STATE OF MAINE
DEPARTMENT OF HEALTH AND HUMAN SERVICES
DIVISION OF HEALTH ENGINEERING
286 WATER STREET
AUGUSTA, MAINE
04333-0011

John Elias Baldacci
Governor

John R. Nicholas
Commissioner

June 27, 2005

Ecological Tanks, Inc.
Attn.: Calvin Locker, R.S.
401 Valley View Drive
Edwardsville, IL 62025

Subject: Product Registration, Aqua Safe

Dear Mr. Locker:

The Division of Health Engineering has completed a review of a registration application for your company's product. This information was submitted pursuant to Section 1802 of the Maine State Plumbing Code, Subsurface Wastewater Disposal Rules (Rules), for code registration, for use in Maine.

Product Description

The Aqua Safe consists of aerated extended treatment tanks with integral conical clarifiers. The Aqua Safe is available in 500 gallon, 600 gallon, 750 gallon, 800 gallon, 1,000 gallon, 1,250 gallon, and 1,500 gallon capacities with corresponding model designations. Various specialty models (such as with integral pre-treatment) are also included under these model designations (ref.: Aqua Safe operation manual dated 2004). Treated 30 day average effluent levels of $CBOD_5$ and TSS are less than 3 mg/l, each.

Claim

According to the information you provided, the Aqua Safe has received National Sanitation Foundation Standard 40 approval. The Aqua Safe qualifies for a 0.5 adjustment factor for disposal area sizing under Table 603.1 of the Subsurface Wastewater Disposal Rules.

Determination

On the basis of the information and sample product submitted, the Division has determined that the Aqua Safe is acceptable for use in the State of Maine, provided that it is installed, operated, and maintained in conformance with the manufacturer's directions.

In the event that the product fails to perform as claimed by the applicant, use of the new or experimental technology in Maine, including all installations approved pursuant to Section 1801.7 of the Rules, shall cease. Use of the new or experimental technology shall not resume until the applicant and the Division have reached a mutually acceptable agreement for resolving the failure to perform as claimed.

Because installation and owner maintenance has a significant effect on the working order of onsite sewage disposal systems, including their components, the Division makes no representation or guarantee as to the efficiency and/or operation of Aqua Safe. Further, registration of this product for use in the State of Maine does not represent Division preference or recommendation for this product over similar products.

If you have any questions please feel free to contact me at (207) 287-5695.

Sincerely,

James A. Jacobsen

James A. Jacobsen, Environmental Specialist IV
Wastewater and Plumbing Control Program
Division of Health Engineering
e-mail: james.jacobsen@state.me.us

/jaj

xc: Product File

ECOLOGICAL TANKS, INC.

Makers of

AQUA SAFE® Wastewater Treatment *and* AQUA AIRE® Wastewater Treatment

2247 Hwy. 151 N. • Downsville, LA 71234 • (318) 644-0397 • Fax (318) 644-7257

June 2, 2005

Mr. James A. Jacobsen
Environmental Specialist IV
Department of Human Services
Bureau of Health
Div. of Health Engineering
Wastewater & Plumbing Program
286 Water Street
Augusta, Maine 04330

Subject: Request for approval of the Aqua Safe and Aqua Aire wastewater treatment plants

Dear Mr. Jacobsen:

Enclosed are the applications and supporting documents for registration of both the Aqua Safe and Aqua Aire wastewater treatment plants. Each treatment plant includes several plant capacities from 500 to 1500 gpd, in addition to various modifications of each size, such as the addition of pretreatment chambers, chlorine contact chambers and pump chambers. These are listed in the enclosed technical manuals, as well as the official NSF listing, which is included with the packet.

Also included are the respective Performance Testing and Evaluation Certification Reports for both the Aqua Safe and Aqua Aire plants, as well as additional testing on both plants to determine nutrient removal capabilities. If you need any additional information, please contact me at 401 Valley View Drive, Edwardsville, IL 62025, (phone: 618-659-1367)

I look forward to hearing from you in the near future.

Sincerely,

Calvin Locker, R.S.
National Sales Director

ECOLOGICAL TANKS, INC.
AQUA SAFE. & AQUA AIRE.
2247 Hwy. 151 North • Downsville, LA 71234
"Changing the shape of Advanced Aerobic Treatment Systems"™

CALVIN LOCKER, R.S.
National Sales Director
401 Valley View Drive
Edwardsville, IL 62025
Office: 618-659-1367
Fax: 618-659-1361
Cell: 618-910-0227
etiaquasafe.com
Email: calvinlocker@sbcglobal.net

Maine Department of Health and Human Services
Bureau of Health
Division of Health Engineering
Wastewater and Plumbing Control Program

APPLICATION FOR REGISTRATION OF EXPERIMENTAL SYSTEM/INNOVATIVE TECHNOLOGY OR ONSITE SEWAGE DISPOSAL SYSTEM PRODUCT

Please complete the following Sections. Please print or type.

Applicant

Company Name: Ecological Tanks, Inc.
Contact Person: George Johnson
Address: 2247 Hwy 151 N.
Town/City: Downsville State/Province: LA Zip Code: 71234
Country: USA
Telephone: 318-644-0397 e-mail: aquasafe@bayou.com

Product

Product Name: Aqua Safe
Model: AS 500, AS 600, AS 750, AS 800, AS 1000, AS 1200, AS1500
Also, all modifications of above as listed on NSF listing

Product Classification (choose one)

Primary or Secondary Treatment Unit

[ ] Septic Tank [X] Extended Aerobic Treatment Unit [ ] Recirculating Aerobic Unit

[ ] Aerobic Fixed Film Unit [ ] Other (specify) _____

Effluent Filter

[ ] Septic Tank Outlet Filter [ ] Post-Tank Filter [ ] Other (specify) _____

Disposal Device

[ ] Gravel-less Disposal Pipe [ ] Gravel-less Disposal Bed [ ] Chamber, Plastic

[ ] Chamber, Other [ ] Other (specify) _____

Miscellaneous

[ ] Pipe [ ] Effluent Flow Distribution Device [ ] Other (specify) _____

Claim

Describe the product's features (attach additional sheets if necessary).

See attached process description

Describe the product's performance (attach additional sheets if necessary).

See attached copies of NSF Standard 40 Test Results (testing was done at Baylor Univ.)

Also attached are test results for nitrogen removal

Has the product received National Sanitation Foundation or Canadian Standards Authority approval?

[ ] No [X] Yes (If "yes", enclose a copy of the certification.)

IMPORTANT NOTE!

Don't forget to enclose relevant product literature, engineering specifications, studies, and third party certifications with this application.

I, Calvin Locker, am the [ ] applicant [X] agent for the applicant of the subject product.
(print name)

I state that the information submitted is correct to the best of my knowledge and understand that any falsification is reason for the Department to deny registration for use of the product in Maine.

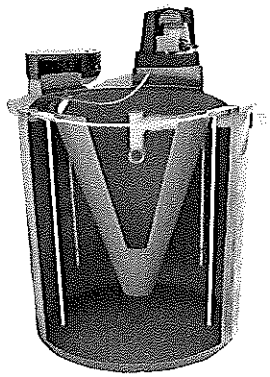
Calvin Locker

[ ] Signature of Applicant
[X] Signature of Agent for Applicant

6/2/05
Date

Aqua Safe® Aerobic Treatment Unit

Narrative Description



The **Aqua Safe®** series of advanced aerobic treatment units are designed to treat domestic wastewater from residential homes, multiple homes, or light commercial applications. The wastewater is treated by the patented **Aqua Safe®** process and the highly treated effluent is disposed of per state regulations by multiple disposal applications.

The **Aqua Safe®** individual home sewage treatment system is an inexpensive self-contained wastewater treatment system that features an extended aeration activated sludge process which reduces sewage to an odorless safe discharge in 24 hours. **Aqua Safe®** was tested according to requirements listed in A.N.S.I./N.S.F. Standard #40 and is listed by NSF as meeting or exceeding Class 1 effluent requirements.

Aqua Safe® series of treatment units are constructed primarily out of fiberglass. Depending on accessibility, concrete is available as well. **Aqua Safe®** A.T.U.'s are available in 500gpd-1500gpd with optional add-on configurations to assist with ease of installations.

Pre-treatment tank-This is an optional item on the **Aqua Safe®** unit unless state code dictates otherwise. The pre-treatment tank is equipped with a discharge baffle extending vertically down into the liquid set to draw between the floatable and settleable solids. This is set to prevent larger solids from passing through to the mixing zone due to peak hydraulic loading periods. There are **Aqua Safe®** models with pre-treatment tanks laminated to the A.T.U. for ease of installation and access ports are appropriately located above baffles for servicing.

Aeration or mixing zone-The **Aqua Safe®** series utilizes an extended aeration activated sludge process which effectively treats the effluent by distributing free dissolved oxygen into the mixed liquor in the aeration zone. This is accomplished by a compressor blowing air to drop lines equally distributed around the perimeter of the tank with the diffusers distributing air above the intake of the clarifier. As the air bubbles rise up through the process fluid, it creates a rolling action which enhances the mixing of the oxygen with the wastewater. This process allows aerobic bacteria and other microorganisms to convert the organic material in the wastewater, into new cell mass. As the number of organisms increase, they clump together, forming a floc, or biomass, which in turn, entraps additional organic matter for further treatment. As the effluent exits the system through the clarifier, the organic solids (floc) settle down through the quiescent zone of the

clarifier, back into the aeration chamber. The aeration chamber has a generous retention time of 40.7 hours which is about 70% larger than the normal design capacity of 24 hours for extended aeration. This additional retention time enables the unit to withstand greater hydraulic surge loadings without allowing solids to be washed out of the system.

During periods of low flows through the treatment plant, organisms in the system consume other microorganisms as an energy source, thereby reducing the total volume of suspended solids. Periodically, however, it is necessary to pump out (waste) the excess solids that accumulate within the system.

Although the extended aeration process is considered to be a suspended growth process, the interior surface area of the aeration chamber, as well as the outer surface area of the clarifier, act as a biological reactor or supporting media to which bacteria clings. For example, the AS500gpd unit has 17,940 sq. in. of clinging space on the interior surface area of the aeration chamber and 7,800 sq.in. of clinging space on the outside of the clarifier for a total of 25,750 sq in of area for bacterial organisms to cling and multiply.

Clarifier-Through hydraulic displacement mixed liquid will enter from the bottom of the conical clarifier. The settleable solids will settle down the slope of the clarifier and re-enter the mixing zone for further aerated treatment. The polished effluent will rise upwards through the clarifier to the discharge pipe. The average retention time in the clarifier is 7.3 hours. The conical design of the clarifier provides for a surface settling rate of .84 gpd/sq.ft., which is >10 times greater than required by 10 States Standards.

Pump tanks-When the method of effluent dispersal requires a pump application, the **Aqua Safe®** series has many models of pump tanks available with most being laminated on to the A.T.U. for ease of installation.

Disinfection-Tablet fed chlorinators are usually located in the pump tanks in line with the discharge pipe for complete disinfection. The chlorinator is brought to grade for ease of servicing or adding chlorine. Liquid chlorinators are also available showing long term savings in chlorine cost. UV disinfection is another alternative that can be used.

Controls-Ecological Tanks Inc., manufactures a wide variety of controls for use in the on-site industry. Controls are constructed out of a poly Nema 4x watertight enclosure and are available in multitudes of demand and timed models for effluent dispersal applications. Controls are equipped with visual and audible alarms for compressor failures and high water situations. All controls are UL 508A listed and meets or exceeds NSF Standard 40 criteria.

Specifications

The **Aqua Safe®** series of wastewater treatment plants comes in fiberglass or concrete and in multitudes of configurations and volumetric sizes. Plants can be used individually or in conjunction with others for larger flows.

500 & 1500?

	A.S. 500	A.S. 600	A.S.750	A.S.1000	A.S. 1500
Treatment capacity	500GPD	600GPD	750 GPD	1000 GPD	1500 GPD
Volumetric Capacity	1000 GAL.	1190 GAL.	1516 GAL.	2008 GAL.	2918 GAL.
Aeration Zone Capacity	848 GAL.	1000 GAL.	1288 GAL.	1706 GAL.	2349 GAL.
Clarifier Capacity	152 GAL.	190 GAL.	228 GAL.	302 GAL.	569 GAL.
BOD 5 Loading	1.25 #/DAY	1.50 #/DAY	1.85 #/DAY	2.50 #/DAY	3.75 #/DAY
Aerator- Aqua Safe Compressor	ASC2532	ASC3342	ASC3352	ASC5082	ASC7510
A.S. (Inside Diameter)	5'6"	6'0"	6'9"	6'9"	8'2"
A.S. Height (Bottom of tank to flange)	6'4"	6'4"	6'4"	8'2"	8'2"

Performance

When properly loaded, operated, and maintained the **Aqua Safe®** wastewater treatment plant should provide an effluent quality consistent with the E.P.A. secondary treatment guideline parameters. The expected final discharge from the plant should provide an effluent quality of:

<25mg/l----------CBOD5
<30mg/l----------TSS
pH of 6 to 9

Testing in accordance with ANSI/NSF Standard 40 requirements showed the **Aqua Safe®** series to demonstrate a 30 day effluent average of: 2.37 mg/l (CBOD5) and 2.11 mg/l (TSS) or 98.6% total removal of harmful pathogens in the wastewater. Discharge levels of Nitrates tested at 7.52 mg/l with no add-on components.

Inspection/Maintenance

Aqua Safe® home wastewater treatment plants have been designed and built by Ecological Tanks, Inc. to provide long term, reliable and cost efficient service. Our treatment plants will operate with a minimum amount of attention.

Maintenance and Inspection- Risers to allow for the inspection and maintenance of the **Aqua Safe®** are strategically located on top of the tank.

Periodically: Check and clean the air filter on aerator compressor. Rinse with warm water to clean if necessary. Make sure filter is dry and re-install on aerator compressor.

Recommended: Frequency of solids removal is no more often than every two (2) to five (5) years. Determination of the need for pumping can be made only by a trained service person by testing the tank contents and/or effluent.

NSF Standard 40 dictates that a 2 year service policy shall be furnished to the owner by the manufacturer or the authorized representative and the cost of the initial service policy be included in the original purchase price. The initial service policy consist of 4 inspection visits that are usually once every 6 months in a 2 year period. Items that need to be serviced or maintained are: electrical and mechanical components, effluent (color, turbidity, settable solids), integrity of the tank(s) and baffles, condition of disposal area, etc...The initial policy states that if a problem arises the owner shall be notified of system failure and a date of correction. Also, an extended service policy shall be made available to the owner when the initial policy expires by the manufacturer or the authorized representative.

Delivery Time

Ecological Tanks Inc. keeps an ample supply of **Aqua Safe®** 500gpd-1500gpd fiberglass units in stock and can be shipped within days depending upon destination. **Aqua Safe®** concrete units are pre-casted throughout the region and one can call the factory for accessibility nearest you.

Costs

Please consult local distributor or manufacturer for availability and pricing.

Manufacturer

Address: Ecological Tanks Inc.
2247 Hwy 151 North
Downsville La. 71234

Office: (318) 644-0397
Fax: (318) 644-7257

E-mail: aquasafe@bayou.com
Website: www.etiaquasafe.com

TM

Performance Testing and Evaluation Certification Report

Baylor University
Department of Environmental Studies
Individual On-Site Waste Water Treatment System
Testing and Certification Program
on the

Aqua Aire 500
With Model Series 600, 750, 1000, and 1500

Manufactured by Ecological Tanks, Inc.
Downsville, Louisiana, U.S.A.

Original Report: May 2, 2002

WATER TEST PREFORMANCE EVALUATION REPORT

The Baylor University, Department of Environmental Studies, Individual On-Site Waste Water Treatment System Testing and Certification Program has determined by a thorough performance evaluation under the provisions of the NSF/ANSI Standard 40, 2000, that the residential wastewater treatment system Aqua Safe 500, manufactured by Ecological Tanks, Inc., of Downsville, Louisiana, USA has successfully fulfilled all the requirements of NSF/ANSI Standard 40, 2000, and has achieved effluent water quality consistent with a Class I effluent residential wastewater treatment system.

All tests were performed at the Waco Metropolitan Area Regional Sewerage System Treatment Plant (WMARSS), Waco, Texas operated by the Brazos River Authority (BRA). Laboratory analysis of samples, including CBOD, TSS, and VSS were conducted at the BRA Laboratory by BRA personnel. Affidavits regarding non-involvement of all Baylor Staff and BRA Staff and laboratory personnel are on file. Characteristics of the raw influent sewage are included in the tabulated data of this report.

The observations and analyses included in this report are certified to be correct and detailed descriptions and analyses are described herein. Additional information about the testing agency, test site, equipment, data collection procedures, QA/QC protocols, etc. is provided to State environmental regulatory authorities under separate cover.

The certified data is the property of the manufacturer of the residential wastewater treatment system and can be released only with the manufacturer's permission. The manufacturer has agreed to present the data in this certification in its entirety whenever it is used in advertising, prospective, bids, or similar uses.

I certify that the attached document is an official report issued by the Baylor University Individual On-Site Waste Water Treatment System Testing and Certification Program. The original of this document is neither a public record nor a publicly recordable document. The original bench data is retained in the files of Baylor University.

Mr. David L. Jumper

Signed before me this 9th day of April, 2003.

Project Director, Individual On-Site
Waste Water Treatment System
Testing and Certification Program
Department of Environmental Studies
P. O. Box 97261
Baylor University, Waco, Texas.76798-7261
Phone: (254) 710-3405 Fax: (254) 710-3409

Date: 2 May, 02

Sharon A. Sloan
My commission expires: Sept. 7, 2003

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		MEDIAN	MINIMUM	MAXIMUM	INTERQUARTILE RANGE
Dissolved Oxygen (mg/l)	aeration	1.025	.03	23.72	.533-3.083
	effluent	1.52	.05	12.12	.78-4.105
Temperature (C)	influent	21.75	8.39	31.65	18.44-25.84
	aeration	22.17	15.63	31.76	17.625-26.16
	effluent	20.89	6.00	31.82	16.74-25.9
pH	influent	7.37	6.09	8.96	7.04-7.65
	aeration	7.785	6.13	9.27	7.483-7.99
	effluent	7.81	5.48	9.33	7.475-8.04
5 day Biochemical Oxygen Demand (mg/l)	influent	108.0	9.0	1071	75.5-223.0
	effluent	0.0	12.6	12.6	2.0-2.115
Suspended Solids (mg/l)	influent	124	44	1560	77.5-225
	aeration	1435	330	4515	825-1935
	effluent	1.6	0	11.4	1.2-2.2
Settleable Solids (ml/l) 45-min..	aeration chamber	6.0	1.0	33.0	4.0-14.0

Median: Fifty percent of the values are less than or equal to this value.
Interquartile Range: The range of variability about the median which is sufficient to contain 50% of the observations. The interquartile range lies between the upper and lower 25% of the observations.

PREFACE

This report describes the results of the performance evaluation conducted by the Baylor University, Department of Environmental Studies, Individual On-Site Waste Water Treatment System Testing and Certification Program, Waco, Texas, with the cooperation of the Brazos River Authority, Waco, Texas, on the residential wastewater treatment system Aqua Safe, 500 GPD manufactured by Ecological Tanks, Inc., in Downsville, Louisiana.

All laboratory tests were performed at the Waco Metropolitan Area Regional Sewerage System Treatment plant (WMARSS) operated by the Brazos River Authority (BRA). In-situ tests and sample collection were performed by Baylor Personnel. All statistical analysis was performed by using Microsoft Excel 5.0. Statistical summaries are included in Appendix A.

This report contains results of the testing protocol, a description of the residential wastewater treatment system, its operation and key process control equipment, and a narrative summary of the test program, including test location, procedures and significant occurrences.

The purpose of this evaluation is to determine the efficacy of the Aqua Safe 500 gpd residential wastewater treatment system for distribution and design application. All phases of this evaluation were conducted in accordance with the provisions and specifications set forth by NSF International in the NSF/ANSI Standard 40, 2000 for residential wastewater treatment systems capable of producing Class I effluent.

NSF/ANSI Standard 40, 2000

Performance evaluation of residential wastewater treatment systems is achieved within the provisions of NSF/ANSI Standard 40, 2000 prepared by the NSF Joint Committee on special Processes or Devices used in Treating Wastewater and adopted by the NSF Board of Trustees, and adopted by the Baylor University Individual On-Site Waste Water Treatment System Testing and Certification Program.

The standard is consistent with the methodology established by NSF International in the development of standards and criteria for special equipment having a bearing on public health and/or the environment. It provides for uniformity of requirements and interpretation applicable to processes intended to treat wastewater from individual homes and other sources having similar types and volumes of liquid wastes.

There are five fundamental principles which relate to application of the standard:

a. The standard represents minimum and basic requirements for evaluation.

b. Performance evaluation is independent of design and construction although the evaluation recognizes structural weaknesses, undesirable noise, and other detriments to the environment as part of the test results.

c. Installation and operation of the equipment is performed according to the instructions of the manufacturer consistent with actual field installation and use.

d. Appropriate warranties and service provisions must support field applications of the equipment to enable continuous operation within the demonstrated performance characteristics of the residential wastewater treatment system or process.

e. Sample collection, preservation and storage, and analytical methods by the testing agency are in accordance with Standard Methods for the Examination of Water and Wastewater, Eighteenth Edition, and Manual of Methods for Chemical Analysis of Water and Wastes, when applicable, and the data produced is certified as a true and accurate record of performance under the known conditions of the test.

Conformance with the standard is not to be construed as a blanket guarantee of the equipment in all applications. Rather it is a certification that the residential wastewater treatment system was appropriately tested and that if the residential wastewater treatment system is manufactured, installed and maintained as it was tested, documented as reported here in and maintained as required by the manufacturer, it will usually produce water quality in accordance with the standard.

Residential wastewater treatment systems conforming to NSF/ANSI Standard 40, 2000 are classified as Class I or Class II residential wastewater treatment systems according to the quality of effluent produced by the residential wastewater treatment systems during their performance evaluation. Class I residential wastewater treatment systems must also demonstrate performance consistent with the odor, oily film and foam requirements of the standard. With the 1978 revision of the standard, Class I residential wastewater treatment systems must satisfy requirements of the EPA's Secondary Treatment Guidelines for five day biochemical oxygen demand, suspended solids and pH quality requirements.

PERFORMANCE EVALUATION

This report is applicable to the residential wastewater treatment system manufactured by Ecological Tanks, Inc., of Downsville, Louisiana, U.S.A and referred to as the Aqua Safe. This residential wastewater treatment system is marketed as a complete home aerobic treatment system and has a rated capacity of 500 gallons per day. This residential wastewater treatment system represented by the drawings, parts list, and specifications included as Appendix D.

NSF/ANSI Standard 40, 2000 delineates a standard method for the performance evaluation of residential wastewater treatment systems. A copy of the NSF/ANSI Standard 40, 2000 can be ordered by writing to:

NSF International
3475 Plymouth Road
PO Box 130140
Ann Arbor, Michigan 48113-0140

Sampling points and their associated analytical parameters are outlined in Table I. The samples were collected seven days per week which exceeds the NSF/ANSI Standard 40, 2000 guidelines, to produce a more accurate representation of the residential wastewater treatment system's performance. Composite samples of the effluent were taken daily, proportional to the flow, by an automatic sampler activated by a timer synchronized with the dosing timer. All other samples were grab samples, or the measurements were made in-situ.

TABLE 1 SAMPLING SCHEDULE

	DO	CBOD	TSS/VSS	pH	Temp.	Sett. Sol.	Color	Odor	Oily Film	Foam
Influent	I	C	C	I	I					
Aeration Chamber	I		G	G	I	G				
Effluent	I	C	C	I	I		G	G	G	G

G = GRAB SAMPLE C = COMPOSITE SAMPLE I = IN SITU MEASUREMENT

Shown in Table II is a statistical summary of the numerous observations for each analytical parameter, expressed in terms of the median, minimum and maximum values, and the interquartile range for each parameter. The median and interquartile range indicate, respectively, the central tendency and variability of the parameter in a manner that is free from assumptions with regard to the overall distribution of data.

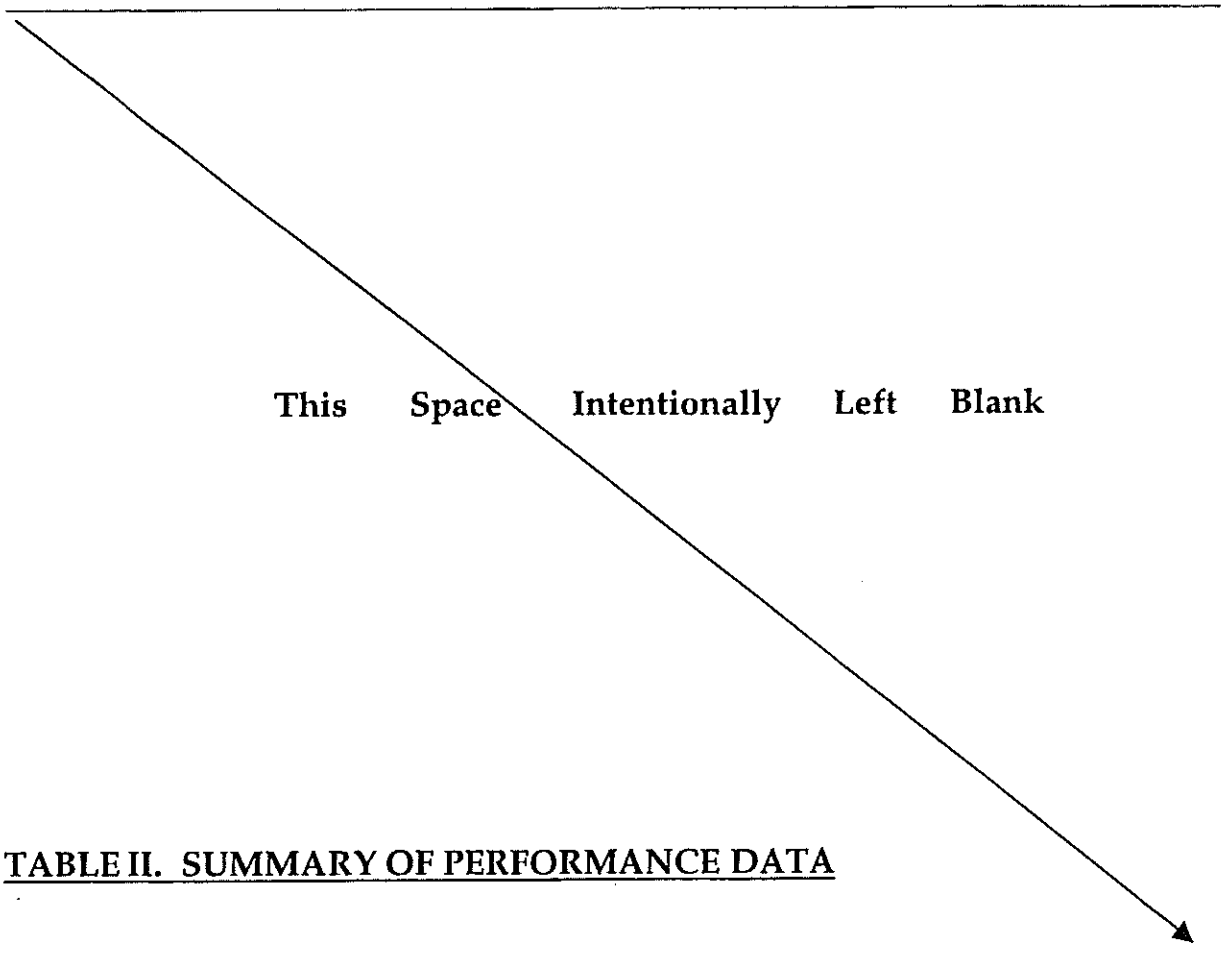


TABLE II. SUMMARY OF PERFORMANCE DATA

		MEDIAN	MINIMUM	MAXIMUM	INTERQUARTILE RANGE
Dissolved Oxygen (mg/l)	aeration	1.025	.03	23.72	.533-3.083
	effluent	1.52	.05	12.12	.78-4.105
Temperature (C)	influent	21.75	8.39	31.65	18.44-25.84
	aeration	22.17	15.63	31.76	17.625-26.16
	effluent	20.89	6.00	31.82	16.74-25.9
pH	influent	7.37	6.09	8.96	7.04-7.65
	aeration	7.785	6.13	9.27	7.483-7.99
	effluent	7.81	5.48	9.33	7.475-8.04
5 day Biochemical Oxygen Demand (mg/l)	influent	108.0	9.0	1071	75.5-223.0
	effluent	0.0	12.6	12.6	2.0-2.115
Suspended Solids (mg/l)	influent	124	44	1560	77.5-225
	aeration	1435	330	4515	825-1935
	effluent	1.6	0	11.4	1.2-2.2
Settleable Solids (ml/l) 45-min..	aeration chamber	6.0	1.0	33.0	4.0-14.0

Median: Fifty percent of the values are less than or equal to this value.
Interquartile Range: The range of variability about the median which is sufficient to contain 50% of the observations. The interquartile range lies between the upper and lower 25% of the observations.

