APPENDIX 3A CALCULATIONS OF LAND USE PARAMETERS AND LAND USE FIGURES

Appendix 3A - Detailed Calculations of Albedo, Bowen Ratio and Surface Roughness

10km x 10km Area for Lamma Island

Land Cover	Area (km^2)	Fraction of Total Area	Bowen Ratio (Bo)	Albedo (r)	ASR
Deciduous Forest	12.959	0.130	0.750	0.163	A1, A2, A3, A25, A26
Urban	4.148	0.041	1.500	0.180	
Grasslands/Herbaceous	1.228	0.012	0.800	0.185	
Open Water	81.665	0.817	0.100	0.100	
		Average:	**0.149**	**0.113**	

10km x 10km Area for Cheung Chau

Land Cover	Area (km^2)	Fraction of Total Area	Bowen Ratio (Bo)	Albedo (r)	ASR
Deciduous Forest	15.255	0.153	0.750	0.163	A24, A56, A57, A58
Urban	1.047	0.010	1.500	0.180	
Grasslands/Herbaceous	0.188	0.002	0.800	0.185	
Open Water	83.509	0.835	0.100	0.100	
		Average:	**0.140**	**0.111**	

10km x 10km Area for Hei Ling Chau

Land Cover	Area (km^2)	Fraction of Total Area	Bowen Ratio (Bo)	Albedo (r)	ASR
Deciduous Forest	23.038	0.230	0.750	0.163	A54, A55
Urban	2.252	0.023	1.500	0.180	
Grasslands/Herbaceous	1.720	0.017	0.800	0.185	
Open Water	72.990	0.730	0.100	0.100	
		Average:	**0.175**	**0.118**	

10km x 10km Area for Southern part of Lantau Island

Land Cover	Area (km^2)	Fraction of Total Area	Bowen Ratio (Bo)	Albedo (r)	ASR
Deciduous Forest	50.132	0.501	0.750	0.163	A52, A53
Urban	4.803	0.048	1.500	0.180	
Grasslands/Herbaceous	8.043	0.080	0.800	0.185	
Open Water	37.022	0.370	0.100	0.100	
		Average:	**0.370**	**0.142**	

10km x 10km Area for Northern part of Lantau Island

Land Cover	Area (km^2)	Fraction of Total Area	Bowen Ratio (Bo)	Albedo (r)	ASR
Deciduous Forest	30.629	0.306	0.750	0.163	A45, A46, A47, A48, A49, A50, A51, A61
Urban	7.129	0.071	1.500	0.180	
Grasslands/Herbaceous	3.675	0.037	0.800	0.185	
Open Water	58.567	0.586	0.100	0.100	
		Average:	**0.243**	**0.128**	

10km x 10km Area for Tsing Yi Area

Land Cover	Area (km^2)	Fraction of Total Area	Bowen Ratio (Bo)	Albedo (r)	ASR
Deciduous Forest	26.881	0.269	0.750	0.163	A43, A44, A60
Urban	27.692	0.277	1.500	0.180	
Grasslands/Herbaceous	0.238	0.002	0.800	0.185	
Open Water	45.189	0.452	0.100	0.100	
		Average:	**0.366**	**0.139**	

10km x 10km Area for Kowloon Area

Land Cover	Area (km^2)	Fraction of Total Area	Bowen Ratio (Bo)	Albedo (r)	ASR
Deciduous Forest	23.367	0.234	0.750	0.163	A36, A37, A38, A39, A40, A41, A42
Urban	50.946	0.509	1.500	0.180	
Grasslands/Herbaceous	0.000	0.000	0.800	0.185	
Open Water	25.688	0.257	0.100	0.100	
		Average:	**0.636**	**0.155**	

Appendix 3A - Detailed Calculations of Albedo, Bowen Ratio and Surface Roughness

10km x 10km Area for Eastern part of Hong Kong Island

Land Cover	Area (km^2)	Fraction of Total Area	Bowen Ratio (Bo)	Albedo (r)	ASR
Deciduous Forest	34.331	0.343	0.750	0.163	A30, A31, A32, A33, A34
Urban	43.436	0.434	1.500	0.180	
Grasslands/Herbaceous	0.000	0.000	0.800	0.185	
Open Water	22.232	0.222	0.100	0.100	
		Average:	**0.648**	**0.156**	

10km x 10km Area for Central & Western part of Hong Kong Island

Land Cover	Area (km^2)	Fraction of Total Area	Bowen Ratio (Bo)	Albedo (r)	ASR
Deciduous Forest	20.516	0.205	0.750	0.163	A4, A6, A7, A10, A12, A15, A35
Urban	33.424	0.334	1.500	0.180	
Grasslands/Herbaceous	0.849	0.008	0.800	0.185	
Open Water	45.211	0.452	0.100	0.100	
		Average:	**0.380**	**0.140**	

10km x 10km Area for Southeastern part of Hong Kong Island

Land Cover	Area (km^2)	Fraction of Total Area	Bowen Ratio (Bo)	Albedo (r)	ASR
Deciduous Forest	39.435	0.394	0.750	0.163	A27, A28, A29
Urban	10.902	0.109	1.500	0.180	
Grasslands/Herbaceous	1.098	0.011	0.800	0.185	
Open Water	48.566	0.486	0.100	0.100	
		Average:	**0.304**	**0.134**	

10km x 10km Area for Southwestern part of Hong Kong Island

Land Cover	Area (km^2)	Fraction of Total Area	Bowen Ratio (Bo)	Albedo (r)	ASR
Deciduous Forest	27.720	0.277	0.750	0.163	A5, A8, A9, A11, A13, A14, A16, A17, A18, A19, A20, A21, A22, A23, A59
Urban	20.939	0.209	1.500	0.180	
Grasslands/Herbaceous	1.758	0.018	0.800	0.185	
Open Water	49.583	0.496	0.100	0.100	
		Average:	**0.320**	**0.136**	

Notes:

(a) Bowen ratio was calculated based on the area-weighted geometric mean within 10km x 10km area from the Project Site. Considering the climate in Hong Kong covers dry and wet season throughout the year, bowen ratios for average moisture conditions have been adopted. With reference to Table A-2 of the AERSURFACE User's Guide 2008 (revised in 2013), the bowen ratio for Urban Area (Class 22 Urban), Class 41 Deciduous Forest, Class 71 Grasslands/Herbaceous and Class 11 Open Water is assumed to be 1.5, 0.75, 0.8 and 0.1, respectively.

(b) Albedo was calculated based on the area-weighted arithmetic mean within 10km x 10km area from the Project Site. With reference to Table A-1 of the AERSURFACE User's Guide 2008 (revised in 2013), the albedo for Urban Area (Class 22 Urban), Class 41 Deciduous Forest, Class 71 Grasslands/Herbaceous and Class 11 Open Water is assumed to be 0.18, 0.163, 0.185 and 0.1, respectively.

(c) The average of the albedo and bowen ratio values in spring, summer and autumn for each land use was used.

Appendix 3A - Detailed Calculations of Albedo, Bowen Ratio and Surface Roughness

PATH Grid	Sector (degree)	Land Use Type	Area (km^2)	Fraction of Section Total Area	Distance (km)	Weighting	Surface Roughness (Zo) [(a)]	Resultant Surface Roughness (Zo) (m) [(a)]	Albedo (r)	Bowen Ratio (Bo)	ASR
20,25	40 - 140	Urban	0.398	0.46	0.26	1.75	1.000	0.860	0.142	0.370	A53
		Deciduous Forest	0.475	0.54	0.74	0.74	0.600				
	140 - 235	Grasslands/Herbaceous	0.125	0.15	0.24	0.63	0.065	0.004	0.142	0.370	
		Open Water	0.704	0.85	0.62	1.37	0.001				
	235 - 40	Deciduous Forest	1.439				0.600	0.600	0.142	0.370	
22,28	40 - 80	Open Water	0.202	0.58	0.50	1.16	0.001	0.006	0.142	0.370	A52
		Deciduous Forest	0.147	0.42	0.90	0.47	0.600				
	80 - 140	Open Water	0.523				0.001	0.001	0.142	0.370	
	140 - 200	Deciduous Forest	0.523				0.600	0.600	0.142	0.370	
	200 - 265	Urban	0.128	0.23	0.32	0.71	1.000	0.189	0.142	0.370	
		Grasslands/Herbaceous	0.439	0.77	0.70	1.11	0.065				
	265 - 330	Deciduous Forest	0.194	0.34	0.36	0.95	0.600	0.211	0.142	0.370	
		Grasslands/Herbaceous	0.373	0.66	0.78	0.84	0.065				
	330 - 40	Deciduous Forest	0.610				0.600	0.600	0.142	0.370	
23,30	240 - 345	Deciduous Forest	0.050	0.05	0.18	0.30	0.600	0.024	0.128	0.243	A61
		Open Water	0.199	0.22	0.34	0.63	0.001		0.128	0.243	
		Grasslands/Herbaceous	0.667	0.73	0.68	1.07	0.065		0.128	0.243	
	345 - 240	Grasslands/Herbaceous	2.225				0.065	0.065	0.128	0.243	
24,32	65 - 120	Urban	0.195	0.41	0.42	0.97	1.000	0.050	0.128	0.243	A48
		Open Water	0.284	0.59	0.80	0.75	0.001				
	120 - 170	Urban	0.436				1.000	1.000	0.128	0.243	
	170 - 65	Urban	0.150	0.07	0.12	0.54	1.000	0.093	0.128	0.243	
		Grasslands/Herbaceous	2.075	0.93	0.26	3.59	0.065				
25,21	15 - 95	Urban	0.110	0.16	0.24	0.65	1.000	0.011	0.111	0.140	A56, A57
		Open Water	0.588	0.84	0.68	1.23	0.001				
	95 - 130	Urban	0.096	0.31	0.37	0.85	1.000	0.772	0.111	0.140	
		Deciduous Forest	0.210	0.69	0.79	0.87	0.600				
	130 - 180	Urban	0.235	0.54	0.48	1.13	1.000	0.105	0.111	0.140	
		Open Water	0.202	0.46	0.84	0.55	0.001				
	180 - 225	Open Water	0.037	0.09	0.21	0.46	0.001	0.134	0.111	0.140	
		Urban	0.075	0.19	0.45	0.42	1.000				
		Deciduous Forest	0.280	0.71	0.76	0.93	0.600				
	225 - 335	Open Water	0.960				0.001	0.001	0.111	0.140	
	335 - 15	Urban	0.166	0.48	0.45	1.06	1.000	0.827	0.111	0.140	
		Deciduous Forest	0.183	0.52	0.84	0.63	0.600				
25,22	45 - 110	Grasslands/Herbaceous	0.326	0.58	0.38	1.51	0.065	0.022	0.111	0.140	A58
		Open Water	0.241	0.42	0.82	0.52	0.001				
	110 - 160	Deciduous Forest	0.086	0.20	0.26	0.76	0.600	0.014	0.111	0.140	
		Open Water	0.350	0.80	0.74	1.08	0.001				
	160 - 190	Deciduous Forest	0.052	0.20	0.30	0.66	0.600	0.826	0.111	0.140	
		Urban	0.210	0.80	0.72	1.11	1.000				
	190 - 220	Deciduous Forest	0.142	0.54	0.52	1.04	0.600	0.072	0.111	0.140	
		Open Water	0.120	0.46	0.88	0.52	0.001				
	220 - 290	Open Water	0.611				0.001	0.001	0.111	0.140	
	290 - 45	Deciduous Forest	0.179	0.18	0.28	0.64	0.600	0.009	0.111	0.140	
		Open Water	0.824	0.82	0.68	1.21	0.001				
25,31	30 - 190	Open Water	1.396				0.001	0.001	0.128	0.243	A49
	190 - 220	Urban	0.057	0.22	0.30	0.73	1.000	0.017	0.128	0.243	
		Open Water	0.205	0.78	0.74	1.06	0.001				
	220 - 275	Deciduous Forest	0.480				0.600	0.600	0.128	0.243	
	275 - 30	Deciduous Forest	0.107	0.11	0.20	0.53	0.600	0.006	0.128	0.243	
		Open Water	0.897	0.89	0.66	1.35	0.001				
26,21	20 - 200	Deciduous Forest	0.082	0.05	0.06	0.87	0.600	0.009	0.111	0.140	A24
		Open Water	1.488	0.95	0.56	1.69	0.001				
	200 - 250	Deciduous Forest	0.117	0.27	0.38	0.70	0.600	0.014	0.111	0.140	
		Open Water	0.320	0.73	0.72	1.02	0.001				
	250 - 300	Deciduous Forest	0.088	0.20	0.38	0.53	0.600	0.846	0.111	0.140	
		Urban	0.349	0.80	0.74	1.08	1.000				
	300 - 20	Deciduous Forest	0.115	0.17	0.22	0.75	0.600	0.012	0.111	0.140	
		Open Water	0.583	0.83	0.70	1.19	0.001				

Appendix 3A - Detailed Calculations of Albedo, Bowen Ratio and Surface Roughness

PATH Grid	Sector (degree)	Land Use Type	Area (km^2)	Fraction of Section Total Area	Distance (km)	Weighting	Surface Roughness (Zo) [(a)]	Resultant Surface Roughness (Zo) (m) [(a)]	Albedo (r)	Bowen Ratio (Bo)	ASR
26,26	45 - 75	Deciduous Forest	0.083	0.32	0.38	0.83	0.600	0.022	0.118	0.175	A55
		Open Water	0.179	0.68	0.76	0.90	0.001				
	75 - 155	Deciduous Forest	0.698				0.600	0.600	0.118	0.175	
	155 - 245	Deciduous Forest	0.055	0.07	0.12	0.58	0.600	0.005	0.118	0.175	
		Open Water	0.730	0.93	0.58	1.60	0.001				
	245 - 315	Deciduous Forest	0.154	0.25	0.30	0.84	0.600	0.018	0.118	0.175	
		Open Water	0.456	0.75	0.74	1.01	0.001				
	315 - 45	Deciduous Forest	0.081	0.10	0.16	0.65	0.600	0.007	0.118	0.175	
		Open Water	0.704	0.90	0.58	1.55	0.001				
26,29	10 - 40	Deciduous Forest	0.038	0.15	0.22	0.66	0.600	0.009	0.128	0.243	A51
		Open Water	0.224	0.85	0.70	1.22	0.001				
	40 - 100	Deciduous Forest	0.336	0.64	0.46	1.40	0.600	0.149	0.128	0.243	
		Open Water	0.187	0.36	0.92	0.39	0.001				
	100 - 330	Deciduous Forest	0.111	0.06	0.06	0.93	0.600	0.007	0.128	0.243	
		Open Water	1.895	0.94	0.46	2.05	0.001				
	330 - 10	Urban	0.130	0.37	0.38	0.98	1.000	0.797	0.128	0.243	
		Deciduous Forest	0.219	0.63	0.80	0.78	0.600				
26,30	0 - 30	Deciduous Forest	0.087	0.33	0.36	0.92	0.600	0.028	0.128	0.243	A50
		Open Water	0.175	0.67	0.78	0.86	0.001				
	30 - 60	Grasslands/Herbaceous	0.019	0.07	0.16	0.46	0.065	0.096	0.128	0.243	
		Deciduous Forest	0.149	0.57	0.52	1.09	0.600				
		Open Water	0.094	0.36	0.90	0.40	0.001				
	60 - 90	Open Water	0.262				0.001	0.001	0.128	0.243	
	90 - 165	Deciduous Forest	0.472	0.72	0.52	1.39	0.600	0.198	0.128	0.243	
		Open Water	0.183	0.28	0.96	0.29	0.001				
	165 - 310	Urban	0.186	0.15	0.14	1.05	1.000	0.017	0.128	0.243	
		Open Water	1.080	0.85	0.56	1.52	0.001				
	310 - 0	Deciduous Forest	0.051	0.12	0.20	0.59	0.600	0.013	0.128	0.243	
		Grasslands/Herbaceous	0.057	0.13	0.40	0.33	0.065				
		Open Water	0.328	0.75	0.70	1.07	0.001				
26,33	40 - 110	Grasslands/Herbaceous	0.611				0.065	0.065	0.128	0.243	A47
	110 - 175	Urban	0.567				1.000	1.000	0.128	0.243	
	175 - 335	Deciduous Forest	1.396				0.600	0.600	0.128	0.243	
	335 - 40	Open Water	0.120	0.21	0.26	0.81	0.001	0.011	0.128	0.243	
		Grasslands/Herbaceous	0.447	0.79	0.70	1.13	0.065				
27,26	35 - 65	Deciduous Forest	0.046	0.18	0.24	0.73	0.600	0.050	0.118	0.175	A54
		Open Water	0.117	0.45	0.60	0.74	0.001				
		Deciduous Forest	0.099	0.38	0.88	0.43	0.600				
	65 - 145	Deciduous Forest	0.076	0.11	0.18	0.60	0.600	0.007	0.118	0.175	
		Open Water	0.622	0.89	0.66	1.35	0.001				
	145 - 210	Deciduous Forest	0.567				0.600	0.600	0.118	0.175	
	210 - 240	Deciduous Forest	0.121	0.46	0.42	1.10	0.600	0.053	0.118	0.175	
		Open Water	0.141	0.54	0.80	0.67	0.001				
	240 - 310	Deciduous Forest	0.611				0.600	0.600	0.118	0.175	
	310 - 35	Deciduous Forest	0.188	0.25	0.26	0.98	0.600	0.023	0.118	0.175	
		Open Water	0.553	0.75	0.74	1.01	0.001				
27,32	30 - 80	Deciduous Forest	0.129	0.30	0.32	0.93	0.600	0.195	0.128	0.243	A45
		Grasslands/Herbaceous	0.307	0.70	0.74	0.95	0.065				
	80 - 260	Grasslands/Herbaceous	0.161	0.10	0.06	1.71	0.065	0.007	0.128	0.243	
		Open Water	1.410	0.90	0.48	1.87	0.001				
	260 - 310	Grasslands/Herbaceous	0.134	0.31	0.38	0.81	0.065	0.211	0.128	0.243	
		Deciduous Forest	0.302	0.69	0.76	0.91	0.600				
	310 - 30	Urban	0.698				1.000	1.000	0.128	0.243	

Appendix 3A - Detailed Calculations of Albedo, Bowen Ratio and Surface Roughness

PATH Grid	Sector (degree)	Land Use Type	Area (km^2)	Fraction of Section Total Area	Distance (km)	Weighting	Surface Roughness (Zo) [(a)]	Resultant Surface Roughness (Zo) (m) [(a)]	Albedo (r)	Bowen Ratio (Bo)	ASR
27,33	50 - 145	Urban	0.054	0.06	0.14	0.46	1.000	0.122	0.128	0.243	A46
		Grasslands/Herbaceous	0.775	0.94	0.60	1.56	0.065				
	145 - 180	Urban	0.154	0.50	0.44	1.15	1.000	0.095	0.128	0.243	
		Open Water	0.151	0.50	0.84	0.59	0.001				
	180 - 220	Urban	0.252	0.72	0.52	1.39	1.000	0.298	0.128	0.243	
		Open Water	0.097	0.28	0.94	0.30	0.001				
	220 - 300	Urban	0.398	0.57	0.42	1.36	1.000	0.873	0.128	0.243	
		Deciduous Forest	0.300	0.43	0.88	0.49	0.600				
	300 - 50	Urban	0.460	0.48	0.30	1.60	1.000	0.420	0.128	0.243	
		Grasslands/Herbaceous	0.500	0.52	0.70	0.74	0.065				
33,36	45 - 100	Deciduous Forest	0.068	0.14	0.25	0.57	0.600	0.566	0.139	0.366	A44, A60
		Urban	0.364	0.76	0.67	1.12	1.000				
		Open Water	0.048	0.10	0.95	0.11	0.001				
	100 - 160	Deciduous Forest	0.043	0.08	0.19	0.44	0.600	0.882	0.139	0.366	
		Urban	0.481	0.92	0.68	1.36	1.000				
	160 - 240	Deciduous Forest	0.698				0.600	0.600	0.139	0.366	
	240 - 270	Deciduous Forest	0.172	0.66	0.53	1.23	0.600	0.622	0.139	0.366	
		Commercial/Industrial/Transport (Not at Airport)	0.090	0.34	0.90	0.38	0.700				
	270 - 300	Deciduous Forest	0.262				0.600	0.600	0.139	0.366	
	300 - 335	Deciduous Forest	0.083	0.27	0.36	0.75	0.600	0.702	0.139	0.366	
		Urban	0.105	0.34	0.65	0.53	1.000				
		Deciduous Forest	0.117	0.38	0.87	0.44	0.600				
	335 - 45	Deciduous Forest	0.065	0.11	0.21	0.52	0.600	0.866	0.139	0.366	
		Urban	0.546	0.89	0.68	1.32	1.000				
33,37	35 - 110	Urban	0.418	0.64	0.46	1.39	1.000	0.200	0.139	0.366	A43
		Open Water	0.237	0.36	0.86	0.42	0.001				
	110 - 140	Urban	0.262				1.000	1.000	0.139	0.366	
	140 - 180	Urban	0.023	0.07	0.14	0.48	1.000	0.778	0.139	0.366	
		Deciduous Forest	0.168	0.48	0.50	0.96	0.600				
		Urban	0.157	0.45	0.88	0.51	1.000				
	180 - 245	Urban	0.046	0.08	0.16	0.51	1.000	0.681	0.139	0.366	
		Deciduous Forest	0.521	0.92	0.60	1.53	0.600				
	245 - 275	Urban	0.104	0.40	0.44	0.90	1.000	0.797	0.139	0.366	
		Deciduous Forest	0.158	0.60	0.84	0.72	0.600				
	275 - 35	Urban	1.047				1.000	1.000	0.139	0.366	
34,23	130 - 160	Urban	0.022	0.08	0.18	0.46	1.000	0.123	0.113	0.149	A1, A3
		Deciduous Forest	0.127	0.49	0.53	0.92	0.600				
		Open Water	0.113	0.43	0.86	0.50	0.001				
	160 - 230	Deciduous Forest	0.143	0.23	0.26	0.89	0.600	0.655	0.113	0.149	
		Commercial/Industrial/Transport (Not at Airport)	0.468	0.77	0.66	1.16	0.700				
	230 - 340	Open Water	0.960				0.001	0.001	0.113	0.149	
	340 - 130	Urban	0.139	0.11	0.07	1.61	1.000	0.781	0.113	0.149	
		Deciduous Forest	1.170	0.89	0.59	1.51	0.600				
34,24	70 - 130	Deciduous Forest	0.423	0.81	0.59	1.36	0.600	0.256	0.113	0.149	A2
		Open Water	0.101	0.19	0.92	0.21	0.001				
	130 - 205	Deciduous Forest	0.654				0.600	0.600	0.113	0.149	
	205 - 250	Deciduous Forest	0.264	0.67	0.53	1.28	0.600	0.148	0.113	0.149	
		Open Water	0.129	0.33	0.92	0.36	0.001				
	250 - 70	Open Water	1.571				0.001	0.001	0.113	0.149	
35,22	45 - 95	Deciduous Forest	0.300	0.69	0.53	1.31	0.600	0.148	0.113	0.149	A25
		Open Water	0.136	0.31	0.86	0.37	0.001				
	95 - 165	Deciduous Forest	0.611				0.600	0.600	0.113	0.149	
	165 - 250	Open Water	0.742				0.001	0.001	0.113	0.149	
	250 - 285	Open Water	0.113	0.37	0.39	0.94	0.001	0.020	0.113	0.149	
		Commercial/Industrial/Transport (Not at Airport)	0.192	0.63	0.79	0.80	0.700				
	285 - 340	Deciduous Forest	0.322	0.67	0.39	1.70	0.600	0.664	0.113	0.149	
		Urban	0.158	0.33	0.79	0.42	1.000				
	340 - 45	Deciduous Forest	0.567				0.600	0.600	0.113	0.149	

Appendix 3A - Detailed Calculations of Albedo, Bowen Ratio and Surface Roughness

PATH Grid	Sector (degree)	Land Use Type	Area (km^2)	Fraction of Section Total Area	Distance (km)	Weighting	Surface Roughness (Zo) [(a)]	Resultant Surface Roughness (Zo) (m) [(a)]	Albedo (r)	Bowen Ratio (Bo)	ASR
35,27	60 - 110	Deciduous Forest	0.436				0.600	0.600	0.136	0.320	A5
	110 - 155	Urban	0.393				1.000	1.000	0.136	0.320	
	155 - 320	Commercial/Industrial/Transport (Not at Airport)	0.168	0.12	0.07	1.78	0.700	0.035	0.136	0.320	
		Open Water	1.271	0.88	0.59	1.49	0.001				
	320 - 60	Urban	0.873				1.000	1.000	0.136	0.320	
35,28	110 - 150	Urban	0.349				1.000	1.000	0.140	0.380	A4
	150 - 280	Urban	0.060	0.05	0.07	0.80	1.000	0.010	0.140	0.380	
		Open Water	1.075	0.95	0.59	1.60	0.001				
	280 - 340	Deciduous Forest	0.232	0.44	0.46	0.96	0.600	0.040	0.140	0.380	
		Open Water	0.291	0.56	0.79	0.70	0.001				
	340 - 110	Deciduous Forest	1.134				0.600	0.600	0.140	0.380	
35,29	40 - 90	Urban	0.436				1.000	1.000	0.140	0.380	A7
	90 - 170	Urban	0.237	0.34	0.33	1.03	1.000	0.787	0.140	0.380	
		Deciduous Forest	0.461	0.66	0.72	0.91	0.600				
	170 - 265	Urban	0.119	0.14	0.07	2.19	1.000	0.827	0.140	0.380	
		Deciduous Forest	0.710	0.86	0.66	1.30	0.600				
	265 - 40	Urban	0.226	0.19	0.13	1.46	1.000	0.035	0.140	0.380	
		Open Water	0.952	0.81	0.59	1.36	0.001				
36,21	15 - 60	Open Water	0.393				0.001	0.001	0.113	0.149	A26
	60 - 200	Grasslands/Herbaceous	1.221				0.065	0.065	0.113	0.149	
	200 - 330	Open Water	0.275	0.24	0.26	0.93	0.001	0.028	0.113	0.149	
		Deciduous Forest	0.859	0.76	0.74	1.02	0.600				
	330 - 15	Open Water	0.143	0.36	0.38	0.96	0.001	0.007	0.113	0.149	
		Grasslands/Herbaceous	0.249	0.64	0.78	0.81	0.065				
36,26	15 - 95	Deciduous Forest	0.119	0.17	0.20	0.86	0.600	0.691	0.136	0.320	A8, A13
		Urban	0.192	0.27	0.46	0.60	1.000				
		Deciduous Forest	0.388	0.56	0.79	0.70	0.600				
	95 - 125	Urban	0.086	0.33	0.39	0.83	1.000	0.772	0.136	0.320	
		Deciduous Forest	0.176	0.67	0.79	0.85	0.600				
	125 - 340	Urban	0.685	0.37	0.13	2.77	1.000	0.146	0.136	0.320	
		Open Water	1.191	0.63	0.59	1.07	0.001				
	340 - 15	Deciduous Forest	0.149	0.49	0.46	1.06	0.600	0.722	0.136	0.320	
		Urban	0.157	0.51	0.86	0.60	1.000				
36,27	145 - 205	Deciduous Forest	0.195	0.37	0.39	0.94	0.600	0.758	0.136	0.320	A9, A11
		Urban	0.329	0.63	0.79	0.80	1.000				
	205 - 285	Deciduous Forest	0.082	0.12	0.13	0.90	0.600	0.099	0.136	0.320	
		Urban	0.227	0.33	0.46	0.71	1.000				
		Open Water	0.389	0.56	0.79	0.71	0.001				
	285 - 335	Urban	0.099	0.23	0.26	0.87	1.000	0.754	0.136	0.320	
		Deciduous Forest	0.337	0.77	0.72	1.07	0.600				
	335 - 145	Urban	0.383	0.26	0.13	1.96	1.000	0.820	0.136	0.320	
		Deciduous Forest	1.100	0.74	0.59	1.25	0.600				
36,28	140 - 195	Urban	0.028	0.06	0.13	0.44	1.000	0.719	0.140	0.380	A6
		Deciduous Forest	0.330	0.69	0.53	1.30	0.600				
		Urban	0.123	0.26	0.92	0.28	1.000				
	195 - 285	Urban	0.597	0.76	0.46	1.65	1.000	0.366	0.140	0.380	
		Open Water	0.189	0.24	0.86	0.28	0.001				
	285 - 140	Deciduous Forest	1.876				0.600	0.600	0.140	0.380	
36,29	40 - 110	Urban	0.611				1.000	1.000	0.140	0.380	A10
	110 - 170	Urban	0.200	0.38	0.36	1.06	1.000	0.799	0.140	0.380	
		Deciduous Forest	0.323	0.62	0.74	0.83	0.600				
	170 - 245	Urban	0.039	0.06	0.14	0.42	1.000	0.668	0.140	0.380	
		Deciduous Forest	0.616	0.94	0.60	1.57	0.600				
	245 - 275	Urban	0.262				1.000	1.000	0.140	0.380	
	275 - 40	Urban	0.604	0.55	0.34	1.63	1.000	0.171	0.140	0.380	
		Open Water	0.487	0.45	0.80	0.56	0.001				

Appendix 3A - Detailed Calculations of Albedo, Bowen Ratio and Surface Roughness

PATH Grid	Sector (degree)	Land Use Type	Area (km^2)	Fraction of Section Total Area	Distance (km)	Weighting	Surface Roughness (Zo) [(a)]	Resultant Surface Roughness (Zo) (m) [(a)]	Albedo (r)	Bowen Ratio (Bo)	ASR
37,25	80 - 135	Urban	0.089	0.19	0.46	0.40	1.000	0.811	0.136	0.320	A22
		Deciduous Forest	0.188	0.39	0.66	0.60	0.600				
		Urban	0.203	0.42	0.92	0.46	1.000				
	135 - 290	Open Water	1.352				0.001	0.001	0.136	0.320	
	290 - 80	Urban	0.105	0.08	0.20	0.41	1.000	0.025	0.136	0.320	
		Open Water	0.563	0.43	0.33	1.31	0.001				
		Commercial/Industrial/Transport (Not at Airport)	0.407	0.31	0.53	0.59	0.700				
		Deciduous Forest	0.235	0.18	0.79	0.23	0.600				
37,26	80 - 110	Deciduous Forest	0.132	0.50	0.46	1.09	0.600	0.633	0.136	0.320	A16
		Commercial/Industrial/Transport (Not at Airport)	0.130	0.50	0.86	0.58	0.700				
	110 - 140	Commercial/Industrial/Transport (Not at Airport)	0.053	0.20	0.33	0.61	0.700	0.018	0.136	0.320	
		Open Water	0.172	0.66	0.66	1.00	0.001				
		Urban	0.037	0.14	0.92	0.15	1.000				
	140 - 285	Urban	0.163	0.13	0.26	0.49	1.000	0.006	0.136	0.320	
		Open Water	1.102	0.87	0.66	1.32	0.001				
	285 - 355	Urban	0.611				1.000	1.000	0.136	0.320	
	355 - 80	Deciduous Forest	0.742				0.600	0.600	0.136	0.320	
37,28	110 - 305	Deciduous Forest	1.701				0.600	0.600	0.140	0.380	A12
	305 - 345	Deciduous Forest	0.201	0.58	0.46	1.25	0.600	0.694	0.140	0.380	
		Urban	0.148	0.42	0.86	0.50	1.000				
	345 - 110	Deciduous Forest	0.296	0.27	0.26	1.03	0.600	0.772	0.140	0.380	
		Urban	0.795	0.73	0.72	1.01	1.000				
38,25	95 - 130	Urban	0.017	0.06	0.13	0.43	1.000	0.025	0.136	0.320	A18, A23
		Commercial/Industrial/Transport (Not at Airport)	0.054	0.18	0.33	0.54	0.700				
		Open Water	0.234	0.77	0.72	1.06	0.001				
	130 - 190	Urban	0.147	0.28	0.33	0.85	1.000	0.759	0.136	0.320	
		Deciduous Forest	0.377	0.72	0.72	1.00	0.600				
	190 - 245	Urban	0.032	0.07	0.13	0.51	1.000	0.230	0.136	0.320	
		Deciduous Forest	0.304	0.63	0.53	1.21	0.600				
		Open Water	0.144	0.30	0.86	0.35	0.001				
	245 - 275	Urban	0.262				1.000	1.000	0.136	0.320	
	275 - 95	Open Water	0.483	0.31	0.13	2.34	0.001	0.010	0.136	0.320	
		Urban	0.673	0.43	0.46	0.93	1.000				
		Deciduous Forest	0.415	0.26	0.86	0.31	0.600				
38,27	50 - 350	Deciduous Forest	2.618				0.600	0.600	0.136	0.320	A14, A17, A59
	350 - 50	Urban	0.434	0.83	0.58	1.43	1.000	0.942	0.136	0.320	
		Deciduous Forest	0.089	0.17	0.91	0.19	0.600				
38,36	70 - 100	Urban	0.118	0.45	0.44	1.02	1.000	0.822	0.155	0.636	A42
		Deciduous Forest	0.144	0.55	0.86	0.64	0.600				
	100 - 295	Urban	1.701				1.000	1.000	0.155	0.636	
	295 - 70	Deciduous Forest	1.178				0.600	0.600	0.155	0.636	
39,25	40 - 95	Commercial/Industrial/Transport (Not at Airport)	0.480				0.700	0.700	0.136	0.320	A19
	95 - 190	Deciduous Forest	0.829				0.600	0.600	0.136	0.320	
	190 - 280	Deciduous Forest	0.098	0.12	0.13	0.95	0.600	0.014	0.136	0.320	
		Open Water	0.687	0.88	0.66	1.33	0.001				
	280 - 40	Commercial/Industrial/Transport (Not at Airport)	0.395	0.38	0.20	1.91	0.700	0.667	0.136	0.320	
		Deciduous Forest	0.652	0.62	0.72	0.86	0.600				
39,28	110 - 250	Deciduous Forest	1.222				0.600	0.600	0.140	0.380	A15
	250 - 110	Urban	1.920				1.000	1.000	0.140	0.380	
39,32	140 - 190	Urban	0.232	0.53	0.46	1.16	1.000	0.114	0.155	0.636	A37
		Open Water	0.204	0.47	0.88	0.53	0.001				
	190 - 220	Urban	0.262				1.000	1.000	0.155	0.636	
	220 - 350	Commercial/Industrial/Transport (Not at Airport)	0.243	0.21	0.10	2.14	0.700	0.049	0.155	0.636	
		Open Water	0.892	0.79	0.54	1.46	0.001				
	350 - 140	Urban	1.308				1.000	1.000	0.155	0.636	
39,35	90 - 120	Urban	0.160	0.61	0.50	1.22	1.000	0.873	0.155	0.636	A41
		Deciduous Forest	0.102	0.39	0.88	0.44	0.600				
	120 - 90	Urban	2.878				1.000	1.000	0.155	0.636	

