

Protecting Our Water Environment



Metropolitan Water Reclamation District of Greater Chicago

***MONITORING AND RESEARCH
DEPARTMENT***

REPORT NO. 12-10

LAWNDALE AVENUE SOLIDS MANAGEMENT AREA

MONITORING REPORT FOR

FOURTH QUARTER 2011

FEBRUARY 2012

Protecting Our Water Environment

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February 22, 2012

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 2011

The attached nine tables contain the monitoring data for the Lawndale Avenue Solids Management Area for October, November, and December 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 October 26, 2011

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 2011

Table 3, Analysis of Water from Lysimeters L-1N Through L-9N at the Lawndale Avenue Solids Management Area Sampled on October 19, 2011

Table 4, Analysis of Monthly Compositing Biosolids Placed in the Lawndale Avenue Solids Management Drying Area During October 2011

Table 5, Analysis of Monthly Compositing Biosolids Placed in the Lawndale Avenue Solids Management Drying Area During November 2011

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 2011

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

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

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

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

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

Very truly yours,

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

TCG:PL:cm

Attachments

cc w/att: R. 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 OCTOBER 26, 2011

Parameter	Unit	Monitoring Well No.		
		M-11	M-12	M-13
pH ¹		7.5	7.6	8.0
EC	mS/m	31	39	76
Total Dissolved Solids	mg/L	674	874	1,294
Total Dissolved Organic Carbon	"	< 1	< 1	2
Cl ⁻	"	12	15	< 10
SO ₄ ⁼	"	188	350	597
TKN	"	1	< 0.5	< 0.5
NH ₃ -N	"	1	0.3	0.4
NO ₂ + NO ₃ -N	"	< 0.04	< 0.04	< 0.04
Total P	"	< 0.10	< 0.10	< 0.10
Alkalinity as CaCO ₃	"	349	302	324
Al	"	< 1.0	< 1.0	< 1.0
As	"	< 0.02	< 0.02	< 0.02
Ca	"	93	82	168
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	11
Mg	"	43.6	38.0	78.9
Mn	"	0.017	0.004	0.010
Na	"	57	138	91
Ni	"	< 0.008	< 0.008	< 0.008
Pb	"	< 0.03	< 0.03	< 0.03
Se	"	< 0.03	< 0.03	< 0.03
Zn	"	0.81	0.76	0.25
Fecal coliform	MPN ²	< 1	< 1	< 1
Static H ₂ O Elev.	ft	628	632	629

TABLE 1 (Continued): ANALYSIS OF WATER FROM MONITORING WELLS M-11 THROUGH M-15 AT THE LAWNDALE AVENUE SOLIDS MANAGEMENT AREA SAMPLED ON OCTOBER 26, 2011

Parameter	Unit	Monitoring Well No.	
		M-14	M-15
pH ¹		7.6	7.3
EC	mS/m	22	90
Total Dissolved Solids	mg/L	540	1,648
Total Dissolved Organic Carbon	"	< 1	2
Cl ⁻	"	< 10	< 10
SO ₄ ⁼	"	123	730
TKN	"	< 0.5	< 0.5
NH ₃ -N	"	0.3	0.5
NO ₂ + NO ₃ -N	"	< 0.04	0.05
Total P	"	0.38	< 0.10
Alkalinity as CaCO ₃	"	323	358
Al	"	< 1.0	< 1.0
As	"	< 0.02	< 0.02
Ca	"	74	239
Cd	"	< 0.001	< 0.001
Cr	"	< 0.003	< 0.003
Cu	"	< 0.005	< 0.005
Fe	"	< 0.2	1
Hg	μg/L	< 0.20	< 0.20
K	mg/L	8	11
Mg	"	40.6	107
Mn	"	0.004	0.029
Na	"	44	64
Ni	"	< 0.008	< 0.008
Pb	"	< 0.03	< 0.03
Se	"	< 0.03	< 0.03
Zn	"	0.80	1.7
Fecal coliform	MPN ²	< 1	< 1
Static H ₂ O Elev.	ft	623	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 LAWNDALE AVENUE SOLIDS MANAGEMENT
AREA SAMPLED DURING OCTOBER, NOVEMBER, AND DECEMBER 2011