Table III summarizes the effluent five day biochemical oxygen demand ($CBOD_5$) and suspended solids measurements, which demonstrated a level of performance by the Aqua Safe residential wastewater treatment system consistent with the Class I effluent requirements of NSF/ANSI Standard 40, 2000.

TABLE III. EFFLUENT QUALITY SUMMARY

Parameter	Number of Observations	Minimum	Maximum	Median	Interquartile Range	Confidence Limit 90%
CBOD mg/L	148	2.0	12.6	2.0	2.0-2.15	2.0-3.866
Suspended Solids	141	0.0	11.4	1.6	1.2-2.2	.743-6.0

Table IV presents removal efficiencies calculated from the mean influent and effluent values, the mean values being more conventional indicators of overall efficiency.

TABLE IV. REMOVAL EFFICIENCIES

Parameter	Influent Mean	Effluent Mean	Reduction	% Reduction
CBOD	170.43	2.40	168.03	98.6
Suspended Solids	183.01	2.104	180.91	98.8

Table V represents the analytical results performed to determine the quality of the effluent.

TABLE V. EFFLUENT QUALITY ANALYSIS

TSS Inf. CB.D	Eff. CBOD 30-day Mean (mg/L)	Eff. TSS 30-day Mean (mg/L)	Eff. CBOD 7-day Mean (mg/L)	Eff. TSS 7-day Mean (mg/L)	CBOD Reduction 30-day (%)	TSS Reduction 30-day (%)
Minimum	2.03	1.18	2.00	.74	97.7	98.6
Maximum	3.26	2.76	4.21	4.47	98.1	99.1
Median	2.37	2.11	2.10	2.07	98.5	98. 7

ANALYTICAL RESULTS

During the 26 weeks of operation, the Aqua Safe residential wastewater treatment system produced a treated effluent quality consistent with the Class I requirement. Based on a 500 gallon per day flow, the Aqua Safe maintained an average $CBOD_5$ effluent of 2.40 mg/L and suspended solids of 2.1 mg/L. On a 90 percentile basis, the residential wastewater treatment system performed with $CBOD_5$ effluent between 2.0 and 3.87mg/l and suspended solids between .743 and 6.0 mg/l. The samples were taken in accordance with and complied to the requirements of the NSF/ANSI Standard 40, 2000 guidelines. The laboratory results summarized and presented in Table II are described herein as follows:

BIOCHEMICAL OXYGEN DEMAND ($CBOD_5$)

A. INFLUENT

Based on >148 observations, the range of $CBOD_5$ values was 9.0 to 1071 mg/L. The median value was 108 mg/L with 50 percent of the values in the range from 75.5 to 223 mg/L

B. AQUA SAFE RESIDENTIAL WASTEWATER TREATMENT SYSTEM EFFLUENT

$CBOD_5$, determined in 148 observations, ranged from a minimum value of 9 mg/L to a maximum value of 1071 mg/L with a median value of 108 mg/L. The interquartile range of values, i.e., the range of variability about the median that lies between the upper and lower 25 percent of the observations, was 75.5 to 223 mg/L. The effluent quality summary, as shown in Table III, indicates that at least 90 percent of the samples had values greater than 2.0 and less than 3.87 mg/L. The analysis performed on the quality of the effluent, as demonstrated in Table V, indicates that the arithmetic mean of all effluent samples collected in a period of 30 consecutive sampling days has a maximum value of 3.26 mg/L. The arithmetic mean for all effluent samples collected in a period of 7 consecutive sampling days has a maximum value of 4.21 mg/L. The analysis indicates that the average reduction for $CBOD_5$ is 98.6 %. The values used in determining removal efficiency are presented in Table IV.

SUSPENDED SOLIDS

A. INFLUENT

The values for suspended solids in the residential wastewater treatment system influent ranged from a minimum of 94 mg/L and a maximum value of 1560 mg/L. The interquartile range of values was between 77.5 and 225 mg/L which bounded a median value of 124 mg/L.

B. AQUA SAFE RESIDENTIAL WASTEWATER TREATMENT SYSTEM EFFLUENT

A median value of 1.6 mg/L was established for effluent suspended solids, based upon 141 observations. The interquartile range was between 1.2 and 2.2 mg/L with 90 percent of the values being greater than .743 and less than 6.0 mg/L. Table III displays the effluent quality summary while Table IV shows the removal efficiencies of $CBOD_5$ and SS. As shown in Table V, the maximum value for the effluent suspended solids is 2.76 mg/L, and the maximum value for the 7-day mean of effluent suspended solids is 4.47 mg/L. Also demonstrated in Table V, the effluent does satisfy the suspended solids criteria set forth by NSF/ANSI Standard 40, 2000, following EPA's Secondary Treatment Guidelines for Class I.

Table IV presents the mean influent and effluent suspended solids values used to calculate percent reduction accomplished by this residential wastewater treatment system which was greater than 98.8 % removal of suspended solids.

AERATION CHAMBER SUSPENDED SOLIDS

The concentration of suspended solids in the aeration chamber ranged from a minimum value of 330 mg/L to a maximum value of 4515 mg/L, with a median of 1435 mg/L. The range of variability about the median which contains fifty percent of the observations ranged from 825 to 1935 mg/L. During the test period, aeration chamber suspended solids concentration did not vary in any consistent or predictable manner with respect to time.

DISSOLVED OXYGEN (D.O.)

A. AERATION CHAMBER

The Aqua Safe system demonstrated the capacity to maintain an aerobic environment in the aeration tank contents. The minimum value for dissolved oxygen was .03 mg/L with a median of 1.025 mg/L and an interquartile range of .533 to 3.083 mg/L.

B. AQUA SAFE RESIDENTIAL WASTEWATER TREATMENT SYSTEM EFFLUENT

A.median of 1.52 mg/L D.O. was obtained based on determinations of effluent dissolved oxygen. The minimum value recorded for dissolved oxygen was .05 mg/L with an interquartile range of .78 to 4.015 mg/L.

COLOR, THRESHOLD ODOR, OILY FILM, FOAM

NSF/ANSI Standard 40, 2000 specifies limits for Class I effluent with respect to color, threshold odor, oily film, and foam. Special attention was devoted to these parameters each sampling day as well as several random checks throughout the 26 weeks, including weekends. Aqua Safe residential wastewater treatment system effluent was within limits specified in NSF/ANSI Standard 40, 2000:

1. Effluent color was less than 15 units
2. Threshold Odor - non-offensive
3. There was no evidence of oily film or foam.

NOISE

Noise level measurements were taken in accordance with NSF/ANSI Standard 40, 2000 and LSC, Chapter 13 Section A,6.4.2:(t). The measured level, including background noise, was within the limits of the NSF/ANSI Standard 40, 2000 and the LSC.

STRESS TESTING

Stress loading of the Aqua Safe was conducted as shown by the shaded data in Appendix C and is designed to evaluate residential wastewater treatment system capabilities and performance under simulated use conditions of wash day loading, working mother loading, equipment or power failure, and return from nine days vacation with the typical attendant shock loading. As can be seen from the results depicted in Figure 1 for effluent five day Biochemical Oxygen Demand ($CBOD_5$) and Figure 2 for effluent Suspended Solids, the performance of Aqua Safe was consistent with the effluent quality requirements of NSF/ANSI Standard 40, 2000 protocol contained in this document. During the seven day period immediately following each stress condition, the effluent values did remain within the limits of Class I effluent quality.

TRASH TRAP ISSUE

The issue of a trash trap requires further comment. The Baylor test typically involves running the residential wastewater treatment system without pretreatment (no trash trap) and, typically, without post-treatment. The goal of the test is to evaluate the capacity of the residential wastewater treatment system to treat the incoming wastewater in its most severe condition. Systems which employ pre- treatment chambers typically are fitted by the manufacturer with a pass-through pipe in order to by-pass the compartment for the test.

Residential wastewater treatment systems are not tested with a trash trap for several reasons:

1. The CBOD strength and low dissolved oxygen levels of the influent sewage means that a portion of the aerobic bacteria are killed in the (septic) trash trap. Therefore, normal floc formation indicative of a residential environment is seriously delayed.
2. Influent water is already coarse filtered to remove non biodegradable materials because these would cause problems for dosing pumps and valves. Such pumps and valves would not normally be put in a residential installation. However, they are necessary for the test to control influent rates and times.
3. A trash trap will provide some reduction of CBOD and TSS. The amount depends on the size of trash trap used. However, operating the test without a trash trap provides a "worst case scenario."

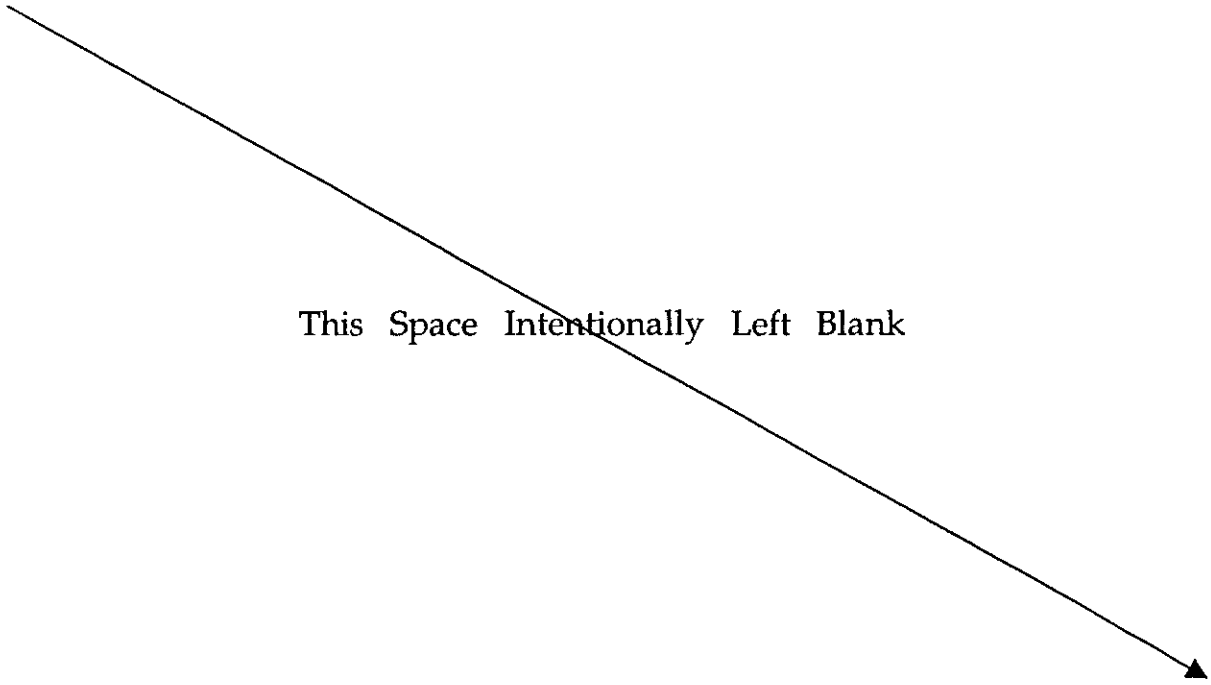
Some states require the use of a trash trap, independent of this test. Baylor recommends strongly the use of a trash trap, especially in all cases where a garbage disposal is being used or may be used. A minimum recommended size for a trash trap is half the daily rated

capacity of the residential wastewater treatment system . An absolute minimum size is 1/4 of the residential wastewater treatment systems daily rated capacity. This recommendation enables enough capacity to "store" non-biodegradable materials over an extended period of time (several years) to minimize pumping requirements. However, this size is also small enough not to interfere substantially with the aerobic performance of the residential wastewater treatment system or to raise costs excessively. For purposes of the residential wastewater treatment system certification, a trash trap is treated as an approved "upgrade."

Systems which employ a pretreatment chamber as an integral part of system design configuration because of cast mold strategies or other considerations, but were not tested with the pretreatment chamber activated, should not be installed with additional pretreatment tankage, if the added volumetric capacity represented by the additional tankage would increase the total net pretreatment volume beyond one-half of the daily rated treatment capacity of the tested or Model Series System.

SUMMARY

Overall, the Aqua Safe residential wastewater treatment system performed admirably during this extended test and under a wide variety of operating conditions. There were no repairs or maintenance work done on the residential wastewater treatment system during the test period. During the course of the test, the basic flow system and residential wastewater treatment system operations were stable and consistent.



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APPENDIX A

STATISTICAL SUMMARIES

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Aqua Safe Statistical Summaries

DO effluent	DO aeration	Temp influent	Temp aeration	Temp effluent	pH influent	pH aeration	pH effluent	CBOD influent	CBOD effluent	7-day average	30-day average	TSS influent	TSS aeration	TSS effluent	7-day average	30-day average	VSS inf (%)	VSS aeration	VSS effluent	SS 45 m.	Dosing GPD
1.93	1.64	31.4	31.3	31.36	7.52	7.83	7.83	861	2			158	1015	1.8			78	725	1.4	5	500
4.1	1.81	31	31.4	31.25	7.5	7.91	7.77	148	2.54			122	550	1.2			75	380	0.6	4	500
2.84	2.73	31.38	31.59	31.46	7.74	7.83	7.99	149	2			94	750	1.2			76	525	0.8	6	500
1.87	6.13	31.25	31.4	31.82	7.12	8.06	7.88	127	2			132	735	0.75			85	525	0.5	6	500
2.53	0.61	31.22	31.5	31.48	7.23	7.71	7.86	122	2			138	745	2			74	500	1	5	500
3.41	2.65	31.41	31.6	31.68	7.57	7.91	7.71	82	2			74	560	1.75			81	390	1.75	4	500
2.17	0.58	31.46	31.76	31.74	7.31	7.72	7.89	61	2	2.077		66	520	1.8	1.500		76	356	1	3	500
2.68	0.72	31.64	31.66	31.63	7.67	7.73	7.9	94	2	2.077		73	520	2.25	1.564		84	340	2	2	500
2.33	3.36	31.64	31.66	31.63	7.67	7.9	7.84	95	2	2.000		70	355	1.5	1.607		79	230	1.5	1	500
2.93	1.95	31.28	31.57	31.25	7.66	7.78	7.98	93	2	2.000		58	468	1	1.579		78	316	1	3	500
3.84	2.09	31.25	31.4	31.34	7.63	7.84	7.94	101	2	2.000		65	466	0.8	1.586		75	320	0.6	3	500
3.83	1.28	31.39	31.4	31.35	7.59	7.76	7.9	84	2	2.000		106	366	1.6	1.529		69	258	1.6	3	500
2.79	1.94	31.55	31.45	31.35	7.6	7.86	7.9	110	2	2.000		134	614	0.8	1.393		71	410	0.8	4	500
2.47	1.19	31.57	31.55	31.49	7.66	7.75	7.88	101	2	2.000		130	450	1.75	1.386		67	300	1	3	500
2.82	1.71	31.64	31.56	31.53	7.63	7.85	7.99	84	2	2.000		190	522	4	1.636		72	332	0.83	3	500
2.35	1.44	31.58	31.54	31.47	7.66	7.82	7.91	104	2	2.000		152	730	11.4	3.050		75	485	0.8	4	500
3.28	2.06	31.65	31.59	31.45	7.75	7.84	7.95	68	2	2.000		128	755	1.5	3.121		13	510	1	5	500
4.72	3.41	31.41	31.5	31.41	7.72	8	8.09	114	2	2.000		404	755	1.4	3.207		74	500	1.4	3	500
3.8	2.96	30.73	31.22	31.08	7.6	7.85	7.98	102	2.87	2.124		114	735	1.8	3.236		79	460	1	2	500
5.11	2.86	30.02	30.62	30.48	7.33	7.91	8.04	106	2	2.124		78	485	1	3.264		78	315	0.8	2	500
3.6	1.41	30	30.15	29.84	7.55	7.84	8.01	194	2	2.124		96	665	2	3.300		76	440	1.4	3	500
5.43	0.79	29.44	29.42	29.31	8.01	8.12	8.21	89	2	2.124		74	410	1.8	2.986		74	275	1.4	2	500
5.03	3.06	29.58	29.42	29.17	8	8.04	8.15	70	2	2.124		76	460	1.2	1.529		82	295	1	2	500
3.82	2.54	29.92	29.57	29.44	7.71	7.93	8.04	63	2	2.124		84	695	1.4	1.514		76	445	1	4	500
3.47	1.62	29.17	29.15	28.94	7.18	7.76	8.01	77	2	2.124		66	700	0.8	1.429		74	435	0.8	4	500
4.12	2.32	29.58	29.18	28.87	7.32	7.99	8.03	9	2	2.000		125	645	1.4	1.371		74	410	0.8	4	500
3.15	1.12	29.28	29.32	29.16	7.66	7.99	8.1	88	2	2.000		175	330	3	1.657		81	220	1.2	5	500
3.97	2.01	29.45	28.7	28.43	7.62	8.1	8.24	40	2	2.000		232	710	7.8	2.486		80	470	2	13	500
4.96	0.29	29.48	28.53	28.34	7.61	7.62	8.16	87.8	2.19	2.027		268	720	2	2.514		78	475	1.6	16	500
3.65	0.99	29.56	28.72	28.36	7.61	7.92	8.16	141	2	2.027	2.053	276	1820	2.6	2.714	2.177	77	1200	1.2	17	500
3.38	1.24	29.22	28.82	28.68	7.55	7.9	7.88	217	2	2.027	2.053	344	1990	2	2.800	2.183	75	1335	1.2	18	500
2.86	1.44	26.01	29.02	28.82	6.43	7.87	7.97	224	2	2.027	2.035	228	1980	1.8	2.943	2.203	75	1335	1.6	20	500
3.61	7.14	27.46	27.92	28.85	6.96	8.23	8.12	643	2	2.027	2.035	540	2135	1.8	3.000	2.223	76	1425	1	19	500
3.92	7.04	27.77	28.92	28.94	6.44	8.21	8.17	291	2.16	2.050	2.041	204	2405	2.8	2.971	2.292	78	1630	1	19	500
7.55	3.81	27.77	29.3	27.6	6.84	7.28	7.48	365	2	2.050	2.041	268	2255	1.2	2.029	2.265	80	1505	1.2	21	500
6.9	1.87	27.71	27	28.8	6.85	7.35	8.51	260	2	2.023	2.041	272	2100	1.2	1.914	2.247	78	1410	0.8	24	500
3.12	7.92	26.4	26.3	10.1	6.85	7.6	5.48	406	2	2.023	2.041	344	2250	1.2	1.714	2.227	78	1530	1.2	21	500
6.83	7.85	25.81	26	7.6	7.46	7.69	7.68	380	2	2.023	2.041	325	2430	0.8	1.543	2.178	78	1670	0.2	14	500
1.04	0.29	25.86	26.6	7.7	6.87	7.59	7.86	214	2	2.023	2.041	372	2650	2	1.571	2.195	77	1780	0.4	8	500
5.44	0.78	25.84	26.1	7.8	7.06	7.38	8.19	388	2.19	2.050	2.047	472	2565	0.8	1.429	2.188	78	1730	1.4	10	500
5.54	0.61	25.89	26.4	6	6.89	8.4	8.32	358	2	2.027	2.047	336	1405	1.8	1.286	2.222	77	970	0.8	14	500

Aqua Safe Statistical Summaries

DO effluent	DO aeration	Temp influent	Temp aeration	Temp effluent	pH influent	pH aeration	pH effluent	CBOD influent	CBOD effluent	7-day average	30-day average	TSS influent	TSS aeration	TSS effluent	7-day average	30-day average	VSS inf (%)	VSS aeration	VSS effluent	SS 45 m.	Dosing GPD
6.12	0.54	25.81	28	8.7	6.78	7.98	8.41	1071	2	2.027	2.047	228	1070	3.4	1.600	2.282	76	640	1.4	33	500
5.79	0.46	25.94	21	27.7	7.01	8.62	8.83	364	2	2.027	2.047	520	1385	1.4	1.629	2.302	77	960	3.4	30	500
6.76	1.03	26.41	25.4	25.9	7.21	8.63	8.01	254	2	2.027	2.047	572	1710	1.4	1.657	2.290	70	1205	1.2	31	500
7.1	1.9	25.5	25.9	27	7.41	8.21	8.91	236	3.89	2.297	2.110	680	2950	1	1.686	2.190	71	2045	1.2	31	500
1.01	0.49	26.44	26.2	27.4	7.25	8.2	8.89	477	6.8	2.983	2.270	515	2940	1.8	1.657	1.870	74	2045	1	22	500
6.26	4.44	26	26.4	27.3	7.41	8.29	8.52	496	2.09	2.969	2.273	510	2895	1.7	1.786	1.877	70	2000	1.8	16	500
0.99	1.51	25.23	27.7	27.4	7.68	7.95	8.46	482	2	2.969	2.273	610	3160	4.7	2.200	1.987	77	2000	71	16	500
1.12	1.36	25.98	27.1	27.27	7.55	7.93	8.53	375	4.46	3.320	2.326	376	1460	3.2	2.171	2.033	75	985	30.7	14	500
1.06	0.81	26.21	26.79	26.68	7.43	7.84	7.94	532	2.23	3.353	2.334	255	1585	2.4	2.314	2.080	81	1045	2	14	500
0.96	1.49	25.69	26.93	26.48	7.48	7.93	7.55	184	2	3.353	2.334	154	1855	7.8	3.229	2.273	78	1230	1.4	14	500
1.68	0.24	25.79	27.04	26.63	7.26	7.5	7.53	128	2	3.083	2.334	134	1785	5.6	3.886	2.400	69	1115	6.2	14	500
2.05	0.31	25.56	27.31	26.78	6.98	7.46	7.47	75	2	2.397	2.334	94	1705	0.8	3.743	2.387	78	1110	4	12	500
1.75	0.33	25.52	27.26	27.16	7.11	7.44	7.44	91	3.22	2.559	2.374	68	1555	0.8	3.614	2.367	77	995	0.4	13	500
2.21	0.21	25.46	26.93	27.01	6.93	7.45	7.48	52	2.39	2.614	2.387	192	1675	3.4	3.429	2.453	75	1105	0.6	12	500
2.88	0.8	25.69	26.18	26.72	7	7.46	7.32	56	2	2.263	2.387	90	1545	0.6	3.057	2.427	76	1005	3	14	500
1.71	1.26	25.54	25.94	25.9	7.02	7.5	7.32	59	2	2.230	2.387	114	1565	1	2.857	2.360	78	1020	0.6	16	500
0.75	0.33	25.75	25.82	25.69	7.05	7.35	7.35	69	2	2.230	2.387	128	3990	0.2	1.771	2.107	74	2460	1	16	500
0.83	0.28	25.43	25.52	25.41	7.48	7.52	7.63	105	2	2.230	2.381	128	1540	1.2	1.143	2.080	72	1035	0.2	17	500
0.98	0.39	22.1	25.29	25.29	7.48	7.74	7.42	193	2	2.230	2.381	93	4102	0.6	1.114	2.013	78	2500	1	17	500
0.94	0.16	25.75	25.3	25.09	7.03	7.5	7.51	224	2	2.056	2.381	214	1880	0.2	1.029	1.953	73	1255	0.6	16	500
1.38	0.27	25.45	25.35	24.88	6.9	7.51	7.51	226	2	2.000	2.381	288	3790	1.2	0.714	1.933	74	2350	0.2	17	500
0.91	1.03	25.53	25.46	25.08	6.86	7.1	7.52	75	2	2.000	2.381	316	4165	2	0.914	1.940	74	2540	1.2	18	500
1.03	0.74	25.29	25.43	23.76	7.08	7.4	7.46	194	2	2.000	2.376	274	4095	0.8	0.886	1.873	76	2500	1.6	12	500
0.92	0.75	25.42	25.45	24.29	7.36	7.46	7.5	352	2	2.000	2.376	544	4355	2.6	1.229	1.920	73	2715	0.8	14	500
1.44	1.78	24.36	25.46	23.53	7.55	7.52	6.98	328	2	2.000	2.376	244	2320	1	1.200	1.913	77	1570	1.8	14	500
0.05	0.07	23.88	25	23.65	7.24	7.46	7.31	343	2	2.000	2.376	320	4515	0.75	1.221	1.898	76	2835	1	15	500
0.17	1.94	23.84	25.24	23.31	7.43	7.57	7.27	409	2	2.000	2.376	460	1435	1.2	1.364	1.912	78	965	0.75	12	500
0.17	0.78	24.62	24.33	23.43	7.28	7.61	7.11	250	2	2.000	2.376	268	1950	1	1.336	1.878	74	1305	1	12	500
0.09	3.4	23.32	24.06	22.75	7.65	7.64	7.28	321	2	2.000	2.369	136	2090	0.8	1.164	1.878	79	1400	1	9	500
3.46	5.65	23.89	24.31	22.45	7.48	7.2	7.28	442	2	2.000	2.369	128	1900	1	1.193	1.852	76	1290	0.8	15	500
3.96	4.7	24.42	24.38	24.02	7.36	7.68	7.76	216	2	2.000	2.369	368	1860	0.8	0.936	1.765	95	1240	1	16	500
2.81	3.98	24.37	24.56	23.78	7.31	7.73	7.9	188	2.18	2.026	2.375	127	2335	0.8	0.907	1.745	79	1545	0.8	13	500
3.12	3.89	23.72	24.74	24.34	7.37	7.75	7.45	204	2.54	2.103	2.393	100	2415	2	1.086	1.765	74	1610	0.8	13	500
1.32	0.32	23.39	24.9	24.54	7.19	7.38	7.46	172	2	2.103	2.330	102	2425	1.4	1.114	1.778	79	16.5	1	12	500
0.49	0.39	23.23	24.96	24.45	7.01	7.42	7.43	242	2.18	2.129	2.176	114	1640	1.2	1.143	1.758	83	1100	1	14	500
0.93	0.18	23.18	24.91	24.74	7.36	7.37	7.47	123	2	2.129	2.173	102	2095	0.4	1.086	1.715	75	1375	1.2	13	500
1.21	0.24	22.93	24.88	24.82	7.23	7.42	7.48	156	2	2.129	2.173	208	2145	1.6	1.171	1.612	72	1460	0.4	11	500
0.81	0.37	23.34	24.8	24.63	7.7	7.37	7.47	146	2	2.129	2.091	123	2420	2.2	1.371	1.578	73	1650	1.2	8	500
0.7	0.11	22.7	24.74	24.67	7.23	7.38	7.5	108	2	2.103	2.084	168	2220	0.8	1.371	1.525	68	1515	1.4	10	500
1.35	0.59	21.94	24.83	24.29	7.33	7.46	7.47	158	2	2.026	2.084	114	1730	2.2	1.400	1.338	73	1130	0.6	9	500
1.1	0.15	22.08	24.59	24.21	8.09	7.42	7.45	120	2	2.026	2.084	328	1560	0.8	1.314	1.178	70	1050	1.2	9	500

