Metropolitan Water Reclamation District of Greater Chicago

MONITORING AND RESEARCH DEPARTMENT

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ANNUAL BIOSOLIDS MANAGEMENT REPORT FOR 2024

August 2025

Metropolitan Water Reclamation District of Greater Chicago
100 East Erie Street Chicago, Illinois 60611-2803 (312) 751-5600

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By

Benjamin Morgan
Environmental Soil Scientist

Guanglong Tian
Principal Environmental Scientist

Albert Cox
Environmental Monitoring and Research Manager

Heng Zhang
Assistant Director of Monitoring and Research
Environmental Monitoring and Research Division

Monitoring and Research Department
Edward W. Podczerwinski, Director **August 2025**

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LIST OF ABBREVIATIONS

Abbreviation	Definition
°C	degrees Celsius
°F	degrees Fahrenheit
As	arsenic
Cd	cadmium
CFR	*Code of Federal Regulations*
CSD	Controlled Solids Distribution
Cu	copper
District	Metropolitan Water Reclamation District of Greater Chicago
DT	dry tons
Egan	John E. Egan
EQ	"Exceptional Quality"
FC	fecal coliform
Hg	mercury
IDOA	Illinois Department of Agriculture
IEPA	Illinois Environmental Protection Agency
kg	kilogram
Kirie	James C. Kirie
L	liter
MBM	Metropolitan Biosolids Management, LLC
mg	milligram
MGD	million gallons per day
Mo	molybdenum
N	nitrogen
NH_3-N	ammonia nitrogen
Ni	nickel
NO_3^-+NO_2^--N	nitrate plus nitrite nitrogen
NO_3^--N	nitrate nitrogen
O'Brien	Terrence J. O'Brien
Part 503	Title 40 Part 503
Pb	lead
PFRP	Process to Further Reduce Pathogens
Se	selenium
SMA	Solids Management Area
TKN	total Kjeldahl nitrogen
TVS	total volatile solids
USEPA	United States Environmental Protection Agency
VAR	vector attraction reduction
WRP	water reclamation plant
Zn	zinc

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Special thanks are given to Ms. Laura Franklin for typing and formatting 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

This report serves as a record of the data and information that fulfills the frequency of monitoring and the reporting requirements for 2024 for biosolids management by the Metropolitan Water Reclamation District of Greater Chicago (District), as specified in the United States Environmental Protection Agency's (USEPA's) *Code of Federal Regulations* (*CFR*) Title 40 Part 503 (Part 503). The Part 503 reporting was done as required through the USEPA's online reporting system in February 2025.

OVERVIEW OF METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO BIOSOLIDS PRODUCTS AND UTILIZATION PROGRAM

The District operates seven (7) water reclamation plants (WRPs), namely the Stickney, Calumet, Terrence J. O'Brien (O'Brien), John E. Egan (Egan), Hanover Park, James C. Kirie (Kirie), and Lemont WRPs. Four WRPs, Stickney, Calumet, Egan, and Hanover Park, produce final biosolids products. Generally, the untreated sludge generated at the Kirie WRP is sent to the Egan WRP, and sludge from the O'Brien and Lemont WRPs is sent to the Stickney WRP for processing into final products. The processing of biosolids at the four WRPs that generate final biosolids products includes anaerobic digestion at 35°C for at least 15 days of detention time to meet the 40 *CFR* Part 503 Class B pathogen reduction requirements. The metal concentrations in all biosolids produced at the District are well below the pollutant concentration limits established in Table 3 of Part 503.13(b)(3). In 2024, all Egan biosolids were sent to the Stickney WRP for processing into final products. The additional processing to achieve the final products varies among the three (3) WRPs as indicated in the description of the biosolids products outlined below.

Biosolids Products at the Metropolitan Water Reclamation District of Greater Chicago

- **Dewatered Class B Biosolids:** These biosolids are produced primarily by centrifugation of anaerobically digested liquid biosolids (~5 percent solids content) to approximately 25 percent solids content (centrifuge cake). Alternatively, the anaerobically digested liquid biosolids are stored temporarily in lagoons, then placed on drying beds for partial drying to >20 percent solids content through mechanical agitation before use. These dewatered biosolids meet the Class B pathogen standards of the USEPA Part 503 biosolids rule and meet vector attraction reduction (VAR) requirements through timely incorporation into land. This product is produced at the Stickney and Calumet WRPs, and sometimes at the Egan WRP (centrifuged biosolids), and commonly applied to farmland as a fertilizer.

- **Air-dried Exceptional Quality Biosolids:** These biosolids are produced by aging centrifuge cake biosolids or digested liquid biosolids in lagoons (typically for over one (1) year) followed by air-drying to at least 65 percent solids content. This air-dried material meets the "Exceptional Quality" (EQ) standards of the USEPA Part 503 biosolids rule, which designates biosolids that meet the strictest trace metals, pathogen, and VAR requirements. This product is produced at the Stickney and Calumet WRPs, and since the early 1990s, it has been used under a Controlled Solids Distribution (CSD) program as a fertilizer or soil amendment on areas such as recreational fields and golf courses and for reclamation of urban soils. The material is currently voluntarily registered as a soil amendment with the Illinois Department of Agriculture (IDOA).

- **Composted Exceptional Quality Biosolids:** The composted biosolids are produced at the Stickney WRP Harlem Avenue Solids Management Area (SMA) and at the Calumet East SMA under permits issued by the Illinois Environmental

Protection Agency (IEPA) Bureau of Land and according to operational standards of the Federal 40 *CFR* Part 503 Process to Further Reduce Pathogens (PFRP) protocol (USEPA, 1993). The composting recipe consists of one part centrifuge cake biosolids and two (2) or three (3) parts woodchips. The composting process used is open-windrow composting for a minimum of 23 days, a minimum of five (5) turnings, with temperature maintained at a minimum of 55°C, and then followed by 16 weeks of curing. The compost produced is currently voluntarily registered as a soil amendment with the IDOA.

- **Liquid Class B Biosolids:** The digested biosolids produced at the Hanover Park WRP are stored and thickened to ~5 percent solids content in lagoons on the grounds of the Hanover Park WRP. This material meets the 40 *CFR* Part 503 Class B pathogen and VAR requirements and is applied through subsurface injection at the on-site Fischer Farm as a fertilizer for crops, mainly corn. The Fisher Farm has an underdrain system that returns drainage from the fields back to the headworks of the WRP.

- **Biosolids Pellets:** The product is produced by heat-drying at a pelletizer facility located at the Stickney WRP that is owned and operated by Metropolitan Biosolids Management, LLC (MBM), a subsidiary of Veolia Water North America. The operation generates fertilizer pellets with a solids content greater than 90 percent that meet EQ biosolids standards.

Metropolitan Water Reclamation District of Greater Chicago Site-Specific Designations and Adjusted Standards for Biosolids Quality and Utilization

- **Illinois Pollution Control Board Adjusted Standards (AS 95-4 and 02-03):** These adjusted standards, originally granted to the District in 1995 by the Illinois Pollution Control Board, allow the use of lagoon-aged (at least 1.5 years) air-dried (at least 65 percent solids content) biosolids for establishing the final vegetative layer on landfills as a landfill final cover. Class A status is not necessary for lagoon-aged air-dried biosolids used for final cover.

- **United States Environmental Protection Agency Site-Specific Process to Further Reduce Pathogens Certification:** This site-specific certification of the Calumet and Stickney WRPs' biosolids processing trains was granted in 2002. The certification specifies that biosolids produced by these processing trains in accordance with all parameters specified in the certification are designated Class A. The codified operational parameters are related to digestion time and temperature, lagoon storage time, loading rates, and frequency of agitation on drying cells. Any biosolids which do not comply with any of the codified parameters for the biosolids processing trains are to be isolated from PFRP-compliant biosolids and must be tested to meet the Part 503 pathogen (virus and helminth) requirements to be designated Class A. This certification was renewable every five (5) years. Over the past ten (10) years, due to operational efficiencies related to lagoon storage time and air-drying operations, biosolids

processing at the Calumet and Stickney WRPs have not been operated to follow the codified parameters; therefore, all air-dried EQ biosolids are tested for helminth ova and viruses. The site-specific certification for Calumet and Stickney WRP air-dried biosolids was also not renewed after it expired in 2022.

