

APPENDIX 3.3

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**Detailed Calculations of  
Dust Emission Rate**

Appendix 3.3a: Emission Rate for Heavy Construction Activities (Existing WENT in operation and Phase 1 of WENT Landfill Extension in construction)  
**Calculation of Emission factor for Heavy Construction**

E = 1.2tons/acre/month of activity (ref : AP-42 S13.2.3.3)  
 or = 2.69Mg/hectare/month of activity

Where

E = Emission Factor

Assume

**Active operational area:**

Existing WENT (%) 100

**Active construction area:**

WENT Landfill Extension (Phase 1) (%): 10 estimated based on the construction schedule

**Unmitigated (Night Time)**

Mitigation efficiency (%): 0 \*0% for Do-nothing, 94% efficiency for watering 8 times daily  
 E (g/sq.m/day): 10.3462 Assume 26 working days per month and 12 working hours a day  
 E (g/sq.m/s): **0.000239494** calculated, 12 working hours per day

**Mitigated (Day Time)**

Mitigation efficiency (%): 94 \*0% for Do-nothing, 94% efficiency for watering 8 times daily  
 E (g/sq.m/day): 10.3462 Assume 26 working days per month and 12 working hours a day  
 E (g/sq.m/s): **0.000014968** calculated, 12 working hours per day

Appendix 3.3b: Emission Rate for Wind Erosion (Existing WENT in operation and Phase 1 of WENT Landfill Extension in construction)

**Calculation of Emission factor for Wind Erosion**

$E = 0.85\text{Mg/hectare/yr}$  (ref : AP-42 S11.9, Table 11.9.4)

Where

E = Emission Factor

Assume

**Active operational area:**

Existing WENT (%) 100

**Active construction area:**

WENT Landfill Extension (Phase 1) (%): 10 estimated based on the construction schedule

**Unmitigated (Night Time)**

Mitigation efficiency (%) 0 \*0% for Do-nothing, 94% efficiency for watering 8 times daily

E (g/sqm/day) 0.2329 calculated as in AP-42 (S11.9, Table 11.9.4)

E (g/sq.m/s) **2.69533E-06** calculated, 24-hour emission

**Mitigated (Day Time)**

Mitigation efficiency (%) 94 \*0% for Do-nothing, 94% efficiency for watering 8 times daily

E (g/sqm/day) 0.2329 calculated as in AP-42 (S11.9, Table 11.9.4)

E (g/sq.m/s) **1.68458E-07** calculated, 24-hour emission

Appendix 3.3c: Emission Rate for Heavy Construction Activities and Wind Erosion (Existing WENT in operation and Phase 1 of WENT Landfill Extension in construction)

**Scenario 1A (Unmitigated - Night Time):**

Description	Source	Total Area, m2	Type of Activities	ID	X-coordinate	Y-coordinate	X Length,m	Y Length, m	Angle (degree)	% of Total Area	Active Area, m2	Emission Factor <sup>[1]</sup> g/sq.m/s
Existing WENT	Area	1080961	Wind Erosion	EX-1	811235	831433	997	651	-19	100	1080961	2.70E-06
				EX-2	811234	830889	598	363	-13			2.70E-06
				EX-3	811215	830435	410	524	8			2.70E-06
Phase 1	Area	340438	Wind Erosion	PH1-1	810519	831072	528	279	-30	100	340438	2.70E-06
				PH1-2	810664	830853	402	246	-30			2.70E-06
				PH1-3	810836	830586	254	371	-15			2.70E-06

Note: [1] See Appendix 3.3a and 3.3b for details

**Scenario 1A (Mitigated - Day Time):**

Description	Source	Total Area, m2	Type of Activities	ID	X-coordinate	Y-coordinate	X Length,m	Y Length, m	Angle (degree)	% of Total Area	Active Area, m2	Emission Factor <sup>[1]</sup> g/sq.m/s
Existing WENT	Area	1080961	Wind Erosion	EX-1-1	811235	831433	997	651	-19	100	1080961	1.7E-07
				EX-1-2	811234	830889	598	363	-13			1.7E-07
				EX-1-3	811215	830435	410	524	8			1.7E-07
Phase 1	Area	340438	Wind Erosion	PH1-1	810519	831072	528	279	-30	100	340438	1.7E-07
				PH1-2	810664	830853	402	246	-30			1.7E-07
				PH1-3	810836	830586	254	371	-15			1.7E-07
Phase 1	Area	340438	Heavy Construction	PH1-1a	810617	831139	185	185	0	10	34044	0.00001497

Note: [1] See Appendix 3.3a and 3.3b for details

Appendix 3.3d: Emission Rate for Heavy Construction Activities and Wind Erosion (Existing WENT in operation and Phase 1 of WENT Landfill Extension in construction)

**Scenario 1B (Unmitigated - Night Time):**

Description	Source	Total Area, m2	Type of Activities	ID	X-coordinate	Y-coordinate	X Length,m	Y Length, m	Angle (degree)	% of Total Area	Active Area, m2	Emission Factor <sup>[1]</sup> g/sq.m/s
Existing WENT	Area	1080961	Wind Erosion	EX-1-1	811235	831433	997	651	-19	100	1080961	2.70E-06
				EX-1-2	811234	830889	598	363	-13			2.70E-06
				EX-1-3	811215	830435	410	524	8			2.70E-06
Phase 1	Area	340438	Wind Erosion	PH1-1	810519	831072	528	279	-30	100	340438	2.70E-06
				PH1-2	810664	830853	402	246	-30			2.70E-06
				PH1-3	810836	830586	254	371	-15			2.70E-06

Note: [1] See Appendix 3.3a and 3.3b for details

**Scenario 1B (Mitigated - Day Time):**

Description	Source	Total Area, m2	Type of Activities	ID	X-coordinate	Y-coordinate	X Length,m	Y Length, m	Angle (degree)	% of Total Area	Active Area, m2	Emission Factor <sup>[1]</sup> g/sq.m/s
Existing WENT	Area	1080961	Wind Erosion	EX-1-1	811235	831433	997	651	-19	100	1080961	1.7E-07
				EX-1-2	811234	830889	598	363	-13			1.7E-07
				EX-1-3	811215	830435	410	524	8			1.7E-07
Phase 1	Area	340438	Wind Erosion	PH1-1	810519	831072	528	279	-30	100	340438	1.7E-07
				PH1-2	810664	830853	402	246	-30			1.7E-07
				PH1-3	810836	830586	254	371	-15			1.7E-07
Phase 1	Area	340438	Heavy Construction	PH1-1b	810369	831037	185	185	0	10	34044	0.00001497

Note: [1] See Appendix 3.3a and 3.3b for details

Appendix 3.3e: Emission Rate for Heavy Construction Activities (Existing WENT in restoration and Phase2 and Phase 3 of WENT Landfill Extension in construction)

**Calculation of Emission factor for Heavy Construction**

E = 1.2tons/acre/month of activity (ref : AP-42 S13.2.3.3)  
 or = 2.69Mg/hectare/month of activity

Where

E = Emission Factor

Assume

**Active operational area:**

Phase 1 (%) 100

**Active restoration area:**

Existing WENT (%) 10

**Active construction area:**

WENT Landfill Extension (Phase 2) (%): 10 estimated based on the construction schedule

WENT Landfill Extension (Phase 3) (%): 10 estimated based on the construction schedule

Nim Wan Road Realignment (%) 10 estimated based on the construction schedule

**Unmitigated (Night Time)**

Mitigation efficiency (%): 0 \*0% for Do-nothing, 94% efficiency for watering 8 times daily

E (g/sq.m/day): 10.3462 Assume 26 working days per month and 12 working hours a day

E (g/sq.m/s): **0.000239494** calculated, 12 working hours per day

**Mitigated (Day Time)**

Mitigation efficiency (%): 94 \*0% for Do-nothing, 94% efficiency for watering 8 times daily

E (g/sq.m/day): 10.3462 Assume 26 working days per month and 12 working hours a day

E (g/sq.m/s): **0.000014968** calculated, 12 working hours per day

Appendix 3.3f: Emission Rate for Wind Erosion (Existing WENT in restoration and Phase2 and Phase 3 of WENT Landfill Extension in construction)

**Calculation of Emission factor for Wind Erosion**

$E = 0.85\text{Mg/hectare/yr}$  (ref : AP-42 S11.9, Table 11.9.4)

Where

E = Emission Factor

Assume

**Active operational area:**

WENT Landfill Extension (Phase 1) (%): 100

**Active restoration area:**

Existing WENT (%) 100

**Active construction area:**

WENT Landfill Extension (Phase 2) (%): 10 estimated based on the construction schedule

WENT Landfill Extension (Phase 3) (%): 10 estimated based on the construction schedule

