons	No./100ml	--	APHA 24th Edn:10200. F
23.	Zooplanktons	No./100ml	--	APHA 24th Edn:10200. G
Sediment Analysis				
1.	Texture	-	--	SEAAL/CHL/SOP/7.2/21
2.	Organic Matter	%	0.1	IS 2720 Part 22:1972
3.	Total Phosphorus (as P)	mg/kg	10	IS 10158: 1982
4.	Aluminium (as Al)	mg/kg	5	USEPA 7000B: 2017
5.	Chromium (as Cr)	mg/kg	5	USEPA 7000B: 2007
6.	Copper (as Cu)	mg/kg	1.5	USEPA 7000B: 2007
7.	Iron (as Fe)	mg/kg	2.5	USEPA 7000B: 2007
8.	Lead (as Pb)	mg/kg	5	USEPA 7000B: 2007
9.	Manganese (as Mn)	mg/kg	1.5	USEPA 7000B: 2007
10.	Mercury (as Hg)	mg/kg	0.10	SEAAL/CHL/SOP/7.2/19
11.	Zinc (as Zn)	mg/kg	1	USEPA 7000B: 2007
12.	Nickel (as Ni)	mg/kg	2.5	USEPA 7000B: 2007
13.	Benthic Organism	No./m ²	1	APHA 24th Edn:10750. B
Soil Analysis				
1.	Texture	-	--	SEAAL/CHL/SOP/7.2/21
2.	Particle Size Distribution	%	0.1	SEAAL/CHL/SOP/7.2/21
3.	pH (1:5 Suspension)	-	1	IS 10158: 1982
4.	Electrical Conductivity (1:5 Suspension at 25°C)	µS/cm	1	IS 14767: 2000
5.	Porosity	%	5	SEAAL/CHL/SOP/7.2/15
6.	Total Kjeldhal Nitrogen (as TKN)	mg/kg	50	IS 14684: 1999
7.	Available Phosphorus (as P)	mg/kg	1	SEAAL/CHL/SOP/7.2/12
8.	Available Potassium (as K)	mg/kg	0.5	SEAAL/CHL/SOP/7.2/11
9.	Total Organic Carbon	g/100g	0.1	IS 2720 Part 22:1972

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Sr. No.	Parameter	Unit	Detection Limit	Method Reference
10.	Organic Matter	g/100g	0.1	IS 2720 Part 22:1972
11.	Available Sodium	mg/kg	0.2	SEAAL/CHL/SOP/7.2/11
12.	Lead (as Pb)	mg/kg	5	USEPA 7000B : 2007
BDL: Below Detectable Limit; LOD: Limit of Detection				

End of Report