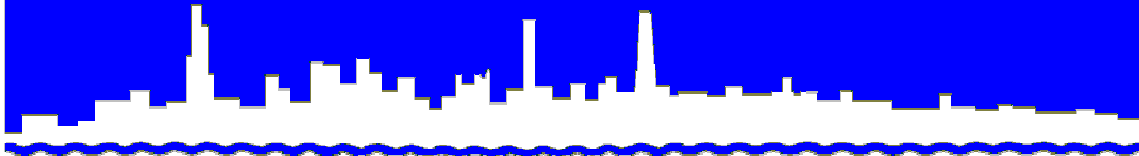


Protecting Our Water Environment



Metropolitan Water Reclamation District of Greater Chicago

***MONITORING AND RESEARCH
DEPARTMENT***

REPORT NO. 09-57

HARLEM AVENUE SOLIDS MANAGEMENT AREA

MONITORING REPORT FOR

SECOND QUARTER 2009

SEPTEMBER 2009

Metropolitan Water Reclamation District of Greater Chicago

100 EAST ERIE STREET CHICAGO, ILLINOIS 60611-3154 312.751.5190

Louis Kollias, P.E., BCEE
Director of Monitoring and Research
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September 4, 2009

Mr. S. Alan Keller, P.E.
Manager, Permit Section
Illinois Environmental Protection Agency
1021 North Grand Avenue East
P.O. Box 19276
Springfield, IL 62794 – 9276

Dear Mr. Keller:

Subject: Harlem Avenue Solids Management Area - Stickney Water Reclamation Plant, Contract No. 84-111-2P, Illinois Environmental Protection Agency Permit No. 2004-AO-2591, Monitoring Report for April, May, and June 2009

The attached ten tables contain the monitoring data for the Harlem Avenue Solids Management Area for April, May, and June 2009 as required by Illinois Environmental Protection Agency (IEPA) Operating Permit No. 2004-AO-2591.

The data reported are as follows:

- Table 1, Analysis of Water from Lysimeters L-1N-1 through L-3N at the Harlem Avenue Solids Management Area Sampled on April 8, 2009
- Table 2, Analysis of Water from Lysimeters L-1N-1 through L-3N at the Harlem Avenue Solids Management Area Sampled on April 22, 2009
- Table 3, Analysis of Water from Lysimeters L-1N-1 through L-3N at the Harlem Avenue Solids Management Area Sampled on May 6, 2009
- Table 4, Analysis of Water from Lysimeters L-1N-1 through L-3N at the Harlem Avenue Solids Management Area Sampled on May 20, 2009
- Table 5, Analysis of Water from Lysimeters L-1N-1 through L-3N at the Harlem Avenue Solids Management Area Sampled on June 3, 2009

Subject: Harlem Avenue Solids Management Area - Stickney Water Reclamation Plant, Contract No. 84-111-2P, Illinois Environmental Protection Agency Permit No. 2004-AO-2591, Monitoring Report for April, May, and June 2009

Table 6, Analysis of Water from Lysimeters L-1N-1 through L-3N at the Harlem Avenue Solids Management Area Sampled on June 17, 2009

Table 7, Analysis of Monthly Compositated Digested Biosolids Placed in the Harlem Avenue Solids Management Drying Area during April 2009

Table 8, Analysis of Monthly Compositated Digested Biosolids Placed in the Harlem Avenue Solids Management Drying Area during May 2009

Table 9, Analysis of Monthly Compositated Digested Biosolids Placed in the Harlem Avenue Solids Management Drying Area during June 2009

Table 10, Analysis of Monthly Compositated Processed Digested Biosolids Removed from the Harlem Avenue Solids Management Drying Area during June 2009

Two new lysimeters, L-2N and L-3N, were installed at this site in September 2008 as replacements for L-2 and L-3, respectively. The old and new lysimeters will be monitored simultaneously for one year. A request will then be submitted to the IEPA to terminate monitoring of the old lysimeters.

Biosolids were placed in the solids drying area during April, May, and June 2009. Biosolids were removed from the solids drying area during June 2009.

