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(LICENSED IN TEXAS ONLY)

April 13, 2004

HAND DELIVERY

Ms. Blanca Bayo
Commission Clerk and Administrative Services Director
Florida Public Service Commission
2540 Shumard Oak Boulevard
Tallahassee, FL 32399

Re: Docket No. 030445-SU; Application by Utilities, Inc. of Eagle Ridge for Rate Increase in Lee County, Florida
Our File No.: 30057.43

Dear Ms. Bayo:

Utilities, Inc. of Eagle Ridge provides the following responses to Staff's data requests dated March 11, 2004:

DATA REQUEST NO. 1:
Explain why the utility believes that the use of customer equivalents (CE) is a more accurate method to allocate common costs than the use of equivalent residential connections (ERCs) based on meter equivalents.

RESPONSE:
Customer equivalents have historically been used by Utilities, Inc. and have been an approved methodology in all the states in which Utilities, Inc. operates.

DATA REQUEST NO. 2:
Explain why the utility determines CEs at June 30 instead of year-end. Explain why this does not produce a mismatch between the CEs and the costs to be allocated.

RESPONSE:
The utility determines CEs at June 30 because companies that are acquired after June 30 do not share in the allocation process. Since they have only been part of the Utilities, Inc.

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family for less than ½ year, these companies have not been a part of Utilities Inc. long enough to reap the benefits of the allocation process.

DATA REQUEST NO. 3:
Explain how the utility's current methodology allocates costs to a system purchased after June 30 of any given year.

RESPONSE:
Please see the response to Data Request No. 2.

DATA REQUEST NO. 4:
Explain whether the utility has considered simplifying the allocation methodology, and if so, what actions have been taken.

RESPONSE:
The utility believes that its allocation process has proven to be the most appropriate way to distribute different types of costs to its operating subsidiaries. The utility has prepared an allocation handbook in order to explain its allocation process.

DATA REQUEST NO. 5:
Provide an explanation for why the utility believes that its method of calculating CEs using factors adequately allocates costs to each system (i.e., 1 for a water or wastewater only customer, 1½ for a water and wastewater customer, and ½ for a water transmission or wastewater collection system only customer). In the explanation, address how billing, accounting, revenue collection, customer service, and miscellaneous costs are impacted by this method.

RESPONSE:
The utility treats a water and wastewater customer as 1 ½ because providing both services together does not have the same effect of providing these services separately (i.e., being a water or wastewater only customer). For example, water and wastewater service are billed together, therefore reducing the amount of stock and postage that would be required to bill them separately. This same idea can be applied to accounting, revenue collection, customer service, and miscellaneous costs. Having to provide these customers with all these services separately would surely result in a higher allocation of costs to the companies in question. Similarly, distribution and collection customers are treated as ½ because providing these types of services requires less time than a water or wastewater customer.

DATA REQUEST NO. 6:
Explain how the CE allocation method addresses whether billing and revenue accounting

costs are adjusted for systems where those services are performed by another entity (i.e. Mid-County Services, Inc.) This explanation should include an analysis of costs other than computer time allocations, and such materials and supplies for paper and envelopes, office salaries, revenue accounting and accounts receivable, postage or any other costs associated with billing and revenue collection. If the utility's method does not address these concerns, explain why.

RESPONSE:
While Pinellas County does perform the billing operations for Mid-County Services, Inc., the utility still receives all benefits of being associated with the Utilities, Inc. family. One of the primary benefits is Mid-County's access to a large pool of human resources from which to draw upon. There are experts in various critical areas, such as construction, engineering operations, accounting, data processing, regulation, customer service, etc. Nowhere could one obtain this combined expertise and level of experience in a more cost-effective manner.

While operating only water and sewer systems, Utilities, Inc.'s personnel have the ability to meet the challenges of the rapidly changing utility industry. Because the Utilities, Inc. companies are focused on the water and sewer industry, our companies enjoy some unique advantages, one of which is that capital is available for improvements and expansion at a reasonable cost. With increasingly more stringent health and environmental standards, ready access to capital will prove vital to continued quality service in the water and sewer utility business.

In addition, the Utilities, Inc. companies have national purchasing power that results in lower costs to rate payers. Expenditures for insurance, vehicles, chemicals and meters are a few examples of purchases where national contracts provide tangible benefits to rate-payers.

DATA REQUEST NO. 7:
Provide an analysis of all billing and customer accounting costs by account number and description for the test year for Utilities, Inc. for the year ended December 31, 2002. This total should be broken down by category and at a minimum, should detail the costs incurred for materials and supplies for paper and envelopes, office salaries, revenue accounting and accounts receivable, postage or any other costs associated with billing and revenue collection. Also specifically identify from what allocation category (SE code) and account number these costs were removed in the utility's current Distribution of Expenses.

RESPONSE:
No such document exists. The utility tracks air freight, postage, and computer supplies outside of its Distribution of Expenses book. All other expenses are tracked in the

Distribution of Expenses book and allocated out based on the most appropriate distribution code.

DATA REQUEST NO. 8:
Provide all calculations used to determine the number of CEs for Eagle Ridge, by customer class, meter size and factor(s) applied. This calculation should agree with the CEs used in the allocation manual. If the calculation does not agree with the Distribution of Expenses manual, describe all differences.

RESPONSE:
The calculation used to determine customer equivalents is as follows:

On June 30, 2002, Eagle Ridge had 2,792 wastewater customers. Because this is a wastewater-only system, there is no multiplication factor, and the customer equivalents also equal 3,238.

DATA REQUEST NO. 9:
Please provide the total ERCs using meter equivalents pursuant to Rule 25-30.055, Florida Administrative Code, as of December 31, 2002. This method should count each customer for the following entities:

a) combined total of all Utilities, Inc. subsidiaries;

b) combined total for all Florida subsidiaries; and

c) total for Eagle Ridge.

RESPONSE:
On page 29 of the recently issued Utilities, Inc. of Florida order, the Commission stated that Utilities, Inc. has used SFEs in the past and that Utilities, Inc. will begin stating its information in the form of ERCs beginning December 31, 2003.

DATA REQUEST NO. 10:
Provide the number of customers for Eagle Ridge, by customer class and meter size.

RESPONSE:
Please see the following:

5/8" residential wastewater	759
5/8" general service wastewater	11

1" general service wastewater	16
1 ½ " general service wastewater	34
2" general service wastewater	24
3" general service wastewater	1

Please see the following for the Cross Creek subdivision:

5/8" wastewater flat	1

While the utility has only one connection in Cross Creek, it is a 905-unit condominium property. We bill the Cross Creek Community Association once each month for consumption for all 905 units.

DATA REQUEST NO. 11:
In Section VI(1) 3, page 13 of 20, of the Eagle Ridge Operating Permit No. FLA 014498, issued October 15, 2003, the utility was required to develop and organize an odor detection program with the homeowner's association to determine and identify the source and cause of odors within 90 days after the issuance date of the permit. Please summarize the utility's odor detection program that was developed. Please explain if the odor problem has been resolved, and what steps the utility took to resolve the problem.

RESPONSE:
The utility determined that the plant headworks and bar screen on top of Equalization Tank #1 were the most likely sources of odors at the plant. Minor modifications were made to the headworks to minimize the production of bad odors in that area. An odor complaint form was developed and submitted to the president of the homeowner's association to use in reporting future odor complaints or issues.

DATA REQUEST NO. 12:
The utility used Histotsal for odor suppression and improving the ability of the sludge to settle. Please provide the manufacturer's specifications sheet that describes the chemical and the purpose of the chemical.

RESPONSE:
See attached information describing the Histosal product and its application to the wastewater treatment process.

DATA REQUEST NO. 13:
For the Eagle Ridge system, there is a discrepancy in the number of residential customers. On Schedule F-7, page 67 of the MFRs, it states that there are 815 single family detached

residences. On Schedule E-2, page 51 of the MFRs, staff calculated an average of 758 residential billing units, by taking the total residential bills for Eagle Ridge and dividing by 12. The map submitted for Eagle Ridge shows 771 residential lots. Please reconcile the number of residential customers in the Eagle Ridge system.

RESPONSE:
With regard to the discrepancy between the map count of 771 single family residential lots and the statement on Schedules F-7 (and F-10) indicating 815 single family detached residences, the Utility acknowledges that the 815 is incorrect (some multi-unit residences may have been double counted during the data collection process). The utility's count from the map yields a total of 771 residences and two vacant lots. With regard to the 758 average residential billing units, this reflects actual units billed for service during the test year, which varied from 745 to 767. The difference between the 771 and 767 represent residences that have had service, but did not have a billable customer during the test year.

DATA REQUEST NO. 14:
Provide a copy of the utility's agreements with the Eagle Ridge Golf and Country Club and the Cross Creek golf course for reuse.

RESPONSE:
Please see the enclosed agreement.

DATA REQUEST NO 15:
Both the Eagle Ridge and Cross Creek systems dispose of their effluent by spray irrigation to golf courses, and therefore, the utility should have some reuse plant pursuant to NARUC USOA. However, Schedule A-6 – Plant in Service by Primary Account, page 4 of the MFRs, does not show any reuse plant. Please provide a breakdown of the reuse plant and accumulated depreciation and revise Schedule A-6 and A-10.

RESPONSE:
The utility's response to this data request will be provided by close of business, Tuesday, April 13, 2004.

DATA REQUEST NO. 16:
On Schedule F-6 of the MFRs, the utility provides Plant in Service balances for Y/E 2002 of $1,909,246 for Eagle Ridge and $1,226,469 for Cross Creek. Please provide the basis used to determine whether the assets were for Eagle Ridge or Cross Creek.

RESPONSE:
The basis for determining whether the assets were for Eagle Ridge or Cross Creek is the

General Ledger (G/L) for Utilities Inc. of Eagle Ridge. In the G/L the assets are given subaccount numbers of 673 for Eagle Ridge and 674 for Cross Creek. Per the G/L the breakdown is as follows:

Eagle Ridge System

Primary Account	Subaccount	Amount
380.4005	673	$1,931,529.56
380.4005	9673*	(22,284.00)
Total		$1,909,245.56

* 9673 is an adjusting account.

Cross Creek

Primary Account	Subaccount	Amount
380.4005	674	$1,226,469.44

DATA REQUEST NO. 17:
In its response dated February 17, 2004, to staff's MFR deficiency No. 11, the utility indicated that for the Cross Creek system, in cannot make a calculation for infiltration/inflow, because it has no water information. Without comparing the amount of water sold and the amount of wastewater treated, the amount of infiltration/inflow cannot be determined. Lee County provides water service through metered connections. Please contact Lee County to obtain the metered water flows for the Cross Creek system. Also, provide the size of the diameter of the collection pipes in inches, and the corresponding length of pipe in miles for Cross Creek, and the calculations for the total amount of infiltration and inflow for Cross Creek for the test year.

RESPONSE:
The Cross Creek collection system is comprised of approximately 14,380 LF or 2.723 miles of 8" gravity sewer main. During the test year, plant flow averaged 0.077 mgd or an average of 85 gpd/dwelling unit. During the six-month period from May through October, plant flow averaged 0.0535 mgd. Assuming that one-third of the 905 dwelling units were occupied during this time period, approximately 177 gpd was generated per dwelling unit during the wettest part of the year. This supports the Utility's contention that infiltration volume is not significant in regard to the Cross Creek collection system.

The water consumption data from Lee County Utilities will be provided under separate cover.

DATA REQUEST NO. 18:
For each plant item, provide the following:

a) a detailed description, including the purpose, and a statement why item should be considered in this rate case. Explain whether the plant item is new or a replacement of a current asset, and whether the plant addition will provide additional capacity or is necessary to provide service only to current customers;

b) a copy of the signed contract for each plant project and the projected in-service date;

RESPONSE:
Pro forma plant additions as identified on Schedule A-3 of the MFRs with estimated date of completion follow. Engineering cost estimates or contractor-submitted quotes are attached.

WWTP AERATION IMPROVEMENTS, $10,000:
Estimated completion date: November, 2004.

Convert air bays and digesters in North and South Plants to fine bubble diffusers. No change will be made to the treatment capacity. Existing coarse bubble diffusers installed in 1999 and 2000 will be retired.

Justification:
Improve oxygen transfer efficiency, and therefore improve plant performance, reduce power consumption and purchased power expense.

INSTALL AQUA DISC FILTER, $165,000:
Estimated completion date: December, 2004

Remove existing 0.100-mgd capacity polishing filter and associated piping. Purchase and install an AquaDisc filter to operate in parallel with remaining 0.500-mgd automatic backwash filter.

Justification:
The existing gravity sand filter experiences rapid head loss due to improper design and hydraulics. It is not adequately sized to handle current plant capacity and therefore, acts as an inadequate backup to the separately operated automatic backwash filter unit. AquaDisc filters are ideal due to small footprint and ease of installation. A new filter is mandated in the recently issued operating permit construction schedule so that the treatment plant will meet Class I reliability requirements. However, the installation of the replacement filter will not increase treatment capacity.

PUMPING CAPACITY INCREASE, LIFT STATION #5, $25,000:

This project has been postponed. Revised estimated completion date: December, 2005

c) support calculations for any capitalized costs estimated in addition to the amount reflected on any contract;

RESPONSE:
Capitalized costs, in addition to the amount reflected in the supporting cost information, reflect estimated costs of permits, drawings, materials, equipment, tools, professional services, and other items necessary to complete the design, permitting, and construction of each project. In addition, each capital project includes a contingency amount of about 10%.

d) an explanation of the prudence of including in rate base, if any of the in-service dates are later than 12/31/2004, or more than 24 months after the end of the test year;

RESPONSE:
All in-service dates are projected to occur prior to 12/31/04, or less than 24 months after the end of the test year.

e) all retirement entries, and the methodology and calculations used to calculate the retirement of plant for any items that are replacement for existing plant; and

RESPONSE:
For Project #1 above, coarse bubble diffuser units installed in 1999 (South Plant) and 2000 (North Plant) will be retired.

