METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO RESOURCE RECOVERY PROGRAM

Enhanced Biological Phosphorus Removal Program

I. Synopsis of the Program

At the end of 2013, the Illinois Environmental Protection Agency (IEPA) issued National Pollutant Discharge Elimination System (NPDES) permits to the Metropolitan Water Reclamation District of Greater Chicago's (District) Stickney, Calumet and O'Brien Water Reclamation Plants (WRPs). These permits include schedules for compliance with new effluent discharge limits of 1.0 mg/L for phosphorus. In order to comply with the new NPDES permit requirements the District is focusing on Resource Recovery by implementing enhanced biological phosphorus removal (EBPR) and recovery technology.

Phosphorus is a non-renewable resource that will be recovered in a reusable form. The District envisions that in the long term, the Stickney and Calumet WRPs will accept high strength phosphorus flow streams directly to their EBPR and recovery processes. In this way, pretreatment, compliance and administrative costs associated with removal and regulation of phosphorus in industrial wastewater may be minimized while recovery for reuse will be maximized.

The District's phosphorus recovery strategy is to enact EBPR from the wastewater entering into the WRPs by utilizing phosphorous accumulating bacteria. These bacteria use volatile fatty acids, which are derived from readily biodegradable carbon in the wastewater, to accumulate phosphorus. The process will enable the District to transfer phosphorus present in the wastewater into concentrated side-streams that can be treated with phosphorus recovery systems yielding slow-release phosphorus fertilizer products.

The implementation of the EBPR process increases demand for readily biodegradable carbon at the WRPs. In order to meet this demand for increased carbon loading, the District intends to accept non-hazardous high strength liquid organic material (HSOM) with desired concentration of chemical oxygen demand (COD) from outside sources or suppliers. The HSOM will be delivered to the WRPs for direct addition to the EBPR system.

The District has determined that Calumet and Stickney WRPs have the hydraulic and organic capacity to handle additional HSOM. The difference between the design capacity (organic and hydraulic) of the WRP and the actual conventional loading through the collection system, determined the available organic and hydraulic capacity to accept HSOM for the EBPR process. The District must ensure that the plant operations always comply with their NPDES permit, water quality, and biosolids standards requirements. Analysis of individual unit processes specific to each WRP, including biosolids and treatment processes, determines the maximum pollutant concentrations and loadings that the WRPs can receive without experiencing interference or pass-through. In order to ensure the District's Resource Recovery Program complies with all applicable regulations and limitations, the District's Board of Commissioners recently adopted the Resource Recovery Ordinance (RRO). The District must ensure that materials accepted for EBPR at its WRPs must comply with all terms of the RRO.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO
RESOURCE RECOVERY PROGRAM

Enhanced Biological Phosphorus Removal Program

Under authority of the RRO, interested generators or sources may apply for authorization to deliver HSOM to the Calumet or Stickney WRPs for the EBPR processes. All prospective HSOM generators or sources will be pre-screened for acceptance by reviewing material description, the anticipated weekly volume, frequency of delivery, and sample analysis for strength characteristics (COD, Volatile Suspended Solids as a percentage of Total Suspended Solids and pH) and pollutants of concern (POC) (refer Table 1 and 2). Prospective suppliers of HSOM may contact the District's Industrial Waste Division office at (312) 751-3044 or BioP@mwrd.org for further information regarding the pre-screening process and requirements. The suppliers of the pre-screened materials will be contacted upon determination of the suitability of their material for the District's EBPR program.

Those generators or sources that have been successfully pre-screened are then directed to the Organic Materials Delivery Authorization (OMDA) application process for consideration to formal acceptance into the program. In addition to the OMDA process, a certified sample analysis of and a completed Material Acceptance Agreement (MAA) for each waste type, will be required to gain formal program entry. Refer to the OMDA Instructions (available at www.mwrd.org) for further information and guidance.

