Considering Land Application Needs
2017 Biosolids Distribution
First year of 100% BENEFICIAL REUSE
**FEDERAL REGULATIONS**

**EPA**

40 CFR PART 503 BIOSOLIDS RULES

“Provides comprehensive requirements for the management of biosolids generated during the process of treating municipal wastewater.”

**STATE REGULATIONS**

**OHIO EPA**

Oversees OAC 3745-40

“Provides comprehensive requirements for the management of biosolids generated during the process of treating municipal wastewater.”

**FACILITY OVERSIGHT**

**NPDES Permit**

How the facility specifically complies with OAC 3745-40 Regulations
Ohio Administrative Code
OAC 3745-40-02

(A) Purpose.

(1) The purpose of this chapter is:
   (a) To establish standards applicable to the treatment, storage, transfer or disposal of sewage sludge or biosolids;
   (b) To establish standards applicable to the beneficial use of biosolids;
   (c) To reasonably protect public health and the environment;
   (d) To encourage the beneficial use of biosolids; and
   (e) To minimize the creation of nuisance odors.

(2) Said standards under this chapter are consistent with section 405 of the federal "Water Pollution Control Act" and regulations adopted under it.

(C) General requirements.

(1) An NPDES permit, in accordance with Chapter 3745-33 of the Administrative Code, is required prior to the discharge of any pollutant to surface waters of the state.
How is agricultural land added to a permitted biosolids program?

Complete the Application for Authorization: Class B Biosolids Beneficial Use Sites form from the OEPA website

- The landowner, the farmer or beneficial use Site operator (if different from the landowner), the beneficial user*, and the biosolids treatment works operator of record all fill in the form which includes but is not limited to:
  - soil maps and soil type data of the site
  - a recent soil test
  - crop production plans and expected yields
  - location of buffered waterways and endangered species habitat
How is the Agronomic Rate Established?

• Before any application, the interactive Agronomic Rate Calculation Spreadsheet available on the OEPA website is completed by the agronomist to calculate rate of application.

“Ohio EPA’s agronomic rate calculation worksheet serves to ensure compliance with Ohio Administrative Code Chapters 3745-40-08(A)(2)(b) and 3745-40-08(A)(3). This worksheet will automatically calculate the nitrogen agronomic rate, the single-year phosphorus agronomic rate, the multi-year phosphorus rate, and the phosphorus index.”

• To complete the worksheet, the agronomist needs a Notice and Necessary Information (NANI) analytics worksheet required from the biosolids treatment works and a recent soil test from the field.

• A NANI is a lab analysis of the biosolids product that will be applied including measurements of nutrients and regulated heavy metals, to ensure compliance with regulatory limits.
**Biosolids Agronomic Rate Calculation Worksheet**

### General Information

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ohio EPA #</td>
<td></td>
</tr>
<tr>
<td>Field ID #</td>
<td></td>
</tr>
<tr>
<td>Generator Name</td>
<td></td>
</tr>
</tbody>
</table>

### Biosolids Data and Beneficial Use Methods

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ammonia Nitrogen</td>
<td>mg/kg</td>
</tr>
<tr>
<td>Total Kjeldahl Nitrogen</td>
<td>mg/kg</td>
</tr>
<tr>
<td>Total Phosphorus</td>
<td>mg/kg</td>
</tr>
<tr>
<td>Organic Nitrogen</td>
<td>0.00 lbs/ton</td>
</tr>
<tr>
<td>Available Nitrogen</td>
<td>0.00 lbs/ton</td>
</tr>
<tr>
<td>Phosphate (P₂O₅)</td>
<td>n/a lbs/ton</td>
</tr>
<tr>
<td>Will Immediate Incorporation / Injection be performed?</td>
<td></td>
</tr>
</tbody>
</table>

### Beneficial Use Site Information

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soil Phosphorus</td>
<td>ppm</td>
</tr>
</tbody>
</table>

