

Annex 3A-1 Odour Emission Rate Estimation for Permanent Sha Tau Kok Sewage Treatment Works (STKSTW) and Temporary Sewage Treatment Plant (TSTP)

	Unit	Permanent Sha Tau Kok Sewage Treatment Works (STKSTW)		Temporary Sewage Treatment Plant (TSTP)		Remarks
		STKSTW No.1	STKSTW No.2	TSTP No.1	TSTP No.2	
Locations	-					-
No. Emission Points	-	1		1	1	1 emission point for both STKSTW No.1 and STKSTW No.2
Stack height	m above ground	17.65		16.30	16.30	For STKSTW, stack is located 2m above the building rooftop. Building height is 15.65m. For TSTP No.1 and No.2, stacks are located 2m above the building rooftop. Building height is 14.3m.
Stack diameter	m	1.5 x 1.5		0.15	0.25	Provided by enigneer
Equivalent stack diameter	m	1.69		0.15	0.25	Provided by enigneer
Exit temperature	-	Ambient		Ambient	Ambient	Provided by enigneer
Total flowrate @ exit temp	m ³ /hr	70279	46722	3952	9293	Provided by enigneer
	m ³ /s	19.52	12.98	1.10	2.58	Provided by enigneer
Exit velocity	m/s	14.44		15.53	13.15	Provided by enigneer
Odour Emission Rate at inlet	Ou/s	17600	16300	3500	160	Provided by enigneer
% of odour removal	%	99.5	99.5	99.5	99.5	Provided by enigneer
Odour emission rate at exhaust	Ou/s	169.5		17.5	0.8	By Calculation

Annex 3A-2 Emission Input to Model

Scenario	Source	X	Y	Elevation	Odour emission rate	Stack height	Temp	Exit Vel.	Diameter
				m	OU/s	m above gd	degree K	m/s	m
STKSTW	STW_P	840726.67	844957.42	5.10	169.50	17.65	Ambient	14.44	1.69
TSTP	TSTP_1	840765.76	844903.85	5.10	17.50	16.3	Ambient	15.53	0.15
	TSTP_2	840770.96	844903.65	5.10	0.80	16.3	Ambient	13.15	0.25

Annex 3A-3 Calculation of Odour Emission Rate in STKSTW

Facilities	NO.	Surface Area (1)	Total Surface Area	Emission Rate ⁽²⁾	Emission Rates	Emission Location	Total Odour Emission in each location (H ₂ S at inlet)	Emission Rate after 99.5% removal efficiency
							(ou/s)	(ou/s)
preliminary treatment area	1	406.00	406.00	8.79	3,568.74	STKSTW No.1	17,558.61	87.79
membrane maintenance room	1	347.00	347.00	8.79	3,050.13	STKSTW No.1		
EQ. tank 1	1	185.27	185.30	8.79	1,628.79	STKSTW No.1		
EQ. tank 2	1	255.08	255.10	8.79	2,242.33	STKSTW No.1		
Post anoxic tanks	5	41.02	205.10	8.79	1,802.83	STKSTW No.1		
Pre anoxic tanks	5	17.75	88.75	8.79	780.11	STKSTW No.1		
MBR tanks	5	34.35	171.80	0.11	18.90	STKSTW No.1		
RAS tank	1	41.86	41.90	8.79	368.30	STKSTW No.1		
scum tank	1	19.60	19.60	26.40	517.44	STKSTW No.1		
aerobic tank	5	74.37	371.90	8.79	3,269.00	STKSTW No.1		
inlet channel	1	14.82	14.80	8.79	130.09	STKSTW No.1		
common channel	1	20.68	20.70	8.79	181.95	STKSTW No.1		
Filter Presses in sludge dewatering & thickening room	1	529.00	529.00	26.40	13,965.60	STKSTW No.2	16,270.32	81.35
Sludge skips in sludge transfer area	1	46.00	46.00	26.40	1,214.40	STKSTW No.2		
sludge holding tank	2	20.64	41.30	26.40	1,090.32	STKSTW No.2		

- Note:
- (1) Please refer to the General Layout Plan of Sha Tau Kok STW Figure 2.5-2.10
 - (2) The emission calculation for the odour source was in accordance with the odour assessment presented in Approved Environmental Impact Assessment of the Upgrading of Cheung Chau Sewage Collection, Treatment and Disposal Facilities and Harbour Area Treatment.

Annex 3A-4 Calculation of Odour Emission Rate in TSTP

Facilities	NO. (A)	Surface Area (B) (m ²)	Total Surface Area (A) x (B) = (C) (m ²)	Emission Rate ⁽¹⁾ (ou/m ² /s)	Emission Rates (ou/s)	Emission Location	Total Odour Emission in each location (H ₂ S at inlet)		Emission Rate after odor removal efficiency	
							(ou/s)	removal efficiency %	(ou/s)	
Packaged pretreatment plant	3	21.88	65.60	8.79	576.62	TSTP No.1	TSTP No. 1	3,450.43	99.50	17.25
Salnes filter	3	4.61	13.80	8.79	121.30	TSTP No.1				
EQ. tank 1	1	67.64	67.60	8.79	594.20	TSTP No.1				
EQ. tank 2	1	125.85	125.90	8.79	1,106.66	TSTP No.1				
Lifting pumping station	1	7.77	7.80	8.79	68.56	TSTP No.1				
Steel oxic tank	6	10.44	62.64	8.79	550.61	TSTP No.1				
Steel DAF tank	3	16.40	49.20	8.79	432.47	TSTP No.1				
sludge holding tank	1	5.83	5.80	26.40	153.12	TSTP No.2	TSTP No. 2	153.12	99.50	0.77

Note:

(1) The emission calculation for the odour source was in accordance with the odour assessment presented in Approved Environmental Impact Assessment of the Upgrading of Cheung Chau Sewage Collection, Treatment and Disposal Facilities and Harbour Area Treatment.