For Project #2 above, a polishing filter and associated PVC piping, installed in 1982, will be retired.

Please refer to attached for the methodology and calculations used to calculate the retirement of plant.

f) a statement addressing whether any of these additions will be funded by contributions in aid of construction.

RESPONSE:
None of the additions will be funded by contributions in aid of construction.

DATA REQUEST NO. 19:
Provide the calculation supporting the utility's requested pro forma property tax expense and documentation supporting the requested millage rate used.

RESPONSE:
A specific millage rate was not requested to be used. The pro forma tax expense requested is the test year property and real estate tax times the ratio of pro forma net plant to test year net plant. The calculation for the pro forma tax and the adjustment is as follows:

$$\text{Pro forma year tax} = \text{Test year per book tax} \times \frac{\text{Pro forma Net Plant}}{\text{Test Year Net Plant}}$$

Tax adjustment = Pro forma year tax - Test year per book tax

Where:

a. test year per book tax is found at Acct 408.1121 and 408.1122. For Eagle Ridge, this is the Lee County tax and the tax allocated to the system.

B. net plant = plant in service + land - accum. deprec. - CIAC + accum. amort CIAC, from Schedule A-1 or A-2, cols. 2 and 4.

$$\text{Wastewater pro forma} = \$4{,}176 \times \frac{\$1{,}884{,}838}{\$1{,}787{,}780} = \$4{,}403$$

Wastewater adjustment = $4,403 - 4,176 = $3,275

DATA REQUEST NO. 20:
State whether the utility has taken into consideration in its filing the tax impacts of the Job Creation and Worker Assistance Act of 2002, or the Jobs and Growth Tax Relief Reconciliation Act of 2003. If so, provide an explanation of any items considered and the resulting calculations of the current or deferred tax impacts.

RESPONSE:
These acts are not included in the utility's filing.

Should you have any questions regarding these responses, please do not hesitate to give me a call.

Very truly yours,

VALERIE L. LORD
Of Counsel

VLL/mp
Enclosures

cc: Ms. Tricia Merchant (w/enclosures) (via hand delivery)
Mr. Jay Revell (w/enclosure) (via hand delivery)
Mr. Steven M. Lubertozzi (w/enclosure)
Mr. Patrick C. Flynn (w/enclosure)
Mr. Frank Seidman (w/enclosure)

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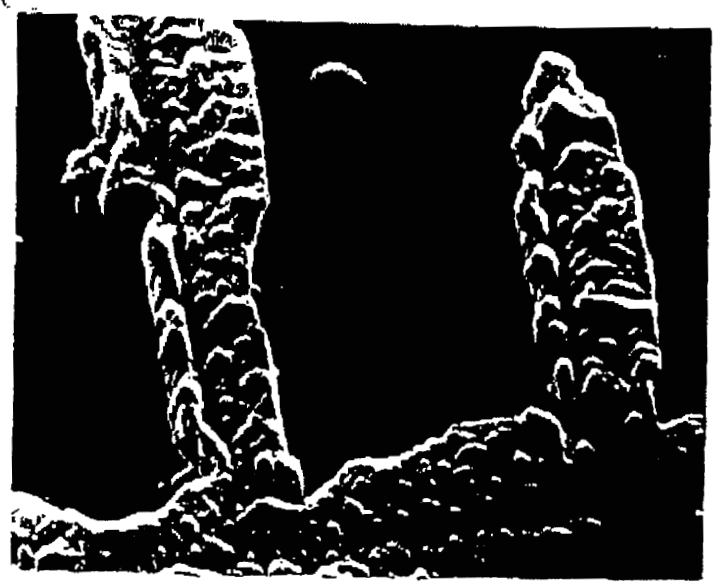
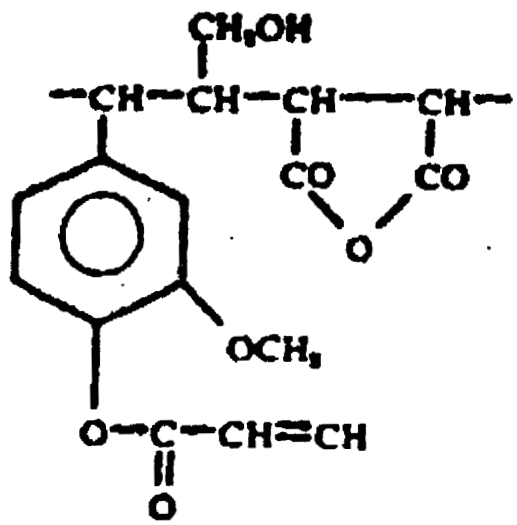
"Solving Environmental Problems with Natural Products"





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Introduction

Organic Products Company would like to introduce an exciting, novel and environmentally friendly discovery. A new patent-pending technology that provides an effective and economical solution to odorous compounds, specifically a resolution to hydrogen sulfide, mercaptans and ammonia compounds, and their resulting corrosive effects.

Organic Products Company is pleased to introduce – Histosol OP-9840, a natural humate compound derived of organic matter consisting of natural beneficial soil constituents. This novel formulation was developed specifically to provide an environmentally acceptable solution to odorous biological reactions. Histosol OP-9840 was developed after nearly 10 years of extensive research and proven through field evaluations.

Histosol OP-9840 is a natural humic composition that represents unexcelled odor control for a wide range of odorous compounds. Histosol OP-9840, in combination with biochemical active ingredients, enhances conditions in receiving waterways, wastewater systems of municipal collection systems. Histosol OP-9840 may be used in all types of applications, soil and water, and effluent streams without concern of effluent impact.

Histosol OP-9840 contains humate salts , a composition of humates, humic acids and lignin resins, as well as a wide range of essential organic based building blocks and related acids, derived from the extraction of highly humified organic materials. These compounds represent essential humic acids, fulvic and ulmic compounds, many of which have their counter parts in all biological tissues. These essential life structural components are known to enhance biological performances (plant and biological), as well as targeting the capture of odorous gaseous reactions and interrupting their subsequent corrosive by products.

How it works – Histosol OP-9840 contains highly active "reactive lignins" with 7 to 9 carbon and oxygen open bonding sites per molecule. The complexed lignin reactive surface structure is estimated at 900,000 square inches per kilogram and an enormous negative cation exchange capacity of 1500 to 3000 moles per kilogram. These active sites function as a macromolecular sponge, adsorbing and binding (capturing) potentially odorous compounds and reacted compounds.

The captured compounds form covalent and trivalent chemically bonded, cross-linked polymers. These "captured, adsorbed compounds" are inaccessible for microorganisms to hydrolyze, blocking sulfide reactions, and eliminating odorous gaseous reactions and gaseous productions.

Histosol OP-9840's lignin components are so reactive that they can adsorb approximately 1000 times their own mass in potential gaseous and pollutant compounds. The lignin's highly reactive structure provides a cost effective, environmentally friendly solution to pollution, odor control and corrosion. Histosol has also proven in numerous field applications to significantly stimulate indigenous biological activity, resulting in tremendous increases in solids degradation.

Benefits

- Rapid odor reaction, results may be obtained on contact, or within 12 to 48 hours of application – eliminates 30, 60, or even 90 day trial periods for large systems.
- Eliminates the release of hydrogen sulfide and related corrosion.
- Economical and cost effective, low PPM rate requirements, some application rates as low as 2 PPM.
- Non-corrosive, non-pollutant, natural solution.
- Stimulates and enhances microbial populations, beneficial to receiving water systems.
- Pricing targets competitive advantage.

We invite you to review the attached information on our Histosol series product line. We look forward to your inquiries.

Organic Products Company
Application Overview

Organic Products Company manufactures a line of environmentally friendly products that are being used extensively in commercial, industrial, and municipal applications to control odor, reduce corrosion, reduce total suspended solids, and reduce biological oxygen demand. This new technology provides an effective and economical solution to many problems confronting the treatment of wastewater. First, the product is extremely effective in controlling odorous compounds, specifically a resolution to hydrogen sulfide, mercaptans and ammonia compounds and their corrosion effects. Second, through natural polymerization, the product improves solids settling in wastewater. Third, the micro and macronutrients present in the product serve as an excellent stimulant to indigenous microbial populations in both aerobic and anaerobic environments, over doubling degradation rates in most applications. Finally, with the addition of selected strains of microorganisms, the product dramatically reduces BOD and TSS.

Success Stories

Odor and Corrosion Applications

- Reduced H2S levels by 88.6% within 24 hours at a wastewater lift station
- Reduced equipment and plant corrosion by 87.5% over a 3 year period
- Reduced H2S levels in a air scrubber system by 76%
- Eliminated odors in the aeration basins of a municipal WWTP
- Reduced H2S levels at a rock quarry by 85.7%
- Eliminated mercaptan odors at a fruit juice factory
- Eliminated odors in a poultry processing plant wastewater land application system
- Eliminated lagoon odors at a hog farm and a dairy farm
- Eliminated odors at a tuna processing plant

TSS and BOD Applications

- Reduced wasted bio-solids by 55% in a municipal wastewater treatment plant
- Reduced TSS by 51% in an 4 million gallon aeration pond at a chicken processing plant
- Reduced BOD5 by 63.5% and TSS by 58.9% in 10 days in a 24 million gallon per day aeration pond
- Reduced BOD from 3,000 to 900 in a grease trap after 30 days of treatment
- Reduced TSS in the reclaim tank of a commercial carwash to a point that 70% of the reclaimed water was recycled through the carwash system – eliminated odors in reclaim tank
- Reduced use of polymer at a bakery pre-treatment plant by over 70%
- Reduced CBOD at a bakery pre-treatment plant from 6,000 to 400
- Reduced oil and grease concentration from 1,000 to 15 at a bakery pre-treatment plant
- Increased clear water decanting by 36,000 gallons at a chicken processing plant in 1 week and eliminated odor problem (Savings = $1,600 to $2,200 weekly in hauling/disposal)
- Increased clear water decanting by 80,000 gallons at a cheese factory and eliminated odors
- Doubled the efficiency of the belt press operation at a municipal WWTP
- Reduced fats & oils build-up by 50% at a chicken processing plant with a 1.2 million gpd wastewater system

Current Applications

- Wastewater Treatment Plants
- Meat and Seafood Processing Plants
- Fruit Juice Factories
- Livestock Farms
- Rock Quarries
- Bakeries
- Restaurants
- Cheese Factories
- Portable Toilet Companies
- Vegetable Canneries
- Steel Mills
- Paper Mills

"Solving Environmental Problems With Natural Products"

Product Data
HISTOSOL OP-9840

DESCRIPTION:

HISTOSOL OP-9840 is a liquid blend extract from naturally occurring organic materials. Histosol is a natural humate compound derived from highly humified organic material consisting of natural soil constituents. This novel formulation was developed specifically to provide and environmentally acceptable solution to odorous biological reactions. Histosol was developed after nearly 10 years of extensive research. This blend has been found to have remarkable properties in odor and corrosion control, stimulating indigenous microbial activity, and wastewater clarification.

Histosol is a natural humic composition that represents unsurpassed odor control for a wide range of odorous compounds. Histosol enhances and stimulants indigenous microbial populations in receiving waterways, dramatically improving waste degradation.

Histosol contains humate salts, a composition of humates, humic acides and lignin matter, as well as a wide range of essential organic based building blocks and related acids, derived from an extraction of highly humified organic material. These compounds represent essential acids and compounds, many of which have their counter parts in all biological tissues.

FEATURES AND BENEFITS

- Rapid odor reaction, results may be obtained on contact, or within 12 to 48 hours of application – eliminates 30,60, or even 90 day trial periods
- Eliminates the release of hydrogen sulfide related corrosion
- Economical and cost effective with low PPM rate requirements
- Non-pollutant, non-corrosive, natural solution
- Stimulates and enhances microbial poulations, beneficial to receiving water systems
- Pricing targets competitive advantage

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Histosol OP-9840

Typical Characteristics

Appearance	Dark brown/black liquid
Total % solids	7.0 (range 7.0-8.5)
Specific Gravity	1.04
pH (as shipped)	8.00 (range 7.5-8.85)
Odor	Earthy smell
Cadmium	0.0
Cu	0.0
Iron	<5.0 mg/L
Zn	<0.5 mg/L

Standard Packaging: 5-250 gallon containers

Optimum Conditions for Use

Histosol performs within a pH range of 3.0 to 11.6 with the optimum near pH 7.0. Effective temperature range is 40 to 145 F.

Storage and Handling

No special handling precautions. Should be protected against long periods of frost or freezing, thaw out before using. Suggested maximum in plant storage is 12 months.

Application

HISTOSOL OP-9840 can be used to control odors from sewage plants, waste collection facilities, paper mills, and rendering operations. In wastewater systems, it reacts with hydrogen sulfide, sulfur dioxide and most organic acids to permanently neutralize the chemical and its odor. 2-30 parts per million is sufficient in most cases for odor control. The product should be metered into the system of continuous flow streams at least 100 yards ahead of the point of H2S release. The product can be metered directly into waste lagoons, aeration basins, digesters, clarifiers, or SBR's. Longer retention improves performance.

It has been found effective in removing hydrogen sulfide and TRS gases from paper mill scrubber systems. The HISTOSOL should be added to the circulating or make-up at the gas inlet of the scrubber. Tests in the circulation water show neutralization of the sulfides. Tests in the gas stream show a reduction 76%.

(Call 1-888-314-8181 for technical assistance in specific applications)

This is a non-toxic and non-hazardous product. Environmental friendly.