Appendix 3A - Detailed Calculations of Albedo, Bowen Ratio and Surface Roughness

PATH Grid	Sector (degree)	Land Use Type	Area (km^2)	Fraction of Section Total Area	Distance (km)	Weighting	Surface Roughness (Zo) [(a)]	Resultant Surface Roughness (Zo) (m) [(a)]	Albedo (r)	Bowen Ratio (Bo)	ASR
40,24	45 - 75	Commercial/Industrial/Transport (Not at Airport)	0.030	0.11	0.20	0.58	0.700	0.042	0.136	0.320	A20
		Deciduous Forest	0.064	0.24	0.46	0.53	0.600				
		Open Water	0.168	0.64	0.79	0.81	0.001				
	75 - 150	Commercial/Industrial/Transport (Not at Airport)	0.051	0.08	0.20	0.40	0.700	0.012	0.136	0.320	
		Deciduous Forest	0.083	0.13	0.37	0.34	0.600				
		Open Water	0.520	0.79	0.66	1.21	0.001				
	150 - 330	Deciduous Forest	0.246	0.16	0.20	0.79	0.600	0.012	0.136	0.320	
		Open Water	1.324	0.84	0.66	1.28	0.001				
	330 - 45	Deciduous Forest	0.654				0.600	0.600	0.136	0.320	
40,25	100 - 185	Commercial/Industrial/Transport (Not at Airport)	0.133	0.18	0.20	0.91	0.700	0.071	0.136	0.320	A21
		Deciduous Forest	0.186	0.25	0.42	0.60	0.600				
		Open Water	0.422	0.57	0.72	0.79	0.001				
	185 - 250	Commercial/Industrial/Transport (Not at Airport)	0.088	0.16	0.20	0.79	0.700	0.636	0.136	0.320	
		Deciduous Forest	0.479	0.84	0.66	1.28	0.600				
	250 - 280	Commercial/Industrial/Transport (Not at Airport)	0.262				0.700	0.700	0.136	0.320	
	280 - 100	Urban	0.918	0.58	0.33	1.78	1.000	0.890	0.136	0.320	
		Deciduous Forest	0.652	0.42	0.79	0.53	0.600				
40,29	50 - 140	Urban	0.785				1.000	1.000	0.140	0.380	A35
	140 - 170	Urban	0.131	0.50	0.50	1.00	1.000	0.827	0.140	0.380	
		Deciduous Forest	0.130	0.50	0.84	0.59	0.600				
	170 - 225	Urban	0.111	0.23	0.28	0.82	1.000	0.747	0.140	0.380	
		Deciduous Forest	0.369	0.77	0.70	1.10	0.600				
	225 - 310	Urban	0.741				1.000	1.000	0.140	0.380	
	310 - 50	Urban	0.405	0.46	0.28	1.66	1.000	0.113	0.140	0.380	
		Open Water	0.467	0.54	0.70	0.77	0.001				
40,31	70 - 230	Urban	0.237	0.17	0.18	0.94	1.000	0.017	0.155	0.636	A36
		Open Water	1.159	0.83	0.62	1.34	0.001				
	230 - 300	Urban	0.276	0.45	0.40	1.13	1.000	0.071	0.155	0.636	
		Open Water	0.334	0.55	0.78	0.70	0.001				
	300 - 70	Urban	1.134				1.000	1.000	0.155	0.636	
40,33	0 - 360	Urban	3.140				1.000	1.000	0.155	0.636	A38
41,33	0 - 360	Urban	3.140				1.000	1.000	0.155	0.636	A39
41,34	0 - 360	Urban	3.140				1.000	1.000	0.155	0.636	A40
42,24	90 - 165	Urban	0.311	0.48	0.38	1.25	1.000	0.839	0.134	0.304	A29
		Deciduous Forest	0.343	0.52	0.80	0.66	0.600				
	165 - 230	Urban	0.052	0.09	0.16	0.57	1.000	0.007	0.134	0.304	
		Open Water	0.516	0.91	0.62	1.47	0.001				
	230 - 290	Urban	0.523				1.000	1.000	0.134	0.304	
	290 - 90	Deciduous Forest	1.396				0.600	0.600	0.134	0.304	
42,30	65 - 155	Urban	0.785				1.000	1.000	0.156	0.648	A34
	155 - 185	Urban	0.123	0.47	0.44	1.06	1.000	0.824	0.156	0.648	
		Deciduous Forest	0.139	0.53	0.82	0.65	0.600				
	185 - 225	Urban	0.349				1.000	1.000	0.156	0.648	
	225 - 65	Urban	0.301	0.17	0.10	1.72	1.000	0.039	0.156	0.648	
		Open Water	1.444	0.83	0.54	1.53	0.001				
43,22	0 - 65	Deciduous Forest	0.180	0.32	0.32	0.99	0.600	0.206	0.134	0.304	A28
		Grasslands/Herbaceous	0.387	0.68	0.74	0.92	0.065				
	65 - 105	Deciduous Forest	0.040	0.12	0.22	0.52	0.600	0.859	0.134	0.304	
		Urban	0.309	0.88	0.72	1.23	1.000				
	105 - 160	Urban	0.246	0.51	0.40	1.28	1.000	0.113	0.134	0.304	
		Open Water	0.234	0.49	0.82	0.59	0.001				
	160 - 190	Urban	0.014	0.05	0.20	0.27	1.000	0.216	0.134	0.304	
		Deciduous Forest	0.174	0.66	0.56	1.18	0.600				
		Open Water	0.074	0.28	0.94	0.30	0.001				
	190 - 220	Deciduous Forest	0.262				0.600	0.600	0.134	0.304	
	220 - 290	Deciduous Forest	0.029	0.05	0.14	0.34	0.600	0.003	0.134	0.304	
		Open Water	0.581	0.95	0.62	1.54	0.001				
	290 - 0	Deciduous Forest	0.611				0.600	0.600	0.134	0.304	

Appendix 3A - Detailed Calculations of Albedo, Bowen Ratio and Surface Roughness

PATH Grid	Sector (degree)	Land Use Type	Area (km^2)	Fraction of Section Total Area	Distance (km)	Weighting	Surface Roughness (Zo) [(a)]	Resultant Surface Roughness (Zo) (m) [(a)]	Albedo (r)	Bowen Ratio (Bo)	ASR
43,23	0 - 60	Deciduous Forest	0.058	0.11	0.20	0.56	0.600	0.128	0.134	0.304	A27
		Grasslands/Herbaceous	0.465	0.89	0.70	1.27	0.065				
	60 - 120	Urban	0.523				1.000	1.000	0.134	0.304	
	120 - 170	Deciduous Forest	0.132	0.30	0.32	0.94	0.600	0.025	0.134	0.304	
		Open Water	0.304	0.70	0.74	0.94	0.001				
	170 - 230	Deciduous Forest	0.020	0.04	0.10	0.39	0.600	0.697	0.134	0.304	
		Urban	0.107	0.21	0.36	0.57	1.000				
		Deciduous Forest	0.396	0.76	0.76	0.99	0.600				
	230 - 270	Deciduous Forest	0.092	0.26	0.32	0.82	0.600	0.018	0.134	0.304	
		Open Water	0.257	0.74	0.74	1.00	0.001				
	270 - 0	Deciduous Forest	0.785				0.600	0.600	0.134	0.304	
43,29	50 - 100	Deciduous Forest	0.340	0.78	0.54	1.44	0.600	0.644	0.156	0.648	A33
		Urban	0.096	0.22	0.96	0.23	1.000				
	100 - 220	Deciduous Forest	1.047				0.600	0.600	0.156	0.648	
	220 - 260	Urban	0.078	0.22	0.30	0.74	1.000	0.742	0.156	0.648	
		Deciduous Forest	0.271	0.78	0.74	1.05	0.600				
	260 - 50	Urban	1.308				1.000	1.000	0.156	0.648	
43,30	90 - 125	Urban	0.305				1.000	1.000	0.156	0.648	A32
	125 - 200	Urban	0.273	0.42	0.38	1.10	1.000	0.818	0.156	0.648	
		Deciduous Forest	0.381	0.58	0.82	0.71	0.600				
	200 - 270	Urban	0.611				1.000	1.000	0.156	0.648	
	270 - 90	Urban	0.344	0.22	0.12	1.83	1.000	0.060	0.156	0.648	
		Open Water	1.226	0.78	0.62	1.26	0.001				
44,30	80 - 160	Urban	0.698				1.000	1.000	0.156	0.648	A31
	160 - 260	Deciduous Forest	0.872				0.600	0.600	0.156	0.648	
	260 - 320	Deciduous Forest	0.107	0.20	0.16	1.27	0.600	0.763	0.156	0.648	
		Urban	0.417	0.80	0.70	1.14	1.000				
	320 - 80	Urban	0.466	0.45	0.30	1.48	1.000	0.098	0.156	0.648	
		Open Water	0.581	0.55	0.74	0.75	0.001				
45,30	110 - 165	Urban	0.480				1.000	1.000	0.156	0.648	A30
	165 - 215	Urban	0.291	0.67	0.48	1.39	1.000	0.898	0.156	0.648	
		Deciduous Forest	0.146	0.33	0.90	0.37	0.600				
	215 - 275	Urban	0.357	0.68	0.44	1.55	1.000	0.906	0.156	0.648	
		Deciduous Forest	0.167	0.32	0.86	0.37	0.600				
	275 - 310	Urban	0.305				1.000	1.000	0.156	0.648	
	310 - 110	Urban	0.319	0.23	0.14	1.63	1.000	0.053	0.156	0.648	
		Open Water	1.077	0.77	0.64	1.21	0.001				

Note:

(a) With reference to Table A-3 of the AERSURFACE User's Guide 2008 (revised in 2013), the surface roughness value for Urban Area (Class 22 Urban), Class 23 Commercial/Industrial/Transport (Not at Airport), Class 71 Grasslands/Herbaceous, Class 11 Open Water are assumed to be 1m, 0.7m, 0.065m and 0.001m, respectively. With the height of tree assumed to be 6m on average, the surface roughness value of 0.6m has been adopted for tree based on the fact that the surface roughness value can be estimated as about 10% of the average height of physical structures. For sector consisting of 2 or more different land use types, the resultant surface roughness length for the sector is calculated based on the inverse-distance weighted geometric mean.

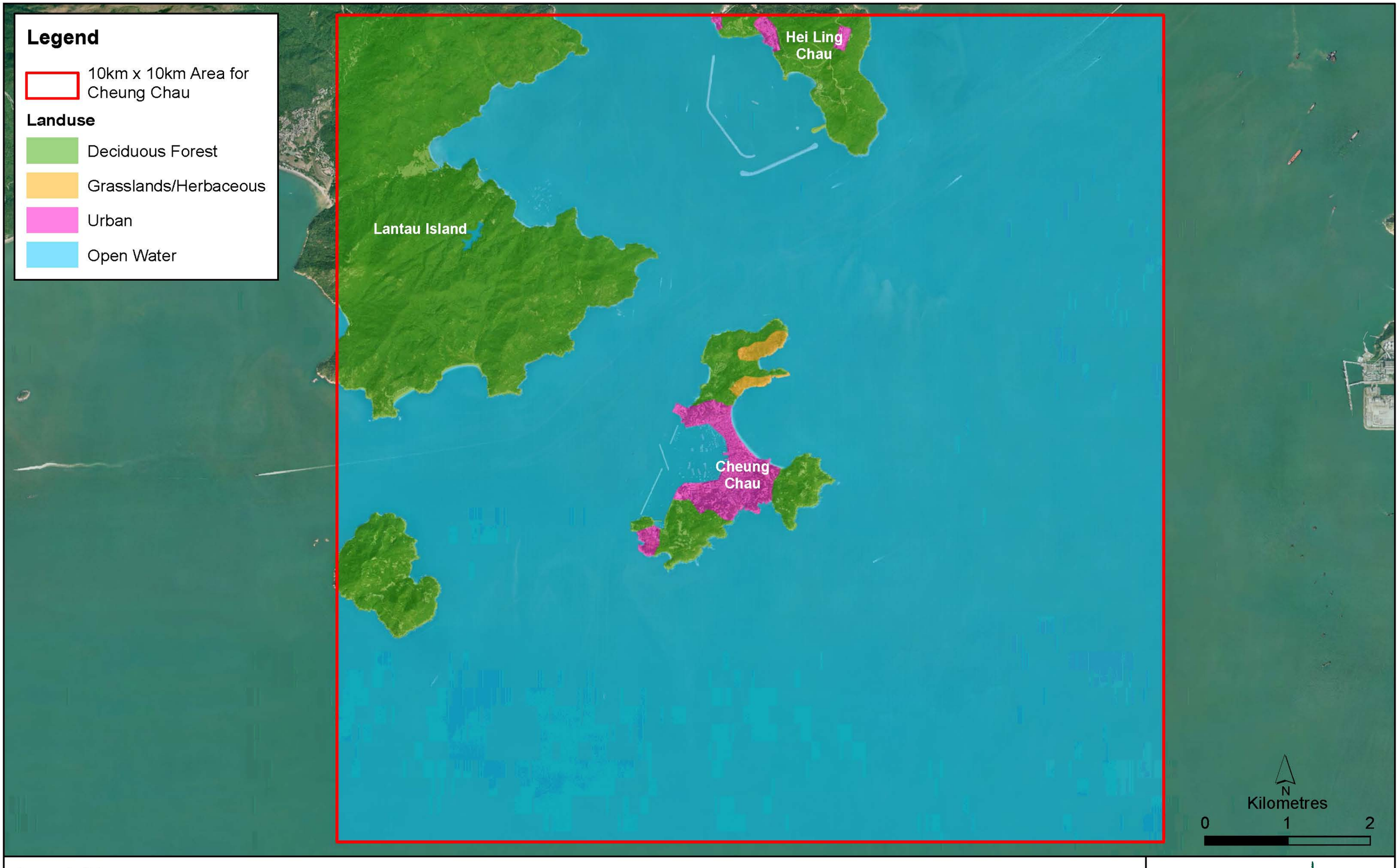
Appendix 3A

10km x 10km Area for Lamma Island

File: T:\GIS\CONTRACT\0576490\mxd\Landuse\0576490_LPS_10km_Landuse_v2_Lamma_Island.mxd
Date: 13/1/2021

Environmental Resources Management

ERM



Appendix 3A

10km x 10km Area for Cheung Chau

File: T:\GIS\CONTRACT\0576490\mxd\Landuse\0576490_LPS_10km_Landuse_v2_Cheung_Chau.mxd
Date: 13/1/2021

Environmental Resources Management

ERM

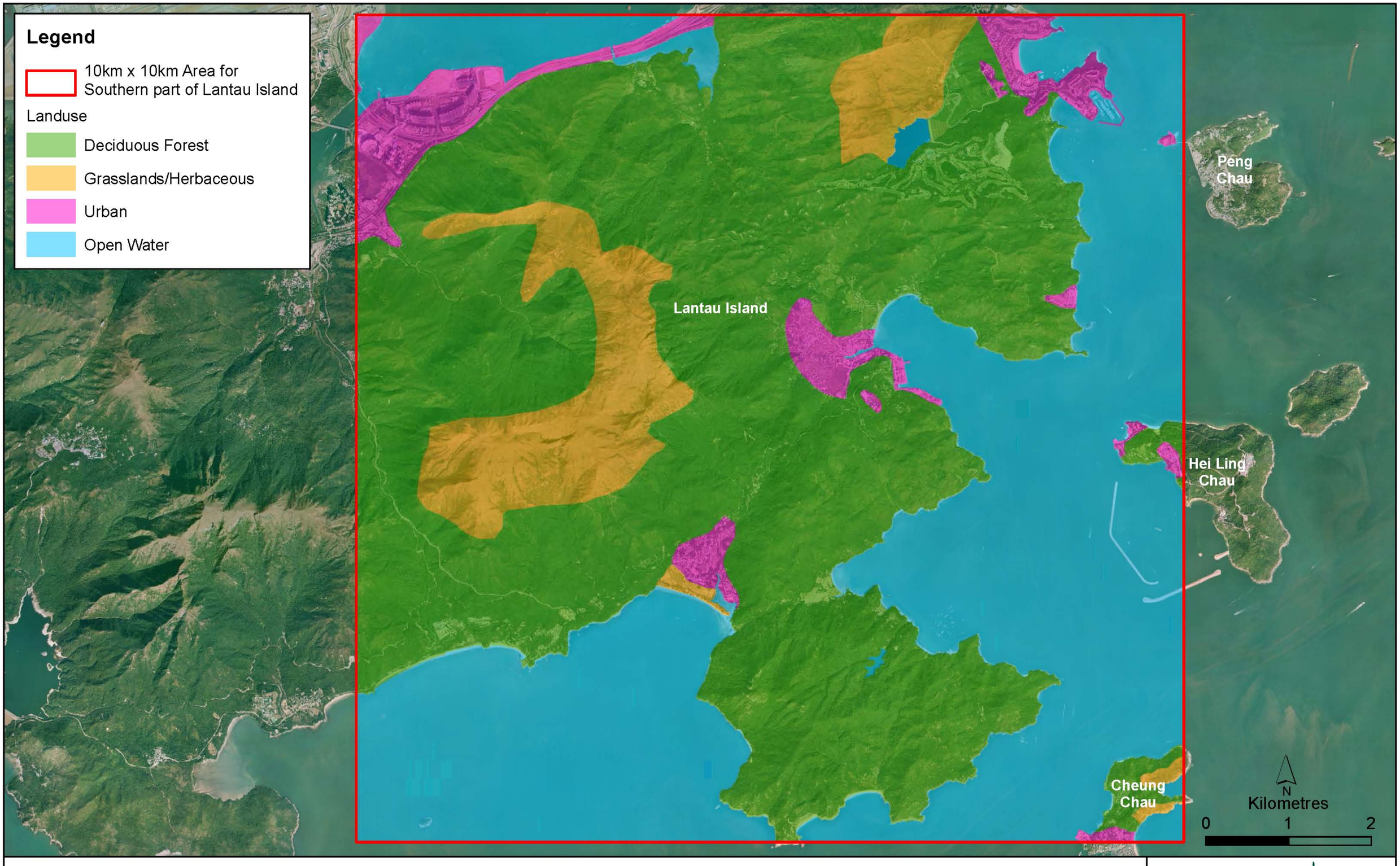
Appendix 3A

10km x 10km Area for Hei Ling Chau

File: T:\GIS\CONTRACT\0576490\mxd\Landuse\0576490_LPS_10km_Landuse_v2_Hei_Ling_Chau.mxd
Date: 13/1/2021

Environmental Resources Management

ERM



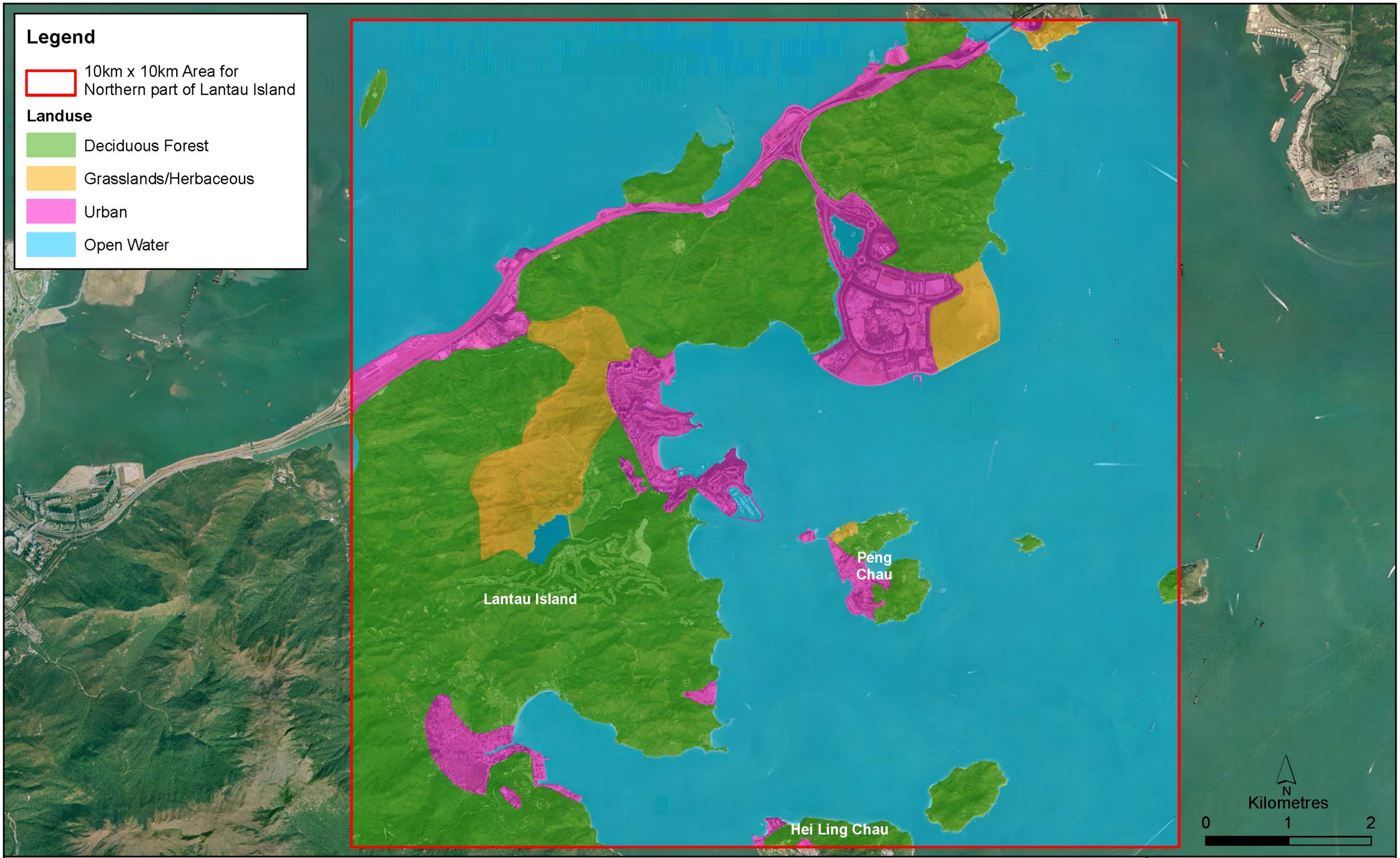
Appendix 3A

10km x 10km Area for Southern part of Lantau Island

File: T:\GIS\CONTRACT\0576490\mxd\Landuse\0576490_LPS_10km_Landuse_v2_Lantau_Southern.mxd
Date: 13/1/2021

Environmental Resources Management

ERM



Appendix 3A

10km x 10km Area for Northern part of Lantau Island

File: T:\GIS\CONTRACT\0576490\mxd\Landuse\0576490_LPS_10km_Landuse_v2_Lantau_Northern.mxd
Date: 18/1/2021

Environmental Resources Management

ERM

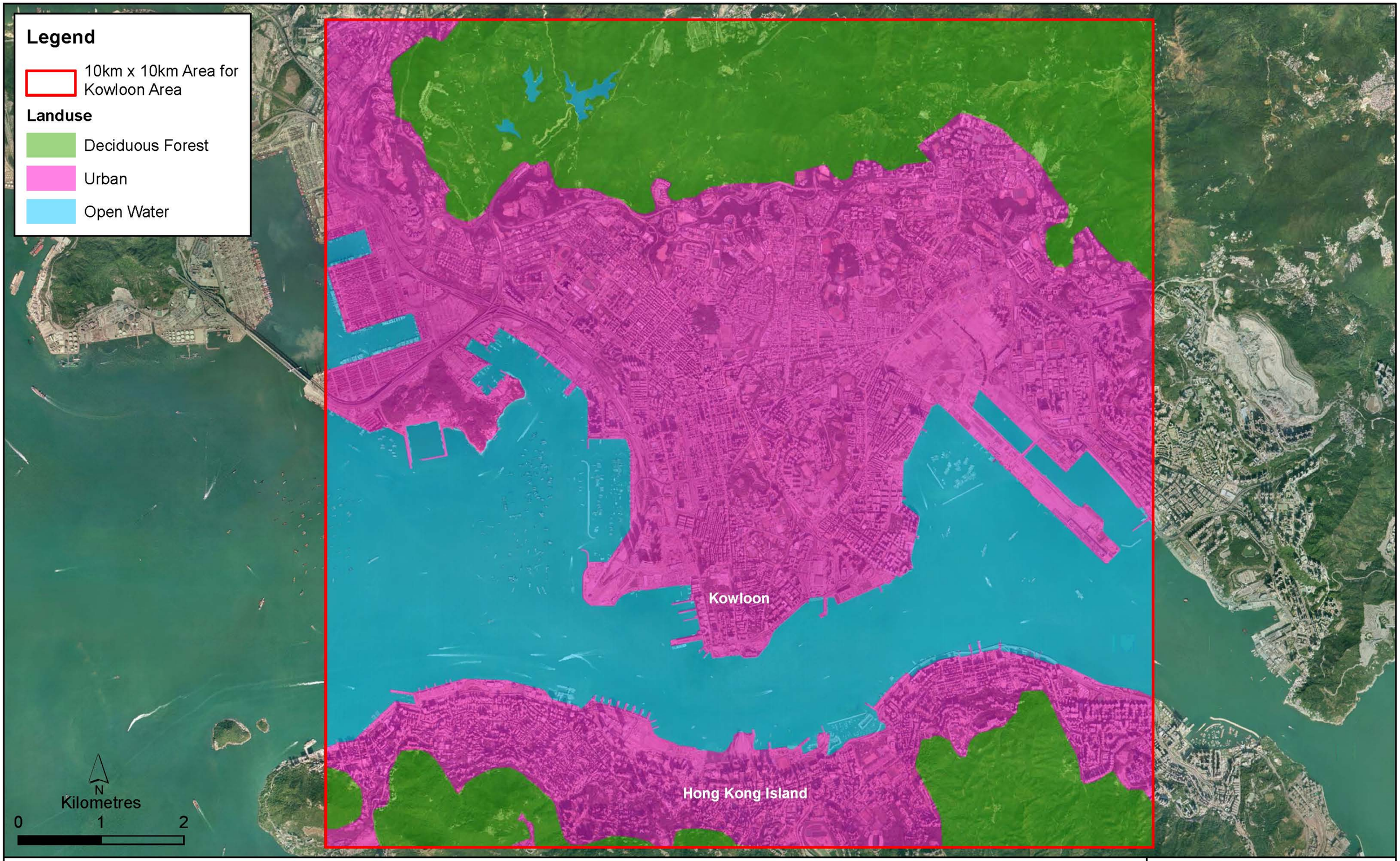
Appendix 3A

10km x 10km Area for Tsing Yi Area

File: T:\GIS\CONTRACT\0576490\mxd\Landuse\0576490_LPS_10km_Landuse_v2_Tsing_Yi.mxd
Date: 13/1/2021

Environmental Resources Management

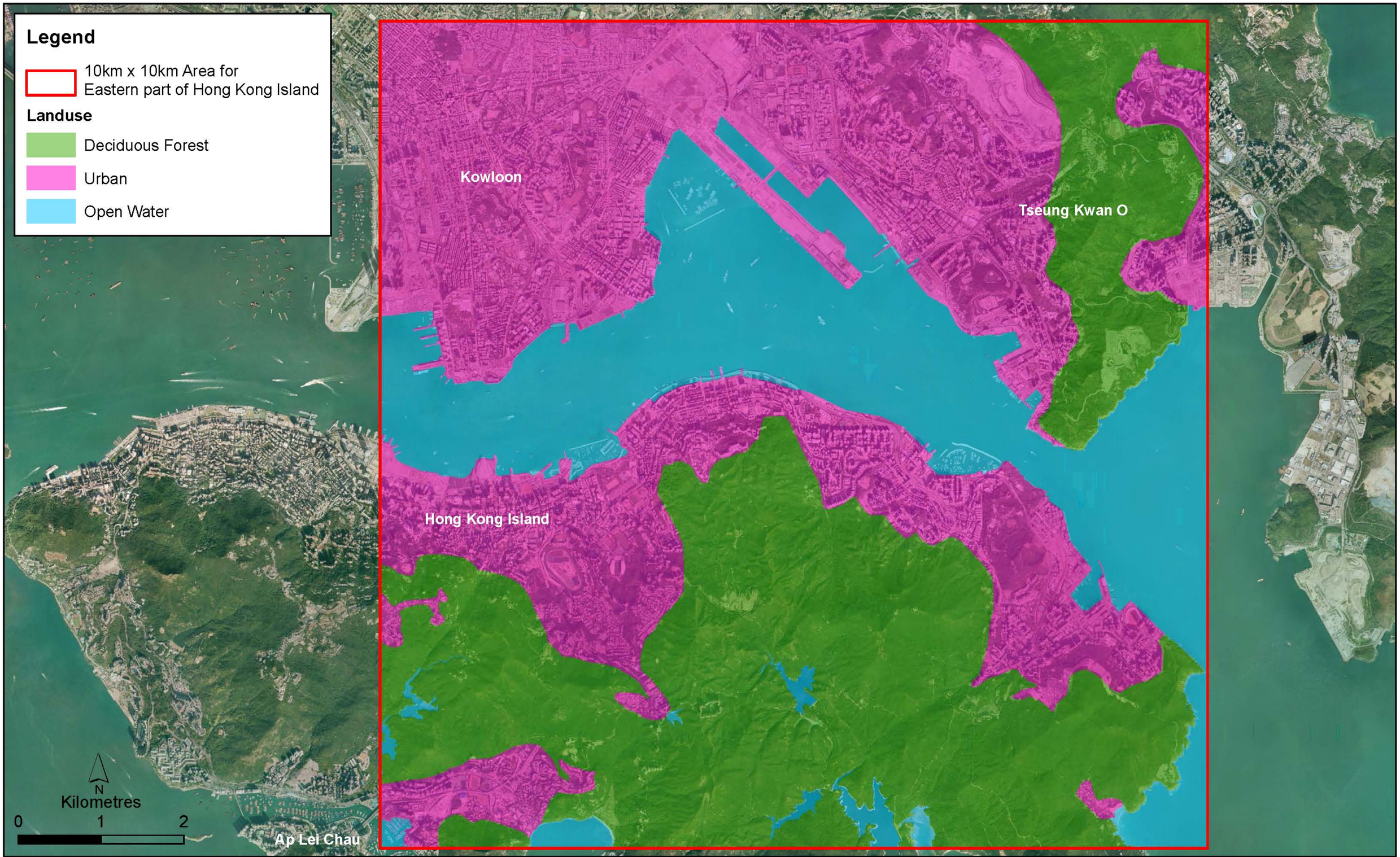
ERM



Appendix 3A

10km x 10km Area for Kowloon Area

Environmental Resources



Appendix 3A

10km x 10km Area for Eastern part of Hong Kong Island

File: T:\GIS\CONTRACT\0576490\mxd\Landuse\0576490_LPS_10km_Landuse_v2_HKI_East.mxd
Date: 13/1/2021

