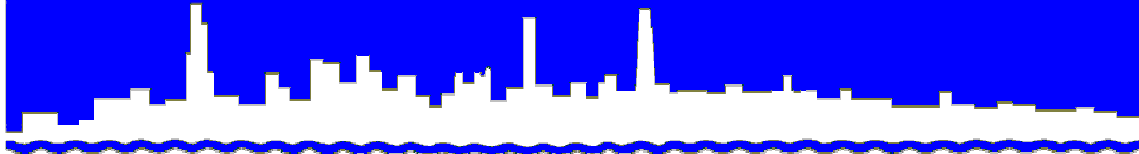


Protecting Our Water Environment



Metropolitan Water Reclamation District of Greater Chicago

***RESEARCH AND DEVELOPMENT
DEPARTMENT***

REPORT NO. 06-6

ANNUAL BIOSOLIDS MANAGEMENT REPORT FOR

2005

FEBRUARY 2006

February 16, 2006

Mr. Patrick Kuefler
Chief of Enforcement Section II
USEPA – Region V
Water Enforcement and Compliance
Assurance Branch (WC-15J)
77 West Jackson Blvd.
Chicago, IL 60604-3590

Dear Mr. Kuefler:

Subject: 2005 Reporting Requirements Under the 40 CFR Part 503 Regulations

The Metropolitan Water Reclamation District of Greater Chicago (District) herein submits the 2005 records required under the 40 CFR Part 503 Regulations at Section 503.18, titled “Annual Biosolids Management Report for 2005.”

We believe this report satisfies the reporting requirements under the 40 CFR Part 503 Regulations.

Certification Statement Required for Record Keeping

“I certify under penalty of law, that the information that will be used to determine compliance with the Class A pathogen requirements, Class B pathogen requirements, vector attraction reduction requirements, management practices, site restrictions, and requirements to obtain information as described in Sections 503.32a6, 503.32a8, 503.32b2, 503.32b3, 503.33b1, 503.33b9, 503.13, 503.14, and 503.16 for the District’s land application sites was prepared under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate the information. I am aware that there are significant penalties for false certification including the possibility of fine and imprisonment.”

Mr. Patrick Kuefler

2

February 16, 2006

Subject: 2005 Reporting Requirements Under the 40 CFR Part 503 Regulations

If you have any questions, please telephone me at (312) 751-5190.

Very truly yours,

Richard Lanyon
Director
Research and Development

RL:AC:spy

Attachment

cc w/att.: Aistars (USEPA)
Bramscher (USEPA)
Keller (IEPA)
Kluge (IEPA)
Garretson (IEPA)
Sulski (IEPA)

cc w/o att.: Farnan
Jamjun
Feldman
Sobanski
Kollias
Granato
O'Connor
Cox
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Metropolitan Water Reclamation District of Greater Chicago

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**ANNUAL BIOSOLIDS MANAGEMENT REPORT
FOR 2005**

By

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February 2006

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ACKNOWLEDGEMENT

The authors would like to acknowledge the following for their assistance, which is greatly appreciated: Mr. Edward Staudacher, Principal Civil Engineer, Lawndale Avenue Solids Management Area; Mr. Daniel Collins, Senior Civil Engineer, Calumet Solids Management Area; Ms. Katarzyna Lai, Assistant Engineer of Treatment Plant Operations I, John E. Egan Water Reclamation Plant (WRP); Mr. Carl Athas, Treatment Plant Operator II, Hanover Park WRP; Mr. George Kedl, Assistant Civil Engineer, Stickney WRP; Dr. James Zmuda, Microbiologist IV, of the Analytical Microbiology and Biomonitoring Section; Mr. John Chavich, Sanitary Chemist IV, of the John E. Egan Analytical Laboratory Section; Mr. Tom Liston, Sanitary Chemist IV, of the Calumet Analytical Laboratory Section; and Ms. Ellice Durham, Sanitary Chemist IV, of the Stickney Analytical Laboratory Section.

Special thanks are given to Ms. Sabina Yarn for the typing of this report.

DISCLAIMER

Mention of proprietary equipment and chemicals in this report does not constitute endorsement by the Metropolitan Water Reclamation District of Greater Chicago.

FOREWORD

The data and information in this report fulfill the frequency of monitoring and the reporting requirements for Biosolids Management by the Metropolitan Water Reclamation District of Greater Chicago as specified in the United States Environmental Protection Agency's (USEPA) 40 CFR Part 503 Regulations for 2005.

INTRODUCTION

The Metropolitan Water Reclamation District of Greater Chicago (District) herein reports the 2005 records required under the 40 CFR Part 503 Regulations at Section 503.18.

The District has four Illinois Environmental Protection Agency (IEPA) permitted biosolids management programs that must comply with Part 503. These programs are as follows:

1. Fulton County Dedicated Biosolids Application to Land Site (IEPA Permit Nos. 2002-SC-2188, and 2005-SC-5073).
2. Hanover Park Fischer Farm Biosolids Application to Land Site (IEPA Permit No. 2002-SC-0672).
3. Controlled Solids Distribution Program (Biosolids Application to Land in the Chicago Area under IEPA Permit Nos. 2000-SC-0872 and 2005-SC-3793).
4. Land Application to Farmland (Application of biosolids from Calumet, Stickney, and John E. Egan Water Reclamation Plants (WRPs) to farmland under IEPA Permit No. 2005-SC-5073).

The 40 CFR Part 503 Regulations require that the District report certain data. In the following sections, we have prepared a short description of the sludge processing and biosolids management operations at the District's seven WRPs. The Lemont, James C. Kirie, and North Side WRPs do not produce a final biosolids product, while the Calumet, Stickney, John E. Egan, and Hanover Park WRPs produced final biosolids products that were used beneficially or disposed of in 2005. In addition, we also discuss the uses for these biosolids, outline the data reporting requirements under the 40 CFR Part 503 Regulations, and present the required monitoring data in summary tables. The 2005 production and final disposition of sludges and biosolids

generated by the District are summarized in Table 1. It should be noted that the total biosolids production in any given year may not equal the amount of the final biosolids product distributed, since biosolids may be distributed from production inventory from a previous year, or biosolids produced in a given year may be aged for distribution at a later time.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 1

2005 PRODUCTION AND USES OF SLUDGE AND BIOSOLIDS

Production and Use	Stickney*	Calumet*	Water Reclamation Plants					Lemont
			North Side	Egan	Hanover Park*	Kirie		
			----- Dry Tons -----					
Production**	126,879	24,553	43,968	5,526	1,269	5,449	309	
Land Applied	79,956	14,178	0	4,454	1,189	0	0	
Surface Disposal	0	0	0	0	0	0	0	
Landfill (Total)	57,050	15,966	0	0	0	0	0	
Co-disposal	2,759	0						
Daily cover	27,577	0						
Final Cover	26,714	15,966						
Incinerated	0	0	0	0	0	0	0	
To Other WRPs for Further Processing	0	0	43,968	1,072	0	5,449	309	

* Differences between biosolids production and total use or disposal in 2005 were due to a net withdrawal out of storage lagoons, and processing of biosolids imported from other WRPs.

** Stickney, Calumet, Egan, and Hanover Park produce biosolids while North Side, Kirie, and Lemont produce undigested sludge. Figures represent total solids generated at the end of each plant's processing train including those imported from other plants for further processing.

LEMONT WRP

The Lemont WRP, located in Lemont, Illinois, has a design capacity of 3.4 mgd. Wastewater reclamation processes include both primary (primary settling) and secondary (activated sludge process) treatment. In 2005, the Lemont WRP produced 309 dry tons of solids (Table 1), which were gravity concentrated and transported to the Stickney WRP for further processing.

No final biosolids product is produced at this WRP.

