

APPENDIX 4A

**Construction Noise
Assessment**

Outlying Islands Sewerage Stage 1 Phase 1 Sewage Treatment Works and Sewerage Investigation, Design and Construction
Final Report

Appendix 4A - Construction Noise Assessment
Table 4A.1 Inventory of Powered Mechanical Equipment for STW Construction Activities

Estimated Timing	Activity	Proposed Construction Plants	Nos	UNMITIGATED CNP No./BS5228	SWL	MITIGATION LEVEL 1 Quiet Plant BS5228	SWL	
STW Construction Month 1 to 6	Site Formation/ Earthworks/ Boulder/rock breaking	Excavator/loader, tracked	4	CNP 081	112	Table C.3 Ref. No. 35	106	
		Breaker, excavator mounted (hydraulic)	4	CNP028	122	Table C.8 Ref. No. 13	110	
		Bulldozer	2	CNP030	115	n/a	115	
		Generator	2	CNP102	100	Table C.7 Ref No.54	89	
		Drilling Machine (Vibration hammer driller)	2	CNP182	123	Table C.8 Ref. No. 13	110	
		Dump Truck	4	CNP067	117	Table C.3 Ref No. 52	109	
		Air Compressor	4	CNP002	102	CNP 001	100	
		Sheet Piling Plant	1	Table C.4 Ref No.13	106	Table C.4 Ref No.12	94	
				TOTAL	131	TOTAL	122	
Month 6 to 8	Mini-piling	Crane, mobile	2	CNP048	112	Table C.7 Ref No.118	99	
		Generator	2	CNP102	100	Table C.7 Ref No.54	89	
		Drilling Plant (bored piling)	2	CNP166	100	n/a	100	
		Welding Machine	2	Table C.7 Ref No.60	108	Table C.7 Ref No.62	100	
		Grout Pump	2	CNP282	103	Table C.10 Ref No.68	94	
		TOTAL	1	TOTAL	117	108		
Month 9 to 15	Concreting/Roadwork	Crane, mobile	2	CNP048	112	Table C.7 Ref No.118	99	
		Concrete lorry mixer	3	CNP044	109	Table C.6 Ref. No. 33	96	
		Generator	2	CNP102	100	Table C.7 Ref No.54	89	
		Poker, vibratory, hand held	4	CNP170	113	Table C.6 Ref No.40	98	
		Roller	2	CNP 185	108	Table C.8 Ref. No. 30	101	
		Grader	1	CNP104	113	Table C.9 Ref. No. 11	110	
		TOTAL	122	TOTAL	113	113		
Effluent Export Pipeline Month 1 to 25	Breaking Concrete Surface	Hydraulic breaker	1	CNP028	122	Table C.8 Ref. No. 12	106	
		Air Compressor	1	CNP002	102	CNP 001	100	
				TOTAL	122	TOTAL	107	
							MITIGATION LEVEL 2 with L1 + temporary barrier SWL	
							-5	101
							-5	95
							TOTAL	102
Excavation	Excavation	Excavator, tracked	1	CNP 081	112	Table C.3 Ref. No. 35	106	
		Dump truck	1	CNP 067	117	Table C.9 Ref. No. 19	102	
				TOTAL	118	TOTAL	107	
							-5	101
							-5	97
							TOTAL	102

Pipelaying

Compactor, vibratory	1	CNP050	105	n/a	105	-5	100
		TOTAL	105	TOTAL	105	TOTAL	100

Surfacing

Concrete lorry mixer	1	CNP044	109	Table C.6 Ref. No. 33	96	-5	91
Poker, vibratory, hand held	2	CNP170	113	Table C.6 Ref No.40	98	-5	93
		TOTAL	117	TOTAL	102	TOTAL	97

multi road openings allowed as long as 1 km apart

Village Sewerage

Jan2005 - Apr2007

Breaking Concrete Surface

(use of PME only applies to construction works which are less than 5m away from the NSR)