Environmental Resources Management

ERM

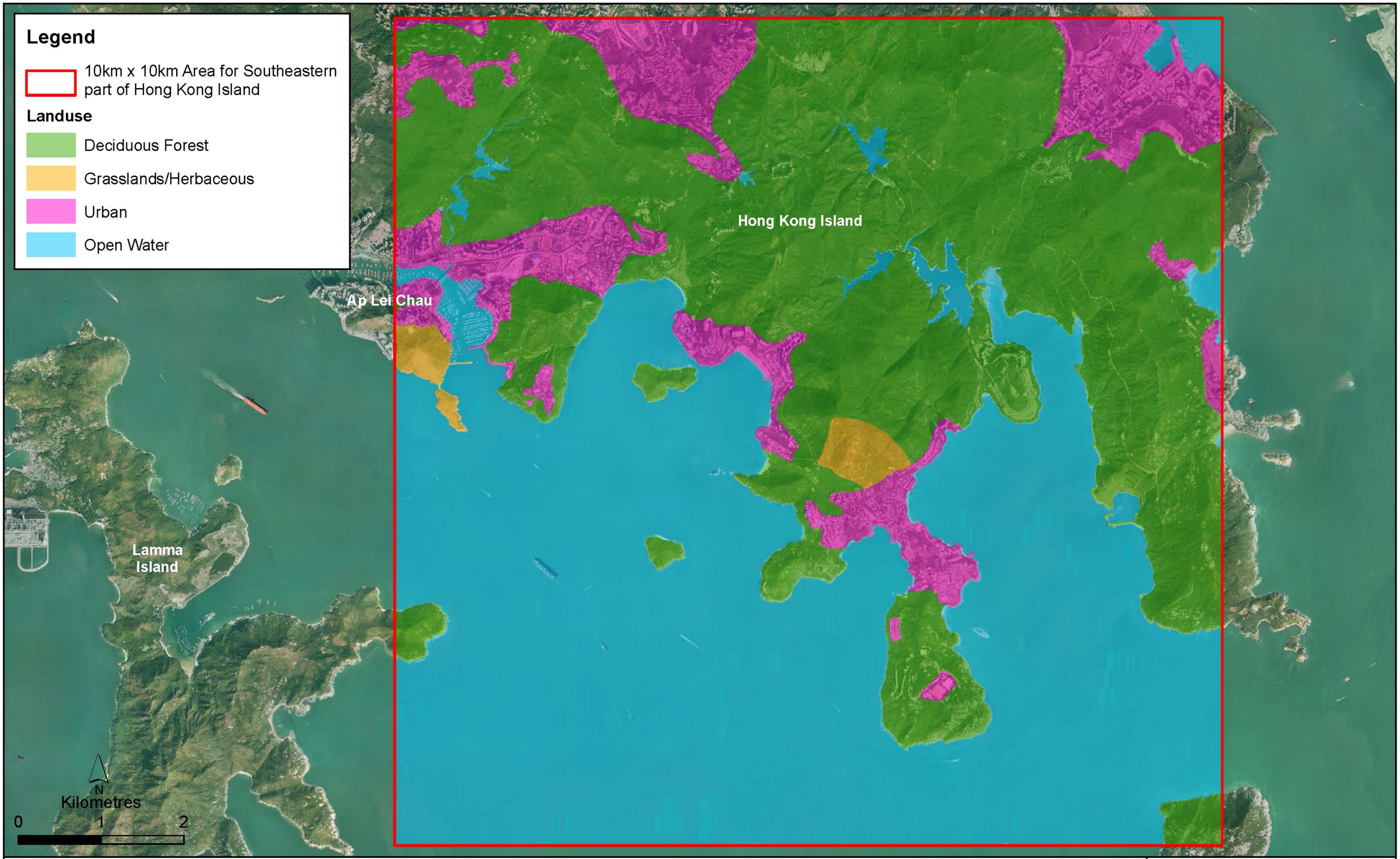
Appendix 3A

10km x 10km Area for Central & Western part of Hong Kong Island

File: T:\GIS\CONTRACT\0576490\mxd\Landuse\0576490_LPS_10km_Landuse_v2_HKI_Central.mxd
Date: 13/1/2021

Environmental Resources Management

ERM



Appendix 3A

10km x 10km Area for Southeastern part of Hong Kong Island

File: T:\GIS\CONTRACT\0576490\mxd\Landuse\0576490_LPS_10km_Landuse_v2_HKI_Southeast.mxd
Date: 13/1/2021

Environmental Resources Management

ERM

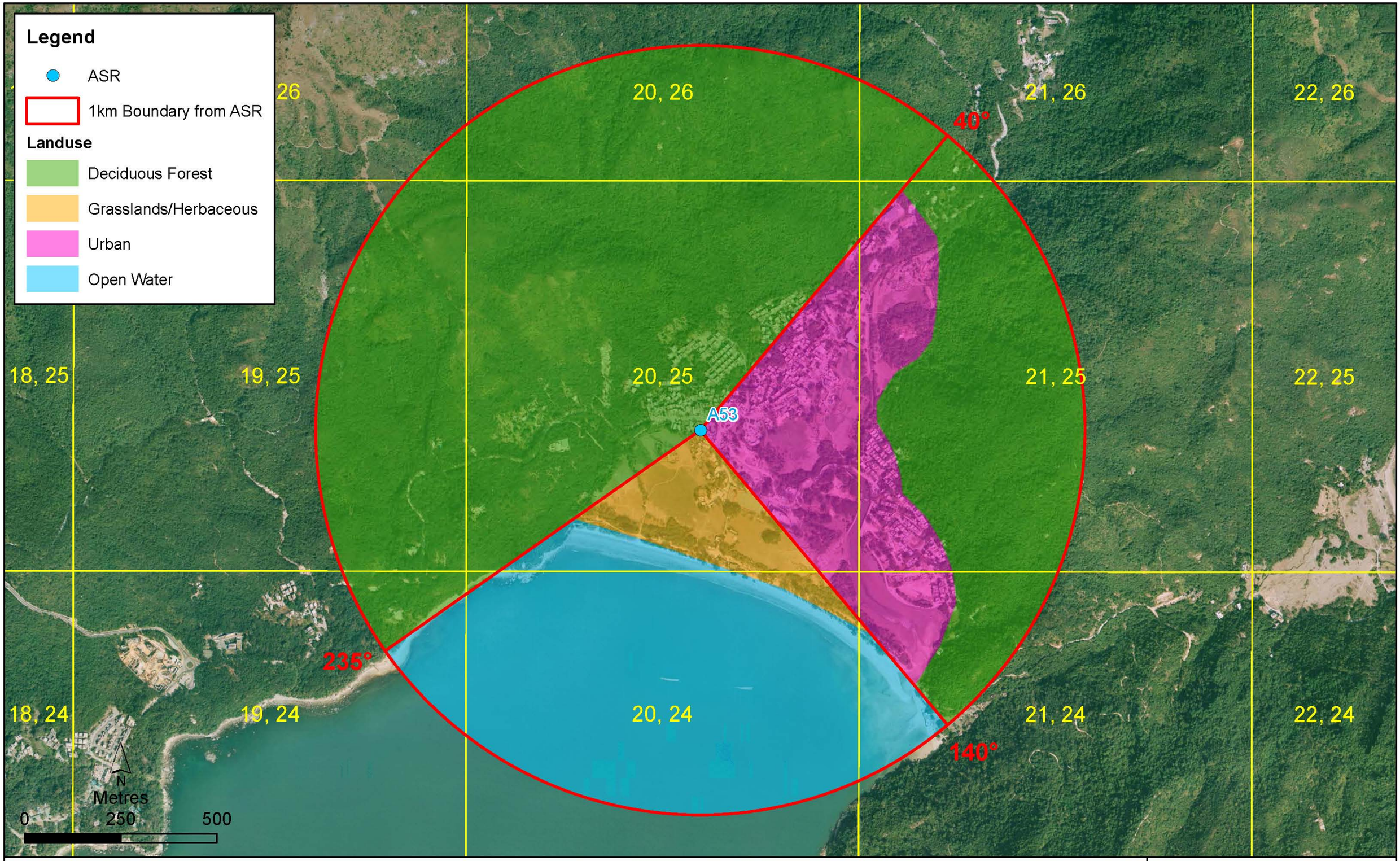
Appendix 3A

10km x 10km Area for Southwestern part of Hong Kong Island

File: T:\GIS\CONTRACT\0576490\mxd\Landuse\0576490_LPS_10km_Landuse_v2_HKI_Southwest.mxd
Date: 13/1/2021