Requirements for Co-Disposal of Unsuitable Biosolids Materials at Landfills

Some biosolids are considered unsuitable for land application because they contain gravel, wood debris, and dust from the sweeping of roads at biosolids processing sites. These materials are co-disposed with municipal solid wastes at a nonhazardous waste landfill according to the federal requirements in 40 *CFR* Parts 258 and 261 and the Illinois nonhazardous waste landfill regulations (Illinois Administrative Code Title 35, Subtitle G, Chapter I, Subchapter H, Part 810). The biosolids are certified for co-disposal at landfills through analysis as specified in 40 *CFR* Part 261 to establish their nonhazardous nature. District biosolids have always met these requirements. Analytical results required for the landfill company's IEPA permits, including toxic characteristic leaching procedure constituents, polychlorinated biphenyls, cyanide, sulfide, and paint filter tests, were updated in October 2021 and remain valid through 2024. Some unsuitable biosolids can be also used as daily cover on landfills.

Total Biosolids Produced at the Metropolitan Water Reclamation District of Greater Chicago

A total of 147,957 dry tons (DT) of biosolids was produced at District WRPs in 2024 based on the total of amounts at the Calumet, Stickney (which received all solids produced at the Egan, O'Brien, Kirie, and Lemont WRPs), and Hanover Park WRPs (Table 1). The Stickney WRP produced 119,234 DT of biosolids from processing of solids generated at the plant and solids transported from the Egan, O'Brien, Kirie, and Lemont WRPs. The Calumet WRP produced 27,914 DT. The Hanover Park WRP produced 809 DT, all of which was land applied at the on-site Fischer Farm or stored on site. This brings the District's five (5)- and ten (10)-year biosolids production running averages to 147,703 and 141,059 DT/year, respectively.

Biosolids Utilization Outlets

The District's Biosolids Management Program is designed to manage all the biosolids for beneficial reuse. There are five (5) main outlets for the beneficial utilization of District biosolids: (1) the Farmland Application Program, (2) the Urban Utilization Program, (3) the Fischer Farm Utilization Program, (4) pelletizing at the MBM facility, and (5) landfill final cover. In 2024, a total of 128,754 DT of biosolids were utilized through these outlets (Table 1). During 2024, no biosolids were co-disposed with municipal solid wastes at landfill sites (Figure 1).

Farmland Application Program. In this program, dewatered Class B biosolids are utilized as a fertilizer for production of row crops in nearby counties in northeastern Illinois. Under this program, land application companies are contracted by the District through the competitive bidding process. The contractor is responsible for enrolling farmers in the program and for hauling and applying the biosolids to the farm fields. The farmland application program is conducted under separate permits issued by the IEPA to the District and the contractor. The District provides

TABLE 1: PRODUCTION AND UTILIZATION OF SLUDGE AND BIOSOLIDS DURING 2024[1]

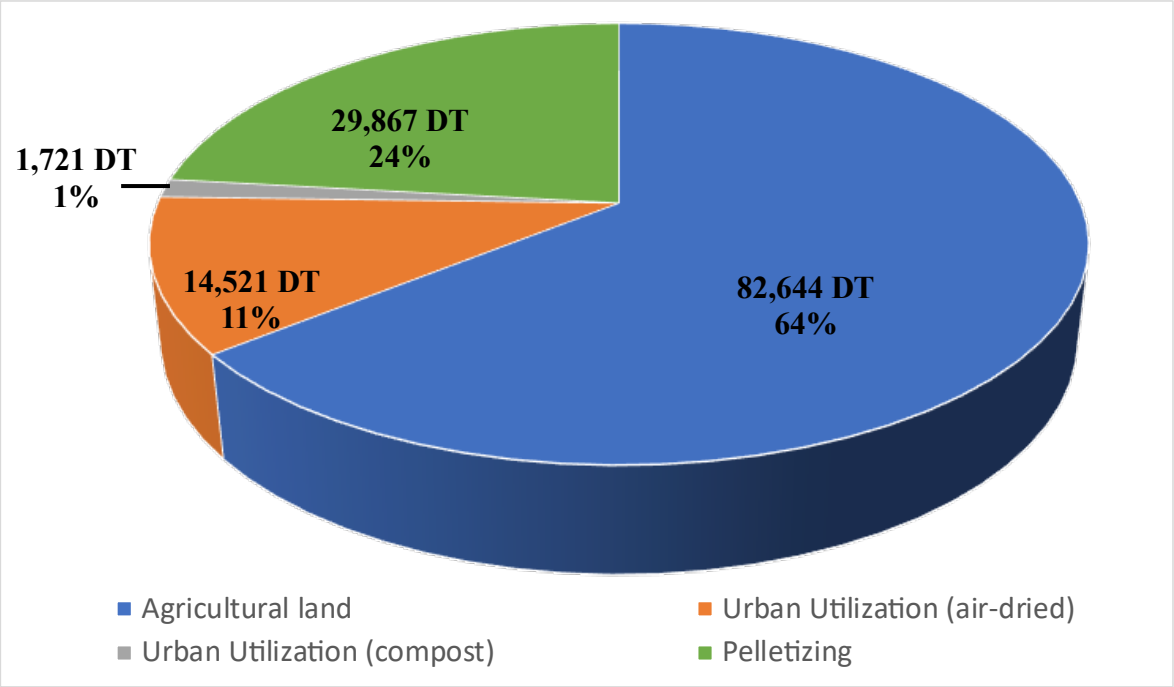
Production and Utilization	Water Reclamation Plants						
	Stickney	Calumet	Hanover Park	Egan	O'Brien	Kirie	Lemont
	Dry Tons (Metric Tons)						
Production	119,234 (108,167)	27,914 (25,323)	809 (734)	5,513 (5,001)	32,691 (29,657)	5,756 (5,221)	362 (328)
To other WRP (Stickney)[2]	0	0	0	-5,513 (5,001)	-32,691 (29,657)	-5,756 (5,221)	-362 (328)
Total	119,234 (108,167)	27,914 (25,323)	809 (734)	0	0	0	0
Utilization							
Agricultural land	59,234 (53,736)	22,356 (20,281)	1,054 (956)	0	0	0	0
Urban land (total)	16,043 (14,554)	200 (181)	0	0	0	0	0
Air-dried	14,321 (12,992)	200 (181)	0	0	0	0	0
Composted	1,721 (1,562)	0 (0)	0	0	0	0	0
Pelletizing facility[3]	29,867 (27,095)	0	0	0	0	0	0
Total	105,144 (95,385)	22,556 (20,462)	1,054 (956)	0	0	0	0

[1]Differences between biosolids production and total use or disposal in 2024 were due to a net withdrawal or storage in lagoons or drying areas and processing of biosolids imported from other WRPs.

[2]In 2024, biosolids produced at the Egan WRP, including the sludge from the Kirie WRP, and sludge from the O'Brien and Lemont WRPs were sent to the Stickney WRP for further processing and utilization. Figures represent solids generated at each WRP plus those imported from other plants.

[3]Processed at Stickney WRP pelletizing facility owned and operated by Metropolitan Biosolids Management, LLC, 6001 W. Pershing Road, Cicero, IL 60804 (Contract No. 98-RFP-10).

FIGURE 1: OUTLETS OF BIOSOLIDS UTILIZATION AND DISPOSAL AT THE METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO IN 2024



oversight of the program to ensure that the land application of biosolids is conducted in accordance with regulations and permits and that the contractor's operations are consistent with the District's goal of improving the public's awareness of the benefits of the farmland application program to the farming community. This District oversight is done by requiring the land application contractor to comply with hauling and field operation specifications and to execute a Public Relations Program, and by District staff who conduct additional activities to complement the activities of the contractors. The District continually evaluates and modifies the program as needed to improve public awareness, benefits to farmers, and long-term sustainability of the program. In 2024, a total of 82,644 DT of dewatered Class B biosolids were applied to farmland as fertilizer, most (81,590 DT) of which was from the Stickney and Calumet WRPs and the remainder from the Hanover Park WRP (Figure 1).

