

*Protecting Our Water Environment*



*Metropolitan Water Reclamation District of Greater Chicago*

***RESEARCH AND DEVELOPMENT  
DEPARTMENT***

**REPORT NO. 06-34**

**HARLEM 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: Harlem Avenue Solids Management Area - Stickney WRP, Contract No. 84-111-2P, IEPA Permit No. 2004-AO-2591, Monitoring Data for January, February, and March 2006

The attached nine tables contain the monitoring data for the Harlem Avenue Solids Management Area for January, February, and March 2006 as required by IEPA Operating Permit No. 2004-AO-2591.

The data reported are as follows:

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

Table 2, Analysis of Water from Lysimeters L-1N through L-1N-1 at the Harlem Avenue Solids Management Area Sampled on January 18, 2006

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

Table 4, Analysis of Water from Lysimeters L-1N through L-1N-1 at the Harlem Avenue Solids Management Area Sampled on February 15, 2006

Table 5, Analysis of Water from Lysimeters L-1N through L-1N-1 at the Harlem Avenue Solids Management Area Sampled on March 1, 2006

Table 6, Analysis of Water from Lysimeters L-1N through L-1N-1 at the Harlem Avenue Solids Management Area Sampled on March 15, 2006

Subject: Harlem Avenue Solids Management Area - Stickney WRP, Contract No. 84-111-2P, IEPA Permit No. 2004-AO-2591, Monitoring Data for January, February, and March 2006

Table 7, Analysis of Monthly Compositated Digested Biosolids Placed in the Harlem Avenue Solids Management Drying Area During January 2006

Table 8, Analysis of Monthly Compositated Digested Biosolids Placed in the Harlem Avenue Solids Management Drying Area During February 2006

Table 9, Analysis of Monthly Compositated Digested Biosolids Placed in the Harlem Avenue Solids Management Drying Area During March 2006

During the earlier months of the quarter, sampling of lysimeter L-1N-1 failed due to a minor malfunction of the device. The problem was corrected and samples were obtained later in the quarter. Biosolids were placed in the solids drying area during January, February, and March. However, no biosolids were removed from the area during this quarter.

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 LYSIMETERS L-1N THROUGH L-1N-1  
 AT THE HARLEM AVENUE SOLIDS MANAGEMENT AREA  
 SAMPLED ON JANUARY 4, 2006

Parameter	Unit	Lysimeter No.				
		L-1N	L-1	L-2	L-3	L-1N-1
pH <sup>1</sup>			7.3	7.4	7.4	7.5
EC	mS/m		415	168	240	191
Total Dissolved Solids	mg/L		3,536	1,304	6,336	NA
Total Dissolved Organic Carbon	"		53	4	7	NA
Cl <sup>-</sup>	"		104	193	96	NA
SO <sub>4</sub> <sup>=</sup>	"		1,671	266	242	NA
		L				
TKN	"	Y	98	4.9	0.74	NA
NH <sub>3</sub> -N	"	S	96	3.9	<0.02	NA
NO <sub>2</sub> + NO <sub>3</sub> -N	"	I	30	1.3	0.19	NA
Total P	"	M	<0.05	<0.05	<0.05	NA
Alkalinity as CaCO <sub>3</sub>	"	E	827	455	1,208	NA
		T				
Al	"	E	<0.06	<0.06	<0.06	NA
Ca	"	R	467	215	329	NA
Cd	"		<0.0003	0.0004	0.0004	NA
Cr	"	F	0.0010	<0.0007	<0.0007	NA
Cu	"	R	0.003	<0.002	<0.002	NA
		O				
Fe	"	Z	0.041	0.009	0.009	NA
Hg	μg/L	E	<0.05	<0.05	<0.05	NA
K	mg/L	N	20	1.1	1.2	NA
Mg	"		256	59.0	153	NA
Mn	"		0.6190	0.0284	0.0870	NA
Na	"		71	76	34	NA
Ni	"		0.018	<0.002	<0.002	NA
Pb	"		<0.0009	<0.0009	<0.0009	NA
Zn	"		0.019	0.007	0.007	NA

