Energy Efficient Sludge Treatment with Reed-Bed Technology Demonstration Project

Final Report 06-12
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New York State
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NYSERDA

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Energy Efficient Sludge Treatment with Reed-Bed Technology Demonstration Project

Final Report

Prepared for the

New York State Energy Research and Development Authority

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ABSTRACT

The Conesus Lake County Sewer District, Lakeville Wastewater Treatment Plant demonstrated an energy-efficient method of treating sludge using reed bed technology. Previously the District used conventional asphalt drying beds.

The demonstration project consisted of the construction, operation and monitoring of one 100' x 60' reed bed. Analysis of the dried sludge over a period of one year confirmed that sludge treated in the reed beds contained low concentrations of heavy metals and other regulated compounds, within acceptable limits established by the New York State Department of Environmental Conservation, for use as compost material. Over the course of the study, the reed beds proved capable of treating a greater volume of sludge per square-foot than the conventional drying beds. Finally, the operation and maintenance savings compared to the conventional beds were significant.

Reed bed technology utilizes the principle of plant uptake for sludge treatment, similar to constructed wetlands for wastewater treatment. Reed beds provide sludge dewatering through plant uptake, evapotranspiration, and drainage. Reed beds chemically alter the sludge as the plants use nutrients and minerals in the sludge for growth. The final product is a well-decomposed, stabilized, humus-like residue suitable for land application.

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INTRODUCTION

The purpose of this demonstration was to evaluate the effectiveness of a reed-bed sludge treatment system. Reed beds are capable of dewatering sludge to the same degree as a conventional sludge drying bed with several advantages. These include the ability to reduce the organic content and metals concentration of the sludge, and to stabilize the volatile elements of the sludge at a less expensive cost, compared to conventional treatment in an asphalt drying bed.

The Conesus Lake County Sewer District (CLCSD) conducted the reed bed demonstration project at its Lakeville Wastewater Treatment Facility to identify potential savings in its sludge management operations. The facility produces approximately 13,000-gallons of digested sludge per day from its primary and secondary anaerobic digester, and has seven (7) asphalt drying beds that provide a total of 21,000-sqare feet of drying area.

Section 1

DESCRIPTION OF REED BED TECHNOLOGY

Reed bed technology involves the application of domestic wastewater sludge to beds that have been planted with a specialized species of reeds, in this case, *Phragmites communis*. Similar to constructed wetlands for wastewater treatment, reed bed technology uses plant uptake, in addition to evapotranspiration, microbial decomposition, and drainage, to stabilize and dewater the sludge. Sludge applied to reed beds is turned into a compost-like material that can be used as a soil conditioner. Reed beds act to dewater and reduce the organic content of the sludge, reduce the metals concentrations of the sludge, and stabilize the sludge for subsequent disposal. This is the result of the following: first, the reed root system provides oxygen to the sludge, which increases the activity and population of microorganisms that mineralize the sludge; second, the growth of the plants makes use of the nutrients, minerals, and water in the sludge.

Drying bed efficiency is defined by loading rate and is typically measured in terms of the applied wet volume per-unit area. Conventional (asphalt) drying beds are typically capable of dewatering approximately 20 gallons of sludge per square foot per year. It is reported that reed beds are capable of dewatering as much as 60 gallons of sludge per square foot per year, three times the conventional rate.

Unlike conventional drying beds, in which dried sludge must be removed before the application of additional sludge, reed beds provide storage of stabilized sludge. In a reed bed, the plant's root system provides channels in the sludge through which water can percolate. Therefore, sludge can be applied to the reed beds regularly without first removing existing sludge. Depending on the size and sludge loading rate, a typical reed bed can be used for approximately 10 years before the stabilized sludge must be removed.

Section 2

ENERGY, ENVIRONMENTAL AND ECONOMIC BENEFITS OF REED BED TECHNOLOGY

Sludge disposal is one of the most difficult and costly aspects of wastewater treatment. Many municipalities experience difficulties with their conventional sludge drying beds. Inadequate performance of existing drying beds, the inability to accommodate lengthy drying times or inadequate sludge storage facilities may force the disposal of large volumes of liquid sludge at a high cost. Additionally, the use of polymers to improve drying bed performance is costly as a result of increased chemical and labor requirements. Improving the ability of a treatment facility to effectively and efficiently dewater and stabilize sludge through the implementation of reed-bed technology has several energy, environmental, and economic benefits.

Reed-bed systems are long lasting and naturally regenerative. They are simple to operate, without chemical additives or complex electronic controls, and are very low maintenance. Consequently, the energy and operational requirements of reed beds are very low.

Reed bed treatment systems are designed to optimize the microbiological, chemical, and physical processes naturally occurring in a wetland. The microorganisms that flourish in these systems can naturally degrade a wide range of organic chemical products.

Reed-bed technology increases the solids content of the stabilized sludge, decreasing sludge volume and disposal costs. Depending on regulatory approval, it may be possible to use the treated sludge as a soil conditioner, thereby eliminating disposal costs entirely.

Section 3
DESCRIPTION OF THE CLCSD REED-BED DESIGN

The reed bed constructed at the CLCSD Lakeville Wastewater Treatment Facility (WWTF) was comprised of earthen berms placed to form a rectangular perimeter with a 60-mil membrane liner. The berms were constructed with 1:2 slopes and a 5-foot depth. The bed was designed to provide for the accumulation of sludge over a 7-10 year period, based on an accumulation of 6 to 8-inches of sludge cake per year.

The bottom of the bed was fitted with an impermeable membrane liner and corrugated drain lines located at 8-foot centers across the width of the bed. The drain lines were supported by pea gravel raked to a 2% slope and flowed into a solid 4-inch poly vinyl chloride (PVC) header pipe. Leachate collected in the header pipe was directed to the primary clarifiers for treatment. The reeds were planted in a 12-inch layer of sand placed over the pea gravel and liner. The reeds were planted in rows with 12-inches between them.

Sludge was transmitted to the reed bed by a 12-inch ductile iron pipe (D.I.P.) force main, which was connected to the existing drying bed's distribution line. Sludge was introduced into the bed through two discharge points located at the top of the containment berm. Each discharge point had appropriate valving to balance the deposited sludge over the bed.

Normally many design parameters are analyzed before sizing a reed bed, such as current capita and average daily treatment flow. For the purpose of comparing the reed bed to the conventional technology, the area of the reed-bed was matched to the area of the existing asphalt drying beds. The installed reed bed dimensions were 60 feet wide by 100 feet long, totaling 6,000 square feet (sf).

The plans for the reed bed design were approved by the New York State Department of Environmental Conservation (DEC). A State Pollutant Discharge Elimination System (SPDES) permit revision was not required for the project because the addition of the beds did not change the facilities discharge or the basic treatment process. The DEC recommended that the sludge not be applied to the beds during the winter months.

Section 4

DESCRIPTION OF WORK PERFORMED DURING DEMONSTRATION PERIOD

1999

Construction of the reed beds began in May 1999 with the installation of the lagoon liner and sludge containment bed. The CLCSD staff did the majority of the work during this stage including installing the liner and arranging excavation work with a contractor.

In July of 1999 the bed was planted with the *Phragmites Communis* reed species. A reed bed technology consultant, New England Waste System, Inc. (NEWS Inc.), was hired to assist in the planting of the reed bed. After planting, the reed bed was continuously loaded with CLCSD plant effluent to keep the bed saturated and to encourage growth of the reeds. Constant saturation of the sand layer is critical during the start-up phase to help establish a root system that is homogeneous throughout the bed. According to NEWS Inc., the normal start-up phase should take one to two years depending on plant growth, weather conditions and the time of year at planting. Once start-up is complete, sludge loading applications may begin.

Throughout the first season, reed growth was monitored by NEWS Inc. The first signs of growth were observed in late August, with sprouts approximately 4-6-inch high. In September, the reeds were 12-18-inches high. Following the initial planting of the reed bed, temperatures in the region were 10-15 degrees Fahrenheit (^{o}F) below normal for an extended period of time. This weather condition likely contributed to slow reed growth during the first year of the demonstration.

2000

In May of 2000, the first sludge loading applications were made by CLCSD staff. At this point, reed growth had been established, with reeds 2-3-ft high covering approximately 85% of the bed. The initial frequency and volume of sludge loadings was determined by NEWS Inc. and adjusted depending on the performance of the bed in dewatering the sludge.

In June of 2000 reed growth was observed to have slowed. As recommended by NEWS Inc. the frequency of sludge applications was cut back to once a month. Sludge was applied at this reduced frequency throughout the remainder of the year.

In November 2000, a final sludge loading was applied to the bed to act as a fertilizing layer for the next season, providing additional moisture and nutrients for reed growth in the spring. Figures 1 through 11 detail the construction, planting, start-up, and loading stages of the reed bed.

During 2000, six (6) sludge-loading applications resulted in an accumulated total of 66,725-gallons of sludge within the reed bed. One supernatant loading was also applied to the bed, which was diluted with plant effluent. Refer to Table 1 for loading frequency and sludge volumes applied in 2000.

2001

The CLCSD staff was also responsible for the maintenance of the reed beds. In January of 2001, the dried reeds were harvested. The reeds were cut with hedge clippers to within 12-inches of the sludge surface. The cut material was removed from the bed to prevent the accumulation of plant debris and to provide room for new growth in the spring.

In May of 2001, sludge loadings were increased to bi-weekly frequency. Data collection and analysis started in June, and sludge was sampled at the time it was placed into the beds, and again10 days after it was collected.

In August 2001 approximately 20% of the reeds were dry, yellow, and showing signs of dormancy. It was observed that the reed beds contained a 12-inch thick semi-liquid sludge cake that was not being dewatered by the reeds. Measurements were made to verify that the percent solids and volatile solids of the sludge were within acceptable ranges, 2-3% and 70% or less, respectively. It was decided that the sludge loading applications should be stopped until the reeds recovered. After one month, the sludge in the bed condensed considerably and the reeds appeared to be in better condition. At that time monthly loadings were resumed. It is assumed that the reduced application rate from bi-weekly to monthly loading better matched the beds ability to uptake the nutrients and dewater the sludge in the early stages of reed growth.

During 2001, eleven (11) sludge-loading applications resulted in an accumulated total of 153,386-gallons of sludge applied to the reed bed. Refer to Table 2 for loading frequency and sludge volumes applied in 2001.

Section 5

PROBLEMS COMMONLY ENCOUNTERED DURING START UP

Lack of Moisture

Summer time start up of a reed bed requires regular attention to ensure that the reeds are getting enough moisture. When the sludge application rate is not sufficient to keep the sand moist, nutrient and oxygen rich effluent from the WWTF should be applied between sludge loadings. This is especially true during the first year.

Sludge Overloading

Overloading a reed bed with nutrient rich sludge can reduce the vitality of the reeds and reduce their ability to dewater the sludge. The strong tendency to apply all of sludge that the treatment facility is producing should be resisted. If the treatment plant is producing more sludge than can be applied to the reed bed, (or other drying beds) the engineer should be notified immediately.

Aphids

Aphids can be a serious problem affecting the reed bed and causing stress and yellowing of the reeds. They can be successfully controlled without the use of a pesticide by introducing Lady Bugs at the rate of 4,500 bugs per 3,000 sf.

Section 6
SAMPLING AND ANALYSIS

CLCSD staff collected sludge samples from both the reed bed and conventional drying bed following the sludge loading applications. The following parameters were recorded at each sampling event:

- Dates of sludge loadings
- Amount of sludge applied
- Percent total solids, volatile solids, and pH of the sludge applied
- Time (Labor) to perform task related to dewatering sludge
- Weather conditions

An independent laboratory, Lozier Analytical Group (Lozier), conducted sludge contaminant analyses on eight (8) of the samples, which included heavy metals, PCBs and fecal coliform density (see Tables 3, 4, 7 and 8).

Section 7

PERFORMANCE ANALYSIS: REED BED VS. CONVENTIONAL DRYING BED

Clark Patterson Associates performed an analysis of all data generated comparing the two dewatering technologies (see Tables 5, 6, 9, and 10). The results of the comparison are described below.

Contaminant Removal

Samples from the reed bed show a superior reduction in heavy metals concentrations. Samples from the conventional bed show a larger decrease in inorganic content. However, both sludge treatment methods produced sludge in compliance with regulatory limits for the disposal of treated sludge, and all parameters were below the limits set by the NYSDEC (see Table 11).

Sludge Volume Reduction

The solids content is the primary parameter in determining the effectiveness of the dewatering capabilities of each technology. A drier sludge will have a higher percent solids value. The accumulated sludge volume applied between June and November 2001 was used to compare the sludge volume reduction capabilities of the reed bed and conventional bed. Sludge volume reduction capabilities were greater in the reed bed than the conventional bed over the same time interval, as shown in the calculations provided below.

Note: The conventional and reed beds were both uncovered and exposed to rainfall accumulation, dry weather evaporation, and infiltration. The effect of exposure was considered to be equal in each bed and was thus neglected. Rainfall data for the demonstration period are recorded in Table 12. According to the WWTF staff, 2001 was a very dry year.

