

**Comparison of Odour Impact between
 Existing (Without Project) and Future (with Project) Scenarios**

1. BACKGROUND

- 1.1.1 San Tin / Lok Ma Chau Development Node (STLMC DN, The Project) is proposed in the area located to the west of Kwu Tung North and Fanling North New Development Areas (NDAs) and Fanling and Sheung Shui New Towns, and to the northeast of Yuen Long and Tin Shui Wai New Towns. Refer to **Appendix A** for the location of the Project area. There are nine existing livestock farms within STLMC DN, including two chicken farms and seven pig farms located at the southern portion of the Project area. These existing livestock farms would be removed under the Project. With the removal of these livestock farms and their odorous sources, it is anticipated the overall odour emission in the area would be improved.
- 1.1.2 Despite these existing livestock farms within the Project area to be removed, an existing livestock farm (Retained Livestock Farm) located in the vicinity of north boundary of the Project area and the Sewage Treatment Works of San Tin Barracks (STBSTW) fall within 500m from Project boundary. These facilities would still pose potential odour impact on the existing air sensitive receivers (ASRs) and planned ASRs under STLMC DN. Also, some infrastructural works under STLMC DN, namely Effluent Polishing Plant (STLMC EPP), Food Waste Pre-treatment Facility (FWPF), Refuse Transfer Station (RTS) and three Sewage Pumping Stations (SPSs), would pose potential odour impact on the existing and planned ASRs.
- 1.1.3 The identified potential odour sources under the Existing Scenario (Without Project) and Future Scenario (With Project) are summarized in **Table 1.1**. The odour emission inventories for both scenarios were also established. The emission data for livestock farms were estimated based on the findings of the odour surveys undertaken under *Study on Phase One of Development of New Territories North – San Tin / Lok Ma Chau Development Node - Feasibility Study*. The odour emission from odorous infrastructural works under STLMC DN were calculated based on the engineering design of the Project and made reference to odour emission data of similar scale of these facilities of past projects. The detailed calculation of the emission inventories for Existing Scenario and Future Scenario are presented in **Appendix A** and **Appendix B** respectively. The overall odour emission in the area would be reduced by around 84% from the Existing Scenario (Without Project) to Future Scenario (With Project).

Table 1.1 Odour Emission Sources in Existing and Future Scenario

Odour Emission Source	Existing Scenario (Without Project)	Future Scenario (With Project)
Existing Pig Farms (Pig Farm 2 – 4, 7 – 8, and 10 – 11)	O	X
Existing Chicken Farm 5, 9 ^[2]	O	X
Existing Chicken Farm 6 ^[1]	O	O
Retained Livestock Farm (Pig Farm 1)	O	O
STBSTW	O	O
STLMC EPP	X	O
Proposed FWPF	X	O
Proposed RTS	X	O
Proposed SPSs	X	O

Remark:

[1] Chicken Farm 6 falls outside 500m assessment area of STLMC DN. It is excluded from the emission inventory.

[2] Chicken Farm 9 is lack of on-site odour survey data and the data collected from odour sampling in Chicken Farm 5 were not applicable. It is therefore excluded from the emission inventory.

1.1.4 However, the model prediction showed that the cumulative odour concentrations would exceed the EIAO-TM criterion of 5 OU/m³ at existing representative ASRs A26 (1.5, 5, 10 mAG) and A33 (1.5, 5, 10, 15 mAG), as shown in **Table 1.2**. Exceedance of odour impact was also predicted at development sites with potential air sensitive use, including Site G.5.8, G.5.9, G.5.10, G.5.11, G.5.12, E.5.1 and E.5.2 at 1.5mAG, 5mAG, 10mAG and 15mAG in vicinity of the existing San Tin Barracks STW, and Site OU(I&T)3.1.8 at 1.5 mAG, 5 mAG, 10 mAG and 15 mAG in the vicinity of Retained Pig Farm. A further study (This Study) is therefore carried out to investigate the change in cumulative odour impact between Existing and Future Scenarios, and confirm such improvement brought by the Project at the ASRs and areas with exceedance.

Table 1.2 Predicted Cumulative Odour Concentrations at A26 and A33

ASR ID	Assessment Height (mAG)	Maximum 5-second Average Odour Concentration (OU/m³) (EIAO-TM: 5 OU/m³)
A26	1.5	13.94
A26	5	13.39
A26	10	12.23
A33	1.5	12.59
A33	5	11.28
A33	10	10.97
A33	15	5.11

2. ASSESSMENT METHODOLOGY

- 2.1.1 The odour emission inventories of Retained Livestock Farm, STBSTW, STMLC EPP, FWPF, RTS and 3 SPSs are presented in **Appendix A** and **B**, while their modelling approach adopted is presented in **Appendix C**.
- 2.1.2 Each of the 7 Existing Pig Farms (Pig Farm No. 2 – 4, 7 – 8, and 10 - 11) was modelled as area source because pig farm is commonly found open-air design. Given that the concerned ASRs are far away from each existing pig farm not to be retained (more than 500m), odour sources in a pig farm were modelled by adopting a single area source over the livestock farm boundary. The livestock farm boundary refers to the farm layout plan obtained from AFCD. The details of these odour emission sources are presented in **Appendix A**.
- 2.1.3 Farm 5 was the only existing chicken farm considered in the assessment because an on-site odour survey has been conducted to determine its odour emission rates. Their odour emission inventories were presented in **Appendix A**. According to the odour survey, chicken house was equipped with mechanical ventilation fans, thus each house was modelled as horizontal point source individually. Other supporting facilities such as sewage treatment, conveyor belts and rubbish bin area, were modelled as one area source. All emission sources were modelled at the **furthest south-east corner** of the farm for the purpose of broad-brush assessment, as illustrated in **Appendix A**. The details of these odour emission sources are also presented in the appendix.
- 2.1.4 Existing chicken Farm 6 falls outside 500m assessment area of the Project, thus it is excluded from the calculation. Chicken Farm 9 is within 500m assessment area, however it is lack of on-site odour survey data and the data collected from odour sampling in Farm 5 is not applicable, thus it is also excluded from the calculation. Such approach results in less odour emission in total considered in Existing Scenario. When comparing the odour impact in the two scenarios, e.g. $OU_{Future} - OU_{Existing}$, a decrease in future odour impact would be diminished in magnitude. Nevertheless, as far as environmental benefit is concerned, e.g. a decrease in odour impact, the approach is on conservative side and is acceptable for the purpose of comparison.

3. CHANGE IN CUMULATIVE ODOUR IMPACT

- 3.1.1 The cumulative odour concentrations at concerned representative ASRs A26 and A33 in the Existing Scenario and Future Scenario were predicted respectively. Comparison of odour impact between the Existing and Future Scenarios are presented in **Table 3.1**. The comparison showed that the cumulative odour concentration at A26 and A33 would be lower under the “Future Scenario”. The implementation of the Project is expected to bring environmental benefit, in particular improving the existing odour impact where exceedance of cumulative odour impact were predicted. No adverse residual odour impact is thus anticipated during the operation phase of the Project.

Table 3.1 Comparison of Odour Impact between Existing and Future Scenarios

ASR ID	Height (mAG)	5-second Average Odour Concentration (OU/m ³)		Change
		Future Scenario	Existing Scenario	
A26	1.5	13.94	15.47	-1.53
A26	5	13.39	14.92	-1.53
A26	10	12.23	14.04	-1.80
A26	15	4.74	6.68	-1.94
A33	1.5	12.59	12.68	-0.09
A33	5	11.28	11.41	-0.14
A33	10	10.97	11.04	-0.07
A33	15	5.11	5.14	-0.03

Remark:

Bold value indicates exceedance in odour criterion of 5 OU/m³ stipulated in EIAO-TM.

- 3.1.2 The change in spatial odour concentration within the exceedance areas were further evaluated. Contours of change in odour impact in 10m x 10m resolution at 1.5mAG, 5mAG, 10mAG, 15mAG and 20mAG are presented in **Appendix D**. The spatial comparison results showed that the cumulative odour impact would generally decrease within the exceedance area with the implementation of the Project. The increase of odour concentration was predicted in the northeast and northwest of the Retained Pig Farm at 10mAG and 15mAG. A temporary shelter is found in the area, however it is less than 5 metres tall and is used for the purpose of parking / storage. An increase of odour concentration was also predicted at 10mAG at the open ground within San Tin Barracks. In summary, no existing and future air sensitive uses, including openable window / fresh air intakes of the ventilation system or recreational uses in open space, within the exceedance zone would suffer from the increase of odour impact. It is further confirmed that no adverse residual odour impact is anticipated during the operation phase of the Project.

Appendix A

Odour Emission Inventory of Existing Scenario

Appendix A Odour Emission Inventory of Existing Scenario

Comparison of Odour Emission Inventory (Existing vs. Future Scenarios)

Facility	Farm No. ^[1]	Odour Emission Rate (OU/s)	
		Existing Scenario	Future Scenario
Pig Farm 1 (Retained Pig Farm)	LK871	7982	7982
Pig Farm 2	LK726	6560	0
Pig Farm 3	LK718	9653	0
Pig Farm 4	LK840	12086	0
Chicken Farm 5	LK1172	28558	0
Chicken Farm 6 ^[3]	LK934	-	-
Pig Farm 7	LK799	3857	0
Pig Farm 8	LK806	8777	0
Chicken Farm 9 ^[3]	LK1090	-	-
Pig Farm 10	LK809	7148	0
Pig Farm 11	LK801	7018	0
San Tin Barracks Sewage Treatment Works (STBSTW)	-	3627	3627
STLMC Effluent Polishing Plant (EPP)	-	0	1266
Proposed Food Waste Pre-treatment Facility (FWPF)	-	0	1577
Proposed Refuse Transfer Station (RTS)	-	0	888
Proposed Sewage Pumping Station (SPSs)	-	0	300
Total		95265	15640
Percentage Change		-	-84%

Remarks:

[1] Odour emission rate calculated for each pig farm and chicken farm are based on the information from Agreement No. CE 28/2019 (CE) Study on Phase One Development of New Territories North - San Tin/ Lok Ma Chau Development Node - Feasibility Study - Working Paper on Odour Emission Inventory for Livestock Farms (17 December 2021).

[2] Odour emission rate calculated for STBSTW, EPP, FWPF, RTS and SPSs are based on the information from Agreement No. CE20/2021 (CE) First Phase Development of New Territories North - San Tin / Lok Ma Chau Development Node - Investigation.

[3] Chicken Farm 6 falls outside the 500m assessment area of STLMC DN. Chicken farm 9 is lack of on-site data and the data collected from odour sampling in Chicken Farm 5 is not applicable. Both Farm 6 and 9 were therefore omitted. This is considered as a conservative approach to demonstrate reduction in odour emission due to the Project.

Appendix A Odour Emission Inventory of Existing Scenario

Farm 1 (Retained Pig Farm Considered in Air Dispersion Modelling)

Farm ID LK871

ID	Use	Dimension, m ^[3]			Area, m ²	Assumed SOER, OU/m ² /s ^{[1][2]}	1-hour Average Emission Rate, OU/s	SOER Reference from Pig Farm 18/19/P43 ^[1]
PF01	Pig House	3.78	x	5.76	21.77	2.89	62.81	Pig House
PF02	Pig House	6.03	x	2.92	17.61	2.89	50.80	Pig House
PF03	Pig House	10.00	x	23.60	236.00	2.89	680.86	Pig House
PF04	Pig House	3.60	x	7.60	27.36	2.89	78.93	Pig House
PF05	Pig House	4.70	x	30.98	145.61	2.89	420.07	Pig House
PF06	Pig House	2.00	x	5.88	11.76	2.89	33.93	Pig House
PF07	Pig House	5.70	x	6.00	34.20	2.89	98.67	Pig House
PF08	Pig House	4.90	x	15.44	75.66	2.89	218.27	Pig House
PF09	Pig House	4.80	x	3.50	16.80	2.89	48.47	Pig House
PF10	Pig House	3.30	x	8.80	29.04	2.89	83.78	Pig House
PF11	Pig House	4.45	x	6.02	26.79	2.89	77.29	Pig House
PF14	Pig House	3.00	x	8.96	26.88	2.89	77.55	Pig House
PF15	Pig House	7.26	x	5.99	43.49	2.89	125.46	Pig House
PF16	Pig House	9.95	x	2.94	29.25	2.89	84.39	Pig House
PF17	Pig House	12.11	x	10.95	132.60	2.89	382.56	Pig House
PF18	Pig House	15.25	x	5.08	77.47	2.89	223.50	Pig House
PF19	Pig House	10.15	x	7.98	81.00	2.89	233.68	Pig House
PF20	Pig House	4.20	x	9.86	41.41	2.89	119.47	Pig House
PF21	Pig House	6.36	x	6.15	39.11	2.89	112.84	Pig House
PF22	Pig House	-	x	-	88.50	2.89	255.32	Pig House
PF23	Pig House	12.00	x	9.00	108.00	2.89	311.58	Pig House
				Total Area	1310.31	Sub-Total	3780.24	
ID	Use	Dimension, m ^[3]			Area, m ²	Assumed SOER, OU/m ² /s ^{[1][4]}	1-hour Average Emission Rate, OU/s	SOER Reference from Pig Farm 18/19/P43 ^[1]
PFA	Collection Tank	2.00	x	2.00	4.00	51.34	205.36	Collection Tank
PFB	Collection Tank	2.00	x	2.00	4.00	51.34	205.36	Collection Tank
PFC	Collection Tank	2.00	x	2.00	4.00	51.34	205.36	Collection Tank
PFD	Waste Segregation Facility ^[5]	-	x	-	1.00	14.04	14.04	Waste Segregation Facility
PFE	Sludge Storage Tank	11.00	x	1.70	18.70	44.96	840.75	Sludge Storage Tank
PFF	Sludge Storage Tank	2.00	x	12.30	24.60	44.96	1106.02	Sludge Storage Tank
PFG	Filtration Tank ^[6]	9.00	x	3.50	31.50	12.35	389.03	Anaerobic Digestion Tank
PFH	Filtration Tank ^[6]	9.00	x	3.50	31.50	12.35	389.03	Anaerobic Digestion Tank
PFI	Filtration Tank ^[6]	9.00	x	3.50	31.50	12.35	389.03	Anaerobic Digestion Tank
PFJ	Filtration Tank ^[6]	9.00	x	3.50	31.50	12.35	389.03	Anaerobic Digestion Tank
PFK	Aeration Tank	4.20	x	3.40	14.28	0.77	11.00	Aeration Tank
PFL	Aeration Tank	5.20	x	3.40	17.68	0.77	13.61	Aeration Tank
PFM	Aeration Tank	5.20	x	3.40	17.68	0.77	13.61	Aeration Tank
PFN	Aeration Tank	5.20	x	7.00	36.40	0.77	28.03	Aeration Tank
PFO	Sedimentation Tank	2.80	x	6.40	17.92	0.12	2.15	Sedimentation Tank
				Total Area	286.26	Sub-Total	4201.39	
Total Odour Emission							7981.63	

Remarks:

[1] SOER refers to Working Paper on Odour Sampling Results and Odour Emission Inventory – Pig Farm LK801 (Revision 2) dated 31 January 2022 which has been approved by EPD.

[2] Average value of 2.89 OU/m²-s is adopted for the overall SOER of a pig house, which is based on two SOERs (1.86 OU/m²-s and 3.91 OU/m²-s) determined in the reference odour survey.

[3] Dimension of the odour sources referenced to the farm layout plan provided by AFCD.

[4] PFA-PFO are area sources and hence their emission rates are presented as OU/m²/s.

[5] It is a stand-alone machine identified from the farm layout plan. 1 m² is assumed for the purpose of calculation.

[6] The facility was not identified odourous in the odour sampling for Pig Farm 18/19/P43. SOER of anaerobic digestion tank is adopted for assessment purpose to avoid underestimation of odour impact.

Appendix A Odour Emission Inventory of Existing Scenario

Farm 2 (Existing Pig Farm)

Farm ID LK726

ID	Use	Dimension, m ^[3]			Area, m ²	Assumed SOER, OU/m ² /s ^{[1][2]}	1-hour Average Emission Rate, OU/s	SOER Reference from Pig Farm 18/19/P43 ^[1]
1	Pig House	6.20	x	15.35	95.17	2.89	274.57	Pig House
2	Pig House	-	x	-	64.50	2.89	186.08	Pig House
3	Pig House	-	x	-	34.74	2.89	100.22	Pig House
4	Pig House	8.60	x	7.00	60.20	2.89	173.68	Pig House
5	Pig House	-	x	-	41.96	2.89	121.05	Pig House
6	Pig House	-	x	-	128.73	2.89	371.39	Pig House
7	Pig House	-	x	-	68.06	2.89	196.35	Pig House
8	Pig House	-	x	-	307.81	2.89	888.03	Pig House
9	Pig House	-	x	-	629.41	2.89	1815.85	Pig House
10	Pig House	20.00	x	12.00	240.00	2.89	692.40	Pig House
				Total Area	1670.58	Sub-Total	4819.62	
ID	Use	Dimension, m ^[3]			Area, m ²	Assumed SOER, OU/m ² /s ^[1]	1-hour Average Emission Rate, OU/s	SOER Reference from Pig Farm 18/19/P43 ^[1]
A	Collection Tank	2.30	x	2.10	4.83	51.34	247.97	Collection Tank
C	Collection Tank	2.30	x	2.10	4.83	51.34	247.97	Collection Tank
D	Anaerobic Digestion Tank	3.90	x	3.70	14.43	12.35	178.21	Anaerobic Digestion Tank
E	Anaerobic Digestion Tank	3.90	x	3.70	14.43	12.35	178.21	Anaerobic Digestion Tank
F	Anaerobic Digestion Tank	4.20	x	3.70	15.54	12.35	191.92	Anaerobic Digestion Tank
G	Anaerobic Digestion Tank	4.20	x	3.70	15.54	12.35	191.92	Anaerobic Digestion Tank
H	Aeration Tank	8.00	x	7.40	59.20	0.77	45.58	Aeration Tank
I	Sedimentation Tank	5.20	x	2.80	14.56	0.12	1.75	Sedimentation Tank
J	Sedimentation Tank	4.70	x	2.80	13.16	0.12	1.58	Sedimentation Tank
K	Filtration Tank	2.00	x	3.00	6.00	12.35	74.10	Anaerobic Digestion Tank
L	Sludge Storage Tank	2.70	x	2.40	6.48	44.96	291.34	Sludge Storage Tank
B	Waste Segregation Facility	-	x	-	6.42	14.04	90.14	Waste Segregation Facility
M	Pond	-	x	-	-	-	-	Odourless, dimensions not provided in Layout Plan
				Total Area	169.00	Sub-Total	1740.69	
						Total Odour Emission	6560.31	

Remarks:

[1] SOER refers to Working Paper on Odour Sampling Results and Odour Emission Inventory – Pig Farm LK801 (Revision 2) dated 31 January 2022 which has been approved by EPD.

[2] Average value of 2.89 OU/m²-s is adopted for the overall SOER of a pig house, which is based on two SOERs (1.86 OU/m²-s and 3.91 OU/m²-s) determined in the reference odour survey. It is the same SOER adopted for the pig houses of Retained Pig Farm (Farm 1)

[3] Dimension of the odour sources referenced to the farm layout plan provided by AFCD.

Appendix A Odour Emission Inventory of Existing Scenario

Farm 3 (Existing Pig Farm)

Farm ID LK718

ID	Use	Dimension, m ^[3]			Area, m ²	Assumed SOER, OU/m ² /s ^{[1][2]}	1-hour Average Emission Rate, OU/s	SOER Reference from Pig Farm 18/19/P43 ^[1]
1	Pig House	-	x	-	481.35	2.89	1388.69	Pig House
4	Pig House	16.40	x	7.15	117.26	2.89	338.30	Pig House
5	Pig House	8.10	x	3.45	27.95	2.89	80.62	Pig House
6	Pig House	11.70	x	8.55	100.04	2.89	288.60	Pig House
7	Pig House	11.70	x	8.50	99.45	2.89	286.91	Pig House
8	Pig House	12.10	x	5.65	68.37	2.89	197.23	Pig House
9	Pig House	-	x	-	189.38	2.89	546.36	Pig House
11	Pig House	17.00	x	2.20	37.40	2.89	107.90	Pig House
12	Pig House	6.80	x	2.90	19.72	2.89	56.89	Pig House
13	Pig House	3.70	x	2.75	10.18	2.89	29.35	Pig House
14	Pig House	12.70	x	4.00	50.80	2.89	146.56	Pig House
15	Pig House	9.15	x	6.20	56.73	2.89	163.67	Pig House
16	Pig House	12.00	x	4.10	49.20	2.89	141.94	Pig House
17	Pig House	11.50	x	2.85	32.78	2.89	94.56	Pig House
18	Pig House	-	x	-	75.07	2.89	216.58	Pig House
19	Pig House	11.75	x	10.10	118.68	2.89	342.38	Pig House
20	Pig House	14.05	x	6.70	94.14	2.89	271.58	Pig House
21	Pig House	-	x	-	140.12	2.89	404.25	Pig House
24	Pig House	-	x	-	74.33	2.89	214.44	Pig House
25	Pig House	19.31	x	11.06	213.57	2.89	616.15	Pig House
				Total Area	2056.48	Sub-Total	5932.96	
ID	Use	Dimension, m ^[3]			Area, m ²	Assumed SOER, OU/m ² /s ^{[1][2]}	1-hour Average Emission Rate, OU/s	SOER Reference from Pig Farm 18/19/P43 ^[1]
A	Waste Storage Area ^[4]	-	x	-	25.18	44.96	1132.09	Sludge Storage Tank
B	Collection Tank	-	x	-	5.30	51.34	272.10	Collection Tank
C	Anaerobic Digestion Tank	-	x	-	113.23	12.35	1398.39	Anaerobic Digestion Tank
D	Aeration Tank	-	x	-	51.61	0.77	39.74	Aeration Tank
E	Retention Tank ^[5]	-	x	-	14.62	51.34	750.59	Collection Tank
F	Aeration Tank	-	x	-	33.54	0.77	25.83	Aeration Tank
G	Sedimentation Tank	-	x	-	5.99	0.12	0.72	Sedimentation Tank
H	Sedimentation Tank	-	x	-	12.20	0.12	1.46	Sedimentation Tank
I	Dry Residue Tank	7.27	x	2.72	19.77	0.28	5.54	Sludge Storage Tank - basin for solid residues
J	Coagulation Tank ^[6]	7.06	x	3.80	26.83	0.12	3.22	Sedimentation Tank
K	Waste Segregation Facility	-	x	-	6.42	14.04	90.14	Waste Segregation Facility
				Total Area	308.27	Sub-Total	3719.82	
						Total Odour Emission	9652.77	

Remarks:

[1] SOER refers to Working Paper on Odour Sampling Results and Odour Emission Inventory – Pig Farm LK801 (Revision 2) dated 31 January 2022 which has been approved by EPD.

[2] Average value of 2.89 OU/m²-s is adopted for the overall SOER of a pig house, which is based on two SOERs (1.86 OU/m²-s and 3.91 OU/m²-s) determined in the reference odour survey. It is the same SOER adopted for the pig houses of Retained Pig Farm

[3] Dimension of the odour sources referenced to the farm layout plan provided by AFCD.

[4] Refer to layout plant by AFCD for Farm 3, there is collection tank to store waste before treatment but no sludge holding tank. It is anticipated that waste storage area is to store waste after treatment, thus the SOER of sludge storage tank is adopted for waste storage area.

[5] Collection tank and retention tank are the facilities before primary treatment and secondary treatment. The waste contents in these facilities are assumed to be similar, thus the SOER of collection tank is adopted for retention tank.

[6] Coagulation and sedimentation usually work together to remove suspended solids from the wastes. The waste contents in both tanks are assumed to be similar, thus the SOER of sedimentation tank is adopted for coagulation tank.

Appendix A Odour Emission Inventory of Existing Scenario

Farm 4 (Existing Pig Farm)

Farm ID LK840

ID	Use	Dimension, m ^[3]			Area, m ²	Assumed SOER, OU/m ² /s ^{[1][2]}	1-hour Average Emission Rate, OU/s	SOER Reference from Pig Farm 18/19/P43 ^[1]
4	Pig House	9.00	x	11.30	101.70	2.89	293.40	Pig House
5	Pig House	6.50	x	11.30	73.45	2.89	211.90	Pig House
6	Pig House	8.00	x	10.35	82.80	2.89	238.88	Pig House
7	Pig House	-	x	-	72.21	2.89	208.33	Pig House
8	Pig House	14.10	x	9.00	126.90	2.89	366.11	Pig House
9	Pig House	-	x	-	123.68	2.89	356.82	Pig House
10	Pig House	8.60	x	24.40	209.84	2.89	605.39	Pig House
11	Pig House	17.05	x	4.40	75.02	2.89	216.43	Pig House
12	Pig House	7.80	x	10.35	80.73	2.89	232.91	Pig House
13	Pig House	7.10	x	15.30	108.63	2.89	313.40	Pig House
14	Pig House	2.10	x	11.30	23.73	2.89	68.46	Pig House
15	Pig House	3.60	x	23.30	83.88	2.89	241.99	Pig House
16	Pig House	-	x	-	36.32	2.89	104.78	Pig House
17	Pig House	3.65	x	10.35	37.78	2.89	108.99	Pig House
18	Pig House	2.50	x	4.40	11.00	2.89	31.74	Pig House
19	Pig House	-	x	-	11.98	2.89	34.56	Pig House
20	Pig House	-	x	-	28.37	2.89	81.85	Pig House
21	Pig House	3.70	x	10.35	38.30	2.89	110.48	Pig House
22	Pig House	8.20	x	2.85	23.37	2.89	67.42	Pig House
23	Pig House	-	x	-	78.72	2.89	227.11	Pig House
24	Pig House	6.20	x	5.50	34.10	2.89	98.38	Pig House
26	Pig House	-	x	-	433.76	2.89	1251.40	Pig House
27	Pig House	2.70	x	11.10	29.97	2.89	86.46	Pig House
28	Pig House	-	x	-	12.60	2.89	36.35	Pig House
29	Pig House	4.00	x	1.70	6.80	2.89	19.62	Pig House
30	Pig House	-	x	-	127.70	2.89	368.41	Pig House
32	Pig House	-	x	-	898.79	2.89	2593.01	Pig House
33	Pig House	-	x	-	207.31	2.89	598.09	Pig House
				Total Area	3179.43	Sub-Total	9172.66	
ID	Use	Dimension, m ^[3]			Area, m ²	Assumed SOER, OU/m ² /s ^{[1][2]}	1-hour Average Emission Rate, OU/s	SOER Reference from Pig Farm 18/19/P43 ^[1]
A	Collection Tank	2.00	x	1.85	3.70	51.34	189.96	Collection Tank
C	Retention Tank ^[4]	3.65	x	1.90	6.94	51.34	356.04	Collection Tank
D	Anaerobic Digestion Tank	5.70	x	3.06	17.44	12.35	215.41	Anaerobic Digestion Tank
E	Anaerobic Digestion Tank	4.80	x	3.06	14.69	12.35	181.40	Anaerobic Digestion Tank
F	Anaerobic Digestion Tank	4.12	x	7.60	31.31	12.35	386.70	Anaerobic Digestion Tank
G	Aeration Tank	4.12	x	7.60	31.31	0.77	24.11	Aeration Tank
H	Aeration Tank	-	x	-	45.22	0.77	34.82	Aeration Tank
I	Aeration Tank	-	x	-	6.99	0.77	5.38	Aeration Tank
J	Sedimentation Tank	2.60	x	3.20	8.32	0.12	1.00	Sedimentation Tank
K	Sedimentation Tank	2.40	x	3.20	7.68	0.12	0.92	Sedimentation Tank
L	Sedimentation Tank	2.10	x	3.20	6.72	0.12	0.81	Sedimentation Tank
N	Dry Residue Tank	3.65	x	1.90	6.94	0.28	1.94	Sludge Storage Tank - basin for solid residues
O	Waste Storage Area ^[5]	-	x	-	31.68	44.96	1424.33	Sludge Storage Tank
B	Waste Segregation facility	-	x	-	6.42	14.04	90.14	Waste Segregation Facility
O	Pond	-	x	-	424.00	-	-	Odourless, dimensions not provided in Layout Plan
P	Pond	-	x	x	244.00	-	-	Odourless, dimensions not provided in Layout Plan
				Total Area	218.93	Sub-Total	2912.96	
						Total Odour Emission	12085.62	

Remarks:

[1] SOER refers to Working Paper on Odour Sampling Results and Odour Emission Inventory – Pig Farm LK801 (Revision 2) dated 31 January 2022 which has been approved by EPD.