Parameter	Unit	Date Sampled			
		10/19/11		11/09/11	
		L-4N	L-6N	L-4N	L-6N
pH ¹		7.9	7.9	8.3	7.9
EC	mS/m	266	325	NRR ²	264
Total Dissolved Solids	mg/L	2,668	3,628	NRR ²	3,726
Total Dissolved Organic Carbon	"	5	69	4	66
Cl ⁻	"	18	88	29	11
SO ₄ ⁼	"	1,617	1,332	NRR ²	1,362
TKN	"	3	14	3	17
NH ₃ -N	"	3	11	4	12
NO ₂ + NO ₃ -N	"	0.53	0.16	0.24	0.07
Total P	"	< 0.10	< 0.10	< 0.10	0.11
Alkalinity as CaCO ₃	"	593	957	275	824
Al	"	< 1.0	< 1.0	< 1.0	< 1.0
As	"	< 0.02	< 0.02	< 0.02	< 0.02
Ca	"	569	729	184	747
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	42	3	52
Hg	μg/L	< 0.20	< 0.20	< 0.20	< 0.20
K	mg/L	5	5	3	5
Mg	"	105	146	40.3	146
Mn	"	0.567	0.858	0.174	0.906
Na	"	54	84	29	78
Ni	"	< 0.008	< 0.008	< 0.008	0.010
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	0.07

TABLE 2 (Continued): ANALYSIS OF WATER FROM LYSIMETERS L-4N
AND L-6N AT THE LAWNSDALE AVENUE SOLIDS MANAGEMENT
AREA SAMPLED DURING OCTOBER, NOVEMBER, AND DECEMBER 2011

Parameter	Unit	Date Sampled	
		L-4N	L-6N
		12/07/11	
		L-4N	L-6N
pH ¹		8.1	8.0
EC	mS/m	270	277
Total Dissolved Solids	mg/L	2,708	3,660
Total Dissolved Organic Carbon	"	3	64
Cl ⁻	"	< 10	66
SO ₄ ⁼	"	1,292	1,399
TKN	"	3	13
NH ₃ -N	"	3	12
NO ₂ + NO ₃ -N	"	0.58	0.07
Total P	"	0.74	0.12
Alkalinity as CaCO ₃	"	559	924
Al	"	< 1.0	< 1.0
As	"	< 0.02	< 0.02
Ca	"	572	751
Cd	"	< 0.001	< 0.001
Cr	"	< 0.003	< 0.003
Cu	"	< 0.005	< 0.005
Fe	"	7	42
Hg	μg/L	< 0.20	< 0.20
K	mg/L	5	5
Mg	"	101	149
Mn	"	0.535	0.874
Na	"	57	79
Ni	"	< 0.008	< 0.008
Pb	"	< 0.03	< 0.03
Se	"	< 0.03	< 0.03
Zn	"	< 0.02	0.04

¹pH analyzed beyond recommended holding time of 15 minutes.

²No reportable result.

TABLE 3: ANALYSIS OF WATER FROM LYSIMETERS L-1N
THROUGH L-9N AT THE LAWNDALE AVENUE SOLIDS MANAGEMENT
AREA SAMPLED ON OCTOBER 19, 2011

Parameter	Unit	Lysimeter No.			
		L-1N	L-2N	L-3N	L-5N
pH ¹		8.3	8.3	8.0	7.9
EC	mS/m	178	223	219	622
Total Dissolved Solids	mg/L	1,472	1,612	1,944	4,832
Total Dissolved Organic Carbon	"	5	4	25	3
Cl ⁻	"	37	345	138	782
SO ₄ ⁼	"	619	299	236	1,171
TKN	"	3	0.6	3	2
NH ₃ -N	"	3	0.2	1	2
NO ₂ + NO ₃ -N	"	0.13	3.4	0.23	0.35
Total P	"	< 0.10	< 0.10	< 0.10	< 0.10
Alkalinity as CaCO ₃	"	417	413	1,155	515
Al	"	< 1.0	< 1.0	< 1.0	< 1.0
As	"	< 0.02	< 0.02	< 0.02	< 0.02
Ca	"	194	177	363	561
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	"	0.6	< 0.2	8	10
Hg	μg/L	< 0.20	< 0.20	< 0.20	< 0.20
K	mg/L	10	2	2	16
Mg	"	109	73.3	139	241
Mn	"	0.054	0.142	0.680	0.284
Na	"	60	205	81	425
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 OCTOBER 19, 2011