Nim Wan Road Realignment (%) 10 estimated based on the construction schedule

**Unmitigated (Night Time)**

Mitigation efficiency (%) 0 \*0% for Do-nothing, 94% efficiency for watering 8 times daily

E (g/sqm/day) 0.2329 calculated as in AP-42 (S11.9, Table 11.9.4)

E (g/sq.m/s) **2.69533E-06** calculated, 24-hour emission (no watering)

**Mitigated (Day Time)**

Mitigation efficiency (%) 94 \*0% for Do-nothing, 94% efficiency for watering 8 times daily

E (g/sqm/day) 0.2329 calculated as in AP-42 (S11.9, Table 11.9.4)

E (g/sq.m/s) **1.68458E-07** calculated, 24-hour emission

Appendix 3.3g: Emission Rate for Heavy Construction Activities and Wind Erosion (Existing WENT in restoration and Phase 2 and Phase 3 of WENT Landfill Extension in construction)

**Scenario 2A (Unmitigated - Night Time):**

Description	Total Area, m2	Source	Type of Activities	ID	X-coordinate	Y-coordinate	X Length,m	Y Length, m	Angle (degree)	% of Total Area	Active Area, m2	Emission Factor <sup>[1]</sup> g/sq.m/s
Existing WENT	1080961	Area	Wind Erosion	EX-1	811235	831433	997	651	-19	100	1080961	2.70E-06
				EX-2	811234	830889	598	363	-13			2.70E-06
				EX-3	811215	830435	410	524	8			2.70E-06
Phase 1	340438	Area	Wind Erosion	PH1-2	810519	831072	528	279	-30	100	340438	2.70E-06
				PH1-3	810664	830853	402	246	-30			2.70E-06
				PH1-4	810836	830586	254	371	-15			2.70E-06
Phase 2	292609	Area	Wind Erosion	PH2-1	810481	830709	191	211	-23	100	292609	2.70E-06
				PH2-2	810592	830487	301	302	-23			2.70E-06
				PH2-3	810727	830127	366	441	18			2.70E-06
Phase 3	355396	Area	Wind Erosion	PH3-1	810312	830522	301	132	0	100	355396	2.70E-06
				PH3-2	810195	830353	526	216	0			2.70E-06
				PH3-3	810191	830092	656	308	0			2.70E-06
Nim Wan Road	229674	Area	Wind Erosion	NW-1	809231	830930	84	158	0	100	185058	2.70E-06
				NW-2	809246	830797	136	109	0			2.70E-06
				NW-3	809281	830569	238	355	0			2.70E-06
				NW-4	809305	830290	160	217	0			2.70E-06
				NW-5	809432	830046	121	312	-29			2.70E-06

Description	Total Area, m2	Source	Type of Activities	ID	X-coordinate	Y-coordinate	Line - Width m	Line - Length m	Angle (degree)	% of Total Area	Active Area, m2	Emission Factor <sup>[1]</sup> g/sq.m/s
Nim Wan Road	44616	Line	Wind Erosion	NWL-1	809232	831576	35	1221	-	100	44616	2.70E-06
				NWL-2	810234	831406	11	171	-			2.70E-06

Note: [1] See Appendix 3.3e and 3.3f for details



Appendix 3.3g: Emission Rate for Heavy Construction Activities and Wind Erosion (Existing WENT in restoration and Phase 2 and Phase 3 of WENT Landfill Extension in construction)

**Scenario 2A (Mitigated - Day Time):**

Description	Total Area, m2	Source	Type of Activities	ID	X-coordinate	Y-coordinate	X Length,m	Y Length, m	Angle (degree)	% of Total Area	Active Area, m2	Emission Factor <sup>[1]</sup> g/sq.m/s			
Existing WENT	1080961	Area	Wind Erosion	EX-1	811235	831433	997	651	-19	100	1080961	1.7E-07			
				EX-2	811234	830889	598	363	-13			1.7E-07			
				EX-3	811215	830435	410	524	8			1.7E-07			
Phase 1	340438	Area	Heavy Construction	EX-1a	810953	831298	329	329	0	10	108096	0.00001497			
			Wind Erosion	PH1-1	810519	831072	528	279	-30	100	340438	1.7E-07			
				PH1-2	810664	830853	402	246	-30			1.7E-07			
Phase 2	292609	Area	Wind Erosion	PH1-3	810836	830586	254	371	-15	100	292609	1.7E-07			
				PH2-1	810481	830709	191	211	-23			1.7E-07			
				PH2-2	810592	830487	301	302	-23			1.7E-07			
Phase 3	355396	Area	Wind Erosion	PH2-3	810727	830127	366	441	18	100	355396	1.7E-07			
				Heavy Construction	PH2-1a	810537	830601	171	171			0	10	29261	0.00001497
				PH3-1	810312	830522	301	132	0			100	355396	1.7E-07	
Heavy Construction	PH3-2	810195	830353	526	216	0	1.7E-07								
	Nim Wan Road	229674	Area	Wind Erosion	PH3-3	810191	830092	656	308	0	100	185058	1.7E-07		
PH3-1a					810327	830483	189	189	0	10			35540	0.00001497	
Nim Wan Road	229674	Area	Wind Erosion	NW-1	809231	830930	84	158	0	100	185058	1.7E-07			
				NW-2	809246	830797	136	109	0			1.7E-07			
				NW-3	809281	830569	238	355	0			1.7E-07			
				NW-4	809305	830290	160	217	0			1.7E-07			
				NW-5	809432	830046	121	312	-29			1.7E-07			
		Heavy Construction	NW-1a	809305	830312	152	152	0	10	22967	0.00001497				

  

Description	Total Area, m2	Source	Type of Activities	ID	X-coordinate	Y-coordinate	Line - Width m	Line - Length m	Angle (degree)	% of Total Area	Active Area, m2	Emission Factor <sup>[1]</sup> g/sq.m/s
Nim Wan Road	44616	Line	Wind Erosion	NWL-1	809232	831576	35	1221	-	100	44616	1.7E-07
				NWL-2	810234	831406	11	171	-			1.7E-07

Note: [1] See Appendix 3.3e and 3.3f for details

Appendix 3.3h: Emission Rate for Heavy Construction Activities and Wind Erosion (Existing WENT in restoration and Phase 2 and Phase 3 of WENT Landfill Extension in construction)

**Scenario 2B (Unmitigated - Night Time):**

Description	Total Area, m2	Source	Type of Activities	ID	X-coordinate	Y-coordinate	X Length,m	Y Length, m	Angle (degree)	% of Total Area	Active Area, m2	Emission Factor <sup>[1]</sup> g/sq.m/s
Existing WENT	1080961	Area	Wind Erosion	EX-1	811235	831433	997	651	-19	100	1080961	2.70E-06
				EX-2	811234	830889	598	363	-13			2.70E-06
				EX-3	811215	830435	410	524	8			2.70E-06
Phase 1	340438	Area	Wind Erosion	PH1-2	810519	831072	528	279	-30	100	340438	2.70E-06
				PH1-3	810664	830853	402	246	-30			2.70E-06
				PH1-4	810836	830586	254	371	-15			2.70E-06
Phase 2	292609	Area	Wind Erosion	PH2-1	810481	830709	191	211	-23	100	292609	2.70E-06
				PH2-2	810592	830487	301	302	-23			2.70E-06
				PH2-3	810727	830127	366	441	18			2.70E-06
Phase 3	355396	Area	Wind Erosion	PH3-1	810312	830522	301	132	0	100	355396	2.70E-06
				PH3-2	810195	830353	526	216	0			2.70E-06
				PH3-3	810191	830092	656	308	0			2.70E-06
Nim Wan Road	229674	Area	Wind Erosion	NW-1	809231	830930	84	158	0	100	185058	2.70E-06
				NW-2	809246	830797	136	109	0			2.70E-06
				NW-3	809281	830569	238	355	0			2.70E-06
				NW-4	809305	830290	160	217	0			2.70E-06
				NW-5	809432	830046	121	312	-29			2.70E-06

Description	Total Area, m2	Source	Type of Activities	ID	X-coordinate	Y-coordinate	Line - Width m	Line - Length m	Angle (degree)	% of Total Area	Active Area, m2	Emission Factor <sup>[1]</sup> g/sq.m/s
Nim Wan Road	44616	Line	Wind Erosion	NWL-1	809232	831576	35	1221	-	100	44616	2.70E-06
				NWL-2	810234	831406	11	171	-			2.70E-06

Note: [1] See Appendix 3.3e and 3.3f for details

Appendix 3.3h: Emission Rate for Heavy Construction Activities and Wind Erosion (Existing WENT in restoration and Phase 2 and Phase 3 of WENT Landfill Extension in construction)

