Metropolitan Water Reclamation District of Greater Chicago

RESEARCH AND DEVELOPMENT DEPARTMENT

REPORT NO. 06-33

LAWNDALE AVENUE SOLIDS MANAGEMENT AREA

MONITORING DATA FOR

FIRST QUARTER 2006

May 2006

May 31, 2006

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 Data for January, February, and March 2006

The attached four tables contain the monitoring data for the Lawndale Avenue Solids Management Area for January, February, and March 2006 as required by IEPA Operating Permit No. 2005-AO-4283.

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 January 25, 2006

Table 2, Analysis of Water from Lysimeters L-1 through L-9N at the Lawndale Avenue Solids Management Area Sampled on January 4, 2006

Table 3, Analysis of Water from Lysimeters L-1 through L-9N at the Lawndale Avenue Solids Management Area Sampled on February 2, 2006

Table 4, Analysis of Water from Lysimeters L-1 through L-9N at the Lawndale Avenue Solids Management Area Sampled on March 1, 2006

Subject: Lawndale Avenue Solids Management Area - Stickney WRP, Contract No. 80-159-2P, IEPA Permit No. 2005-AO-4283, Monitoring Data for January, February, and March 2006

No biosolids were placed in or removed from the solids drying area during the period of January to March.

Very truly yours,

Richard Lanyon
Director
Research and Development

RL:PL:spy
Enclosure
cc w/enc: Records Unit (IEPA)
Sulski (IEPA)

cc via MWRDGC Web Site:
Levy/Sharma
Kollias/Granato
O'Connor/Cox
Lindo/Patel, M.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 1

ANALYSIS OF WATER FROM MONITORING WELLS M-11 THROUGH M-15
AT THE LAWNDALE AVENUE SOLIDS MANAGEMENT AREA
SAMPLED ON JANUARY 25, 2006

		Monitoring Well No.				
Parameter	Unit	W-11	W-12	W-13	W-14	W-15
pH[1]		7.2	7.0	7.0	7.1	7.0
EC	mS/m	47	67	52	53	61
Total Dissolved Solids	mg/L	742	982	1,436	536	1,660
Total Dissolved Organic Carbon	”	1	1	1	0.9	2
Cl^-	”	0.5	0.7	0.4	0.5	0.6
$SO_4^=$	”	182	952	2,744	120	3,607
TKN	”	0.94	0.35	0.56	0.33	0.58
NH_3-N	”	0.81	0.31	0.38	0.21	0.47
$NO_2 + NO_3$-N	”	0.13	0.04	0.03	0.03	0.04
Total P	”	<0.04	<0.04	<0.04	<0.04	<0.04
Alkalinity as $CaCO_3$	”	350	299	322	318	348
Al	”	<0.06	<0.06	<0.06	<0.06	<0.06
As	”	<0.002	<0.002	<0.002	<0.002	<0.002
B	”	1.18	1.55	1.32	1.17	1.03
Ca	”	91	77	165	72	234
Cd	”	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Cr	”	<0.0007	<0.0007	<0.0007	0.0010	<0.0007
Cu	”	<0.002	<0.002	<0.002	<0.002	<0.002
Fe	”	0.602	0.014	0.030	0.025	1.02
Hg	μg/L	<0.05	<0.05	<0.05	<0.05	<0.05
K	mg/L	8.7	9.8	10	8.2	10
Mg	”	44.0	36.6	79.0	40.8	107
Mn	”	0.0422	0.0120	0.0128	0.0063	0.0205
Na	”	57	136	91	43	63
Ni	”	<0.002	<0.002	<0.002	<0.002	<0.002
Pb	”	0.0040	0.0010	<0.0009	0.0020	0.0010
Se	”	<0.002	<0.002	<0.002	<0.002	<0.002
Zn	”	0.704	0.314	0.409	0.622	1.52
Fecal Coliform	#/100mL	<1	<1	<1	<1	<1
Static H_2O Elev.	ft	580	578	582	585	NR

[1]pH analyzed beyond recommended holding time of 15 minutes.
NR = No reportable result.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 2

ANALYSIS OF WATER FROM LYSIMETERS L-1 THROUGH L-9N
AT THE LAWNDALE AVENUE SOLIDS MANAGEMENT AREA
SAMPLED ON JANUARY 4, 2006