[2] Average value of 2.89 OU/m²-s is adopted for the overall SOER of a pig house, which is based on two SOERs (1.86 OU/m²-s and 3.91 OU/m²-s) determined in the reference odour survey. It is the same SOER adopted for the pig houses of Retained Pig Farm

[3] Dimension of the odour sources referenced to the farm layout plan provided by AFCD.

[4] Collection tank and retention tank are the facilities before primary treatment and secondary treatment. The waste contents in these facilities are assumed to be similar, thus the SOER of collection tank is adopted for retention tank.

[5] Refer to layout plant by AFCD for Farm 4, there is collection tank to store waste before treatment but no sludge holding tank. It is anticipated that waste storage area is to store waste after treatment, thus the SOER of sludge storage tank is adopted for waste storage area.

Appendix A Odour Emission Inventory of Existing Scenario

Farm 5 (Existing Chicken Farm)

Farm ID LK1172

ID	Use	Area, m ² [2]	Ventilation Exhaust Fan				Ambient Odour Gas Sampling [3]	Source Emission Strength [1]	Total Emission Rate, OU/s	1-hour Average Emission Rate, OU/s	Total emission rate derived from On-site Odour Sampling [1]
			Diameter, m	Area, m ²	Velocity, m/s	Number of Exhaust Fans	Avg. Measured Result, OU/m ³	Avg. Measured SOER, OU/m ² /s			
1	Chicken House	94	1.3	1.33	5.7	3	143	-	3245.7	2102.18	Chicken House No.1
2	Chicken House	51						-			Chicken House No.2
5	Chicken House	52	1.3	1.33	5.7	4	45	-	1361.8	786.04	Chicken House No.5
6	Chicken House	38						-			Chicken House No.6
8	Chicken House	97	1.0	0.79	4.3	2	754	-	5092.8	5092.80	Chicken House No.8
10	Chicken House	41	1.0	0.79	4.3	2	158	-	1067.2	1067.20	Chicken House No.10
11	Chicken House	58	1.0	0.79	4.3	1	122	-	412.0	412.00	Chicken House No.11
13	Chicken House	24	1.0	0.79	4.3	2	116	-	783.5	783.50	Chicken House No.13
14	Chicken House	575	1.3	1.33	5.7	6	184	-	8352.6	8352.60	Chicken House No.14
15	Chicken House	385	1.3	1.33	5.7	6	82	-	3722.3	3722.30	Chicken House No.15
16	Chicken House	392	1.3	1.33	5.7	6	51	-	2315.1	2315.10	Chicken House No.16
17	Chicken House	443	1.3	1.33	5.7	6	46	-	2088.1	2088.10	Chicken House No.17
Total Area		2251							Sub-Total	28441.10	
C1	Conveyor Belt	2.00	-	-				0.73	1.46	1.46	Conveyor Belt
C2	Rubbish Bin in Use	0.42	-	-				0.73	0.31	0.31	Rubbish Bin in Use
R1	Uncovered Rubbish Bin	0.42	-	-				39.17	16.45	16.45	Uncovered Rubbish Bin
R2	Covered Rubbish Bin	20.00	-	-				4.92	98.40	98.40	Covered Rubbish Bin
A [4]	Retention Tank	-	-	-				-	-	-	-
B [4]	Septic Tank	-	-	-				-	-	-	-
C [4]	Filtration Tank	-	-	-				-	-	-	-
Total Area		22.84							Sub-Total	116.62	
									Total Odour Emission	28557.72	

Remarks:

[1] Emission Rate of chicken house and SOER of conveyor belt and rubbish bin refer to the Working Paper on Odour Sampling Results and Odour Emission Inventory – Chicken Farm LK 1172 (Revision 2) dated 17 December 2021 which has been approved by EPD.

[2] Areas of the odour sources referenced to the farm layout plan provided by AFCD.

[3] The odour emission inside each chicken house is discharged to the atmosphere via the exhaust fans. Hence, instead of taking samples on sources to determine the odour emission strength, gas samples were collected inside each chicken house to determine the odour concentrations.

[4] No SOER / emission rate of retention tank, septic tank and filtration tank in the chicken farm was determined in the odour survey from the referenced Working Paper. SOERs of relevant facilities in the pig farms are not applicable because pig farm usually has stronger odour. Thus, odour emission from these facilities are not considered in this comparison assessment between "With Project" and "Without Project" scenarios as a conservative approach.

Appendix A Odour Emission Inventory of Existing Scenario

Farm 7 (Existing Pig Farm)

Farm ID LK799

ID	Use	Dimension, m ^[3]			Area, m ²	Assumed SOER, OU/m ² /s ^{[1][2]}	1-hour Average Emission Rate, OU/s	SOER Reference from Pig Farm 18/19/P43 ^[1]
3	Pig House	4.80	x	3.60	17.28	2.89	49.85	Pig House
5	Pig House	13.10	x	4.80	62.88	2.89	181.41	Pig House
6	Pig House	-	x	-	162.11	2.89	467.69	Pig House
8	Pig House	6.00	x	4.80	28.80	2.89	83.09	Pig House
9	Pig House	6.40	x	4.50	28.80	2.89	83.09	Pig House
10	Pig House	-	x	-	133.73	2.89	385.81	Pig House
11	Pig House	-	x	-	169.66	2.89	489.47	Pig House
12	Pig House	-	x	-	52.27	2.89	150.80	Pig House
13	Pig House	4.55	x	3.15	14.33	2.89	41.35	Pig House
14	Pig House	7.90	x	4.80	37.92	2.89	109.40	Pig House
				Total Area	707.78	Sub-Total	2041.95	
ID	Use	Dimension, m ^[3]			Area, m ²	Assumed SOER, OU/m ² /s ^{[1][2]}	1-hour Average Emission Rate, OU/s	SOER Reference from Pig Farm 18/19/P43 ^[1]
A	Collection Tank	3.60	x	2.40	8.64	51.34	443.58	Collection Tank
B	Sludge Storage Tank	2.40	x	2.40	5.76	44.96	258.97	Sludge Storage Tank
C	Retention Tank ^[4]	6.00	x	2.50	15.00	51.34	770.10	Collection Tank
D	Anaerobic Digestion Tank	4.60	x	2.60	11.96	12.35	147.71	Anaerobic Digestion Tank
E	Anaerobic Digestion Tank	3.80	x	3.40	12.92	12.35	159.56	Anaerobic Digestion Tank
F	Aeration Tank	5.80	x	2.60	15.08	0.77	11.61	Aeration Tank
G	Aeration Tank	8.20	x	3.40	27.88	0.77	21.47	Aeration Tank
H	Sedimentation Tank	4.40	x	2.60	11.44	0.12	1.37	Sedimentation Tank
I	Sedimentation Tank	3.40	x	2.80	9.52	0.12	1.14	Sedimentation Tank
				Total Area	118.20	Sub-Total	1815.51	
						Total Odour Emission	3857.46	

Remarks:

[1] SOER refers to Working Paper on Odour Sampling Results and Odour Emission Inventory – Pig Farm LK801 (Revision 2) dated 31 January 2022 which has been approved by EPD.

[2] Average value of 2.89 OU/m²·s is adopted for the overall SOER of a pig house, which is based on two SOERs (1.86 OU/m²·s and 3.91 OU/m²·s) determined in the reference odour survey. It is the same SOER adopted for the pig houses of Retained Pig Farm

[3] Dimension of the odour sources referenced to the farm layout plan provided by AFCD.

[4] Collection tank and retention tank are the facilities before primary treatment and secondary treatment. The waste contents in these facilities are assumed to be similar, thus the SOER of collection tank is adopted for retention tank.

Appendix A Odour Emission Inventory of Existing Scenario

Farm 8 (Existing Pig Farm)

Farm ID LK806

ID	Use	Dimension, m ^[3]			Area, m ²	Assumed SOER, OU/m ² /s ^{[1][2]}	1-hour Average Emission Rate, OU/s	SOER Reference from Pig Farm 18/19/P43 ^[1]
1	Pig House	-	x	-	347.80	2.89	1003.40	Pig House
2	Pig House	34.00	x	8.00	272.00	2.89	784.72	Pig House
3	Pig House	-	x	-	138.42	2.89	399.34	Pig House
4	Pig House	15.00	x	7.35	110.25	2.89	318.07	Pig House
				Total Area	868.47	Sub-Total	2505.54	
ID	Use	Dimension, m ^[3]			Area, m ²	Assumed SOER, OU/m ² /s ^{[1][2]}	1-hour Average Emission Rate, OU/s	SOER Reference from Pig Farm 18/19/P43 ^[1]
A	Sludge Storage Tank	4.50	x	6.00	27.00	44.96	1213.92	Sludge Storage Tank
B	Collection Tank	4.50	x	6.00	27.00	51.34	1386.18	Collection Tank
D	Equilibrating Tank ^[4]	5.30	x	9.60	50.88	51.34	2612.18	Collection Tank
E	Anaerobic Digestion Tank	5.80	x	9.60	55.68	12.35	687.65	Anaerobic Digestion Tank
F	Aeration Tank	5.80	x	9.60	55.68	0.77	42.87	Aeration Tank
G	Aeration Tank	5.40	x	9.60	51.84	0.77	39.92	Aeration Tank
C	Sludge Segregation Facility	-	x	-	6.42	44.96	288.64	Sludge Storage Tank
H	Pond	-	x	-	-	-	-	Odourless, dimensions not provided in Layout Plan
				Total Area	268.08	Sub-Total	6271.36	
						Total Odour Emission	8776.90	

Remarks:

[1] SOER refers to Working Paper on Odour Sampling Results and Odour Emission Inventory – Pig Farm LK801 (Revision 2) dated 31 January 2022 which has been approved by EPD.

[2] Average value of 2.89 OU/m²-s is adopted for the overall SOER of a pig house, which is based on two SOERs (1.86 OU/m²-s and 3.91 OU/m²-s) determined in the reference odour survey. It is the same SOER adopted for the pig houses of Retained Pig Farm

[3] Dimension of the odour sources referenced to the farm layout plan provided by AFCD.

[4] Collection tank and equilibrating tank are the facilities before primary treatment and secondary treatment. The waste contents in these facilities are assumed to be similar, thus the SOER of collection tank is adopted for equilibrating tank.

Appendix A Odour Emission Inventory of Existing Scenario

Farm 10 (Existing Pig Farm)

Farm ID LK809

ID	Use	Dimension, m ^[3]			Area, m ²	Assumed SOER, OU/m ² /s ^{[1][2]}	1-hour Average Emission Rate, OU/s	SOER Reference from Pig Farm 18/19/P43 ^[1]
1	Pig House	7.30	x	6.25	45.63	2.89	131.63	Pig House
2	Pig House	-	x	-	32.83	2.89	94.71	Pig House
3	Pig House	-	x	-	102.90	2.89	296.87	Pig House
4	Pig House	-	x	-	70.96	2.89	204.72	Pig House
5	Pig House	-	x	-	93.73	2.89	270.41	Pig House
6	Pig House	9.50	x	2.00	19.00	2.89	54.82	Pig House
7	Pig House	10.00	x	4.15	41.50	2.89	119.73	Pig House
8	Pig House	12.80	x	8.00	102.40	2.89	295.42	Pig House
9	Pig House	-	x	-	79.20	2.89	228.49	Pig House
10	Pig House	4.00	x	3.75	15.00	2.89	43.28	Pig House
11	Pig House	-	x	-	69.53	2.89	200.59	Pig House
12	Pig House	5.80	x	3.20	18.56	2.89	53.55	Pig House
13	Pig House	23.20	x	9.80	227.36	2.89	655.93	Pig House
14	Pig House	12.30	x	8.60	105.78	2.89	305.18	Pig House
15	Pig House	-	x	-	151.40	2.89	436.79	Pig House
16	Pig House	19.20	x	6.00	115.20	2.89	332.35	Pig House
				Total Area	1290.98	Sub-Total	3724.46	
ID	Use	Dimension, m ^[3]			Area, m ²	Assumed SOER, OU/m ² /s ^{[1][2]}	1-hour Average Emission Rate, OU/s	SOER Reference from Pig Farm 18/19/P43 ^[1]
A	Collection Tank	4.60	x	4.30	19.78	51.34	1015.51	Collection Tank
B	Waste Storage Area ^[4]	-	x	-	33.54	44.96	1507.96	Sludge Storage Tank
C	Anaerobic Digestion Tank	-	x	-	61.84	12.35	763.72	Anaerobic Digestion Tank
D	Aeration Tank	-	x	-	51.88	0.77	39.95	Aeration Tank
E	Sedimentation Tank	8.30	x	4.20	34.86	0.12	4.18	Sedimentation Tank
F	Sedimentation Tank	8.30	x	1.80	14.94	0.12	1.79	Sedimentation Tank
G	Waste Segregation Facility	-	x	-	6.42	14.04	90.14	Waste Segregation Facility
				Total Area	223.26	Sub-Total	3423.25	
Total Odour Emission							7147.71	

Remarks:

[1] SOER refers to Working Paper on Odour Sampling Results and Odour Emission Inventory – Pig Farm LK801 (Revision 2) dated 31 January 2022 which has been approved by EPD.

[2] Average value of 2.89 OU/m²-s is adopted for the overall SOER of a pig house, which is based on two SOERs (1.86 OU/m²-s and 3.91 OU/m²-s) determined in the reference odour survey. It is the same SOER adopted for the pig houses of Retained Pig Farm

[3] Dimension of the odour sources referenced to the farm layout plan provided by AFCD.

[4] Refer to layout plant by AFCD for Farm 10, there is collection tank to store waste before treatment but no sludge holding tank. It is anticipated that waste storage area is to store waste after treatment, thus the SOER of sludge storage tank is adopted for waste storage area.

Appendix A Odour Emission Inventory of Existing Scenario

Farm 11 (Pig Farm)

Farm ID LK801

ID	Use	Dimension, m ^[3]			Area, m ²	Assumed SOER, OU/m ² /s ^{[1][2]}	1-hour Average Emission Rate, OU/s	SOER derived from On-site Odour Sampling ^[1]
1-5	Pig House No 1 to 5	-	x	-	525	2.89	1514.63	Pig House
6-9	Pig House No 6 to 9	-	x	-	1061	2.89	3060.99	Pig House
				Total Area	1586	Sub-Total	4575.61	
ID	Use	Dimension, m ^[3]			Area, m ²	Assumed SOER, OU/m ² /s ^{[1][2]}	1-hour Average Emission Rate, OU/s	SOER derived from On-site Odour Sampling ^[1]
A	Collection Tank	-	x	-	17	51.34	873.81	Collection Tank
B	Waste Segregation Facility	-	x	-	6	14.04	90.18	Waste Segregation Facility
C	Sludge Storage Tank	-	x	-	13	44.96	593.47	Sludge Storage Tank
D to I	Anaerobic Digestion Tank	-	x	-	80	12.35	311.22	Anaerobic Digestion Tank
L to O and Q	Aeration Tank	-	x	-	84	0.77	64.68	Aeration Tank
P	Sedimentation Tank	-	x	-	5	0.12	0.62	Sedimentation Tank
R	Sedimentation Tank	-	x	-	26	0.12	3.10	Sedimentation Tank
J	Sludge Storage Tank - basin for solid residues	-	x	-	12	0.28	2.86	Sludge Storage Tank - basin for solid residues
S	Sludge Storage Tank - tank for sewage	-	x	-	20	44.96	459.94	Sludge Storage Tank
RB	Rubbish Bin Holding Area	-	x	-	6	0.07	0.42	Rubbish Bin Holding Area
K	Filtration Tank	1.80	x	1.90	3	12.35	42.24	Anaerobic Digestion Tank
				Total Area	272	Sub-Total	2442.54	
						Total Odour Emission	7018.15	

Remarks:

[1] SOER refers to Working Paper on Odour Sampling Results and Odour Emission Inventory – Pig Farm LK801 (Revision 2) dated 31 January 2022 which has been approved by EPD.

[2] Average value of 2.89 OU/m²·s is adopted for the overall SOER of a pig house, which is based on two SOERs (1.86 OU/m²·s and 3.91 OU/m²·s) determined in the reference odour survey. It is the same SOER adopted for the pig houses of Retained Pig Farm

[3] Dimension of the odour sources referenced to the farm layout plan provided by AFCD.

Appendix A Odour Emission Inventory of Existing Scenario

Retained Pig Farm

Emission Source Listing in AERMOD

Source ID	Source Type	X	Y	Width (m)	Height (mAG)	No. of Vertices	Syinit (m)	Szinit (m)	Emission Rate with 5-second Peak Factor ¹
PF01a	VOLUME	827222.51	840760.60	4.81	2.00	-	1.12	1.86	74.55
PF01b	VOLUME	827224.88	840762.25	4.70	2.00	-	1.09	1.86	69.92
PF02a	VOLUME	827232.85	840755.25	4.17	2.00	-	0.97	1.86	57.71
PF02b	VOLUME	827235.45	840756.78	4.22	2.00	-	0.98	1.86	59.12
PF03a	VOLUME	827206.01	840742.49	13.03	2.00	-	3.03	1.86	553.75
PF03b	VOLUME	827212.90	840746.61	12.62	2.00	-	2.93	1.86	510.81
PF03c	VOLUME	827219.45	840750.52	12.53	2.00	-	2.91	1.86	501.42
PF04a	VOLUME	827240.67	840758.46	5.24	2.00	-	1.22	1.86	90.96
PF04b	VOLUME	827243.72	840760.71	5.23	2.00	-	1.22	1.86	90.59
PF05a	VOLUME	827208.86	840730.52	6.74	2.00	-	1.57	1.86	150.58
PF05b	VOLUME	827213.04	840733.38	7.10	2.00	-	1.65	1.86	165.83
PF05c	VOLUME	827217.43	840736.39	7.10	2.00	-	1.65	1.86	165.83
PF05d	VOLUME	827221.63	840739.27	6.78	2.00	-	1.58	1.86	152.16
PF05e	VOLUME	827225.87	840742.18	7.16	2.00	-	1.67	1.86	168.51
PF05f	VOLUME	827230.26	840745.18	7.04	2.00	-	1.64	1.86	163.24
PF06a	VOLUME	827227.74	840736.36	2.71	2.00	-	0.63	1.86	24.17
PF06b	VOLUME	827228.59	840734.59	2.90	2.00	-	0.68	1.86	27.94
PF06c	VOLUME	827229.48	840732.77	2.80	2.00	-	0.65	1.86	25.92
PF07a	VOLUME	827233.50	840736.71	8.28	2.00	-	1.92	1.86	226.94
PF08a	VOLUME	827237.89	840739.64	6.86	2.00	-	1.59	1.86	156.02
PF08b	VOLUME	827242.41	840742.03	7.31	2.00	-	1.70	1.86	176.33
PF08c	VOLUME	827247.12	840744.51	7.16	2.00	-	1.66	1.86	169.66
PF09a	VOLUME	827254.76	840748.80	5.94	2.00	-	1.38	1.86	111.48
PF10a	VOLUME	827239.68	840729.82	5.45	2.00	-	1.27	1.86	94.83
PF10b	VOLUME	827243.99	840730.72	5.56	2.00	-	1.29	1.86	97.87
PF11a	VOLUME	827250.81	840731.11	7.49	2.00	-	1.74	1.86	177.76
PF14a	VOLUME	827265.95	840743.84	4.29	2.00	-	1.00	1.86	61.12
PF14b	VOLUME	827268.71	840745.17	4.29	2.00	-	1.00	1.86	60.93
PF14c	VOLUME	827271.36	840746.45	4.12	2.00	-	0.96	1.86	56.31
PF15a	VOLUME	827271.79	840740.20	9.41	2.00	-	2.19	1.86	288.56
PF16a	VOLUME	827276.44	840747.90	4.04	2.00	-	0.94	1.86	54.10
PF16b	VOLUME	827277.78	840744.97	4.71	2.00	-	1.10	1.86	71.77
PF16c	VOLUME	827279.27	840741.70	4.57	2.00	-	1.06	1.86	68.23
PF17a	VOLUME	827245.77	840718.90	16.33	2.00	-	3.80	1.86	879.90
PF18a	VOLUME	827245.42	840710.55	6.84	2.00	-	1.59	1.86	154.22
PF18b	VOLUME	827250.26	840711.75	7.41	2.00	-	1.72	1.86	181.84
PF18c	VOLUME	827255.44	840713.04	7.33	2.00	-	1.70	1.86	177.99
PF19a	VOLUME	827279.00	840727.62	12.91	2.00	-	3.00	1.86	537.46
PF20a	VOLUME	827279.71	840719.28	6.45	2.00	-	1.50	1.86	136.38
PF20b	VOLUME	827284.60	840719.91	6.50	2.00	-	1.51	1.86	138.40
PF21a	VOLUME	827279.53	840776.94	8.85	2.00	-	2.06	1.86	259.54
PF22a	VOLUME	827281.27	840770.35	9.53	2.00	-	2.22	1.86	296.93
PF22b	VOLUME	827283.11	840763.40	9.40	2.00	-	2.19	1.86	290.31
PF23a	VOLUME	827212.66	840757.53	15.00	2.00	-	3.49	1.86	716.64
PFA	AREAPOLY	827285.37	840727.92	-	2.00	4	-	-	128.35
PFB	AREAPOLY	827285.37	840727.92	-	3.00	4	-	-	128.35
PFC	AREAPOLY	827285.20	840729.91	-	3.00	4	-	-	128.35
PFD	AREAPOLY	827285.27	840731.93	-	3.00	4	-	-	35.10
PFE	AREAPOLY	827222.16	840784.40	-	1.00	4	-	-	112.40
PFF	AREAPOLY	827222.16	840784.40	-	1.00	4	-	-	112.40
PFG	AREAPOLY	827224.02	840785.14	-	1.00	4	-	-	30.88
PFH	AREAPOLY	827225.31	840781.88	-	1.00	4	-	-	30.88
PFI	AREAPOLY	827226.60	840778.63	-	1.00	4	-	-	30.88
PFJ	AREAPOLY	827227.89	840775.38	-	1.00	4	-	-	30.88
PFK	AREAPOLY	827253.97	840772.09	-	1.00	4	-	-	1.93
PFL	AREAPOLY	827253.97	840772.09	-	4.50	4	-	-	1.93
PFM	AREAPOLY	827250.13	840770.39	-	4.50	4	-	-	1.93
PFN	AREAPOLY	827248.75	840773.49	-	4.50	4	-	-	1.93
PFO	AREAPOLY	827261.94	840763.93	-	2.50	4	-	-	0.30

Remark:

1. The unit of odour emission rate for volume source is OU/s, and for area source it is OU/m²-s.

Appendix A Odour Emission Inventory of Existing Scenario

Retained Pig Farm

Vertices of Area Source

Source ID	Vertex 1		Vertex 2		Vertex 3		Vertex 4	
	X	Y	X	Y	X	Y	X	Y
PFA	827285.37	840727.92	827287.36	840728.08	827287.52	840726.09	827285.53	840725.93
PFB	827285.37	840727.92	827285.20	840729.91	827287.20	840730.08	827287.36	840728.08
PFC	827285.20	840729.91	827285.04	840731.91	827287.03	840732.07	827287.20	840730.08
PFD	827285.27	840731.93	827285.18	840732.92	827286.18	840733.00	827286.26	840732.01
PFE	827222.16	840784.40	827221.53	840785.98	827231.75	840790.04	827232.38	840788.46
PFF	827222.16	840784.40	827224.02	840785.14	827228.55	840773.70	827226.70	840772.97
PFG	827224.02	840785.14	827232.38	840788.46	827233.67	840785.20	827225.31	840781.88
PFH	827225.31	840781.88	827233.67	840785.20	827234.96	840781.95	827226.60	840778.63
PFI	827226.60	840778.63	827234.96	840781.95	827236.26	840778.70	827227.89	840775.38
PFJ	827227.89	840775.38	827236.26	840778.70	827237.55	840775.45	827229.18	840772.12
PFK	827253.97	840772.09	827255.35	840768.98	827251.51	840767.28	827250.13	840770.39
PFL	827253.97	840772.09	827257.08	840773.47	827259.19	840768.71	827256.08	840767.34
PFM	827250.13	840770.39	827248.75	840773.49	827253.50	840775.60	827254.88	840772.49
PFN	827248.75	840773.49	827245.91	840779.89	827250.67	840782.00	827253.50	840775.60
PFO	827261.94	840763.93	827259.37	840769.79	827261.93	840770.91	827264.51	840765.05

Appendix A Odour Emission Inventory of Existing Scenario

San Tin Barracks Sewerage Treatment Works

Odour Emission Source

Source ID	Description	Source Type	X	Y	Height (mAG)	No. of Vertices ¹	Radius (m) ¹	Assumed SOER, OU/m ² .s	SOER Reference ^{2,3}
STBSTW_01	Inlet works	AREAPOLY	826166.08	838818.23	0.50	4	-	3.26	S1 Inlet pumping station of SWHSTW
STBSTW_02	Sedimentation Tank	AREAPOLY	826163.52	838806.11	0.50	4	-	4.03	S6 Primary Sedimentation Tank of SWHSTW
STBSTW_03	Bioreactor	AREACIRC	826150.61	838819.39	0.50	-	5.50	1.65	S7 Bioreactor of SWHSTW
STBSTW_04	Bioreactor	AREACIRC	826149.50	838805.32	0.50	-	5.50	1.65	S7 Bioreactor of SWHSTW
STBSTW_05	Sludge Treatment Tank	AREAPOLY	826151.92	838842.56	0.50	4	-	26.42	Sludge Mixing Tank of YLEPP

Remark:

- The vertices, radius and dimensions of the facilities are determined with Geoinfo Map Hong Kong.
- SOERs of SWHSTW refer to Appendix 3.8 of NENT Development EIA (AEIAR-175/2013)
- SOERs of YLEPP refer to Appendix 3.9 of YLEPP EIA (AEIAR-220/2019)

Conversion of 1-hour Average to 5-second Average Concentration

Source ID	Emission Rate (OU/m ² .s)	Stability Class	Conversion Multiplier	Emission Rate with 5-second Peak Factor (OU/m ² .s)	Reference
STBSTW_01	3.26	A, B, C, D, E, F	2.5	8.15	- Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales. - Katestone Scientific 1995, The Evaluation of Peak-to-Mean Ratios for Odour Assessments, volumes I and II, Katestone Scientific Pty Ltd, Brisbane. - Katestone Scientific 1998, Peak-to-Mean Concentration Ratios for Odour Assessments, Katestone Scientific Pty Ltd, Brisbane.
STBSTW_02	4.03	A, B, C, D, E, F	2.5	10.08	
STBSTW_03	1.65	A, B, C, D, E, F	2.5	4.13	
STBSTW_04	1.65	A, B, C, D, E, F	2.5	4.13	
STBSTW_05	26.42	A, B, C, D, E, F	2.5	66.05	

Emission Source Listing in AERMOD

Source ID	Source Type	X	Y	Height (mAG)	No. of Vertices ¹	Radius (m) ¹	Emission Rate with 5-second Peak Factor (OU/m ² .s)
STBSTW_01	AREAPOLY	826166.08	838818.23	0.50	4	-	8.15
STBSTW_02	AREAPOLY	826163.52	838806.11	0.50	4	-	10.08
STBSTW_03	AREACIRC	826150.61	838819.39	0.50	-	5.50	4.13
STBSTW_04	AREACIRC	826149.50	838805.32	0.50	-	5.50	4.13
STBSTW_05	AREAPOLY	826151.92	838842.56	0.50	4	-	66.05

Remark:

- The vertices, radius and dimensions of the facilities are determined with Geoinfo Map Hong Kong.