Reed Bed Applied Sludge Volume Reduction Calculations

Reed Bed Total Applied Sludge Volume = 153,386-gals

Sludge Volume Remaining (cf)

= (10-inches thick/12) x (6,000-sf) x (7.47-gal/cf) = 37,350-gals of sludge

Volume of Sludge Reduction = [1-(37,350-gals remaining)/(153,386-gals cumulative)]

= Volume of Sludge Reduction = 78% Reduction

Conventional Bed Applied Sludge Volume Reduction Calculations

Conventional Bed Total Applied Sludge Volume = 14,130-gals

Sludge Volume Remaining (cf)

= (1.5-inches thick/12) x (6,000-sf) x (7.47-gal/cf) = 5,603-gals

Volume of Sludge Reduction = [1-(5,603-gals Remaining)/(14,130-gals cumulative)]

= Volume of Sludge Reduction = <u>60% Reduction</u>

<u>Loading Rates</u>

The loading frequency of the reed bed was not consistent due to operational problems. However, assuming no operation problems, the loading rate calculated is consistent with the previously reported theoretical loading rate of 60 gallons/sf/year, as shown in the calculations below, which is significantly higher than that of the conventional bed.

Reed Bed Loading Rate

Actual Loading Rate

= (153,386-gals)/(6,000 sf) = <u>28.3 gallons/sf</u>

Assuming no operational problems, the Projected Annual Loading Rate is:

Projected Annual Loading Rate

= (24 loadings x 14,138 gals)/(6,000 sf) = <u>56.5 gallons/sf/year</u>.

Conventional Bed Loading Rate

Actual Loading Rate

= (14,130-gals)/(6,000 sf) = <u>2.4-gallons/sf</u>

To accurately compare costs associated with the two sludge management methods a Projected Annual Loading Rate for the conventional bed was also calculated:

Projected Annual Loading Rate

= (8 loadings x 14,130-gals/loading)/(6,000 sf) = <u>25.9 gals/sf/year</u>

Section 8
COST AND ENERGY SAVINGS ANALYSIS

The following calculations compare the yearly costs to treat sludge using both technologies. A per gallon analysis is provided for each bed type in Tables 13 and 14.

Dried Sludge Hauling Costs

Conventional Bed

In conventional drying bed the dried sludge cake is removed manually, loaded on a truck, and hauled away for final disposal. The current final disposal practice is land spreading by a local farmer. The yearly cumulated dried sludge total was 92 tons (21,000 sf total bed area) and the hauling cost was $3,427.00. The average conventional drying bed sludge disposal cost (for the 6,000 sf comparison cell) is calculated as followed:

Cost of Disposal (6,000 sf comparison cell) = (6,000sf / 21,000sf) x $3,427 = $979.14 year

= ($3,427.00)/[(92 tons) x (2000 lbs/ton)] = 0.018625 $/lbs or $37.25/ton

Reed Bed

Sludge remains in the reed bed for an estimated 10 years. Therefore, the costs of using this technology are one tenth that of the yearly conventional bed costs.

Cost of Disposal (6,000 sf demonstration cell) = ($979.14) x (1/10) = $97.91 year

= 1/10 x ($3,427.00)/[(92 tons) x (2000 lbs/ton)] = 0.0018625 $/lbs or $3.72/ton

Sludge Pumping Electrical Costs (Reed Bed and Conventional)

Sludge pumping is required in order to deliver sludge to either of the beds. Therefore the electrical cost for pumping is equal in both systems.

Pumping from Digester to Storage Tank

The digester is 785 gallons per inch and the staff usually pumps from the digester to the storage tank when the depth in the digester reaches five feet. The digester is pumped to the one foot sludge depth. This typically occurs every three days.

Total gallons pumped = (785 gallons per inch) x (5ft -1ft) = 37,680 gals (3 days of accumulation)

Pumping time = 3 hours

Pump HP @ 75% efficiency = 7 hp x 0.75 = 5.25 hp

Energy Cost KWh = $0.12/KW/hr (includes all delivery and fees)

Electrical Cost (per pump cycle) = (5.25 hp) x (0.746 KW/hp) x ($0.12/KW/hr) x (3.0 hours) = $1.41

Electrical Cost per year = ($1.41) x (365days/3days) = $171.55/yr

Pumping from Storage Tank to Beds

Total gallons pumped per loading = 14,130 gallons/per bed

Pumping time = 0.56 hours

Pump HP @ 75% efficiency = 7 hp x 0.75 = 5.25 hp

Energy Cost KWh = $0.12/KW/hr (includes all delivery and fees)

Electrical Cost (per loading) = (5.25 hp) x (0.746 KW/1 hp) x ($0.12/KW/hr) x (0.56 hours)

= $0.26/loading

Electrical Cost per year = ($0.26/loading) x (11 loadings for demonstration) = $2.86/yr

Section 9
COST AND ENERGY SAVINGS SUMMARY

Demonstration Costs (annualized for comparison)

Conventional Bed = (113,040 gals) x ($0.022/gals) = $2,535.60/year

Reed Bed = (153,386 gals) x ($0.0039/gals) = $600.59/year

- Based on the above, the reed bed is 76.31% less expensive to operate than the conventional bed.

Projected Full-Scale Cost Savings

The CLCSD currently produces 13,000 gallons of digested sludge per day from its primary and secondary anaerobic digesters.

Conventional Bed = (13,000 gals/day) x (365 days/yr) x ($0.022/gals) = $104,390/year

Reed Bed = (13,000 gals/day) x (365 days/yr) x ($0.0039/gals) = $18,505.50/year

Based on the above, the CLCSD WWTP would reduce costs by 82.27% if the conventional beds were replaced with reed beds.

Demonstration Costs

The costs to perform this demonstration are provided in Tables 15 and 16.

Section 10
PROJECT CONCLUSIONS

- The reed bed demonstrated a greater sludge volume reduction than the conventional bed.

- Treatment in the reed bed demonstrated slightly more effectiveness in decreasing most heavy metals compared to the conventional bed. All contaminants in the sludge were below the EPA and DEC Maximum Contaminate Levels (MCL).

- The operation and maintenance costs associated with the conventional bed are higher than those associated with the reed bed. For this demonstration, the operation and maintenance costs associated with the reed bed were 76.31% lower than those of the conventional bed.

Section 11
TECHNOLOGY TRANSFER OPPORTUNITIES

Approximately 263 wastewater treatment facilities in New York State currently use conventional sand or asphalt drying beds for sludge treatment. The modifications required to convert conventional sludge drying beds to reed beds are simple and require a relatively small capital investment. A list of New York State communities that could benefit from the technology is included as Appendix A.

Clark Patterson Associates has installed a reed bed at the Village of Alfred wastewater treatment facility with similar results. In addition, reed beds have been evaluated for the Village of Perry and the Town of York.

APPENDIX A

TABLE 1: LOADING FREQUENCY AND VOLUMES (2000)

ENERGY EFFICIENT SLUDGE TREATMENT
WITH REED BED TECHNOLOGY DEMONSTRATION PROJECT
CONESUS LAKE COUNTY SEWER DISTRICT LAKEVILLE TREATMENT FACILITY
NYSERDA (PON) No. 342-96

Progress Report Data Sampling Range: 3/23/2000 to 11/30/2000

Performed by CLCSD WWTF staff

Composite Sludge Sample (3 Quarts) obtained by staff for analysis

DE-WATERING METHOD	REED BED	CONV. BED	REED BED	CONV. BED	REED BED	CONV. BED	REED BED	CONV. BED	REED BED	CONV. BED	REED BED	CONV. BED
LOADING NO#	1	1	2	2	3	3	4	4	5	5	6	6
DATE:	**3/23/2000**	**3/23/2000**	**7/8/2000**	**7/8/2000**	**8/2/2000**	**8/2/2000**	**8/28/2000**	**8/28/2000**	**10/5/2000**	**10/5/2000**	**11/30/2000**	**11/30/2000**
INITIAL LOADING (gallons)	14,915	Not loaded	9,420	Not loaded	9,420	Not loaded	9,420	Not loaded	9,420	11,462	14,130	14,130
(pH)	7.1		n/a		7.1		n/a		n/a	n/a	n/a	n/a
(Total Solids %)	2.9%	n/a	3.0%	n/a	2.9%	n/a	2.8%	n/a	3.0%	3.0%	3.0%	2.9%
(Total Volatile Solids %)	60.0%	n/a	60.0%	n/a	57.0%	n/a	62.0%	n/a	60.0%	60.0%	62.0%	60.0%
DATE:	**4/28/2000**	**4/28/2000**	**7/13/2000**	**7/13/2001**	**8/8/2000**	**8/8/2000**	**9/3/2000**	**9/3/2000**	**10/10/2000**	**10/10/2000**	**12/5/2000**	**12/5/2000**
5-DAYS AFTER LOADING												
(pH)												
(Total Solids %)	n/a	n/a		n/a	3.0%	n/a	12.5%	n/a	7.8%	5.0%	7.5%	n/a
(Total Volatile Solids %)	n/a	n/a		n/a	59.0%	n/a	55.0%	n/a	57.0%	n/a	63.0%	n/a
DATE:	**5/2/2000**	**5/2/2000**	**7/18/2000**	**7/18/2000**	**8/12/2000**	**8/12/2000**	**9/7/2000**	**9/7/2000**	**10/16/2000**	**10/16/2000**	**12/10/2000**	**12/10/2000**
10-DAYS AFTER LOADING												
(pH)												
(Total Solids %)	n/a	n/a	n/a	n/a	7.6%	n/a	12.5%	n/a	14.0%	7.0%	12.5%	n/a
(Total Volatile Solids %)	n/a	n/a	n/a	n/a	60.0%	n/a	59.0%	n/a	56.0%	n/a	60.0%	n/a
DATE:												
SUPERNATANT AMOUNT PER LOADING												
	REED BED	CONV. BED	REED BED	CONV. BED	REED BED	CONV. BED	REED BED	CONV. BED	REED BED	CONV. BED	REED BED	CONV. BED
CUMULATED SLUDGE TOTALS (gallons)	14,915	Not loaded	24,335	Not loaded	33,755	Not loaded	43,175	Not loaded	52,595	11,462	66,725	14,130
SLUDGE TREATED (gallons/sf/time)	2.5	n/a	4.1	n/a	5.6	n/a	7.2	n/a	8.8	3.8	11.1	4.7

TABLE 2: LOADING FREQUENCY AND VOLUMES (2001)

ENERGY EFFICIENT SLUDGE TREATMENT
WITH REED BED TECHNOLOGY DEMONSTRATION PROJECT
CONESUS LAKE COUNTY SEWER DISTRICT LAKEVILLE TREATMENT FACILITY
NYSERDA (PON) No. 342-96

Progress Report Data Sampling Range: 4/23/2001 to 10/22/2001

Performed by CLCSD WWTF staff

Composite Sludge Sample (3 Quarts) obtained by staff for analysis

DE-WATERING METHOD	REED BED	CONV. BED	REED BED	CONV. BED	REED BED	CONV. BED	REED BED	CONV. BED	REED BED	CONV. BED
LOADING NO#	Pre-Sampling	Pre-Sampling	Pre-Sampling	Pre-Sampling	Pre-Sampling	Pre-Sampling	1	1	2	2
DATE:	**4/23/2001**	**4/23/2001**	**5/9/2001**	**5/9/2001**	**5/23/2001**	**5/23/2001**	**6/6/2001**	**6/6/2001**	**6/22/2001**	**6/22/2001**
INITIAL LOADING (gallons)	9,420	9,400	15,000	9,400	15,000	9,400	15,000	9,420	14,138	14,130
(pH)			7.1	7.1	7.1	7.1	7.1	7.1	7.2	7.2
(Total Solids %)	3.0%	3.0%	3.3%	3.3%	2.9%	2.9%	3.0%	3.0%	2.9%	2.9%
(Total Volatile Solids %)	61.0%	61.0%	59.0%	61.0%	57.0%	57.0%	57.0%	57.0%	63.0%	62.0%
DATE:	**4/28/2001**	**4/28/2001**	**5/14/2001**	**5/14/2001**	**5/28/2001**	**5/28/2001**	**6/11/2001**	**6/11/2001**	**6/27/2001**	**6/27/2001**
5-DAYS AFTER LOADING										
(pH)										
(Total Solids %)	9.5%	5.1%	6.4%	6.4%	7.0%	7.1%	8.5%	8.1%	15.7%	11.9%
(Total Volatile Solids %)	61.0%	61.0%	59.0%	59.0%	60.0%	59.0%	61.0%	62.0%	56.0%	56.0%
DATE:	**5/4/2001**	**5/4/2001**	**5/19/2001**	**5/19/2001**	**6/2/2001**	**6/2/2001**	**6/18/2001**	**6/18/2001**	**7/2/2001**	**7/2/2001**
10-DAYS AFTER LOADING										
(pH)										
(Total Solids %)	36.1%	10.7%	11.8%	7.3%	9.4%	7.3%	12.5%	11.7%	13.5%	14.9%
(Total Volatile Solids %)	61.0%	58.0%	61.0%	62.0%	58.0%	62.0%	59.0%	61.0%	54.0%	50.0%
DATE:										
SUPERNATANT AMOUNT PER LOADING										
	REED BED	CONV. BED	REED BED	CONV. BED	REED BED	CONV. BED	REED BED	CONV. BED	REED BED	CONV. BED
CUMULATED SLUDGE TOTALS (gallons	9,420	9,400	24,420	9,400	39,420	9,400	54,420	9,420	68,558	14,130
SLUDGE TREATED (gallons/sf/time)	1.6	1.6	4.1	1.6	6.6	1.6	9.1	1.6	11.4	2.4

