

Protecting Our Water Environment



Metropolitan Water Reclamation District of Greater Chicago

***MONITORING AND RESEARCH
DEPARTMENT***

REPORT NO. 11-69

LAWNDALE AVENUE SOLIDS MANAGEMENT AREA

MONITORING REPORT FOR

THIRD QUARTER 2011

NOVEMBER 2011

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Metropolitan Water Reclamation District of Greater Chicago

CECIL LUE-HING RESEARCH AND DEVELOPMENT COMPLEX
6001 West Pershing Road Cicero, Illinois 60804-4112

Thomas C. Granato, Ph.D.
Director of Monitoring and Research

November 30, 2011

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 Water Reclamation Plant, Illinois Environmental Protection Agency Permit No. 2010-AO-0267, Monitoring Report for July, August, and September 2011

The attached nine tables contain the monitoring data for the Lawndale Avenue Solids Management Area for July, August, and September 2011 as required by Illinois Environmental Protection Agency (IEPA) Operating Permit No. 2010-AO-0267.

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 July 13, 2011
- Table 2, Analysis of Water from Lysimeters L-4N and L-6N at the Lawndale Avenue Solids Management Area Sampled During July, August, and September 2011
- Table 3, Analysis of Water from Lysimeters L-1N Through L-9N at the Lawndale Avenue Solids Management Area Sampled on July 20, 2011
- Table 4, Analysis of Monthly Compositated Biosolids Placed in the Lawndale Avenue Solids Management Drying Area During July 2011
- Table 5, Analysis of Monthly Compositated Biosolids Placed in the Lawndale Avenue Solids Management Drying Area During August 2011

Subject: Lawndale Avenue Solids Management Area - Stickney Water Reclamation Plant, Illinois Environmental Protection Agency Permit No. 2010-AO-0267, Monitoring Report for July, August, and September 2011

Table 6, Analysis of Monthly Compositated Biosolids Placed in the Lawndale Avenue Solids Management Drying Area During September 2011

Table 7, Analysis of Monthly Compositated Processed Digested Biosolids Removed from the Lawndale Avenue Solids Management Drying Area During July 2011

Table 8, Analysis of Monthly Compositated Processed Digested Biosolids Removed from the Lawndale Avenue Solids Management Drying Area During August 2011

Table 9, Analysis of Monthly Compositated Processed Digested Biosolids Removed from the Lawndale Avenue Solids Management Drying Area During September 2011

A new lysimeter L-7N-1 was installed in June 2010 as a replacement for L-7N.

Biosolids were placed in the solids drying area and removed from the site during July, August, and September.

Very truly yours,

Thomas C. Granato, Ph.D.
Director
Monitoring and Research

TCG:PL:cm

Attachments

cc w/att: Mr. Sulski, IEPA
Records Unit, IEPA

TABLE 1: ANALYSIS OF WATER FROM MONITORING WELLS M-11
THROUGH M-15 AT THE LAWNDALE AVENUE SOLIDS MANAGEMENT
AREA SAMPLED ON JULY 13, 2011

Parameter	Unit	Monitoring Well No.		
		M-11	M-12	M-13
pH ¹		7.0	7.4	7.4
EC	mS/m	53	42	99
Total Dissolved Solids	mg/L	684	862	1,354
Total Dissolved Organic Carbon	"	2	< 1	2
Cl ⁻	"	13	15	< 10
SO ₄ ⁼	"	174	319	566
TKN	"	1	0.6	< 0.5
NH ₃ -N	"	1	0.2	0.4
NO ₂ + NO ₃ -N	"	< 0.04	0.10	< 0.04
Total P	"	< 0.10	< 0.10	< 0.10
Alkalinity as CaCO ₃	"	361	309	336
Al	"	< 1.0	< 1.0	< 1.0
As	"	< 0.02	< 0.02	< 0.02
B	"	1.4	1.8	1.6
Ca	"	92	79	165
Cd	"	< 0.001	< 0.001	< 0.001
Cr	"	< 0.003	< 0.003	< 0.003
Cu	"	< 0.005	< 0.005	< 0.005
Fe	"	< 0.2	< 0.2	< 0.2
Hg	μg/L	< 0.20	< 0.20	< 0.20
K	mg/L	9	10	10
Mg	"	43.3	36.6	77.6
Mn	"	0.023	0.004	0.007
Na	"	57	137	91
Ni	"	< 0.008	< 0.008	< 0.008
Pb	"	< 0.03	< 0.03	< 0.03
Se	"	< 0.03	< 0.03	< 0.03
Zn	"	2.2	1.7	2.1
Fecal coliform	MPN ²	< 1	< 1	< 1
Static H ₂ O Elev.	ft	627	630	628