		Lysimeter No.				
Parameter	Unit	L-1	L-2	L-3	L-3N[2]	L-4
pH[1]		7.5	7.9	7.8		7.2
EC	mS/m	160	294	131		373
Total Dissolved Solids	mg/L	1,330	2,304	916		4,266
Total Dissolved Organic Carbon	”	8	2	6		17
Cl^-	”	53	551	193		69
$SO_4^=$	”	500	545	155		1,776
TKN	”	5.1	0.60	3.9		16
NH_3-N	”	4.4	<0.04	3.1		12
$NO_2 + NO_3$-N	”	0.02	0.04	<0.02		0.04
Total P	”	<0.05	<0.10	1.5		0.73
Alkalinity as $CaCO_3$	”	493	386	334		982
Al	”	<0.06	<0.12	<0.06		<0.06
As	”	<0.002	<0.004	<0.002		<0.002
B	”	0.387	0.154	0.188		0.131
Ca	”	211	238	117		602
Cd	”	<0.0003	0.0006	0.0004		0.0005
Cr	”	<0.0007	<0.0014	<0.0007		<0.0007
Cu	”	<0.002	<0.004	<0.002		<0.002
Fe	”	5.40	0.018	1.77		22.2
Hg	μg/L	<0.05	<0.10	<0.05		0.05
K	mg/L	5.8	2.7	2.9		8.7
Mg	”	91.1	106	50.6		329
Mn	”	0.0699	0.0090	0.0810		0.8016
Na	”	49	259	93		26
Ni	”	<0.002	<0.004	<0.002		<0.002
Pb	”	<0.0009	<0.0018	0.0020		<0.0009
Se	”	<0.002	<0.004	<0.002		<0.002
Zn	”	0.004	0.020	0.010		0.006

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 2 (Continued)

ANALYSIS OF WATER FROM LYSIMETERS L-1 THROUGH L-9N
AT THE LAWNDALE AVENUE SOLIDS MANAGEMENT AREA
SAMPLED ON JANUARY 4, 2006

		Lysimeter No.				
Parameter	Unit	L-4N[2]	L-5	L-5N[2]	L-6	L-6N[3]
pH[1]			7.7			
EC	mS/m		158		|	|
Total Dissolved Solids	mg/L		1,366		|	|
Total Dissolved Organic Carbon	,,		0.6		|	|
Cl^-	,,		49		|	|
$SO_4^=$	,,		571		|	|
					|	|
TKN	,,		0.15		|	
NH_3-N	,,		<0.02		|	L
$NO_2 + NO_3$-N	,,		0.05			Y
Total P	,,		<0.05		L	S
Alkalinity as $CaCO_3$	,,		273		Y	I
					S	M
Al	,,		<0.06		I	E
As	,,		<0.002		M	T
B	,,		0.649		E	E
Ca	,,		160		T	R
Cd	,,		0.0005		E	
					R	F
Cr	,,		<0.0007			R
Cu	,,		<0.002		D	O
Fe	,,		0.020		R	Z
Hg	μg/L		<0.05		Y	E
K	mg/L		3.2			N
					|	
Mg	,,		108		|	|
Mn	,,		0.0082		|	|
Na	,,		43		|	|
Ni	,,		<0.002		|	|
Pb	,,		<0.0009		|	|
					|	|
Se	,,		<0.002		|	|
Zn	,,		0.009			

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 2 (Continued)

ANALYSIS OF WATER FROM LYSIMETERS L-1 THROUGH L-9N
AT THE LAWNDALE AVENUE SOLIDS MANAGEMENT AREA
SAMPLED ON JANUARY 4, 2006

		Lysimeter No.		
Parameter	Unit	L-7N[3]	L-8N[3]	L-9N
pH[1]		8.1	8.0	7.8
EC	mS/m	117	225	250
Total Dissolved Solids	mg/L	796	1,448	1,876
Total Dissolved Organic Carbon	”	NA	4	25
Cl^-	”	120	454	157
$SO_4^=$	”	NA	196	297
TKN	”	1.8	1.6	2.9
NH_3-N	”	0.60	0.56	0.98
$NO_2 + NO_3$-N	”	0.12	0.12	0.11
Total P	”	<0.10	<0.10	<0.10
Alkalinity as $CaCO_3$	”	342	350	1,112
Al	”	<0.12	<0.12	<0.12
As	”	<0.004	<0.004	<0.004
B	”	0.282	0.180	0.222
Ca	”	94	129	164
Cd	”	<0.0006	<0.0006	<0.0006
Cr	”	<0.0014	<0.0014	<0.0014
Cu	”	0.008	0.006	<0.004
Fe	”	0.074	0.044	6.43
Hg	μg/L	<0.10	<0.10	<0.10
K	mg/L	9.9	5.7	6.3
Mg	”	69.9	63.1	91.2
Mn	”	0.0302	0.0902	0.1192
Na	”	54	233	337
Ni	”	0.004	<0.004	<0.004
Pb	”	<0.0018	0.0020	0.0040
Se	”	<0.004	<0.004	<0.004
Zn	”	0.032	0.032	0.018