Electric breaker
Generator

	1	CNP102	105			-5	100
	1	TOTAL	100			-5	95
			106			TOTAL	101

Excavation/Pipelaying

Manual construction methods using hand tools

Reinstatement of Pavement

Manual construction methods using hand tools

Pump Chamber

Excavation/Pipelaying

Excavator, mini size

	1	CNP 081	112	Table C.3 Ref. No.35	106	-5	101
		TOTAL	112	TOTAL	106	TOTAL	101

Concreting of Pump Chamber

Concrete lorry mixer
Poker, vibratory, hand held

	1	CNP044	109	Table C.6 Ref. No. 33	96	-5	91
	2	CNP170	113	Table C.6 Ref No.40	98	-5	93
		TOTAL	117	TOTAL	102	TOTAL	97

Note: SWL : Sound Power Level

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Appendix 4A - Construction Noise Assessment
 Table 4A.2 Noise Level of STW Construction Activities

Nearest NSRs	Distance to site boundary (m)	Distance Correction dB(A)	Façade Effect dB(A)	Predicted		
				SWL dB(A)	Noise Level at NSR1	Noise Level at NSR2
NSR1 Lin Chi Monastery	441	-60.9	3			
NSR2 Tin Tan Buddha Statue	276	-56.8	0			
NSR3 Village House Near Bus Terminal/Ngong Ping Road	240	-55.6	3			
<u>STW Construction</u>						
Site Formation/ Earthworks/ Boulder/rock breaking						
	Unmitigated scenario	73	74	131	78	
	Mitigation Level 1	64	65	122	69	
Mini-piling						
	Unmitigated scenario	59	60	117	64	
	Mitigation Level 1	50	51	108	55	
Concreting/Roadwork						
	Unmitigated scenario	64	65	122	69	
	Mitigation Level 1	55	56	113	60	
<u>Construction of Pump Chamber near Lin Chi Monastery</u>						
	Distance to site (m)	20	350		200	
	Unmitigated scenario	81	56	112	61	
	Mitigation Level 1	75	50	106	55	
	Mitigation Level 2	70	45	101	50	

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**Appendix 4A - Construction Noise Assessment
 Table 4A.3 Noise Level of Village Sewerage & Pump Chamber Construction Activities**

Nearest NSRs	Distance to site boundary (m)	Distance Correction dB(A)	Façade Effect dB(A)	Predicted Noise Level		
				SWL dB(A)	v60	v27
v60	13	-30.0	3			
v27	1	-8.0	3			
v129	7	-25.0	3			
Breaking Concrete Surface						
	Unmitigated scenario			106	79	84
	Mitigation Level 2			101	74	79

Village Sewerage

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Appendix 4A - Construction Noise Assessment
 Table 4A.4 Noise Level of Effluent Export Pipeline Construction Activities

Noise Criteria dB(A)	Nearest NSRs	Distance to site boundary (m)	Distance Correction dB(A)	Façade Effect dB(A)	SWL	Effluent Export Pipeline Construction		
						Unmitigated scenario	worst-case Mitigation Level 1	Mitigation Level 2
						122	107	102
						Predicted Noise Level		
70	Ying Hing Monastery (West)	578	-63.2	3	62	47	42	42
70	Ying Hing Monastery (East)	553	-62.9	3	62	47	42	42
75	Fa Hua Ging Yuen	108	-48.7	3	76	61	56	56
75	San Fung Tsuen (Upper)	49	-41.8	3	83	68	63	63
75	San Fung Tsuen (Middle)	66	-44.4	3	81	66	61	61
70	Kwun Yan Monastery	142	-51.0	3	74	59	54	54
75	San Fung Tsuen (Lower)	95	-47.6	3	77	62	57	57
75	Sam A Shui Tsuen	55	-42.8	3	82	67	62	62
70	Ling Yan Monastery	409	-60.2	3	65	50	45	45
75	Houses	12	-29.6	3	95	80	75	75
75	Tin Fook House	33	-38.4	3	87	72	67	67
75	Lung Tin Estate (West)	93	-47.4	3	78	63	58	58
75	Lung Tin Estate (West)	77	-45.7	3	79	64	59	59
75	Lung Hin Court	34	-38.6	3	86	71	66	66
75	Lung Hin Court	20	-34.0	3	91	76	71	71
75	Village Houses (West)	27	-36.6	3	88	73	68	68
75	Tin Hei House	28	-36.9	3	88	73	68	68
75	Tin Tak House	36	-39.1	3	86	71	66	66
70	Buddhist Fat Ho Memorial College (East)	53	-42.5	3	83	68	63	63
75	Lung Hin Court	41	-40.3	3	85	70	65	65
75	Lung Hin Court	18	-33.1	3	92	77	72	72
75	Village Houses (East)	44	-40.9	3	84	69	64	64
75	Village Houses Along Tai O Wing On Street	107	-48.6	3	76	61	56	56
70	Buddhist Fat Ho Memorial College (West)	144	-51.2	3	74	59	54	54