Urban Utilization Program. Air-dried and composted EQ biosolids are applied to recreational areas (e.g., parks, golf courses, and athletic fields) and residential properties within the Chicago metropolitan area. The air-dried biosolids are typically used as topdressing on established turfgrass or blended into topsoil as a soil amendment. The composted biosolids are typically applied to land as a soil amendment or as mulch on planter beds. This program has traditionally been done under a CSD Permit issued by the IEPA Bureau of Water. In 2015, the Illinois General Assembly amended the Illinois Environmental Protection Act to adopt the USEPA EQ standard in the state and recognize biosolids as a safe, beneficial, and renewable resource. This legislative change eased state regulations that were stricter than federal restrictions on the use of EQ biosolids, and the CSD permit is no longer relevant for utilization of EQ biosolids. In 2024, 14,521 DT of air-dried biosolids and 1,721 DT of composted biosolids from the Stickney and Calumet WRPs were used in the metropolitan Chicago area (Figure 1).

Fischer Farm Utilization Program. The liquid Class B biosolids produced at the Hanover Park WRP are stored and thickened in lagoons and are utilized as fertilizer for application to farmland by subsurface injection at the Fischer Farm located at the WRP. The supernatant from the settling of the biosolids and the settled biosolids are applied separately. In 2024, a total of 1,054 DT of biosolids as liquid biosolids and lagoon supernatant were applied to the farm, as part of 82,644 DT of total amount applied to agricultural land shown in Figure 1. The application of the biosolids and production of the row crops at that site are done by a contractor under separate contracts.

Pelletizing Facility. Anaerobically digested centrifuge-dewatered biosolids are delivered to the MBM facility located at the Stickney WRP, where they are dried to at least 90 percent solids, pelletized, and sold as a fertilizer product by MBM. In 2024, 29,867 DT of pelletized biosolids were generated from anaerobically digested biosolids produced at the Stickney WRP (Figure 1).

Biosolids to Landfills. In 2024, no biosolids were sent to landfills for co-disposal with municipal solid wastes or used as daily or final landfill cover.

The following sections provide a short description of the sludge processing and biosolids management operations at each of the District's seven WRPs. In addition, we discuss the utilization of the biosolids, outline the data-reporting requirements under Part 503, and present the required monitoring data in summary tables. The production and utilization of sludge and biosolids by the District in 2024 are summarized in Table 1. All utilization of biosolids in 2024 complied with the management practices specified in Section 503.14. The total biosolids production in any given year may not equal the amount of the final biosolids product utilized, since biosolids may be utilized from production inventory for a previous year or biosolids produced in a given year may be stored or aged for utilization in subsequent years.

This report documents the production and utilization of the District's biosolids in 2024 records required under Part 503 at Section 503.18.

The District has three (3) IEPA-permitted biosolids management programs that must also comply with Part 503 requirements. These programs are:

1. Hanover Park Fischer Farm Biosolids Application to Land (IEPA Permit No. 2022-SC-66896).

2. The CSD Program (Biosolids Application to Land in the Chicago Area under IEPA Permit No. 2019-SC-64906).

3. Farmland Application Program (Biosolids Application to Farmland from the Calumet, Stickney, and the Egan WRPs under IEPA Permit No 2023-SC-68367).

In addition, the District has two (2) IEPA permits for composting biosolids, at the Calumet East SMA (Permit No. 2017-017-DE/OP, updated in 2021-403-SP) and at the Harlem Avenue SMA (Permit No. 2017-013-DE/OP, updated in 2021-440-SP), and an IEPA Beneficial Use Determination for compost generated at both Calumet East and Harlem Avenue SMAs (BUD21-001). The biosolids compost is distributed for use as a soil amendment under Illinois Department of Agriculture registration (License No. 100181).

STICKNEY WATER RECLAMATION PLANT

Treatment Plant and Biosolids Process Train Description

The Stickney WRP, located in Stickney, Illinois, has a design average flow of 1,200 million gallons per day (MGD). The annual average treated flow in 2024 was 685 MGD. Wastewater reclamation processes include primary (primary settling) and secondary (activated sludge process) treatments. All solids produced at this WRP, solids directly transported from the Lemont WRP, solids pipelined from the O'Brien WRP, and processed solids generated at the Egan and Kirie WRPs, are anaerobically digested at the Stickney WRP. Stickney WRP biosolids are then handled as follows:

1. Placed in lagoons for dewatering, aging, and stabilization and then transported to paved cells and air-dried prior to:

   a. Application to urban land as EQ biosolids.

   b. Application to farmland as dewatered Class B biosolids.

   c. Use at local municipal solid waste landfills as final landfill cover. No biosolids were utilized through this outlet in 2024.

2. Dewatered by centrifuging to approximately 25 percent solids content and then applied to farmland as Class B biosolids by a private contractor.

3. Dewatered by centrifuging to approximately 25 percent solids content, transported to paved cells, and air-dried prior to use as daily landfill cover. No biosolids were utilized this way in 2024.

4. Dewatered by centrifuging to approximately 25 percent solids content and transported to the Harlem Avenue SMA for co-composting with woodchips and yard waste prior to application to urban land as composted EQ biosolids. Class A pathogen reduction was achieved using the open windrow composting process through which all the requirements were met. The temperature of the compost piles was maintained at ≥55°C for at least 15 days, and the piles were turned five (5) times during this period. The VAR requirement was achieved through the same open windrow composting process that met the established standards of Section 503.33(b)(5) by fulfilling the temperature and time requirements (≥45°C for at least 14 days). No new compost was produced in 2024. All EQ compost distributed in 2024 was produced in previous years and met time and temperature requirements as reported in the Annual Biosolids Management Reports of previous years.

4. Dewatered by centrifuging to approximately 25 percent solids content, placed in lagoons for aging and stabilization, transported to paved cells, and air-dried prior to:

a. Application to urban land as EQ biosolids.

b. Use at local municipal solid waste landfills as final landfill cover. No biosolids were utilized through this outlet in 2024.

5. Dewatered by centrifuging to approximately 25 percent solids content and conveyed to MBM to produce heat-dried biosolids pellets under Contract 98-RFP-10. The biosolids pellets were marketed to users by MBM. The analysis of these biosolids (provided by MBM) is presented in Table 2.

In 2024, the Stickney WRP produced a total of 119,234 DT of biosolids (Table 1). This total includes biosolids generated by processing sludge originating at the Stickney WRP as well as the sludge imported from the Egan, O'Brien, Kirie, and Lemont WRPs for further processing. The quantity of biosolids beneficially utilized (105,144 DT) was less than the total 2024 production for the Stickney WRP. Hence, 14,090 DT of the biosolids generated in 2024 were stored in lagoons and/or on drying cells for further processing and future use.

Biosolids to Landfills

In 2024, no biosolids produced at the Stickney WRP were sent to landfill for co-disposal with municipal solid wastes or used as daily or final landfill cover.

Application of Class B Biosolids to Farmland

In 2024, a total of 59,234 DT of dewatered Class B biosolids (centrifuge cake and semi-dried biosolids) generated at the Stickney WRP was applied to agricultural land under IEPA Permit No. 2023-SC-68367. Application to agricultural land was done through contracts with Synagro Midwest, Inc., and Stewart Environmental, Inc. In accordance with Table 1 of Section 503.16, the frequency of monitoring for these biosolids is 12 times per year.

All Stickney WRP dewatered Class B biosolids land applied in 2024 met the pollutant concentration limits in Table 3 of Section 503.13 (Table 3), the VAR requirements of Section 503.33(b)(10) (by incorporation in soil within six (6) hours after application), and the anaerobic digestion time and temperature requirements of the Class B pathogen standard of Section 503.32(b)(3) (Table 4). The biosolids nitrogen (N) concentrations (Table 3) were used to compute the agronomic rates for farmland application.

Application of Exceptional Quality Biosolids to Urban Land

In 2024, a total of 16,043 DT of Stickney WRP air-dried EQ (14,321 DT) and composted EQ (1,721 DT) biosolids were applied to urban land for various uses such as the construction and maintenance of golf courses, recreation fields, and parks. The sites and methods of utilization of these biosolids under the program are listed in Table 5.

