STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION

PAUL R. LEPAGE
GOVERNOR

AVERY T. DAY
ACTING COMMISSIONER

September 23, 2015

Ms. Katie Marrese
US EPA
5 Post Office Square, Suite 100
OEP06-2
Boston, MA 02109

Katie:

The Sanford Sewerage District (District) in Sanford, Maine (City) is in the process of constructing a composting facility to process waste treatment sludge to create a Class A biosolid for general resale. Given the status of this project as "green", a business case must be made for environmentally innovative technologies of the treatment plant. The composting facility being constructed includes a "treatment technology or approach that significantly reduces and lowers the chemical volume of residuals". The following is the business case justifying the Green Project Reserve (GPR) funding for this project.

Summary
The construction of the composting facility will allow the District to create a Class A biosolids product for reuse in the community and provide a revenue stream for the District. The loan amount has been approved for approximately $2.6 million, 100% of which is used to construct the composting facility and water efficient site work. Construction of the composting facility will allow the District to continue to keep sludge on site, saving sludge hauling and disposal costs and creating a revenue stream for the District.

Background
The District operates a treatment plant in Sanford, Maine that is composed of oxidation ditches and lagoons. The current sludge that is produced in the treatment process is landfilled at the site of the treatment plant. The landfill is nearing capacity and the District is currently using SRF funds to design and build a composting facility to create Class A biosolids using plant residuals and City of Sanford yard waste materials as amendment. The District serves the community of Sanford, Maine which serves a population of 4,780 users. Roughly 97% of the wastewater the plant processes is from residential users; the remaining 3% is from industrial users in the City. The plant can produce, on average, 20,200 wet pounds of biosolids per day to use for composting[1]. Current biosolids production does not meet the Maine Department of Environmental Protection's (DEP) Chapter 419 guidelines for screening concentrations due to increased levels of arsenic. It is thought that adding in amendments such as yard wastes, wood ash, and wood grindings that the arsenic levels would dissipate given the mass increase.

AUGUSTA
17 STATE HOUSE STATION
AUGUSTA, MAINE 04333-0017
(207) 287-7688 FAX: (207) 287-7826

BANGOR
106 HOGAN ROAD, SUITE 6
BANGOR, MAINE 04401
(207) 941-4570 FAX: (207) 941-4584

PORTLAND
312 CANCO ROAD
PORTLAND, MAINE 04103
(207) 822-6300 FAX: (207) 822-6303

PRESQUE ISLE
1235 CENTRAL DRIVE, SKYWAY PARK
PRESQUE ISLE, MAINE 04769
(207) 764-0477 FAX: (207) 760-3143

web site: www.maine.gov/dep

Results
The biosolids and amendments would be aerated in the composting facility for approximately three weeks, and then removed to cure outside of the facility. The estimated cost of the project is approximately $2.6 million. The composting facility is projected to cost the District $150,000 per year in operations and management. Alternatively, hauling and disposing of the sludge of will cost the District $250,000 per year[2].

Although it was not calculated in the engineering report, the revenue from selling Class A biosolids could be estimated given information from the Lewiston-Auburn Wastewater Pollution Control Authority (LAWPCA) in Lewiston, Maine. Given that one cubic yard of LAWPCA's compost mix weighs about 1,000 pounds including amendments[3], costs around $8.00 depending on the time of year[3], revenue could potentially be $50,000 per year in Class A sales.

Given the loan repayment plus yearly operations costs, the District could modestly reduce costs by selling Class A biosolids if the demand remains high. This project is not meant to offset any disposal costs, but rather to reuse the solids in the treatment process in creating a product that can be used in residential and commercial applications.

Other Benefits
Owning and operating a composting facility creates multiple benefits for the District. The District can optimize their sludge output and composition and create a location for the City to dispose of collected yard and wood wastes. The availability of composting ingredients and the ability to create compost will save the City and District money in disposal costs. Environmental benefits include reduction in gas and carbon emissions from any long haul trucking to disposal sites within the State of Maine, as well as reduction in any emissions from incineration.

Conclusion
The construction on the composting facility by the Sanford Sewerage District will allow for the creation of Class A biosolids which can be purchased and utilized in various applications. The District will create a revenue stream as a product of composting and will create environmental benefits in the reduction of carbon emissions from long haul trucking for sludge disposal and incineration of current yard wastes by the City. Between potential revenue and the operations cost for the compost facility, the District can save approximately $100,000 per year, and will have the flexibility to dispose of their solid waste in a manner that is beneficial for the environment and City of Sanford.

