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APPENDICES

APPENDIX A

Temperature during Experiment

Table A-1 Temperature during Experiment (°C)

Day	Temperature
1	31.0
2	32.0
3	31.0
4	29.0
5	30.0
6	30.5
7	30.0
8	31.0
9	30.0
10	30.0
11	29.0
12	30.0
13	30.0
14	31.0
15	30.5
16	30.0
17	29.0
18	30.0
19	31.0
20	30.5
21	31.0
22	30.5
23	30.2
24	31.0
25	31.5
26	30.0
27	30.0
28	29.5
29	30.2
30	29.0
31	29.0
32	31.0
33	30.0
34	30.0
35	30.0
36	29.5
37	28.8
38	29.0
39	29.0
40	29.0
41	29.0
42	30.0

Day	Temperature
43	30.0
44	29.5
45	30.0
46	30.0
47	30.0
48	27.5
49	29.0
50	30.5
51	31.0
52	30.5
53	30.5
54	31.0
55	30.8
56	31.0
57	31.0
58	31.0
59	31.0
60	31.0
61	30.5
62	29.7
63	29.5
64	30.0
65	30.0
66	30.0
67	31.0
68	30.5
69	30.8
70	30.0
71	29.0
72	29.5
73	29.0
74	32.0
75	30.0
76	31.0
77	30.0
78	30.5
79	31.2
80	31.5
81	32.0
82	32.5
83	33.0
84	32.5

Day	Temperature
85	32.0
86	32.5
87	32.5
88	33.0
89	32.5
90	32.0
91	30.5
92	31.5
93	32.0
94	32.0
95	32.0
96	32.5
97	32.0
98	31.8
99	31.5
100	33.0
101	32.0
102	32.0
103	31.5
104	32.0
105	31.5
106	31.5
107	31.0
108	31.5
109	30.5
110	30.0
111	30.0
112	30.5
113	30.0
114	30.5
115	30.5
116	30.5
117	31.0
118	30.5
119	31.0
120	30.5
121	29.5
122	30.0
123	30.0
124	29.5
125	29.0
126	29.0

Table A-1 Temperature during Experiment (°C) (continuous)

Day	Temperature
127	29.0
128	28.0
129	28.0
130	28.0
131	28.0
133	29.0
134	30.0
135	29.0
136	30.0
141	29.5
143	30.5
144	31.0
145	31.5
146	31.0
147	32.0
148	32.0
149	31.5
150	31.0
151	29.5
152	30.0
153	30.0
154	30.0
155	30.0
156	30.5
157	30.5
158	31.5
159	30.0
160	31.0
161	30.0
162	29.5
163	29.5
164	29.5
165	30.0
166	31.0
167	31.0
168	31.5
169	30.5
170	30.0
171	32.0
172	31.2
173	31.5
174	31.0

Day	Temperature
175	30.5
176	29.5
177	29.0
178	29.0
179	28.0
180	26.5
181	29.5
182	29.0
183	29.8
184	28.5
185	28.6
186	28.5
187	31.0
188	32.0
189	32.0
190	29.5
191	31.0
192	30.0
193	30.0
194	30.5
195	30.5

APPENDIX B

Gas Analysis Data from the Simulated Landfill Reactors

Table B-1 Cumulative Gas Production from the Simulated Landfill Reactors (L)

Day	Plan A	Plan B	Single Pass
1	0.00	2.87	0.04
2	0.00	4.13	0.32
3	0.00	4.13	0.32
4	0.00	4.13	0.32
5	1.70	6.25	3.38
6	3.31	8.78	5.66
7	5.21	12.84	7.24
8	6.49	16.40	9.60
9	6.49	18.46	10.34
10	12.01	26.01	14.32
11	15.17	33.61	14.96
12	15.79	39.85	17.90
13	19.97	41.57	18.42
14	30.21	52.07	23.75
15	36.49	56.95	27.79
16	48.59	67.92	39.37
17	61.19	72.88	45.96
18	77.33	81.24	48.98
19	105.43	90.52	55.93
20	114.35	97.98	61.04
21	119.68	104.90	63.90
22	129.88	115.79	70.17
23	135.60	123.29	73.62
24	141.05	133.56	77.39
25	148.31	153.50	83.83
26	155.26	163.57	91.35
27	156.94	167.34	94.59
28	159.38	171.97	98.51
29	163.34	178.67	103.40
30	165.26	182.47	105.67
31	166.82	185.69	108.05
32	169.97	191.05	111.83
33	172.85	196.14	113.63
34	175.46	200.21	115.19
35	177.71	203.73	116.51
36	179.20	206.55	117.81
37	180.39	209.34	119.08
38	183.03	213.28	120.81
39	184.58	215.19	122.09
40	187.18	218.92	123.33
41	187.88	219.86	123.71