TABLE 1 (Continued): ANALYSIS OF WATER FROM MONITORING WELLS M-11 THROUGH M-15 AT THE LAWDALE AVENUE SOLIDS MANAGEMENT AREA SAMPLED ON JULY 13, 2011

Parameter	Unit	Monitoring Well No.	
		M-14	M-15
pH ¹		7.4	7.4
EC	mS/m	58	74
Total Dissolved Solids	mg/L	554	1,718
Total Dissolved Organic Carbon	"	< 1	2
Cl ⁻	"	< 10	< 10
SO ₄ ⁼	"	124	750
TKN	"	< 0.5	< 0.5
NH ₃ -N	"	0.2	0.4
NO ₂ + NO ₃ -N	"	< 0.04	< 0.04
Total P	"	< 0.10	< 0.10
Alkalinity as CaCO ₃	"	323	352
Al	"	< 1.0	< 1.0
As	"	< 0.02	< 0.02
B	"	1.3	1.2
Ca	"	73	232
Cd	"	< 0.001	< 0.001
Cr	"	< 0.003	< 0.003
Cu	"	< 0.005	< 0.005
Fe	"	< 0.2	0.5
Hg	µg/L	< 0.20	< 0.20
K	mg/L	8	11
Mg	"	39.9	104
Mn	"	0.005	0.027
Na	"	42	63
Ni	"	< 0.008	< 0.008
Pb	"	< 0.03	< 0.03
Se	"	< 0.03	< 0.03
Zn	"	0.66	2.3
Fecal coliform	MPN ²	< 1	< 1
Static H ₂ O Elev.	ft	622	NR ³

¹pH analyzed beyond recommended holding time of 15 minutes.

²Most probable number per 100 mL.

³No reading.

TABLE 2: ANALYSIS OF WATER FROM LYSIMETERS L-4N
AND L-6N AT THE LAWDALE AVENUE SOLIDS MANAGEMENT
AREA SAMPLED DURING JULY, AUGUST, AND SEPTEMBER 2011

Parameter	Unit	Date Sampled			
		07/20/11		08/03/11	
		L-4N	L-6N	L-4N	L-6N
pH ¹		8.0	7.9	7.7	7.8
EC	mS/m	285	342	275	273
Total Dissolved Solids	mg/L	3,020	3,802	2,988	3,870
Total Dissolved Organic Carbon	"	5	54	6	56
Cl ⁻	"	11	95	14	37
SO ₄ ⁼	"	1,188	1,201	1,215	1,276
TKN	"	4	16	4	18
NH ₃ -N	"	4	13	4	13
NO ₂ + NO ₃ -N	"	0.68	0.18	0.68	0.20
Total P	"	< 0.10	< 0.10	0.11	< 0.10
Alkalinity as CaCO ₃	"	598	879	598	983
Al	"	< 1.0	< 1.0	< 1.0	< 1.0
As	"	< 0.02	< 0.02	< 0.02	< 0.02
B	"	0.10	0.21	0.13	0.24
Ca	"	541	658	554	684
Cd	"	< 0.001	< 0.001	< 0.001	< 0.001
Cr	"	< 0.003	< 0.003	< 0.003	< 0.003
Cu	"	< 0.005	< 0.005	< 0.005	< 0.005
Fe	"	4	32	6	33
Hg	μg/L	< 0.20	< 0.20	< 0.20	< 0.20
K	mg/L	5	5	5	5
Mg	"	111	138	102	144
Mn	"	0.637	0.723	0.601	0.790
Na	"	77	79	57	77
Ni	"	< 0.008	0.010	< 0.008	< 0.008
Pb	"	< 0.03	< 0.03	< 0.03	< 0.03
Se	"	< 0.03	< 0.03	< 0.03	< 0.03
Zn	"	< 0.02	< 0.02	0.06	< 0.02

TABLE 2 (Continued): ANALYSIS OF WATER FROM LYSIMETERS L-4N
AND L-6N AT THE LAWNDALE AVENUE SOLIDS MANAGEMENT
AREA SAMPLED DURING JULY, AUGUST, AND SEPTEMBER 2011