"Solving Environmental Problems With Natural Products"

Product Data
Histosol OP-Bio

DESCRIPTION:

Unlike any other product on the market, Histosol OP-Bio is a ready-to-use liquid bacterial and biological stimulant formulation specifically designed to reduce odors and corrosion, as well as provide improved waste degradation for residential, municipal, and industrial wastewater applications. This product is recommended for applications where the control of odors and corrosion, along with the reduction of TSS and BOD are the primary objectives. The Histosol OP-Bio is recommended at various concentrations depending on the level of BOD in the wastewater.

Histosol OP-Bio contains a synergistic blend of new Bacterial strains which have been scientifically developed (selectively adapted) to cope with difficult compounds and chemicals present in wastewater effluent. Unlike any other bio-formulation, Histosol OP-Bio contains bacterial strains which actually digest difficult and non-biodegradable compounds such as detergents, paper, oil, grease, hydrocarbons, phenols, etc.. Histosol OP-9840 is the primary carrier for this microbial blend, providing immediate odor and corrosion control as well as stimulating microbial growth and performance.

Histosol OP-Bio bio-formulation provides exceptional results when utilized to accomplish reseeding of wastewater and septic systems where chemical kills have occurred and for the continued maintenance of bio-systems to insure optimum performance.

Histosol OP-Bio formulation significantly improves the performance of septic tanks, lagoons, aeration basins, activated sludge, SBR's, aerobic digesters, trickling filter and waste holding basins. These cultures provide the best protection your customers can buy for wastewater applications.

FEATURES AND BENEFITS:

- Digests difficult compounds which are toxic to naturally occurring bacteria or existing sewage bacteria.
- Provides rapid breakdown of difficult detergents, fats, oils, tissue, hydrocarbons, etc.
- Cultures grow in either the presence or absence of oxygen.
- Long-term stability (1-2 years).
- Non corrosive, non-pathogenic; safe to handle and store.
- Can be used as supplied.
- Each batch is tested and standardized for a high level of quality.
- Certified salmonella-free.

"Solving Environmental Problems With Natural Products"

Histosol OP-Bio

Typical Characteristics

Biological		Physical	
Bacterial strains		Appearance	dark brown
• Protein digesting bacteria		Odor	musty fragrance
• Starch digesting bacteria		Specific gravity	1.04
• Cellulose digesting bacteria		pH	Neutral
• Detergent digesting bacteria		Effective pH range	5.0 – 9.8
• Fat, grease and oil digesting bacteria		Effective temp. range	40 - 145 F
		Standard packaging	5-250 gallon container
Bacterial Count	40-400 billion/gal.	Shelf life	1-2 years

Optimum Conditions for Use

Bacteria in Histosol OP-Bio perform within a pH range of 5.0 – 9.8 with the optimum near pH 7.0. Temperature affects the activity of the working solution and action increases with rising temperatures up to 145 F. No activity can be expected below 40 F. (5 C.)

Storage and Handling

Storage.....store in a cool, dry place
Handling.....avoid excessive inhalation
Wash hands with warm, soapy water after handling

Recommended Dosage Schedule

Area	Dosage	Frequency
Waste Lagoons	* 50 PPM	Initial Application
	*5-30 PPM	Daily

* Calculation based on retention volume of lagoon or basin being treated

(Call 1-888-314-8181 for technical assistance for specific application)

For problem systems, double the recommended feed rate for the first two weeks.

"Solving Environmental Problems with Natural Products"

Case Studies Update

P.O. Box 426 Claxton, Georgia 30417 * Office (888) 314-8181

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Organic Products Company
Case Studies

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Case Study One
Hydrogen Sulfide Reduction and Corrosion Control - Industrial/Municipal Application

Problem:
Stone Container (Pulp/Paper Mill) - Savannah Plant, is located within the city limits of Port Wentworth, Georgia. The plant is tied in to the municipal wastewater treatment system for the city of Port Wentworth. The plant had been in operation for several years and complaints from the city residents and government officials escalated continuously because of the extremely unpleasant odors that were being emitted by the plant. Residents living near the plant began to complain about discoloration of window blinds and shades. Many reports of headaches and sore eyes also began to surface. A determination was made that the high levels of hydrogen sulfide being emitted by the plant, either directly into the air via inadequate air scrubber systems, or as a result of effluent being released into the wastewater sewer system, was the major cause of the yellowing effect on the blinds and shades as well as the source for the offensive odors in the air which could be associated with the high level of reported headaches and sore eyes.

The city of Port Wentworth also began to experience chronic problems with sewer line blowouts and corrosion in the city's sewer system began advancing at an alarming rate. The blowouts were usually located within the vicinity of forced mains. Corrosion was calculated as high as 30.86% annually in some locations. These problems were being caused by crown corrosion which could be traced back to high concentration of hydrogen sulfide in the sewer system. Leaching hydrogen sulfide into the concrete was causing rapid deterioration of the city's system. Again, the source of the problem was traced back to Stone Container.

In 1995, Port Wentworth government officials began relentlessly pressuring Stone Container management to find a solution to the problems being created by the plant.

Solution:
Organic Products Company, in association with ChemStone, Inc., was awarded a contract to reduce the hydrogen sulfide emission and control sewer corrosion in May of 1995.

Histosol OP-9840 was applied into the sewer system via metering pumps at strategic locations on the Stone Container site as well as sites located in the city. Levels of initial application were determined by the hydrogen sulfide levels and the maximum daily effluent flow rate at the site. The metering stations were located "up-line" from problem areas where unacceptable levels of hydrogen sulfide were being emitted.

For example, one lift station in the plant was consistently generating H2S reading above 50 PPM. The maximum daily flow rate at this lift station was estimated at slightly over 1 million gallons per day. The metering station for treatment of this lift station was located approximately 200 yards "up-line" from the lift station at a manhole. The H2S reading the day before treatment began was 62 PPM. Histosol OP-9840 was applied at a rate of 50 PPM of the maximum daily flow rate for the first day of treatment. The H2S reading the following day were 12 PPM at the station. The application of Histosol OP-9840 was then reduced daily until the final daily "maintenance" application reached 12 PPM, or 12 gallons per day. A total of four metering stations were eventually set up at the plant and in the city.

Histosol OP-9840 was also injected into the circulation water of the air scrubber system at the plant. The daily application was set at 25 PPM. Tests in the gas stream showed a reduction of hydrogen sulfide by 76%.

Corrosion tests were conducted at ten selected sites in the sewer system over a three-year period. The introduction of Histosol OP-9840 over the three-year period produced dramatic improvements in corrosion levels. By greatly reducing the H2S in the system, the Histosol product had also virtually eliminated the crown corrosion caused by leaching hydrogen sulfide. Over the three-year test period, corrosion levels at the ten sites were reduced by an average of 87.5%, from 19.2% annually before treatment to 2.4% annually at the end of the test period.

Conclusion:
Over the course of this three year study, the Histosol OP-9840 produced dramatic improvements in the air quality at the Stone Container Plant, as well as the air quality in the city of Port Wentworth. Complaints from the city's residents and government officials ceased. The expensive repairs to city sewer system were greatly reduced. The fragile relationship between the Stone Container Plant and the City of Port Wentworth was corrected.

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Case Study Two
Odor Control in Portable Toilets

Problem:
Portable toilet and pumper companies were facing increasing resistance and escalating regulations from operators of wastewater treatment facilities concerning the composition of chemicals being pumped into the systems from the tanks of the pumping trucks. Companies using formaldehyde, or formaldehyde-based odor control products were the main target. Many products being used would create two major problems for the treatment facilities. The introduction of many of the toxic products into the treatment system would cause "biological kills" of the bacteria being used to degrade the solid waste and control BOD in the facility. These toxic products in the effluent would also create unacceptable water release problems for the facilities. Also attributing to the need to find an alternative product was the fact that most of the products on the market were hazardous to handle, and in some cases, actually fatal if ingested, even in very small quantities. The companies were faced with a two-fold problem. First, they had to have a safe, effective product to control the odors in the portable units. Second, they had to find a product that would be readily accepted by the operators of the wastewater treatment facilities. Most companies had tried natural products that would be acceptable at the treatment facilities, but found the products to be ineffective in controlling the odors in the portable units.

Solution:
At the request of a manager of a Waste Management facility, Organic Products Company formulated an odor control product using the Histosol OP-9840 as the substrate. The initial field tests were conducted with the assistance of Waste Management. The tests were conducted in southeast Georgia in the month of July. Average daily temperatures ranged 90 to 96 degree F. The relative humidity was consistently above 90% during the test period. The product was found to be extremely effective in controlling odors emitted by the portable units. With a system charge of one ounce of the Organic-Pro Port-a-Clean product, one heavily used test unit was not pumped for 14 days. No offensive odors were ever present in the unit. The unit eventually had to be pumped and cleaned because it had reach volume capacity and near overflowing levels.

This unique and innovative product is the first of its type. The product is not a masking agent that simply covers up unpleasant odors, particularly hydrogen sulfide odors. It actually reduces the effluent's ability to produce the odors.

After several formulation modifications to adhere to specific client needs such as dye and fragrance additions, marketing of the product in a variety of formulations was initiated. Within a period of two weeks, the product was being sold in 16 states throughout the U.S. Customer feedback was very positive. Testimonials provided support and proof of the product's effectiveness. The product is not only accepted by all wastewater treatment facilities, but it also provides a residual benefit to the effluent at the treatment plants by helping to control hydrogen sulfide odors and corrosion along with contributing to a measurable reduction in TSS and BOD at the plant.

Conclusion:

Organic Products Company was able to utilize the same technology that had made the Histosol OP-9840 so effective in controlling hydrogen sulfide in industrial and municipal applications to solve the problems confronting portable toilet companies. The product is environmentally friendly. It will not harm human, animal, or marine life when used as directed. The product is extremely effective in controlling offensive odors emitted by portable toilets. Discharge of effluent from pumping trucks is welcomed by waste collection facilities. This product conclusively solved all the problems associated with the use of toxic chemicals in the treatment of portable toilets.

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Case Study Thirteen
Odor and TSS Reduction – WWTP Application

Problem:
A wastewater treatment plant with a daily flow rate of 700,000 was experiencing bad odor problems, poor degradation of waste, oil and grease, gray water in the aeration tanks, black foam, and poor settling in the clarifiers.

Solution:
OP-Bio was added at the head of the plant. After one week the water in the aeration tanks had changed to a light brown and there was a light tan foam on the tanks. The settling in the clarifiers was greatly increased and 98% of the odor was eliminated.

This facility also has several large aerobic digesters and their sludge is processed across a belt press and put into a roll-off container for disposal at a local landfill. Prior to the use of OP-Bio, 30,000 gallons of sludge was processed to fill each roll-off container. The facility is now able to process 60,000 of sludge per roll-off container.

Conclusion:
OP-Bio virtually eliminated the odor problem at the WWTP. Through improved degradation and settling OP-Bio has increased the efficiency of the plant belt press operation by 100%

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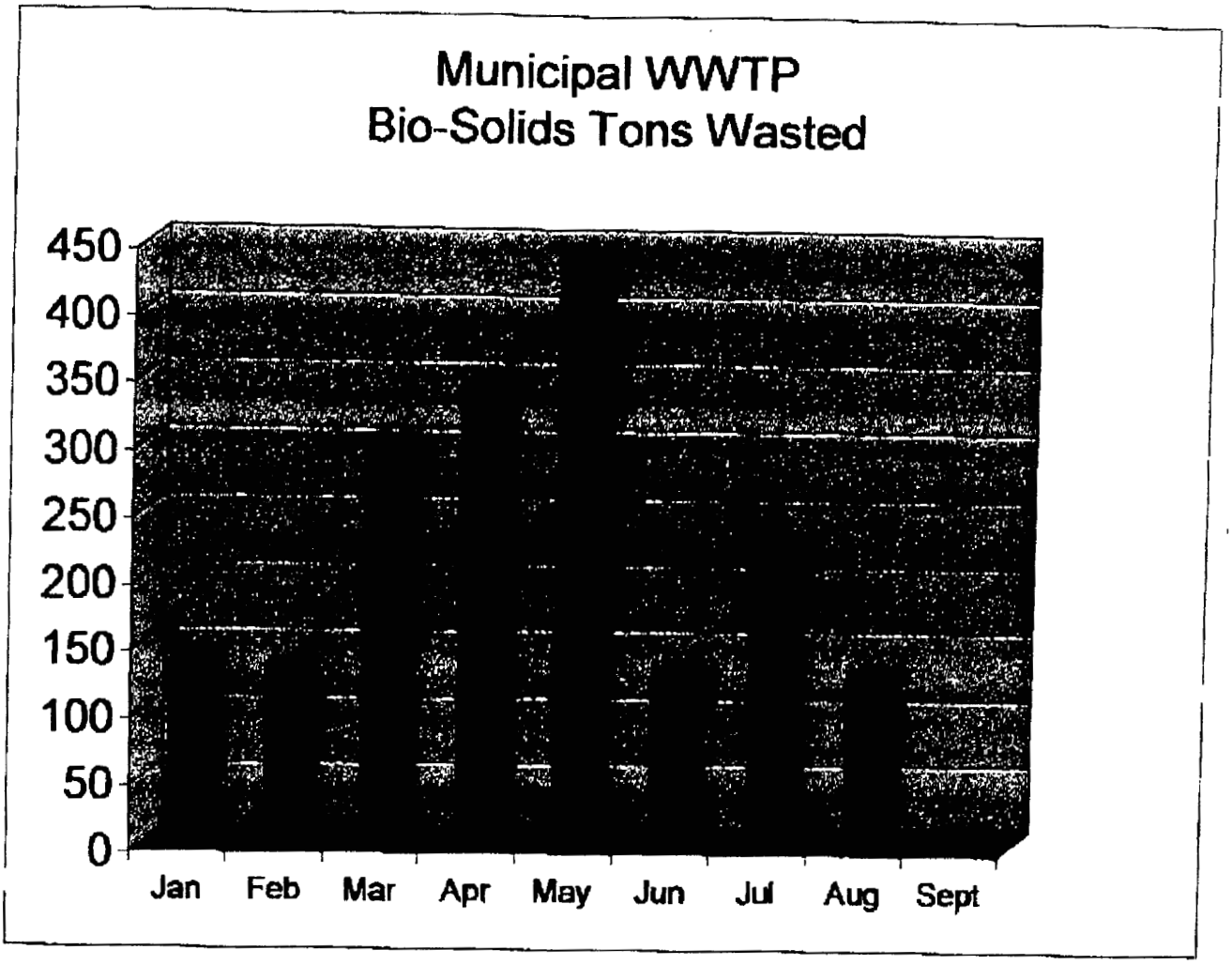
Case Study Seventeen
Odor & Solids Reduction – WWTP

Problem:
A WWTP in Southeast Georgia located on a resort island has a 3 million gallon per day flow. The WWTP was experiencing major odor problems at the head of the plant, as well as poor digestion and settling of bio-solids in the SBR's and aerobic digesters. The odors were primarily H2S and were the source of numerous complaints from the residents living in the vicinity of the WWTP. The plant was hauling and disposing an average of 125 to 150 tons of bio-solids per month at a cost of approximately $60 per ton, which equates to $7,500 to $9,000 total average hauling/disposal charges per month.