Appendix A Odour Emission Inventory of Existing Scenario

San Tin Barracks Sewerage Treatment Works

Vertices of Area Source

Source ID	Vertex 1		Vertex 2		Vertex 3		Vertex 4	
	X	Y	X	Y	X	Y	X	Y
STBSTW_01	826166.08	838818.23	826166.76	838828.81	826172.34	838828.45	826171.67	838817.87
STBSTW_02	826163.52	838806.11	826163.61	838816.71	826169.21	838816.66	826169.12	838806.06
STBSTW_05	826151.92	838842.56	826161.31	838842.18	826160.85	838830.59	826151.45	838830.97

Remark:

1. The vertices are determined with Geoinfo Map Hong Kong.

Appendix A Odour Emission Inventory of Existing Scenario

Emission Source Listing in AERMOD

Source ID ^[1]	Description	Source Type	X	Y	Area (m ²)	Release Height (mAG)	No. of Vertices	1-hour Average Odour Emission Rate ^{[2][3]}	Conversion Multiplier	5-second Average Odour Emission Rate ^[2]
F2	Farm 2	AREAPOLY	827276.72	839242.40	3698.17	1.50	19	1.77	2.5	4.43
F3	Farm 3	AREAPOLY	827224.89	838981.29	5525.02	1.50	17	1.75	2.5	4.37
F4	Farm 4	AREAPOLY	827209.19	838919.52	9347.98	1.50	16	1.29	2.5	3.23
F7	Farm 7	AREAPOLY	825595.84	838338.32	2833.58	1.50	13	1.36	2.5	3.40
F8	Farm 8	AREAPOLY	826098.49	839530.27	3150.77	1.50	15	2.79	2.5	6.96
F10a	Farm 10	AREAPOLY	826928.91	839344.95	2580.65	1.50	12	1.56	2.5	3.90
F10b	Farm 10	AREAPOLY	827015.56	839315.52	2003.66	1.50	12	1.56	2.5	3.90
F11	Farm 11	AREAPOLY	826998.94	839122.00	7158.35	1.50	16	0.98	2.5	2.45
CF01	Farm 5 Chicken House 1	POINTHOR	827306.28	838801.30	-	1.35	-	2102.18	2.3	4835.02
CF02	Farm 5 Chicken House 2	POINTHOR	827306.28	838801.30	-	1.35	-	1143.52	2.3	2630.09
CF05	Farm 5 Chicken House 5	POINTHOR	827306.28	838801.30	-	1.65	-	786.04	2.3	1807.89
CF06	Farm 5 Chicken House 6	POINTHOR	827306.28	838801.30	-	1.65	-	575.76	2.3	1324.25
CF08	Farm 5 Chicken House 8	POINTHOR	827306.28	838801.30	-	2.00	-	5092.80	2.3	11713.44
CF10	Farm 5 Chicken House 10	POINTHOR	827306.28	838801.30	-	2.00	-	1067.20	2.3	2454.56
CF11	Farm 5 Chicken House 11	POINTHOR	827306.28	838801.30	-	2.00	-	412.00	2.3	947.60
CF13	Farm 5 Chicken House 13	POINTHOR	827306.28	838801.30	-	2.00	-	783.50	2.3	1802.05
CF14	Farm 5 Chicken House 14	POINTHOR	827306.28	838801.30	-	2.35	-	8352.60	2.3	19210.98
CF15	Farm 5 Chicken House 15	POINTHOR	827306.28	838801.30	-	2.35	-	3722.30	2.3	8561.29
CF16	Farm 5 Chicken House 16	POINTHOR	827306.28	838801.30	-	2.35	-	2315.10	2.3	5324.73
CF17	Farm 5 Chicken House 17	POINTHOR	827306.28	838801.30	-	2.35	-	2088.10	2.3	4802.63
CF18	Farm 5 Conveyor Belt and Rubbish Bin	AREAPOLY	827298.95	838804.82	22.84	0.50	4	5.11	2.5	12.76

Remark

[1] Chicken Farm 6 falls outside the 500m assessment area of STLMC DN. Chicken Farm 9 is lack of on-site odour survey data and the SOERs derived from odour sampling in Chicken Farm 5 were not applicable. They are not included in the comparative assessment as a conservative approach.

[2] The unit of odour emission rate for area source is OU/m²-s, and for horizontal point source it is OU/s.

[3] For this comparative assessment, the estimated 1-hour Average Emission Rate (OU/m²-s) of a Pig Farm (F2, F3, F4, F7, F8, F10, F11) = Total Odour Emission Rate from a Pig Farm (OU/s) / Estimated Area of Corresponding Pig Farm (m²).

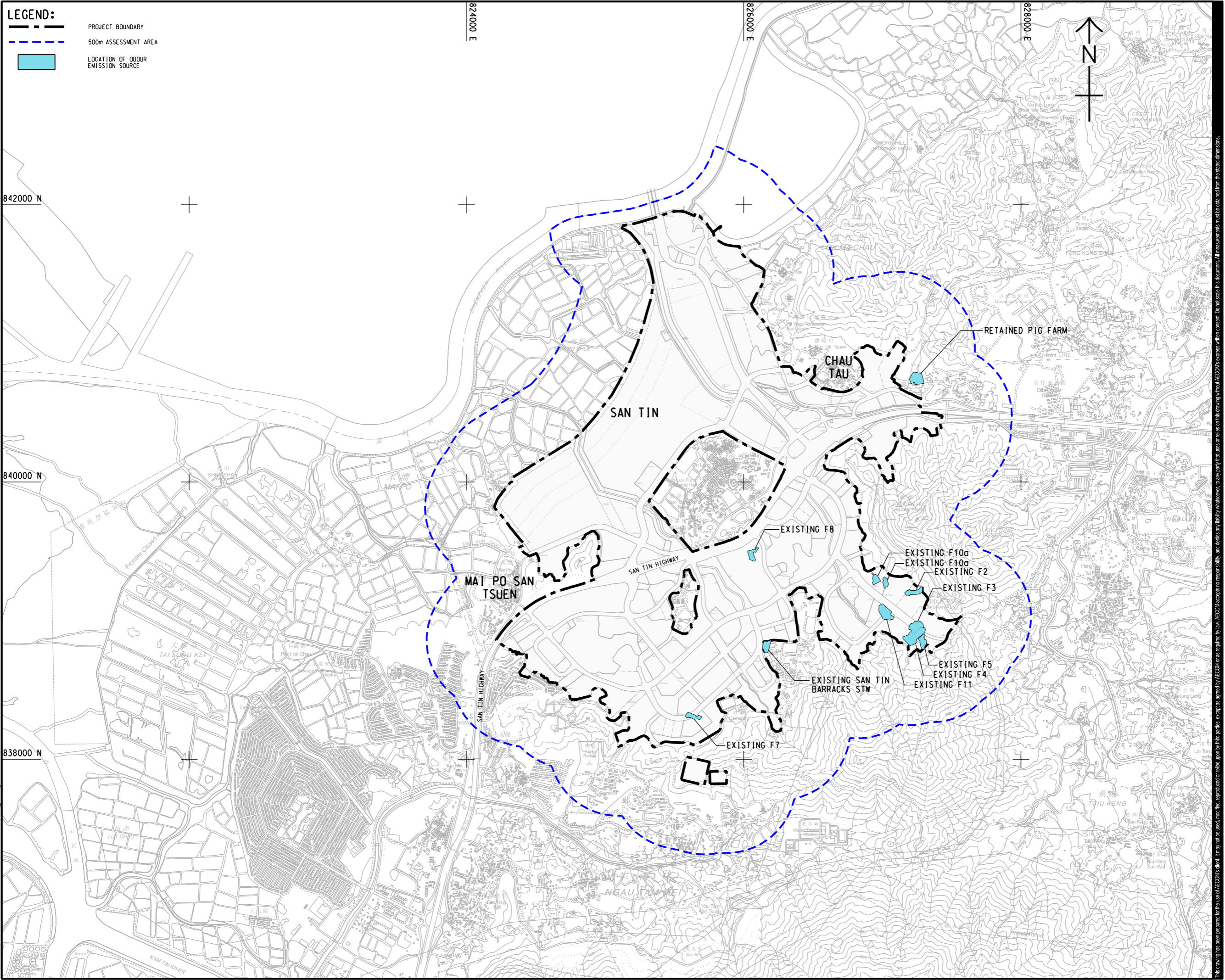
Appendix A Odour Emission Inventory of Existing Scenario

Vertices of Area Source

Source ID	Vertex 1		Vertex 2		Vertex 3		Vertex 4		Vertex 5		Vertex 6		Vertex 7		Vertex 8		Vertex 9		Vertex 10	
	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y
F2	827276.72	839242.40	827284.80	839243.81	827288.03	839229.93	827285.55	839205.04	827274.36	839198.68	827267.58	839194.48	827241.06	839190.52	827198.18	839188.98	827197.76	839182.85	827176.62	839179.12
F3	827224.89	838981.29	827232.26	838992.12	827244.00	838994.66	827269.67	838995.16	827280.63	838988.24	827294.99	838967.47	827296.78	838954.32	827288.28	838948.85	827274.17	838950.21	827261.26	838934.12
F4	827209.19	838919.52	827226.34	838902.58	827252.58	838933.70	827261.26	838934.12	827274.17	838950.21	827303.56	838947.70	827310.11	838939.20	827303.23	838911.42	827240.61	838864.56	827250.57	838849.24
F7	825595.84	838338.32	825652.73	838316.09	825652.46	838311.07	825664.64	838307.63	825673.63	838317.42	825698.77	838306.04	825680.25	838285.93	825668.87	838294.13	825655.37	838291.75	825641.62	838290.69
F8	826098.49	839530.27	826107.22	839523.13	826083.94	839494.02	826077.32	839499.05	826064.62	839490.85	826084.47	839437.40	826079.97	839435.82	826080.50	839430.79	826072.03	839430.79	826041.87	839444.28
F10a	826928.91	839344.95	826940.15	839327.76	826947.76	839333.05	826958.01	839328.75	826969.92	839313.20	826986.45	839284.43	826935.52	839260.29	826929.90	839274.51	826935.85	839287.41	826930.56	839306.92
F10b	827015.56	839315.52	827026.14	839309.24	827034.41	839299.64	827036.39	839283.11	827043.67	839266.24	827037.72	839250.37	827024.16	839243.42	827021.51	839234.49	827015.23	839236.81	827002.99	839279.47
F11	826998.94	839122.00	827067.02	839060.95	827057.81	839050.04	827061.93	839037.93	827084.22	839026.30	827078.89	839012.49	827059.75	839009.10	827057.08	839005.47	827026.07	839011.04	827016.87	839010.31
CF18	827298.95	838804.82	827303.95	838804.82	827303.95	838800.26	827298.95	838800.26	-	-	-	-	-	-	-	-	-	-	-	-

Source ID	Vertex 11		Vertex 12		Vertex 13		Vertex 14		Vertex 15		Vertex 16		Vertex 17		Vertex 18		Vertex 19	
	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y
F2	827162.52	839200.73	827177.12	839214.70	827190.35	839216.71	827191.88	839222.39	827199.25	839222.18	827200.18	839216.82	827238.14	839214.55	827259.56	839223.81	827269.80	839232.14
F3	827252.58	838933.70	827226.34	838902.58	827209.19	838919.52	827207.50	838935.18	827191.13	838939.49	827198.81	838967.83	827206.65	838976.77	-	-	-	-
F4	827225.97	838828.87	827199.59	838821.48	827147.76	838874.46	827150.83	838883.11	827185.75	838895.31	827200.70	838916.76	-	-	-	-	-	-
F7	825618.86	838302.07	825591.87	838301.54	825579.17	838310.80	-	-	-	-	-	-	-	-	-	-	-	-
F8	826041.60	839456.45	826028.64	839500.90	826058.27	839507.25	826070.44	839514.40	826084.20	839511.75	-	-	-	-	-	-	-	-
F10a	826936.18	839324.78	826923.62	839341.65	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F10b	827012.91	839289.06	827003.32	839299.64	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F11	827002.33	839014.43	827001.60	839025.33	826983.19	839054.41	826975.68	839069.91	826976.41	839106.49	826983.19	839109.89	-	-	-	-	-	-
CF18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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 Designer:
 Project Management Initials:
 2023/11/22
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LEGEND:

- PROJECT BOUNDARY
- 500m ASSESSMENT AREA
- LOCATION OF ODOUR EMISSION SOURCE



PROJECT
 項目
FIRST PHASE DEVELOPMENT OF THE NEW TERRITORIES NORTH – SAN TIN / LOK MA CHAU DEVELOPMENT NODE – INVESTIGATION

CLIENT
 業主
土木工程拓展署
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 Planning Department

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 分判工程師/顧問公司

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I/R	DATE	DESCRIPTION	CHK.
修訂	日期	內容摘要	核對

STATUS
 階段

SCALE
 比例
 A3 1 : 25000

DIMENSION UNIT
 尺寸單位
 METRES

KEY PLAN
 索引圖

PROJECT NO.
 項目編號
 60670882

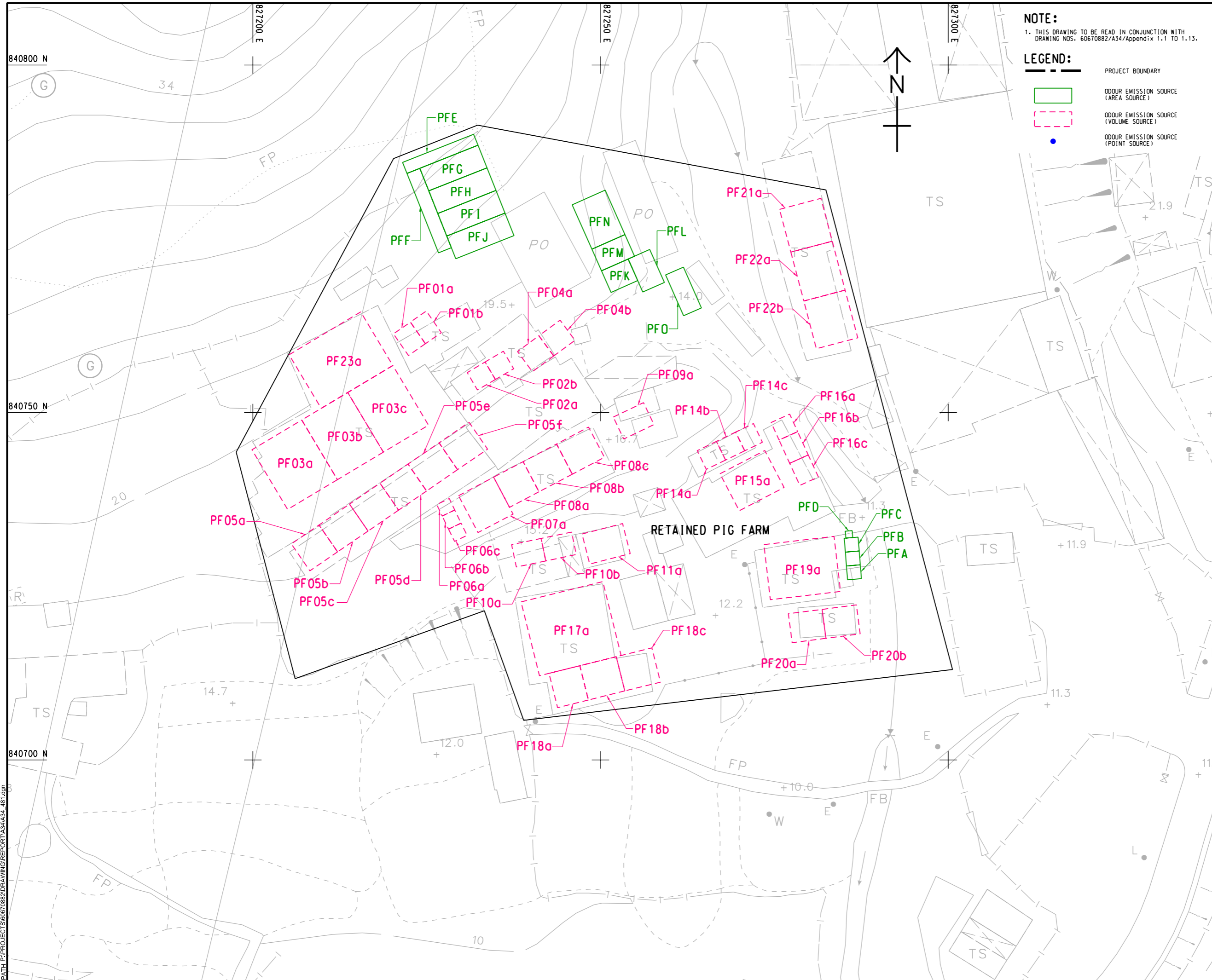
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 協議編號
 CE 20/2021

SHEET TITLE
 圖紙名稱
LOCATION OF ODOUR EMISSION SOURCES (OVERVIEW, WITHOUT PROJECT)

SHEET NUMBER
 圖紙編號
 60670882/A34/Appendix 1

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 Plot File by: Zhou23
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NOTE:
 1. THIS DRAWING TO BE READ IN CONJUNCTION WITH DRAWING NOS. 60670882/A34/Appendix 1.1 TO 1.13.

LEGEND:

- PROJECT BOUNDARY
- ODOUR EMISSION SOURCE (AREA SOURCE)
- ODOUR EMISSION SOURCE (VOLUME SOURCE)
- ODOUR EMISSION SOURCE (POINT SOURCE)



PROJECT
 項目
FIRST PHASE DEVELOPMENT OF THE NEW TERRITORIES NORTH – SAN TIN / LOK MA CHAU DEVELOPMENT NODE – INVESTIGATION

CLIENT
 業主
土木工程拓展署
 Civil Engineering and Development Department
規劃署
 Planning Department

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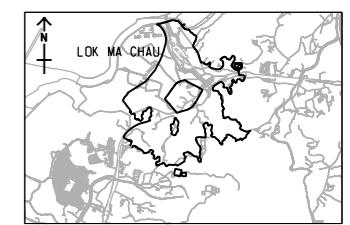
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IR	DATE	DESCRIPTION	CHK.
修訂	日期	內容摘要	核核

STATUS
 階段

SCALE **DIMENSION UNIT**
 比例 尺寸單位
 A3 1 : 500 METRES

KEY PLAN A3 1 : 200000



PROJECT NO. **AGREEMENT NO.**
 項目編號 協議編號
 60670882 CE 20/2021

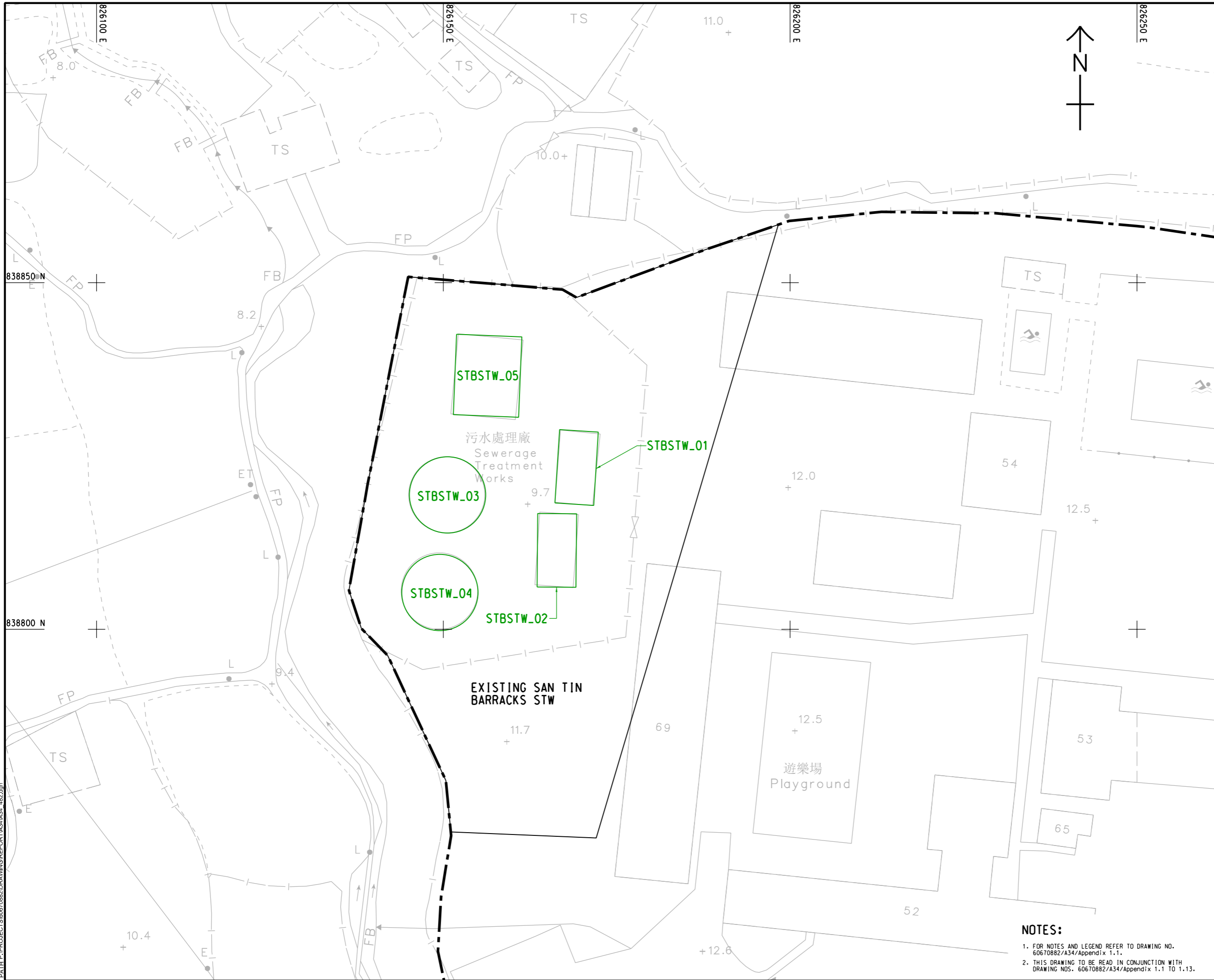
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 圖紙名稱
LOCATION OF ODOUR EMISSION SOURCES (RETAINED PIG FARM)

SHEET 1 OF 13

SHEET NUMBER
 圖紙編號
 60670882/A34/Appendix 1.1

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PROJECT
 項目
FIRST PHASE DEVELOPMENT OF THE NEW TERRITORIES NORTH – SAN TIN / LOK MA CHAU DEVELOPMENT NODE – INVESTIGATION

CLIENT
 業主
 **土木工程拓展署**
 Civil Engineering and Development Department
 **規劃署**
 Planning Department

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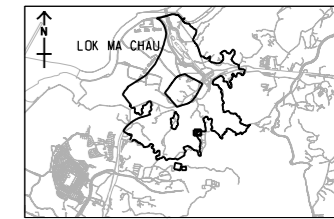
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修訂	日期	內容摘要	核對

