

*Protecting Our Water Environment*



*Metropolitan Water Reclamation District of Greater Chicago*

***RESEARCH AND DEVELOPMENT  
DEPARTMENT***

*REPORT NO. 07-72*

*CALUMET EAST SOLIDS MANAGEMENT AREA*

*MONITORING REPORT FOR*

*THIRD QUARTER 2007*

*NOVEMBER 2007*

**Metropolitan Water Reclamation District of Greater Chicago**

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

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312-751-5190

November 29, 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 July, August, and September 2007

The attached six tables contain the monitoring data for the Calumet East Solids Management Area for July, August, and September 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-IN through L-6 at the Calumet East Solids Management Area Sampled on July 11, 2007

Table 2, Analysis of Water from Lysimeters L-IN through L-6 at the Calumet East Solids Management Area Sampled on August 8, 2007

Table 3, Analysis of Water from Lysimeters L-IN through L-6 at the Calumet East Solids Management Area Sampled on September 5, 2007

Table 4, Analysis of Monthly Compositated Processed Digested Biosolids Removed from the Calumet East Solids Management Drying Area During July 2007

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

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

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

No biosolids were placed in the solids drying area during July, August, and September 2007. Biosolids were removed from the solids drying area during July, August, and September 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/Garelli/Jamjun/Conway

TABLE 1: ANALYSIS OF WATER FROM LYSIMETERS  
L-1N THROUGH L-6 AT THE CALUMET EAST  
SOLIDS MANAGEMENT AREA SAMPLED ON JULY 11, 2007

Parameter	Unit	Lysimeter No.				
		L-1N	L-2	L-3	L-4	L-5
pH <sup>1</sup>		7.4	7.3	7.4		7.5
EC	mS/m	398	341	166		186
Total Diss. Org. Carbon	mg/L	8	4	7		0.9
Cl <sup>-</sup>	"	187	193	48		223
SO <sub>4</sub> <sup>=</sup>	"	1,971	2,064	530		549
TKN	"	13	0.90	0.97		0.29
NH <sub>3</sub> -N	"	3.4	<0.02	0.14		0.02
NO <sub>2</sub> + NO <sub>3</sub> -N	"	0.07	0.22	0.13	L	0.51
Total P	"	0.09	0.05	0.05	Y	0.06
Alkalinity as CaCO <sub>3</sub>	"	575	505	506	S	253
Al	"	0.067	0.112	0.045	I	0.046
Ca	"	481	559	188	M	200
Cd	"	0.0005	0.0005	0.0004	E	0.0010
Cr	"	0.0041	0.0039	0.0023	T	0.0025
Cu	"	<0.002	<0.002	<0.002	E	<0.002
Fe	"	10.4	0.069	0.317	R	0.392
Hg	μg/L	<0.05	<0.05	<0.05	D	<0.05
K	mg/L	10	6	2	R	4
Mg	"	275	262	119	Y	94.6
Mn	"	0.2703	0.0130	0.0136		0.0279
Na	"	172	143	52		83
Ni	"	<0.0004	0.0037	<0.0004		<0.0004
Pb	"	<0.004	<0.004	0.005		0.005
Zn	"	0.007	0.034	0.010		0.003

TABLE 1 (Continued): ANALYSIS OF WATER FROM LYSIMETERS  
L-1N THROUGH L-6 AT THE CALUMET EAST  
SOLIDS MANAGEMENT AREA SAMPLED ON JULY 11, 2007

Parameter	Unit	Lysimeter No. L-6
pH <sup>1</sup>		7.6
EC	mS/m	147
Total Diss. Org. Carbon	mg/L	1
Cl <sup>-</sup>	"	19
SO <sub>4</sub> <sup>=</sup>	"	607
TKN	"	0.12
NH <sub>3</sub> -N	"	<0.02
NO <sub>2</sub> + NO <sub>3</sub> -N	"	0.61
Total P	"	0.05
Alkalinity as CaCO <sub>3</sub>	"	277
Al	"	0.039
Ca	"	167
Cd	"	<0.0004
Cr	"	0.0021
Cu	"	<0.002
Fe	"	0.174
Hg	μg/L	<0.05
K	mg/L	3
Mg	"	83.5
Mn	"	0.0320
Na	"	68
Ni	"	<0.0004
Pb	"	0.006
Zn	"	0.003

<sup>1</sup>pH analyzed beyond recommended holding time of 15 minutes.