TABLE 3: REED BED - INITIAL LOADING

ENERGY EFFICIENT SLUDGE TREATMENT
WITH REED BED TECHNOLOGY DEMONSTRATION PROJECT
CONESUS LAKE COUNTY SEWER DISTRICT LAKEVILLE TREATMENT FACILITY
NYSERDA (PON) No. 342-96

Progress Report Data Sampling Range: 6/6/2001 to 10/22/2001
PARAMETERS TESTED: NYSDEC [6-NYCRR PART 360-4]/ EPA Title 40CFR 503
Performed by Representative of Lozier Laboratories Inc.:
Composite Sludge Sample (3 Quarts) obtained by staff for analysis

INITIAL SAMPLE	Date	6/6/2001	#######	7/6/2001	7/20/2001	8/3/2001	8/17/2001	9/14/2001	########	AVERAGE
Parameters [Composition] (Analyzed)	INITIAL CONCENTRATION	Loading #1	Loading #2	Loading #3	Loading #4	Loading #5	Loading #6	Loading #7	Loading #8	Loading Ave
LOADING AMOUNTS	Gallons	15,000	14,138	14,138	14,138	14,138	14,138	14,138	14,138	14,138
Total Solids (%)		2.8	2.4	2.7	2.4	2.7	2.5	2.6	2.6	2.6
Total Volatile Solids (%)		56.7	49.1	62	56.9	57.3	56.4	59.5	61.4	57.4
pH (S.U.)		7.28	7.33	7.26	7.38	7.02	7.11	7.22	7.28	7.2

Parameters -[Inorganic Chemical Composition] (Analyzed)	INITIAL CONCENTRATION	Loading #1	Loading #2	Loading #3	Loading #4	Loading #5	Loading #6	Loading #7	Loading #8	Loading Ave
Ammonia Nitrogen -N	(mg/kg)	702	1,580	2,120	1,840	2,360	2,490	2,690	2,260	2,005
Total Kjeldahl Nitrogen (TKN)	(mg/kg)	1,680	2,880	3,680	2,260	4,250	3,080	6,300	4,910	3,630
Total Phosphorus	(mg/kg)	469	765	1,540	1,280	1,950	1,860	2,170	1,890	1,491
Nitrate (NO3)	(mg/kg)	71.4	83.3	74	83.3	74	80	76.9	76.9	77.5
Nitrite (NO2)	(mg/kg)	71.4	83.3	74	83.3	74	80	76.9	76.9	77.5

Parameters -Inorganics [Heavy Metals] (Analyzed)	INITIAL CONCENTRATION	Loading #1	Loading #2	Loading #3	Loading #4	Loading #5	Loading #6	Loading #7	Loading #8	Loading Ave
Arsenic (As)	(mg/kg)	7.28	6.42	8.67	8.97	3.72	6.98	16.4	10.9	8.7
Cadmium (Cd)	(mg/kg)	1.71	2.1	3.02	2.68	1.22	2.87	5.52	6.02	3.1
Total Chromium (Cr)	(mg/kg)	23.9	24.5	30.6	35.6	24.6	31.8	34.2	33.2	29.8
Copper (Cu)	(mg/kg)	646	730	736	698	856	687	842	689	736
Lead (Pb)	(mg/kg)	48.3	51.5	55.9	51.8	60.7	56.9	41.3	53.2	52.5
Mercury (Hg)	(mg/kg)	0.265	0.168	0.197	0.139	0.184	0.153	0.158	0.167	0.2
Molybdenum (Mo)	(mg/kg)	1.98	2.06	2.54	2.06	2.68	2.09	2.67	2.89	2.4
Nickel (Ni)	(mg/kg)	11.3	11.7	15.8	19.2	14.9	29.6	14.7	12.9	16.3
Potassium (K)	(mg/kg)	2,250	2,500	2,690	2,410	2,180	2,480	2,550	2,180	2,405
Selenium (Se)	(mg/kg)	5.99	7.33	8.62	9.63	10.9	6.82	7.36	9.86	8
Zinc (Zn)	(mg/kg)	309	408	571	549	491	568	609	628	517

Parameters [Pathogens] (Analyzed)	INITIAL CONCENTRATION	Loading #1	Loading #2	Loading #3	Loading #4	Loading #5	Loading #6	Loading #7	Loading #8	Loading Ave
Fecal Coliform Density (Wet)	col/100ml	50	50	110	23	8	11	110	14	47.0
Fecal Coliform Density (Dry)	col/100ml	1,800	2,000	4,100	960	300	440	4,200	540	1,793

Other Parameters Analyzed (Analyzed)	INITIAL CONCENTRATION	Loading #1	Loading #2	Loading #3	Loading #4	Loading #5	Loading #6	Loading #7	Loading #8	Loading Ave
Total PCB's	(ug/kg), ppb	*DL(U)	*DL(U)	*DL(U)	*DL(U)	Not Tested	Not Tested	Not Tested	Not Tested	*DL(U)

*DL(U) = analyzed but not detected

TABLE 4: REED BED - 10 DAY SAMPLING

ENERGY EFFICIENT SLUDGE TREATMENT
WITH REED BED TECHNOLOGY DEMONSTRATION PROJECT
CONESUS LAKE COUNTY SEWER DISTRICT LAKEVILLE TREATMENT FACILITY
NYSERDA (PON) No. 342-96

Progress Report Data Sampling Range: 6/6/2001 to 10/22/2001
PARAMETERS TESTED: NYSDEC [6-NYCRR PART 360-4]/ EPA Title 40CFR 503
Performed by Representative of Lozier Laboratories Inc.:
Composite Sludge Sample (3 Quarts) obtained by staff for analysis

10-DAY SAMPLE	Date	6/18/2001	7/2/2001	7/16/2001	7/30/2001	8/13/2001	8/27/2001	9/24/2001	10/22/2001	AVERAGE
Parameters [Composition] (Analyzed)	TREATED CONCENTRATION	Loading #1	Loading #2	Loading #3	Loading #4	Loading #5	Loading #6	Loading #7	Loading #8	Loading Ave
LOADING AMOUNTS	Gallons	15,000	14,138	14,138	14,138	14,138	14,138	14,138	14,138	14,138
Total Solids (%)		9.7	17.7	6.5	19.1	14.2	20.1	6.4	4.9	12.3
Total Volatile Solids (%)		48.4	53.2	55.4	54.1	56.9	55.3	56.9	57	54.7
pH (S.U.)		7.76	7.91	7.89	7.89	7.85	7.42	7.65	7.51	7.7

Parameters -[Inorganic Chemical Compositio (Analyzed)	TREATED CONCENTRATION	Loading #1	Loading #2	Loading #3	Loading #4	Loading #5	Loading #6	Loading #7	Loading #8	Loading Ave
Ammonia Nitrogen -N	(mg/kg)	1,420	1,120	2,130	1,850	3,200	2,810	2,680	2,980	2,274
Total Kjeldahl Nitrogen (TKN)	(mg/kg)	2,410	1,810	2,780	2,580	3,450	3,290	3,850	3,650	2,978
Total Phosphorus	(mg/kg)	698	548	1,420	1,520	2,150	2,080	1,920	2,480	1,602
Nitrate (NO3)	(mg/kg)	74.1	11.3	30.8	10.5	14.1	9.95	31.2	40.8	27.8
Nitrite (NO2)	(mg/kg)	74.1	11.3	30.8	10.5	14.1	9.95	31.2	40.8	27.8

Parameters -Inorganics [Heavy Metals] (Analyzed)	TREATED CONCENTRATION	Loading #1	Loading #2	Loading #3	Loading #4	Loading #5	Loading #6	Loading #7	Loading #8	Loading Ave
Arsenic (As)	(mg/kg)	8.91	4.09	8.23	3.87	12.6	9.72	8.75	4.88	7.6
Cadmium (Cd)	(mg/kg)	2.43	1.42	2.92	4.81	6.78	5.84	4.27	7.62	4.5
Total Chromium (Cr)	(mg/kg)	28.9	16.5	24.9	37.2	29.3	34.6	34.8	37.7	30.5
Copper (Cu)	(mg/kg)	533	333	822	816	691	615	657	699	646
Lead (Pb)	(mg/kg)	32.8	35.5	47.9	57.4	51.3	48.6	45.1	47.3	45.7
Mercury (Hg)	(mg/kg)	0.276	0.135	0.136	0.138	0.168	0.148	0.124	0.134	0.2
Molybdenum (Mo)	(mg/kg)	1.85	2.22	2.36	2.17	2.49	2.19	2.17	2.54	2.2
Nickel (Ni)	(mg/kg)	15.4	8.63	16.5	31.7	31.5	27.3	21.8	19.5	21.5
Potassium (K)	(mg/kg)	1,680	1,830	2,230	2,490	2,460	2,240	2,030	1,950	2,114
Selenium (Se)	(mg/kg)	6.46	5.29	10.4	9.08	4.21	5.69	4.17	8.5	7
Zinc (Zn)	(mg/kg)	238	305	698	573	548	527	564	678	516

Parameters [Pathogens] (Analyzed)	TREATED CONCENTRATION	Loading #1	Loading #2	Loading #3	Loading #4	Loading #5	Loading #6	Loading #7	Loading #8	Loading Ave
Fecal Coliform Density (Wet)	col/100ml	300	1,400	1,100	30,000	11,000	500	800	220	5,665.0
Fecal Coliform Density (Dry)	col/100ml	3,090	7,900	1,700	160,000	77,000	2,500	13,000	4,500	33,711

Other Parameters Analyzed (Analyzed)	TREATED CONCENTRATION	Loading #1	Loading #2	Loading #3	Loading #4	Loading #5	Loading #6	Loading #7	Loading #8	Loading Ave
Total PCB's	(ug/kg), ppb	*DL(U)	*DL(U)	*DL(U)	*DL(U)	Not tested	Not tested	Not tested	Not tested	*DL(U)

*DL(U) = analyzed but not detected

TABLE 5: REED BED - COMPARISON

ENERGY EFFICIENT SLUDGE TREATMENT
WITH REED BED TECHNOLOGY DEMONSTRATION PROJECT
CONESUS LAKE COUNTY SEWER DISTRICT LAKEVILLE TREATMENT FACILITY
NYSERDA (PON) No. 342-96

Progress Report Data Sampling Range: 6/6/2001 to 10/22/2001
PARAMETERS TESTED: NYSDEC [6-NYCRR PART 360-4]/ EPA Title 40CFR 503
Performed by Representative of Lozier Laboratories Inc.:
Composite Sludge Sample (3 Quarts) obtained by staff for analysis

COMPARISON	Date	(6/6)-(6/18)	(6/22)-(7/2)	(7/6)-(7/16)	(7/20)-(7/30)	(8/3)-(8/13)	(8/17)-(8/27)	(9/14)-(9/24)	(10/12)-(10/22)	(6/6)-(10/22)
Parameters [Composition] (Analyzed)	COMPARED CONCENTRATION	Loading #1	Loading #2	Loading #3	Loading #4	Loading #5	Loading #6	Loading #7	Loading #8	AVERAGE CHANGE
CUMULATED LOADING AMOUNTS	Gallons	15,000	14,138	14,138	14,138	14,138	14,138	14,138	14,138	14,138
Total Solids (%)		246.43%	637.50%	140.74%	695.83%	425.93%	704.00%	146.15%	88.46%	376.3%
Total Volatile Solids (%)		-14.64%	8.35%	-10.65%	-4.92%	-0.70%	-1.95%	-4.37%	-7.17%	-4.8%
pH (S.U.)		6.59%	7.91%	8.68%	6.91%	11.82%	4.36%	5.96%	3.16%	6.9%

Parameters -[Inorganic Chemical Composition] (Analyzed)	COMPARED CONCENTRATION	Loading #1	Loading #2	Loading #3	Loading #4	Loading #5	Loading #6	Loading #7	Loading #8	AVERAGE CHANGE
Ammonia Nitrogen -N	(mg/kg)	102.28%	-29.11%	0.47%	0.54%	35.59%	12.85%	-0.37%	31.86%	13.4%
Total Kjeldahl Nitrogen (TKN)	(mg/kg)	43.45%	-37.15%	-24.46%	14.16%	-18.82%	6.82%	-38.89%	-25.66%	-18.0%
Total Phosphorus	(mg/kg)	48.83%	-28.37%	-7.79%	18.75%	10.26%	11.83%	-11.52%	31.22%	7.5%
Nitrate (NO3)	(mg/kg)	3.78%	-86.43%	-58.38%	-87.39%	-80.95%	-87.56%	-59.43%	-46.94%	-64.1%
Nitrite (NO2)	(mg/kg)	3.78%	-86.43%	-58.38%	-87.39%	-80.95%	-87.56%	-59.43%	-46.94%	-64.1%