Parameter	Unit	Date Sampled	
		09/14/11	
		L-4N	L-6N
pH ¹		8.1	8.1
EC	mS/m	251	342
Total Dissolved Solids	mg/L	2,692	1,760
Total Dissolved Organic Carbon	"	4	64
Cl ⁻	"	16	84
SO ₄ ⁼	"	1,319	1,374
TKN	"	4	18
NH ₃ -N	"	4	14
NO ₂ + NO ₃ -N	"	0.62	0.28
Total P	"	0.16	< 0.10
Alkalinity as CaCO ₃	"	499	960
Al	"	< 1.0	< 1.0
As	"	< 0.02	< 0.02
B	"	0.12	0.52
Ca	"	565	706
Cd	"	< 0.001	< 0.001
Cr	"	< 0.003	< 0.003
Cu	"	< 0.005	< 0.005
Fe	"	5	27
Hg	μg/L	< 0.20	< 0.20
K	mg/L	5	7
Mg	"	103	150
Mn	"	0.560	0.800
Na	"	54	88
Ni	"	< 0.008	< 0.008
Pb	"	< 0.03	< 0.03
Se	"	< 0.03	< 0.03
Zn	"	< 0.02	< 0.02

¹pH analyzed beyond recommended holding time of 15 minutes.

TABLE 3: ANALYSIS OF WATER FROM LYSIMETERS L-1N
THROUGH L-9N AT THE LAWNDALE AVENUE SOLIDS MANAGEMENT
AREA SAMPLED ON JULY 20, 2011

Parameter	Unit	Lysimeter No.			
		L-1N	L-2N	L-3N	L-5N
pH ¹		8.1	8.2	8.0	NA ²
EC	mS/m	176	188	274	578
Total Dissolved Solids	mg/L	1,662	1,456	2,216	5,554
Total Dissolved Organic Carbon	"	5	3	26	4
Cl ⁻	"	34	290	142	789
SO ₄ ⁼	"	581	190	239	1,547
TKN	"	3	1	3	3
NH ₃ -N	"	4	0.2	0.8	2
NO ₂ + NO ₃ -N	"	0.12	3.8	0.59	0.41
Total P	"	< 0.10	< 0.10	< 0.10	< 0.10
Alkalinity as CaCO ₃	"	420	379	1,197	521
Al	"	< 1.0	< 1.0	< 1.0	< 1.0
As	"	< 0.02	< 0.02	< 0.02	< 0.02
B	"	0.59	0.11	0.09	0.26
Ca	"	191	145	358	541
Cd	"	< 0.001	< 0.001	< 0.001	< 0.001
Cr	"	< 0.003	< 0.003	< 0.003	< 0.003
Cu	"	< 0.005	< 0.005	< 0.005	< 0.005
Fe	"	< 0.2	< 0.2	0.3	11
Hg	μg/L	< 0.20	< 0.20	< 0.20	< 0.20
K	mg/L	10	2	2	15
Mg	"	105	62.3	136	231
Mn	"	0.051	0.127	0.848	0.304
Na	"	57	162	78	403
Ni	"	< 0.008	< 0.008	< 0.008	< 0.008
Pb	"	< 0.03	< 0.03	< 0.03	< 0.03
Se	"	< 0.03	< 0.03	< 0.03	< 0.03
Zn	"	< 0.02	< 0.02	< 0.02	< 0.02

TABLE 3 (Continued): ANALYSIS OF WATER FROM LYSIMETERS L-1N THROUGH L-9N AT THE LAWNDALE AVENUE SOLIDS MANAGEMENT AREA SAMPLED ON JULY 20, 2011

Parameter	Unit	Lysimeter No.		
		L-7N	L-8N	L-9N
pH ¹		8.4	8.3	8.0
EC	mS/m	NRR ³	234	259
Total Dissolved Solids	mg/L	836	1,688	2,386
Total Dissolved Organic Carbon	"	9	4	27
Cl ⁻	"	115	456	273
SO ₄ ⁼	"	16	162	202
TKN	"	2	0.9	2
NH ₃ -N	"	0.9	0.6	< 0.1
NO ₂ + NO ₃ -N	"	0.13	0.18	0.89
Total P	"	0.28	< 0.10	< 0.10
Alkalinity as CaCO ₃	"	412	339	944
Al	"	< 1.0	< 1.0	< 1.0
As	"	< 0.02	< 0.02	< 0.02
B	"	0.26	0.17	0.14
Ca	"	57	135	270
Cd	"	< 0.001	< 0.001	< 0.001
Cr	"	< 0.003	< 0.003	< 0.003
Cu	"	< 0.005	< 0.005	< 0.005
Fe	"	< 0.2	< 0.2	< 0.2
Hg	μg/L	< 0.20	< 0.20	< 0.20
K	mg/L	9	5	4
Mg	"	74.1	53.8	154
Mn	"	0.024	0.159	0.067
Na	"	51	249	115
Ni	"	< 0.008	< 0.008	< 0.008
Pb	"	< 0.03	< 0.03	< 0.03
Se	"	< 0.03	< 0.03	< 0.03
Zn	"	< 0.02	< 0.02	< 0.02

