Alum Facility Maintenance Reduction Studies

Prepared for
Ramsey-Washington Metro Watershed District
Tanner's Lake Alum Treatment Facility Floc Pond

February 2005

BARR

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Ramsey-Washington Metro Watershed District

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Executive Summary

The purpose of this study was to evaluate alternative cost-effective ways to manage and dispose of the alum sludge at the Ramsey-Washington Metro Watershed District's Tanners Lake alum treatment facility floc pond. The following was investigated: land application; sludge consolidation by periodic drawdown of the pond; on-site sludge dewatering technologies; disposal of the sludge through the St. Paul Water Utility; other alternative disposal options; and direct discharge of the sludge to a municipal sanitary sewer.

With respect to cost, the potential for successful implementation, ease of implementation, and disposal and management alternatives are ranked below from most promising to least promising:

1. Disposal by direct discharge to the Oakdale/Metropolitan Council sanitary sewer
2. Disposal at an alternative disposal facility such as AB Environmental
3. Land application of the sludge
4. Use of on-site sludge dewatering equipment
5. Disposal through the St. Paul Water Utility
6. Sludge consolidation by periodic drawdown of the pond surface water

After discussions with the Metropolitan Council Environmental Services (MCES), it was determined that MCES did not have an issue with the discharge of the alum sludge to their system. MCES would apply a strength fee with the discharge but, with this fee, this option would be much lower cost than landfilling. The City of Oakdale was also amenable to the discharge of alum sludge into their adjacent system as long as the District could demonstrate that no clogging or sludge accumulation occurs from the discharge. This appears to be a low cost and feasible disposal option. ***This is likely the best alternative for future sludge disposal activities.***

If disposal of alum sludge by MCES is pursued, it is recommended that the feasibility of the method be demonstrated by pumping out the pond, routing the hose through storm sewer pipe under Century Avenue, and discharging the alum sludge into the Oakdale sewer. If it is determined that this is a practical method for alum sludge disposal, then a permanent connection to the Maplewood or Oakdale sewer or MCES interceptor could be constructed. This system would include a permanent underdrain installed in the bottom of the pond and a pump that could be housed at the existing alum building. It is recommended that disposal be performed on an annual or biannual basis to ensure that the floc/sludge is easily pumpable and will not cause clogging in the downstream sewer system.

As a second alternative, AB Environmental will accept the sludge and incorporate it into roadbed material. They will take the sludge in its hydrated form, dry it, and use it as roadbed material. This is also a low cost and feasible disposal option. With this alternative, it would still be necessary to arrange with a contractor to remove the alum sludge from the pond and transport it to AB Environmental in Belle Plaine, Minnesota.

Land application of sludge is also a viable disposal method; however, for purposes of permitting and to convince the landowner that the sludge has some value, a determination needs to be performed (may simply be chemical measurements) to show that the sludge will provide a "beneficial use" to the farmland by providing available nutrients and organic matter.

The other disposal options (4 through 6) should be considered only after the first three options above have been deemed infeasible.

1.0 Introduction

This study evaluated different options for the cost-effective disposal of alum sludge and the implementation of periodic dewatering activities at the sludge pond to consolidate the sludge material and increase the available volume in the pond for sludge accumulation (reducing the frequency of sludge maintenance activities). There were three parts to this study:

1. Phone survey of city municipalities, land applicators, state agencies, and other entities that dispose of alum sludge to determine if there are cost-effective and practical disposal options other than landfilling.

2. A study to determine if periodic dewatering of the floc pond will lead to more consolidated sludge, reduce the sludge volume, and reduce maintenance frequency. Also, the Metropolitan Council, City of Maplewood, and City of Oakdale were contacted to determine the practicality of periodic dewatering and/or sludge disposal through the sanitary sewer system.

3. Evaluation of sludge dewatering technologies to determine the cost-effectiveness and practicality of purchasing these technologies to consolidate the sludge material and reduce disposal costs.

1.1 Results of Phone Survey

The purpose of the phone survey was as follows:

- Identify how various municipalities dispose of their alum sludge or similar sludge.

- Identify the contractors that dispose of the alum sludge for these municipalities.

- Determine if it is feasible to land-apply the alum sludge that is generated at the Tanners Lake facility and whether this will reduce the overall cost of sludge management.

- Identity who else might dispose of the alum sludge besides land application or landfill.

- Determine if any of the utilities would be willing to take the alum sludge for a fee or exchange of in-kind services.

- Contact the MPCA to gain an understanding of how land application of alum sludge is regulated.

1.1.1 Permitting and Solid Waste Re-use Considerations

There are two routes that the MPCA has developed by which the alum sludge can be disposed by land application. Attached are print-outs from the MPCA web site regarding solid waste utilization. Solid waste utilization regulations are found in Minnesota Rules 7001. According to Matt Herman of the MPCA, they no longer preapprove land application sites; however, the permittee still is required to apply for a permit before land application is performed.

1. **Apply for an industrial solid waste permit for land application**. This route recognizes that there may not be any beneficial use of the material but it can be safely disposed of by land application.

2. **Land-apply the alum sludge as a beneficial use material**. There are several materials that can be disposed of by land application that do not require regulatory approval. Alum sludge is not among those materials. To land-apply alum sludge, it is necessary to make a beneficial use determination (BUD). It is not specified in the regulations what the BUD needs to entail. Matt Herman of the MPCA agrees that the BUD for alum sludge could be as simple as a chemical measurement of alum sludge that demonstrates its potential benefits, such as providing organic material and available phosphorus to agricultural land. The alum sludge would need to be analyzed for total organic carbon and available phosphorus (this test is called a Bray-P test or equivalent).

Even if the MPCA gives a favorable beneficial use determination (BUD) to the alum sludge, the landowner has the final say with regard to whether they will accept the material.

1.1.2 Sludge Disposal by Municipalities

Dave Schuler (office: 651-266-6286; cell: 651-775-6216) of the City of Saint Paul Water Utility was contacted to discuss how they dispose of their sludge material and whether they would be willing to take the alum sludge produced at Tanners Lake for a fee and/or some trade of in-kind services. They contract with a company call Avon Ag Lime (Rick Winter at 320-363-7915). According to Mr. Schuler, their sludge is mostly iron and lime with some aluminum. However, a quick calculation by Mr. Schuler during our conversation suggests that the aluminum content of their sludge is actually greater than the aluminum content of the Tanners Lake material. Mr. Schuler was open to the possibility of accepting the Tanners Lake material and believed that it was technically possible to introduce the sludge into their system. He agreed that the District would have to pay some sort of fee for this service. With regard to other payment options, such as in-kind service, he did not know what services the District could provide them. Although he was open to the idea of taking the alum sludge, he considered the disposal of the Tanners Lake sludge through the Water Utility "to be a potentially big hassle and possibly more work than it would be worth."

The City of Eden Prairie (Mary Kraus: 952-949-8315) was contacted to see how they dispose of their drinking water treatment sludge (lime). They contract with a land applicator in Wisconsin called DRT Transport (715-568-1730).