Aqua Safe Statistical Summaries

DO effluent	DO aeration	Temp influent	Temp aeration	Temp effluent	pH influent	pH aeration	pH effluent	CBOD influent	CBOD effluent	7-day average	30-day average	TSS influent	TSS aeration	TSS effluent	7-day average	30-day average	VSS inf (%)	VSS aeration	VSS effluent	SS 45 m.	Dosing GPD
0.77	0.26	22.16	24.49	25.11	8.1	7.44	7.4	222	2	2.000	2.084	51	1870	2	1.429	1.218	68	1245	0.6	9	500
0.74	0.15	22.43	24.349	24.36	7.98	7.45	7.41	215	2	2.000	2.043	106	1650	1.6	1.600	1.245	74	1085	1.5	9	500
0.78	0.12	21.93	24.3	22.99	7.58	7.46	7.47	277	2	2.000	2.030	124	1930	1.6	1.600	1.185	28	1285	1.4	9	500
2.46	0.16	21.61	24.16	22.22	7.62	7.49	7.47	120	2	2.000	2.030	48	1825	1.4	1.486	1.212	77	1215	1.4	8	500
1.08	0.22	22.72	24.25	20.5	7.43	7.42	7.44	79	2	2.000	2.030	77	1460	1.8	1.629	1.238	80	960	1.4	7	500
0.75	1.4	22.93	23.35	23.07	7.43	7.5	7.44	94	2	2.000	2.030	222	1590	2.2	1.629	1.305	87	965	1.4	8	500
0.83	3.55	22.4	23.41	23.2	7.56	7.48	7.44	108	2	2.000	2.030	120	1650	2.2	1.829	1.338	85	1080	1.4	6	500
1.11	1.55	22.18	23.58	23.21	7.68	7.54	7.48	85	2	2.000	2.030	57	1595	1.8	1.800	1.378	77	955	1.6	5	500
0.77	0.05	21.22	23.7	23.42	7.69	7.44	7.51	105	2	2.000	2.030	96	1605	2.6	1.943	1.458	72	1005	1.4	5	500
0.98	0.43	21.37	23.27	23.53	7.62	7.5	7.53	16.5	2	2.000	2.030	160	1295	1	1.857	1.452	77	805	1.4	7	500
0.93	0.52	21.36	22.83	22.93	7.6	7.48	7.53	22.5	2	2.000	2.030	152	1020	4.4	2.286	1.532	86	620	1	4	500
0.65	0.17	22.12	22.61	22.67	7.48	7.46	7.58	32	2	2.000	2.030	124	990	5.4	2.800	1.685	64	630	0.3	4	500
1.39	0.21	21.75	22.64	22.46	7.27	7.51	7.46	66.5	2	2.000	2.030	70	1815	6	3.343	1.798	73	1020	4.4	5	500
0.76	0.22	20.81	22.66	22.51	7.37	7.43	7.56	69	3.59	2.227	2.083	140	970	3.6	3.543	1.885	68	620	5.8	5	500
0.79	0.13	20.95	22.65	22.58	7.65	7.55	7.47	108	3.59	2.454	2.136	92	910	1.4	3.486	1.907	69	610	3.4	5	500
0.53	0.07	20.2	22.35	21.35	7.5	7.45	7.62	76	5.26	2.920	2.245	60	1000	1	3.257	1.900	80	635	1.4	5	500
0.52	0.07	19.2	22.43	22.14	7.36	7.56	7.61	80	4.2	3.234	2.318	52	1130	2.2	3.429	1.940	74	720	1	5	500
0.45	0.39	18.5	22.15	22.23	7.4	7.6	7.6	149	2.19	3.261	2.324	60	1050	1.8	3.057	1.973	73	670	1.4	6	500
0.55	0.41	20.03	21.45	21.7	7.84	7.6	7.67	69	2	3.261	2.324	72	1260	1.4	2.486	1.987	79	800	1	6	500
0.96	0.62	20.17	20.99	20.89	7.79	7.65	7.92	60	2	3.261	2.324	44	1120	2.6	2.000	2.047	82	695	1.4	4	500
0.79	0.43	20.72	20.87	20.66	7.76	7.9	7.61	72	2	3.034	2.318	50	1180	7.8	2.600	2.280	86	744	2.2	3	500
0.63	0.18	20.62	21.01	19.23	7.61	7.61	7.64	72	2	2.807	2.300	50	1490	2.8	2.800	2.307	72	930	6.6	4	500
0.62	0.22	20.35	21.17	20.81	8.79	7.66	8.2	60	2	2.341	2.300	96	1055	2.4	3.000	2.340	82	685	2	4	500
0.66	0.53	19.56	21.35	20.75	7.44	8.23	8.1	34.5	12.54	3.533	2.646	164	830	1.2	2.857	2.340	76	530	2.4	4	500
1.22	0.48	19.82	21.82	19.28	7.94	8.15	8.13	64	3.53	3.724	2.697	130	840	2.6	2.971	2.413	79	530	1.2	4	500
0.87	0.62	18.61	22.19	21.62	7.48	8.06	7.71	102	2	3.724	2.697	106	990	2.2	3.086	2.433	77	615	1.6	4	500
0.88	0.07	19.85	22.54	21.01	7.37	7.66	7.65	83	2	3.724	2.697	98	765	1.8	2.971	2.420	72	470	1.8	4	500
0.62	1.02	17.98	22.52	22.32	7.4	7.79	7.65	88	2	3.724	2.697	112	800	6	2.714	2.593	75	500	1	6	500
0.45	0.06	17.25	21.93	21.22	8	7.59	7.66	86	2.22	3.756	2.704	140	825	6.2	3.200	2.727	77	525	4.8	4	500
0.39	0.03	17.25	21.14	21.5	7.65	7.61	7.65	104	2.46	3.821	2.719	60	825	1.8	3.114	2.760	73	510	5.4	3	500
0.4	0.03	17.95	20.73	20.99	7.35	7.57	7.62	152	3.81	2.574	2.780	47	1384	1.6	3.171	2.747	73	840	1.8	3	500
0.39	0.99	17.18	21.56	20.52	7.45	7.68	7.79	140	12.6	3.870	3.133	67	1010	1	2.943	2.727	100	630	1.4	3	500
0.77	0.03	12.98	20.6	20.88	8.65	7.43	7.86	316	2.74	3.976	3.158	56	760	1.2	2.800	2.713	73	490	1	3	500
1	0.99	16.58	20.29	20.32	8.84	7.83	7.96	95	2.98	4.116	3.190	64	1615	2.4	2.886	2.747	87	970	1.2	3	500
0.82	0.76	8.39	20.08	19.96	8.85	7.86	8.12	79	2	4.116	3.190	72	695	1.2	2.200	2.727	79	440	1.4	3	500
0.88	0.68	10.37	18.99	19.82	8.84	7.85	7.01	83	2	4.084	3.190	123	1935	1.8	1.571	2.713	70	1185	1.2	3	500
0.68	0.58	18.72	18.67	18.95	8.38	7.91	7.01	46	3.36	4.213	3.236	194	2010	0.6	1.400	2.660	73	1220	1.6	2	500
0.69	0.5	19.14	18.65	18.46	8.37	7.88	7.99	172	2.62	4.043	3.256	120	480	1.6	1.400	2.653	77	320	0.6	4	500
0.58	0.72	19.35	18.79	18.35	8.32	7.96	7.94	271	2	2.529	3.256	100	652	1.4	1.457	2.613	75	420	1.4	5	500
0.86	0.87	19.94	18.71	18.57	8.04	7.88	8.03	120	2	2.423	3.256	150	608	2.2	1.600	2.653	78	380	0.8	5	500
0.98	1.11	19.78	18.29	18.36	8.25	8.06	8.05	59	2	2.283	3.256	57	1900	2.8	1.657	2.600	82	1165	1.8	5	500

Aqua Safe Statistical Summaries

DO effluent	DO aeration	Temp influent	Temp aeration	Temp effluent	pH influent	pH aeration	pH effluent	CBOD influent	CBOD effluent	7-day average	30-day average	TSS influent	TSS aeration	TSS effluent	7-day average	30-day average	VSS inf (%)	VSS aeration	VSS effluent	SS 45 m.	Dosing GPD
0.99	1.12	19.3	18.86	18.12	8.17	8.05	8.14	106	2	2.283	3.256	52	1145	1.2	1.657	2.460	73	730	2.8	5	500
1.02	1.07	18.65	18.91	17.24	8.6	8.14	8.11	57	2	2.283	3.256	55	1880	0	1.400	2.260	76	1140	0.6	4	500
0.87	1.09	18.06	18.73	18.59	8.57	8.18	8.17	46	2	2.089	3.203	44	1225	0.8	1.429	2.167	75	755	0	4	500
0.79	0.81	17.7	18.4	18.59	8.55	8.17	8.11	50	2	2.000	3.150	82	1250	1.2	1.371	2.160	70	720	0.8	5	500
0.9	0.9	17.23	18	18.1	8.64	8.06	8.09	45	2	2.000	3.042	77	1095	1.2	1.343	2.167	81	685	1.2		500
0.87	0.86	16.99	17.69	17.76	8.55	8.07	9.05	55	2	2.000	2.968	78	1315	1.2	1.200	2.133	68	805	1.2		500
0.9	0.86	16.72	17.93	17.62	8.66	9.03	8.21	69	2	2.000	2.962	112	915	1.2	0.971	2.113	80	565	1		500
0.99	1.04	15.98	18.3	17.72	8.96	8.28	8.04	65	2	2.000	2.962	88	1235	1.25	0.979	2.108	51	775	1.2		500
0.54	1.1	15.96	18.17	17.62	8.93	8.29	7.94	75	2	2.000	2.962	52	1088	1.4	1.179	2.068		668	2		500
0.88	0.91	17.5	17.65	17.23	8.88	7.19	8.08	82	2	2.000	2.962	54	1180	0.8	1.179	1.835		664	1.4		500
0.76	0.8	16	17.62	17.45	7.24	8.02	8.02	40	2	2.000	2.962	82	1545	1.8	1.264	1.802		995	0.6		500
0.8	0.81	19	17.64	17	7.7	8.14	8.06	58	3.77	2.253	3.021	68	1140	2.8	1.493	1.815		700	1.4		500
0.77	0.74	19.78	17.35	17.23	7.3	8.07	7.99	88	2.88	2.379	2.699	164	980	5.8	2.150	1.968		650	2		500
0.79	0.87	18.39	17.24	17.05	7.25	7.92	8.01	232	2.8	2.493	2.675	216	835	11	3.550	2.248		565	3.6		500
0.77	0.8	19.57	17.27	15.35	7.26	7.98	7.98	260	2.19	2.520	2.681	260	1420	5	4.086	2.342		930	2.8		500
0.78	0.88	19.52	17.14	16.73	7.27	7.98	8.69	247	2.14	2.540	2.686	148	1420	2.8	4.286	2.375		910	4		500
0.63	0.25	19.04	17.08	16	7.04	8.28	8.79	176	2	2.540	2.686	96	1590	2.1	4.471	2.245		1070	2.2		500
0.51	0.16	19.52	17.06	14.17	6.64	8.47	8.72	148	2	2.540	2.678	1560	2255					1445	2.2		500
0.61	0.68	19.55	17.09	17.32	6.72	8.74	8.68	159	2.92	2.419	2.694	616	2635					1700			500
0.46	0.7	19.71	17.7	17.59	6.95	8.63	8.78	307	4.46	2.644	2.715	114	1904					1184			500
0.54	0.75	19.05	17.87	14.27	7.22	8.69	8.64	332	2	2.530	2.362		2904					1784			500
0.49	0.65	19.12	17.56	14.05	7.3	8.69	8.64	143	2	2.503	2.337		2620					1595			500
0.44	0.84	19.29	17.12	13.91	7.34	8.77	8.86	59	2.02	2.486	2.305										500
0.58	0.68	19.01	16.77	13.79	7.31	8.56	8.97	96	2.41	2.544	2.319										500
0.52	0.57	18.88	16.47	13.8	7.26	8.62	9.07														500
0.55	0.83	17.58	16.27	13.89	7.18	8.88	9.16														500
0.55	0.84	17.26	16.18	13.91	7.3	9.02	9.33														500
0.54	0.84	17.64	16.07	13.86	6.66	9.03	9.19														500
0.52	0.81	17.97	15.93	13.74	7.34	9.07	9.28														500
0.5	0.76	18.05	15.77	15.6	7.36	9.24	9.29														500
0.51	0.75	17.64	15.86	15.89	7.34	9.14	9.31														500
0.54	0.71	17.63	16.27	16.83	7.33	9.19	9.04														500
0.51	0.72	17.84	17	16.94	7.33	9.22	7.64														500
5.04	0.74	17.85	17.8	16.93	6.71	9.27	7.64														500
4.47	0.51	18.09	17.69	17.08	6.75	9.05	7.68														500
4.16	6.29	18.01	17.55	17.74	6.73	7.85	7.67														500
3.34	5.75	18.22	17.62	17.41	6.79	7.85	7.84														500
3.57	5.18	18.44	17.76	17.41	7.35	7.86	7.61														500
3.42	4.46	18.89	18.21	17.17	7.37	7.88	7.8														500
2.33	3.09	18.88	17.85	16.1	6.81	7.83	7.66														500
0.87	2.66	19.38	18.77	17.51	6.7	7.83	7.63														500

Aqua Safe Statistical Summaries

DO effluent	DO aeration	Temp influent	Temp aeration	Temp effluent	pH influent	pH aeration	pH effluent	CBOD influent	CBOD effluent	7-day average	30-day average	TSS influent	TSS aeration	TSS effluent	7-day average	30-day average	VSS inf (%)	VSS aeration	VSS effluent	SS 45 m.	Dosing GPD
1.6	2.91	19.11	18.47	15.85	6.5	7.81	7.71														500
0.85	2.96	18.57	17.52	17.27	6.09	7.72	7.78														500
2.07	3.01	18.63	17.85	16.27	6.33	7.71	7.82														500
6.96	2.69	17.78	17.77	17.39	6.27	7.72	7.77														500
7.35	1.97	15.86	17.66	16.42	6.25	7.67	7.81														500
8.52	7.14	15.81	17.29	11.23	6.45	7.74	7.68														500
9.77	7.57	16.04	16.66	15.4	6.64	7.8	7.63														500
5.71	8.92	16.8	16.7	15.97	6.57	7.89	7.78														500
10.48	9.36	16.47	16.77	16.09	6.42	7.93	7.76														500
7.85	9.93	16.18	16.84	16.08	6.56	7.94	7.87														500
7.9	10.69	14.4	16.64	16.16	6.38	8	7.91														500
8.27	23.72	14.07	16.55	16.19	6.57	7.41	7.86														500
8.08	7.48	14.11	16.44	16.05	6.61	7.84	7.94														500
9.41	8.46	15.17	16.75	16.52	6.84	7.9	7.9														500
8.97	9.19	15.7	16.79	16.26	7.04	7.94	7.94														500
9.08	17.24	15.38	16.99	15.98	6.46	7.91	7.87														500
7.62	12.16	15.25	17.15	16.41	6.68	7.2	7.93														500
9.02	3.04		16.99	17.04		6.99	7.91														500
12.12	12.1		17.24	16.74		6.9	7.84														500
7.33	8.32		17.59	16.86		7.86	7.81														500
6.74	0.48		17.86	17.17		6.78	7.31														500
5.55	10.05		18.02	17.8		8.09	7.27														500
4.52	9.85		18.11	15.62		8.07	7.21														500
3.15	8.25		18.06	17.04		7.63	7.27														500
2.81	7.71		17.78	16.48		7.59	6.91														500
6.66	6.56		16.65	16.8		7.41	7.15														500
4.22	1.03		17.09	15.72		7.21	7.16														500
4.36	19.1		16.54	16.01		7.18	7.23														500
4.53	2.82		16.61	14.1		6.61	7.26														500
5.56	2.67		16.32	13.93		6.13	7.23														500
5.72	6.12		16.27	13.73		7.33	7.19														500
4.32	3.76		16.01	13.54		6.49	7.24														500
4.22	7.35		15.77	13.6		6.22	7.22														500
3.45	7.6		15.63	15.25		6.69	7.42														500
3.69	7.58		15.66	15.32		6.74	7.31														500
3.98	8.57		15.85	15.51		7.5	7.28														500
4.43	7.54		16.06	15.38		7.63	7.26														500
4.77	8.04		15.98			7.57	7.32														500
6.95	4.68					7.43	7.39														500
5.98	6.1					7.4															500
	7.09					7.31															

Aqua Safe Statistical Summaries

DO effluent	DO aeration	Temp influent	Temp aeration	Temp effluent	pH influent	pH aeration	pH effluent	CBOD influent	CBOD effluent	7-day average	30-day average	TSS influent	TSS aeration	TSS effluent	7-day average	30-day average	VSS inf (%)	VSS aeration	VSS effluent	SS 45 m.	Dosing GPD
	7.21					7.45															
2.749	2.643	22.392	22.381	21.305	7.409	7.800	7.839	170.434	2.403	2.409	2.448	183.014	1539.228	2.104	2.067	2.065	75.275	985.052	2.176	9.307	500
1.520	1.025	21.750	22.170	20.890	7.370	7.785	7.810	108.000	2.000	2.103	2.366	124.000	1435.000	1.600	1.657	2.108	76.000	955.000	1.200	6.000	500
0.050	0.030	8.390	15.630	6.000	6.090	6.130	5.480	9.000	2.000	2.000	2.030	44.000	330.000	0.000	0.714	1.178	13.000	16.500	0.000	1.000	500
12.120	23.720	31.650	31.760	31.820	8.960	9.270	9.330	1071.000	12.600	4.213	3.256	1560.000	4515.000	11.400	4.471	2.760	100.000	2835.000	71.000	33.000	500
0.780	0.533	18.440	17.625	16.740	7.040	7.483	7.475	75.500	2.000	2.000	2.084	77.500	825.000	1.200	1.388	1.861	73.000	525.000	1.000	4.000	500
4.105	3.083	25.840	26.160	25.900	7.650	7.990	8.040	223.000	2.115	2.540	2.697	225.000	1935.000	2.200	2.929	2.323	78.000	1255.000	1.600	14.000	500
0.465	0.123	15.700	16.076	13.740	6.460	7.183	7.221	45.300	2.000	2.000	2.030	52.000	470.400	0.743	1.011	1.275	68.000	315.200	0.400	2.300	500
7.893	9.123	31.410	31.500	31.450	8.640	8.853	8.908	432.100	3.866	3.821	3.239	519.500	3118.000	6.000	3.545	2.720	85.000	2045.000	4.400	21.000	500
0.050	0.030	8.390	15.630	6.000	6.090	6.130	5.480	9.000	2.000	2.000	2.030	44.000	330.000	0.000	0.714	1.178	13.000	16.500	0.000	1.000	500
DO effluent	DO aeration	Temp influent	Temp aeration	Temp effluent	pH influent	pH aeration	pH effluent	CBOD influent	CBOD effluent	7-day average	30-day average	TSS influent	TSS aeration	TSS effluent	7-day average	30-day average	VSS inf (%)	VSS aeration	VSS effluent	SS 45 m.	Dosing GPD

APPENDIX B

BAYLOR WORKSHEETS

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BAYLOR UNIVERSITY

Wastewater Treatment System Evaluation
Brazos River Authority (WMARSS) Data Sheet

SAMPLES	SS ml/l (45 min.)	Temp °C	pH	D.O. mg/l	Color (D,M,L)
RAW					
PRETREAT					
Unit 1 Red					
Unit 2 Yellow					
Unit 3 Dr. Blue					
Unit 4 Gray					
Unit 5 Green					
AERATION #1					
Unit 1 Red					
Unit 2 Yellow					
Unit 3 Dr. Blue					
Unit 4 Gray					
Unit 5 Green					
EFFLUENT #2					
Unit 1 Red					
Unit 2 Yellow					
Unit 3 Dr. Blue					
Unit 4 Gray					
Unit 5 Green					
COMP. (ref.)		of Refrigerator			
Unit 1 Red					
Unit 2 Yellow					
Unit 3 Dr. Blue					
Unit 4 Gray					
Unit 5 Green					

Date Sample Secured_____

Time Sample Secured_____

Name(s) of Sampler(s):

_____

_____

Outside Temperature °F_____

_____

Comments:

If anything is written in this box you must inform David Jumper at 710-3405 or 710-6556, leave message.

Page 2 of Data Sheet Colleciton Sheet

Full Name of:

Person Recording Data: _____

Person obtaining samples: _____

Below, Initial EVERY Blank

T -Cross Cleaned

	Cleaned by	Checked by
Unit 1	_____	_____
Unit 2	_____	_____
Unit 3	_____	_____
Unit 4	_____	_____
Unit 5	_____	_____

All Caps, Bottles and graduated cylinders present:

_____ _____

YSI 610-DM Meter present and working:

Probe put in Water

_____ _____

Phone call made to 710-3405

_____ _____

I have obtained the samples and conducted testing to Standard 17 &1 8 procedures and have, to the best of my ability, insured safe and accurate recording of said results.

_____ _____

I, as a representative of the Brazos River Authority, state that I have received the samples in good condition and take responsibility for them from Baylor University.

_____ _____

Signature of Baylor University Representative

Signature of B.R.A. WMARSS Representative

Baylor Wastewater Treatment Program

Stress Sequence Evaluation

Stress A-1

Wash Day:

Added three times in one five day week.

_____DAY 1 - 8:30 am - 11:30 am 3 wash loads = 105 gallons (3 wash and 6 rinse cycles)
_____DAY 2 - Collect extra grab sample
_____DAY 3 - 8:30 am - 11:30 am 3 wash loads = 105 gallons (3 wash and 6 rinse cycles)
_____DAY 4 - Collect extra grab sample
_____DAY 5 - 8:30 am - 11:30 am 3 wash loads = 105 gallons (3 wash and 6 rinse cycles)

* This Stressing is followed by a SEVEN day rest period of Normal Loading

Stress A-2

Working Parents:

No Loading 9:00 am to 5:00 pm for 5 consecutive days.

_____DAY 1 - Load 6-9:00 am 40% flow. Load 5-8:00 pm 60% flow including 1 wash load.
_____DAY 2 - Load 6-9:00 am 40% flow. Load 5-8:00 pm 60% flow including 1 wash load.
_____DAY 3 - Load 6-9:00 am 40% flow. Load 5-8:00 pm 60% flow including 1 wash load.
_____DAY 4 - Load 6-9:00 am 40% flow. Load 5-8:00 pm 60% flow including 1 wash load.
_____DAY 5 - Load 6-9:00 am 40% flow. Load 5-8:00 pm 60% flow including 1 wash load.

* This Stressing is followed by a SEVEN day rest period of Normal Loading

Stress A-3

Equipment Power Failure:

All power to residential wastewater treatment system off for 48 hours, one time only.
Feed off 8:00 pm on stress rest day seven.

_____DAY 1 - No Loading
_____DAY 2 - No Loading until 9:00 pm. 9-12(midnight) 60% flow inc. 1 wash load.

* This stressing is followed by a SEVEN day rest period of Normal Loading.

Stress A-4

One Week Vacation:

No loading over 9-day period but all power on and sudden shock when family returns home.
Normal Loading 6-9:00 am, 11-2:00 pm. Then feed off at 5:00 pm. on rest day seven.

_____DAY 1 - Feed Off
_____DAY 2 - Feed Off
_____DAY 3 - Feed Off
_____DAY 4 - Feed Off
_____DAY 5 - Feed Off
_____DAY 6 - Feed Off
_____DAY 7 - Feed Off
_____DAY 8 - Feed Off
_____DAY 9 - 5-8:00 pm 60% flow including 3 wash loads.

* This stressing is followed by a three week period of Normal Loading.

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APPENDIX C

OFFICIAL DATA REPORT

Aqua Safe Official Data

	effluent	aeration	influent	aeration	effluent	influent	aeration	effluent	influent	effluent	influent	aeration	effluent	(%)	aeration	effluent	m.	GPD
8/1/2001																		
8/2/2001																		
8/3/2001																		
8/4/2001																		
8/5/2001																		
8/6/2001																		
8/7/2001																		
8/8/2001																		
8/9/2001																		
8/10/2001	1.93	1.64	31.4	31.3	31.36	7.52	7.83	7.83	ns	ns	ns	ns	ns	ns	ns	ns	ns	500
8/11/2001	4.1	1.81	31	31.4	31.25	7.5	7.91	7.77		ns	ns	ns	ns	ns	ns	ns	ns	500
8/12/2001	2.84	2.73	31.38	31.59	31.46	7.74	7.83	7.99	861	1.79	ns	ns	ns	ns	ns	ns	ns	500
8/13/2001	1.87	6.13	31.25	31.4	31.82	7.12	8.06	7.88	148	2.54	158	1015	1.8	78	725	1.4		500
8/14/2001	2.53	0.61	31.22	31.5	31.48	7.23	7.71	7.86	149	1.34	122	550	1.2	75	380	0.6	5	500
8/15/2001	3.41	2.65	31.41	31.6	31.68	7.57	7.91	7.71	127	1.75	94	750	1.2	76	525	0.8	4	500
8/16/2001	2.17	0.58	31.46	31.76	31.74	7.31	7.72	7.89	122	1.21	132	735	0.75	85	525	0.5	6	500
8/17/2001	2.68	0.72	31.64	31.66	31.63	7.67	7.73	7.9	we	we	we	we	we	we	we	we	6	500
8/18/2001	2.33	3.36	31.64	31.66	31.63	7.67	7.9	7.84	we	we	we	we	we	we	we	we	we	500
8/19/2001	2.93	1.95	31.28	31.57	31.25	7.66	7.78	7.98	82	1.71	138	we	2	74	we	1	we	500
8/20/2001	3.84	2.09	31.25	31.4	31.34	7.63	7.84	7.94	61	1.27	74	745	1.75	81	500	1.75	5	500
8/21/2001	3.83	1.28	31.39	31.4	31.35	7.59	7.76	7.9	94	1.43	66	560	1.8	76	390	1	4	500
8/22/2001	2.79	1.94	31.55	31.45	31.35	7.6	7.86	7.9	95	1.62	73	520	2.25	ne	356	2	3	500
8/23/2001	2.47	1.19	31.57	31.55	31.49	7.66	7.75	7.88	93	1.76	70	520	1.5	84	340	1.5	2	500
8/24/2001	2.82	1.71	31.64	31.56	31.53	7.63	7.85	7.99	101	1.48		355			230		1	500
8/25/2001	2.35	1.44	31.58	31.54	31.47	7.66	7.82	7.91	84	1.15								500
8/26/2001	3.28	2.06	31.65	31.59	31.45	7.75	7.84	7.95	110	1.44	58		1	79		1		500
8/27/2001	4.72	3.41	31.41	31.5	31.41	7.72	8	8.09	101	1.48	65	468	0.8	78	316	0.6	3	500
8/28/2001	3.8	2.96	30.73	31.22	31.08	7.6	7.85	7.98	84	1.15	106	466	1.6	75	320	1.6	3	500
8/29/2001	5.11	2.86	30.02	30.62	30.48	7.33	7.91	8.04	104	0.81	134	366	0.8	69	258	0.8	3	500
8/30/2001	3.6	1.41	30	30.15	29.84	7.55	7.84	8.01	68	0.53	130	614	1.75	71	410	1	4	500
8/31/2001	5.43	0.79	29.44	29.42	29.31	8.01	8.12	8.21	we	we	we	450	we	we	300	we	3	500
9/1/2001	ns	ns	ns	ns	ns	ns	ns	ns	we	we	we	we	we	we	we	we	we	500
9/2/2001	ns	ns	ns	ns	ns	ns	ns	ns	114	0.51	190	we	4	67	we	0.83	we	500
9/3/2001	5.03	3.06	29.58	29.42	29.17	8	8.04	8.15	102	2.87	152	522	11.4	72	332	0.8	3	500
9/4/2001	3.82	2.54	29.92	29.57	29.44	7.71	7.93	8.04	106	0.99	128	730	1.5	75	485	1	4	500
9/5/2001	no readi	taken							194	1.09	404	755	1.4	13	510	1.4	5	500
9/6/2001	3.47	1.62	29.17	29.15	28.94	7.18	7.76	8.01	89	1.33	114	755	1.8	ne	500	1	3	500
9/7/2001	4.12	2.32	29.58	29.18	28.87	7.32	7.99	8.03	we	we	we	735	we	we	460	ns	2	500
9/8/2001	3.15	1.12	sf	29.32	29.16	sf	7.99	8.1	we	we	we	we	we	we	we			500
9/9/2001	sf	sf	sf	sf	sf	sf	sf	sf	70	0.86	78	we	1	74	we	0.8		500
9/10/2001	sf	sf	sf	sf	sf	sf	sf	sf	63	1.13	96	485	2	79	315	1.4	2	500
9/11/2001	3.97	2.01	29.28	28.7	28.43	7.66	8.1	8.24	77	1.07	74	665	1.8	78	440	1.4	3	500
9/12/2001	4.96	0.29	29.45	28.53	28.34	7.62	7.62	8.16	9	1.28	76	410	1.2	76	275	1	2	500
9/13/2001	3.65	0.99	29.48	28.72	28.36	7.61	7.92	8.16	88	1.87	84	460	1.4	74	295	1	2	500
9/14/2001	3.38	1.24	29.56	28.82	28.68	7.61	7.9	7.88	we	we	we	695	we	we	445	we	4	500
9/15/2001	2.86	1.44	29.22	29.02	28.82	7.55	7.87	7.97	we	we	we	we	we	we	we	we	we	500
9/16/2001	3.61	7.14	ns	27.92	28.85	ns	8.23	8.12	40	0.65	66	we	we	82	we	0.8	we	500
9/17/2001	3.92	7.04	ns	28.92	28.94	ns	8.21	8.17	87.8	2.19	125	700	0.8	76	435	0.8	4	500
9/18/2001	sonde	failure	no	readings	taken				141	0.69	175	645	1.4	74	410	1.2	4	500
9/19/2001	7.55	3.81	nr	nr	nr	nr	7.28	7.48	217	1.7	232	330	3	74	220	2		500
9/20/2001	6.9	1.87	nr	nr	nr	nr	7.35	8.51	224	1.5	268	710	7.8	81	470	1.6	5	500