TABLE 2: CONCENTRATIONS OF NITROGEN AND METALS IN HEAT-DRIED BIOSOLIDS PELLETS GENERATED BY METROPOLITAN BIOSOLIDS MANAGEMENT FACILITIES AT THE STICKNEY WATER RECLAMATION PLANT IN 2024[1]

Date	Total N[2]	NO_3^-+NO_2^--N	NH_3-N	As	Cd	Cu	Hg	Mo	Ni	Pb	Se	Zn
	mg/dry kg											
01/02/24	37,619	<27.0	4,580	8.1	2.2	427	0.58	14.7	37.6	65.4	5	783
02/06/24	48,719	<27.4	5,020	9.3	3.9	394	0.4	14	39.8	63.5	5.6	792
03/05/24	56,410	<13.5	3,360	7.7	2.8	417	0.39	14.3	40.6	64.1	5	823
04/02/24	41,809	<13.4	5,230	7.6	2.2	390	0.53	12.2	36.8	68.5	4.3	761
05/07/24	40,619	<26.7	5,000	8.7	2	412	0.54	12.5	38.2	81.8	5.3	799
06/05/24	41,809	<13.3	3,880	9.4	1.9	418	0.49	14.6	40.3	91.7	5.2	861
07/02/24	19,209	<13.2	3,030	8.9	2.1	464	0.51	15.5	46.8	113	4.9	951
08/06/24	33,310	<13.5	2,940	6.3	1.7	332	0.52	12.1	33.1	72.8	4.2	771
09/03/24	40,709	<13.4	3,710	6.9	1.6	362	0.46	15.8	39.5	82	4.2	752
10/02/24	36,310	<13.5	2,490	7.3	1.7	398	0.49	18.3	38.5	68.1	4.4	754
11/04/24	35,309	<13.4	2,130	7.9	1.6	431	0.48	19.8	42.6	79.5	<4.1	797
12/01/24	47,009	<13.3	3,230	7.8	1.7	461	0.52	18.3	44.4	74.6	5.8	932
Minimum	19,209	NC[3]	2,130	6.3	1.6	332	0.39	12.1	33.1	63.5	<4.1	752
Mean[4]	39,903	NC	3,717	8.0	2.1	409	0.49	15.2	39.9	77.1	4.7	815
Maximum	56,410	NC	5,230	9.4	3.9	464	0.58	19.8	46.8	113	5.8	951
503 Limit[5]	NL[6]	NL	NL	41	39	1,500	17	75	420	300	100	2,800

[1]Data provided by Metropolitan Biosolids Management, LLC.
[2]Total N was calculated as total Kjeldahl N plus nitrate- and nitrite-N. If the sum of nitrate- and nitrite-N was below the laboratory reporting limit, that sum was divided by the square root of two and added to total Kjeldahl N.
[3]Minimum, mean, and maximum were not calculated because more than half of the reported values were below the laboratory reporting limit.
[4]In calculating each mean, any value less than the reporting limit was treated as equal to the reporting limit divided by the square root of two.
[5]Regulatory limit established under United States *Code of Federal Regulations* Title 40 Part 503.
[6]No limit established under Part 503.

TABLE 3: CONCENTRATIONS OF NITROGEN AND METALS IN DEWATERED BIOSOLIDS GENERATED AT THE STICKNEY WATER RECLAMATION PLANT AND APPLIED TO FARMLAND IN 2024

Date	TKN	NO_3^-+NO_2^--N	NH_3-N	As	Cd	Cu	Hg	Mo	Ni	Pb	Se	Zn
	mg/ dry kg											
03/07/24	43,045	55	11,749	<10.0	6.43	412	0.37	13.9	37.8	84.9	<10.0	788
03/07/24	34,884	38	10,536	<10.0	7.81	443	0.26	13.2	42.9	94.4	<10.0	880
04/12/24	20,374	54	3,606	11.8	2.92	482	0.63	15.2	44.4	101	<10.0	898
04/12/24	36,981	44	11,073	<10.0	3.04	473	0.56	16.5	46.3	92.0	<10.0	948
04/24/24	42,523	BRL[1]	12,806	10.2	5.65	428	0.32	15.3	39.4	76.1	<10.0	885
04/26/24	44,337	260	11,674	11.8	4.72	412	0.42	13.7	40.7	85.7	<10.0	875
05/10/24	37,328	229	3,528	<10.0	3.34	493	0.42	15.5	46.1	98.3	<10.0	875
05/10/24	26,255	BRL	5,345	<10.0	3.57	478	0.55	18.1	47.1	87.0	<10.0	885
05/29/24	61,536	75	22,034	<10.0	3.79	384	0.53	14.3	38.9	60.4	<10.0	780
05/29/24	48,956	59	14,290	<10.0	2.99	392	0.53	12.0	37.0	72.1	<10.0	797
06/20/24	27,922	BRL	6,685	<10.0	3.74	477	0.57	18.1	53.4	78.0	<10.0	916
06/20/24	44,704	BRL	14,503	<10.0	8.38	431	0.40	15.8	42.7	70.8	<10.0	914
06/25/24	41,719	BRL	15,772	10.0	3.71	383	0.41	14.0	38.4	62.0	<10.0	792
06/25/24	45,721	BRL	16,063	<10.0	2.47	387	0.35	12.3	35.8	66.6	<10.0	792
07/19/24	51,297	67	16,682	10.8	4.42	403	0.36	15.0	38.0	66.7	<10.0	804
07/19/24	44,469	BRL	18,676	<10.0	2.67	385	0.55	12.7	35.7	74.6	<10.0	790
07/26/24	34,998	BRL	10,789	<10.0	3.41	501	0.46	17.8	50.5	76.8	<10.0	868
07/26/24	46,675	BRL	623	<10.0	6.83	464	0.50	15.3	40.7	79.4	<10.0	841
08/20/24	44,358	BRL	15,364	<10.0	2.30	392	0.31	13.4	34.9	79.6	<10.0	818
08/20/24	49,524	BRL	15,856	<10.0	2.28	401	0.31	13.8	36.7	84.0	<10.0	868
08/27/24	30,858	BRL	8,965	<10.0	3.65	472	0.38	16.2	47.1	70.6	<10.0	824
08/27/24	27,001	BRL	8,007	<10.0	5.84	478	0.42	16.2	44.3	86.9	<10.0	943
09/23/24	44,433	BRL	13,244	<10.0	2.54	402	0.34	17.1	40.5	82.0	<10.0	857
09/23/24	43,289	BRL	15,187	<10.0	2.65	427	0.35	14.9	41.6	93.7	<10.0	934
09/30/24	33,172	BRL	8,664	<10.0	4.37	514	0.40	18.6	53.6	81.9	<10.0	936
09/30/24	31,663	BRL	7,689	<10.0	5.83	498	0.45	17.2	47.0	90.0	<10.0	977

TABLE 3 (Continued): CONCENTRATIONS OF NITROGEN AND METALS IN DEWATERED BIOSOLIDS GENERATED AT THE STICKNEY WATER RECLAMATION PLANT AND APPLIED TO FARMLAND IN 2024

Date	TKN	NO_3^-+NO_2^--N	NH_3-N	As	Cd	Cu	Hg	Mo	Ni	Pb	Se	Zn
	mg/dry kg											
10/18/24	40,062	BRL	14,035	<10.0	2.44	415	0.42	17.1	41.2	86.6	<10.0	881
10/18/24	39,981	BRL	14,883	<10.0	2.40	429	0.44	15.3	39.3	94.7	<10.0	912
10/29/24	34,228	BRL	8,756	<10.0	3.36	430	0.55	14.3	42.0	66.5	<10.0	747
10/29/24	50,289	BRL	16,211	<10.0	5.25	468	0.34	15.3	43.2	66.2	<10.0	812
Minimum	20,374	BRL	623	<10.0	2.28	383	0.26	12.0	34.9	60.4	<10.0	747
Mean	40,086	NC[2]	11,776	NC	4.09	438	0.42	15.3	42.2	80.3	<10.0	861
Maximum	61,536	260	22,034	11.8	8.38	514	0.63	18.6	53.6	101	<10.0	977
503 Limit[3]	NL[4]	NL	NL	41	39	1,500	17	75	420	300	100	2,800

[1]The NO_3^-+NO_2^--N result was below the laboratory reporting limit (BRL) of 0.5 mg/L in the aliquot analyzed.
[2]Mean was not calculated because more than half of reported values were below the laboratory reporting limit.
[3]Regulatory limit established under United States *Code of Federal Regulations* Title 40 Part 503.
[4]No limit established under Part 503.