**Scenario 2B (Mitigated - Day Time):**

Description	Total Area, m2	Source	Type of Activities	ID	X-coordinate	Y-coordinate	X Length,m	Y Length, m	Angle (degree)	% of Total Area	Active Area, m2	Emission Factor <sup>[1]</sup> g/sq.m/s		
Existing WENT	1080961	Area	Wind Erosion	EX-1	811235	831433	997	651	-19	100	1080961	1.7E-07		
				EX-2	811234	830889	598	363	-13			1.7E-07		
				EX-3	811215	830435	410	524	8			1.7E-07		
Phase 1	340438	Area	Heavy Construction	EX-1b	811482	831541	329	329	0	10	108096	0.00001497		
			Wind Erosion	PH1-1	810519	831072	528	279	-30	100	340438	1.7E-07		
				PH1-2	810664	830853	402	246	-30			1.7E-07		
Phase 2	292609	Area	Wind Erosion	PH1-3	810836	830586	254	371	-15	100	292609	1.7E-07		
				PH2-1	810481	830709	191	211	-23			1.7E-07		
				PH2-2	810592	830487	301	302	-23			1.7E-07		
Phase 3	355396	Area	Wind Erosion	PH2-3	810727	830127	366	441	18	100	355396	1.7E-07		
				PH2-1b	810537	830601	171	171	0			10	29261	0.00001497
				PH3-1	810312	830522	301	132	0			100	355396	1.7E-07
PH3-2	810195	830353	526	216	0	1.7E-07								
Nim Wan Road	229674	Area	Wind Erosion	PH3-3	810191	830092	656	308	0	100	185058	1.7E-07		
				PH3-1b	809980	830231	189	189	0			10	35540	0.00001497
				NW-1	809231	830930	84	158	0			100	185058	1.7E-07
NW-2	809246	830797	136	109	0	1.7E-07								
Nim Wan Road	229674	Area	Wind Erosion	NW-3	809281	830569	238	355	0	100	185058	1.7E-07		
				NW-4	809305	830290	160	217	0			1.7E-07		
				NW-5	809432	830046	121	312	-29			1.7E-07		
			Heavy Construction	NW-1b	809305	830312	152	152	0	10	22967	0.00001497		

Description	Total Area, m2	Source	Type of Activities	ID	X-coordinate	Y-coordinate	Line - Width m	Line - Length m	Angle (degree)	% of Total Area	Active Area, m2	Emission Factor <sup>[1]</sup> g/sq.m/s
Nim Wan Road	44616	Line	Wind Erosion	NWL-1	809232	831576	35	1221	-	100	44616	1.7E-07
				NWL-2	810234	831406	11	171	-			1.7E-07

Note: [1] See Appendix 3.3e and 3.3f for details

Appendix 3.3i: Emission Rate for Heavy Construction Activities and Wind Erosion (Existing WENT in restoration and Phase 2 and Phase 3 of WENT Landfill Extension in construction)

**Scenario 2C (Unmitigated - Night Time):**

Description	Total Area, m2	Source	Type of Activities	ID	X-coordinate	Y-coordinate	X Length, m	Y Length, m	Angle (degree)	% of Total Area	Active Area, m2	Emission Factor <sup>[1]</sup> g/sq.m/s
Existing WENT	1080961	Area	Wind Erosion	EX-1	811235	831433	997	651	-19	100	1080961	2.70E-06
				EX-2	811234	830889	598	363	-13			2.70E-06
				EX-3	811215	830435	410	524	8			2.70E-06
Phase 1	340438	Area	Wind Erosion	PH1-2	810519	831072	528	279	-30	100	340438	2.70E-06
				PH1-3	810664	830853	402	246	-30			2.70E-06
				PH1-4	810836	830586	254	371	-15			2.70E-06
Phase 2	292609	Area	Wind Erosion	PH2-1	810481	830709	191	211	-23	100	292609	2.70E-06
				PH2-2	810592	830487	301	302	-23			2.70E-06
				PH2-3	810727	830127	366	441	18			2.70E-06
Phase 3	355396	Area	Wind Erosion	PH3-1	810312	830522	301	132	0	100	355396	2.70E-06
				PH3-2	810195	830353	526	216	0			2.70E-06
				PH3-3	810191	830092	656	308	0			2.70E-06
Nim Wan Road	229674	Area	Wind Erosion	NW-1	809231	830930	84	158	0	100	185058	2.70E-06
				NW-2	809246	830797	136	109	0			2.70E-06
				NW-3	809281	830569	238	355	0			2.70E-06
				NW-4	809305	830290	160	217	0			2.70E-06
				NW-5	809432	830046	121	312	-29			2.70E-06

Description	Total Area, m2	Source	Type of Activities	ID	X-coordinate	Y-coordinate	Line - Width m	Line - Length m	Angle (degree)	% of Total Area	Active Area, m2	Emission Factor <sup>[1]</sup> g/sq.m/s
Nim Wan Road	44616	Line	Wind Erosion	NWL-1	809232	831576	35	1221	-	100	44616	2.70E-06
				NWL-2	810234	831406	11	171	-			2.70E-06

Note: [1] See Appendix 3.3e and 3.3f for details

Appendix 3.3: Emission Rate for Heavy Construction Activities and Wind Erosion (Existing WENT in restoration and Phase 2 and Phase 3 of WENT Landfill Extension in construction)

**Scenario 2C (Mitigated - Day Time):**

Description	Total Area, m2	Source	Type of Activities	ID	X-coordinate	Y-coordinate	X Length,m	Y Length, m	Angle (degree)	% of Total Area	Active Area, m2	Emission Factor <sup>[1]</sup> g/sq.m/s
Existing WENT	1080961	Area	Wind Erosion	EX-1	811235	831433	997	651	-19	100	1080961	1.7E-07
				EX-2	811234	830889	598	363	-13			1.7E-07
				EX-3	811215	830435	410	524	8			1.7E-07
Phase 1	340438	Area	Heavy Construction	EX-1c	811482	831541	329	329	0	10	108096	0.00001497
			Wind Erosion	PH1-1	810519	831072	528	279	-30	100	340438	1.7E-07
				PH1-2	810664	830853	402	246	-30			1.7E-07
Phase 2	292609	Area	Wind Erosion	PH1-3	810836	830586	254	371	-15	100	292609	1.7E-07
				PH2-1	810481	830709	191	211	-23			1.7E-07
				PH2-2	810592	830487	301	302	-23			1.7E-07
Phase 3	355396	Area	Heavy Construction	PH2-3	810727	830127	366	441	18	10	29261	0.00001497
			Wind Erosion	PH2-1c	810537	830601	171	171	0	100	355396	1.7E-07
				PH3-1	810312	830522	301	132	0			1.7E-07
Nim Wan Road	229674	Area	Wind Erosion	PH3-2	810195	830353	526	216	0	100	185058	1.7E-07
				PH3-3	810191	830092	656	308	0			1.7E-07
				Heavy Construction	PH3-1c	809980	830231	189	189			0
Nim Wan Road	229674	Area	Wind Erosion	NW-1	809231	830930	84	158	0	100	185058	1.7E-07
				NW-2	809246	830797	136	109	0			1.7E-07
				NW-3	809281	830569	238	355	0			1.7E-07
				NW-4	809305	830290	160	217	0			1.7E-07
				NW-5	809432	830046	121	312	-29			1.7E-07
Heavy Construction	NW-1c	809459	829991	120	191	-29	10	22967	0.00001497			

Description	Total Area, m2	Source	Type of Activities	ID	X-coordinate	Y-coordinate	Line - Width m	Line - Length m	Angle (degree)	% of Total Area	Active Area, m2	Emission Factor <sup>[1]</sup> g/sq.m/s
Nim Wan Road	44616	Line	Wind Erosion	NWL-1	809232	831576	35	1221	-	100	44616	1.7E-07
				NWL-2	810234	831406	11	171	-			1.7E-07

Note: [1] See Appendix 3.3e and 3.3f for details

Appendix 3.3j: Emission Rate for Heavy Construction Activities (Existing WENT in restoration and Phase 4 and Phase 5 of WENT Landfill Extension in construction)

**Calculation of Emission factor for Heavy Construction**

E = 1.2tons/acre/month of activity (ref : AP-42 S13.2.3.3)  
 or = 2.69Mg/hectare/month of activity

Where

E = Emission Factor

Assume

**Active operational area:**

Phase 1 (%) 100  
 Phase 2 (%) 100  
 Phase 3 (%) 100

**Active restoration area:**

Existing WENT (%) 10

**Active construction area:**

WENT Landfill Extension (Phase 4) (%): 10 estimated based on the construction schedule  
 WENT Landfill Extension (Phase 5) (%): 10 estimated based on the construction schedule  
 Pond (%) 10 estimated based on the construction schedule