JAMES C. KIRIE WRP

The James C. Kirie WRP, located in Des Plaines, Illinois, has a design capacity of 72 mgd. Wastewater reclamation processes include grit tanks, secondary (activated sludge process), and tertiary (sand filtration) treatment. In 2005, the James C. Kirie WRP produced 5,449 dry tons of solids (Table 1), which were sent via force main to the John E. Egan WRP for further processing.

No final biosolids product is produced at this WRP.

NORTH SIDE WRP

The North Side WRP, located in Skokie, Illinois, has a design capacity of 333 mgd. Wastewater reclamation processes at the North Side WRP include primary (primary settling) and secondary (activated sludge process) treatment. In 2005, the North Side WRP produced 43,968 dry tons of solids (Table 1), which were sent via pipeline to the Stickney WRP for further treatment. This total includes solids generated from water reclamation at the North Side WRP and biosolids conveyed from the John E. Egan WRP.

No final biosolids product is produced at this WRP.

JOHN E. EGAN WRP

The John E. Egan WRP, located in Schaumburg, Illinois, has a design flow of 30 mgd. Wastewater reclamation processes include primary (primary settling), secondary (activated sludge process), and tertiary (sand filtration) treatment. All solids managed at the John E. Egan WRP are anaerobically digested. During winter or when the centrifuges are not operating, liquid digested biosolids are sent via sewers to the North Side WRP. Centrifuge centrate containing biosolids are also sent via sewers to the North Side WRP.

In 2005, the total biosolids production at the John E. Egan WRP was 5,526 dry tons (Table 1). This total includes biosolids generated from processing of sludge originating at the John E. Egan WRP as well as the sludge that was imported from the James C. Kirie WRP for further processing.

Summary of Use and Disposal at Landfills

In 2005, none of the biosolids generated at the John E. Egan WRP were sent to landfills.

Biosolids Conveyed to Other WRPs for Further Processing

In 2005, 846 dry tons of biosolids were pumped to North Side WRP. Of this amount, 463 dry tons were conveyed to the North Side WRP in centrifuge centrate and 383 dry tons were conveyed as liquid digested biosolids.

In 2005, 226 dry tons of centrifuge cake biosolids were trucked to the Lawndale Avenue Solids Management Area (managed by the Stickney WRP) late in the year, and were placed in storage for the following application season.

Land Application of Centrifuge Cake Biosolids

In 2005, the John E. Egan WRP land applied a total of 4,454 dry tons of centrifuge cake biosolids to farmland under IEPA Permit No. 2005-SC-5073 through a contract with Synagro Midwest, Inc. In accordance with Table 1 of Section 503.16, the frequency of monitoring for this biosolids product is six times per year.

All John E. Egan WRP centrifuge cake biosolids that were land applied in 2005 met the pollutant concentration limits in Table 3 of Section 503.13 (Table 2), the Class B pathogen requirements of Section 503.32b2 (Table 3), and the vector attraction reduction requirements of Section 503.33b10. Table 2 also shows the biosolids nitrogen concentration data that were used by the land applier to compute the agronomic loading rates at the farmland sites.

The John E. Egan WRP did not have any additional requirement for reporting under Part 503 in 2005.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 2

NITROGEN AND METALS CONCENTRATIONS IN CENTRIFUGE CAKE BIOSOLIDS
FROM THE JOHN E. EGAN WATER RECLAMATION PLANT APPLIED TO FARMLAND IN 2005

Date	TKN	NH ₃ -N	As	Cd	Cu	Hg	Mo	Ni	Pb	Se	Zn
01/08/05	66,397	3,504	<1	4.1	809	1.6	20	59	53	<0.8	877
01/15/05	61,730	5,701	<1	3.7	802	NA	19	61	50	<0.8	903
01/22/05	40,352	4,636	<1	4.0	822	NA	19	63	51	<0.8	922
01/29/05	45,640	4,612	<1	4.1	773	NA	20	63	55	<0.8	923
02/05/05	48,045	5,978	<1	3.4	775	NA	18	60	52	<0.8	906
02/12/05	43,788	4,498	<1	3.5	753	1.7	17	66	57	<0.8	876
02/19/05	49,783	5,655	<1	3.7	757	NA	18	67	64	<0.8	918
02/26/05	44,543	6,188	<1	3.4	780	NA	17	68	53	<0.8	917
03/05/05	46,288	5,761	<1	3.4	780	NA	16	65	55	<0.8	879
03/12/05	46,773	6,377	<1	3.5	789	2.4	15	75	64	<0.8	918
03/19/05	48,789	7,728	<1	3.5	758	NA	14	71	53	<0.8	858
03/26/05	45,880	6,832	<1	3.7	777	NA	14	71	50	<0.8	838
04/02/05	30,966	5,619	<1	4.0	785	NA	15	73	54	<0.8	878
04/09/05	41,260	6,208	<1	4.1	827	0.79	14	73	49	<0.8	844
04/16/05	30,353	4,417	<1	3.8	809	NA	14	76	48	<0.8	819
04/23/05	53,036	5,484	<1	3.8	846	NA	15	79	64	<0.8	838
04/30/05	54,424	5,579	<1	3.8	819	NA	15	75	51	<0.8	806
05/07/05	45,364	6,917	<1	3.7	815	1.5	17	75	72	<0.8	820
05/14/05	38,426	5,771	<1	3.7	844	NA	16	74	54	<0.8	863
05/21/05	46,733	6,296	<1	3.7	838	NA	17	75	53	<0.8	898

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 2 (Continued)

NITROGEN AND METALS CONCENTRATIONS IN CENTRIFUGE CAKE BIOSOLIDS
FROM THE JOHN E. EGAN WATER RECLAMATION PLANT APPLIED TO FARMLAND IN 2005

Date	TKN	NH ₃ -N	As	Cd	Cu	Hg	Mo	Ni	Pb	Se	Zn
05/28/05	30,658	4,884	<1	3.9	809	NA	16	77	56	<0.8	863
06/04/05	30,697	4,990	<1	3.8	820	NA	17	90	55	<0.8	917
06/11/05	29,901	5,098	<1	4.4	779	1.2	17	81	56	<0.8	870
06/18/05	18,033	3,833	<1	4.3	812	NA	17	90	59	<0.8	874
06/25/05	19,887	3,207	<1	4.1	825	NA	19	81	55	<0.8	955
07/02/05	23,733	4,041	<1	4.2	805	NA	20	81	60	<0.8	952
07/09/05	34,216	3,560	<1	4.1	872	1.6	19	87	52	<0.8	951
07/16/05	40,229	3,821	<1	3.7	838	NA	21	83	71	<0.8	953
07/23/05	30,249	4,027	<1	4.3	821	NA	23	85	59	<0.8	1,013
07/30/05	20,707	3,372	<1	4.1	852	NA	21	NRR	73	<0.8	991
08/06/05	26,750	4,060	<1	3.9	854	NA	23	86	57	<0.8	1,050
08/13/05	37,322	3,634	<1	3.9	861	0.58	23	80	58	<0.8	1,054
08/20/05	45,927	3,244	<1	4.3	847	NA	25	80	58	<0.8	1,117
08/27/05	36,656	2,710	<1	4.4	821	NA	23	80	60	<0.8	1,061
09/03/05	43,336	3,981	<1	4.2	882	NA	25	82	71	<0.8	1,117
09/10/05	42,048	3,262	2.1	4.1	886	2.2	25	98	66	<0.8	1,145
09/17/05	28,603	2,829	<1	4.5	875	NA	25	85	61	<0.8	1,108
09/24/05	40,258	3,572	<1	3.9	870	NA	25	89	60	<0.8	1,120
10/01/05	35,920	3,310	<1	3.9	871	NA	24	97	69	<0.8	1,141
10/08/05	36,853	3,095	<1	4.0	867	0.68	23	96	56	<0.8	1,086

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 2 (Continued)

NITROGEN AND METALS CONCENTRATIONS IN CENTRIFUGE CAKE BIOSOLIDS
FROM THE JOHN E. EGAN WATER RECLAMATION PLANT APPLIED TO FARMLAND IN 2005