Day	Plan A	Plan B	Single Pass
42	190.11	222.82	126.00
43	191.62	224.70	127.18
44	193.57	226.81	128.88
45	195.51	229.01	130.26
46	196.31	230.28	130.80
47	197.13	231.48	131.03
48	197.13	231.48	131.03
49	199.15	234.05	132.73
50	201.26	236.49	134.10
51	201.26	236.49	134.10
52	201.56	237.09	134.32
53	203.70	239.41	136.00
54	204.20	240.05	136.00
55	205.33	241.25	136.52
56	206.65	242.95	136.92
57	208.09	244.59	138.16
58	209.55	246.12	139.34
59	210.41	246.99	140.31
60	211.31	247.94	140.52
61	211.31	247.94	140.52
62	211.31	247.94	140.52
63	211.31	247.94	140.52
64	211.31	247.94	140.52
65	211.54	248.19	140.70
66	212.22	248.93	141.47
67	214.06	250.63	142.97
68	214.06	250.63	142.97
69	214.06	250.63	142.97
70	214.06	250.63	142.97
71	214.06	250.63	142.97
72	214.06	250.63	142.97
73	214.10	250.66	142.97
74	215.99	252.59	144.49
75	216.72	252.73	144.49
76	218.38	254.06	144.49
77	218.38	254.06	144.49
78	218.48	254.06	144.49
79	218.48	254.06	144.49
80	218.48	254.06	144.49
81	218.80	254.39	144.49
82	220.81	256.28	145.21

Table B-1 Cumulative Gas Production from the Simulated Landfill Reactors (L) (continuous)

Day	Plan A	Plan B	Single Pass
83	222.43	257.77	145.72
84	222.43	257.77	145.72
85	222.83	258.12	145.72
86	223.91	258.80	145.82
87	224.03	259.11	145.82
88	225.11	259.99	146.22
89	225.11	259.99	146.22
90	225.46	259.99	146.22
91	225.46	259.99	146.22
92	225.46	259.99	146.22
93	226.63	261.02	146.90
94	227.74	261.80	147.30
95	228.36	262.96	147.66
96	229.10	263.40	147.68
97	229.10	263.40	147.68
98	229.10	263.40	147.68
99	229.10	263.40	147.68
100	229.10	263.40	147.68
101	229.10	263.40	147.68
102	229.15	263.44	147.71
103	229.15	263.44	147.71
104	229.46	263.74	147.71
105	229.46	263.74	147.71
106	230.34	264.12	147.71
107	230.34	264.12	147.71
108	230.99	264.81	148.46
109	230.99	264.81	148.46
110	230.99	264.81	148.46
111	230.99	264.81	148.46
112	231.35	265.07	148.83
113	231.35	265.07	148.83
114	231.35	265.17	148.83
115	231.35	265.17	148.83
116	231.35	265.17	148.83
117	231.48	265.33	148.83
118	232.01	265.83	148.89
119	232.01	265.83	148.89
120	232.01	265.83	148.89
121	232.01	265.83	148.89
122	232.01	265.83	148.89
123	232.01	265.83	148.89
124	232.01	265.83	148.89
125	232.01	265.83	148.89
126	232.48	267.55	149.67
127	232.48	267.55	149.67
128	232.48	267.55	149.67
129	232.48	267.55	149.67
130	232.48	267.55	149.67
131	232.81	267.55	150.55
133	232.81	267.55	150.55
134	232.81	267.55	150.55
135	232.81	267.55	150.55
136	233.29	267.55	150.55
141	234.55	267.55	150.55
143	234.55	267.55	150.59
144	234.55	267.55	150.59
145	234.55	267.55	150.59
146	234.55	267.55	150.59
147	234.55	267.55	151.03
148	234.55	267.55	151.03
149	234.62	267.63	151.51
150	234.62	267.63	151.51
151	235.36	267.63	152.19
152	235.36	267.63	152.19
153	237.20	269.08	154.53
154	238.01	269.72	156.20
155	238.07	269.92	157.17
156	238.65	270.25	160.40
157	239.59	271.11	160.88
158	239.63	271.11	160.94
159	242.20	273.68	161.76
160	243.97	274.26	162.54
161	248.81	276.66	162.74
162	251.39	277.58	162.74
163	253.69	278.58	162.94
164	257.06	278.58	163.19
165	259.46	279.42	163.69
166	263.94	279.87	164.15

Table B-1 Cumulative Gas Production from the Simulated Landfill Reactors (L) (continuous)