Parameters -Inorganics [Heavy Metals] (Analyzed)	COMPARED CONCENTRATION	Loading #1	Loading #2	Loading #3	Loading #4	Loading #5	Loading #6	Loading #7	Loading #8	AVERAGE CHANGE
Arsenic (As)	(mg/kg)	22.39%	-36.29%	-5.07%	-56.86%	238.71%	39.26%	-46.65%	-55.23%	-12.0%
Cadmium (Cd)	(mg/kg)	42.11%	-32.38%	-3.31%	79.48%	455.74%	103.48%	-22.64%	26.58%	43.6%
Total Chromium (Cr)	(mg/kg)	20.92%	-32.65%	-18.63%	4.49%	19.11%	8.81%	1.75%	13.55%	2.3%
Copper (Cu)	(mg/kg)	-17.49%	-54.38%	11.68%	16.91%	-19.28%	-10.48%	-21.97%	1.45%	-12.2%
Lead (Pb)	(mg/kg)	-32.09%	-31.07%	-14.31%	10.81%	-15.49%	-14.59%	9.20%	-11.09%	-12.8%
Mercury (Hg)	(mg/kg)	4.15%	-19.64%	-30.96%	-0.72%	-8.70%	-3.27%	-21.52%	-19.76%	-12.0%
Molybdenum (Mo)	(mg/kg)	-6.57%	7.77%	-7.09%	5.34%	-7.09%	4.78%	-18.73%	-12.11%	-5.2%
Nickel (Ni)	(mg/kg)	36.28%	-26.24%	4.43%	65.10%	111.41%	-7.77%	48.30%	51.16%	32.5%
Selenium (Se)	(mg/kg)	-25.33%	-26.80%	-17.10%	3.32%	12.84%	-9.68%	-20.39%	-10.55%	-12.1%
Potassium (K)	(mg/kg)	7.85%	-27.83%	20.65%	-5.71%	-61.38%	-16.57%	-43.34%	-13.79%	-19.1%
Zinc (Zn)	(mg/kg)	-22.98%	-25.25%	22.24%	4.37%	11.61%	-7.22%	-7.39%	7.96%	-0.05%

Parameters [Pathogens] (Analyzed)	COMPARED CONCENTRATION	Loading #1	Loading #2	Loading #3	Loading #4	Loading #5	Loading #6	Loading #7	Loading #8	AVERAGE CHANGE
Fecal Coliform Density (Wet)	col/100ml	500.00%	2700.00%	900.00%	#########	#########	4445.45%	627.27%	1471.43%	11953.2%
Fecal Coliform Density (Dry)	col/100ml	71.67%	295.00%	-58.54%	16566.67%	25566.67%	468.18%	209.52%	733.33%	1780.7%

Other Parameters Analyzed (Analyzed)	COMPARED CONCENTRATION	Loading #1	Loading #2	Loading #3	Loading #4	Loading #5	Loading #6	Loading #7	Loading #8	AVERAGE CHANGE
Total PCB's	(ug/kg), ppb	*DL(U)	*DL(U)	*DL(U)	*DL(U)	Not tested	Not tested	Not tested	Not tested	*DL(U)

*DL(U) = analyzed but not detected

TABLE 6: REED BED - VOLUME REDUCTION

ENERGY EFFICIENT SLUDGE TREATMENT
WITH REED BED TECHNOLOGY DEMONSTRATION PROJECT
CONESUS LAKE COUNTY SEWER DISTRICT LAKEVILLE TREATMENT FACILITY
NYSERDA (PON) No. 342-96

Progress Report Data Sampling Range: 6/6/2001 to 10/22/2001
PARAMETERS TESTED: NYSDEC [6-NYCRR PART 360-4]/ EPA Title 40CFR 503
Performed by Representative of Lozier Laboratories Inc.:
Composite Sludge Sample (3 Quarts) obtained by staff for analysis

VOLUME REDUCTION					
Parameters	TREATED CONCENTRATION	INITIAL Loading Sample	10-Day Sampling	DEDUCTION AMOUNTS	COMMENTS
CUMULATED LOADING AMOUNT	Gallons	153,386			
Sludge thickness in bed	Inches		10		
Area	SF	6,000	6,000		
Volume of Sludge	CF	20,534	5,000	15534	Decreased Volume of Sludge

Parameters (Analyzed)	TREATED CONCENTRATION	INITIAL Loading	10-Day Sampling	CONCENTRATION PERCENT CHANGE	COMMENTS
Total Solids (%)	(mg/kg)	2.6	12.3	376%	Increased Percent (Concentration)
Total Volatile Solids (%)	(mg/kg)	57.4	54.7	-5%	Decreased Percent (Concentration)

VOLUMES (Analyzed)	TREATED CONCENTRATION	INITIAL Loading	10-Day Sampling	REDUCTIONS PERCENT CHANGE	COMMENTS
Volume of Sludge	Gallons	153,386	37,350	-76%	Decreased Volume
Volume of Water	Gallons	149,417	32,747	-78%	Decreased Volume
Volume of Solids	Gallons	3,969	4,603	16%	Increased Volume (Concentration)
Volume Volatile of Solids	Gallons	2,279	2,516	10%	Increased Volume (Concentration)

TABLE 7: CONVENTIONAL BED - INITIAL LOADING

ENERGY EFFICIENT SLUDGE TREATMENT
WITH REED BED TECHNOLOGY DEMONSTRATION PROJECT
CONESUS LAKE COUNTY SEWER DISTRICT LAKEVILLE TREATMENT FACILITY
NYSERDA (PON) No. 342-96

Progress Report Data Sampling Range: 6/6/2001 to 10/22/2001
PARAMETERS TESTED: NYSDEC [6-NYCRR PART 360-4]/ EPA Title 40CFR 503
Performed by Representative of Lozier Laboratories Inc.:
Composite Sludge Sample (3 Quarts) obtained by staff for analysis

INITIAL SAMPLE	Date	6/6/2001	#######	7/6/2001	7/20/2001	8/3/2001	8/17/2001	9/14/2001	########	AVERAGE
Parameters [Composition] (Analyzed)	INITIAL CONCENTRATION	Loading #1	Loading #2	Loading #3	Loading #4	Loading #5	Loading #6	Loading #7	Loading #8	Loading Ave
LOADING AMOUNTS	Gallons	9,420	14,130	14,130	14,130	14,130	14,130	14,130	14,130	14,130
Total Solids (%)		2.1	2.2	2.7	2.3	2.9	2.5	2.6	2.6	2.5
Total Volatile Solids (%)		56	41.7	56.9	58.3	60.8	56.3	59.5	61.4	56.4
pH (S.U.)		7.32	7.3	7.28	7.43	7.48	7.13	7.22	7.28	7.3

Parameters -[Inorganic Chemical Compositio (Analyzed)	INITIAL CONCENTRATION	Loading #1	Loading #2	Loading #3	Loading #4	Loading #5	Loading #6	Loading #7	Loading #8	Loading Ave
Ammonia Nitrogen -N	(mg/kg)	685	1,380	1,850	1,460	2,100	2,180	2,690	2,260	1,826
Total Kjeldahl Nitrogen (TKN)	(mg/kg)	1,530	2,240	3,250	1,970	3,790	2,890	6,300	4,910	3,360
Total Phosphorus	(mg/kg)	395	809	1,410	1,370	1,480	1,740	2,170	1,890	1,408
Nitrate (NO3)	(mg/kg)	9.48	90.9	74	87	69	80	76.9	76.9	70.5
Nitrite (NO2)	(mg/kg)	9.48	90.9	74	87	69	80	76.9	76.9	70.5

Parameters -Inorganics [Heavy Metals] (Analyzed)	INITIAL CONCENTRATION	Loading #1	Loading #2	Loading #3	Loading #4	Loading #5	Loading #6	Loading #7	Loading #8	Loading Ave
Arsenic (As)	(mg/kg)	6.73	7.48	8.62	8.12	5.32	8.75	16.4	10.9	9.0
Cadmium (Cd)	(mg/kg)	1.77	2.22	3.49	3.75	1.63	4.96	5.52	6.02	3.7
Total Chromium (Cr)	(mg/kg)	22.1	26.7	28.9	29.1	21.4	27.3	34.2	33.2	27.9
Copper (Cu)	(mg/kg)	622	765	719	725	832	634	842	689	729
Lead (Pb)	(mg/kg)	42.9	56.5	58.8	59.7	53.9	51.7	41.3	53.2	52.3
Mercury (Hg)	(mg/kg)	0.234	0.192	0.167	0.154	0.157	0.141	0.158	0.167	0.2
Molybdenum (Mo)	(mg/kg)	2.36	2.26	3.05	2.87	2.17	2.67	2.67	2.89	2.6
Nickel (Ni)	(mg/kg)	10.9	12.5	17.8	13.4	9.68	32.8	14.7	12.9	15.6
Potassium (K)	(mg/kg)	2190	2650	2130	2180	2060	2170	2550	2180	2,264
Selenium (Se)	(mg/kg)	5.3	6.48	6.91	7.54	9.54	5.93	7.36	9.86	7
Zinc (Zn)	(mg/kg)	285	364	549	627	512	547	609	628	515

Parameters [Pathogens] (Analyzed)	INITIAL CONCENTRATION	Loading #1	Loading #2	Loading #3	Loading #4	Loading #5	Loading #6	Loading #7	Loading #8	Loading Ave
Fecal Coliform Density (Wet)	col/100ml	170	90	17	50	2	22	110	14	59.4
Fecal Coliform Density (Dry)	col/100ml	810	4,000	630	2,200	70	880	4,200	540	1,666

Other Parameters Analyzed (Analyzed)	INITIAL CONCENTRATION	Loading #1	Loading #2	Loading #3	Loading #4	Loading #5	Loading #6	Loading #7	Loading #8	Loading Ave
Total PCB's	(ug/kg), ppb	*DL(U)	*DL(U)	*DL(U)	*DL(U)	Not Tested	Not Tested	Not Tested	Not Tested	*DL(U)

*DL(U) = analyzed but not detected

TABLE 8: CONVENTIONAL BED - 10 DAY SAMPLING

ENERGY EFFICIENT SLUDGE TREATMENT
WITH REED BED TECHNOLOGY DEMONSTRATION PROJECT
CONESUS LAKE COUNTY SEWER DISTRICT LAKEVILLE TREATMENT FACILITY
NYSERDA (PON) No. 342-96

Progress Report Data Sampling Range: 6/6/2001 to 10/22/2001
PARAMETERS TESTED: NYSDEC [6-NYCRR PART 360-4]/ EPA Title 40CFR 503
Performed by Representative of Lozier Laboratories Inc.:
Composite Sludge Sample (3 Quarts) obtained by staff for analysis

10 -DAY SAMPLE	Date	6/18/2001	7/2/2001	7/16/2001	7/30/2001	8/13/2001	8/27/2001	########	10/22/2001	AVERAGE
Parameters [Composition] (Analyzed)	TREATED CONCENTRATION	Loading #1	Loading #2	Loading #3	Loading #4	Loading #5	Loading #6	Loading #7	Loading #8	Loading Ave
LOADING AMOUNTS	Gallons	9,420	14,130	14,130	14,130	14,130	14,130	14,130	14,130	14,130
Total Solids (%)		9.3	54.1	19.3	82.2	92.1	12.5	6.8	18.7	36.9
Total Volatile Solids (%)		45.3	65.1	56.7	56.4	58.6	56.7	56.8	53.5	56.1
pH (S.U.)		7.96	7.8	8.26	7.77	7.62	7.81	7.99	7.92	7.9

Parameters -[Inorganic Chemical Compositio (Analyzed)	TREATED CONCENTRATION	Loading #1	Loading #2	Loading #3	Loading #4	Loading #5	Loading #6	Loading #7	Loading #8	Loading Ave
Ammonia Nitrogen -N	(mg/kg)	1,280	1,060	1,560	2,090	2,560	2,470	3,110	3,460	2,199
Total Kjeldahl Nitrogen (TKN)	(mg/kg)	2,160	1,680	2,240	2,910	3,120	2,760	4,260	4,580	2,964
Total Phosphorus	(mg/kg)	582	469	1,310	1,670	1,670	1,610	2,260	2,730	1,538
Nitrate (NO3)	(mg/kg)	86.9	3.7	10.4	1.43	2.17	16	29.4	10.7	20.1
Nitrite (NO2)	(mg/kg)	86.9	3.7	10.4	2.43	2.17	16	29.4	10.7	20.2

Parameters -Inorganics [Heavy Metals] (Analyzed)	TREATED CONCENTRATION	Loading #1	Loading #2	Loading #3	Loading #4	Loading #5	Loading #6	Loading #7	Loading #8	Loading Ave
Arsenic (As)	(mg/kg)	5.87	9.72	10.1	6.35	9.64	8.47	7.96	6.97	8.1
Cadmium (Cd)	(mg/kg)	2.09	2.77	3.49	2.16	4.87	6.11	6.35	5.49	4.2
Total Chromium (Cr)	(mg/kg)	21.8	29.6	39.2	31.6	32.8	30.2	31.2	24.9	30.2
Copper (Cu)	(mg/kg)	614	681	833	752	627	674	720	607	689
Lead (Pb)	(mg/kg)	24.5	27.9	62.1	51.3	55.8	44.3	52.6	52.5	46.4
Mercury (Hg)	(mg/kg)	0.216	0.119	0.157	0.164	0.127	0.156	0.163	0.125	0.2
Molybdenum (Mo)	(mg/kg)	0.968	2.82	2.68	1.68	2.67	2.44	2.69	2.37	2.3
Nickel (Ni)	(mg/kg)	10.9	14.3	18.4	25.4	28.3	25.9	25.3	22.7	21.4
Potassium (K)	(mg/kg)	2010	1660	2380	2860	2180	2070	2650	1740	2,194
Selenium (Se)	(mg/kg)	4.82	7.47	10.9	5.87	3.87	3.58	5.99	7.71	6.3
Zinc (Zn)	(mg/kg)	257	574	778	627	619	502	498	548	550