Appendix 4A - Construction Noise Assessment
 Table 4A.5 Distances to the Nearest Sewer in Ngong Ping Village

ID	X	Y	NAME	DISTANCE to the nearest sewer (m)
1	808894.3	812908.9	V1	3.5
2	808830.5	812930.0	V2	61.0
3	808798.0	812870.8	V3	11.5
4	808792.3	812956.5	V4	96.5
5	808788.6	812919.9	V5	60.8
6	808762.7	812928.3	V6	74.5
7	808759.7	812920.6	V7	68.0
8	808755.7	812938.1	V8	85.0
9	808751.7	812836.1	V9	6.6
10	808735.2	812843.4	V10	21.0
11	808728.2	813147.1	V11	58.0
12	808719.4	812850.8	V12	17.5
13	808716.4	812845.1	V13	12.8
14	808711.5	813187.0	V14	52.5
15	808707.0	812918.3	V15	42.5
16	808706.4	813132.3	V16	41.0
17	808704.0	813154.8	V17	33.7
18	808702.7	812941.8	V18	55.5
19	808700.0	812826.2	V19	6.0
20	808696.6	813146.4	V20	27.0
21	808692.8	813172.5	V21	28.4
22	808688.6	813167.6	V22	23.2
23	808687.8	812812.8	V23	15.0
24	808685.9	812888.7	V24	7.5
25	808683.9	812897.1	V25	12.0
26	808670.8	813140.7	V26	9.0
27	808665.8	813145.8	V27	1.0
28	808664.9	813154.5	V28	4.5
29	808659.0	813054.5	V29	35.0
30	808657.4	813149.7	V30	5.0
31	808653.0	813143.1	V31	3.5
32	808653.0	813107.5	V32	7.5
33	808649.8	813234.1	V33	89.0
34	808647.8	813138.3	V34	1.0
35	808642.6	812978.0	V35	45.0
36	808640.8	813150.0	V36	15.0
37	808637.6	812905.2	V37	3.0
38	808633.9	813011.2	V38	36.0
39	808630.1	813064.8	V39	5.0
40	808624.3	812810.3	V40	1.0
41	808621.8	813037.4	V41	27.8
42	808618.0	812909.0	V42	12.0
43	808614.6	812920.7	V43	10.0
44	808609.4	812906.4	V44	21.0
45	808606.0	812895.5	V45	25.0
46	808604.4	813148.4	V46	27.5
47	808601.8	812965.9	V47	25.0
48	808598.8	813101.7	V48	9.8
49	808595.5	813145.8	V49	25.0
50	808592.4	812981.4	V50	11.8
51	808592.0	812900.4	V51	26.0
52	808588.3	813001.0	V52	9.8
53	808587.5	813020.9	V53	9.0
54	808586.8	813013.0	V54	10.0
55	808582.6	813045.4	V55	6.8
56	808577.4	813144.2	V56	31.0
57	808574.7	813186.0	V57	50.0
58	808572.4	813086.9	V58	4.3
59	808572.4	813010.0	V59	25.0
60	808569.4	813089.5	V60	12.5
61	808569.0	813139.6	V61	28.8
62	808558.5	813066.1	V62	24.5
63	808553.2	813165.9	V63	44.0
64	808549.5	813036.7	V64	41.5
65	808548.3	813076.3	V65	30.5
66	808543.5	813242.4	V66	17.7
67	808542.2	813132.5	V67	24.5
68	808537.6	813223.4	V68	11.6
69	808533.6	812991.9	V69	48.5
70	808532.5	813094.4	V70	0.5
71	808515.5	813165.2	V71	9.8
72	808510.3	813086.6	V72	2.7
73	808508.6	813126.4	V73	8.8
74	808506.8	813143.8	V74	7.0
75	808504.3	812971.6	V75	50.0
76	808502.7	813162.5	V76	2.0
77	808501.6	813020.2	V77	21.0
78	808494.4	813134.1	V78	16.0
79	808493.1	813163.8	V79	10.0
80	808491.9	813213.7	V80	21.5
81	808491.2	813105.0	V81	3.0
82	808485.4	813201.0	V82	7.0

