

Appendix 3.34 Estimation of Odour Emission Rates for New Yau Ma Tei Typhoon Shelter

Grid No.	Odour Emission Rates (OER) (ou/m2/s)					Odour Emission Rates (OER) (ou/m2/s)			
	Adjusted Monitoring Results in August 2012 [Note (a)]	Review Results in February 2013 [Note (b)]	Review Results in March 2013 [Note (c)]	Estimated Results for Current Odour Scenario Modelling [Note (d)]	Estimated Results for Background Odour Scenario Modelling [Note (e)]	Estimated Results for Mitigated - A 1:1 Odour Scenario Modelling [Note (f)]	Estimated Results for Mitigated - A 1:0.75 Odour Scenario Modelling [Note (f)]	Estimated Results for Mitigated - A 1:0.50 Odour Scenario Modelling [Note (f)]	Estimated Results for Mitigated - A 1:0.25 Odour Scenario Modelling [Note (f)]
1	0.032	--	--	0.032	0.032	0.032	0.032	0.032	0.032
2	0.032	--	--	0.032	0.032	0.032	0.032	0.032	0.032
3	0.032	--	--	0.032	0.032	0.032	0.032	0.032	0.032
4	0.032	--	--	0.032	0.032	0.032	0.032	0.032	0.032
5	0.106	--	0.997	0.997	0.032	0.557	0.667	0.777	0.887
6	0.032	--	--	0.032	0.032	0.032	0.032	0.032	0.032
7	1.322	1.126	0.291	1.322	0.032	0.739	0.885	1.031	1.176
8	0.130	--	0.027	0.130	0.032	0.073	0.087	0.102	0.116
9	0.205	--	0.142	0.205	0.032	0.114	0.137	0.160	0.182
10	0.093	--	0.029	0.093	0.032	0.052	0.062	0.073	0.083
11	0.032	--	0.025	0.032	0.032	0.032	0.032	0.032	0.032
12	0.032	--	--	0.032	--	0.032	0.032	0.032	0.032
13	0.520	--	--	0.520	0.032	0.290	0.348	0.405	0.463
14	0.033	--	0.022	0.033	0.032	0.032	0.032	0.032	0.032
15	0.032	--	--	0.032	0.032	0.032	0.032	0.032	0.032
16	0.032	--	--	0.032	0.032	0.032	0.032	0.032	0.032
17	0.032	--	0.012	0.032	0.032	0.032	0.032	0.032	0.032
18	0.032	--	--	0.032	0.032	0.032	0.032	0.032	0.032
19	0.032	--	--	0.032	0.032	0.032	0.032	0.032	0.032
20	0.175	--	0.108	0.175	0.032	0.073	0.117	0.136	0.155
21	0.148	--	0.037	0.148	0.032	0.062	0.099	0.115	0.132
22	0.228	--	0.122	0.228	0.032	0.096	0.153	0.178	0.203
23	0.511	--	0.830	0.830	0.032	0.347	0.555	0.647	0.738
24	0.071	--	0.035	0.071	0.032	0.032	0.048	0.056	0.063
25	0.031	--	0.004	0.032	0.032	0.032	0.032	0.032	0.032
26	0.160	--	0.004	0.160	0.032	0.067	0.107	0.125	0.142
27	0.005	--	0.052	0.052	0.032	0.032	0.035	0.041	0.046
28	0.113	--	0.113	0.113	0.032	0.047	0.076	0.088	0.101
29	1.129	1.061	0.713	1.129	0.032	0.472	0.755	0.880	1.004
30	2.702	1.061	0.713	2.702	0.032	1.129	1.807	2.105	2.403
Control/ Seawater	0.032				0.032				

