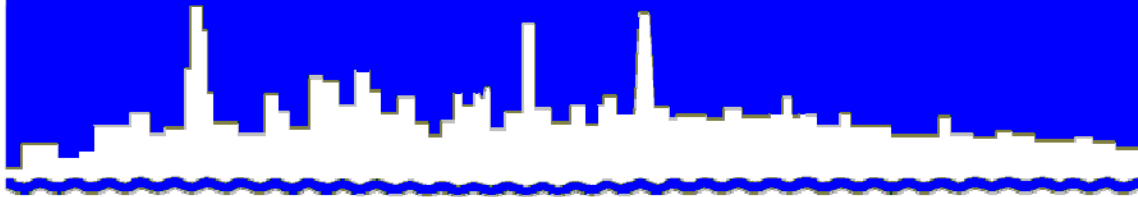


Protecting Our Water Environment



Metropolitan Water Reclamation District of Greater Chicago

*MONITORING AND RESEARCH
DEPARTMENT*

REPORT NO. 15-10

CONTROLLED SOLIDS DISTRIBUTION PROGRAM:

TREND OF BIOSOLIDS DISTRIBUTED

March 2015

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**CONTROLLED SOLIDS DISTRIBUTION PROGRAM: TREND OF
BIOSOLIDS DISTRIBUTED**

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EXECUTIVE SUMMARY

In the early 1990s, following promulgation of the 40 Code of Federal Regulations Part 503 (Part 503) Rule, the Metropolitan Water Reclamation District of Greater Chicago (District) formulated a policy to utilize exceptional quality (EQ) biosolids for distribution in the Chicago metropolitan area under the Controlled Solids Distribution (CSD) Program. The goal was set to utilize 15 to 20 percent of biosolids generated by the District in the CSD Program. However, this goal has not been reached yet. This report summarizes the historical trend, current status, and strengths, weaknesses, opportunities, and threats analysis of the CSD Program. The local use of biosolids for topdressing, construction, renovations, maintenance, and ecological restoration projects has fluctuated from year to year between 2006 and 2014. The **S**trengths, **W**eaknesses, **O**pportunities, and **T**hreats (SWOT) analysis identified some strengths of the CSD Program that the District can build upon to grow the program further. The main factor limiting the growth of the CSD Program is our inability to match biosolids availability with demand, which often results in biosolids not being available to customers at their preferred time. Due to the weather dependency of biosolids processing and drying operations, availability, and scheduling the use of biosolids between the generator, biosolids spreading contractor, and the user can be challenging. Therefore, better coordination and the use of on-site biosolids storage facilities may improve biosolids availability. Public perception and regulatory restrictions remain additional ongoing threats, but in 2014, the Illinois Environmental Protection Agency (IEPA) issued a supplemental CSD permit that removed the setback distance to occupied dwellings and restrictions to use of EQ biosolids for growing food crops and thus enables the District to distribute EQ biosolids to homeowners. Strong public education and outreach programs, support from a strong research community (such as the United States Department of Agriculture W-3170 Workgroup), the rising costs of commercial fertilizers, good working relationships with regulatory agencies, and rising societal consciousness of environmental sustainability offer good opportunities for the CSD Program. It is recommended that the District intensify the five-component strategy in the following areas:

1. Biosolids availability – increase production of EQ biosolids and construct on-site storage facilities at both the Stickney and Calumet solids drying areas.
2. Public and user awareness – increase awareness by educating the general public, managers of recreational areas, and pertinent administrators/decision makers about the benefits and safety of biosolids use.
3. Biosolids user base – intensify outreach to potential new users/agencies in the city of Chicago and the surrounding 126 suburban communities in Cook County.
4. Biosolids quality – conduct research to improve biosolids quality (to enhance storability and stability to minimize odor and reduce dust potential).
5. Integrate biosolids in routine turf maintenance regimen – provide spreading assistance to new users to help them integrate biosolids in their routine turf maintenance regimen.

INTRODUCTION

The District's Biosolids Management Program is designed to manage all the biosolids generated from its water reclamation plants (WRPs) through beneficial reuse. Final biosolids products are generated at four of the seven WRPs. Biosolids from the Hanover Park WRP are utilized through liquid injection on-site at the Fisher farm. Biosolids from the John E. Egan (Egan) WRP are utilized mostly as Class B under the Farmland Application Program. Since 2013, some of the Egan biosolids are also being composted at the Harlem Avenue Solids Management Area (HASMA) and the Calumet Solids Management Area. Biosolids from the Stickney and Calumet WRPs, the two largest WRPs, are utilized mainly under the Farmland Application and the CSD Programs. The sludge generated at the other WRPs is routed to the Stickney, Calumet, and Egan WRPs for further processing. In the CSD Program, biosolids are used as a soil amendment and fertilizer in the Chicago metropolitan area under a permit issued by the IEPA. The CSD Program is very attractive because it offers an economical solids management option and provides benefits to the District's constituency.

Biosolids as a soil amendment and fertilizer provide essential plant nutrients, including nitrogen, phosphorus, potassium, and many micronutrients, such as zinc, iron, copper, sulfur, and magnesium, that many commercial fertilizers do not provide. Additionally, biosolids provide organic matter to soil, which further improves nutrient retention and the soil's physical characteristics, such as water infiltration and retention, for better plant establishment and growth.

The CSD Program began in the early 1990s when the District formulated a policy, following promulgation of the Part 503 Rule, to utilize only EQ biosolids for distribution in the Chicago metropolitan area. During the same time, the District made a commitment to become more proactive in developing the local biosolids market. The District set a goal that 55 to 70 percent of its total biosolids production would be EQ, of which 30 to 35 percent would be used in final landfill cover, 15 to 20 percent in the CSD Program, and 10 to 15 percent for commercially distributed products (Cargill et al., 1997). Of the 132,885 dry tons (DT) of biosolids produced in 2013, 6,231 DT (~5 percent) were distributed under the CSD Program, and the trend was similar in 2014. The initial goal of distributing 15 – 20 percent in the CSD Program is yet to be achieved. This could be mainly attributed to the District's inability to produce the required quantity of dry EQ biosolids when needed by the users. Not all the EQ biosolids produced by the District are utilized under the CSD Program, and EQ biosolids produced in excess of CSD demand in some months are diverted to other outlets such as farmland. The status of the program is summarized in this report.