Environmental Resources Management

ERM



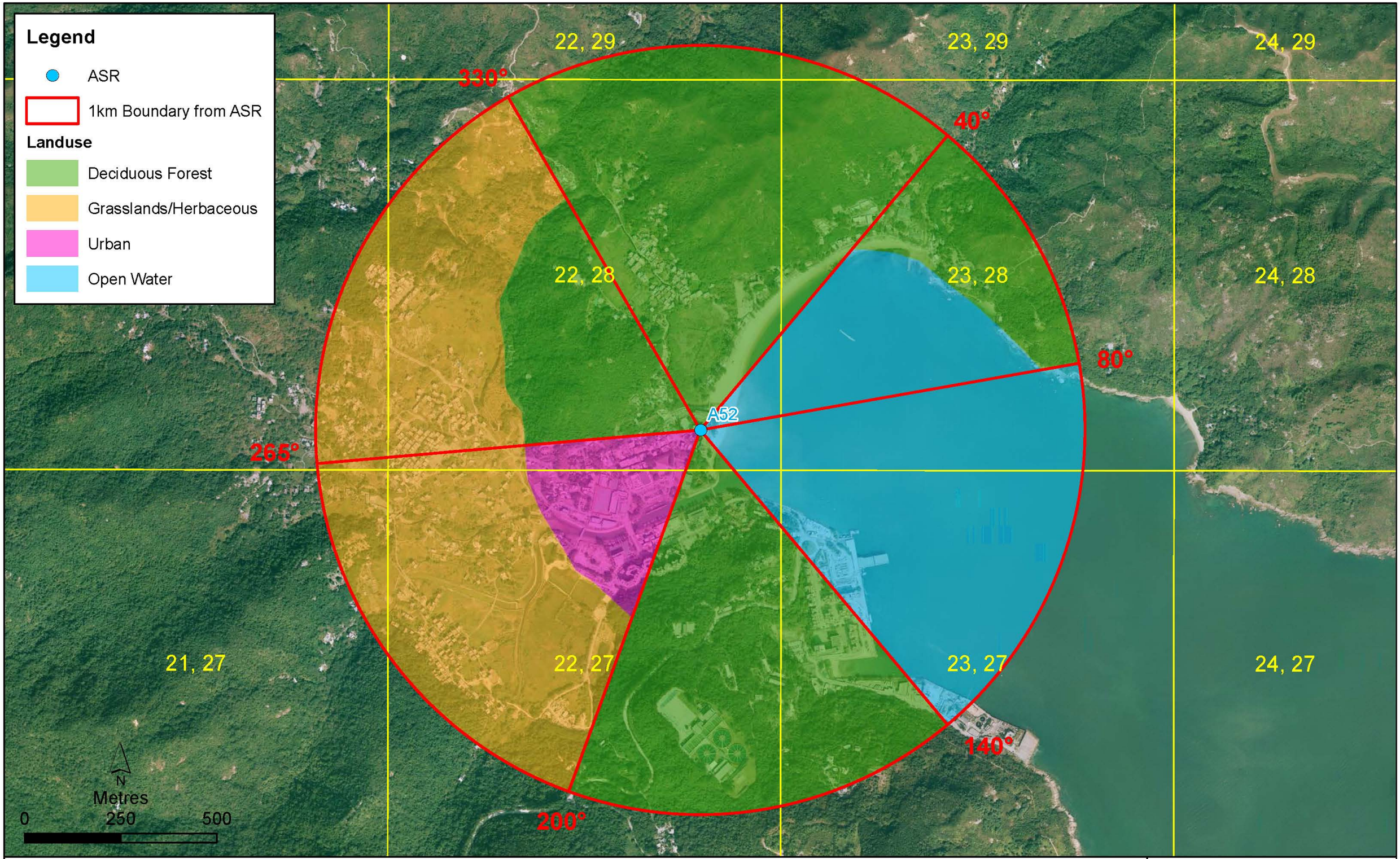
Appendix 3A

Sectors of Land Use for PATH Grid 20,25

File: T:\GIS\CONTRACT\0576490\mxd\Landuse\0576490_2025.mxd
Date: 13/1/2021

Environmental Resources Management

ERM



Appendix 3A

Sectors of Land Use for PATH Grid 22,28

File: T:\GIS\CONTRACT\0576490\mxd\Landuse\0576490_2228.mxd
Date: 13/1/2021

Environmental Resources Management

ERM

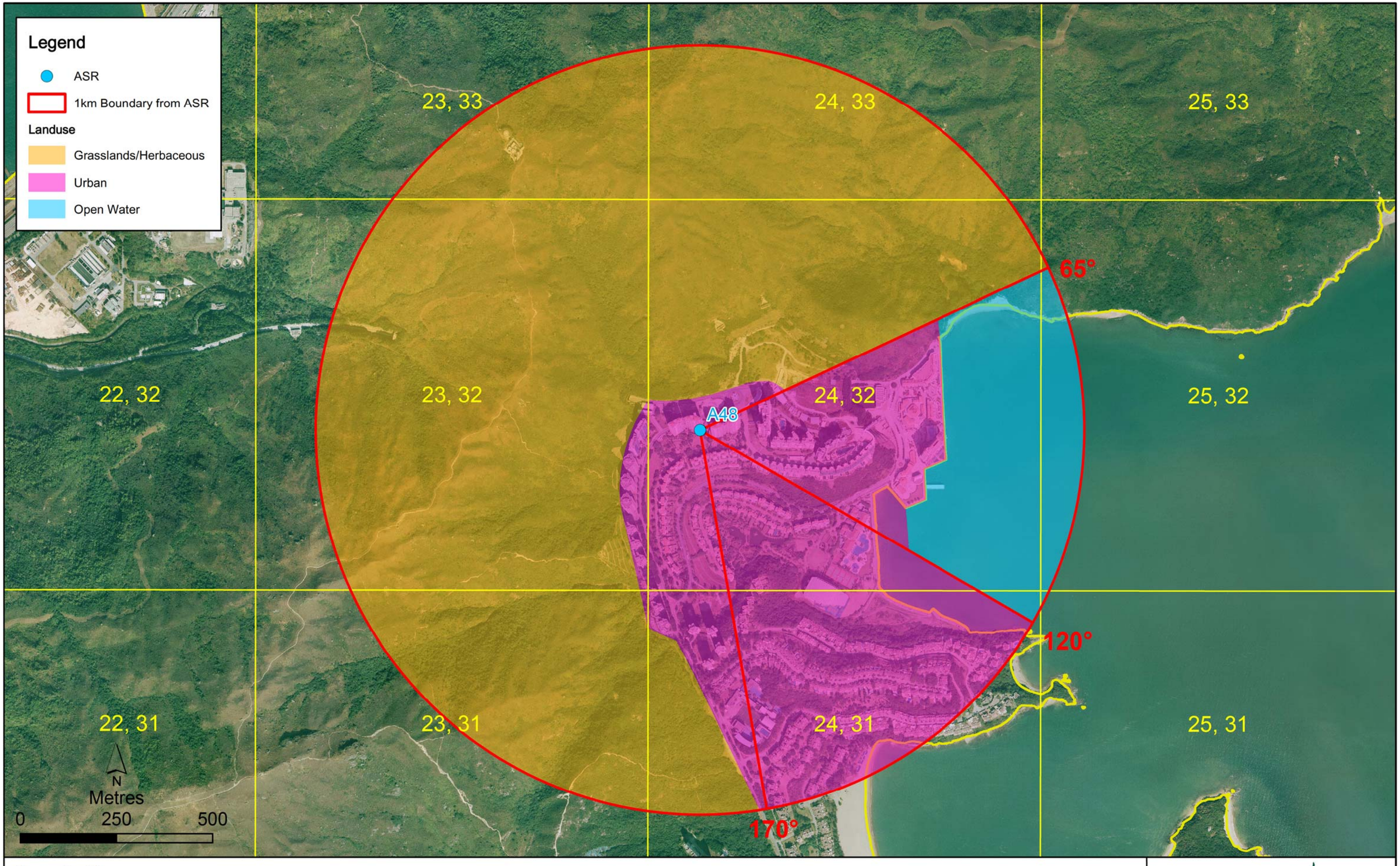
Appendix 3A

Sectors of Land Use for PATH Grid 23,30

File: T:\GIS\CONTRACT\0576490\mxd\Landuse\0576490_2330.mxd
Date: 25/8/2021

Environmental Resources Management

ERM



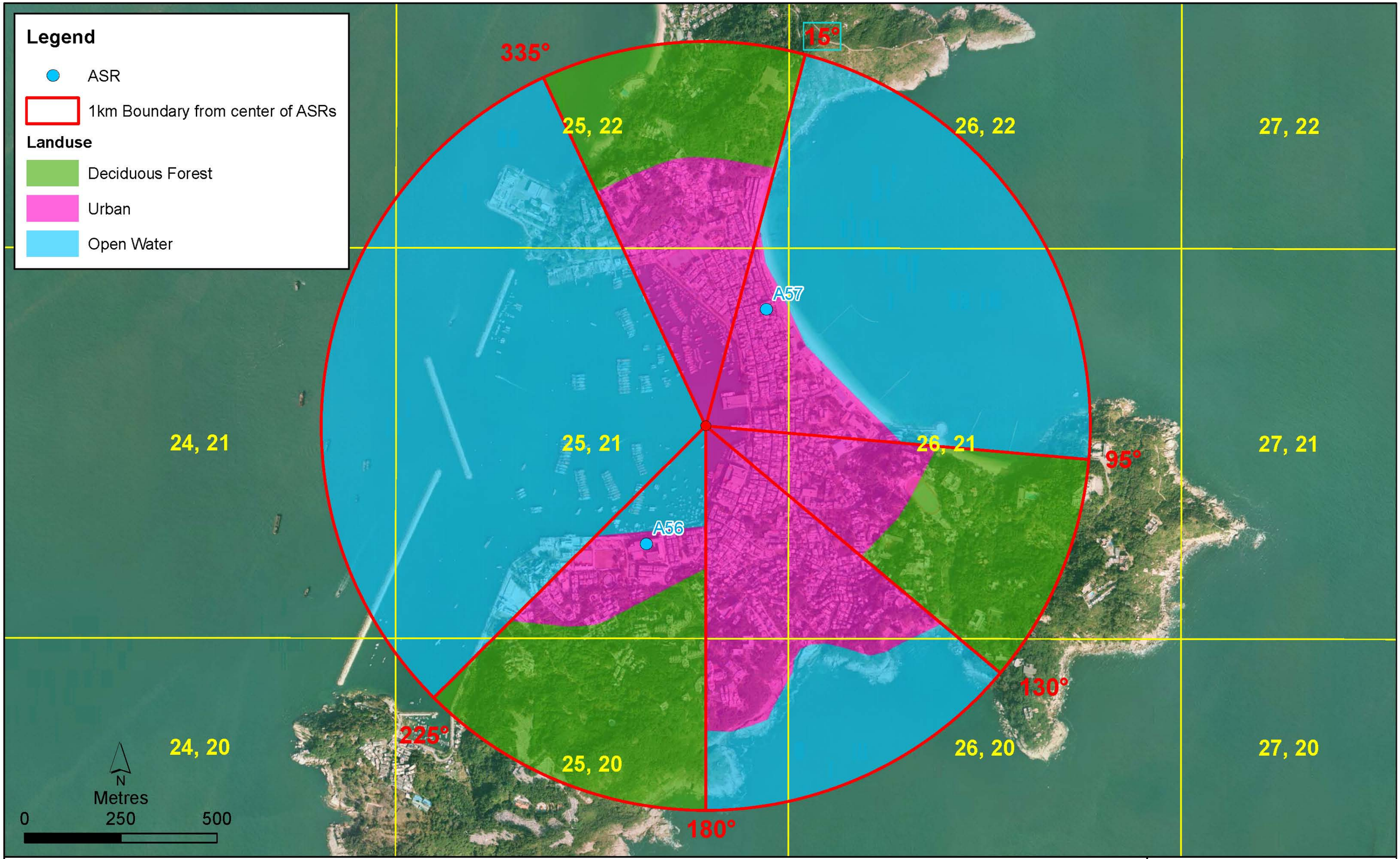
Appendix 3A

Sectors of Land Use for PATH Grid 24,32

File: T:\GIS\CONTRACT\0576490\mxd\Landuse\0576490_2432.mxd
Date: 27/8/2021

Environmental Resources Management

ERM



Appendix 3A

Sectors of Land Use for PATH Grid 25,21

File: T:\GIS\CONTRACT\0576490\mxd\Landuse\0576490_2521.mxd
Date: 13/1/2021

Environmental Resources Management

ERM

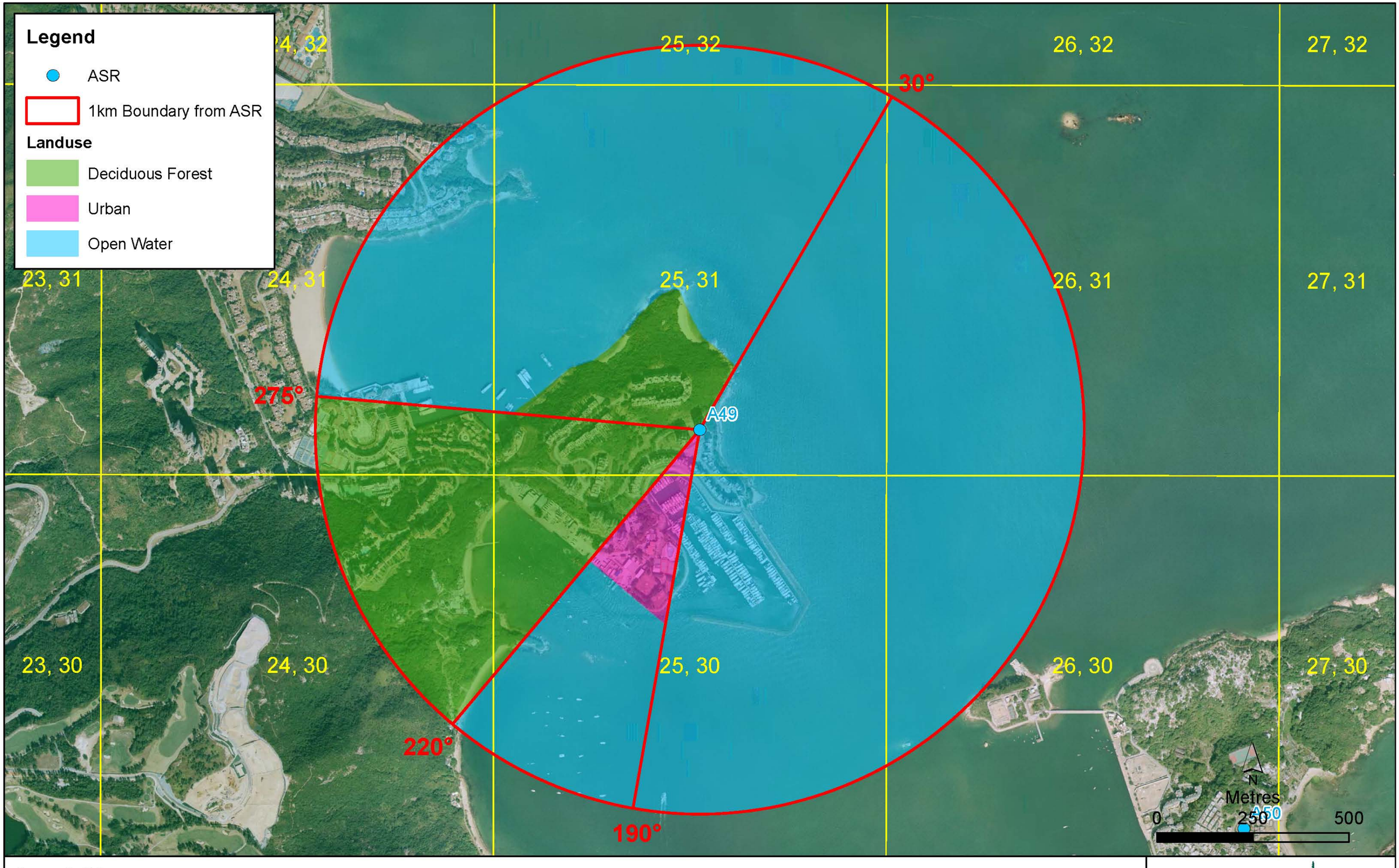
Appendix 3A

Sectors of Land Use for PATH Grid 25,22

File: T:\GIS\CONTRACT\0576490\mxd\Landuse\0576490_2522.mxd
Date: 13/1/2021

Environmental Resources Management

ERM



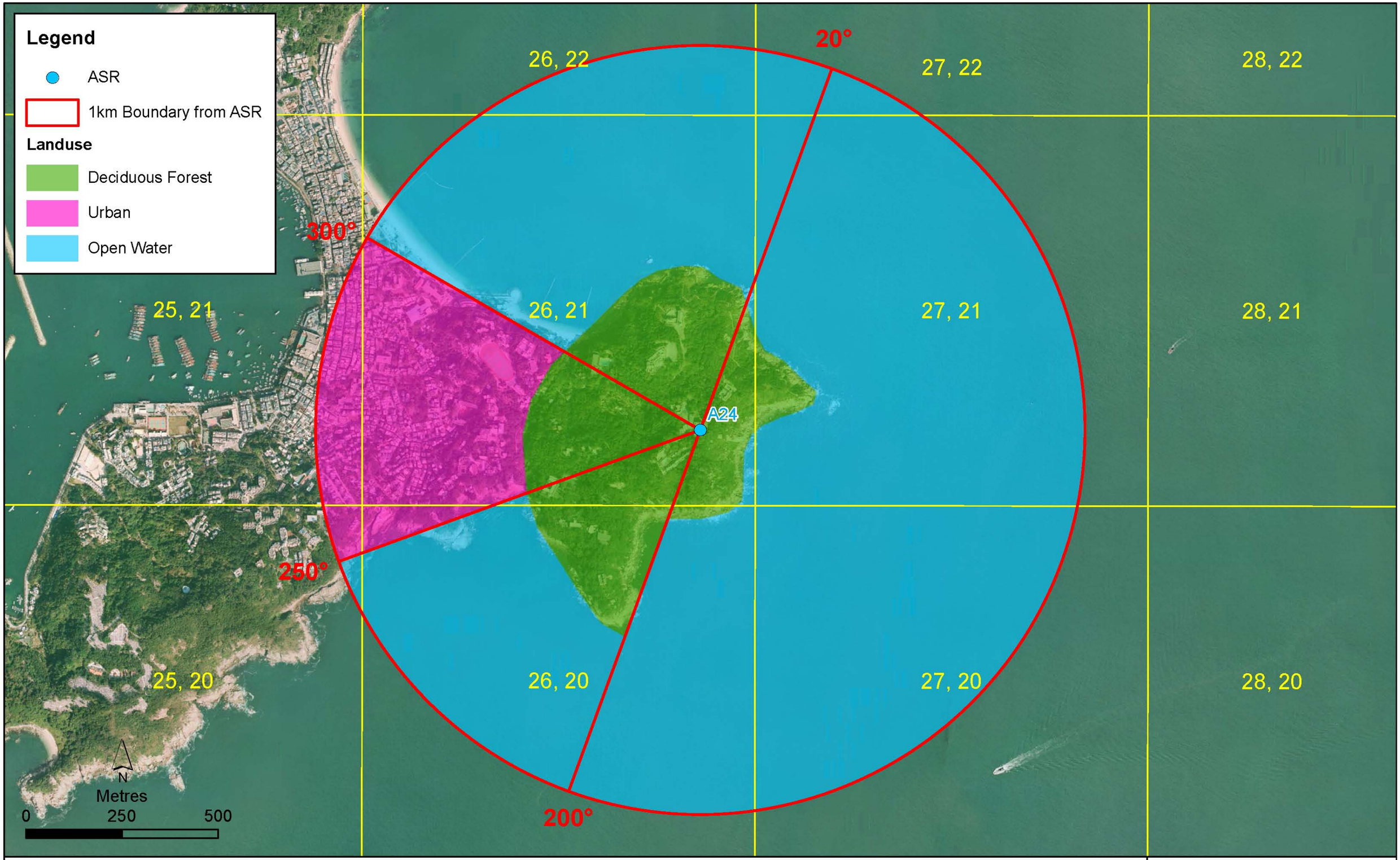
Appendix 3A

Sectors of Land Use for PATH Grid 25,31

File: T:\GIS\CONTRACT\0576490\mxd\Landuse\0576490_2531.mxd
Date: 13/1/2021

Environmental Resources Management

ERM



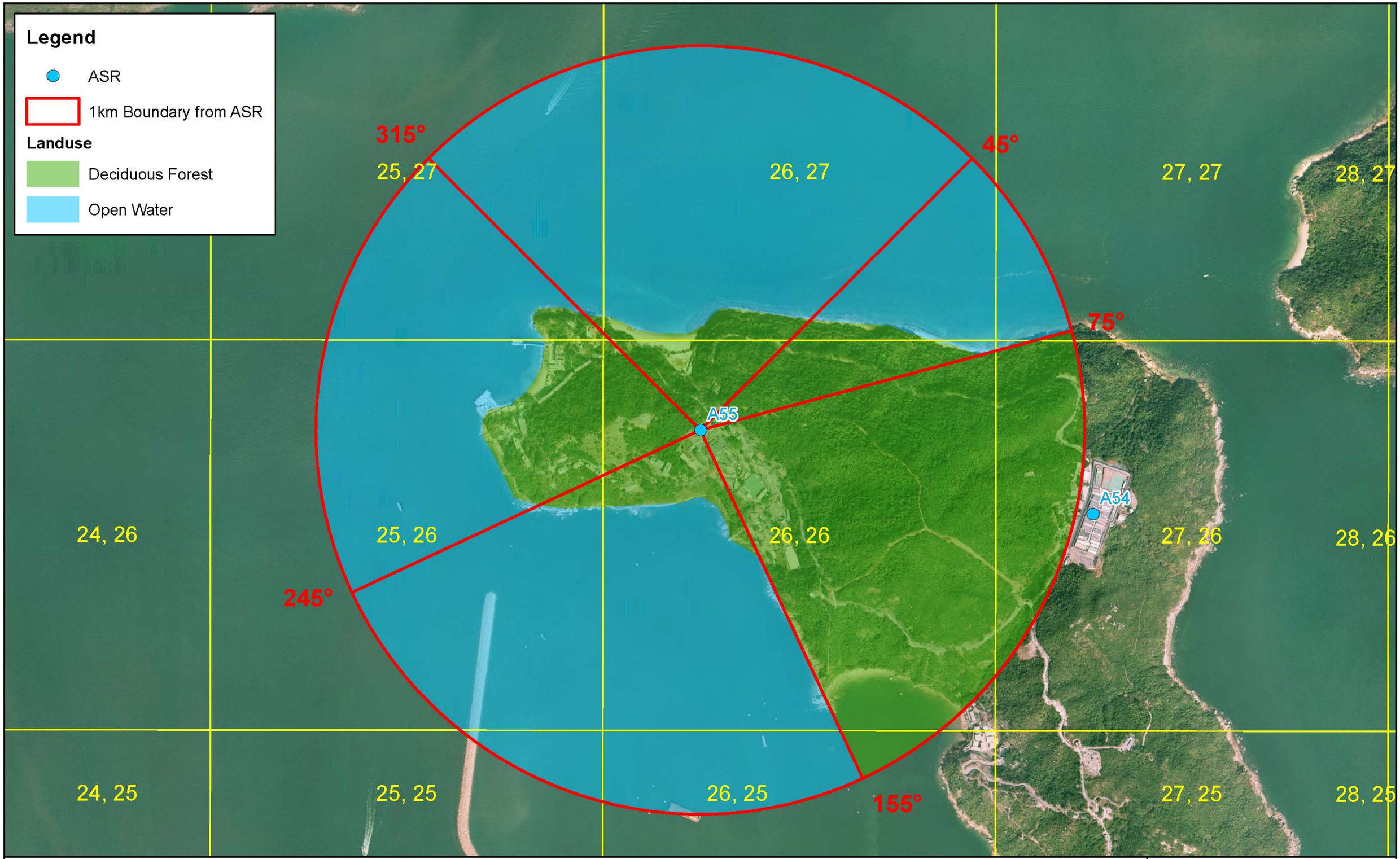
Appendix 3A

Sectors of Land Use for PATH Grid 26,21

File: T:\GIS\CONTRACT\0576490\mxd\Landuse\0576490_2621.mxd
Date: 13/1/2021

Environmental Resources Management

ERM



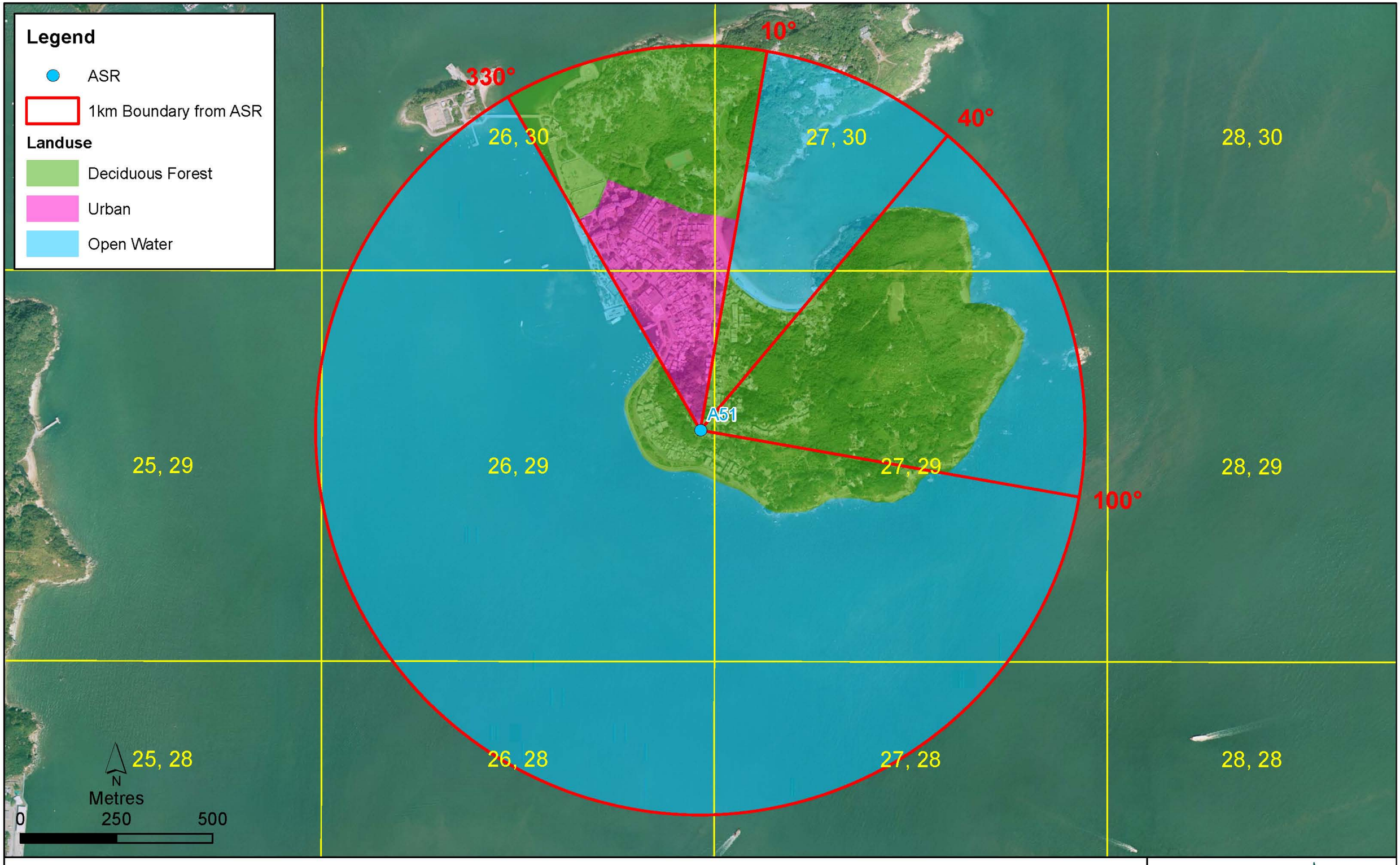
Appendix 3A

Sectors of Land Use for PATH Grid 26,26

File: T:\GIS\CONTRACT\0576490\mxd\Landuse\0576490_2626.mxd
Date: 13/1/2021

Environmental Resources Management

ERM



Appendix 3A

Sectors of Land Use for PATH Grid 26,29

File: T:\GIS\CONTRACT\0576490\mxd\Landuse\0576490_2629.mxd
Date: 13/1/2021

Environmental Resources Management

ERM

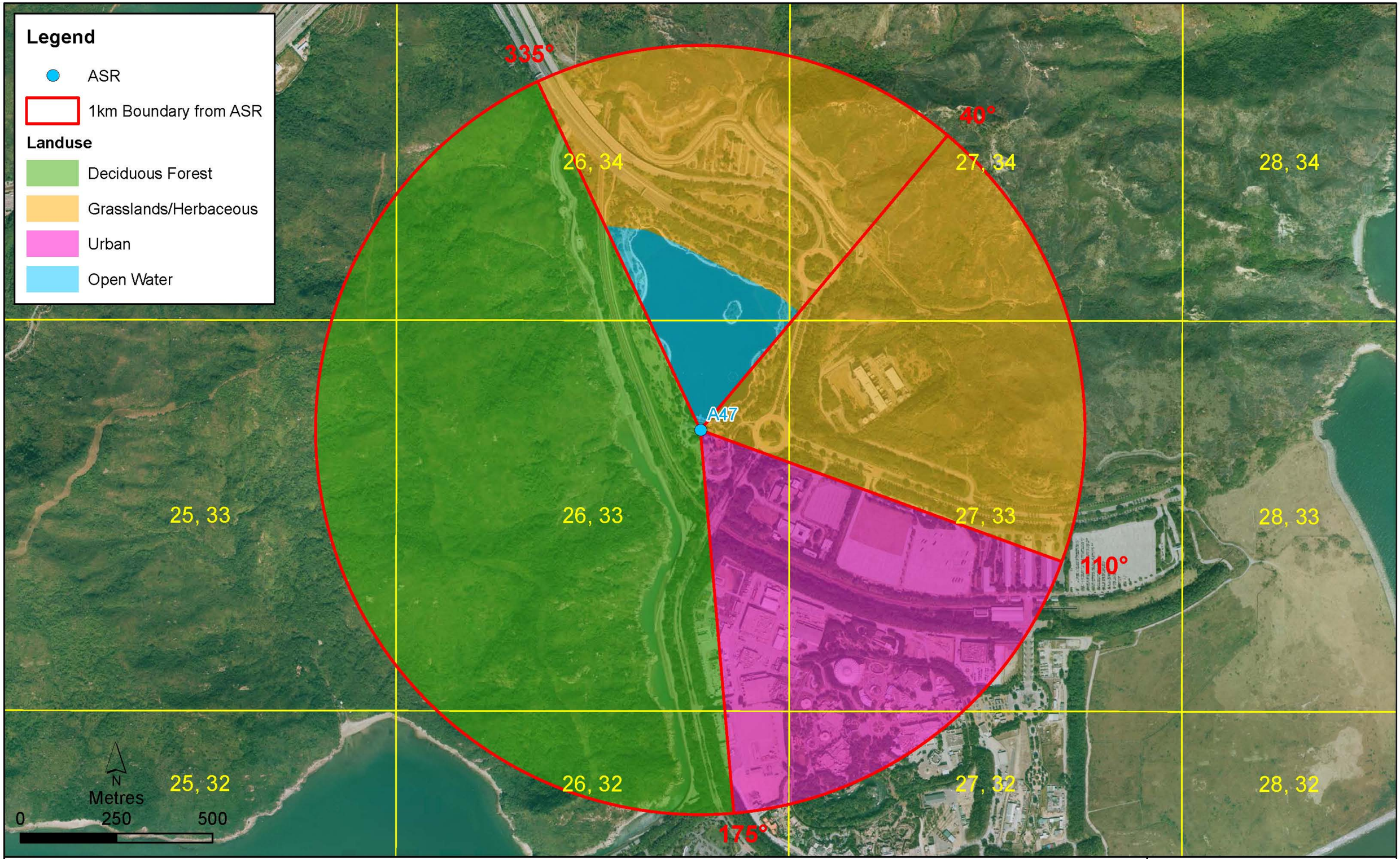
Appendix 3A

Sectors of Land Use for PATH Grid 26,30

File: T:\GIS\CONTRACT\0576490\mxd\Landuse\0576490_2630.mxd
Date: 13/1/2021