If you have any questions or concerns about the project, please contact me either by email at john.skelley@maine.gov or by phone at (207)-287-9091.

Sincerely,

John Skelley, E.I.
SRF Project Engineer
Maine Department of Environmental Protection
Division of Water Quality Management

Enc.: Supporting Documents

1 Preliminary Design Report for the Sanford Composting Facility, prepared by Wright-Pierce March 2012.
2 Calculations from Wright-Pierce on operations and maintenance and sludge disposal costs for facility. September 2, 2015 email.
3 Fact sheets from LAWPCA on Compost Uses and Pricing.

COMPOSTING FACILITY

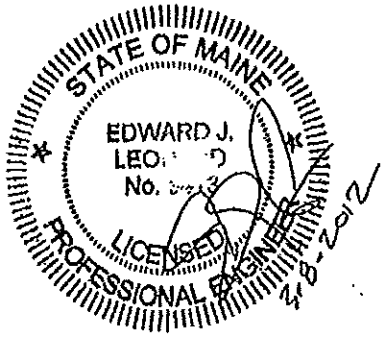
for the

SANFORD SEWERAGE DISTRICT

SANFORD, MAINE

PRELIMINARY DESIGN REPORT

MARCH 2012



Prepared By:

Wright-Pierce
99 Maine Street
Topsham, Maine 04086

is estimated based on the dry weight of the solids dewatered and the percent solids of the sludge cake. A summary of this data is provided below.

TABLE 1-1
BIOSOLIDS PRODUCTION — 2010

MONTH	VOLUME (CY/MO)	DRY WEIGHT (LBS/MO)	% ODS	WT WEIGHT (LBS/MO)	WT WEIGHT 7 DAYS/WK (LBS/DAY)	WT WEIGHT 5 DAYS/WK (LBS/DAY)	WT WEIGHT 4 DAYS/WK (LBS/DAY)
January	193	67,114	18%	372,856	12,429	18,643	23,303
February	179	58,026	18%	322,367	10,746	16,118	20,148
March	237	79,035	18%	439,083	14,636	21,954	27,443
April	190	62,526	18%	347,367	11,579	17,368	21,710
May	213	68,354	18%	379,744	12,658	18,987	23,734
June	299	90,911	18%	505,061	16,835	25,253	31,566
July	226	70,885	18%	393,806	13,127	19,690	24,613
August	249	82,192	18%	456,622	15,221	22,831	28,539
September	248	74,441	18%	413,561	13,785	20,678	25,848
October	225	68,227	18%	379,039	12,635	18,952	23,690
November	257	78,722	18%	437,344	14,578	21,867	27,334
December	260	81,612	18%	453,400	15,113	22,670	28,338
TOTAL	*2,776*	*882,045*	—	*4,900,250*	—	—	—
AVERAGE	*229*	*72,767*	*18%*	*404,259*	*13,475*	*20,213*	*25,266*

These quantities represent total biosolids production per month; however, biosolids are processed 3 to 5 days per week depending on the season. For the purposes of sizing the Composting Facility, we have assumed that sludge will be dewatered and stacked 3 to 5 days per week and that composting will occur 5 days per week.

- Biosolids from process — 13,500 wet pounds per day average month; 16,800 wet pounds per day maximum month
- Biosolids from dewatering — 25,300 wet pounds per day average month; 31,600 wet pounds per day maximum month
- Biosolids for composting — 20,200 wet pounds per day average month; 25,300 wet pounds per day maximum month

For the purposes of the Preliminary Design Report, reference to average capacity is based on 20,200 wet pounds per day of biosolids for composting.

1.3 EXISTING SLUDGE QUALITY

The AWWTF receives approximately 97% of wastewater from residential and commercial sources and approximately 3% from industrial sources. Since the biosolids from the AWWTF are disposed of at the on-site secure sludge landfill, the District does not need to meet the Maine DEP Chapter 419 heavy metals screening concentrations. However, if the biosolids are proposed to be used for beneficial reuse, then the finished product would need to meet these concentrations in the future. The table below summarizes the concentration of metals in the District's sludge as compared to the Maine DEP Chapter 419 Screening Concentrations.