Day	Plan A	Plan B	Single Pass
167	278.22	281.89	167.36
168	285.22	283.74	168.18
169	287.32	285.05	168.53
170	290.22	285.57	168.97
171	293.82	286.07	169.45
172	298.14	286.57	169.51
173	299.92	287.17	169.88
174	300.40	287.77	169.96
175	302.50	288.41	170.28
176	304.36	288.89	170.54
177	305.02	289.15	170.58
178	305.86	291.29	171.78
179	309.07	296.34	172.78
180	310.85	298.18	173.98
181	314.01	304.94	176.48
182	316.23	307.66	178.28
183	317.43	314.86	178.78
184	318.21	318.88	179.48
185	318.86	324.92	179.73
186	319.65	330.86	179.91
187	320.67	338.13	180.23
188	322.17	344.98	180.72
189	323.82	349.53	181.24
175	278.22	281.89	167.36
176	285.22	283.74	168.18
177	287.32	285.05	168.53
178	290.22	285.57	168.97
179	293.82	286.07	169.45
180	298.14	286.57	169.51
181	299.92	287.17	169.88
182	300.40	287.77	169.96
183	302.50	288.41	170.28
184	304.36	288.89	170.54
185	305.02	289.15	170.58
186	305.86	291.29	171.78
187	309.07	296.34	172.78
188	310.85	298.18	173.98
189	314.01	304.94	176.48
190	325.35	352.29	181.69

Day	Plan A	Plan B	Single Pass
191	326.99	355.89	182.17
192	328.99	358.96	182.79
193	330.97	361.06	183.37
194	332.75	363.49	183.90
195	333.73	365.74	184.33

Table B-2 Daily Gas Volume Produced from the Simulated Landfill Reactors (mL)

Day	Plan A	Plan B	Single Pass
1	-	2870	40
2	-	1260	280
3	-	-	-
4	-	-	-
5	1700	2120	3060
6	1610	2530	2280
7	1900	4060	1580
8	1280	3560	2360
9	-	2060	740
10	5520	7550	3980
11	3160	7600	640
12	624	6240	2940
13	4180	1720	520
14	10240	10500	5330
15	6280	4880	4040
16	12100	10970	11580
17	12600	4960	6590
18	16140	8360	3020
19	28100	9280	6950
20	8920	7460	5110
21	5330	6920	2860
22	10200	10890	6270
23	5720	7500	3450
24	5450	10270	3770
25	7260	19940	6440
26	6950	10070	7520
27	1680	3770	3240
28	2440	4630	3920
29	3960	6700	4890
30	1920	3800	2270
31	1560	3220	2380
32	3150	5360	3780
33	2880	5090	1800
34	2610	4070	1560
35	2250	3520	1320
36	1490	2820	1300
37	1190	2790	1270
38	2640	3940	1730
39	1550	1910	1280
40	2600	3730	1240
41	700	940	380

Day	Plan A	Plan B	Single Pass
42	2230	2960	2290
43	1510	1880	1180
44	1950	2110	1700
45	1940	2200	1380
46	800	1270	540
47	820	1200	230
48	-	-	-
49	2020	2570	1700
50	2110	2440	1370
51	-	-	-
52	300	600	220
53	2140	2320	1680
54	500	640	-
55	1130	1200	520
56	1320	1700	400
57	1440	1640	1240
58	1460	1530	1180
59	860	870	970
60	900	950	210
61	-	-	-
62	-	-	-
63	-	-	-
64	-	-	-
65	230	250	180
66	680	740	770
67	1840	1700	1500
68	-	-	-
69	-	-	-
70	-	-	-
71	-	-	-
72	-	-	-
73	40	30	-
74	1890	1930	1520
75	730	140	-
76	1660	1330	-
77	-	-	-
78	100	-	-
79	-	-	-
80	-	-	-
81	320	330	-
82	2010	1890	720

Table B-2 Daily Gas Volume Produced from the Simulated Landfill Reactors (mL) (continuous)

Day	Plan A	Plan B	Single Pass
83	1620	1490	510
84	-	-	-
85	400	350	-
86	1080	680	100
87	120	310	-
88	1080	880	400
89	-	-	-
90	350	-	-
91	-	-	-
92	-	-	-
93	1170	1030	680
94	1110	780	400
95	620	1160	360
96	740	440	20
97	-	-	-
98	-	-	-
99	-	-	-
100	-	-	-
101	-	-	-
102	50	40	30
103	-	-	-
104	310	300	-
105	-	-	-
106	880	380	-
107	-	-	-
108	650	690	750
109	-	-	-
110	-	-	-
111	-	-	-
112	360	260	370
113	-	-	-
114	-	100	-
115	-	-	-
116	-	-	-
117	130	160	-
118	530	500	60
119	-	-	-
120	-	-	-
121	-	-	-