Date	TKN	NH ₃ -N	As	Cd	Cu	Hg	Mo	Ni	Pb	Se	Zn
10/15/05	38,262	3,448	<1	3.6	888	NA	24	94	57	<0.8	1,100
10/22/05	47,289	3,410	<1	3.9	918	NA	24	93	60	<0.8	1,054
10/29/05	20,368	3,654	<1	3.9	845	NA	24	87	50	<0.8	985
11/05/05	26,041	2,865	<1	4.0	849	NA	21	89	58	<0.8	913
11/12/05	29,031	4,456	<1	3.8	814	0.23	24	80	60	<0.8	910
11/19/05	25,274	3,911	<1	3.7	832	NA	23	81	57	<0.8	909
11/26/05	19,672	5,733	<1	3.7	820	NA	22	92	63	<0.8	905
12/03/05	24,626	4,019	<1	3.3	835	NA	22	80	53	<0.8	865
12/10/05	36,169	4,639	<1	3.0	818	2.5	19	78	44	<0.8	812
12/17/05	33,957	5,793	<1	4.0	951	NA	22	90	54	<0.8	945
12/24/05	38,782	5,165	2.6	3.4	886	NA	22	94	60	<0.8	901
12/31/05	31,018	4,878	<1	3.5	840	NA	21	88	42	<0.8	784
Minimum	18,033	2,710	<1	3.0	753	0.23	14	59	42	<0.8	784
Mean*	37,520	4,620	1.1	3.8	829	1.4	20	80	57	<0.8	941
Maximum	66,397	7,728	2.6	4.5	951	2.5	25	98	73	<0.8	1,145
503 Limit	NL	NL	41	39	1,500	17	75	420	300	100	2,800

*In calculating the means, values less than the detection limit were considered as the detection limit.

NA = No analysis; analyzed only once per month.

NL = No limit.

NRR= No reportable result.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 3

DIGESTER* TEMPERATURES AND DETENTION TIMES FOR BIOSOLIDS
FROM THE JOHN E. EGAN WATER RECLAMATION PLANT APPLIED
TO FARMLAND IN 2005

Month	Average Temperature ----°F----	Average Detention Time ----days----	Meets Part 503 Class B Requirements	Minimum Detention Time Required by 503.32b3** ----days----
January	95	31.8	yes	15.0
February	96	32.1	yes	15.0
March	96	26.2	yes	15.0
April	96	25.0	yes	15.0
May	96	24.9	yes	15.0
June	96	24.8	yes	15.0
July	96	29.9	yes	15.0
August	96	29.3	yes	15.0
September	96	24.9	yes	15.0
October	96	19.9	yes	15.0
November	96	27.1	yes	15.0
December	96	24.2	yes	15.0

* Data are for primary Digesters A and C and do not include additional digestion achieved in secondary Digesters B and D.

*** For anaerobic digestion at average temperature achieved.

HANOVER PARK WRP

Treatment Plant and Biosolids Process Train Description

The Hanover Park WRP, located in Hanover Park, Illinois, has a design capacity of 12 mgd. Wastewater reclamation processes at this WRP include primary (primary settling), secondary (activated sludge process), and tertiary (sand filtration) treatment. All solids produced at the Hanover Park WRP are anaerobically digested and stored in lagoons. The digested biosolids stored in the lagoons are then applied by injection at an on-site farm, formerly the Fischer Farm. All of the biosolids produced by the Hanover Park WRP are land applied at the Fischer Farm, which is contained on the plant grounds.

Land Application of Liquid Biosolids

In 2005, the total biosolids production at this WRP was 1,269 dry tons (Table 1). Land application of liquid biosolids at the Hanover Park Fischer Farm site in 2005 utilized 1,189 dry tons. The quantity of land applied biosolids was lower than the quantity of biosolids produced in 2005. The remaining biosolids were stored in a lagoon. In accordance with Table 1 of Section 503.16, the frequency of monitoring for this biosolids product is four times per year.

All Hanover Park WRP lagooned biosolids that were land applied in 2005 met the pollutant concentration limits in Table 3 of Section 503.13 (Table 4), the Class B pathogen anaerobic digester time and temperature requirements of Section 503.32b3 (Table 5), and the vector attraction reduction requirements of Section 503.33b1 (Table 6). Management practices at this land application site complied with Section 503.14 as previously described in a letter to Mr. Michael J. Mikulka dated January 28, 1994 (Appendix I).

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 4

NITROGEN AND METALS CONCENTRATIONS IN BIOSOLIDS APPLIED TO THE HANOVER PARK
FISCHER FARM IN 2005

Composite Sample Date	TKN	NH ₃ -N	As	Cd	Cu	Hg	Mo	Ni	Pb	Se	Zn
02/19/05*	366,644	321,867	28	<0.7	63	0.14	3	14	4	<3	106
03/26/05*	529,753	463,120	11	0.40	99	0.23	1	14	5	<2	147
03/26/05	150,336	307	2	1.8	813	2.3	13	27	31	5	686
04/02/05*	516,373	441,867	14	<0.4	87	0.38	2	13	5	4	135
04/09/05*	552,433	421,040	13	<0.4	121	0.21	2	14	5	3	146
06/18/05*	420,607	370,847	13	<0.4	79	0.25	2	18	3	3	115
06/25/05*	344,300	277,319	16	<0.4	61	0.15	3	17	3	3	88
07/16/05*	287,819	224,269	14	<0.4	38	0.11	4	24	5	<2	55
07/23/05*	248,780	232,173	15	<0.4	32	0.06	3	19	1	3	50
07/30/05*	248,575	214,313	14	<0.4	32	0.07	2	18	1	4	44
09/10/05*	169,722	102,861	14	0.33	59	0.05	5	26	5	<2	89
09/17/05	60,988	4,585	5	3.6	977	2.9	13	35	45	7	815
09/17/05*	182,813	144,306	15	<0.4	43	0.06	2	20	3	3	54
09/24/05	44,473	12,569	6	4.4	973	3.0	13	40	50	8	810
09/24/05*	168,100	123,060	12	<0.3	35	<0.03	2	17	2	3	45
10/15/05	66,916	18,223	6	4.2	1,062	3.5	15	44	57	7	877
10/22/05	15,969	7,931	5	3.8	1,121	9.0	17	41	51	6	923
10/29/05	30,295	9,508	4	4.0	1,106	2.8	17	38	49	8	886

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 4 (Continued)

NITROGEN AND METALS CONCENTRATIONS IN BIOSOLIDS APPLIED TO THE HANOVER PARK FISCHER FARM IN 2005

Composite Sample Date	TKN	NH ₃ -N	As	Cd	Cu	Hg	Mo	Ni	Pb	Se	Zn
12/03/05	3,134	135	10	1.5	142	0.95	1	30	25	<0.8	176
12/10/05	3,440	175	6	2.7	191	1.3	2	35	35	<0.8	216
12/17/05	3,563	448	9	8.4	290	0.32	4	49	54	<0.8	280
12/24/05	2,598	462	9	5.5	180	0.79	2	38	39	<0.8	199
Minimum	2,598	135	2	0.3	32	<0.03	1	13	1	<0.8	44
Mean**	200,801	154,154	11	2	346	1.3	6	27	22	3	315
Maximum	552,433	463,120	28	8	1,121	9.0	17	49	57	8	923
503 Limit	NL	NL	41	39	1,500	17	75	420	300	100	2,800

* Biosolids applied as supernatant.

