

Protecting Our Water Environment



Metropolitan Water Reclamation District of Greater Chicago

*MONITORING AND RESEARCH
DEPARTMENT*

REPORT NO. 14-07

LAWNDALE AVENUE SOLIDS MANAGEMENT AREA

MONITORING REPORT FOR

FOURTH QUARTER 2013

February 2014

Protecting Our Water Environment



Metropolitan Water Reclamation District of Greater Chicago

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February 20, 2014

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 October, November, and December 2013

The attached eight tables contain the monitoring data for the Lawndale Avenue Solids Management Area for October, November, and December 2013 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 October 2, 2013

Table 2, Analysis of Water from Lysimeters L-4N and L-6N at the Lawndale Avenue Solids Management Area Sampled During October, November, and December 2013

Table 3, Analysis of Water from Lysimeters L-1N Through L-9N at the Lawndale Avenue Solids Management Area Sampled on November 6, 2013

Table 4, Analysis of Monthly Compositing Biosolids Placed in the Lawndale Avenue Solids Management Drying Area During October 2013

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Table 5, Analysis of Monthly Composited Biosolids Placed in the Lawndale Avenue Solids Management Drying Area During November 2013

Table 6, Analysis of Monthly Composited Processed Digested Biosolids Removed from the Lawndale Avenue Solids Management Drying Area During October 2013

Table 7, Analysis of Monthly Composited Processed Digested Biosolids Removed from the Lawndale Avenue Solids Management Drying Area During November 2013

Table 8, Analysis of Monthly Composited Processed Digested Biosolids Removed from the Lawndale Avenue Solids Management Drying Area During December 2013

Biosolids were placed in the solids drying area during October and November and removed from the site during October, November, and December 2013.

Very truly yours,

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

TCG:PL:cm
Attachments
cc w/att: Mr. J. Patel, IEPA
Records Unit, IEPA

TABLE 1: ANALYSIS OF WATER FROM MONITORING WELLS M-11 THROUGH M-15 AT THE LAWDALE AVENUE SOLIDS MANAGEMENT AREA SAMPLED ON OCTOBER 2, 2013

Parameter ¹	Unit	Monitoring Well No.		
		M-11	M-12	M-13
pH ¹		7.5	7.9	7.6
EC	mS/m	43	101	166
Total Dissolved Solids	mg/L	716	884	1,450
Total Dissolved Organic Carbon	"	< 1	< 1	2
Cl ⁻	"	16	15	< 10
SO ₄ ⁼	"	191	344	610
Alkalinity as CaCO ₃	"	350	299	326
TKN	"	2	< 1	< 1
NH ₃ -N	"	2	0.5	0.5
NO ₂ + NO ₃ -N	"	< 0.15	< 0.15	< 0.15
Total P	"	< 0.20	< 0.20	< 0.20
Al	"	< 1.0	< 1.0	< 1.0
Ca	"	93	78	161
Cd	"	< 0.001	< 0.001	< 0.001
Cr	"	< 0.005	< 0.005	< 0.005
Cu	"	< 0.005	< 0.005	< 0.005
Fe	"	0.2	< 0.1	< 0.1
Hg	μg/L	< 0.20	< 0.20	< 0.20
K	mg/L	10	11	12
Mg	"	46	38	83
Mn	"	0.011	0.003	0.007
Na	"	59	135	93
Ni	"	< 0.005	< 0.005	< 0.005
Pb	"	< 0.02	< 0.02	< 0.02
Zn	"	0.72	0.19	1.3

TABLE 1 (Continued): ANALYSIS OF WATER FROM MONITORING WELLS M-11 THROUGH M-15 AT THE LAWNSDALE AVENUE SOLIDS MANAGEMENT AREA SAMPLED ON OCTOBER 2, 2013

Parameter ¹	Unit	Monitoring Well No.	
		M-14	M-15
pH ¹		7.9	7.3
EC	mS/m	66	149
Total Dissolved Solids	mg/L	578	1,802
Total Dissolved Organic Carbon	"	< 1	2
Cl ⁻	"	< 10	< 10
SO ₄ ⁼	"	119	799
Alkalinity as CaCO ₃	"	318	351
TKN	"	< 1	< 1
NH ₃ -N	"	0.3	0.5
NO ₂ + NO ₃ -N	"	< 0.15	< 0.15
Total P	"	< 0.20	< 0.20
Al	"	< 1.0	< 1.0
Ca	"	72	218
Cd	"	< 0.001	< 0.001
Cr	"	< 0.005	< 0.005
Cu	"	< 0.005	< 0.005
Fe	"	< 0.1	2
Hg	μg/L	< 0.20	< 0.20
K	mg/L	9	12
Mg	"	42	108
Mn	"	0.004	0.029
Na	"	44	62
Ni	"	< 0.005	< 0.005
Pb	"	< 0.02	< 0.02
Zn	"	0.48	1.7

¹pH analyzed beyond recommended holding time of 15 minutes.