Aqua Safe Official Data

	effluent	aeration	influent	aeration	effluent	influent	aeration	effluent	influent	effluent	influent	aeration	effluent	(%)	aeration	effluent	m.	GPD
9/21/2001	3.12	7.92	nr	nr	nr	nr	7.6	5.48	643	we	276	720	we	80	475	we	we	500
9/22/2001	6.83	7.85	nr	nr	27.6	nr	7.69	7.68	we	we	we	we	we	we	we	we	we	500
9/23/2001	1.04	0.29	nr	29.3	28.8	nr	7.59	7.86	291	1.16	we	we	2	we	we	1.2	we	500
9/24/2001	5.44	0.78	nr	27	10.1	nr	7.38	8.19	365	2.16	344	1820	2.6	78	1200	1.2	13	500
9/25/2001	5.54	0.61	nr	26.3	7.6	nr	8.4	8.32	260	1.36	228	1990	2	77	1335	1.6	16	500
9/26/2001	6.12	0.54	nr	26	7.7	nr	7.98	8.41	ns	0.86	ns	1980	1.8	ns	1335	1	17	500
9/27/2001	5.79	0.46	nr	26.6	7.8	nr	8.62	8.83	406	1.35	540	2135	1.8	75	1425	1	18	500
9/28/2001	6.76	1.03	nr	26.1	6	nr	8.63	8.01	we	we	204	2405	ns	75	1630	ns		500
9/29/2001	7.1	1.9	nr	26.4	8.7	nr	8.21	8.91	we	we	we	we	we	we	we	we	we	500
9/30/2001	1.01	0.49	nr	28	27.7	nr	8.2	8.89	380	0.91	268	we	2.8	76	we	1.2	we	500
10/1/2001	6.26	4.44	nr	21	25.9	nr	8.29	8.52	214	0.78	272	2255	1.2	78	1505	0.8	20	500
10/2/2001	0.99	1.51	nr	25.4	27	nr	7.95	8.46	388	2.19	344	2100	1.2	80	1410	1.2	19	500
10/3/2001	1.12	1.36	nr	25.9	27.4	nr	7.93	8.53	358	1.86	325	2250	1.2	78	1530	0.2	19	500
10/4/2001	1.06	0.81	nr	26.2	27.3	nr	7.84	7.94	1071	ne	372	2430	ne	ne	1670	ne	21	500
10/5/2001	0.96	1.49	nr	26.4	27.4	nr	7.93	nr				2650			1780		24	500
10/6/2001	1.68	0.24	nr	27.7	27.27	nr	7.5	7.55										500
10/7/2001	2.05	0.31	nr	27.1	26.68	nr	7.46	7.53	364	1.14	472		0.8	78		0.4		500
10/8/2001	1.75	0.33	26.01	26.79	26.48	6.43	7.44	7.47	254	1.32	336	2565	2	78	1730	1.4	21	500
10/9/2001	2.21	0.21	27.46	26.93	26.63	6.96	7.45	7.44	236	1.31	228	1405	0.8	77	970	0.8	14	500
10/10/2001	2.88	0.8	27.77	27.04	26.78	6.44	7.46	7.48	477	3.89	520	1070	1.8	ne	640	1.4	8	500
10/11/2001	1.71	1.26	27.77	27.31	27.16	6.84	7.5	7.32	496	6.8	572	1385	3.4	78	960	3.4	10	500
10/12/2001	0.75	0.33	27.71	27.26	27.01	6.85	7.35	7.32			680	1710		77	1205		14	500
10/13/2001	0.83	0.28	26.4	26.93	26.72	6.85	7.52	7.35	482	2.09								500
10/14/2001	0.98	0.39	25.81	26.18	25.9	7.46	7.74	7.63	375	1.91	515		1.4	76		1.2		500
10/15/2001	0.94	0.16	25.86	25.94	25.69	6.87	7.5	7.42	532	4.46	510	2950	1.4	77	2045	1.2	33	500
10/16/2001	1.38	0.27	25.84	25.82	25.41	7.06	7.51	7.51	184	2.23	610	2940	1	ne	2045	1	30	500
10/17/2001	0.91	1.03	25.89	25.52	25.29	6.89	7.1	7.51	128	1.9	376	2895	1.8	70	2000	1.8	31	500
10/18/2001	1.03	0.74	25.81	25.29	25.09	6.78	7.4	7.52				3160			2000		31	500
10/19/2001	0.92	0.75	25.94	25.3	24.88	7.01	7.46	7.46									22	500
10/20/2001	1.44	1.78	26.41	25.35	25.08	7.21	7.52	7.5										500
10/21/2001	0.05	0.07	25.5	25.46	23.76	7.41	7.46	6.98	75	ns	255							500
10/22/2001	0.17	1.94	26.44	25.43	24.29	7.25	7.57	7.31	91	ne	154		10.7	71		7.1		500
10/23/2001	0.17	0.78	26	25.45	23.53	7.41	7.61	7.27	52	ne	134	1460	4.4	74	985	3.7		500
10/24/2001	0.09	3.4	25.23	25.46	23.65	7.68	7.64	7.11	56	1.8	94	1585	3.2		1045	2		500
10/25/2001	3.46	5.65	25.98	25	23.31	7.55	7.2	7.28	59	1.65	68	1855	2.4	70	1230	1.4	16	500
10/26/2001	3.96	4.7	26.21	25.24	23.43	7.43	7.68	7.28				1785			1115		16	500
10/27/2001																		500
10/28/2001	2.81	3.98	25.69	24.33	22.75	7.48	7.73	7.76	69	ns	192			77				500
10/29/2001	3.12	3.89	25.79	24.06	22.45	7.26	7.75	7.9	105	3.22	90	1705	7.8	75	1110	6.2	14	500
10/30/2001	1.32	0.32	25.56	24.31	24.02	6.98	7.38	7.45	193	2.39	114	1555	5.6	81	995	4	14	500
10/31/2001	0.49	0.39	25.52	24.38	23.78	7.11	7.42	7.46	224	0.86	128	1675	0.8	78	1105	0.4	14	500
11/1/2001	0.93	0.18	25.46	24.56	24.34	6.93	7.37	7.43	226	1.33	128	1545	0.8	69	1005	0.6	14	500
11/2/2001	1.21	0.24	25.69	24.74	24.54	7	7.42	7.47				1565			1020		12	500
11/3/2001	0.81	0.37	25.54	24.9	24.45	7.02	7.37	7.48										500
11/4/2001	0.7	0.11	25.75	24.96	24.74	7.05	7.38	7.47	75	1.91	93		3.4	78		3		500
11/5/2001	1.35	0.59	25.43	24.91	24.82	7.48	7.46	7.5	194	0.54	214	3990	0.6	77	2460	0.6	13	500
11/6/2001	1.1	0.15	22.1	24.88	24.63	7.48	7.42	7.47	352	1.56	288	1540	1	75	1035	1	12	500
11/7/2001	0.77	0.26	25.75	24.8	24.67	7.03	7.44	7.45	328	1.14	316	4102	0.2	76	2500	0.2	14	500
11/8/2001	0.74	0.15	25.45	24.74	24.29	6.9	7.45	7.4	343	0.95	274	1880	1.2	78	1255	1	16	500
11/9/2001	0.78	0.12	25.53	24.83	24.21	6.86	7.46	7.41	409	0.75		3790			2350		16	500

Aqua Safe Official Data

	effluent	aeration	influent	aeration	effluent	influent	aeration	effluent	influent	effluent	influent	aeration	effluent	(%)	aeration	effluent	m.	GPD
11/10/2001	2.46	0.16	25.29	24.59	25.11	7.08	7.49	7.47	250	0.96								500
11/11/2001	1.08	0.22	25.42	24.49	24.36	7.36	7.42	7.47	321	0.82	544		0.6	74		0.6		500
11/12/2001	0.75	1.4	24.36	24.349	22.99	7.55	7.5	7.44	442	0.98	244	4165	0.2	72	2540	0.2	17	500
11/13/2001	0.83	3.55	23.88	24.3	22.22	7.24	7.48	7.44			320	4095	1.2	78	2500	1.2	17	500
11/14/2001	1.11	1.55	23.84	24.16	20.5	7.43	7.54	7.44			460	4355	2	73	2715	1.6	16	500
11/15/2001	0.77	0.05	24.62	24.25	23.07	7.28	7.44	7.48	216	0.99	268	2320	0.8	74	1570	0.8	17	500
11/16/2001	0.98	0.43	23.32	23.35	23.2	7.65	7.5	7.51				4515			2835		18	500
11/17/2001	0.93	0.52	23.89	23.41	23.21	7.48	7.48	7.53										500
11/18/2001	0.65	0.17	24.42	23.58	23.42	7.36	7.46	7.53	188	0.74	136		2.6	74		1.8		500
11/19/2001	1.39	0.21	24.37	23.7	23.53	7.31	7.51	7.58	204	0.77	128	1435	1	76	965	1	12	500
11/20/2001	0.76	0.22	23.72	23.27	22.93	7.37	7.43	7.46	172	0.93	368	1950	0.75	73	1305	0.75	14	500
11/21/2001	0.79	0.13	23.39	22.83	22.67	7.19	7.55	7.56				2090			1400		14	500
11/22/2001	0.53	0.07	23.23	22.61	22.46	7.01	7.45	7.47										500
11/23/2001	0.52	0.07	23.18	22.64	22.51	7.36	7.56	7.62										500
11/24/2001	0.45	0.39	ne	22.66	22.58	ne	7.6	7.61									15	500
11/25/2001	0.55	0.41	ne	22.65	21.35	ne	7.6	7.6	242	0.68	127		1.2	77		1		500
11/26/2001	0.96	0.62	22.93	22.35	22.14	7.23	7.65	7.67	123	0.25	100	1900	1	76	1290	1	12	500
11/27/2001	0.79	0.43	23.34	22.43	22.23	7.7	7.9	7.92	156	2.18	102	1860	0.8	78	1240	0.8	12	500
11/28/2001	0.63	0.18	22.7	22.15	21.7	7.23	7.61	7.61	146	2.54	114	2335	1	74	1545	1	9	500
11/29/2001	0.62	0.22	21.94	21.45	20.89	7.33	7.66	7.64	108	1.25	102	2415	0.8		1610	0.8	15	500
11/30/2001	0.66	0.53	22.08	20.99	20.66	8.09	8.23	8.2				2425			16.5		16	500
12/1/2001	1.22	0.48	22.16	20.87	19.23	8.1	8.15	8.1										500
12/2/2001	0.87	0.62	22.43	21.01	20.81	7.98	8.06	8.13	158	2.18	208		0.8	79		0.8		500
12/3/2001	0.88	0.07	21.93	21.17	20.75	7.58	7.66	7.71	120	0.94	123	1640	2	76	1100	1	13	500
12/4/2001	0.62	1.02	21.61	21.35	19.28	7.62	7.79	7.65	222	0.95	168	2095	1.4		1375	1	13	500
12/5/2001	0.45	0.06	22.72	21.82	21.62	7.43	7.59	7.65	215	0.01	114	2145	1.2	95	1460	1.2	12	500
12/6/2001	0.39	0.03	22.93	22.19	21.01	7.43	7.61	7.66	277	1.1	328	2420	0.4	79	1650	0.4	14	500
12/7/2001	0.4	0.03	22.4	22.54	22.32	7.56	7.57	7.65				2220			1515		13	500
12/8/2001	0.39	0.99	22.18	22.52	21.22	7.68	7.68	7.62										500
12/9/2001	0.77	0.03	21.22	21.93	21.5	7.69	7.43	7.79	120	0.66	51		1.6	74		1.2		500
12/10/2001	1	0.99	21.37	21.14	20.99	7.62	7.83	7.86	79	0.86	106	1730	2.2	79	1130	1.4	11	500
12/11/2001	0.82	0.76	21.36	20.73	20.52	7.6	7.86	7.96	94	1.28	124	1560	0.8		1050	0.6	8	500
12/12/2001	0.88	0.68	22.12	21.56	20.88	7.48	7.85	8.12	108	1.78	48	1870	2.2	83	1245	1.2	10	500
12/13/2001	0.68	0.58	21.75	20.6	20.32	7.27	7.91	7.01	85	1.06	77	1650	0.8	75	1085	0.6	9	500
12/14/2001	0.69	0.5	20.81	20.29	19.96	7.37	7.88	7.01	ne	1.59	ne	1930	2	ne	1285	1.5	9	500
12/15/2001	0.58	0.72	20.95	20.08	19.82	7.65	7.96	7.99	ne	0	ne	1825	1.6	ne	1215	1.4	9	500
12/16/2001	0.86	0.87	20.2	18.99	18.95	7.5	7.88	7.94	105	0.45	222	1460	1.6	72	960	1.4	9	500
12/17/2001	0.98	1.11	19.2	18.67	18.46	7.36	8.06	8.03	16.5	0.14	120	1590	1.4	73	965	1.4	9	500
12/18/2001	0.99	1.12	18.5	18.65	18.35	7.4	8.05	8.05	22.5	0.98	ne	1650	1.8	ne	1080	1.4	8	500
12/19/2001	1.02	1.07	ne	18.79	18.57	ne	8.14	8.14	32	1.05	57	1595	2.2	68	955	1.4	7	500
12/20/2001	0.87	1.09	20.03	18.71	18.36	7.84	8.18	8.11	66.5	1.12	96	1605	2.2	73	1005	1.6	8	500
12/21/2001	0.79	0.81	20.17	18.29	18.12	7.79	8.17	8.17	69	0.89	160	1295	1.8	70	805	1.4	6	500
2/22/2001	0.9	0.9	20.72	18.86	17.24	7.76	8.06	8.11	108	0.71	152	1020	2.6	68	620	1.4	5	500
12/23/2001	0.87	0.86	20.62	18.91	18.59	7.61	8.07	8.09	76	1.06	124	990	1	74	630	1	5	500
12/24/2001	0.9	0.86	20.35	18.73	18.59	8.79	9.03	9.05	80	3.59	70	1815	4.4	28	1020	0.3	7	500
12/25/2001	0.99	1.04	19.56	18.4	18.1	7.44	8.28	8.21	149	3.59	140	970	5.4	77	620	4.4	4	500
12/26/2001	0.54	1.1	19.82	18	17.76	7.94	8.29	8.04	69	5.26	92	910	6	80	610	5.8	4	500
12/27/2001	0.88	0.91	18.61	17.69	17.62	7.48	7.19	7.94	60	4.2	60	1000	3.6	87	635	3.4	5	500
12/28/2001	0.76	0.8	19.85	17.93	17.72	7.37	8.02	8.08	ne	2.19	ne	1130	1.4	ne	720	1.4	5	500
12/29/2001	0.8	0.81	17.98	18.3	17.62	7.4	8.14	8.02	72	1.7	52	1050	1	85	670	1	5	500

Aqua Safe Official Data

	effluent	aeration	influent	aeration	effluent	influent	aeration	effluent	influent	effluent	influent	aeration	effluent	(%)	aeration	effluent	m.	GPD
12/30/2001	0.77	0.74	17.25	18.17	17.23	8	8.07	8.06	72	1.86	60	1260	2.2	77	800	1.4	5	500
12/31/2001	0.79	0.87	17.25	17.65	17.45	7.65	7.92	7.99	60	1.77	72	1120	1.8	72	695	1	5	500
1/1/2002	0.77	0.8	17.95	17.62	17	7.35	7.98	8.01	34.5	1.15	44	1180	1.4	77	744	1.4	6	500
1/2/2002	0.78	0.88	17.18	17.64	17.23	7.45	7.98	7.98	64	1.94	50	1490	2.6	86	930	2.2	6	500
1/3/2002	ne	0.25	12.98	17.35	ne	8.65	8.28	ne	ns	ns	50	1055			685		4	500
1/4/2002	ne	0.16	16.58	17.24	ne	8.84	8.47	ne	102	12.54	96		7.8	64		6.6		500
1/5/2002	0.63	0.68	8.39	17.27	17.05	8.85	8.74	8.69	ne	3.53	164	830	2.8	73	530	2	3	500
1/6/2002	0.51	0.7	10.37	17.14	15.35	8.84	8.63	8.79	83	1.64	130	840	2.4	68	530	2.4	4	500
1/7/2002	0.61	0.75	18.72	17.08	16.73	8.38	8.69	8.72	88	1.59	106	990	1.2	ne	615	1.2	4	500
1/8/2002	0.46	0.65	19.14	17.06	16	8.37	8.69	8.68	86	4.12	98	765	2.6	69	470	1.6	4	500
1/9/2002	0.54	0.84	19.35	17.09	14.17	8.32	8.77	8.78	104	2.22	112	800	2.2	80	500	1.8	4	500
1/10/2002	0.49	0.68	19.94	17.7	17.32	8.04	8.56	8.64	152	2.46	140	825	1.8	74	525	1	4	500
1/11/2002	0.44	0.57	19.78	17.87	17.59	8.25	8.62	8.64				825			510		4	500
1/12/2002	0.58	0.83	19.3	17.56	14.27	8.17	8.88	8.86										500
1/13/2002	0.52	0.84	18.65	17.12	14.05	8.6	9.02	8.97	ns	ns								500
1/14/2002	0.55	0.84	18.06	16.77	13.91	8.57	9.03	9.07	ns	ns								500
1/15/2002	0.55	0.81	17.7	16.47	13.79	8.55	9.07	9.16										500
1/16/2002	0.54	0.76	17.23	16.27	13.8	8.64	9.24	9.33										500
1/17/2002	0.52	0.75	16.99	16.18	13.89	8.55	9.14	9.19										500
1/18/2002	0.5	0.71	16.72	16.07	13.91	8.66	9.19	9.28										500
1/19/2002	0.51	0.72	15.98	15.93	13.86	8.96	9.22	9.29										500
1/20/2002	0.54	0.74	15.96	15.77	13.74	8.93	9.27	9.31	140	3.81	60		6	73		4.8		500
1/21/2002	0.51	0.51	17.5	15.86	15.6	8.88	9.05	9.04	316	12.6	47	1384	6.2	79	840	5.4	6	500
1/22/2002	5.04	6.29	16	16.27	15.89	7.24	7.85	7.64	95	2.74	67	1010	1.8	82	630	1.8	4	500
1/23/2002	4.47	5.75	19	17	16.83	7.7	7.85	7.64	79	2.98	56	760	1.6	86	490	1.4	3	500
1/24/2002	4.16	5.18	19.78	17.8	16.94	7.3	7.86	7.68	83	1.21	64	1615	1	72	970	1	3	500
1/25/2002	3.34	4.46	18.39	17.69	16.93	7.25	7.88	7.67				695			440		3	500
1/26/2002	3.57	3.09	19.57	17.55	17.08	7.26	7.83	7.84										500
1/27/2002	3.42	2.66	19.52	17.62	17.74	7.27	7.83	7.61	46	1.6	72		1.2	82		1.2		500
1/28/2002	2.33	2.91	19.04	17.76	17.41	7.04	7.81	7.8	172	3.36	123	1935	2.4	76	1185	1.4	3	500
1/29/2002	0.87	2.96	19.52	18.21	17.41	6.64	7.72	7.66	271	2.62	194	2010	1.2	79	1220	1.2	3	500
1/30/2002	1.6	3.01	19.55	17.85	17.17	6.72	7.71	7.63	120	1.87	120	480	1.8	77	320	1.6	3	500
1/31/2002	0.85	2.69	19.71	18.77	16.1	6.95	7.72	7.71	59	1.28	100	652	0.6	72	420	0.6	3	500
2/1/2002	2.07	1.97	19.05	18.47	17.51	7.22	7.67	7.78				608			380		2	500
2/2/2002	6.96	7.14	19.12	17.52	15.85	7.3	7.74	7.82										500
2/3/2002	7.35	7.57	19.29	17.85	17.27	7.34	7.8	7.77	106	1.5	150		1.6	75		1.4		500
2/4/2002	8.52	8.92	19.01	17.77	16.27	7.31	7.89	7.81	57	1.22	57	1900	1.4	77	1165	0.8	4	500
2/5/2002	9.77	9.36	18.88	17.66	17.39	7.26	7.93	7.68	46	1.04	52	1145	2.2	73	730	1.8		500
2/6/2002	5.71	9.93	17.58	17.29	16.42	7.18	7.94	7.63	50	no entry	55	1880	no entry	73	1140	no entry		500
2/7/2002	10.48	10.69	17.26	16.66	11.23	7.3	8	7.78			44	1225	2.8	100	755	2.8		500
2/8/2002	7.85	23.72	17.64	16.7	15.4	6.66	7.41	7.76	45	0.31		1250			720			500
2/9/2002	7.9	7.48	17.97	16.77	15.97	7.34	7.84	7.87										500
2/10/2002	8.27	8.46	18.05	16.84	16.09	7.36	7.9	7.91	55	0.83	82		1.2	73		0.6		500
2/11/2002	8.08	9.19	17.64	16.64	16.08	7.34	7.94	7.86	69	0.86	77	1095	0	87	685	0	5	500
2/12/2002	9.41	17.24	17.63	16.55	16.16	7.33	7.91	7.94	65	1.05	78	1315	0.8	79	805	0.8	5	500
2/13/2002	8.97	12.16	17.84	16.44	16.19	7.33	7.2	7.9	75	1.05	112	915	1.2	70	565	1.2	5	500
2/14/2002	9.08	3.04	17.85	16.75	16.05	6.71	6.99	7.94	82	1.64	88	1235	1.2	73	775	1.2	5	500
2/15/2002	7.62	12.1	18.09	16.79	16.52	6.75	6.9	7.87				1088			668		4	500
2/16/2002	9.02	8.32	18.01	16.99	16.26	6.73	7.86	7.93										500
2/17/2002	12.12	0.48	18.22	17.15	15.98	6.79	6.78	7.91	40	0.73	52		1.2	77		1		500

Aqua Safe Official Data

	effluent	aeration	influent	aeration	effluent	influent	aeration	effluent	influent	effluent	influent	aeration	effluent	(%)	aeration	effluent	m.	GPD
2/18/2002	7.33	10.05	18.44	16.99	16.41	7.35	8.09	7.84	<2	0.79	54	1180	1.2	75	664	1.2	4	500
2/19/2002	6.74	9.85	18.89	17.24	17.04	7.37	8.07	7.81	58	0.7	82	1545	1.25	78	995	2	5	500
2/20/2002	5.55	8.25	18.88	17.59	16.74	6.81	7.63	7.31	88	3.77	68	1140	1.4	82	700	1.4		500
2/21/2002	4.52	7.71	19.38	17.86	16.86	6.7	7.59	7.27	232	2.88	164	980	0.8	73	650	0.6		500
2/22/2002	3.15	6.56	19.11	18.02	17.17	6.5	7.41	7.21	we	we	we	we	we	we	we	we		500
2/23/2002	2.81	1.03	18.57	18.11	17.8	6.09	7.21	7.27	we	we	we	we	we	we	we	we		500
2/24/2002	6.66	19.1	18.63	18.06	15.62	6.33	7.18	6.91	260	2.8	216	we	1.8	76	we	1.4		500
2/25/2002	4.22	2.82	17.78	17.78	17.04	6.27	6.61	7.15	247	2.19	260	835	2.8	75	565	2		500
2/26/2002	4.36	2.67	15.86	16.65	16.48	6.25	6.13	7.16	176	2.14	148	1420	5.8	70	930	3.6		500
2/27/2002	4.53	6.12	15.81	17.09	16.8	6.45	7.33	7.23	148	1.93	96	1420	11	81	910	2.8		500
2/28/2002	5.56	3.76	16.04	16.54	15.72	6.64	6.49	7.26	159	1.07	ns	1590	5	ns	1070	4		500
3/1/2002	5.72	7.35	16.8	16.61	16.01	6.57	6.22	7.23	we	we	we	2255	we	we	1445	we		500
3/2/2002	4.32	7.6	16.47	16.32	14.1	6.42	6.69	7.19	we	we	we	we	we	we	we	we		500
3/3/2002	4.22	7.58	16.18	16.27	13.93	6.56	6.74	7.24	307	2.92	1560	we	2.8	68	we	2.2		
3/4/2002	3.45	8.57	14.4	16.01	13.73	6.38	7.5	7.22	332	ns	616	2635	ns	80	1700	ns		
3/5/2002	3.69	7.54	14.07	15.77	13.54	6.57	7.63	7.42	ns	ns	ns	1904	ns	ns	1184	ns		
3/6/2002	3.98	8.04	14.11	15.63	13.6	6.61	7.57	7.31	ns	4.46	114	2904	2.1	51	1784	2.2		
3/7/2002	4.43	4.68	15.17	15.66	15.25	6.84	7.43	7.28	143	1.43	260	2620	1.2	92	1595	1.2		
3/8/2002	4.77	6.1	15.7	15.85	15.32	7.04	7.4	7.26				2570			1560			
3/9/2002	6.95	7.09	15.38	16.06	15.51	6.46	7.31	7.32										
3/10/2002	5.98	7.21	15.25	15.98	15.38	6.68	7.45	7.39	la	1.3	158		1.2	70		0.8		
3/11/2002	5.51	7.77	15.66	15.89	15.54	6.86	7.56	7.35	59	2.02	59	2640	3.8	64	1660	2.6		
3/12/2002	6.8	8.91	15.65	15.98	15.57	7.14	7.65	7.46	96	2.41	218	2300	4	69	1465	3.2		
3/13/2002	6.78	9.61	16.3	15.33	14.69	7.03	7.78	7.57	98	1.57	158	3265	4	ne	1995	4.2		
3/14/2002	6.5	8.57	16.45	16.2	16.03	7.06	7.64	7.46	102	1.59	la	2865	7.8	la	1435	3.8		
3/15/2002	6.06	7.57	17.15	16.6	16.54	6.91	7.58	7.45				2685			1650			
3/16/2002	7.22	7.52	16.78	16.88	18.73	6.61	7.55	7.06										
3/17/2002	6.52	7.46	17.54	17.03	16.8	6.99	7.59	7.43	28	2.43	170		104.2	81		19		
3/18/2002	6.29	7.15	16.62	16.99	15.64	6.68	7.37	7.55	52	1.81	114	3235	11	88	1990	2.2		
3/19/2002	6.22	7.65	17.6	17.48	17.19	6.81	7.6	7.4	86	1.46	66	3105	2.8	64	1945	0.4		
3/20/2002	6.71	5.17	17.28	16.8	17.34	6.84	6.85	7.42	123	1.74	236	3370	3.6	69	2050	2.4		
3/21/2002	6.56	7.97	17.58	17.62	16.66	6.93	7.66	7.5	64	1.63	57	3220	1.8	65	1965	1.2		
3/22/2002	7.31	8.77	16.91	17.42	16.84	6.97	7.69	7.49				2960			1795			
3/23/2002	8.59	8.68	16.98	17.12	17.25	6.98	7.53	7.55										
3/24/2002	8.37	8.36	19.23	18.32	17.87	6.95	7.65	7.55	ns	1.5	ns		3.6	ns		3		
3/25/2002	7.18	8.94	19.99	18.6	18.36	7.25	7.79	7.66	42	1.3	55	2950	5	65	1820	3.2		
3/26/2002	7.28	9.33	19.26	18.53	18.03	7.21	7.85	7.69	32	1.1	21	3555	1.8	81	2175	1		
3/27/2002	7.8	8.42	19.97	18.44	17.57	7.26	7.77	7.74			19	3480	1	63	2145	0.6		
3/28/2002	8.34	7.58	20.57	18.88	18.59	7.31	7.69	7.6				2970			1800			
3/29/2002	8.25	7.5	20.64	18.65	18.44	7.28	7.55	7.59										
3/30/2002	8.15	7.64	21.36	18.95	18.71	7.28	7.71	7.65										
3/31/2002	8.54	7.71	20.86	18.88	18.94	7.36	7.81	7.68										

abbreviation key			
la - lab accident		mc - missed cutoff time	
pf - pump failure		ne - no entry by lab	
sf - sonde failure		ns - no sample, we - weekend	
bt - bad test		unk - unknown	

APPENDIX D

AS500 RESIDENTIAL WASTEWATER TREATMENT SYSTEM SPECIFICATIONS AND DRAWINGS

AQUA SAFE WASTEWATER TREATMENT PLANT PROCESS DESCRIPTION

AS 500 are made with an outer mixing compartment and a center settling or clarifier compartment. They are in many ways similar to large township or municipality sewage treatment plants. They employ an extended aeration activated sludge process. This type of treatment depends primarily upon the use of air that is introduced by air passing from the aerator compressor to four air lines located around the perimeter of the aeration mixing compartment. As wastewater enters the aeration mixing compartment simple hydraulic displacement is accomplished by the introduction of air which promotes the growth of aerobic organisms in much larger quantities than would occur naturally. These bacteria break down the organic solids in the wastewater. From the aeration mixing compartment, mixed liquid enters the cone shaped settling or clarifier compartment from the bottom. No mixing occurs in this quiet zone where solids separate from the liquid and settle to the bottom of the clarifier and re-enter the mixing compartment. The liquid that separates from the solids in the clarifier continue to flow upward to the discharge pipe.