**Unmitigated (Night Time)**

Mitigation efficiency (%): 0 \*0% for Do-nothing, 94% efficiency for watering 8 times daily  
 E (g/sq.m/day): 10.3462 Assume 26 working days per month and 12 working hours a day  
 E (g/sq.m/s): **0.000239494** calculated, 12 working hours per day

**Mitigated (Day Time)**

Mitigation efficiency (%): 94 \*0% for Do-nothing, 94% efficiency for watering 8 times daily  
 E (g/sq.m/day): 10.3462 Assume 26 working days per month and 12 working hours a day  
 E (g/sq.m/s): **0.000014968** calculated, 12 working hours per day

Appendix 3.3k: Emission Rate for Wind Erosion (Existing WENT in restoration and Phase4 and Phase 5 of WENT Landfill Extension in construction)

**Calculation of Emission factor for Wind Erosion**

$E = 0.85\text{Mg/hectare/yr}$  (ref : AP-42 S11.9, Table 11.9.4)

Where

E = Emission Factor

Assume

**Active operational area:**

WENT Landfill Extension (Phase 1) (%)	100
WENT Landfill Extension (Phase 2) (%)	100
WENT Landfill Extension (Phase 3) (%)	100

**Active restoration area:**

Existing WENT (%)	100
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**Active construction area:**

WENT Landfill Extension (Phase 4) (%)	10	estimated based on the construction schedule
WENT Landfill Extension (Phase 5) (%)	10	estimated based on the construction schedule
Pond (%)	10	estimated based on the construction schedule

**Unmitigated (Night Time)**

Mitigation efficiency (%)	0	*0% for Do-nothing, 94% efficiency for watering 8 times daily
E (g/sqm/day)	0.2329	calculated as in AP-42 (S11.9, Table 11.9.4)
E (g/sq.m/s)	<b>2.69533E-06</b>	calculated, 24-hour emission

**Mitigated (Day Time)**

Mitigation efficiency (%)	94	*0% for Do-nothing, 94% efficiency for watering 8 times daily
E (g/sqm/day)	0.2329	calculated as in AP-42 (S11.9, Table 11.9.4)
E (g/sq.m/s)	<b>1.68458E-07</b>	calculated, 24-hour emission

Appendix 3.3: Emission Rate for Heavy Construction Activities and Wind Erosion (Existing WENT in restoration and Phase 4 and Phase 5 of WENT Landfill Extension in construction)

**Scenario 3A (Unmitigated - Night Time):**

Description	Total Area, m2	Source	Type of Activities	ID	X-coordinate	Y-coordinate	X Length,m	Y Length, m	Angle (degree)	% of Total Area	Active Area, m2	Emission Factor <sup>[1]</sup> g/sq.m/s
Existing WENT	1080961	Area	Wind Erosion	EX-1	811235	831433	997	651	-19	100	1080961	2.70E-06
				EX-2	811234	830889	598	363	-13			2.70E-06
				EX-3	811215	830435	410	524	8			2.70E-06
Phase 1	340438	Area	Wind Erosion	PH1-2	810519	831072	528	279	-30	100	340438	2.70E-06
				PH1-3	810664	830853	402	246	-30			2.70E-06
				PH1-4	810836	830586	254	371	-15			2.70E-06
Phase 2	292609	Area	Wind Erosion	PH2-1	810481	830709	191	211	-23	100	292609	2.70E-06
				PH2-2	810592	830487	301	302	-23			2.70E-06
				PH2-3	810727	830127	366	441	18			2.70E-06
Phase 3	355396	Area	Wind Erosion	PH3-1	810312	830522	301	132	0	100	355396	2.70E-06
				PH3-2	810195	830353	526	216	0			2.70E-06
				PH3-3	810191	830092	656	308	0			2.70E-06
Phase 4	397744	Area	Wind Erosion	PH4-1	810116	830757	424	352	-41	100	397744	2.70E-06
				PH4-2	809700	830641	372	668	-30			2.70E-06
Phase 5	151497	Area	Wind Erosion	PH5-1	809457	831271	339	155	0	100	151497	2.70E-06
				PH5-2	809466	831081	434	228	0			2.70E-06
Pond	66834	Area	Wind Erosion	P-1	811068	831401	282	237	0	100	66834	2.70E-06

Note: [1] See Appendix 3.3j and 3.3k for details

**Scenario 3A (Mitigated - Day Time):**

Description	Total Area, m2	Source	Type of Activities	ID	X-coordinate	Y-coordinate	X Length,m	Y Length, m	Angle (degree)	% of Total Area	Active Area, m2	Emission Factor <sup>[1]</sup> g/sq.m/s
Existing WENT	1080961	Area	Wind Erosion	EX-1	811235	831433	997	651	-19	100	1080961	1.7E-07
				EX-2	811234	830889	598	363	-13			1.7E-07
				EX-3	811215	830435	410	524	8			1.7E-07
Phase 1	340438	Area	Wind Erosion	EX-1a	811045	831114	329	329	0	10	108096	0.00001497
				PH1-1	810519	831072	528	279	-30	100	340438	1.7E-07
				PH1-2	810664	830853	402	246	-30			1.7E-07
				PH1-3	810836	830586	254	371	-15			1.7E-07
Phase 2	292609	Area	Wind Erosion	PH2-1	810481	830709	191	211	-23	100	292609	1.7E-07
				PH2-2	810592	830487	301	302	-23			1.7E-07
				PH2-3	810727	830127	366	441	18			1.7E-07
Phase 3	355396	Area	Wind Erosion	PH3-1	810312	830522	301	132	0	100	355396	1.7E-07
				PH3-2	810195	830353	526	216	0			1.7E-07
				PH3-3	810191	830092	656	308	0			1.7E-07
Phase 4	397744	Area	Wind Erosion	PH4-1	810116	830757	424	352	-41	100	397744	1.7E-07
				PH4-2	809700	830641	372	668	-30			1.7E-07
				Heavy Construction	PH4-1a	810175	830823	200	200			0
Phase 5	151497	Area	Wind Erosion	PH5-1	809457	831271	339	155	0	100	151497	1.7E-07
				PH5-2	809466	831081	434	228	0			1.7E-07
				Heavy Construction	PH5-1a	809603	831100	123	123			0
Pond	66834	Area	Wind Erosion	P-1	811068	831401	282	237	0	100	66834	1.7E-07
				Heavy Construction	P-1a	810970	831409	81	81	0	10	6683

Note: [1] See Appendix 3.3j and 3.3k for details



Appendix 3.3m: Emission Rate for Heavy Construction Activities and Wind Erosion (Existing WENT in restoration and Phase 4 and Phase 5 of WENT Landfill Extension in construction)

**Scenario 3B (Unmitigated - Night Time):**

Description	Total Area, m2	Source	Type of Activities	ID	X-coordinate	Y-coordinate	X Length,m	Y Length, m	Angle (degree)	% of Total Area	Active Area, m2	Emission Factor <sup>[1]</sup> g/sq.m/s
Existing WENT	1080961	Area	Wind Erosion	EX-1	811235	831433	997	651	-19	100	1080961	2.70E-06
				EX-2	811234	830889	598	363	-13			2.70E-06
				EX-3	811215	830435	410	524	8			2.70E-06
Phase 1	340438	Area	Wind Erosion	PH1-2	810519	831072	528	279	-30	100	340438	2.70E-06
				PH1-3	810664	830853	402	246	-30			2.70E-06
				PH1-4	810836	830586	254	371	-15			2.70E-06
Phase 2	292609	Area	Wind Erosion	PH2-1	810481	830709	191	211	-23	100	292609	2.70E-06
				PH2-2	810592	830487	301	302	-23			2.70E-06
				PH2-3	810727	830127	366	441	18			2.70E-06
Phase 3	355396	Area	Wind Erosion	PH3-1	810312	830522	301	132	0	100	355396	2.70E-06
				PH3-2	810195	830353	526	216	0			2.70E-06
				PH3-3	810191	830092	656	308	0			2.70E-06
Phase 4	397744	Area	Wind Erosion	PH4-1	810116	830757	424	352	-41	100	397744	2.70E-06
				PH4-2	809700	830641	372	668	-30			2.70E-06
Phase 5	151497	Area	Wind Erosion	PH5-1	809457	831271	339	155	0	100	151497	2.70E-06
				PH5-2	809466	831081	434	228	0			2.70E-06
Pond	66834	Area	Wind Erosion	P-1	811068	831401	282	237	0	100	66834	2.70E-06