Please note that the agronomic rates and phosphorus index have been calculated within the Calculated Agronomic Rates section; however, based upon the above provided Soil Phosphorus result, you must utilize the most limiting factor or the Phosphorus Index:

<table>
<thead>
<tr>
<th>Year 1</th>
<th>Crop 1</th>
<th>Crop 2</th>
<th>Crop 3</th>
<th>Crop 4</th>
<th>Crop 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 2</td>
<td>Crop 1</td>
<td>Crop 2</td>
<td>Crop 3</td>
<td>Crop 4</td>
<td>Crop 5</td>
</tr>
<tr>
<td>Year 3</td>
<td>Crop 1</td>
<td>Crop 2</td>
<td>Crop 3</td>
<td>Crop 4</td>
<td>Crop 5</td>
</tr>
</tbody>
</table>

THE CITY OF COLUMBUS
ANDREW J. GINThER, MAYOR
DEPARTMENT OF PUBLIC UTILITIES
FOCUS ON SOIL HEALTH

• Addition of biosolids to conventionally farmed soils adds much needed ORGANIC MATTER (OM) to soils denuded of OM.

• While biosolids provide NPK for the crop in a slow release organic form (requiring microbial breakdown before nutrients are plant available) the MAJOR soil health factor we emphasize to farmers is CARBON.

• Adding CARBON through the organic matter of biosolids provides soil microbes with the inputs needed to increase microbial activity in the soil.

• Microbial activity is the driver behind soil aggregation, which is the mechanism behind better tilth, more pore space, and increased water infiltration.
COLUMBUS LAND APPLICATION

• Columbus produces a 8-10% Total solids liquid Class B biosolids product for land application.
• Land application represents 11 – 15 % of total beneficial reuse for Columbus – especially important for winter months.
• No surface cake application under current NPDES Permit.
• Synagro has the current contract for land application, which include the services of an Certified Crop Advisor agronomist.
• The City of Columbus has many fields shown as permitted but the majority of the fields have not been applied to within the past 10 years*. 
Injection Applicator
Approximate range of City of Columbus Land Application
Land Application 2012 - 2017

- 2018 applied: ~12,000,000 gallons of 8-10% biosolids
- ~1300 acres
- ~1900 acres

Year of application:
- 2012
- 2013
- 2014
- 2015
- 2016
- 2017
Projected Land Application

Approximate gallons of 8-10% biosolids

Year of application

2012 JPLA
2013 JPLA
2014 JPLA
2015 JPLA
2016 JPLA & SOLA
2017 SOLA
2018 SOLA
2019 JPLA & SOLA

THE CITY OF COLUMBUS
ANDREW J. GINther, MAYOR
DEPARTMENT OF PUBLIC UTILITIES
Days of Land Application

Year of application

Days run per calendar year

2012 2013 2014 2015 2016 2017 2018

2018 days applied: as of 11.13.18 – 73 days
Days of Land Application

2017 Application Year

AVG Loads per day: 25
Min Loads per day: 1
Max Loads per day: 56

Almost all issues were weather based.
Phosphorus Recovery at the WWTP?

JACKSON PIKE AND SOUTHERLY WWTP

- Traditional Activated Sludge Type Plants
  - Primary Clarification
  - Secondary Biological Treatment (aeration)
  - Final Clarification

- Solids Treatment System
  - Combined 24,000 dry tons per year
    - Unclassified
    - Anaerobic Digested Class B
    - Class A Exceptional Quality Biosolids
Phosphorus recovery at the WWTP...

Phosphorus limits will bring about new technologies. There is a range of possibilities for phosphorus recovery technologies: talk to your engineers and

BE AWARE OF HOW THOSE CHANGES WILL AFFECT BIOSOLIDS PLACEMENT.

More P in the solids → Lower ag rate of application, more land required to move same volume

Less P in the solids → Great! Will still have some organic P, will be less of limiting factor
Thank you!

QUESTIONS?
hmcurtis@Columbus.gov