TABLE 4: DIGESTER TEMPERATURES AND DETENTION TIMES DURING PROCESSING OF BIOSOLIDS GENERATED AT THE STICKNEY WATER RECLAMATION PLANT IN 2024

Month	Average Temperature °F	Average Detention Time	Minimum Detention Time Required by 503.32(b)(3)[1]	Meets Part 503 Class B Requirements
		days		
January	97.2	20.6	15.0	Yes
February	96.7	17.7	15.0	Yes
March	95.5	15.7	15.0	Yes
April	97.4	19.2	15.0	Yes
May	98.2	19.6	15.0	Yes
June	98.7	20.0	15.0	Yes
July	98.9	22.6	15.0	Yes
August	98.9	21.6	15.0	Yes
September	98.8	21.6	15.0	Yes
October	98.2	19.2	15.0	Yes
November	97.9	22.0	15.0	Yes
December	98.3	27.4	15.0	Yes

[1]For anaerobic digestion at average temperature achieved.

TABLE 5: PROFILE OF USERS THAT UTILIZED STICKNEY WATER RECLAMATION PLANT COMPOSTED AND AIR-DRIED EXCEPTIONAL QUALITY BIOSOLIDS IN 2024[1]

User Type	Use	Number of Users
Composted Biosolids		
Park districts, municipalities, governments	Landscaping	5
Golf courses and athletic clubs	Landscaping	2
Landscaping and construction companies	Landscaping	7
Nongovernmental organizations	Landscaping	3
Metropolitan Water Reclamation District of Greater Chicago Stickney Water Reclamation Plant	Landscaping	NA
Air-Dried Biosolids		
Park districts, municipalities, governments	Landscaping	11
Landscaping and construction companies	Landscaping	2
Park districts, municipalities, governments	Topdressing	7
Golf courses and athletic clubs	Topdressing	5
Schools and universities	Topdressing	3
Nongovernmental organizations	Landscaping and topdressing	2
Landscaping and construction companies	Brownfields and construction sites	2

[1]Individual users and organizations on file.

Air-Dried Exceptional Quality Biosolids. In 2024, a total of 14,321 DT of Stickney WRP air-dried EQ biosolids was applied to urban land. All Stickney air-dried biosolids utilized as EQ material and applied to urban land in 2024 met the pollutant concentration limits in Table 3 of Section 503.13, the VAR requirements of Section 503.33(b)(1) (Table 6), and the Class A pathogen limits of Section 503.32(a)(5) (Tables 7 and 8). Enteric viruses and helminth ova were analyzed before biosolids were dried, in August, September, and October 2023, and May, June, and July 2024 (Table 7). The fecal coliform (FC) analyses were performed after the biosolids were dried and prior to utilization on urban land, in May, June, July, August, September, and October 2024 (Table 8). Management practices complied with Section 503.14. In accordance with Table 1 of Section 503.16, the frequency of monitoring for these biosolids is six (6) times per year.

Composted Exceptional Quality Biosolids. In 2024, a total of 1,721 DT of composted EQ biosolids from the Stickney WRP was applied to urban land. The composted EQ biosolids applied to urban land in 2024 met composting temperature and time requirements in previous years and met the pollutant concentration limits in Table 3 of Section 503.13 prior to utilization in 2024 (Table 9). The FC analyses were performed after the composted EQ biosolids were cured and prior to utilization on urban land (Table 10). In accordance with Table 1 of Section 503.16, the frequency of monitoring for the biosolids is six (6) times per year.

TABLE 6: CONCENTRATIONS OF NITROGEN AND METALS AND VOLATILE SOLIDS REDUCTION IN AIR-DRIED EXCEPTIONAL QUALITY BIOSOLIDS GENERATED AT THE STICKNEY WATER RECLAMATION PLANT AND APPLIED TO URBAN LAND IN 2024

Date	TVS[1]	TVS[2] Reduction	TKN	NO_3^-+NO_2^--N	NH_3-N	As	Cd	Cu	Hg	Mo	Ni	Pb	Se	Zn
	----	%	----	----	----	----	----	mg/dry kg	----	----	----	----	----	----
05/21/24	38.1	58.4	11,084	1,057	1,245	<10.0	3.61	490	0.76	15.5	47.4	107	<10.0	961
05/24/24	37.1	60.2	15,318	1,019	1,573	11.6	3.53	479	0.64	15.2	44.0	103	<10.0	905
06/12/24	37.0	60.4	24,633	186	4,738	11.9	2.83	364	0.67	11.7	34.7	79	<10.0	708
06/20/24	37.5	59.5	17,319	480	4,894	11.3	3.47	429	0.64	14.6	44.4	102	<10.0	893
07/08/24	36.2	70.1	23,110	1,377	6,359	<10.0	3.14	424	0.71	13.3	47.5	93	<10.0	789
07/24/24	35.9	70.5	13,111	1,424	273	10.5	3.49	495	0.68	15.2	45.2	99	<10.0	907
08/06/24	36.6	61.1	15,324	13	640	<10.0	3.39	478	0.49	14.8	42.8	97	<10.0	872
08/21/24	39.5	65.6	27,568	80	6,382	10.2	3.73	507	0.49	17.3	51.1	75	<10.0	881
09/16/24	37.8	67.9	19,117	63	4,273	<10.0	3.68	496	0.42	17.2	49.1	75	<10.0	836
09/18/24	40.4	64.1	19,372	462	5,001	<10.0	3.55	495	0.39	17.5	49.4	74	<10.0	829
10/01/24	39.1	66.1	29,449	725	5,774	<10.0	3.89	495	0.49	17.0	50.1	74	<10.0	882
10/02/24	40.5	64.0	27,436	38	6,465	<10.0	4.14	501	0.49	16.3	51.2	82	<10.0	919
10/08/24	40.9	63.5	28,125	54	5,353	<10.0	4.51	514	0.42	17.4	51.5	79	<10.0	935
10/15/24	39.5	65.4	21,910	1,716	3,070	<10.0	3.73	501	0.46	17.3	50.1	76	<10.0	865
11/01/24	40.1	64.6	21,627	40	3,855	<10.0	3.53	510	0.46	16.9	48.9	77	<10.0	863
Minimum	35.9	58.4	11,084	13	273	<10.0	2.83	364	0.39	11.7	34.7	74	<10.0	708
Mean	38.4	64.1	20,967	582	3,993	NC[3]	3.61	479	0.55	15.8	47.2	86	<10.0	870
Maximum	40.9	70.5	29,449	1,716	6,465	11.9	4.51	514	0.76	17.5	51.5	107	<10.0	961
503 Limit[4]	NL[5]	≥38.0	NL	NL	NL	41	39	1,500	17	75	420	300	100	2,800

[1]Total volatile solids as percentage of total solids.
[2]For calculating TVS reduction, mean TVS of digester feed during months when lagoon 23 was loaded from 2018 to 2021 was used for the samples collected on 05/21/24 through 06/20/24 and the sample collected on 08/06/24. Mean TVS of digester feed during months when lagoon 30 was loaded from 2021 to 2023 was used for all other samples.
[3]Mean was not calculated because more than half of reported values were below the laboratory reporting limit.
[4]Regulatory limit established under United States *Code of Federal Regulations* Title 40 Part 503.
[5]No limit established under Part 503.

TABLE 7: PATHOGEN ANALYSIS OF AIR-DRIED EXCEPTIONAL QUALITY BIOSOLIDS GENERATED AT THE STICKNEY WATER RECLAMATION PLANT AND APPLIED TO URBAN LAND IN 2024

Sample Date	Lagoon No.	Enteric Virus PFU[1]/4g	Helminth Ova Viable Ova/4g
08/08/23	23	<0.8000	<0.0800
09/19/23	23	<0.8000	<0.0800
10/11/23	23	<0.8000	<0.0800
05/07/24	23	<0.8000	0.24
06/12/24	23	<0.8000	<0.0800
07/09/24	30	<0.8000	0.24

[1]Plaque-forming unit.

TABLE 8: FECAL COLIFORM ANALYSIS OF AIR-DRIED EXCEPTIONAL QUALITY BIOSOLIDS GENERATED AT THE STICKNEY WATER RECLAMATION PLANT AND TESTED PRIOR TO UTILIZATION ON URBAN LAND IN 2024

Sample Date	Lagoon No.	Total Solids %	Fecal Coliform MPN[1]/g
05/21/24	23	75.8	5
06/20/24	23	67.7	42
07/24/24	30	64.2	150
08/21/24	30	73.1	930
09/18/24	30	70.2	72
10/08/24	30	72.3	14

[1]Most probable number.