Note: [1] See Appendix 3.3j and 3.3k for details

**Scenario 3B (Mitigated - Day Time):**

Description	Total Area, m2	Source	Type of Activities	ID	X-coordinate	Y-coordinate	X Length,m	Y Length, m	Angle (degree)	% of Total Area	Active Area, m2	Emission Factor <sup>[1]</sup> g/sq.m/s		
Existing WENT	1080961	Area	Wind Erosion	EX-1	811235	831433	997	651	-19	100	1080961	1.7E-07		
				EX-2	811234	830889	598	363	-13			1.7E-07		
				EX-3	811215	830435	410	524	8			1.7E-07		
Phase 1	340438	Area	Wind Erosion	PH1-1	810519	831072	528	279	-30	100	340438	1.7E-07		
				PH1-2	810664	830853	402	246	-30			1.7E-07		
				PH1-3	810836	830586	254	371	-15			1.7E-07		
				PH1-4	810481	830709	191	211	-23			1.7E-07		
Phase 2	292609	Area	Wind Erosion	PH2-1	810481	830709	191	211	-23	100	292609	1.7E-07		
				PH2-2	810592	830487	301	302	-23			1.7E-07		
				PH2-3	810727	830127	366	441	18			1.7E-07		
Phase 3	355396	Area	Wind Erosion	PH3-1	810312	830522	301	132	0	100	355396	1.7E-07		
				PH3-2	810195	830353	526	216	0			1.7E-07		
				PH3-3	810191	830092	656	308	0			1.7E-07		
Phase 4	397744	Area	Wind Erosion	PH4-1	810116	830757	424	352	-41	100	397744	1.7E-07		
				PH4-2	809700	830641	372	668	-30			1.7E-07		
				PH4-1b	809541	830808	200	200	0			10	39774	0.00001497
				PH4-2b	809700	830641	372	668	-30			10	39774	0.00001497
Phase 5	151497	Area	Wind Erosion	PH5-1	809457	831271	339	155	0	100	151497	1.7E-07		
				PH5-2	809466	831081	434	228	0			1.7E-07		
				PH5-1b	809360	831035	123	123	0			10	15150	0.00001497
Pond	66834	Area	Wind Erosion	P-1	811068	831401	282	237	0	100	66834	1.7E-07		
				P-1b	810970	831409	81	81	0			10	6683	0.00001497

Note: [1] See Appendix 3.3j and 3.3k for details

Appendix 3.3n: Emission Rate for Heavy Construction Activities - Annual TSP Concentration (Scenario 1)

**Calculation of Emission factor for Heavy Construction**

E = 1.2tons/acre/month of activity (ref : AP-42 S13.2.3.3)  
 or = 2.69Mg/hectare/month of activity

Where

E = Emission Factor

Assume

**Active operational area:**

Existing WENT (%) 100

**Active construction area:**

WENT Landfill Extension (Phase 1) (%): 10 estimated based on the construction schedule

**Unmitigated (Night Time)**

Mitigation efficiency (%): 0 \*0% for Do-nothing, 94% efficiency for watering 8 times daily

E (g/sq.m/day): 10.3462 Assume 26 working days per month and 12 working hours a day

E (g/sq.m/s): **0.000239494** calculated, 12 working hours per day

**Mitigated (Day Time)**

Mitigation efficiency (%): 94 \*0% for Do-nothing, 94% efficiency for watering 8 times daily

E (g/sq.m/day): 10.3462 Assume 26 working days per month and 12 working hours a day

E (g/sq.m/s) (10% Active Area): **0.00001497** calculated, 12 working hours per day

E (g/sq.m/s) (Dispersed Source): **0.00000150** source assumed to be dispersed over the phase

Appendix 3.3o: Emission Rate for Wind Erosion - Annual TSP Concentration (Scenario 1)

**Calculation of Emission factor for Wind Erosion**

$E = 0.85\text{Mg/hectare/yr}$  (ref : AP-42 S11.9, Table 11.9.4)

Where

E = Emission Factor

Assume

**Active operational area:**

Existing WENT (%): 100

**Active construction area:**

WENT Landfill Extension (Phase 1) (%): 10 estimated based on the construction schedule

**Unmitigated (Night Time)**

Mitigation efficiency (%) 0 \*0% for Do-nothing, 94% efficiency for watering 8 times daily

E (g/sqm/day) 0.2329 calculated as in AP-42 (S11.9, Table 11.9.4)

E (g/sq.m/s) **2.69533E-06** calculated, 24-hour emission (no watering)

**Mitigated (Day Time)**

Mitigation efficiency (%) 94 \*0% for Do-nothing, 94% efficiency for watering 8 times daily

E (g/sqm/day) 0.2329 calculated as in AP-42 (S11.9, Table 11.9.4)

E (g/sq.m/s) **1.68458E-07** calculated, 24-hour emission

Appendix 3.3p: Emission Rate for Heavy Construction Activities and Wind Erosion (Existing WENT in operation and Phase 1 of WENT Landfill Extension in construction) - Dispersed Source Annual TSP Concentration

**Scenario 1 (Unmitigated - Night Time):**

Description	Total Area, m2	Source	Type of Activities	ID	X-coordinate	Y-coordinate	X Length,m	Y Length, m	Angle (degree)	% of Total Area	Active Area, m2	Emission Factor <sup>[1]</sup> g/sq.m/s
Existing WENT	1080961	Area	Wind Erosion	EX-1	811235	831433	997	651	-19	100	1080961	2.70E-06
				EX-2	811234	830889	598	363	-13			2.70E-06
				EX-3	811215	830435	410	524	8			2.70E-06
Phase 1	340438	Area	Wind Erosion	PH1-2	810519	831072	528	279	-30	100	340438	2.70E-06
				PH1-3	810664	830853	402	246	-30			2.70E-06
				PH1-4	810836	830586	254	371	-15			2.70E-06

Note: [1] See Appendix 3.3n and 3.3o for details

**Scenario 1 (Mitigated - Day Time):**

Description	Total Area, m2	Source	Type of Activities	ID	X-coordinate	Y-coordinate	X Length,m	Y Length, m	Angle (degree)	% of Total Area	Active Area, m2	Emission Factor <sup>[1]</sup> g/sq.m/s
Existing WENT	1080961	Area	Wind Erosion	EX-1	811235	831433	997	651	-19	100	1080961	1.7E-07
				EX-2	811234	830889	598	363	-13			1.7E-07
				EX-3	811215	830435	410	524	8			1.7E-07
Phase 1	340438	Area	Wind Erosion	PH1-1	810519	831072	528	279	-30	100	340438	1.7E-07
				PH1-2	810664	830853	402	246	-30			1.7E-07
				PH1-3	810836	830586	254	371	-15			1.7E-07
	340438	Area	Heavy Construction	PH1-1	810519	831072	528	279	-30	100	340438	0.00000150
				PH1-2	810664	830853	402	246	-30			0.00000150
				PH1-3	810836	830586	254	371	-15			0.00000150

Note: [1] See Appendix 3.3n and 3.3o for details

Appendix 3.3q: Emission Rate for Heavy Construction Activities and Wind Erosion (Phase 1 of WENT Landfill Extension in construction) - Dispersed Source  
Annual TSP Concentration - Contribution from WENT Landfill Extension Only

**Scenario 1 (Unmitigated - Night Time):**

Description	Total Area, m2	Source	Type of Activities	ID	X-coordinate	Y-coordinate	X Length,m	Y Length, m	Angle (degree)	% of Total Area	Active Area, m2	Emission Factor <sup>[1]</sup> g/sq.m/s
Phase 1	340438	Area	Wind Erosion	PH1-2	810519	831072	528	279	-30	100	340438	2.70E-06
				PH1-3	810664	830853	402	246	-30			2.70E-06
				PH1-4	810836	830586	254	371	-15			2.70E-06

Note: [1] See Appendix 3.3n and 3.3o for details

**Scenario 1 (Mitigated - Day Time):**

Description	Total Area, m2	Source	Type of Activities	ID	X-coordinate	Y-coordinate	X Length,m	Y Length, m	Angle (degree)	% of Total Area	Active Area, m2	Emission Factor <sup>[1]</sup> g/sq.m/s
Phase 1	340438	Area	Wind Erosion	PH1-1	810519	831072	528	279	-30	100	340438	1.7E-07
				PH1-2	810664	830853	402	246	-30			1.7E-07
				PH1-3	810836	830586	254	371	-15			1.7E-07
	340438	Area	Heavy Construction	PH1-1	810519	831072	528	279	-30	100	340438	0.00000150
				PH1-2	810664	830853	402	246	-30			0.00000150
				PH1-3	810836	830586	254	371	-15			0.00000150

Note: [1] See Appendix 3.3n and 3.3o for details

Appendix 3.3r: Emission Rate for Heavy Construction Activities - Annual TSP Concentration (Scenario 2)

**Calculation of Emission factor for Heavy Construction**

E = 1.2tons/acre/month of activity (ref : AP-42 S13.2.3.3)  
 or = 2.69Mg/hectare/month of activity