Day	Plan A	Plan B	Single Pass
122	-	-	-
123	-	-	-
124	-	-	-
125	-	-	-
126	470	1720	780
127	-	-	-
128	-	-	-
129	-	-	-
130	-	-	-
131	330	-	880
132	-	-	-
133	-	-	-
134	-	-	-
135	480	-	-
136	1260	-	-
137	-	-	40
138	-	-	-
139	-	-	-
140	-	-	-
141	-	-	440
142	-	-	-
143	70	80	480
144	-	-	-
145	740	-	680
146	-	-	-
147	1840	1450	2340
148	810	640	1670
149	60	200	970
150	580	330	3230
151	940	860	480
152	40	-	60
153	2570	2570	820
154	1770	580	780
155	4840	2400	200
156	2580	920	-
157	2300	1000	200
158	3370	-	250
159	2400	840	500
160	4480	450	460

Table B-2 Daily Gas Volume Produced from the Simulated Landfill Reactors (mL) (continuous)

Day	Plan A	Plan B	Single Pass
161	3500	300	-
162	-	180	1570
163	2560	380	290
164	1100	200	480
165	3130	-	230
166	2165	160	290
167	1820	800	350
168	7000	1850	820
169	2100	1310	350
170	2900	520	440
171	3600	500	480
172	4320	500	60
173	1780	600	370
174	480	600	80
175	2100	640	320
176	1860	480	260
177	660	260	40
178	840	2140	1200
179	3210	5050	1000
180	1780	1840	1200
181	3160	6760	2500
182	2220	2720	1800
183	1200	7200	500
184	780	4020	700
185	650	6040	250
186	790	5940	180
187	1020	7270	320
188	1500	6850	490
189	1650	4550	520
190	1530	2760	450
191	1640	3600	480
192	2000	3070	620
193	1980	2100	580
194	1780	2430	530
195	980	2250	430

Table B-3 Normalized Methane Percentages (%)

Day	Plan A Reactor	Plan B Reactor	Single Pass Reactor
148	2.20	-	2.30
151	3.70	-	5.20
153	5.80	5.50	5.50
155	12.60	9.60	-
158	19.00	11.30	12.30
160	29.60	24.20	28.00
162	22.30	23.40	16.70
168	-	30.64	-
173	34.77	31.17	30.72
176	39.26	29.54	47.68
179	32.75	39.23	51.77
181	39.60	37.48	54.79
183	42.29	33.63	62.88
186	46.45	38.60	55.08
188	50.63	38.24	60.73
194	53.29	35.69	62.46

APPENDIX C

Leachate Analysis data from the Simulated Landfill Reactors

Table C-1 pH of Leachate

Day	Plan A	Plan B	Single Pass
1	3.95	3.71	3.85
2	3.95	3.72	3.86
3	3.97	3.72	3.87
4	3.96	3.71	3.87
5	4.01	3.74	3.91
6	4.01	3.75	3.94
7	3.98	3.71	3.90
8	3.96	3.69	3.88
9	3.97	3.70	3.89
10	3.99	3.71	3.89
11	4.03	3.74	3.90
12	4.06	3.77	3.91
13	4.14	3.84	3.96
14	4.12	3.82	3.93
15	4.18	3.88	3.98
16	4.27	3.97	4.44
17	4.32	4.01	5.08
18	4.43	4.08	5.20
19	4.88	4.17	5.20
20	5.13	4.26	5.31
21	5.14	4.27	5.28
22	5.14	4.31	5.20
23	5.13	4.35	5.16
24	5.13	4.41	5.13
25	5.11	4.57	5.07
26	5.10	4.70	5.03
27	5.10	4.73	5.01
28	5.12	4.78	4.99
29	5.08	4.81	4.99
30	5.08	4.84	4.97
31	5.07	4.88	4.97
32	5.11	4.93	5.01
33	5.13	4.98	4.99
34	5.10	4.99	4.99
35	5.13	5.04	4.97
36	5.08	5.03	4.91
37	5.12	5.09	4.93
38	5.12	5.07	4.88
39	5.13	5.10	4.88
40	5.13	5.08	4.88
41	5.15	5.15	5.09