Parameters [Pathogens] (Analyzed)	TREATED CONCENTRATION	Loading #1	Loading #2	Loading #3	Loading #4	Loading #5	Loading #6	Loading #7	Loading #8	Loading Ave
Fecal Coliform Density (Wet)	col/100ml	2,400	50,000	9,000	50,000	26,000	14,000	50	240	18,961.3
Fecal Coliform Density (Dry)	col/100ml	25,800	92,000	47,000	61,000	28,000	110,000	740	1,300	45,730

Other Parameters Analyzed (Analyzed)	TREATED CONCENTRATION	Loading #1	Loading #2	Loading #3	Loading #4	Loading #5	Loading #6	Loading #7	Loading #8	Loading Ave
Total PCB's	(ug/kg), ppb	*DL(U)	*DL(U)	*DL(U)	*DL(U)	Not Tested	Not Tested	Not Tested	Not Tested	*DL(U)

*DL(U) = analyzed but not detected

TABLE 9: CONVENTIONAL BED - COMPARISON

ENERGY EFFICIENT SLUDGE TREATMENT
WITH REED BED TECHNOLOGY DEMONSTRATION PROJECT
CONESUS LAKE COUNTY SEWER DISTRICT LAKEVILLE TREATMENT FACILITY
NYSERDA (PON) No. 342-96

Progress Report Data Sampling Range: 6/6/2001 to 10/22/2001
PARAMETERS TESTED: NYSDEC [6-NYCRR PART 360-4]/ EPA Title 40CFR 503
Performed by Representative of Lozier Laboratories Inc.:
Composite Sludge Sample (3 Quarts) obtained by staff for analysis

COMPARISON	Date	(6/6)-(6/18)	(6/22)-(7/2)	(7/6)-(7/16)	(7/20)-(7/30)	(8/3)-(8/13)	(8/17)-(8/27)	(9/14)-(9/24)	(10/12)-(10/22)	(6/6)-(10/22)
Parameters [Composition] (Analyzed)	COMPARED CONCENTRATION	Loading #1	Loading #2	Loading #3	Loading #4	Loading #5	Loading #6	Loading #7	Loading #8	AVERAGE CHANGE
CUMULATED LOADING AMOUNTS	Gallons	14,130	14,130	14,130	14,130	14,130	14,130	14,130	14,130	14,130
Total Solids (%)		342.86%	2359.09%	614.81%	3473.91%	3075.86%	400.00%	161.54%	619.23%	1382.4%
Total Volatile Solids (%)		-19.11%	56.12%	-0.35%	-3.26%	-3.62%	0.71%	-4.54%	-12.87%	-0.4%
pH (S.U.)		8.74%	6.85%	13.46%	4.58%	1.87%	9.54%	10.66%	8.79%	8.0%

Parameters -[Inorganic Chemical Composition] (Analyzed)	COMPARED CONCENTRATION	Loading #1	Loading #2	Loading #3	Loading #4	Loading #5	Loading #6	Loading #7	Loading #8	AVERAGE CHANGE
Ammonia Nitrogen -N	(mg/kg)	86.86%	-23.19%	-15.68%	43.15%	21.90%	13.30%	15.61%	53.10%	20.4%
Total Kjeldahl Nitrogen (TKN)	(mg/kg)	41.18%	-25.00%	-31.08%	47.72%	-17.68%	-4.50%	-32.38%	-6.72%	-11.8%
Total Phosphorus	(mg/kg)	47.34%	-42.03%	-7.09%	21.90%	12.84%	-7.47%	4.15%	44.44%	9.2%
Nitrate (NO3)	(mg/kg)	816.67%	-95.93%	-85.95%	-98.36%	-96.86%	-80.00%	-61.77%	-86.09%	-71.5%
Nitrite (NO2)	(mg/kg)	816.67%	-95.93%	-85.95%	-97.21%	-96.86%	-80.00%	-61.77%	-86.09%	-71.3%

Parameters -Inorganics [Heavy Metals] (Analyzed)	COMPARED CONCENTRATION	Loading #1	Loading #2	Loading #3	Loading #4	Loading #5	Loading #6	Loading #7	Loading #8	AVERAGE CHANGE
Arsenic (As)	(mg/kg)	-12.78%	29.95%	17.17%	-21.80%	81.20%	-3.20%	-51.46%	-36.06%	-10.0%
Cadmium (Cd)	(mg/kg)	18.08%	24.77%	0.00%	-42.40%	198.77%	23.19%	15.04%	-8.80%	13.5%
Total Chromium (Cr)	(mg/kg)	-1.36%	10.86%	35.64%	8.59%	53.27%	10.62%	-8.77%	-25.00%	8.3%
Copper (Cu)	(mg/kg)	-1.29%	-10.98%	15.86%	3.72%	-24.64%	6.31%	-14.49%	-11.90%	-5.5%
Lead (Pb)	(mg/kg)	-42.89%	-50.62%	5.61%	-14.07%	3.53%	-14.31%	27.36%	-1.32%	-11.2%
Mercury (Hg)	(mg/kg)	-7.69%	-38.02%	-5.99%	6.49%	-19.11%	10.64%	3.16%	-25.15%	-10.4%
Molybdenum (Mo)	(mg/kg)	-58.98%	24.78%	-12.13%	-41.46%	23.04%	-8.61%	0.75%	-17.99%	-12.5%
Nickel (Ni)	(mg/kg)	0.00%	14.40%	3.37%	89.55%	192.36%	-21.04%	72.11%	75.97%	37.3%
Selenium (Se)	(mg/kg)	-8.22%	-37.36%	11.74%	31.19%	5.83%	-4.61%	3.92%	-20.18%	-3.1%
Potassium (K)	(mg/kg)	-9.06%	15.28%	57.74%	-22.15%	-59.43%	-39.63%	-18.61%	-21.81%	-14.8%
Zinc (Zn)	(mg/kg)	-9.82%	57.69%	41.71%	0.00%	20.90%	-8.23%	-18.23%	-12.74%	6.8%

Parameters [Pathogens] (Analyzed)	COMPARED CONCENTRATION	Loading #1	Loading #2	Loading #3	Loading #4	Loading #5	Loading #6	Loading #7	Loading #8	AVERAGE CHANGE
Fecal Coliform Density (Wet)	col/100ml	1311.76%	55455.56%	52841.18%	99900.00%	1299900.00%	63536.36%	-54.55%	1614.29%	31834.7%
Fecal Coliform Density (Dry)	col/100ml	3085.19%	2200.00%	7360.32%	2672.73%	39900.00%	12400.00%	-82.38%	140.74%	2644.5%

Other Parameters Analyzed (Analyzed)	COMPARED CONCENTRATION	Loading #1	Loading #2	Loading #3	Loading #4	Loading #5	Loading #6	Loading #8	Loading #10	AVERAGE CHANGE
Total PCB's	(ug/kg), ppb	*DL(U)	*DL(U)	*DL(U)	*DL(U)	Not Tested	Not Tested	Not Tested	Not Tested	*DL(U)

*DL(U) = analyzed but not detected

TABLE 10: CONVENTIONAL BED - VOLUME REDUCTION

ENERGY EFFICIENT SLUDGE TREATMENT
WITH REED BED TECHNOLOGY DEMONSTRATION PROJECT
CONESUS LAKE COUNTY SEWER DISTRICT LAKEVILLE TREATMENT FACILITY
NYSERDA (PON) No. 342-96

Progress Report Data Sampling Range: 6/6/2001 to 10/22/2001
PARAMETERS TESTED: NYSDEC [6-NYCRR PART 360-4]/ EPA Title 40CFR 503
Performed by Representative of Lozier Laboratories Inc.:
Composite Sludge Sample (3 Quarts) obtained by staff for analysis

VOLUME REDUCTION					
Parameters	TREATED CONCENTRATION	INITIAL Loading Sample	10-Day Sampling	DEDUCTION AMOUNTS	COMMENTS
AVE LOADING AMOUNT	Gallons	14,130			
Sludge thickness in bed	Inches	4.0	1.5		
Area	SF	6,000	6,000		
Volume of Sludge	CF	1,892	750	1142	Decreased Volume of Sludge

Parameters (Analyzed)	TREATED CONCENTRATION	INITIAL Loading	10-Day Sampling	CONCENTRATION PERCENT CHANGE	COMMENTS
Total Solids (%)	(mg/kg)	2.5	36.9	1382%	Increased Percent (Concentration)
Total Volatile Solids (%)	(mg/kg)	56.4	56.1	0%	Increased Percent (Concentration)

VOLUMES (Analyzed)	TREATED CONCENTRATION	INITIAL Loading	10-Day Sampling	REDUCTIONS PERCENT CHANGE	COMMENTS
Volume of Sludge	Gallons	14,130	5,603	-60%	Decreased Volume
Volume of Water	Gallons	13,779	3,537	-74%	Decreased Volume
Volume of Solids	Gallons	351	2,066	488%	Increased Volume (Concentration)
Volume Volatile of Solids	Gallons	198	1,160	485%	Increased Volume (Concentration)

TABLE 11: SLUDGE TREATMENT EFFECTIVENESS - COMPARISON

ENERGY EFFICIENT SLUDGE TREATMENT
WITH REED BED TECHNOLOGY DEMONSTRATION PROJECT
CONESUS LAKE COUNTY SEWER DISTRICT LAKEVILLE TREATMENT FACILITY
NYSERDA (PON) No. 342-96

Progress Report Data Sampling Range: 6/6/2001 to 10/22/2001
PARAMETERS TESTED: NYSDEC [6-NYCRR PART 360-4]/ EPA Title 40CFR 503
Performed by Representative of Lozier Laboratories Inc.:
Composite Sludge Sample (3 Quarts) obtained by staff for analysis

COMPARISON	Date Range	(6/6)-(10/22)		(6/6)-(10/22)		Date Range	(6/6)-(10/22)		(6/6)-(10/22)	
Parameters [Composition] (Analyzed)	TREATED CONCENTRATION	REED BED Ave.	REED BED EFEECTIVENESS	CONV. BED Ave.	CONV. BED EFEECTIVENESS	LOADING LIMITS	REED BED Ave.	REED BED EFEECTIVENESS	CONV. BED Ave.	CONV. BED EFEECTIVENESS
CUMULATED LOADING AMOUNTS	Gallons	153,386	Sludge Treated	14,130	Sludge Treated	Design Loading	14,138	Sludge Treated	14,130	Sludge Treated
Total Solids (%)		376.3%	Increased Conc.	1382.4%	Increased Conc.	2 to 3	2.6	In Range	2.5	In Range
Total Volatile Solids (%)		-4.8%	Decreased Conc.	-0.4%	Decreased Conc.	< 65	57.4	In Range	56.4	In Range
pH (S.U.)		6.9%	Increased Conc.	8.0%	Increased Conc.	5.5 to 8.5	7.2	In Range	7.3	In Range

Parameters -[Inorganic Chemical Composition] (Analyzed)	TREATED CONCENTRATION	REED BED Ave.	REED BED EFEECTIVENESS	CONV. BED Ave.	CONV. BED EFEECTIVENESS	MAX CONCENTRATION	REED BED Ave.	REED BED EFEECTIVENESS	CONV. BED Ave.	CONV. BED EFEECTIVENESS
Ammonia Nitrogen -N	(mg/kg)	13.4%	Increase Conc.	20.4%	Increased Conc.	Not Part of 503	2,005.3	-	1,825.6	-
Total Kjeldahl Nitrogen (TKN)	(mg/kg)	-18.0%	Decreased Conc.	-11.8%	Decreased Conc.	Not Part of 503	3,630.0	-	3,360.0	-
Total Phosphorus	(mg/kg)	7.5%	Increased Conc.	9.2%	Increased Conc.	Not Part of 503	1,490.5	-	1,408.0	-
Nitrate (NO3)	(mg/kg)	-64.1%	Decreased Conc.	-71.5%	Decreased Conc.	Not Part of 503	77.5	-	70.5	-
Nitrite (NO2)	(mg/kg)	-64.1%	Decreased Conc.	-71.3%	Decreased Conc.	Not Part of 503	77.5	-	70.5	-