TABLE 2: ANALYSIS OF WATER FROM LYSIMETERS  
L-1N THROUGH L-6 AT THE CALUMET EAST  
SOLIDS MANAGEMENT AREA SAMPLED ON AUGUST 8, 2007

Parameter	Unit	Lysimeter No.				
		L-1N	L-2	L-3	L-4	L-5
pH <sup>1</sup>		7.4	7.3	7.3	7.1	7.5
EC	mS/m	378	378	162	384	182
Total Diss. Org. Carbon	mg/L	8	NA	7	2	1
Cl <sup>-</sup>	"	182	190	47	516	214
SO <sub>4</sub> <sup>=</sup>	"	1,967	NA	528	1,522	544
TKN	"	13	0.88	0.94	1.1	0.28
NH <sub>3</sub> -N	"	3.2	0.15	0.12	0.53	0.03
NO <sub>2</sub> + NO <sub>3</sub> -N	"	0.61	0.25	0.28	0.44	0.74
Total P	"	0.09	<0.05	<0.05	<0.05	<0.05
Alkalinity as CaCO <sub>3</sub>	"	569	504	499	366	246
Al	"	0.050	0.066	0.033	0.047	0.028
Ca	"	480	550	185	470	199
Cd	"	0.0004	0.0009	0.0005	0.0008	0.0007
Cr	"	0.0014	0.0008	0.0009	0.0007	<0.0005
Cu	"	<0.002	<0.002	<0.002	<0.002	<0.002
Fe	"	11.0	0.394	0.195	14.5	0.170
Hg	μg/L	<0.05	<0.05	<0.05	<0.05	0.05
K	mg/L	10	6	2	6	4
Mg	"	278	259	114	253	93.9
Mn	"	0.2740	0.0074	0.0119	0.1114	0.0351
Na	"	176	144	52	142	84
Ni	"	<0.0004	0.0038	0.0010	<0.0004	<0.0004
Pb	"	<0.004	<0.004	<0.004	<0.004	<0.004
Zn	"	0.008	0.037	0.010	0.006	0.004

TABLE 2 (Continued): ANALYSIS OF WATER FROM LYSIMETERS  
L-1N THROUGH L-6 AT THE CALUMET EAST  
SOLIDS MANAGEMENT AREA SAMPLED ON AUGUST 8, 2007

Parameter	Unit	Lysimeter No. L-6
pH <sup>1</sup>		7.6
EC	mS/m	145
Total Diss. Org. Carbon	mg/L	1
Cl <sup>-</sup>	"	17
SO <sub>4</sub> <sup>=</sup>	"	611
TKN	"	0.19
NH <sub>3</sub> -N	"	<0.02
NO <sub>2</sub> + NO <sub>3</sub> -N	"	0.61
Total P	"	<0.05
Alkalinity as CaCO <sub>3</sub>	"	271
Al	"	0.029
Ca	"	166
Cd	"	0.0005
Cr	"	0.0008
Cu	"	<0.002
Fe	"	0.211
Hg	μg/L	0.06
K	mg/L	3
Mg	"	84.0
Mn	"	0.0338
Na	"	69
Ni	"	<0.0004
Pb	"	<0.004
Zn	"	0.007

<sup>1</sup>pH analyzed beyond recommended holding time of 15 minutes.

NA = No analysis; insufficient sample.

TABLE 3: ANALYSIS OF WATER FROM LYSIMETERS  
L-1N THROUGH L-6 AT THE CALUMET EAST  
SOLIDS MANAGEMENT AREA SAMPLED ON SEPTEMBER 5, 2007

Parameter	Unit	Lysimeter No.				
		L-1N	L-2	L-3	L-4	L-5
pH <sup>1</sup>		7.4	7.3	7.4	7.1	7.5
EC	mS/m	376	386	164	400	192
Total Diss. Org. Carbon	mg/L	19	NA	7	3	1
Cl <sup>-</sup>	"	388	194	46	512	219
SO <sub>4</sub> <sup>=</sup>	"	3,719	NA	562	1,501	514
TKN	"	25	0.98	0.45	1.3	0.69
NH <sub>3</sub> -N	"	6.7	<0.02	<0.02	0.61	0.32
NO <sub>2</sub> + NO <sub>3</sub> -N	"	0.15	0.18	0.07	0.11	0.19
Total P	"	0.12	<0.05	<0.05	<0.05	<0.05
Alkalinity as CaCO <sub>3</sub>	"	1,164	497	496	381	256
Al	"	0.158	0.089	0.055	0.078	0.052
Ca	"	916	554	187	449	190
Cd	"	<0.0008	<0.0004	<0.0004	0.0004	<0.0004
Cr	"	0.0012	0.0008	<0.0005	<0.0005	0.0009
Cu	"	<0.004	<0.002	<0.002	<0.002	<0.002
Fe	"	17.9	0.014	0.032	14.4	0.462
Hg	μg/L	0.72	0.07	0.07	0.06	0.06
K	mg/L	21	6	2	6	4
Mg	"	528	258	118	245	92.2
Mn	"	0.5580	0.0061	0.0014	0.1072	0.0892
Na	"	344	140	52	137	83
Ni	"	<0.0008	0.0025	0.0004	<0.0004	<0.0004
Pb	"	<0.008	<0.004	<0.004	<0.004	<0.004
Zn	"	0.021	0.031	0.012	0.010	0.005