Solution:
OP-Bio DB5 (Histosol OP-Bio 5) was added to the influent of the wastewater stream approximately 100 yards before the head of the plant. The product was added at a rate of 3-4 PPM of the daily flow (3 million gallons). Odors were immediately reduced at the head of the plant. Within 2 days the plant operator began to see a significant reduction in solids in the SBR's as well as the digesters.

The WWTP was treated for a period of 30 days at a rate of 3-4 PPM. The plant operator also added 2.5 gallons of product directly into the digesters each day.

Conclusion:
During the first month of treatment the odors being generated at the head of the plant were dramatically reduced. No odor complaints from the residents were received during the first month of application.The total wasted solids for the 30 period were reduced from an average of 125 to 150 tons to 4 tons (96.8% reduction). The plant saved $7,260 in hauling/disposal expense during the month. The improvement in overall plant operation also allowed for fewer man hours being needed to run the plant.



MicroSurge DB1 feed at a rate of 3PPM during the month of September. Saved WWTP $7,000 in hauling and disposal fees.

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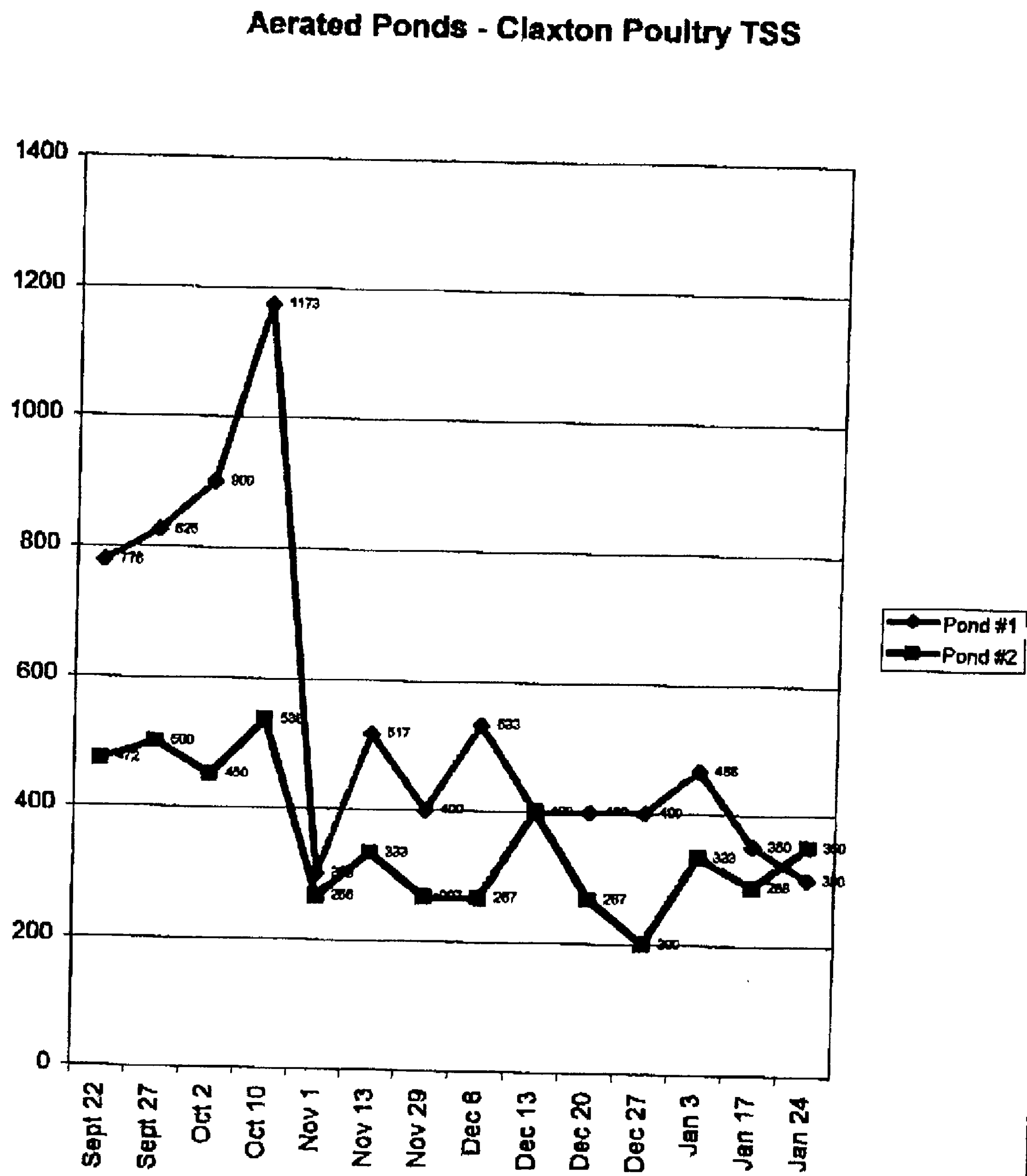
Case Study Twenty
TSS, BOD, Ammonia, Hydrogen Sulfide, and Sludge Reduction – Chicken Processing Plant

Problem:
A large chicken processing and rendering plant in Southeast Georgia was faced with numerous problems associated with the treatment of wastewater at the plant. The plant has a daily flow of 1.8 million gallons of water. The first problem was a heavy fats, grease and oil build up on the surface of a 10,000 gallon grease trap located down-line from the rendering building. The solids build up on the surface of this grease pit would exceed 2.5 feet and forced the plant operators to physically remove the cap with a backhoe once the thickness of cap began to reach the overflow level of the pit. The second problem was high TSS (750-1100 ppm), COD/BOD (1400-1800 ppm), and ammonia nitrogen (50-70 ppm) levels in the plants two aeration ponds. These ponds are in sequence with the first pond having a capacity of 4.5 million gallons and the second having a capacity of 14 million gallons. The plant has a land application permits which allows for irrigation of hay fields with the treated wastewater. The third problem resulted with high H2S levels being generated by the aeration ponds.

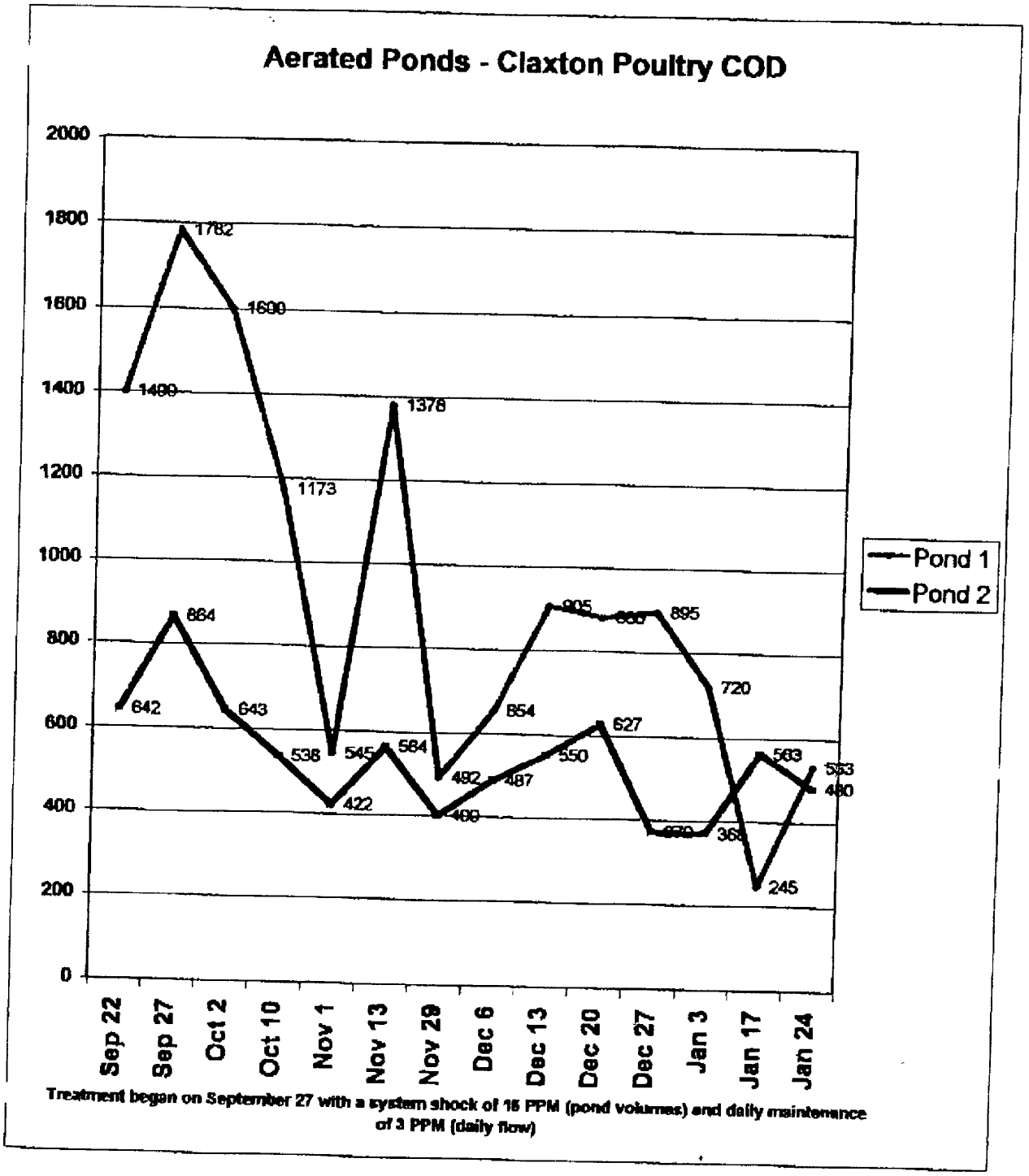
Solution:
To address the sludge cap problem on the grease pit Histosol OP-BRZBio 20 was applied through a pressure sprayer at a rate of 8-ounces per gallon directly onto the surface of the cap. One quart of concentrated product was applied per treatment. The cap was treated twice each day. Within 7 days the cap was reduced to approximately 5 inches of tan foam. Treatment continues at the same rate twice daily.

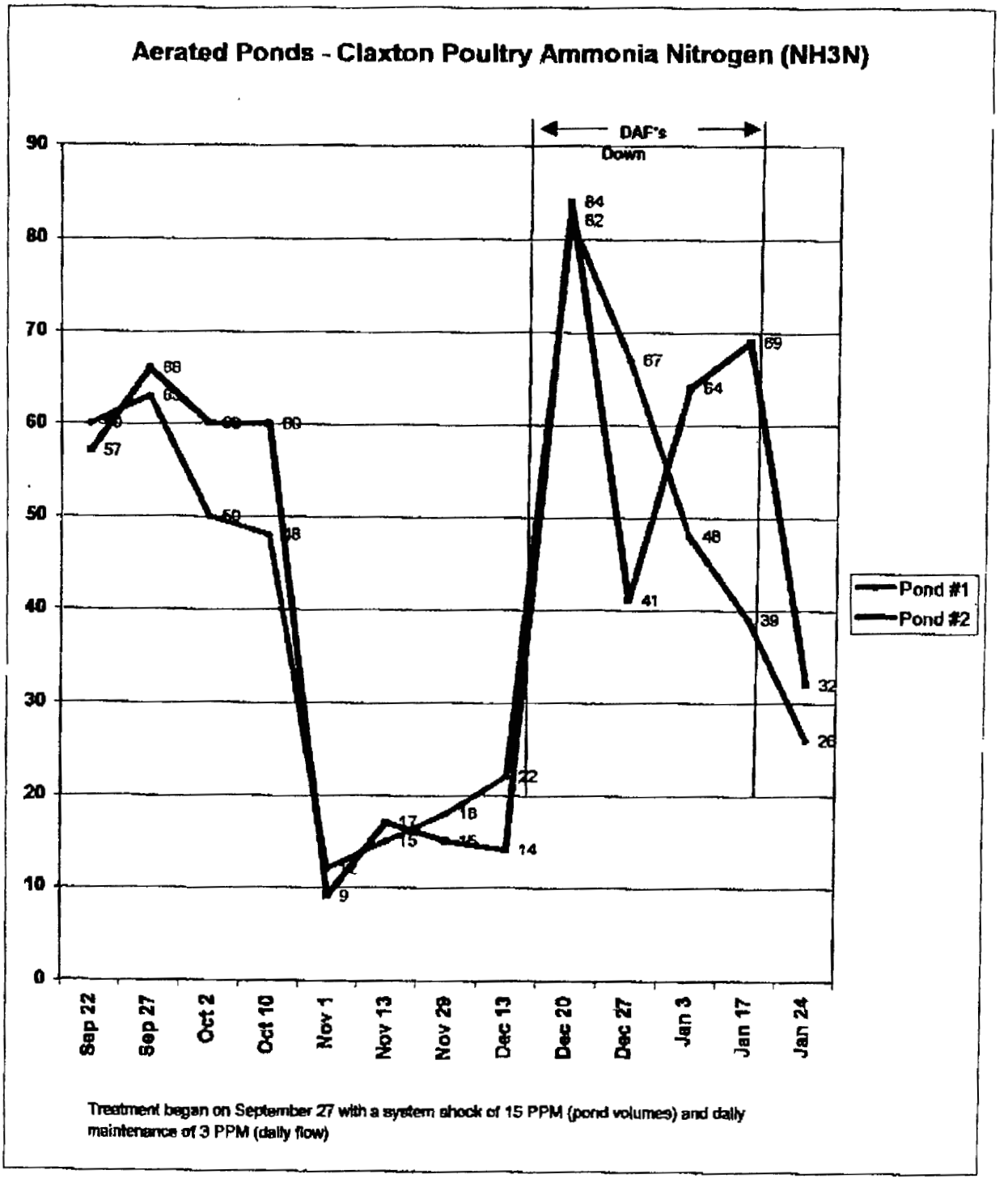
To address to TSS, COD/BOD, ammonia nitrogen, and hydrogen sulfide problems in the aerated ponds Histosol OP-Bio 5 was the recommended product. Pond #1 (4.5 million gallon capacity) was shocked with 75 gallons (17 ppm) and Pond #2 (14 million gallon capacity) was shocked with 175 gallons (12 ppm). The shock treatment was applied with a high pressure hose to provide a more uniform coverage of the pond surface area and allow for better blending of the product into the wastewater. A daily maintenance program was implemented where 5-gallons (2.8 ppm of the daily flow rate) of product would be metered into pone #1 at the influent point. There was a significant reduction in hydrogen sulfide odors with 48 hours of treatment. After 30 days of treatment the TSS and COD/BOD levels on average were reduced by 60-65%. The ammonia nitrogen levels were reduced by approximately 85%. (see charts on following pages). The maintenance application rate of 5 gallons per day continues.