** In calculating the mean, values less than the detection limit were considered as the detection limit.

NL = No limit; not applicable.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 5

DIGESTER TEMPERATURES AND DETENTION TIMES FOR BIOSOLIDS FROM THE HANOVER PARK WATER RECLAMATION PLANT APPLIED AT THE FISCHER FARM IN 2005

Month	Average Temperature	Average Detention Time	Meets Part 503 Class B Requirements	Minimum Detention Time Required by 503.32b3*
	----°F----	----days----		----days----
January	95	27.6	yes	15.0
February	95	32.0	yes	15.0
March	95	27.6	yes	15.0
April	95	29.8	yes	15.0
May	95	20.3	yes	15.0
June	96	21.7	yes	15.0
July	96	26.2	yes	15.0
August	96	30.3	yes	15.0
September	96	30.1	yes	15.0
October	96	37.9	yes	15.0
November	96	35.5	yes	15.0
December	96	37.0	yes	15.0

*For anaerobic digestion at average temperature achieved.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 6

VOLATILE SOLIDS REDUCTION FOR BIOSOLIDS FROM THE
 HANOVER PARK WATER RECLAMATION PLANT APPLIED AT THE FISCHER
 FARM IN 2005

Draw	Digester Feed	Digester Draw	Lagoon Biosolids	Volatile Solids Reduction*
	----- % Total Volatile Solids -----			----- % -----
February	85.8	74.5	46.8	85.4
March	87.0	75.1	57.0	80.2
April	86.1	74.8	52.5	82.2
June	84.2	75.1	66.2	63.2
July	84.7	76.5	58.6	74.4
September	81.0	75.4	63.2	59.6
October	81.6	74.1	66.2	55.8

* Volatile solids reduction computed using digester feed and lagoon biosolids.

CALUMET WRP

Treatment Plant and Biosolids Process Train Description

The Calumet WRP, located in Chicago, Illinois, has a design capacity of 354 mgd. Wastewater reclamation processes at this WRP include primary (primary settling) and secondary (activated sludge process) treatment. All solids produced at the Calumet WRP are anaerobically digested. Calumet WRP biosolids are then:

- a. Placed into lagoons for dewatering, aging and stabilization, and then transported to paved cells and air-dried prior to:
 1. Application to land as Exceptional Quality (EQ) biosolids under the District's Controlled Solids Distribution Permit.
 2. Use at local municipal solid waste landfills as final landfill cover.
 3. Disposal in local municipal solid waste landfills.
- b. Dewatered by centrifuging to approximately 25 percent solids content, and then applied to farmland by a private contractor as a Class B cake.
- c. Dewatered by centrifuging to approximately 25 percent solids content, and then transported to paved cells and air-dried prior to use as daily landfill cover.
- d. Dewatered by centrifuging to approximately 25 percent solids content, placed into lagoons for aging and stabilization, and transported to paved cells and air-dried prior to:
 1. Application to land as EQ biosolids under the District's Controlled Solids Distribution Permit.
 2. Use at local municipal solid waste landfills as final landfill cover.

In 2005, the total biosolids production at the Calumet WRP was 24,553 dry tons (Table 1). The quantity of biosolids that were used and disposed of in 2005 exceeded the total production for the Calumet WRP due to processing of biosolids produced in previous years that were stored in lagoons.

Summary of Use and Disposal at Landfills

In 2005, the Calumet WRP sent 15,996 dry tons of biosolids to landfills for use as final cover. This practice is exempt from the Part 503 Regulations and requires no further reporting.

Land Application of Centrifuge Cake Biosolids

In 2005, the Calumet WRP land applied 11,883 dry tons of centrifuge cake biosolids to farmland under IEPA Permit No. 2005-SC-5073 through a contract with Synagro Midwest, Inc. In accordance with Table 1 of Section 503.16, the frequency of monitoring for this biosolids product is six times per year.

All Calumet WRP centrifuge cake biosolids that were land applied in 2005, met the pollutant concentration limits in Table 3 of Section 503.13 (Table 7), the Class B pathogen anaerobic digester time and temperature requirements of Section 503.32b3 (Table 8), and the vector attraction reduction requirements of Section 503.33b10. Table 7 also contains the biosolids nitrogen concentration data that were utilized by the land applier to compute the agronomic loading rates at the farmland sites.

Land Application of Aged, Air-Dried Biosolids

In 2005, the Calumet WRP land applied a total of 2,294 dry tons of air-dried EQ biosolids through the District's Controlled Solids Distribution Program under IEPA Permit Nos.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 7

NITROGEN AND METALS CONCENTRATIONS IN CENTRIFUGE CAKE BIOSOLIDS FROM THE CALUMET WATER RECLAMATION PLANT APPLIED TO FARMLAND IN 2005

Date	TKN	NH ₃ -N	As	Cd	Cu	Hg	Mo	Ni	Pb	Se	Zn
2/8/05	51,775	7,548	4	3	415	1.0	16	33	94	12	941
2/15/05	47,917	9,427	8	4	410	NA	15	42	93	4	965
2/22/05	40,354	8,122	9	3	388	NA	13	39	89	10	889
3/1/05	39,926	8,535	7	3	397	NA	14	42	123	6	914
3/8/05	38,384	8,154	9	3	366	NA	12	38	92	9	857
3/15/05	41,648	8,282	6	3	378	NA	12	41	81	10	859
3/22/05	37,630	7,841	5	3	398	NA	11	34	78	10	795
3/29/05	45,623	8,108	5	3	393	NA	13	36	79	8	838
4/5/05	39,821	8,221	7	4	408	0.30	12	45	79	7	861
4/12/05	45,155	9,513	4	3	415	NA	13	37	86	2	906
4/19/05	46,222	8,733	5	3	403	NA	13	35	84	11	865
4/26/05	45,599	7,372	5	4	441	NA	12	35	87	6	912
5/3/05	42,572	7,212	7	4	429	0.69	15	37	87	10	891
5/10/05	45,146	7,386	9	3	471	NA	14	34	83	3	900
5/16-5/19/05	39,888	10,636	6	3	429	0.74	20	35	105	4	952
5/17/05	43,529	6,369	6	3	435	NA	14	32	81	5	870
5/23-5/27/05	45,140	11,442	3	3	384	1.8	16	40	94	4	913
5/24/05	44,401	5,950	8	3	400	NA	14	31	85	8	873

----- mg/dry kg -----

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 7 (Continued)

NITROGEN AND METALS CONCENTRATIONS IN CENTRIFUGE CAKE BIOSOLIDS
FROM THE CALUMET WATER RECLAMATION PLANT APPLIED TO
FARMLAND IN 2005

Date	TKN	NH ₃ -N	As	Cd	Cu	Hg	Mo	Ni	Pb	Se	Zn
5/31/05	41,723	6,334	9	3	407	NA	15	31	88	6	901
6/7/05	43,432	6,409	7	3	416	0.96	16	35	93	4	920
6/14/05	37,771	5,427	10	3	426	NA	15	31	91	5	930
6/21/05	38,075	5,793	8	2	422	NA	14	27	91	7	935
6/30/05	34,903	4,901	7	3	429	NA	16	31	87	5	951
7/5/05	39,825	5,503	8	3	459	0.74	17	32	87	7	1001
7/12/05	40,693	5,418	6	3	456	NA	18	31	89	4	1005
7/12-7/15/05	43,614	11,760	6	3	449	0.55	15	36	91	3	957
7/19/05	41,971	6,017	10	3	438	NA	19	34	84	2	960
7/25/05	17,624	9,189	6	3	442	0.74	16	32	98	8	950
7/26/05	35,916	5,390	6	3	419	NA	18	32	86	5	951
8/2/05	35,740	4,044	7	3	446	0.64	21	34	91	9	987
8/9/05	42,200	4,206	4	3	450	NA	22	36	90	12	997
8/16/05	41,454	4,465	5	3	452	NA	26	35	94	<1.4	1,052
8/10-8/11/05	44,523	11,959	7	3	476	0.48	21	32	89	11	1,029
8/18-8/22/05	44,118	11,315	5	4	450	0.57	21	34	87	3	1,012
8/24/05	45,523	5,578	7	4	455	NA	27	39	91	8	1,021
8/30/05	36,628	4,800	7	3	451	NA	27	49	93	5	1,036

