2019 MEWEA FALL CONFERENCE
SESSION #29
UTILITY IMPACTS WITH PFAS

ANDRÉ BROUSSEAU
SUPERINTENDENT-SANFORD SEWERAGE DISTRICT
HISTORY OF GENERATING BIOSOLIDS IN SANFORD
LANDFILLING VS. LAND APPLICATION

- BIOSOLIDS FROM THE LAGOONS HAD ELEVATED AL. FROM THE ALUM PRECIPITATE
- LACK OF LAND TO ADDRESS THE ELEVATED ALUMINUM
- LATE 80’S SWITCHED TO PAC
- CONTINUED UTILIZING EXISTING LANDFILL
THE 90’S AND INTO THE 21ST CENTURY

EPA ADMINISTRATIVE ORDER

- 1998 COMPLIANCE WITH NUTRIENTS, METALS & TOXICITY

MEDEP TMDL STUDY ON THE MOUSAM RIVER

- 2001 STUDY DIRECTED THE 2003 PLANT UPGRADE
BIOSOLIDS GENERATION IN THE 21 ST CENTURY

• ACTIVATED SLUDGE PROCESS (2005 UPGRADE)
• BIOSOLIDS PRODUCTION DRAMATICALLY INCREASED DUE TO ACTIVATED SLUDGE
• FINAL DISPOSAL - LANDFILL
LANDFILL SPACE WAS RAPIDLY DWINDLING

MID 1980’S  2006  2013
2010 ALTERNATIVE DISPOSAL OPTIONS

- BUILD ANOTHER LANDFILL
- CONTRACT FOR REGIONAL COMPOST/LANDFILL
- LIME STABILIZATION FACILITY
- BUILD COMPOST FACILITY
2014

- SECURE FUNDING
- FINALIZING DESIGN
- APPLICATION FOR COMPOST LICENSE
### Sanford Sewerage District

#### Compost Curing Pile Results

**Curing Pile #**

<table>
<thead>
<tr>
<th>Curing Pile #</th>
<th>CP-9-18</th>
</tr>
</thead>
</table>

**Salmonella MPN/4g**

<table>
<thead>
<tr>
<th>Result</th>
<th>0.708</th>
</tr>
</thead>
</table>

*Method SM9260D*

#### Heavy Metal Results

<table>
<thead>
<tr>
<th>Heavy Metal Results</th>
<th>Screening Conc.</th>
<th>Ceiling Conc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminum (Al)</td>
<td>10800</td>
<td>N/A</td>
</tr>
<tr>
<td>Arsenic (As)</td>
<td>10</td>
<td>34</td>
</tr>
<tr>
<td>Barium (Ba)</td>
<td>430</td>
<td>N/A</td>
</tr>
<tr>
<td>Beryllium (Be)</td>
<td>0.722</td>
<td>N/A</td>
</tr>
<tr>
<td>Cadmium (Cd)</td>
<td>4.61</td>
<td>10</td>
</tr>
<tr>
<td>Chromium (Cr)</td>
<td>20.2</td>
<td>1000</td>
</tr>
<tr>
<td>Cobalt (Co)</td>
<td>3.26</td>
<td>N/A</td>
</tr>
<tr>
<td>Copper (Cu)</td>
<td>332</td>
<td>1000</td>
</tr>
<tr>
<td>Lead (Pb)</td>
<td>46.2</td>
<td>300</td>
</tr>
<tr>
<td>Mercury (Hg)</td>
<td>0.22</td>
<td>6</td>
</tr>
<tr>
<td>Molybdenum (Mo)</td>
<td>4.68</td>
<td>75</td>
</tr>
<tr>
<td>Nickel (Ni)</td>
<td>16.6</td>
<td>200</td>
</tr>
<tr>
<td>Selenium (Se)</td>
<td>3.5</td>
<td>100</td>
</tr>
<tr>
<td>Silver (Ag)</td>
<td>1.7</td>
<td>N/A</td>
</tr>
<tr>
<td>Vanadium (V)</td>
<td>12</td>
<td>N/A</td>
</tr>
<tr>
<td>Zinc (Zn)</td>
<td>988</td>
<td>2000</td>
</tr>
</tbody>
</table>