Conclusion:
The Histosol products used in this application far exceeded original expectations.



Treatment began on September 27 with a system shock of 15 PPM (pond volumes) and daily maintenance of 3 PPM (daily flow)


Aerated Ponds - Claxton Poultry COD
2000
1800
1600
1400
1200
1000
800
600
400
200
0
1782
1690
1400
1378
1173
864
642
643
538
545
584
422
492
487
550
627
563
553
480
245
Pond 1
Pond 2
Sep 22
Sep 27
Oct 2
Oct 10
Nov 1
Nov 13
Nov 29
Dec 6
Dec 13
Dec 20
Dec 27
Jan 3
Jan 17
Jan 24
Treatment began on September 27 with a system shock of 15 PPM (pond volumes) and daily maintenance of 3 PPM (daily flow)


Aerated Ponds - Claxton Poultry Ammonia Nitrogen (NH3N)
DAF's Down
90
80
70
60
50
40
30
20
10
0
Sep 22
Sep 27
Oct 2
Oct 10
Nov 1
Nov 13
Nov 29
Dec 13
Dec 20
Dec 27
Jan 3
Jan 17
Jan 24
Pond #1
Pond #2
Treatment began on September 27 with a system shock of 15 PPM (pond volumes) and daily maintenance of 3 PPM (daily flow)

USPTO Patent Full-Text and Image Database

(1 of 1)

United States Patent *6,656,723*
Phillips **December 2, 2003**

Odor controlling composition and methods of making and using

Abstract

The invention relates to a composition and method for controlling odors, the composition containing an activated lignin-derived complex containing a histosol compound, and optionally containing a hydrolytic enzyme, or at least one microorganism capable of providing the hydrolytic enzyme, or a combination of hydrolytic enzyme and at least one microorganism capable of providing the enzyme. The composition can be applied to holding tanks, portable toilets, pulp and paper mills, and other loci giving rise to noxious odors, in particular, to hydrogen sulfide emission.

Inventors: **Phillips; Jerry D.** (Statesboro, GA)
Assignee: **Organic Products Co.** (Statesboro, GA)
Appl. No.: **817651**
Filed: **March 26, 2001**

Current U.S. Class: **435/266**; 252/180; 422/5; 423/266; 435/262.5; 530/500; 562/513
Intern'l Class: C12S 005/00
Field of Search: 435/262,262.5,266,277,264 422/4,5 252/179,180,184 562/400,513 71/24 210/610,611,632 423/226,230 530/500,503

References Cited [Referenced By]

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11009674 Jan., 1999 JP

Primary Examiner: Beisner; William H.
Attorney, Agent or Firm: Gray; Bruce D. Kilpatrick Stockton LLP

Claims

What is claimed is:

1. An odor controlling and organic waste degrading composition, comprising a chemically reactive lignin complex comprising a histosol-derived compound having one or more groups of structural formula: ##STR2##

and either

(a) a hydrolytic enzyme,

(b) at least one microorganism capable of providing hydrolytic enzyme or

(c) a combination of (a) and (b).

2. The composition of claim 1, wherein the hydrolytic enzyme or microorganism is chosen from the group consisting of amylases, lipases, cellulases, and lignases.

3. A process of producing the organic waste control composition of claim 1 comprising:

(a) contacting the peat or humus with water and sodium carbonate to form an extraction mixture, wherein the extraction mixture comprises a histosol-derived compound having one or more groups of structural formula: ##STR3##

and adding either:

(1) a hydrolytic enzyme,

(2) at least one microorganism capable of providing hydrolytic enzyme or

(3) a combination of (1) and (2);

(b) homogenizing the extraction mixture by subjecting it to high shear mixing;

(c) adding a dispersant during homogenizing to form a homogenized, dispersed mixture;

(d) aerating the homogenized dispersed mixture.

4. The process of claim 3, further comprising filtering the extraction mixture.

5. The process of claim 3, further comprising adjusting the moisture content of said peat prior to contacting with water and sodium carbonate.

6. The process of claim 5, wherein said peat is adjusted to a moisture content between about 35% and about 40%.

7. A method of reducing odor causing compounds or organisms comprising applying to the locus of said odor-causing compounds or organisms an effective amount of the odor controlling composition of claim 1.

8. The method of claim 7, wherein the odor-causing compounds comprise hydrogen sulfide.

9. The method of claim 7, wherein said locus is in or near a pulp or paper mill.

10. The method of claim 7, wherein said locus is in or near a portable toilet.

11. The method of claim 7, wherein said locus is in or near an organic waste holding tank.

12. The method of claim 7, wherein said locus is in or near livestock waste.

13. The method of claim 7, wherein said locus is in or near a solid waste transfer station.

14. The method of claim 7, wherein said locus is in or near a wastewater holding pond.

15. The method of claim 7, wherein said locus is in or near a septic system.

16. The method of claim 7, wherein said locus is in or near a water reclamation tank.

17. An odor controlling composition, comprising a chemically reactive lignin complex comprising a histosol-derived compound having one or more groups of structural formula: ##STR4##

Description

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to the reduction and control of odorous chemical compounds released during manufacturing of organic chemicals, and during organic waste control operations.

2. Description of the Related Art

Organic wastes and the offensive odors they produce, have plagued human beings since time began. When organic compounds decompose, their constituent elements are released as progressively smaller compounds and finally basic elements. This process of decomposition is performed by combinations of physical, chemical, and biochemical reactions.

The chemical nature of the organic compounds undergoing decomposition, and the dominant mechanism of the decomposition process determine to a large degree how fast the reactions occur, what by-products are released, and to what degree offensive odors are released. The ability to determine how organic materials are recycled is of great interest because the majority of organic waste produced by human activity is recycled via accelerated microbial hydrolysis, releasing undesirable compounds. The

undesirable compounds include atmospheric pollutants such as hydrogen sulfide and methane.

The type of compounds released during the biochemical decomposition of organic waste is frequently determined by the organisms dominating the decomposition process. Septic organisms release chemical compounds that are considered offensive to human senses, i.e., hydrogen sulfide and methane. Aerobic organism by-products include carbon dioxide, oxygen, and water.

Chemical industries and waste processing plants have used, and continue to use, a number of concepts in their efforts to take advantage of the above listed fundamental differences between aerobic and anaerobic systems of organic recycling. These efforts include aeration systems, inoculation of waste streams with aerobic organisms, and settling ponds, with subsequent landfill of accumulated un-reacted organic pollutants.

While the above listed techniques for amplification of aerobic digestion of organic wastes have been somewhat effective, these efforts are limited by numerous critical deficiencies. These deficiencies include the cost of inoculation with a sufficient quantity of organisms, the inability of the aerobic inocula to out-compete septic organisms, and the high cost of physically aerating large bodies of effluent. These factors are in no small way responsible for release of noxious odor, as well as excessive landfill volumes.

SUMMARY OF THE INVENTION

Accordingly, this invention is directed to methods, compositions, and compounds that substantially obviate one or more of the above-mentioned problems. To achieve these and other advantages, and in accordance with the purpose of the invention, the invention is directed to an organic waste control composition that contains an activated lignin complex containing a histosol.

In yet another embodiment, the activated lignin composition may also be combined with at least one hydrolytic enzyme, at least one microorganism that is capable of producing the hydrolytic enzyme, or a mixture of one or more hydrolytic enzymes and the microorganisms capable of producing them.

Without wishing to be bound by any theory or mechanism, it is believed that the composition of the invention serves as a macromolecular sponge, adsorbing and absorbing noxious sulfur compounds, and thereby reducing the odor caused by these compounds.

In addition, the desirable histosol component of the composition typically is not prepared by conventional paper or pulp treating processes, which are much too severe to provide the activated lignin-derived complex. The activated lignin-derived complex used in the composition of the invention is therefore produced from peat or other highly degraded organic humus by a process which forms yet another aspect of the invention, and which includes:

(a) contacting the peat or humus with water and sodium carbonate to form an extraction mixture;

(b) homogenizing the extraction mixture by subjecting it to high shear mixing;

(c) adding a dispersant during homogenizing to form a homogenized, dispersed mixture;

(d) aerating the homogenized dispersed mixture.

The invention can be more clearly understood by referring to the accompanying drawings, described below, as well as to the detailed description of specific embodiments of the invention, neither of which

should be viewed as limiting the scope of the invention in any way.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a graph that shows the reduction of hydrogen sulfide after the application of the activated lignin-derived complex of the invention at a pulp and paper mill as described in Example 2.

FIG. 2 is a graph that shows the copper corrosion weight loss after the application of the activated lignin-derived complex of the invention at a pulp and paper mill as described in Example 2.

FIG. 3 is a graph that shows the reduction of total suspended solids after the application of the activated lignin-derived complex at a pulp and paper mill as described in Example 7.

FIG. 4 is a graph that shows the reduction of BOD after the application of the activated lignin-derived complex at a pulp and paper mill as described in Example 7.

DETAILED DESCRIPTION OF SPECIFIC EMBODIMENTS OF THE INVENTION

The activated lignin-derived complex used in the composition of the invention may contain a number of different compounds, but desirably contains one or more histosol type compounds, having one or more groups of the structural formula: ##STR1##

The histosol compounds in the activated lignin-derived complex contain an estimated average of seven to nine open bonding sites, a molecular surface area estimated to be approximately 900,000 square meters per kilogram, and a negative charge with a cation exchange capacity estimated to be 1,500 to 3,000 moles of charge per kilogram. The above listed combination of components provides superior odor controlling results. Similarly, when the activated lignin-derived complex is combined with a hydrolytic enzyme, or at least one microorganism capable of providing said enzyme, or a combination a hydrolytic enzyme and at least one microorganism capable of providing said hydrolytic enzyme, the results obtained are better than those obtained using the components individually, or in combination.

As described above, present pulp and paper producing technologies use conditions that are so severe that the lignin constituent of woody plant material is generally rendered inert, no longer capable of adsorbing and/or absorbing other compounds, and unsuitable for preparing the activated lignin-derived complex used in the composition of the invention. As a result, another aspect of the invention relates to a process for preparing the activated lignin-derived complex from an organic humus, such as peat. The process includes:

(a) contacting the peat or humus with water and sodium carbonate to form an extraction mixture;

(b) homogenizing the extraction mixture by subjecting it to high shear mixing;

(c) adding a dispersant during homogenizing to form a homogenized, dispersed mixture;

(d) aerating the homogenized dispersed mixture.

Additional processing steps may be included, such as adjusting the moisture content of the peat or humus, filtering the extraction mixture to remove solids, adjusting the pH of the extraction mixture to a pH of about 7.5 to about 8.8. Moreover, the precise amounts of peat or humus, sodium carbonate, dispersant, and aeration may be somewhat variable, as determined by one skilled in the art, and may depend on the precise nature of the peat or humus used, its moisture content, etc. An example of a

preparation process for an activated lignin-derived complex from a particular organic humus is provided below.

EXAMPLE 1

A raw material comprising a highly degraded organic humus, known "organic peat humus" and available from Organic Products, Inc., Statesboro, Ga. was used. The humus was screened through a 3/8" vibrating screener. 500 gallons of water were added to a mixing vat and the mixing units powered on. 100-pounds of light soda ash (sodium carbonate) was added to the mixing vat and mixed for a minimum of 15 minutes. 26 cubic feet of the screened organic humus and having a moisture content of 35-40% were added to the mixing vat. 3 ounces of DrewPlus L474 foam control agent were added into the vat, and this mixture blended for a minimum of 90 minutes. The blended product was then pumped from the mixing vat onto vibrating shaker screen. The product in the shaker screen holding tank was then pumped into mixing/shearing/homogenizing tank and mixed for at least 30 minutes.