----- mg/dry kg -----

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 7 (Continued)

NITROGEN AND METALS CONCENTRATIONS IN CENTRIFUGE CAKE BIOSOLIDS
FROM THE CALUMET WATER RECLAMATION PLANT APPLIED TO
FARMLAND IN 2005

Date	TKN	NH ₃ -N	As	Cd	Cu	Hg	Mo	Ni	Pb	Se	Zn
9/6/05	33,077	3,303	2	3	400	1.3	26	38	99	5	938
9/7-9/8/05	39,314	11,914	10	3	485	1.0	29	45	100	5	1,091
9/13/05	31,212	4,076	<1	3	456	NA	28	38	94	14	1,064
9/20/05	40,354	4,521	6	3	487	NA	33	38	94	11	1,101
9/27/05	26,245	3,533	6	3	457	NA	28	35	101	12	1,045
10/4/05	24,163	3,840	8	4	476	NA	28	36	101	8	1,056
10/11/05	36,418	3,139	3	3	359	NA	24	29	81	6	888
10/18/05	35,699	4,341	8	3	434	NA	24	33	101	6	1,010
10/26/05	42,553	4,724	9	3	467	NA	24	37	100	6	1,047
10/27-10/29/05	38,366	7,285	4	3	468	3.1	30	43	94	<1.4	1,076
10/31/05	38,374	6,526	9	3	424	1.3	24	32	94	15	1,017
11/8/05	40,287	4,440	2	4	407	NA	23	37	94	13	980
11/15/05	35,441	5,044	3	4	412	NA	22	39	97	9	966
11/22/05	38,943	6,149	7	3	418	NA	21	37	99	6	984
11/29/05	39,067	5,724	8	3	446	NA	20	38	100	6	923
12/6/05	34,465	5,028	6	3	429	1.6	18	38	92	<1.4	917
12/13/05	41,227	5,672	5	3	429	NA	19	36	91	5	916
12/20/05	43,127	6,583	4	3	426	NA	18	35	86	7	890

----- mg/dry kg -----

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 7 (Continued)

NITROGEN AND METALS CONCENTRATIONS IN CENTRIFUGE CAKE BIOSOLIDS
FROM THE CALUMET WATER RECLAMATION PLANT APPLIED TO
FARMLAND IN 2005

Date	TKN	NH ₃ -N	As	Cd	Cu	Hg	Mo	Ni	Pb	Se	Zn
12/29/05	47,100	7,471	4	3	422	NA	15	32	68	6	847
Minimum	17,624	3,139	<1	2	359	0.30	11	27	68	<1.4	795
Mean*	39,889	6,802	6	3	429	1.1	19	36	91	7	950
Maximum	51,775	12,278	10	4	487	3.3	33	49	123	15	1,101
503 Limit	NL	NL	41	39	1,500	17	75	420	300	100	2,800

*In calculating the mean, values less than the detection limit were considered as the detection limit.
NA = No analysis.
NL = No limit; not applicable.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 8

DIGESTER* TEMPERATURES AND DETENTION TIMES FOR CENTRIFUGE CAKE BIOSOLIDS FROM THE CALUMET WATER RECLAMATION PLANT APPLIED TO FARMLAND IN 2005

Month	Average Temperature -----°F-----	Average Detention Time ---days---	Meets Part 503 Class B Requirements	Minimum Detention Time Required by 503.32b3** ---days---
January	96	22.3	yes	15.0
February	96	29.5	yes	15.0
March	97	18.2	yes	15.0
April	97	18.8	yes	15.0
May	96	17.6	yes	15.0
June	97	18.9	yes	15.0
July	97	17.5	yes	15.0
August	96	16.3	yes	15.0
September	96	15.8	yes	15.0
October	96	16.3	yes	15.0
November	97	16.7	yes	15.0
December	97	17.6	yes	15.0

*Temperatures and detention times are for primary digesters 1 through 8 at the Calumet WRP. All biosolids exiting these primary digesters also received additional processing in secondary digesters 9 through 12.

** For anaerobic digestion at average temperature achieved.

2000-SC-0872 and 2005-SC-3743 for maintenance of golf courses, landscaping, nurseries, and construction of recreation fields. The quantities of biosolids utilized by each site under the Controlled Solids Distribution Program and how they were used are shown in Table 9. In accordance with Table 1 of Section 503.16, the frequency of monitoring for this biosolids product is six times per year.

The USEPA Region V designated, on a site-specific basis for the Calumet and Stickney WRPs, two of the District's biosolids processing trains as equivalent to a Process to Further Reduce Pathogens (PFRP). The current PFRP equivalency took effect on August 1, 2002 (Appendix III), and on this basis, all EQ biosolids produced by the Calumet WRP met the Part 503 Class A pathogen requirements of 503.32a8 in 2005.

All Calumet WRP EQ biosolids that were land applied in 2005 met the pollutant concentration limits in Table 3 of Section 503.13 (Table 10), the Class A pathogen limits of Section 503.32a8 (Table 11), and the vector attraction reduction requirements of Section 503.33b1 (Table 10). Management practices complied with Section 503.14 as previously described in a letter to Mr. Michael J. Mikulka dated January 28, 1994 (Appendix I).

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 9

QUANTITIES OF CALUMET WATER RECLAMATION PLANT BIOSOLIDS UTILIZED BY EACH SITE UNDER THE CONTROLLED SOLIDS DISTRIBUTION PROGRAM IN 2005

Site	Description of Use	Quantity
		----- Dry Tons -----
Cinder Ridge Golf Course Wilmington, IL 60481	Soil conditioner and nutrient source for turf growth	326
Conservation Land Stewardship Elmhurst, IL 60176	Soil conditioner and nutrient source for native landscape (prairie) installation on a brownfield site	555
Longwood Country Club Crete, Illinois 60417	Soil conditioner and nutrient source for turf growth	93
St. Charles School District 303 St. Charles, Illinois 60174	Soil conditioner and nutrient source for turf growth	523
Valley View School District Romeoville, IL 60440	Soil conditioner and nutrient source for turf growth	384
Great Lakes Youth Sports Events, LLC Lynwood, IL 60411	Soil conditioner and nutrient source for turf growth	225
Chalet Hills Golf Course Cary, IL 60013	Soil conditioner and nutrient source for turf growth	177
Oak Brook Park District Oak Brook, IL 60523	Soil conditioner and nutrient source for turf growth	11

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 10

NITROGEN CONCENTRATIONS, VOLATILE SOLIDS REDUCTION, AND METALS CONCENTRATIONS
 IN AIR-DRIED BIOSOLIDS FROM THE CALUMET WATER RECLAMATION PLANT
 APPLIED TO LAND IN 2005

Sample Date	TKN	NH ₃ -N	TVS* Reduction	As	Cd	Cu	Hg	Mo	Ni	Pb	Se	Zn
	-----mg/dry kg ----		----- % -----									
5/11	18,239	1,474	68.4	7	6	414	1.4	15	36	144	14	1,357
5/11	15,522	162	69.4	5	8	439	0.84	15	35	142	16	1,364
5/11	8,013	167	70.2	9	7	430	1.1	15	34	153	11	1,355
5/11	10,985	1,272	85.4	4	6	245	0.72	9	30	101	5	794
5/11	22,178	3,055	70.0	10	7	385	0.97	14	33	132	15	1,289
5/11	22,094	3,136	70.6	5	7	376	1.1	14	36	134	12	1,265
5/18	12,678	1,839	84.9	10	6	238	0.67	10	37	108	6	823
5/23-27	12,559	1,216	88.4	5	5	219	0.67	11	34	95	8	765
5/24	17,349	412	68.0	8	8	435	1.0	13	34	167	14	1,482
5/26	29,670	2,037	68.2	6	7	434	1.0	17	37	150	20	1,469
5/27	26,090	2,498	68.8	3	7	395	1.1	17	33	145	10	1,336
5/31-6/02	17,196	4,215	70.6	11	7	398	0.95	17	37	136	11	1,306
5/31-6/03	13,341	2,250	68.8	8	7	436	1.3	16	38	144	15	1,445
6/02-03	15,485	2,354	66.5	10	7	416	1.1	17	36	146	12	1,382
6/06-09	8,745	1,804	65.2	8	7	413	1.0	17	35	141	12	1,372
6/06-09	16,270	2,115	65.8	8	7	433	1.5	16	35	147	12	1,453
6/10	9,021	1,116	68.7	1	7	456	2.3	16	NRR	138	12	1,376
6/16	22,858	3,907	67.0	7	6	411	0.92	15	35	143	14	1,388
6/17	19,331	2,927	66.2	6	7	422	1.3	18	35	141	12	1,426
6/17	22,911	2,170	69.5	8	7	398	0.94	15	33	140	10	1,374

