

Appendix B. Water Quality Monitoring Results

Table B1: Action and Limit Levels of Water Quality for Dredging, Disposal and Capping Activities at ESC CMP V

Parameters	Action	Limit
Dissolved Oxygen (DO) in mg L ⁻¹ (Surface, Middle & Bottom) ⁽¹⁾	Surface and Middle Depth⁽²⁾ 5%-ile of baseline data for surface and middle layer = 3.76 and Significantly less than the reference station's mean DO (at the same tide of the same day)	Surface and Middle Depth⁽²⁾ 1%-ile of baseline data for surface and middle layer = 3.11 ⁽³⁾ and Significantly less than the reference station's mean DO (at the same tide of the same day)
	Bottom 5%-ile of baseline data for surface and middle layer = 2.96 and Significantly less than the reference station's mean DO (at the same tide of the same day)	Bottom The average of the impact station readings are < 2 and Significantly less than the reference station's mean DO (at the same tide of the same day)
Suspended Solids (SS) in mg L ⁻¹ (depth-averaged) ⁽⁶⁾	95%-ile of baseline data for depth-averaged = 37.88 and 120% of control station's SS at the same tide of the same day	99%-ile of baseline data for depth-averaged = 61.92 and 130% of control station's SS at the same tide of the same day
Turbidity in NTU (depth-averaged) ⁽⁴⁾⁽⁵⁾	95%-ile of baseline data = 28.14 and 120% of control station's Turbidity at the same tide of the same day	99%-ile of baseline data = 38.32 and 130% of control station's Turbidity at the same tide of the same day

Notes:

- For DO, non-compliance of the water quality limits occurs when monitoring result is lower than the limits.
- Action and Limit Levels for DO for Surface and Middle layers were calculated from the combined pool of baseline surface layer data and baseline middle layer data.
- Given the Action Level for DO for Surface and Middle layers has already been lower than 4 mg L⁻¹, it is proposed to set the Limit Level at 3.11 mg L⁻¹ which is the first percentile of the baseline data.
- "Depth-averaged" is calculated by taking the arithmetic means of reading of all three depths.
- For turbidity and SS, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.

Table B2: Water Column Profiling Results for ESC CMP Vb in March 2022

Station	Temp. (°C)	Salinity (ppt)	Turbidity (NTU)	Dissolved Oxygen (%)	(mg L ⁻¹)	pH	Suspended Solids (mg L ⁻¹)
WCP 1 (Downstream)	18.31	28.27	11.40	106.33	8.45	8.16	2.7
WCP 2 (Upstream)	18.42	28.00	0.84	109.27	8.68	8.17	3.9
WQO (Dry Season)	N/A	25.20 - 30.80 [#]	N/A	N/A	>4	6.5 - 8.5	13.1

Notes:

- # Not exceeding 10% of natural ambient level which is the result obtained from the Reference Station.
- Cell shaded yellow / red indicates value exceeding the Action/Limit levels.
- Cell shaded grey indicates value exceeding the WQO.

Table B3: In-situ Monitoring Results for Routine Water Quality Monitoring of ESC CMPs in March 2022

Station	Temp. (°C)	Salinity (ppt)	Turbidity (NTU)	Dissolved Oxygen (%)	(mg L ⁻¹)	pH
RFF (Reference)	18.47	28.05	0.44	114.12	9.05	8.19
IPF (Impact)	18.49	28.15	0.62	112.34	8.90	8.15
INF (Intermediate)	18.55	28.04	0.69	113.53	8.99	8.15
Ma Wan	18.01	30.02	0.13	108.97	8.62	8.15
WQO (Dry Season)	N/A	25.25 - 30.86 [#]	N/A	N/A	>4	6.5 - 8.5

Notes:

- # Not exceeding 10% of natural ambient level which is the result obtained from the Reference Station.
- Cell shaded yellow / red indicates value exceeding the Action/Limit levels.
- Cell shaded grey indicates value exceeding the WQO.