Very truly yours,

Louis Kollias
Director
Monitoring and Research

LK:PL:kq
Attachments
cc w/att: Mr. Sulski, IEPA
Records Unit, IEPA

TABLE 1: ANALYSIS OF WATER FROM LYSIMETERS
L-1N-1 THROUGH L-3N AT THE HARLEM AVENUE
SOLIDS MANAGEMENT AREA SAMPLED ON APRIL 8, 2009

Parameter	Unit	Lysimeter No.				
		L-1N-1	L-2	L-2N	L-3	L-3N
pH ¹		7.7	7.2	7.6	7.6	7.4
EC	mS/m	285	340	382	234	216
Total Dissolved Solids	mg/L	1,680	2,844	3,644	1,612	1,552
Total Diss. Org. Carbon	"	40	4	8	6	7
Cl ⁻	"	120	319	47	145	182
SO ₄ ⁼	"	6	1,009	1,631	234	271
TKN	"	9	0.8	2	0.9	2
NH ₃ -N	"	6	<0.1	<0.1	<0.1	0.9
NO ₂ + NO ₃ -N	"	<0.1	1	42	0.3	0.2
Total P	"	<0.25	<0.25	<0.25	<0.25	<0.25
Alkalinity as CaCO ₃	"	1,545	473	683	895	620
Al	"	0.089	0.117	0.130	0.089	0.077
Ca	"	309	468	606	256	248
Cd	"	<0.002	<0.002	<0.002	<0.002	<0.002
Cr	"	<0.003	<0.003	<0.003	<0.003	<0.003
Cu	"	<0.01	<0.01	<0.01	<0.01	<0.01
Fe	"	4.7	<0.02	<0.02	0.32	20
Hg	μg/L	<0.20	<0.20	<0.20	<0.20	<0.20
K	mg/L	4	<1	2	<1	2
Mg	"	175	116	184	106	79
Mn	"	0.435	0.652	3.46	1.13	0.862
Na	"	54	86	26	86	81
Ni	"	<0.002	<0.002	0.006	<0.002	<0.002
Pb	"	<0.02	<0.02	<0.02	<0.02	<0.02
Zn	"	<0.01	0.02	<0.01	<0.01	<0.01

¹pH analyzed beyond recommended holding time of 15 minutes.

TABLE 2: ANALYSIS OF WATER FROM LYSIMETERS
L-1N-1 THROUGH L-3N AT THE HARLEM AVENUE
SOLIDS MANAGEMENT AREA SAMPLED ON APRIL 22, 2009

Parameter	Unit	Lysimeter No.				
		L-1N-1	L-2	L-2N	L-3	L-3N
pH ¹		7.5	7.0	7.3	7.5	7.5
EC	mS/m	265	314	349	236	200
Total Dissolved Solids	mg/L	1,960	2,920	4,544	1,916	1,888
Total Diss. Org. Carbon	"	39	4	5	6	7
Cl ⁻	"	108	308	50	138	171
SO ₄ ⁼	"	7	1,130	1,636	255	283
TKN	"	9	0.4	0.5	0.4	1
NH ₃ -N	"	6	<0.1	<0.1	<0.1	0.9
NO ₂ + NO ₃ -N	"	0.2	2	58	0.5	0.2
Total P	"	<0.25	<0.25	<0.25	<0.25	<0.25
Alkalinity as CaCO ₃	"	1,651	481	687	980	695
Al	"	0.096	0.118	0.132	0.088	0.083
Ca	"	294	468	644	277	249
Cd	"	<0.002	<0.002	<0.002	<0.002	<0.002
Cr	"	<0.003	<0.003	<0.003	<0.003	<0.003
Cu	"	<0.01	<0.01	<0.01	<0.01	<0.01
Fe	"	9.0	<0.02	<0.02	0.44	19
Hg	μg/L	<0.20	<0.20	<0.20	<0.20	<0.20
K	mg/L	4	<1	<1	<1	2
Mg	"	164	120	178	106	78
Mn	"	0.396	2.14	3.63	1.11	1.01
Na	"	48	86	22	78	76
Ni	"	<0.002	0.005	0.007	<0.002	<0.002
Pb	"	<0.02	<0.02	<0.02	<0.02	<0.02
Zn	"	0.04	0.04	<0.01	<0.01	<0.01

¹pH analyzed beyond recommended holding time of 15 minutes.

