METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

RESEARCH AND DEVELOPMENT DEPARTMENT

REPORT NO. 08-8

HARLEM AVENUE SOLIDS MANAGEMENT AREA

MONITORING REPORT FOR

FOURTH QUARTER 2007

MARCH 2008

Protecting Our Water Environment

Metropolitan Water Reclamation District of Greater Chicago

100 EAST ERIE STREET CHICAGO, ILLINOIS 60611-3154 312·751·5600

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March 5, 2008

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 WRP, Contract No. 84-111-2P, IEPA Permit No. 2004-AO-2591, Monitoring Report for October, November, and December 2007

The attached eight tables contain the monitoring data for the Harlem Avenue Solids Management Area for October, November, and December 2007 as required by IEPA Operating Permit No. 2004-AO-2591. In a letter dated January 19, 2007, the IEPA granted permission to terminate the monitoring of lysimeters L-1 and L-1N. Therefore, monitoring data for these lysimeters will not be included in this and subsequent reports.

The data reported are as follows:

Table 1, Analysis of Water from Lysimeters L-2 through L-1N-1 at the Harlem Avenue Solids Management Area Sampled on October 10, 2007

Table 2, Analysis of Water from Lysimeters L-2 through L-1N-1 at the Harlem Avenue Solids Management Area Sampled on October 24, 2007

Table 3, Analysis of Water from Lysimeters L-2 through L-1N-1 at the Harlem Avenue Solids Management Area Sampled on November 7, 2007

Table 4, Analysis of Water from Lysimeters L-2 through L-1N-1 at the Harlem Avenue Solids Management Area Sampled on November 20, 2007

Table 5, Analysis of Water from Lysimeters L-2 through L-1N-1 at the Harlem Avenue Solids Management Area Sampled on December 5, 2007

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Table 6, Analysis of Water from Lysimeters L-2 through L-1N-1 at the Harlem Avenue Solids Management Area Sampled on December 19, 2007

Table 7, Analysis of Monthly Composited Digested Biosolids Placed in the Harlem Avenue Solids Management Drying Area During December 2007

Table 8, Analysis of Monthly Composited Processed Digested Biosolids Removed from the Harlem Avenue Solids Management Drying Area During October 2007

Biosolids were placed in the solids drying area during December 2007. Biosolids were removed from the solids drying area during October 2007.

Very truly yours,

Louis Kollias
Director
Research and Development

LK:PL:spy
Attachments
cc w/att: Mr. Sulski, IEPA
Records Unit, IEPA
Stuba/Granato/Cox/Lindo/M. Patel

cc wo/att: Jamjun/Sharma/Garelli/Conway

TABLE 1: ANALYSIS OF WATER FROM LYSIMETERS
L-2 THROUGH L-1N-1 AT THE HARLEM AVENUE
SOLIDS MANAGEMENT AREA SAMPLED ON OCTOBER 10, 2007

Parameter	Unit	Lysimeter No.		
		L-2	L-3	L-1N-1
pH[1]		7.3	7.4	7.7
EC	mS/m	217	191	240
Total Dissolved Solids	mg/L	1,836	1,798	1,644
Total Diss. Org. Carbon	”	3	7	36
Cl^-	”	289	115	102
$SO_4^=$	”	517	277	27
TKN	”	0.52	0.52	8.9
NH_3-N	”	<0.04	<0.02	4.9
$NO_2 + NO_3$-N	”	0.30	0.35	2.2
Total P	”	<0.10	<0.05	<0.05
Alkalinity as $CaCO_3$	”	448	1,090	1,395
Al	”	0.042	0.034	0.039
Ca	”	317	313	293
Cd	”	<0.0008	<0.0004	<0.0004
Cr	”	<0.0010	0.0023	0.0006
Cu	”	0.018	<0.002	<0.002
Fe	”	0.046	0.040	2.46
Hg	μg/L	<0.10	<0.05	<0.05
K	mg/L	0.4	1	4
Mg	”	80.1	135	177
Mn	”	0.0084	0.4809	0.3344
Na	”	75	45	47
Ni	”	<0.0008	<0.0004	<0.0004
Pb	”	0.008	<0.004	<0.004
Zn	”	0.021	0.003	0.004

[1]pH analyzed beyond recommended holding time of 15 minutes.