TABLE 9: CONCENTRATIONS OF NITROGEN AND METALS IN COMPOSTED EXCEPTIONAL QUALITY BIOSOLIDS PRODUCED AT THE HARLEM AVENUE SOLIDS MANAGEMENT AREA IN PREVIOUS YEARS AND APPLIED TO URBAN LAND IN 2024

Date[1]	TKN	NO_3^-+NO_2^--N	NH_3-N	As	Cd	Cu	Hg	Mo	Ni	Pb	Se	Zn
	mg/dry kg											
03/07/24	17,269	778	331	<10.0	3.62	367	0.30	11.9	37.9	93	<10.0	773
03/07/24	11,339	528	80	<10.0	2.93	333	0.44	12.5	33.4	89	<10.0	664
05/16/24	15,921	796	44	<10.0	2.89	345	0.55	12.0	37.8	90	<10.0	755
05/16/24	17,915	832	50	<10.0	2.91	350	0.68	12.7	38.5	89	<10.0	766
06/27/24	15,358	407	31	24.8	3.29	329	0.50	11.0	33.1	103	<10.0	696
08/20/24	15,833	1,111	69	16.4	2.49	315	0.38	11.6	30.6	96	<10.0	602
09/24/24	16,302	1,094	29	14.8	3.70	417	0.48	13.5	40.5	113	<10.0	846
10/31/24	17,821	563	124	14.5	2.99	370	0.52	13.0	36.4	104	<10.0	702
10/31/24	15,895	583	116	15.5	2.75	353	0.52	11.7	33.5	101	<10.0	697
Minimum	11,339	407	29	<10.0	2.49	315	0.30	11.0	30.6	88.7	<10.0	602
Mean[2]	15,962	744	97	12.7	3.06	353	0.48	12.2	35.7	97	<10.0	722
Maximum	17,915	1,111	331	24.8	3.70	417	0.68	13.5	40.5	113	<10.0	846
503 Limit[3]	NL[4]	NL	NL	41	39	1,500	17	75	420	300	100	2,800

[1]Materials tested in 2024 prior to utilization.
[2]For calculating the mean, values below the reporting limit were treated as equal to the reporting limit divided by the square root of two.
[3]Regulatory limit established under United States *Code of Federal Regulations* Title 40 Part 503.
[4]No limit established under Part 503.

TABLE 10: FECAL COLIFORM ANALYSIS OF CURED COMPOSTED EXCEPTIONAL QUALITY BIOSOLIDS PRODUCED AT THE HARLEM AVENUE SOLIDS MANAGEMENT AREA IN PREVIOUS YEARS AND SAMPLED PRIOR TO UTILIZATION ON URBAN LAND IN 2024

Sample Date[1]	Total Solids %	Fecal Coliform MPN[2]/g
03/07/24	42.7	16
05/16/24	47.5	14
06/27/24	54.1	3
08/20/24	53.0	7
09/24/24	50.7	2
11/06/24	45.2	6

[1]Materials tested in 2024 prior to utilization.
[2]Most probable number.

CALUMET WATER RECLAMATION PLANT

Treatment Plant and Biosolids Process Train Description

The Calumet WRP, located in Chicago, Illinois, has a design average flow of 354 MGD. The annual average treated flow in 2024 was 244 MGD. Wastewater reclamation processes at this WRP include primary settling and secondary activated sludge processes. All solids produced at the Calumet WRP are anaerobically digested. The Calumet WRP biosolids are then:

1. Placed in lagoons for dewatering, aging, and stabilization and then transported to paved cells and air-dried prior to:

    a. Application to urban land as EQ biosolids.

    b. Use at local municipal solid waste landfills as final cover. No biosolids were utilized through this outlet in 2024.

2. Placed in lagoons for dewatering and transported to paved cells for air-drying prior to:

    a. Application to farmland as dewatered Class B biosolids by a private contractor.

    b. Use as daily landfill cover. No biosolids were utilized through this outlet in 2024.

In 2024, a total of 27,914 DT of biosolids was produced at the Calumet WRP (Table 1). The total quantity of biosolids utilized (22,556 DT) was less than the total 2024 production for the Calumet WRP (27,914 DT). Hence, 5,358 DT of biosolids were stored in lagoons and/or on drying cells for further processing and later use.

Biosolids to Landfills

In 2024, no biosolids produced at the Calumet WRP were sent to landfill for co-disposal with municipal solid wastes or used as daily or final landfill cover.

Application of Class B Biosolids to Farmland

In 2024, the Calumet WRP land-applied 22,356 DT of dewatered (semi-dried) Class B biosolids to farmland (Table 1) under IEPA Permit Nos 2018-SC-63703 and 2023-SC-68367 through a contract and Stewart Environmental, Inc. (Contract No. 24-690-11). In accordance with Table 1 of Section 503.16, the frequency of monitoring for these biosolids is twelve (12) times per year.

All Calumet WRP dewatered Class B biosolids land-applied in 2024 met the pollutant concentration limits in Table 3 of Section 503.13 (Table 11), the VAR requirements of Section

503.33(b)(10) (by incorporation in soil within six (6) hours after application), and the anaerobic digestion time and temperature requirements of the Class B pathogen standard of Section 503.32(b)(3) (Table 12).

Application of Exceptional Quality Biosolids to Urban Land

Air-Dried Exceptional Quality Biosolids. In 2024, a total of 200 DT of air-dried EQ biosolids generated at the Calumet WRP was applied to urban land for the maintenance of golf course turf and restoration of brownfield sites (Table 13). All Calumet WRP air-dried EQ biosolids utilized as EQ material and land-applied in 2024 met the pollutant concentration limits in Table 3 of Section 503.13 (Table 14), the VAR requirements of Section 503.33(b)(1) (Table 14), and the Class A pathogen limits of Section 503.32(a)(5) (Tables 15 and 16). Enteric viruses and helminth ova (Table 15) were analyzed before biosolids were dried, in August, September, and October 2023, and April, May, June (helminth ova only), and July (enteric viruses only) 2024. The FC analyses (Table 16) were performed after the biosolids were dried and prior to utilization on urban land, in May, June, August, October, and November 2023. In accordance with Table 1 of Section 503.16, a single monitoring event for these biosolids was required in 2024.

TABLE 11: CONCENTRATIONS OF NITROGEN AND METALS IN DEWATERED BIOSOLIDS GENERATED AT THE CALUMET WATER RECLAMATION PLANT AND APPLIED TO FARMLAND IN 2024

Date	TKN	NO_3^-+NO_2^--N	NH_3-N	As	Cd	Cu	Hg	Mo	Ni	Pb	Se	Zn
	mg/dry kg											
04/16/24	NRR[1]	223	566	11.4	2.01	400	0.43	17.0	34.1	66.7	<10.0	1,077
04/16/24	NRR	745	915	12.9	2.12	436	0.83	19.8	34.0	67.8	<10.0	1,102
04/16/24	NRR	NDR[2]	3,367	13.6	1.79	418	0.42	18.3	33.3	66.1	<10.0	1,100
07/05/24	NRR	46	6,608	12.9	2.09	377	<0.25	19.2	32.3	58.6	<10.0	949
08/12/24	NRR	BRL[3]	3,838	13.5	2.53	424	0.37	21.5	34.9	65.2	<10.0	1,062
09/05/24	NRR	BRL	3,459	11.0	2.61	368	0.29	18.9	30.8	68.3	<10.0	936
09/05/24	NRR	BRL	3,903	12.1	3.60	354	0.43	16.2	32.2	78.5	<10.0	964
09/18/24	NRR	BRL	3,370	10.9	2.19	387	<0.25	20.9	29.4	50.3	<10.0	947
09/27/24	NRR	42	1,934	11.5	6.68	297	0.52	14.2	34.5	97.4	<10.0	904
10/01/24	NRR	25	2,345	10.8	2.61	400	0.41	21.0	33.0	66.6	<10.0	1,035
11/02/24	NRR	53	5,636	10.9	2.04	425	0.35	21.9	31.9	54.1	<10.0	1,034
11/22/24	NRR	30	4,545	11.8	3.68	370	0.41	17.5	32.6	71.5	<10.0	991
11/22/24	NRR	33	6,284	11.9	2.33	415	0.58	20.0	32.7	63.4	<10.0	1,007
11/26/24	NRR	BRL	3,513	12.3	2.63	446	0.39	24.0	34.2	60.9	<10.0	1,132
12/04/24	NRR	39	6,022	<10.0	2.61	382	0.35	19.8	30.9	63.4	<10.0	962
12/04/24	NRR	BRL	3,463	10.4	6.67	243	0.42	12.0	30.2	94.2	<10.0	774
12/09/24	NRR	BRL	4,065	10.9	2.39	399	0.37	19.7	30.9	61.1	<10.0	1,035
Minimum	NC[4]	BRL	566	<10.0	1.79	243	<0.25	12.0	29.4	50.3	<10.0	774
Mean[5]	NC	88	3,755	11.3	2.98	385	0.41	18.9	32.5	67.9	<10.0	1,001
Maximum	NC	745	6,608	13.6	6.68	446	0.83	24.0	34.9	97.4	<10.0	1,132
503 Limit[6]	NL[7]	NL	NL	41	39	1,500	17	75	420	300	100	2,800

