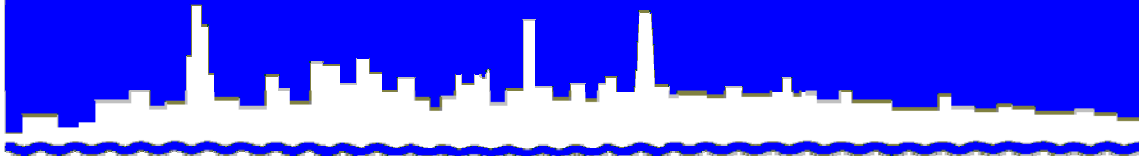


*Protecting Our Water Environment*



*Metropolitan Water Reclamation District of Greater Chicago*

***RESEARCH AND DEVELOPMENT  
DEPARTMENT***

*REPORT NO. 08-47*

*LAWNDALE AVENUE SOLIDS MANAGEMENT AREA*

*MONITORING REPORT FOR*

*SECOND QUARTER 2008*

*AUGUST 2008*

Terrence J. O'Brien  
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*Vice President*  
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**Metropolitan Water Reclamation District of Greater Chicago**

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Louis Kollias, P.E., BCEE

August 29, 2008

*Director of Research and Development*

312-751-5190

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: Lawndale Avenue Solids Management Area - Stickney WRP, Contract No. 80-159-2P, IEPA Permit No. 2005-AO-4283, Monitoring Report for April, May, and June 2008

The attached eight tables contain the monitoring data for the Lawndale Avenue Solids Management Area for April, May, and June 2008 as required by IEPA Operating Permit No. 2005-AO-4283. In a letter dated January 19, 2007, the IEPA granted permission to terminate the monitoring of lysimeters L-7 and L-8. Beginning October 2007, they also granted permission to terminate the monitoring of lysimeters L-3, L-4, and L-5. 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 Monitoring Wells M-11 through M-15 at the Lawndale Avenue Solids Management Area Sampled on April 16, 2008

Table 2, Analysis of Water from Lysimeters L-1 through L-9N at the Lawndale Avenue Solids Management Area Sampled on April 10, 2008

Table 3, Analysis of Water from Lysimeters L-1 through L-9N at the Lawndale Avenue Solids Management Area Sampled on May 7, 2008

Table 4, Analysis of Water from Lysimeters L-1 through L-9N at the Lawndale Avenue Solids Management Area Sampled on June 5, 2008

Subject: Lawndale Avenue Solids Management Area - Stickney WRP, Contract No. 80-159-2P, IEPA Permit No. 2005-AO-4283, Monitoring Report for April, May, and June 2008

Table 5, Analysis of Monthly Compositated Digested Biosolids Placed in the Lawndale Avenue Solids Management Drying Area During May 2008

Table 6, Analysis of Monthly Compositated Digested Biosolids Placed in the Lawndale Avenue Solids Management Drying Area During June 2008

Table 7, Analysis of Monthly Compositated Processed Digested Biosolids Removed from the Lawndale Avenue Solids Management Drying Area During May 2008

Table 8, Analysis of Monthly Compositated Processed Digested Biosolids Removed from the Lawndale Avenue Solids Management Drying Area During June 2008

Biosolids were placed in and removed from the solids drying area during May and June 2008.

Very truly yours,

Louis Kollias  
Director  
Research and Development

LK:PL:kq  
Attachments

cc w/att: Mr. Sulski, IEPA  
Records Unit, IEPA  
Stuba/Granato/Cox/Lindo/M. Patel  
cc wo/att: Jamjun/Sharma/Garelli

TABLE 1: ANALYSIS OF WATER FROM MONITORING WELLS  
M-11 THROUGH M-15 AT THE LAWNSDALE AVENUE  
SOLIDS MANAGEMENT AREA SAMPLED ON APRIL 16, 2008