The water engineer with the City of Minneapolis (Shahin Rezania: 612-661-4910) was contacted. They contract with Avon (Rick Winter at 320-363-7915) and Mountain Environmental (see below). The material is land-applied.

1.1.3 Solid Waste Land Applicators/Brokers

There are several land-application brokers/contractors in the state of Minnesota. The MPCA maintains a list of these contractors (see attachments). Two of these contractors, both located near the Twin Cities, were called to get a better understanding of their business, costs, time needed to plan for the removal of the sludge material, and whether they thought that landowners would be willing to accept this material.

Mountain Environmental – Paul Montain (651-261-2149). Paul Montain is a contractor who finds landowners that accept beneficial re-use material. He excavates the materials, transports them to the application site, and performs the application. His primary concern was being provided enough time to find a site that would be willing to accept the alum sludge, get the appropriate permits from the MPCA, and get approval from the county (approximately six weeks). Overall, he needs approximately three to six months for planning. He also believed it was necessary to convince the landowner that the alum sludge would be a good soil amendment (perform a detailed chemical analysis on the material, including phosphorus availability test). He estimated it would cost approximately \$15/ton for the alum sludge disposal. This includes excavation, transport, and application. In 2003, 1,640 tons of material was removed from the pond. If this mass is removed, it would cost approximately \$24,600 to remove this material using Mountain Environmental. This cost appears low based upon our estimated cost to excavate and transport the material to AB Environmental in Belle Plaine, Minnesota (see Other Disposal Options).

Hydro Engineering – Keith Zumberge (952-467-3100). Hydro Engineering is also a contractor that distributes beneficial re-use material for agricultural application. He said many farmers have different soil amendment needs and their interest in the alum sludge would depend upon how they needed to change the chemical characteristics of their soil. He also said that he preferred the sludge to be of low solids content because it is easier to apply a liquid rather than a solid (hence, no need to consolidate the material). He would pump out the alum rather than excavate it. He believed the sludge would have to be analyzed for heavy metals, organics, and nutrients (N, P, and K). He made a quick estimate that it would cost about $20,576 to remove, transport, and dispose of 1,640 tons (approximately $12.50/ton). This cost also appears low based upon our estimated cost to excavate and transport the material to AB Environmental in Belle Plaine, Minnesota (see Other Disposal Options).

1.1.4 Other Disposal Options

A few additional disposal options were investigated. A company called AB Environmental (Shawn Kluger – cell phone: 612-490-1426), located just south of the Twin Cities in Belle Plaine, took the alum sludge from Eagan, dried it, and incorporated it into road-base material. It is necessary to get a permit (demonstrate beneficial use) from the MPCA to use alum sludge in this process. They charge $7/ton to dispose of the material (approximately $11,480 for 1,640 tons). A contractor would be needed to remove and transport the material to AB Environmental. Possibly, a contractor such as Hydro Engineering would be less expensive than one such as Bolander and Sons. We estimate that it will cost $99,000 to excavate and transport 500,000 gallons of sludge (with site preparation and cleanup included).

2.0 Pumping Study

2.1 Sludge Consolidation Study

To test whether the periodic pumpout of water from the floc pond would cause the alum sludge to consolidate, four sediment cores were collected from the middle of the sludge pond on October 20, 2004 with the assistance of District Technician Eric Korte. A gravity corer was used (3.2-foot length, 2.75-inch I.D.). The depth of the alum sludge was 1.5 feet, underlain by gray-green clay. The sediment cores were collected to a depth that just penetrated this clay layer which facilitated keeping the alum sludge in the core. The cores were transported upright to the Barr Engineering field laboratory and measured for sludge thickness and water head height and then stored in a refrigerator (5.5°C) to minimize microbial growth. The cores were loosely covered with parafilm. The experiment was set up as follows:

1. Two of the cores were set aside as controls, whereby no manipulation of the water level was made.
2. The water level in the remaining two cores was drawn down to either
    a. very near the floc surface.
    b. half way to the floc surface.
3. After initial measurements on October 20, 2004, the water levels were drawn down according to the above scenario (#2 above) and allowed to sit for one week. Measurement of the sludge thickness was made to evaluate sludge consolidation and, with the purpose of simulating groundwater inflow, the water level was then raised to its initial level and allowed to sit for one week. The cycle was then repeated twice, yielding four time points (including time = 0).

The results show that a small amount of additional compaction can be obtained by drawing down the water level halfway to the alum sludge surface. Consolidation is defined as the alum sludge thickness divided by the initial alum sludge thickness at time = 0 (week 1 as shown on Figure 1). Relative to the average of the two controls (average sludge thickness = 96.6%), after three drawdown cycles, the scenario of halfway drawdown provided an additional 3.1% consolidation (Figure 1).

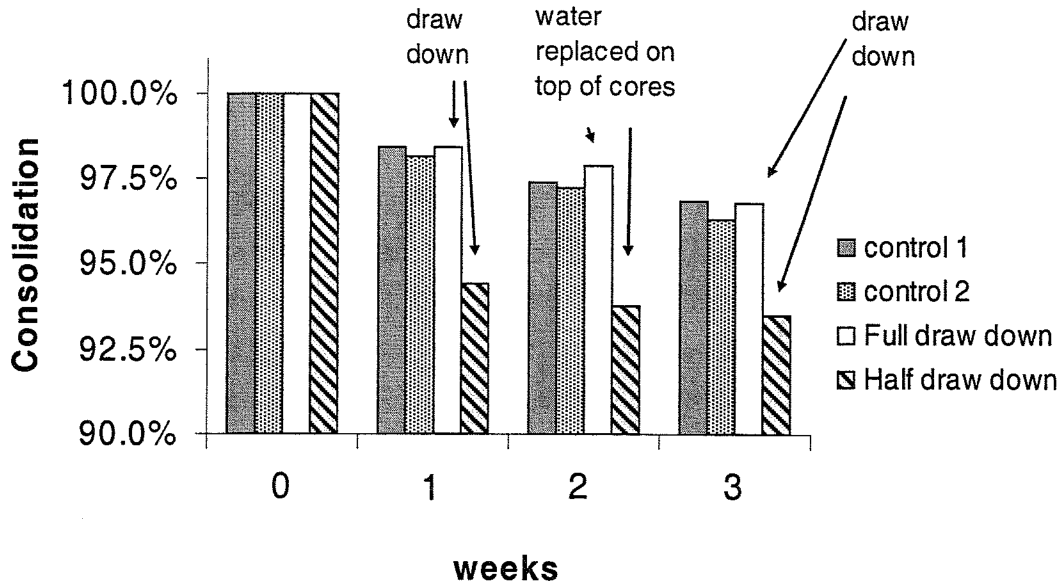

Figure 1. Alum Sludge Consolidation Study Results. Four Sediment Cores Collected October 20, 2004. Consolidation is Relative to the Initial Alum Sludge Thickness (Week 1)

After three drawdown and fill cycles, the percent water was measured in each of the four sediment cores. To collect the sediment in a uniform manner, a peristaltic pump was inserted 0.5 feet into the alum sludge and a 150-mL sample was withdrawn. The average from the four alum sludges was 98.18% water $\pm$ 0.13.