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 10 (Continued)

NITROGEN CONCENTRATIONS, VOLATILE SOLIDS REDUCTION, AND METALS CONCENTRATIONS
IN AIR-DRIED BIOSOLIDS FROM THE CALUMET WATER RECLAMATION PLANT
APPLIED TO LAND IN 2005

Sample Date	TKN	NH ₃ -N	TVS*	TVS* Reduction	As	Cd	Cu	Hg	Mo	Ni	Pb	Se	Zn
	----mg/dry kg ----		----- % -----						----- % -----				
9/7	24,303	2,577	43.1	63.7	5	7	453	1.1	15	37	152	25	1,573
9/7	20,768	1,378	42.2	65.0	4	9	459	1.1	15	40	159	13	1,586
9/12	17,221	1,536	35.2	73.9	5	11	380	0.39	13	42	124	7	1,049
9/12-13	21,232	2,593	40.7	67.0	8	11	383	0.97	13	39	114	7	1,033
9/13-14	21,187	1,517	37.6	71.1	5	12	404	0.09	13	39	102	3	1,047
9/14-15	20,235	3,203	45.7	59.6	7	11	378	0.38	13	40	121	3	1,022
9/21-22	22,312	3,541	34.7	74.4	7	11	363	0.60	12	38	129	8	1,029
9/22	16,190	1,963	40.7	67.0	7	8	454	1.7	15	38	151	18	1,481
10/31-11/1	14,303	1,156	40.1	66.4	4	8	438	1.7	11	33	148	6	1,416
11/2-3	15,749	980	41.0	70.8	7	8	441	1.6	13	35	141	13	1,404
Minimum	8,013	162	23	60	1	5	219	0.09	9	30	95	3	765
Mean	17,801	2,019	41	70	7	8	398	1	14	36	136	11	1,282
Maximum	29,670	4,215	46	88	11	12	459	2	18	42	167	25	1,586
503 Limit	NL	NL	NL	38	41	39	1,500	17	75	420	300	100	2,800

*TVS = Total Volatile Solids.
NL = No limit; not applicable.
NRR = No reportable result.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 11

DATA FOR MONITORING PART 503 CLASS A PATHOGEN COMPLIANCE AT THE CALUMET WATER RECLAMATION PLANT FOR 2005

Sample Date	Lagoon Source	Total Solids	Fecal Coliform *
		----%----	----No./g----
05/05/05	5	68.9	550
05/10/05	17	74.8	67
05/10/05	5	54.1	700
05/10/05	5	78.3	49
05/24/05	17	59.6	150
05/24/05	17	73.1	39
06/02/05	5	63.1	16
06/02/05	5	85.0	8
07/26/05	4	95.0	61
08/02/05	4	81.2	160

*Beginning August 1, 2002 the Calumet WRP EQ Processing Trains met Class A standards according to Section 503 32a8 and required only Fecal Coliform analysis at the time of use.

STICKNEY WRP

Treatment Plant and Biosolids Process Train Description

The Stickney WRP, located in Stickney, Illinois, has a design capacity of 1,200 mgd. Wastewater reclamation processes include primary (Imhoff and primary settling) and secondary (activated sludge process) treatment. All solids produced at this WRP are anaerobically digested. Stickney WRP biosolids are then:

- a. Placed into lagoons for dewatering, aging, and stabilization, and then transported to paved cells and air-dried prior to:
 1. Application to land as EQ biosolids under the District's Controlled Solids Distribution Permit.
 2. Use at local municipal solid waste landfills as final landfill cover.
 3. Disposal in local municipal solid waste landfills.
- b. Dewatered by centrifuging to approximately 25 percent solids content, and then applied to land by a private contractor as a Class B cake.
- c. Dewatered by centrifuging to approximately 25 percent solids content, transported to paved cells, and air-dried prior to use as daily landfill cover.
- d. Dewatered by centrifuging to approximately 25 percent solids content, placed into lagoons for aging and stabilization, and transported to paved cells and air-dried prior to:
 1. Application to land as EQ biosolids under the District's Controlled Solids Distribution Permit.
 2. Use at local municipal solid waste landfills as final landfill cover.
 3. Disposal in local municipal solid waste landfills.

In 2005, the total biosolids production at the Stickney WRP was 126,879 dry tons (Table 1). This total includes biosolids generated from processing of sludge originating at the Stickney WRP as well as the sludge that was imported from the North Side and Lemont WRPs for further processing. The quantity of biosolids that were used and disposed of in 2005 was 136,957 dry tons. This total is greater than the total 2005 production for the Stickney WRP due to a net withdrawal of biosolids from lagoon storage.

Summary of Use and Disposal at Landfills

In 2005, the Stickney WRP sent 48,327 dry tons of biosolids to landfills. Of this amount, 27,577 dry tons were used as daily cover, 26,714 dry tons were used as final cover, and 2,759 dry tons were co-disposed with municipal solid waste. These practices are exempt from the Part 503 Regulations and require no further reporting.

Land Application of Centrifuge Cake Biosolids

In 2005, the Stickney WRP land applied 48,327 dry tons of centrifuge cake biosolids to farmland under IEPA Permit No. 2005-SC-5073 through contracts with Synagro Midwest, Inc. This does not include the 1,954 dry tons of centrifuge cake that was transported from the John E. Egan WRP to the Lawndale Avenue Solids Management Area, prior to being applied to farmland by Synagro Midwest, Inc. In accordance with Table 1 of Section 503.16, the frequency of monitoring for this biosolids product is 12 times per year.

All Stickney WRP centrifuge cake biosolids that were land applied in 2005 met the pollutant concentration limits in Table 3 of Section 503.13 (Table 12), the Class B pathogen anaerobic digester

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 12

NITROGEN AND METALS CONCENTRATIONS IN CENTRIFUGE CAKE BIOSOLIDS
FROM THE STICKNEY WATER RECLAMATION PLANT APPLIED TO FARMLAND IN 2005

Date	TKN	NH ₃ -N	As	Cd	Cu	Hg	Mo	Ni	Pb	Se	Zn
1/6	50,312	6,592	5	4	371	0.94	14	51	115	<0.7	846
2/9	49,299	8,366	6	4	361	1.1	12	45	117	<0.7	805
2/15	60,436	8,528	<1	2	750	1.4	19	63	67	<0.7	953
2/15	60,436	8,528	<1	2	750	1.4	19	63	67	<0.7	953
2/15	47,074	6,723	5	4	392	1.5	12	48	124	1	871
2/15	47,939	6,125	5	4	366	0.91	11	44	111	3	772
3/10	49,846	6,505	3	5	424	1.5	14	54	125	<0.7	920
3/17	66,817	9,997	<1	3	751	2.5	19	58	56	<0.7	921
3/17	41,048	6,935	<1	3	527	1.5	18	47	88	<0.7	864
3/17	45,679	8,526	1	4	374	1.1	13	48	114	1	834
4/7	49,319	10,226	<1	2	790	1.4	17	72	58	<0.7	923
4/7	45,139	11,798	6	5	375	0.96	11	44	118	<0.7	822
4/7	43,493	8,691	5	5	406	0.74	12	46	102	1	796
4/7	35,819	5,664	5	4	378	0.93	13	44	112	<0.7	792
4/15	51,658	8,692	8	5	371	0.69	13	59	118	<0.7	886
5/5	44,477	4,640	3	4	387	0.73	14	46	134	<0.7	860
5/12	57,308	8,348	<1	2	677	1.1	22	61	59	<0.7	844
5/12	57,813	11,731	8	4	340	0.81	14	61	125	<0.7	822
5/12	49,138	10,069	7	5	453	0.64	13	52	138	<0.7	982