Current State of the Controlled Solids Distribution Program

Currently, EQ biosolids are utilized under the CSD Program as a nutrient-rich soil amendment for the construction or renovation of recreational areas (such as golf courses, sports fields, and parks) and as fertilizer topdressing. Recent efforts by the District towards expanding the CSD Program include:

- Emphasizing direct marketing to potential users (Figure 1).
- Improving biosolids quality (e.g. minimizing the potential for nuisances such as odor and dust).
- Working with regulators as partners to increase public distribution of biosolids.
- Optimizing operational efficiency to reduce costs.
- Use of an available warehouse as a storage facility to reduce the cost of re-drying and align biosolids availability with customers' demands.
- Providing technical support to users by dedicated and trained professional staff.
- Conducting workshops, field days, and demonstration projects.
- Developing promotional and informational brochures and pamphlets.
- Conducting applied research to support and showcase the agronomic and environmental benefits of biosolids use.
- Providing a fee-based biosolids spreading service through a contractor for customers who do not have spreading capability.
- Initiating production of composted biosolids as a higher quality product that will be available year-round and to a more diverse customer base.

The amount of biosolids used in the CSD Program has fluctuated from year to year since 2006 and was partly affected by one-time construction projects and weather conditions. Biosolids use peaked in 2008 at 20,000 DT due to the large quantities (14,240 DT) used at the Highland Country Club and Cook County Forest Preserves. Biosolids use was steady at approximately 6,000 DT during 2009 – 2011 and reached above 10,000 DT in 2012 (Figure 2). Only 6,231 and 8,844 DT were used in 2013 and 2014, respectively, due to a relatively wet fall, which affected the availability of dried biosolids and created unfavorable field conditions for biosolids application during the two years. It is noteworthy to mention here that a majority of the EQ biosolids produced by the District was always utilized under the CSD Program, and the availability of EQ biosolids has to be improved to grow the CSD Program further. Park districts have been a substantial and steady user of biosolids in the past few years, and the Chicago Park District contributed significantly to total biosolids use in 2014 (Table 1). The numbers of new, repeat, and total users in a given year are shown in Figure 1.