Where

E = Emission Factor

Assume

**Active operational area:**

WENT Landfill Extension (Phase 1) (%): 100

**Active restoration area:**

Existing WENT (%) 10

**Active construction area:**

WENT Landfill Extension (Phase 2) (%): 10 estimated based on the construction schedule

WENT Landfill Extension (Phase 3) (%): 10 estimated based on the construction schedule

Nim Wan Road Realignment (%) 10 estimated based on the construction schedule

**Unmitigated (Night Time)**

Mitigation efficiency (%): 0 \*0% for Do-nothing, 94% efficiency for watering 8 times daily

E (g/sq.m/day): 10.3462 Assume 26 working days per month and 12 working hours a day

E (g/sq.m/s): **0.000239494** calculated, 12 working hours per day

**Mitigated (Day Time)**

Mitigation efficiency (%): 94 \*0% for Do-nothing, 94% efficiency for watering 8 times daily

E (g/sq.m/day): 10.3462 Assume 26 working days per month and 12 working hours a day

E (g/sq.m/s) (10% Active Area): **0.00001497** calculated, 12 working hours per day

E (g/sq.m/s) (Dispersed Source): **0.00000150** source assumed to be dispersed over the phase

Appendix 3.3s: Emission Rate for Wind Erosion - Annual TSP Concentration (Scenario 2)

**Calculation of Emission factor for Wind Erosion**

$E = 0.85\text{Mg/hectare/yr}$  (ref : AP-42 S11.9, Table 11.9.4)

Where

E = Emission Factor

Assume

**Active operational area:**

WENT Landfill Extension (Phase 1) (%): 100

**Active restoration area:**

Existing WENT (%) 100

**Active construction area:**

WENT Landfill Extension (Phase 2) (%): 10 estimated based on the construction schedule

WENT Landfill Extension (Phase 3) (%): 10 estimated based on the construction schedule

Nim Wan Road Realignment (%) 10 estimated based on the construction schedule

**Unmitigated (Night Time)**

Mitigation efficiency (%) 0 \*0% for Do-nothing, 94% efficiency for watering 8 times daily

E (g/sqm/day) 0.2329 calculated as in AP-42 (S11.9, Table 11.9.4)

E (g/sq.m/s) **2.69533E-06** calculated, 24-hour emission (no watering)

**Mitigated (Day Time)**

Mitigation efficiency (%) 94 \*0% for Do-nothing, 94% efficiency for watering 8 times daily

E (g/sqm/day) 0.2329 calculated as in AP-42 (S11.9, Table 11.9.4)

E (g/sq.m/s) **1.68458E-07** calculated, 24-hour emission

Appendix 3.3t: Emission Rate for Heavy Construction Activities and Wind Erosion (Existing WENT in restoration and Phase 2 and Phase 3 of WENT Landfill Extension and Nim Wan Road in construction) - Dispersed Source Annual TSP Concentration

**Scenario 2 (Unmitigated - Night Time):**

Description	Total Area, m2	Source	Type of Activities	ID	X-coordinate	Y-coordinate	X Length,m	Y Length, m	Angle (degree)	% of Total Area	Active Area, m2	Emission Factor <sup>[1]</sup> g/sq.m/s
Existing WENT	1080961	Area	Wind Erosion	EX-1	811235	831433	997	651	-19	100	1080961	2.70E-06
				EX-2	811234	830889	598	363	-13			2.70E-06
				EX-3	811215	830435	410	524	8			2.70E-06
Phase 1	340438	Area	Wind Erosion	PH1-2	810519	831072	528	279	-30	100	340438	2.70E-06
				PH1-3	810664	830853	402	246	-30			2.70E-06
				PH1-4	810836	830586	254	371	-15			2.70E-06
Phase 2	292609	Area	Wind Erosion	PH2-1	810481	830709	191	211	-23	100	292609	2.70E-06
				PH2-2	810592	830487	301	302	-23			2.70E-06
				PH2-3	810727	830127	366	441	18			2.70E-06
Phase 3	355396	Area	Wind Erosion	PH3-1	810312	830522	301	132	0	100	355396	2.70E-06
				PH3-2	810195	830353	526	216	0			2.70E-06
				PH3-3	810191	830092	656	308	0			2.70E-06
Nim Wan Road	229674	Area	Wind Erosion	NW-1	809231	830930	84	158	0	100	185058	2.70E-06
				NW-2	809246	830797	136	109	0			2.70E-06
				NW-3	809281	830569	238	355	0			2.70E-06
				NW-4	809305	830290	160	217	0			2.70E-06
				NW-5	809432	830046	121	312	-29			2.70E-06

Description	ID	Source	Type of Activities	ID	X-coordinate	Y-coordinate	Line - Width m	Line - Length m	Angle (degree)	% of Total Area	Active Area, m2	Emission Factor <sup>[1]</sup> g/sq.m/s
Nim Wan Road	44616	Line	Wind Erosion	NWL-1	809232	831576	35	1221	-	100	44616	2.70E-06
				NWL-2	810234	831406	11	171	-			2.70E-06

Note: [1] See Appendix 3.3r and 3.3s for details



Appendix 3.3t: Emission Rate for Heavy Construction Activities and Wind Erosion (Existing WENT in restoration and Phase 2 and Phase 3 of WENT Landfill Extension and Nim Wan Road in construction) - Dispersed Source Annual TSP Concentration

**Scenario 2 (Mitigated - Day Time):**

Description	Total Area, m2	Source	Type of Activities	ID	X-coordinate	Y-coordinate	X Length,m	Y Length, m	Angle (degree)	% of Total Area	Active Area, m2	Emission Factor <sup>(1)</sup> g/sq.m/s
Existing WENT	1080961	Area	Wind Erosion	EX-1	811235	831433	997	651	-19	100	1080961	1.7E-07
				EX-2	811234	830889	598	363	-13			1.7E-07
				EX-3	811215	830435	410	524	8			1.7E-07
	1080961	Area	Heavy Construction	EX-1	811235	831433	997	651	-19	100	1080961	0.00000150
				EX-2	811234	830889	598	363	-13			0.00000150
				EX-3	811215	830435	410	524	8			0.00000150
Phase 1	340438	Area	Wind Erosion	PH1-1	810519	831072	528	279	-30	100	340438	1.7E-07
				PH1-2	810664	830853	402	246	-30			1.7E-07
				PH1-3	810836	830586	254	371	-15			1.7E-07
Phase 2	292609	Area	Wind Erosion	PH2-1	810481	830709	191	211	-23	100	292609	1.7E-07
				PH2-2	810592	830487	301	302	-23			1.7E-07
				PH2-3	810727	830127	366	441	18			1.7E-07
	292609	Area	Heavy Construction	PH2-1	810481	830709	191	211	-23	100	292609	0.00000150
				PH2-2	810592	830487	301	302	-23			0.00000150
				PH2-3	810727	830127	366	441	18			0.00000150
Phase 3	355396	Area	Wind Erosion	PH3-1	810312	830522	301	132	0	100	355396	1.7E-07
				PH3-2	810195	830353	526	216	0			1.7E-07
				PH3-3	810191	830092	656	308	0			1.7E-07
	355396	Area	Heavy Construction	PH3-1	810312	830522	301	132	0	100	355396	0.00000150
				PH3-2	810195	830353	526	216	0			0.00000150
				PH3-3	810191	830092	656	308	0			0.00000150
Nim Wan Road	229674	Area	Wind Erosion	NW-1	809231	830930	84	158	0	100	185058	1.7E-07
				NW-2	809246	830797	136	109	0			1.7E-07
				NW-3	809281	830569	238	355	0			1.7E-07
				NW-4	809305	830290	160	217	0			1.7E-07
				NW-5	809432	830046	121	312	-29			1.7E-07
	229674	Area	Heavy Construction	NW-1	809231	830930	84	158	0	100	185058	0.00000150
				NW-2	809246	830797	136	109	0			0.00000150
				NW-3	809281	830569	238	355	0			0.00000150
				NW-4	809305	830290	160	217	0			0.00000150
				NW-5	809432	830046	121	312	-29			0.00000150

Description	Total Area, m2	Source	Type of Activities	ID	X-coordinate	Y-coordinate	Line - Width m	Line - Length m	Angle (degree)	% of Total Area	Active Area, m2	Emission Factor <sup>(1)</sup> g/sq.m/s
Nim Wan Road	44616	Line	Wind Erosion	NWL-1	809232	831576	35	1221	-	100	44616	1.7E-07
				NWL-2	810234	831406	11	171	-			1.7E-07
		Line	Heavy Construction	NWL-1	809232	831576	35	1221	-	100	44616	0.00000150
				NWL-2	810234	831406	11	171	-			0.00000150

Note: [1] See Appendix 3.3r and 3.3s for details

Appendix 3.3u: Emission Rate for Heavy Construction Activities and Wind Erosion (Phase 2 and Phase 3 of WENT Landfill Extension and Nim Wan Road in construction) - Dispersed Source  
Annual TSP Concentration - Contribution from WENT Landfill Extension Only