Notes

- (a) The results were obtained by using air drawn through activated carbon filter as carrier gas. Therefore, the results in shaded cells (identified with high OER and sewage/rotten egg odour) have been divided by an adjustment factor to provide more realistic estimates. The adjustment factor is 74.4 for those grids in the vicinity of Cherry St Box Culvert (Grids 20 and above) and 161.07 for those grids in the vicinity of Jordan Box Culvert (Grids 14 and below). The adjustment factor is taken as the lowest ratio of OER obtained by using air drawn through activated carbon filter as carrier gas to that by using nitrogen gas for the relevant area (see Appendix 3.26b).
- (b) The results were obtained by using nitrogen gas as carrier gas. The results for grids 7, 29 and 30 are average of the OER values obtained during different rounds of measurements in February 2013 (see Appendix 3.26b). As one odour sample was collected to cover both grids 29 and 30 due to their close proximity, the OERs for both grids were estimated based on the testing result of the same odour sample.
- (c) The results were obtained by using nitrogen gas as carrier gas. The results for grids 11 and 17 are average of the OER values obtained during different rounds of measurements in March 2013 (see Appendix 3.26b). As one odour sample was collected to cover both grids 29 and 30 due to their close proximity, the OERs for both grids were estimated based on the testing result of the same odour sample.
- (d) The results adopted for modelling are taken as the maximum of the corresponding values in August 2012, February 2013 and March 2013 in order to obtain conservative estimates of the current odour scenario.
- (e) Based on "Seawater" OER from control points for 2012. Assumes the OER can not get lower than this
- (f) Based on reduction of 80% of foul water entering NYMTTS through Cherry St BC and reduction of 60.7% of foul water entering NYMTTS through Jordan Rd BC. 72.8% water bound odour for both Cherry St and Jordan Rd, as averaged from Appendix 3.26b, shown in Appendix 3.33
 For Cherry St BC: Mitigated A OER for Grid 30 = (100% - 72.8%) x Current Odour [non water-bound odour proportion] + 72.8% x Current Odour x (100% - (80% x ratio water:odour)) [water bound odour proportion reduced by proportion of 80% due to new DWFI at Cherry St BC]
 For Jordan Rd BC: Mitigated A OER for Grid 30 = (100% - 72.8%) x Current Odour [non water-bound odour proportion] + 72.8% x Current Odour x (100% - (60.7% x ratio water:odour)) [water bound odour proportion reduced by proportion of 60.7% due to improved interception efficiency of DWFI servicing Jordan Rd BC]
- (g) Based on reduction of a proportion of 80% of foul water entering NYMTTS through Cherry ST BC only and 72.8% water bound odour for Cherry St
- (h) max percent reduction = (current OER - minimum mitigated OER) / current OER

Appendix 3

Adjustment factor (Jordan Rd) [ref App 3.26b, page 27-25]	161.07
Adjustment factor (Cherry St) [ref App 3.26b, page 27-25]	74.4
Water contribution to odour [ref App 3.33, Table 4]	72.8%
% reduction of BOD loading entering NYMTTS (Jordan Rd) [ref App 3.33, Table 3]	60.7%
% reduction of BOD loading entering NYMTTS (Cherry St) [ref App 3.33, Table 3]	80.0%