TABLE 2: ANALYSIS OF WATER FROM LYSIMETERS
L-2 THROUGH L-1N-1 AT THE HARLEM AVENUE
SOLIDS MANAGEMENT AREA SAMPLED ON OCTOBER 24, 2007

Parameter	Unit	Lysimeter No.		
		L-2	L-3	L-1N-1
pH[1]		7.0	7.2	7.3
EC	mS/m	199	239	262
Total Dissolved Solids	mg/L	1,912	1,788	1,832
Total Diss. Org. Carbon	”	3	7	35
Cl^-	”	295	108	107
$SO_4^=$	”	504	263	3
TKN	”	0.70	0.78	10
NH_3-N	”	<0.02	<0.02	4.8
$NO_2 + NO_3$-N	”	1.1	0.62	1.1
Total P	”	<0.05	<0.05	<0.05
Alkalinity as $CaCO_3$	”	465	1,137	1,553
Al	”	0.042	0.042	0.037
Ca	”	330	329	309
Cd	”	<0.0004	0.0004	<0.0004
Cr	”	<0.0005	<0.0005	0.0011
Cu	”	<0.002	<0.002	<0.002
Fe	”	0.010	0.026	9.72
Hg	μg/L	<0.05	<0.05	<0.05
K	mg/L	0.4	1	4
Mg	”	81.7	147	188
Mn	”	0.0085	0.3273	0.3667
Na	”	80	41	48
Ni	”	<0.0004	<0.0004	0.0011
Pb	”	<0.004	<0.004	<0.004
Zn	”	0.033	0.024	0.032

[1]pH analyzed beyond recommended holding time of 15 minutes.

TABLE 3: ANALYSIS OF WATER FROM LYSIMETERS
L-2 THROUGH L-1N-1 AT THE HARLEM AVENUE
SOLIDS MANAGEMENT AREA SAMPLED ON NOVEMBER 7, 2007

Parameter	Unit	Lysimeter No.		
		L-2	L-3	L-1N-1
pH[1]		7.4	7.5	7.6
EC	mS/m	229	238	239
Total Dissolved Solids	mg/L	NA	1,856	1,888
Total Diss. Org. Carbon	”	2	7	39
Cl^-	”	289	108	104
$SO_4^=$	”	529	279	13
TKN	”	0.48	0.75	8.5
NH_3-N	”	<0.02	<0.02	4.8
$NO_2 + NO_3$-N	”	0.05	0.23	0.04
Total P	”	<0.05	<0.05	<0.05
Alkalinity as $CaCO_3$	”	470	1,160	1,502
Al	”	0.039	0.051	0.043
Ca	”	327	335	318
Cd	”	0.0008	0.0009	0.0007
Cr	”	0.0005	0.0006	<0.0005
Cu	”	<0.002	<0.002	<0.002
Fe	”	0.018	0.007	0.015
Hg	μg/L	<0.05	<0.05	<0.05
K	mg/L	0.3	1	0.4
Mg	”	81.2	153	80.8
Mn	”	0.0065	0.2502	0.0064
Na	”	82	40	82
Ni	”	<0.0004	<0.0004	<0.0004
Pb	”	<0.004	<0.004	<0.004
Zn	”	0.033	0.018	0.032

[1]pH analyzed beyond recommended holding time of 15 minutes.
NA = No analysis; insufficient sample.

TABLE 4: ANALYSIS OF WATER FROM LYSIMETERS
L-2 THROUGH L-1N-1 AT THE HARLEM AVENUE
SOLIDS MANAGEMENT AREA SAMPLED ON NOVEMBER 20, 2007

Parameter	Unit	Lysimeter No.		
		L-2	L-3	L-1N-1
pH[1]		7.2	7.2	7.4
EC	mS/m	210	209	238
Total Dissolved Solids	mg/L	1,900	1,712	1,728
Total Diss. Org. Carbon	"	3	7	5
Cl^-	"	288	104	110
$SO_4^=$	"	461	250	11
TKN	"	0.50	0.71	8.6
NH_3-N	"	<0.02	<0.02	4.4
$NO_2 + NO_3$-N	"	0.09	0.30	0.30
Total P	"	<0.05	<0.05	<0.05
Alkalinity as $CaCO_3$	"	482	1,131	1,598
Al	"	0.054	0.056	0.055
Ca	"	332	335	316
Cd	"	<0.0004	<0.0004	<0.0004
Cr	"	0.0014	0.0013	0.0024
Cu	"	<0.002	<0.002	<0.002
Fe	"	0.047	0.018	13.9
Hg	μg/L	<0.05	<0.05	<0.05
K	mg/L	0.4	1	4
Mg	"	81.0	148	186
Mn	"	0.0070	0.2104	0.3658
Na	"	83	38	47
Ni	"	<0.0004	<0.0004	0.0004
Pb	"	<0.004	<0.004	<0.004
Zn	"	0.011	0.010	0.010

[1]pH analyzed beyond recommended holding time of 15 minutes.