[1]pH analyzed beyond recommended holding time of 15 minutes.
[2]Lysimeter installed in December 2005; final testing pending.
[3]Lysimeter installed in May 2005.
NA = No analysis; insufficient sample.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 3

ANALYSIS OF WATER FROM LYSIMETERS L-1 THROUGH L-9N
AT THE LAWNDALE AVENUE SOLIDS MANAGEMENT AREA
SAMPLED ON FEBRUARY 2, 2006

		Lysimeter No.				
Parameter	Unit	L-1	L-2	L-3	L-3N[2]	L-4
pH[1]		7.5	7.8	7.8	7.9	7.5
EC	mS/m	170	164	131	199	373
Total Dissolved Solids	mg/L	1,372	NA	944	1,348	4,150
Total Dissolved Organic Carbon	”	7	2	6	17	17
Cl^-	”	47	573	185	140	63
$SO_4^=$	”	582	738	206	250	2,020
TKN	”	4.7	0.78	3.7	3.1	16
NH_3-N	”	4.2	<0.04	3.1	1.2	13
$NO_2 + NO_3$-N	”	0.11	0.34	0.04	0.10	0.06
Total P	”	<0.05	<0.10	1.3	<0.05	0.93
Alkalinity as $CaCO_3$	”	470	408	324	879	962
Al	”	0.34	0.53	0.26	0.36	0.30
As	”	<0.002	<0.004	<0.002	<0.002	<0.002
B	”	0.659	0.268	0.287	0.272	0.317
Ca	”	212	261	123	262	604
Cd	”	0.0018	0.0038	0.0014	0.0022	0.0022
Cr	”	<0.0007	0.0020	0.0010	0.0010	<0.0007
Cu	”	<0.002	<0.004	<0.002	<0.002	<0.002
Fe	”	4.39	0.054	1.94	0.399	10.1
Hg	μg/L	0.13	<0.10	0.06	<0.05	0.05
K	mg/L	5.4	2.7	2.7	3.6	8.6
Mg	”	88.7	116	52.4	108	316
Mn	”	0.0749	0.0028	0.1071	1.102	0.8532
Na	”	40	277	89	83	25
Ni	”	<0.002	<0.004	<0.002	<0.002	<0.002
Pb	”	<0.0009	<0.0018	0.0020	<0.0009	<0.0009
Se	”	<0.002	<0.004	<0.002	<0.002	<0.002
Zn	”	0.007	0.024	0.010	0.037	0.009

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 3 (Continued)

ANALYSIS OF WATER FROM LYSIMETERS L-1 THROUGH L-9N
AT THE LAWNDALE AVENUE SOLIDS MANAGEMENT AREA
SAMPLED ON FEBRUARY 2, 2006

		Lysimeter No.				
Parameter	Unit	L-4N[2]	L-5	L-5N[2]	L-6	L-6N[3]
pH[1]		7.9	7.9	7.9		
EC	mS/m	278	148	503		
Total Dissolved Solids	mg/L	2,564	1,410	4,904		
Total Dissolved Organic Carbon	,,	16	0.6	6		
Cl^-	,,	52	48	693		
$SO_4^=$	,,	1,168	635	1,600		
TKN	,,	15	0.98	3.5		
NH_3-N	,,	12	<0.02	1.9		
$NO_2 + NO_3$-N	,,	0.04	0.09	0.08		
Total P	,,	<0.05	<0.05	<0.05		
Alkalinity as $CaCO_3$	,,	837	268	494		
Al	,,	0.38	0.23	0.40		
As	,,	<0.002	<0.002	<0.002		
B	,,	0.262	1.03	0.587		
Ca	,,	443	160	539		
Cd	,,	0.0019	0.0015	0.0032		
Cr	,,	0.0010	<0.0007	<0.0007		
Cu	,,	<0.002	<0.002	<0.002		
Fe	,,	0.759	0.010	0.076		
Hg	μg/L	0.05	<0.05	0.06		
K	mg/L	8.4	3.1	42		
Mg	,,	198	102	317		
Mn	,,	1.019	0.0004	0.2055		
Na	,,	21	41	345		
Ni	,,	<0.002	<0.002	0.004		
Pb	,,	<0.0009	<0.0009	<0.0009		
Se	,,	<0.002	<0.002	<0.002		
Zn	,,	0.048	0.005	0.034		