Appendix 4A - Construction Noise Assessment
 Table 4A.5 Distances to the Nearest Sewer in Ngong Ping Village

ID	X	Y	NAME	DISTANCE to the nearest sewer (m)
83	808482.9	813136.5	V83	9.0
84	808481.2	813182.5	V84	2.8
85	808480.2	813030.5	V85	1.5
86	808473.2	813056.8	V86	18.5
87	808465.0	813202.0	V87	4.8
88	808460.8	813186.7	V88	17.8
89	808460.8	813027.1	V89	6.0
90	808457.7	813207.8	V90	4.0
91	808453.2	813053.7	V91	28.7
92	808452.5	813149.3	V92	10.0
93	808452.1	813175.3	V93	9.4
94	808450.1	813239.5	V94	39.0
95	808448.7	813044.7	V95	23.6
96	808448.3	813194.0	V96	6.0
97	808447.6	813038.1	V97	22.0
98	808445.2	813183.2	V98	17.7
99	808436.2	813269.8	V99	54.5
100	808435.2	813034.7	V100	28.5
101	808432.7	813153.8	V101	4.3
102	808432.4	813064.8	V102	20.7
103	808432.1	813227.5	V103	17.8
104	808429.3	813073.1	V104	19.3
105	808428.1	813199.4	V105	6.0
106	808421.3	813029.5	V106	23.4
107	808420.3	813180.8	V107	11.6
108	808418.5	813242.8	V108	24.6
109	808415.8	813167.0	V109	2.5
110	808414.7	813075.9	V110	2.0
111	808408.8	813082.1	V111	3.6
112	808408.8	813021.9	V112	11.5
113	808398.6	813077.0	V113	9.0
114	808396.0	813217.2	V114	6.4
115	808389.1	813027.1	V115	9.0
116	808388.4	813103.6	V116	32.3
117	808386.3	812876.2	V117	3.5
118	808383.2	813017.0	V118	5.0
119	808374.9	813016.3	V119	5.1
120	808370.4	813000.7	V120	10.0
121	808355.9	813182.5	V121	6.5
122	808355.2	813242.8	V122	45.5
123	808351.0	813138.2	V123	37.0
124	808345.5	812975.5	V124	11.0
125	808342.7	813141.7	V125	31.0
126	808341.0	813028.8	V126	3.0
127	808340.3	813155.9	V127	17.2
128	808338.2	812936.3	V128	7.5
129	808337.8	813036.1	V129	6.8
130	808333.7	813088.7	V130	25.0
131	808331.1	813229.5	V131	9.4
132	808330.6	813039.2	V132	12.6
133	808329.0	813241.1	V133	12.0
134	808323.3	813127.8	V134	25.0
135	808322.6	813229.6	V135	2.6
136	808322.4	813220.1	V136	9.5
137	808316.2	813232.4	V137	2.8
138	808312.4	813250.5	V138	20.8
139	808310.5	813301.0	V139	63.5
140	808309.8	813040.6	V140	10.0
141	808303.2	812951.9	V141	6.0
142	808302.5	813268.1	V142	41.5
143	808295.9	813085.2	V143	5.2
144	808292.1	813083.2	V144	10.5
145	808276.6	813214.7	V145	7.0
146	808275.9	813231.7	V146	1.8
147	808275.6	813245.3	V147	7.8
148	808271.4	813223.0	V148	8.0
149	808267.2	813274.3	V149	14.5
150	808264.8	813290.3	V150	10.0
151	808262.0	813286.0	V151	5.0

Appendix 4A - Construction Noise Assessment

Table 4A.6 Summary of Noise Exceedances due to the Construction of Ngong Ping Village Sewerage