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

NA = No analysis; insufficient sample.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 2

ANALYSIS OF WATER FROM LYSIMETERS L-1N THROUGH L-1N-1  
 AT THE HARLEM AVENUE SOLIDS MANAGEMENT AREA  
 SAMPLED ON JANUARY 18, 2006

Parameter	Unit	Lysimeter No.				
		L-1N	L-1	L-2	L-3	L-1N-1
pH <sup>1</sup>			7.3		7.2	
EC	mS/m		414		244	
Total Dissolved Solids	mg/L		3,448		1,772	
Total Dissolved Organic Carbon	"		48		9	
Cl <sup>-</sup>	"		NA		NA	
SO <sub>4</sub> <sup>=</sup>	"		1,638		300	
		L		L		L
TKN	"	Y	98	Y	3.4	Y
NH <sub>3</sub> -N	"	S	89	S	1.9	S
NO <sub>2</sub> + NO <sub>3</sub> -N	"	I	42	I	1.7	I
Total P	"	M	0.36	M	0.11	M
Alkalinity as CaCO <sub>3</sub>	"	E	764	E	1,107	E
		T		T		T
Al	"	E	<0.12	E	<0.06	E
Ca	"	R	446	R	341	R
Cd	"		<0.0006		<0.0003	
Cr	"	F	0.0020	F	<0.0007	F
Cu	"	R	0.008	R	<0.002	R
		O		O		O
Fe	"	Z	0.066	Z	0.016	Z
Hg	μg/L	E	<0.10	E	<0.05	E
K	mg/L	N	19	N	1.7	N
Mg	"		248		158	
Mn	"		0.4978		0.2358	
Na	"		78		34	
Ni	"		0.016		<0.002	
Pb	"		0.0040		<0.0009	
Zn	"		0.020		0.008	

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

NA = No analysis; insufficient sample.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 3

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

Parameter	Unit	Lysimeter No.					L-1N-1
		L-1N	L-1	L-2	L-3		
pH <sup>1</sup>		8.0	7.6	7.7	7.6		
EC	mS/m	108	381	161	229		
Total Dissolved Solids	mg/L	1,416	968	1,226	1,632		
Total Dissolved Organic Carbon	"	18	50	4	7		
Cl <sup>-</sup>	"	63	99	182	96		
SO <sub>4</sub> <sup>=</sup>	"	79	1,708	287	277		
							L
TKN	"	5.1	103	4.3	0.67		Y
NH <sub>3</sub> -N	"	3.4	93	3.4	0.03		S
NO <sub>2</sub> + NO <sub>3</sub> -N	"	1.9	32	1.4	0.31		I
Total P	"	<0.10	<0.05	<0.05	<0.05		M
Alkalinity as CaCO <sub>3</sub>	"	1,286	775	438	1,170		E
							T
Al	"	0.53	0.30	0.27	0.29		E
Ca	"	253	466	208	332		R
Cd	"	0.0018	0.0026	0.0019	0.0024		
Cr	"	0.0020	0.0020	0.0010	<0.0007		F
Cu	"	<0.004	<0.002	<0.002	<0.002		R
							O
Fe	"	1.22	0.048	0.024	0.016		Z
Hg	µg/L	<0.10	<0.05	<0.05	<0.05		E
K	mg/L	2.7	20	0.86	1.1		N
Mg	"	142	251	55.7	144		
Mn	"	0.2666	0.6250	0.0256	0.1425		
Na	"	41	71	72	34		
Ni	"	<0.004	0.018	<0.002	<0.002		
Pb	"	<0.0018	<0.0009	0.0020	<0.0009		
Zn	"	0.060	0.054	0.019	0.019		