AQUA SAFE PRODUCT SPECIFICATIONS

INDIVIDUAL HOME WASTEWATER TREATMENT PLANT

MODEL A.S. 500

	A.S. 500
Treatment Capacity	500 GPD
Volumetric Capacity	1000 GAL.
Aeration Zone Capacity	848 GAL.
Clarifier Capacity	152 GAL.
BOD_5 Loading	1.25 #/DAY
Aerator-Aqua Safe Compressor	ASC2532

DESIGN COMPONENTS AND MATERTIALS

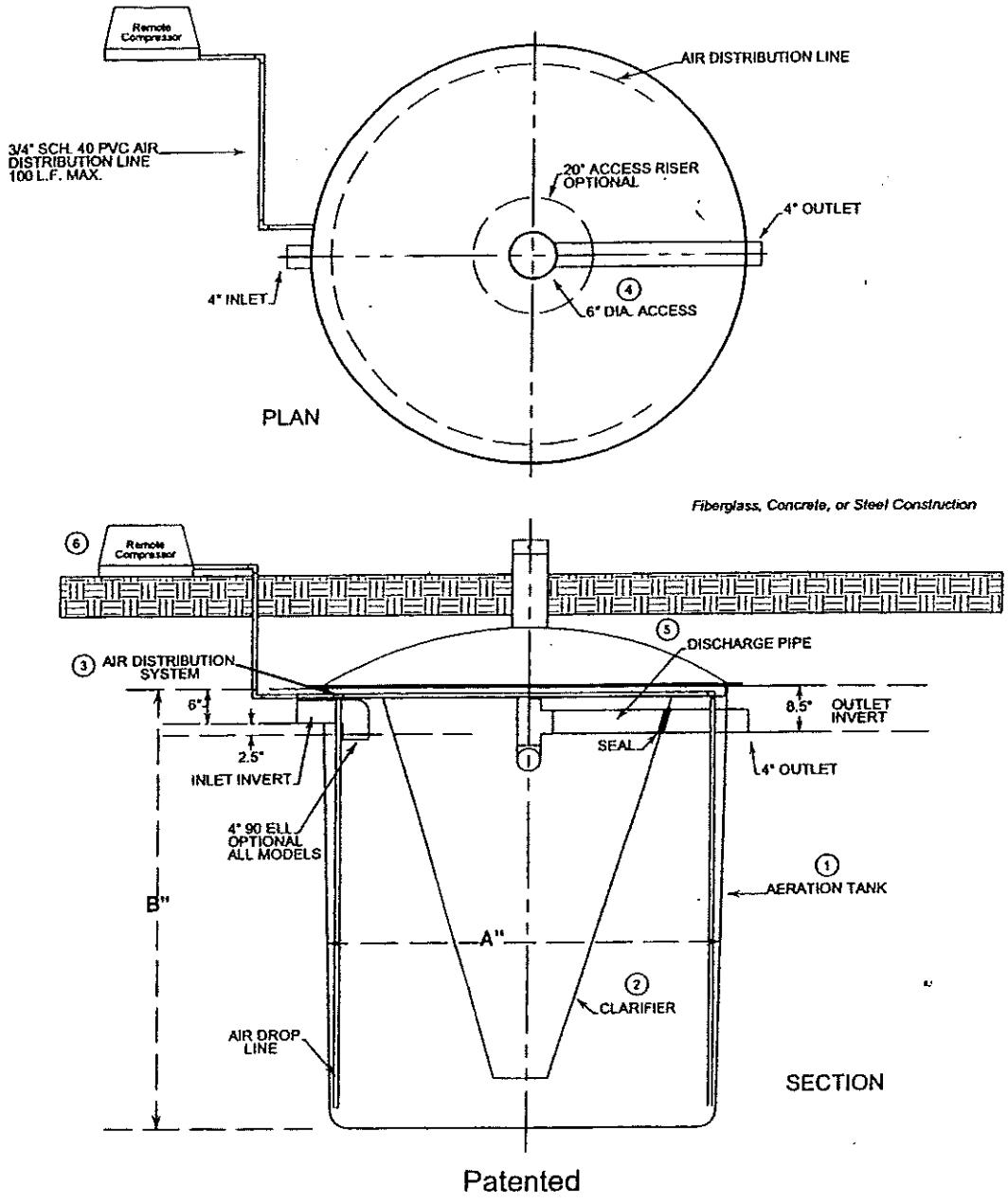
Aeration Tank & Cover ..... **fiberglass, steel, or concrete**
Clarifier ..... **polyethylene or fiberglass**
Compressor Housing ..... **polyethylene, fiberglass, or concrete**

PARTS LIST

Aeration Tank ..... **item #1**
Clarifier **2**
Air Distribution System **3**
Access Cover, 6" Diameter PVC, 16" Fiberglass or 20" Polyethylene **4**
Discharge Piping Assembly **5**
Compressor Housing **6**

	DIMENSIONS	
MODEL	A (I.D.)	B (HEIGHT)
A.S. 500	5'6"	6'4"

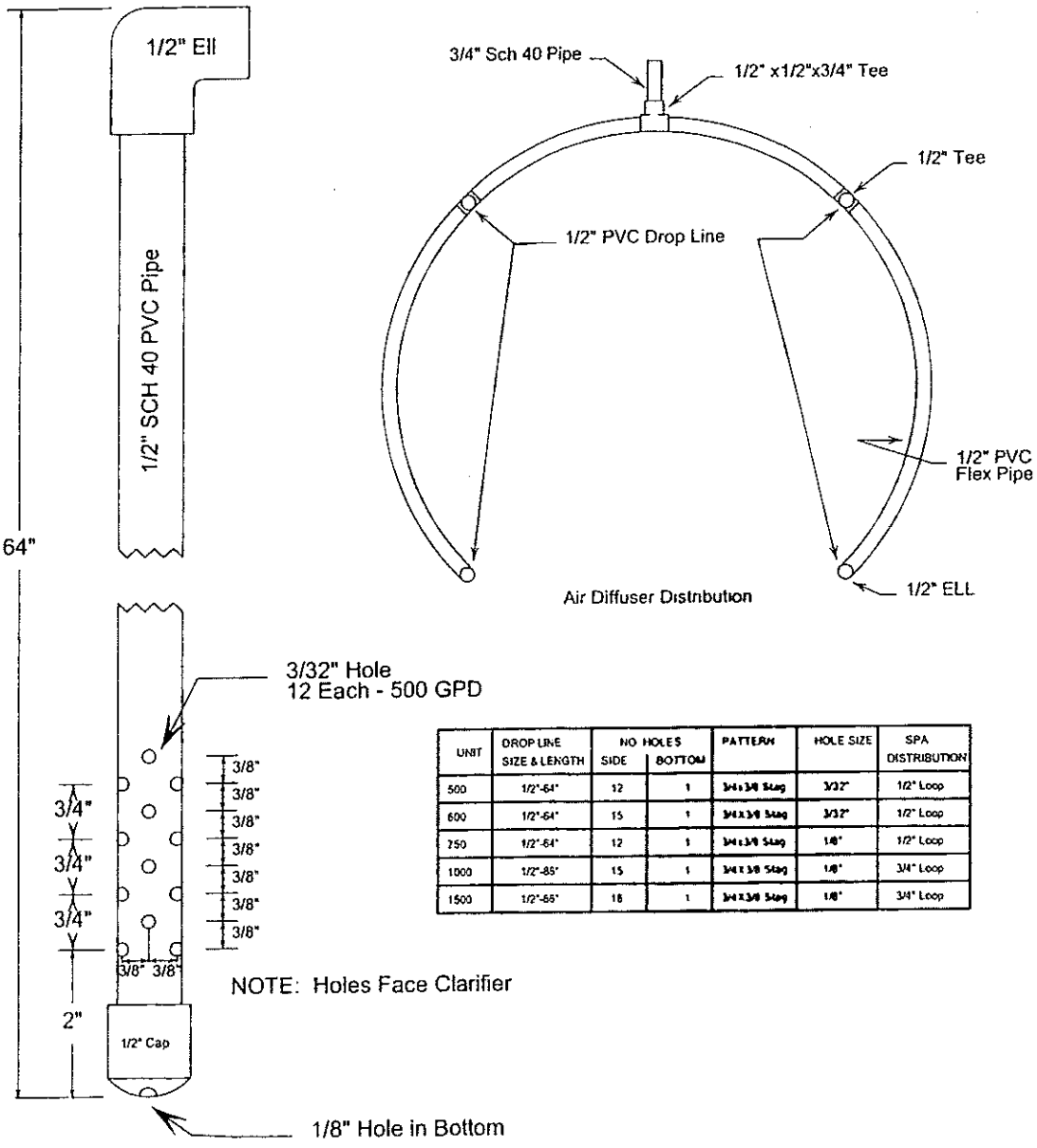
ECOLOGICAL TANKS, INC
Individual Home Wastewater Treatment Plant



Patented

A.S. 500

AQUA SAFE TREATMENT PLANTS
AIR LINE DIFFUSION



UNIT	DROP LINE SIZE & LENGTH	NO HOLES SIDE	NO HOLES BOTTOM	PATTERN	HOLE SIZE	SPA DISTRIBUTION
500	1/2"-64"	12	1	3/4 x 3/8 Stag	3/32"	1/2" Loop
600	1/2"-64"	15	1	3/4 x 3/8 Stag	3/32"	1/2" Loop
750	1/2"-64"	12	1	3/4 x 3/8 Stag	1/8"	1/2" Loop
1000	1/2"-85"	15	1	3/4 x 3/8 Stag	1/8"	3/4" Loop
1500	1/2"-65"	18	1	3/4 x 3/8 Stag	1/8"	3/4" Loop

NOTE: Holes Face Clarifier

ECOLOGICAL TANKS, INC. 04/2002

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APPENDIX E

MODEL SERIES 600, 750, 1000, AND 1500
RESIDENTIAL WASTEWATER TREATMENT SYSTEM
SPECIFICATIONS AND DRAWINGS

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AQUA SAFE WASTEWATER TREATMENT PLANT PROCESS DESCRIPTION

Ecological Tanks, Inc., Aqua Safe model numbers **AS500, AS600, AS750, AS1000 and AS1500** are made with an outer mixing compartment and a center settling or clarifier compartment. They are in many ways similar to large township or municipality sewage treatment plants. They employ an extended aeration activated sludge process. This type of treatment depends primarily upon the use of air that is introduced by air passing from the aerator compressor to four air lines located around the perimeter of the aeration mixing compartment. As wastewater enters the aeration mixing compartment simple hydraulic displacement is accomplished by the introduction of air which promotes the growth of aerobic organisms in much larger quantities than would occur naturally. These bacteria break down the organic solids in the wastewater. From the aeration mixing compartment, mixed liquid enters the cone shaped settling or clarifier compartment from the bottom. No mixing occurs in this quiet zone where solids separate from the liquid and settle to the bottom of the clarifier and re-enter the mixing compartment. The liquid that separates from the solids in the clarifier continue to flow upward to the discharge pipe.

AQUA SAFE PRODUCT SPECIFICATIONS

INDIVIDUAL HOME WASTEWATER TREATMENT PLANT

A.S. 600

	A.S. 600
Treatment Capacity	600 GPD
Volumetric Capacity	1190 GAL.
Aeration Zone Capacity	1000 GAL.
Clarifier Capacity	190 GAL.
BOD_5 Loading	1.50 #/DAY
Aerator-Aqua Safe Compressor	ASC3342

DESIGN COMPONENTS AND MATERTIALS

Aeration Tank & Cover ..... **fiberglass, steel, or concrete**
Clarifier ..... **polyethylene or fiberglass**
Compressor Housing ..... **polyethylene, fiberglass, or concrete**

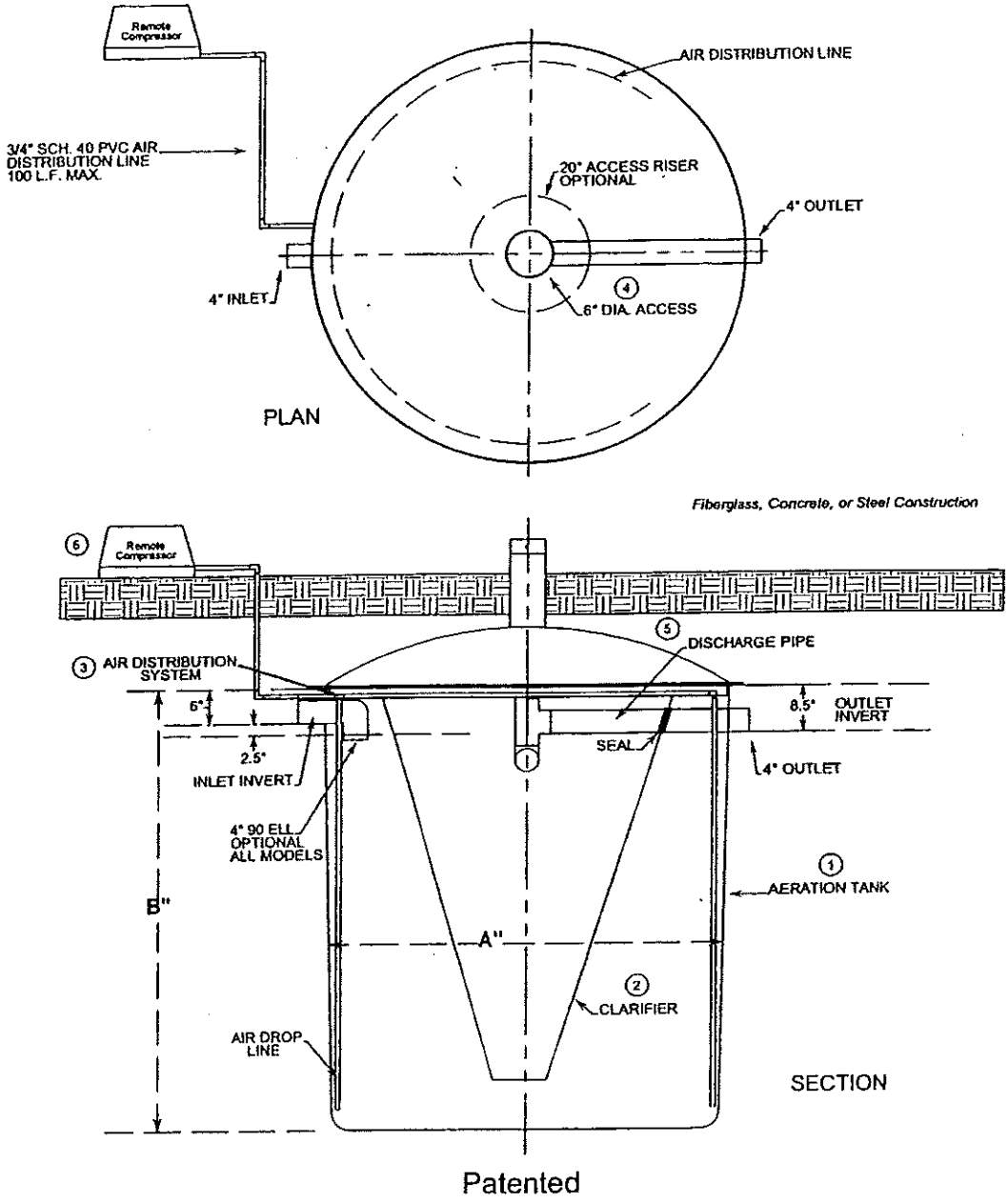
PARTS LIST

Aeration Tank ..... **item #1**
Clarifier **2**
Air Distribution System **3**
Access Cover, 6" Diameter PVC, 16" Fiberglass or 20" Polyethylene **4**
Discharge Piping Assembly **5**
Compressor Housing **6**

	DIMENSIONS	
MODEL	A (I.D.)	B (HEIGHT)
A.S. 600	6'0"	6'4"
A.S. 750	6'9"	6'4"
A.S. 1000	6'9"	8'2"
A.S. 1500	8'2"	8'2"

ECOLOGICAL TANKS, INC

Individual Home Wastewater Treatment Plant



Patented

A.S. 600

AQUA SAFE PRODUCT SPECIFICATIONS

INDIVIDUAL HOME WASTEWATER TREATMENT PLANT

A.S.750

	A.S. 750
Treatment Capacity	750 GPD
Volumetric Capacity	1516 GAL.
Aeration Zone Capacity	1288 GAL.
Clarifier Capacity	228 GAL.
BOD_5 Loading	1.85 #/DAY
Aerator-Aqua Safe Compressor	ASC3352

DESIGN COMPONENTS AND MATERTIALS

Aeration Tank & Cover ..... **fiberglass, steel, or concrete**
Clarifier ..... **polyethylene or fiberglass**
Compressor Housing ..... **polyethylene, fiberglass, or concrete**

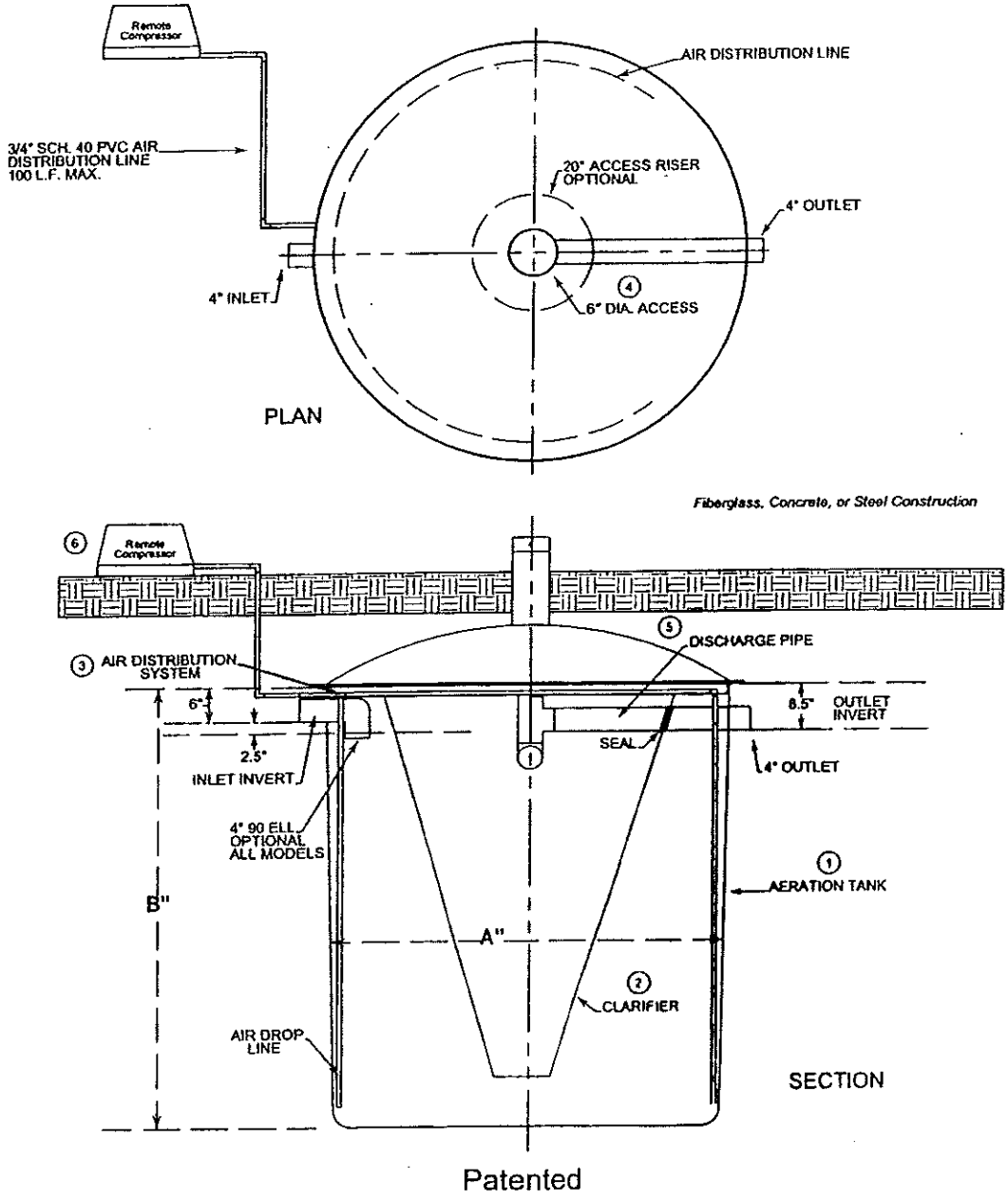
PARTS LIST

Aeration Tank ..... **item #1**
Clarifier **2**
Air Distribution System **3**
Access Cover, 6" Diameter PVC, 16" Fiberglass or 20" Polyethylene **4**
Discharge Piping Assembly **5**
Compressor Housing **6**

	DIMENSIONS	
MODEL	A (I.D.)	B (HEIGHT)
A.S. 600	6'0"	6'4"
A.S. 750	6'9"	6'4"
A.S. 1000	6'9"	8'2"
A.S. 1500	8'2"	8'2"

ECOLOGICAL TANKS, INC

Individual Home Wastewater Treatment Plant



Patented

A.S.750

AQUA SAFE PRODUCT SPECIFICATIONS

INDIVIDUAL HOME WASTEWATER TREATMENT PLANT

A.S. 1000

	A.S. 1000
Treatment Capacity	1000 GPD
Volumetric Capacity	2008 GAL.
Aeration Zone Capacity	1706 GAL.
Clarifier Capacity	302 GAL.
BOD_5 Loading	2.50 #/DAY
Aerator-Aqua Safe Compressor	ASC5082

DESIGN COMPONENTS AND MATERTIALS

Aeration Tank & Cover ..... **fiberglass, steel, or concrete**
Clarifier ..... **polyethylene or fiberglass**
Compressor Housing ..... **polyethylene, fiberglass, or concrete**

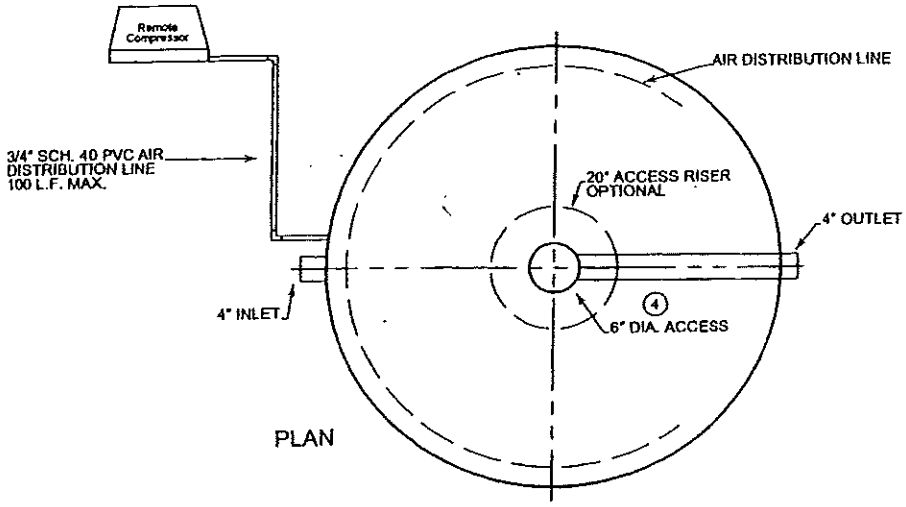
PARTS LIST

Aeration Tank ..... **item #1**
Clarifier **2**
Air Distribution System **3**
Access Cover, 6" Diameter PVC, 16" Fiberglass or 20" Polyethylene **4**
Discharge Piping Assembly **5**
Compressor Housing **6**

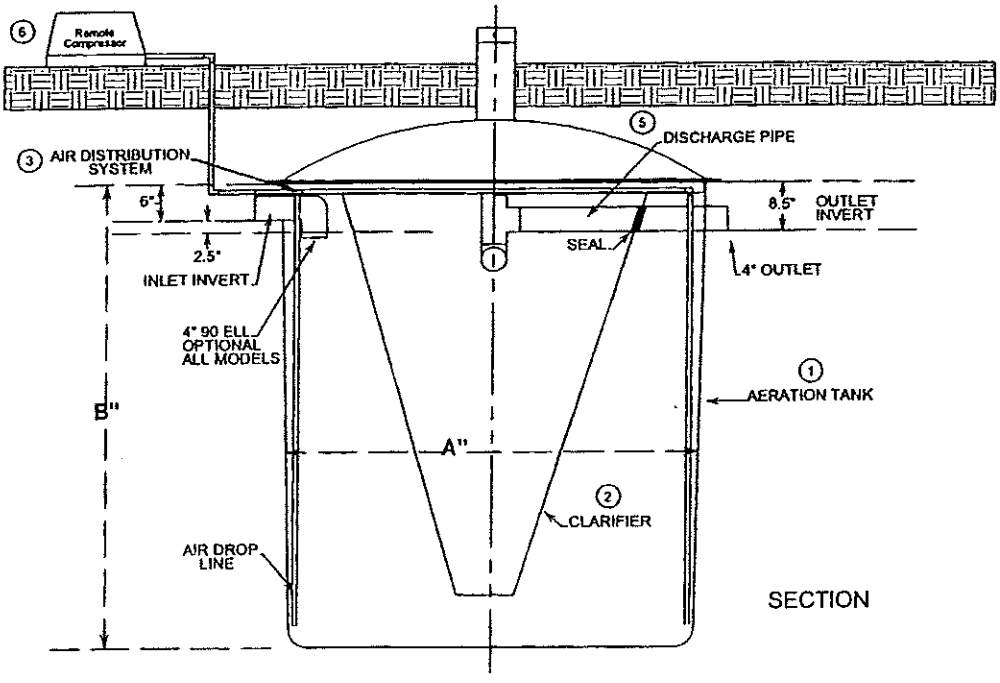
	DIMENSIONS	
MODEL	A (I.D.)	B (HEIGHT)
A.S. 600	6'0"	6'4"
A.S. 750	6'9"	6'4"
A.S. 1000	6'9"	8'2"
A.S. 1500	8'2"	8'2"