Environmental Resources Management

ERM



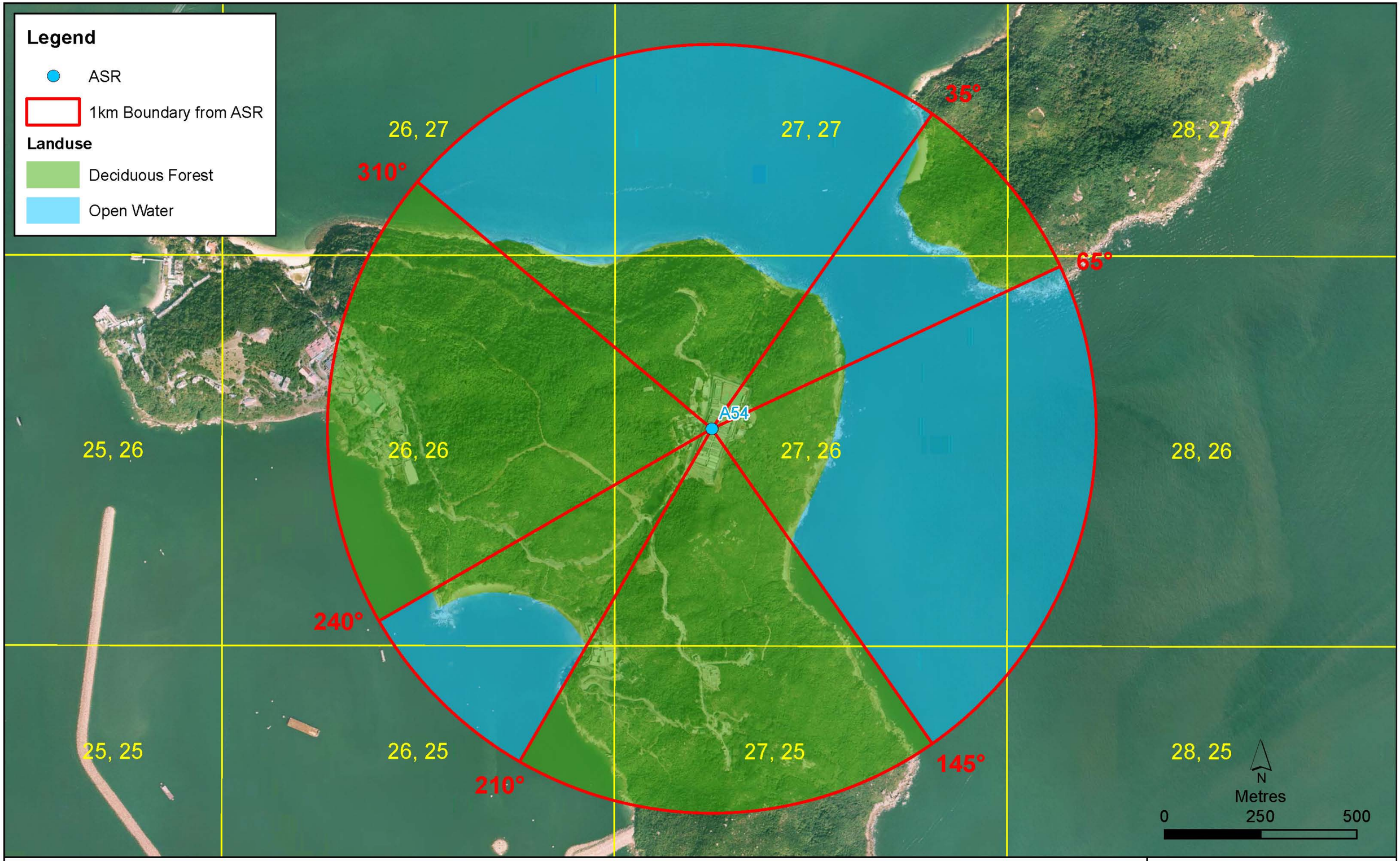
Appendix 3A

Sectors of Land Use for PATH Grid 26,33

File: T:\GIS\CONTRACT\0576490\mxd\Landuse\0576490_2633.mxd
Date: 13/1/2021

Environmental Resources Management

ERM



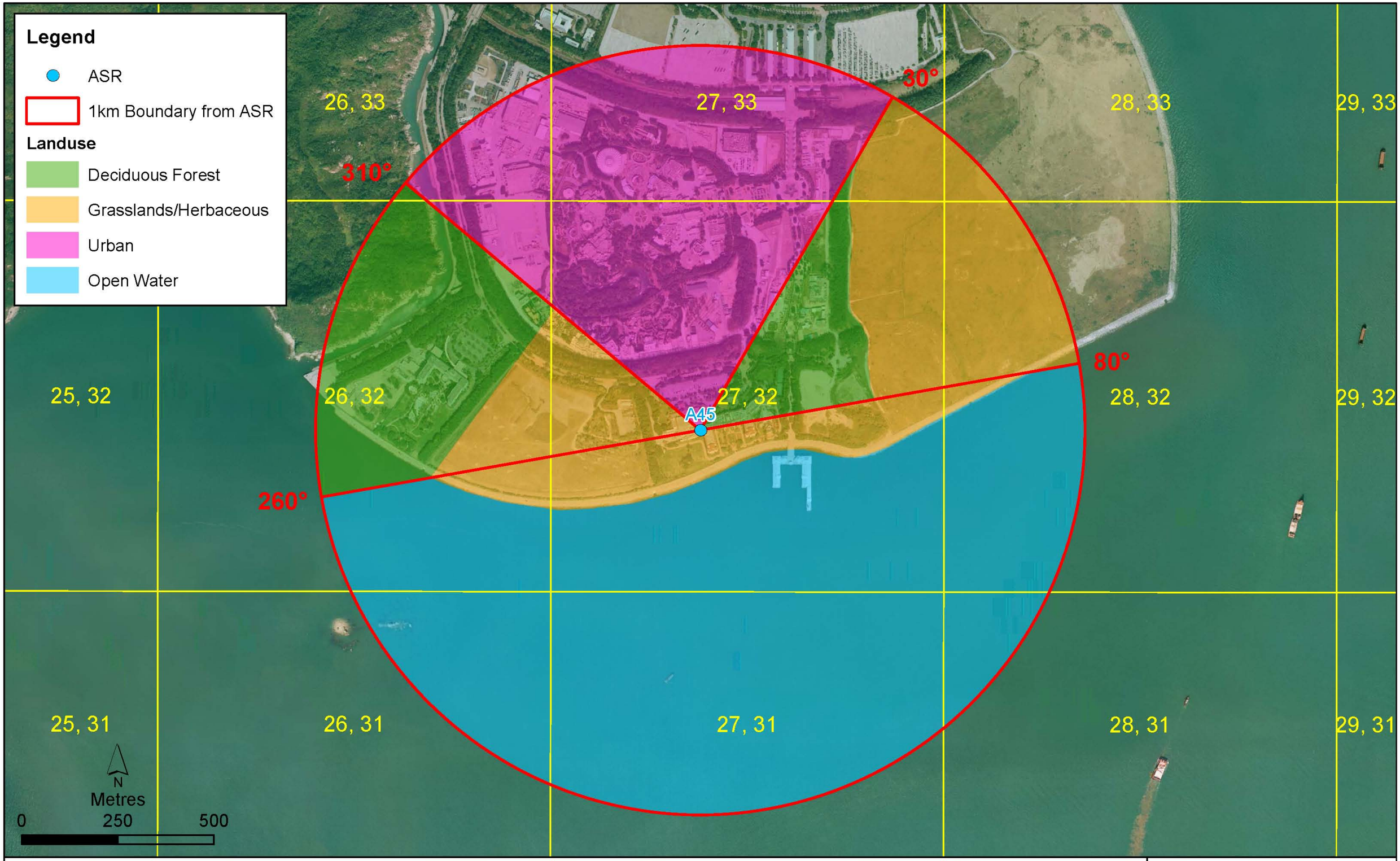
Appendix 3A

Sectors of Land Use for PATH Grid 27,26

File: T:\GIS\CONTRACT\0576490\mxd\Landuse\0576490_2726.mxd
Date: 13/1/2021

Environmental Resources Management

ERM



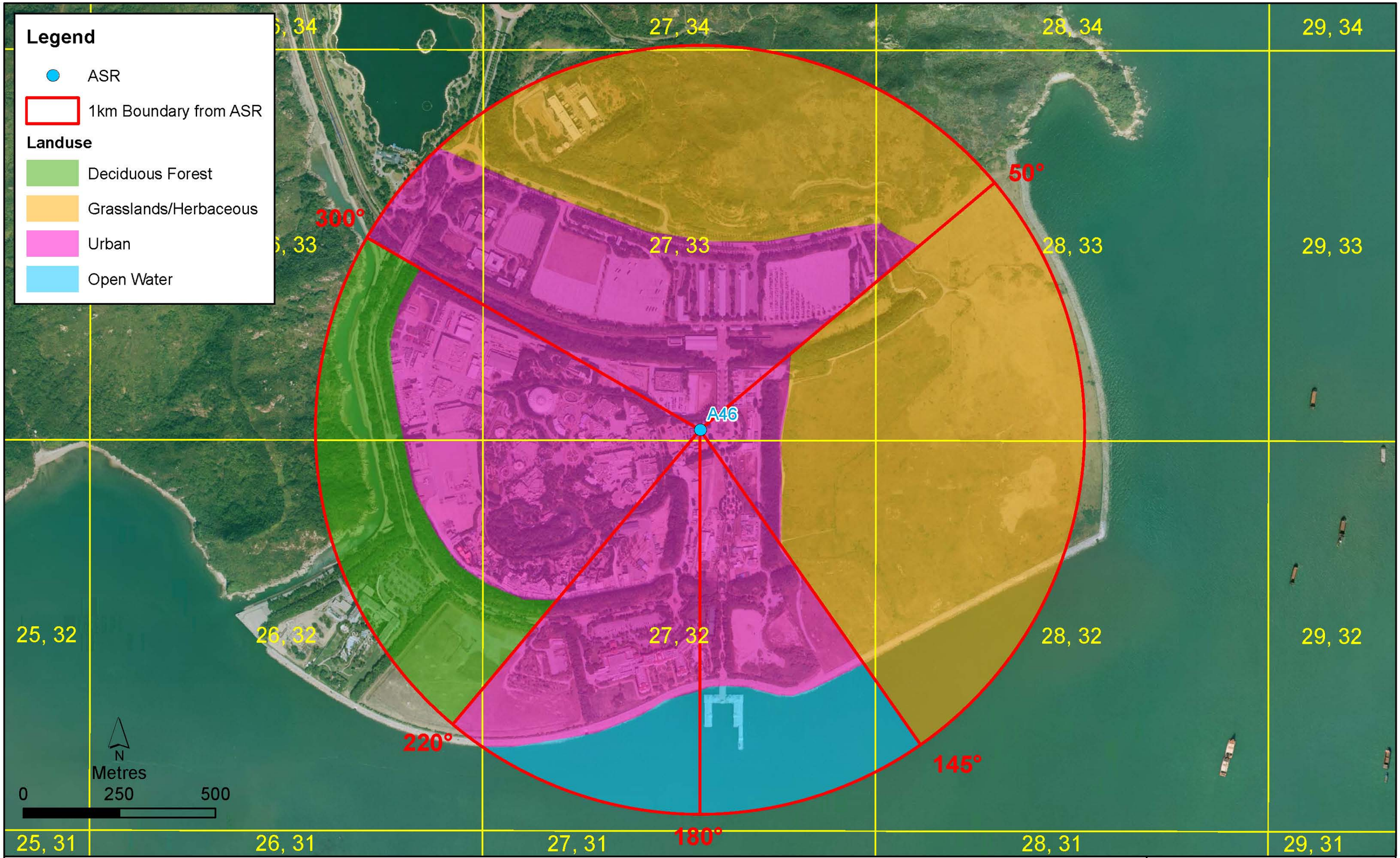
Appendix 3A

Sectors of Land Use for PATH Grid 27,32

File: T:\GIS\CONTRACT\0576490\mxd\Landuse\0576490_2732.mxd
Date: 13/1/2021

Environmental Resources Management

ERM



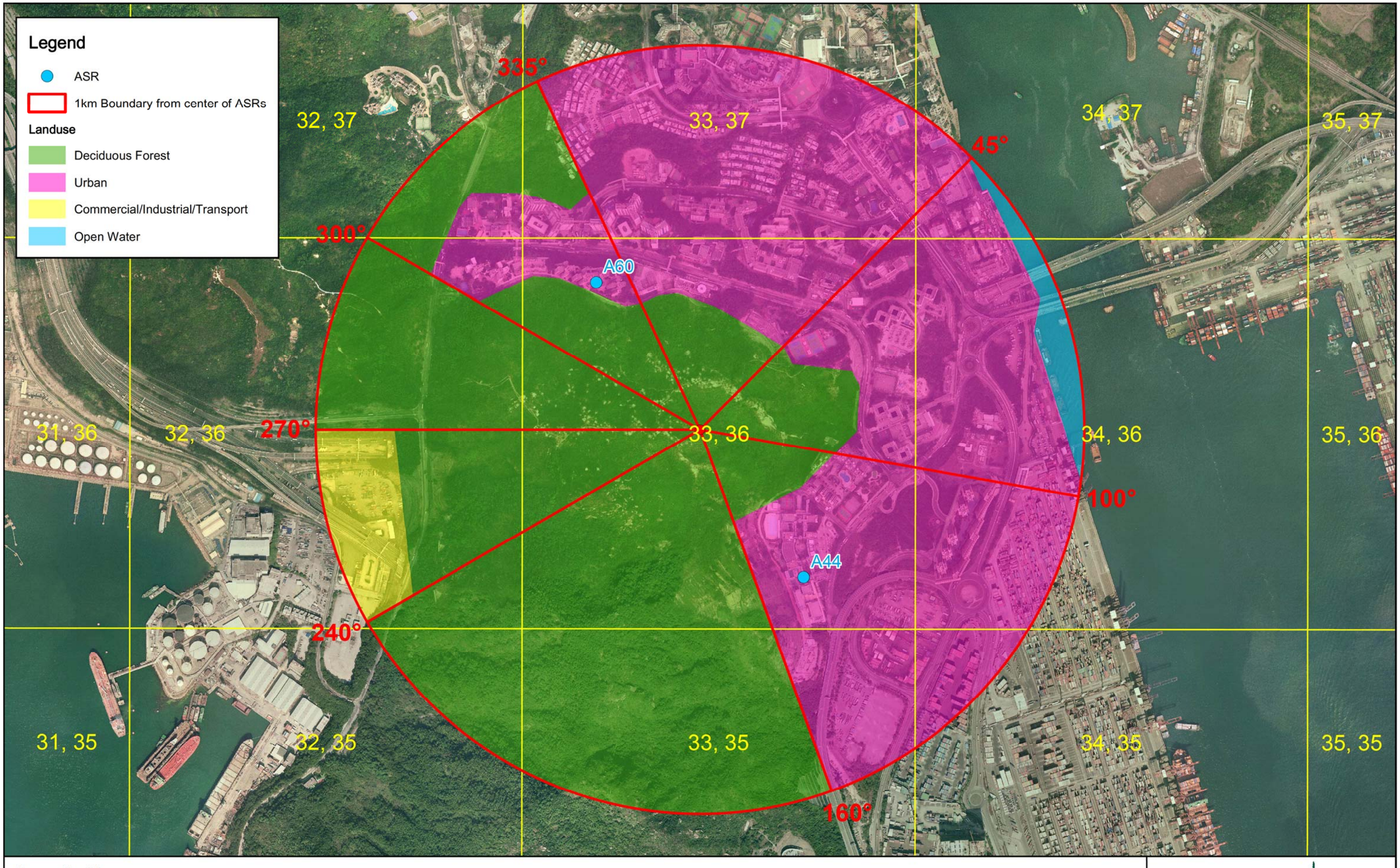
Appendix 3A

Sectors of Land Use for PATH Grid 27,33

File: T:\GIS\CONTRACT\0576490\mxd\Landuse\0576490_2733.mxd
Date: 13/1/2021

Environmental Resources Management

ERM



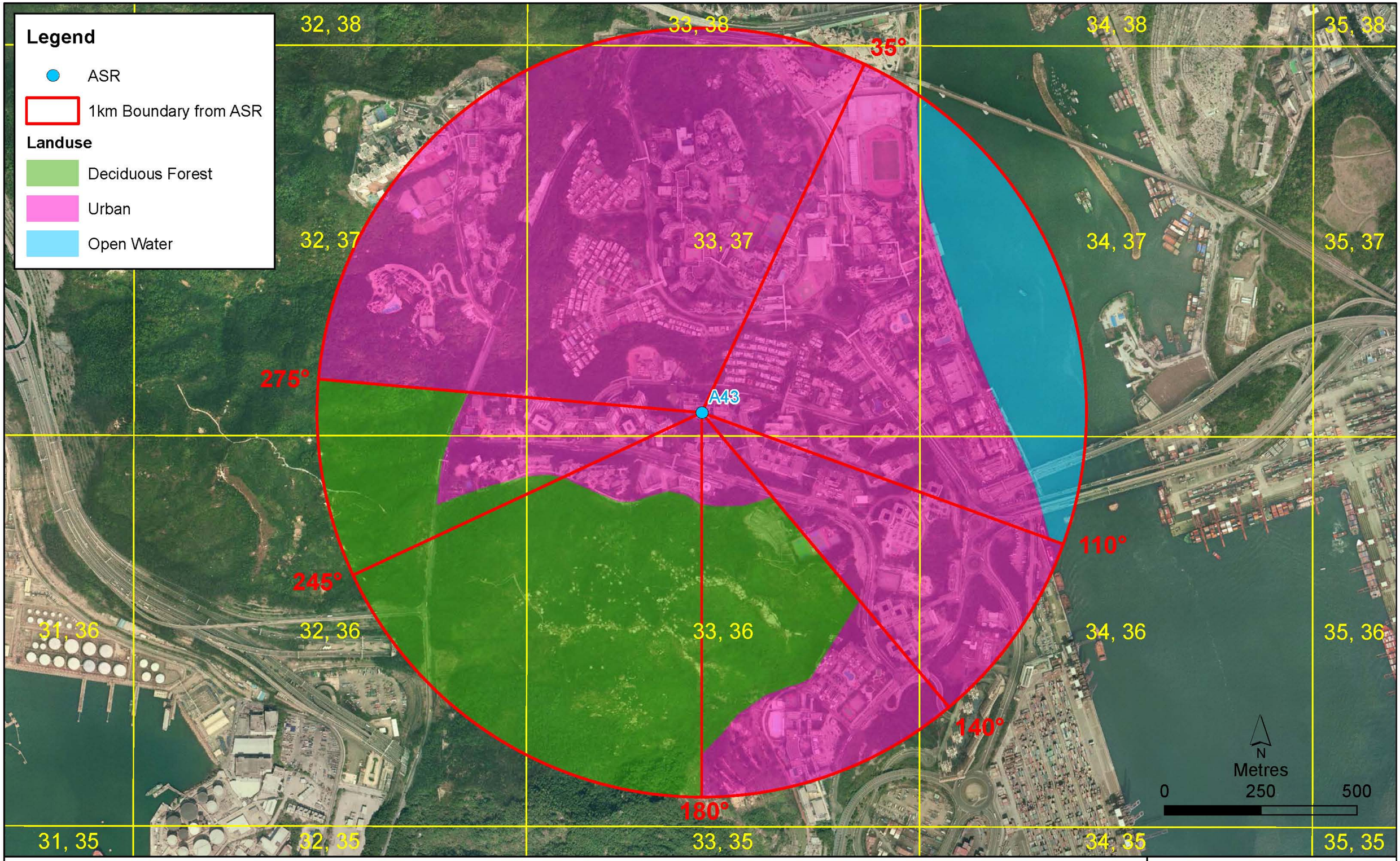
Appendix 3A

Sectors of Land Use for PATH Grid 33,36

File: T:\GIS\CONTRACT\0576490\mxd\Landuse\0576490_3336.mxd
Date: 25/8/2021

Environmental Resources Management

ERM



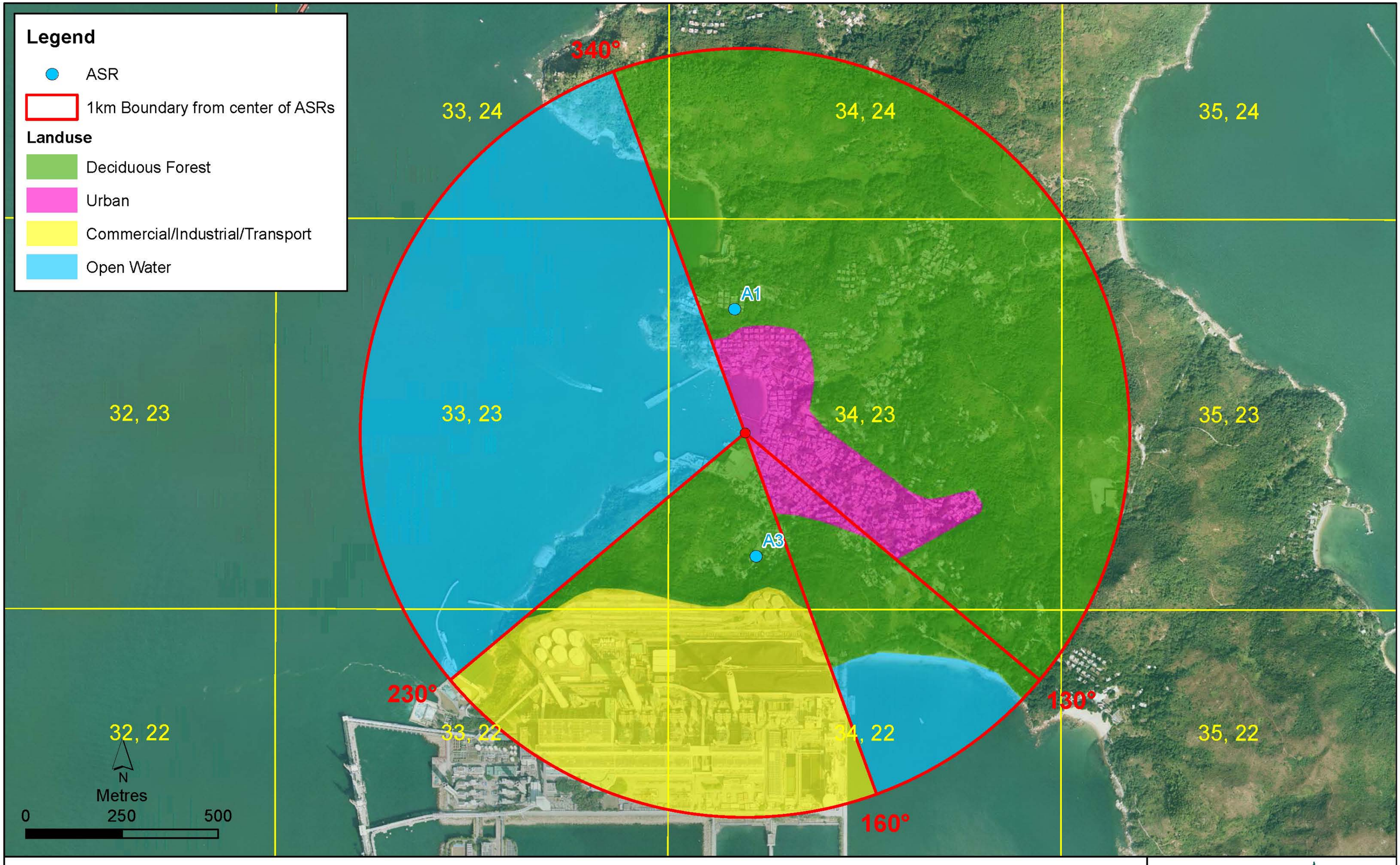
Appendix 3A

Sectors of Land Use for PATH Grid 33,37

File: T:\GIS\CONTRACT\0576490\mxd\Landuse\0576490_3337.mxd
Date: 13/1/2021

Environmental Resources Management

ERM



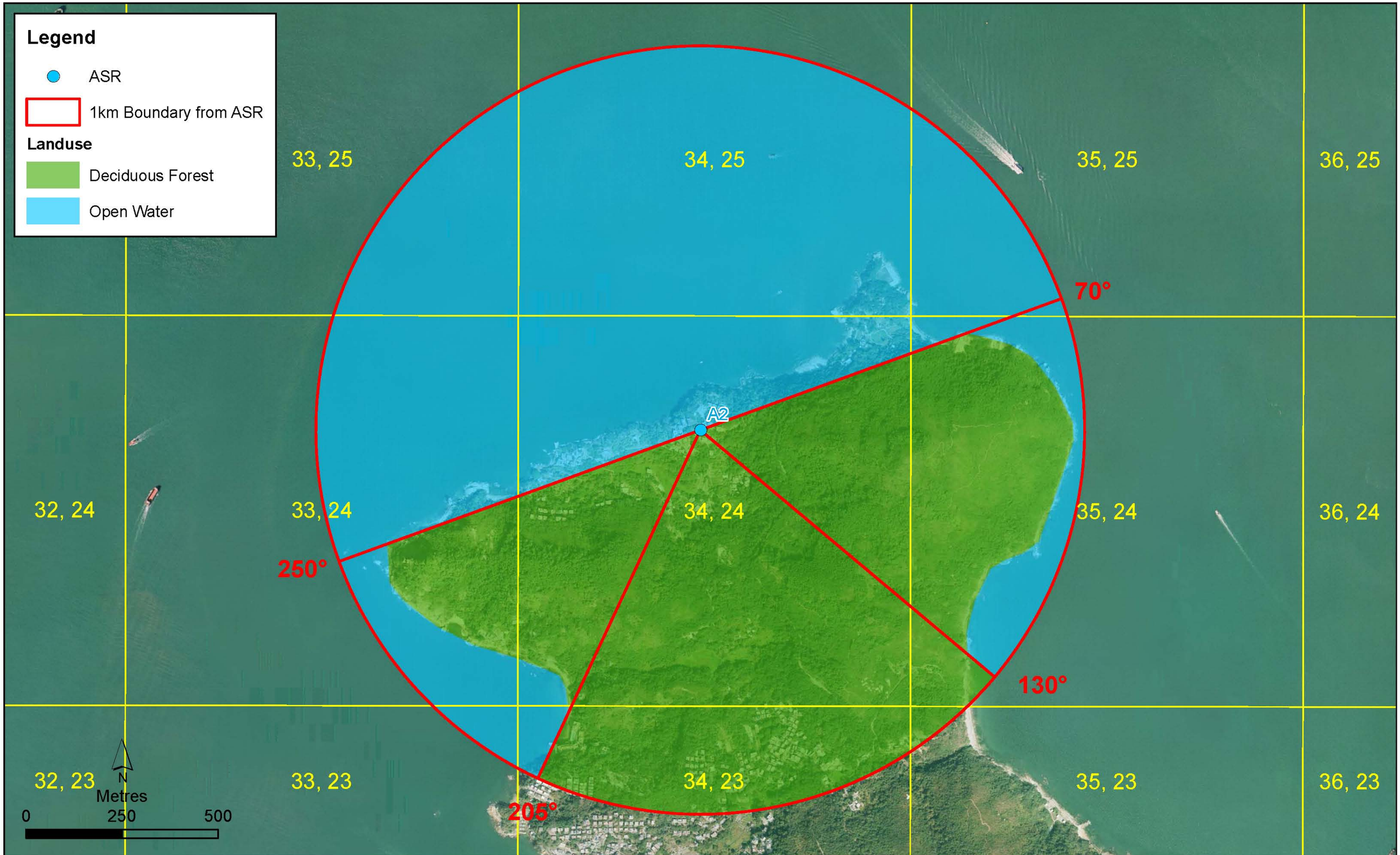
Appendix 3A

Sectors of Land Use for PATH Grid 34,23

File: T:\GIS\CONTRACT\0576490\mxd\Landuse\0576490_3423.mxd
Date: 13/1/2021

Environmental Resources Management

ERM



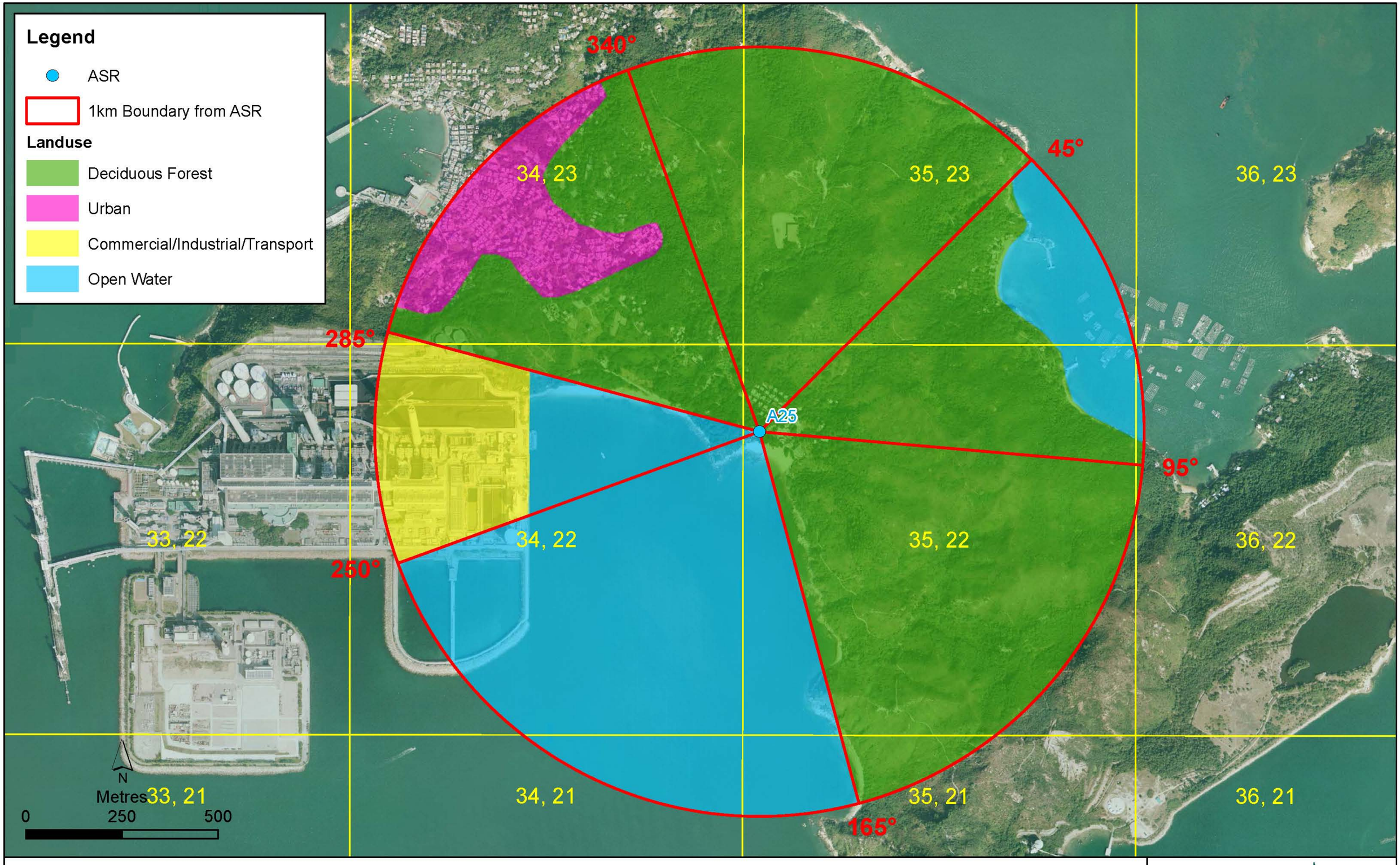
Appendix 3A

Sectors of Land Use for PATH Grid 34,24

File: T:\GIS\CONTRACT\0576490\mxd\Landuse\0576490_3424.mxd
Date: 13/1/2021

Environmental Resources Management

ERM



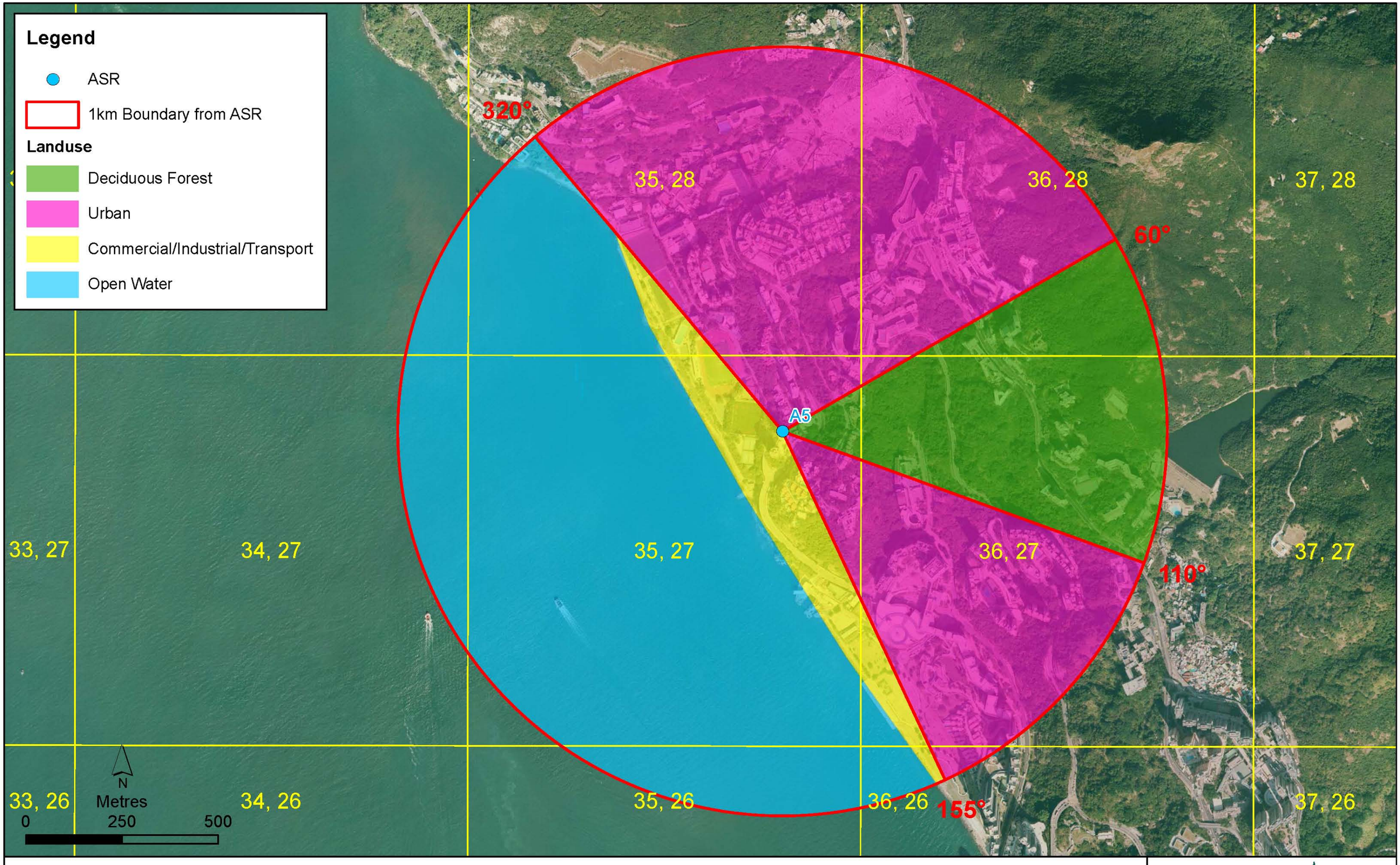
Appendix 3A

Sectors of Land Use for PATH Grid 35,22

File: T:\GIS\CONTRACT\0576490\mxd\Landuse\0576490_3522.mxd
Date: 14/1/2021

Environmental Resources Management

ERM



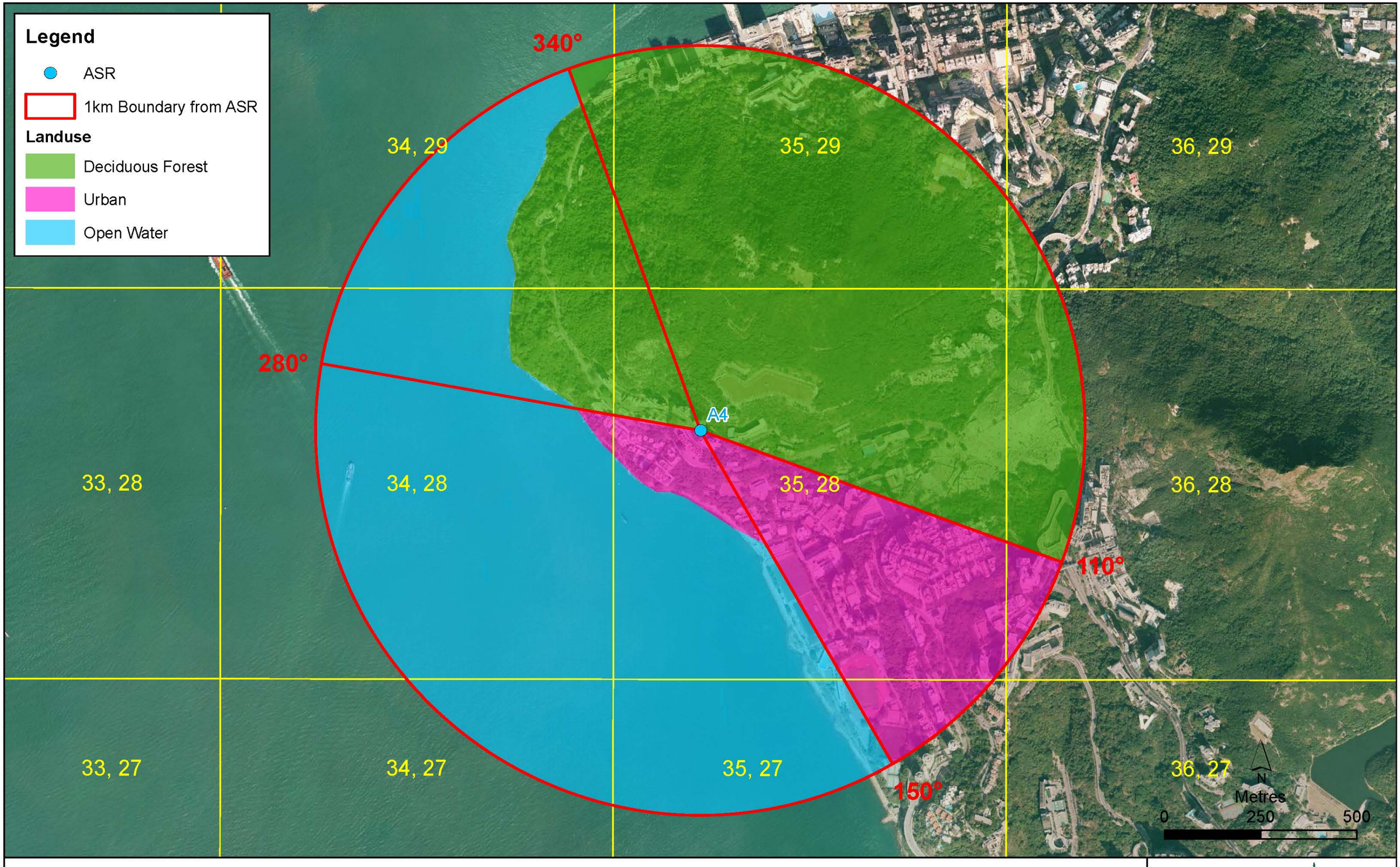
Appendix 3A

Sectors of Land Use for PATH Grid 35,27

File: T:\GIS\CONTRACT\0576490\mxd\Landuse\0576490_3527.mxd
Date: 13/1/2021

Environmental Resources Management

ERM



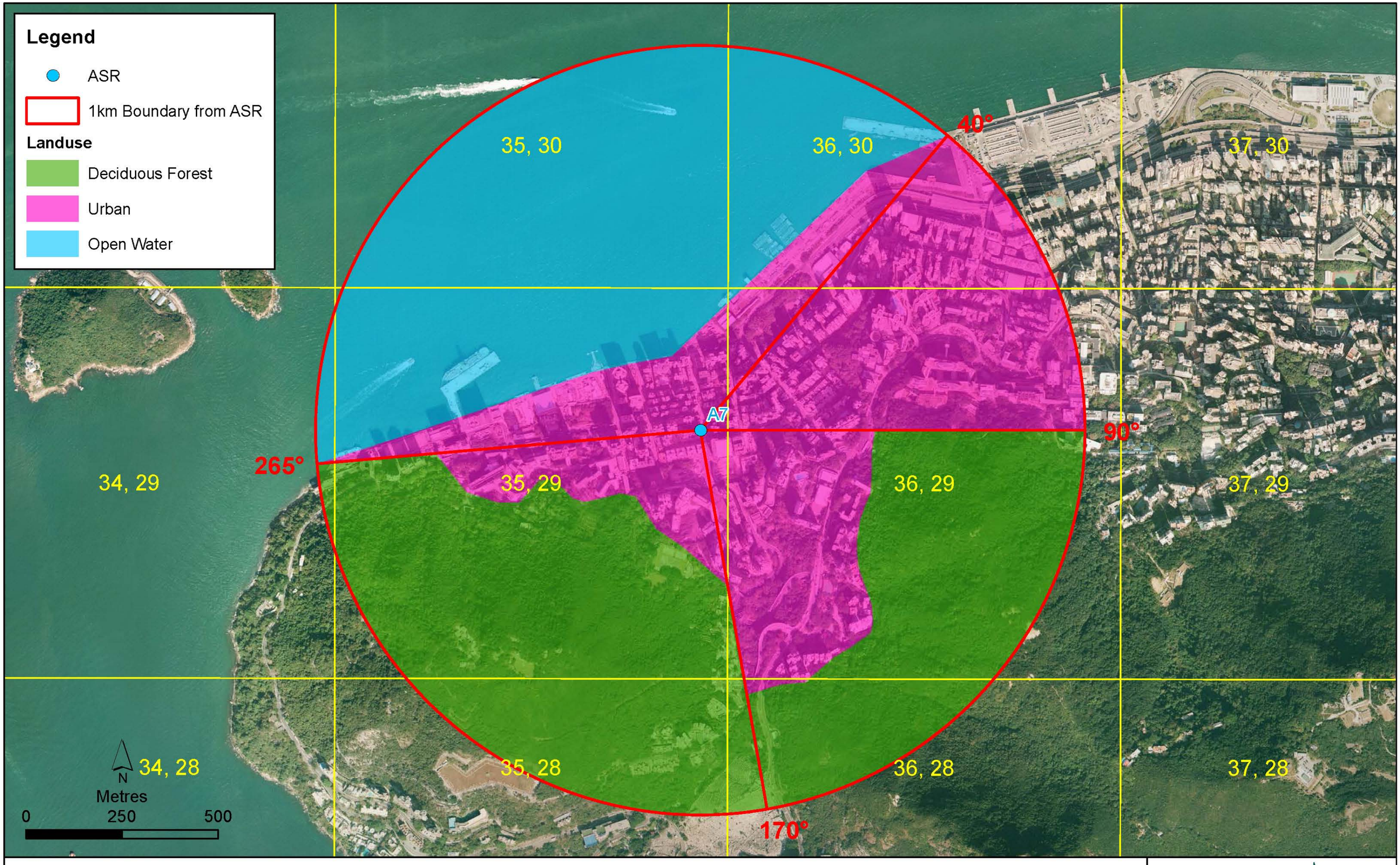
Appendix 3A