TABLE 3: ANALYSIS OF WATER FROM LYSIMETERS
L-1N-1 THROUGH L-3N AT THE HARLEM AVENUE
SOLIDS MANAGEMENT AREA SAMPLED ON MAY 6, 2009

Parameter	Unit	Lysimeter No.				
		L-1N-1	L-2	L-2N	L-3	L-3N
pH ¹		7.5	7.0	7.4	7.4	7.6
EC	mS/m	233	307	345	204	185
Total Dissolved Solids	mg/L	1,732	2,992	3,792	1,600	1,612
Total Diss. Org. Carbon	"	38	4	6	6	6
Cl ⁻	"	112	296	62	142	164
SO ₄ ⁼	"	11	1,171	1,676	251	302
TKN	"	8	0.8	1	0.8	1
NH ₃ -N	"	6	<0.1	<0.1	<0.1	0.6
NO ₂ + NO ₃ -N	"	<0.1	4	68	0.4	<0.1
Total P	"	<0.25	<0.25	<0.25	<0.25	<0.25
Alkalinity as CaCO ₃	"	1,651	505	709	1,033	760
Al	"	0.070	0.094	0.116	0.064	0.067
Ca	"	313	502	620	273	271
Cd	"	<0.002	<0.002	<0.002	<0.002	<0.002
Cr	"	<0.003	<0.003	<0.003	<0.003	<0.003
Cu	"	<0.01	<0.01	<0.01	<0.01	<0.01
Fe	"	12	<0.02	0.03	0.03	0.68
Hg	μg/L	<0.20	<0.20	<0.20	<0.20	<0.20
K	mg/L	4	<1	<1	<1	2
Mg	"	184	142	201	114	90
Mn	"	0.421	1.39	3.62	0.950	0.936
Na	"	47	85	22	74	68
Ni	"	<0.002	0.003	0.004	<0.002	<0.002
Pb	"	<0.02	<0.02	<0.02	<0.02	<0.02
Zn	"	<0.01	0.05	0.06	<0.01	<0.01

¹pH analyzed beyond recommended holding time of 15 minutes.

TABLE 4: ANALYSIS OF WATER FROM LYSIMETERS
L-1N-1 THROUGH L-3N AT THE HARLEM AVENUE
SOLIDS MANAGEMENT AREA SAMPLED ON MAY 20, 2009

Parameter	Unit	Lysimeter No.				
		L-1N-1	L-2	L-2N	L-3	L-3N
pH ¹		7.5	7.2	7.4	7.5	7.6
EC	mS/m	264	337	377	221	204
Total Dissolved Solids	mg/L	1,668	3,092	3,808	1,660	1,540
Total Diss. Org. Carbon	"	39	4	6	6	6
Cl ⁻	"	114	304	56	154	188
SO ₄ ⁼	"	9	1,304	1,727	302	345
TKN	"	8	0.7	0.8	0.6	1
NH ₃ -N	"	6	<0.1	<0.1	<0.1	0.8
NO ₂ + NO ₃ -N	"	<0.1	4	74	0.4	0.2
Total P	"	<0.25	<0.25	<0.25	<0.25	<0.25
Alkalinity as CaCO ₃	"	1,618	569	649	939	668
Al	"	0.059	0.089	0.106	0.062	0.059
Ca	"	302	562	666	278	252
Cd	"	<0.002	<0.002	<0.002	<0.002	<0.002
Cr	"	<0.003	<0.003	<0.003	<0.003	<0.003
Cu	"	<0.01	<0.01	<0.01	<0.01	<0.01
Fe	"	13	<0.02	<0.02	0.27	13
Hg	μg/L	<0.20	<0.20	<0.20	<0.20	<0.20
K	mg/L	4	<1	<1	<1	2
Mg	"	178	137	197	114	82
Mn	"	0.405	0.819	3.52	0.948	0.916
Na	"	48	96	23	75	78
Ni	"	<0.002	0.005	0.007	<0.002	<0.002
Pb	"	<0.02	<0.02	<0.02	<0.02	<0.02
Zn	"	<0.01	0.02	0.02	<0.01	<0.01

¹pH analyzed beyond recommended holding time of 15 minutes.