ECOLOGICAL TANKS, INC

Individual Home Wastewater Treatment Plant



Fiberglass, Concrete, or Steel Construction



Patented

A.S. 1000

AQUA SAFE PRODUCT SPECIFICATIONS

INDIVIDUAL HOME WASTEWATER TREATMENT PLANT

A.S. 1500

	A.S. 1500
Treatment Capacity	1500 GPD
Volumetric Capacity	2918 GAL.
Aeration Zone Capacity	2349 GAL.
Clarifier Capacity	569 GAL.
BOD_5 Loading	3.75 #/DAY
Aerator-Aqua Safe Compressor	ASC7510

DESIGN COMPONENTS AND MATERTIALS

Aeration Tank & Cover ..... **fiberglass, steel, or concrete**
Clarifier ..... **polyethylene or fiberglass**
Compressor Housing ..... **polyethylene, fiberglass, or concrete**

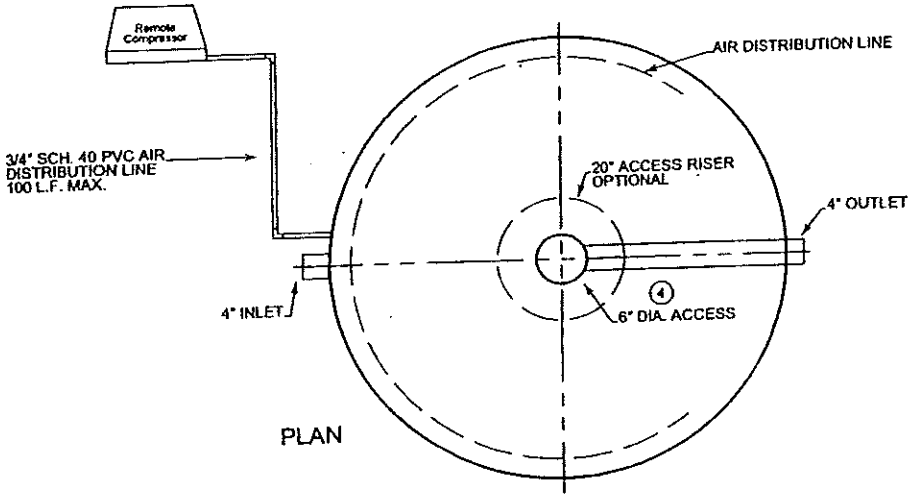
PARTS LIST

Aeration Tank ..... **item #1**
Clarifier **2**
Air Distribution System **3**
Access Cover, 6" Diameter PVC, 16" Fiberglass or 20" Polyethylene **4**
Discharge Piping Assembly **5**
Compressor Housing **6**

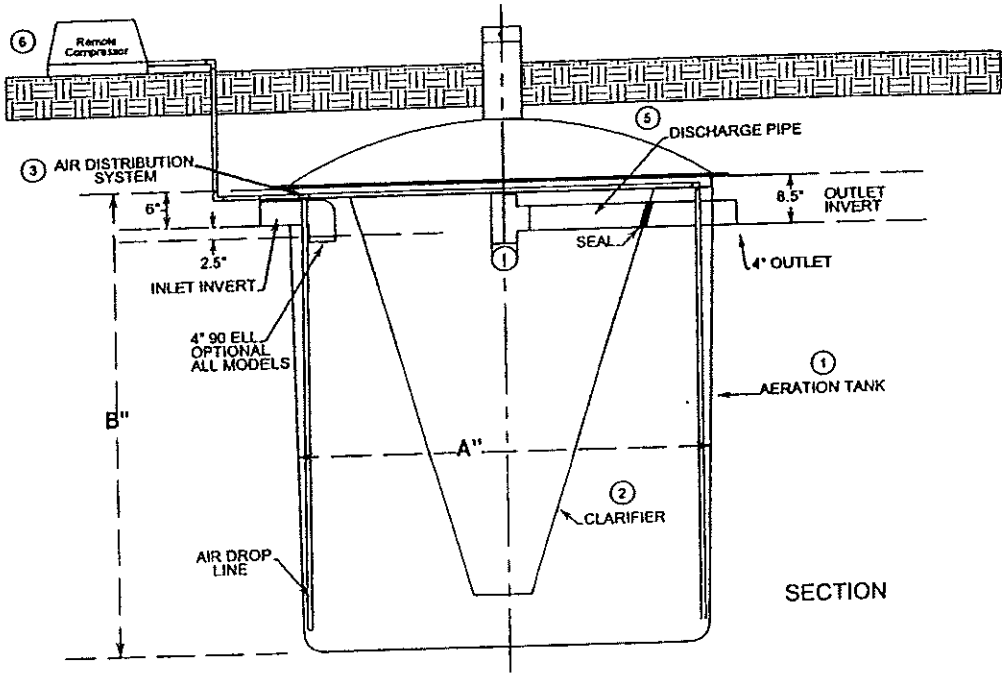
	DIMENSIONS	
MODEL	A (I.D.)	B (HEIGHT)
A.S. 600	6'0"	6'4"
A.S. 750	6'9"	6'4"
A.S. 1000	6'9"	8'2"
A.S. 1500	8'2"	8'2"

ECOLOGICAL TANKS, INC

Individual Home Wastewater Treatment Plant



Fiberglass, Concrete, or Steel Construction



Patented

A.S. 1500

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EZ Model Series

RESIDENTIAL WASTEWATER TREATMENT SYSTEM SPECIFICATIONS AND DRAWINGS

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AQUA SAFE WASTEWATER TREATMENT PLANT PROCESS DESCRIPTION

Ecological Tanks, Inc., Aqua Safe model numbers **AS500EZ, AS600EZ, AS750EZ, AS1000EZ and AS1500EZ** are made with an outer mixing compartment and a center settling or clarifier compartment. They are in many ways similar to large township or municipality sewage treatment plants. They employ an extended aeration activated sludge process. This type of treatment depends primarily upon the use of air that is introduced by air passing from the aerator compressor to four air lines located around the perimeter of the aeration mixing compartment. As wastewater enters the aeration mixing compartment simple hydraulic displacement is accomplished by the introduction of air which promotes the growth of aerobic organisms in much larger quantities than would occur naturally. These bacteria break down the organic solids in the wastewater. From the aeration mixing compartment, mixed liquid enters the cone shaped settling or clarifier compartment from the bottom. No mixing occurs in this quiet zone where solids separate from the liquid and settle to the bottom of the clarifier and re-enter the mixing compartment. The liquid that separates from the solids in the clarifier continue to flow upward to the discharge pipe.

AQUA SAFE PRODUCT SPECIFICATIONS

INDIVIDUAL HOME WASTEWATER TREATMENT PLANT

MODELS A.S. 500, A.S. 600, A.S.750, A.S. 1000, & A.S. 1500

Includes EZ Models

	A.S. 500	A.S. 600	A.S. 750	A.S. 1000	A.S. 1500
Treatment Capacity	500 GPD	600 GPD	750 GPD	1000 GPD	1500 GPD
Volumetric Capacity	1000 GAL.	1190 GAL.	1516 GAL.	2008 GAL.	2918 GAL.
Aeration Zone Capacity	848 GAL.	1000 GAL.	1288 GAL.	1706 GAL.	2349 GAL.
Clarifier Capacity	152 GAL.	190 GAL.	228 GAL.	302 GAL.	569 GAL.
BOD_5 Loading	1.25 #/DAY	1.50 #/DAY	1.85 #/DAY	2.50 #/DAY	3.75 #/DAY
Aerator-Aqua Safe Compressor	ASC2532	ASC3342	ASC3352	ASC5082	ASC7510

DESIGN COMPONENTS AND MATERTIALS

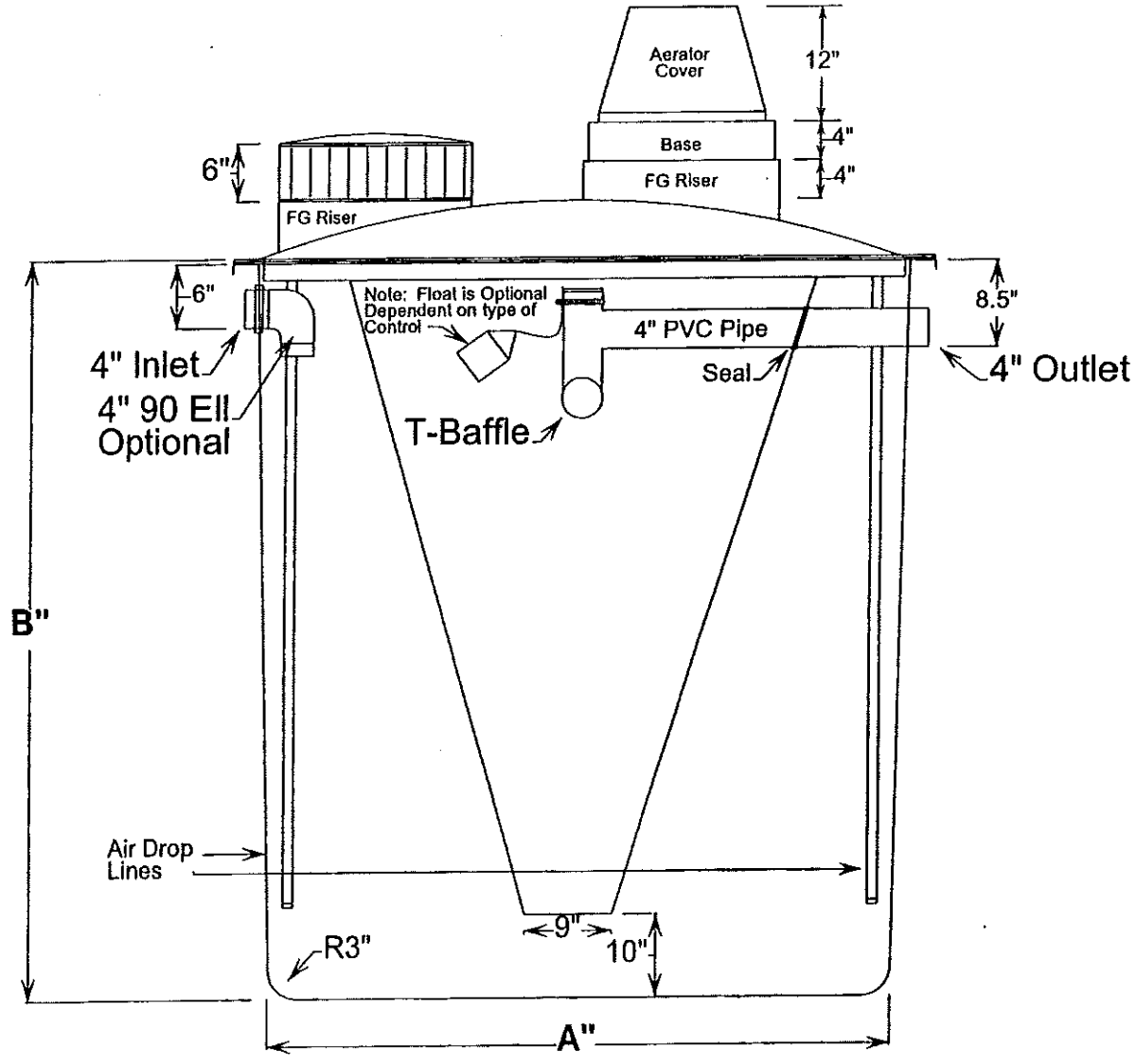
Aeration Tank & Cover ..... fiberglass, steel, or concrete
Clarifier ..... polyethylene or fiberglass
Compressor Housing ..... polyethylene, fiberglass, or concrete

PARTS LIST

Aeration Tank ..... item #1
Clarifier 2
Air Distribution System 3
Access Cover, 6" Diameter PVC, 16" Fiberglass or 20" Polyethylene 4
Discharge Piping Assembly 5
Compressor Housing 6

	DIMENSIONS	
MODEL	A (I.D.)	B (HEIGHT)
A.S. 500	5'6"	6'4"
A.S. 600	6'0"	6'4"
A.S. 750	6'9"	6'4"
A.S. 1000	6'9"	8'2"
A.S. 1500	8'2"	8'2"

Aqua Safe AS 500 - 1500 With EZ Top



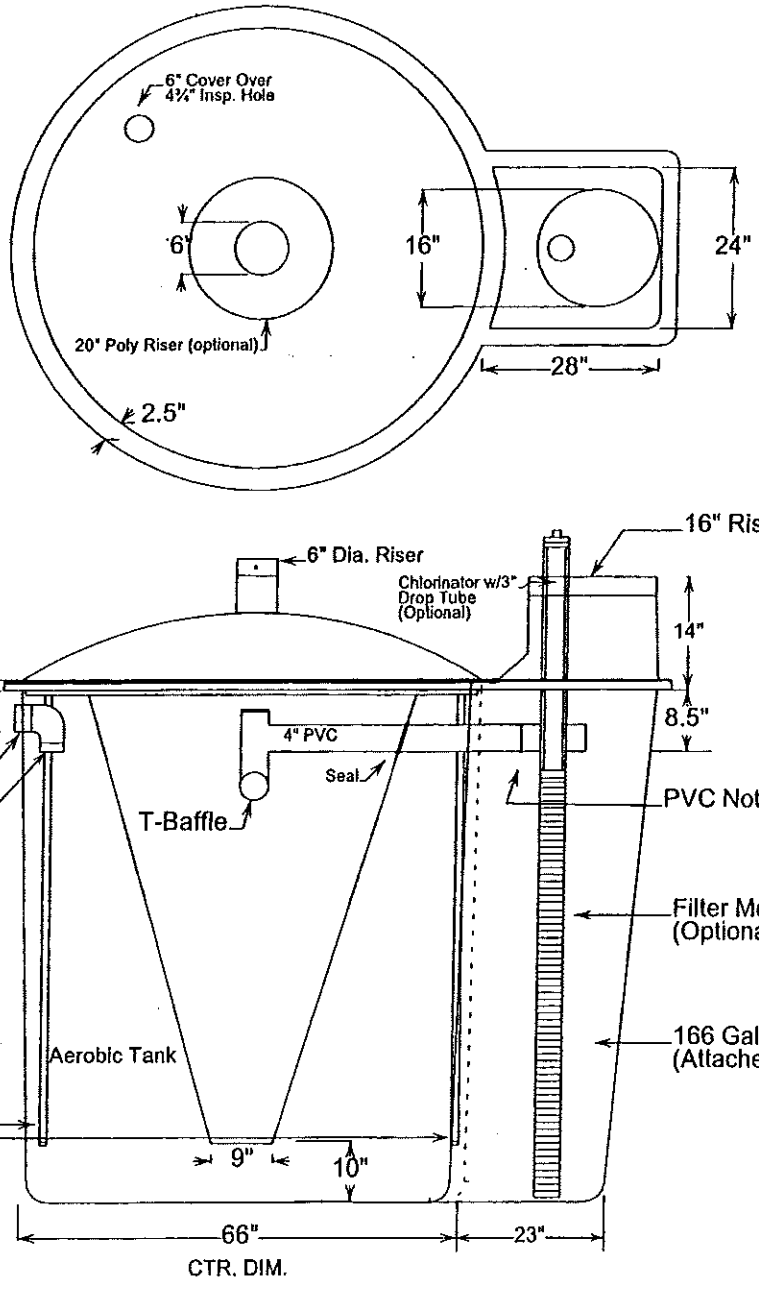
Ecological Tanks, Inc. Patented 4/2002

AQUA SAFE WASTEWATER TREATMENT PLANT PROCESS DESCRIPTION

The **Aqua Safe** model number **AS500-166** is a fiberglass round tank configuration comprised of an aeration mixing compartment, a center settling or clarifier compartment and a 166 gallon attached pump tank. It is in many ways similar to large township or municipality sewage treatment plants. It employs an extended aeration activated sludge process. This type of treatment depends primarily upon the use of air that is introduced by air passing from the aerator compressor to four air lines located around the perimeter of the aeration mixing compartment. As wastewater enters the aeration mixing compartment simple hydraulic displacement is accomplished by the introduction of air which promotes the growth of aerobic organisms in much larger quantities than would occur naturally. These bacteria break down the organic solids in the wastewater. From the aeration mixing compartment, mixed liquid enters the cone shaped settling or clarifier compartment from the bottom. No mixing occurs in this quiet zone where solids separate from the liquid and settle to the bottom of the clarifier and re-enter the mixing compartment. The liquid that separates from the solids in the clarifier continue to flow upward to the discharge pipe. From the plant's discharge pipe, the final effluent passes through a chlorination devise and pump tank effluent filter into the pump tank compartment for storage and chlorine contact mixing. (Note: The chlorination devise and effluent filter are optional depending on code requirements.) The treated and disinfected effluent is then safely discharged, via an application pump, to a surface spray, overland flow or other disposal area.

Aqua Safe AS500 -166

NOTE: EZ Top Optional



Ecological Tanks, Inc. Patent Pending 4/2002

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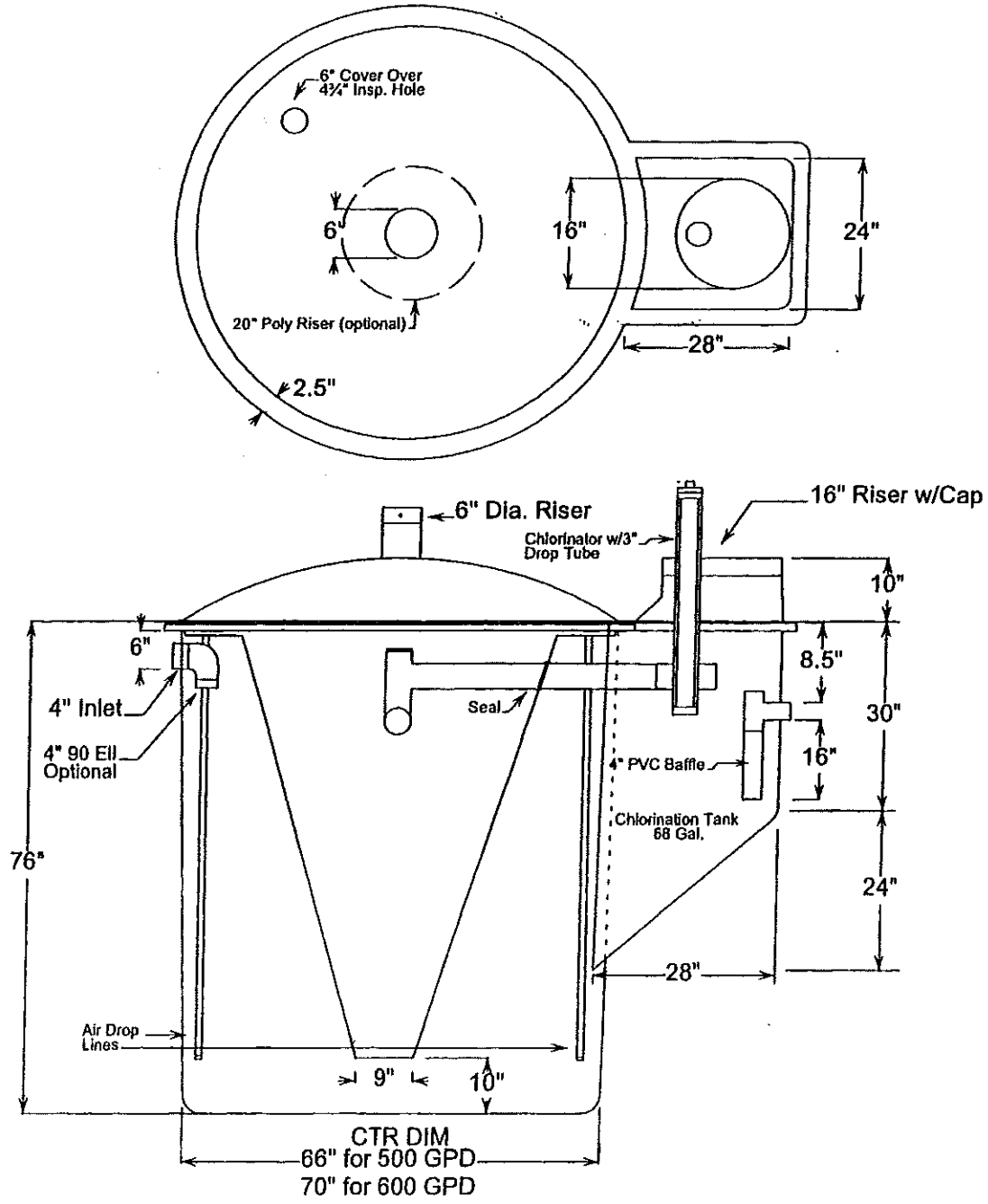
The **Aqua Safe** models **AS500CU** and **AS600CU** are fiberglass round tank configurations comprised of an aeration mixing compartment and a center clarifier compartment. Additionally, they both have an attached 68 gallon chlorine contact tank with a chlorination devise.

The **Aqua Safe** model **AS500-P5CU** is a four compartment fiberglass tank configuration. It is comprised of a forward 516 gallon pre-treatment tank, an aeration mixing zone, a settling or clarifier compartment and a 68 gallon chlorine contact tank with a chlorination devise. Wastewater first enters the pre-treatment tank compartment of the plant, then gravity flows through a 4" SDR 35 PVC inlet to the aeration mixing zone. The mixed liquid next enters the clarifier compartment and continues to flow upward to the discharge pipe. From the plant's discharge pipe, the final effluent passes through a chlorination devise into the chlorine contact tank. The treated and disinfected effluent is then safely discharged in the disposal area.