[1]No reportable results were available for TKN in 2024 due to inadvertent use of expired reagents.
[2]No data reportable due to inappropriate dilution prior to analysis.
[3]The NO_3^-+NO_2^--N result was below the laboratory reporting limit (BRL) of 0.5 mg/L in the aliquot analyzed.
[4]Minimum, mean, and maximum were not calculated because no reportable results were available for TKN.
[5]In calculating each mean, any value less than the reporting limit was treated as equal to the reporting limit divided by the square root of two.
[6]Regulatory limit established under United States *Code of Federal Regulations* Title 40 Part 503.
[7]No limit established under Part 503.

TABLE 12: DIGESTER[1] TEMPERATURES AND DETENTION TIMES DURING PROCESSING OF BIOSOLIDS GENERATED AT THE CALUMET WATER RECLAMATION PLANT IN 2024

Month	Average Temperature °F	Average Detention Time	Minimum Detention Time Required by 503.32(b)(3)[2]	Meets Part 503 Class B Requirements
		days		
January	97.3	55.5	15.0	Yes
February	97.3	49.0	15.0	Yes
March	97.4	50.1	15.0	Yes
April	97.8	55.8	15.0	Yes
May	97.9	51.7	15.0	Yes
June	97.9	45.4	15.0	Yes
July	97.9	35.5	15.0	Yes
August	100.1	43.0	15.0	Yes
September	97.9	43.3	15.0	Yes
October	97.8	41.2	15.0	Yes
November	97.4	37.7	15.0	Yes
December	97.4	47.3	15.0	Yes

[1]Temperatures and detention times are for primary digesters 1 through 12 at the Calumet WRP.
[2]For anaerobic digestion at average temperature achieved.

TABLE 13: PROFILE OF USERS THAT UTILIZED CALUMET WATER RECLAMATION PLANT AIR-DRIED EXCEPTIONAL QUALITY BIOSOLIDS IN 2024[1]

User Type and Number of Users	Use	Number of Users
Golf courses and athletic clubs	Topdressing	1
Landscaping and construction companies	Brownfields & construction sites	1

[1]Individual users and organizations on file.

TABLE 14: CONCENTRATIONS OF NITROGEN AND METALS AND VOLATILE SOLIDS REDUCTION IN AIR-DRIED EXCEPTIONAL QUALITY BIOSOLIDS GENERATED AT THE CALUMET WATER RECLAMATION PLANT AND APPLIED TO URBAN LAND IN 2024

Date	TVS[1]	TVS[2] Reduction	TKN	NO_3^-+NO_2^--N	NH_3-N	As	Cd	Cu	Hg	Mo	Ni	Pb	Se	Zn
	%		mg/dry kg											
05/21/24	40.3	74.3	NRR[3]	662	1,371	10.2	2.51	451	0.67	19.4	36.2	72.2	<10.0	1,195
07/08/24	43.5	70.8	NRR	1,551	921	11.1	2.50	448	0.74	20.3	35.3	67.5	<10.0	1,109
08/21/24	36.5	78.2	NRR	46	229	12.0	2.76	474	0.46	18.6	38.0	72.2	<10.0	1,207
Minimum	36.5	70.8	NC[4]	46	229	10.2	2.50	448	0.46	18.6	35.3	67.5	<10.0	1,109
Mean	40.1	74.4	NC	239	840	11.1	2.59	457	0.62	19.4	36.5	70.6	<10.0	1,170
Maximum	43.5	78.2	NC	1,551	1,371	12.0	2.76	474	0.74	20.3	38.0	72.2	<10.0	1,207
503 Limit[5]	NL[6]	≥38	NL	NL	NL	41	39	1,500	17	75	420	300	100	2,800

[1]Total volatile solids as percentage of total solids.
[2]Total volatile solids for digester feed during months when lagoons were loaded from 2021 to 2022 were used to calculate TVS reduction.
[3]No reportable results were available for TKN in 2024 due to inadvertent use of expired reagents.
[4]Minimum, mean, and maximum were not calculated because no reportable results were available for TKN.
[5]Regulatory limit established under United States *Code of Federal Regulations* Title 40 Part 503.
[6]No limit established under Part 503.

TABLE 15: PATHOGEN ANALYSIS OF AIR-DRIED EXCEPTIONAL QUALITY BIOSOLIDS GENERATED AT THE CALUMET WATER RECLAMATION PLANT AND APPLIED TO URBAN LAND IN 2024

Sample Date	Lagoon No.	Enteric Virus PFU[1]/4g	Helminth Ova Viable Ova/4g
08/08/23	19	<0.8000	<0.0800
09/20/23	3	<0.8000	<0.0800
10/11/23	19	<0.8000	<0.0800
05/08/24	4	<0.8000	0.24
06/11/24	4	<0.8000	0.56
07/09/24	17	<0.8000	0.56

[1]Plaque-forming unit.

TABLE 16: FECAL COLIFORM ANALYSIS OF AIR-DRIED EXCEPTIONAL QUALITY BIOSOLIDS GENERATED AT THE CALUMET WATER RECLAMATION PLANT AND TESTED PRIOR TO UTILIZATION ON URBAN LAND IN 2024

Sample Date	Lagoon No.	Total Solids %	Fecal Coliform MPN[1]/dry g
07/02/24	4	77.9	120
08/20/24	14	81.7	61

[1]Most probable number.

HANOVER PARK WATER RECLAMATION PLANT

Treatment Plant and Biosolids Process Train Description

The Hanover Park WRP, located in Hanover Park, Illinois, has a design average flow of 12 MGD. The annual average treated flow in 2024 was 6.67 MGD. Wastewater reclamation processes at this WRP include primary (primary settling), secondary (activated sludge process), and tertiary (filtration) treatments. All solids produced at the Hanover Park WRP are anaerobically digested and stored in lagoons and later land-applied by injection at the on-site Fischer Farm.

In 2024, the total biosolids production at this WRP was 809 DT (Table 1).

Land Application of Class B Liquid Biosolids

In 2024, the Hanover Park WRP land-applied a total of 1,054 DT of lagooned biosolids and lagoon supernatant at the on-site Fischer Farm under IEPA Permit No. 2022-61315. The total quantity of biosolids utilized (1,054 DT) was more than the total 2024 production for the Hanover Park WRP (809 DT) with the excess coming from the on-site storage lagoons. Hence, net storage of biosolids in lagoons was reduced by 245 DT in 2024. In accordance with Table 1 of Section 503.16, the frequency of monitoring for these biosolids was four times per year.

All Hanover Park WRP lagoon biosolids land-applied in 2024 met the pollutant concentration limits in Table 3 of Section 503.13 for all metals (Table 17), the anaerobic digestion time and temperature requirements of the Class B pathogen standards of Section 503.32(b)(3) (Table 18), and the VAR requirements of Section 503.33(b)(1) (Table 19). Management practices at this land-application site complied with Section 503.14.