TABLE 5: ANALYSIS OF WATER FROM LYSIMETERS
L-1N-1 THROUGH L-3N AT THE HARLEM AVENUE
SOLIDS MANAGEMENT AREA SAMPLED ON JUNE 3, 2009

Parameter	Unit	Lysimeter No.				
		L-1N-1	L-2	L-2N	L-3	L-3N
pH ¹		7.7	7.8	7.5	7.6	7.7
EC	mS/m	244	310	365	194	200
Total Dissolved Solids	mg/L	1,784	3,216	ND	1,688	1,632
Total Diss. Org. Carbon	"	38	4	5	6	7
Cl ⁻	"	105	290	56	126	142
SO ₄ ⁼	"	9	1,176	1,534	229	219
TKN	"	9	0.4	0.7	0.4	1
NH ₃ -N	"	6	<0.1	<0.1	<0.1	0.8
NO ₂ + NO ₃ -N	"	<0.1	2	87	<0.1	0.2
Total P	"	<0.25	<0.25	<0.25	<0.25	<0.25
Alkalinity as CaCO ₃	"	1,565	494	609	955	727
Al	"	0.063	0.086	0.110	0.056	0.065
Ca	"	288	498	658	260	241
Cd	"	<0.002	<0.002	<0.002	<0.002	<0.002
Cr	"	<0.003	<0.003	<0.003	<0.003	<0.003
Cu	"	<0.01	<0.01	<0.01	<0.01	<0.01
Fe	"	13	<0.02	<0.02	<0.02	18
Hg	μg/L	<0.20	<0.20	<0.20	<0.20	<0.20
K	mg/L	4	<1	<1	<1	<1
Mg	"	171	128	196	113	82
Mn	"	0.375	0.853	3.56	0.750	0.859
Na	"	45	88	22	72	62
Ni	"	<0.002	0.005	0.007	<0.002	<0.002
Pb	"	<0.02	<0.02	<0.02	<0.02	<0.02
Zn	"	<0.01	0.03	0.03	<0.01	<0.01

¹pH analyzed beyond recommended holding time of 15 minutes.

ND = No data.

TABLE 6: ANALYSIS OF WATER FROM LYSIMETERS
L-1N-1 THROUGH L-3N AT THE HARLEM AVENUE
SOLIDS MANAGEMENT AREA SAMPLED ON JUNE 17, 2009

Parameter	Unit	Lysimeter No.				
		L-1N-1	L-2	L-2N	L-3	L-3N
pH ¹		7.5	7.2	7.4	7.5	7.6
EC	mS/m	279	329	403	226	200
Total Dissolved Solids	mg/L	1,796	2,936	4,320	1,744	1,624
Total Diss. Org. Carbon	"	40	4	5	7	8
Cl ⁻	"	103	282	54	121	128
SO ₄ ⁼	"	3	1,191	1,617	227	186
TKN	"	8	0.7	0.6	0.8	2
NH ₃ -N	"	6	<0.1	<0.1	<0.1	0.8
NO ₂ + NO ₃ -N	"	<0.1	1	92	0.3	<0.1
Total P	"	<0.25	<0.25	<0.25	<0.25	<0.25
Alkalinity as CaCO ₃	"	1,607	489	626	1,079	853
Al	"	0.064	0.084	0.106	0.063	0.059
Ca	"	310	492	565	283	259
Cd	"	<0.002	<0.002	<0.002	<0.002	<0.002
Cr	"	<0.003	<0.003	<0.003	<0.003	<0.003
Cu	"	<0.01	<0.01	<0.01	<0.01	<0.01
Fe	"	13	<0.02	<0.02	0.25	15
Hg	μg/L	<0.20	<0.20	<0.20	<0.20	<0.20
K	mg/L	4	<1	<1	<1	2
Mg	"	180	134	202	121	93
Mn	"	0.392	1.78	3.56	0.774	0.934
Na	"	47	90	24	67	56
Ni	"	<0.002	0.006	0.008	<0.002	<0.002
Pb	"	<0.02	<0.02	<0.02	<0.02	<0.02
Zn	"	<0.01	0.02	0.02	<0.01	<0.01

¹pH analyzed beyond recommended holding time of 15 minutes.

TABLE 7: ANALYSIS OF MONTHLY COMPOSITED DIGESTED
 BIOSOLIDS PLACED IN THE HARLEM AVENUE
 SOLIDS MANAGEMENT DRYING AREA DURING APRIL 2009

Parameter	Unit	Concentration ¹
pH		8.4
Total Solids	%	24.5
Total Volatile Solids ²	%	58.7
TKN	mg/kg	11,701
NH ₃ -N	”	2,892

¹Values for one sample only.