STATUS
 階段

SCALE **DIMENSION UNIT**
 比例 尺寸單位
 A3 1 : 500 METRES

KEY PLAN A3 1 : 20000
 索引圖



PROJECT NO. **AGREEMENT NO.**
 項目編號 協議編號
 60670882 CE 20/2021

SHEET TITLE
 圖紙名稱

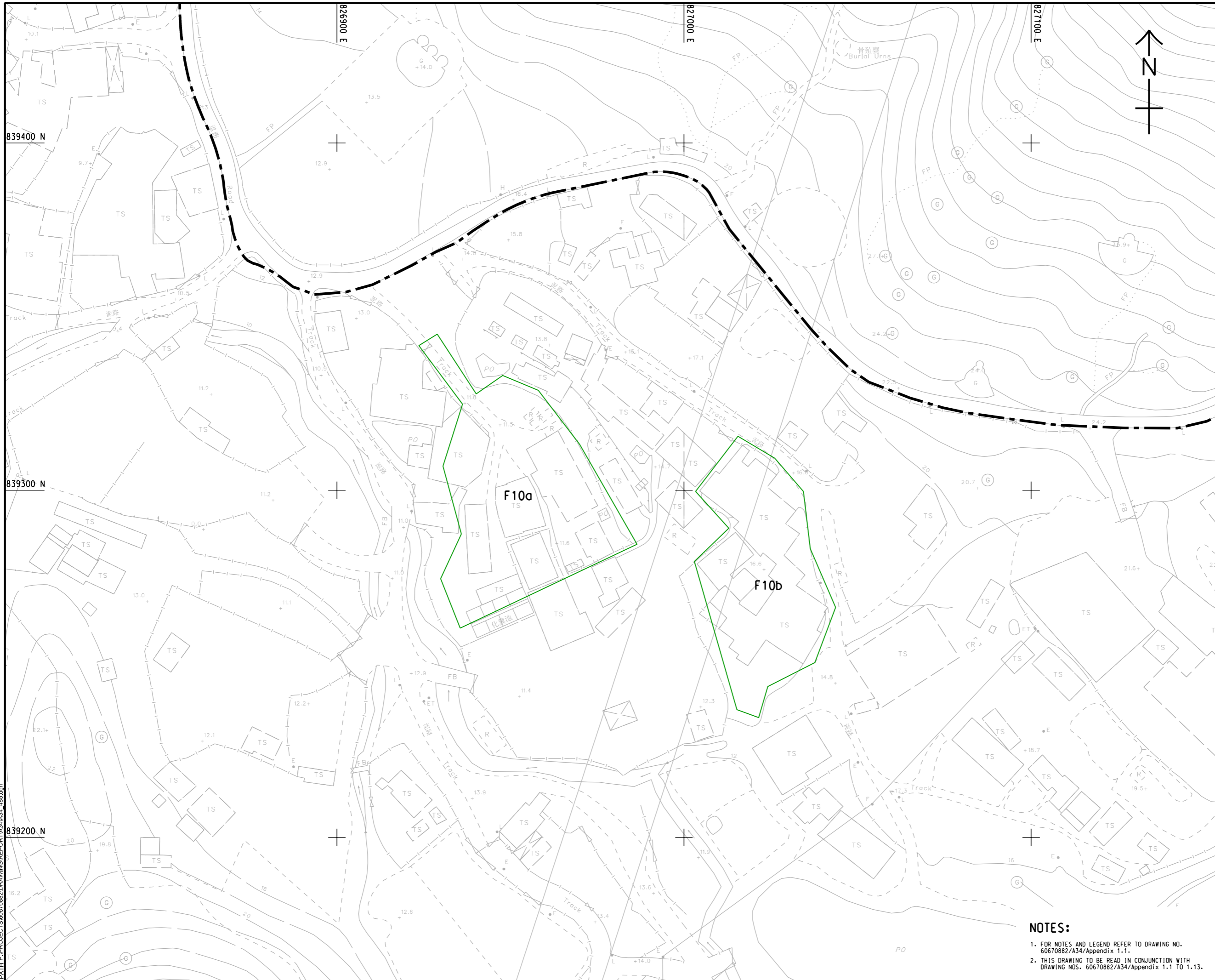
LOCATION OF ODOUR EMISSION SOURCE (EXISTING SAN TIN BARRACKS STW)
 SHEET 2 OF 13

SHEET NUMBER
 圖紙編號
 60670882/A34/Appendix 1.2

- NOTES:**
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PROJECT
 項目
**FIRST PHASE DEVELOPMENT OF
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 DEVELOPMENT NODE –
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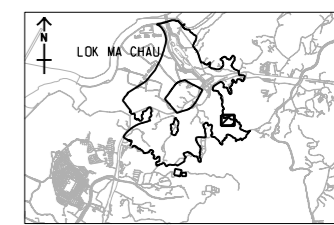
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編號	日期	內容摘要	校核

STATUS
圖版

SCALE
 比例
 A3 1 : 1000
DIMENSION UNIT
 尺寸單位
 METRES

KEY PLAN A3 1 : 200000
 索引圖



PROJECT NO.
 項目編號
 60670882
AGREEMENT NO.
 協議編號
 CE 20/2021

SHEET TITLE
 圖紙名稱
 LOCATION OF ODOUR EMISSION
 SOURCES (FARM 10)

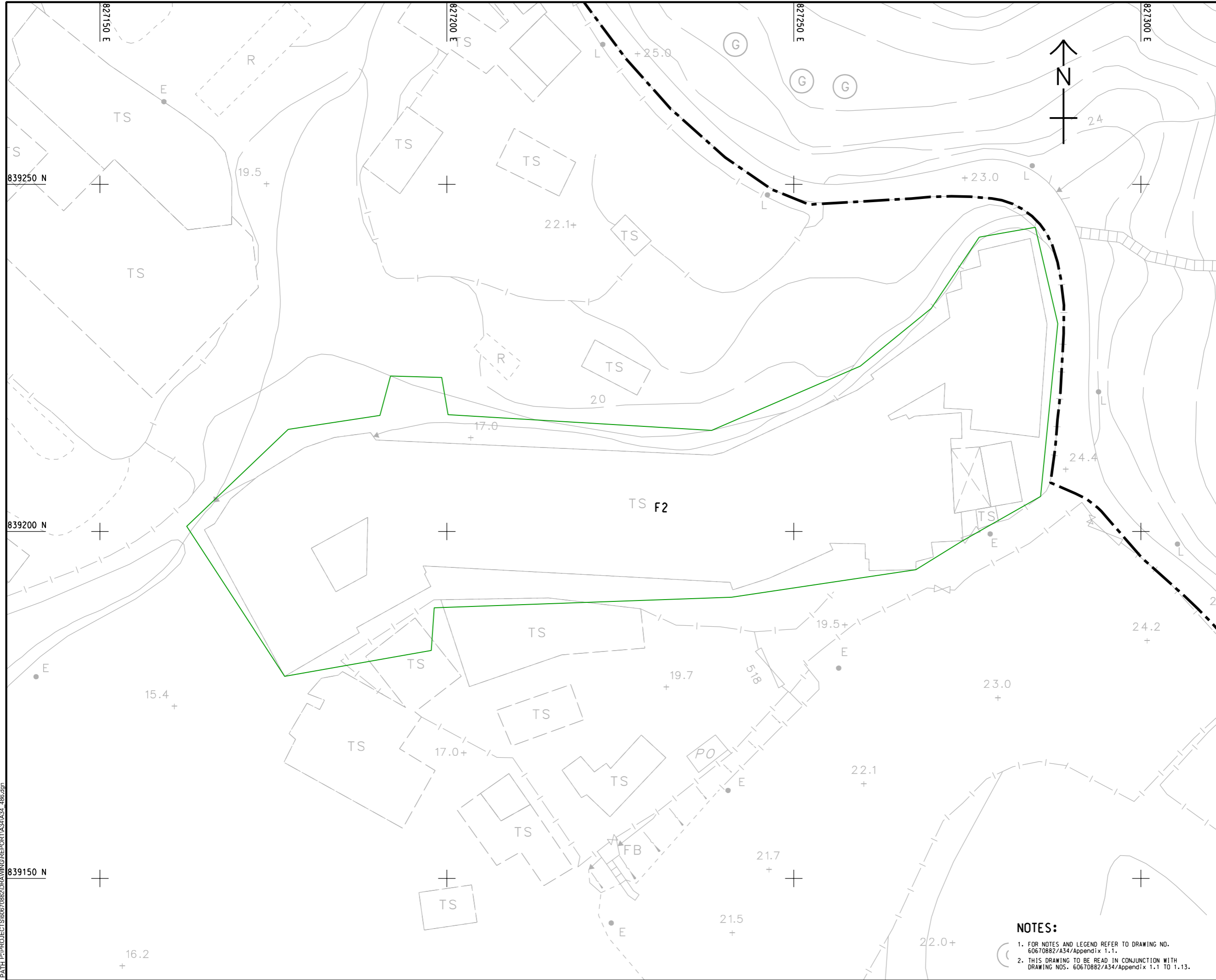
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 60670882/A34/Appendix 1.5

- NOTES:**
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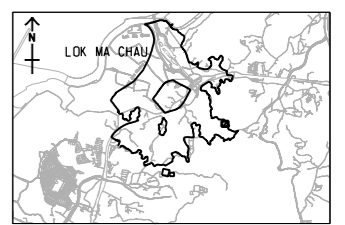
ISSUE/REVISION
 修訂

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修訂	日期	內容摘要	校核

STATUS
 階段

SCALE **DIMENSION UNIT**
 比例 尺寸單位
 A3 1 : 500 METRES

KEY PLAN A3 1 : 200000
 索引圖



PROJECT NO. **AGREEMENT NO.**
 項目編號 協議編號
 60670882 CE 20/2021

SHEET TITLE
 圖紙名稱

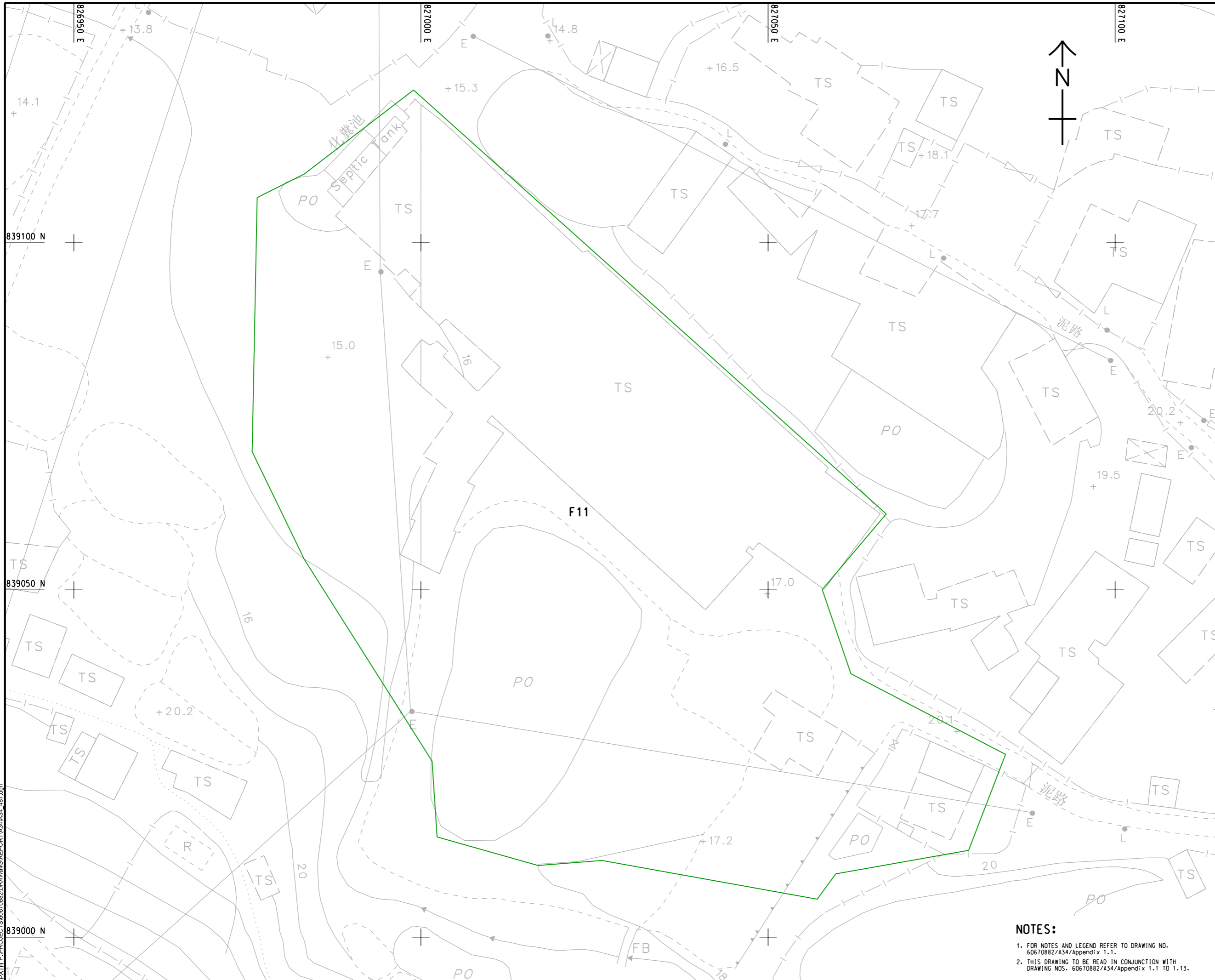
LOCATION OF ODOUR EMISSION SOURCES (FARM 2)

SHEET NUMBER
 圖紙編號
 60670882/A34/Appendix 1.6

- NOTES:**
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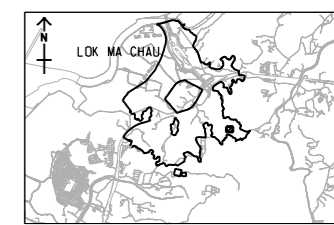
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編號	日期	內容摘要	校核

STATUS

SCALE
 比例
 A3 1 : 500

DIMENSION UNIT
 尺寸單位
 METRES

KEY PLAN A3 1 : 200000
 索引圖



PROJECT NO.
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SHEET TITLE
 圖紙名稱

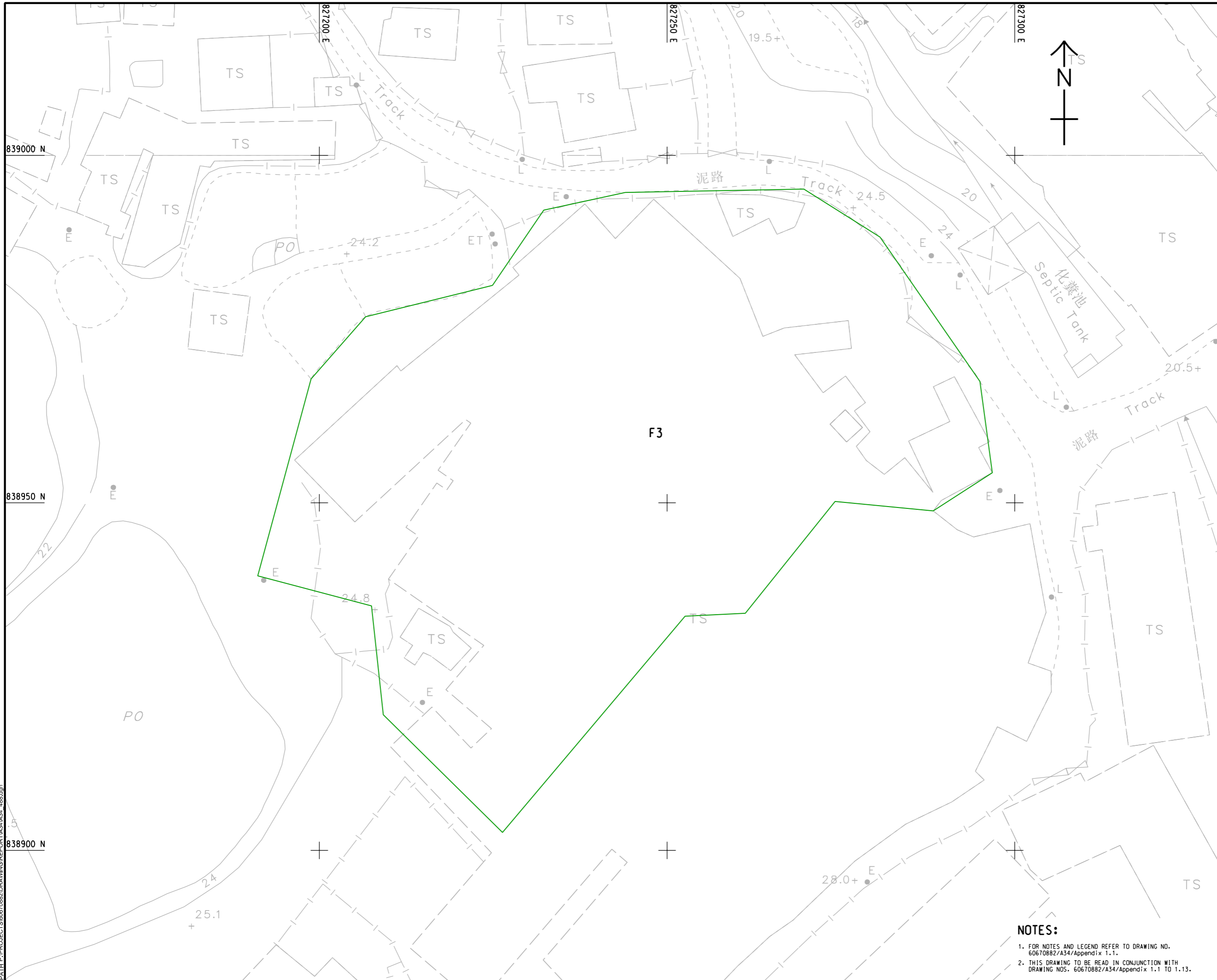
LOCATION OF ODOUR EMISSION SOURCES (FARM 11)

SHEET NUMBER
 圖紙編號
 60670882/A34/Appendix 1.7

- NOTES:**
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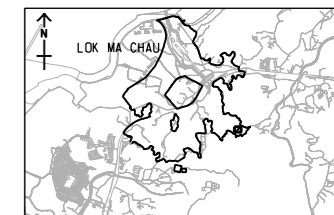
IR	DATE	DESCRIPTION	CHK.
修訂	日期	內容摘要	核對

STATUS
 階段

SCALE **DIMENSION UNIT**
 比例 尺寸單位

A3 1 : 500 METRES

KEY PLAN A3 1 : 20000



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SHEET TITLE
 圖紙名稱

LOCATION OF ODOUR EMISSION SOURCES (FARM 3)

SHEET 8 OF 13

SHEET NUMBER
 圖紙編號

60670882/A34/Appendix 1.8

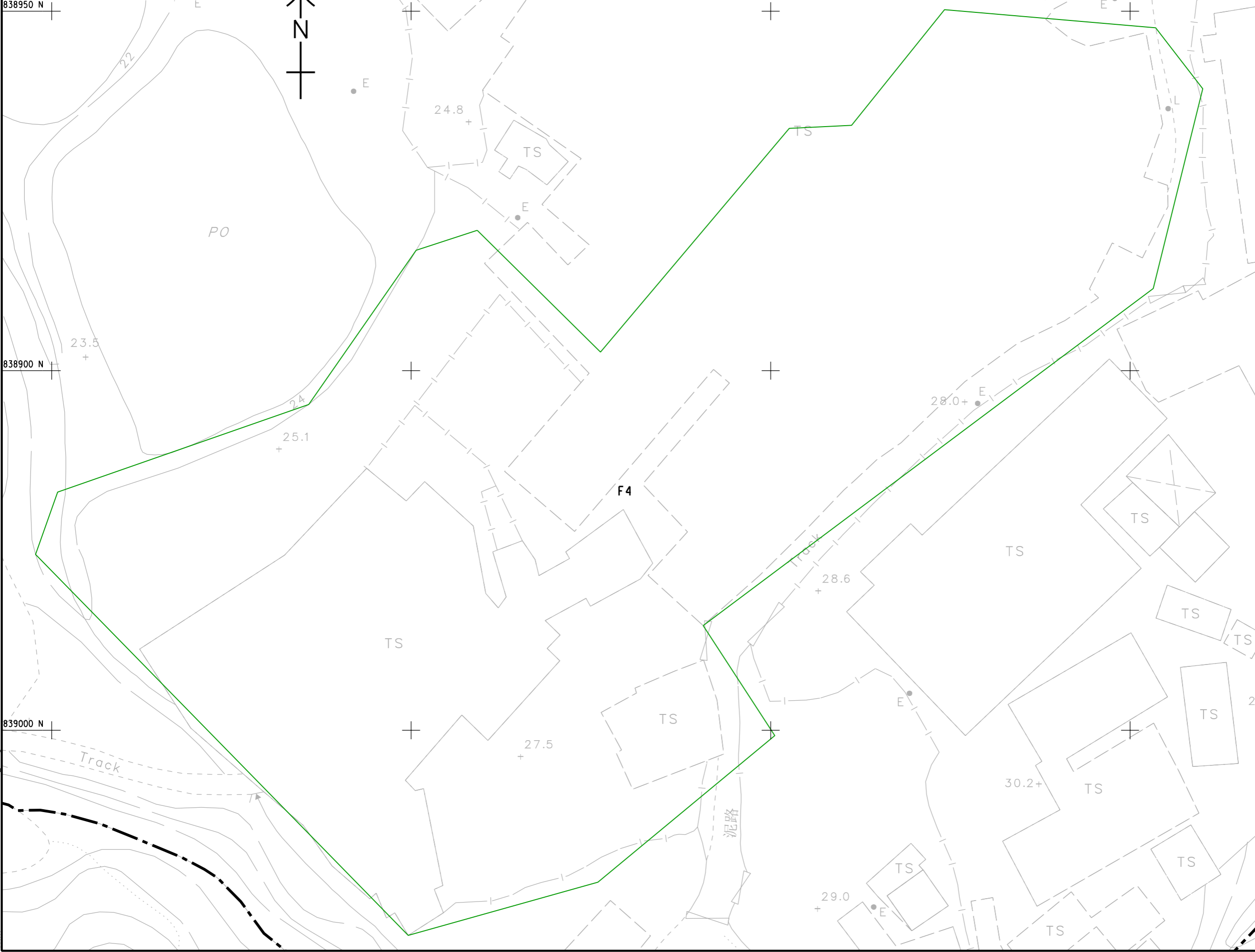
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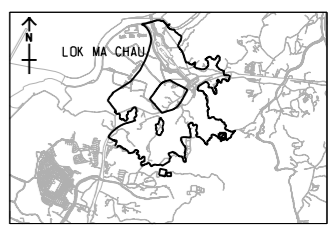
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修訂	日期	內容摘要	核對

STATUS
 階段

SCALE **DIMENSION UNIT**
 比例 尺寸單位
 A3 1 : 500 METRES

KEY PLAN A3 1 : 200000
 索引圖



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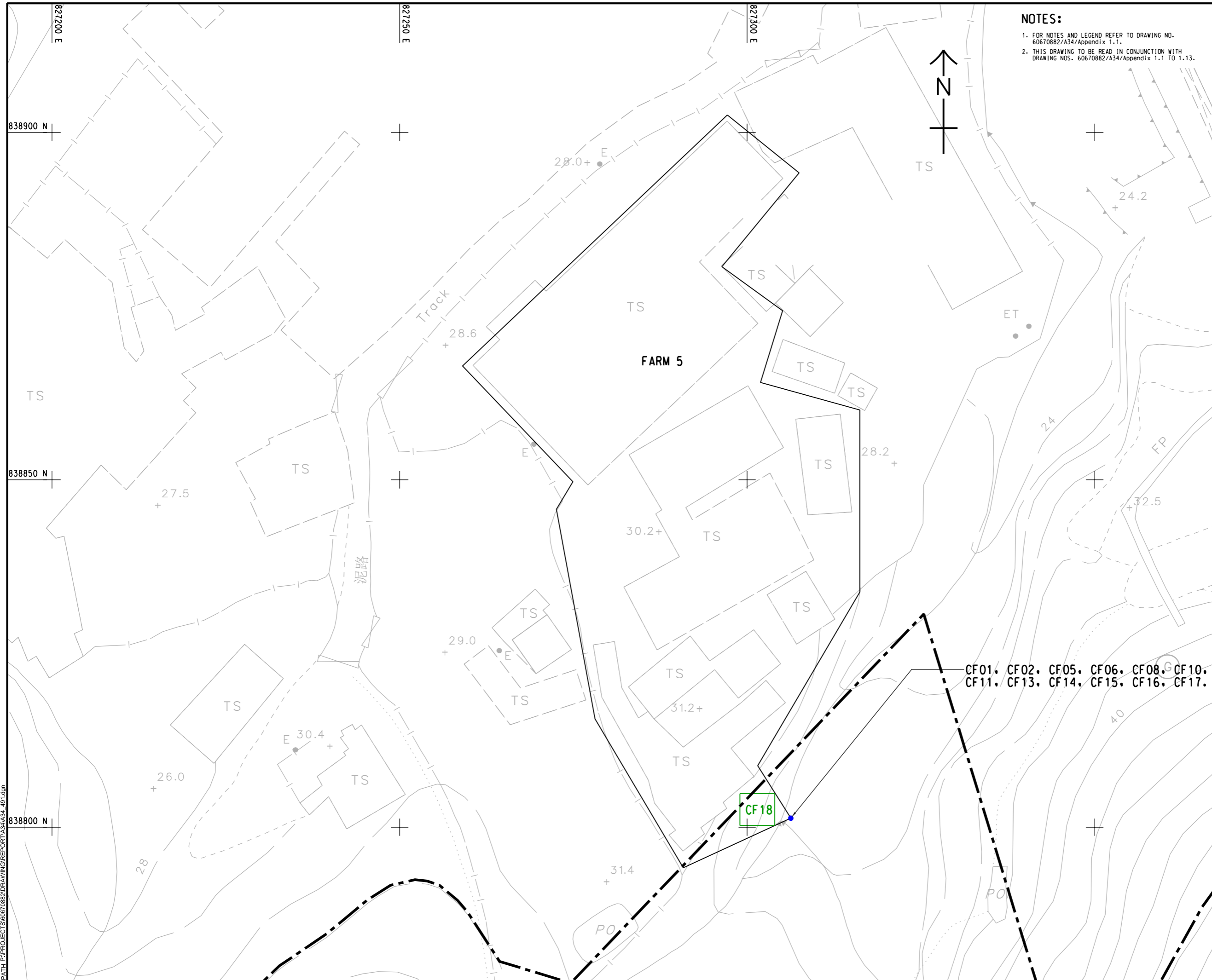
SHEET TITLE
 圖紙名稱
 LOCATION OF ODOUR EMISSION SOURCES (FARM 4)

SHEET NUMBER
 圖紙編號
 60670882/A34/Appendix 1.9

SHEET 9 OF 13

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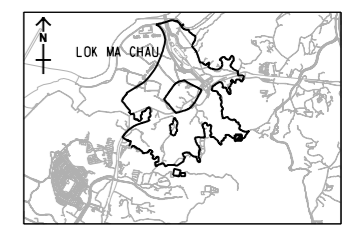
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STATUS
 階段