Parameter	Unit	Monitoring Well No.				
		M-11	M-12	M-13	M-14	M-15
pH <sup>1</sup>		7.6	7.5	7.8	7.5	7.6
EC	mS/m	46	58	77	46	82
Total Dissolved Solids	mg/L	670	868	1,326	590	1,624
Total Diss. Org. Carbon	"	1	1	1	0.8	1
Cl <sup>-</sup>	"	10	16	11	10	10
SO <sub>4</sub> <sup>=</sup>	"	196	359	626	159	791
TKN	"	1.1	0.40	0.56	0.34	0.64
NH <sub>3</sub> -N	"	0.87	0.28	0.41	0.24	0.47
NO <sub>2</sub> + NO <sub>3</sub> -N	"	0.07	0.09	0.02	0.02	0.02
Total P	"	0.06	0.05	<0.05	<0.05	0.07
Alkalinity as CaCO <sub>3</sub>	"	351	302	326	322	361
Al	"	0.026	0.026	0.051	0.030	0.072
As	"	<0.01	<0.01	<0.01	<0.01	<0.01
B	"	1.30	1.84	1.51	1.34	1.19
Ca	"	89	81	159	77	221
Cd	"	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004
Cr	"	0.0008	0.0008	0.0012	0.0010	0.0009
Cu	"	<0.002	<0.002	<0.002	<0.002	<0.002
Fe	"	0.015	0.006	0.005	0.004	0.455
Hg	μg/L	<0.25 <sup>a</sup>	<0.25 <sup>a</sup>	<0.25 <sup>a</sup>	<0.25 <sup>a</sup>	<0.25 <sup>a</sup>
K	mg/L	8	10	10	8	10
Mg	"	43.3	38.7	77.5	42.8	102
Mn	"	0.0237	0.0039	0.0066	0.0031	0.0126
Na	"	56	138	93	45	63
Ni	"	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004
Pb	"	<0.004	<0.004	<0.004	<0.004	<0.004
Se	"	<0.02	<0.02	0.02	<0.02	<0.02
Zn	"	0.833	0.635	1.03	0.735	1.77
FC	MPN*	<1	<1	<1	<1	<1
Static H <sub>2</sub> O Elev.	ft	627	632	628	623	605

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

<sup>a</sup>Limit of quantitation (LOQ) instead of MDL was used as reporting limit.

\*MPN = Most probable number per 100 mL.

TABLE 2: ANALYSIS OF WATER FROM LYSIMETERS  
L-1 THROUGH L-9N AT THE LAWNDALE AVENUE  
SOLIDS MANAGEMENT AREA SAMPLED ON APRIL 10, 2008

Parameter	Unit	Lysimeter No.				
		L-1	L-2	L-3N	L-4N	L-5N
pH <sup>1</sup>		7.5	7.9	7.4	7.6	7.8
EC	mS/m	161	295	272	362	546
Total Dissolved Solids	mg/L	1,440	2,232	2,132	3,348	4,688
Total Diss. Org. Carbon	"	6	8	21	7	2
Cl <sup>-</sup>	"	49	430	126	80	879
SO <sub>4</sub> <sup>=</sup>	"	523	648	365	1,579	1,601
TKN	"	4.8	2.8	3.5	9.4	2.9
NH <sub>3</sub> -N	"	4.1	1.6	1.6	7.3	2.0
NO <sub>2</sub> + NO <sub>3</sub> -N	"	0.36	1.3	0.41	0.53	0.22
Total P	"	0.06	0.14	0.31	0.05	<0.05
Alkalinity as CaCO <sub>3</sub>	"	464	472	1,169	772	507
Al	"	0.042	0.048	0.058	0.067	0.067
As	"	<0.01	<0.02	<0.01	<0.01	<0.01
B	"	0.458	0.194	0.065	0.138	0.304
Ca	"	210	277	372	554	529
Cd	"	0.0005	0.0008	0.0005	0.0008	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	"	5.04	0.262	11.9	6.46	6.07
Hg	μg/L	<0.25 <sup>a</sup>	<0.25 <sup>a</sup>	<0.25 <sup>a</sup>	<0.25 <sup>a</sup>	<0.25 <sup>a</sup>
K	mg/L	6	3	2	7	21
Mg	"	92.1	109	136	159	276
Mn	"	0.0699	0.0452	0.8453	1.015	0.1802
Na	"	45	239	88	178	439
Ni	"	<0.0004	<0.0008	0.0009	<0.0004	0.0008
Pb	"	<0.004	<0.008	<0.004	<0.004	<0.004
Se	"	<0.02	<0.04	<0.02	<0.02	<0.02
Zn	"	0.006	0.005	0.008	0.013	0.008

TABLE 2 (Continued): ANALYSIS OF WATER FROM LYSIMETERS  
L-1 THROUGH L-9N AT THE LAWNDALE AVENUE  
SOLIDS MANAGEMENT AREA SAMPLED ON APRIL 10, 2008