The magnitude of compaction observed in the laboratory studies was less than the compaction that was observed in the field during the excavation of the pond. It is possible that compaction in the laboratory columns was hindered because the polycarbonate columns held up the sediment, thus the sediment in the top of the column did not compress sediment in the bottom of the column. Although the mechanism is not known, compaction of sludge in the field may have been partly due to the effect of pumping of water off the top of the pond during excavation.

2.2 Periodic Pumpout of Floc Pond

MCES (Karalynn Marr, 651-602-1000), the City of Maplewood (Ed Nadeau, 651-249-2430), and the City of Oakdale (Brian Bachmeir, 651-730-2730), were contacted to determine the procedures involved and the possibility of getting approval for performing the following periodic maintenance on the pond: (1) pump "clear water" from the pond to the Maplewood sanitary sewer on an annual basis to consolidate the alum sludge; and (2) pump the entire contents of the pond, clear water and sludge to the sewer system.

MCES requires that an application for a One-Time Approval Special Discharge Permit be completed each time the pond is dewatered. This can be done on an annual basis or more frequently if needed. Use of the One-Time Approval Special Discharge Permit is less expensive than getting a permit for a periodic discharge if dewatering is performed only once each year.

The Council also was willing to accept the alum sludge into the sanitary sewer. If this route is considered, it may be worthwhile to discharge the sludge and the clear water together into the sanitary system on an annual or semiannual basis to reduce the solids content of the discharge water and ensure that the sludge readily flows through the sanitary sewer (see attached council interceptor sewer map). MCES will charge the District according to the total suspended solids concentration and the chemical oxygen demand of the sludge.

The City of Maplewood does not want the alum sludge discharged into the adjacent section of the Maplewood sewer system based on the belief that the sludge would potentially clog up the sewer there. This concern regarding the discharge of alum sludge into the Maplewood sewer system may be because the City was not notified in advance in 2003 when decant water was discharged into their system. However, the City of Oakdale (Brian Bachmeir, 651-730-2730) was willing to accept the decant water or sludge from the pond as long as we confirm that it does not clog up their system. This could be achieved by recording a video of the sewer system before and after the alum sludge is discharged. Apparently, a City of Oakdale sewer system runs past the floc pond on the east side of Century Avenue and the sludge could be pumped to a manhole on that side.

If it is determined that discharge to MCES is a practical method for alum sludge disposal, then a permanent connection to the Maplewood or Oakdale sewer or MCES interceptor could be constructed. This system would include a permanent underdrain installed in the bottom of the pond and a pump that could be housed at the existing alum building. It is recommended that disposal be performed on an annual or biannual basis to ensure that the floc/sludge is easily pumpable and will not cause clogging in the downstream sewer system.

Based upon the solids content of the sludge in 2003 (approximately 5% solids), and an estimated chemical oxygen demand of 25,000 mg/L, a discharge volume of approximately 500,000 gallons, and a total mass of 546 tons (used to calculate the total suspended solids concentration—total tonnage for sludge removal in 2003 was three times this mass), the estimated annual cost to discharge the alum sludge to the sewers would be approximately $12,440. This cost includes the strength charge (based on solids and chemical oxygen demand), the volume cost that is typically charged to a city, the permit application fee, and a cost estimate for the anticipated staff time committed by the District.

3.0 On-Site Sludge Management Evaluation

The purpose of this section is to evaluate the feasibility of District staff performing periodic sludge management activities at the alum treatment facility using on-site sludge dewatering equipment.

The purpose of using this sort of device is to reduce the volume of the sludge and to increase its solids content. The benefit of this is that it reduces transportation costs and reduces disposal costs at a landfill. Based upon understanding gathered regarding land application of the sludge, this method may not be beneficial for land application because many brokers/contractors prefer to spread sludge material in a liquid form. However, other brokers/contractors clearly accept consolidated sludge material from several city water utilities (Eden Prairie, City of Minneapolis, City of St. Paul). Overall, it appears that the primary benefit of this method is that it will reduce the volume or mass of sludge that will be sent to a landfill or other disposal option (AB Environmental). However, vendors have expressed some concern that it will be difficult to use the dewatering box (see below) to achieve significant dewatering of alum sludge. They indicated that other sludge materials such as municipal wastewater sludges are better suited to dewatering by the dewatering box method. It appears that there may be some uncertainty in the use of this methodology to achieve significant cost benefits. Also, there could be significant involvement of District Staff or contacted staff time in the operation of these devices.

General types of sludge dewatering devices are as follows:

1. Centrifuge
2. Belt Press/Thickener
3. Filter Press
4. Dewatering Box

Centrifuges, belt presses, and filter presses are generally used in large facilities, are expensive, require somewhat frequent maintenance, and need to be housed inside a facility. These devices are not practical given the limited space that is available at the facility. For use at the floc pond, the **dewatering box** is likely the most applicable. This device is simply a metal box with filter material that is mounted on the sides of the box (see attachments). Sludge material is pumped into the box, polymer is mixed with the sludge, and the solids and water separate. The water passes through the filter fabric and the solids with reduced water content remain in the box.

There are a variety of designs available (see attachments). Some boxes are designed to be picked-up, placed on a semitrailer, and transported to the dumping site, others have hydraulic lifts for dumping the sludge material on site onto a receiving pad, and others are permanently mounted onto a trailer. Depending on size, the trailer-mounted sludge dewatering box can be hooked up to a truck/pickup for transport to a disposal site.

There are essentially two suppliers of the dewatering box: Flo-Trend (713-699-0152) and Sludge Management and Reuse Technologies (1-800-899-1802). Comprehensive price lists were not available for all of their products. The annualized cost estimates for three products that could be used at the floc pond are provided in the following section.

3.1 Cost Estimates

Annual operating cost estimates for the dewatering devices are provided below.

Flow Trend: Trailer Mounted Dewatering Unit

- **Unit**: 20-cubic-yard, trailer-mounted (for transport behind a truck/pickup) dewatering box with polymer feed device.
- **Unit Cost**: $52,500.
- **Polymer Cost**: $18/gallon. One gallon of polymer is required to dewater 200 gallons of sludge. A total of $35,355 of polymer would be required to dewater 1,640 tons of sludge.
- **Disposal Cost (1,640 tons of sludge)**: $25/ton for landfill; $7/ton AB Environmental.
  - **Dewatered to 10% Solids:** Total Disposal Cost: $4,100 (landfill); $1,148 (AB Environmental).
  - **Dewatered to 15% Solids:** Total Disposal Cost: $2,733 (landfill); $765 (AB Environmental).
- **Transportation Cost**: Assumed to be zero, dewatering box can be transported to the disposal site by District staff.
- **Ramsey Washington Watershed District Staff Time**: 35 days per cleaning.