75 gallons of water were added to a separate 100 gallon mixing tank, and the mixing unit powered on. 32 ounces of Acti-Sperse FB (sodium polyacrylate solution) was added to the 100 gallon mixing tank, as were 75 pounds of Min-U-Gel 200 clay. This mixture was mixed for 30 minutes, and then pumped into the mixing/shearing/homogenizing tank. The product was then transferred to an aeration tank and aerated for 36 hours prior to shipping.

The resulting product was an activated lignin-derived complex containing highly reactive histosol compounds as described above. The addition of a hydrolytic enzyme, or at least one microorganism capable of providing said hydrolytic enzyme, or a combination of a hydrolytic enzyme and at least one microorganism is an optional step that increases the beneficial odor controlling and waste degradation properties of the composition of the invention, but is not necessary to obtain a useful composition according to the invention, and its addition in the above example can be omitted.

Each of the embodiments of the invention has been found to provide a superior substitute for conventional odor control and solid waste decomposition systems, including those using formaldehyde, such as the systems used in portable toilets and holding tanks in boats, recreational vehicles, airplanes, buses, etc. The compositions of the invention result in noticeable reduction in unpleasant odors that are associated with these waste-disposal systems.

The invention as described actually reduces odor released from effluents rather than merely masking the odors because the odor-causing materials are absorbed, and adsorbed or reacted with the composition. Formaldehydes have been shown to be deleterious to the proper functioning of sewage treatment plants. Additionally, formaldehyde is a known carcinogen. By contrast, the invention as described allows for effluents treated by the invention to be pumped into municipal waste systems, improving the ability of the system to process effluent rather than impeding performance of the system as can occur with the introduction of formaldehyde compounds.

This invention can also be used for reduction of organic solids, such as those found in waste retention ponds. Typically the solid stream from industrial manufacturing is released as a slurry into the retention pond. These ponds receive undigested organic compounds, serving as holding areas.

Often, the ponds release the by-products of the effluent stream as noxious, and degradative volatile sulfur and methane compounds. The composition of the invention releases oxygen, carbon dioxide, and water vapor, and secures sulfur, thus reducing noxious, harmful vapors and accelerating digestion of solid waste into innocuous vapors and gases.

The invention can also be used to reduce corrosion of piping, holding tanks, pumps, and other surface areas in contact with organic wastes.

While not wishing to be bound by any theory, it is believed that the composition of the invention functions to reduce odor one or more of several possible mechanisms. One possible mechanism of action involves chemical or physical absorption of pollutants by the reactive lignins in the composition. The reactive lignins in the composition of the invention appear to immobilize over 1,000 times their mass in potential pollutants.

Another potential mechanism at work in compositions of the invention is the blocking of sulfur processing sites in odor causing septic organisms by the activated lignin complex. This blocking allows beneficial aerobic organisms the ability to out-compete the odor-producing septic organisms, thus reducing the release of odor causing compounds such as hydrogen sulfide. This same mechanism also enables the preferred microorganisms to out-compete corrosion and fouling organisms for surface space in the pipes, vessels, tanks, pumps, etc., because it aids in formation of protective bio-films.

These methods and compositions herein may be used in a wide variety of systems and vessels, including, but not limited to, municipal sewage treatment systems, lift tanks, grease traps, holding ponds, animal litter, and industrial waste systems such as: pulp and paper mills, sewage treatment holding tanks as in motor homes, planes, boats, etc.

Similarly, the present invention can be used to minimize blockage due to fouling growth and solid waste accumulation in evaporators, condensers, pump stations, and tanks resulting in lower maintenance costs for these systems. The compositions of the invention are used by simply applying to the locus where odor causing materials exist.

Various aspects of the use of the invention are illustrated in the Examples below, which are not intended to limit the scope of the invention in any way:

EXAMPLE 2

A pulp and paper mill located within the city limits of Port Wentworth, Ga., is tied into the municipal waste water system for the city. The plant has been in operation for several years and complaints from the city residents and government officials escalated continuously because of the noxious odors emitted by the mill. Residents living near the mill complained about headaches and burning eyes.

The city government determined that high levels of hydrogen sulfide being emitted by the plant, either directly into the air through the scrubbers, from effluent being released into the sewers, or a combination of the two, was responsible for the hydrogen sulfide pollution problem.

The city of Port Wentworth also experienced damage to the sewer system, including blowouts near the forced mains and corrosion as high as 30.86% annually. The problems were caused by crown corrosion directly related to the effluent released by the pulp and paper mill.

The reactive lignin complex prepared as described in Example 1 was tested by introducing it to the effluent stream via the use of metering pumps. A lift station at the pulp and paper mill was generating hydrogen sulfide levels above 50 ppm. The flow rate at this station was approximately one (1) million gallons per day. The day before the introduction of the lignin solution, as described above, hydrogen sulfide readings were taken and the level of hydrogen sulfide found to be at 62 ppm. The lignin solution was metered in at 50 ppm the first day. Twenty-four (24) hours later, the hydrogen sulfide level was 12 ppm and the amount of lignin solution introduced was reduced to 5 ppm to maintain the lower level of

hydrogen sulfide (FIG. 2).

The lignin solution was also injected into a plant scrubber at a rate of 25 ppm, and this rate reduced the hydrogen sulfide by 76%. By reducing hydrogen sulfide levels, the reactive lignin solution reduced corrosion levels from 19.2% annually to 2.4% based on samples taken at ten (10) test sites, over the thirty six (36) months of the test period (FIG. 3).

EXAMPLE 3

Portable toilet and pumping companies are faced with increasing resistance from the owners of waste-water treatment facilities, as well as, local, state, and federal government agencies concerning the use of formaldehyde or formaldehyde-based odor control products. The introduction of these compounds creates two major problems for treatment facilities. First, the compounds kill the beneficial microorganisms in the system. Second, the wastewater released would be unacceptable and the compounds therein are considered toxic and sometimes fatal with ingestion of even small amounts.

The reactive lignin solution described in Example 1 was tested by Waste Management Company. The tests were conducted in Southeast Georgia in the month of July with daytime temperatures above 90.degree. Fahrenheit, with relative humidity over 90%. One ounce of the reactive solution was added to five (5) gallons of water, and this was added to a waste holding tank. Waste was added to the tank, and the tank produced no perceptible odor during the fourteen (14) day trial. The trial ended at fourteen (14) days because the holding tank was near its capacity of 40 gallons of waste.

EXAMPLE 4

The majority of odor control products marketed in the recreational vehicle industry contain toxic compounds (formaldehydes) that are harmful, or fatal, if ingested, or inhaled. Most of the products are masking agents that cover the offensive odor, released via organic waste decomposition.

The reactive lignin composition, described in Example 1, was field tested in fifty (50) recreational vehicle holding tanks. The lignin solution was added at a rate of four (4) ounces per gallon of water per forty (40) gallon holding tank, and organic waste was added to the tank in normal use. No perceptible odor was evident in any of the test units after the five (5) day test periods. The above rate of lignin solution is one half of the standard application rate for formaldehyde based chemicals.

EXAMPLE 5

Odor generated from animal waste is offensive and the effluent produced is a serious water pollutant. The use of toxic chemicals is not an option for use near livestock or pets.

Field tests were conducted by applying the reactive lignin composition as described in Example 1 to animal waste in kennels for dogs via a high-pressure hose-end sprayer at a rate of 6 ounces per gallon of water. No additional cleaning steps were required since the operators normally washed the kennels daily. The resulting odor reduction in the kennels was immediately noticeable. There were also noticeable odor reductions in the septic system, and the retention pond into which this waste was fed.

EXAMPLE 6

A Waste Management solid waste transfer station located in the center of a residential area was creating an odor problem for the residents in the community.

The odors were due to several different factors. Dumpsters at the facility produced noxious odors, the transfer physical plant was producing offensive odor as the run off from the transfer piles decomposed, and the retention pond was producing noxious fumes. There was also an erosion problem with the concrete floor of the station due to hydrogen sulfide leaching from the waste.

Tests were conducted by using the reactive lignin composition as described in Example 1 by adding this composition to the wash down cycle. The composition was applied to the dumpsters and physical plant via a pressure washer operating at 150 psi at the rate of 6 ounces per gallon of water.

There was an immediate reduction in odors from the facility. Hydrogen sulfide levels in the retention pond dropped from 70 ppm to 10 ppm.

EXAMPLE 7

Effluent from a pulp/paper mill in Savannah, Ga., contained excessive suspended solids and imposed an excessive biological oxygen demand on the wastewater holding ponds. The ponds have a 24 million gallon waste stream. The average daily total suspended solids varies from 6,000 to 29,000 pounds, as shown by the histograms in group 1 in FIG. 3. BOD5 was also high, with levels ranging from 70,000 to 210,000, as shown by the histograms in group 1 in FIG. 4.

The pond was treated with the reactive lignin composition described in Example 1, modified to include reactive microorganisms capable of producing hydrolytic enzymes. The object of treatment was reduction of Total Suspended Solids (TSS) and BOD levels by 50% or more in a cost-effective fashion.

The above solution was added to the mill's effluent stream at the rate of 2 ppm (50 gallons per day) during a ten day test. The total suspended solids and BOD5 during this period are shown by the histograms in group 2 in FIG. 3 and FIG. 4, respectively.

Upon completion of the ten day trial, TSS levels dropped from 14,125 pounds per day to 5,810 pounds, a reduction of 58.9%, as shown by the histograms in group 3 in FIG. 3. The BOD5 level was reduced from 43,875 to 16,000, a reduction of 63.5% as shown by the histograms in group 3 in FIG. 4.

EXAMPLE 8

A commercial hog farm located in Southeast Georgia has a 5,500,000 gallon waste lagoon that had become septic. There was virtually no aerobic activity and solids accumulation was severe. The farm and pond also produced high levels of hydrogen sulfide, along with odors so noxious it became inoperable at times due to health hazards to employees.

The waste lagoon was treated with the combination of reactive lignin composition and microorganisms as described above in Example 7.

There was an immediate noticeable reduction in odor. After the 21 day test surface solids were gone, the pond water considerably clarified, and aerobic activity was pronounced, with CO.sub.2, H, and O.sub.2 /H.sub.2 O the primary emission gases rather than hydrogen sulfide and methane.

The barns were treated for hydrogen sulfide with the reactive lignin composition described in Example 1 at the rate of 32 ounces to 242 gallons of water in the rinse tanks. Each barn was rinsed twice per day, using two tanks of rinse water per barn. Odor reduction was immediate, as well as hydrogen sulfide levels as measured via a hydrogen sulfide meter.

The lignin solution was also used in cleaning the farrowing barn, at the rate of 6 ounces per gallon water, applied via pressure washer at 150 psi. Similar results were obtained in reduction of odor and hydrogen sulfide levels.

The above test ran for 60 days with no further loss of operations due to fume toxicity.

EXAMPLE 9

A seafood restaurant in Statesboro, Ga. had a severe problem with septic tank malfunctions. The drain fields were constantly blocked. Due to these difficulties, the tanks were pumped every two weeks at a cost of $250.00 per visit. City sewer lines could not be run to the restaurant for another 18 months, necessitating an enormous expenditure to keep the septic tanks operating.

The reactive lignin and microorganism complex as described in Example 7 was used to treat the septic system. Initially, the system was shocked with 2.5 gallons, then applied at a rate of 0.5 gallons every third day. Following the above test, the pump outs had been extended to seven to eight week intervals, instead of two weeks.

EXAMPLE 10

Automatic car wash operators are being required to reduce hydrogen sulfide levels by government restrictions. These same operations are also very interested in finding an affordable product or process that will enable them to recycle the reclaimed water in the car washes.

The reactive lignin and microorganisms in solution as described in Example 7 were added to the recovery/reclaim tanks of a car wash. The application rate was 2.5 gallons per 8000-gallon tank on day one, then the product was added at a rate of one ounce per day thereafter for 30 days. Within 72 hours of initial application, the hydrogen sulfide odors were eliminated. After the 21 st day of the test, the water in the reclaim tank was being recycled in the car wash cycle. The reactive lignin and microorganisms in solution as described in the patent also removed the minerals from the water, which resulted in a dramatic reduction in water spots on the cars after washing. The car wash reduced fresh water consumption by over 75%.

* * * * *

Eagle Ridge
Staff's 1st set
#13

Prepared by and return to:

Michael B. Fischer, Esq.
Rudnick & Wolfe
203 North LaSalle Street
Chicago, Illinois 60601-1293

3942885

OR2693 PG3040

* RECORD VERIFIED - CHARLIE GREEN, CLERK *
* By: K. DeLong, D.C. *

EASEMENT AND EFFLUENT REUSE AGREEMENT

THIS AGREEMENT made and entered into as of this 21st day of August, 1995, by and between **EAGLE RIDGE GOLF AND TENNIS CLUB, LTD.**, a Florida Limited Partnership, whose address is 14589 Eagle Ridge Drive, S.E., Fort Meyers, FL 33912, ("Owner"), and **EAGLE RIDGE UTILITIES, INC.**, whose address is 14589 Eagle Ridge Drive, S.E., Fort Myers, FL 33912, ("Utility").

WITNESSETH:

WHEREAS, Owner is the fee simple owner of certain lands situated, lying and being in Lee County, Florida, and legally described in Exhibit "A" attached hereto and made a part hereof (the "Owner's Parcel"), upon a portion of which Owner has constructed a golf course;

WHEREAS, Utility owns or leases certain lands situated, lying and being in Lee County, Florida, and legally described as Exhibit "B" attached hereto and made a part hereof (the "Utility Parcel"), upon which Utility operates a sewage treatment facility ("S.T.F."), pursuant to and under a certificate from the Florida Public Service Commission and certain operating permits from the Florida Department of Environmental Protection;

WHEREAS, Utility has determined that the method of disposing of properly treated sewage effluent ("Effluent") provided for in this Agreement is less expensive than alternate methods of Effluent disposal which would require considerably greater capital investment and would result in significantly higher sewer rates to its customers;

WHEREAS, Owner has a need for an assured and available supply of properly treated Effluent in order to irrigate its landscaping and golf course, which effluent is available to Owner at a minimal cost as set forth hereinafter; and

WHEREAS, Utility and Owner have entered into an agreement dated as of April 11, 1995, to memorialize the agreement between them concerning this matter, but now wish to clarify their intentions with regard thereto by restating the terms and conditions of the agreement in this instrument.

