SRS Project Options

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Consulting Engineers

Creating Community Since 1956

Background

- Project Goals
  1. Capture a revenue stream that is currently leaving the Township
  2. Eliminate septage land application which can potentially be harmful to the lakes
- Wastewater Lagoon Basis of Design
  - Hydraulic Capacity – Fluid Volume
  - Organic Loading – Stuff needing treatment
- MDEQ Discussions concerning septage land-app elimination

> *Part 117 allows for Twp or Co ordinances to have supremacy. [The Township] can write an ordinance that would prohibit land application of septage in the Twp or the Co, but in order for the ordinance to be enforceable, [They] would have to have the capacity to take all the septage generated within the Twp or Co, and get DEQ approval of the ordinance.*

Two Potential Projects

1. Build a smaller SRS without creating an Ordinance.
   - Lower capital costs
   - Captures revenue
   - Doesn't eliminate land application of septage around the lakes

2. Build a larger SRS and create an Ordinance
   - Higher capital costs
   - Higher revenue capture
   - Eliminates land application of septage around the lakes

Aeration Technologies to meet organic loading

Aeration Industries International

AIRE-O_2

Aire-O_2® Aspirator Aerator

fluence™

Tornado®

SURFACE ASPIRATING AERATOR

triplepoint™ environmental

Project 1

Aeration Technologies Cost Analysis - Original Plan

Aeration Industries	
Surface Aerators	
System Cost	
$ 431,945.80	Capital Costs
$ 86,389.16	Installation Costs (20%)
$ 30,000.00	Sitework
$ 103,666.99	Electrical (20%)
$ 130,400.39	Contingency (20%)
$ 782,402.34	Total Capital Cost
$ 117,360.35	Engineering Cost
$ 899,762.69	**System Cost**
20-yr Energy Cost	
12	units
10	HP/Unit
24	Hrs/d
0.9	Operating Efficiency
2592	BHP-h/d
0.75	(kWh)/(HP-h/d)
1944	kWh-d
365	d/y
20	years
14,191,200	kWh/20 years
$ 0.10	$/kWh
$ 1,419,120.00	**20-year Energy Cost**
20-yr Maintenance and Replacement Cost	
10	Design Life in years
2.00	Full system replacements
$ 2,542,781.25	20-year Replacement costs
$ 254,278.12	General maintenance (10%)
$ 2,797,059.37	**Total M&R Cost**
20-yr System Cost	
$ 5,115,942.06	**20-yr OM&R**
Total HP	120

Fluence Corporation	
Surface Aerators	
System Cost	
$ 203,100.00	Capital Costs
$ 40,620.00	Installation Costs (20%)
$ 30,000.00	Sitework
$ 48,744.00	Electrical (20%)
$ 64,492.80	Contingency (20%)
$ 386,956.80	Total Capital Cost
$ 58,043.52	Engineering Cost
$ 445,000.32	**System Cost**
20-yr Energy Cost	
18	units
7.5	HP/Unit
24	Hrs/d
0.9	Operating Efficiency
2916	BHP-h/d
0.75	(kWh)/(HP-h/d)
2187	kWh-d
365	d/y
20	years
15,965,100	kWh/20 years
$ 0.10	$/kWh
$ 1,596,510.00	**20-year Energy Cost**
20-yr Maintenance and Replacement Cost	
10	Design Life in years
2.00	Full system replacements
$ 1,207,054.08	20-year Replacement costs
$ 120,705.41	General maintenance (10%)
$ 1,327,759.49	**Total M&R Cost**
20-yr System Cost	
$ 3,369,269.81	**20-yr OM&R**
Total HP	135

Triplepoint MARS	
Subsurface Aerators	
System Cost	
$ 296,700.00	Capital Costs
$ 59,340.00	Installation Costs (20%)
$ 30,000.00	Sitework
$ 71,208.00	Electrical (20%)
$ 91,449.60	Contingency (20%)
$ 548,697.60	Total Capital Cost
$ 87,791.62	Engineering Cost
$ 636,489.22	**System Cost**
20-yr Energy Cost	
3	units
50	HP
24	Hrs/d
0.9	Operating Efficiency
3240	BHP-h/d
0.75	(kWh)/(HP-h/d)
2430	kWh-d
365	d/y
20	years
17,739,000	kWh/20 years
$ 0.10	$/kWh
$ 1,773,900.00	**20-year Energy Cost**
20-yr Maintenance and Replacement Cost	
20	Design Life in years
1.00	Full system replacements
$ 887,663.23	20-year Replacement costs
$ 88,766.32	General maintenance (10%)
$ 976,429.56	**Total M&R Cost**
20-yr System Cost	
$ 3,386,818.77	**20-yr OM&R**
Total HP	150