SCALE
 比例
 A3 1 : 500

DIMENSION UNIT
 尺寸單位
 METRES

KEY PLAN A3 1 : 200000
 索引圖



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SHEET TITLE
 圖紙名稱

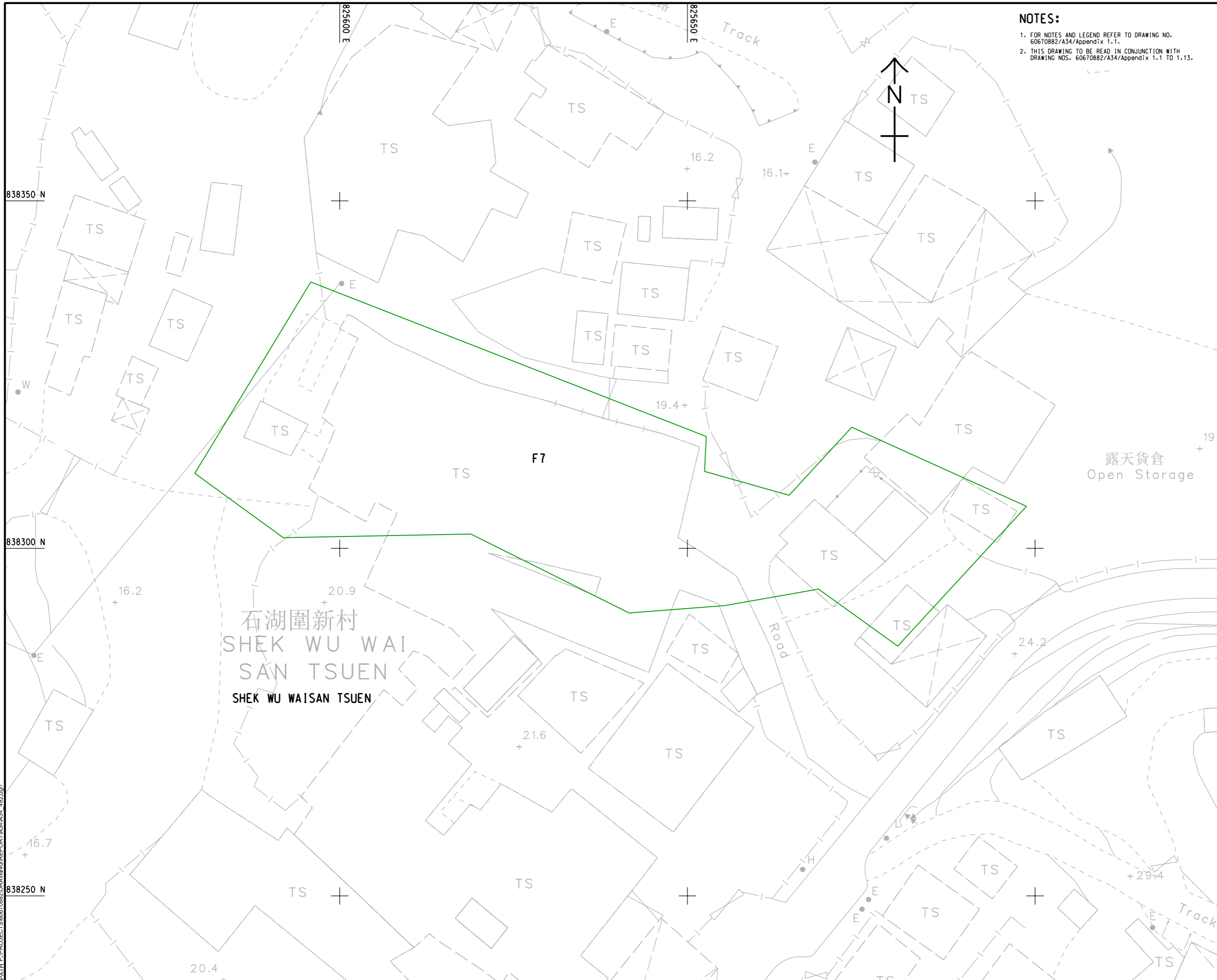
LOCATION OF ODOUR EMISSION SOURCES (FARM 5)

SHEET NUMBER
 圖紙編號
 60670882/A34/Appendix 1.11

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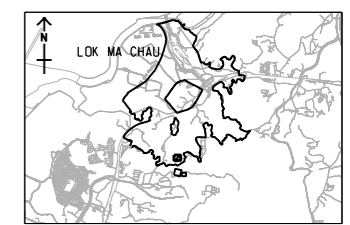
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 修訂

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修訂	日期	內容摘要	校核

STATUS
 階段

SCALE **DIMENSION UNIT**
 比例 尺寸單位
 A3 1 : 500 METRES

KEY PLAN A3 1 : 20000
 索引圖



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 項目編號 協議編號
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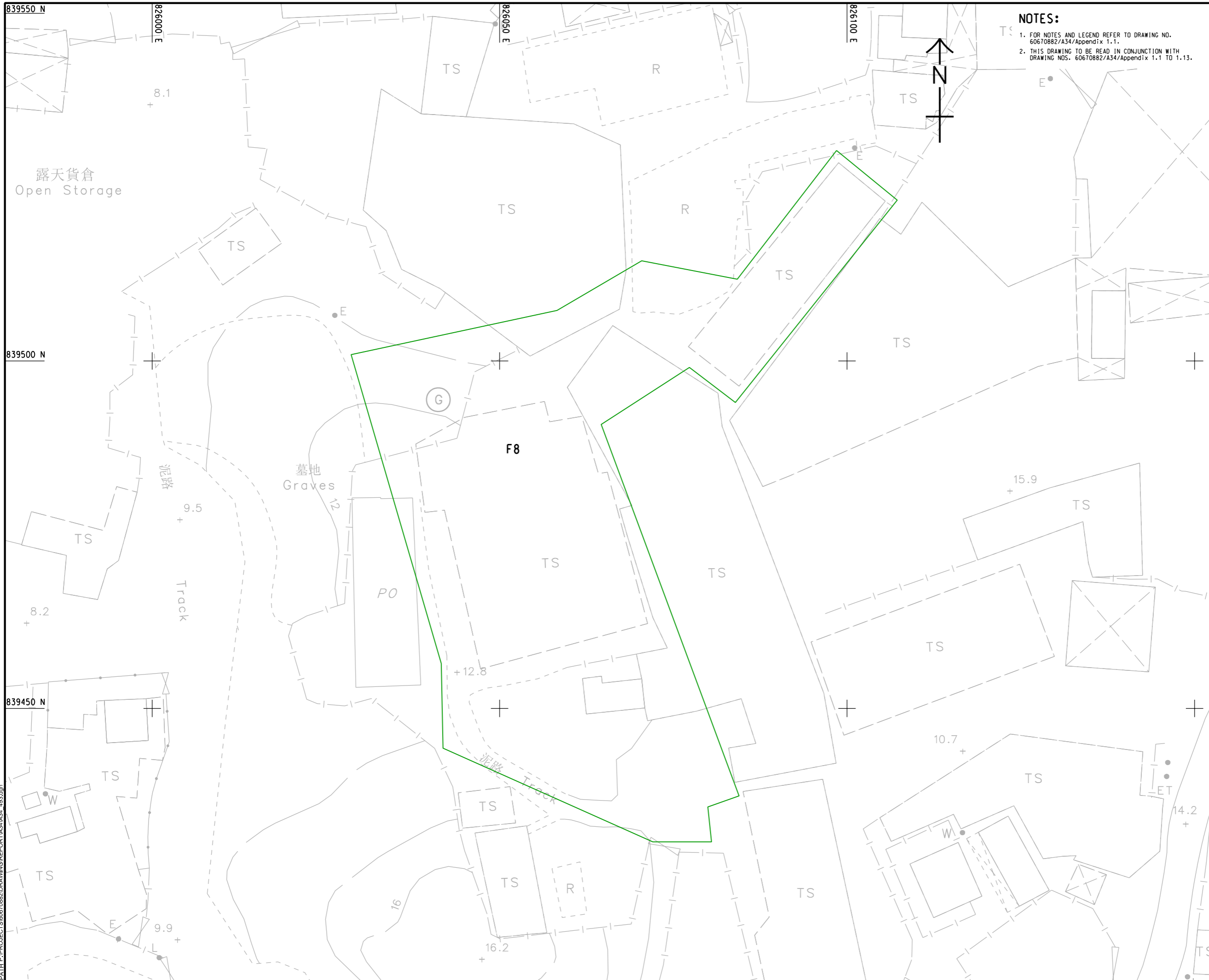
SHEET TITLE
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LOCATION OF ODOUR EMISSION SOURCES (FARM 7)

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NOTES:
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FIRST PHASE DEVELOPMENT OF THE NEW TERRITORIES NORTH – SAN TIN / LOK MA CHAU DEVELOPMENT NODE – INVESTIGATION

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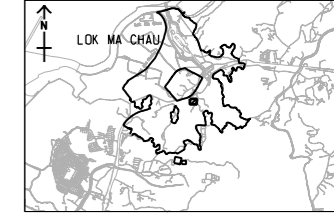
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STATUS
 階段

SCALE
 比例
 A3 1 : 500

DIMENSION UNIT
 尺寸單位
 METRES

KEY PLAN A3 1 : 200000
 索引圖



PROJECT NO.
 項目編號
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AGREEMENT NO.
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SHEET TITLE
 圖紙名稱

LOCATION OF ODOUR EMISSION SOURCES (FARM 8)

SHEET NUMBER
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 SHEET 13 OF 13

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Appendix B

Odour Emission Inventory of Future Scenario

Appendix B Odour Emission Inventory of Future Scenario

Proposed Effluent Polishing Plant

Exhaust Design

Deodouriser	Description	Source Type	Exhaust Location		Exhaust Diameter (m)	Height (mAG)	Exit Temperature (K)	Exit Velocity (m/s)
			X	Y				
EPP_DO1	Exhaust point (Inlet Works + PST)	POINTCAP	825097.11	839152.71	2.07	33.00	Ambient	7.5
EPP_DO2	Exhaust point (Sludge + Side Stream)	POINTCAP	824745.29	839062.78	1.00	33.00	Ambient	7.5
EPP_DO3	Exhaust point (BR)	POINTCAP	824955.70	839226.23	2.24	33.00	Ambient	7.5
EPP_DO4	Exhaust point (MBR Building)	POINTCAP	825023.18	839112.82	2.15	33.00	Ambient	7.5
EPP_DO5	Exhaust point (Food Waste)	POINTCAP	824665.88	839101.06	0.42	33.00	Ambient	7.5

Remark:

1. The exhaust parameters are provided by engineer.

Conversion of 1-hour Average to 5-second Average Concentration

Deodouriser	Emission Rate (OU/s)	Stability Class	Conversion Multiplier	Emission Rate with 5-second Peak Factor (OU/s)	Reference
EPP_DO1	668	A, B, C, D, E, F	2.3	1535.95	- Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales.
EPP_DO2	222	A, B, C, D, E, F	2.3	510.70	- Katestone Scientific 1995, The Evaluation of Peak-to-Mean Ratios for Odour Assessments, volumes I and II, Katestone Scientific Pty Ltd, Brisbane.
EPP_DO3	217	A, B, C, D, E, F	2.3	498.89	- Katestone Scientific 1998, Peak-to-Mean Concentration Ratios for Odour Assessments, Katestone Scientific Pty Ltd, Brisbane.
EPP_DO4	123	A, B, C, D, E, F	2.3	283.75	
EPP_DO5	36	A, B, C, D, E, F	2.3	83.22	

Emission Source Listing in AERMOD

Source ID	Type	X	Y	Exhaust Diameter (m)	Height (mAG)	Exit Temperature (K)	Exit Velocity(m/s)	Emission Rate with 5-second Peak Factor (OU/s)
EPP_DO1	POINTCAP	825097.11	839152.71	2.07	33.00	Ambient	7.5	1535.95
EPP_DO2	POINTCAP	824745.29	839062.78	1.00	33.00	Ambient	7.5	510.70
EPP_DO3	POINTCAP	824955.70	839226.23	2.24	33.00	Ambient	7.5	498.89
EPP_DO4	POINTCAP	825023.18	839112.82	2.15	33.00	Ambient	7.5	283.75
EPP_DO5	POINTCAP	824665.88	839101.06	0.42	33.00	Ambient	7.5	83.22

Remark:

1. For the source of information, refer to San Tin / Lok Ma Chau Development Node EIA Report - Appendix 3.10.

Appendix B Odour Emission Inventory of Future Scenario

Proposed Food Waste Pre-treatment Facility

Exhaust Design

Deodouriser	Description	Source Type	Exhaust Location		Exhaust Diameter (m)	Height (mAG)	Exit Temperature (K)	Exit Velocity (m/s)
			X	Y				
FWPF1a	Exhaust point	POINT	824662.37	839134.79	0.80	10.00	Ambient	6.6
FWPF1b	Exhaust point	POINT	824662.37	839134.79	0.80	10.00	Ambient	6.6
FWPF2a	Exhaust point	POINT	824580.35	839099.98	0.80	10.00	Ambient	6.6
FWPF2b	Exhaust point	POINT	824580.35	839099.98	0.80	10.00	Ambient	6.6

Remark:

- Two units of food waste pre-treatment facility (50 tpd each) of the Food Waste / Sludge Anaerobic Co-Digestion Tai Po Pilot Plant is employed to account for the proposed capacity of 100 tpd.
- The exhaust parameters are provided by engineer.

Conversion of 1-hour Average to 5-second Average Concentration

Deodouriser	Emission Rate (OU/s)	Stability Class	Conversion Multiplier	Emission Rate with 5-second Peak Factor (OU/s)	Reference
FWPF1a	637	A, B, C, D, E, F	2.3	1464.67	- Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales.
FWPF1b	152	A, B, C, D, E, F	2.3	348.55	- Katestone Scientific 1995, The Evaluation of Peak-to-Mean Ratios for Odour Assessments, volumes I and II, Katestone Scientific Pty Ltd, Brisbane.
FWPF2a	637	A, B, C, D, E, F	2.3	1464.67	- Katestone Scientific 1998, Peak-to-Mean Concentration Ratios for Odour Assessments, Katestone Scientific Pty Ltd, Brisbane.
FWPF2b	152	A, B, C, D, E, F	2.3	348.55	

Emission Source Listing in AERMOD

Source ID	Type	X	Y	Exhaust Diameter (m)	Height (mAG)	Exit Temperature (K)	Exit Velocity(m/s)	Emission Rate with 5-second Peak Factor (OU/s)
FWPF1a	POINT	824662.37	839134.79	0.80	10.00	Ambient	6.63	1464.67
FWPF1b	POINT	824662.37	839134.79	0.80	10.00	Ambient	6.63	348.55
FWPF2a	POINT	824580.35	839099.98	0.80	10.00	Ambient	6.63	1464.67
FWPF2b	POINT	824580.35	839099.98	0.80	10.00	Ambient	6.63	348.55

Remark:

- For the source of information, refer to San Tin / Lok Ma Chau Development Node EIA Report - Appendix 3.10.

Appendix B Odour Emission Inventory of Future Scenario

Proposed Sewage Pumping Station (OU.1.2, OU.3.2, OU.5.7)

Design of Sewage Pumping Station

Location	Total Odour Emission Area (m ²) ¹	SOER (ou/m ² ·s)	Unmitigated Odour Emission Rate (ou/s)	Removal Efficiency (%)	Mitigated Odour Emission Rate (ou/s)
SPS at OU.5.7	954.00	3.26	3110.04	95	155.502
SPS at OU.3.2	563.50	3.26	1837.01	95	91.8505
SPS at OU.1.2	322.50	3.26	1051.35	95	52.5675

Remark:

- The area of wet well is provided by design engineer.
- SOER of the inlet well / wet well of the Proposed EPP is adopted to represent the raw sewage.

Exhaust Design

Deodouriser	Description	Source Type	Exhaust Location		Exhaust Diameter (m)	Height (mAG)	Exit Temperature (K)	Exit Velocity (m/s)
			X	Y				
SPS1	Exhaust point of SPS at Site OU.5.7	POINTHOR	825509.39	839378.40	2.00	4.35	Ambient	5.0
SPS2	Exhaust point of SPS at Site OU.3.2	POINTHOR	826578.39	840033.99	2.00	4.35	Ambient	5.0
SPS3	Exhaust point of SPS at Site OU.1.2	POINTHOR	825472.87	841653.66	2.00	4.35	Ambient	5.0

Remark:

- The exhaust parameters are provided by engineer.

Conversion of 1-hour Average to 5-second Average Concentration

Deodouriser	Emission Rate (OU/s)	Stability Class	Conversion Multiplier	Emission Rate with 5-second Peak Factor (OU/s)	Reference
SPS1	156	A, B, C, D, E, F	2.3	357.65	- Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales. - Katestone Scientific 1995, The Evaluation of Peak-to-Mean Ratios for Odour Assessments, volumes I and II, Katestone Scientific Pty Ltd, Brisbane.
SPS2	92	A, B, C, D, E, F	2.3	211.26	- Katestone Scientific 1998, Peak-to-Mean Concentration Ratios for Odour Assessments, Katestone Scientific Pty Ltd, Brisbane.
SPS3	53	A, B, C, D, E, F	2.3	120.91	

Emission Source Listing in AERMOD

Source ID	Type	X	Y	Exhaust Diameter (m)	Height (mAG)	Exit Temperature (K)	Exit Velocity(m/s)	Emission Rate with 5-second Peak Factor (OU/s)
SPS1	POINTHOR	825509.39	839378.40	2.00	4.35	Ambient	5.00	357.65
SPS2	POINTHOR	826578.39	840033.99	2.00	4.35	Ambient	5.00	211.26
SPS3	POINTHOR	825472.87	841653.66	2.00	4.35	Ambient	5.00	120.91

Remark:

- For the source of information, refer to San Tin / Lok Ma Chau Development Node EIA Report - Appendix 3.10.

Appendix B Odour Emission Inventory of Future Scenario

Proposed Refuse Transfer Station

H2S and NH3 Monitoring data at WKTS

Maximum Total Odour Emission at DO Inlets (OU/s)	Odour Contribution by H ₂ S (OU/s)	Odour contribution by NH ₃ (OU/s)
485532.85	482360.83	3172.01

Remark:

Based on the monitoring data recorded from Jan 2021 to May 2022 in West Kowloon Refuse Transfer Station (WKTS) and it covers the odour from the wastewater treatment plant.

Odour threshold of H₂S = 0.00047 ppm

Odour threshold of NH₃ = 0.037 ppm

MSW Handling Capacity of Proposed RTS (tpd)	MSW Handling Capacity of WKTS (tpd)	Odour Emission Adjustment factor
3000	2700	1.11

Estimation of Odour Emission from Proposed RTS

	Emission Rate (OU/s)	Adjustment factor	Removal Efficiency	Controlled Odour Emission (OU/s)
Odour by H ₂ S	482360.83	1.11	99.90%	535.96
Odour by NH ₃	3172.01	1.11	90.00%	352.45
Total odour emission (OU/s)				888.40

Remark:

Two stage deodorisation system with 99.9% and 90% removal efficiency for H₂S and NH₃ are adopted for the proposed RTS.

Continuous monitoring of actual H₂S and NH₃ concentrations after commissioning is required.

The odour emission rate is the total emission rate to be evenly distributed among the six deodorizing units RTS_DO1-RTS_DO6 below.

Exhaust Points of Waste Transfer Building

Deodouriser	Description	Source Type	Exhaust Location		Exhaust Diameter (m)	Height (mAG)	Exit Temperature (K)	Exit Velocity (m/s)
			X	Y				
RTS_DO1	Exhaust point	POINT	827349.99	840396.11	1.20	41.41	Ambient	15.0
RTS_DO2	Exhaust point	POINT	827332.42	840401.79	1.20	41.41	Ambient	15.0
RTS_DO3	Exhaust point	POINT	827314.86	840407.48	1.20	41.41	Ambient	15.0
RTS_DO4	Exhaust point	POINT	827297.30	840413.16	1.20	41.41	Ambient	15.0
RTS_DO5	Exhaust point	POINT	827279.74	840418.85	1.20	41.41	Ambient	15.0
RTS_DO6	Exhaust point	POINT	827262.17	840424.53	1.20	41.41	Ambient	15.0

Remark:

The exhaust parameters refers to the expansion of WKTS with 3,182 tpd in Refurbishment and Upgrading Studies for (A) West Kowloon Transfer Station and (B) Island West and Island East Transfer Stations

Conversion of 1-hour Average to 5-second Average Concentration

Deodouriser	Emission Rate (OU/s)	Stability Class	Conversion Multiplier	Emission Rate with 5-second Peak Factor (OU/s)	Reference
RTS_DO1	148	A, B, C, D, E, F	2.3	340.55	- Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales. - Katestone Scientific 1995, The Evaluation of Peak-to-Mean Ratios for Odour Assessments, volumes I and II, Katestone Scientific Pty Ltd, Brisbane. - Katestone Scientific 1998, Peak-to-Mean Concentration Ratios for Odour Assessments, Katestone Scientific Pty Ltd, Brisbane.
RTS_DO2	148	A, B, C, D, E, F	2.3	340.55	
RTS_DO3	148	A, B, C, D, E, F	2.3	340.55	
RTS_DO4	148	A, B, C, D, E, F	2.3	340.55	
RTS_DO5	148	A, B, C, D, E, F	2.3	340.55	
RTS_DO6	148	A, B, C, D, E, F	2.3	340.55	

Remark:

6-stack configuration is assumed for the proposed RTS, with reference to the expansion of WKTS with 3,182 tpd in Refurbishment and Upgrading Studies for (A) West Kowloon Transfer Station and (B) Island West and Island East Transfer Stations.

Emission Source Listing in AERMOD

Source ID	Type	X	Y	Exhaust Diameter (m)	Height (mAG)	Exit Temperature (K)	Exit Velocity(m/s)	Emission Rate with 5-second Peak Factor (OU/s)
RTS_DO1	POINT	827349.99	840396.11	1.20	41.41	Ambient	15.00	340.55
RTS_DO2	POINT	827332.42	840401.79	1.20	41.41	Ambient	15.00	340.55
RTS_DO3	POINT	827314.86	840407.48	1.20	41.41	Ambient	15.00	340.55
RTS_DO4	POINT	827297.30	840413.16	1.20	41.41	Ambient	15.00	340.55
RTS_DO5	POINT	827279.74	840418.85	1.20	41.41	Ambient	15.00	340.55
RTS_DO6	POINT	827262.17	840424.53	1.20	41.41	Ambient	15.00	340.55

Remark:

1. For the source of information, refer to San Tin / Lok Ma Chau Development Node EIA Report - Appendix 3.11.

Appendix B Odour Emission Inventory of Future Scenario

Retained Pig Farm

Emission Source Listing in AERMOD

Source ID	Source Type	X	Y	Width (m)	Height (mAG)	No. of Vertices	Syinit (m)	Szinit (m)	Emission Rate with 5-second Peak Factor ¹
PF01a	VOLUME	827222.51	840760.60	4.81	2.00	-	1.12	1.86	74.55
PF01b	VOLUME	827224.88	840762.25	4.70	2.00	-	1.09	1.86	69.92
PF02a	VOLUME	827232.85	840755.25	4.17	2.00	-	0.97	1.86	57.71
PF02b	VOLUME	827235.45	840756.78	4.22	2.00	-	0.98	1.86	59.12
PF03a	VOLUME	827206.01	840742.49	13.03	2.00	-	3.03	1.86	553.75
PF03b	VOLUME	827212.90	840746.61	12.62	2.00	-	2.93	1.86	510.81
PF03c	VOLUME	827219.45	840750.52	12.53	2.00	-	2.91	1.86	501.42
PF04a	VOLUME	827240.67	840758.46	5.24	2.00	-	1.22	1.86	90.96
PF04b	VOLUME	827243.72	840760.71	5.23	2.00	-	1.22	1.86	90.59
PF05a	VOLUME	827208.86	840730.52	6.74	2.00	-	1.57	1.86	150.58
PF05b	VOLUME	827213.04	840733.38	7.10	2.00	-	1.65	1.86	165.83
PF05c	VOLUME	827217.43	840736.39	7.10	2.00	-	1.65	1.86	165.83
PF05d	VOLUME	827221.63	840739.27	6.78	2.00	-	1.58	1.86	152.16
PF05e	VOLUME	827225.87	840742.18	7.16	2.00	-	1.67	1.86	168.51
PF05f	VOLUME	827230.26	840745.18	7.04	2.00	-	1.64	1.86	163.24
PF06a	VOLUME	827227.74	840736.36	2.71	2.00	-	0.63	1.86	24.17
PF06b	VOLUME	827228.59	840734.59	2.90	2.00	-	0.68	1.86	27.94
PF06c	VOLUME	827229.48	840732.77	2.80	2.00	-	0.65	1.86	25.92
PF07a	VOLUME	827233.50	840736.71	8.28	2.00	-	1.92	1.86	226.94
PF08a	VOLUME	827237.89	840739.64	6.86	2.00	-	1.59	1.86	156.02
PF08b	VOLUME	827242.41	840742.03	7.31	2.00	-	1.70	1.86	176.33
PF08c	VOLUME	827247.12	840744.51	7.16	2.00	-	1.66	1.86	169.66
PF09a	VOLUME	827254.76	840748.80	5.94	2.00	-	1.38	1.86	111.48
PF10a	VOLUME	827239.68	840729.82	5.45	2.00	-	1.27	1.86	94.83
PF10b	VOLUME	827243.99	840730.72	5.56	2.00	-	1.29	1.86	97.87
PF11a	VOLUME	827250.81	840731.11	7.49	2.00	-	1.74	1.86	177.76
PF14a	VOLUME	827265.95	840743.84	4.29	2.00	-	1.00	1.86	61.12
PF14b	VOLUME	827268.71	840745.17	4.29	2.00	-	1.00	1.86	60.93
PF14c	VOLUME	827271.36	840746.45	4.12	2.00	-	0.96	1.86	56.31
PF15a	VOLUME	827271.79	840740.20	9.41	2.00	-	2.19	1.86	288.56
PF16a	VOLUME	827276.44	840747.90	4.04	2.00	-	0.94	1.86	54.10
PF16b	VOLUME	827277.78	840744.97	4.71	2.00	-	1.10	1.86	71.77
PF16c	VOLUME	827279.27	840741.70	4.57	2.00	-	1.06	1.86	68.23
PF17a	VOLUME	827245.77	840718.90	16.33	2.00	-	3.80	1.86	879.90
PF18a	VOLUME	827245.42	840710.55	6.84	2.00	-	1.59	1.86	154.22
PF18b	VOLUME	827250.26	840711.75	7.41	2.00	-	1.72	1.86	181.84
PF18c	VOLUME	827255.44	840713.04	7.33	2.00	-	1.70	1.86	177.99
PF19a	VOLUME	827279.00	840727.62	12.91	2.00	-	3.00	1.86	537.46
PF20a	VOLUME	827279.71	840719.28	6.45	2.00	-	1.50	1.86	136.38
PF20b	VOLUME	827284.60	840719.91	6.50	2.00	-	1.51	1.86	138.40
PF21a	VOLUME	827279.53	840776.94	8.85	2.00	-	2.06	1.86	259.54
PF22a	VOLUME	827281.27	840770.35	9.53	2.00	-	2.22	1.86	296.93
PF22b	VOLUME	827283.11	840763.40	9.40	2.00	-	2.19	1.86	290.31
PF23a	VOLUME	827212.66	840757.53	15.00	2.00	-	3.49	1.86	716.64
PFA	AREAPOLY	827285.37	840727.92	-	2.00	4	-	-	128.35
PFB	AREAPOLY	827285.37	840727.92	-	3.00	4	-	-	128.35
PFC	AREAPOLY	827285.20	840729.91	-	3.00	4	-	-	128.35
PDF	AREAPOLY	827285.27	840731.93	-	3.00	4	-	-	35.10
PFE	AREAPOLY	827222.16	840784.40	-	1.00	4	-	-	112.40
PFF	AREAPOLY	827222.16	840784.40	-	1.00	4	-	-	112.40
PFG	AREAPOLY	827224.02	840785.14	-	1.00	4	-	-	30.88
PFH	AREAPOLY	827225.31	840781.88	-	1.00	4	-	-	30.88
PFI	AREAPOLY	827226.60	840778.63	-	1.00	4	-	-	30.88
PFJ	AREAPOLY	827227.89	840775.38	-	1.00	4	-	-	30.88
PFK	AREAPOLY	827253.97	840772.09	-	1.00	4	-	-	1.93
PFL	AREAPOLY	827253.97	840772.09	-	4.50	4	-	-	1.93
PFM	AREAPOLY	827250.13	840770.39	-	4.50	4	-	-	1.93
PFN	AREAPOLY	827248.75	840773.49	-	4.50	4	-	-	1.93
PFO	AREAPOLY	827261.94	840763.93	-	2.50	4	-	-	0.30

Remark:

1. The unit of odour emission rate for volume source is OU/s, and for area source it is OU/m²·s.
2. For the source of information, refer to San Tin / Lok Ma Chau Development Node EIA Report - Appendix 3.11.

