

Protecting Our Water Environment



Metropolitan Water Reclamation District of Greater Chicago

***RESEARCH AND DEVELOPMENT
DEPARTMENT***

REPORT NO. 07-54

CALUMET EAST SOLIDS MANAGEMENT AREA

MONITORING REPORT FOR

SECOND QUARTER 2007

AUGUST 2007

Metropolitan Water Reclamation District of Greater Chicago

100 EAST ERIE STREET

CHICAGO, ILLINOIS 60611-3154

312-751-5600

Louis Kollias, P.E., BCEE

Director of Research and Development

312-751-5190

August 30, 2007

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: Calumet East Solids Management Area - Stickney WRP, Contract No. 85-273-2P, L170401, IEPA Permit No. 2005-AO-4281-1, Monitoring Report for April, May, and June 2007

The attached six tables contain the monitoring data for the Calumet East Solids Management Area for April, May, and June 2007 as required by IEPA Operating Permit No. 2005-AO-4281-1. In a letter dated January 19, 2007, the IEPA granted permission to terminate the monitoring of lysimeter L-1. Therefore, monitoring data for this lysimeter will not be included in this and subsequent reports.

The data reported are as follows:

Table 1, Analysis of Water from Lysimeters L-1N through L-6 at the Calumet East Solids Management Area Sampled on April 4, 2007

Table 2, Analysis of Water from Lysimeters L-1N through L-6 at the Calumet East Solids Management Area Sampled on May 2, 2007

Table 3, Analysis of Water from Lysimeters L-1N through L-6 at the Calumet East Solids Management Area Sampled on June 14, 2007

Table 4, Analysis of Monthly Compositated Digested Biosolids Placed in the Calumet East Solids Management Drying Area During June 2007

Table 5, Analysis of Monthly Compositated Processed Digested Biosolids Removed from the Calumet East Solids Management Drying Area During May 2007

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Table 6, Analysis of Monthly Compositated Processed Digested Biosolids Removed from the Calumet East Solids Management Drying Area During June 2007

Biosolids were placed in the solids drying area during June 2007. Biosolids were removed from the solids drying area during May and June 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: Sharma/S. Levy/Jamjun/Quintanilla

TABLE 1: ANALYSIS OF WATER FROM LYSIMETERS
L-1N THROUGH L-6 AT THE CALUMET EAST
SOLIDS MANAGEMENT AREA SAMPLED ON APRIL 4, 2007

Parameter	Unit	Lysimeter No.				
		L-1N	L-2	L-3	L-4	L-5
pH ¹		7.3	7.3	7.3	7.1	7.3
EC	mS/m	352	317	185	362	218
Total Dissolved Solids	mg/L	3,866	4,120	1,566	3,938	1,598
Total Diss. Org. Carbon	"	9	4	7	3	1
Cl ⁻	"	189	197	42	526	244
SO ₄ ⁼	"	1,823	2,158	523	1,494	471
TKN	"	17	0.92	0.73	1.4	0.92
NH ₃ -N	"	3.2	<0.04	<0.02	0.52	0.40
NO ₂ + NO ₃ -N	"	0.18	0.32	0.06	0.21	0.18
Total P	"	<0.05	<0.10	<0.05	<0.05	0.05
Alkalinity as CaCO ₃	"	591	526	539	397	260
Al	"	0.065	0.096	0.040	0.061	0.037
Ca	"	466	572	201	471	207
Cd	"	<0.0004	<0.0008	<0.0004	0.0004	<0.0004
Cr	"	<0.0005	<0.0010	<0.0005	<0.0005	<0.0005
Cu	"	<0.002	<0.004	<0.002	<0.002	<0.002
Fe	"	7.99	0.012	0.017	13.4	3.70
Hg	μg/L	<0.05	<0.10	<0.05	<0.05	<0.05
K	mg/L	11	6	2	6	4
Mg	"	263	271	127	257	97.0
Mn	"	0.2894	0.0078	0.0024	0.1087	0.0473
Na	"	167	144	53	139	87
Ni	"	<0.0004	0.0010	0.0009	<0.0004	<0.0004
Pb	"	<0.004	<0.008	<0.004	<0.004	<0.004
Zn	"	0.005	0.042	0.016	0.006	0.005

TABLE 1 (Continued): ANALYSIS OF WATER FROM LYSIMETERS
L-1N THROUGH L-6 AT THE CALUMET EAST
SOLIDS MANAGEMENT AREA SAMPLED ON APRIL 4, 2007

Parameter	Unit	Lysimeter No. L-6
pH ¹		7.7
EC	mS/m	149
Total Dissolved Solids	mg/L	NA
Total Diss. Org. Carbon	"	2
Cl ⁻	"	15
SO ₄ ⁼	"	551
TKN	"	0.23
NH ₃ -N	"	<0.02
NO ₂ + NO ₃ -N	"	0.73
Total P	"	0.07
Alkalinity as CaCO ₃	"	280
Al	"	0.036
Ca	"	165
Cd	"	0.0004
Cr	"	<0.0005
Cu	"	0.002
Fe	"	0.142
Hg	μg/L	<0.05
K	mg/L	3
Mg	"	83.1
Mn	"	0.0331
Na	"	70
Ni	"	<0.0004
Pb	"	<0.004
Zn	"	0.009

¹pH analyzed beyond recommended holding time of 15 minutes.

