

MTR LMC Spur Line - Compliance with no net increase in pollution load in Deep Bay

Option 3 - Increase in Reedbed HRT				
	<u>Influent BOD</u>			
A	Flowrate under ultimate case	1228	m ³ /day	(EIA-071/2001 Table 8.19)
B	Influent BOD concentration	619	mg/L	(EIA-071/2001 Table 8.19)
C	Influent BOD loading	760	kg/day	(EIA-071/2001 Table 8.19)
	<u>Effluent BOD from LMC Station STW</u>			
D	Flowrate under ultimate case	1228	m ³ /day	(EIA-071/2001 S8.8.40)
E	RBC BOD removal rate	96.8%		(EIA-071/2001 S8.8.40)
F	RBC Effluent BOD concentration	20.0	mg/L	(EIA-071/2001 S8.8.40)
G	RBC Effluent BOD loading to reedbed	24.6	kg/day	(EIA-071/2001 S8.8.40)
	<u>Existing Reedbed</u>			
H	Total reedbed area	4.65	ha	(FEP-06/129/2002F Clouser 2.14)
I	Existing active reedbed area	2	ha	(FEP-06/129/2002F Clouser 2.14)
J	Flowrate from San Tin Eastern Drainage Channel	320	m ³ /day	(EIA-071/2001 Table 8.24)
K	BOD loading from San Tin Eastern Drainage Channel	24.6	kg/day	(EIA-071/2001 Table 8.23)
L	Total BOD loading (RBC Effluent+STEDC)	49.2	kg/day	G+K
M	Hydraulic retention time	3.88	days	$I \times 0.3 / (D+J)$ (water depth of 0.3m, EIA-071/2001 S8.8.61), Say 3.9 days
N	Total BOD treated (per 2 ha)	95.3	kg	$L \times M \times 50\%$ (50% removal efficiency)
	<u>With Direct Link to MTR LMC Station</u>			
O	Max reedbed loss	320	m ²	
P	Remaining active reedbed area	1.968	ha	$I - O$ (Conservative side assume all affected reedbed area are active, see Item H)
Q	Reduced Hydraulic retention time	3.81	days	$P \times 0.3 / (D+J)$ (water depth of 0.3m, EIA-071/2001 S8.8.61)
R	Reduced Total BOD treated	93.7	kg	$L \times Q \times 50\%$ (50% removal efficiency)
	<u>Adjustment of HRT</u>			
S	Equivalent total BOD treated (per 2 ha)	95.3	kg	N
T	Remaining active reedbed area	1.968	ha	P
U	Adjusted HRT	3.94	days	$M \times I / T$
V	Percentage of HRT increase	1.6%		$(W - O)/O$, Say 2%
W	Adjusted water depth	0.310	m	$(D + J) \times U / T$ (will not deteriorate the function if water depth <1.5m)
X	Percentage of water depth increase	3%		Negligible by daily variations