Sectors of Land Use for PATH Grid 35,28

File: T:\GIS\CONTRACT\0576490\mxd\Landuse\0576490_3528.mxd
Date: 13/1/2021

Environmental Resources Management

ERM



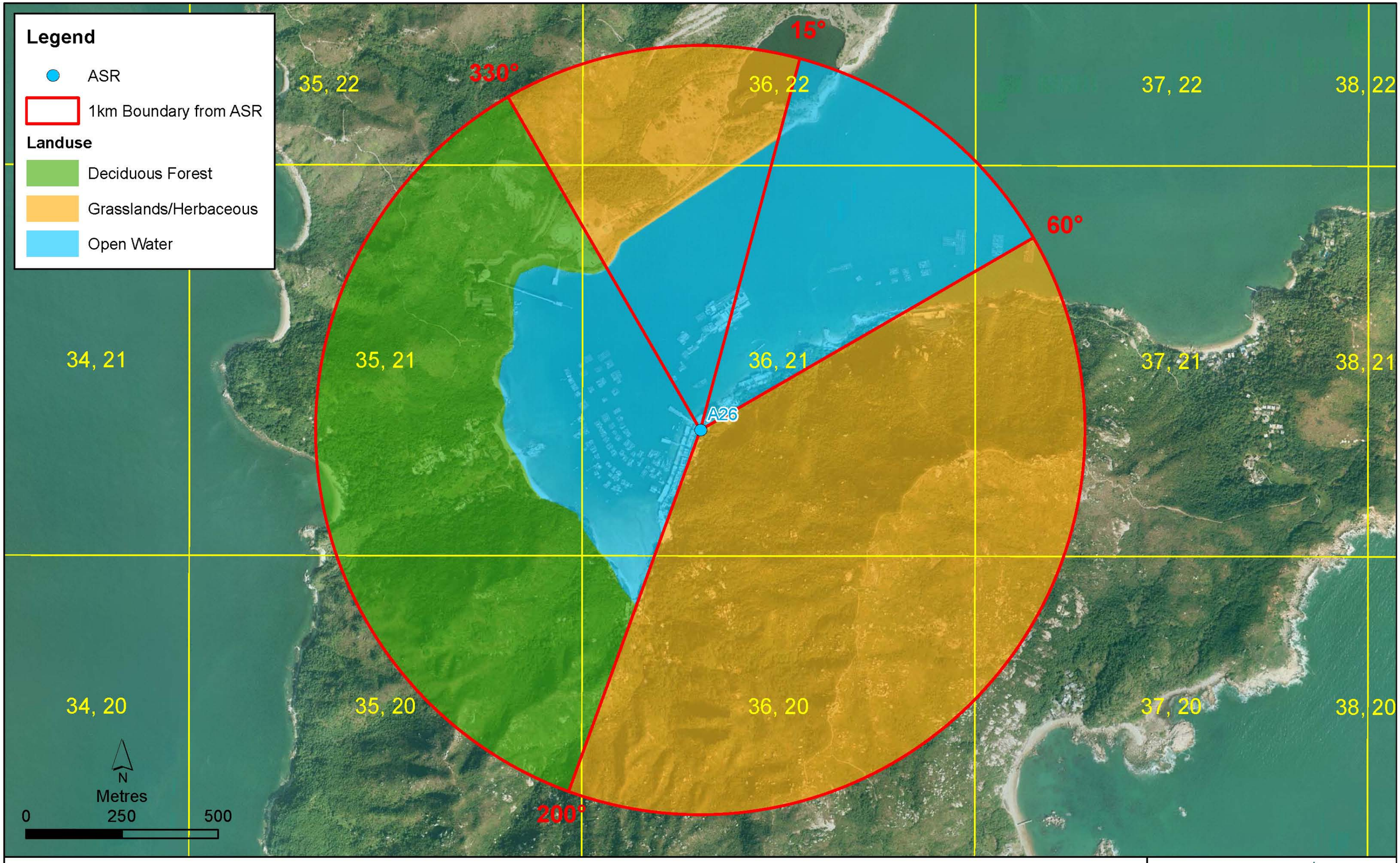
Appendix 3A

Sectors of Land Use for PATH Grid 35,29

File: T:\GIS\CONTRACT\0576490\mxd\Landuse\0576490_3529.mxd
Date: 13/1/2021

Environmental Resources Management

ERM



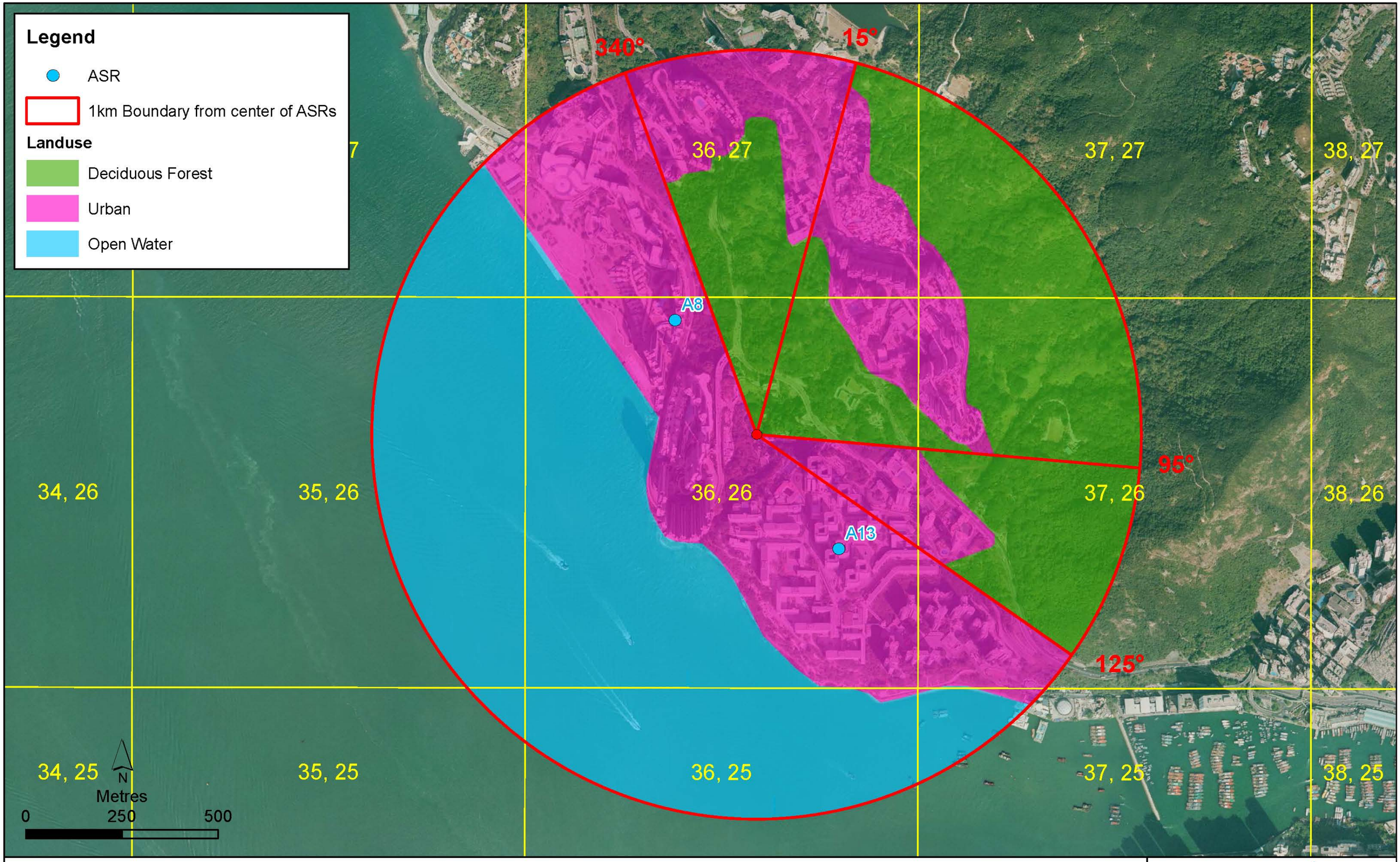
Appendix 3A

Sectors of Land Use for PATH Grid 36,21

File: T:\GIS\CONTRACT\0576490\mxd\Landuse\0576490_3621.mxd
Date: 13/1/2021

Environmental Resources Management

ERM



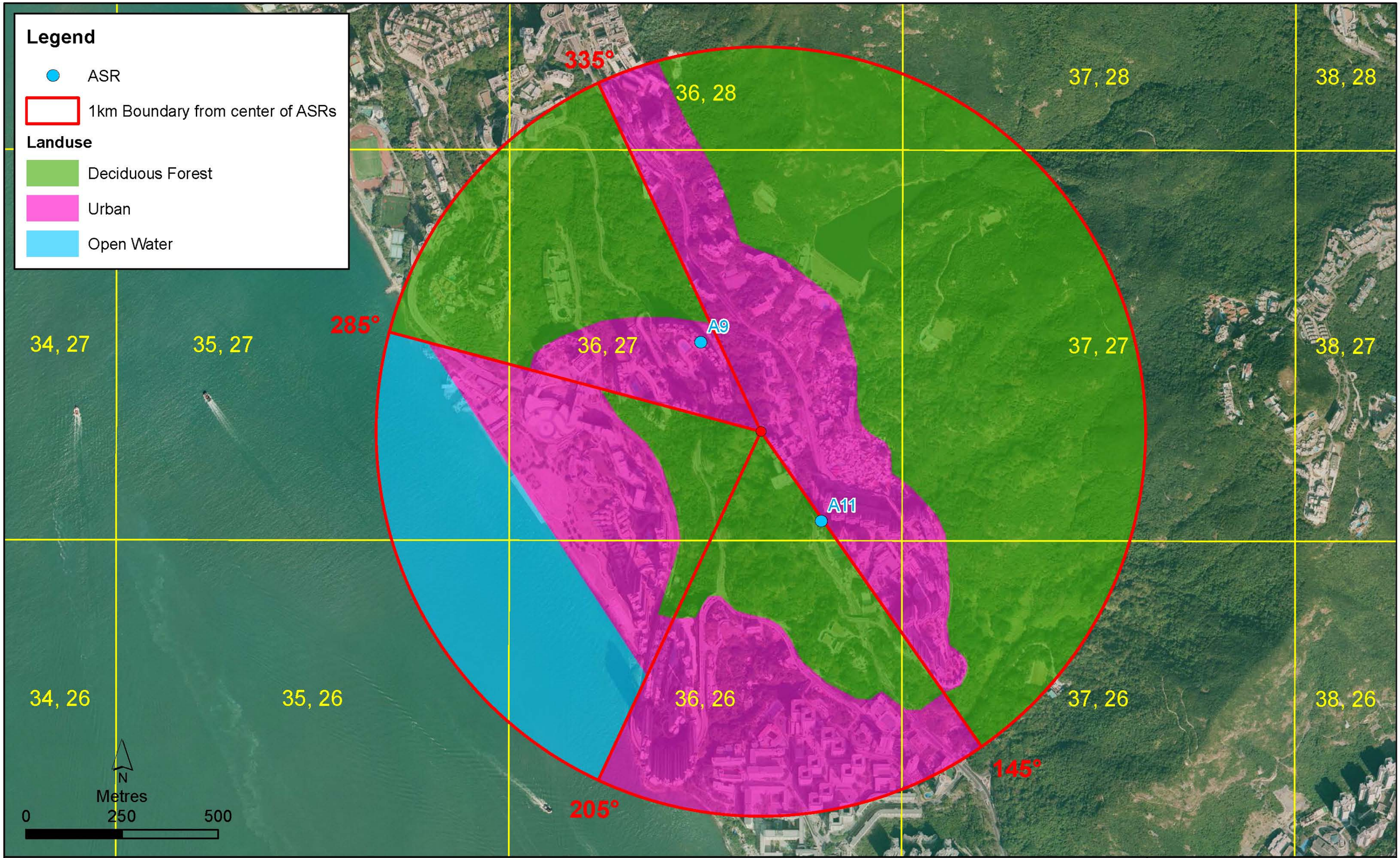
Appendix 3A

Sectors of Land Use for PATH Grid 36,26

File: T:\GIS\CONTRACT\0576490\mxd\Landuse\0576490_3626.mxd
Date: 14/1/2021

Environmental Resources Management

ERM



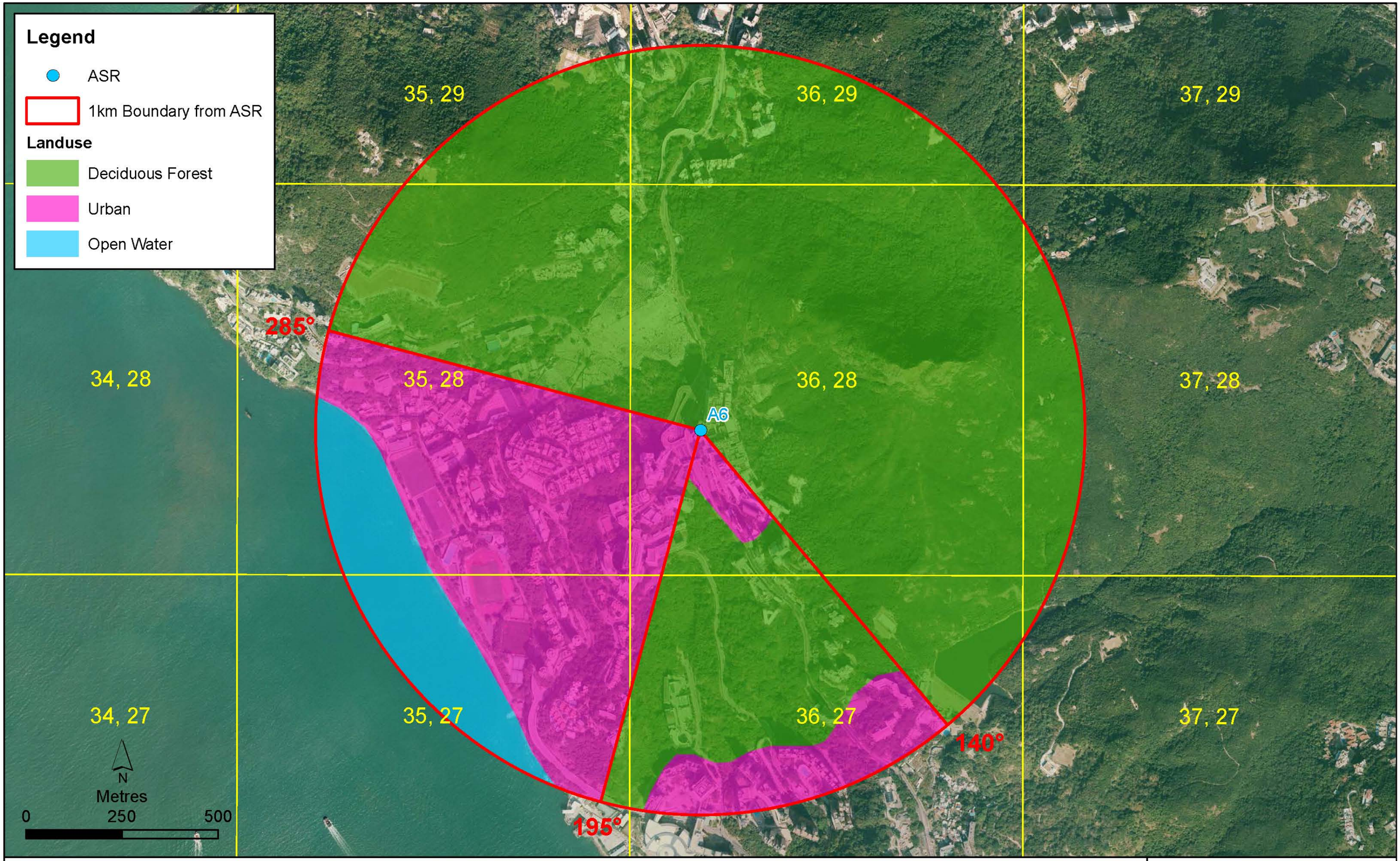
Appendix 3A

Sectors of Land Use for PATH Grid 36,27

File: T:\GIS\CONTRACT\0576490\mxd\Landuse\0576490_3627.mxd
Date: 13/1/2021

Environmental Resources Management

ERM



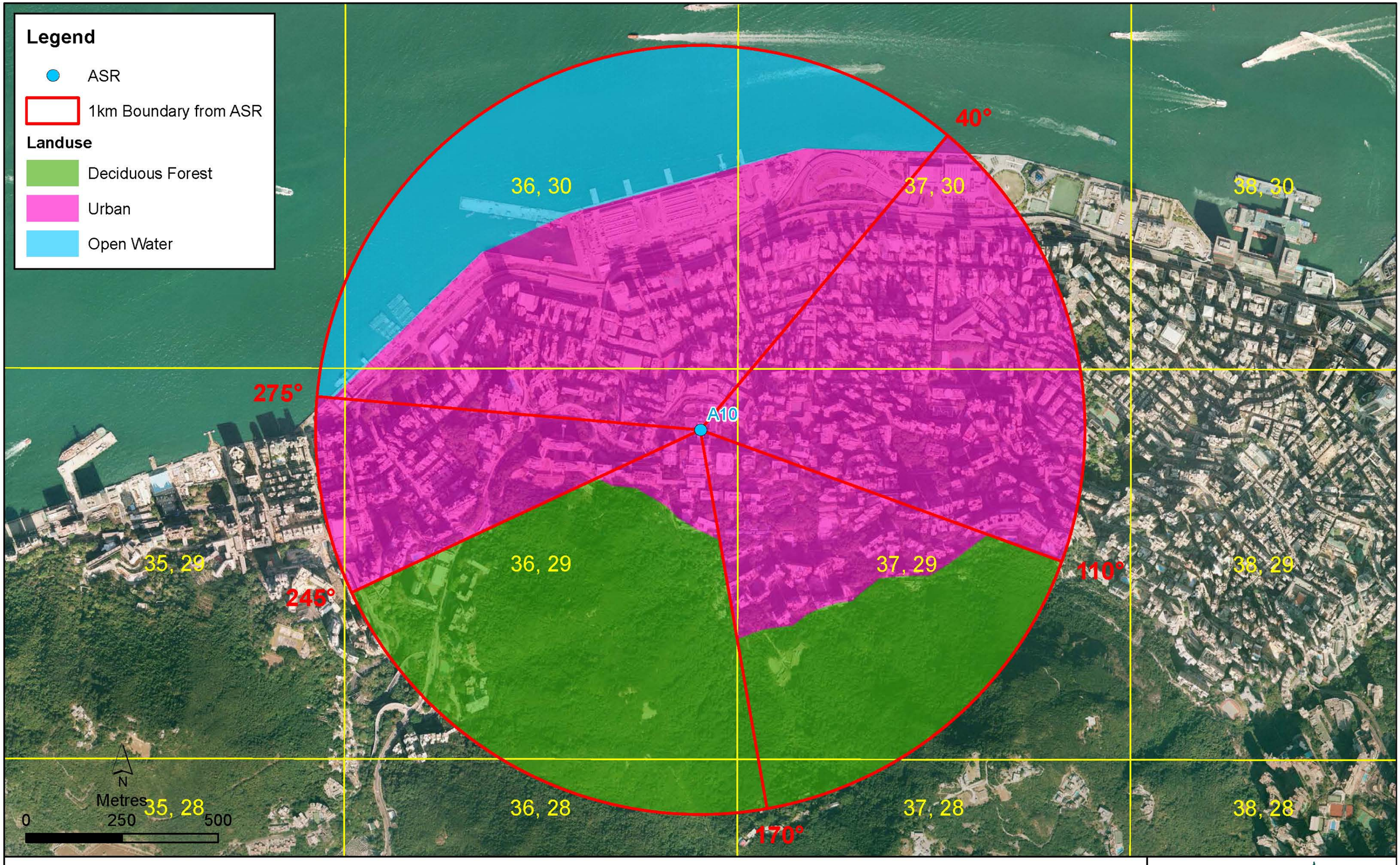
Appendix 3A

Sectors of Land Use for PATH Grid 36,28

File: T:\GIS\CONTRACT\0576490\mxd\Landuse\0576490_3628.mxd
Date: 13/1/2021

Environmental Resources Management

ERM



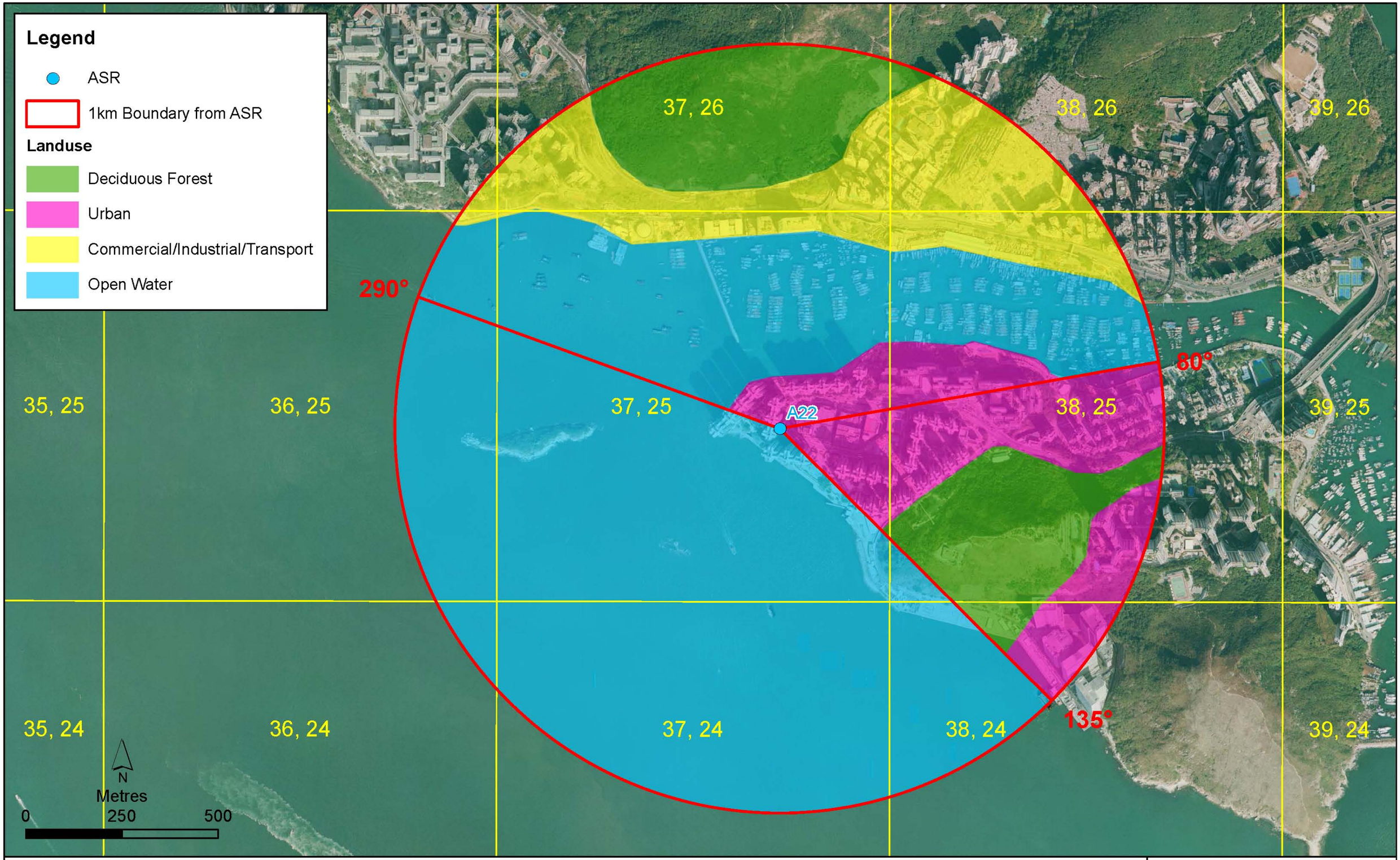
Appendix 3A

Sectors of Land Use for PATH Grid 36,29

File: T:\GIS\CONTRACT\0576490\mxd\Landuse\0576490_3629.mxd
Date: 13/1/2021

Environmental Resources Management

ERM



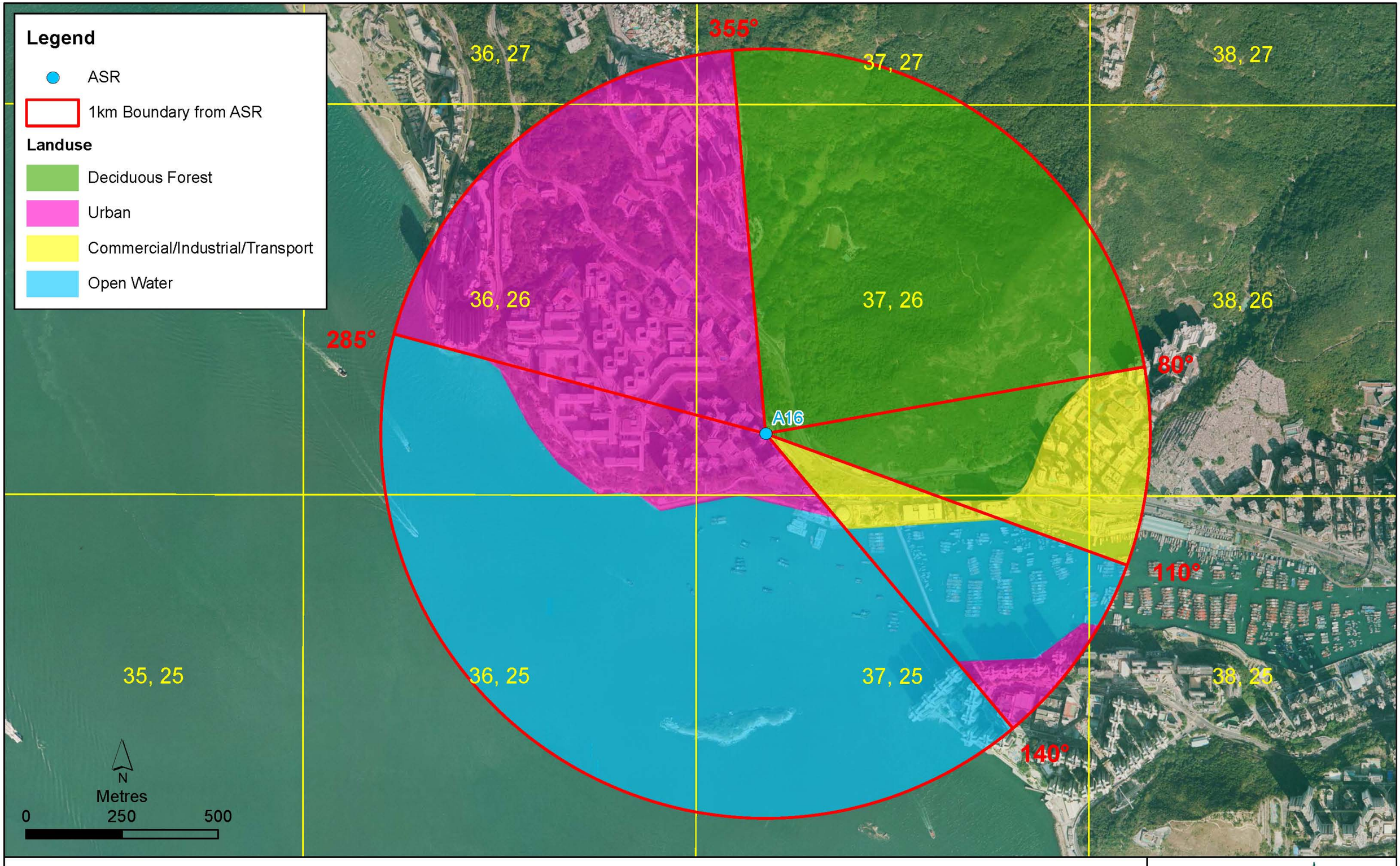
Appendix 3A

Sectors of Land Use for PATH Grid 37,25

File: T:\GIS\CONTRACT\0576490\mxd\Landuse\0576490_3725.mxd
Date: 14/1/2021

Environmental Resources Management

ERM



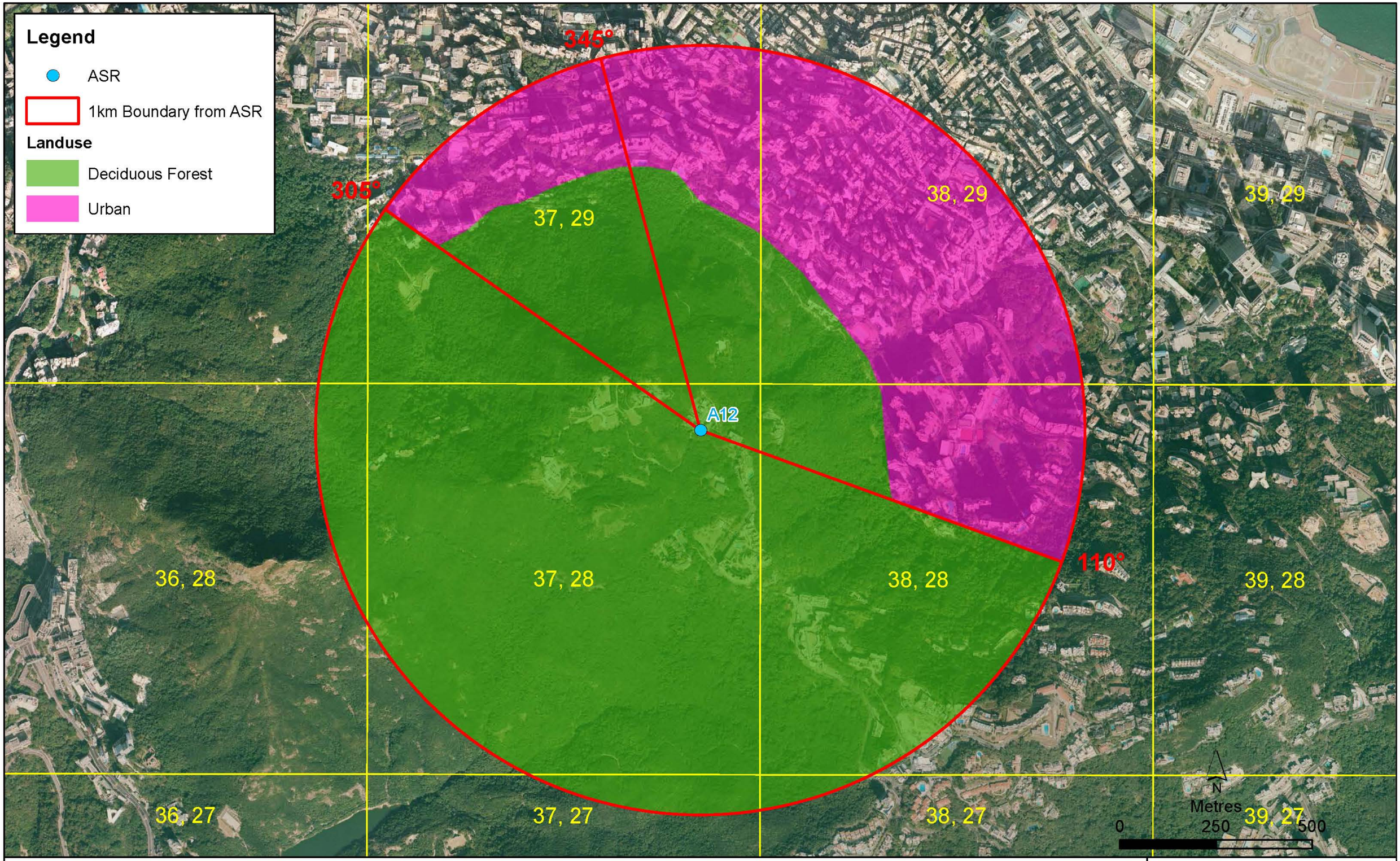
Appendix 3A

Sectors of Land Use for PATH Grid 37,26

File: T:\GIS\CONTRACT\0576490\mxd\Landuse\0576490_3726.mxd
Date: 13/1/2021

Environmental Resources Management

ERM



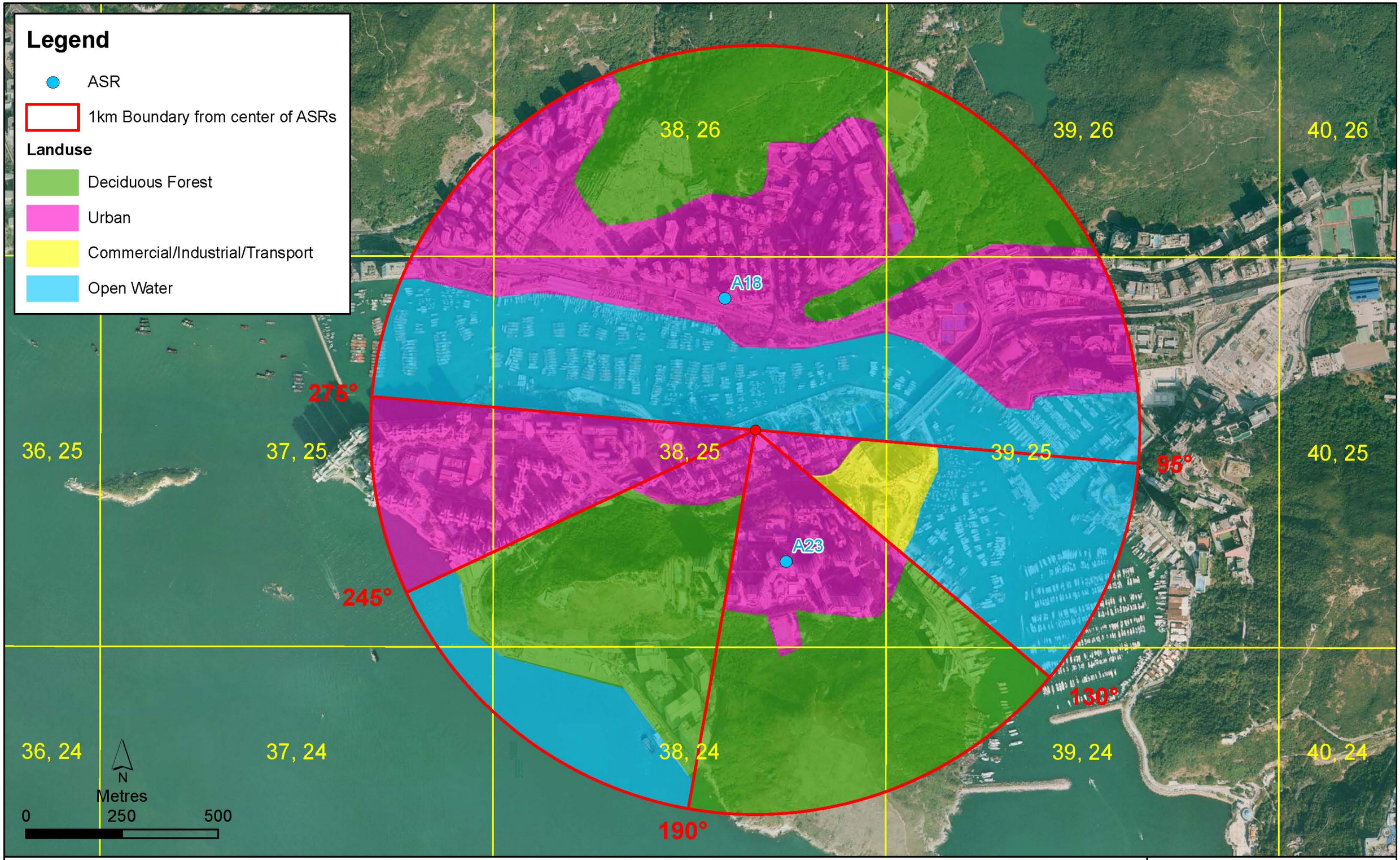
Appendix 3A

Sectors of Land Use for PATH Grid 37,28

File: T:\GIS\CONTRACT\0576490\mxd\Landuse\0576490_3728.mxd
Date: 13/1/2021

Environmental Resources Management

ERM



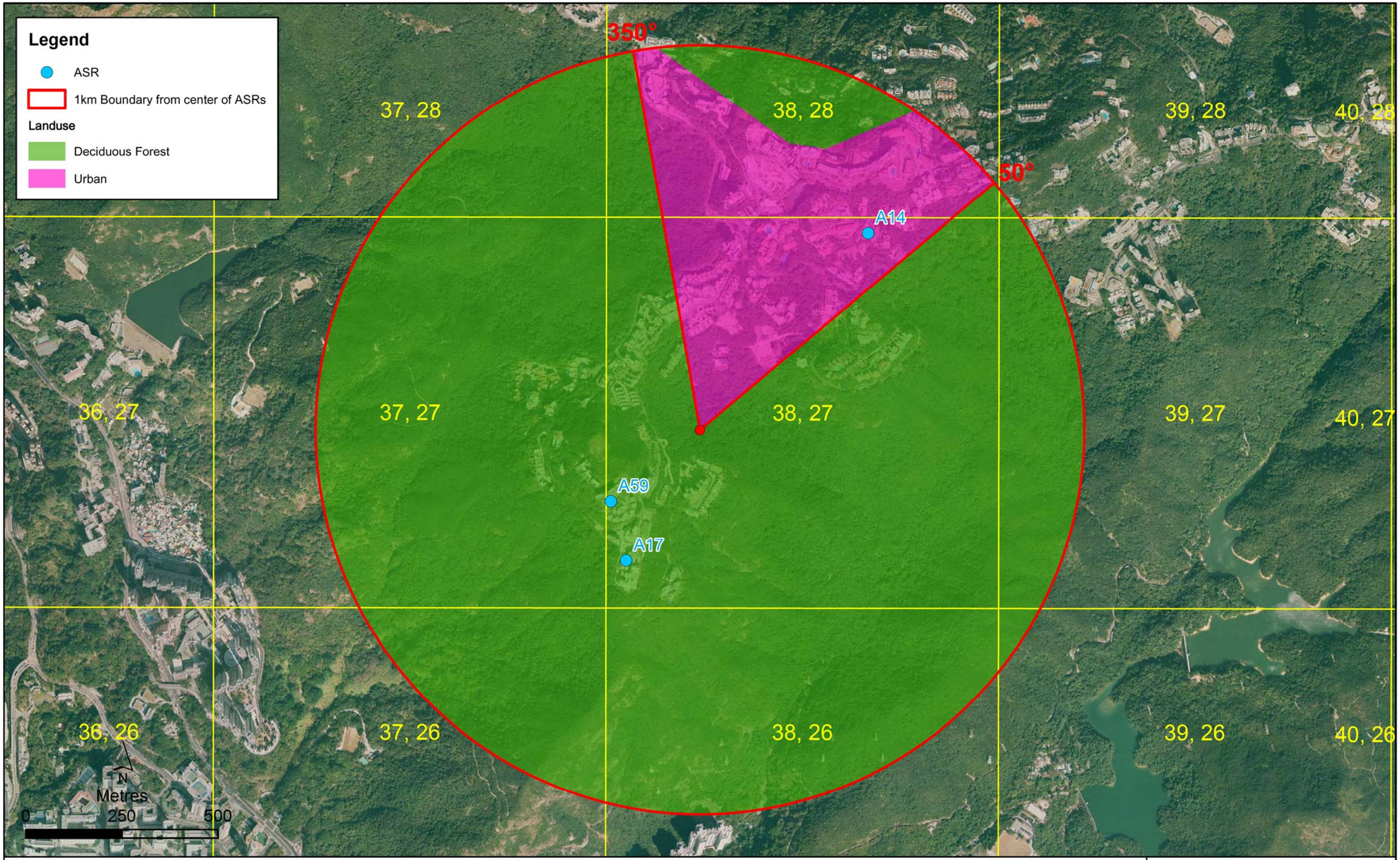
Appendix 3A

Sectors of Land Use for PATH Grid 38,25

File: T:\GIS\CONTRACT\0576490\mxd\Landuse\0576490_3825.mxd