- **Annualized Disposal Cost**: Assuming a 20-year lifespan of the dewatering box and the capacity of the pond to hold sludge from three years of operations.
  - Depending on solids concentration achieved and disposal option, cost could range from $17,975 to $21,310.

Flow Trend: Stationary Box Unit

- **Unit**: 30-cubic-yard, stationary dewatering box with polymer feed device.
- **Unit Cost**: $34,600.
- **Polymer Cost**: $18/gallon. One gallon of polymer is required to dewater 200 gallons of sludge. A total of $35,355 of polymer would be required to dewater 1,640 tons of sludge.
- **Disposal Cost (1,640 tons of sludge)**: $25/ton for landfill; $7/ton AB Environmental.
  - **Dewatered to 10% Solids:** Total Disposal Cost: $4,100 (landfill); $1,148 (AB Environmental).
  - **Dewatered to 15% Solids:** Total Disposal Cost: $2,733 (landfill); $765 (AB Environmental).
- **Ramsey Washington Watershed District Staff Time**: 20 days per cleaning.
- **Transportation Cost**: Estimated to be $2,200 to $3,333.
- **Annualized Disposal Cost**: Assuming a 20-year lifespan of the dewatering box and the capacity of the pond to hold sludge from three years of operations.
  - Depending on solids concentration achieved and disposal option, cost could range from $18,067 to $22,495.

Flow Trend: Centrifuge Unit

- **Unit**: 50-gpm sludge processing unit.
- **Unit Cost**: $130,000 for unit; $15,000 for housing of centrifuge.
- **Polymer Cost**: $18/gallon. One gallon of polymer is required to dewater 200 gallons of sludge. A total of $35,355 of polymer would be required to dewater 1,640 tons of sludge.

- **Disposal Cost (1,640 tons of sludge)**: $25/ton for landfill; $7/ton AB Environmental.
  - **Dewatered to 20% Solids:** Total Disposal Cost: $2,050 (landfill); $574 (AB Environmental).
- **Ramsey Washington Watershed District Staff Time**: 15 days per cleaning.
- **Transportation Cost**: Assumed to be $3,333.
- **<u>Annualized</u> Disposal Cost**: Assuming a 20-year lifespan of the dewatering box and the capacity of the pond to hold sludge from three years of operations.
  - Estimated annual disposal cost could range from $22,849 to $24,325.

3.2 Other Logistical and Spatial Considerations

The primary limitation in the use of the dewatering boxes or the centrifuge is the lack of available space at the floc settling pond. The stationary dewatering box will need to be permanently sited somewhere adjacent to the pond, with a concrete pad, additional room for a dumpster to collect the dewatered alum, and access for a truck. Similarly, the centrifuge, which will be 10 feet long, 5 feet wide, and 3.5 feet tall, will require additional housing. It appears that the most practical dewatering device is the trailer-mounted dewatering box (see attached photograph). This device can be attached to a truck, transported to the floc pond, the alum sludge dewatered, and then the dewatered alum directly transported to the landfill or other disposal facility. The benefit of this device is that it can be easily stored off site and the alum sludge can be transported in it. However, it will take longer to dewater the sludge in the pond (over a month) and frequent trips to the disposal facility will be required.

4.0 Summary/Conclusions

There are several options for disposal of alum sludge at the Tanners Lake floc pond and these options are less expensive than the use of a contractor to excavate and dispose of the material in a landfill. Conclusions of this study are as follows:

- **The Saint Paul Water Utility** is willing to consider the use of their facility to dewater and dispose of the alum sludge. However, they would consider this to be more work than it is worth. This is unlikely a long-term solution to sludge management at Tanners Lake.
- **The sludge dewatering experiment** demonstrated that the sludge material can be consolidated by approximately 7% by performing successive water drawdowns on an annual basis. This activity will not lead to measurable improvements in the time between required sludge maintenance activities.
- **Land Application**. There are several brokers/land applicators that are available to remove the sludge material and apply it to land. Three to six months planning time will be required to get a land applicator to consider bidding on future removal projects. There is some uncertainty whether farmers would be willing to accept this material. This is a much lower cost option compared to landfilling; however, the costs quoted by these brokers are likely much lower than the actual cost (likely by 100 to 200%).
- **Other Disposal Options**. The sludge material can be used for other beneficial uses. AB Environmental took the Eagan sludge and incorporated it into road-base material. The disposal cost charged by AB Environmental is significantly lower than the disposal cost at a landfill.
- **Sanitary Sewer Disposal**. The Metropolitan Council Environmental Services is willing to accept the sludge material into their interceptor system for a fee (strength fee based upon solids and chemical oxygen demand). The City of Oakdale is also willing to allow the discharge of this material into their sewer system. ***This is likely the best disposal option.***
- **Dewatering devices** may be used to reduce the volume and mass of alum sludge that is ultimately disposed. This method will most likely be used in conjunction with disposal in a landfill or by some other alternative such as incorporation into roadbed material (AB Environmental). It is likely that the most practical dewatering device (the dewatering

box) may not lead to significant reductions in sludge volume and mass because of reported difficulties in dewatering alum. Land availability at the treatment facility is limited and could constrain any dewatering activities.

- **A comparison of the different methods by cost and confidence in the method is provided on Figure 2 below.** The level of confidence is simply an estimate of whether the implementation of such a method would be successful and of low difficulty. A value between 1 and 5 was given for each method based upon professional judgment and feedback from the phone survey. A value of 1 means low likelihood of success and high difficulty; a value of 5 means high likelihood of success and low difficulty. This value was then graphed with the estimated annual disposal cost. This provides some comparison of cost estimates and whether a particular method is expected to be feasible.