Appendix B Odour Emission Inventory of Future Scenario

Retained Pig Farm

Vertices of Area Source

Source ID	Vertex 1		Vertex 2		Vertex 3		Vertex 4	
	X	Y	X	Y	X	Y	X	Y
PFA	827285.37	840727.92	827287.36	840728.08	827287.52	840726.09	827285.53	840725.93
PFB	827285.37	840727.92	827285.20	840729.91	827287.20	840730.08	827287.36	840728.08
PFC	827285.20	840729.91	827285.04	840731.91	827287.03	840732.07	827287.20	840730.08
PFD	827285.27	840731.93	827285.18	840732.92	827286.18	840733.00	827286.26	840732.01
PFE	827222.16	840784.40	827221.53	840785.98	827231.75	840790.04	827232.38	840788.46
PFF	827222.16	840784.40	827224.02	840785.14	827228.55	840773.70	827226.70	840772.97
PFG	827224.02	840785.14	827232.38	840788.46	827233.67	840785.20	827225.31	840781.88
PFH	827225.31	840781.88	827233.67	840785.20	827234.96	840781.95	827226.60	840778.63
PFI	827226.60	840778.63	827234.96	840781.95	827236.26	840778.70	827227.89	840775.38
PFJ	827227.89	840775.38	827236.26	840778.70	827237.55	840775.45	827229.18	840772.12
PFK	827253.97	840772.09	827255.35	840768.98	827251.51	840767.28	827250.13	840770.39
PFL	827253.97	840772.09	827257.08	840773.47	827259.19	840768.71	827256.08	840767.34
PFM	827250.13	840770.39	827248.75	840773.49	827253.50	840775.60	827254.88	840772.49
PFN	827248.75	840773.49	827245.91	840779.89	827250.67	840782.00	827253.50	840775.60
PFO	827261.94	840763.93	827259.37	840769.79	827261.93	840770.91	827264.51	840765.05

Remark:

1. For the source of information, refer to San Tin / Lok Ma Chau Development Node EIA Report - Appendix 3.11.

Appendix B Odour Emission Inventory of Future Scenario

San Tin Barracks Sewage Treatment Works

Odour Emission Source

Source ID	Description	Source Type	X	Y	Height (mAG)	No. of Vertices ¹	Radius (m) ¹	Assumed SOER, OU/m ² .s	SOER Reference ^{2,3}
STBSTW_01	Inlet works	AREAPOLY	826166.08	838818.23	0.50	4	-	3.26	S1 Inlet pumping station of SWHSTW
STBSTW_02	Sedimentation Tank	AREAPOLY	826163.52	838806.11	0.50	4	-	4.03	S6 Primary Sedimentation Tank of SWHSTW
STBSTW_03	Bioreactor	AREACIRC	826150.61	838819.39	0.50	-	5.50	1.65	S7 Bioreactor of SWHSTW
STBSTW_04	Bioreactor	AREACIRC	826149.50	838805.32	0.50	-	5.50	1.65	S7 Bioreactor of SWHSTW
STBSTW_05	Sludge Treatment Tank	AREAPOLY	826151.92	838842.56	0.50	4	-	26.42	Sludge Mixing Tank of YLEPP

Remark:

- The vertices, radius and dimensions of the facilities are determined with Geoinfo Map Hong Kong.
- SOERs of SWHSTW refer to Appendix 3.8 of NENT Development EIA (AEIAR-175/2013)
- SOERs of YLEPP refer to Appendix 3.9 of YLEPP EIA (AEIAR-220/2019)

Conversion of 1-hour Average to 5-second Average Concentration

Source ID	Emission Rate (OU/m ² .s)	Stability Class	Conversion Multiplier	Emission Rate with 5-second Peak Factor (OU/m ² .s)	Reference
STBSTW_01	3.26	A, B, C, D, E, F	2.5	8.15	- Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales. - Katestone Scientific 1995, The Evaluation of Peak-to-Mean Ratios for Odour Assessments, volumes I and II, Katestone Scientific Pty Ltd, Brisbane. - Katestone Scientific 1998, Peak-to-Mean Concentration Ratios for Odour Assessments, Katestone Scientific Pty Ltd, Brisbane.
STBSTW_02	4.03	A, B, C, D, E, F	2.5	10.08	
STBSTW_03	1.65	A, B, C, D, E, F	2.5	4.13	
STBSTW_04	1.65	A, B, C, D, E, F	2.5	4.13	
STBSTW_05	26.42	A, B, C, D, E, F	2.5	66.05	

Emission Source Listing in AERMOD

Source ID	Source Type	X	Y	Height (mAG)	No. of Vertices ¹	Radius (m) ¹	Emission Rate with 5-second Peak Factor (OU/m ² .s)
STBSTW_01	AREAPOLY	826166.08	838818.23	0.50	4	-	8.15
STBSTW_02	AREAPOLY	826163.52	838806.11	0.50	4	-	10.08
STBSTW_03	AREACIRC	826150.61	838819.39	0.50	-	5.50	4.13
STBSTW_04	AREACIRC	826149.50	838805.32	0.50	-	5.50	4.13
STBSTW_05	AREAPOLY	826151.92	838842.56	0.50	4	-	66.05

Remark:

- The vertices, radius and dimensions of the facilities are determined with Geoinfo Map Hong Kong.
- For the source of information, refer to San Tin / Lok Ma Chau Development Node EIA Report - Appendix 3.12.

Appendix B Odour Emission Inventory of Future Scenario

San Tin Barracks Sewage Treatment Works

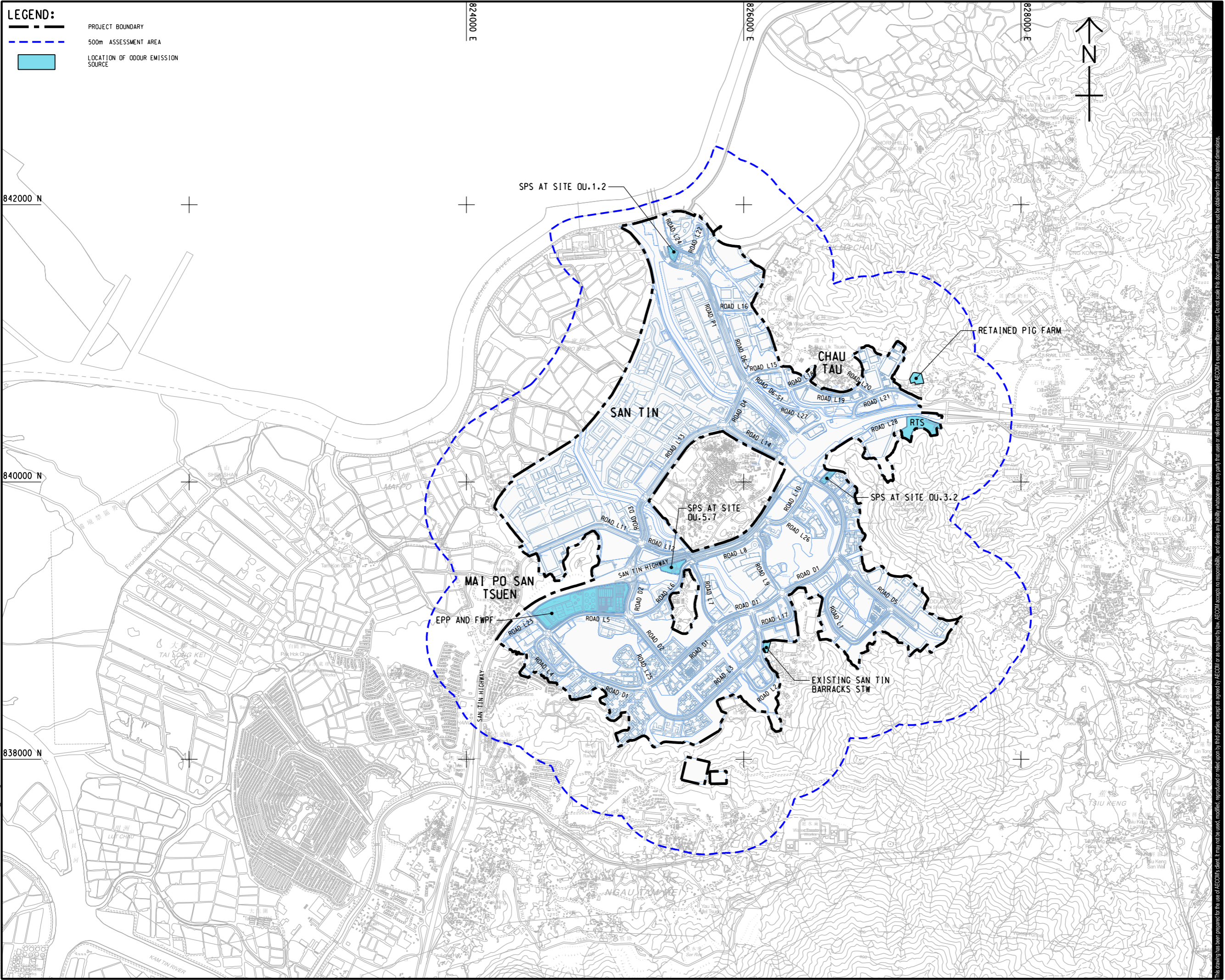
Vertices of Area Source

Source ID	Vertex 1		Vertex 2		Vertex 3		Vertex 4	
	X	Y	X	Y	X	Y	X	Y
STBSTW_01	826166.08	838818.23	826166.76	838828.81	826172.34	838828.45	826171.67	838817.87
STBSTW_02	826163.52	838806.11	826163.61	838816.71	826169.21	838816.66	826169.12	838806.06
STBSTW_05	826151.92	838842.56	826161.31	838842.18	826160.85	838830.59	826151.45	838830.97

Remark:

1. The vertices are determined with Geoinfo Map Hong Kong.
2. For the source of information, refer to San Tin / Lok Ma Chau Development Node EIA Report - Appendix 3.12.

ISO A1 594mm x 841mm
 Approved:
 Checked:
 Designer:
 Project Management Initials:
 Plot File by: haquan.zhao 11/09/2023
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LEGEND:

- PROJECT BOUNDARY
- 500m ASSESSMENT AREA
- LOCATION OF ODOUR EMISSION SOURCE



PROJECT
 項目
 FIRST PHASE DEVELOPMENT OF THE NEW TERRITORIES NORTH – SAN TIN / LOK MA CHAU DEVELOPMENT NODE – INVESTIGATION

CLIENT
 業主
 土木工程拓展署
 Civil Engineering and Development Department
 規劃署
 Planning Department

CONSULTANT
 顧問公司
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SUB-CONSULTANTS
 分包工程師/顧問公司

ISSUE/REVISION
 修訂

I/R	DATE	DESCRIPTION	CHK.
修訂	日期	內容描述	核對

STATUS
 階段

SCALE
 比例
 A3 1 : 25000

DIMENSION UNIT
 尺寸單位
 METRES

KEY PLAN
 索引圖

PROJECT NO.
 項目編號
 60670882

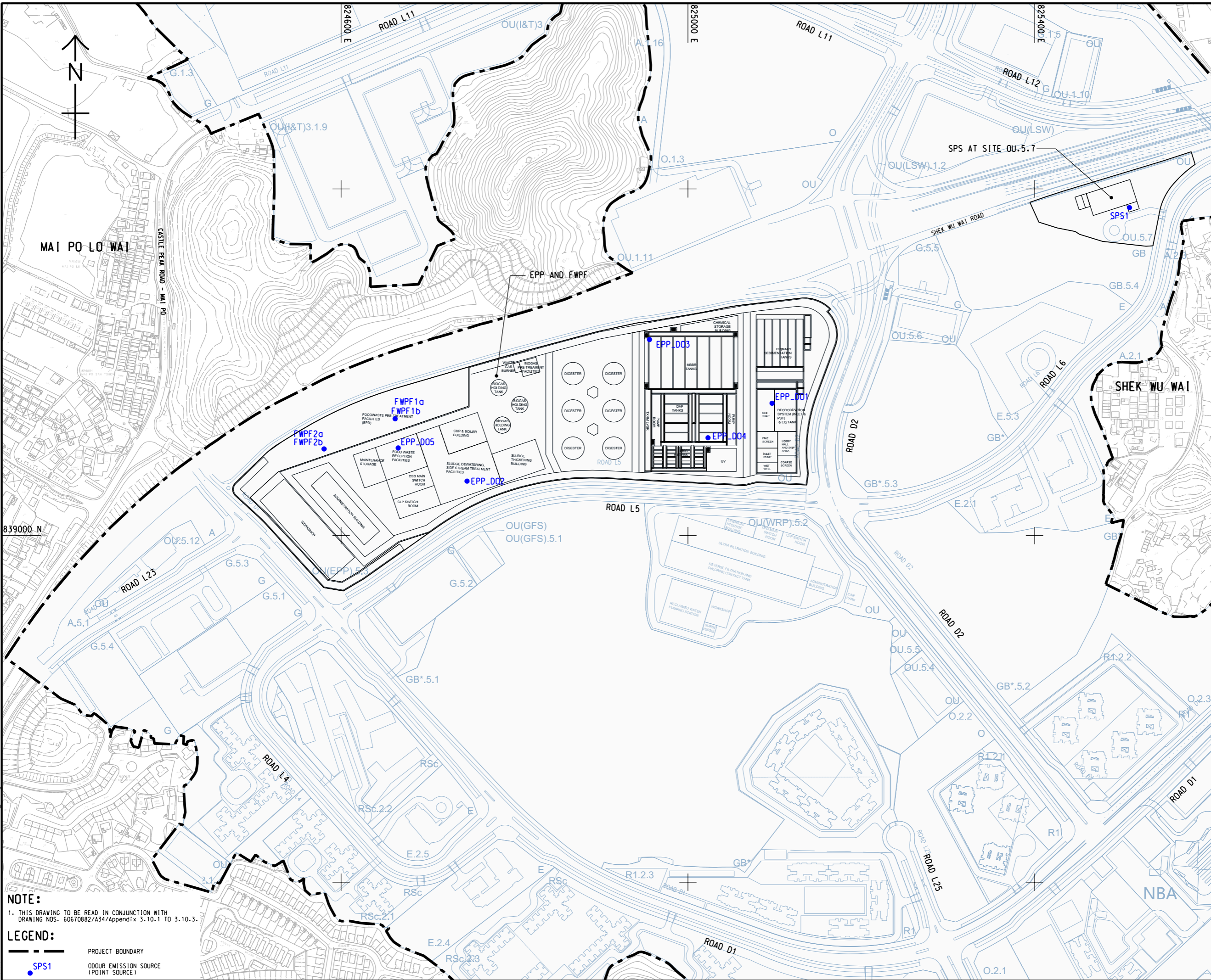
AGREEMENT NO.
 協議編號
 CE 20/2021

SHEET TITLE
 圖紙名稱
 LOCATION OF ODOUR EMISSION SOURCES (OVERVIEW)

SHEET NUMBER
 圖紙編號
 60670882/A34/Appendix 3.10

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NOTE:
 1. THIS DRAWING TO BE READ IN CONJUNCTION WITH DRAWING NOS. 60670882/A34/Appendix 3.10.1 TO 3.10.3.

LEGEND:
 - - - PROJECT BOUNDARY
 ● SPS1
 ● ODOUR EMISSION SOURCE (POINT SOURCE)



PROJECT
 項目
 FIRST PHASE DEVELOPMENT OF THE NEW TERRITORIES NORTH – SAN TIN / LOK MA CHAU DEVELOPMENT NODE – INVESTIGATION

CLIENT
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 土木工程拓展署
 Civil Engineering and Development Department
 規劃署
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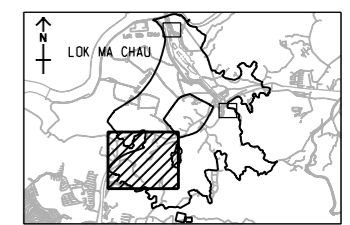
IR	DATE	DESCRIPTION	CHK.

STATUS
 階段

SCALE
 比例
 A3 1 : 4000

DIMENSION UNIT
 尺寸單位
 METRES

KEY PLAN A3 1 : 150000
 索引圖



PROJECT NO.
 項目編號
 60670882

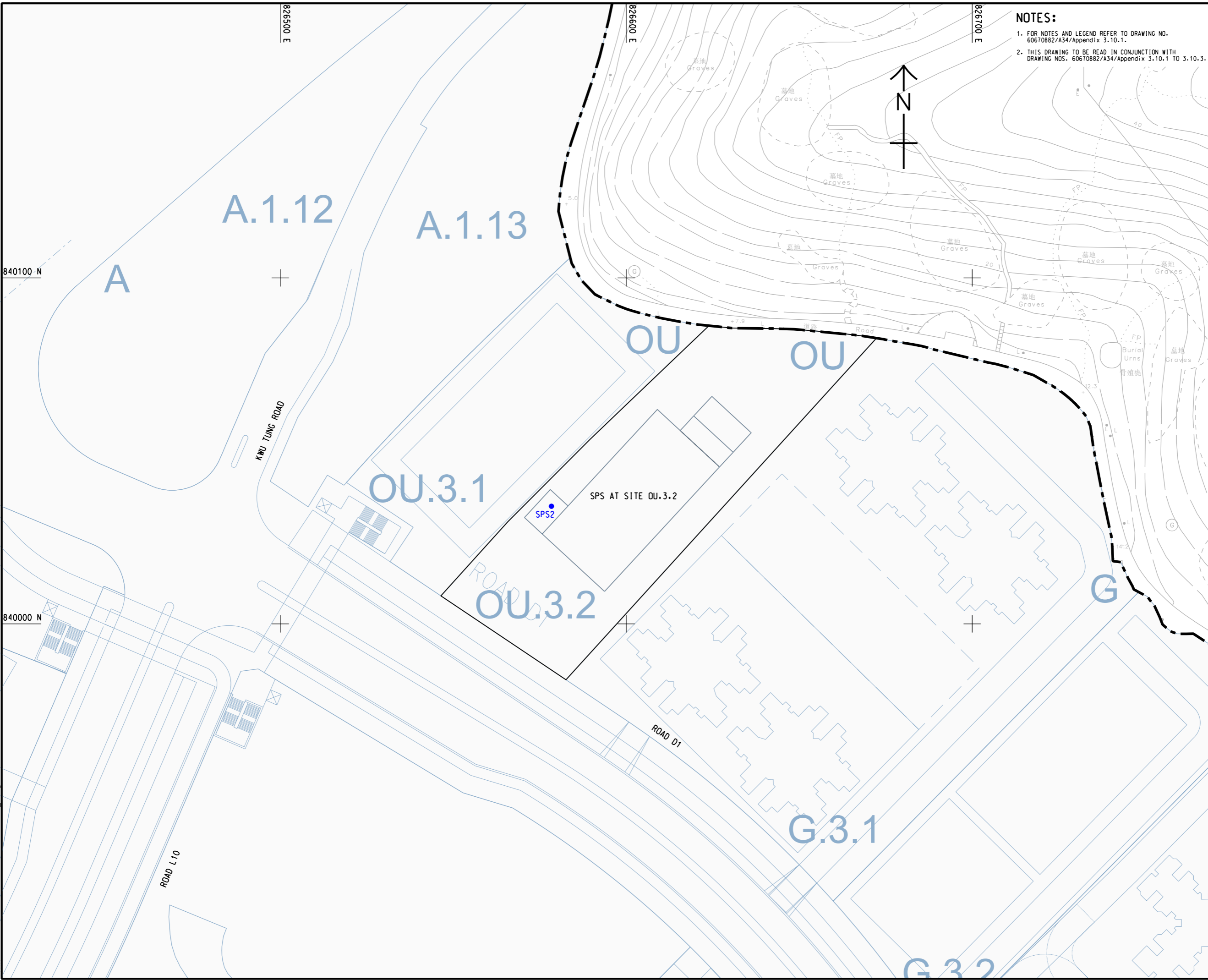
AGREEMENT NO.
 協議編號
 CE 20/2021

SHEET TITLE
 圖紙名稱
 LOCATION OF ODOUR EMISSION SOURCES (PROPOSED EPP, FWPF AND SPS)

SHEET NUMBER
 圖紙編號
 SHEET 1 OF 3

60670882/A34/Appendix 3.10.1

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PROJECT
 項目
 FIRST PHASE DEVELOPMENT OF THE NEW TERRITORIES NORTH – SAN TIN / LOK MA CHAU DEVELOPMENT NODE – INVESTIGATION

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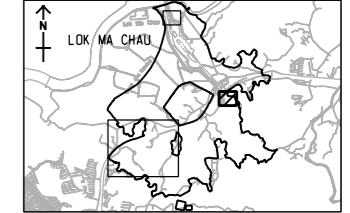
STATUS

SCALE

A3 1 : 1000 METRES

KEY PLAN

A3 1 : 150000



PROJECT NO.

60670882

AGREEMENT NO.

CE 20/2021

SHEET TITLE

LOCATION OF ODOUR EMISSION SOURCES (PROPOSED EPP, FWPF AND SPS)

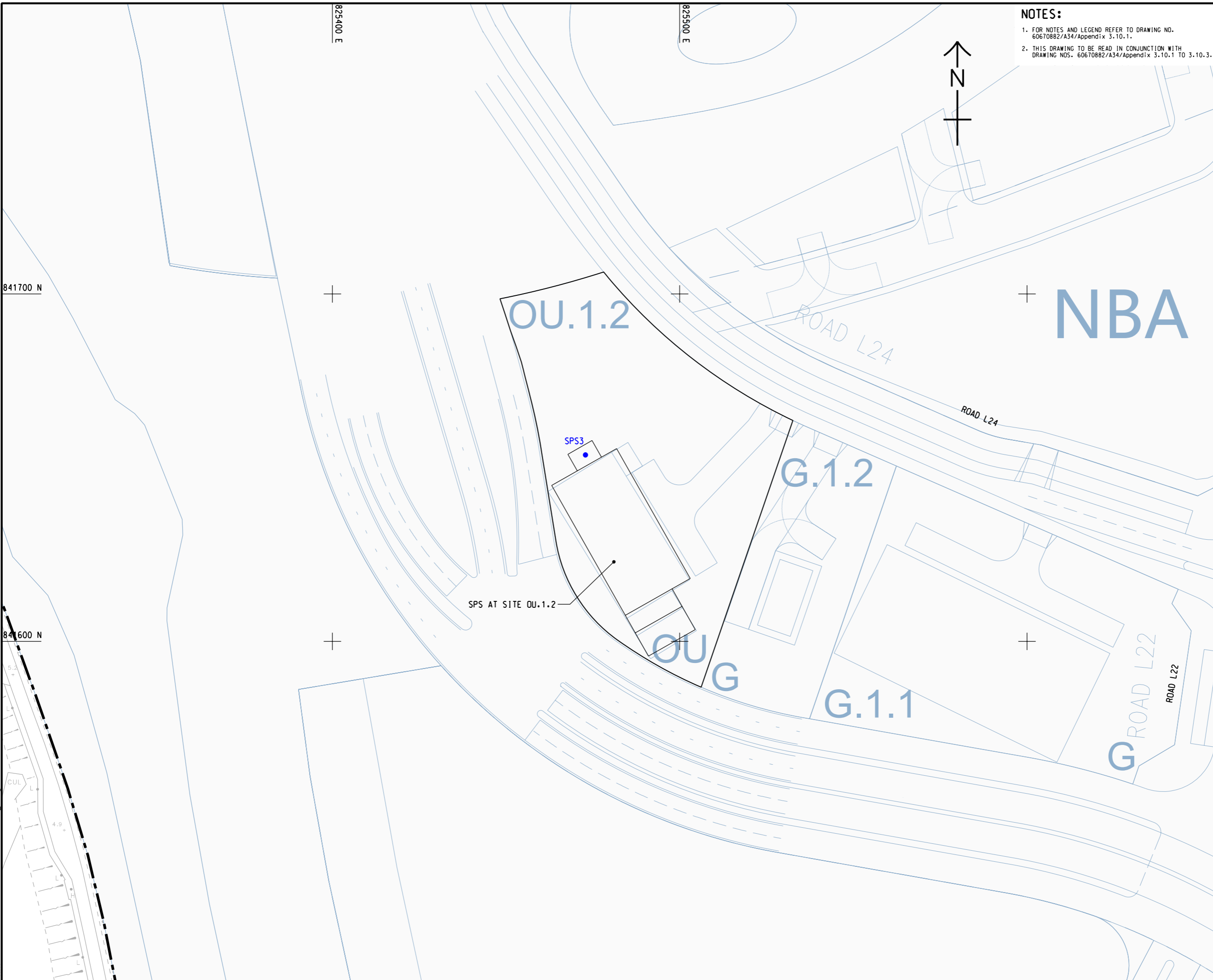
SHEET 2 OF 3

SHEET NUMBER

60670882/A34/Appendix 3.10.2

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 Designer:
 Project Management Initials:
 841700 N
 841600 N
 Plot File by: YeeFB
 PATH: P:\PROJECTS\60670882\DRAWING\REPORT\A34\A34_527.dgn
 26/10/2023



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 2. THIS DRAWING TO BE READ IN CONJUNCTION WITH DRAWING NOS. 60670882/A34/Appendix 3.10.1 TO 3.10.3.