²Total volatile solids as a percentage of total solids.

TABLE 8: ANALYSIS OF MONTHLY COMPOSITED DIGESTED
 BIOSOLIDS PLACED IN THE HARLEM AVENUE
 SOLIDS MANAGEMENT DRYING AREA DURING MAY 2009

Parameter	Unit	Concentration ¹
pH		7.9
Total Solids	%	15.4
Total Volatile Solids ²	%	47.4
TKN	mg/kg	50,611
NH ₃ -N	”	18,180

¹Values for one sample only.

²Total volatile solids as a percentage of total solids.

TABLE 9: ANALYSIS OF MONTHLY COMPOSITED DIGESTED
 BIOSOLIDS PLACED IN THE HARLEM AVENUE
 SOLIDS MANAGEMENT DRYING AREA DURING JUNE 2009

Parameter	Unit	Concentration ¹
pH		8.3
Total Solids	%	17.4
Total Volatile Solids ²	%	47.1
TKN	mg/kg	44,417
NH ₃ -N	”	14,580

¹Values for one sample only.

²Total volatile solids as a percentage of total solids.

TABLE 10: ANALYSIS OF MONTHLY COMPOSITED PROCESSED DIGESTED
BIOSOLIDS REMOVED FROM THE HARLEM AVENUE
SOLIDS MANAGEMENT DRYING AREA DURING JUNE 2009

Parameter	Unit	Concentration ¹
pH		6.8
Total Solids	%	47.5
Total Volatile Solids ²	%	48.2
TKN	mg/kg	32,491
NH ₃ -N	''	4,685
Total P	''	24,132
Al	''	12,241
As	''	<10
Ca	''	39,080
Cd	''	3
Cr	''	157
Cu	''	518
Fe	''	37,070
Hg	''	1.1
K	''	1,676
Mg	''	13,689
Mn	''	773
Mo	''	12
Na	''	<800
Ni	''	49
Pb	''	94
Se	''	<8
Zn	''	899

¹Values are the means of two samples.

²Total volatile solids as a percentage of total solids.

TABLE 1: ANALYSIS OF WATER FROM LYSIMETERS
L-1N-1 THROUGH L-3N AT THE HARLEM AVENUE
SOLIDS MANAGEMENT AREA SAMPLED ON APRIL 8, 2009

Parameter	Unit	Lysimeter No.				
		L-1N-1	L-2	L-2N	L-3	L-3N
pH ¹		7.7	7.2	7.6	7.6	7.4
EC	mS/m	285	340	382	234	216
Total Dissolved Solids	mg/L	1,680	2,844	3,644	1,612	1,552
Total Diss. Org. Carbon	"	40	4	8	6	7
Cl ⁻	"	120	319	47	145	182
SO ₄ ⁼	"	6	1,009	1,631	234	271
TKN	"	9	0.8	2	0.9	2
NH ₃ -N	"	6	<0.1	<0.1	<0.1	0.9
NO ₂ + NO ₃ -N	"	<0.1	1	NRR	0.3	0.2
Total P	"	<0.25	<0.25	<0.25	<0.25	<0.25
Alkalinity as CaCO ₃	"	1,545	473	683	895	620
Al	"	0.089	0.117	0.130	0.089	0.077
Ca	"	309	468	606	256	248
Cd	"	<0.002	<0.002	<0.002	<0.002	<0.002
Cr	"	<0.003	<0.003	<0.003	<0.003	<0.003
Cu	"	<0.01	<0.01	<0.01	<0.01	<0.01
Fe	"	4.7	<0.02	<0.02	0.32	20
Hg	μg/L	<0.20	<0.20	<0.20	<0.20	<0.20
K	mg/L	4	<1	2	<1	2
Mg	"	175	116	184	106	79
Mn	"	0.435	0.652	3.46	1.13	0.862
Na	"	54	86	26	86	81
Ni	"	<0.002	<0.002	0.006	<0.002	<0.002
Pb	"	<0.02	<0.02	<0.02	<0.02	<0.02
Zn	"	<0.01	0.02	<0.01	<0.01	<0.01

¹pH analyzed beyond recommended holding time of 15 minutes.

NRR = No reportable result.