Approved applicants to the program shall not introduce HSOM with high concentrations of POCs or prohibited materials or constituents as listed in the RRO and in this document. Any applicant that introduces such pollutants into the District's treatment processes will be subject to enforcement or legal action, including but not limited to, immediate revocation of its OMDA and MAA, as authorized by the RRO.

II. Getting Started: Initial Criteria for Accepting High Strength Liquid Organic Materials

A. Generators or suppliers should contact the Monitoring and Research (M&R) Department, Industrial Waste Division, at (312) 751-3044 or BioP@mwrd.org with information regarding their high-strength liquid organic material.

1. The criteria for acceptance are quantified.

    a. Laboratory analysis will confirm general suitability of material.

    b. Material acceptance may be Calumet or Stickney WRP-specific.

2. Participants with liquid materials having high COD values, un-pigmented, sugary, starchy and homogenous end products will be most appropriate for participation.

3. For administrative and operational efficiency this program requires participants agree to deliver at minimum two 5,000-gallon loads per week.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO
RESOURCE RECOVERY PROGRAM

Enhanced Biological Phosphorus Removal Program

B. Application Process

1. If the HSOM conforms to the acceptance criteria of the program, a sample description and laboratory analysis along with a delivery authorization application are required for M&R Department's review.

   a. High strength liquid organic materials, also known as, high strength liquid waste (in RRO) are generally considered waste products of food processing facilities, restaurants, breweries, ethanol production facilities, tank bottoms, and similar sources, which are homogeneous liquids or slurries high in organic content as measured in concentrations of COD, and are typically too concentrated to be disposed of by discharge to sewers.

   b. Unless otherwise determined by the Program Manager, HSOM will have the characteristics as presented in Table 1 below:

TABLE 1 HIGH STRENGTH LIQUID ORGANIC MATERIAL LIMITS

Constituent	Value	Limit
COD	75,000 mg/L	Minimum
Volatile Solids in Total Solids	75%	Minimum
pH*	4-10 pH units	Range

* pH outside this range may be acceptable through prior arrangement with the District

2. Material transported to the WRP must not introduce pollutant(s) which cause pass-through or interference to the WRPs and must not contain the following:

   a. Hazardous waste identified under the Resource Conservation and Recovery Act, 42 U.S.C. §6901 et seq., and relevant regulations (40 C.F.R. §§261.31-33), or by the IEPA under its solid waste disposal program, and relevant regulations (Title 35 Ill. Adm. Code §721), or any waste that generally exhibits the characteristics of being ignitable, corrosive, reactive or toxic.

   b. Anything other than high strength liquid waste and other recovered resources as defined in the Resource Recovery Ordinance.

   c. Polychlorinated biphenyls (PCBs), dioxins, or surfactants.
   d. Liquid organic wastes containing dissolved oxygen or other oxidizers.

e. Materials that are non-pumpable.

f. Materials not consistent with a current Delivery Authorization.

g. Cleanings from chemical toilets, septic tanks, and cesspools.

h. Contents of any holding tank without prior written approval of the Program Director.

i. Materials transported by any vehicle that holds a permit issued by IEPA for hauling hazardous waste, or any vehicle that is used or has been used to pump or hold hazardous wastes.

j. Materials with excessive discoloration which threatens the District's operations.

3. In order to comply with effluent and biosolids regulations, and to protect the treatment process, the District must monitor certain POCs in the feed to the aeration system. Table 2 lists these POCs. HSOM which contain POCs are not necessarily excluded from this OMDA; rather, the District will monitor such constituents, and may require the Program Director to limit the amount of material accepted from generators if necessary to avoid interference or pass through of POCs which may negatively impact wastewater treatment plant operations or biosolids quality. These POCs will be monitored closely at all times in the aeration system and the incoming HSOM. Table 2 lists the major POCs but this list is not all inclusive, and the District may elect to monitor other constituents that are not listed in Table 2.