Day	Plan A	Plan B	Single Pass
42	5.10	5.07	4.90
43	5.09	5.06	4.87
44	5.10	5.05	4.85
45	5.09	5.06	4.86
46	5.13	5.08	4.87
47	5.11	5.07	4.87
48	5.10	5.04	4.84
49	5.07	5.04	4.84
50	5.07	5.04	4.88
51	5.00	5.04	4.88
52	5.06	5.02	4.88
53	5.09	5.07	4.91
54	5.07	5.05	4.91
55	5.12	5.11	4.99
56	5.11	5.09	4.96
57	5.12	5.10	4.96
58	5.13	5.09	4.96
59	5.10	5.08	4.95
60	5.08	5.07	4.94
61	5.08	5.06	4.94
62	5.12	5.11	4.97
63	5.12	5.12	4.97
64	5.10	5.09	4.96
65	5.12	5.11	4.98
66	5.08	5.09	4.94
67	5.14	5.12	4.98
68	5.13	5.13	4.99
69	5.07	5.07	4.92
70	5.10	5.09	4.96
71	5.11	5.09	4.96
72	5.09	5.10	4.97
73	5.07	5.07	4.94
74	5.07	5.08	4.94
75	5.04	5.05	4.91
76	5.09	5.08	4.97
77	5.03	5.03	4.88
78	-	-	-
79	5.05	5.06	4.93
80	5.05	5.05	4.90
81	5.06	5.06	4.90
82	5.07	5.06	4.89

Table C-1 pH of Leachate (continuous)

Day	Plan A	Plan B	Single Pass
83	5.06	5.05	4.87
84	5.05	5.05	4.86
85	5.05	5.06	4.85
86	5.05	5.06	4.85
87	5.06	5.06	4.83
88	5.05	5.06	4.85
89	5.04	5.06	4.83
90	5.05	5.05	4.82
91	5.05	5.05	4.82
92	5.06	5.06	4.83
93	5.10	5.10	4.85
94	5.10	5.10	4.85
95	5.08	5.10	4.85
96	5.08	5.07	4.84
97	5.06	5.07	4.84
98	5.06	5.07	4.84
99	5.07	5.10	4.82
100	5.07	5.08	4.82
101	5.10	5.09	4.83
102	5.09	5.09	4.82
103	5.07	5.07	4.82
104	5.06	5.06	4.82
105	5.06	5.08	4.82
106	5.08	5.08	4.82
107	5.09	5.10	4.81
108	5.08	5.09	4.81
109	5.08	5.08	4.81
110	5.11	5.12	4.83
111	5.04	5.09	4.80
112	5.10	5.09	4.80
113	5.10	5.14	4.85
114	5.07	5.08	4.83
115	5.11	-	-
116	5.11	5.10	4.82
117	5.08	5.11	4.83
118	5.05	5.06	4.81
119	5.06	5.07	4.81
120	5.06	5.07	4.81
121	5.11	5.13	4.85
122	5.11	-	-
123	5.13	5.16	4.86
124	5.06	5.08	4.79
125	5.06	-	-
126	5.12	5.14	4.83
127	5.09	5.11	4.81
128	5.12	5.14	4.83
129	-	5.10	4.83
130	-	5.13	-
131	5.13	5.14	4.83
132	-	-	4.83
133	5.08	5.12	4.83
134	5.09	5.04	4.85
135	-	-	4.82
136	5.29	5.23	-
137	-	-	-
138	-	-	-
139	-	-	-
140	-	-	-
141	5.33	5.26	4.83
142	-	-	-
143	5.19	5.19	4.79
144	5.18	5.19	4.78
145	5.17	5.20	4.78
146	5.17	5.18	4.82
147	5.18	5.18	4.82
148	5.15	5.23	4.92
149	5.20	5.24	4.93
150	5.24	5.24	4.90
151	5.32	5.30	5.01
152	5.31	5.28	5.07
153	5.27	5.25	5.09
154	5.23	5.28	5.09
155	5.18	5.23	-
156	5.16	5.25	4.92
157	5.11	5.26	4.95
158	5.09	5.22	4.93
159	5.11	5.27	4.91
160	5.12	5.30	4.91
161	5.14	5.32	4.92
162	5.15	5.31	4.89
163	5.17	5.31	4.90
164	5.16	5.32	4.90

Table C-1 pH of Leachate (continuous)

Day	Plan A	Plan B	Single Pass
165	5.25	5.31	4.88
166	5.22	5.33	4.87
167	5.27	5.31	4.87
168	5.23	5.34	4.88
169	5.28	5.37	4.87
170	5.30	5.39	4.88
171	5.31	5.44	4.87
172	5.33	5.45	4.87
173	5.38	5.49	4.89
174	5.51	5.52	4.89
175	5.58	5.61	4.90
176	5.64	5.68	4.87
177	5.67	5.66	4.88
178	5.74	5.82	4.89
179	5.79	5.89	4.89
180	5.81	6.13	4.89
181	5.91	6.14	4.86
182	5.93	6.20	4.88
183	6.19	6.31	4.92
184	6.33	6.37	4.93
185	6.45	6.48	4.96
186	6.55	6.64	4.94
187	6.74	6.71	4.97
188	6.91	6.84	5.01
189	6.93	6.78	4.99
190	6.94	6.96	5.01
191	6.98	6.91	5.07
192	7.09	6.91	5.10
193	7.08	6.92	5.11
194	7.09	6.91	5.18
195	7.10	6.93	5.18