Project 2

Aeration Technologies Cost Analysis - Full Township

Aeration Industries	
Surface Aerators	
System Cost	
$ 431,945.80	Capital Costs
$ 86,389.16	Installation Costs (20%)
$ 30,000.00	Sitework
$ 103,666.99	Electrical (20%)
$ 130,400.39	Contingency (20%)
$ 782,402.34	Total Capital Cost
$ 117,360.35	Engineering Cost
$ 899,762.69	**System Cost**
20-yr Energy Cost	
15	units
10	HP/Unit
24	Hrs/d
0.9	Operating Efficiency
3240	BHP-h/d
0.75	(kWh)/(HP-h/d)
2430	kWh-d
365	d/y
20	years
17,739,000	kWh/20 years
$ 0.10	$/kWh
$ 1,773,900.00	**20-year Energy Cost**
20-yr Maintenance and Replacement Cost	
10	Design Life in years
2.00	Full system replacements
$ 2,542,781.25	20-year Replacement costs
$ 254,278.12	General maintenance (10%)
$ 2,797,059.37	**Total M&R Cost**
20-yr System Cost	
$ 5,470,722.06	**20-yr OM&R**
Total HP	150

Fluence Corporation	
Surface Aerators	
System Cost	
$ 236,950.00	Capital Costs
$ 47,390.00	Installation Costs (20%)
$ 30,000.00	Sitework
$ 56,868.00	Electrical (20%)
$ 74,241.60	Contingency (20%)
$ 445,449.60	Total Capital Cost
$ 66,817.44	Engineering Cost
$ 512,267.04	**System Cost**
20-yr Energy Cost	
20	units
7.5	HP/Unit
24	Hrs/d
0.9	Operating Efficiency
3240	BHP-h/d
0.75	(kWh)/(HP-h/d)
2430	kWh-d
365	d/y
20	years
17,739,000	kWh/20 years
$ 0.10	$/kWh
$ 1,773,900.00	**20-year Energy Cost**
20-yr Maintenance and Replacement Cost	
10	Design Life in years
2.00	Full system replacements
$ 1,404,629.76	20-year Replacement costs
$ 140,462.98	General maintenance (10%)
$ 1,545,092.74	**Total M&R Cost**
20-yr System Cost	
$ 3,831,259.78	**20-yr OM&R**
Total HP	150

Triplepoint MARS	
Subsurface Aerators	
System Cost	
$ 445,050.00	Capital Costs
$ 89,010.00	Installation Costs (20%)
$ 30,000.00	Sitework
$ 106,812.00	Electrical (20%)
$ 134,174.40	Contingency (20%)
$ 805,046.40	Total Capital Cost
$ 128,807.42	Engineering Cost
$ 933,853.82	**System Cost**
20-yr Energy Cost	
2	units
75	HP
24	Hrs/d
0.9	Operating Efficiency
3240	BHP-h/d
0.75	(kWh)/(HP-h/d)
2430	kWh-d
365	d/y
20	years
17,739,000	kWh/20 years
$ 0.10	$/kWh
$ 1,773,900.00	**20-year Energy Cost**
20-yr Maintenance and Replacement Cost	
20	Design Life in years
1.00	Full system replacements
$ 1,325,734.85	20-year Replacement costs
$ 132,573.48	General maintenance (10%)
$ 1,458,308.33	**Total M&R Cost**
20-yr System Cost	
$ 4,166,062.16	**20-yr OM&R**
Total HP	150

Project Costs

Project 1: FRP Tank, Existing Pump, 10,000 Gal of Septage Air Treatment	$675,200
Project 1 (Alternate): FRP Tank, Suction Lift Packaged Station, 10,000 Gal of Septage Treatment	$766,000
Project 2: Full Township Septage Treatment – 25,000 Gal of Septage Treatment	$980,000

Conclusion

- The only option meeting all the goals is Project 2
- Need to average about 5,500 gallons per day (20 day/month) to cover the payments on a 20 year loan at 3.125% ($66,630/yr.)
- Taking in septage creates the potential for odors
- Recommend discussions of ordinance with an attorney

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Questions

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