### Compost Analysis Report

- **Sample type:** Compost
- **Sample Name:** Sanford
- **Analytical Lab**
  - 5722 Gannet Hall
  - Orono, ME 04469-3122
  - (207) 334-2117
- **Sample ID:** 1338
- **Date Received:** 09/23/19
- **Report Date:** 01/15/19

#### Standard Analysis

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Dry Basis</th>
<th>As is Basis</th>
<th>Lab/Ton (as is)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Solids (%)</td>
<td>30.8</td>
<td>30.8</td>
<td>30.8</td>
</tr>
<tr>
<td>Total Carbon (%)</td>
<td>46.1</td>
<td>46.1</td>
<td>46.1</td>
</tr>
<tr>
<td>Total Nitrogen (%)</td>
<td>1.60</td>
<td>1.60</td>
<td>1.60</td>
</tr>
<tr>
<td>Potassium (%)</td>
<td>2.26</td>
<td>2.26</td>
<td>2.26</td>
</tr>
<tr>
<td>Phosphorus (%)</td>
<td>1.01</td>
<td>1.01</td>
<td>1.01</td>
</tr>
<tr>
<td>Volatiles (%)</td>
<td>63.7</td>
<td>63.7</td>
<td>63.7</td>
</tr>
<tr>
<td>pH</td>
<td>7.3</td>
<td>7.3</td>
<td>7.3</td>
</tr>
<tr>
<td>Bulk Density (lb/ft³)</td>
<td>1100</td>
<td>1100</td>
<td>1100</td>
</tr>
<tr>
<td>Conductivity (mS/cm)</td>
<td>10.1</td>
<td>10.1</td>
<td>10.1</td>
</tr>
</tbody>
</table>

- **Expansion Analysis**
  - **Parameter**
    - Boron (ppm)
    - Calcium (%)
    - Copper (ppm)
    - Iron (ppm)
    - Magnesium (%)

  - **Values**
    - Boron (ppm): 16.8
    - Calcium (%): 26.5
    - Copper (ppm): 190
    - Iron (ppm): 0.15
    - Magnesium (%): 0.65
MEMO

To: Andre Brousseau
From: Andrew Carpenter, Northern Tilth
Subject: Sanford Compost Value
Date: July 25, 2018

After collecting a composite sample from a mature/finished stockpile of the Sanford compost on May 18th, 2018, Northern Tilth sent it out for the University of Maine’s standard compost analysis. The analytical results are attached to this memo.

In general, the Sanford compost is a nutrient-rich, pH-balanced soil amendment with a high organic matter content. A summary of the nutrient analysis of the compost is included in the table below.

<table>
<thead>
<tr>
<th>Nutrients per ton of Sanford Compost</th>
<th>pounds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Nitrogen</td>
<td>10</td>
</tr>
<tr>
<td>Plant-Available Nitrogen:</td>
<td>8</td>
</tr>
<tr>
<td>Phosphorous (P2O5):</td>
<td>14</td>
</tr>
<tr>
<td>Potassium (K2O):</td>
<td>16</td>
</tr>
<tr>
<td>Lime Equivalence:</td>
<td>138</td>
</tr>
<tr>
<td>Organic Matter:</td>
<td>384</td>
</tr>
<tr>
<td>pH:</td>
<td>7.9 S.U.</td>
</tr>
</tbody>
</table>
2017 BROUGHT ON THE SCRUTINY

• 2016 UCMR #3 INCLUDED PFAS SAMPLING FOR PUBLIC DRINKING WATER PROGRAMS SERVING > 10,000

• 2016 DEP STUDY OF THE ARUNDEL FARM

• SSD WAS ADVISED OF EMERGING CONTAMINANTS FOUND WITHIN BIOSOLIDS

• SSD COMPLIANCE RECORD
TO SAMPLE OR NOT TO SAMPLE IS THE ?