PROJECT
 項目
 FIRST PHASE DEVELOPMENT OF THE NEW TERRITORIES NORTH - SAN TIN / LOK MA CHAU DEVELOPMENT NODE - INVESTIGATION

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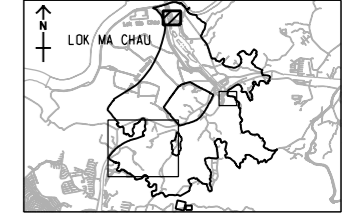
I/R	DATE	DESCRIPTION	CHK.
修訂	日期	內容摘要	核對

STATUS
 階段

SCALE
 比例
 A3 1 : 1000
 A3 1 : 150000

DIMENSION UNIT
 尺寸單位
 METRES

KEY PLAN
 索引圖



PROJECT NO.
 項目編號
 60670882

AGREEMENT NO.
 協議編號
 CE 20/2021

SHEET TITLE
 圖紙名稱

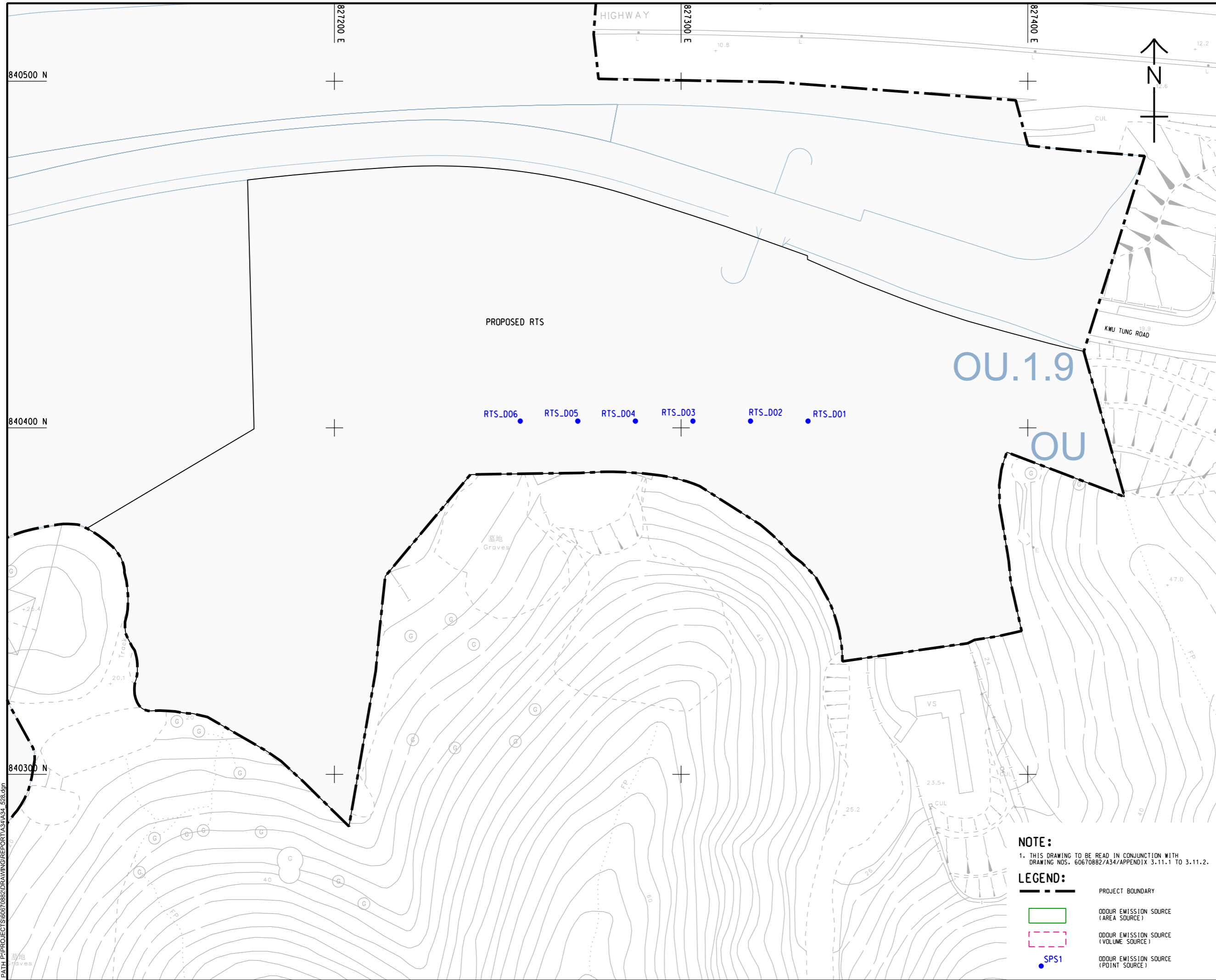
LOCATION OF ODOUR EMISSION SOURCES (PROPOSED EPP, FWPF AND SPS)

SHEET 3 OF 3

SHEET NUMBER
 圖紙編號
 60670882/A34/Appendix 3.10.3

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Project Management Initials:



PROJECT
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FIRST PHASE DEVELOPMENT OF
THE NEW TERRITORIES NORTH –
SAN TIN / LOK MA CHAU
DEVELOPMENT NODE –
INVESTIGATION

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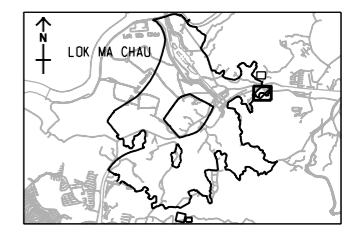
I/R	DATE	DESCRIPTION	CHK.

STATUS
階段

SCALE
比例
A3 1 : 1000

DIMENSION UNIT
尺寸單位
METRES

KEY PLAN A3 1 : 150000
索引圖



PROJECT NO.
項目編號
60670882

AGREEMENT NO.
協議編號
CE 20/2021

SHEET TITLE
圖紙名稱
LOCATION OF ODOUR EMISSION
SOURCES (RETAINED PIG FARM
AND PROPOSED RTS)

SHEET 1 OF 2

SHEET NUMBER
圖紙編號
60670882/A34/Appendix 3.11.1

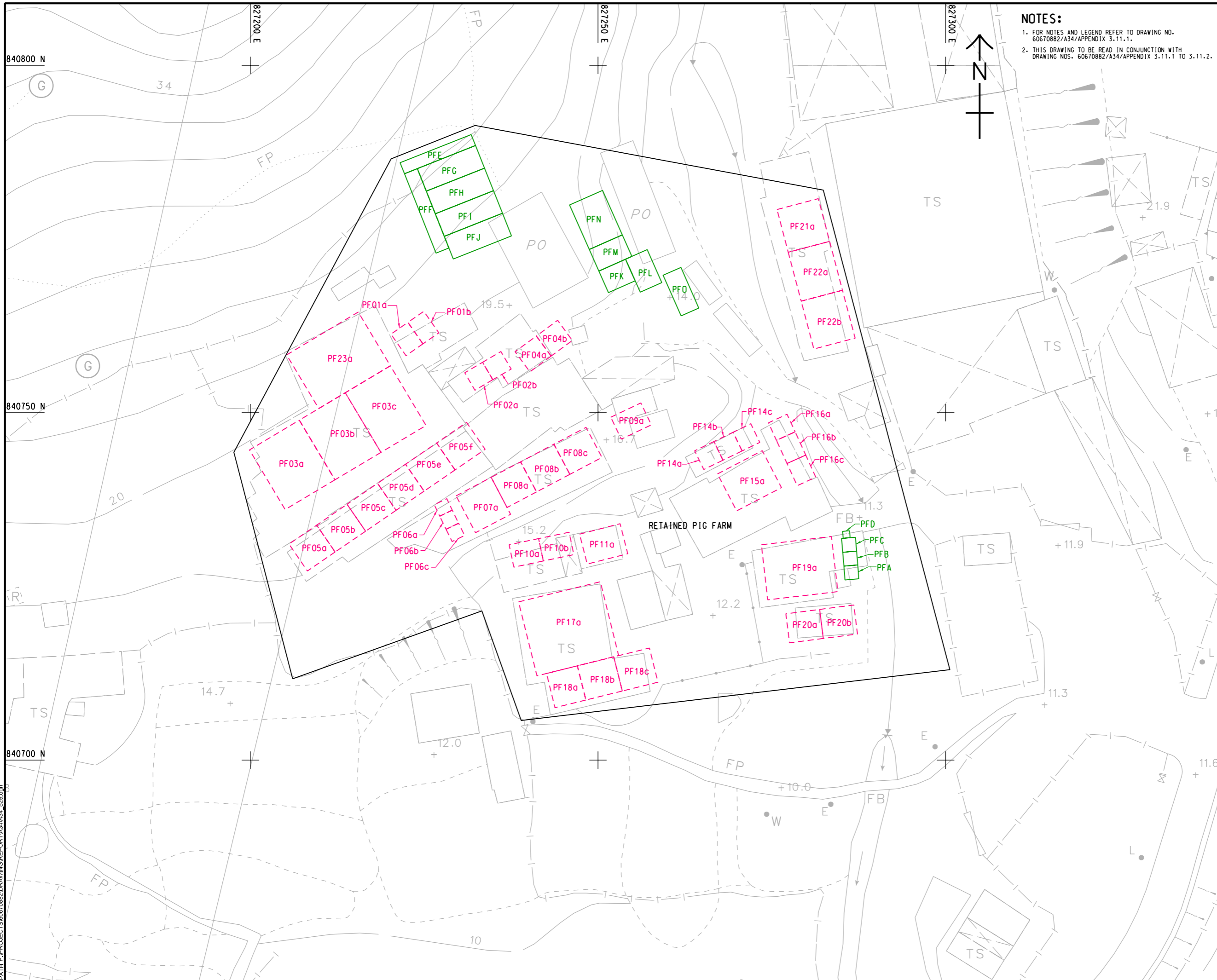
NOTE:
1. THIS DRAWING TO BE READ IN CONJUNCTION WITH
DRAWING NOS. 60670882/A34/APPENDIX 3.11.1 TO 3.11.2.

- LEGEND:**
- PROJECT BOUNDARY
 - ODOUR EMISSION SOURCE (AREA SOURCE)
 - ODOUR EMISSION SOURCE (VOLUME SOURCE)
 - ODOUR EMISSION SOURCE (POINT SOURCE)

Plot File by: haiquan.zhao 11/10/2023
PATH: P:\PROJECTS\60670882\DRAWING\REPORT\A34\A34_526.dgn

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 Plot File by: vicky.xia1 11/16/2023
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 1. FOR NOTES AND LEGEND REFER TO DRAWING NO. 60670882/A34/APPENDIX 3.11.1.
 2. THIS DRAWING TO BE READ IN CONJUNCTION WITH DRAWING NOS. 60670882/A34/APPENDIX 3.11.1 TO 3.11.2.



PROJECT
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FIRST PHASE DEVELOPMENT OF THE NEW TERRITORIES NORTH – SAN TIN / LOK MA CHAU DEVELOPMENT NODE – INVESTIGATION

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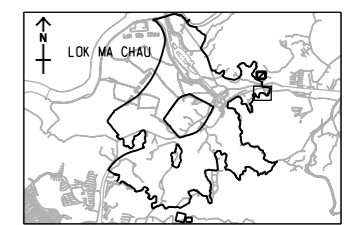
I/R	DATE	DESCRIPTION	CHK.
修訂	日期	內容摘要	核對

STATUS
 階段

SCALE
 比例
 A3 1 : 500

DIMENSION UNIT
 尺寸單位
 METRES

KEY PLAN A3 1 : 150000
 索引圖



PROJECT NO.
 項目編號
 60670882

AGREEMENT NO.
 協議編號
 CE 20/2021

SHEET TITLE
 圖紙名稱
LOCATION OF ODOUR EMISSION SOURCES (RETAINED PIG FARM AND PROPOSED RTS)

SHEET 2 OF 2

SHEET NUMBER
 圖紙編號
 60670882/A34/Appendix 3.11.2

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OU.5.9

A



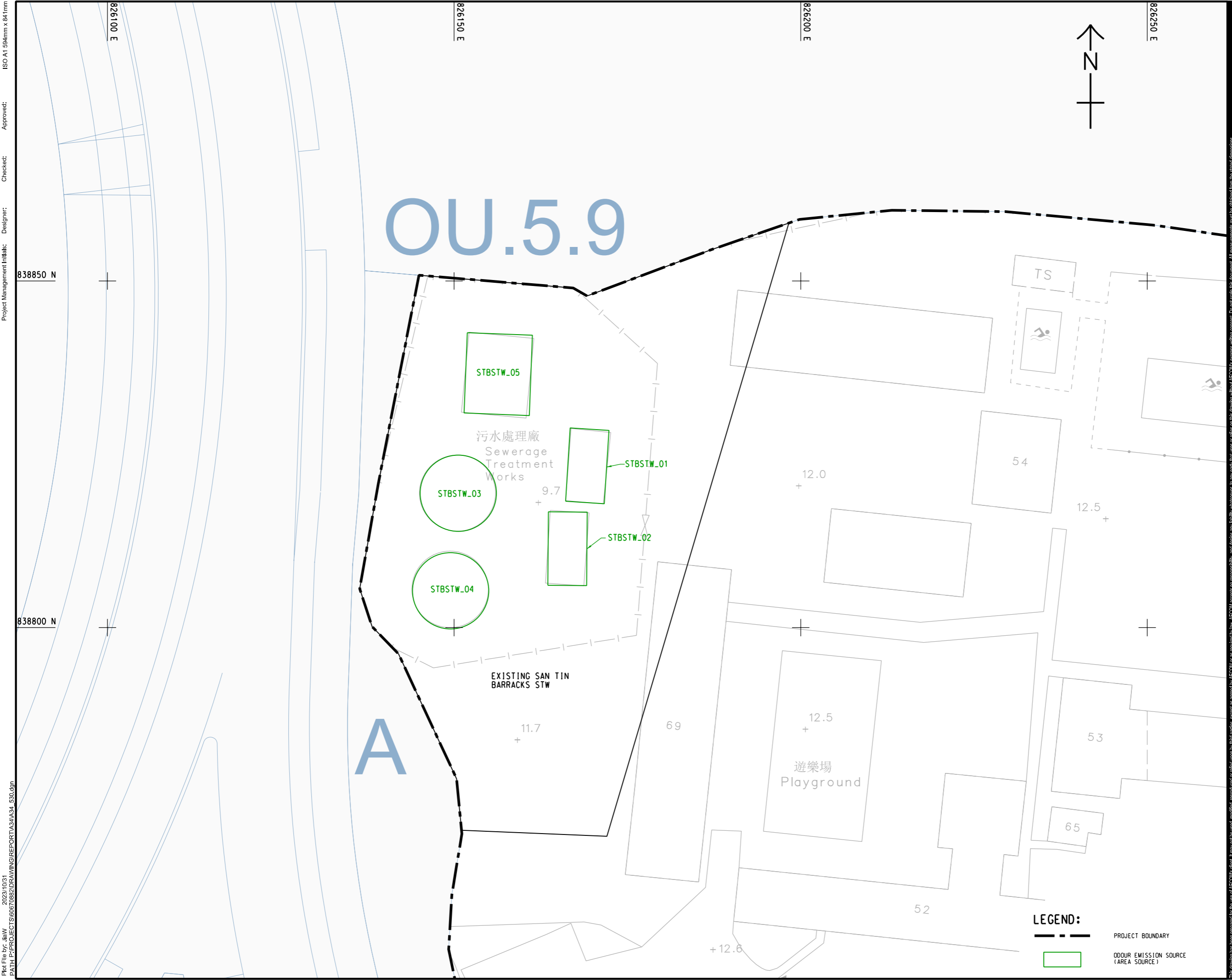
污水處理廠
Sewerage
Treatment
Works

EXISTING SAN TIN
BARRACKS STW



LEGEND:

- PROJECT BOUNDARY
- ODOUR EMISSION SOURCE (AREA SOURCE)



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 Checked:
 Designer:
 Project Management Initials:
 826100 E
 826150 E
 826200 E
 826250 E
 838850 N
 838800 N
 Plot File by: jliw
 2023/10/31
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PROJECT
項目
FIRST PHASE DEVELOPMENT OF
THE NEW TERRITORIES NORTH –
SAN TIN / LOK MA CHAU
DEVELOPMENT NODE –
INVESTIGATION

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I/R	DATE	DESCRIPTION	CHK.

STATUS

SCALE **DIMENSION UNIT**
比例 尺寸單位
A3 1 : 500 METRES

KEY PLAN

PROJECT NO. **AGREEMENT NO.**
項目編號 協議編號
60670882 CE 20/2021

SHEET TITLE

圖紙名稱
LOCATION OF ODOUR EMISSION
SOURCES (EXISTING SAN TIN
BARRACKS STW)

SHEET NUMBER
圖紙編號
60670882/A34/Appendix 3.12

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Appendix C

Modelling Approach

Appendix C Modelling Approach

With reference to Clause 3.4.3 and Appendices B and B-1 of the EIA Study Brief ESB-340/2021 and EPD's Guidelines for Local-Scale Air Quality Assessment Using Models, American Meteorological Society (AMS) and U.S. Environmental Protection Agency (EPA) Regulatory Model (AERMOD), the HKEPD approved air dispersion model, was employed to predict the odour impact at representative ASRs.

Cumulative odour impact within 500m from these odour sources, namely the proposed EPP, RTS and FWPF, proposed SPSs, Retained Pig Farm and San Tin Barracks STW, were assessed. It is assumed that the proposed deodorizing units/system of the proposed EPP and the proposed RTS operate continuously on a 24-hour-per-day basis with steady state ventilation rate and exhaust gas velocity in the assessment, unless otherwise specified. Odour emission from the exhaust outlet of the deodorizers was modelled as point source, while odour emission from the retained pig farm was modelled as volume and area sources for pig houses and tank surfaces respectively. Odour emission inventory in detail is shown in **Appendix B**.

Hourly meteorological conditions including wind data, temperature, relative humidity, pressure, cloud cover and mixing height of Year 2015 were extracted from the WRF meteorological data adopted in the PATHv2.1 system. The dataset by WRF should be intact and consistent among parameters. In order to avoid any hours misidentified as missing data by AERMOD and its associated components, the WRF met data were handled manually to set wind direction between 0° – 0.1° to be 360°. The height of the input data was assumed to be 9 metres above ground for the first layer of the WRF data as input.

The wind speed and mixing heights in the WRF data were further adjusted before meteorological pre-processing by AERMET. The minimum wind speed was capped at 1 metre per second. The mixing height was capped between 131 metres and 1941 metres according to the observation in Year 2015 by HKO. After pre-processed by AERMET, the mixing height was verified once again and adjusted to the capped range if necessary.

Surface characteristic parameters such as albedo, Bowen ratio and surface roughness are required in the AERMET. The parameters are determined according to land use classified for the surrounding and the latest AERMOD Implementation Guide. Flat terrain was applied in AERMOD.

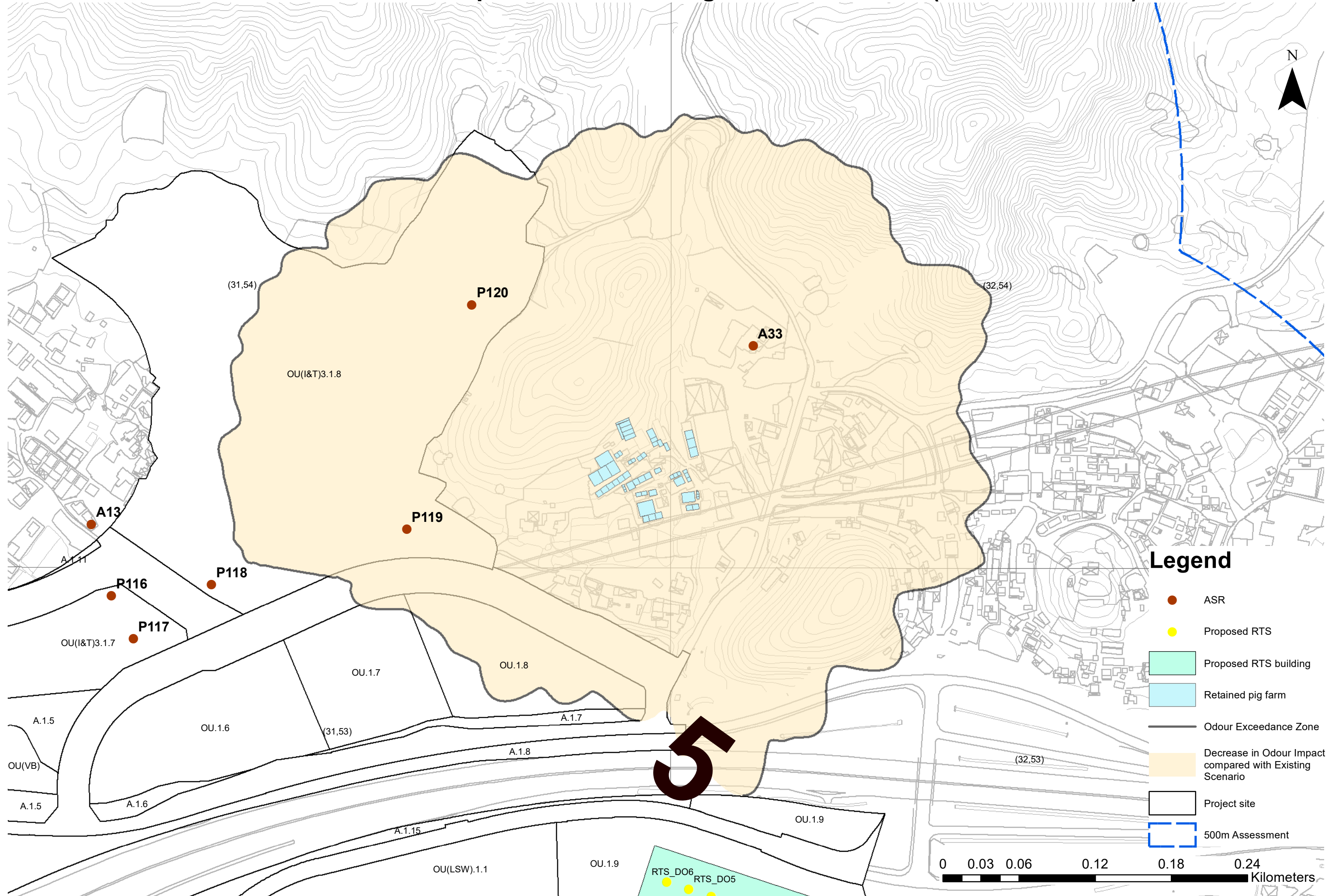
If the odour emission sources are found to be wake-affected point sources, the 1-hour to 1-second conversion factors from Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales (NSW Approved Method) for wake-affected point sources would then be adopted. The conversion factors for wake-affected point sources converting 1-hour average to 1-second average concentration stipulated in NSW Approved Method would be adopted directly to convert the 1-hour concentration predicted by the AERMOD model to 5-second concentration as a conservative approach. The conversion factors for different types of source and stability classes are listed in **Table C.1**. Pasquill-Gifford stability refers to the dataset based on the WRF meteorological data.

Table C.1 Conversion Factors to 5-second Mean Concentration

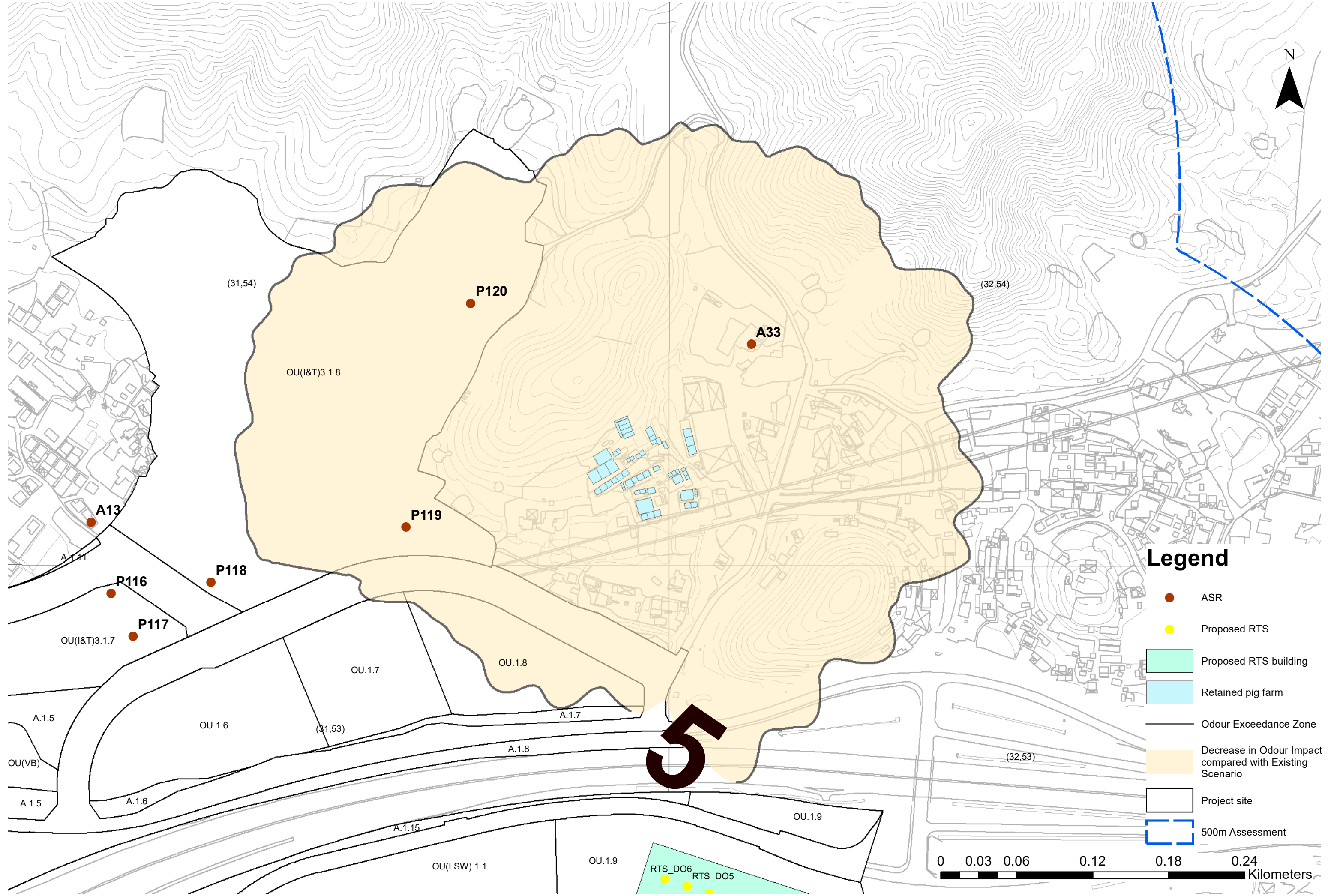
Pasquill Stability Class	Conversion Factor	
	Wake Affected Point Source / Volume Source	Area
A	2.3	2.5
B	2.3	2.5
C	2.3	2.5
D	2.3	2.5
E	2.3	2.3
F	2.3	2.3