TABLE 2: ANALYSIS OF WATER FROM LYSIMETERS L-4N
AND L-6N AT THE LAWNDALE AVENUE SOLIDS MANAGEMENT
AREA SAMPLED DURING OCTOBER, NOVEMBER, AND DECEMBER 2013

Parameter	Unit	Date Sampled			
		10/02/13		11/06/13	
		L-4N	L-6N	L-4N	L-6N
pH ¹		7.6	7.5	7.8	7.8
EC	mS/m	274	355	227	278
Total Dissolved Solids	mg/L	2,884	4,016	2,984	3,654
Total Dissolved Organic Carbon	"	6	64	7	72
Cl ⁻	"	29	67	24	84
SO ₄ ⁼	"	1,313	1,437	1,449	1,376
Alkalinity as CaCO ₃	"	637	994	666	1,078
TKN	"	6	18	8	26
NH ₃ -N	"	4	12	4	12
NO ₂ + NO ₃ -N	"	0.39	< 0.15	0.48	0.25
Total P	"	< 0.20	< 0.20	< 0.20	< 0.20
Al	"	< 1.0	< 1.0	< 1.0	< 1.0
Ca	"	476	597	494	564
Cd	"	< 0.001	< 0.001	< 0.001	< 0.001
Cr	"	< 0.005	< 0.005	< 0.005	< 0.005
Cu	"	< 0.005	< 0.005	< 0.005	< 0.005
Fe	"	3	46	4	50
Hg	μg/L	< 0.20	< 0.20	< 0.20	< 0.20
K	mg/L	7	6	5	5
Mg	"	114	140	127	133
Mn	"	0.434	0.755	0.487	0.814
Na	"	47	82	40	73
Ni	"	< 0.005	0.006	< 0.005	0.008
Pb	"	< 0.02	< 0.02	< 0.02	< 0.02
Zn	"	< 0.01	< 0.01	< 0.01	0.05

TABLE 2 (Continued): ANALYSIS OF WATER FROM LYSIMETERS L-4N
AND L-6N AT THE LAWNDALE AVENUE SOLIDS MANAGEMENT
AREA SAMPLED DURING OCTOBER, NOVEMBER, AND DECEMBER 2013

Parameter	Unit	Date Sampled	
		12/04/13	
		L-4N	L-6N
pH ¹		8.0	7.8
EC	mS/m	265	297
Total Dissolved Solids	mg/L	3,080	3,708
Total Dissolved Organic Carbon	"	10	76
Cl ⁻	"	24	76
SO ₄ ⁼	"	1,426	1,395
Alkalinity as CaCO ₃	"	675	1,096
TKN	"	6	18
NH ₃ -N	"	5	12
NO ₂ + NO ₃ -N	"	0.48	0.38
Total P	"	< 0.20	< 0.20
Al	"	< 1.0	< 1.0
Ca	"	500	579
Cd	"	< 0.001	< 0.001
Cr	"	< 0.005	< 0.005
Cu	"	< 0.005	< 0.005
Fe	"	7	53
Hg	μg/L	< 0.20	< 0.20
K	mg/L	7	4
Mg	"	125	137
Mn	"	0.509	0.802
Na	"	45	83
Ni	"	< 0.005	0.006
Pb	"	< 0.02	< 0.02
Zn	"	< 0.01	0.03

¹pH analyzed beyond recommended holding time of 15 minutes.

TABLE 3: ANALYSIS OF WATER FROM LYSIMETERS L-1N
THROUGH L-9N AT THE LAWNSDALE AVENUE SOLIDS MANAGEMENT
AREA SAMPLED ON NOVEMBER 6, 2013

Parameter	Unit	Lysimeter No.			
		L-1N	L-2N	L-3N	L-5N
pH ¹		8.1	8.1	7.9	7.9
EC	mS/m	140	181	168	406
Total Dissolved Solids	mg/L	1,526	1,448	1,800	4,296
Total Dissolved Organic Carbon	"	4	4	25	3
Cl ⁻	"	14	301	135	699
SO ₄ ⁼	"	675	337	202	1,610
Alkalinity as CaCO ₃	"	405	377	1,194	485
TKN	"	4	< 1	4	4
NH ₃ -N	"	2	< 0.1	1	1
NO ₂ + NO ₃ -N	"	< 0.15	2.0	< 0.15	0.71
Total P	"	< 0.20	< 0.20	0.25	< 0.20
Al	"	< 1.0	< 1.0	< 1.0	< 1.0
Ca	"	167	140	287	417
Cd	"	< 0.001	< 0.001	< 0.001	< 0.001
Cr	"	< 0.005	< 0.005	< 0.005	< 0.005
Cu	"	< 0.005	< 0.005	< 0.005	< 0.005
Fe	"	2	< 0.1	8	0.2
Hg	μg/L	< 0.20	< 0.20	< 0.20	< 0.20
K	mg/L	8	< 1	3	17
Mg	"	118	62	124	210
Mn	"	0.034	0.109	0.496	0.256
Na	"	53	174	77	271
Ni	"	< 0.005	0.009	< 0.005	0.041
Pb	"	< 0.02	< 0.02	< 0.02	< 0.02
Zn	"	< 0.01	0.02	< 0.01	0.02