1001030

.70

Documentary Tax Pd. $_____ Intangible Tax Pd. $_____
CHARLIE GREEN, CLERK, LEE COUNTY
By: _____ Deputy Clerk

NOW THEREFORE, in consideration of the mutual promises of the parties hereto, one to another, and/or other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, it is hereby agreed as follows:

1. **RECITALS**. All recitals hereto are agreed by the parties to be true and correct and are incorporated herein by specific reference.

2. **GRANTS BY OWNER**. Owner hereby creates, grants and conveys to Utility, its successors and assigns, an easement appurtenant burdening the Owner's Parcel and benefitting the Utility Parcel, for the purposes of using the golf course for discharge of up to 450,000 gallons per day of treated Effluent generated in connection with the operation of the S.T.F., discharge and dispersal lines and other facilities necessary for Effluent disposal into the golf course on the Owner's Parcel. Owner agrees to accept on the golf course all discharge of up to 450,000 gallons per day of Effluent generated in connection with the operation of the S.T.F. on the Utility Parcel to the fullest extent the golf course can tolerate such discharge. Utility shall have the right of reasonable and necessary egress and ingress across the Owner's Parcel for the foregoing purposes. Owner further agrees to pay to Utility the sum of Ten and No/100 Dollars ($10.00) per annum in consideration of the receipt by Owner of the Effluent as contemplated herein.

3. **COVENANTS OF UTILITY**. Utility covenants and agrees with Owner as follows:

a. Subject to the issuance of any necessary permits or approvals by the Florida Department of Environmental Protection, which Utility agrees to use its best efforts to obtain, Utility shall discharge all of the Effluent generated in connection with the operation of the S.T.F., but in no event in excess of 450,000 gallons per day without Owner's written permission, into the golf course on Owner's Parcel, and Utility further covenants and agrees not to seek approval and/or request any authorization from the Florida Public Service Commission and the Florida Department of Environmental Protection to implement any charges for effluent disposal on the golf course without prior approval from Owner.

b. Utility shall not unreasonably interfere with Owner's operation of the golf course.

c. Utility shall exercise its rights under the easement in accordance with the established and generally accepted practices of waste water treatment and effluent disposal systems and in conformity with all existing and future rules, regulations, ordinances, laws and statutes lawfully established and imposed by any governmental body or agency having jurisdiction of Utility, and specifically those requirements relating to the treatment and disposal of "public access" effluent for spray irrigation. Any costs associated with meeting such standards shall be borne by Utility.

d. Utility agrees never to exercise its easement rights in such a manner as to create a public nuisance on the Owner's Parcel and in the event that Owner shall ever contend that this provision has been violated, Owner agrees to give Utility a written notice accordingly and Utility shall have a reasonable period of time to cure any actual and conceded condition of public nuisance. If Utility does not agree with Owner that a condition of public nuisance does exist, the controversy shall be submitted to a court of competent jurisdiction for determination on the complaint of either party.

e. Utility agrees that if the Effluent discharged onto the golf course is not properly treated, Utility shall be responsible for the increased maintenance costs due to abnormally increased vegetation growth in or adjacent to the golf course. Utility further agrees to indemnify and hold harmless Owner from all damages, costs and expenses incurred by Owner in connection with any discharge of improperly treated Effluent onto the golf course, provided that Utility is given the right to defend any claims made by others against Owner in connection therewith.

f. Utility has no ownership interest in the discharge and dispersal lines located on the Owner's Parcel, and ownership thereof by Owner is hereby acknowledged.

4. **MAINTENANCE**. Owner agrees to maintain and operate the irrigation system, i.e., the discharge and dispersal lines and the spray heads, at its sole cost and expense, in a good and serviceable condition and in accordance with Utility's guidelines and governmental regulations. Major repairs and replacements to the system which are not in the nature of routine maintenance items shall be at the sole cost and expense of Utility.

5. **COVENANTS RUNNING WITH THE LAND**. The easements created pursuant to this Agreement shall be deemed to run with the lands described in Exhibit "A" (the "Owner's Parcel") in favor of the lands described in Exhibit "B" (the "Utility Parcel"), and the obligation to discharge the Effluent into the golf course on the Owner's Parcel shall be deeded to run with the Utility Parcel in favor of the Owner's Parcel.

6. **EFFLUENT REUSE ASSURANCE**. Utility agrees that all treated Effluent generated and discharged by the S.T.F., up to 450,000 gallons per day, shall be provided to Owner and that Utility shall not discharge to any third party any of the first 450,000 gallons per day of treated Effluent without Owner's prior express written consent, as long as Owner has the capacity to accept such treated Effluent. In the event Owner has the capacity to accept less than 450,000 gallons per day of treated Effluent, Utility agrees that all such treated Effluent, up to 450,000 gallons per day, generated and discharged by the S.T.F. which can be properly accepted by Owner shall be provided to Owner. Owner and Utility agree that a breach by Utility of this covenant would cause irreparable harm to Owner and that this covenant may be enforced by a suit by Owner for damages and for specific performance.

7. **FURTHER ASSURANCES**. The parties hereto agree to execute and deliver to one another from time to time such documents or instruments as may be reasonably required to confirm or implement the provisions and intentions of this Agreement.

8. **SUCCESSORS AND ASSIGNS**. Whenever reference is made to a party, said reference is intended to extend to and include the successors and assigns of said party whether so stated or not, it being the agreement of the parties that the provisions hereof shall bind and inure to their respective successors and assigns.

IN WITNESS WHEREOF, the parties have hereunto set their hands and seals as of the date first above written.

Witnesses:

Theresa J. Jacobs
Printed Name of Witness: Theresa J Jacobs

Dale Sindt
Print Name of Witness: Dale Sindt

EAGLE RIDGE GOLF AND TENNIS CLUB, LTD., a Florida limited partnership

By: William E. Maddox
WILLIAM E. MADDOX, General Partner

Attest: Dawn M. Miff

Witnesses:

Theresa J. Jacobs
Print Name of Witness: Theresa J Jacobs

Thomas W. Campbell
Print Name of Witness: THOMAS W CAMPBELL

EAGLE RIDGE UTILITIES, INC.

By:
FREDERICK QUINN, President

Attest:

STATE OF FLORIDA)
) SS
COUNTY OF LEE)

The foregoing instrument was acknowledged before me this 14th day of February, 1995, by **WILLIAM E. MADDOX**, who is the General Partner of **EAGLE RIDGE GOLF AND TENNIS CLUB, LTD.**, a Florida limited partnership, on behalf of the limited partnership. He is personally known to me and did not take an oath.

THERESA J. JACOBS
My Comm Exp. 3/24/98
Bonded By Service Ins
No. CC345869

Theresa J. Jacobs
Notary Public

Theresa J. Jacobs
Printed Name of Notary Public

My Commission Expires: 3-24-98

STATE OF FLORIDA)
) SS
COUNTY OF LEE)

The foregoing instrument was acknowledged before me this 15th day of February, 1995, by **FREDERICK QUINN**, who is the President of **EAGLE RIDGE UTILITIES, INC.**, on behalf of the corporation. He is personally known to me and did not take an oath.

THERESA J. JACOBS
My Comm Exp. 3/24/98
Bonded By Service Ins
No. CC345869

Theresa J. Jacobs
Notary Public

Theresa J. Jacobs
Printed Name of Notary Public

My Commission Expires: 3-24-98

1001035

EXHIBIT "A"

LEGAL DESCRIPTION
EAGLE RIDGE GOLF COURSE

A PARCEL OR TRACT OF LAND LYING IN SECTION 29, TOWNSHIP 45 SOUTH, RANGE 25 EAST, LEE COUNTY, FLORIDA, MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING AT THE SOUTHEAST CORNER OF SECTION 29, RUN N 49°41'12" W (BASIS OF BEARINGS BEING THE FLORIDA STATE PLANE COORDINATE SYSTEM, WEST ZONE) FOR 960.91 FEET TO THE POINT OF BEGINNING; THENCE S 89°00'58" W FOR 750.00 FEET; THENCE N 00°57'20" W FOR 298.84 FEET; THENCE N 73°59'21" W FOR 284.00 FEET; THENCE N 5°19'00" W FOR 681.00 FEET; THENCE N 16°03'35" W FOR 245.32 FEET; THENCE N 18°30'00" E FOR 259.98 FEET; THENCE N 48°10'00" W FOR 192.00 FEET; THENCE N 87°10'00" W FOR 384.98 FEET; THENCE S 32°25'00" W FOR 105.00 FEET; THENCE S 19°46'00" E FOR 315.00 FEET; THENCE S 3°19'00" E FOR 484.02 FEET; THENCE S 89°00'58" W FOR 635.43 FEET TO THE SOUTHEAST CORNER OF LOT 60, BLOCK 7, EAGLE RIDGE UNIT TWO AS RECORDED IN PLAT BOOK 36, PAGES 61 THRU 63 OF THE PUBLIC RECORDS OF LEE COUNTY, FLORIDA; THENCE N 1°59'00" W FOR 700.99 FEET; THENCE N 44°55'30" W FOR 374.06 FEET; THENCE S 75°04'21" W FOR 249.42 FEET; THENCE S 4°08'19" E FOR 671.25 FEET; THENCE S 15°36'34" E FOR 444.86 FEET; THENCE S 88°58'59" W FOR 1891.29 FEET; THENCE N 1°01'05" W FOR 184.88 FEET TO THE BEGINNING OF A CURVE CONCAVE TO THE SOUTHWEST HAVING A RADIUS OF 325.42 FEET; THENCE NORTHWESTERLY ALONG THE ARC OF THE CURVE TO THE LEFT THROUGH AN ANGLE OF 10°19'17" FOR 58.62 FEET TO A NON-TANGENT LINE TO WHICH A RADIAL LINE TO THE END OF SAID CURVE BEARS N 78°39'37" E; THENCE N 47°10'00" E FOR 842.97 FEET; THENCE N 42°30'39" E FOR 809.31 FEET; THENCE N 23°44'58" W FOR 273.13 FEET; THENCE S 70°48'55" W FOR 420.86 FEET; THENCE S 47°10'00" W FOR 519.83 FEET TO THE EAST MOST CORNER OF LOT 34, BLOCK 2, EAGLE RIDGE UNIT ONE AS RECORDED IN PLAT BOOK 35, PAGES 79 THRU 89 OF AFORESAID PUBLIC RECORDS; THENCE N 1°00'13" W FOR 933.27 FEET; THENCE N 41°33'38" E FOR 944.15 FEET; THENCE N 57°28'38" E FOR 819.70 FEET; THENCE N 37°16'01" E FOR 398.15 FEET; THENCE N 19°24'38" E FOR 609.93 FEET; THENCE N 84°09'00" E FOR 212.79 FEET; THENCE N 88°59'06" E FOR 750.00 FEET; THENCE S 0°55'38" E FOR 959.9 FEET; THENCE S 1°55'42" FOR 250.87 FEET; THENCE S 0°55'38" E FOR 70.00 FEET; THENCE N 89°04'38" E FOR 200.00 FEET; THENCE 0°55'38" E FOR 40.00 FEET; THENCE S 89°04'38" W FOR 200.00 FEET; THENCE S 0°58'49" W FOR 261.93 FEET; THENCE WEST FOR 194.4 FEET; THENCE N 10°17'13" W FOR 562.15 FEET; THENCE N 19°55'06" E FOR 820.00 FEET; THENCE N 69°55'00" W FOR 900.00 FEET; THENCE S 25°29'48" W FOR 283.00 FEET; THENCE S 19°55'06" W FOR 565.00 FEET; THENCE S 21°16'57" E FOR 784.62 FEET; THENCE SOUTH FOR 94.59 FEET TO THE BEGINNING OF A NON-TANGENT CURVE CONCAVE TO THE SOUTHEAST HAVING A RADIUS OF 280.00 FEET TO WHICH POINT OF BEGINNING A RADIAL LINE BEARS NORTH; THENCE SOUTHWESTERLY ALONG THE ARC OF THE CURVE TO THE LEFT THROUGH AN ANGLE OF 68°19'11" FOR 230.48 FEET TO THE BEGINNING OF A REVERSE CURVE CONCAVE TO THE NORTHWEST HAVING A RADIUS OF 30.00 FEET; THENCE SOUTHWESTERLY ALONG THE ARC OF THE CURVE TO THE RIGHT THROUGH AN ANGLE OF 74°52'42" FOR 39.21 FEET TO A POINT OF TANGENCY; THENCE N 83°28'29" W FOR 133.78 FEET; THENCE NORTH FOR 192.29 FEET; THENCE N 46°08'55" W FOR 601.27 FEET; THENCE S 75°47'38" W FOR 479.89 FEET; THENCE S 12°22'44" W FOR 479.89 FEET; THENCE N 88°19'01" E FOR 894.92 FEET; THENCE NORTH FOR 29.05 FEET; THENCE S 83°28'29" E FOR 126.82 FEET TO THE BEGINNING OF A CURVE CONCAVE TO THE SOUTHWEST HAVING A RADIUS OF 30.00 FEET; THENCE SOUTHEASTERLY ALONG THE ARC OF THE CURVE TO THE RIGHT THROUGH AN ANGLE OF 74°52'42" FOR 39.21 FEET TO THE BEGINNING OF A REVERSE CURVE CONCAVE TO THE NORTHEAST HAVING A RADIUS OF 209.00 FEET; THENCE SOUTHEASTERLY ALONG THE ARC OF THE CURVE TO THE LEFT THROUGH AN ANGLE OF 54°54'09" FOR 196.62 FEET TO THE BEGINNING OF A REVERSE CURVE CONCAVE TO THE SOUTHWEST HAVING A RADIUS OF 140.00 FEET; THENCE SOUTHEASTERLY ALONG THE ARC OF THE CURVE TO THE RIGHT THROUGH AN ANGLE OF 27°40'58" FOR 189.8 FEET TO A POINT OF TANGENCY; THENCE S 12°15'06" W FOR 123.00 FEET; THENCE N 77°15'17" W FOR 112.25 FEET; THENCE S 37°22'53" FOR 560.82 FEET; THENCE S 64°34'03" W FOR 331.71 FEET; THENCE S 6°20'20" E FOR 135.03 FEET; THENCE S 77°42'58" E FOR 634.5 FEET; THENCE N 12°15'06" E FOR 989.20 FEET TO THE BEGINNING OF A CURVE CONCAVE TO THE WEST HAVING A RADIUS OF 200.00 FEET; THENCE NORTHERLY ALONG THE ARC OF THE CURVE TO THE LEFT THROUGH AN ANGLE OF 13°51'02" FOR 48.39 FEET TO A NON-TANGENT LINE WHICH A RADIAL LINE TO THE END OF SAID CURVE BEARS N 88°22'04" E; THENCE N 77°48'02" E FOR 535.29 FEET; THENCE NORTH FOR 28.05 FEET; THENCE S 89°05'08" E FOR 398.98 FEET; THENCE N 66°02'19" E FOR 88.49 FEET; THENCE NORTH FOR 661.99 FEET; THENCE 65°55'09" E FOR 891.00 FEET; THENCE N 85°23'27" E FOR 104.00 FEET; THENCE N 9°07'42" E FOR 311.94 FEET; THENCE N 55°00'29" FOR 97.69 FEET; THENCE WEST FOR 295.27 FEET; THENCE N 65°39'09" W FOR 823.89 FEET; THENCE S 89°04'38" W FOR 84.47 FEET; THENCE N 0°55'38" W FOR 80.00 FEET; THENCE N 89°04'38" E FOR 118.03 FEET; THENCE N 87°43'31" E FOR 138.03 FEET; THENCE 88°56'08" E FOR 339.08 FEET; THENCE S 88°26'05" E FOR 287.74 FEET; THENCE N 88°58'08" E FOR 498.08 FEET; THENCE S 86°27'08" FOR 308.13 FEET; THENCE S 3°58'00" E FOR 812.38 FEET; THENCE S 86°10'00" E FOR 197.58 FEET; THENCE S 70°58'00" E FOR 167. FEET; THENCE N 42°19'00" E FOR 98.08 FEET; THENCE N 15°14'37" W FOR 189.06 FEET TO THE BEGINNING OF A NON-TANGENT CURVE CONCAVE TO THE NORTHWEST HAVING A RADIUS OF 89.00 FEET TO WHICH POINT OF BEGINNING A RADIAL LINE BEARS S 15°14'37" E; THENCE NORTHEASTERLY ALONG THE ARC OF THE CURVE TO THE LEFT THROUGH AN ANGLE OF 123°21'28" FOR 159.95 FEET TO THE BEGINNING OF A REVERSE CURVE CONCAVE TO THE NORTHEAST HAVING A RADIUS OF 90.00 FEET; THENCE NORTHWESTERLY ALONG THE ARC OF THE CURVE TO THE RIGHT THROUGH AN ANGLE OF 39°10'03" FOR 61.55 FEET TO A POINT OF TANGENCY; THENCE N 9°28'08" W FOR 317.03 FEET; THENCE 80°48'08" E FOR 170.00 FEET; THENCE N 9° 08' 19" E FOR 94.87 FEET; THENCE N 9°28'08" W FOR 151.99 FEET; THENCE N 24°28'08" FOR 452.09 FEET; THENCE N 88°58'08" E FOR 200.00 FEET; THENCE S 1°11'10" E FOR 689.21 FEET; THENCE S 75°29'59" W FOR 38. FEET; THENCE S 88°58'08" W FOR 189.36 FEET; THENCE S 15°07'18" W FOR 303.94 FEET; THENCE S 38°49'16" E FOR 148.88 FEE THENCE S 67°38'23" E FOR 194.55 FEET; THENCE S 1°11'10" E FOR 300.00 FEET TO THE POINT OF BEGINNING. CONTAINING 12145 ACR MORE OR LESS.