FIGURE 1: NUMBER OF BIOSOLIDS USERS UNDER THE CONTROLLED SOLIDS DISTRIBUTION PROGRAM BETWEEN 2008 AND 2014

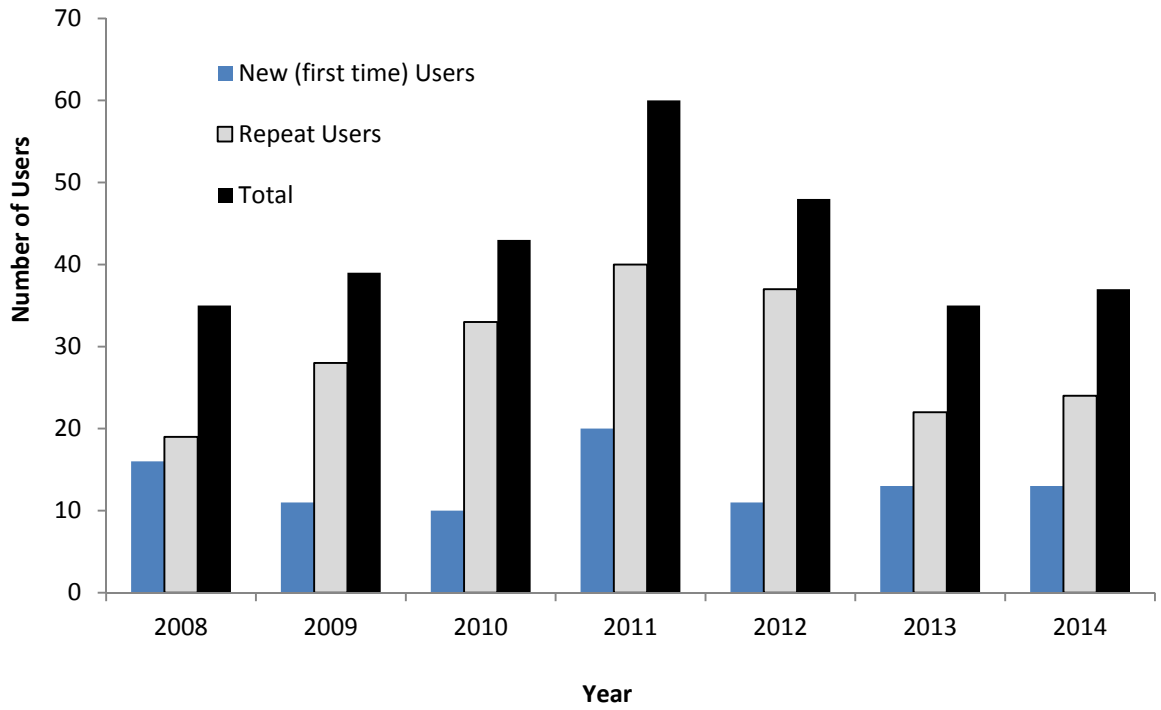


FIGURE 2: TOTAL DRY TONS OF BIOSOLIDS DISTRIBUTED UNDER THE CONTROLLED SOLIDS DISTRIBUTION PROGRAM BETWEEN 2006 AND 2014

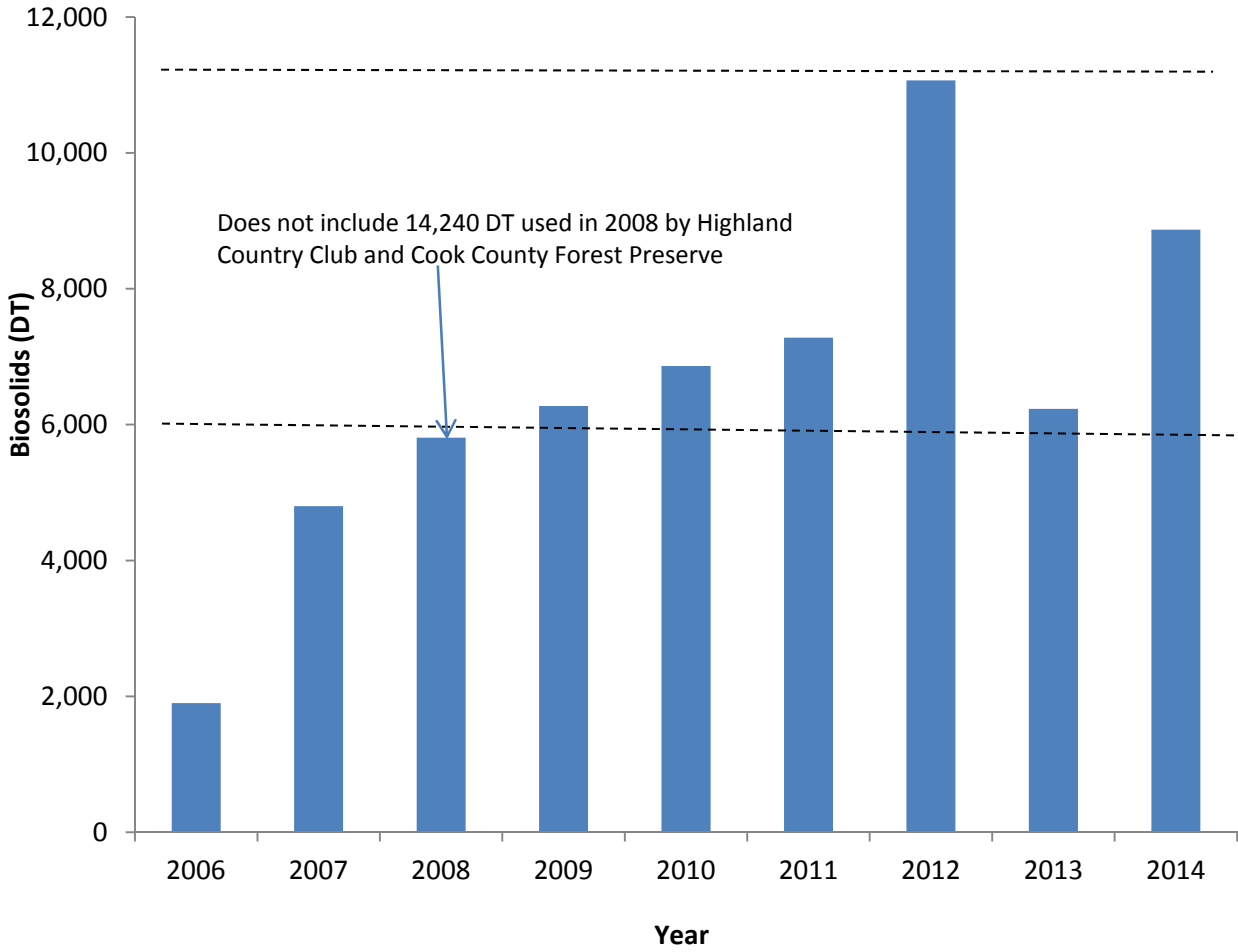


TABLE 1: AMOUNT OF BIOSOLIDS UTILIZED BY VARIOUS USERS UNDER THE CONTROLLED SOLIDS DISTRIBUTION PROGRAM (INCLUDING THE CHICAGO PARK DISTRICT AND THE METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO) BETWEEN 2009 AND 2014

Year	Park Districts ¹	Chicago Park District	Golf Courses	Schools	Others ²	MWRDGC	Total
2009	2,171	0	1,091	976	1,474	562	6,274
2010	2,470	0	545	767	2,890	191	6,863
2011	2,246	1,474	792	1,197	171	1,250	7,130
2012	5,322	841	2,317	1,519	198	854	11,051
2013	2,084	2,103	920	316	139	669	6,231
2014	2,838	3,769	527	284	743	683	8,844

¹Does not include the Chicago Park District.

²Other users not in the categories indicated such as cemeteries, churches, landscaping companies, etc.

2014 GOALS AND ACCOMPLISHMENTS

In 2014, our goal was to utilize 10,000 DT of biosolids under the CSD Program and increase the number of users. To accomplish this goal, we performed the following:

- Promoted biosolids use to over 80 new users through phone calls and meetings.
- Enlisted 19 new users (12 of which used biosolids in 2014).
- Worked closely with all biosolids users and increased oversight to minimize any potential nuisance episodes that may erode public confidence in biosolids land application practices.
- Organized a sustainability workshop to educate potential biosolids users.
- Began a new biosolids composting project.
- Initiated studies on the agronomic evaluation of biosolids composts.
- Published peer-reviewed journal articles on land application of biosolids.

We met the 2014 outreach goals through phone calls and meetings. The 12 new users in 2014 are:

Cog Hill Golf Course	Glenview Park District
Western Springs Park District	Calumet City Park District
Naperville Park District	Glenwoodie Golf Course
Northbrook Park District	City of Northlake
Coolidge Junior High School, Phoenix	Mokena Park District
Lake Street Supply (Bloomington Trail)	Hoffman Estate Park District

We did not meet our goal of utilizing 10,000 DT of biosolids in 2014 ([Figure 4](#)) but exceeded the amount of biosolids distributed in 2013 ([Figures 3 and 4](#)). Again, all the EQ biosolids produced by the District in 2014 were utilized under the CSD Program, but many users did not receive the biosolids they requested due to the unavailability of EQ biosolids. The extremely wet spring and fall was the major factor limiting the availability and use of biosolids under the program. In 2013 and 2014, dried biosolids were not available until June, while biosolids were available as early as April in 2012 ([Figure 3](#)). In addition, due to the wet fall in 2014, many users were unable to apply biosolids due to wet field conditions. The impact of weather is clearly shown in the monthly comparison of biosolids utilization under the CSD Program during 2012, 2013, and 2014 ([Figure 3](#)). [Table 2](#) shows a list of users whose requests