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 12 (Continued)

NITROGEN AND METALS CONCENTRATIONS IN CENTRIFUGE CAKE BIOSOLIDS
FROM THE STICKNEY WATER RECLAMATION PLANT APPLIED TO FARMLAND IN 2005

Date	TKN	NH ₃ -N	As	Cd	Cu	Hg	Mo	Ni	Pb	Se	Zn
5/19	41,865	6,747	7	4	374	NA	17	90	147	<0.7	867
6/9	43,193	4,221	7	5	440	0.67	14	53	157	<0.7	950
6/9	43,047	8,839	6	4	420	0.66	15	52	146	<0.7	961
6/9	47,611	11,243	<1	3	785	0.98	20	76	56	<0.7	906
6/9	57,772	11,879	5	4	439	0.79	14	51	140	<0.7	965
6/20-21	52,434	9,281	<1	3	763	1.3	21	70	63	<0.7	922
6/27-28	41,368	9,789	6	5	406	0.64	14	55	126	<0.7	899
7/1	42,387	12,627	7	5	410	0.51	12	52	109	3	839
7/6-9	46,717	11,950	6	4	400	0.58	12	60	121	1	890
7/7	88,461	7,427	5	3	448	0.73	16	51	135	<0.7	873
7/11-16	50,039	14,254	6	5	393	0.51	12	56	121	4	861
7/18-23	50,670	15,363	9	4	392	0.48	12	50	122	1	854
7/20	24,252	19,879	5	6	457	0.46	14	62	111	<0.7	954
7/20	23,165	17,891	8	5	452	0.58	15	65	144	<0.7	1,063
7/25-30	55,415	14,576	8	4	388	0.45	12	49	124	2	848
8/1-6	48,103	13,051	8	5	455	1.0	16	58	141	2	995
8/4	43,381	3,201	<1	4	439	0.85	20	50	151	<0.7	930
8/8-11	51,757	18,783	5	5	433	2.1	14	52	111	1	879
8/18	42,735	9,765	4	5	457	2.2	16	55	107	5	901

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 12 (Continued)

NITROGEN AND METALS CONCENTRATIONS IN CENTRIFUGE CAKE BIOSOLIDS
FROM THE STICKNEY WATER RECLAMATION PLANT APPLIED TO FARMLAND IN 2005

Date	TKN	NH ₃ -N	As	Cd	Cu	Hg	Mo	Ni	Pb	Se	Zn
8/22-27	45,739	15,691	4	5	426	1.8	16	54	123	2	896
8/29-31	39,556	11,764	4	4	451	1.5	15	54	146	2	982
9/1-2	54,055	16,018	7	3	362	1.0	12	47	128	1	752
9/6-9	48,923	15,322	7	4	377	0.59	16	53	133	2	822
9/7	44,410	11,864	2	5	495	1.1	17	66	148	3	1,079
9/12-13	43,194	12,097	3	3	332	0.71	16	46	116	2	890
9/19	45,959	3,541	4	5	485	1.6	23	54	136	<0.7	1,044
9/21	58,361	20,503	7	3	361	0.49	13	54	123	<0.7	751
10/4-8	47,544	9,326	6	4	443	2.1	21	57	152	<0.7	962
10/5	39,819	9,844	6	5	429	1.3	17	60	131	<0.7	947
10/5	43,498	6,859	2	4	478	1.9	22	61	140	2	1,052
10/9	45,569	3,888	5	4	437	1.6	20	47	132	<0.7	996
10/10-13	47,090	11,680	7	4	458	1.6	21	59	149	<0.7	975
10/14-15	50,935	7,627	6	4	454	0.99	24	62	148	<0.7	940
10/17-20	48,942	12,368	6	4	407	1.5	16	56	134	<0.7	854
10/25	44,713	7,519	7	5	445	1.1	19	63	155	<0.7	890
10/28-29	47,116	10,201	6	4	393	2.1	18	61	126	<0.7	816
10/31	50,385	15,092	7	4	375	1.3	14	50	124	<0.7	788
11/3-5	34,311	8,861	3	3	403	1.1	24	52	138	<0.7	889

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 12 (Continued)

NITROGEN AND METALS CONCENTRATIONS IN CENTRIFUGE CAKE BIOSOLIDS
FROM THE STICKNEY WATER RECLAMATION PLANT APPLIED TO FARMLAND IN 2005

Date	TKN	NH ₃ -N	As	Cd	Cu	Hg	Mo	Ni	Pb	Se	Zn
11/10	32,103	7,463	3	4	411	2.5	24	64	139	<0.7	872
11/15	39,049	4,006	5	3	346	0.85	16	45	115	<0.7	723
12/8	22,986	3,315	6	3	365	1.2	17	59	109	<0.7	707
Minimum	22,986	3,201	<1	2	332	0.45	11	44	56	<0.7	707
Mean*	46,660	9,640	5	4	447	1.1	16	56	121	1	890
Maximum	88,461	20,503	9	6	790	2.5	24	90	157	5	1,079
503 Limit	NL	NL	41	39	1,500	17	75	420	300	100	2,800

* In calculating the mean, values less than the detection limit were considered as the detectable level.

NA= No analysis.

NL = No limit; not applicable.

time and temperature requirements of Section 503.32b3 (Table 13), and the vector attraction reduction requirements of Section 503.33b10. Table 12 also contains the biosolids nitrogen concentration data that were used by the land applier to compute the agronomic loading rates at the farmland sites.

Land Application of Aged, Air-Dried Biosolids

In 2005, the Stickney WRP land applied a total of 31,629 dry tons of air-dried EQ biosolids through the District's Controlled Solids Distribution Program under IEPA Permit Nos. 2000-SC-0872 and 2005-SC-3793. The quantities of biosolids utilized by each site under the controlled Solids Distribution Program and how they were used are shown in Table 14. In accordance with Table 1 of Section 503.16, the frequency of monitoring for this biosolids product is 12 times per year.

An exception to the frequency of the monitoring requirement in Table 1 of Section 503.16 was granted, effective March 1, 2000, by USEPA Region V, for compliance with Class A pathogen standards. The Calumet WRP biosolids that are land applied are required to be monitored only six times per year for compliance with Class A pathogen standards in Part 503 (Appendix II). Subsequent to this, USEPA Region V designated, on a site-specific basis for the Calumet and Stickney WRPs, two of the District's biosolids processing trains, as equivalent to a PFRP. This PFRP equivalency took effect on August 1, 2002 (Appendix III) and on this basis, all EQ biosolids produced by the Stickney WRP met the Part 503 Class A pathogen requirements of 503.32a8 in 2005.

All Stickney WRP EQ biosolids that were land applied in 2005 met the pollutant concentration limits in Table 3 of Section 503.13 (Table 15), the Class A pathogen limits of Section 503.32a8 (Table 16), and the vector attraction reduction requirements of Section

503.33b1 (Table 15). Management practices complied with Section 503.14, as previously described in a letter to Mr. Michael J. Mikulka dated January 28, 1994 (Appendix I).