Table C-2 Chemical Oxygen Demand of Leachate (mg/L)

Day	Plan A Reactor	Plan B Reactor	Single Pass Reactor
1	29209	43209	35877
4	36134	45466	49466
7	33466	42800	42800
10	39466	54350	31466
13	36800	46800	36800
19	46613	57052	53448
25	50134	64558	39466
28	45466	45466	48518
31	46134	48134	48134
34	43366	38062	44134
37	46800	47466	49466
43	53393	56810	54134
51	37665	40473	39703
58	40008	59162	20886
66	48474	52292	35752
70	44160	40000	33600
84	38400	49600	20800
94	43200	49600	24000
105	48000	51200	22400
115	48000	49600	17600
123	38400	49600	22400
129	43840	48000	19840
134	40192	46080	15360
136	35840	25600	17408
141	32768	30464	27136
147	30720	31232	7168
150	30720	30464	17920
151	32768	34048	22528
154	35328	40960	23040
156	30976	34304	15872
158	32512	41984	17150
162	39827	37945	26342
164	46726	32928	14112
170	43904	38249	12857
173	38886	36064	17560
174	33555	29792	12230
176	27283	28224	16620
179	35436	36064	13171
181	33555	33868	16307
186	32614	31360	10662
189	32928	33555	14739
195	29491	31027	13209

Table C-3 Oxidation-Reduction Potential of Leachate

Day	Plan A	Plan B	Single Pass
99	-163.4	-149.8	-6.3
100	-155.1	-155.1	-58.2
101	-121.6	-105.6	-4.3
102	-82.9	-83.9	9
103	-125.9	-119.3	3.8
104	-133.2	-128.6	-32.3
105	-	-	-
106	-80.5	-86.6	40.2
107	-155.9	-138.8	-20
108	-168.2	-147.1	-13.5
109	-168.3	-162.2	4.7
110	-55.4	-53.2	23.8
111	-149.2	-150	-44.7
112	-149.5	-147.5	-15.7
113	-79.6	-71.7	24.3
114	-148.3	-185	-81.2
115	-	-	-
116	-173.9	-180.1	-31.1
117	-121.4	-121.5	-50.4
118	-164.6	-160.6	-11.9
119	-123.1	-165.1	-2.1
120	-63.8	-71.4	3
121	-101.3	-122.8	12.5
122	-	-	-
123	-147.5	-195.9	-127.8
124	-88.9	-102.5	-17.6
125	-	-	-
126	-6	-55.2	-43.5
127	-166.9	-178.3	-65.3
128	-167.4	-192	-60.4
129	-	-201.5	-70.6
130	-	-193.4	-60.2
131	-138.7	-120.2	-23.2
132	-	-	-36.8
133	-129.9	-150	-76.5
134	-171.1	-186.9	-53.6
135	-166.9	-165.8	-82.4
136	-215.2	-210.5	-
137	-	-	-
138	-	-	-
139	-	-	-

Day	Plan A	Plan B	Single Pass
140	-	-	-
141	-151.5	-144.4	-9.1
142	-	-	-
143	-143.9	-145	-
144	-141.3	-138	-32.2
145	-138.4	-130.4	-33.4
146	-163.6	-174.9	-75.2
147	-194.2	-168.2	-76.2
148	-181.3	-151.3	-95.7
149	-181.6	-172.5	-124.7
150	-227.5	-252	-163.3
151	-231	-239.3	-160.6
152	-233.8	-208.8	-202.5
153	-198.9	-201.6	-198.9
154	-222.5	-209	-214.8
155	-174.2	-207.7	-133.8
156	-155.3	-186.2	-156.8
157	-227	-219.6	-198.7
158	-	-	-
159	-153.4	-206.6	-152.2
160	-154.5	-202	-160.3
161	-191.5	-214.2	-153.7
162	-148.8	-214.9	-146.6
163	-178.5	-216.4	-140.2
164	-203.8	-233.8	-151.8
165	-215.4	-226.6	-138.4
166	-199.3	-220.6	-136.7
167	-196.6	-207.4	-138.6
168	-188.1	-184.9	-149.4
169	-194.4	-206.4	-140.8
170	-190.1	-201.2	-140.3
171	-211	-191	-154.2
172	-181.9	-193	-152.5
173	-177.7	-184.6	-122.4
174	-148	-175.1	-142.8
175	-166	-186.5	-99.1
176	-205.8	-193.1	-143.8
177	-211.1	-180.7	-156
178	-222.9	-182.1	-145.4
179	-222.1	-188.8	-146.4
180	-202.9	-74.7	-142.5