FIGURE 3: MONTHLY BIOSOLIDS USE UNDER THE CONTROLLED SOLIDS DISTRIBUTION PROGRAM DURING 2012, 2013, AND 2014

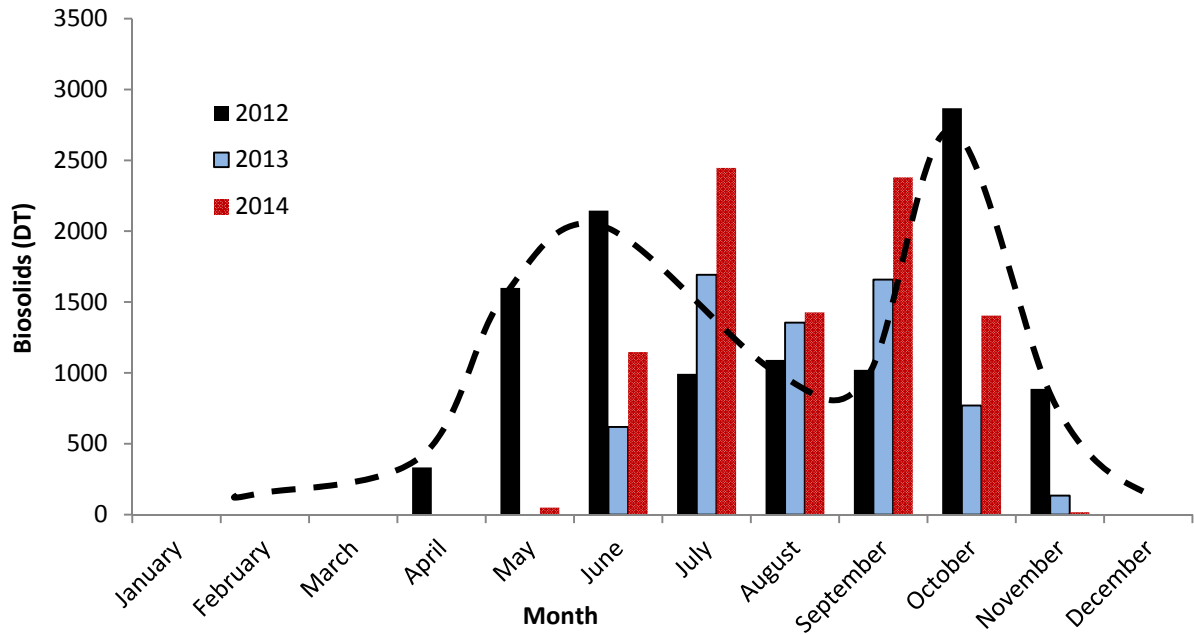


FIGURE 4: CUMULATIVE BIOSOLIDS USED UNDER THE CONTROLLED SOLIDS DISTRIBUTION PROGRAM IN 2013 AND 2014 AND THE 2014 GOAL

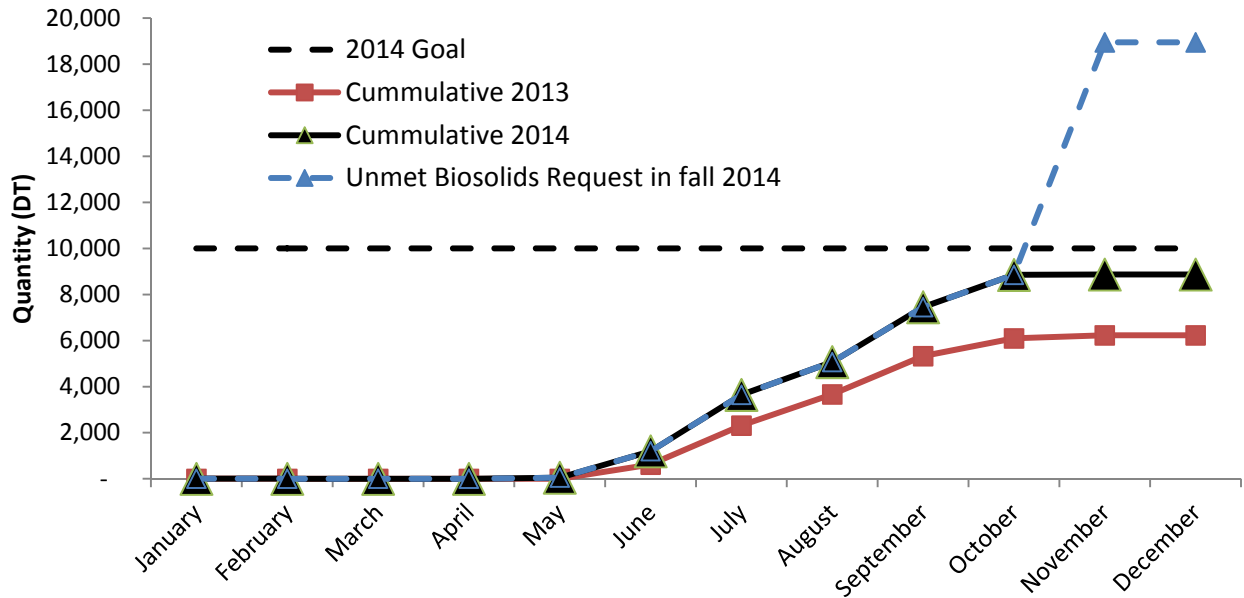


TABLE 2: BIOSOLIDS REQUESTED BY USERS AND NOT AVAILABLE IN LATE FALL OF 2014

User Name	Category of user	No. of Loads Requested	Estimated Quantity DT
Hickory Hills Park District	Repeat user	4	60
Hinsdale Park District	Repeat user	4	60
Lemont Park District	Repeat user	40	600
Midlothian Park District	Repeat user	5	75
Westside Baseball of Oak Lawn	New user	10	150
Stony Creek Golf Course	New user	20	300
Cog Hill Golf	New user	200	3,000
Chicago Park District	Repeat user	100	1,500
Frankfort Park District	Repeat user	5	75
Village of Glenwood	Repeat user	150	2,250
Elmhurst Park District	Repeat user	24	360
Coyote Run Golf Course	Repeat user	10	150
Others ¹	Repeat users	100	1,500
Total		672	10,080

¹Customers that refused to pay over 30-mile hauling fee.

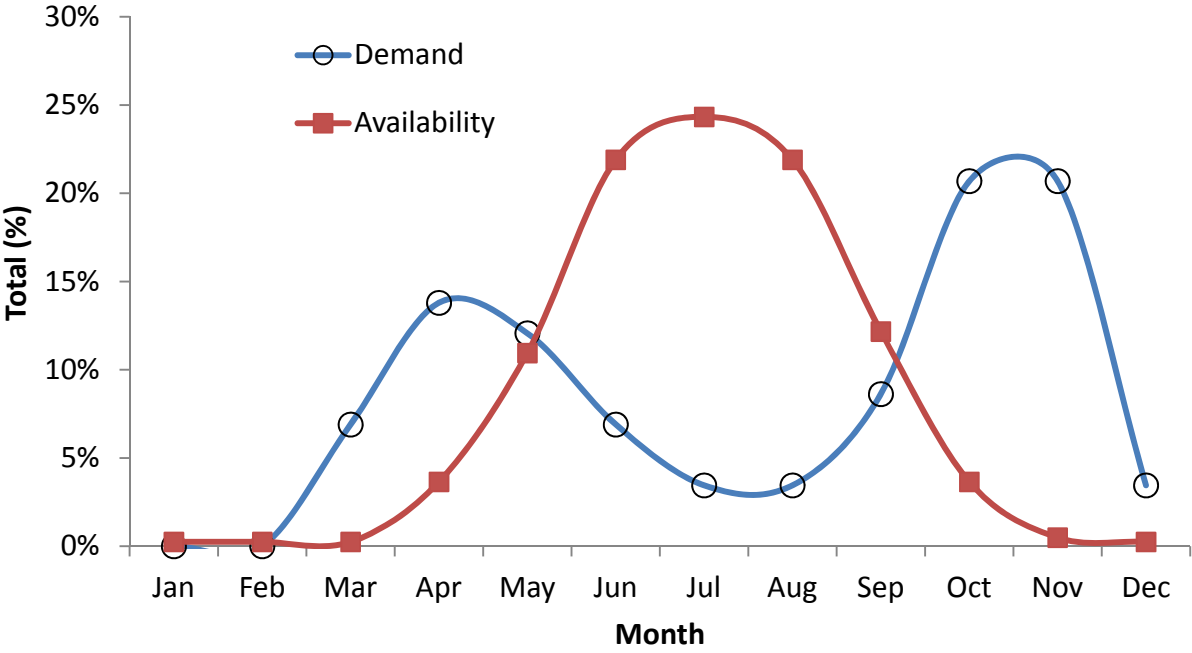
could not be met in 2014, the numbers of loads requested, and the quantity estimated. Given favorable weather condition or a storage facility, an additional 10,080 DT would have been distributed and the goal exceeded in 2014 ([Figure 4](#)).