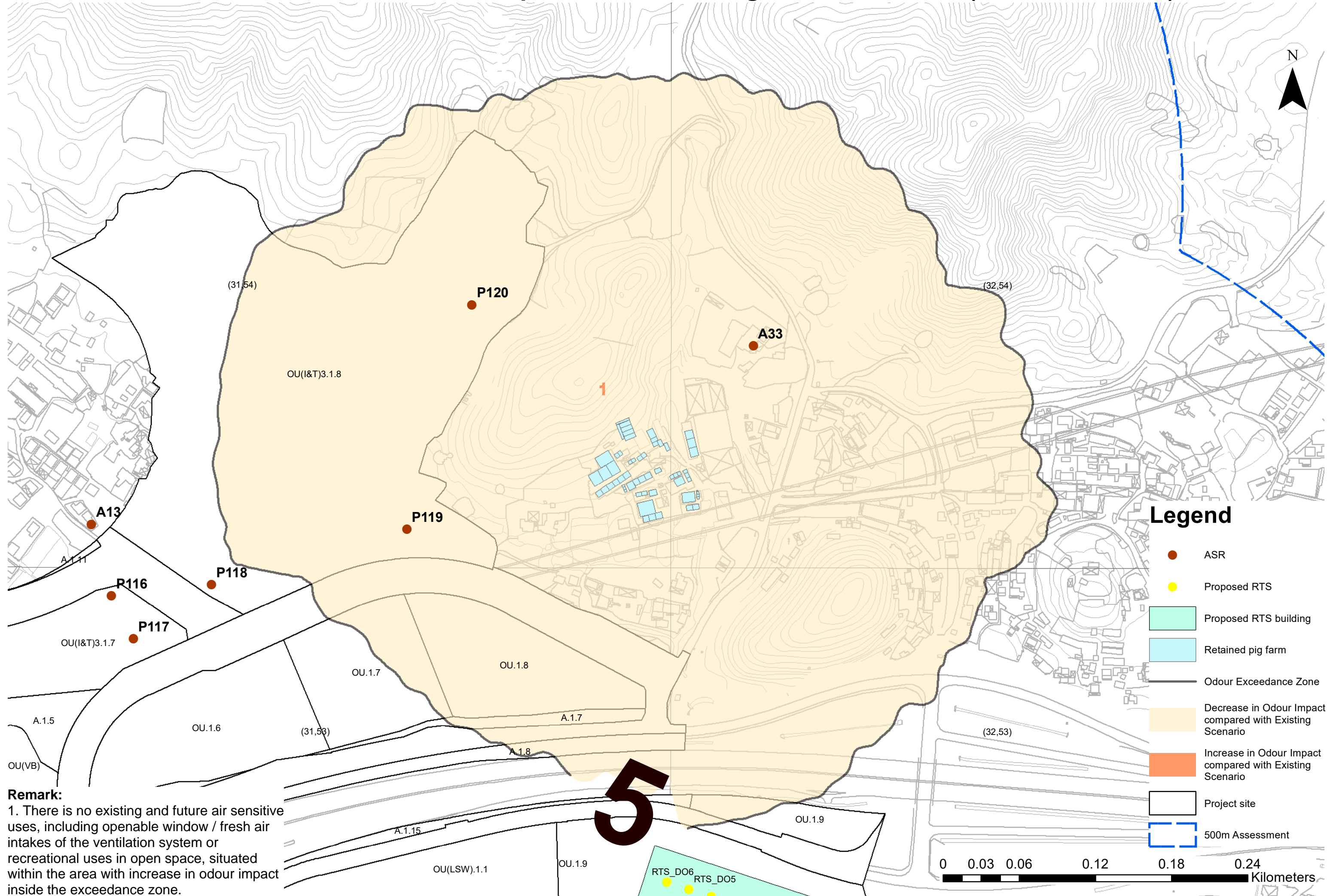
Appendix D

Appendix D Contour Plot for Odour Impact at Retained Pig Farm at 1.5 mAG (Future Scenario)

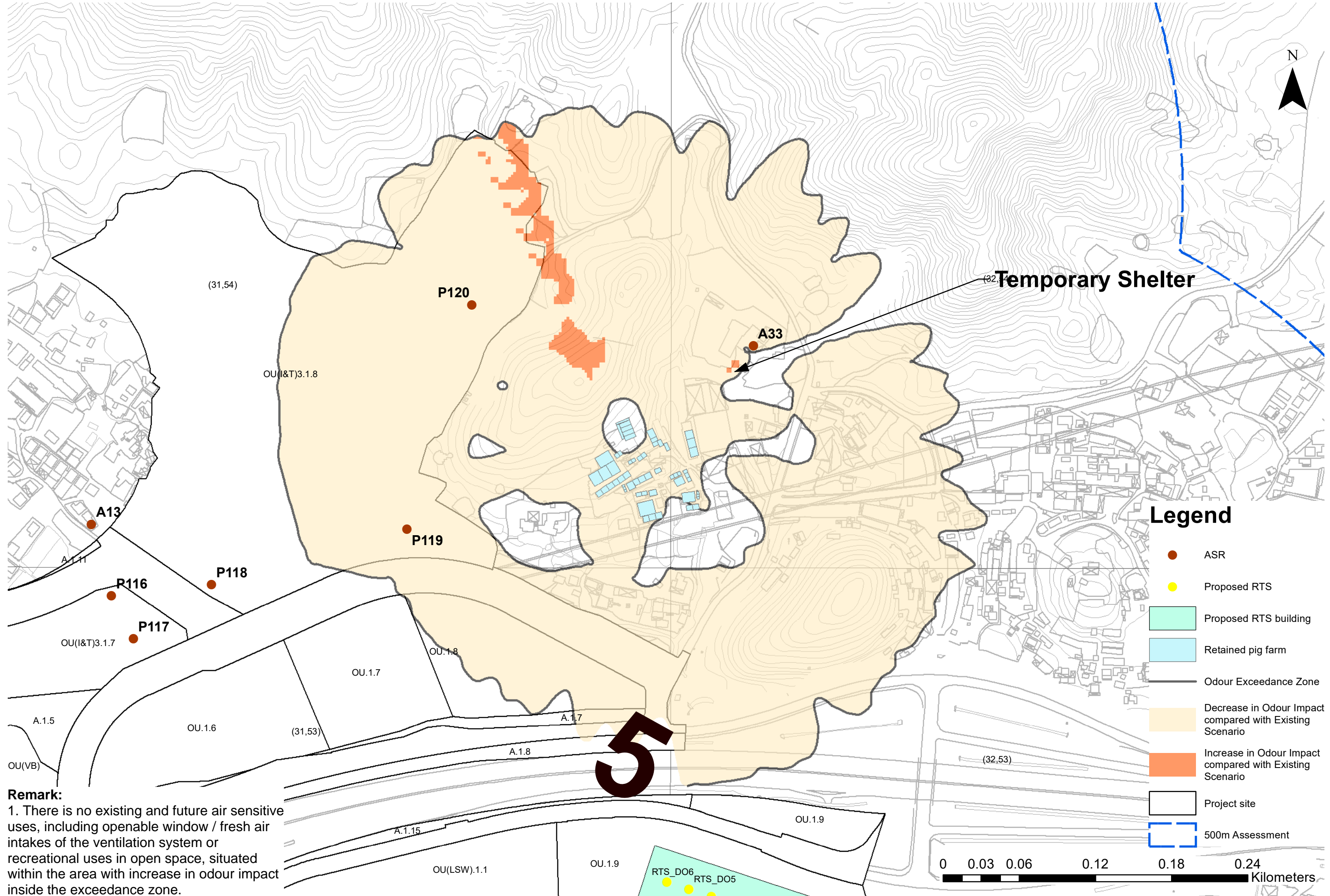


Appendix D Contour Plot for Odour Impact at Retained Pig Farm at 5 mAG (Future Scenario)



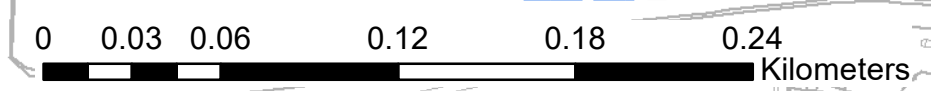


Appendix D Contour Plot for Odour Impact at Retained Pig Farm at 15 mAG (Future Scenario)

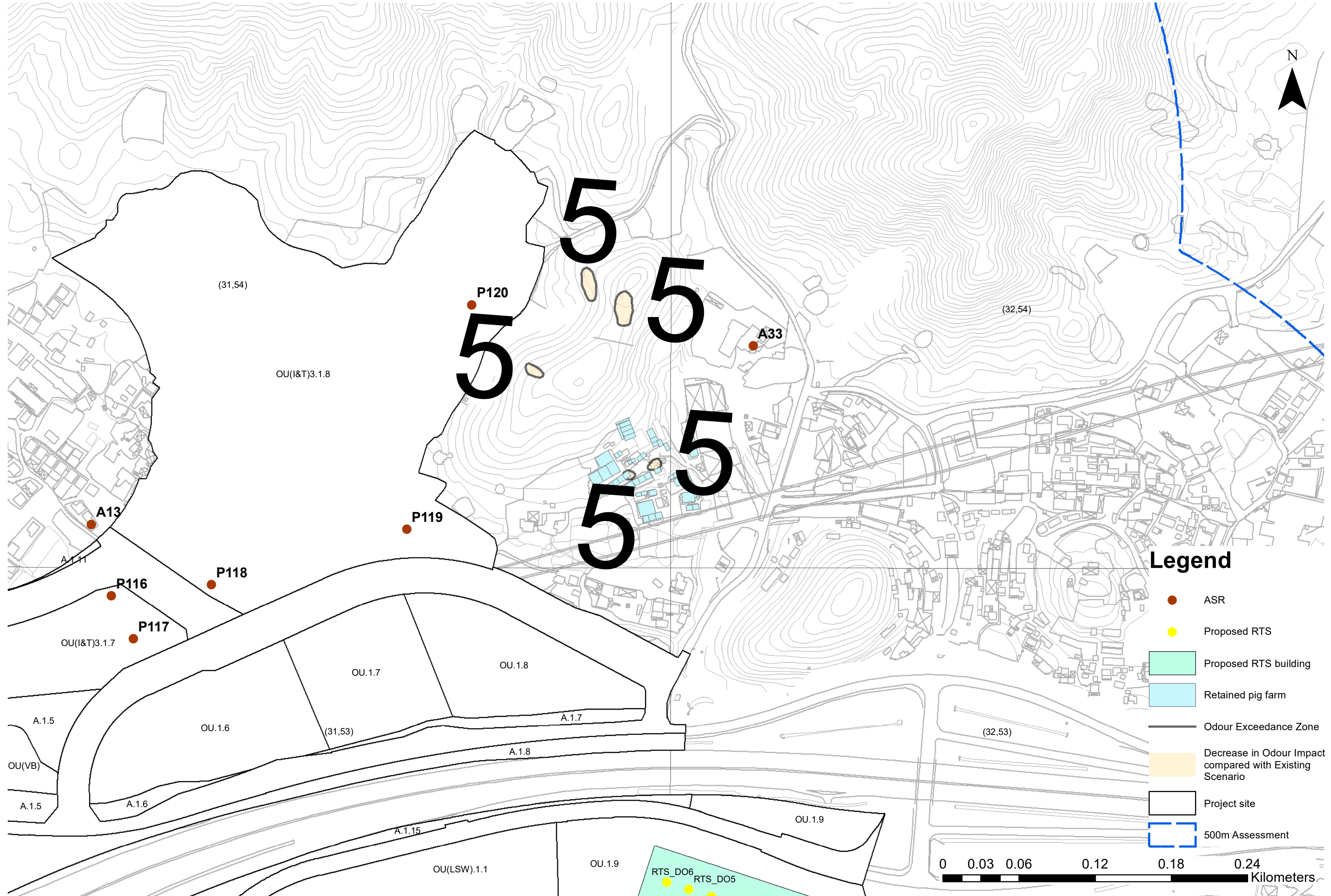


Remark:
 1. There is no existing and future air sensitive uses, including openable window / fresh air intakes of the ventilation system or recreational uses in open space, situated within the area with increase in odour impact inside the exceedance zone.

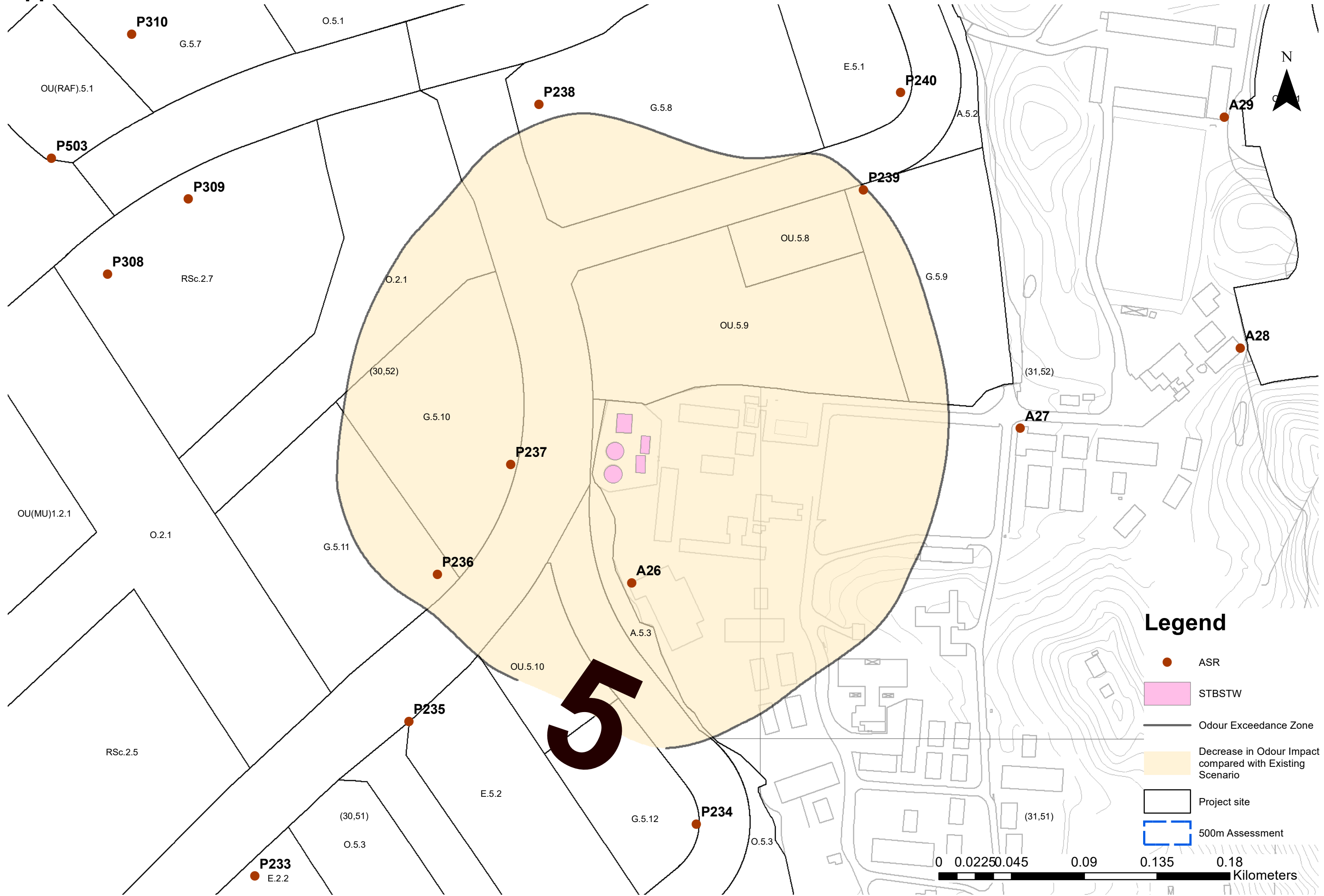
- Legend**
- ASR
 - Proposed RTS
 - Proposed RTS building
 - Retained pig farm
 - Odour Exceedance Zone
 - Decrease in Odour Impact compared with Existing Scenario
 - Increase in Odour Impact compared with Existing Scenario
 - Project site
 - 500m Assessment



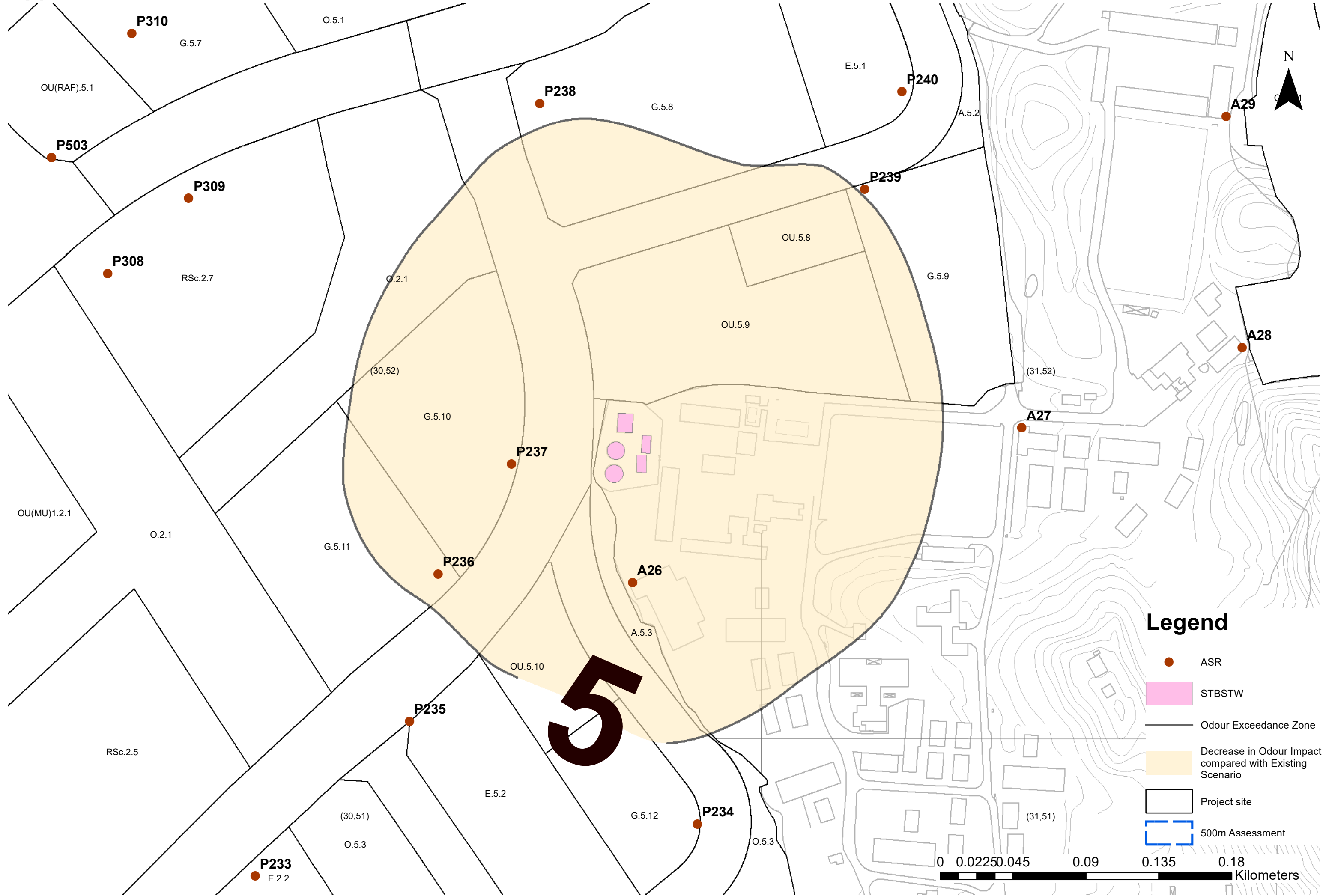
Appendix D Contour Plot for Odour Impact at Retained Pig Farm at 20 mAG (Future Scenario)



Contour Plot for Odour Impact at STBSTW at 1.5 mAG (Future Scenario)



Contour Plot for Odour Impact at STBSTW at 5 mAG (Future Scenario)



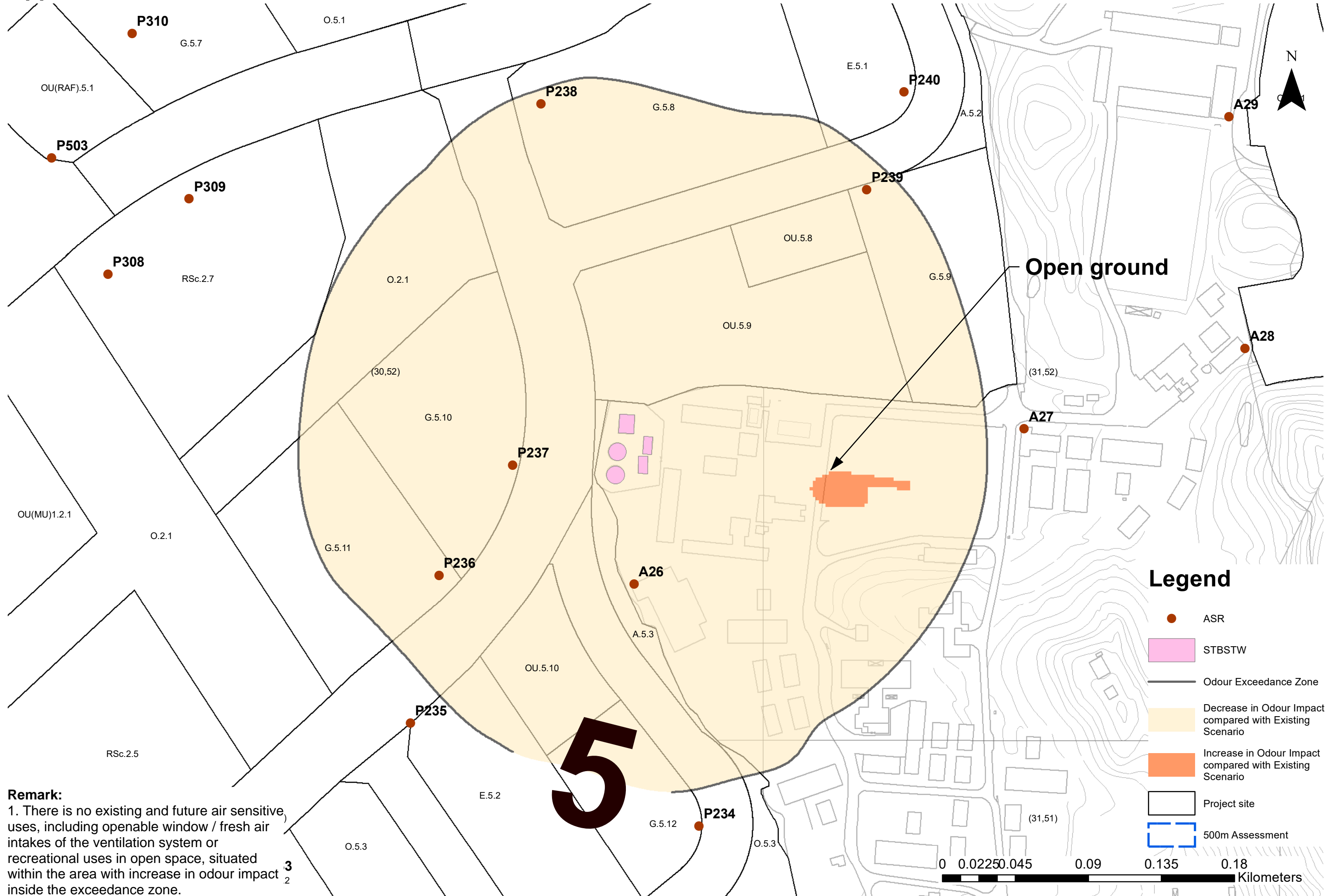
5

Legend

- ASR
- STBSTW
- Odour Exceedance Zone
- Decrease in Odour Impact compared with Existing Scenario
- Project site
- 500m Assessment

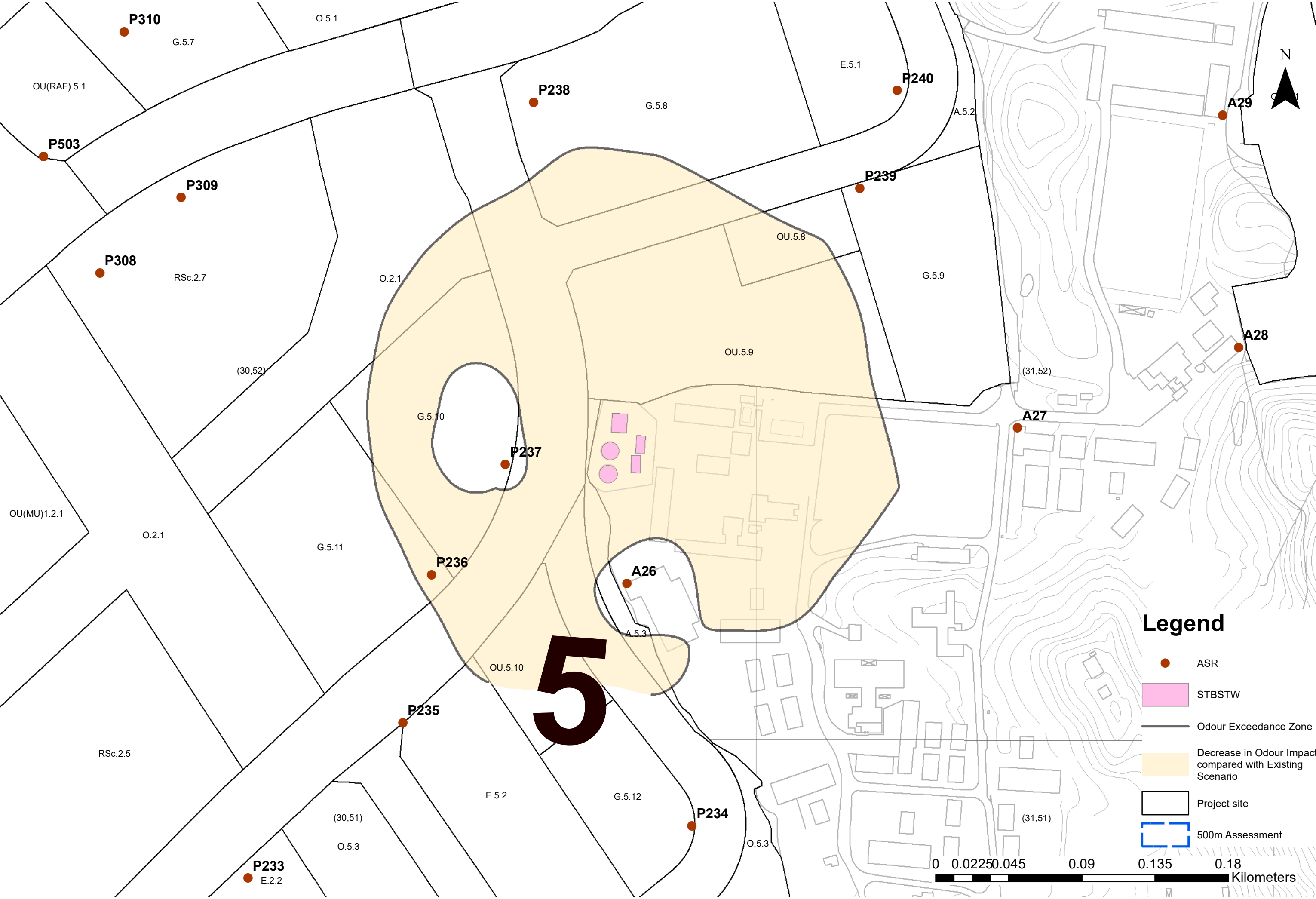
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Contour Plot for Odour Impact at STBSTW at 10 mAG (Future Scenario)



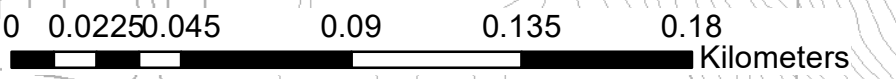
Appendix D

Contour Plot for Odour Impact at STBSTW at 15 mAG (Future Scenario)



Legend

- ASR
- STBSTW
- Odour Exceedance Zone
- Decrease in Odour Impact compared with Existing Scenario
- Project site
- 500m Assessment



5

Appendix D

Contour Plot for Odour Impact at STBSTW at 20 mAG (Future Scenario)