TABLE 2: ANALYSIS OF WATER FROM LYSIMETERS
L-1N-1 THROUGH L-3N AT THE HARLEM AVENUE
SOLIDS MANAGEMENT AREA SAMPLED ON APRIL 22, 2009

Parameter	Unit	Lysimeter No.				
		L-1N-1	L-2	L-2N	L-3	L-3N
pH ¹		7.5	7.0	7.3	7.5	7.5
EC	mS/m	265	314	349	236	200
Total Dissolved Solids	mg/L	1,960	2,920	4,544	1,916	1,888
Total Diss. Org. Carbon	"	39	4	5	6	7
Cl ⁻	"	108	308	50	138	171
SO ₄ ⁼	"	7	1,130	1,636	255	283
TKN	"	9	0.4	0.5	0.4	1
NH ₃ -N	"	6	<0.1	<0.1	<0.1	0.9
NO ₂ + NO ₃ -N	"	0.2	2	NRR	0.5	0.2
Total P	"	<0.25	<0.25	<0.25	<0.25	<0.25
Alkalinity as CaCO ₃	"	1,651	481	687	980	695
Al	"	0.096	0.118	0.132	0.088	0.083
Ca	"	294	468	644	277	249
Cd	"	<0.002	<0.002	<0.002	<0.002	<0.002
Cr	"	<0.003	<0.003	<0.003	<0.003	<0.003
Cu	"	<0.01	<0.01	<0.01	<0.01	<0.01
Fe	"	9.0	<0.02	<0.02	0.44	19
Hg	μg/L	<0.20	<0.20	<0.20	<0.20	<0.20
K	mg/L	4	<1	<1	<1	2
Mg	"	164	120	178	106	78
Mn	"	0.396	2.14	3.63	1.11	1.01
Na	"	48	86	22	78	76
Ni	"	<0.002	0.005	0.007	<0.002	<0.002
Pb	"	<0.02	<0.02	<0.02	<0.02	<0.02
Zn	"	0.04	0.04	<0.01	<0.01	<0.01

¹pH analyzed beyond recommended holding time of 15 minutes.

NRR = No reportable result.

TABLE 3: ANALYSIS OF WATER FROM LYSIMETERS
L-1N-1 THROUGH L-3N AT THE HARLEM AVENUE
SOLIDS MANAGEMENT AREA SAMPLED ON MAY 6, 2009

Parameter	Unit	Lysimeter No.				
		L-1N-1	L-2	L-2N	L-3	L-3N
pH ¹		7.5	7.0	7.4	7.4	7.6
EC	mS/m	233	307	345	204	185
Total Dissolved Solids	mg/L	1,732	2,992	3,792	1,600	1,612
Total Diss. Org. Carbon	"	38	4	6	6	6
Cl ⁻	"	112	296	62	142	164
SO ₄ ⁼	"	11	1,171	1,676	251	302
TKN	"	8	0.8	1	0.8	1
NH ₃ -N	"	6	<0.1	<0.1	<0.1	0.6
NO ₂ + NO ₃ -N	"	<0.1	4	NRR	0.4	<0.1
Total P	"	<0.25	<0.25	<0.25	<0.25	<0.25
Alkalinity as CaCO ₃	"	1,651	505	709	1,033	760
Al	"	0.070	0.094	0.116	0.064	0.067
Ca	"	313	502	620	273	271
Cd	"	<0.002	<0.002	<0.002	<0.002	<0.002
Cr	"	<0.003	<0.003	<0.003	<0.003	<0.003
Cu	"	<0.01	<0.01	<0.01	<0.01	<0.01
Fe	"	12	<0.02	0.03	0.03	0.68
Hg	μg/L	<0.20	<0.20	<0.20	<0.20	<0.20
K	mg/L	4	<1	<1	<1	2
Mg	"	184	142	201	114	90
Mn	"	0.421	1.39	3.62	0.950	0.936
Na	"	47	85	22	74	68
Ni	"	<0.002	0.003	0.004	<0.002	<0.002
Pb	"	<0.02	<0.02	<0.02	<0.02	<0.02
Zn	"	<0.01	0.05	0.06	<0.01	<0.01

¹pH analyzed beyond recommended holding time of 15 minutes.

NRR = No reportable result.