Less biosolids were utilized during the spring and fall in 2013 and 2014 than during those periods in 2012 ([Figure 3](#)). The peak availability of biosolids was from June through August; however, the peak demand for biosolids is early March through April and late October through November ([Figure 5](#)) when many users prefer to fertilize and repair their fields. Although the early fall demand for biosolids is generally met, there remains a mismatch between the timing of biosolids availability and demand in the summer, late fall, and spring ([Figure 5](#)). Currently, demand is estimated to be approximately 5,000 DT and 10,000 DT in late spring and early fall, respectively, but is expected to increase with increased marketing and promotion. Aggressive promotion and marketing improved biosolids use in July – August of 2013 and 2014 compared to 2012 ([Figure 3](#)). However, customers' demands were not met in fall 2014 due to the unavailability of biosolids ([Table 2](#)). Clearly, biosolids availability has to improve to align better with customers' demands, and production of EQ biosolids has to increase to meet customers' needs to further grow the CSD Program.

To address the mismatch and meet the long-term goal of utilizing most of the District's biosolids under the CSD Program, on-site storage facilities (to store ~10,000 DT of biosolids) should be constructed at both the Stickney and Calumet solids drying areas. The storage facilities will help store dry biosolids over the winter for early spring users, protect dried biosolids from rewetting during rain events in the summer, and thus eliminate the time and cost of re-drying and fecal coliform testing. The storage facilities will also enhance the supply of biosolids to users during frequent rain events, as the fields become available for biosolids spreading more quickly than the biosolids could be re-dried during wet periods in the summer and make biosolids available to meet late fall demands. The District obtained a permit from the IEPA to use an old warehouse at HASMA for storage of dried biosolids to meet the demand during the off season such as early spring or late fall. However, the warehouse is off-site and has a low ceiling and thus was neither convenient nor cost-effective to store dry biosolids. Moving biosolids in and out of the warehouse was cumbersome, time-consuming, and costly, which made it a less desirable storage facility. That is why the warehouse was not used much, and only 100 loads of biosolids were stored in 2014. It is recommended that the storage facilities be constructed at the drying sites and designed to push dried biosolids in and out with wheel loaders conveniently and efficiently.

In 2013, the District started charging a fee to users for hauling biosolids based on additional mileage beyond the 30 miles from the biosolids management area. This has also contributed to the low use of biosolids under the CSD Program in 2013 because of the unwillingness of users to incur any costs related to biosolids use. For example, River Trails Park District cancelled its request for 38 loads of biosolids in 2013 and 2014 when asked to pay the fee for the additional five miles for shipping biosolids from the Calumet Solids Management Area to its parks.

FIGURE 5: TREND OF MONTHLY (AS PERCENTAGE OF ANNUAL) AVAILABILITY AND DEMAND OF CONTROLLED SOLIDS DISTRIBUTION PROGRAM BIOSOLIDS



STRENGTHS, WEAKNESSES, OPPORTUNITIES, AND THREATS ANALYSIS OF THE CONTROLLED SOLIDS DISTRIBUTION PROGRAM

A SWOT analysis of beneficial biosolids reuse under the CSD Program was done to evaluate the status of the program and to determine what changes can be implemented to strategically position the CSD Program to ensure sustainability and growth. Results of the SWOT analysis are summarized in Table 3. The SWOT analysis illustrates that there are some strengths that the District can build upon to further grow the CSD Program.

Cost savings for users are identified as a major strength of the program as well as the inherent benefits of biosolids as a soil conditioner and fertilizer. However, there are also factors limiting the growth of the CSD Program. The major weakness of the program is the unavailability of biosolids to meet the customers' demands at their preferred time. This mainly results from the District's inability to produce enough EQ biosolids and store dry EQ biosolids to align availability with demand in the spring and late fall (Table 2). In many instances, dry EQ biosolids had to be diverted to other uses, such as farmland application, due to the District's inability to effectively store dry biosolids during rain events and late fall when air drying is inefficient and slow. Logistical weaknesses of the program are due primarily to the bulkiness of biosolids as a topdressing fertilizer compared to a chemical fertilizer requiring specialized spreading equipment, which most users lack. In addition, scheduling biosolids application among the generator, spreading contractor, and the user can be challenging due to the weather dependency of biosolids availability. Also identified as weaknesses in the program is the lack of biosolids spreading capability of new users and a limited guarantee on the amount of nitrogen in the biosolids. Public perception and regulatory restrictions remain additional ongoing threats, but a strong public education and outreach program, support from a strong research community, rising societal consciousness of environmental sustainability, and the rising costs of commercial fertilizers offer good opportunities for the CSD Program. A supplemental CSD permit issued by the IEPA in 2014 removed the setback buffer zone to occupied dwellings and restrictions to growing food crops in soil amended with EQ biosolids. This regulatory relief enables the District to distribute EQ biosolids to homeowners. However, the IEPA Act defines biosolids as "waste," which prohibits the unrestricted use of EQ biosolids as a feedstock for composting yard waste and producing specialized turf maintenance fertilizer blends. There are also some opportunities to improve the quality of air-dried biosolids with respect to odor potential and total nitrogen content.