TABLE 3 (Continued): ANALYSIS OF WATER FROM LYSIMETERS L-1N THROUGH L-9N AT THE LAWDALE AVENUE SOLIDS MANAGEMENT AREA SAMPLED ON NOVEMBER 6, 2013

Parameter	Unit	Lysimeter No.		
		L-7N	L-8N	L-9N
pH ¹		8.3	8.2	8.0
EC	mS/m	135	225	207
Total Dissolved Solids	mg/L	1,064	1,682	2,042
Total Dissolved Organic Carbon	"	8	3	26
Cl ⁻	"	246	558	312
SO ₄ ⁼	"	31	197	194
Alkalinity as CaCO ₃	"	489	323	1,030
TKN	"	2	2	3
NH ₃ -N	"	< 0.1	0.4	0.4
NO ₂ + NO ₃ -N	"	1.1	0.23	0.29
Total P	"	< 0.20	< 0.20	< 0.20
Al	"	< 1.0	< 1.0	< 1.0
Ca	"	94	130	250
Cd	"	< 0.001	< 0.001	< 0.001
Cr	"	< 0.005	< 0.005	< 0.005
Cu	"	< 0.005	< 0.005	< 0.005
Fe	"	< 0.1	0.3	5
Hg	μg/L	< 0.20	< 0.20	< 0.20
K	mg/L	5	7	5
Mg	"	92	55	169
Mn	"	0.066	0.197	0.559
Na	"	81	215	87
Ni	"	< 0.005	< 0.005	< 0.005
Pb	"	< 0.02	< 0.02	< 0.02
Zn	"	< 0.01	< 0.01	0.03

¹pH analyzed beyond recommended holding time of 15 minutes.

TABLE 4: ANALYSIS OF MONTHLY COMPOSITED BIOSOLIDS
 PLACED IN THE LAWNSDALE AVENUE SOLIDS MANAGEMENT DRYING AREA
 DURING OCTOBER 2013

Parameter	Unit	Concentration ¹
pH		7.1
Total Solids	%	9.4
Total Volatile Solids ²	"	44.6

¹Values are the means of nine 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 NOVEMBER 2013

Parameter	Unit	Concentration ¹
pH		7.3
Total Solids	%	9.9
Total Volatile Solids ²	"	45.6

¹Values are the means of 14 samples.

²Total volatile solids as a percentage of total solids.

TABLE 6: ANALYSIS OF MONTHLY COMPOSITED PROCESSED DIGESTED BIOSOLIDS REMOVED FROM THE LAWNSDALE AVENUE SOLIDS MANAGEMENT DRYING AREA DURING OCTOBER 2013

Parameter	Unit	Concentration ¹
pH		7.2
Total Solids	%	32.9
Total Volatile Solids ²	"	41.9
TKN	mg/kg	32,620
NH ₃ -N	"	4,059
Total P	"	21,385
Al	"	18,657
Ca	"	42,326
Cd	"	3
Cr	"	148
Cu	"	436
Fe	"	18,194
Hg	"	1.1
K	"	3,442
Mg	"	19,247
Mn	"	526
Na	"	1,578
Ni	"	45
Pb	"	117
Zn	"	871

¹Values are the means of seven 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 NOVEMBER 2013

Parameter	Unit	Concentration ¹
pH		7.3
Total Solids	%	37.2
Total Volatile Solids ²	"	34.4
TKN	mg/kg	29,668
NH ₃ -N	"	3,123
Total P	"	16,674
Al	"	15,222
Ca	"	59,817
Cd	"	2
Cr	"	112
Cu	"	350
Fe	"	14,494
Hg	"	0.77
K	"	2,725
Mg	"	30,949
Mn	"	412
Na	"	1,166
Ni	"	34
Pb	"	88
Zn	"	633

¹Values are the means of three 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 DECEMBER 2013

Parameter	Unit	Concentration ¹
pH		7.3
Total Solids	%	39.1
Total Volatile Solids ²	"	38.7
TKN	mg/kg	24,037
NH ₃ -N	"	3,218
Total P	"	19,660
Al	"	19,655
Ca	"	45,359
Cd	"	5
Cr	"	144
Cu	"	457
Fe	"	18,179
Hg	"	1.1
K	"	3,921
Mg	"	23,157
Mn	"	433
Na	"	1,662
Ni	"	45
Pb	"	127
Zn	"	865

¹Values are the means of two samples.

²Total volatile solids as a percentage of total solids.