TABLE 5: ANALYSIS OF WATER FROM LYSIMETERS
L-2 THROUGH L-1N-1 AT THE HARLEM AVENUE
SOLIDS MANAGEMENT AREA SAMPLED ON DECEMBER 5, 2007

Parameter	Unit	Lysimeter No.		
		L-2	L-3	L-1N-1
pH[1]		7.1	7.4	7.6
EC	mS/m	216	212	232
Total Dissolved Solids	mg/L	1,888	1,768	1,668
Total Diss. Org. Carbon	”	2	7	39
Cl^-	”	260	93	105
$SO_4^=$	”	514	276	15
TKN	”	0.48	0.56	9.9
NH_3-N	”	0.02	<0.02	5.9
$NO_2 + NO_3$-N	”	0.31	0.43	0.46
Total P	”	<0.05	<0.05	<0.05
Alkalinity as $CaCO_3$	”	447	1,043	1,276
Al	”	0.038	0.052	0.039
Ca	”	347	320	299
Cd	”	<0.0004	<0.0004	<0.0004
Cr	”	0.0013	0.0013	0.0020
Cu	”	<0.002	<0.002	<0.002
Fe	”	0.014	0.011	2.45
Hg	μg/L	<0.05	<0.05	<0.05
K	mg/L	0.3	1	4
Mg	”	82.2	145	180
Mn	”	0.0116	0.1738	0.3460
Na	”	83	36	49
Ni	”	0.0053	<0.0004	0.0006
Pb	”	0.005	<0.004	<0.004
Zn	”	0.017	0.009	0.007

[1]pH analyzed beyond recommended holding time of 15 minutes.

TABLE 6: ANALYSIS OF WATER FROM LYSIMETERS
L-2 THROUGH L-1N-1 AT THE HARLEM AVENUE
SOLIDS MANAGEMENT AREA SAMPLED ON DECEMBER 19, 2007

Parameter	Unit	Lysimeter No.		
		L-2	L-3	L-1N-1
pH[1]		7.3	7.5	7.6
EC	mS/m	217	225	213
Total Dissolved Solids	mg/L	1,900	1,808	1,624
Total Diss. Org. Carbon	”	2	6	NA
Cl^-	”	279	109	107
$SO_4^=$	”	527	277	NA
TKN	”	0.38	0.67	8.5
NH_3-N	”	<0.02	<0.02	5.8
$NO_2 + NO_3$-N	”	0.07	0.28	<0.04
Total P	”	<0.05	<0.05	<0.10
Alkalinity as $CaCO_3$	”	485	1,112	1,440
Al	”	0.052	0.055	0.064
Ca	”	327	328	293
Cd	”	<0.0004	<0.0004	<0.0008
Cr	”	0.0013	0.0016	0.0038
Cu	”	<0.002	<0.002	<0.004
Fe	”	0.008	0.008	0.412
Hg	μg/L	<0.05	<0.05	<0.10
K	mg/L	0.2	1	4
Mg	”	80.2	142	181
Mn	”	0.0169	0.2551	0.3608
Na	”	83	40	45
Ni	”	<0.0004	<0.0004	<0.0008
Pb	”	<0.004	<0.004	0.010
Zn	”	0.015	0.012	0.013

[1]pH analyzed beyond recommended holding time of 15 minutes.
NA = No analysis; insufficient sample.

TABLE 7: ANALYSIS OF MONTHLY COMPOSITED DIGESTED BIOSOLIDS PLACED IN THE HARLEM AVENUE SOLIDS MANAGEMENT DRYING AREA DURING DECEMBER 2007

Parameter	Unit	Concentration[1]
pH		7.9
Total Solids	%	22.5
Total Volatile Solids[2]	%	57.4
TKN	mg/kg	49,353
NH_3-N	,,	5,975

[1]Values for one sample only.
[2]Total volatile solids as a percentage of total solids.

TABLE 8: ANALYSIS OF MONTHLY COMPOSITED PROCESSED DIGESTED BIOSOLIDS REMOVED FROM THE HARLEM AVENUE SOLIDS MANAGEMENT DRYING AREA DURING OCTOBER 2007

Parameter	Unit	Concentration[1]
pH		6.0
Total Solids	%	73.2
Total Volatile Solids[2]	%	36.9
TKN	mg/kg	12,429
NH_3-N	,,	658
Total P	,,	15,219
Al	,,	27,034
As	,,	<5
Ca	,,	43,510
Cd	,,	5
Cr	,,	277
Cu	,,	414
Fe	,,	21,048
Hg	,,	1.0
K	,,	5,018
Mg	,,	20,291
Mn	,,	574
Mo	,,	14
Na	,,	711
Ni	,,	53
Pb	,,	139
Se	,,	<4
Zn	,,	941

[1]Values for one sample only.
[2]Total volatile solids as a percentage of total solids.