TABLE 3: SUMMARY OF STRENGTHS, WEAKNESSES, OPPORTUNITIES, AND THREATS ANALYSIS OF THE CONTROLLED SOLIDS DISTRIBUTION PROGRAM

<u>Strengths</u>	<u>Weaknesses</u>
<i>Benefits to District</i>	<i>Demand and Availability</i>
<ol style="list-style-type: none"> 1. Low hauling cost due to proximity of outlets and high solids content of Class A products. 2. Diverse customer base and application types offer potential for a sustainable program. 3. User groups (e.g. Illinois Association of Park Districts) enhance outreach programs. 4. Higher quality of air-dried biosolids results in less PR issues compared to the Class B. 5. Program provides a direct benefit to the District constituents (improves public image and builds partnership). 6. Use of biosolids within District service area protects programs operating outside District service area. 	<ol style="list-style-type: none"> 1. Availability and use of air-dried biosolids is weather-dependent. 2. Demand and availability not guaranteed.
<i>Benefits to Users</i>	<i>Public Education</i>
<ol style="list-style-type: none"> 1. Cost savings to users operating on limited budgets builds a returning customer base. 2. Environmentally friendly. 3. Perform better than fertilizer. 4. Conserves water by reducing irrigation frequency. 5. Improves soil health and thus turf performance. 	<ol style="list-style-type: none"> 1. Customers have limited knowledge on benefits and resources (e.g. specialized spreader) to use. 2. Proximity to urban and residential areas creates potential nuisance problems due to odor and dust from air-dried biosolids.
<u>Opportunity</u>	<i>Biosolids Quality</i>
<ol style="list-style-type: none"> 1. High cost of fertilizers. 2. Tight budgets of potential users. 3. Support from other biosolids generators and researchers. 4. Demonstrated performance. 5. Quality improvement potential. 6. Rising societal consciousness of sustainability. 	<ol style="list-style-type: none"> 1. Limited guarantee on nitrogen supply and physical characteristics. 2. Odor and dust potential of air-dried biosolids.
	<i>Logistical Hurdles</i>
	<ol style="list-style-type: none"> 1. New users lack spreading capability. 2. Biosolids are bulky compared to chemical fertilizers. 3. Extensive coordination required to match generator, spreading contracts, and users' schedules.
	<i>State Regulations</i>
	<ol style="list-style-type: none"> 1. Setback distance and other restrictions in Illinois biosolids rule. 2. Biosolids defined as "waste" in Illinois Environmental Protection Act.
	<u>Threat</u>
	<ol style="list-style-type: none"> 1. Regulatory restrictions due to potential environmental impacts of biosolids phosphorus. 2. Emerging issues related to safety of land application practices. 3. Negative public perception due to lack of awareness and education on benefits and safety of biosolids. 4. Odor and dust potential of air-dried biosolids.

CONTROLLED SOLIDS DISTRIBUTION PROGRAM BIOSOLIDS SUPPORT STRATEGIES

The SWOT analysis serves as an initial step to formulate a strategy to grow the CSD Program. The overall strategy for the CSD Program includes seizing the opportunities, optimizing the strengths, eliminating the weaknesses, and minimizing the impact of identified threats to the program. The current strategy focuses on five key components: (1) public and user awareness, (2) biosolids user base, (3) biosolids quality, (4) availability of biosolids, (5) and integration of biosolids in the routine turf maintenance regimen.

The new approach is to intensify the five-component strategy in the following areas:

- I. Education
- II. Outreach to new user sectors
- III. Product improvement
- IV. Improve biosolids availability to align better with user demand
- V. Spreading assistance

Component I: Educating the Public and the Biosolids Users

This component will involve increased intensity on the revised approach to increase awareness and educate the general public, managers of recreational areas, and pertinent authorities about the benefits and safety of biosolids use under the CSD Program. Park districts and golf courses comprise the bulk of current users in the CSD Program. These organizations will be contacted to retain current users and, in addition to marketing, to target potential new users. Activities will include:

Direct Marketing.

- Make phone calls to at least 500 potential and repeat biosolids users per year.
- Meet at least 50 potential new users per year.
- Distribute promotional documents to at least 300 potential users per year via mass mailing and at conferences and trade shows.
- Display promotional posters at conferences and trade shows, e.g. Illinois Association of Park Districts.
- Work with the General Administration Department, Public Affairs Section, to advertise the use of biosolids in at least three local/social media outlets, including *Way of the Wild* magazine, Patch.com, Facebook, Twitter, and blogs.
- Maintain up-to-date information about biosolids (uses, benefits, safety, etc.) on the District's website.

Networking.

- Membership and attendance at local conferences of two associations involved in the turf grass industry, such as the Midwest Association of Golf Course Superintendents and the Illinois Association of Park Districts.
- Presentations at educational institutions, such as Chicago State University and DePaul University, and community groups such as Watershed Planning Council meetings organized by the Stormwater Section of the District's Engineering Department.
- Interaction and collaboration with park districts, golf courses, and schools within Cook County to promote biosolids use as a topdressing fertilizer for turf maintenance.

Demonstrations.

- Conduct one workshop in collaboration with the General Administration Department, Public Affairs Section, and one field day.
- Maintain greenhouse demonstrations to showcase performance of turf grass and ornamental plants fertilized with biosolids.
- Showcase use of biosolids for maintenance of good quality turf grass at the Stickney WRP, a local park, and a golf course to improve public perception and acceptance.
- Conduct one on-site demonstration to showcase biosolids use for community gardening.
- Conduct four case studies to document the use and benefits of biosolids and biosolids compost.

Technical Publications.

- Prepare guidelines for using biosolids and composted biosolids for topdressing turf grass and renovation or construction of recreational facilities.
- Publish technical papers in collaboration with university extension specialists to address public concerns regarding emerging contaminants – triclosan, triclocarban, and pharmaceuticals.

Component II: Potential Biosolids User Sectors

Outreach to possible new sectors will be conducted throughout 2015, including the city of Chicago and the surrounding 126 suburban communities in Cook County, that work with conservation groups for developing new open spaces. The city of Chicago, for example, recently published its Sustainable Chicago 2015 Plan, which highlights its work with local conservation groups, such as Openlands and Chicago Wilderness, to continually create new spaces in the city and surrounding areas. There may be opportunities to work with these groups to incorporate biosolids into their operations. Urban forestry is also highlighted in the Chicago 2015 Plan, and outreach activities to regional forestry-related organizations will also be planned. Forestry groups will likely have a greater interest in the woodchip-composted biosolids for tree planting and will be targeted first so that the available compost is distributed in 2015.

Component III: Improvement in Quality and Guarantee of Biosolids Characteristics

Major factors affecting the acceptability of biosolids under the CSD Program include the potential for dust and odor when biosolids are applied close to residential properties and the variability of plant available nitrogen supply of biosolids. This is especially important on highly managed turf such as on golf courses and athletic fields. The following activities will improve the quality of biosolids available through the program:

- Research, such as identifying the optimum level of dryness to minimize dust and odor.
- Composting of biosolids. In addition to ongoing composting, at least two new composting technologies will be evaluated.