TABLE 4: ANALYSIS OF WATER FROM LYSIMETERS
L-1N-1 THROUGH L-3N AT THE HARLEM AVENUE
SOLIDS MANAGEMENT AREA SAMPLED ON MAY 20, 2009

Parameter	Unit	Lysimeter No.				
		L-1N-1	L-2	L-2N	L-3	L-3N
pH ¹		7.5	7.2	7.4	7.5	7.6
EC	mS/m	264	337	377	221	204
Total Dissolved Solids	mg/L	1,668	3,092	3,808	1,660	1,540
Total Diss. Org. Carbon	"	39	4	6	6	6
Cl ⁻	"	114	304	56	154	188
SO ₄ ⁼	"	9	1,304	1,727	302	345
TKN	"	8	0.7	0.8	0.6	1
NH ₃ -N	"	6	<0.1	<0.1	<0.1	0.8
NO ₂ + NO ₃ -N	"	<0.1	4	NRR	0.4	0.2
Total P	"	<0.25	<0.25	<0.25	<0.25	<0.25
Alkalinity as CaCO ₃	"	1,618	569	649	939	668
Al	"	0.059	0.089	0.106	0.062	0.059
Ca	"	302	562	666	278	252
Cd	"	<0.002	<0.002	<0.002	<0.002	<0.002
Cr	"	<0.003	<0.003	<0.003	<0.003	<0.003
Cu	"	<0.01	<0.01	<0.01	<0.01	<0.01
Fe	"	13	<0.02	<0.02	0.27	13
Hg	μg/L	<0.20	<0.20	<0.20	<0.20	<0.20
K	mg/L	4	<1	<1	<1	2
Mg	"	178	137	197	114	82
Mn	"	0.405	0.819	3.52	0.948	0.916
Na	"	48	96	23	75	78
Ni	"	<0.002	0.005	0.007	<0.002	<0.002
Pb	"	<0.02	<0.02	<0.02	<0.02	<0.02
Zn	"	<0.01	0.02	0.02	<0.01	<0.01

¹pH analyzed beyond recommended holding time of 15 minutes.

NRR = No reportable result.

TABLE 5: ANALYSIS OF WATER FROM LYSIMETERS
L-1N-1 THROUGH L-3N AT THE HARLEM AVENUE
SOLIDS MANAGEMENT AREA SAMPLED ON JUNE 3, 2009

Parameter	Unit	Lysimeter No.				
		L-1N-1	L-2	L-2N	L-3	L-3N
pH ¹		7.7	7.8	7.5	7.6	7.7
EC	mS/m	244	310	365	194	200
Total Dissolved Solids	mg/L	1,784	3,216	ND	1,688	1,632
Total Diss. Org. Carbon	"	38	4	5	6	7
Cl ⁻	"	105	290	56	126	142
SO ₄ ⁼	"	9	1,176	1,534	229	219
TKN	"	9	0.4	0.7	0.4	1
NH ₃ -N	"	6	<0.1	<0.1	<0.1	0.8
NO ₂ + NO ₃ -N	"	<0.1	2	NRR	<0.1	0.2
Total P	"	<0.25	<0.25	<0.25	<0.25	<0.25
Alkalinity as CaCO ₃	"	1,565	494	609	955	727
Al	"	0.063	0.086	0.110	0.056	0.065
Ca	"	288	498	658	260	241
Cd	"	<0.002	<0.002	<0.002	<0.002	<0.002
Cr	"	<0.003	<0.003	<0.003	<0.003	<0.003
Cu	"	<0.01	<0.01	<0.01	<0.01	<0.01
Fe	"	13	<0.02	<0.02	<0.02	18
Hg	μg/L	<0.20	<0.20	<0.20	<0.20	<0.20
K	mg/L	4	<1	<1	<1	<1
Mg	"	171	128	196	113	82
Mn	"	0.375	0.853	3.56	0.750	0.859
Na	"	45	88	22	72	62
Ni	"	<0.002	0.005	0.007	<0.002	<0.002
Pb	"	<0.02	<0.02	<0.02	<0.02	<0.02
Zn	"	<0.01	0.03	0.03	<0.01	<0.01

¹pH analyzed beyond recommended holding time of 15 minutes.

ND = No data.

NRR = No reportable result.