Date: 13/1/2021

Environmental Resources Management

ERM



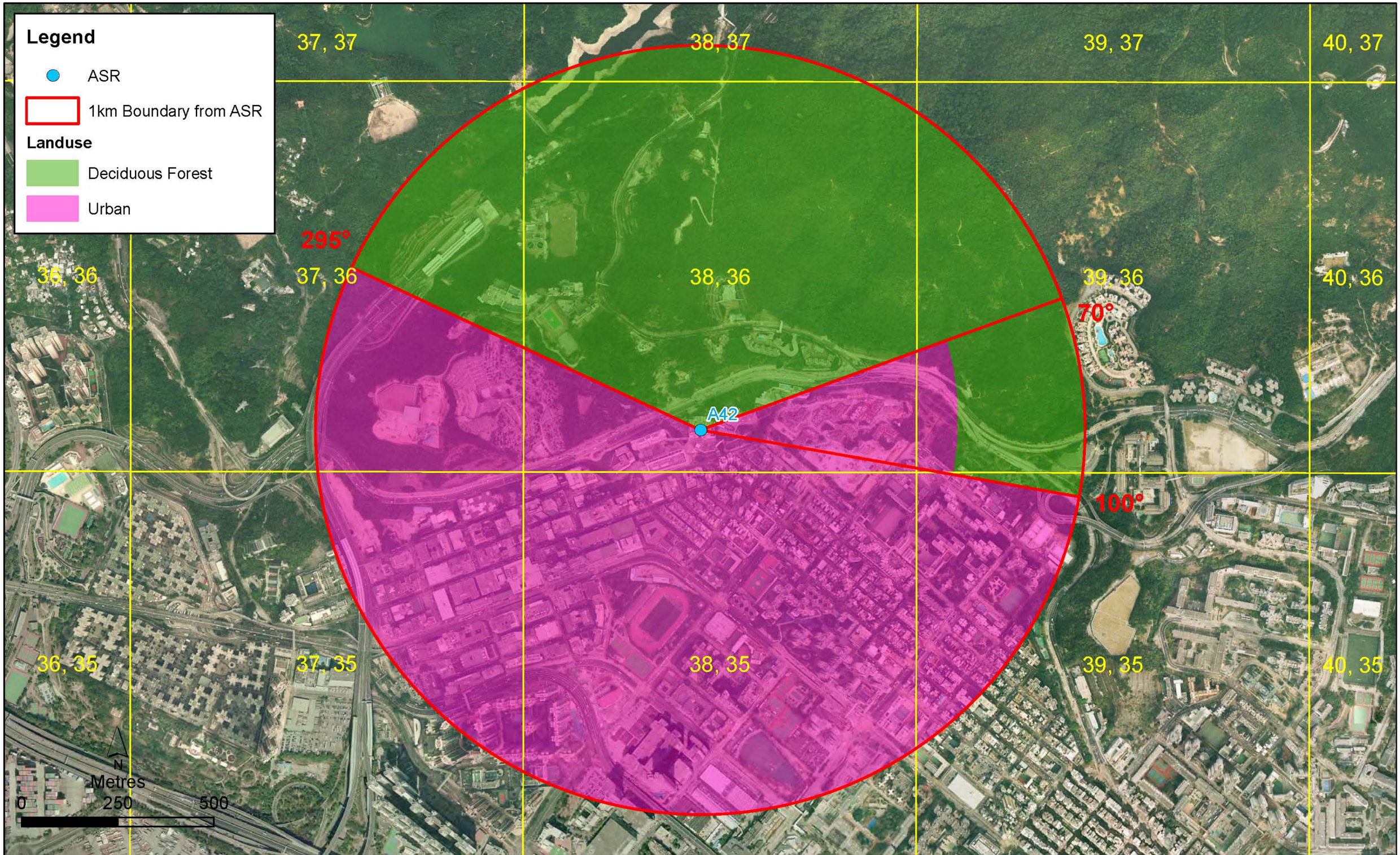
Appendix 3A

Sectors of Land Use for PATH Grid 38,27

File: T:\GIS\CONTRACT\0576490\mxd\Landuse\0576490_3827.mxd
Date: 25/8/2021

Environmental Resources Management

ERM



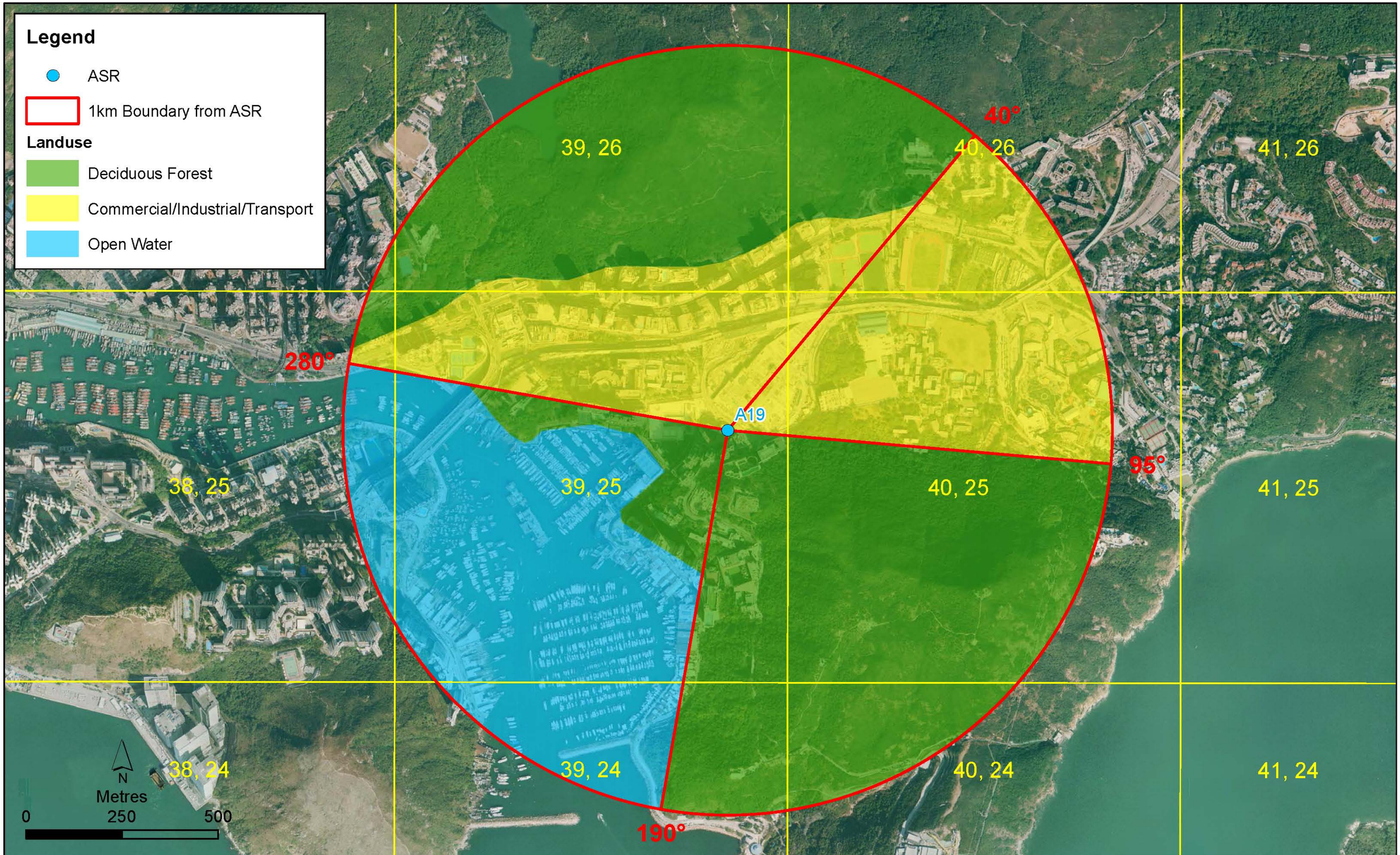
Appendix 3A

Sectors of Land Use for PATH Grid 38,36

File: T:\GIS\CONTRACT\0576490\mxd\Landuse\0576490_3836.mxd
Date: 13/1/2021

Environmental Resources Management

ERM



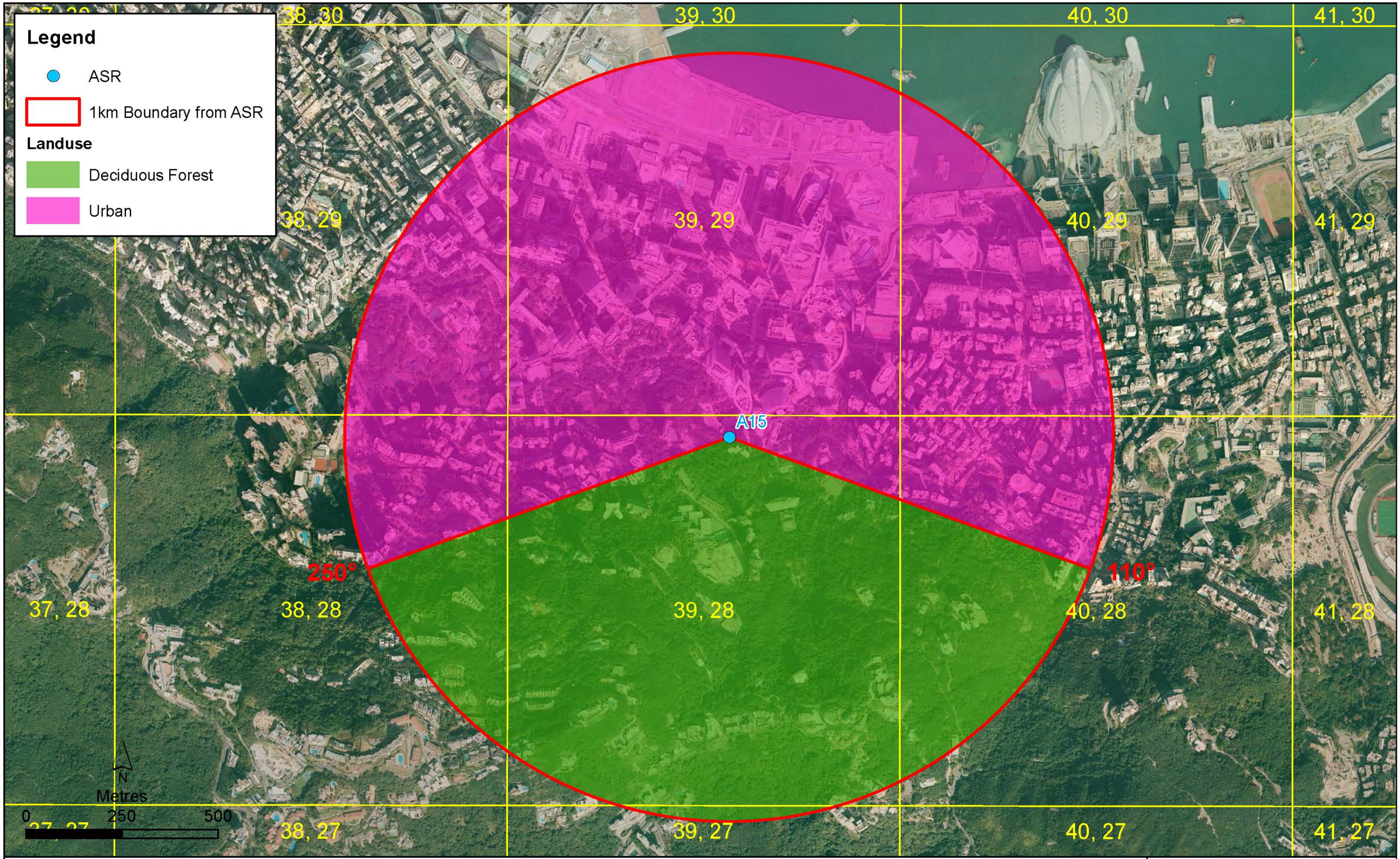
Appendix 3A

Sectors of Land Use for PATH Grid 39,25

File: T:\GIS\CONTRACT\0576490\mxd\Landuse\0576490_3925.mxd
Date: 13/1/2021

Environmental Resources Management

ERM



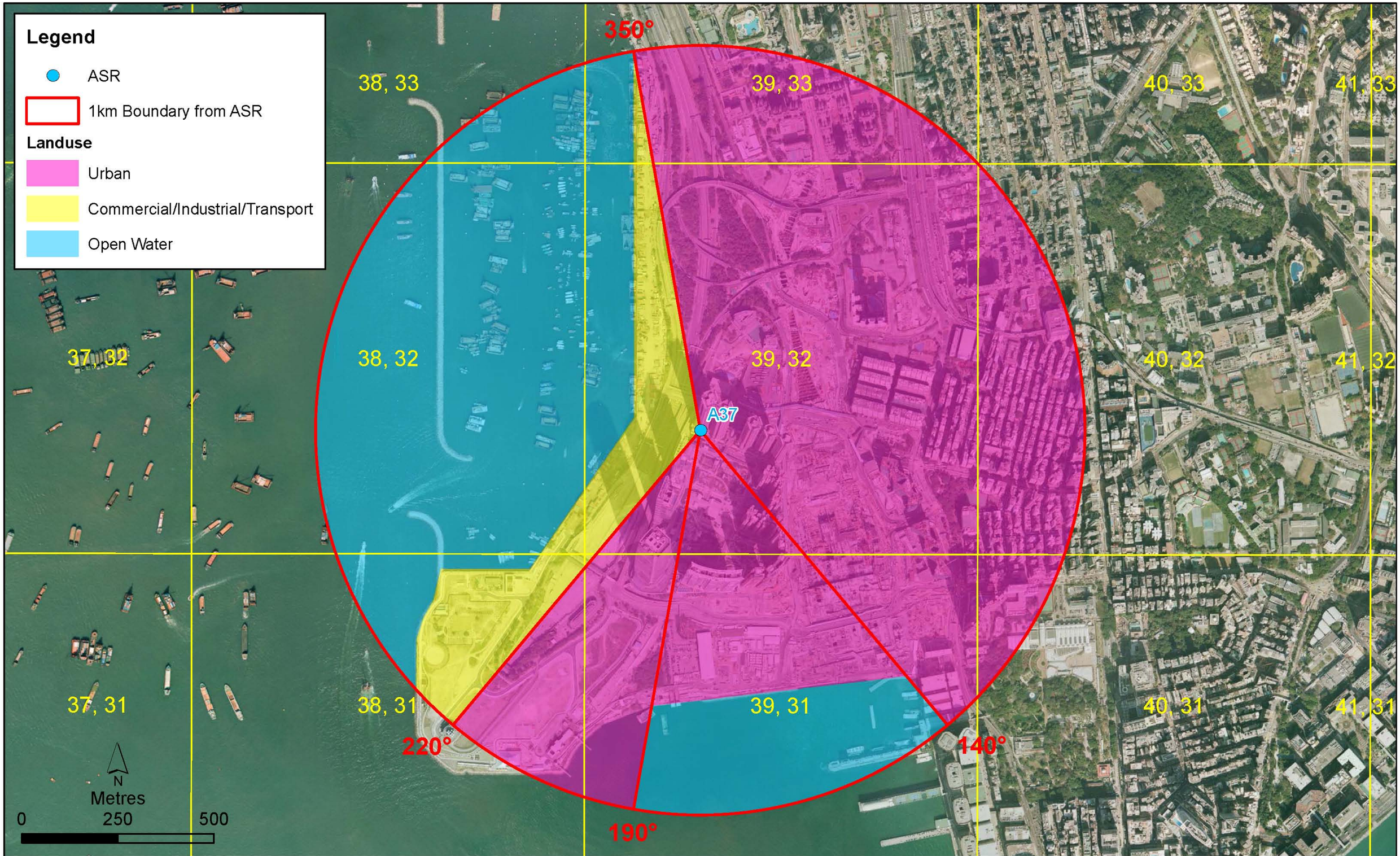
Appendix 3A

Sectors of Land Use for PATH Grid 39,28

File: T:\GIS\CONTRACT\0576490\mxd\Landuse\0576490_3928.mxd
Date: 13/1/2021

Environmental Resources Management

ERM



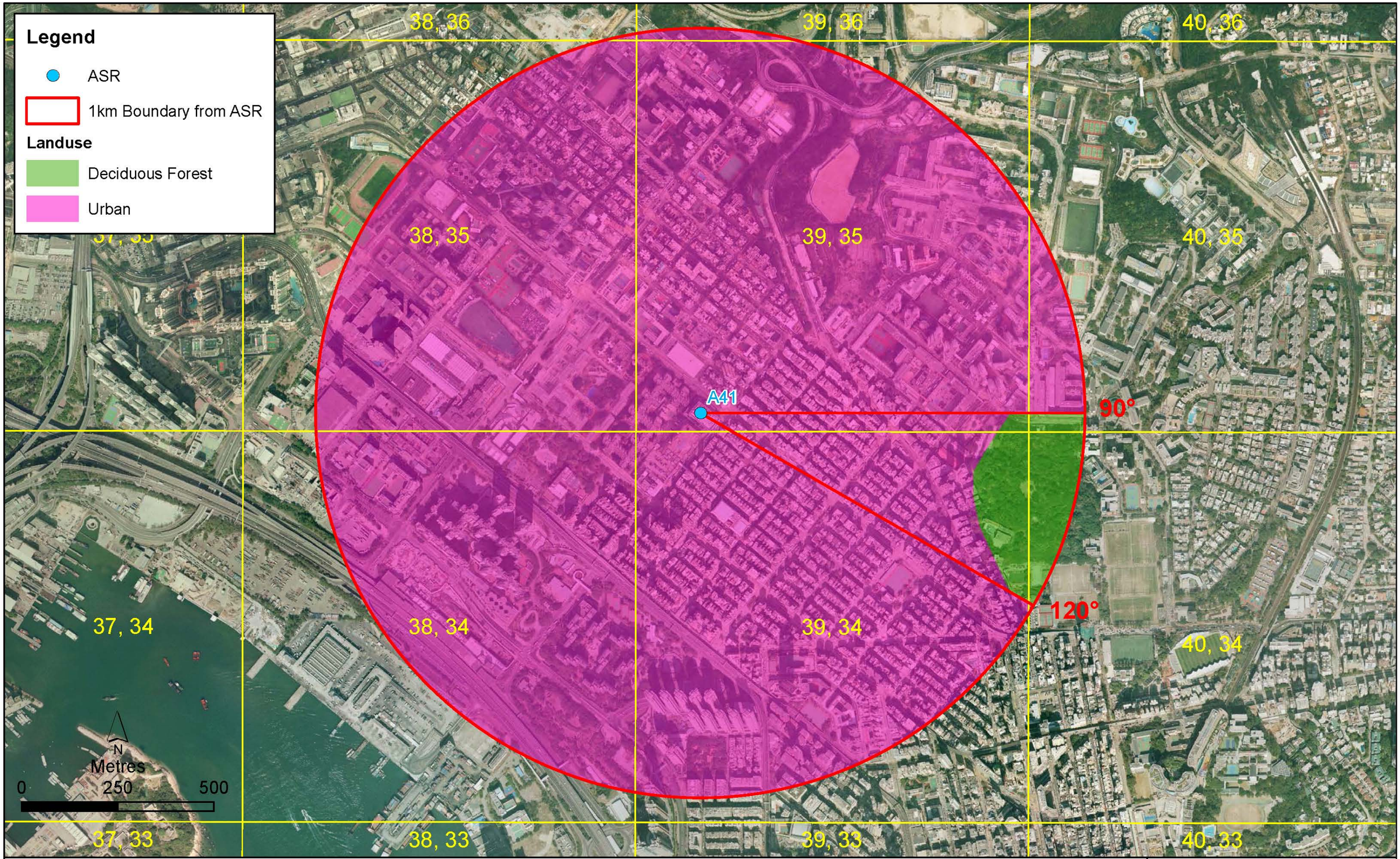
Appendix 3A

Sectors of Land Use for PATH Grid 39,32

File: T:\GIS\CONTRACT\0576490\mxd\Landuse\0576490_3932.mxd
Date: 13/1/2021

Environmental Resources Management

ERM



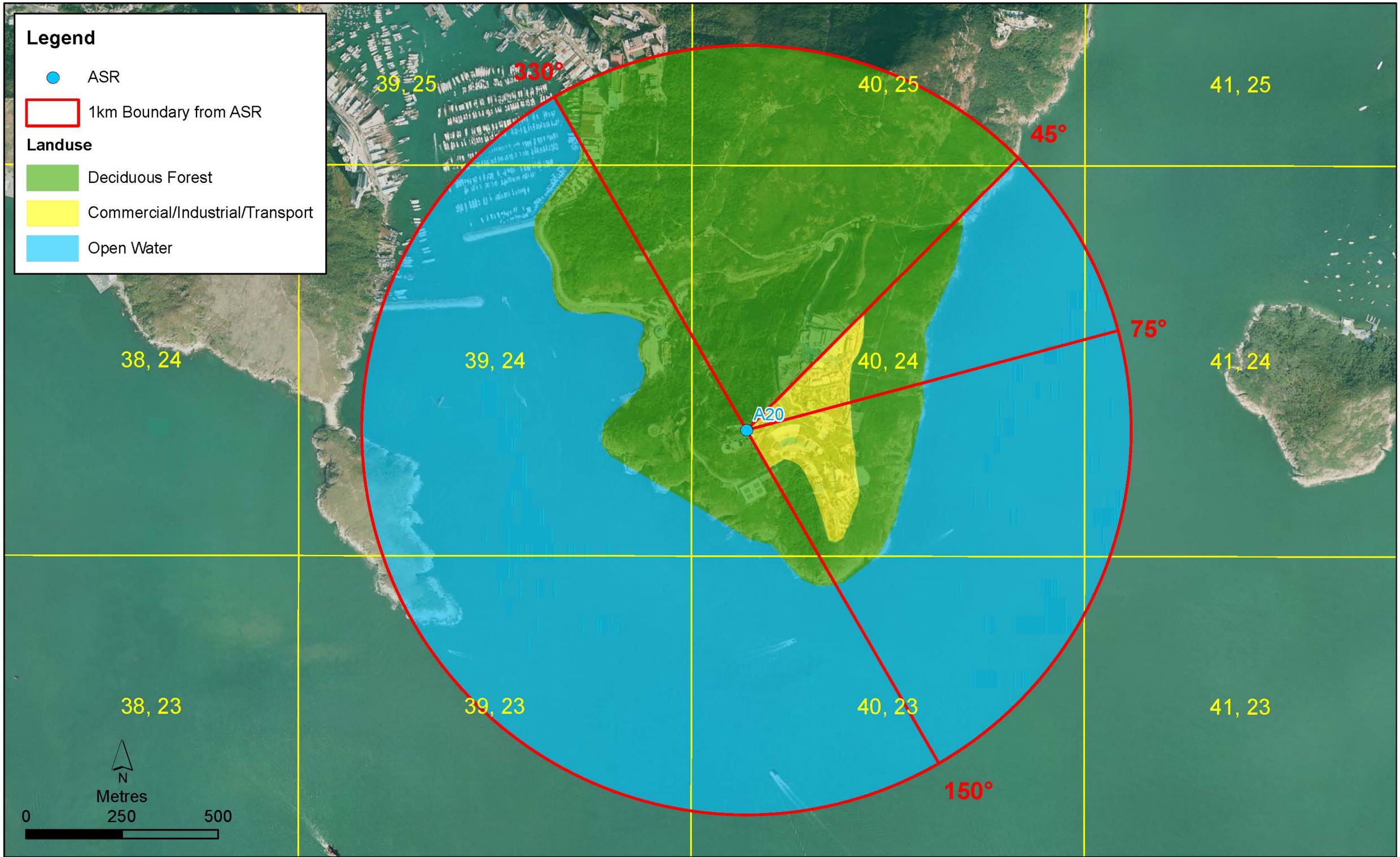
Appendix 3A

Sectors of Land Use for PATH Grid 39,35

File: T:\GIS\CONTRACT\0576490\mxd\Landuse\0576490_3935.mxd
Date: 13/1/2021

Environmental Resources Management

ERM



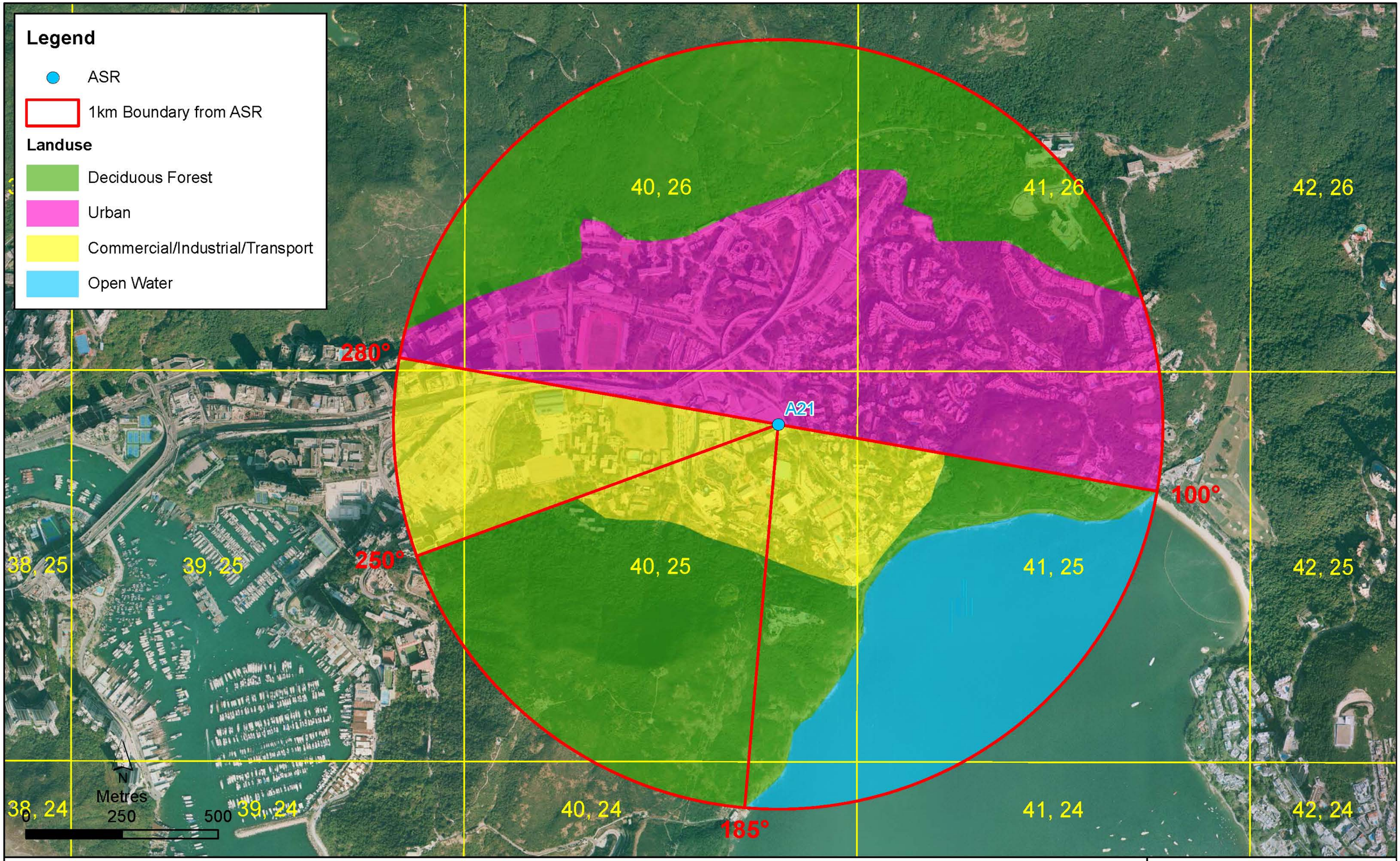
Appendix 3A

Sectors of Land Use for PATH Grid 40,24

File: T:\GIS\CONTRACT\0576490\mxd\Landuse\0576490_4024.mxd
Date: 13/1/2021

Environmental Resources Management

ERM



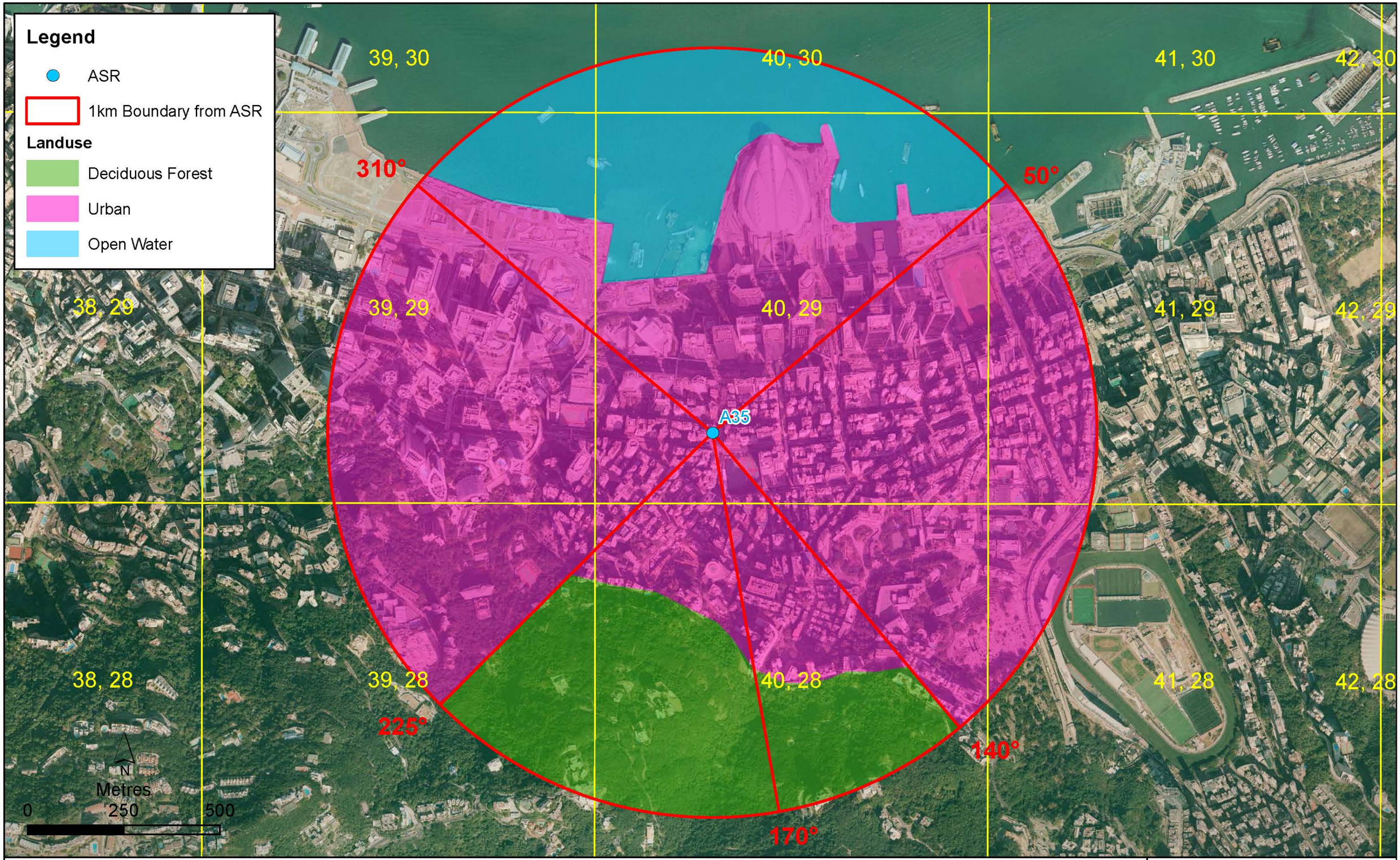
Appendix 3A

Sectors of Land Use for PATH Grid 40,25

File: T:\GIS\CONTRACT\0576490\mxd\Landuse\0576490_4025.mxd
Date: 5/12/2019

Environmental Resources Management

ERM



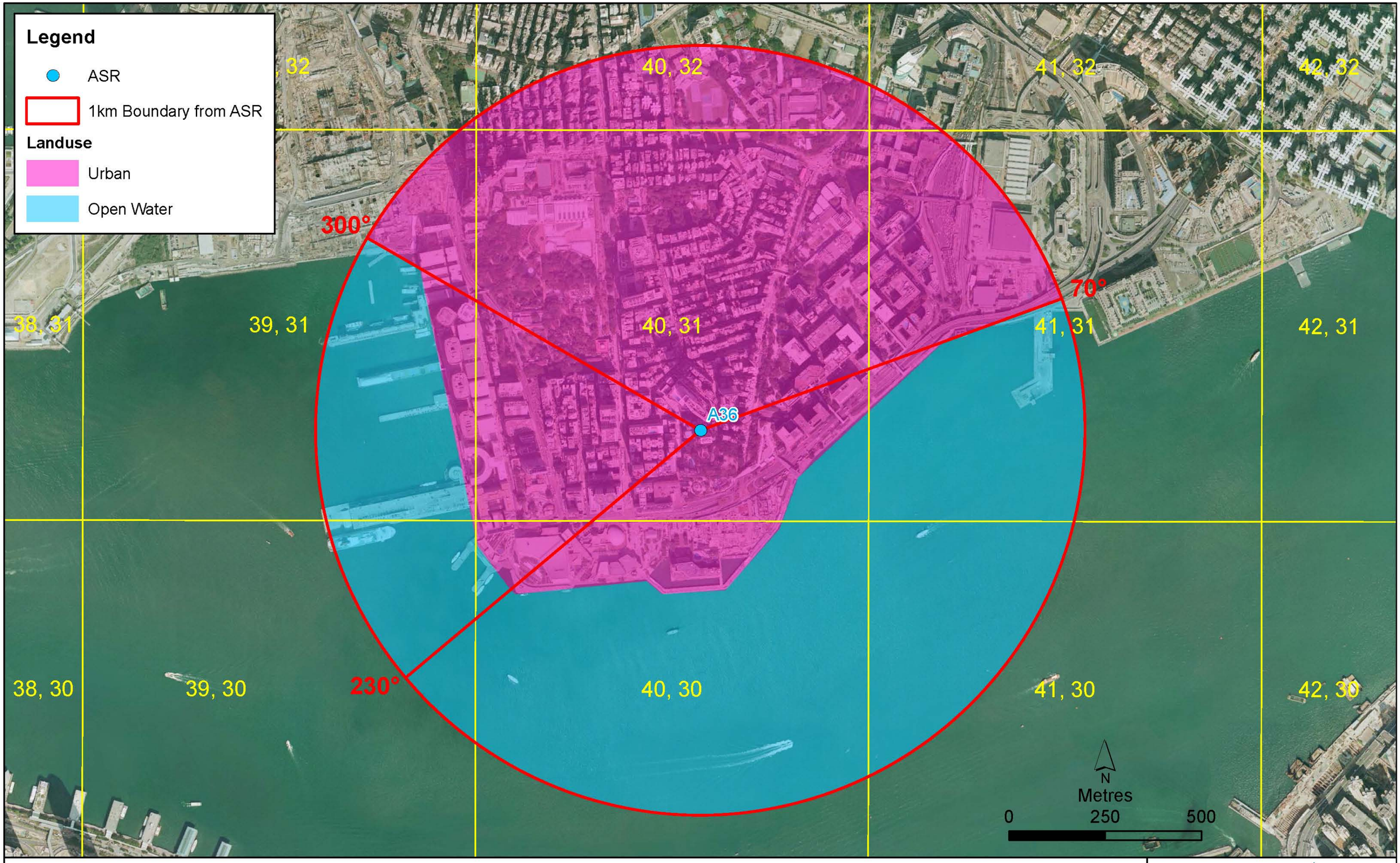
Appendix 3A

Sectors of Land Use for PATH Grid 40,29

File: T:\GIS\CONTRACT\0576490\mxd\Landuse\0576490_4029.mxd
Date: 13/1/2021

Environmental Resources Management

ERM



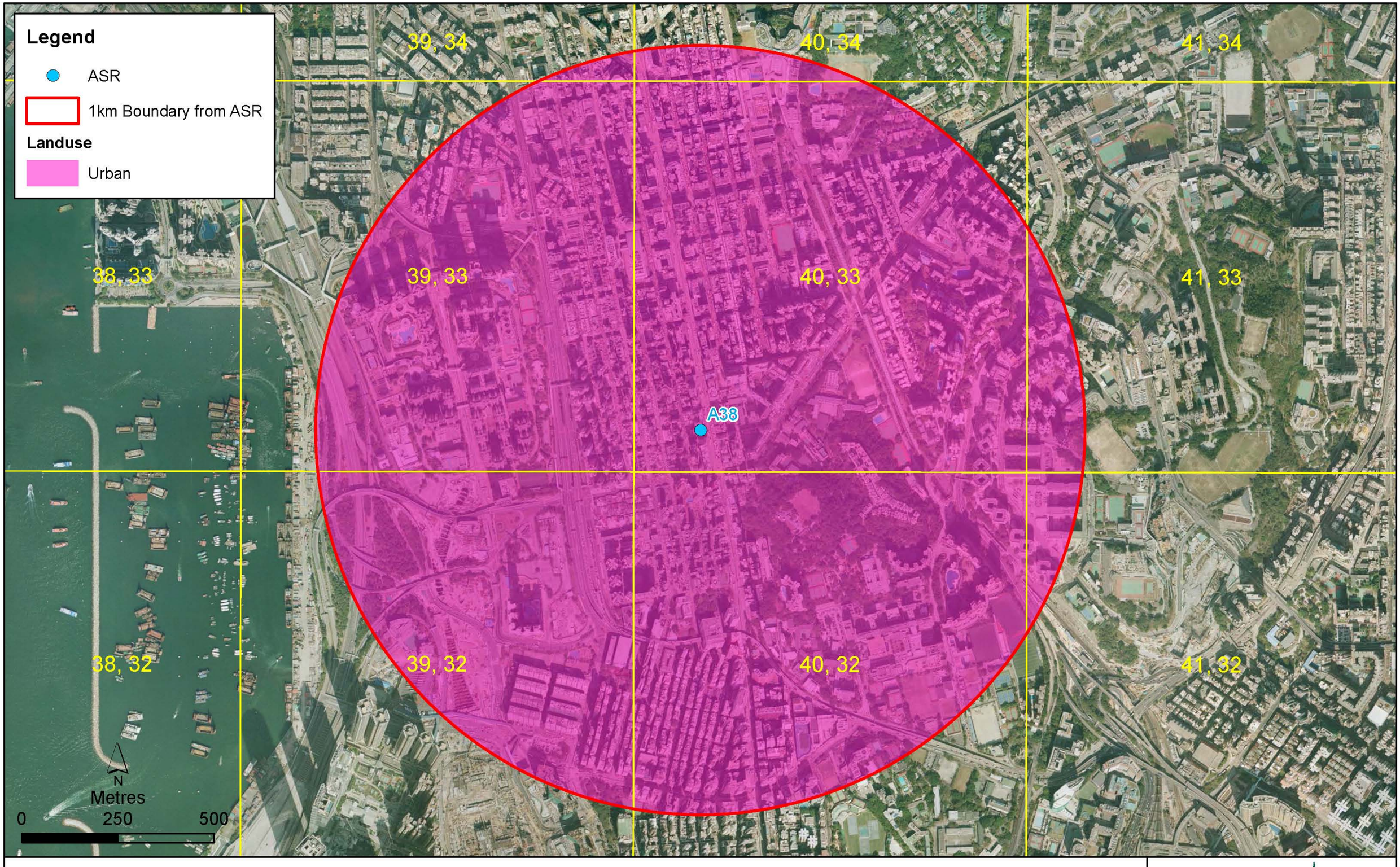
Appendix 3A

Sectors of Land Use for PATH Grid 40,31

File: T:\GIS\CONTRACT\0576490\mxd\Landuse\0576490_4031.mxd
Date: 13/1/2021

Environmental Resources Management

ERM



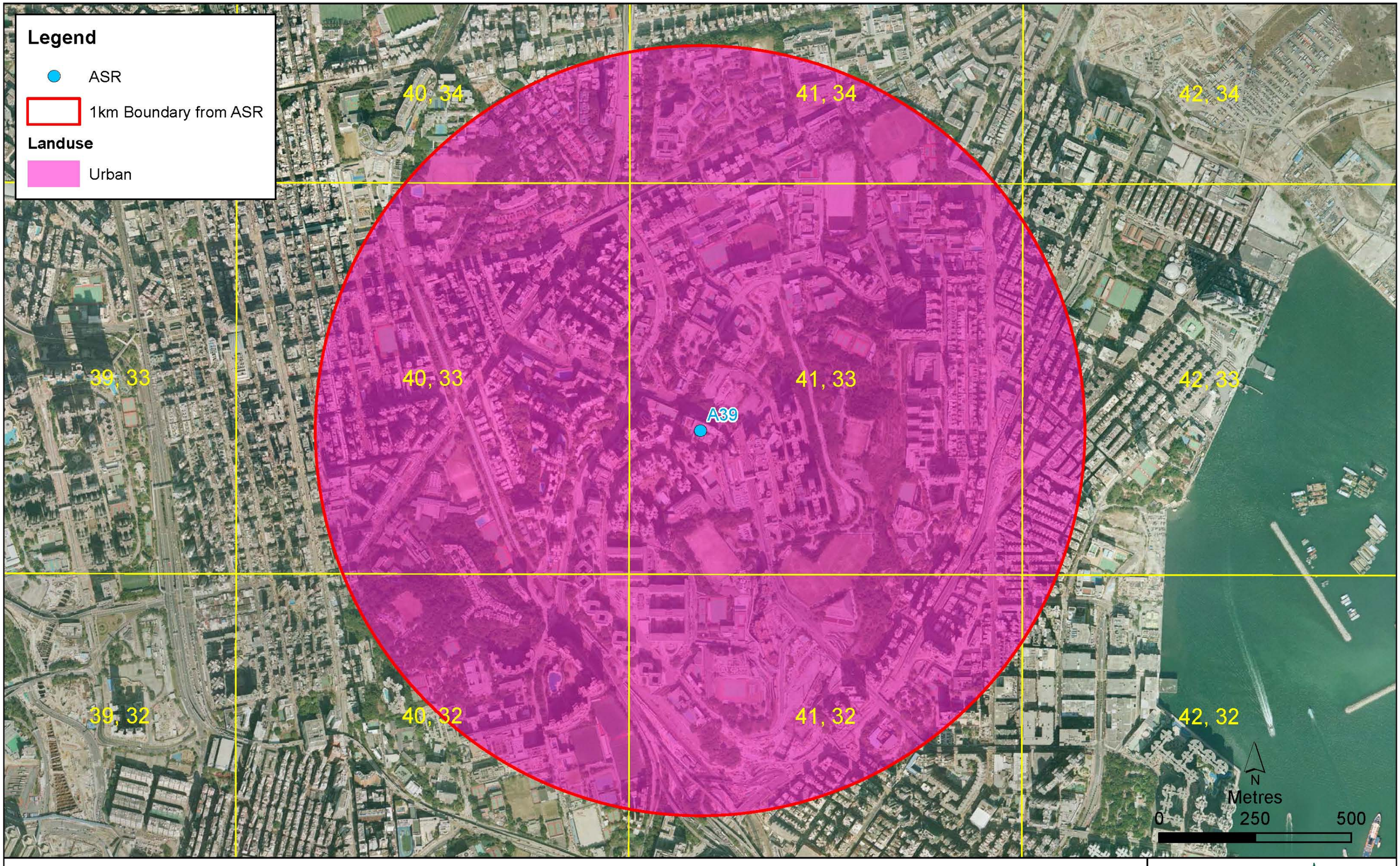