Component IV: Improve Availability of Biosolids to Users' Demands

Biosolids drying on paved beds to meet the Class A requirement, as specified in the District's codified operation of the solids processing train, is weather-dependent. Rewetting by rain often results in air-dried biosolids being unavailable at the time they are needed by users. The following practices will be implemented to minimize this drawback:

- Project biosolids needs by contacting potential users in advance to set their schedule for using biosolids.
- Use of storage facilities for air-dried biosolids. A portion of biosolids in 2015 will be stored through the winter to meet the 2016 spring demand.
- Coordination to ensure clear communication between the parties (Monitoring and Research [M&R] and Maintenance and Operations [M&O] Departments) involved in scheduling the contractor for spreading. This was highlighted as a major impediment to moving the program forward, and it will be a key goal in 2015.

Component V: Spreading Assistance

One major constraint to the CSD Program is spreading costs, especially for new users with no prior budget for biosolids. Therefore, the new users will receive spreading assistance on a priority basis. During the 2013 distribution season, users were charged a fee of \$5.00 per DT for the spreading service to defray the District's biosolids spreading cost. This spreading fee was well received by users.

The fee was discontinued in the third quarter of 2014, and the spreading was done free of charge for those users who opted for the spreading service. Some users were not aware of the free spreading service until after the spreading was done and were thrilled to receive the free spreading service. Below is an excerpt from Ms. Cindy Grannan, Director of Parks and Recreation, Oak Forest Park District (a beneficiary of the spreading assistance):

“Oh my, I almost fell off my chair and had to read this twice. That is quite generous and kind, thank you! I've been spreading the word on how great these biosolids are and will continue to do so. Again, thank you!” - Cindy

Other beneficiaries of the free spreading service in 2014 are the Chicago Park District, Mokena Park District, Fox Valley Park District, and Western Springs Park District. The spreading cost seems to limit some big users such as the Chicago Park District that has a \$10,000 annual budget for spreading. In 2013, spreading of biosolids was discontinued by the Chicago Park District when their spreading budget was exhausted. However, in 2014, the Park District opened up additional parks (in addition to the scheduled 100 acres) for the free spreading until no more dry biosolids were available. The attitude of users to the free spreading could not be accurately gauged in 2014 because most of the users were not aware of the spreading assistance, and others were informed about it late in the season (towards the end of the 2014 biosolids spreading season).

GOALS FOR 2015

The 2015 goals are to:

1. Increase the number of users by 25 percent by reaching out to both repeat and new users, especially those within the District's service area, through presentations, calls, collaborations, etc.
2. Increase biosolids use under the CSD Program to 12,000 DT.

The 2015 goal is based on a five-year running average that includes past and future projected biosolids use as shown in Table 4. The use of biosolids from the CSD Program has fluctuated from year to year, with a high of 12,000 DT to a low of 6,000 DT in recent years. Weather is a major contributor to this variability because it affects the availability of dried biosolids and field conditions for application. A rolling average of five years was used to lessen the impact of the variability on planning. The approach involves accounting for the amount of biosolids used in the previous five years to project the amount that would be needed in each year to reach 10,000 DT.

Setting the five-year running average goal will be an iterative process in that it will be revised at the end of the year to take into account that year's data. To meet a five-year average of 8,000 DT, no less than 9,800 DT would need to be used in 2014. This is less than what was used in 2012, but more than what was used 2013. Increasing the five-year average goal to 9,000 DT in 2015 will require that 12,000 DT be used in 2015. Achieving the 2015 goal is possible because of regulatory relief given by the supplemental permit issued by the IEPA in 2014 which allows biosolids use by homeowners.

TABLE 4: CONTROLLED SOLIDS DISTRIBUTION PROGRAM BIOSOLIDS GOALS
 BASED ON A FIVE-YEAR ROLLING AVERAGE

Year	Quantity Used	Five-Year Average of Quantity Used	Five-Year Average Goal	Goal ¹
2007	6,000	-	-	-
2008	10,000	-	-	-
2009	6,000	-	-	-
2010	7,000	-	-	-
2011	7,000	7,200	-	-
2012	10,000	8,000	-	-
2013	6,200	7,240	-	-
2014			8,000	9,800
2015	Estimated 9,800		9,000	12,000
2016	Estimated 12,000		10,000	13,000

¹Amount needed to achieve goal

CONCLUSION AND RECOMENDATIONS

The local use of biosolids for topdressing, construction, renovations, maintenance, and ecological restoration projects has fluctuated from year to year between 2006 and 2014. The M&R Department staff will continue to work closely with the M&O Department towards increasing the use of biosolids under the CSD Program in the Chicago metropolitan region and to increase the user base. The SWOT analysis identified some strengths, including cost savings, to users that the District can build upon to grow the CSD Program. The main factor limiting the growth of the CSD Program is our inability to match biosolids availability with demand, which often results in the unavailability of biosolids to customers at the preferred time. Due to the weather dependency of biosolids processing and drying operations, availability and scheduling the use of biosolids between the generator, biosolids spreading contractor, and the user can be challenging. On-site storage facilities (to store ~20,000 DT biosolids) at both the Stickney and Calumet solids drying sites and improved coordination among the users, spreading contractor, and solids drying site manager will improve the availability. Public perception and regulatory restrictions remain additional ongoing threats, but in 2014, the IEPA gave some regulatory reliefs that allow biosolids use by homeowners. Public education, outreach programs, support from a strong research community (such as the United States Department of Agriculture W-3170 Workgroup), rising societal consciousness of environmental sustainability, and the cost of commercial fertilizers offer good opportunities for the CSD Program.

We recommend intensifying the five-component strategy in the following areas:

1. Educating the public and the biosolids users: Increase awareness by educating the general public, managers of recreational areas, and pertinent administrators/decision makers about the benefits and safety of biosolids use. The approach may include direct marketing, networking, demonstrations, and targeted presentations and technical publications.
2. Outreach to potential biosolids user sectors: There is a need to intensify outreach to potential new users/agencies in the city of Chicago and the surrounding 126 suburban communities in Cook County. The potential users include conservation groups, landscaping companies, park districts, the city of Chicago, and regional forestry-related organizations who may be interested in woodchip-composted biosolids for tree planting.
3. Improvement in quality and consistency of biosolids products by evaluating available composting technologies, including scale up of aerated, static pile-covered composting to improve operational efficiency and product consistency. Conducting research to improve biosolids quality such as identifying the optimum level of drying to minimize dust, odor, and storability of dry biosolids is also recommended.
4. Align biosolids availability with demand: Project biosolids needs by contacting potential users in advance to set their schedule to use biosolids. Proper biosolids storage facilities are required to meet early spring and late

fall demand. Improve communication between the M&R and the M&O Departments' staff involved in scheduling biosolids delivery and application.