NA = No analysis; insufficient sample.

TABLE 2: ANALYSIS OF WATER FROM LYSIMETERS
L-1N THROUGH L-6 AT THE CALUMET EAST
SOLIDS MANAGEMENT AREA SAMPLED ON MAY 2, 2007

Parameter	Unit	Lysimeter No.				
		L-1N	L-2	L-3	L-4	L-5
pH ¹		7.5	7.4	7.6	7.3	7.6
EC	mS/m	362	381	182	390	199
Total Dissolved Solids	mg/L	4,072	4,198	1,562	4,276	1,860
Total Diss. Org. Carbon	"	8	4	8	2	1
Cl ⁻	"	189	194	42	508	280
SO ₄ ⁼	"	1,935	2,110	523	1,587	505
TKN	"	14	1.3	1.3	1.4	0.86
NH ₃ -N	"	3.2	<0.02	<0.02	0.50	<0.02
NO ₂ + NO ₃ -N	"	0.14	0.08	0.04	0.12	0.44
Total P	"	<0.05	<0.05	<0.05	0.09	<0.05
Alkalinity as CaCO ₃	"	580	509	558	374	248
Al	"	0.065	0.079	0.044	0.068	0.047
Ca	"	442	525	184	477	208
Cd	"	<0.0004	0.0004	<0.0004	<0.0004	<0.0004
Cr	"	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Cu	"	<0.002	<0.002	<0.002	<0.002	<0.002
Fe	"	8.24	0.052	0.175	10.7	0.168
Hg	μg/L	<0.05	<0.05	<0.05	<0.05	<0.05
K	mg/L	10	6	2	6	4
Mg	"	252	252	118	256	93.0
Mn	"	0.2827	0.0086	0.0116	0.1096	0.0383
Na	"	162	137	49	139	87
Ni	"	<0.0004	0.0045	0.0014	<0.0004	<0.0004
Pb	"	<0.004	<0.004	<0.004	<0.004	<0.004
Zn	"	0.006	0.045	0.014	0.008	0.006

TABLE 2 (Continued): ANALYSIS OF WATER FROM LYSIMETERS
L-1N THROUGH L-6 AT THE CALUMET EAST
SOLIDS MANAGEMENT AREA SAMPLED ON MAY 2, 2007

Parameter	Unit	Lysimeter No. L-6
pH ¹		7.8
EC	mS/m	143
Total Dissolved Solids	mg/L	1,380
Total Diss. Org. Carbon	"	2
Cl ⁻	"	16
SO ₄ ⁼	"	622
TKN	"	0.37
NH ₃ -N	"	<0.02
NO ₂ + NO ₃ -N	"	0.56
Total P	"	0.06
Alkalinity as CaCO ₃	"	275
Al	"	0.030
Ca	"	158
Cd	"	<0.0004
Cr	"	<0.0005
Cu	"	<0.002
Fe	"	0.093
Hg	μg/L	<0.05
K	mg/L	3
Mg	"	80.1
Mn	"	0.0349
Na	"	68
Ni	"	<0.0004
Pb	"	<0.004
Zn	"	0.006

¹pH analyzed beyond recommended holding time of 15 minutes.

TABLE 3: ANALYSIS OF WATER FROM LYSIMETERS
L-1N THROUGH L-6 AT THE CALUMET EAST
SOLIDS MANAGEMENT AREA SAMPLED ON JUNE 14, 2007