Parameters -Inorganics [Heavy Metals] (Analyzed)	TREATED CONCENTRATION	REED BED Ave.	REED BED EFEECTIVENESS	CONV. BED Ave.	CONV. BED EFEECTIVENESS	CEILING CONCENTRATION	REED BED Ave.	REED BED EFEECTIVENESS	CONV. BED Ave.	CONV. BED EFEECTIVENESS
Arsenic (As)	(mg/kg)	-11.96%	Decreased Conc.	-10.0%	Decreased Conc.	75	7.6	Below Limit	9.0	Below Limit
Cadmium (Cd)	(mg/kg)	43.56%	Increased Conc.	13.5%	Increased Conc.	85	4.5	Below Limit	3.7	Below Limit
Total Chromium (Cr)	(mg/kg)	2.31%	Increased Conc.	8.3%	Increased Conc.	Not Part of 503	30.5	-	27.9	-
Copper (Cu)	(mg/kg)	-12.20%	Decreased Conc.	-5.5%	Decreased Conc.	4300	645.8	Below Limit	728.5	Below Limit
Lead (Pb)	(mg/kg)	-12.80%	Decreased Conc.	-11.2%	Decreased Conc.	840	45.7	Below Limit	52.3	Below Limit
Mercury (Hg)	(mg/kg)	-12.02%	Decreased Conc.	-10.4%	Decreased Conc.	57	0.2	Below Limit	0.2	Below Limit
Molybdenum (Mo)	(mg/kg)	-5.17%	Decreased Conc.	-12.5%	Decreased Conc.	75	2.2	Below Limit	2.6	Below Limit
Nickel (Ni)	(mg/kg)	32.46%	Increased Conc.	37.3%	Increased Conc.	420	21.5	Below Limit	15.6	Below Limit
Potassium (K)	(mg/kg)	-12.11%	Decreased Conc.	-3.1%	Decreased Conc.	Not Part of 503	2,113.75	-	2,263.75	-
Selenium (Se)	(mg/kg)	-19.11%	Decreased Conc.	-14.8%	Decreased Conc.	100	6.7	Below Limit	7.4	Below Limit
Zinc (Zn)	(mg/kg)	-0.05%	Decreased Conc.	6.8%	Increased Conc.	7500	516.4	Below Limit	515.1	Below Limit

Parameters [Pathogens] (Analyzed)	TREATED CONCENTRATION	REED BED Ave.	REED BED EFEECTIVENESS	CONV. BED Ave.	CONV. BED EFEECTIVENESS	CEILING CONCENTRATION	REED BED Ave.	REED BED EFEECTIVENESS	CONV. BED Ave.	CONV. BED EFEECTIVENESS
Fecal Coliform Density (Wet)	col/100ml	11953.19%	Increased Conc.	31834.74%	Increased Conc.	-	5665.0	Below Limit	59.4	
Fecal Coliform Density (Dry)	col/100ml	1780.68%	Increased Conc.	2644.49%	Increased Conc.	<2,000,000	33711.3	Below Limit	1666.3	Below Limit

Other Parameters Analyzed (Analyzed)	TREATED CONCENTRATION	REED BED Ave.	REED BED EFEECTIVENESS	CONV. BED Ave.	CONV. BED EFEECTIVENESS	CEILING CONCENTRATION	REED BED Ave.	REED BED EFEECTIVENESS	CONV. BED Ave.	CONV. BED EFEECTIVENESS
Total PCB's	(ug/kg), ppb	*DL(U)	No Detection	*DL(U)	No Detection	-	*DL(U)	No Detection	*DL(U)	No Detection

*DL(U) = analyzed but not detected

TABLE 12: WEATHER CONDITIONS

ENERGY EFFICIENT SLUDGE TREATMENT
WITH REED BED TECHNOLOGY DEMONSTRATION PROJECT
CONESUS LAKE COUNTY SEWER DISTRICT LAKEVILLE TREATMENT FACILITY
NYSERDA (PON) No. 342-96

Progress Report Data Sampling Range: 6/6/2001 to 10/22/2001

Performed by CLCSD WWTF staff

Composite Sludge Sample (3 Quarts) obtained by staff for analysis

MONTH/YEAR:

Date	Rain (Inches)	Temperature (F)	Wind (mph)	Comments
Mar-00	1.65			
Apr-00	5.22			
May-00	5.40			
Jun-00	5.59			
Jul-00	5.10			
Aug-00	3.53			
Sep-00	5.46			
Oct-00	1.55			
Nov-00	3.18			
Dec-00	3.54			
Jan-01	1.36			
Feb-01	1.84			
Mar-01	3.05			
Apr-01	0.67			
May-01	1.42			
Jun-01	1.45			
Jul-01	2.47			
Aug-02	n/a			
Sep-01	n/a			
Oct-01	n/a			
Nov-01	n/a			
Dec-01	n/a			

Per-Gallon Treatment Costs (Reed Bed vs. Conventional Bed)

TABLE 13: REED BED – TREATMENT COST PER GALLON

Task	**Reed bed Task**	Reed bed (Hrs)	Sludge Loadings	Total Hours	Wages $/hr	Total ($)
Task 2.4	Loading	0.56	11	6.16	$23.16	$142.67
Task 2.5	Maintenance	Reeds Cut Once/yr		4	$23.16	$92.64
Task 3.1	Sampling & Analysis	0.25	9	2.25	$26.48	$59.58
Task 3.2	Reports	0.5	9	4.5	$26.48	$119.16
					Total =	$414.05

Dried Sludge Disposal Cost/per year =	$97.91
Pumping to Sludge Storage Tank (Elec Cost/per year, split cost) =	$85.78
Pumping to Bed (Elec Cost/per year) =	$2.86
TOTAL COSTS/YEAR =	$600.59
(Demonstration interval sludge treatment) Total gallons of sludge treated/year =	153,386
SLUDGE TREAMENT COST ($/gal) =	**$0.0039**

TABLE 14: CONVENTIONAL BED – TREATMENT COST PER GALLON

Task	**Conventional bed Task**	Conventional bed (Hrs)	Sludge Loadings	Total Hours	Wages $/hr	Total $
Task 2.4	Loading	0.56	11	6.16	$23.16	$142.67
Task 2.5	Maintenance	4.5 - Sludge Cake Removal	11	49.5	$23.16	$1,146.42
Task 3.1	Sampling & Analysis	0.25	9	2.25	$26.48	$59.58
Task 3.2	Reports	0.5	9	4.5	$26.48	$119.16
					Total =	$1,467.83

Dried Sludge Disposal Cost/per year =	$979.14
Pumping to Sludge Storage Tank (Elec Cost/per year, split cost) =	$85.78
Pumping to Bed (Elec Cost/per year) =	$2.86
TOTAL COSTS/YEAR =	$2,535.60
(Demonstration interval sludge treatment) Total gallons of sludge treated/year =	113,040
SLUDGE TREAMENT COST ($/gal) =	**$0.022**

Conesus Lake County Sewer District
Reed Bed Demonstration Project

TABLE 15: GROUP TASK COST SUMMARY

		Group 1			Group 2			Group 3		
		Clark Patterson Associates and NEWS, Inc.			Construction of Beds and Analysis Costs			Conesus Lake County Sewer District Labor Costs		
	Tasks	Project Task Cost	Spent to Date	Amount Remaining	Project Task Cost	Spent to Date	Amount Remaining	Project Task Cost	Spent to Date	Amount Remaining
Task 1.1	Design	$2,500.00	$2,500.00	$0.00						
Task 1.2	Plans	$3,300.00	$3,300.00	$0.00						
Task 1.3	Permits	$2,500.00	$2,500.00	$0.00						
Task 2.1	Construction	$900.00	$900.00	$0.00	$40,960.00	$40,960.00	$0.00	$1,186.20	$1,186.20	$0.00
Task 2.2	Planting	$10,000.00	$10,000.00	$0.00				$829.40	$829.40	$0.00
Task 2.3	Monitoring	$6,000.00	$6,000.00	$0.00	$3,360.00	$3,360.00	$0.00			
Task 2.4	Loading	$2,000.00	$2,000.00	$0.00				$4,147.00	$4,147.00	$0.00
Task 2.5	Maintenance							$4,147.00	$4,147.00	$0.00
Task 3.1	Sampling & Analysis	$5,750.00	$5,750.00	$0.00				$4,147.00	$4,147.00	$0.00
Task 3.2	Reports	$9,810.00	$9,810.00	$0.00				$945.20	$945.20	$0.00
	Contingency				$13,150.00	$0.00	$13,150.00			
	Total Group Tasks Cost	**$42,760.00**	**$42,760.00**	**$0.00**	**$44,320.00**	**$44,320.00**	**$0.00**	**$15,401.80**	**$15,401.80**	**$0.00**

TABLE 16: TASK COST SUMMARY

	Tasks	Total Project Costs	Total Spent to Date	Total Remaining
Task 1.1	Design	$2,500.00	$2,500.00	$0.00
Task 1.2	Plans	$3,300.00	$3,300.00	$0.00
Task 1.3	Permits	$2,500.00	$2,500.00	$0.00
Task 2.1	Construction	$43,046.20	$43,046.20	$0.00
Task 2.2	Planting	$10,829.40	$10,829.40	$0.00
Task 2.3	Monitoring	$9,360.00	$9,360.00	$0.00
Task 2.4	Loading	$6,147.00	$6,147.00	$0.00
Task 2.5	Maintenance	$4,147.00	$4,147.00	$0.00
Task 3.1	Sampling & Analysis	$9,897.00	$9,897.00	$0.00
Task 3.2	Reports	$10,755.20	$10,755.20	$0.00
	Contingency	$13,150.00	$0.00	$13,150.00
	Total Group Tasks Cost	$115,631.80	$102,481.80	$13,150.00

APPENDIX B

APPENDIX C

NEW YORK STATE - PUBLICLY OWNED WASTEWATER TREATMENT FACILITIES

That use sludge drying beds for sludge treatment

	Facility Name	Authority Name	City Name	County Name	Zip Code
1	ALTAMONT STP	ALTAMONT, VILLAGE OF	ALTAMONT	ALBANY	12009
2	PARK GUILDERLAND STP	GUILDERLAND, TOWN OF	GUILDERLAND	ALBANY	12084
3	RENSSELAERVILLE WWTP	RENSSELAERVILLE, TOWN OF	RENSSELAERVILLE	ALBANY	12147
4	VOORHEESVILLE WWTP	VOORHEESVILLE, VILLAGE OF	VOORHEESVILLE	ALBANY	12186
5	ALFRED STP	ALFRED, VILLAGE OF	ALFRED	ALLEGANY	14803
6	BELMONT STP	BELMONT, VILLAGE OF	BELMONT	ALLEGANY	14813
7	BOLIVAR STP	BOLIVAR, VILLAGE OF	BOLIVAR	ALLEGANY	14715
8	CUBA STP	CUBA, VILLAGE OF	CUBA	ALLEGANY	14727
9	FRIENDSHIP WWCS	FRIENDSHIP, TOWN OF	FRIENDSHIP	ALLEGANY	14739
10	WELLSVILLE WWTP	WELLSVILLE, VILLAGE OF	WELLSVILLE	ALLEGANY	14895
11	DEPOSIT VILLAGE STP	DEPOSIT, VILLAGE OF	DEPOSIT	BROOME	13754
12	FRANKLINVILLE WWTP	FRANKLINVILLE, VILLAGE OF	FRANKLINVILLE	CATTARAUGUS	14737
13	LIMESTONE STP	LIMESTONE, VILLAGE OF	LIMESTONE	CATTARAUGUS	14753
14	PORTVILLE WWTP	PORTVILLE, VILLAGE OF	PORTVILLE	CATTARAUGUS	14770
15	RANDOLPH WWTF	RANDOLPH, VILLAGE OF	RANDOLPH	CATTARAUGUS	14772
16	AURORA WPCF	AURORA, VILLAGE OF	AURORA	CAYUGA	13026
17	MORAVIA WPCP	MORAVIA, VILLAGE OF	MORAVIA	CAYUGA	13118
18	PORT BYRON WWTP	NYS ENV FAC CORP	PORT BYRON	CAYUGA	12201
19	UNION SPRINGS STP	UNION SPRGS DEPT PUB WKS	UNION SPRINGS	CAYUGA	13160
20	WEEDSPORT SS	WEEDSPORT VILLAGE	WEEDSPORT	CAYUGA	13166
21	CHAUTAUQUA STP	CHAUTAUQUA UTILITY DIST	CHAUTAUQUA	CHAUTAUQUA	14722
22	JAMESTOWN WWTP	JAMESTOWN DPW	JAMESTOWN	CHAUTAUQUA	14701
23	N CHAUTAUQUA LAKE STP	MAYVILLE, VILLAGE OF	MAYVILLE	CHAUTAUQUA	14757
24	RIPLEY SEW DIST	RIPLEY, TOWN OF	RIPLEY	CHAUTAUQUA	14775
25	SHERMAN WWTP	SHERMAN, VILLAGE OF	SHERMAN	CHAUTAUQUA	14781
26	SILVER CREEK WWTP	SILVER CREEK, VILLAGE OF	SILVER CREEK	CHAUTAUQUA	14136
27	HANOVER SD #1	HANOVER, TOWN OF	SILVER CREEK	CHAUTAUQUA	14136
28	SOUTHPORT UNIV. AREA	SOUTHPORT (T)	SOUTHPORT (V)	CHEMUNG	14903
29	BAINBRIDGE STP	BAINBRIDGE, VILLAGE OF	BAINBRIDGE	CHENANGO	13733
30	GREENE STP AND COLL SYS	GREENE, VILLAGE OF	GREENE	CHENANGO	13778
31	NORWICH STP	NORWICH, CITY OF	NORWICH	CHENANGO	13815
32	OXFORD STP & SS	OXFORD, VILLAGE OF	OXFORD	CHENANGO	13830