Parameter	Unit	Lysimeter No.			
		L-6N	L-7N	L-8N	L-9N
pH <sup>1</sup>		7.5	7.9	7.8	7.9
EC	mS/m	244	150	251	265
Total Dissolved Solids	mg/L	3,484	956	1,728	1,776
Total Diss. Org. Carbon	"	57	10	7	25
Cl <sup>-</sup>	"	119	147	447	183
SO <sub>4</sub> <sup>=</sup>	"	1,530	130	219	290
TKN	"	19	1.4	5.2	2.1
NH <sub>3</sub> -N	"	13	0.54	3.8	0.60
NO <sub>2</sub> + NO <sub>3</sub> -N	"	0.36	0.31	0.96	0.59
Total P	"	0.07	0.05	0.05	0.07
Alkalinity as CaCO <sub>3</sub>	"	845	448	552	1,042
Al	"	0.079	0.030	0.037	0.046
As	"	<0.01	<0.01	<0.01	<0.01
B	"	0.191	0.341	0.232	0.166
Ca	"	634	129	191	228
Cd	"	0.0004	<0.0004	0.0004	0.0005
Cr	"	<0.0005	<0.0005	<0.0005	<0.0005
Cu	"	<0.002	<0.002	<0.002	<0.002
Fe	"	25.6	0.499	2.03	0.158
Hg	μg/L	<0.25 <sup>a</sup>	<0.25 <sup>a</sup>	<0.25 <sup>a</sup>	<0.25 <sup>a</sup>
K	mg/L	8	6	6	5
Mg	"	157	72.9	89.2	127
Mn	"	0.5134	0.0909	0.3052	0.0611
Na	"	96	56	227	206
Ni	"	0.0073	0.0023	<0.0004	0.0012
Pb	"	<0.004	<0.004	<0.004	<0.004
Se	"	<0.02	<0.02	<0.02	<0.02
Zn	"	0.011	0.007	0.005	0.004

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

<sup>a</sup>Limit of quantitation (LOQ) instead of MDL was used as reporting limit.

TABLE 3: ANALYSIS OF WATER FROM LYSIMETERS  
L-1 THROUGH L-9N AT THE LAWNDALE AVENUE  
SOLIDS MANAGEMENT AREA SAMPLED ON MAY 7, 2008

Parameter	Unit	Lysimeter No.				
		L-1	L-2	L-3N	L-4N	L-5N
pH <sup>1</sup>		7.7	7.9	7.6	7.8	7.9
EC	mS/m	164	238	237	308	474
Total Dissolved Solids	mg/L	1,412	2,192	1,956	3,424	4,676
Total Diss. Org. Carbon	"	6	5	22	6	2
Cl <sup>-</sup>	"	47	448	136	52	877
SO <sub>4</sub> <sup>=</sup>	"	526	555	260	1,559	1,570
TKN	"	4.4	0.92	2.6	8.0	2.4
NH <sub>3</sub> -N	"	3.9	0.52	1.0	6.9	1.9
NO <sub>2</sub> + NO <sub>3</sub> -N	"	0.06	0.21	0.14	0.18	0.07
Total P	"	<0.05	<0.10	0.25	0.10	<0.05
Alkalinity as CaCO <sub>3</sub>	"	478	524	1,192	696	492
Al	"	0.065	0.056	0.054	0.088	0.058
As	"	<0.01	<0.02	<0.01	<0.01	<0.01
B	"	0.464	0.302	0.059	0.142	0.284
Ca	"	225	264	381	578	521
Cd	"	0.0006	0.0008	0.0005	0.0004	0.0007
Cr	"	<0.0005	<0.0010	<0.0005	<0.0005	<0.0005
Cu	"	<0.002	<0.004	<0.002	<0.002	<0.002
Fe	"	4.95	0.112	8.43	2.13	3.68
Hg	μg/L	<0.25 <sup>a</sup>	<0.25 <sup>a</sup>	<0.25 <sup>a</sup>	<0.25 <sup>a</sup>	<0.25 <sup>a</sup>
K	mg/L	6	3	2	7	21
Mg	"	98.8	119	143	160	269
Mn	"	0.0719	0.0410	0.7833	0.8076	0.1936
Na	"	45	256	85	185	460
Ni	"	0.0007	<0.0008	0.0013	<0.0004	0.0011
Pb	"	<0.004	<0.008	<0.004	<0.004	<0.004
Se	"	<0.02	<0.04	<0.02	<0.02	<0.02
Zn	"	0.005	0.006	0.006	0.022	0.007

TABLE 3 (Continued): ANALYSIS OF WATER FROM LYSIMETERS  
L-1 THROUGH L-9N AT THE LAWNDALE AVENUE  
SOLIDS MANAGEMENT AREA SAMPLED ON MAY 7, 2008