Appendix 3A

Sectors of Land Use for PATH Grid 40,33

File: T:\GIS\CONTRACT\0576490\mxd\Landuse\0576490_4033.mxd
Date: 13/1/2021

Environmental Resources Management

ERM



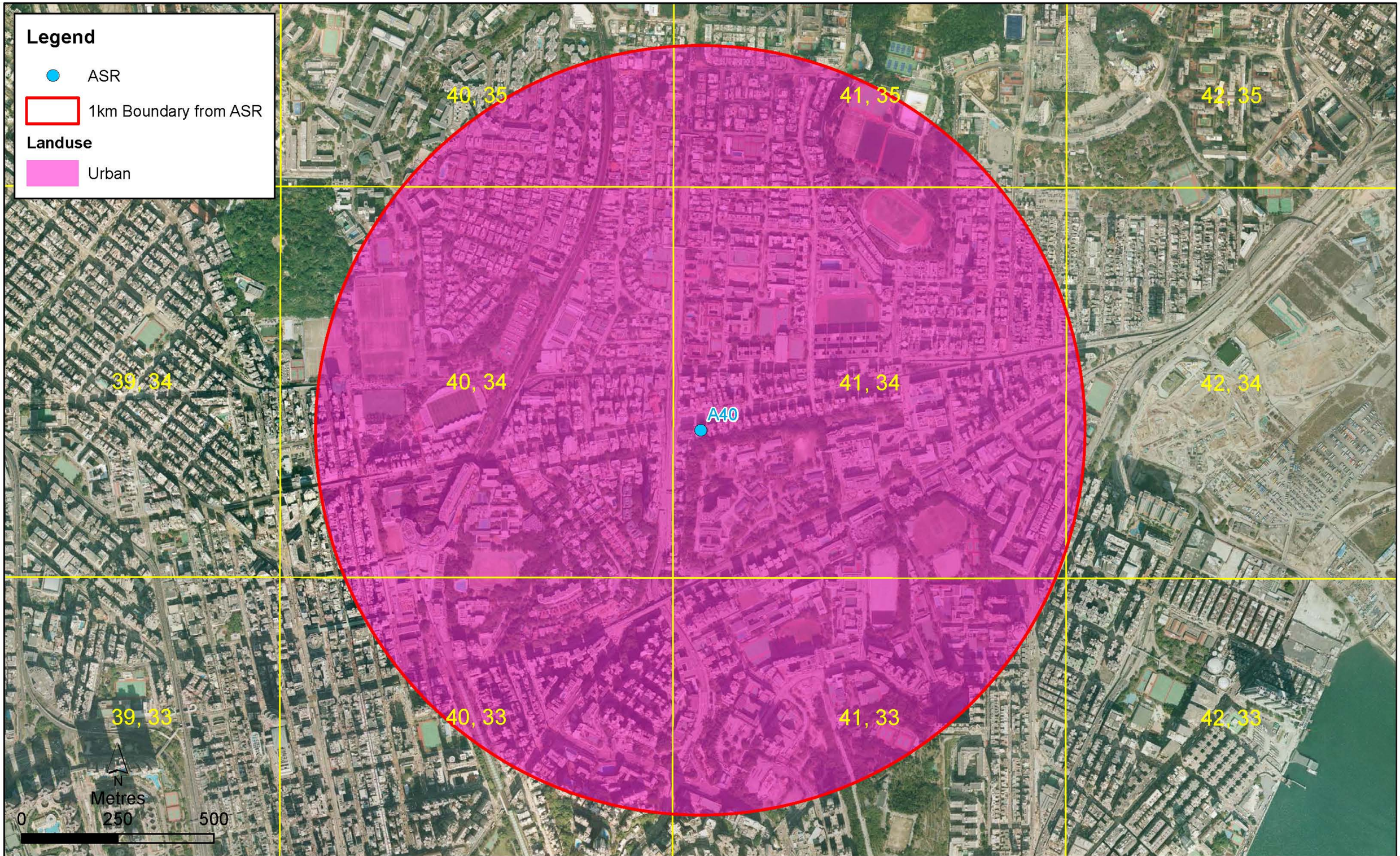
Appendix 3A

Sectors of Land Use for PATH Grid 41,33

File: T:\GIS\CONTRACT\0576490\mxd\Landuse\0576490_4133.mxd
Date: 13/1/2021

Environmental Resources Management

ERM



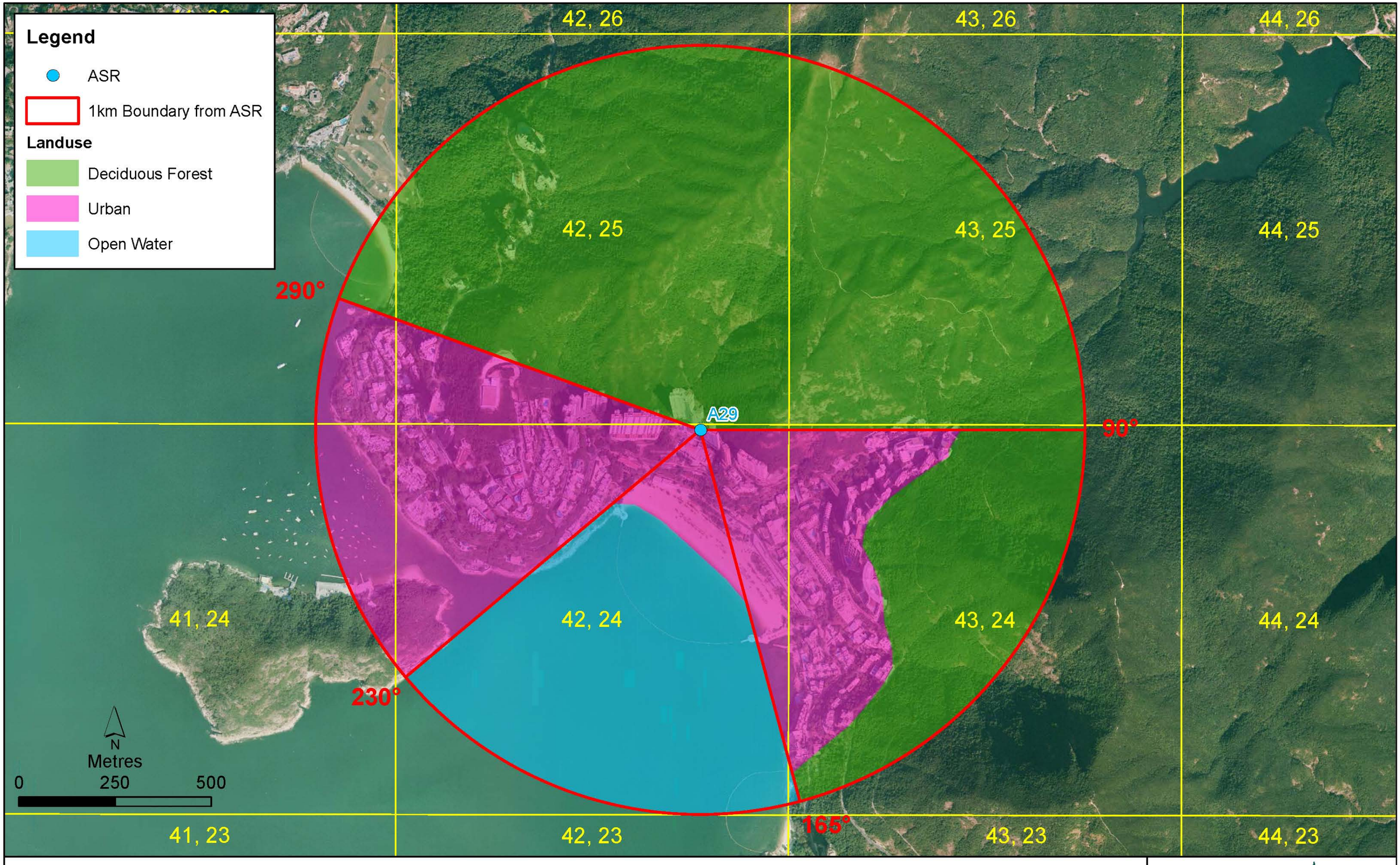
Appendix 3A

Sectors of Land Use for PATH Grid 41,34

File: T:\GIS\CONTRACT\0576490\mxd\Landuse\0576490_4134.mxd
Date: 13/1/2021

Environmental Resources Management

ERM



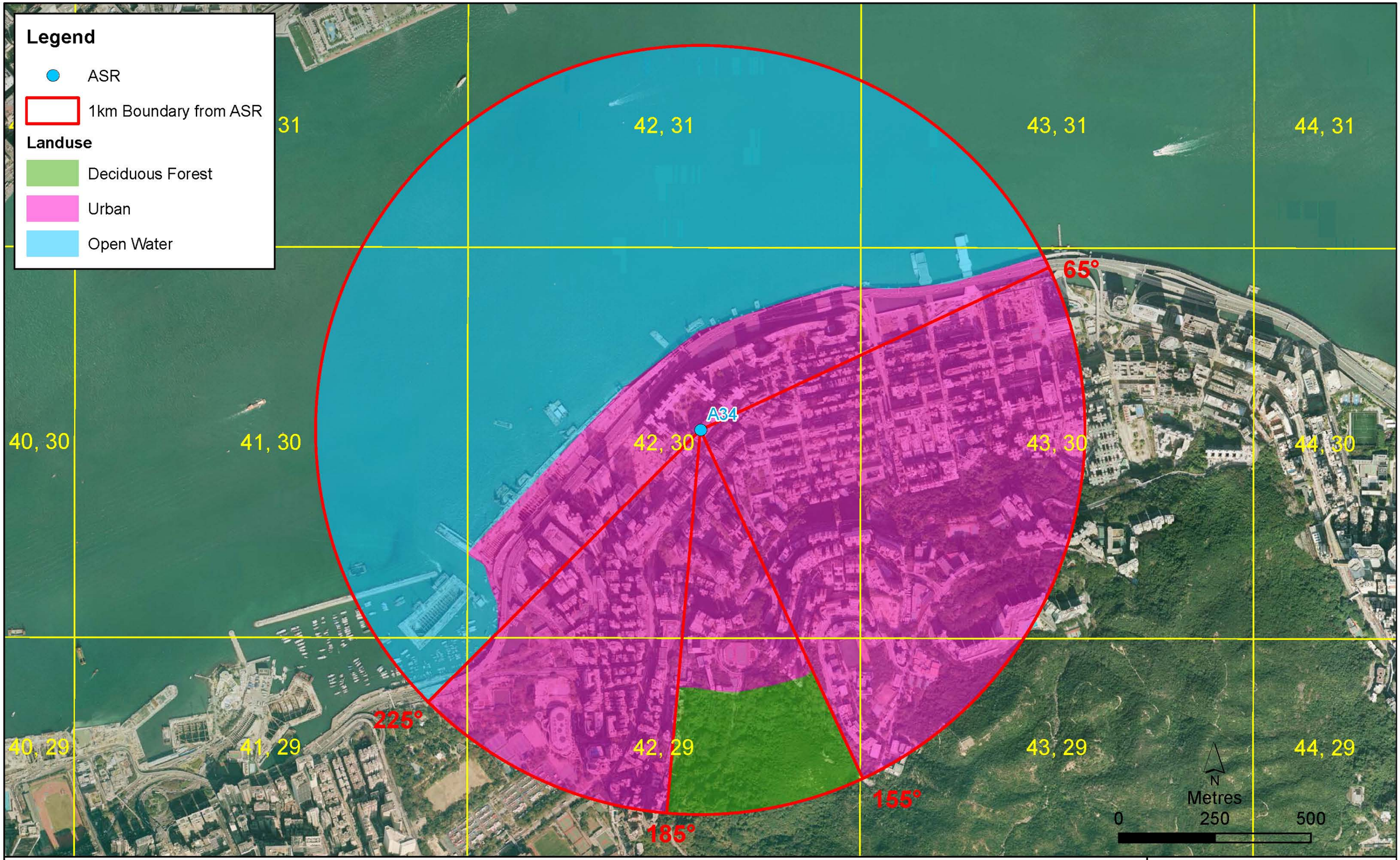
Appendix 3A

Sectors of Land Use for PATH Grid 42,24

File: T:\GIS\CONTRACT\0576490\mxd\Landuse\0576490_4224.mxd
Date: 13/1/2021

Environmental Resources Management

ERM



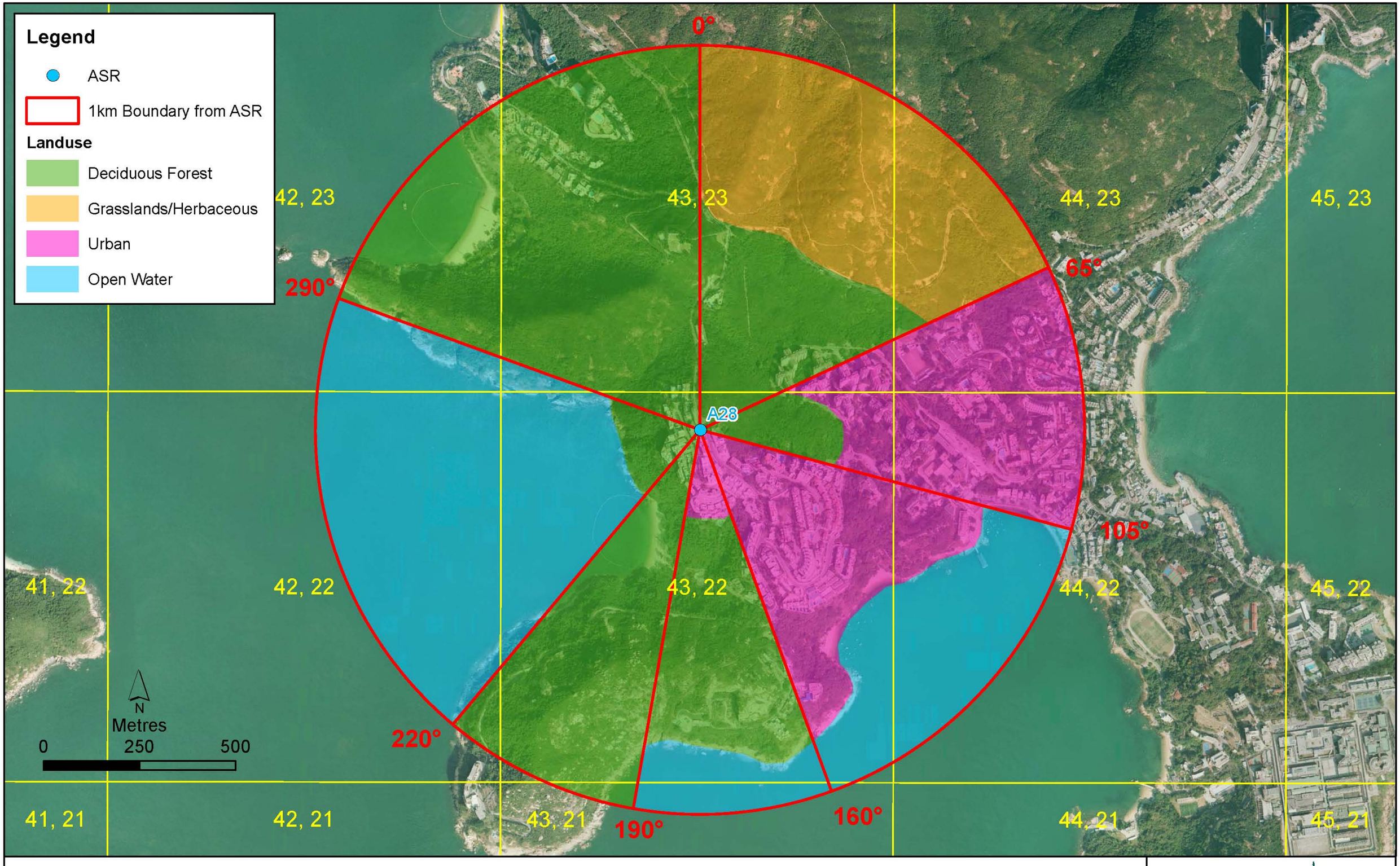
Appendix 3A

Sectors of Land Use for PATH Grid 42,30

File: T:\GIS\CONTRACT\0576490\mxd\Landuse\0576490_4230.mxd
Date: 13/1/2021

Environmental Resources Management

ERM



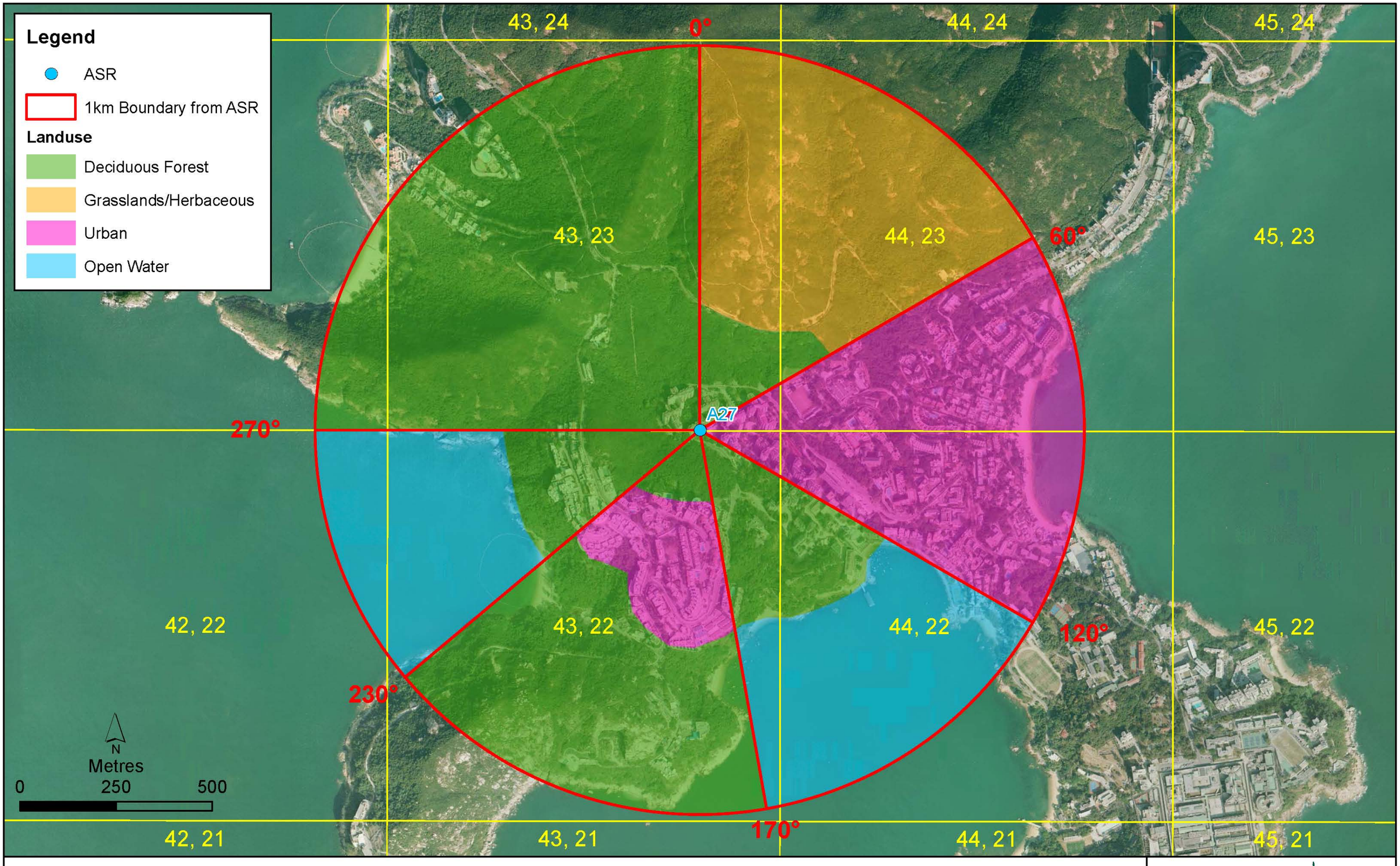
Appendix 3A

Sectors of Land Use for PATH Grid 43,22

File: T:\GIS\CONTRACT\0576490\mxd\Landuse\0576490_4322.mxd
Date: 13/1/2021

Environmental Resources Management

ERM



Appendix 3A

Sectors of Land Use for PATH Grid 43,23

File: T:\GIS\CONTRACT\0576490\mxd\Landuse\0576490_4323.mxd
Date: 13/1/2021

Environmental Resources Management

ERM

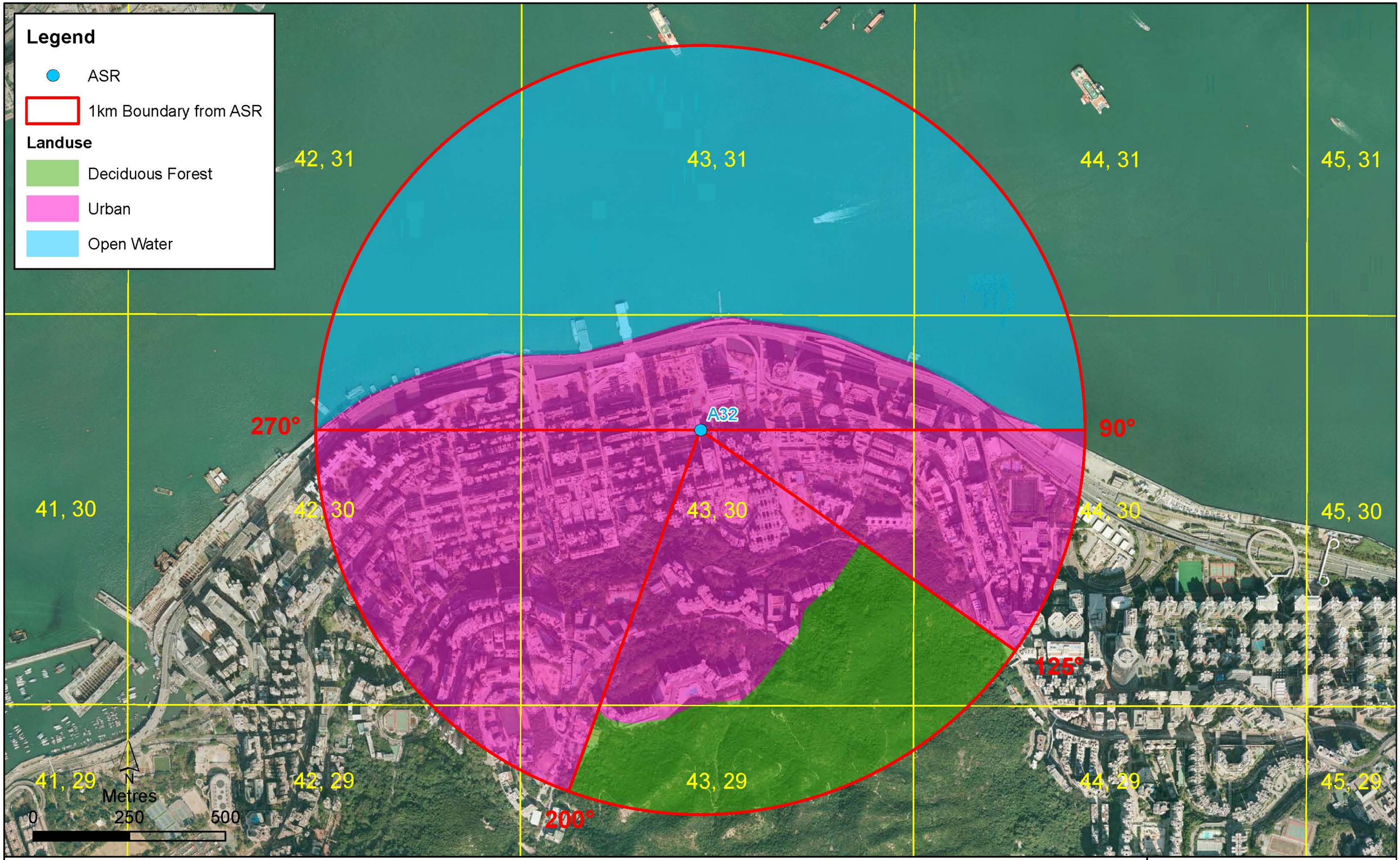
Appendix 3A

Sectors of Land Use for PATH Grid 43,29

File: T:\GIS\CONTRACT\0576490\mxd\Landuse\0576490_4329.mxd
Date: 13/1/2021

Environmental Resources Management

ERM



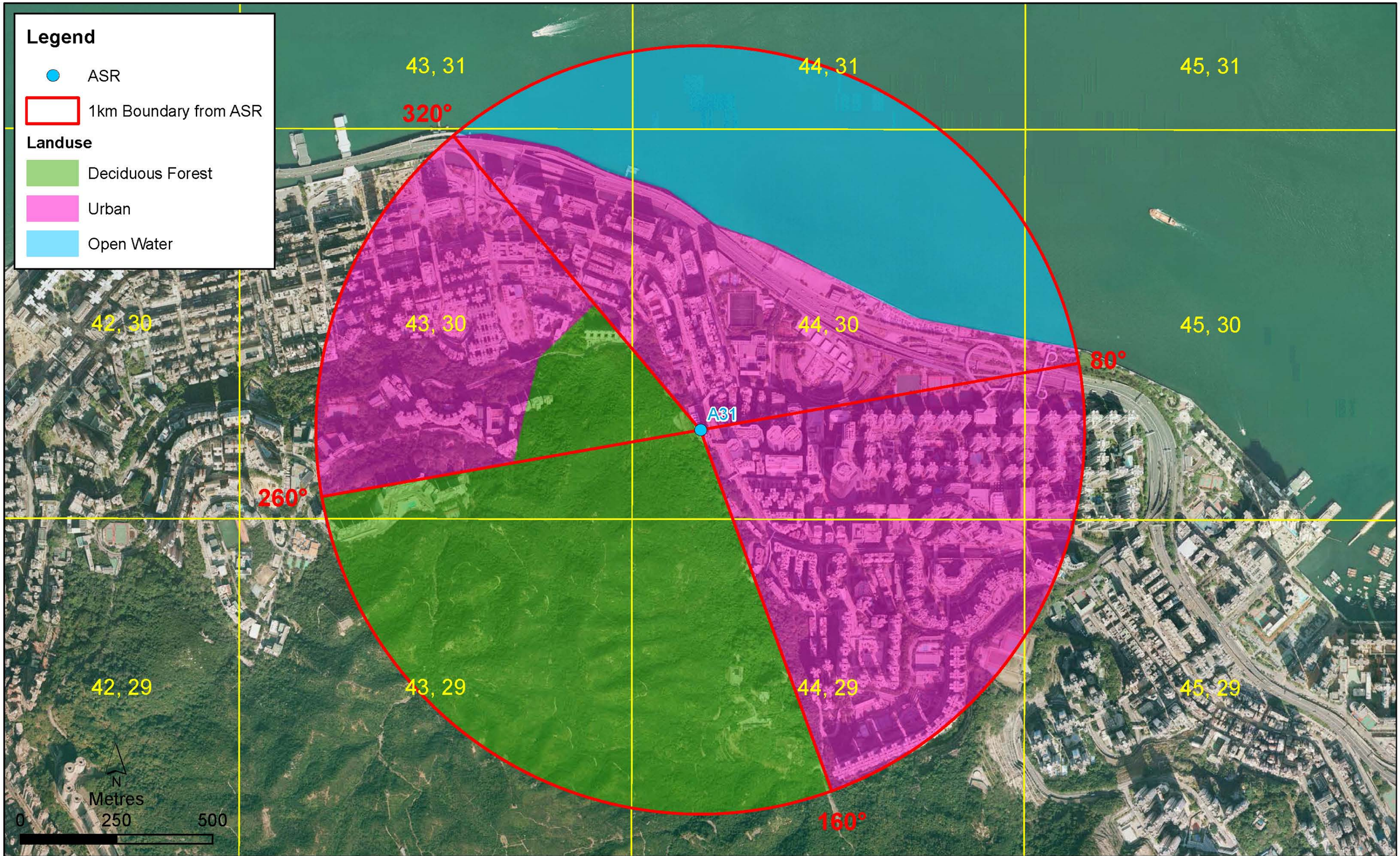
Appendix 3A

Sectors of Land Use for PATH Grid 43,30

File: T:\GIS\CONTRACT\0576490\mxd\Landuse\0576490_4330.mxd
Date: 13/1/2021

Environmental Resources Management

ERM



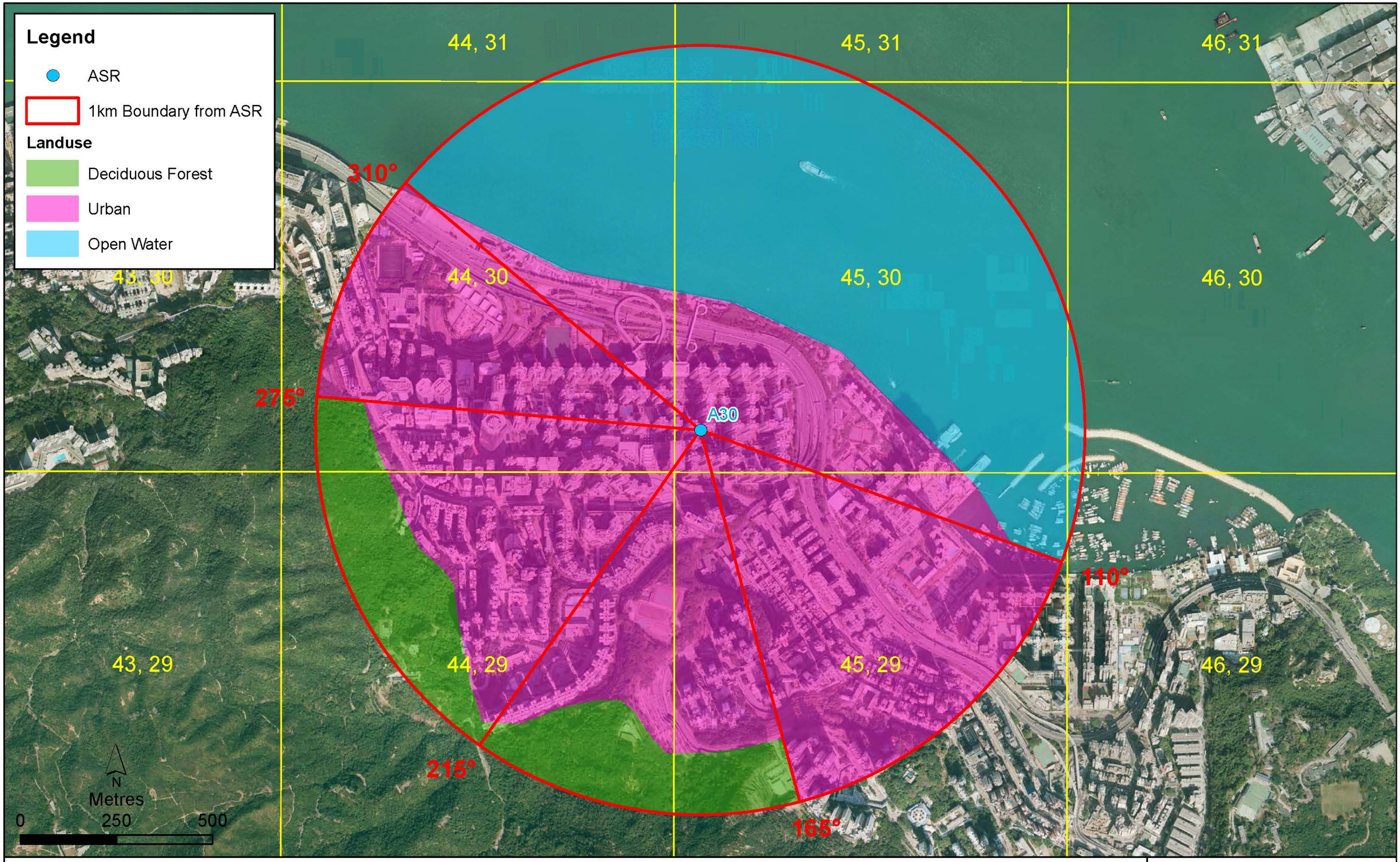
Appendix 3A

Sectors of Land Use for PATH Grid 44,30

File: T:\GIS\CONTRACT\0576490\mxd\Landuse\0576490_4430.mxd
Date: 13/1/2021

Environmental Resources Management

ERM



Appendix 3A

Sectors of Land Use for PATH Grid 45,30

File: T:\GIS\CONTRACT\0576490\mxd\Landuse\0576490_4530.mxd
Date: 13/1/2021

Environmental Resources Management

ERM