**Scenario 2 (Unmitigated - Night Time):**

Description	Total Area, m2	Source	Type of Activities	ID	X-coordinate	Y-coordinate	X Length, m	Y Length, m	Angle (degree)	% of Total Area	Active Area, m2	Emission Factor <sup>(1)</sup> g/sq.m/s
Phase 1	340438	Area	Wind Erosion	PH1-2	810519	831072	528	279	-30	100	340438	2.70E-06
				PH1-3	810664	830853	402	246	-30			2.70E-06
				PH1-4	810836	830586	254	371	-15			2.70E-06
Phase 2	292609	Area	Wind Erosion	PH2-1	810481	830709	191	211	-23	100	292609	2.70E-06
				PH2-2	810592	830487	301	302	-23			2.70E-06
				PH2-3	810727	830127	366	441	18			2.70E-06
Phase 3	355396	Area	Wind Erosion	PH3-1	810312	830522	301	132	0	100	355396	2.70E-06
				PH3-2	810195	830353	526	216	0			2.70E-06
				PH3-3	810191	830092	656	308	0			2.70E-06
Nim Wan Road	229674	Area	Wind Erosion	NW-1	809231	830930	84	158	0	100	185058	2.70E-06
				NW-2	809246	830797	136	109	0			2.70E-06
				NW-3	809281	830569	238	355	0			2.70E-06
				NW-4	809305	830290	160	217	0			2.70E-06
				NW-5	809432	830046	121	312	-29			2.70E-06

Description	Total Area, m2	Source	Type of Activities	ID	X-coordinate	Y-coordinate	Line - Width m	Line - Length m	Angle (degree)	% of Total Area	Active Area, m2	Emission Factor <sup>(1)</sup> g/sq.m/s
Nim Wan Road	44616	Line	Wind Erosion	NWL-1	809232	831576	35	1221	-	100	44616	2.70E-06
				NWL-2	810234	831406	11	171	-			2.70E-06

Note: [1] See Appendix 3.3r and 3.3s for details

Appendix 3.3u: Emission Rate for Heavy Construction Activities and Wind Erosion (Phase 2 and Phase 3 of WENT Landfill Extension and Nim Wan Road in construction) - Dispersed Source  
Annual TSP Concentration - Contribution from WENT Landfill Extension Only

**Scenario 2 (Mitigated - Day Time):**

Description	Total Area, m2	Source	Type of Activities	ID	X-coordinate	Y-coordinate	X Length,m	Y Length, m	Angle (degree)	% of Total Area	Active Area, m2	Emission Factor <sup>(1)</sup> g/sq.m/s
Phase 1	340438	Area	Wind Erosion	PH1-1	810519	831072	528	279	-30	100	340438	1.7E-07
				PH1-2	810664	830853	402	246	-30			1.7E-07
				PH1-3	810836	830586	254	371	-15			1.7E-07
Phase 2	292609	Area	Wind Erosion	PH2-1	810481	830709	191	211	-23	100	292609	1.7E-07
				PH2-2	810592	830487	301	302	-23			1.7E-07
				PH2-3	810727	830127	366	441	18			1.7E-07
	292609	Area	Heavy Construction	PH2-1	810481	830709	191	211	-23	100	292609	0.00000150
				PH2-2	810592	830487	301	302	-23			0.00000150
				PH2-3	810727	830127	366	441	18			0.00000150
Phase 3	355396	Area	Wind Erosion	PH3-1	810312	830522	301	132	0	100	355396	1.7E-07
				PH3-2	810195	830353	526	216	0			1.7E-07
				PH3-3	810191	830092	656	308	0			1.7E-07
	355396	Area	Heavy Construction	PH3-1	810312	830522	301	132	0	100	355396	0.00000150
				PH3-2	810195	830353	526	216	0			0.00000150
				PH3-3	810191	830092	656	308	0			0.00000150
Nim Wan Road	229674	Area	Wind Erosion	NW-1	809231	830930	84	158	0	100	185058	1.7E-07
				NW-2	809246	830797	136	109	0			1.7E-07
				NW-3	809281	830569	238	355	0			1.7E-07
				NW-4	809305	830290	160	217	0			1.7E-07
				NW-5	809432	830046	121	312	-29			1.7E-07
	229674	Area	Heavy Construction	NW-1	809231	830930	84	158	0	100	185058	0.00000150
				NW-2	809246	830797	136	109	0			0.00000150
				NW-3	809281	830569	238	355	0			0.00000150
				NW-4	809305	830290	160	217	0			0.00000150
				NW-5	809432	830046	121	312	-29			0.00000150

Description	Total Area, m2	Source	Type of Activities	ID	X-coordinate	Y-coordinate	Line - Width m	Line - Length m	Angle (degree)	% of Total Area	Active Area, m2	Emission Factor <sup>(1)</sup> g/sq.m/s
Nim Wan Road	44616	Line	Wind Erosion	NWL-1	809232	831576	35	1221	-	100	44616	1.7E-07
				NWL-2	810234	831406	11	171	-			1.7E-07
		Line	Heavy Construction	NWL-1	809232	831576	35	1221	-	100	44616	0.00000150
				NWL-2	810234	831406	11	171	-			0.00000150

Note: [1] See Appendix 3.3r and 3.3s for details

Appendix 3.3v: Emission Rate for Heavy Construction Activities - Annual TSP Concentration (Scenario 3)

**Calculation of Emission factor for Heavy Construction**

E = 1.2tons/acre/month of activity (ref : AP-42 S13.2.3.3)  
 or = 2.69Mg/hectare/month of activity

Where

E = Emission Factor

Assume

**Active operational area:**

WENT Landfill Extension (Phase 1) (%): 100  
 WENT Landfill Extension (Phase 2) (%): 100  
 WENT Landfill Extension (Phase 3) (%): 100

**Active restoration area:**

Existing WENT (%) 100

**Active construction area:**

WENT Landfill Extension (Phase 4) (%): 10 estimated based on the construction schedule  
 WENT Landfill Extension (Phase 5) (%): 10 estimated based on the construction schedule  
 Pond (%) 10 estimated based on the construction schedule

**Unmitigated (Night Time)**

Mitigation efficiency (%): 0 \*0% for Do-nothing, 94% efficiency for watering 8 times daily  
 E (g/sq.m/day): 10.3462 Assume 26 working days per month and 12 working hours a day  
 E (g/sq.m/s): **0.000239494** calculated, 12 working hours per day

**Mitigated (Day Time)**

Mitigation efficiency (%): 94 \*0% for Do-nothing, 94% efficiency for watering 8 times daily  
 E (g/sq.m/day): 10.3462 Assume 26 working days per month and 12 working hours a day  
 E (g/sq.m/s) (10% Active Area): **0.00001497** calculated, 12 working hours per day  
 E (g/sq.m/s) (Dispersed Source): **0.00000150** source assumed to be dispersed over the phase

Appendix 3.3w: Emission Rate for Wind Erosion - Annual TSP Concentration (Scenario 3)

**Calculation of Emission factor for Wind Erosion**

$E = 0.85\text{Mg/hectare/yr}$  (ref : AP-42 S11.9, Table 11.9.4)

Where

E = Emission Factor

Assume

**Active operational area:**

WENT Landfill Extension (Phase 1) (%): 100

WENT Landfill Extension (Phase 2) (%): 100

WENT Landfill Extension (Phase 3) (%): 100

**Active restoration area:**

Existing WENT (%): 100

**Active construction area:**

WENT Landfill Extension (Phase 4) (%): 10 estimated based on the construction schedule

WENT Landfill Extension (Phase 5) (%): 10 estimated based on the construction schedule

Pond (%): 10 estimated based on the construction schedule

**Unmitigated (Night Time)**

Mitigation efficiency (%): 0 \*0% for Do-nothing, 94% efficiency for watering 8 times daily

E (g/sqm/day): 0.2329 calculated as in AP-42 (S11.9, Table 11.9.4)

E (g/sq.m/s): **2.69533E-06** calculated, 24-hour emission (no watering)

**Mitigated (Day Time)**

Mitigation efficiency (%): 94 \*0% for Do-nothing, 94% efficiency for watering 8 times daily

E (g/sqm/day): 0.2329 calculated as in AP-42 (S11.9, Table 11.9.4)

E (g/sq.m/s): **1.68458E-07** calculated, 24-hour emission

Appendix 3.3x: Emission Rate for Heavy Construction Activities and Wind Erosion (Existing WENT in restoration and Phase 4 and Phase 5 of WENT Landfill Extension in construction) - Dispersed Source Annual TSP Concentration