Grid No.	Odour Emission Rates (OER) (ou/m2/s)				max percent reduction (mitigated:current) [Note (h)]
	Estimated Results for Mitigated - B Odour Scenario Modelling [Note (g)]	Estimated Results for Mitigated - B 1:0.75 Odour Scenario Modelling [Note (g)]	Estimated Results for Mitigated - B 1:0.50 Odour Scenario Modelling [Note (g)]	Estimated Results for Mitigated - B 1:0.25 Odour Scenario Modelling [Note (g)]	
1	0.032	0.032	0.032	0.032	0.0%
2	0.032	0.032	0.032	0.032	0.0%
3	0.032	0.032	0.032	0.032	0.0%
4	0.032	0.032	0.032	0.032	0.0%
5	0.997	0.997	0.997	0.997	44.1%
6	0.032	0.032	0.032	0.032	0.0%
7	1.322	1.322	1.322	1.322	44.1%
8	0.130	0.130	0.130	0.130	44.1%
9	0.205	0.205	0.205	0.205	44.1%
10	0.093	0.093	0.093	0.093	44.1%
11	0.032	0.032	0.032	0.032	0.0%
12	0.032	0.032	0.032	0.032	0.0%
13	0.520	0.520	0.520	0.520	44.1%
14	0.033	0.033	0.033	0.033	2.8%
15	0.032	0.032	0.032	0.032	0.0%
16	0.032	0.032	0.032	0.032	0.0%
17	0.032	0.032	0.032	0.032	0.0%
18	0.032	0.032	0.032	0.032	0.0%
19	0.032	0.032	0.032	0.032	0.0%
20	0.073	0.117	0.136	0.155	58.2%
21	0.062	0.099	0.115	0.132	58.2%
22	0.096	0.153	0.178	0.203	58.2%
23	0.347	0.555	0.647	0.738	58.2%
24	0.032	0.048	0.056	0.063	55.1%
25	0.032	0.032	0.032	0.032	0.0%
26	0.067	0.107	0.125	0.142	58.2%
27	0.032	0.035	0.041	0.046	38.5%
28	0.047	0.076	0.088	0.101	58.2%
29	0.472	0.755	0.880	1.004	58.2%
30	1.129	1.807	2.105	2.403	58.2%
Control/ Seawater					

Notes

- (a) The results were obtained by using air drawn through activated carbon filter as carrier gas. Therefore, the results in shaded cells (identified with high OER and sewage/rotten egg odour) have been divided by an adjustment factor to provide more realistic estimates. The adjustment factor is 74.4 for those grids in the vicinity of Cherry St Box Culvert (Grids 20 and above) and 161.07 for those grids in the vicinity of Jordan Box Culvert (Grids 14 and below). The adjustment factor is taken as the lowest ratio of OER obtained by using air drawn through activated carbon filter as carrier gas to that by using nitrogen gas for the relevant area (see Appendix 3.26b).
- (b) The results were obtained by using nitrogen gas as carrier gas. The results for grids 7, 29 and 30 are average of the OER values obtained during different rounds of measurements in February 2013 (see Appendix 3.26b). As one odour sample was collected to cover both grids 29 and 30 due to their close proximity, the OERs for both grids were estimated based on the testing result of the same odour sample.
- (c) The results were obtained by using nitrogen gas as carrier gas. The results for grids 11 and 17 are average of the OER values obtained during different rounds of measurements in March 2013 (see Appendix 3.26b). As one odour sample was collected to cover both grids 29 and 30 due to their close proximity, the OERs for both grids were estimated based on the testing result of the same odour sample.
- (d) The results adopted for modelling are taken as the maximum of the corresponding values in August 2012, February 2013 and March 2013 in order to obtain conservative estimates of the current odour scenario.
- (e) Based on "Seawater" OER from control points for 2012. Assumes the OER can not get lower than this
- (f) Based on reduction of 80% of foul water entering NYMTTS through Cherry St BC and reduction of 60.7% of foul water entering NYMTTS through Jordan Rd BC. 72.8% water bound odour for both Cherry St and Jordan Rd, as averaged from Appendix 3.26b, shown in Appendix 3.33
 For Cherry St BC: Mitigated A OER for Grid 30 = (100% - 72.8%) x Current Odour [non water-bound odour proportion] + 72.8% x Current Odour x (100% - (80% x ratio water:odour)) [water bound odour proportion reduced by proportion of 80% due to new DWFI at Cherry St BC]
 For Jordan Rd BC: Mitigated A OER for Grid 30 = (100% - 72.8%) x Current Odour [non water-bound odour proportion] + 72.8% x Current Odour x (100% - (60.7% x ratio water:odour)) [water bound odour proportion reduced by proportion of 60.7% due to improved interception efficiency of DWFI servicing Jordan Rd BC]
- (g) Based on reduction of a proportion of 80% of foul water entering NYMTTS through Cherry ST BC only and 72.8% water bound odour for Cherry St
- (h) max percent reduction = (current OER - minimum mitgated OER) / current OER