33	SHERBURNE WTP	SHERBURNE, VILLAGE OF	SHERBURNE	CHENANGO	13460
34	SMYRNA STP & COLL SYST	SMYRNA, VILLAGE OF	SMYRNA	CHENANGO	13464
35	CHAMPLAIN STP	CHAMPLAIN, VILLAGE OF	CHAMPLAIN	CLINTON	12919
36	KEESEVILLE STP	KEESEVILLE, VILLAGE OF	KEESEVILLE	CLINTON	12944
37	PERU SEWER DISTRICT	PERU, TOWN OF	PERU	CLINTON	12972
38	PLATTSBURGH, TOWN OF	PLATTSBURGH, TOWN OF	PLATTSBURGH	CLINTON	12962
39	CHAMPLAIN PARK SD	PLATTSBURGH, TOWN OF	PLATTSBURGH	CLINTON	12901
40	ROUSES POINT STP	ROUSES POINT, VILLAGE OF	ROUSES POINT	CLINTON	12979
41	CHATHAM VILLAGE WPCF	CHATHAM, VILLAGE OF	CHATHAM	COLUMBIA	12037
42	GREENPORT TOWN STP	GREENPORT, TOWN OF	GREENPORT	COLUMBIA	11944
43	PHILMONT STP	PHILMONT, VILLAGE OF	PHILMONT	COLUMBIA	12565
44	VALATIE STP	VALATIE, VILLAGE OF	VALATIE	COLUMBIA	12184
45	DELHI WWTF	DELHI, VILLAGE OF	DELHI	DELAWARE	13753
46	GRAND GORGE STP	NYCDEP	GRAND GORGE	DELAWARE	12434
47	HANCOCK SEWERAGE FAC	HANCOCK, VILLAGE OF	HANCOCK	DELAWARE	13783
48	HOBART WWTF	HOBART, VILLAGE OF	HOBART	DELAWARE	13788
49	MARGARETVILLE-ARKVILLE	NYC DEP	MIDDLETOWN	DELAWARE	12455
50	SIDNEY WWTP	SIDNEY, VILLAGE OF	SIDNEY	DELAWARE	13838
51	STAMFORD WWTF	STAMFORD, VILLAGE OF	STAMFORD	DELAWARE	12167
52	DUTCHESS PARK STP	FISHKILL, TOWN OF	BRINKERHOFF SS ARE/	DUTCHESS	12524
53	BROCKWAY SS AREA #3	FISHKILL, TOWN OF	HUDSON VIEW APTS ST	DUTCHESS	12524
54	PAWLING WWTP	PAWLING, VILLAGE OF	PAWLING	DUTCHESS	12564
55	LAGRANGE SD #2 STP	LAGRANGE TOWN SEWER DISTR	PLEASANT VALLEY	DUTCHESS	12569
56	COUNTRY CLUB ESTATES WWTP	POUGHKEEPSIE, TOWN OF	POUGHKEEPSIE	DUTCHESS	12603
57	STAATSBURG NEW AREA 1A	HYDE PARK S I A	STAATSBURG	DUTCHESS	12580
58	TIVOLI WWTP	TIVOLI, VILLAGE OF	TIVOLI	DUTCHESS	12583
59	AKRON STP	AKRON, VILLAGE OF	AKRON	ERIE	14001
60	ALDEN STP	ALDEN, VILLAGE OF	ALDEN	ERIE	14004
61	ERIE CO.HOME & INFIRM.	ERIE COUNTY	ALDEN	ERIE	14004
62	BIG SISTER CR. STP	ERIE CO	ANGOLA	ERIE	14006
63	BLASDELL STP	BLASDELL, VILLAGE OF	BLASDELL	ERIE	14219
64	EAST AURORA	EAST AURORA, VILLAGE OF	EAST AURORA	ERIE	14052
65	ERIE COUNTY SD #6B	ERIE CO	HOLLAND	ERIE	14080
66	HOLLAND STP/ECSD#3 EXT	ERIE CO	HOLLAND	ERIE	14080
67	SD #6 - LACKAWANNA	ERIE COUNTY	LACKAWANNA	ERIE	14218

68	SPRINGVILLE STP	SPRINGVILLE, VILLAGE OF	SPRINGVILLE	ERIE	14141
69	ELIZABETHTOWN SD	ELIZABETHTOWN, TOWN OF	ELIZABETHTOWN	ESSEX	12932
70	LAKE PLACID STP	LAKE PLACID, VILLAGE OF	LAKE PLACID	ESSEX	12946
71	PORT HENRY STP	PORT HENRY, VILLAGE OF	PORT HENRY	ESSEX	12974
72	SCHROON LAKE WPCP	NYS ENVIR FAC CORP	SCHROON LAKE	ESSEX	12870
73	TICONDEROGA STP	TICONDEROGA, TOWN OF	TICONDEROGA	ESSEX	12883
74	WESTPORT ST	WESTPORT, TOWN OF	WESTPORT	ESSEX	12993
75	WILLSBORO STP	WILLSBORO, TOWN OF	WILLSBORO	ESSEX	12936
76	MALONE STP	MALONE, VILLAGE OF	MALONE	FRANKLIN	12953
77	SARANAC LAKE STP	SARANAC LAKE, VILLAGE OF	SARANAC LAKE	FRANKLIN	12983
78	TUPPER LAKE WPC	TUPPER LAKE, VILLAGE OF	TUPPER LAKE	FRANKLIN	12986
79	CORFU WWTP	CORFU, VILLAGE OF	CORFU	GENESEE	14036
80	LEROY STP	LEROY, VILLAGE OF	LEROY	GENESEE	14482
81	OAKFIELD STP	OAKFIELD, VILLAGE OF	OAKFIELD	GENESEE	14125
82	MAIN TREATMENT PLANT	ATHENS, VILLAGE OF	ATHENS	GREENE	12015
83	CAIRO SEWER DISTRICT #1	CAIRO SEWER AUTH, TOWN OF	CAIRO	GREENE	12413
84	CEMENTON WPCF	CATSKILL-CEMENTON SA	CATSKILL	GREENE	12415
85	HUNTER VILLAGE SD	HUNTER, VILLAGE OF	HUNTER	GREENE	12442
86	TWILIGHT PARK SD	HUNTER, TOWN OF	HUNTER	GREENE	12485
87	HAINES FALLS SD	HUNTER, TOWN OF	HUNTER	GREENE	12485
88	NEW BALTIMORE STP	NEW BALTIMORE, TOWN OF	NEW BALTIMORE	GREENE	12124
89	SPECULATOR SD	SPECULATOR, VILLAGE OF	SPECULATOR	HAMILTON	12164
90	OLD FORGE WWTF	WEBB, TOWN OF	OLD FORGE	HERKIMER	13420
91	ADAMS TREATMENT PLANT	ADAMS, VILLAGE OF	ADAMS	JEFFERSON	13605
92	CAPE VINCENT STP	CAPE VINCENT, VILLAGE OF	CAPE VINCENT	JEFFERSON	13618
93	CLAYTON WWTP	CLAYTON, VILLAGE OF	CLAYTON	JEFFERSON	13624
94	SACKETTS HARBOR STP	SACKETTTS HARBOR, VILL. OF	SACKETTS HARBOR	JEFFERSON	13685
95	THOUSAND IS. PARK. S.D.	ORLEANS, TOWN OF	THOUSAND ISL. PK.	JEFFERSON	13656
96	CASTORLAND VILLAGE SD	CASTORLAND, VILLAGE OF	CASTORLAND	LEWIS	13620
97	PORT LEYDEN WWTP	PORT LEYDEN, VILLAGE OF	PORT LEYDEN	LEWIS	13433
98	AVON WTW	AVON, VILLAGE OF	AVON	LIVINGSTON	14414
99	GENESEO STP	GENESEO, VILLAGE OF	GENESEO	LIVINGSTON	14454
100	CONESUS LAKE CO SD	CONESUS LAKE COUNTY SEWER	LAKEVILLE	LIVINGSTON	14480
101	LIMA STP	LIMA, VILLAGE OF	LIMA	LIVINGSTON	14485
102	MT MORRIS STP	MT MORRIS, VILLAGE OF	MT MORRIS	LIVINGSTON	14510

103	AGR AND TECH COLLEGE STP	SUNY AT MORRISVILLE	EATON	MADISON	13408
104	HAMILTON WPC PLANT	HAMILTON, VILLAGE OF	HAMILTON	MADISON	13346
105	MADISON STP & S S	MADISON, VILLAGE OF	MADISON	MADISON	13402
106	MORRISVILLE STP & SS	MORRISVILLE, VILLAGE OF	MORRISVILLE	MADISON	13408
107	CHURCHVILLE STP	CHURCHVILLE, VILLAGE OF	CHURCHVILLE	MONROE	14428
108	SCOTTSVILLE SD	SCOTTSVILLE, VILLAGE OF	SCOTTSVILLE	MONROE	14546
109	STATE AGR & IND SCHOOL	NYS GEN SERVICE OFFICE	TOWN OF RUSH	MONROE	14543
110	WEBSTER TP	WEBSTER, VILLAGE OF	WEBSTER	MONROE	14580
111	MONT CO SD 1 AND STP	MONT CO SD NO. 1	FORT PLAIN	MONTGOMERY	13339
112	LAWRENCE WPC	INC VILLAGE OF LAWRENCE	LAWRENCE	NASSAU	11559
113	ROYALTON SD#1	ROYALTON TOWN OF	GASPORT	NIAGARA	14067
114	LOCKPORT WWTP	LOCKPORT DPW	LOCKPORT	NIAGARA	14094
115	RANSOMVILLE	PORTER, TOWN OF	PORTER	NIAGARA	14131
116	WILSON STP	WILSON, VILLAGE OF	WILSON	NIAGARA	14172
117	BOONVILLE STP	BOONVILLE, VILLAGE OF	BOONVILLE	ONEIDA	13309
118	CAMDEN WWT FACILITY	CAMDEN, VILLAGE OF	CAMDEN	ONEIDA	13316
119	CLARK MILLS SD AND STP	KIRKLAND, TOWN OF	CLARK HILLS	ONEIDA	13321
120	CLINTON WWT PLANT	CLINTON, VILLAGE OF	CLINTON	ONEIDA	13323
121	SHERRILL STP	SHERRILL, CITY OF	SHERRILL	ONEIDA	13461
122	VERNON WPCF	NYS ENV FACILITIES CORP	VERNON	ONEIDA	13476
123	WATERVILLE STP	WATERVILLE, VILLAGE OF	WATERVILLE	ONEIDA	13480
124	BALDWINSVILLE-SENECA KNOL	ONONDAGA COUNTY DPW	BALDWINSVILLE	ONONDAGA	13207
125	BREWERTON STP LAKE SHORE	ONONDAGA DDS	BREWERTON	ONONDAGA	13029
126	MEADOWBROOK LIMESTONE STP	ONONDAGA COUNTY DDS	MANLIUS	ONONDAGA	13104
127	MARCELLUS STP	MARCELLUS, VILLAGE OF	MARCELLUS	ONONDAGA	13108
128	MINOA WWTP	MINOA, VILLAGE OF	MINOA	ONONDAGA	13116
129	TULLY STP	TULLY, VILLAGE OF	TULLY	ONONDAGA	13159
130	FARMINGTON STP	FARMINGTON, TOWN OF	FARMINGTON	ONTARIO	14564
131	MARSH CREEK TREATMENT PLA	GENEVA, CITY OF	GENEVA	ONTARIO	14456
132	VICTOR STP	VICTOR, VILLAGE OF	VICTOR	ONTARIO	14564
133	FORT MONTGOMERY SD	HIGHLANDS, TOWN OF	FT. MONTGOMERY	ORANGE	10922
134	GOSHEN S T P	GOSHEN, VILLAGE OF	GOSHEN	ORANGE	10924
135	ORANGE DPT. OF SOCIAL SER.	ORANGE CO	GOSHEN	ORANGE	10924
136	ORANGE COUNTY SD#1	ORANGE CO	HARRIMAN	ORANGE	10924
137	MAYBROOK, STP	MAYBROOK, VILLAGE OF	MAYBROOK	ORANGE	12543