TABLE 6: ANALYSIS OF WATER FROM LYSIMETERS
L-1N-1 THROUGH L-3N AT THE HARLEM AVENUE
SOLIDS MANAGEMENT AREA SAMPLED ON JUNE 17, 2009

Parameter	Unit	Lysimeter No.				
		L-1N-1	L-2	L-2N	L-3	L-3N
pH ¹		7.5	7.2	7.4	7.5	7.6
EC	mS/m	279	329	403	226	200
Total Dissolved Solids	mg/L	1,796	2,936	4,320	1,744	1,624
Total Diss. Org. Carbon	"	40	4	5	7	8
Cl ⁻	"	103	282	54	121	128
SO ₄ ⁼	"	3	1,191	1,617	227	186
TKN	"	8	0.7	0.6	0.8	2
NH ₃ -N	"	6	<0.1	<0.1	<0.1	0.8
NO ₂ + NO ₃ -N	"	<0.1	1	NRR	0.3	<0.1
Total P	"	<0.25	<0.25	<0.25	<0.25	<0.25
Alkalinity as CaCO ₃	"	1,607	489	626	1,079	853
Al	"	0.064	0.084	0.106	0.063	0.059
Ca	"	310	492	565	283	259
Cd	"	<0.002	<0.002	<0.002	<0.002	<0.002
Cr	"	<0.003	<0.003	<0.003	<0.003	<0.003
Cu	"	<0.01	<0.01	<0.01	<0.01	<0.01
Fe	"	13	<0.02	<0.02	0.25	15
Hg	μg/L	<0.20	<0.20	<0.20	<0.20	<0.20
K	mg/L	4	<1	<1	<1	2
Mg	"	180	134	202	121	93
Mn	"	0.392	1.78	3.56	0.774	0.934
Na	"	47	90	24	67	56
Ni	"	<0.002	0.006	0.008	<0.002	<0.002
Pb	"	<0.02	<0.02	<0.02	<0.02	<0.02
Zn	"	<0.01	0.02	0.02	<0.01	<0.01

¹pH analyzed beyond recommended holding time of 15 minutes.

NRR = No reportable result.

TABLE 7: ANALYSIS OF MONTHLY COMPOSITED DIGESTED
 BIOSOLIDS PLACED IN THE HARLEM AVENUE
 SOLIDS MANAGEMENT DRYING AREA DURING APRIL 2009

Parameter	Unit	Concentration ¹
pH		8.4
Total Solids	%	24.5
Total Volatile Solids ²	%	58.7
TKN	mg/kg	11,701
NH ₃ -N	"	2,892

¹Values for one sample only.

²Total volatile solids as a percentage of total solids.

TABLE 8: ANALYSIS OF MONTHLY COMPOSITED DIGESTED
 BIOSOLIDS PLACED IN THE HARLEM AVENUE
 SOLIDS MANAGEMENT DRYING AREA DURING MAY 2009

Parameter	Unit	Concentration ¹
pH		7.9
Total Solids	%	15.4
Total Volatile Solids ²	%	47.4
TKN	mg/kg	50,611
NH ₃ -N	”	18,180

¹Values for one sample only.

²Total volatile solids as a percentage of total solids.

TABLE 9: ANALYSIS OF MONTHLY COMPOSITED DIGESTED
 BIOSOLIDS PLACED IN THE HARLEM AVENUE
 SOLIDS MANAGEMENT DRYING AREA DURING JUNE 2009

Parameter	Unit	Concentration ¹
pH		8.3
Total Solids	%	17.4
Total Volatile Solids ²	%	47.1
TKN	mg/kg	44,417
NH ₃ -N	”	14,580

¹Values for one sample only.

²Total volatile solids as a percentage of total solids.

TABLE 10: ANALYSIS OF MONTHLY COMPOSITED PROCESSED DIGESTED
BIOSOLIDS REMOVED FROM THE HARLEM AVENUE
SOLIDS MANAGEMENT DRYING AREA DURING JUNE 2009

Parameter	Unit	Concentration ¹
pH		6.8
Total Solids	%	47.5
Total Volatile Solids ²	%	48.2
TKN	mg/kg	32,491
NH ₃ -N	''	4,685
Total P	''	24,132
Al	''	12,241
As	''	<10
Ca	''	39,080
Cd	''	3
Cr	''	157
Cu	''	518
Fe	''	37,070
Hg	''	1.1
K	''	1,676
Mg	''	13,689
Mn	''	773
Mo	''	12
Na	''	<800
Ni	''	49
Pb	''	94
Se	''	<8
Zn	''	899

¹Values are the means of two samples.

²Total volatile solids as a percentage of total solids.