TABLE 2: POLLUTANTS OF CONCERN

Constituent	
Cadmium	Zinc
Chromium (Hexavalent)	Cyanide
Chromium (Total)	Phosphorous
Copper	Toxic Organic Compounds
Iron	Molybdenum
Lead	Selenium
Mercury	Arsenic
Nickel	

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III. Description of Program Elements for Material Acceptance to District Facilities

A. Organic Materials Delivery Authorization Application

1. Applicant Information

2. Fee Structure

   a. Fees are charged based on nominal volume capacity of the tanker truck making deliveries.

   b. Fees are prepaid using a coupon voucher system, with coupons redeemable at the gate to allow entry into District facilities.

3. General Conditions

   a. Reporting Requirements

   b. Monitoring and Enforcement

      i. The District reserves the right to suspend or revoke the OMDA.

      ii. The Program Director shall have full discretion to reject any delivery, material, or any person or entity from participating in the Resource Recovery Program for any lawful reason.

      iii. The Program Director may prohibit a delivery at any time if it is determined that the WRP lacks receipt capability, it is necessary for effective WRP operation, or it is otherwise in the District's best interest.

      iv. The Program Director shall have the right to monitor, inspect and/or test any delivery. This includes, but is not limited to, conducting un-announced spot checks on trucks and collecting samples.

      v. The Program Director may reject a delivery, at any time, if it is determined that the delivered material does not meet the acceptance criteria of the OMDA, including but not limited to criteria in this OMDA's section "High Strength Liquid Organic Material Requirements" or for any other violation of the RRO.

c. Indemnification

d. Insurance

e. Waiver of Subrogation Rights

f. Certification

i. Legal responsibility.

ii. Comply with terms of the RRO.

iii. Certify delivery.

iv. The District reserves the right to refuse deliveries at any time.

g. Authorization –Provisional, Original or Revision/Renewal.

B. Material Acceptance Agreement (MAA) – Required for each type of material

1. Material must conform to discharge limitations specified in the RRO, OMDA, Table 1 and Table 2 of this document.

2. Laboratory analysis for Table 1 and Table 2 constituents.

3. Name of Generator.

4. Location of Generator.

5. Material Description (including description of the process and raw material(s) from which it originates.)

6. Estimated volume generated daily.

7. Estimated delivery dates and frequency.

8. If approved, a signed copy of the MAA will be provided and a Material Acceptance Number will be assigned.

C. Truck Hauler Requirements:

1. Truck Hauler Identification.
2. Vehicle Identification.
3. License Identification.
4. Completion of Appendix D including MAA Number, Truck Hauler Information, Generator of Material Information, OMDA Holder Information and Number.

D. Delivery Acceptance Requirements:

1. Approval of OMDA.
2. Approved MAA - only the material for which you receive a signed copy of the MAA agreement may be delivered.
3. Completed Appendix D to accompany driver upon delivery at the WRP.
4. A copy of the truck manifest or bill of lading with driver upon delivery to the WRP.
5. Coupons based on nominal volume capacity of the truck.
6. Discharge instructions: Provided in OMDA
7. Site orientation.

E. Sampling Loads on Delivery

a. Upon delivery, a sample of the first load will be collected and analyzed for compliance. Subsequent loads will be sampled at random.

b. Samples can be collected from each load, labeled, preserved and stored until scheduled confirmation testing of digester products is completed.

c. Loads may be rejected based upon sampling and analysis results, review of the manifest, visible characteristics of the trucked material, any provision listed in the RRO or for any other reason as determined by the District.

d. In no case will any vehicle that is permitted by the IEPA to haul hazardous wastes, or that is used to pump or decant hazardous wastes, be allowed to make a delivery of HSOM to a District WRP.

Dated: XXXXX XX, 2016, to become effective XXXXX XX, 2016

Approved:

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Thomas C. Granato, Ph.D, BCES
Director of Monitoring and Research