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

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TABLE 4

ANALYSIS OF WATER FROM LYSIMETERS L-1N THROUGH L-1N-1  
 AT THE HARLEM AVENUE SOLIDS MANAGEMENT AREA  
 SAMPLED ON FEBRUARY 15, 2006

Parameter	Unit	Lysimeter No.				
		L-1N	L-1	L-2	L-3	L-1N-1
pH <sup>1</sup>		7.4	7.1	7.2	7.8	7.3
EC	mS/m	179	404	140	217	264
Total Dissolved Solids	mg/L	NA	3,538	1,296	1,776	1,330
Total Dissolved Organic Carbon	"	NA	51	3	7	39
Cl <sup>-</sup>	"	NA	92	181	109	103
SO <sub>4</sub> <sup>=</sup>	"	NA	1,759	298	330	7
TKN	"	NA	110	5.1	0.81	10
NH <sub>3</sub> -N	"	NA	97	3.6	<0.02	5.3
NO <sub>2</sub> + NO <sub>3</sub> -N	"	NA	30	1.2	0.42	0.20
Total P	"	NA	<0.05	<0.05	<0.05	<0.05
Alkalinity as CaCO <sub>3</sub>	"	NA	829	442	1,051	1,107
Al	"	NA	<0.06	<0.06	<0.06	<0.06
Ca	"	NA	409	203	337	313
Cd	"	NA	0.0004	0.0003	0.0005	0.0006
Cr	"	NA	0.0030	0.0010	0.0010	0.0010
Cu	"	NA	0.002	<0.002	<0.002	<0.002
Fe	"	NA	0.034	0.011	0.009	1.11
Hg	μg/L	NA	<0.05	<0.05	<0.05	<0.05
K	mg/L	NA	17	0.98	1.2	5.5
Mg	"	NA	221	53.4	137	187
Mn	"	NA	0.5166	0.0599	0.1883	0.3520
Na	"	NA	63	69	39	48
Ni	"	NA	0.017	<0.002	<0.002	0.002
Pb	"	NA	<0.0009	0.0010	<0.0009	<0.0009
Zn	"	NA	0.024	0.007	0.025	0.029

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

NA = No analysis; insufficient sample.

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TABLE 5

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

Parameter	Unit	Lysimeter No.				
		L-1N	L-1	L-2	L-3	L-1N-1
pH <sup>1</sup>		7.6	7.5	7.6	7.6	7.7
EC	mS/m	175	370	154	222	240
Total Dissolved Solids <sup>2</sup>	mg/L	NA	3,064	1,248	1,636	1,580
Total Dissolved Organic Carbon	"	NA	53	3	8	39
Cl <sup>-</sup>	"	58	100	183	91	105
SO <sub>4</sub> <sup>=</sup>	"	NA	1,688	273	276	29
TKN	"	7.6	120	4.5	0.88	9.2
NH <sub>3</sub> -N	"	5.0	114	3.2	<0.02	4.7
NO <sub>2</sub> + NO <sub>3</sub> -N	"	5.8	26	0.84	0.27	0.04
Total P	"	<0.10	<0.05	<0.05	<0.05	<0.05
Alkalinity as CaCO <sub>3</sub>	"	906	941	448	1,164	1,470
Al	"	<0.12	<0.06	<0.06	<0.06	<0.06
Ca	"	245	494	221	338	315
Cd	"	<0.0006	0.0004	0.0004	0.0003	0.0008
Cr	"	0.0040	0.0050	0.0020	0.0020	0.0030
Cu	"	0.014	<0.002	<0.002	<0.002	<0.002
Fe	"	0.234	0.039	0.014	0.005	1.15
Hg	μg/L	<0.10	<0.05	<0.05	<0.05	<0.05
K	mg/L	2.5	21	0.89	1.1	5.5
Mg	"	148	275	58.9	155	201
Mn	"	0.2542	0.6155	0.0206	0.1676	0.3549
Na	"	44	78	78	36	51
Ni	"	<0.004	0.017	<0.002	<0.002	<0.002
Pb	"	0.0180	0.0060	0.0080	0.0080	0.0080
Zn	"	0.084	0.022	0.007	0.007	0.020

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

<sup>2</sup>For L-1, TDS analysis performed on 25-mL instead of usual 50-mL volume due to insufficient sample.  
 NA = No analysis; insufficient sample.