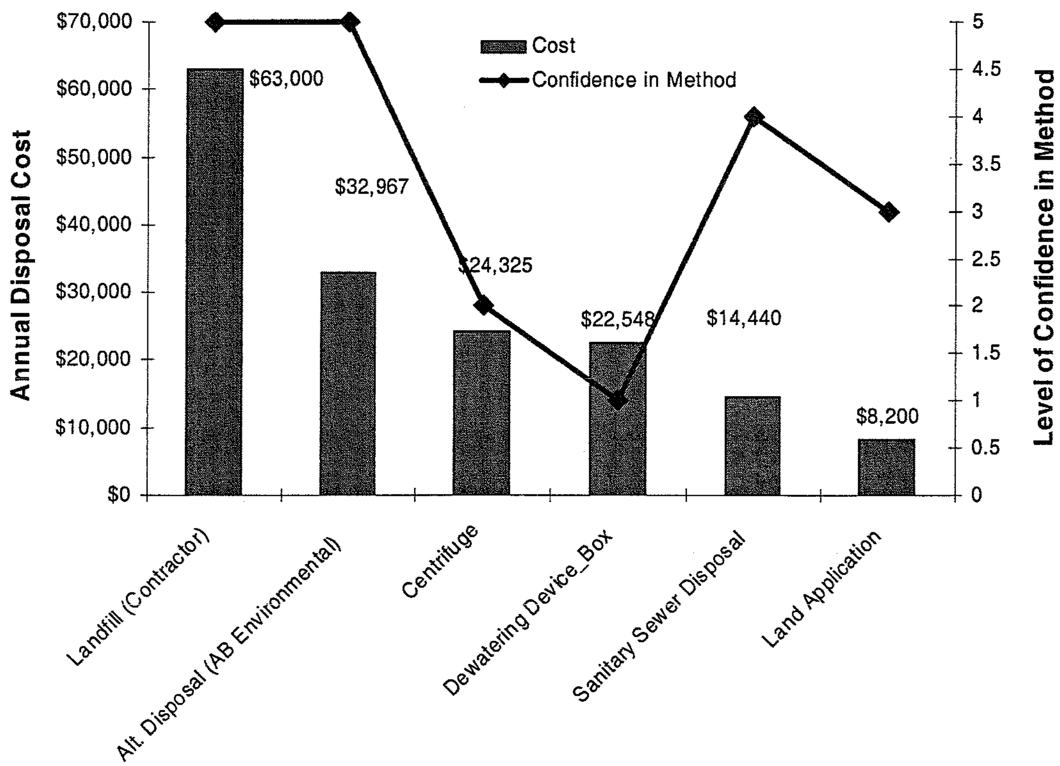

Figure 2. Cost to Dispose of the Alum Sludge Material by Different Methods and the Confidence that the Method can be Implemented Successfully

Attachments

Minnesota Pollution Control Agency

November 2001

Facts about

MPCA Industrial By-Products Land Application Program

During the past three years, the Minnesota Pollution Control Agency (MPCA) has experienced decreased funding and needs to trim staff by about nine percent.

To assure that Minnesota's highest environmental priorities can still be met, the MPCA has reduced service in some programs, including the program that services the Industrial By-Products (IBPs) Land Application permitting, and discontinued a number of others.

Introduction

Because the permitting program has been very successful, the MPCA can now shift its focus to permitting land application of wastes that have historically caused environmental problems in the state. These wastes are primarily generated from the food and beverage processing industries, but also include some other industries that produce similar high nitrogen, phosphorus, and other wastes. Staff time has been reduced from 2.5 FTEs (full-time employees) to less than one.

NOTE: *Biosolids generated from the treatment of municipal wastewater is not an IBP and is regulated separately from IBP's by state rule (MN Rule Ch. 7041) and by federal rule (40 CFR part 503).*

Land application of IBPs has required a permit from MPCA since a policy was established in 1998. Currently, not all land-applied IBP's have a permit. Staff continues to work at meeting this goal.

Although, state rules 7050 and 7060 require protection of surface and ground waters during land application activities, past experience has shown that it is difficult to cite and enforce these ground water or surface water rules until a major catastrophe occurs (i.e. fishkill). The permitting program was established to prevent ground water and surface water contamination.

IBP's are technically classified as solid waste and are the result of processes such as food and beverage processing, ethanol production, generation of electricity, and treatment of drinking water. Examples of IBP's from these industries include:

- Whey
- Sweet corn silage / leachate
- Pretreatment sludges
- Wood, coal, and mixed ashes
- By-product limes
- Thin stillage and process condensate (ethanol plants)

MPCA will now focus on...

- Issuing general and individual permits to food and beverage processors that land apply their wastes and also to other industries which have similar waste streams.
- Providing continued training for all land appliers of industrial sludges and other industrial wastes (an annual course that focuses on industrial land application).
- Reviewing land application annual reports.
- Following-up on complaints issued at industrial land application sites.

MPCA will no longer...

- Approve land application sites, however, all the procedures listed in the permit will still be required of the permittee.
- Perform policy and planning activities such as development of standards for land application of sand trap/flammable trap waste; wood, coal, and mixed ash waste; and by-product limes (an alternative being considered is incorporating some of these requirements into the solid waste rules currently being revised).

- Issue individual permits for miscellaneous wash waters and nonfood holding tank waste.
- Review storage facility designs; however, MPCA will require plans and specifications be submitted and assure that the design is signed by a registered engineer.

Permittees will continue be required to follow all requirements of the permit not listed above.

Additional information

For assistance or additional information, contact either Pat Burford at (651) 296-8745 or Wendy Turri at (507) 280-2990. These individuals may also be reached through MPCA's toll-free line at 1-800-657-3864.

Additional IBP information can be found at www.pca.state.mn.us/water/landapp.html.

The MPCA regrets this necessary loss of service to citizens, contractors and local governments who have come to depend on us for information and assistance with IBP matters. Hard financial realities have necessitated cutbacks in many other program areas as well.

For more information about the end of, and adjustments to, MPCA programs and service, please visit our Web site at www.pca.state.mn.us/about/changes

Quick Links:

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Solid Waste

Waste

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Solid Waste Utilization

In early 2004 MPCA staff completed amendments to Minn rule Ch 7035 pertaining to the beneficial use of solid waste. The rules revisions were conducted to establish a system that will **assist persons generating wastes to identify beneficial uses for those wastes rather than sending them to a landfill.** The beneficial use of solid waste will save landfill capacity for materials that do not have alternative uses and reduce the amount of raw materials used in construction and other industries. By using solid waste individuals and organizations can reduce disposal costs, or even generate profit through the sale of materials that have a beneficial use.

For more information on the rulemaking, see the following:

- Rule Making Process
- Rule Language
- Statement of Need and Reasonableness (SONAR)

The solid waste utilization program will achieve this goal by establishing:

- Procedures by which persons who wish to explore a potential beneficial use can do so through a limited demonstration/research project (DRP) even if the use is not allowed under present rules or permit conditions.

- A category of standing beneficial uses (SBUD) of wastes that do not require any regulatory contact or approval.

- Procedures whereby a person proposing a use not in the "standing" category can seek and obtain regulatory approval for that use through a beneficial use determination (BUD).

- Methods for characterizing the solid waste and the proposed use such that information about the proposed use can be shared with regulators and interested people.
- Standards for storage of solid waste prior to its beneficial use.
- A point in time when the designation of a material as a solid waste is removed and the material is no longer subject to solid waste regulation.

To qualify as beneficial a use must meet the following criteria:

1. the solid waste must not be stored in anticipation of speculative future markets;
2. the solid waste must be adequately characterized in accordance with part 7035.2861;
3. the solid waste must be an effective substitute for an analogous material or a necessary ingredient in a new product;
4. the use of the solid waste does not adversely impact human health or the environment; and
5. the solid waste must not be used in quantities that exceed accepted engineering or commercial standards. (excess use of solid waste is not authorized by this part and is considered disposal)

Conditions for Solid Waste Use

The solid waste utilization rules identify **three different conditions** under which wastes can be used rather than disposed of: standing beneficial use determinations (SBUD), case specific beneficial use determinations (BUD), and demonstration / research projects (DRP).