Table B4: Laboratory Results for Routine Water Quality Monitoring of ESC CMPs in March 2022

Station	As (µg/L)	Cd (µg/L)	Cr (µg/L)	Cu (µg/L)	Pb (µg/L)	Hg (µg/L)	Ni (µg/L)	Ag (µg/L)	Zn (µg/L)	NH ₃ (mg/L)	TIN (mg/L)	BOD ₅ (mg/L)	SS (mg/L)
RFF	1.83	<LOR	1.86	1.80	1.18	<LOR	1.11	<LOR	48.16	0.12	0.51	2.14	4.5
IPF	1.82	<LOR	1.68	1.86	0.77	<LOR	0.88	<LOR	49.69	0.08	0.47	1.48	4.6
INF	1.72	<LOR	1.86	1.93	1.32	<LOR	1.07	<LOR	50.63	0.10	0.51	1.92	5.2
Ma Wan	1.88	<LOR	2.05	1.70	1.38	<LOR	1.03	<LOR	46.53	0.13	0.39	2.10	3.6

WQO of TIN: 0.5 mg/L
 Dry Season WQO of SS: 13.1 mg/L

Notes:

- "<LOR" indicates the concentrations of metals and metalloids are below the limit of reporting.
- Cell shaded yellow / red indicates value exceeding the Action/Limit levels.
- Cell shaded grey indicates value exceeding the WQO.

Table B5: Summary Table of DO, Turbidity and SS Levels Recorded in March 2022 for Impact Water Quality Monitoring during Dredging Operations of ESC CMP Vc

Sampling Date	Tidal Period	Station	Average DO Levels (mg/L)		Average Turbidity Level (NTU)	Average SS Level (mg/L)
			Bottom	Surface and Mid Depth		
14/03/2022	Mid Ebb	US1	9.28	10.95	0.59	4.60
		US2	9.17	11.16	0.85	4.12
		DS1	8.90	10.53	0.85	11.40
		DS2	8.94	10.26	0.85	6.27
		DS3	8.75	10.10	1.42	5.93
		DS4	9.45	10.78	0.54	5.00
		DS5	9.22	10.97	0.47	7.95
		MW	8.60	8.67	0.57	3.08
	Mid Flood	US1	8.64	10.00	0.84	4.72
		US2	8.67	10.51	1.09	4.62
		DS1	8.80	10.03	0.84	3.53
		DS2	9.02	10.48	0.74	3.72
		DS3	8.65	10.71	0.97	4.42
		DS4	9.10	11.00	1.22	5.02
DS5		9.07	11.31	0.94	3.35	
MW		8.69	9.55	0.20	3.77	
16/03/2022	Mid Ebb	US1	8.95	9.42	1.19	2.42
		US2	9.01	9.55	0.94	6.23
		DS1	8.88	9.51	1.42	3.03
		DS2	8.99	9.69	1.05	2.20
		DS3	8.92	9.70	1.05	2.27
		DS4	9.15	9.67	1.19	2.35
		DS5	9.42	9.85	1.12	2.83
		MW	8.79	9.15	0.99	2.25
	Mid Flood	US1	9.01	9.94	1.67	5.08
		US2	8.69	9.30	18.84	17.12
		DS1	8.80	9.68	2.15	2.77
		DS2	8.92	9.43	2.20	3.65
		DS3	8.97	9.50	2.37	4.02
		DS4	9.17	9.63	2.02	3.52
DS5		9.12	9.62	4.12	6.85	
MW		8.68	8.99	1.29	1.88	

Sampling Date	Tidal Period	Station	Average DO Levels (mg/L)		Average Turbidity Level (NTU)	Average SS Level (mg/L)
			Bottom	Surface and Mid Depth		
18/03/2022	Mid Ebb	US1	8.71	8.97	7.06	10.42
		US2	8.60	8.87	8.66	12.27
		DS1	8.70	9.30	6.50	9.87
		DS2	8.70	9.27	6.66	9.90
		DS3	8.75	9.19	6.71	9.52
		DS4	8.82	9.39	5.91	7.93
		DS5	8.86	9.28	6.15	9.62
		MW	8.68	8.78	2.59	5.98
	Mid Flood	US1	8.46	9.15	11.59	16.12
		US2	8.74	9.42	4.48	8.85
		DS1	8.80	9.12	5.50	8.93
		DS2	9.13	9.73	4.33	8.55
		DS3	9.00	9.55	5.27	8.83
		DS4	9.03	9.57	6.72	13.55
		DS5	9.10	9.65	5.60	8.73
		MW	8.48	8.75	4.00	8.10
21/03/2022	Mid Ebb	US1	8.15	8.36	3.90	6.57
		US2	7.88	8.05	5.41	9.62
		DS1	7.98	8.25	5.50	9.18
		DS2	8.02	8.27	4.57	8.03
		DS3	7.96	8.20	5.33	10.33
		DS4	8.09	8.39	4.72	8.87
		DS5	8.03	8.31	5.38	17.88
		MW	8.01	8.26	2.87	7.77
	Mid Flood	US1	7.92	8.04	7.96	17.57
		US2	7.91	8.00	8.68	12.60
		DS1	8.01	8.11	11.07	13.77
		DS2	8.03	8.13	8.71	13.42
		DS3	7.99	8.11	11.49	20.80
		DS4	8.03	8.10	11.96	24.00
		DS5	8.06	8.10	11.11	15.57
		MW	7.95	8.04	2.69	11.17