TABLE 3 (Continued): ANALYSIS OF WATER FROM LYSIMETERS  
L-1N THROUGH L-6 AT THE CALUMET EAST  
SOLIDS MANAGEMENT AREA SAMPLED ON SEPTEMBER 5, 2007

Parameter	Unit	Lysimeter No. L-6
pH <sup>1</sup>		7.6
EC	mS/m	144
Total Diss. Org. Carbon	mg/L	1
Cl <sup>-</sup>	"	18
SO <sub>4</sub> <sup>=</sup>	"	586
TKN	"	0.25
NH <sub>3</sub> -N	"	0.14
NO <sub>2</sub> + NO <sub>3</sub> -N	"	0.33
Total P	"	<0.05
Alkalinity as CaCO <sub>3</sub>	"	286
Al	"	0.042
Ca	"	167
Cd	"	<0.0004
Cr	"	0.0008
Cu	"	<0.002
Fe	"	0.086
Hg	μg/L	0.05
K	mg/L	3
Mg	"	84.6
Mn	"	0.0335
Na	"	69
Ni	"	<0.0004
Pb	"	<0.004
Zn	"	0.004

<sup>1</sup>pH analyzed beyond recommended holding time of 15 minutes.

NA = No analysis; insufficient sample.

TABLE 4: ANALYSIS OF MONTHLY COMPOSITED PROCESSED DIGESTED  
BIOSOLIDS REMOVED FROM THE CALUMET EAST  
SOLIDS MANAGEMENT DRYING AREA DURING JULY 2007

Parameter	Unit	Concentration <sup>1</sup>
pH		7.2
Total Solids	%	60.1
Total Volatile Solids <sup>2</sup>	%	37.8
TKN	mg/kg	18,669
NH <sub>3</sub> -N	"	1,696
Total P	"	20,715
Al	"	18,229
As	"	9.0
Ca	"	50,636
Cd	"	8
Cr	"	131
Cu	"	429
Fe	"	31,308
Hg	"	1
K	"	4,676
Mg	"	17,466
Mn	"	832
Mo	"	13
Na	"	584
Ni	"	41
Pb	"	110
Se	"	8.0
Zn	"	1,058

<sup>1</sup>Values are the means of seven samples.

<sup>2</sup>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 AUGUST 2007

Parameter	Unit	Concentration <sup>1</sup>
pH		7.9
Total Solids	%	37.1
Total Volatile Solids <sup>2</sup>	%	42.5
TKN	mg/kg	25,086
NH <sub>3</sub> -N	"	6,005
Total P	"	19,230
Al	"	18,610
As	"	10
Ca	"	49,138
Cd	"	5
Cr	"	100
Cu	"	372
Fe	"	33,231
Hg	"	0.64
K	"	4,943
Mg	"	16,701
Mn	"	984
Mo	"	12
Na	"	881
Ni	"	36
Pb	"	102
Se	"	4.0
Zn	"	964

<sup>1</sup>Values are the means of four samples.

<sup>2</sup>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 SEPTEMBER 2007

Parameter	Unit	Concentration <sup>1</sup>
pH		6.6
Total Solids	%	74.4
Total Volatile Solids <sup>2</sup>	%	34.4
TKN	mg/kg	14,174
NH <sub>3</sub> -N	"	75
Total P	"	24,051
Al	"	16,710
As	"	10
Ca	"	52,276
Cd	"	9.2
Cr	"	145
Cu	"	416
Fe	"	28,183
Hg	"	0.82
K	"	4,145
Mg	"	17,866
Mn	"	826
Mo	"	12
Na	"	NRR
Ni	"	37
Pb	"	133
Se	"	8.0
Zn	"	1,171

<sup>1</sup>Values are the means of five samples.

<sup>2</sup>Total volatile solids as a percentage of total solids.

NRR = No reportable result.