Case Specific Beneficial Use Determinations (CSBUD):	Standing Beneficial Use Determinations (SBUD):	Demonstration / Research Projects (DRP):
For uses of solid waste not identified in 7035.2860 subpart 4, the agency shall make a case-by-case determination on whether the proposed management option for the specific solid waste is a beneficial use. This	A standing beneficial use determination (SBUD) means that the generator or end user of a material can do so in accordance with 7035.2860 without contacting the agency. Only those specific solid wastes and the uses designated in	Minn Rule part 7035.0450 provides a process of regulatory oversight of Demonstration / Research projects. Demonstration/research projects are limited scale projects conducted for the purpose of

determination must be based on information submitted in accordance with 7035.2860. To qualify as beneficial a use must meet the following criteria:

A. the solid waste must not be stored in anticipation of speculative future markets;

B. the solid waste must be adequately characterized in accordance with part 7035.2861;

C. the solid waste must be an effective substitute for an analogous material or a necessary ingredient in a new product;

D. the use of the solid waste does not adversely impact human health or the environment; and

E. the solid waste must not be used in quantities that exceed accepted engineering or commercial standards. (excess use of solid waste is not authorized by this part and is considered disposal)

For more information, go to the Case Specific Beneficial Use Determinations

7035.2860 have been given standing beneficial use determinations. Any other uses of solid waste must follow the procedure for obtaining a case specific beneficial use determination (BUD), outlined in 7035.2860 subp 5, or a Demonstration/Research project (DRP), outlined in 2035.0450.

For more information, go to the Standing Beneficial Use Determinations page.

obtaining information and data on methods of solid waste management including but not limited to utilization. For example a DRP may be conducted to evaluate new landfill designs or solid waste management technologies.

For more information, go to the Demonstration/Research Project page.

page.

Solid Waste Utilization

How do I determine which category my potential use should fall under?

First, review the list of standing beneficial uses in Minn. Rule part 7035.2860 subp 4. If the waste and use you are considering are listed, you may go forward without notifying the MPCA. If the waste and use are not listed as an SBUD, you will have to submit a proposal for a CSBUD or a DRP. When deciding between a CSBUD or a DRP, consider the goals of the project. If a project is being done to gain data or to test a new idea, it should be submitted as a DRP proposal. If a potential use is designed to be an ongoing activity, it should be proposed as a CSBUD. If MPCA staff feel that more information is needed to approve a BUD, they may recommend the design and completion of a DRP.

Storage prior to beneficial use

Solid wastes that are beneficially used are no longer exempt from storage standards. The standards established for solid wastes stored before their beneficial use are detailed in 7035.2855. The standards established allow flexibility in storage design. The goal of the design is to prevent contaminants from migrating into ground or surface waters and prevent nuisance conditions from occurring at the storage facility.

Contacts

For more information contact:

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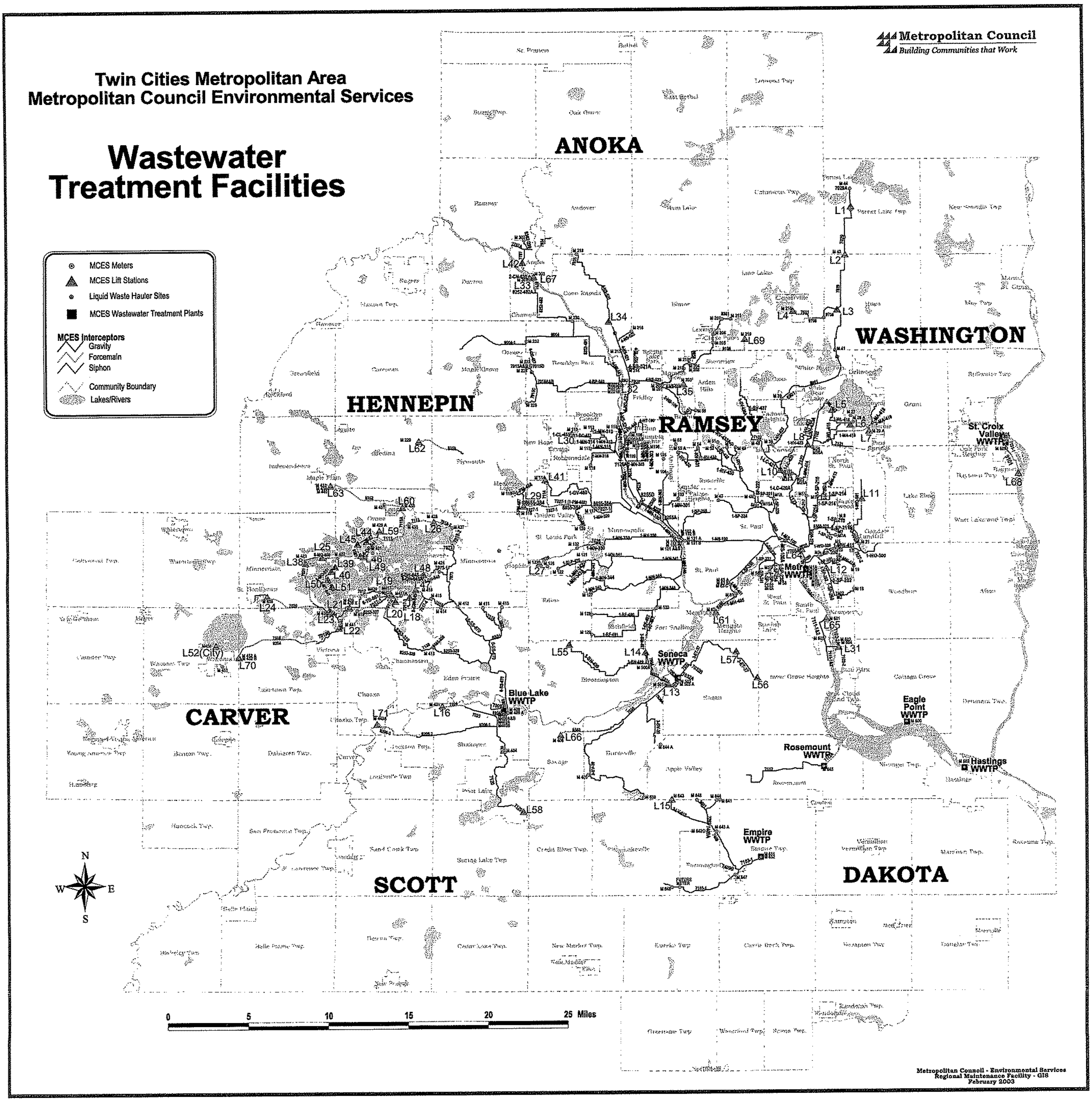
Twin Cities Metropolitan Area
Metropolitan Council Environmental Services
Wastewater Treatment Facilities
Metropolitan Council
Building Communities that Work
MCES Meters
MCES Lift Stations
Liquid Waste Hauler Sites
MCES Wastewater Treatment Plants
MCES Interceptors
Gravity
Forcemain
Siphon
Community Boundary
Lakes/Rivers
ANOKA
HENNEPIN
RAMSEY
WASHINGTON
CARVER
SCOTT
DAKOTA
St. Croix Valley WWTP
Metro WWTP
Seneca WWTP
Blue Lake WWTP
Eagle Point WWTP
Rosemount WWTP
Hastings WWTP
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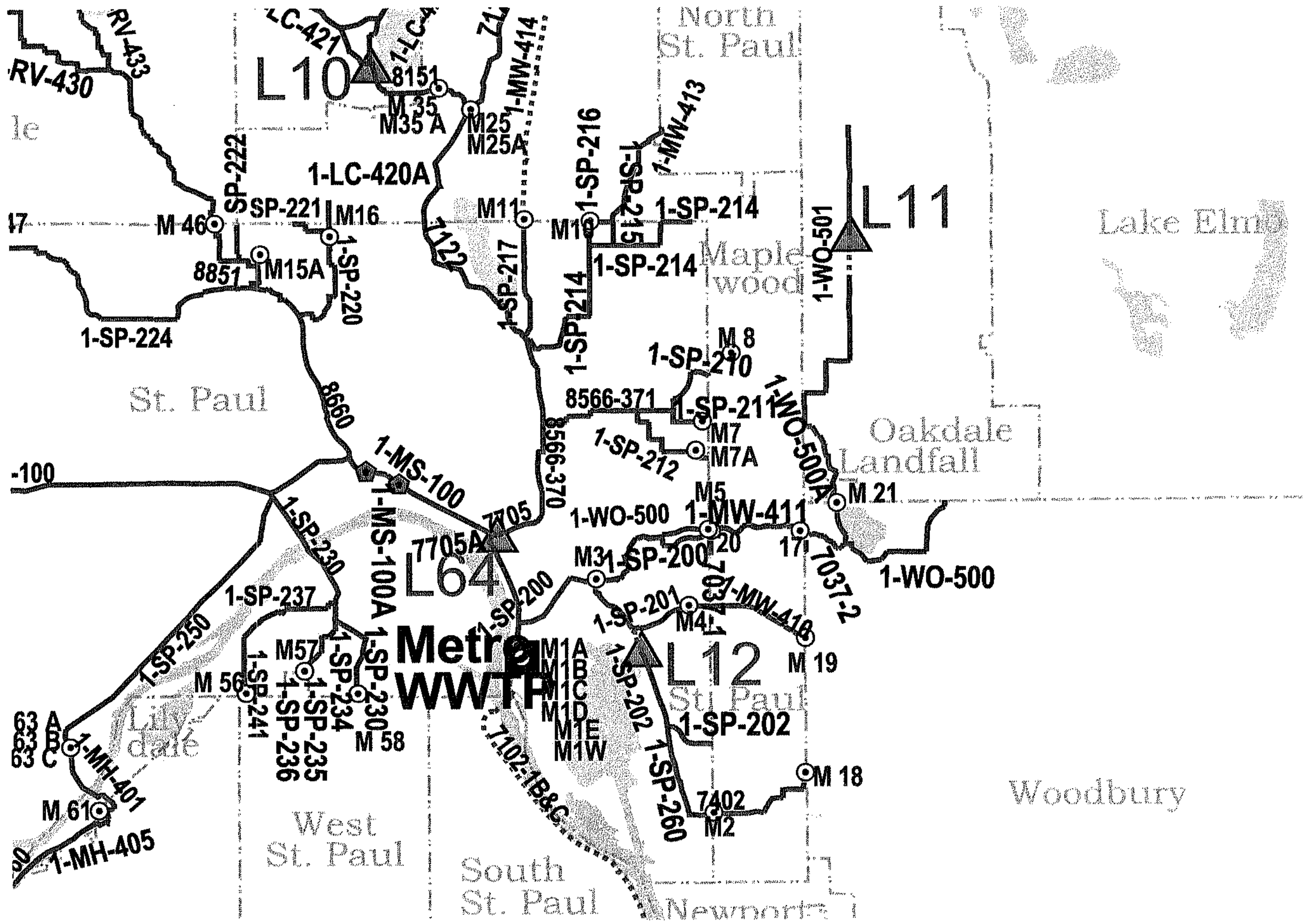
Metropolitan Council - Environmental Services
Regional Maintenance Facility - GIS
February 2003


North St. Paul
Maple wood
Lake Elmo
Oakdale Landfall
St. Paul
West St. Paul
South St. Paul
Woodbury
Lily dale
Metro WWTP
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L11
L12
L64
1-WO-501
1-WO-500A
1-WO-500
7037-2
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M1D
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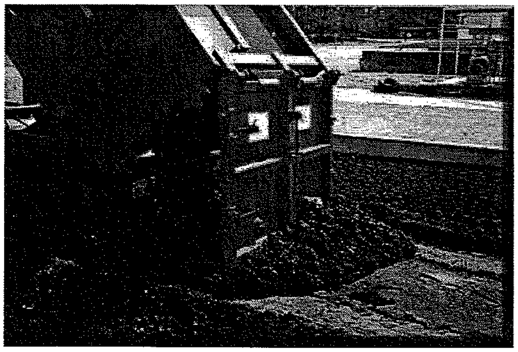
M1W
7102:1B&C
63 A
63 B
63 C
1-MH-401
1-MH-405
M 61

Trailer Mounted Sludge Mate®



Designed to Dewater

- **Grease Trap Waste**
- **Septic Tank Waste**
- **Digested Sludge**
- **Alum Sludge**

The Sludge Mate® is used along with polymer to dewater various types of waste. The polymer is mixed with the waste, then the mixture is processed through the Sludge Mate®. The Sludge Mate® has filters that retain the solids and allow the water to pass through the filters and out the drainage ports. The clear liquid is not treated water and must be disposed of properly. Once the sludge has been dewatered for between 12 and 24 hours, it will pass the paint filter test and will be ready for disposal.

Sample Application*

Beginning Waste % of Solids	Beginning Waste Volume	Processing Time	Dewatered Waste % of Solids	Dewatered Waste Volume	Volume Reduction
2 - 3%	10,000	24 Hours	12-16%	2,000 (9.9 cubic yards)	80-85%

Sludge Mate® Processing Capabilities*

Sludge Mate® Size	Amount of sludge processed per day
5 cu. yd.	5,000 gallons
7 cu. yd	7,000 gallons
12 cu. yd.	12,000 gallons
15 cu. yd.	15,000 gallons
20 cu. yd.	20,000 gallons
25 cu. yd.	25,000 gallons
30 cu. yd.	30,000 gallons
40 cu. yd.	40,000 gallons

*Note: Individual application results, as well as processing capability depends on % solids in the sludge.