Parameter	Unit	Lysimeter No.			
		L-6N	L-7N	L-8N	L-9N
pH <sup>1</sup>		7.8	8.2	8.0	8.1
EC	mS/m	306	119	224	218
Total Dissolved Solids	mg/L	3,124	888	1,620	1,784
Total Diss. Org. Carbon	"	47	8	7	24
Cl <sup>-</sup>	"	99	154	433	215
SO <sub>4</sub> <sup>=</sup>	"	1,263	120	200	289
TKN	"	17	0.73	2.9	1.6
NH <sub>3</sub> -N	"	13	0.15	2.3	0.15
NO <sub>2</sub> + NO <sub>3</sub> -N	"	0.04	0.25	0.28	0.70
Total P	"	0.09	0.10	0.05	0.05
Alkalinity as CaCO <sub>3</sub>	"	534	373	578	775
Al	"	0.077	0.031	0.036	0.066
As	"	<0.01	<0.01	<0.01	<0.01
B	"	0.214	0.199	0.206	0.274
Ca	"	612	125	207	580
Cd	"	0.0005	<0.0004	0.0006	0.0005
Cr	"	<0.0005	<0.0005	<0.0005	<0.0005
Cu	"	<0.002	<0.002	<0.002	<0.002
Fe	"	7.38	0.014	0.143	4.49
Hg	μg/L	<0.25 <sup>a</sup>	<0.25 <sup>a</sup>	<0.25 <sup>a</sup>	<0.25 <sup>a</sup>
K	mg/L	7	6	6	9
Mg	"	146	67.3	94.9	300
Mn	"	0.4773	0.0607	0.3044	0.1110
Na	"	83	58	230	173
Ni	"	0.0063	0.0021	<0.0004	<0.0004
Pb	"	<0.004	<0.004	<0.004	<0.004
Se	"	<0.02	<0.02	<0.02	<0.02
Zn	"	0.011	0.006	0.005	0.009

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

<sup>a</sup>Limit of quantitation (LOQ) instead of MDL was used as reporting limit.



TABLE 4: ANALYSIS OF WATER FROM LYSIMETERS  
L-1 THROUGH L-9N AT THE LAWNDALE AVENUE  
SOLIDS MANAGEMENT AREA SAMPLED ON JUNE 5, 2008

Parameter	Unit	Lysimeter No.				
		L-1	L-2	L-3N	L-4N	L-5N
pH <sup>1</sup>		7.5	7.9	7.5	7.6	7.6
EC	mS/m	175	317	254	341	522
Total Dissolved Solids	mg/L	1,506	2,672	1,928	3,330	5,298
Total Diss. Org. Carbon	"	6	2	21	7	3
Cl <sup>-</sup>	"	52	488	132	48	851
SO <sub>4</sub> <sup>=</sup>	"	570	612	255	1,746	1,710
TKN	"	4.4	0.58	2.9	7.6	3.0
NH <sub>3</sub> -N	"	3.7	0.16	0.94	5.7	2.0
NO <sub>2</sub> + NO <sub>3</sub> -N	"	0.42	0.86	0.78	1.3	0.28
Total P	"	<0.05	<0.10	<0.05	<0.05	<0.05
Alkalinity as CaCO <sub>3</sub>	"	470	424	1,174	674	511
Al	"	0.042	0.056	0.059	0.081	0.070
As	"	<0.01	<0.02	<0.01	<0.01	<0.01
B	"	0.483	0.192	0.069	0.132	0.272
Ca	"	215	257	356	541	510
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	0.010	<0.002	<0.002	<0.002
Fe	"	2.69	0.496	4.96	0.933	4.73
Hg	μg/L	<0.25 <sup>a</sup>	<0.25 <sup>a</sup>	<0.25 <sup>a</sup>	<0.25 <sup>a</sup>	<0.25 <sup>a</sup>
K	mg/L	6	4	2	6	20
Mg	"	96.6	118	137	149	258
Mn	"	0.0671	0.0192	0.7679	0.9954	0.2017
Na	"	49	270	82	165	448
Ni	"	<0.0004	<0.0008	0.0007	<0.0004	0.0011
Pb	"	<0.004	<0.008	<0.004	<0.004	<0.004
Se	"	<0.02	<0.04	<0.02	<0.02	<0.02
Zn	"	0.005	0.020	0.012	0.020	0.011

TABLE 4 (Continued): ANALYSIS OF WATER FROM LYSIMETERS  
L-1 THROUGH L-9N AT THE LAWNDALE AVENUE  
SOLIDS MANAGEMENT AREA SAMPLED ON JUNE 5, 2008