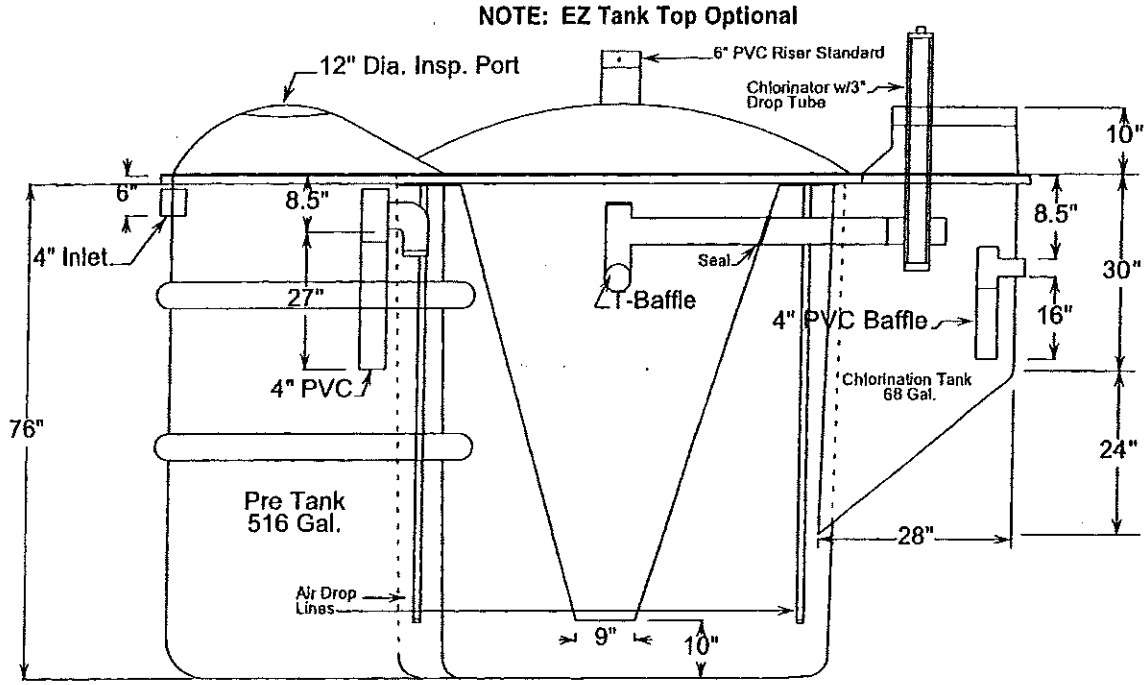
Aqua Safe AS500 CU and AS600 CU

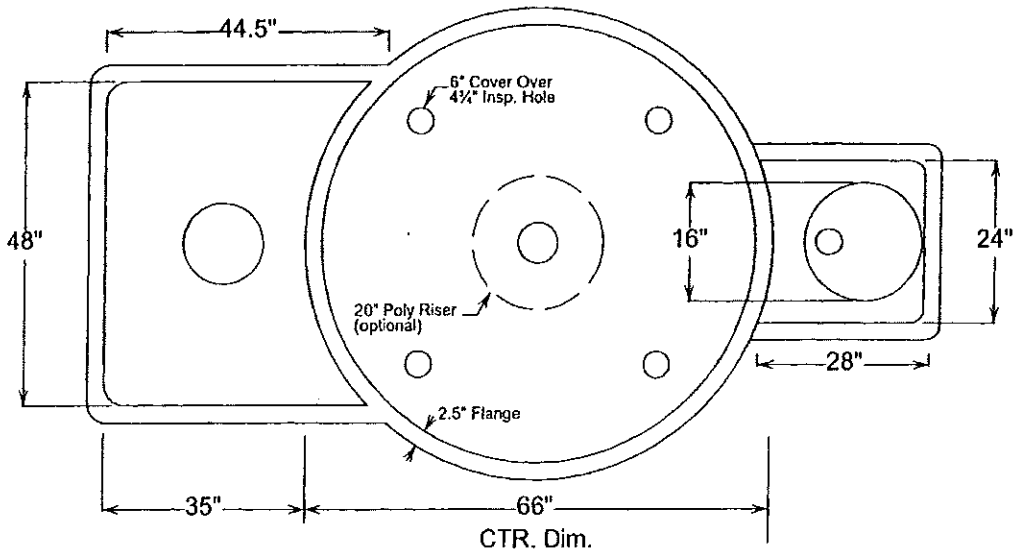
NOTE: EZ Top Optional



Ecological Tanks, Inc. Patented 4/2002

Aqua Safe AS500
P5 CU





Ecological Tanks, Inc. Patented 4/2002

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Model +5 Series

RESIDENTIAL WASTEWATER TREATMENT SYSTEM SPECIFICATIONS AND DRAWINGS

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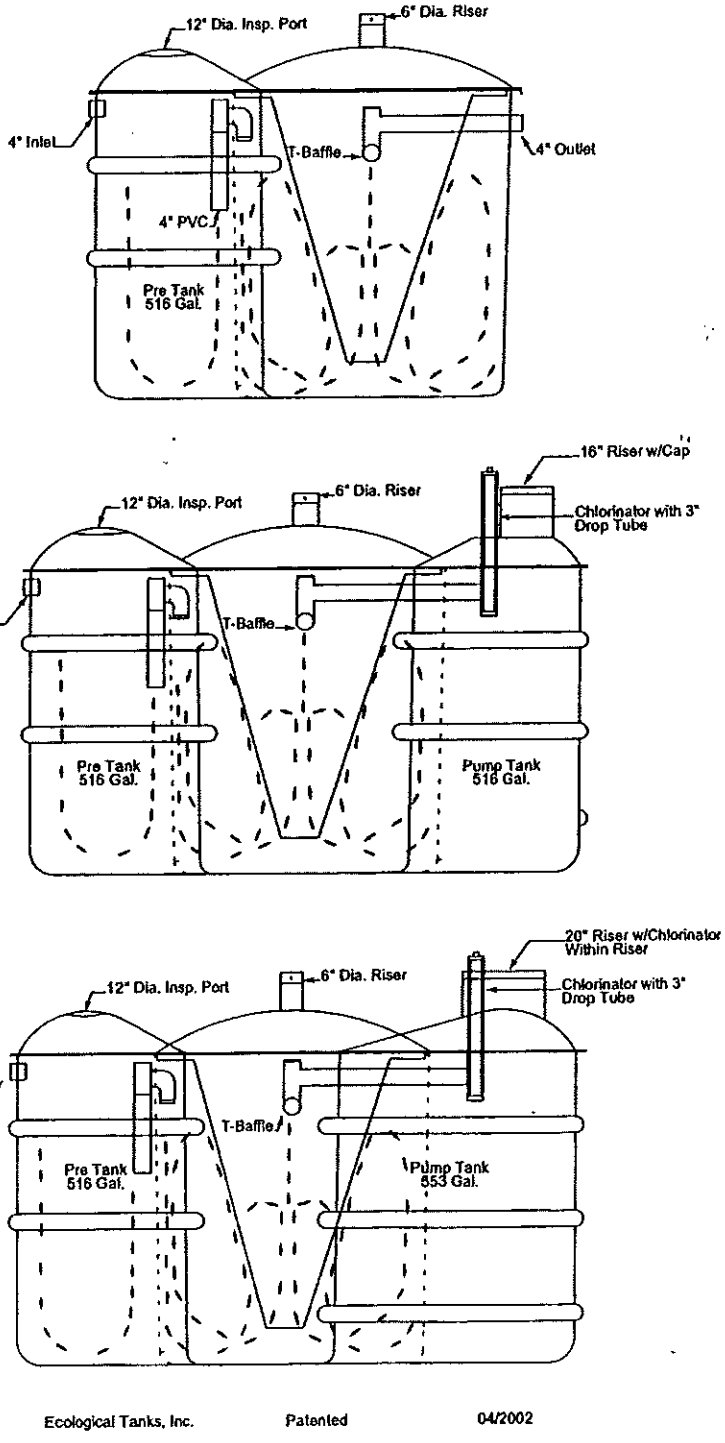
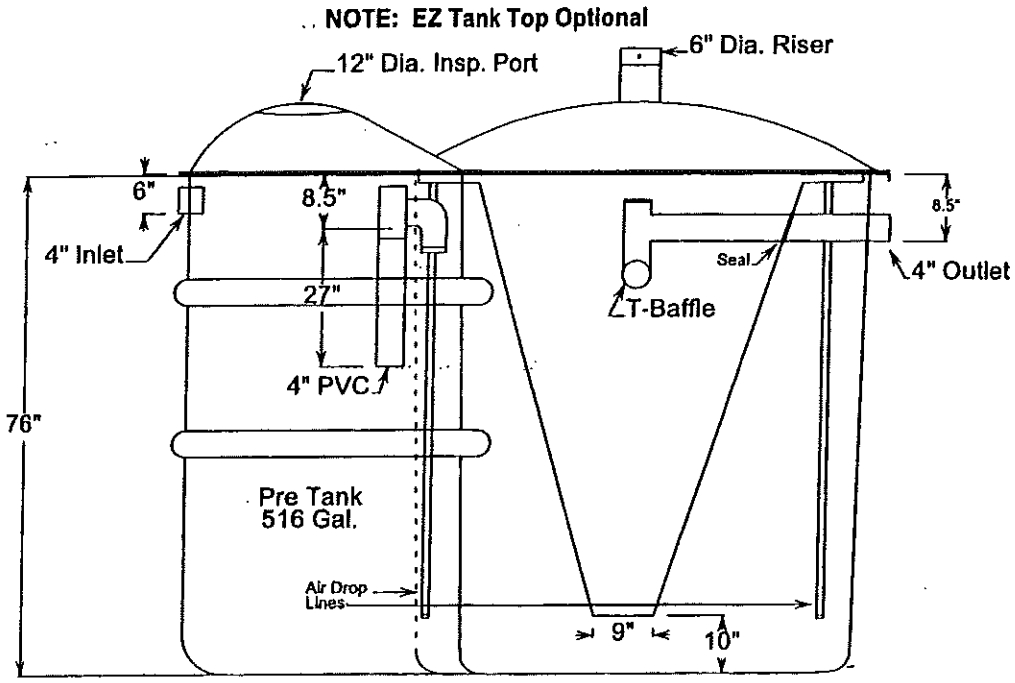
The **Aqua Safe** model **AS500-5 pre** is a three compartment fiberglass tank configuration. It is comprised of a forward 516 gallon pre-treatment tank, an aeration mixing zone and a settling or clarifier compartment. Wastewater first enters the pre-treatment tank compartment of the plant, then gravity flows through a 4" SDR 35 PVC inlet to the aeration mixing zone. The mixed liquid next enters the clarifier compartment and continues to flow upward to the discharge pipe.

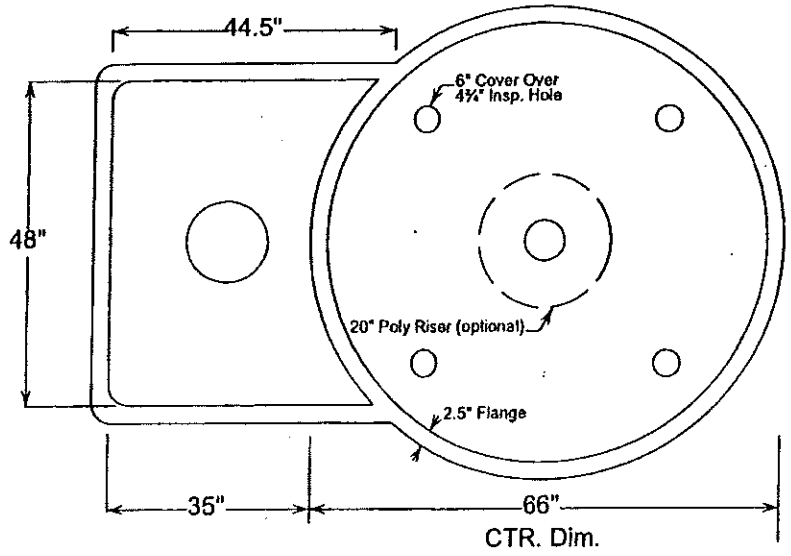
The **Aqua Safe** models **AS500-5+5 and AS500-5+5E** are four compartment fiberglass tank configurations with a chlorination devise. They are comprised of a forward 516 gallon pre-treatment tank, an aeration mixing zone, a settling or clarifier compartment and a rear pump tank compartment. Model **AS500-5+5** has a pump tank flow line capacity of 516 gallons and model **AS500 5+5E** has 553 gallons. Wastewater first enters the pre-treatment tank compartment of the plant, then gravity flows through a 4" SDR 35 PVC inlet to the aeration mixing zone. The mixed liquid next enters the clarifier compartment and continues to flow upward to the discharge pipe. From the plant's discharge pipe, the final effluent passes through a chlorination devise into the pump tank compartment for storage and contact mixing. The treated and disinfected effluent is then safely discharged, via an application pump, to a surface spray, subsurface drip, low pressure dose, absorptive mound or other disposal area.

Aqua Safe Flow Diagram



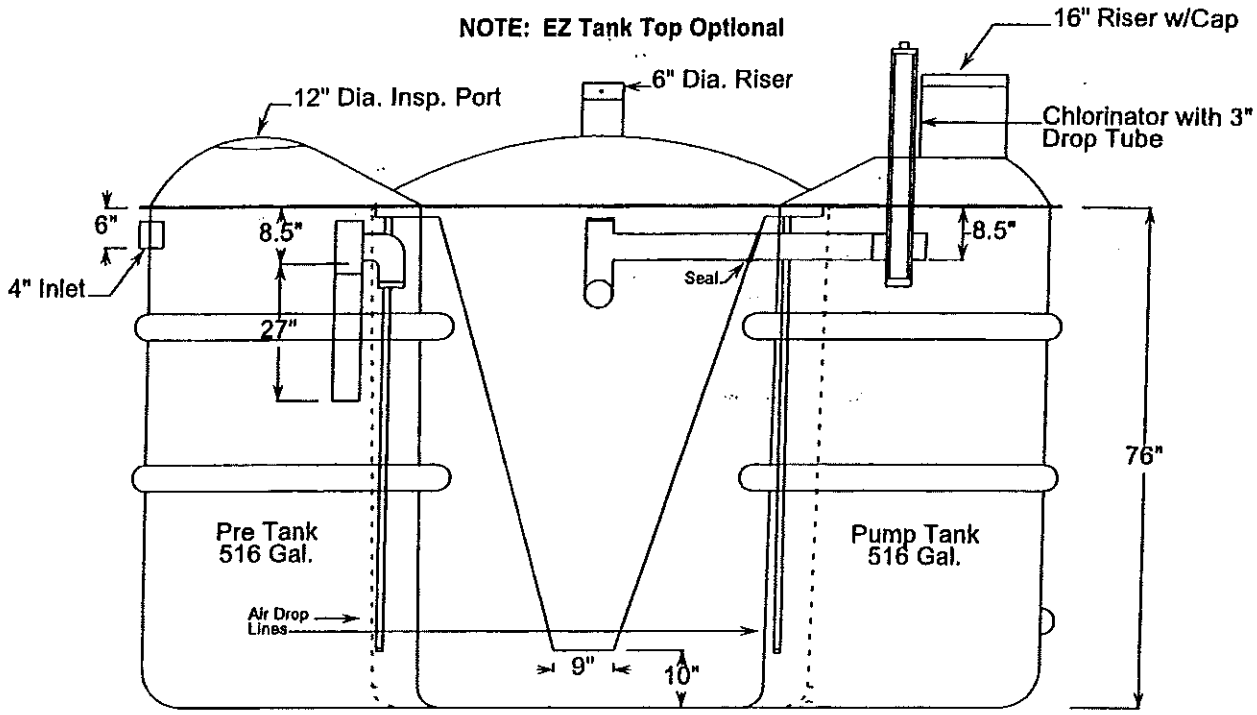
Aqua Safe AS500-5 Pre

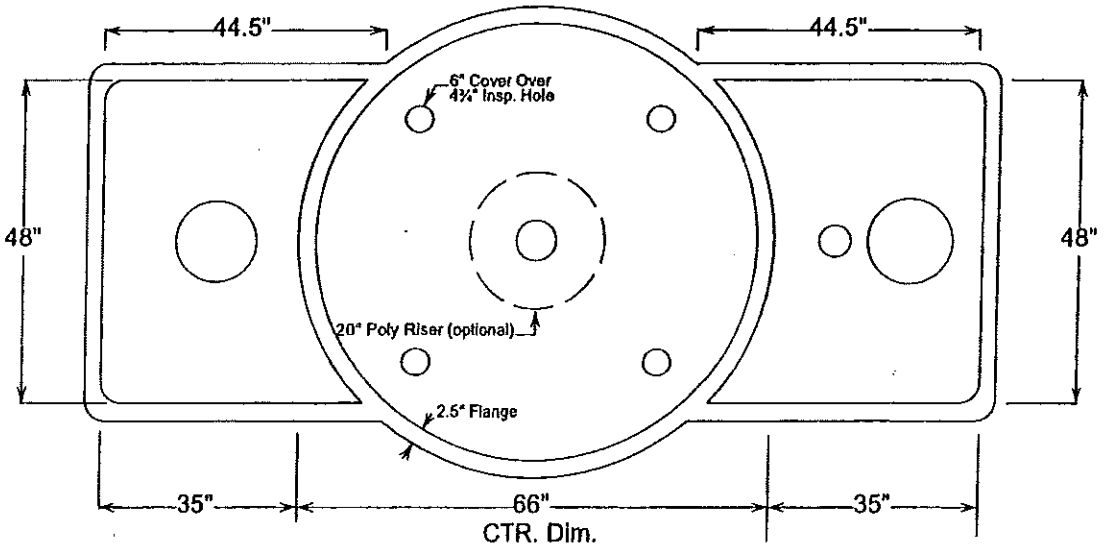




Ecological Tanks, Inc. Patented 4/2002

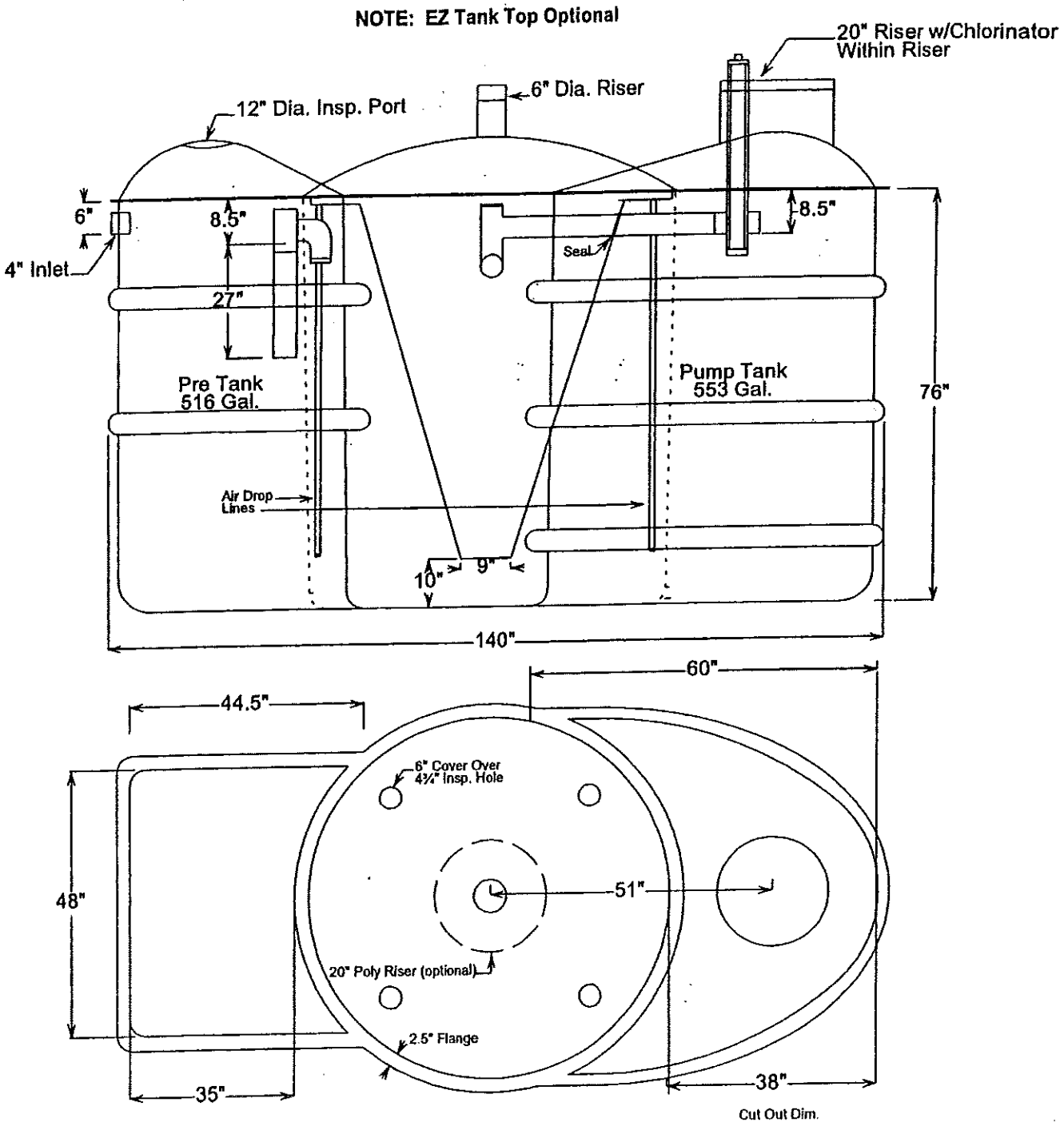
Aqua Safe AS500 5 Plus 5





Ecological Tanks, Inc. Patented 4/2002

AS500 5+5E



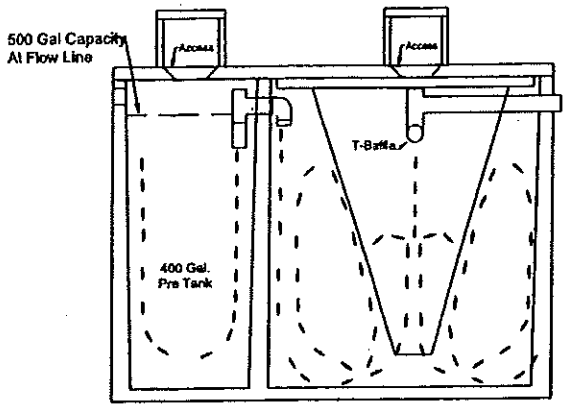
Ecological Tanks, Inc. Patented 3/2002

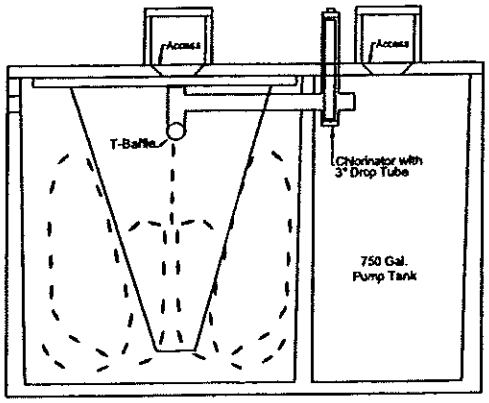
The **Aqua Safe** model **AS500+5 pre** is a three compartment concrete tank configuration. It is comprised of a forward 500 gallon pre-treatment tank, an aeration mixing zone and a settling or clarifier compartment. Wastewater first enters the pre-treatment tank compartment of the plant, then gravity flows through a 4" SDR 35 PVC inlet to the aeration mixing zone. The mixed liquid next enters the clarifier compartment and continues to flow upward to the discharge pipe.

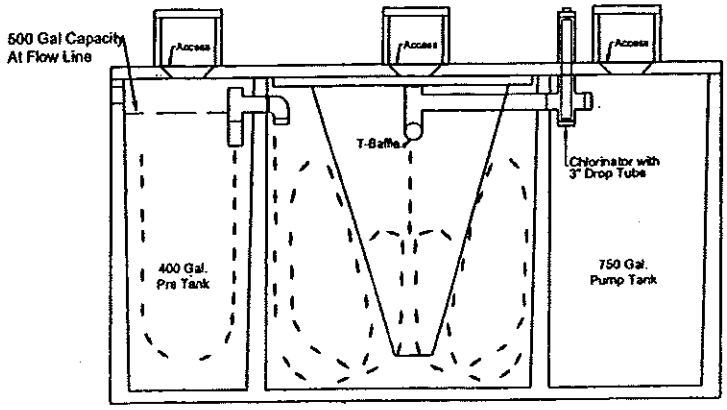
The **Aqua Safe** model **AS500-5 pump** is a three compartment concrete tank configuration. It is comprised of an aeration mixing zone, a settling or clarifier compartment and a 500 gallon flow line capacity pump tank compartment with an optional chlorination devise. Wastewater first enters the aeration mixing zone. The mixed liquid next enters the clarifier compartment and continues to flow upward to the discharge pipe. From the plant's discharge pipe, the final effluent passes through a chlorination devise into the pump tank compartment for storage and contact mixing. The treated and disinfected effluent is then safely discharged, via an application pump, to a surface spray, subsurface drip, low pressure dose, absorptive mound or other disposal area.

The **Aqua Safe** model **AS500-4+75** is a four compartment concrete tank configuration with a chlorination devise. It is comprised of a forward 400 gallon pre-treatment tank, an aeration mixing zone, a settling or clarifier compartment and a rear 750 gallon flow line capacity pump tank compartment. Wastewater first enters the pre-treatment tank compartment of the plant, then gravity flows through a 4" SDR 35 PVC inlet to the aeration mixing zone. The mixed liquid next enters the clarifier compartment and continues to flow upward to the discharge pipe. From the plant's discharge pipe, the final effluent passes through a chlorination devise into the pump tank compartment for storage and contact mixing. The treated and disinfected effluent is then safely discharged, via an application pump, to a surface spray, subsurface drip, low pressure dose, absorptive mound or other disposal area.

Aqua Safe Flow Diagram

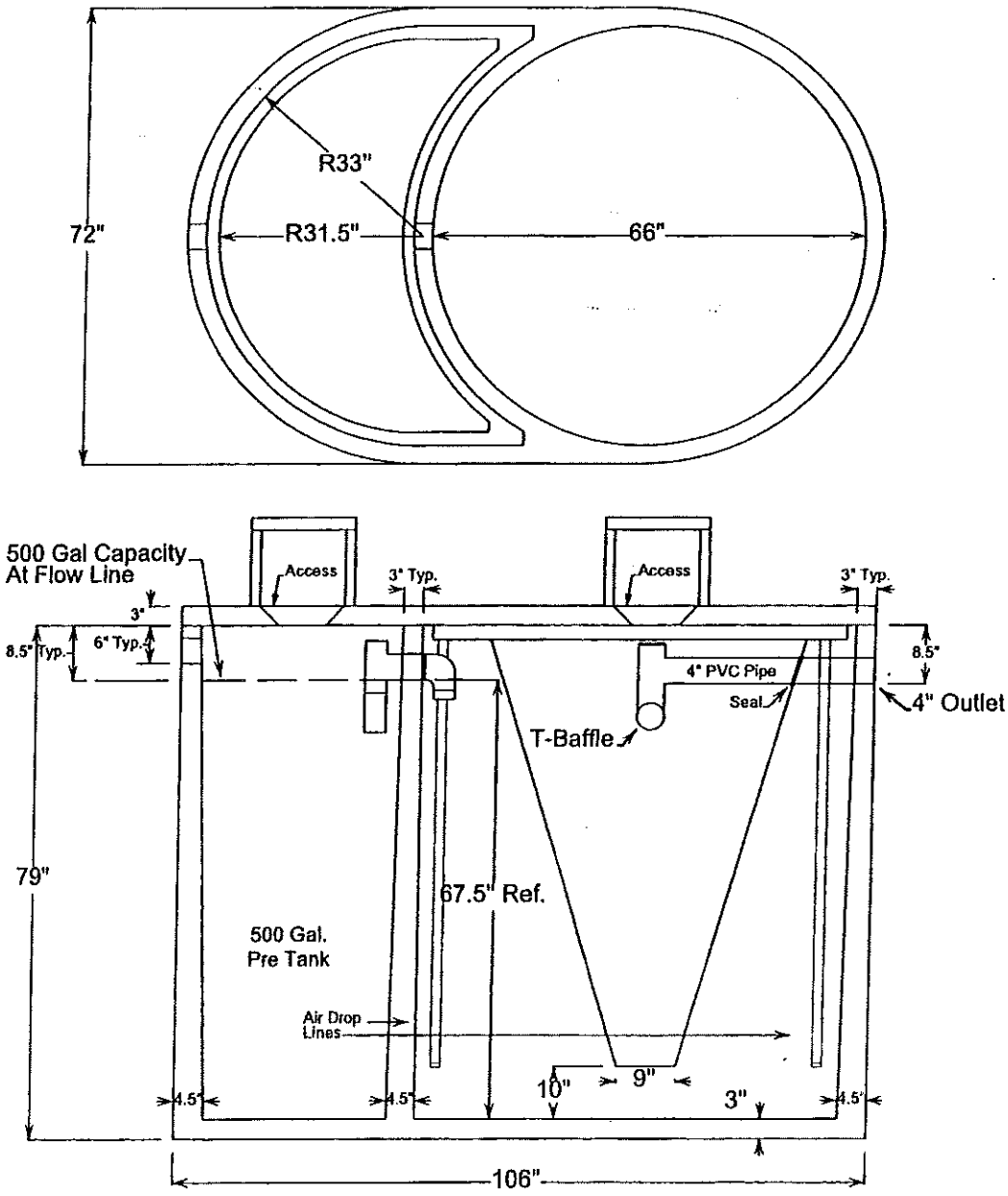






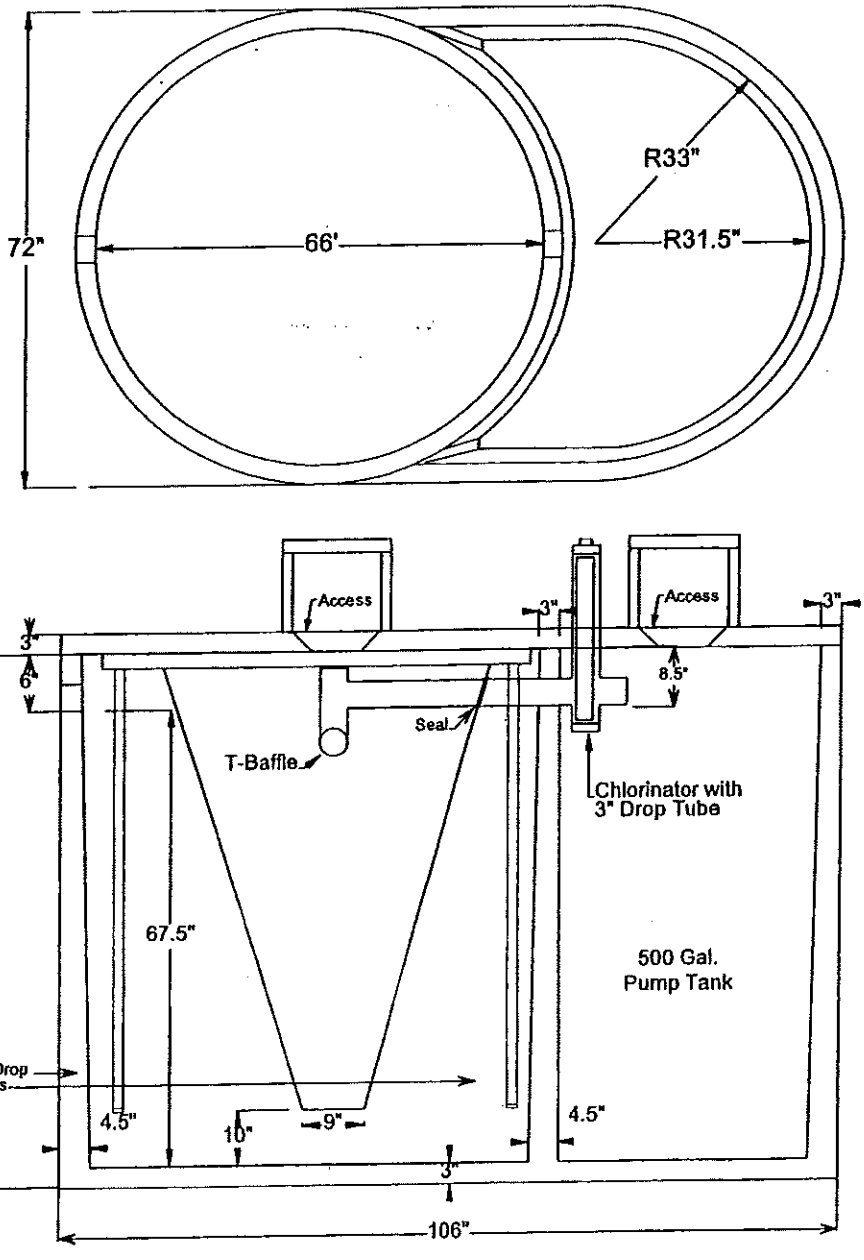
Ecological Tanks, Inc. Patent Pending 04/2002