TABLE 1-2
COMPARISON OF HEAVY METAL CONCENTRATIONS IN BIOSOLIDS WITH DEP CHAPTER 419 SCREENING CONCENTRATIONS

Heavy Metal	Laboratory Testing Results of Sewage Sludge, mg/kg		Chapter 419 Screening Concentration in Sewage Sludge, mg/kg
	September 2009	March 2010	
Arsenic	15	13	10
Cadmium	1.43	4.55	10
Chromium	48.5	31.7	1000
Copper	550	405	1000
Lead	42	34	300
Mercury	0.73	0.88	6
Molybdenum	7.1	5.9	75
Nickel	18.8	22.4	200
Selenium	4	4.5	100
Zinc	756	668	2000

The AWWTF biosolids routinely meet the Chapter 419 criteria, except for arsenic. It is possible that the AWWTF compost end product would meet the existing Chapter 419 criteria for arsenic due to the increase in mass associated with amendments (i.e. dilution).

The Maine DEP has a proposed rule change in process at this time (5 MRSA 8057-A) which proposes to change the screening concentration from 10 mg/kg to 34 mg/kg. If this change is passed, the AWWTF biosolids would be expected to routinely meet this arsenic criteria.

1.4 FUTURE SLUDGE QUANTITY AND QUALITY

Based on budget constraints, the District intends to set the maximum building size at 50 feet wide by 350 feet long. The capacity of the facility depends on the amendments used for the composting process. It is important to note that the District's biosolids require a high energy amendment mixture to make the energy and moisture balance work. The approximate capacity sludge volumes that can be composted with various amendment materials in the composting area footprint are shown in **Table 1-3.**

TABLE 1-3
MAXIMUM COMPOSTING FACILITY THROUGH-PUT

AMENDMENT MATERIAL	BIOSOLIDS (wet lbs/ day)	BIOSOLIDS (cy/ day)	AMENDMENT (cy/ day)	ESTIMATED COMPOST PRODUCTION (cy/ year)
Local Wood Grindings	30,000	19	39	14,000
Wood Ash	17,400	11	28	18,100
Yard Waste	39,000	24	35	11,500

Yard waste has the most "available energy" to drive the composting process which results in the highest facility throughput and the lowest volume of finished product. Conversely, wood ash has the lowest available energy which results in the lowest facility throughput and the highest volume of finished product. (Note that wood ash does not have enough available energy to process the average capacity of 20,200 wet pounds per day of biosolids discussed in **Section 1.2** in the 50-foot by 350-foot footprint.) The District can "mix" amendments to optimize the recipe. Ultimately, the operation and maintenance cost for the facility is a function of the amendment used and the volume of finished product generated.

Skelley, John

From: Edward Leonard <ed.leonard@wright-pierce.com>
Sent: Wednesday, September 02, 2015 12:01 PM
To: Skelley, John
Cc: Andre Brousseau (abrousseau@sanfordsewerage.org); Lindsey Shields
Subject: RE: Sanford Composting Green Funds
Attachments: 2013 CWSRF Project Info (SSD Compost).docx

John – Here is what we wrote to get on the SRF list some time ago. The cost of the building structure itself is about $1,100,000.

In the PDR phase, we estimated the O&M costs. For startup year (2450 wet tons/yr of sludge, producing approximately 6,000 CY/yr), O&M for composting was estimated at approximately $150,000 per year as compared to approximately $250,000 for off-site disposal. We did not assume any revenue for finished compost.

Let me know if you need additional information.

Thanks, Ed

From: Skelley, John [mailto:John.Skelley@maine.gov]
Sent: Tuesday, September 01, 2015 10:14 AM
To: Edward Leonard
Cc: Andre Brousseau (abrousseau@sanfordsewerage.org); Lindsey Shields
Subject: Sanford Composting Green Funds

Ed,

We are currently in the process of writing a business case justification of green project reserve funds to put in the composting project file. It is required as part of the SRF funds distributed from the EPA. I have been looking through the PER of the composting facility from March 2012 while writing, and would just like a little more information on some cost figures. If you could come up with some figures (cost savings of not hauling sludge, projected revenue from biosolids resale, operations costs given a certain amendment recipe, cost of the composting building structure versus the overall $2.644 Million project cost, etc.) to attach to the report, that would be great. Also, if you could provide a list of major benefits for building the structure, that would great. I am not sure if this has been provided already (this was originally Karen Hefler's project until Sanford was given to me when I started at DEP and I did not find anything like this in our records).