Trailer mounted units are available in sizes ranging from 5 cu. yd. to 40 cu. yd. Each unit can be equipped with a closed roof with hatchways, a tarp or an open top.

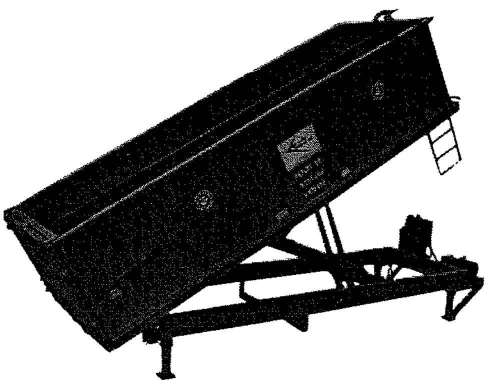
FLO TREND® SYSTEMS, INC.

Dewatering Made Simple

707 Lehman St.
Houston, TX 77018
713-699-0152
Fax 713-699-8054

www.flotrend.com
flotrend@flotrend.com

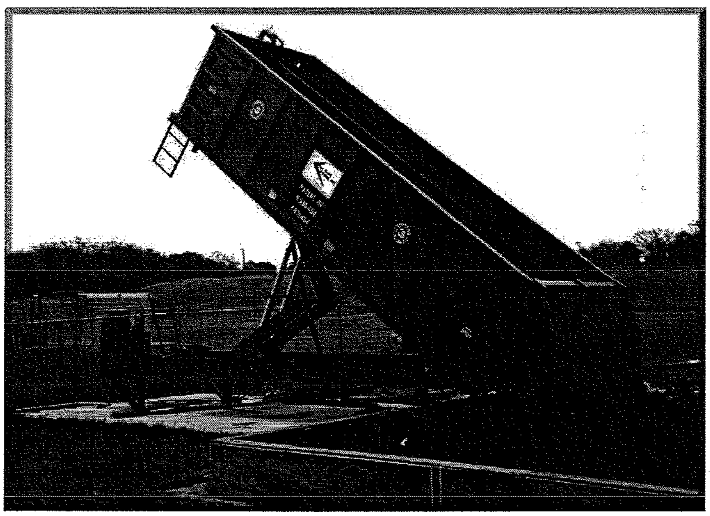
Tipping Stand Mounted Sludge Mate®



Designed to Dewater

- Grease Trap Waste
- Septic Tank Waste
- Digested Sludge
- Alum Sludge

The Sludge Mate® is used along with polymer to dewater various types of waste. The polymer is mixed with the waste, then the mixture is processed through the Sludge Mate®. The Sludge Mate® has filters that retain the solids and allow the water to pass through the filters and out the drainage ports. The clear liquid is not treated water and must be disposed of properly. Once the sludge has had ample time to dewater, it will be ready for disposal.



Stationary hydraulically operated units are available in 12, 20, 25, 30, and 40 cubic yards with dump capacities ranging from 20,000 to 60,000 lbs.

The Sludge Mate® Container Filter can be permanently mounted on a tipping stand for the convenience of the user.

Standard tipping stand mounted units are electric over hydraulic. Other options are available. Hoists for these units include single and dual cylinder scissors, as well as vertical single cylinder telescopic with capacities ranging from 24,000 to 60,000 lbs.

All units come standard with a 2' high stand, but stand extension legs are available for additional height. Each unit can be equipped with a closed roof, a tarp or an open top.

All tipping stand mounted units are offered with or without the Poly-Mate® Polymer Mixing and Injection System.

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Fax 713-699-8054

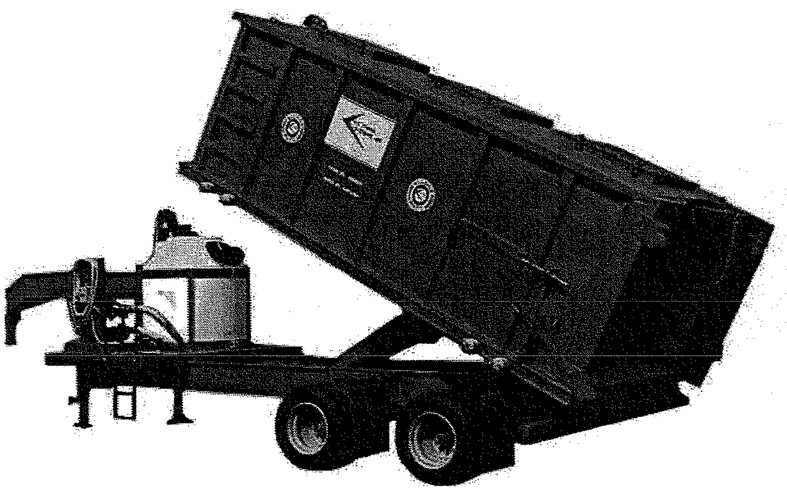
www.flotrend.com
flotrend@flotrend.com

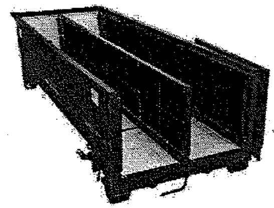
Dewatering Made Simple

Container Filters

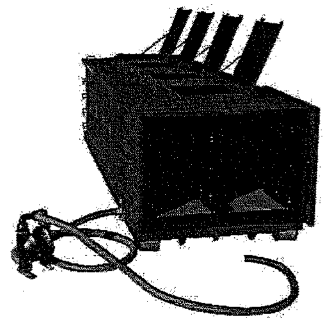
for

Simple, Economical Liquid and Solid Separations

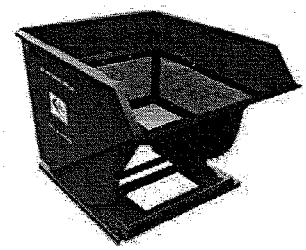




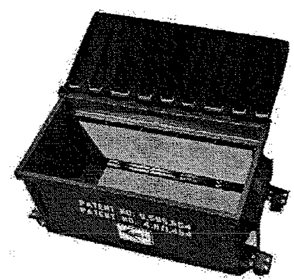
Roll-Off Style Container Filter



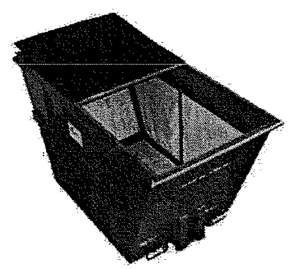
The Sludge Mate®



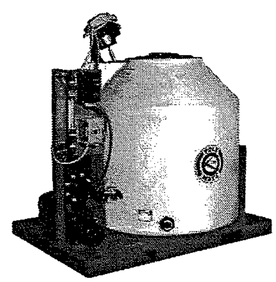
Self-Dumping Container Filter



Front Loader Container Filter



Lugger-Style Container Filter



Polymer Injection Unit

FLO TREND® SYSTEMS, INC.

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e-mail: flotrend@flotrend.com
website: www.flotrend.com

Trailer Mounted
Dewatering Unit