¹pH analyzed beyond recommended holding time of 15 minutes.

²No analysis; insufficient sample.

³No reportable result.

TABLE 4: ANALYSIS OF MONTHLY COMPOSITED BIOSOLIDS
 PLACED IN THE LAWNSDALE AVENUE SOLIDS MANAGEMENT DRYING AREA
 DURING JULY 2011

Parameter	Unit	Concentration ¹
pH		7.6
Total Solids	%	11.1
Total Volatile Solids ²	"	48.1

¹Values are the means of 22 samples.

²Total volatile solids as a percentage of total solids.

TABLE 5: ANALYSIS OF MONTHLY COMPOSITED BIOSOLIDS
 PLACED IN THE LAWNSDALE AVENUE SOLIDS MANAGEMENT DRYING AREA
 DURING AUGUST 2011

Parameter	Unit	Concentration ¹
pH		7.5
Total Solids	%	11.9
Total Volatile Solids ²	”	48.1

¹Values are the means of 18 samples.

²Total volatile solids as a percentage of total solids.

TABLE 6: ANALYSIS OF MONTHLY COMPOSITED BIOSOLIDS
PLACED IN THE LAWNSDALE AVENUE SOLIDS MANAGEMENT DRYING AREA
DURING SEPTEMBER 2011

Parameter	Unit	Concentration ¹
pH		7.9
Total Solids	%	20.6
Total Volatile Solids ²	”	45.7

¹Values are the means of 14 samples.

²Total 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 JULY 2011

Parameter	Unit	Concentration ¹
pH		7.2
Total Solids	%	55.5
Total Volatile Solids ²	"	41.8
TKN	mg/kg	27,382
NH ₃ -N	"	5,283
Total P	"	21,111
Al	"	19,754
Ca	"	38,840
Cd	"	3
Cr	"	150
Cu	"	410
Fe	"	17,673
Hg	"	1.0
K	"	2,866
Mg	"	19,116
Mn	"	572
Na	"	913
Ni	"	40
Pb	"	111
Zn	"	833

¹Values are the means of 14 samples.

²Total 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 AUGUST 2011

Parameter	Unit	Concentration ¹
pH		7.5
Total Solids	%	47.6
Total Volatile Solids ²	"	40.3
TKN	mg/kg	29,922
NH ₃ -N	"	6,507
Total P	"	20,557
Al	"	18,151
Ca	"	39,492
Cd	"	3
Cr	"	142
Cu	"	400
Fe	"	16,988
Hg	"	0.86
K	"	2,928
Mg	"	19,412
Mn	"	561
Na	"	1,122
Ni	"	39
Pb	"	107
Zn	"	790

¹Values are the means of 20 samples.

²Total volatile solids as a percentage of total solids.

TABLE 9: ANALYSIS OF MONTHLY COMPOSITED PROCESSED DIGESTED BIOSOLIDS REMOVED FROM THE LAWNSDALE AVENUE SOLIDS MANAGEMENT DRYING AREA DURING SEPTEMBER 2011

Parameter	Unit	Concentration ¹
pH		7.6
Total Solids	%	45.4
Total Volatile Solids ²	"	42.6
TKN	mg/kg	28,285
NH ₃ -N	"	5,709
Total P	"	20,777
Al	"	19,227
Ca	"	39,705
Cd	"	4
Cr	"	147
Cu	"	427
Fe	"	17,553
Hg	"	0.83
K	"	3,053
Mg	"	19,526
Mn	"	561
Na	"	1,011
Ni	"	41
Pb	"	112
Zn	"	822

¹Values are the means of 14 samples.

²Total volatile solids as a percentage of total solids.