TABLE 17: CONCENTRATIONS OF NITROGEN AND METALS IN BIOSOLIDS GENERATED AT THE HANOVER PARK WATER RECLAMATION PLANT AND APPLIED AT THE FISCHER FARM SITE IN 2024

Sample Date	TKN	NO_3^-+NO_2^--N	NH_3-N	As	Cd	Cu	Hg	Mo	Ni	Pb	Se	Zn
	Supernatant, mg/L											
03/19/24	915	1.19	798	0.014	<0.002	0.161	<0.0005	0.008	0.027	0.002	0.006	0.283
04/29/24	813	<0.50	795	0.015	<0.002	0.132	<0.0005	0.007	0.029	0.002	0.005	0.221
05/21/24	643	<0.50	608	0.012	<0.002	0.168	<0.0005	0.007	0.023	0.003	0.005	0.296
05/21/24	595	<0.50	595	0.014	<0.002	0.122	<0.0005	0.008	0.030	0.003	0.005	0.231
08/20/24	291	0.85	273	0.014	<0.002	0.062	<0.0005	0.007	0.035	<0.002	0.005	0.118
09/21/24	563	<0.50	470	0.014	<0.002	0.077	<0.0005	0.004	0.026	<0.002	0.005	0.134
10/22/24	499	0.61	441	0.014	<0.002	0.089	<0.0005	0.007	0.041	<0.002	0.006	0.166
Minimum	291	<0.50	273	0.012	<0.002	0.062	<0.0005	0.004	0.023	0.002	0.005	0.118
Mean[1]	617	NC[2]	569	0.014	<0.002	0.116	<0.0005	0.007	0.030	0.002	0.005	0.207
Maximum	915	1.19	798	0.015	<0.002	0.168	<0.0005	0.008	0.041	0.003	0.006	0.296
	Liquid Biosolids, mg/kg											
11/13/24	101,263	351	35,753	<10.0	<1.00	623	1.04	12.1	29.6	14.8	<10.0	768
11/16/24	81,793	BRL[3]	34,562	<10.0	1.03	642	0.47	12.9	34.6	18.1	<10.0	794
Minimum	81,793	BRL	34,562	<10.0	<1.00	623	0.47	12.1	29.6	14.8	<10.0	768
Mean	91,528	NC	35,157	<10.0	0.87	633	0.75	12.5	32.1	16.5	<10.0	781
Maximum	101,263	351	35,753	<10.0	1.03	642	1.04	12.9	34.6	18.1	<10.0	794
503 Limit[4]	NL[5]	NL	NL	41	39	1,500	17	75	420	300	100	2,800

[1]In calculating each mean, any value less than the reporting limit was treated as equal to the reporting limit divided by the square root of two.
[2]Mean was not calculated because half or more of reported results were below the laboratory reporting limit.
[3]The NO_3^-+NO_2^--N result was below the laboratory reporting limit (BRL) of 0.5 mg/L in the aliquot analyzed.
[4]Regulatory limit established under United States *Code of Federal Regulations* Title 40 Part 503.
[5]No limit established under Part 503.

TABLE 18: DIGESTER TEMPERATURES AND DETENTION TIMES DURING PROCESSING OF BIOSOLIDS GENERATED AT THE HANOVER PARK WATER RECLAMATION PLANT IN 2024

Month	Average Temperature °F	Average Detention Time	Minimum Detention Time Required by 503.32(b)(3)[1]	Meets Part 503 Class B Requirements
		days		
January	98.0[2]	27.3	15.0	Yes
February	98.0	26.3	15.0	Yes
March	98.0	25.9	15.0	Yes
April	98.0	26.1	15.0	Yes
May	98.0	28.1	15.0	Yes
June	98.0	31.6	15.0	Yes
July	98.0	31.8	15.0	Yes
August	98.0	30.3	15.0	Yes
September	98.0	35.0	15.0	Yes
October	98.0	29.7	15.0	Yes
November	98.0	27.6	15.0	Yes
December	98.0	27.6	15.0	Yes

[1]For anaerobic digestion at average temperature achieved.
[2]Temperature inside the digesters maintained at 98 ºF year-round.

TABLE 19: VOLATILE SOLIDS REDUCTION IN BIOSOLIDS GENERATED AT THE HANOVER PARK WATER RECLAMATION PLANT AND APPLIED AT THE FISCHER FARM SITE IN 2024

Month[1]	Digester Feed	Digester Draw	Applied Biosolids	Volatile Solids Reduction[2]
	% Total Volatile Solids			%
March	87.0	74.6	57.0	80.3
April	87.0	74.1	54.8	81.8
May	87.2	74.3	57.5	80.1
August	87.0	74.2	58.5	78.9
September	87.1	75.5	63.6	74.0
October	87.6	76.7	51.4	85.1
November	87.0	76.5	67.3	69.3

[1]Biosolids applied as lagoon supernatant from March through October, and as liquid biosolids in November.
[2]Volatile solids reduction computed using total volatile solids data for digester feed and applied biosolids.

JOHN E. EGAN WATER RECLAMATION PLANT

The Egan WRP, located in Schaumburg, Illinois, has a design average flow of 30 MGD. The annual average treated flow in 2024 was 20.8 MGD. Wastewater reclamation processes include primary (primary settling), secondary (activated sludge process), and tertiary (sand filtration) treatments. Under normal operations, all solids generated at the Egan WRP, including solids conveyed from the Kirie WRP, are anaerobically digested.

In 2024, a total amount of 5,513 DT biosolids were produced at the Egan WRP, all of which were sent via sewer to the Stickney WRP for further processing, storage, and utilization (Table 1). Anaerobic digestion at the Egan WRP in 2024 met the time and temperature requirements of the Class B pathogen standards of Section 503.32(b)(3) (Table 20).

TABLE 20: DIGESTER[1] TEMPERATURES AND DETENTION TIMES DURING PROCESSING OF BIOSOLIDS GENERATED AT THE JOHN E. EGAN WATER RECLAMATION PLANT IN 2024

Month	Average Temperature °F	Average Detention Time	Minimum Detention Time Required by 503.32(b)(3)[2]	Meets Part 503 Class B Requirements
		days		
January	96.5	27.1	15.0	Yes
February	96.9	29.9	15.2	Yes
March	96.5	27.4	15.0	Yes
April	95.1	25.5	16.5	Yes
May	97.6	26.5	15.0	Yes
June	96.8	32.4	15.0	Yes
July	97.6	30.8	15.0	Yes
August	97.5	29.6	15.0	Yes
September	97.2	32.2	15.0	Yes
October	97.1	31.6	15.0	Yes
November	97.0	26.8	15.0	Yes
December	96.2	31.3	15.0	Yes

[1]Temperatures and detention times are for primary digesters A and C at the Egan WRP.
[2]For anaerobic digestion at average temperature achieved.

TERRENCE J. O'BRIEN WATER RECLAMATION PLANT

The O'Brien WRP, located in Skokie, Illinois, has a design average flow of 333 MGD. The annual average treated flow in 2024 was 216 MGD. Wastewater reclamation processes at the O'Brien WRP include primary (primary settling) and secondary (activated sludge process) treatments. In 2024, the O'Brien WRP produced 32,691 DT of solids (Table 1), which were sent via pipeline to the Stickney WRP where they were commingled with the solids from that WRP for anaerobic digestion and further processing, storage, and utilization.

JAMES C. KIRIE WATER RECLAMATION PLANT

The Kirie WRP, located in Des Plaines, Illinois, has a design average flow of 52 MGD. The annual average treated flow in 2024 was 34.36 MGD. Wastewater reclamation processes include grit tanks, secondary (activated sludge process), and tertiary (sand filtration) treatments. In 2024, the Kirie WRP produced 5,756 DT of solids (Table 1), which were sent via force main to the Egan WRP for anaerobic digestion. Subsequently, the biosolids from the Egan WRP were transferred to the Stickney WRP and commingled with the solids there for anaerobic digestion and further processing, storage, and utilization.

LEMONT WATER RECLAMATION PLANT

The Lemont WRP, located in Lemont, Illinois, has a design average flow of 2.3 million MGD. The annual average treated flow in 2024 was 2.70 MGD. Wastewater reclamation processes include both primary (primary settling) and secondary (activated sludge process) treatments. In 2024, the Lemont WRP produced 362 DT of solids (Table 1), which were gravity concentrated and transported to the Stickney WRP where they were commingled with the solids from that WRP for anaerobic digestion and further processing, storage, and utilization.