LYSIMETER SAMPLE

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 3 (Continued)

ANALYSIS OF WATER FROM LYSIMETERS L-1 THROUGH L-9N
AT THE LAWNDALE AVENUE SOLIDS MANAGEMENT AREA
SAMPLED ON FEBRUARY 2, 2006

		Lysimeter No.		
Parameter	Unit	L-7N[3]	L-8N[3]	L-9N
pH[1]		8.3	8.0	8.0
EC	mS/m	93	227	243
Total Dissolved Solids	mg/L	1,324	1,622	1,578
Total Dissolved Organic Carbon	”	8	4	23
Cl^-	”	170	448	170
$SO_4^=$	”	369	241	347
TKN	”	1.5	1.3	2.6
NH_3-N	”	0.54	0.71	0.93
$NO_2 + NO_3$-N	”	0.23	0.16	0.11
Total P	”	<0.10	<0.05	<0.05
Alkalinity as $CaCO_3$	”	434	377	958
Al	”	0.60	0.34	0.37
As	”	<0.004	<0.002	<0.002
B	”	0.424	0.321	0.405
Ca	”	142	136	156
Cd	”	0.0022	0.0015	0.0019
Cr	”	<0.0014	0.0010	0.0010
Cu	”	<0.004	<0.002	<0.002
Fe	”	0.030	0.040	0.120
Hg	μg/L	<0.10	0.20	0.05
K	mg/L	12	6.2	6.6
Mg	”	89.4	65.5	86.3
Mn	”	0.0698	0.1262	0.1291
Na	”	76	234	335
Ni	”	0.004	<0.002	0.002
Pb	”	0.0020	<0.0009	<0.0009
Se	”	<0.004	<0.002	<0.002
Zn	”	0.016	0.029	0.014

[1]pH analyzed beyond recommended holding time of 15 minutes.
[2]Lysimeter installed in December 2005.
[3]Lysimeter installed in May 2005.
NA = No analysis; insufficient sample.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 4

ANALYSIS OF WATER FROM LYSIMETERS L-1 THROUGH L-9N
AT THE LAWNDALE AVENUE SOLIDS MANAGEMENT AREA
SAMPLED ON MARCH 1, 2006

		Lysimeter No.				
Parameter	Unit	L-1	L-2	L-3	L-3N[2]	L-4
pH[1]		7.5	7.9	7.9	7.8	7.2
EC	mS/m	158	283	142	222	352
Total Dissolved Solids	mg/L	1,426	NA	992	1,588	4,098
Total Dissolved Organic Carbon	”	7	NA	6	16	17
Cl^-	”	55	530	185	185	60
$SO_4^=$	”	619	NA	169	266	1,050
TKN	”	5.5	0.90	4.0	3.3	17
NH_3-N	”	4.2	<0.04	2.8	1.2	12
$NO_2 + NO_3$-N	”	0.02	0.30	<0.02	0.08	0.02
Total P	”	<0.05	<0.10	1.4	<0.05	0.80
Alkalinity as $CaCO_3$	”	468	402	383	383	988
Al	”	<0.06	<0.12	<0.06	<0.06	<0.06
As	”	<0.002	<0.004	<0.002	<0.002	<0.002
B	”	0.548	0.262	0.238	0.259	0.206
Ca	”	232	261	135	312	659
Cd	”	0.0005	0.0006	0.0004	0.0009	0.0003
Cr	”	0.0020	0.0040	0.0020	0.0030	0.0020
Cu	”	<0.002	<0.004	<0.002	<0.002	<0.002
Fe	”	5.38	0.032	2.02	0.174	23.8
Hg	μg/L	<0.05	<0.10	<0.05	0.06	<0.05
K	mg/L	6.2	4.0	2.9	3.2	8.9
Mg	”	99.7	120	57.2	145	328
Mn	”	0.0754	0.0596	0.1628	0.7807	0.9482
Na	”	48	268	93	85	26
Ni	”	<0.002	<0.004	<0.002	<0.002	<0.002
Pb	”	0.0080	0.0200	0.0100	0.0120	0.0060
Se	”	<0.002	<0.004	<0.002	<0.002	<0.002
Zn	”	0.005	0.010	0.008	0.023	0.006