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 13

DIGESTER TEMPERATURES AND DETENTION TIMES FOR CENTRIFUGE CAKE BIOSOLIDS FROM THE STICKNEY WATER RECLAMATION PLANT APPLIED TO FARMLAND IN 2005

Month	Average Temperature	Average Detention Time	Meets Part 503 Class B Requirements	Minimum Detention Time Required by 503.32b3*
	---- °F ----	--- days ---		--- days ---
January	97	23.0	yes	15.0
February	97	19.3	yes	15.0
March	97	20.1	yes	15.0
April	97	18.0	yes	15.0
May	97	20.8	yes	15.0
June	97	19.9	yes	15.0
July	98	24.8	yes	15.0
August	98	24.1	yes	15.0
September	97	29.5	yes	15.0
October	98	26.9	yes	15.0
November	97	17.7	yes	15.0
December	97	18.4	yes	15.0

*For anaerobic digestion at average temperature achieved.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 14

QUANTITIES OF STICKNEY WATER RECLAMATION PLANT BIOSOLIDS UTILIZED BY EACH SITE UNDER THE CONTROLLED SOLIDS DISTRIBUTION PROGRAM IN 2005

Site	Description of Use	Quantity
		----- Dry Tons -----
Lakepoint Club Corp./DBA Cinder Ridge Golf Course Wilmington, IL 60481	Soil conditioner and nutrient source to establish vegetative cover on a coal refuse pile	30,329
Metropolitan Water Reclamation District of Greater Chicago Willow Springs, IL 60480	Soil conditioner and nutrient source to establish vegetation at Willow Springs berm	1,300

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 15

NITROGEN CONCENTRATIONS, VOLATILE SOLIDS REDUCTION, AND METALS CONCENTRATIONS
IN AIR-DRIED BIOSOLIDS FROM THE STICKNEY WATER RECLAMATION PLANT
APPLIED TO LAND IN 2005

Sample Date	TKN	NH ₃ -N	TVS*	TVS* Reduction	As	Cd	Cu	Hg	Mo	Ni	Pb	Se	Zn
	----- mg/dry kg ----		-----%-----										
5/17-18	8,249	983	42.0	50.8	11	5	515	0.90	21	56	182	<0.7	1,205
5/17-18	9,374	196	37.3	59.5	8	7	480	1.1	21	63	171	<0.7	1,070
5/24-27	19,947	2,263	41.8	51.2	11	5	494	0.99	22	63	172	<0.7	1,130
5/24-27	11,562	447	40.9	52.9	9	8	475	1.2	20	59	188	<0.7	1,054
5/31	3,752	95	42.5	49.8	9	5	498	0.98	21	56	182	<0.7	1,165
5/31	12,507	253	35.1	63.2	8	9	445	1.0	18	60	167	<0.7	1,015
6/1-2	7,959	398	35.4	64.5	8	9	465	1.2	22	71	176	<0.7	1,147
6/1-2	4,202	346	41.4	54.2	7	6	518	1.2	20	59	196	<0.7	1,307
6/7-8	8,255	437	36.5	62.8	5	8	500	1.3	21	64	180	<0.7	1,173
6/7-8	25,493	7,371	36.8	62.2	6	6	551	1.0	20	63	208	<0.7	1,354
6/8-11	13,225	731	31.5	70.2	6	14	450	1.1	14	60	172	<0.7	1,083
6/13-16	10,568	953	32.3	69.1	6	13	439	0.65	15	71	177	<0.7	1,102
6/16	6,182	689	36.4	62.9	8	7	472	1.2	22	68	172	<0.7	1,137
6/16-17	5,904	760	39.4	57.9	7	6	492	1.1	17	58	188	<0.7	1,196
6/20-24	12,144	1,368	40.4	56.1	6	5	494	0.92	19	57	182	<0.7	1,202
6/27	14,022	2,830	45.0	47.0	5	4	421	0.64	14	67	161	<0.7	1,043
6/28	12,732	3,688	47.0	42.7	5	7	481	1.2	17	65	149	<0.7	988

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 15 (Continued)

NITROGEN CONCENTRATIONS, VOLATILE SOLIDS REDUCTION, AND METALS CONCENTRATIONS
IN AIR-DRIED BIOSOLIDS FROM THE STICKNEY WATER RECLAMATION PLANT
APPLIED TO LAND IN 2005

Sample Date	TKN	NH ₃ -N	TVS* Reduction	As	Cd	Cu	Hg	Mo	Ni	Pb	Se	Zn
	mg/dry kg ----		%-----	mg/dry kg -----								
Minimum	3,752	95	42.7	5	4	421	0.64	14	56	149	<0.7	988
Mean**	10,946	1,400	57.5	7	7	482	1.0	19	62	178	<0.7	1,139
Maximum	25,493	7,371	70.2	11	14	551	1.3	22	71	208	<0.7	1,354
503 Limit	NL	NL	38.0	41	39	1,500	17	75	420	300	100	2,800

*TVS = Total Volatile Solids.

**In calculating the mean, values less than the detection limit were considered as the detection limit.

NL = No limit; not applicable.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

Table 16

DATA FOR MONITORING PART 503 CLASS A PATHOGEN COMPLIANCE
AT THE STICKNEY WATER RECLAMATION PLANT FOR 2005

Sample Date	Lagoon Source	Total Solids	Fecal Coliform *
		----%----	----No./g----
05/10/05	23	72.7	39
05/24/05	30	70.2	41
06/07/05	23	75.2	7
06/21/05	23	88.4	6
07/12/05	23	84.3	2
07/26/05	23	79.4	120
08/16/05	23	76.3	38
09/13/05	21	94.9	30
10/18/05	21	70.5	27

*Beginning August 1, 2002 the Stickney WRP EQ Processing Trains met Class A standards according to Section 503.32a8 and required only Fecal Coliform analysis at the time of use.

DISTRICT BIOSOLIDS DISTRIBUTED TO LANDFILLS UNDER
40 CFR PARTS 258 AND 261

Biosolids from two of the District's WRPs (Stickney and Calumet) were sent to landfills in 2005 for co-disposal with municipal solid waste, use as daily cover, and use as final cover. Biosolids going to these landfills are either processed to meet the requirements of AS 95-4, AS 98-5, and AS 03-02 (Adjusted Standards) approved by the Illinois Pollution Control Board for biosolids used as a final vegetative cover, or they are centrifuged and air-dried to various end points, and analyzed as specified in 40 CFR Part 261 to establish the nonhazardous nature of this material for biosolids used as daily cover and co-disposed. Analytical results, including TCLP constituents, PCB, cyanide, sulfide, and paint filter test, are submitted to the landfill company to satisfy the requirements of their IEPA permit. District biosolids have always met the requirements of 40 CFR Parts 258 and 261, and the Illinois nonhazardous waste landfill regulations (Title 35, Subtitle G, Chapter I, Subchapter h, Part 810).

Stickney WRP

A total of 57,050 dry tons of biosolids from the Stickney WRP were co-disposed, used as daily cover with municipal solid waste, or used as a final vegetative cover at nonhazardous waste landfills in 2005.

A total of 2,759 dry tons were co-disposed at Land and Lakes River Bend Prairie Landfill at 801 East 138th Street, Dolton, Illinois.

A total of 27,577 dry tons were used as daily cover at Land and Lakes River Bend Prairie Landfill.

A total of 14,577 dry tons of biosolids were used as a final vegetative cover at Land and Lakes River Bend Prairie Landfill and 12,137 dry tons were used as final cover at the Waste

Management of North America, Inc., CID Recycling and Disposal Facility in Calumet City, Illinois.

Calumet WRP

In 2005, a total of 15,966 dry tons of biosolids from the Calumet WRP were used as final cover at nonhazardous waste landfills. These biosolids were used as final vegetative cover at Paxton Landfill located at 12201 South Oglesby Avenue, Chicago, Illinois.

John E. Egan WRP

The John E. Egan WRP did not send any biosolids to landfills in 2005.