138	MIDDLETOWN WTP	ORANGE CO. SA	MIDDLETOWN	ORANGE	10940
139	MONTGOMERY STP	MONTGOMERY, VILLAGE OF	MONTGOMERY	ORANGE	12549
140	COLDEN PARK SD	NEWBURGH, TOWN OF	NEWBURGH	ORANGE	12550
141	MOUNT HOPE SD NO. 1	MOUNT HOPE, TOWN OF	OTISVILLE	ORANGE	10963
142	PORT JERVIS STP	NYC DEP	PORT JERVIS	ORANGE	12771
143	TUXEDO PK WTP	TUXEDO PARK, VILLAGE OF	TUXEDO PARK	ORANGE	10987
144	TUXEDO STP	TUXEDO, TOWN OF	TUXEDO-HAMLET	ORANGE	10987
145	WALDEN STP	WALDEN, VILLAGE OF	WALDEN	ORANGE	12586
146	WALLKILL STP	WALLKILL, TOWN OF	WALLKILL	ORANGE	10940
147	WARWICK WWTS	WAWAYANDA D.B.	WARWICK	ORANGE	10990
148	WICKHAM LAKE STP	WAWAYANDA D.B.	WARWICK	ORANGE	10990
149	BLOOMING GROVE SD NO 5	BLOOMING GROVE, TOWN OF	WASHINGTONVILLE	ORANGE	10992
150	WASHINGTONVILLE STP	WASHINGTONVILLE, VILLAGE	WASHINGTONVILLE	ORANGE	10992
151	LYNDONVILLE STP	LYNDONVILLE, VILLAGE OF	LYNDONVILLE	ORLEANS	14098
152	CENTRAL SQ WPCP	CENTRAL SQUARE, VIL OF	CENTRAL SQUARE	OSWEGO	13036
153	CLEVELAND STP	CLEVELAND, VILLAGE OF	CLEVELAND	OSWEGO	13042
154	HANNIBAL STP	HANNIBAL, VILLAGE OF	HANNIBAL	OSWEGO	13074
155	SLEEPY HOLLOW SD	OSWEGO, TOWN OF	OSWEGO	OSWEGO	13126
156	PHOENIX SS & STP	PHOENIX, VILLAGE OF	PHOENIX	OSWEGO	13135
157	PULASKI WWTP	NYS ENVIR FAC CORP	PULASKI	OSWEGO	13142
158	WEST MONROE STP	WEST MONROE, TOWN OF	WEST MONROE	OSWEGO	13167
159	COOPERSTOWN STP	COOPERSTOWN, VILLAGE OF	COOPERSTOWN	OTSEGO	13326
160	ONEONTA WWT PLANT	ONEONTA, CITY OF	ONEONTA	OTSEGO	13820
161	RICHFIELD SPRINGS STP	RICHFIELD SPGS, VILL. OF	RICHFIELD SPRINGS	OTSEGO	13439
162	UNADILLA WTF	UNADILLA, VILLAGE OF	UNADILLA	OTSEGO	13849
163	BREWSTER STP	NYC DEP	BREWSTER (V)	PUTNAM	10509
164	CARMEL SEWER DIST #2	CARMEL, TOWN OF	CARMEL	PUTNAM	10512
165	SOUTHEAST WPCP	SOUTHEAST, TOWN OF	CENTRAL CORE AREA	PUTNAM	10509
166	COLD SPRING WWTP	COLD SPRING (V)	COLD SPRING	PUTNAM	10516
167	CARMEL SD #4(LK SECOR)	CARMEL, TOWN OF	LAKE SECOR	PUTNAM	10541
168	CARMEL SD 1&3	CARMEL, TOWN OF	MAHOPAC	PUTNAM	10541
169	CARMEL SD#5	CARMEL, TOWN OF	MAHOPAC	PUTNAM	10541
170	HOOSICK FALLS STP	HOOSICK FALLS, VILLAGE OF	HOOSICK FALLS	RENSSELAER	12090
171	SCHAGHTICOKE STP	SCHAGHTICOKE ,VILLAGE	SCHAGHTICOKE	RENSSELAER	12154
172	SCHODACK MAIN STP	SCHODACK, TOWN OF	SCHODACK	RENSSELAER	12156

173	STONY POINT STP	STONY POINT, TOWN OF	STONY POINT	ROCKLAND	10980
174	HADLEY SD TREATMENT PLANT	HADLEY SEWER DIST, TOWN OF	HADLEY	SARATOGA	12835
175	SCHUYLERVILLE STP	SCHUYLERVILLE, VILLAGE OF	SCHUYLERVILLE	SARATOGA	12871
176	STILLWATER STP	STILLWATER VILLAGE	STILLWATER	SARATOGA	12170
177	WATERFORD STP	ENVIRONMENTAL FAC CORP	WATERFORD	SARATOGA	12188
178	NISKAYUNA SD #6 STP	NISKAYUNA, TOWN 0F	NISKAYUNA	SCHENECTADY	12309
179	ROTTERDAM SD#2 STP	ROTTERDAM, TOWN OF	ROTTERDAM	SCHENECTADY	12303
180	COBLESKILL STP	COBLESKILL, VILLAGE OF	COBLESKILL	SCHOHARIE	12043
181	MIDDLEBURGH STP	MIDDLEBURGH, VILLAGE OF	MIDDLEBURGH	SCHOHARIE	12122
182	RICHMONDVILLE STP	RICHMONDVILLE, VILLAGE OF	RICHMONDVILLE	SCHOHARIE	12149
183	SCHOHARIE WWTP	SCHOHARIE, VILLAGE OF	SCHOHARIE	SCHOHARIE	12157
184	SHARON SPRINGS WTF	SHARON SPRINGS, VILLAGE OF	SHARON SPRINGS	SCHOHARIE	13459
185	MONTOUR FALLS STP	MONTOUR FALLS, VILLAGE OF	MONTOUR FALLS	SCHUYLER	14685
186	TYRONE SD #1	TYRONE, TOWN OF	TYRONE	SCHUYLER	14887
187	WATKINS GLEN STP	WATKINS GLEN, VILLAGE OF	WATKINS GLEN	SCHUYLER	14891
188	SENECA FALLS STP	SENECA FALLS, VILLAGE OF	SENECA FALLS	SENECA	13148
189	SENECA CO REG STP	SENECA CO SEW DIST #1	WILLARD	SENECA	14588
190	HERMON PCP	HERMON, VILLAGE OF	HERMON	ST LAWRENCE	13652
191	STP MASSENA	MASSENA, VILLAGE OF	MASSENA	ST LAWRENCE	13662
192	OGDENSBURG WPCP	OGDENSBURG, CITY OF	OGDENSBURG	ST LAWRENCE	13669
193	WADDINGTON WPCP	WADDINGTON, VILLAGE OF	WADDINGTON	ST LAWRENCE	13694
194	ADDISON WWTP	NYS EFC	ADDISON (V)	STEUBEN	14801
195	PAINTED POST WWTP	PAINTED POST, VILLAGE OF	PAINTED POST	STEUBEN	14870
196	WAYLAND SEWERAGE SYSTEM	WAYLAND, VILLAGE OF	WAYLAND	STEUBEN	14572
197	LK. RONKONKOMA	SUFFOLK CO DPW	CALVERTON	SUFFOLK	11933
198	E HAMPTON ST	E HAMPTON, TOWN OF	EAST HAMPTON	SUFFOLK	11937
199	GREENPORT STP	GREENPORT, VILLAGE OF	GREENPORT	SUFFOLK	11944
200	S.D. #5	SUFFOLK CO. DPW	HUNTINGTON	SUFFOLK	11746
201	NORTHPORT SEW TREAT FAC	NORTHPORT BD OF TRUSTEES	NORTHPORT	SUFFOLK	11768
202	PATCHOGUE STP	INC VILLAGE OF PATCHOGUE	PATCHOGUE	SUFFOLK	11772
203	RIVERHEAD STP	RIVERHEAD SEWER DIST ,	RIVERHEAD	SUFFOLK	11901
204	SAG HARBOR WWTP	SAG HARBOR, VILLAGE OF	SAG HARBOR	SUFFOLK	11963
205	SHELTER ISLAND STP	SHELTER ISLAND, TOWN OF	SHELTER ISLAND	SUFFOLK	11964
206	PARR VILLAGE,S.D.#16	SUFFOLK CO DPW	YAPHANK	SUFFOLK	11980
207	DELAWARE SD #2	DELAWARE, TOWN OF	CALLICOON	SULLIVAN	12723

208	SOUTH FALLSBURG SD	FALLSBURG, TOWN OF	FALLSBURG	SULLIVAN	12779
209	JEFFERSONVILLE	JEFFERSONVILLE, VILLAGE OF	JEFFERSONVILLE	SULLIVAN	12748
210	LAKE HUNTINGTON SD	COCHECTON, TOWN OF	LAKE HUNTINGTON	SULLIVAN	12752
211	LIVINGSTON MANOR STP	ROCKLAND, TOWN OF	LIVINGSTON MANOR	SULLIVAN	12758
212	ROSCOE STP	ROCKLAND, TOWN OF	LIVINGSTON MANOR	SULLIVAN	12776
213	LOCH SHELDRAKE SD#1	FALLSBURG, TOWN OF	LOCH SHELDRAKE	SULLIVAN	12759
214	MONTICELLO STP AND SD #1	MONTICELLO, VILLAGE OF	MONTICELLO	SULLIVAN	12701
215	KIAMESHA LAKE SD STP	THOMPSON, TOWN OF	MONTICELLO	SULLIVAN	12701
216	GRAHAMSVILLE STP	NYC DEP	NEVERSINK	SULLIVAN	12740
217	PARKSVILLE SEWER DIST	LIBERTY, TOWN OF	PARKSVILLE	SULLIVAN	12768
218	SWAN LAKE SEWER DIST	LIBERTY, TOWN OF	SWAN LAKE	SULLIVAN	12783
219	SACKETT LAKE SD #4	THOMPSON, TOWN OF	THOMPSON	SULLIVAN	12701
220	KAUNEONGA LAKE STP	BETHEL, TOWN OF	WHITE LAKE	SULLIVAN	12749
221	OWEGO WPCF	OWEGO SEWER DISTRICT NO 1	APALACHIN	TIOGA	13732
222	CANDOR STP	CANDOR, VILLAGE OF	CANDOR	TIOGA	13743
223	OWEGO VILLAGE STP	OWEGO, VILLAGE OF	OWEGO	TIOGA	13827
224	WAVERLY STP	WAVERLY, VILLAGE OF	WAVERLY	TIOGA	14892
225	DRYDEN STP	DRYDEN, VILLAGE OF	DRYDEN	TOMPKINS	13053
226	GROTON WWTP	GROTON, VILLAGE OF	GROTON	TOMPKINS	13073
227	TRUMANSBURG WWTP	TRUMANSBURG, VILLAGE OF	TRUMANSBURG	TOMPKINS	14886
228	ELLENVILLE WWTP	ELLENVILLE, VILLAGE OF	ELLENVILLE	ULSTER	12428
229	ULSTER SIA	ULSTER, TOWN OF	LAKE KATRINE	ULSTER	12449
230	MARLBOROUGH SWR IMP AREA	MARLBOROUGH, TOWN OF	MARLBOROUGH	ULSTER	12542
231	NAPANOCH CS STP	WAWARSING, TOWN OF	NAPANOCH	ULSTER	12458
232	NEW PALTZ STP	NEW PALTZ, VILLAGE OF	NEW PALTZ	ULSTER	12561
233	PINE HILL STP	NYC DEP	PINE HILL	ULSTER	12465
234	ROSENDALE STP	ROSENDALE, VILLAGE OF	ROSENDALE	ULSTER	12472
235	SAUGERTIES SD AND STP	SAUGERTIES, VILLAGE OF	SAUGERTIES	ULSTER	12477
236	MALDEN-ON-HUDSON SD	SAUGERTIES, TOWN OF	SAUGERTIES	ULSTER	12477
237	MT MARION SD	SAUGERTIES, TOWN OF	SAUGERTIES	ULSTER	12477
238	WHITTIER SD	ULSTER TOWN BOARD	ULSTER	ULSTER	12449
239	WALLKILL SD AND STP	SHAWANGUNK, TOWN OF	WALLKILL	ULSTER	12589
240	WOODSTOCK SIA	WOODSTOCK, TOWN OF	WOODSTOCK	ULSTER	12498
241	HAGUE SD	HAGUE, TOWN OF	HAGUE	WARREN	12836
242	WARRENSBURG STP	WARRENSBURG, TOWN OF	WARRENSBURG	WARREN	12885

243	FORT ANN STP	FORT ANN, TOWN OF	FORT ANN	WASHINGTON	12827
244	FORT ANN SD	FORT ANN, VILLAGE OF	FORT ANN	WASHINGTON	12827
245	GRANVILLE STP	GRANVILLE, VILLAGE OF	GRANVILLE	WASHINGTON	12832
246	GREENWICH WPCP	GREENWICH, VILLAGE OF	GREENWICH	WASHINGTON	12834
247	WHITEHALL WTF	WHITEHALL, VILLAGE OF	WHITEHALL	WASHINGTON	12887
248	CLYDE SAN SEW SYS	CLYDE, VILLAGE OF	CLYDE	WAYNE	14433
249	ONTARIO SAN SEW. SYSTEM	ONTARIO, TOWN OF	ONTARIO	WAYNE	14519
250	PALMYRA STP	PALMYRA, VILLAGE OF	PALMYRA	WAYNE	14522
251	SAVANNAH WPC PLANT	SAVANNAH, TOWN OF	SAVANNAH	WAYNE	13146
252	SODUS STP	SODUS, VILLAGE OF	SODUS	WAYNE	14551
253	SODUS POINT WPC FAC	SODUS POINT, VILLAGE OF	SODUS POINT	WAYNE	14555
254	WALWORTH SEWERAGE SYSTEM	WALWORTH, TOWN OF	WALWORTH	WAYNE	14568
255	WILLIAMSON STP	WILLIAMSON PURE WATER SYS	WILLIAMSON	WAYNE	14589
256	NORTHCASTLE TOWN SD STP	NORTHCASTLE, TOWN OF	ARMONK	WESTCHESTER	10504
257	BUCHANAN STP	BUCHANAN, VILLAGE OF	BUCHANAN	WESTCHESTER	10511
258	MAMARONECK SAN. SEW. DIST.	WESTCHESTER CO DEF	MAMARONECK	WESTCHESTER	10543
259	ARCADE WWTP	ARCADE, VILLAGE OF	ARCADE	WYOMING	14009
260	ATTICA WWTP	ATTICA, VILLAGE OF	ATTICA	WYOMING	14011
261	PERRY STP	PERRY, VILLAGE OF	PERRY	WYOMING	14530
262	WARSAW STP	WARSAW, VILLAGE OF	WARSAW	WYOMING	14569
263	DRESDEN STP & CS	DRESDEN, VILLAGE OF	DRESDEN	YATES	14441
264	PENN YAN STP	PENN YAN, VILLAGE OF	PENN YAN	YATES	14527

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