5. Spreading Assistance: One major constraint to the CSD Program is spreading costs, especially for new users with no prior budget for biosolids. Providing spreading assistance to new users will help them integrate biosolids in their routine turf maintenance regimen.

APPENDIX A

TABLE A-1: TOTAL NUMBER OF USERS AND QUANTITY OF CONTROLLED SOLIDS
DISTRIBUTION PROGRAM BIOSOLIDS DISTRIBUTED BETWEEN
2005 AND 2014

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
<u>No. of Users</u>										
New (first time)	--	10	35	16	11	10	20	11	13	13
Repeat users	8	2	2	19	28	33	40	37	22	24
Total	8	12	37	35	39	43	60	48	35	37
<u>Biosolids Qty. (dry tons)</u>										
Total	2,300	1,900	4,800	5,808 ¹	6,274	6,863	7,130	11,051	6,231	8,844

¹Does not include 14,240 DT used in 2008 by Highland Country Club and Cook County Forest Preserve.

TABLE A-2: MONTHLY NUMBERS OF SITES THAT USED
CONTROLLED SOLIDS DISTRIBUTION PROGRAM
BIOSOLIDS IN 2014

Month	No. of Users
January	0
February	0
March	0
April	0
May	3
June	23
July	18
August	12
September	12
October	9
November	1
December	0
Total ¹	78

¹This value is higher than the total number of individual users since some users used biosolids in multiple sites and in more than one month during 2014.

TABLE A-3: SITES THAT UTILIZED AIR-DRIED BIOSOLIDS UNDER THE CONTROLLED SOLIDS DISTRIBUTION PROGRAM IN 2014

WRP	User	Use/Location
Calumet	Chicago Park District, Chicago	Athletic fields – 12 parks
	Oak Lawn Park District, Oak Lawn	Athletic fields – Oakview Parks
	Elmhurst Lacrosse, Elmhurst	Athletic fields – Playing Ground
	Keith Construction, Lemont	Landscaping
	Evanston High School, Evanston	Athletic fields – Baseball Field
	Evanston-Wilmette Golf Course, Evanston	Golf course
	Oak Forest Park District	Athletic fields – 9 parks
	Mokena Park District	Athletic fields – 6 parks
	Frankfort Square Park District, Frankfort	Athletic fields – Baseball Field
	Thornton Fractional South HS	Athletic fields – Baseball Field
	Reavis High School	Athletic fields – Baseball Field
	Tinley Park Park District	Athletic fields – Dog Parks
	Calumet Park District	Athletic fields – Memorial Park
	Glenwoodie Golf Course	Golf course
	Village of Hinsdale, Hinsdale	Athletic fields – 3 parks
	Stony Creek Golf Course	Golf course
Stickney	Maywood Park District	Athletic fields – 2 Parks
	Chicago Park District, Chicago	Athletic fields – 3 parks
	MWRD - Stickney WRP	Landscaping – Meany Garden, Lane project
	Moe Landscaping Inc.	Landscaping
	Fox Valley Park District	Athletic fields – Stuart Park
	Deerfield Park District	Athletic fields – Jewett Park
	St. Charles Park District	Athletic fields – Breen Park, East Side Sport Complex
	Village of Lyons, Lyons	Athletic fields – Veterans Park
	Naperville Park District	Athletic fields – Frontier Park
	Lake Street Supply	Landscaping – Bloomingdale Trail
	Western Spring Park District, Western Spring	Athletic fields – 3 parks
	Franklin Park District, Franklin Park	Athletic fields – Community Park
	Village of Glenwood, Glenwood	Athletic fields – Hickory Glen Park
	Tinley Park Park District, Tinley Park	Athletic fields – Memorial Park
	Glenwoodie Golf Course	Golf course
	North Shore Country Club, Glenview	Golf course
Coolidge Junior High School, Phoenix	Athletic fields – Baseball Field	
City of Northlake, Northlake	Athletic fields – Centerpoint Preserve	

TABLE A-4: USERS OF AIR-DRIED BIOSOLIDS UNDER THE CONTROLLED SOLIDS DISTRIBUTION PROGRAM IN 2014

Month	User	Total Used (DT)	Total Monthly Used (DT)
May	Meany Garden Project	8	37
	Moe Landscaping Inc.	6	
	Stony Creek	23	
June	Chicago Park District (CPD), Maggie Daley Park	163	1,147
	Maywood Park District	27	
	Mokena Park District ¹	250	
	Oak Forest Park District ¹	298	
	Reavis High School	118	
	Stony Creek	15	
	Fox Valley Park District ¹	151	
	Thornton Fractional High School	52	
	Western Springs Park District ¹	73	
July	CPD ¹	966	2,431
	Deerfield Park District	45	
	Elmhurst Lacrosse ¹	51	
	Evanston - Wilmette Golf Course ¹	215	
	Evanston Township	59	
	Hinsdale Park District ¹	178	
	Keith Construction Inc.	101	
	Lake Street Supply	15	
	CPD, Maggie Daley Park	329	
	Oak Lawn Park District	22	
	St. Charles Park District	421	
	Village of Lyons	12	
	Western Springs Park District ¹	17	
August	CPD ¹	425	1,427
	Frankfort Square Park District	15	
	Lane Project	646	
	CPD, Maggie Daley Park	96	
	Moe Landscaping Inc.	8	
	Naperville Park District	21	
	Tinley Park Park District	216	

TABLE A-4 (Continued): USERS OF AIR-DRIED BIOSOLIDS UNDER THE CONTROLLED SOLIDS DISTRIBUTION PROGRAM IN 2014

Month	User	Total Shipped/ User (DT)	Total Shipped/ Month (DT)
September	Calumet Park District	68	2,379
	Coolidge Junior High	55	
	CPD, Maggie Daley Park	427	
	CPD ¹	584	
	Franklin Park Park District	32	
	Glenwoodie Golf Club	14	
	Golfview Estates	6	
	Village of Glenwood	263	
	Lake Street Supply	61	
	Lane Project	37	
	City of Northlake	250	
	North Shore Country Club	201	
	Tinley Park Park District	44	
	Village of Lyons	337	
October	CPD, Maggie Daley Park	762	1,406
	Hoffman Estate Park District	63	
	Lake Street Supply	371	
	Cog Hill Golf Course	53	
	McNulty/Lemont Park District	102	
	Village of Alsip ¹	55	
November	CPD, Maggie Daley Park	17	17
Total		8,844	8,844

¹These users utilized the biosolids spreading service through the District's contractor.