ID	X	Y	NAME	Breaking Concrete Surface						
				Level 2 Mitigation (Use of Quiet Equipment and Temporary Noise Barrier)			Level 3 Mitigation (Use of manual construction methods in works area which are less than 5 m away from the nearest NSR)			
				DISTANCE to the nearest sewer (m)	Predicted Noise Levels dB(A)	Residual Impact dB(A)	Duration of Exceedance, No. of Day	Predicted Noise Levels dB(A)	Residual Impact dB(A)	Duration of Exceedance, No. of Day
70	808532.5	813094.4	V70	0.5	102.0	27.0	1	N/A	N/A	N/A
27	808665.8	813145.8	V27	1.0	96.0	21.0	1	N/A	N/A	N/A
34	808647.8	813138.3	V34	1.0	96.0	21.0	1	N/A	N/A	N/A
40	808624.3	812810.3	V40	1.0	96.0	21.0	1	N/A	N/A	N/A
85	808480.2	813030.5	V85	1.5	92.5	17.5	1	N/A	N/A	N/A
146	808275.9	813231.7	V146	1.8	90.9	15.9	1	N/A	N/A	N/A
76	808502.7	813162.5	V76	2.0	90.0	15.0	1	N/A	N/A	N/A
110	808414.7	813075.9	V110	2.0	90.0	15.0	1	N/A	N/A	N/A
109	808415.8	813167.0	V109	2.5	88.0	13.0	1	N/A	N/A	N/A
135	808322.6	813229.6	V135	2.6	87.7	12.7	1	N/A	N/A	N/A
72	808510.3	813096.6	V72	2.7	87.4	12.4	1	N/A	N/A	N/A
84	808481.2	813182.5	V84	2.8	87.1	12.1	1	N/A	N/A	N/A
137	808316.2	813232.4	V137	2.8	87.1	12.1	1	N/A	N/A	N/A
37	808637.6	812905.2	V37	3.0	86.5	11.5	1	N/A	N/A	N/A
81	808491.2	813105.0	V81	3.0	86.5	11.5	1	N/A	N/A	N/A
126	808341.0	813028.8	V126	3.0	86.5	11.5	1	N/A	N/A	N/A
1	808894.3	812908.9	V1	3.5	85.1	10.1	1	N/A	N/A	N/A
31	808653.0	813143.1	V31	3.5	85.1	10.1	1	N/A	N/A	N/A
117	808386.3	812876.2	V117	3.5	85.1	10.1	1	N/A	N/A	N/A
111	808408.8	813082.1	V111	3.6	84.9	9.9	1	N/A	N/A	N/A
90	808457.7	813207.8	V90	4.0	84.0	9.0	1	N/A	N/A	N/A
58	808572.4	813086.9	V58	4.3	83.3	8.3	1	N/A	N/A	N/A
101	808432.7	813153.8	V101	4.3	83.3	8.3	1	N/A	N/A	N/A
28	808664.9	813154.5	V28	4.5	82.9	7.9	1	N/A	N/A	N/A
87	808465.0	813202.0	V87	4.8	82.4	7.4	1	N/A	N/A	N/A
30	808657.4	813149.7	V30	5.0	82.0	7.0	1	N/R	N/R	N/R
39	808630.1	813064.8	V39	5.0	82.0	7.0	1	N/R	N/R	N/R
118	808383.2	813017.0	V118	5.0	82.0	7.0	1	N/R	N/R	N/R
151	808262.0	813266.0	V151	5.0	82.0	7.0	1	N/R	N/R	N/R
119	808374.9	813016.3	V119	5.1	81.8	6.8	1	N/R	N/R	N/R
143	808295.9	813085.2	V143	5.2	81.7	6.7	1	N/R	N/R	N/R
19	808700.0	812826.2	V19	6.0	80.4	5.4	1	N/R	N/R	N/R
89	808460.8	813027.1	V89	6.0	80.4	5.4	1	N/R	N/R	N/R
96	808448.3	813194.0	V96	6.0	80.4	5.4	1	N/R	N/R	N/R
105	808428.1	813199.4	V105	6.0	80.4	5.4	1	N/R	N/R	N/R
141	808303.2	812951.9	V141	6.0	80.4	5.4	1	N/R	N/R	N/R
114	808396.0	813217.2	V114	6.4	79.9	4.9	1	N/R	N/R	N/R
121	808355.9	813182.5	V121	6.5	79.7	4.7	1	N/R	N/R	N/R
9	808751.7	812836.1	V9	6.6	79.6	4.6	1	N/R	N/R	N/R
55	808582.6	813045.4	V55	6.8	79.3	4.3	1	N/R	N/R	N/R
129	808337.8	813036.1	V129	6.8	79.3	4.3	1	N/R	N/R	N/R
74	808506.8	813143.8	V74	7.0	79.1	4.1	1	N/R	N/R	N/R
82	808485.4	813201.0	V82	7.0	79.1	4.1	1	N/R	N/R	N/R
145	808276.6	813214.7	V145	7.0	79.1	4.1	1	N/R	N/R	N/R
24	808685.9	812888.7	V24	7.5	78.5	3.5	1	N/R	N/R	N/R
32	808653.0	813107.5	V32	7.5	78.5	3.5	1	N/R	N/R	N/R
128	808338.2	812936.3	V128	7.5	78.5	3.5	1	N/R	N/R	N/R
147	808275.6	813245.3	V147	7.8	78.2	3.2	1	N/R	N/R	N/R
148	808271.4	813223.0	V148	8.0	77.9	2.9	1	N/R	N/R	N/R
73	808508.6	813126.4	V73	8.8	77.1	2.1	1	N/R	N/R	N/R
26	808670.8	813140.7	V26	9.0	76.9	1.9	1	N/R	N/R	N/R
53	808587.5	813020.9	V53	9.0	76.9	1.9	1	N/R	N/R	N/R
83	808482.9	813136.5	V83	9.0	76.9	1.9	1	N/R	N/R	N/R
113	808398.6	813077.0	V113	9.0	76.9	1.9	1	N/R	N/R	N/R
115	808389.1	813027.1	V115	9.0	76.9	1.9	1	N/R	N/R	N/R
93	808452.1	813175.3	V93	9.4	76.5	1.5	1	N/R	N/R	N/R
131	808331.1	813229.5	V131	9.4	76.5	1.5	1	N/R	N/R	N/R
136	808322.4	813220.1	V136	9.5	76.4	1.4	1	N/R	N/R	N/R
48	808598.8	813101.7	V48	9.8	76.2	1.2	1	N/R	N/R	N/R
52	808588.3	813001.0	V52	9.8	76.2	1.2	1	N/R	N/R	N/R
71	808515.5	813165.2	V71	9.8	76.2	1.2	1	N/R	N/R	N/R
43	808614.6	812920.7	V43	10.0	76.0	1.0	1	N/R	N/R	N/R