Sampling Date	Tidal Period	Station	Average DO Levels (mg/L)		Average Turbidity Level (NTU)	Average SS Level (mg/L)
			Bottom	Surface and Mid Depth		
23/03/2022	Mid Ebb	US1	7.27	7.33	4.70	9.93
		US2	7.26	7.36	5.20	8.97
		DS1	7.37	7.35	3.92	6.98
		DS2	7.21	7.38	3.57	7.00
		DS3	7.22	7.40	3.67	7.07
		DS4	7.38	7.37	3.10	8.70
		DS5	7.38	7.42	3.14	7.05
		MW	7.24	7.28	2.29	6.50
	Mid Flood	US1	7.41	7.43	7.51	13.47
		US2	7.40	7.41	7.38	22.67
		DS1	7.39	7.48	10.08	24.73
		DS2	7.43	7.52	10.63	16.33
		DS3	7.34	7.50	13.37	16.00
		DS4	7.35	7.44	15.21	17.83
		DS5	7.45	7.50	15.76	15.42
MW	7.28	7.32	3.05	5.53		
25/03/2022	Mid Ebb	US1	7.19	7.28	2.37	6.02
		US2	7.11	7.22	2.90	5.05
		DS1	7.01	7.16	4.75	9.73
		DS2	7.08	7.20	3.42	8.45
		DS3	7.03	7.15	3.62	7.68
		DS4	7.14	7.11	3.87	6.60
		DS5	7.15	7.19	3.60	6.87
		MW	7.07	7.10	2.25	3.02
	Mid Flood	US1	7.16	7.15	2.54	3.85
		US2	7.07	7.12	3.30	5.85
		DS1	7.18	7.19	2.45	4.87
		DS2	7.04	7.07	4.37	9.93
		DS3	7.13	7.17	3.57	6.72
		DS4	7.12	7.13	3.40	7.40
		DS5	7.12	7.14	3.17	6.23
MW	6.92	6.94	2.40	5.70		

Sampling Date	Tidal Period	Station	Average DO Levels (mg/L)		Average Turbidity Level (NTU)	Average SS Level (mg/L)
			Bottom	Surface and Mid Depth		
28/03/2022	Mid Ebb	US1	6.56	6.56	5.35	9.15
		US2	6.62	6.60	5.51	8.73
		DS1	6.67	6.56	6.41	10.25
		DS2	6.68	6.59	4.93	7.83
		DS3	6.60	6.59	4.49	6.67
		DS4	6.65	6.69	4.07	7.83
		DS5	6.76	6.68	4.20	7.92
		MW	6.82	6.73	2.92	5.42
	Mid Flood	US1	6.83	6.91	3.45	7.88
		US2	6.77	6.78	5.15	14.05
		DS1	6.80	6.91	4.68	10.15
		DS2	6.94	6.96	4.78	7.22
		DS3	7.22	6.90	4.20	7.00
		DS4	6.79	6.87	6.01	9.70
		DS5	6.80	6.93	5.00	7.93
		MW	6.76	6.73	3.68	8.52
30/03/2022	Mid Ebb	US1	6.84	6.78	7.06	10.90
		US2	6.81	6.81	9.71	13.55
		DS1	6.81	6.76	7.18	6.55
		DS2	6.63	6.68	13.54	16.45
		DS3	6.65	6.70	13.54	12.47
		DS4	6.66	6.71	14.14	14.97
		DS5	6.79	6.75	9.58	8.92
		MW	6.58	6.57	5.46	9.30
	Mid Flood	US1	6.81	6.79	10.88	8.00
		US2	6.80	6.78	14.21	22.27
		DS1	6.85	6.79	9.49	12.63
		DS2	6.78	6.83	8.21	9.38
		DS3	6.95	6.94	7.21	8.68
		DS4	6.83	6.82	8.41	9.83
		DS5	6.83	6.79	6.86	10.18
		MW	6.72	6.60	5.58	7.72

Notes:

1. Please refer to Table B1 above for the Action and Limit Levels for dredging activities.
2. Cell shaded yellow indicates value exceeding the Action Level criteria.
3. Cell shaded red indicates value exceeding the Limit Level criteria.