• COMPLIANCE, COMPLIANCE, COMPLIANCE
• INTERNAL DEBATE AS TO WHETHER WE WANT TO SAMPLE
• FINALLY PULLED THE TRIGGER
2017 VOLUNTARY PFAS TEST RESULT

SANFORD SEWERAGE DISTRICT

• 3.7 UG/KG (PPB) PFOA
• 21 UG/KG (PPB) PFOS

COMPARISON

RESULTS ARE PPB

• 8-68 PFOA - LAND APPLIED BIOSOLIDS
• 80-219 PFOS - LAND APPLIED BIOSOLIDS
• 8.3,15 PFOA - NORTHERN NE BIOSOLIDS COMPOST
• 9.9 PFOS - NORTHERN NE BIOSOLIDS COMPOST
• 142 PFOA - DUST DAYCARE CENTERS
• 201 PFOS - DUST DAYCARE CENTERS

DATA CURTISY OF NEBRA
HOW DID SSD MOVE AHEAD WITH PFAS

• TRUSTEE WORK SHOPS
• MEETINGS WITH COUNTERPART
• REVIEW OF CITY ORDINANCE WITH POSSIBLE CHANGES
• CONTENTIUS PUBLIC MEETING
• TESTIFYING IN OPOSSITION OF CHAPTER 418- APPENDIX A
AGREEMENT WITH POLICY CHANGES TO DISTRIBUTE COMPOST

• PROPERLY SCREEN FOR THE FINAL DEPOSITION OF COMPOST

• COMPARE SANFORD’S ADDRESSES TO THE WELL HEAD PROTECTION ZONES

• JUNE 19, 2019 WAS OUR VERY FIRST REFUSAL
Please call the Sanford Water District at 321-2342 to determine if a location is within our protection zone.

Note that there are several other Public Water Supply wells located in Sanford that are not owned or maintained by the Sanford Water District. These facilities would include things such as trailer parks, restaurants, and others. This map does not show those wells, nor does it show private wells.
MARCH 22, 2019

• ALL APPROVED LAND SPREADING /COMPOST PROGRAMS HAVE AN IMMEDIATE MORATORIUM

• IN ORDER TO CONTINUE LAND APPLING BIOSOLIDS/COMPOST THE FOLLOWING MUST BE MEET:

   BIOSOLIDS/COMPOST MUST BE AT OR BELOW THE FOLLOW

   PERFLUOROOCTANOIC ACID (PFOA) = 0.0025 MG/KG
   PERFLUOROOCTANE SULFONATE ACID (PFOS) = 0.0052 MG/KG
   PERFLUORBUTANE SULFONIC ACID (PFBS) = 1.9 MG/KG
WHAT TO DO NOW?

• LANDFILL BIDS WERE PUT ON HOLD SO WE COULD DISPOSE BIOSOLIDS

• QUICKLY CALLED LAB TO RECEIVE SAMPLE BOTTLES

• SAMPLED AND WAITED ONLY TO FIND OUT WE EXCEEDED

  PFOA = 0.0017 MG/KG  PFOS = 0.00857  PFBS = ND
WHAT TO DO NOW?

- DEP ASSISTED WITH A LOADING CALCULATION WORK SHEET
- 5 WET TONS @ 35.5% SOLIDS
- DEVELOP A SAWP PROGRAM
- DUE BY APRIL 12, 2019
Applications Rate

- Loading rates must not exceed 7.5 yards per acre

Benefits

- Valuable source of organic matter
- Rich nutrient fertilizer
- Compost phosphorus is valuable on cropland
- Good iron fertilizer better than commercial fertilizers for iron
- Assists in the improvement of soil structure
- Reduces landfill disposal
- Ground water protection – organic nitrogen in compost is much less likely to cause ground water pollution than chemical nitrogen fertilizers
- High carbon wood ash is used in the composting process which is a great source of potassium.

Potential Uses

- Fertilizer/soil conditioner
  - Lawns
  - Flower beds
  - Shrubs
  - Land restoration and forestry
  - Recreational fields
  - Landscaping

Compost may not be applied to frozen, snow covered, or saturated ground such that the compost will be washed into drainage ways, streams, or surface water bodies, and this compost may not be placed below the groundwater table without prior approval from the Maine DEP.

If you should have any questions or concerns about our compost, please call the Sanford Sewerage District at 207-324-0047.
HOW DO WE MOVE AHEAD WITH PFAS?

• IDENTIFY HOT SPOTS
• SURVEY INDUSTRIAL/COMMERCIAL USERS
• PUBLIC OUTREACH
• SAMPLE THROUGHOUT THE COLLECTION SYSTEM
QUESTIONS?