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 4 (Continued)

ANALYSIS OF WATER FROM LYSIMETERS L-1 THROUGH L-9N
AT THE LAWNDALE AVENUE SOLIDS MANAGEMENT AREA
SAMPLED ON MARCH 1, 2006

		Lysimeter No.				
Parameter	Unit	L-4N[2]	L-5	L-5N[2]	L-6	L-6N[3]
pH[1]		7.7	7.8	7.8		
EC	mS/m	300	151	455		
Total Dissolved Solids	mg/L	2,940	1,332	4,870		
Total Dissolved Organic Carbon	,,	16	0.5	5		
Cl^-	,,	64	49	669		
$SO_4^=$	,,	721	729	1,104		
TKN	,,	18	0.34	3.8		
NH_3-N	,,	13	0.02	2.0		
$NO_2 + NO_3$-N	,,	0.02	0.05	0.16		
Total P	,,	<0.05	<0.05	0.05		
Alkalinity as $CaCO_3$	,,	901	268	425		
Al	,,	<0.06	<0.06	<0.06		
As	,,	<0.002	<0.002	<0.002		
B	,,	0.216	0.847	0.460		
Ca	,,	519	169	528		
Cd	,,	0.0006	0.0004	0.0008		
Cr	,,	0.0030	0.0020	0.0020		
Cu	,,	<0.002	<0.002	<0.002		
Fe	,,	0.734	0.009	0.085		
Hg	μg/L	<0.05	<0.05	<0.05		
K	mg/L	9.1	3.3	41		
Mg	,,	245	109	345		
Mn	,,	0.9833	0.0053	0.1237		
Na	,,	30	44	347		
Ni	,,	<0.002	<0.002	<0.002		
Pb	,,	0.0070	0.0090	0.0060		
Se	,,	<0.002	<0.002	<0.002		
Zn	,,	0.024	0.006	0.021		

LYSIMETER DATA

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 4 (Continued)

ANALYSIS OF WATER FROM LYSIMETERS L-1 THROUGH L-9N
AT THE LAWNDALE AVENUE SOLIDS MANAGEMENT AREA
SAMPLED ON MARCH 1, 2006

		Lysimeter No.		
Parameter	Unit	L-7N[3]	L-8N[3]	L-9N
pH[1]		8.2	8.0	7.9
EC	mS/m	130	219	255
Total Dissolved Solids	mg/L	1,040	1,632	1,872
Total Dissolved Organic Carbon	”	8	4	26
Cl^-	”	155	460	151
$SO_4^=$	”	191	249	317
TKN	”	1.7	2.1	3.3
NH_3-N	”	0.34	0.73	1.2
$NO_2 + NO_3$-N	”	0.22	0.11	0.28
Total P	”	0.16	<0.05	0.06
Alkalinity as $CaCO_3$	”	412	383	1,097
Al	”	<0.12	<0.06	<0.06
As	”	<0.004	<0.002	<0.002
B	”	0.324	0.229	0.366
Ca	”	133	158	172
Cd	”	<0.0006	0.0005	0.0005
Cr	”	0.0040	0.0020	0.0030
Cu	”	<0.004	<0.002	<0.002
Fe	”	0.026	0.041	5.37
Hg	μg/L	<0.10	<0.05	<0.05
K	mg/L	10	6.2	6.5
Mg	”	79.0	72.7	96.8
Mn	”	0.1290	0.1743	0.1373
Na	”	68	255	346
Ni	”	<0.004	<0.002	<0.002
Pb	”	0.0140	0.0120	0.0110
Se	”	<0.004	<0.002	<0.002
Zn	”	0.008	0.012	0.017

[1]pH analyzed beyond recommended holding time of 15 minutes.
[2]Lysimeter installed in December 2005.
[3]Lysimeter installed in May 2005.
NA = No analysis; insufficient sample.