Parameter	Unit	Lysimeter No.			
		L-6N	L-7N	L-8N	L-9N
pH <sup>1</sup>		7.6	7.8	7.9	7.8
EC	mS/m	329	144	262	280
Total Dissolved Solids	mg/L	3,350	1,190	1,984	1,636
Total Diss. Org. Carbon	"	51	8	10	26
Cl <sup>-</sup>	"	76	163	372	186
SO <sub>4</sub> <sup>=</sup>	"	1,370	129	217	327
TKN	"	20	0.92	4.3	2.2
NH <sub>3</sub> -N	"	13	0.25	2.9	0.46
NO <sub>2</sub> + NO <sub>3</sub> -N	"	1.6	0.46	1.2	1.1
Total P	"	<0.05	<0.05	<0.05	<0.05
Alkalinity as CaCO <sub>3</sub>	"	870	406	720	971
Al	"	0.075	0.024	0.042	0.048
As	"	<0.01	<0.01	<0.01	<0.01
B	"	0.196	0.213	0.206	0.305
Ca	"	615	123	210	243
Cd	"	<0.0004	<0.0004	0.0004	0.0004
Cr	"	<0.0005	<0.0005	<0.0005	<0.0005
Cu	"	<0.002	<0.002	<0.002	<0.002
Fe	"	20.9	0.072	1.05	0.415
Hg	μg/L	<0.25 <sup>a</sup>	<0.25 <sup>a</sup>	<0.25 <sup>a</sup>	<0.25 <sup>a</sup>
K	mg/L	7	6	6	5
Mg	"	147	68.4	103	139
Mn	"	0.5274	0.0849	0.3491	0.0748
Na	"	73	62	198	199
Ni	"	0.0062	0.0023	<0.0004	0.0019
Pb	"	<0.004	0.005	<0.004	<0.004
Se	"	<0.02	<0.02	<0.02	<0.02
Zn	"	0.008	0.008	0.005	0.006

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

<sup>a</sup>Limit of quantitation (LOQ) instead of MDL was used as reporting limit.

TABLE 5: ANALYSIS OF MONTHLY COMPOSITED DIGESTED  
BIOSOLIDS PLACED IN THE LAWNSDALE AVENUE  
SOLIDS MANAGEMENT DRYING AREA DURING MAY 2008

Parameter	Unit	Concentration <sup>1</sup>
pH		8.3
Total Solids	%	19.4
Total Volatile Solids <sup>2</sup>	%	45.8
TKN	mg/kg	49,468
NH <sub>3</sub> -N	”	16,215

<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 DIGESTED  
BIOSOLIDS PLACED IN THE LAWNSDALE AVENUE  
SOLIDS MANAGEMENT DRYING AREA DURING JUNE 2008

Parameter	Unit	Concentration <sup>1</sup>
pH		8.1
Total Solids	%	21.4
Total Volatile Solids <sup>2</sup>	%	46.7
TKN	mg/kg	22,427
NH <sub>3</sub> -N	”	15,443

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

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

TABLE 7: ANALYSIS OF MONTHLY COMPOSITED PROCESSED DIGESTED  
BIOSOLIDS REMOVED FROM THE LAWNSDALE AVENUE  
SOLIDS MANAGEMENT DRYING AREA DURING MAY 2008

Parameter	Unit	Concentration <sup>1</sup>
pH		6.3
Total Solids	%	66.4
Total Volatile Solids <sup>2</sup>	%	33.8
TKN	mg/kg	16,247
NH <sub>3</sub> -N	”	1,499
Total P	”	20,705
Al	”	26,577
As	”	<5
Ca	”	44,474
Cd	”	6
Cr	”	222
Cu	”	408
Fe	”	21,288
Hg	”	1.15
K	”	5,578
Mg	”	20,710
Mn	”	597
Mo	”	13
Na	”	713
Ni	”	50
Pb	”	136
Se	”	<4
Zn	”	951

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

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

TABLE 8: ANALYSIS OF MONTHLY COMPOSITED PROCESSED DIGESTED BIOSOLIDS REMOVED FROM THE LAWNSDALE AVENUE SOLIDS MANAGEMENT DRYING AREA DURING JUNE 2008

Parameter	Unit	Concentration <sup>1</sup>
pH		6.8
Total Solids	%	68.0
Total Volatile Solids <sup>2</sup>	%	29.2
TKN	mg/kg	8,827
NH <sub>3</sub> -N	”	2,494
Total P	”	9,026
Al	”	16,100
As	”	<14.29 <sup>a</sup>
Ca	”	48,939
Cd	”	8
Cr	”	182
Cu	”	346
Fe	”	18,120
Hg	”	0.941
K	”	2,229
Mg	”	23,577
Mn	”	508
Mo	”	11
Na	”	647
Ni	”	47
Pb	”	125
Se	”	<28.57 <sup>a</sup>
Zn	”	764

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

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

<sup>a</sup>Limit of quantitation (LOQ) instead of MDL was used as reporting limit.