If you have any questions, please let me know. If you could get us something by the end of the week that would be excellent. I don't believe it has to be anything really in depth since I am combining it with the PER. Let me know if that is a tight schedule.

Thanks,

John Skelley, E.I.
Assistant Environmental Engineer
Maine Department of Environmental Protection
Bureau of Water Quality
17 State House Station
Augusta, ME 04333-0017

Compost Uses and Application Rates

Uses of Compost: Compost can be used as a soil conditioner, low grade fertilizer, decorative mulch, in potting mixes, to establish or rejuvenate lawns and play fields, etc. Nearly any type of soil can be improved with a 20 to 50% addition of compost. The ability of compost to suppress many common turf diseases as well as the natural "softening" of the grass surface has made compost a favorite material for golf course and sports field maintenance professionals. Compost can be used in the vegetable garden in much the same manner as one might use manure. MaineGro is a safe and effective product that needs no special handling or permits.

A word about Salt and Conductivity: Salts are common in soils to varying degrees, and in fact the nutrients in soils are in the form of ions that are commonly measured as salt. Too much salt can, however, be damaging to certain sensitive plants such as narrow leaf evergreens, rhododendrons, azaleas, and geraniums. It is also recommended that the salt content of potting mixes be tested. In nearly all applications, a salt content as measured by the conductivity of the growth medium (that is its ability to transmit a current through the compost-soil mixture) should not be above 3.0 mmhos/cm. Maine State regulations require distributors of compost having a salt content above 2.0 mmhos/cm to distribute information on salt content to customers. Based upon our testing and experience, the salt content of MaineGro should not be a concern in most applications.

Application Rates for Different Uses:

Use or Purpose	Application Rate	Notes, Remarks, etc.
New Lawn	1.5 to 5 (15 to 30%)	Till into the top 4 to 6 inches of soil, smooth surface, remove large objects, seed, hydro-seed, sprig or sod.
Lawn Rehab or Maintenance	0.5 to 2.0 (n/a)	Spring or fall, cut grass short, broadcast over surface and rake in. Keep lawn moist for 2 cuttings after appl
Renovation of Sports Fields	1.5 to 5.0 (15 to 30%)	Remove existing growth 2 to 4 weeks before tilling, follow new lawn instructions, hydro seed.
Vegetables	.5 to 4 (10 to 30%)	Till into the topsoil (3 to 6 inches). Lower rates if other fertilizer is to be used. Use precautions similar to manure.
Potting Mixes and House Plants	n/a (20 to 50%)	Mix Thoroughly using sand, vermiculite, perlite, etc. On salt sensitive species, test mix or use lower compost component.
Flower Gardens	.5 to 4 (10 to 30%)	Till into soil to a depth of 3 to 6 inches, or use as backfill when planting annuals and bushes mix well
Decorative Mulch	3 to 7 (1" to 2" layer)	Reduce fertilizer application, use care in erosion prone locations, weed seeds that land on compost will grow
Topsoil Blending	n/a (20 to 50%)	Use higher rates for very sandy or clayey soils.

Note: Application rates are given in cubic yards per 1000 square feet and percentage of compost in the final soil/growth medium mix. One Cubic yard of compost weighs 900 to 1100 lbs. Weight is highly variable with moisture content, as influenced by storage & weather.

Compost Use Estimator:

1 inch layer covering 1,000 square feet will require about 3 cubic yards of compost

1 inch layer covering 1 acre will require about 134 cubic yards of compost

rev 5: Apr 2015

COMPOST SALES

Sales of Compost to the public will be done from the treatment plant on Lincoln St. in Lewiston on the following days and times:

NON HOLIDAY WEDNESDAY & SATURDAYS during the growing season

8:00 a.m. to 3:30 p.m. (we will load)

Other days and times will be accommodated as possible when requested 24 hours in advance.

Price is $8.00 per cubic Yard (Tax Included) from (April 1st – October 31st) and winter season pricing is $7.00 per cubic yard (Tax Included) from November 1st to March 31st. Please bring a load cover to keep compost from blowing off of open trucks and trailers.

For bulk sales (10+ yards and discounts for 100+ yards) call 784-9609

For more information call 782-0917 ex 24 or ex 36.

For more information about our Compost Process and Compost Fact Sheets, please visit www.lawpca.org