Parameter	Unit	Lysimeter No.				
		L-1N	L-2	L-3	L-4	L-5
pH ¹		7.5	7.3	7.6	7.0	7.6
EC	mS/m	384	388	171	396	188
Total Dissolved Solids	mg/L	4,040	4,216	1,580	4,388	1,780
Total Diss. Org. Carbon	"	8	3	7	2	1
Cl ⁻	"	178	189	39	547	237
SO ₄ ⁼	"	1,979	1,985	600	1,659	573
TKN	"	14	0.81	0.61	1.3	0.47
NH ₃ -N	"	5.1	<0.02	<0.02	0.52	<0.02
NO ₂ + NO ₃ -N	"	0.05	0.03	0.09	0.15	0.49
Total P	"	<0.05	0.05	0.06	<0.05	<0.05
Alkalinity as CaCO ₃	"	566	496	494	374	243
Al	"	0.080	0.095	0.050	0.083	0.057
Ca	"	479	575	201	500	206
Cd	"	<0.0004	0.0006	<0.0004	<0.0004	0.0006
Cr	"	0.0026	0.0021	0.0017	0.0022	0.0017
Cu	"	<0.002	<0.002	<0.002	<0.002	<0.002
Fe	"	9.80	0.030	0.019	16.4	0.063
Hg	μg/L	0.06	0.07	0.08	0.12	0.29
K	mg/L	11	6	2	6	4
Mg	"	274	266	126	265	97.3
Mn	"	0.2864	0.0043	0.0020	0.1216	0.0155
Na	"	174	145	52	145	86
Ni	"	<0.0004	0.0023	<0.0004	<0.0004	<0.0004
Pb	"	<0.004	<0.004	<0.004	<0.004	<0.004
Zn	"	0.012	0.039	0.013	0.014	0.008

TABLE 3 (Continued): ANALYSIS OF WATER FROM LYSIMETERS
L-1N THROUGH L-6 AT THE CALUMET EAST
SOLIDS MANAGEMENT AREA SAMPLED ON JUNE 14, 2007

Parameter	Unit	Lysimeter No. L-6
pH ¹		7.7
EC	mS/m	149
Total Dissolved Solids	mg/L	1,400
Total Diss. Org. Carbon	"	0.9
Cl ⁻	"	23
SO ₄ ⁼	"	664
TKN	"	0.31
NH ₃ -N	"	<0.02
NO ₂ + NO ₃ -N	"	0.48
Total P	"	<0.05
Alkalinity as CaCO ₃	"	281
Al	"	0.046
Ca	"	172
Cd	"	<0.0004
Cr	"	0.0019
Cu	"	<0.002
Fe	"	0.112
Hg	μg/L	<0.05
K	mg/L	4
Mg	"	86.7
Mn	"	0.0340
Na	"	72
Ni	"	<0.0004
Pb	"	<0.004
Zn	"	0.005

¹pH analyzed beyond recommended holding time of 15 minutes.

TABLE 4: ANALYSIS OF MONTHLY COMPOSITED DIGESTED
 BIOSOLIDS PLACED IN THE CALUMET EAST
 SOLIDS MANAGEMENT DRYING AREA DURING JUNE 2007

Parameter	Unit	Concentration*
pH		8.2
Total Solids	%	23.7
Total Volatile Solids**	%	42.0
TKN	mg/kg	34,508
NH ₃ -N	”	11,954

*Values are the means of five samples.

**Total volatile solids as a percentage of total solids.

TABLE 5: ANALYSIS OF MONTHLY COMPOSITED PROCESSED DIGESTED BIOSOLIDS REMOVED FROM THE CALUMET EAST SOLIDS MANAGEMENT DRYING AREA DURING MAY 2007

Parameter	Unit	Concentration*
pH		6.7
Total Solids	%	66.5
Total Volatile Solids**	%	35.4
TKN	mg/kg	20,116
NH ₃ -N	”	2,299
Total P	”	25,677
Al	”	15,586
As	”	7
Ca	”	49,496
Cd	”	10
Cr	”	146
Cu	”	410
Fe	”	28,438
Hg	”	2.3
K	”	3,765
Mg	”	17,631
Mn	”	759
Mo	”	12
Na	”	709
Ni	”	41
Pb	”	123
Se	”	12
Zn	”	1,136

*Values are the means of ten samples.

**Total volatile solids as a percentage of total solids.

TABLE 6: ANALYSIS OF MONTHLY COMPOSITED PROCESSED DIGESTED
BIOSOLIDS REMOVED FROM THE CALUMET EAST
SOLIDS MANAGEMENT DRYING AREA DURING JUNE 2007

Parameter	Unit	Concentration*
pH		6.6
Total Solids	%	71.8
Total Volatile Solids**	%	30.8
TKN	mg/kg	13,401
NH ₃ -N	”	736
Total P	”	17,217
Al	”	17,669
As	”	8
Ca	”	51,778
Cd	”	9.1
Cr	”	130
Cu	”	347
Fe	”	28,050
Hg	”	0.89
K	”	4,590
Mg	”	19,111
Mn	”	779
Mo	”	11
Na	”	517
Ni	”	37
Pb	”	117
Se	”	9.0
Zn	”	998

*Values are the means of seven samples.

**Total volatile solids as a percentage of total solids.