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Appendix 4A - Construction Noise Assessment

Table 4A.6 Summary of Noise Exceedances due to the Construction of Ngong Ping Village Sewerage

ID	X	Y	NAME	DISTANCE to the nearest sewer (m)	Breaking Concrete Surface			Level 3 Mitigation (Use of manual construction methods in works area which are less than 5 m away from the nearest NSR)		
					Level 2 Mitigation (Use of Quiet Equipment and Temporary Noise Barrier)			Predicted Noise Levels dB(A)	Residual Impact dB(A)	Duration of Exceedance, No. of Day
54	808586.8	813013.0	V54	10.0	76.0	1.0	1	N/R	N/R	N/R
79	808493.1	813163.8	V79	10.0	76.0	1.0	1	N/R	N/R	N/R
92	808452.5	813149.3	V92	10.0	76.0	1.0	1	N/R	N/R	N/R
120	808370.4	813000.7	V120	10.0	76.0	1.0	1	N/R	N/R	N/R
140	808309.8	813040.6	V140	10.0	76.0	1.0	1	N/R	N/R	N/R
150	808264.8	813230.3	V150	10.0	76.0	1.0	1	N/R	N/R	N/R
144	808292.1	813083.2	V144	10.5	75.6	0.6	1	N/R	N/R	N/R
124	808345.5	812975.5	V124	11.0	75.2	0.2	1	N/R	N/R	N/R

Notes:

N/A - Not Applicable. No powered mechanical equipment will be used for works areas which are less than 5 m away from the NSR.
 N/R - Not Required. Level 3 Mitigation Measures are not required for works areas which are at or more than 5 m away from the NSR.