Table C-3 Oxidation-Reduction Potential of Leachate

Day	Plan A	Plan B	Single Pass
181	-216.7	-123.7	-124.6
182	-198	-140.7	-126.5
183	-243.7	-239.8	-126.2
184	-239	-162	-137.7
185	-251.5	-222.2	-145.7
186	-266.4	-157.8	-157.4
187	-289.3	-254	-147.6
188	-327.6	-314.3	-119.1
189	-360.6	-339.5	-163.4
190	-368.2	-359.0	-113.7
191	-368.2	-345.0	-131.3
192	-379.7	-344.0	-152.6
193	-380.0	-346.0	-141.8
194	-382.4	-347.0	-151.7
195	-381.6	-348.0	-152.0

Table C-4 Ammonia Nitrogen of Leachate (mg/L as Nitrogen)

Day	Plan A Reactor	Plan B Reactor	Single Pass Reactor
13	381	429	314
50	1423	1222	693
77	1287	1205	514
116	1614	1427	881
158	969	398	495
183	1299	1291	770

Table C-5 Orthophosphate of Leachate (mg/L as Phosphorus)

Day	Plan A Reactor	Plan B Reactor	Single Pass Reactor
13	204	230	306
50	617	609	454
77	652	658	349
116	184	105	44
158	306	288	122
183	765	1224	153

Appendix D

Volume of Moisture in Plan A and Plan B Reactors

Table D-1 Volume of Moisture Available in the Plan A and Plan B Reactors (mL)

Day	Plan A Reactor		Plan B Reactor	
	Initial Liquid 18540		Initial Liquid 18508	
	Added Water	Sampled Liquid	Added Liquid	Sampled Liquid
-2		120		120
-1	120		120	
0				
1		100		100
2				
3				
4		100		130
5				
6				
7		100		100
8				
9				
10		120		1130
11				
12				
13		300		300
14				
15		40		80
16				
17				
18				
19		60		60
20				
21				
22		60		70
23				
24				
25		70		60
26				
27				
28		60		60
29				
30				
31		60		60
32				
33		50		50
34		60		60
35				
36				

Table D-1 Volume of Moisture Available in the Plan A and Plan B Reactors (mL) (continuous)

Day	Plan A Reactor		Plan B Reactor	
	Added Water	Sampled Liquid	Added Liquid	Sampled Liquid
37				
38				
39				
40		15		15
41				
42				
43		60		60
44				
45				
46				
47				
48		60		60
49				
50		300		300
51				
52				
53				
54				
55				
56				
57				
58				
59				
60		15		15
61		30		30
62				
63	500	10	500	10
64				
65	500		500	
66				
67	500	20	500	30
68				
69	500		500	
70		25		25
71	500		500	
72				
73				
74		20		25
75				

Table D-1 Volume of Moisture Available in the Plan A and Plan B Reactors (mL) (continuous)

Day	Plan A Reactor		Plan B Reactor	
	Added Water	Sampled Liquid	Added Liquid	Sampled Liquid
76				
77		300		300
78				
79				
80				
81		15		15
82				
83				
84		15		15
85				
86				
87				
88		15		15
89				
90				
91		30		20
92				
93				
94				
95		20		30
96				
97				
98		30		30
99				
100				
101				
102		30		15
103				
104				
105				
106		15		10
107				
108				
109				
110		25		15
111				
112				
113		15		15
114				

Table D-1 Volume of Moisture Available in the Plan A and Plan B Reactors (mL) (continuous)

Day	Plan A Reactor		Plan B Reactor	
	Added Water	Sampled Liquid	Added Liquid	Sampled Liquid
115				
116		300		300
117		15		15
118				
119				
120				
121				
122				
123				
124		15		15
125	2000		2000	
126		15		15
127				
128				
129				
130				
131		10		10
132				
133		15		15
134				
135				
136				
137				
138				
139				
140				
141				
142	600		600	
143	600		600	
144				
145				
146	1000		1000	
147				
148				
149				
150				
151				
152				
153		2		2

Table D-1 Volume of Moisture Available in the Plan A and Plan B Reactors (mL) (continuous)