EXHIBIT A 1

LEGAL DESCRIPTION - EAGLE RIDGE CLUB HOUSE SITE

A PARCEL OF LAND LYING IN THE SOUTHWEST QUARTER OF SECTION 29, TOWNSHIP 43 SOUTH, RANGE 25 EAST, LEE COUNTY, FLORIDA, MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING AT THE SOUTHWEST CORNER OF LOT 1, BLOCK 4, EAGLE RIDGE UNIT ONE, AS RECORDED IN PLAT BOOK 35, PAGE 82 OF THE PUBLIC RECORDS OF LEE COUNTY, FLORIDA; THENCE SOUTH 60.00 FEET TO THE POINT OF BEGINNING OF THE HEREIN DESCRIBED PARCEL; THENCE EAST ALONG THE SOUTH BOUNDARY OF SAID PLAT FOR 580.00 FEET; THENCE SOUTH FOR 331.01 FEET; THENCE S77°48'42"W FOR 533.29 FEET TO THE EASTERLY RIGHT OF WAY OF EAGLE RIDGE DRIVE SE AND THE BEGINNING OF A NON-TANGENT CURVE CONCAVE TO THE SOUTHWEST HAVING A RADIUS OF 200 FEET TO WHICH POINT OF BEGINNING A RADIAL LINE BEARS N88°22'03"E; THENCE ALONG THE BOUNDARY OF SAID PLAT AND SAID RIGHT OF WAY ALONG THE ARC OF A CURVE TO THE LEFT THROUGH AN ANGLE OF 63°49'59" FOR 222.82 FEET TO THE BEGINNING OF A REVERSE CURVE CONCAVE TO THE EAST HAVING A RADIUS OF 140.00 FEET; THENCE NORTHWESTERLY ALONG BOUNDARY OF SAID PLAT AND SAID RIGHT OF WAY AND ALONG THE ARC OF THE CURVE TO THE RIGHT THROUGH AN ANGLE OF 155°27'52" FOR 379.87 FEET TO A POINT OF TANGENCY AND THE POINT OF BEGINNING.
CONTAINING 5.83 ACRES.

EXHIBIT "A"

LEGAL DESCRIPTION - GOLF COURSE MAINTENANCE FACILITIES SITE

A tract or parcel of land being a part of Tract A, EAGLE RIDGE UNIT ONE, as recorded in Plat Book 35, Pages 79 through 85, of the Public Records of Lee County, Florida, lying in the Southwest Quarter of Section 29, Township 45 South, Range 25 East, Lee County, Florida, more particularly described as follows:

Commencing at the southwest corner of said Section 29, being also the southwest corner of said Tract A; thence N01°08'13"W (Basis of bearings being said record plat of Eagle Ridge Unit One) along the west line of said Section 29 and said Tract A for 679.93 feet to the Point of Beginning; thence continuing N01°08'13"W along the west line of said Tract A for 150.00 feet to the northwest corner of said Tract A; thence N88°51'47"E along the north line of said Tract A for 219.65 feet to the northeast corner of said Tract A, being a point on a non-tangent curve concave to the northeast having a radius of 134.33 feet; thence southeasterly along the easterly line of said Tract A and the arc of said curve to the left (interior angle of 19°50'40", chord bearing and distance of S32°54'41"E, 46.29 feet) for 46.53 feet to a point of tangency; thence S42°50'00"E along the easterly line of said Tract A for 120.00 feet to a curve concave to the southwest having a radius of 265.42 feet; thence southeasterly along the easterly line of said Tract A and the arc of said curve to the right (interior angle of 41°48'54", chord bearing and distance of S21°55'32"E, 189.44 feet) for 193.71 feet; thence S01°01'05"E along the east line of said Tract A for 12.00 feet; thence S88°58'55"W for 130.00 feet; thence N01°01'05"W for 26.72 feet; thence S88°58'55"W for 34.12 feet; thence N01°08'13"W for 119.00 feet; thence N46°08'13"W for 31.11 feet; thence S88°51'47"W for 205.00 feet to the Point of Beginning.

Containing 1.51 acres, more or less.

Subject to easements, restrictions, and reservations of record.

EXHIBIT "B"

WASTEWATER TREATMENT PLANT FACILITIES SITE
LEGAL DESCRIPTION

A tract or parcel of land being a part of Tract A, EAGLE RIDGE UNIT ONE, as recorded in Plat Book 35, Pages 79 through 85, of the Public Records of Lee County, Florida, lying in the Southwest Quarter of Section 29, Township 45 South, Range 25 East, Lee County, Florida, more particularly described as follows:

Beginning at the southwest corner of said Section 29, being also the southwest corner of said Tract A; thence N01°08'13"W (Basis of bearings being said record plat of Eagle Ridge Unit One) along the westerly line of said Section 29 and said Tract A for 679.93 feet; thence N88°51'47"E for 205.00 feet; thence S46°08'13"E for 31.11 feet; thence S01°08'13"E for 119.00 feet; thence N88°58'55"E for 34.12 feet; thence S01°01'05"E for 26.72 feet; thence N88°58'55"E for 130.00 feet to the westerly right-of-way line of Aeries Way Drive S.E. and the easterly line of said Tract A; thence continue along said right-of-way line S01°01'05"E for 177.68 feet to a point of curvature; thence southeasterly along said right-of-way line along the arc of a curve to the left having a radius of 302.43 feet, interior angle of 41°06'38", chord bearing and distance of S21°34'25"E, 212.57 feet, for 217.00 feet to the northerly line of Lot 1, Block B, EAGLE RIDGE UNIT TWO, as recorded in Plat Book 38, Page 62 of the Public Records of Lee County, Florida; thence southwesterly along said northerly line and along a curve to the right having a radius of 315.2 feet, interior angle of 34°43'39", chord bearing and distance of S71°37'06"W, 188.14 feet, for 191.05 feet; thence S01°01'05"E along the westerly line of said Lot 1 for 85.00 feet to the southerly line of said Section 29; thence S88°58'55"W along said southerly line for 285.00 feet to the southwest corner of said Section 29 and the Point of Beginning.
Containing 5.41 acres, more or less.

Subject to easements, restrictions, and reservations of record.

EAGLE RIDGE
AQUADISC
FILTER

QUOTATION

C&V Carter & VerPlanck, Inc.
Mechanical Equipment Sales & Service
P.O. Box 24169 - Telephone (813) 287-0709
Tampa, Florida 33623

February 4, 2003

TO: UTILITIES, INC. (Attn: Pat Flint)

EAGLE RIDGE WWTP

QUANTITY	WE ARE PLEASE TO QUOTE ON THE FOLLOWING MATERIAL FOR ACCEPTANCE WITHIN 30 DAYS

CLOTH MEDIA FILTER

1 *Aqua-Aerobic System, Inc.* AquaDisk Filter Model # ADFP-54x2E, including all appurtenances as described on the attached Process Design Report #18444.

TOTAL PRICE FOR EQUIPMENT AND APPURTENANCES LISTED ABOVE, INCLUDING FREIGHT, AND START-UP SERVICES IS $ 130,000.00 .
TERMS NET THIRTY (30) DAYS. TAX NOT INCLUDED.

PLEASE NOTE:

1. We do not include pressure gauges, anchor bolts, wire, cable, conduit, installation, hook-up, field testing, control panels or any other accessories or other ancillary items which are not specifically called out in this scope of supply.
2. Under no circumstances will Carter & VerPlanck, Inc. or its suppliers be liable for any incidental, consequential, liquidated, special or late delivery damages whatsoever.
3. Payment terms are 100% net 30 days from delivery with approved credit. Our price is based upon no retainage.
4. Pricing is based upon Carter & VerPlanck, Inc. and the manufacturer's Standard Terms and Conditions of Sale. Copies of these documents are attached herewith for your review and reference. No other Terms or Conditions of Sale will apply unless accepted in writing by an officer of the Company.
5. We estimate the following milestones:
   a. Submittal Data Available: Approximately four (4).
   b. Shipment of Equipment: Approximately fourteen (14) to sixteen (16) weeks

Carter & VerPlanck, Inc.

BY _____
Kenneth J. Graham
Telephone (407) 341-1701

30455 ADDER - $26,000 +

2 PAGES

PROPOSAL

Kamin Electric
P.O. Box 903
Stuart, FL 34995-0903

(772) 225-9299

September 18, 2003

Attn: Scott
Utilities Inc.

RE: Lift Station #1
Eagle Ridge

We hereby propose to furnish the materials and perform the labor necessary for the completion of the installation of:

Approximately 500 feet of wire and pipe for 100 amp, 3 phase electrical service from sewer plant distribution center to lift station #1. This will allow the lift station to be on generator power. This requires hand digging of trench due to unknown underground pipes.

The above work will be completed in a substantial workmanlike manner for the sum of $ 7,243.00

Payment as follows: Upon completion

Respectfully submitted,

William Kamin
Kamin Electric

This proposal may be withdrawn by us if not accepted within 30 days.

ACCEPTANCE OF PROPOSAL

The above price, specifications and conditions are satisfactory and are hereby accepted. You are authorized to do the work as specified. Payments will be made as outlined above.

Date_____ Signature_____

Utilities, Inc. of Eagle Ridge
Docket No. 030445-SU
Staff's First Set, Response to 18(e)

Project: WWTP aeration improvements

Accumulated depreciation	4,444	
Sewage treatment plant		4,444
Accumulated depreciation	4,769	
Sewage treatment plant		4,769