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TABLE 6

ANALYSIS OF WATER FROM LYSIMETERS L-1N THROUGH L-1N-1  
 AT THE HARLEM AVENUE SOLIDS MANAGEMENT AREA  
 SAMPLED ON MARCH 15, 2006

Parameter	Unit	Lysimeter No.				
		L-1N	L-1	L-2	L-3	L-1N-1
pH <sup>1</sup>			7.2	7.5	7.4	7.7
EC	mS/m		366	156	218	185
Total Dissolved Solids	mg/L		3,490	1,246	1,766	NA
Total Dissolved Organic Carbon	"		51	3	7	NA
Cl <sup>-</sup>	"		94	185	96	96
SO <sub>4</sub> <sup>=</sup>	"		1,657	250	252	NA
		L				
TKN	"	Y	106	4.3	1.7	7.2
NH <sub>3</sub> -N	"	S	101	3.3	<0.02	4.8
NO <sub>2</sub> + NO <sub>3</sub> -N	"	I	28	0.91	0.19	0.25
Total P	"	M	0.08	<0.05	<0.05	0.16
Alkalinity as CaCO <sub>3</sub>	"	E	876	444	1,153	1,226
		T				
Al	"	E	<0.06	<0.06	<0.06	<0.12
Ca	"	R	466	216	337	261
Cd	"		<0.0003	<0.0003	<0.0003	<0.0006
Cr	"	F	<0.0007	0.0009	<0.0007	<0.0014
Cu	"	R	0.010	0.002	<0.002	<0.004
		O				
Fe	"	Z	0.048	0.011	0.013	0.078
Hg	μg/L	E	<0.05	0.08	0.10	0.14
K	mg/L	N	20	1.0	1.2	4.2
Mg	"		255	58.9	151	171
Mn	"		0.5386	0.0676	0.1676	0.1962
Na	"		72	77	37	42
Ni	"		0.018	<0.002	<0.002	<0.004
Pb	"		<0.0009	0.0049	0.0012	0.0120
Zn	"		0.015	0.005	0.011	0.007

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

NA = No analysis; insufficient sample.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 7

ANALYSIS OF MONTHLY COMPOSITED DIGESTED BIOSOLIDS  
 PLACED IN THE HARLEM AVENUE  
 SOLIDS MANAGEMENT DRYING AREA DURING JANUARY 2006

Parameter	Unit	Concentration*
pH		8.1
Total Solids	%	26.1
Total Volatile Solids	''	72.4
TKN	mg/kg	31,008
NH <sub>3</sub> -N	''	4,809

\*Values are the means of five samples.

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TABLE 8

ANALYSIS OF MONTHLY COMPOSITED DIGESTED BIOSOLIDS  
 PLACED IN THE HARLEM AVENUE  
 SOLIDS MANAGEMENT DRYING AREA DURING FEBRUARY 2006

Parameter	Unit	Concentration*
pH		8.3
Total Solids	%	30.5
Total Volatile Solids	''	72.1
TKN	mg/kg	29,522
NH <sub>3</sub> -N	''	4,802

\*Values are the means of five samples.

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TABLE 9

ANALYSIS OF MONTHLY COMPOSITED DIGESTED BIOSOLIDS  
 PLACED IN THE HARLEM AVENUE  
 SOLIDS MANAGEMENT DRYING AREA DURING MARCH 2006

Parameter	Unit	Concentration*
pH		8.2
Total Solids	%	29.6
Total Volatile Solids	''	72.4
TKN	mg/kg	26,617
NH <sub>3</sub> -N	''	4,295

\*Values are the means of four samples.