Day	Plan A Reactor		Plan B Reactor	
	Added Water	Sampled Liquid	Added Liquid	Sampled Liquid
154				
155				
156				
157				
158				
159		5		5
160				
161		1		1
162				
163				
164				
165		1		1
166				
167				
168				
169				
170				
171				
172				
173				
174		8		8
175				
176		300		300
177				
178				
179				
180				
181				
182				
183				
184				
185				
186		6		6
187				
188				
189		6		6
Total	6820	3064	6820	4129
Moisture Available		22296		21199

Table D-2 Leachate Recirculation Inventory of Plan A and Plan B Reactors

Day	Plan A Reactor			Plan B Reactor		
	Leachate Recycle (mL)	Mass COD (mg)	Volume Methane (mL)	Leachate Recycle (mL)	Mass COD (mg)	Volume Methane (mL)
148	1000	30720.00	17.82	1000	31232.00	-
149	1000	30720.00	1.32	1000	31232.00	-
150	1000	30720.00	12.76	1000	30464.00	-
151	1000	32768.00	34.78	1000	34048.00	-
152	900	29491.20	1.48	1230	30643.20	-
153	900	29491.20	149.06	2300	30643.20	141.35
154	900	31795.20	102.66	1300	36864.00	31.90
155	900	31795.20	609.84	2000	36864.00	230.40
156	900	27878.40	325.08	1600	30873.60	88.32
157	900	27878.40	289.80	1600	30873.60	96.00
158	900	29260.80	640.30	1600	37785.60	-
159	900	29260.80	456.00	1500	37785.60	94.92
160	900	29260.80	1326.08	900	37785.60	108.90
161	900	29260.80	1036.00	1000	37785.60	72.60
162	900	35844.48	-	1000	34151.04	42.12
163	900	35844.48	570.88	1000	34151.04	88.92
164	900	42053.76	245.30	1000	29635.20	46.80
165	900	42053.76	697.99	1000	29635.20	-
166	1200	56071.68	482.80	600	39513.60	37.44
167	1200	56071.68	405.86	600	39513.60	187.20
168	1200	56071.68	1561.00	1500	39513.60	566.84
169	1200	56071.68	468.30	1600	39513.60	401.38
170	1200	52684.80	646.70	1800	45899.04	159.33
171	1200	52684.80	802.80	1800	45899.04	153.20
172	2700	118540.80	963.36	1900	103272.84	153.20
173	2700	104993.28	618.91	2400	97372.80	187.02
174	2700	90599.04	166.90	2800	83417.60	187.02
175	2700	90599.04	730.17	2000	59584.00	199.49
176	2700	73664.64	730.24	1700	47980.80	141.79
178	2700	73664.64	259.12	4600	129830.40	76.80
179	2700	73664.64	329.78	4600	129830.40	632.16
180	2700	95679.36	1051.28	5500	198352.00	1981.12
181	2700	95679.36	582.95	4000	144256.00	721.83
182	4500	150998.40	1251.36	7000	237076.00	2533.65
183	4500	150998.40	1758.24	3000	101604.00	1019.46
184	4500	150998.40	507.48	4000	135472.00	141.25
185	4500	150998.40	329.86	4000	135472.00	1351.93
186	4500	150998.40	274.89	6000	203208.00	2031.25
187	4500	146764.80	366.96	7000	219520.00	2292.84

Table D-2 Leachate Recirculation Inventory of Plan A and Plan B Reactors (continuous)

Day	Plan A Reactor			Plan B Reactor		
	Leachate Recycle (mL)	Mass COD (mg)	Volume Methane (mL)	Leachate Recycle (mL)	Mass COD (mg)	Volume Methane (mL)
188	4500	150998.40	759.45	8000	250880.00	2621.35
189	4500	148176.00	835.40	5000	167776.00	1739.92
190	4500	148176.00	774.64	3000	100665.60	1055.42
191	4500	148176.00	830.33	4000	134220.80	1376.64
192	4500	148176.00	1012.60	3000	100665.60	1173.97
193	4500	148176.00	1002.47	2400	80532.48	803.04
194	4500	148176.00	948.56	2000	67110.40	867.27
195	4500	132710.40	522.24	2000	62054.40	803.03

BIOGRAPHY

Mr. Krispol Jaijongrak was born on 22nd February in Bangkok. He finished higher secondary course from Assumption College, Bangkok in March 1998. After that, he graduated a bachelor's degree in Environmental Technology from Sirindhorn International Institute of Technology, Thammasat University, Patumthani in 2002. He continued further study for Master's degree of Science in Environmental Management inter-Department Program in Environmental Management, Graduate School, Chulalongkorn University and achieved Master's Degree in April 2004.