Parameter	Unit	Lysimeter No.		
		L-7N-1	L-8N	L-9N
pH ¹		8.6	8.4	8.1
EC	mS/m	119	249	259
Total Dissolved Solids	mg/L	NA ²	1,656	2,156
Total Dissolved Organic Carbon	"	9	3	25
Cl ⁻	"	106	487	277
SO ₄ ⁼	"	28	188	217
TKN	"	< 0.5	3	2
NH ₃ -N	"	0.9	2	0.4
NO ₂ + NO ₃ -N	"	0.14	0.19	0.42
Total P	"	< 0.10	< 0.10	< 0.10
Alkalinity as CaCO ₃	"	475	380	969
Al	"	< 1.0	< 1.0	< 1.0
As	"	< 0.02	< 0.02	< 0.02
Ca	"	65	154	280
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	3
Hg	μg/L	NA ²	< 0.20	< 0.20
K	mg/L	9	6	5
Mg	"	85.1	65.0	161
Mn	"	0.081	0.226	1.16
Na	"	47	265	117
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.

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

Parameter	Unit	Concentration ¹
pH		7.3
Total Solids	%	9.2
Total Volatile Solids ²	”	48.5

¹Values are the means of 18 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 2011

Parameter	Unit	Concentration ¹
pH		7.5
Total Solids	%	8.9
Total Volatile Solids ²	"	46.7

¹Values are the means of 14 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 DECEMBER 2011

Parameter	Unit	Concentration ¹
pH		7.5
Total Solids	%	12.7
Total Volatile Solids ²	”	49.2

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 OCTOBER 2011

Parameter	Unit	Concentration ¹
pH		7.4
Total Solids	%	57.7
Total Volatile Solids ²	"	38.7
TKN	mg/kg	24,777
NH ₃ -N	"	4,423
Total P	"	19,864
Al	"	16,500
Ca	"	45,188
Cd	"	3
Cr	"	138
Cu	"	410
Fe	"	16,315
Hg	"	1.0
K	"	2,553
Mg	"	22,703
Mn	"	529
Na	"	1,083
Ni	"	39
Pb	"	104
Zn	"	791

¹Values are the means of 16 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 NOVEMBER 2011

Parameter	Unit	Concentration ¹
pH		7.3
Total Solids	%	48.4
Total Volatile Solids ²	"	35.4
TKN	mg/kg	25,128
NH ₃ -N	"	4,448
Total P	"	18,608
Al	"	15,743
Ca	"	52,625
Cd	"	4
Cr	"	141
Cu	"	359
Fe	"	15,328
Hg	"	0.91
K	"	2,324
Mg	"	28,407
Mn	"	475
Na	"	782
Ni	"	36
Pb	"	104
Zn	"	711

¹Values are the means of 13 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 DECEMBER 2011

Parameter	Unit	Concentration ¹
pH		7.7
Total Solids	%	32.2
Total Volatile Solids ²	"	42.0
TKN	mg/kg	26,431
NH ₃ -N	"	6,153
Total P	"	21,052
Al	"	20,542
Ca	"	37,848
Cd	"	3
Cr	"	147
Cu	"	405
Fe	"	16,679
Hg	"	0.90
K	"	3,128
Mg	"	18,469
Mn	"	573
Na	"	1,061
Ni	"	39
Pb	"	107
Zn	"	809

¹Values are the means of three samples.

²Total volatile solids as a percentage of total solids.