**Scenario 3 (Unmitigated - Night Time):**

Description	Total Area, m2	Source	Type of Activities	ID	X-coordinate	Y-coordinate	X Length,m	Y Length, m	Angle (degree)	% of Total Area	Active Area, m2	Emission Factor <sup>[1]</sup> g/sq.m/s
Existing WENT	1080961	Area	Wind Erosion	EX-1	811235	831433	997	651	-19	100	1080961	2.70E-06
				EX-2	811234	830889	598	363	-13			2.70E-06
				EX-3	811215	830435	410	524	8			2.70E-06
Phase 1	340438	Area	Wind Erosion	PH1-2	810519	831072	528	279	-30	100	340438	2.70E-06
				PH1-3	810664	830853	402	246	-30			2.70E-06
				PH1-4	810836	830586	254	371	-15			2.70E-06
Phase 2	292609	Area	Wind Erosion	PH2-1	810481	830709	191	211	-23	100	292609	2.70E-06
				PH2-2	810592	830487	301	302	-23			2.70E-06
				PH2-3	810727	830127	366	441	18			2.70E-06
Phase 3	355396	Area	Wind Erosion	PH3-1	810312	830522	301	132	0	100	355396	2.70E-06
				PH3-2	810195	830353	526	216	0			2.70E-06
				PH3-3	810191	830092	656	308	0			2.70E-06
Phase 4	397744	Area	Wind Erosion	PH4-1	810116	830757	424	352	-41	100	397744	2.70E-06
				PH4-2	809700	830641	372	668	-30			2.70E-06
Phase 5	151497	Area	Wind Erosion	PH5-1	809457	831271	339	155	0	100	151497	2.70E-06
				PH5-2	809466	831081	434	228	0			2.70E-06
Pond	66834	Area	Wind Erosion	P-1	811068	831401	282	237	0	100	66834	2.70E-06

Note: [1] See Appendix 3.3v and 3.3w for details

Appendix 3.3x: Emission Rate for Heavy Construction Activities and Wind Erosion (Existing WENT in restoration and Phase 4 and Phase 5 of WENT Landfill Extension in construction) - Dispersed Source Annual TSP Concentration

**Scenario 3 (Mitigated - Day Time):**

Description	Total Area, m2	Source	Type of Activities	ID	X-coordinate	Y-coordinate	X Length,m	Y Length, m	Angle (degree)	% of Total Area	Active Area, m2	Emission Factor <sup>[1]</sup> g/sq.m/s
Existing WENT	1080961	Area	Wind Erosion	EX-1	811235	831433	997	651	-19	100	1080961	1.7E-07
				EX-2	811234	830889	598	363	-13			1.7E-07
				EX-3	811215	830435	410	524	8			1.7E-07
	1080961	Area	Heavy Construction	EX-1	811235	831433	997	651	-19	100	1080961	0.00000150
				EX-2	811234	830889	598	363	-13			0.00000150
				EX-3	811215	830435	410	524	8			0.00000150
Phase 1	340438	Area	Wind Erosion	PH1-1	810519	831072	528	279	-30	100	340438	1.7E-07
				PH1-2	810664	830853	402	246	-30			1.7E-07
				PH1-3	810836	830586	254	371	-15			1.7E-07
Phase 2	292609	Area	Wind Erosion	PH2-1	810481	830709	191	211	-23	100	292609	1.7E-07
				PH2-2	810592	830487	301	302	-23			1.7E-07
				PH2-3	810727	830127	366	441	18			1.7E-07
Phase 3	355396	Area	Wind Erosion	PH3-1	810312	830522	301	132	0	100	355396	1.7E-07
				PH3-2	810195	830353	526	216	0			1.7E-07
				PH3-3	810191	830092	656	308	0			1.7E-07
Phase 4	397744	Area	Wind Erosion	PH4-1	810116	830757	424	352	-41	100	397744	1.7E-07
				PH4-2	809700	830641	372	668	-30			1.7E-07
					397744	Area	Heavy Construction	PH4-1	810116			830757
PH4-2	809700	830641	372					668	-30	0.00000150		
Phase 5	151497	Area	Wind Erosion	PH5-1	809457	831271	339	155	0	100	151497	1.7E-07
				PH5-2	809466	831081	434	228	0			1.7E-07
					151497	Area	Heavy Construction	PH5-1	809457			831271
PH5-2	809466	831081	434					228	0	0.00000150		
Pond	66834	Area	Wind Erosion	P-1	811068	831401	282	237	0	100	66834	1.7E-07
	66834	Area	Heavy Construction	P-1	811068	831401	282	237	0	100	66834	0.00000150

Note: [1] See Appendix 3.3v and 3.3w for details

Appendix 3.3y: Emission Rate for Heavy Construction Activities and Wind Erosion (Phase 4 and Phase 5 of WENT Landfill Extensions in construction) - Dispersed Source  
Annual TSP Concentration - Contribution from WENT Landfill Extension Only

**Scenario 3 (Unmitigated - Night Time):**

Description	Total Area, m2	Source	Type of Activities	ID	X-coordinate	Y-coordinate	X Length,m	Y Length, m	Angle (degree)	% of Total Area	Active Area, m2	Emission Factor <sup>[1]</sup> g/sq.m/s
Phase 1	340438	Area	Wind Erosion	PH1-2	810519	831072	528	279	-30	100	340438	2.70E-06
				PH1-3	810664	830853	402	246	-30			2.70E-06
				PH1-4	810836	830586	254	371	-15			2.70E-06
Phase 2	292609	Area	Wind Erosion	PH2-1	810481	830709	191	211	-23	100	292609	2.70E-06
				PH2-2	810592	830487	301	302	-23			2.70E-06
				PH2-3	810727	830127	366	441	18			2.70E-06
Phase 3	355396	Area	Wind Erosion	PH3-1	810312	830522	301	132	0	100	355396	2.70E-06
				PH3-2	810195	830353	526	216	0			2.70E-06
				PH3-3	810191	830092	656	308	0			2.70E-06
Phase 4	397744	Area	Wind Erosion	PH4-1	810116	830757	424	352	-41	100	397744	2.70E-06
				PH4-2	809700	830641	372	668	-30			2.70E-06
Phase 5	151497	Area	Wind Erosion	PH5-1	809457	831271	339	155	0	100	151497	2.70E-06
				PH5-2	809466	831081	434	228	0			2.70E-06
Pond	66834	Area	Wind Erosion	P-1	811068	831401	282	237	0	100	66834	2.70E-06

Note: [1] See Appendix 3.3v and 3.3w for details



Appendix 3.3y: Emission Rate for Heavy Construction Activities and Wind Erosion (Phase 4 and Phase 5 of WENT Landfill Extensions in construction) - Dispersed Source  
Annual TSP Concentration - Contribution from WENT Landfill Extension Only

**Scenario 3 (Mitigated - Day Time):**

Description	Total Area, m2	Source	Type of Activities	ID	X-coordinate	Y-coordinate	X Length,m	Y Length, m	Angle (degree)	% of Total Area	Active Area, m2	Emission Factor <sup>[1]</sup> g/sq.m/s
Phase 1	340438	Area	Wind Erosion	PH1-1	810519	831072	528	279	-30	100	340438	1.7E-07
				PH1-2	810664	830853	402	246	-30			1.7E-07
				PH1-3	810836	830586	254	371	-15			1.7E-07
Phase 2	292609	Area	Wind Erosion	PH2-1	810481	830709	191	211	-23	100	292609	1.7E-07
				PH2-2	810592	830487	301	302	-23			1.7E-07
				PH2-3	810727	830127	366	441	18			1.7E-07
Phase 3	355396	Area	Wind Erosion	PH3-1	810312	830522	301	132	0	100	355396	1.7E-07
				PH3-2	810195	830353	526	216	0			1.7E-07
				PH3-3	810191	830092	656	308	0			1.7E-07
Phase 4	397744	Area	Wind Erosion	PH4-1	810116	830757	424	352	-41	100	397744	1.7E-07
				PH4-2	809700	830641	372	668	-30			1.7E-07
	397744	Area	Heavy Construction	PH4-1	810116	830757	424	352	-41	100	397744	0.00000150
				PH4-2	809700	830641	372	668	-30			0.00000150
Phase 5	151497	Area	Wind Erosion	PH5-1	809457	831271	339	155	0	100	151497	1.7E-07
				PH5-2	809466	831081	434	228	0			1.7E-07
	151497	Area	Heavy Construction	PH5-1	809457	831271	339	155	0	100	151497	0.00000150
				PH5-2	809466	831081	434	228	0			0.00000150
Pond	66834	Area	Wind Erosion	P-1	811068	831401	282	237	0	100	66834	1.7E-07
	66834	Area	Heavy Construction	P-1	811068	831401	282	237	0	100	66834	0.00000150

Note: [1] See Appendix 3.3v and 3.3w for details