AS500+5 Pre
Concrete Tank with Lid



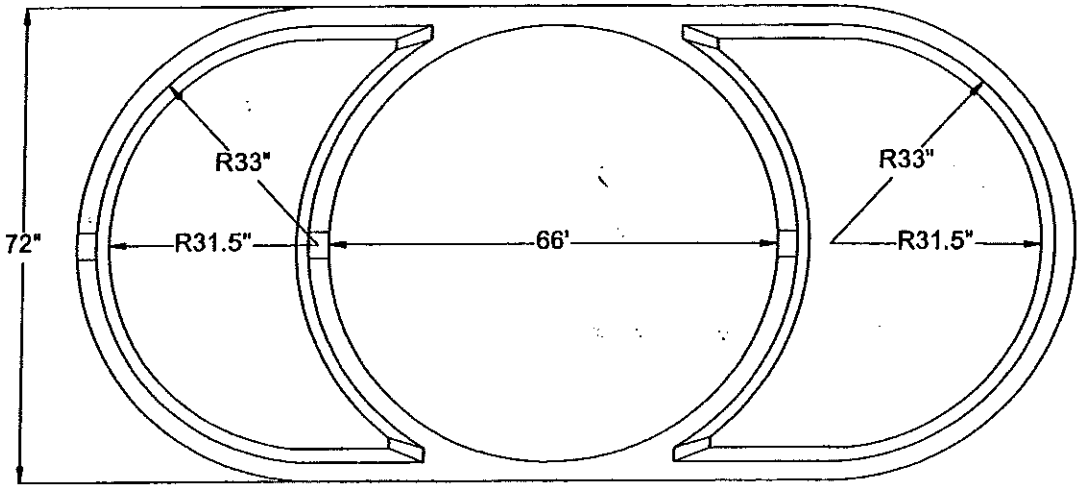
Ecological Tanks, Inc. Patented 4/2002

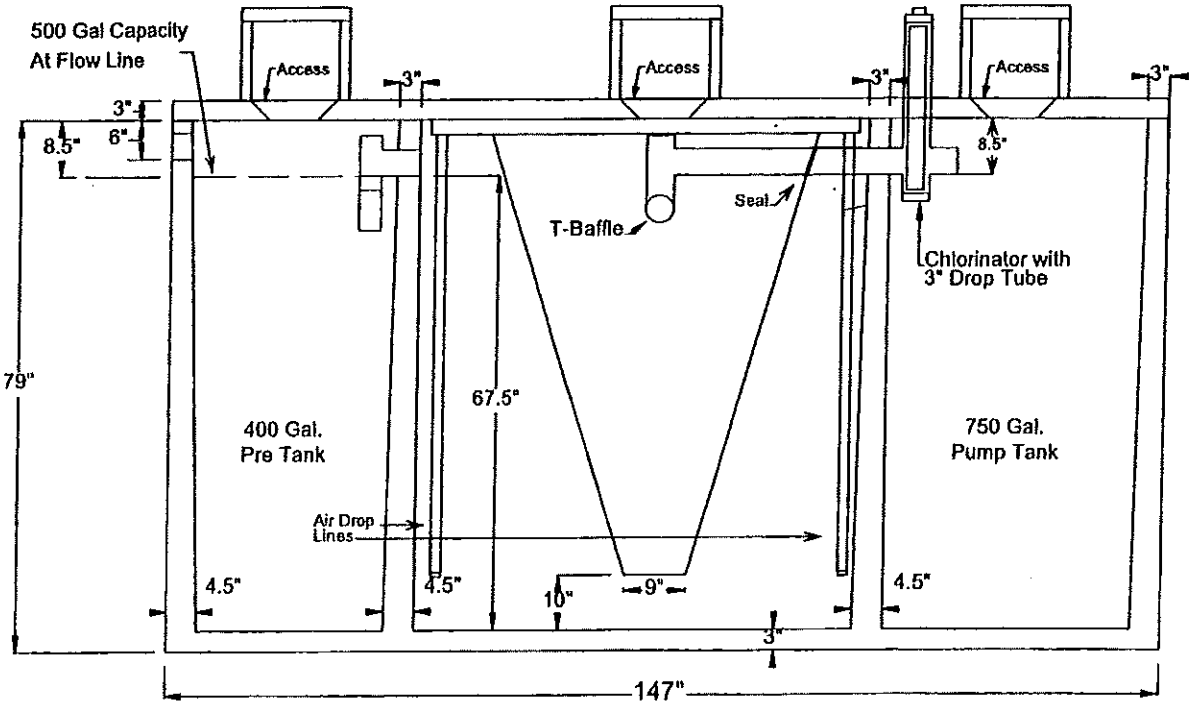
AS500-5 Pump
Concrete Tank With Lid



Ecological Tanks, Inc. Patented 4/2002

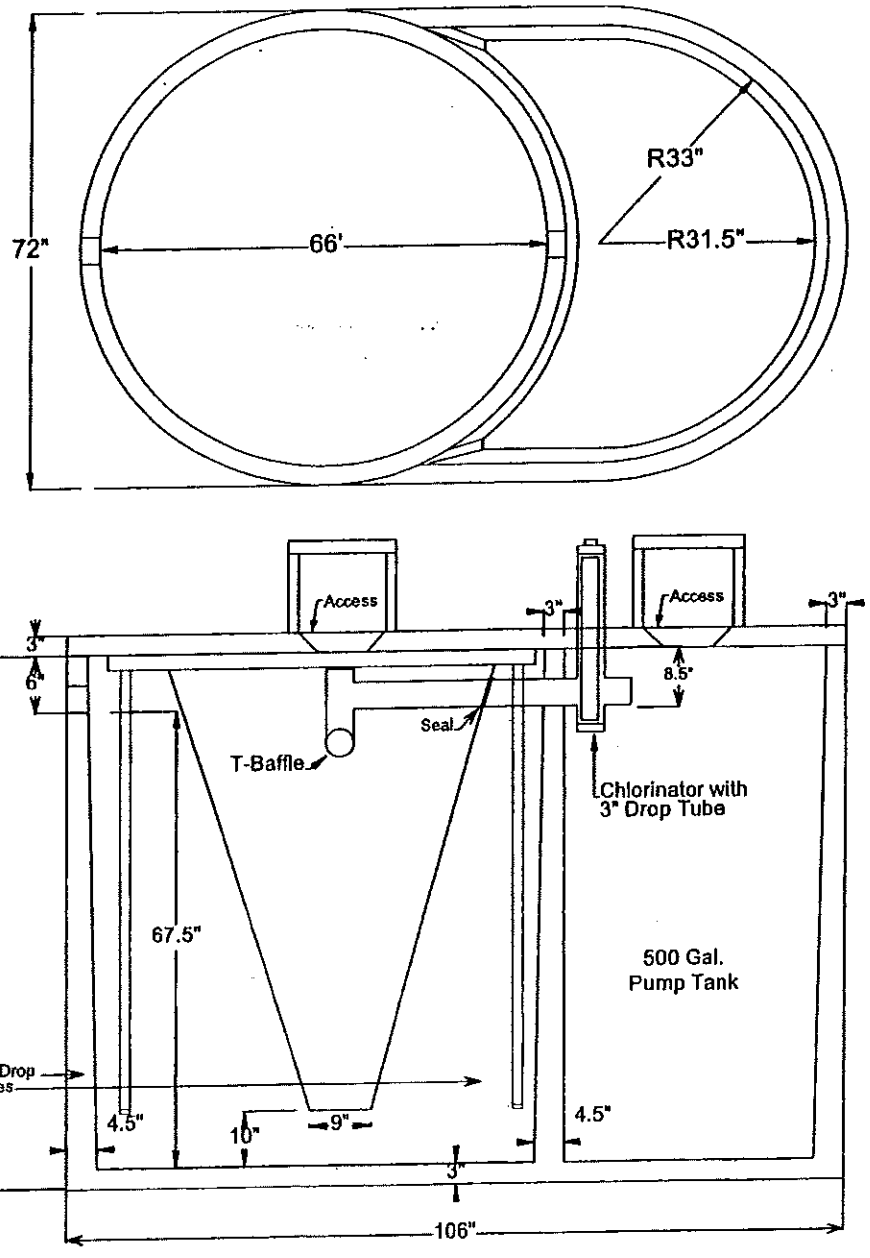
AS500 4+75
Concrete Tank With Lid





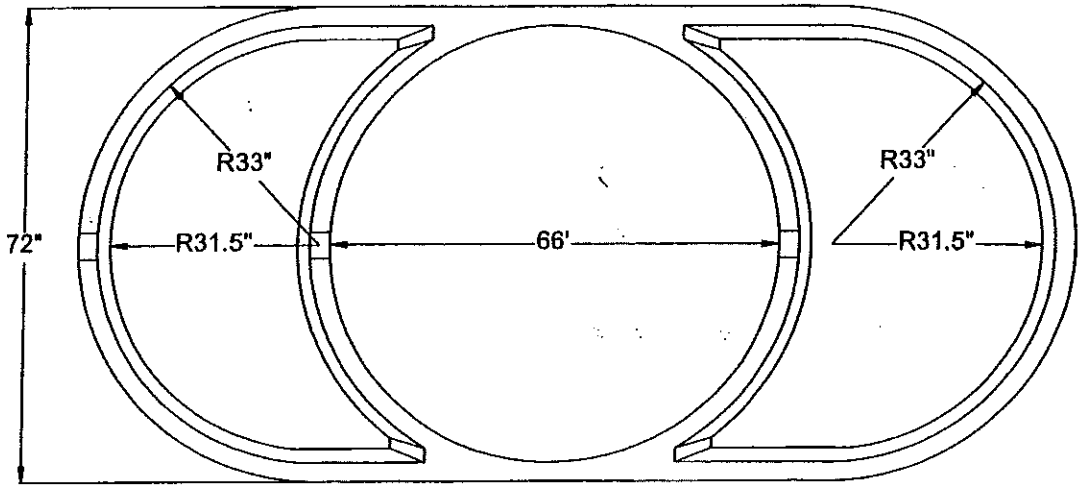
Ecological Tanks, Inc. Patented 4/2002

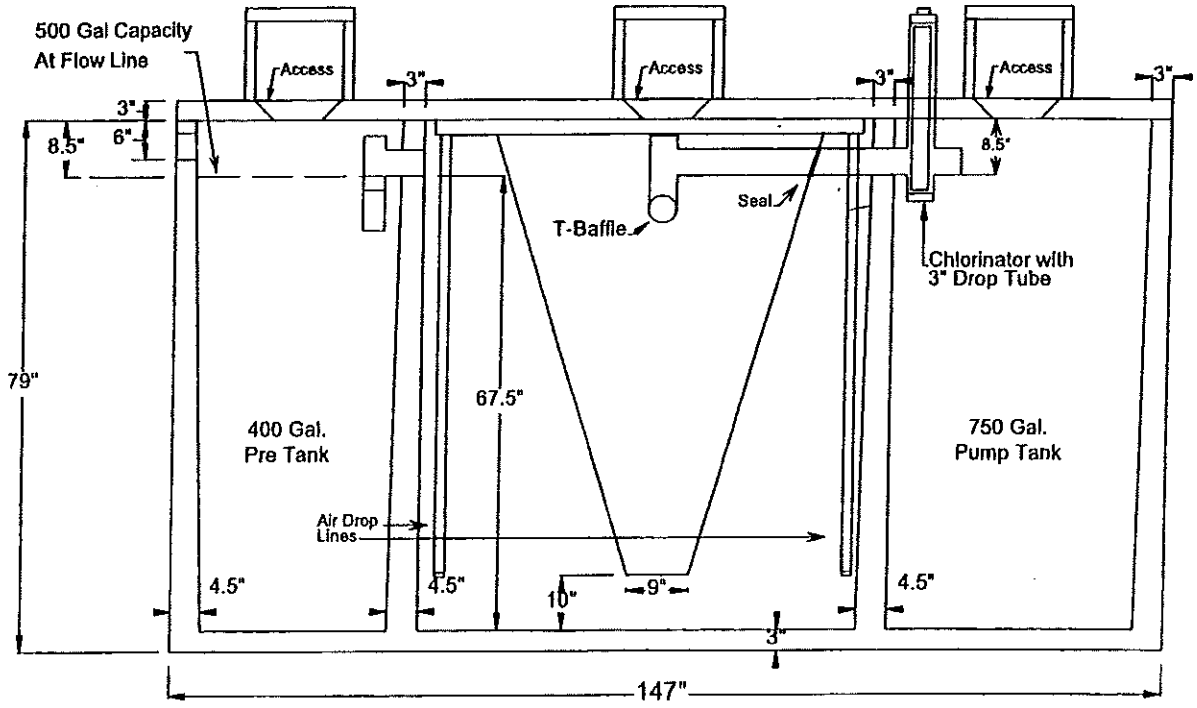
AS500-5 Pump
Concrete Tank With Lid



Ecological Tanks, Inc. Patented 4/2002

AS500 4+75
Concrete Tank With Lid





Ecological Tanks, Inc. Patented 4/2002

BAYLOR
UNIVERSITY

9-15-03

Attn: George Johnson
Ecological Tanks, Inc.
2247 Hwy 151 N.
Downsville, LA 71234

Dear George;

The accompanying report is the synopsis of the nutrient reduction evaluation performed on the Aqua Safe system in 2002. We have double checked to ensure that the quality of the data and the validity of the analysis are accurate. If you have any questions, or concerns please contact us at your earliest convenience and David Jumper or I will be glad to discuss the report with you.

Sincerely,

Joe C. Yelderman Jr.
Director
Baylor Wastewater Research Program

Cc: David Jumper

DEPARTMENT OF GEOLOGY
PO BOX 97354 · WACO, TEXAS 76798-7354
(254) 710-2361 · FAX (254) 710-2673

OSSF Nutrient Reduction Report
for the
Ecological Tanks, Inc.
Aqua Safe
Wastewater Treatment System
Completed by the
Baylor University
Wastewater Research Program

September 15, 2003

Introduction

The following report details the results of extended effluent sampling and evaluation of the performance of the Aqua Safe wastewater treatment system by the Baylor University Wastewater Research Program to determine reduction of nutrient levels found in a documented raw influent wastewater stream.

Nutrients measured for the report include; Total Kjeldahl Nitrogen (TKN), ammonia, nitrate, nitrite, total phosphorous and phosphate. In addition, fecal coliform bacteria counts were made on the effluent only. TKN measures the total organic nitrogen and ammonia nitrogen. TKN plus nitrates and nitrites equal the total nitrogen in the influent or the effluent. In the decomposition of wastewater, organic nitrogen is converted into ammonia nitrogen, which in turn is converted into nitrate and nitrite. Nitrite is usually the lowest concentration and is sometimes omitted from the analysis of wastewater but is included in this study.

The mean, maximum, and minimum values in the raw and treated effluent for each of these parameters are reported in tabular and graphic form and may be found in the appendices included.

It is pertinent to note that the evaluation reported here took place during a period of time when the Aqua Safe system was undergoing an evaluation under the NSF/ANSI Standard 40 certification testing protocol at the Baylor University Testing and Certification test facility in Waco, Texas. The test was conducted from April 15, 2002 until December 24, 2002 and samples were taken on a weekly basis.

Systems undergoing this test protocol are dosed every day with the full gallons per day dose commensurate with the system daily rated capacity (in this case the Aqua Safe system was dosed with exactly 500 gallons per day). Notably the Standard 40 protocol also includes a six-month evaluation period of daily dosing and four stress sequences of non-ideal dosing conditions, designed to test the system's ability to perform under adverse conditions. Systems installed in the field under normal conditions are typically considered to receive somewhat less daily dosing volumes.

Executive Summary

Significant reductions occurred in total nitrogen and organic nitrogen. Specifically, phosphorous, phosphate, TKN and ammonia were reduced but nitrites and nitrates increased as the TKN and ammonia were converted to nitrates and nitrites. Variations or peaks do not seem to correlate directly with stress periods and weekly analyses may not provide enough detail to evaluate the specific effects of individual stresses. However, the stress periods did not appear to impact the treatment system's performance in overall reduction of nutrient levels in the treatment processes. Fluctuations in dosing and influent values may have had a greater impact on effluent concentrations. Generally, the system reduced nutrients and average effluent nutrient values were not at levels of health concern.

Summary Table

Raw Influent	mg/l	Treated Effluent	mg/l	
TKN	28.46	TKN	07.25	
Ammonia	17.96	Ammonia	05.25	
Nitrate	02.13	Nitrate	07.52	
Nitrite	00.19	Nitrite	00.13	**Reduction**
Total N	30.78	Total N	14.90	**52 %**
Total Organic N	10.50	Total Organic N	02.00	**81 %**
Phosphorous	08.21	Phosphorous	05.87	**28 %**
Phosphate	06.60	Phosphate	04.84	**25 %**

Fecal Coliform
Fecal coliform bacteria are often of concern in evaluating water quality. This study calculated the numbers of colonies per 100 ml of sample from the effluent only. The numbers varied widely from 10-80000 colonies/100ml. The average (mean) number of colonies/100ml was approximately 7000 (6999) but the median was 2200. The wide variability produced a standard deviation of 15500 (15458) colonies/100ml, which was even greater than the average or median values. Four samples accounted for the high numbers. These samples include counts of 20000, 23200, 40000, and 80000 colonies on November 19, October 14, November 26, and July 8 respectively. Graphic and tabular data for fecal coliform bacteria are included in the appendices.

Total Kjeldahl Nitrogen (TKN)
The raw influent averaged 28.5 mg/l TKN (mean) and ranged from a low of 2.18 mg/l TKN on April 22, 2002 to a high of 64.6 mg/l TKN on August 26, 2002. Only 4 of 35 samples exceeded 50 mg/ l. The treated effluent averaged 7.25 mg/l TKN (mean) and ranged from a low of .05 mg/l TKN on July 22, 2002, to a high of 42.30 mg/l TKN on September 3, 2002. The median TKN value for the treated effluent was 2.72 mg/l and although this value is almost 4.5 mg/l less than the mean value for the treated effluent it is more than 27 mg/l less than the mean value for the raw influent. The lowest values for the treated effluent were in May, June, and July 2002 when values were less than 3 mg/l but beginning in August 2002, values exceeded 10 mg/l on several occasions. The difference between the mean raw influent value and the mean effluent value is 21.3 mg/l, which represents a decrease of 75%. On only one occasion did the treated effluent value exceed the raw influent value and that was the day with the highest value for the effluent. Graphic and tabular data for TKN are included in the appendices.

Ammonia
The raw influent averaged 18 mg/l of ammonia (mean) and ranged from a low of .05 mg/l ammonia on April 22, 2002 to a high of 63.50 mg/l ammonia on September 30, 2002. Only 1 in 35 samples exceeded 50 mg/l. The treated effluent averaged 5.3 mg/l ammonia (mean) and ranged from a low of .05 mg/l ammonia on May13, 20, and 28 and June 10 and 17, 2002 to a high of 22.50 mg/l ammonia on September 3, 2002. The median ammonia value for the treated effluent was .95 mg/l and this value is almost 4.3 mg/l less than the mean value for the treated effluent it is more than 15 mg/l less than the mean value for the raw influent. The lowest values for the treated effluent were in May and June 2002 when values were less than 1 mg/l but beginning in August, values often exceeded 10 mg/l. The difference between the mean raw values for ammonia and the mean treated effluent values is 12.7 mg/l, which is a decrease of over 70 percent. At no time did the treated effluent values exceed the raw influent values. Graphic and tabular data for ammonia are included in the appendices.

Nitrate
Nitrate is the byproduct of nitrification of the ammonia. The raw influent averaged 2.1 mg/l of nitrate (mean) and ranged from a low of .05 mg/l nitrate on 11 different occasions to a high of 31.50 mg/l nitrate on April 15, 2002. Only 1 in 35 samples exceeded 10 mg/l and only 3 values were greater than 5 mg/l. The treated effluent averaged 7.5 mg/l nitrate (mean) and ranged from a low of .21 mg/l nitrate on October 7, 2002 to a high of 22.80 mg/l nitrate on May 5, 2002. The median nitrate value for the treated effluent was 5.8 mg/l and although this value is almost 2 mg/l less than the mean value for the treated effluent it is almost 4 mg/l greater than the mean value for the raw influent. The lowest values for the treated effluent were in July, August, and September 2002 when values were less than 10 mg/l but in May, June, October and November values exceeded 10 mg/l on all but two days. The cumulative average decreased steadily from May through October 2002, then increased slightly in November. The difference between the mean raw values for nitrate and the mean treated effluent values is an increase of 5.4 mg/l. On only 3 occasions were the treated effluent values less than the raw influent values and these included the two lowest values for the treated effluent and the highest value of the raw influent. Graphic and tabular data for nitrate are included in the appendices.

Nitrite
Nitrite is the byproduct of nitrification of the ammonia. The raw influent averaged .19 mg/l of nitrite (mean) and ranged from a low of .05 mg/l nitrite on numerous occasions to a high of 1.00 mg/l nitrite on May 28, 2002. Only 1 in 35 samples reached 1 mg/l and only 2 values were greater than .5 mg/l. The

treated effluent averaged .13 mg/l nitrite (mean) and ranged from a low of .05 mg/l nitrite on numerous occasions to a high of 1.32 mg/l nitrite on April 29, 2002. The median nitrite value for the treated effluent was .05 mg/l and although this value is almost .08 mg/l less than the mean value for the treated effluent it is more than .1 mg/l less than the mean value for the raw influent. The difference between the mean raw values for nitrite and the mean treated effluent values is .06 mg/l, which is a decrease of almost 32 percent. On several occasions the treated effluent values exceeded the raw influent values but only twice was the difference more than .1 mg/l. Graphic and tabular data for nitrite are included in the appendices.

Nitrogen Summary

The TKN is the sum of the ammonia nitrogen and the organic nitrogen. Therefore, the total organic nitrogen is the mean TKN value minus the mean ammonia value. The mean organic nitrogen calculated for the raw influent is 10.5 mg/l. The total nitrogen is the sum of the TKN, nitrate and nitrite. Therefore, the total mean nitrogen for the raw influent is 30.8 mg/l. The organic mean nitrogen for the treated effluent is 2.00 mg/l and the total mean nitrogen for the treated effluent is 14.90 mg/l. This is a reduction of 81% of the organic mean nitrogen and 52% of the total mean nitrogen.

Phosphorous

The raw influent averaged 8.21 mg/l of phosphorous (mean) and ranged from a low of 1.16 mg/l phosphorous on April 22, 2002, to a high of 18.30 mg/l phosphorous on October 14, 2002. Only 2 in 35 samples exceeded 15 mg/l and only 12 values were greater than 10 mg/l. The treated effluent averaged 5.9 mg/l phosphorous (mean) and ranged from a low of .84 mg/l phosphorous on July 22, 2002, to a high of 71.3 mg/l phosphorous on July 8, 2002. The median phosphorous value for the treated effluent was 3.5 mg/l and although this value is about 2.4 mg/l less than the mean value for the treated effluent, it is more than 4.5 mg/l less than the mean value for the raw influent. The cumulative average rose abruptly after the spike on July 8, 2002, and then declined steadily. The difference between the mean raw values for phosphorous and the mean treated effluent values is about 2.3 mg/l, which is a decrease of almost 28 percent. On seven occasions the treated effluent values exceeded the raw influent values. Graphic and tabular data for phosphorous are included in the appendices.

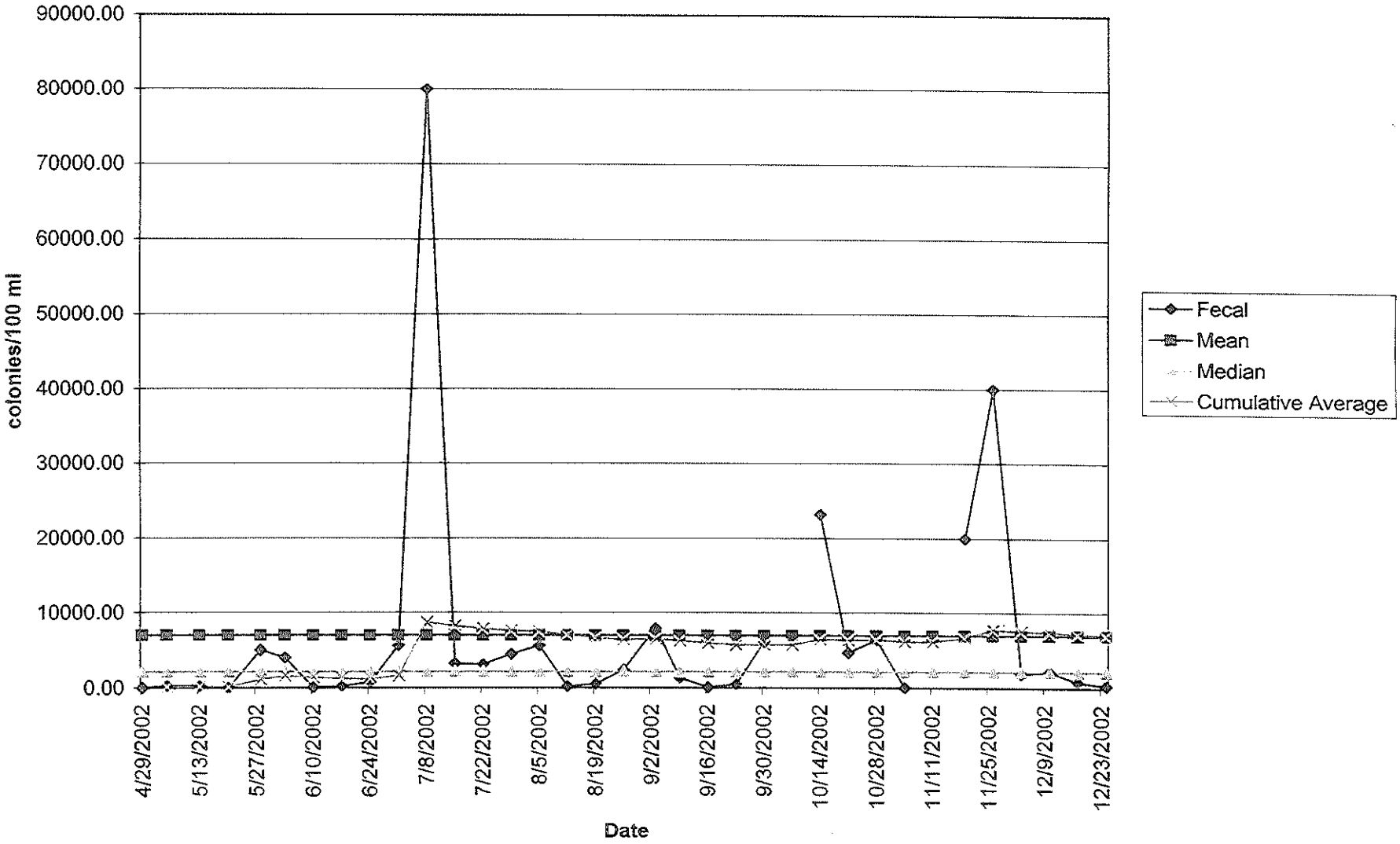
Phosphate

The raw influent averaged 6.6 mg/l of phosphate (mean) and ranged from a low of .93 mg/l phosphate on April 22, 2002, to a high of 13.3 mg/l phosphate on August 26, 2002. Only 6 values in 35 samples were greater than 10 mg/l. The treated effluent averaged 4.84 mg/l phosphate (mean) and ranged from a low of 1.17 mg/l phosphate on September 9, 2002,to a high of 58.8 mg/l phosphate on July 8, 2002. The median phosphate value for the treated effluent was 3.18 mg/l and although this value is a little less than 3 mg/l less than the mean value for the treated effluent, it is over 3 mg/l less than the mean value for the raw influent. The cumulative average rose abruptly after the spike and then declined steadily. The difference between the mean raw values for phosphate and the mean treated effluent values is about 2 mg/l, which is a decrease of over 25 percent. On six occasions the treated effluent values exceeded the raw influent values. Graphic and tabular data for phosphate are included in the appendices.

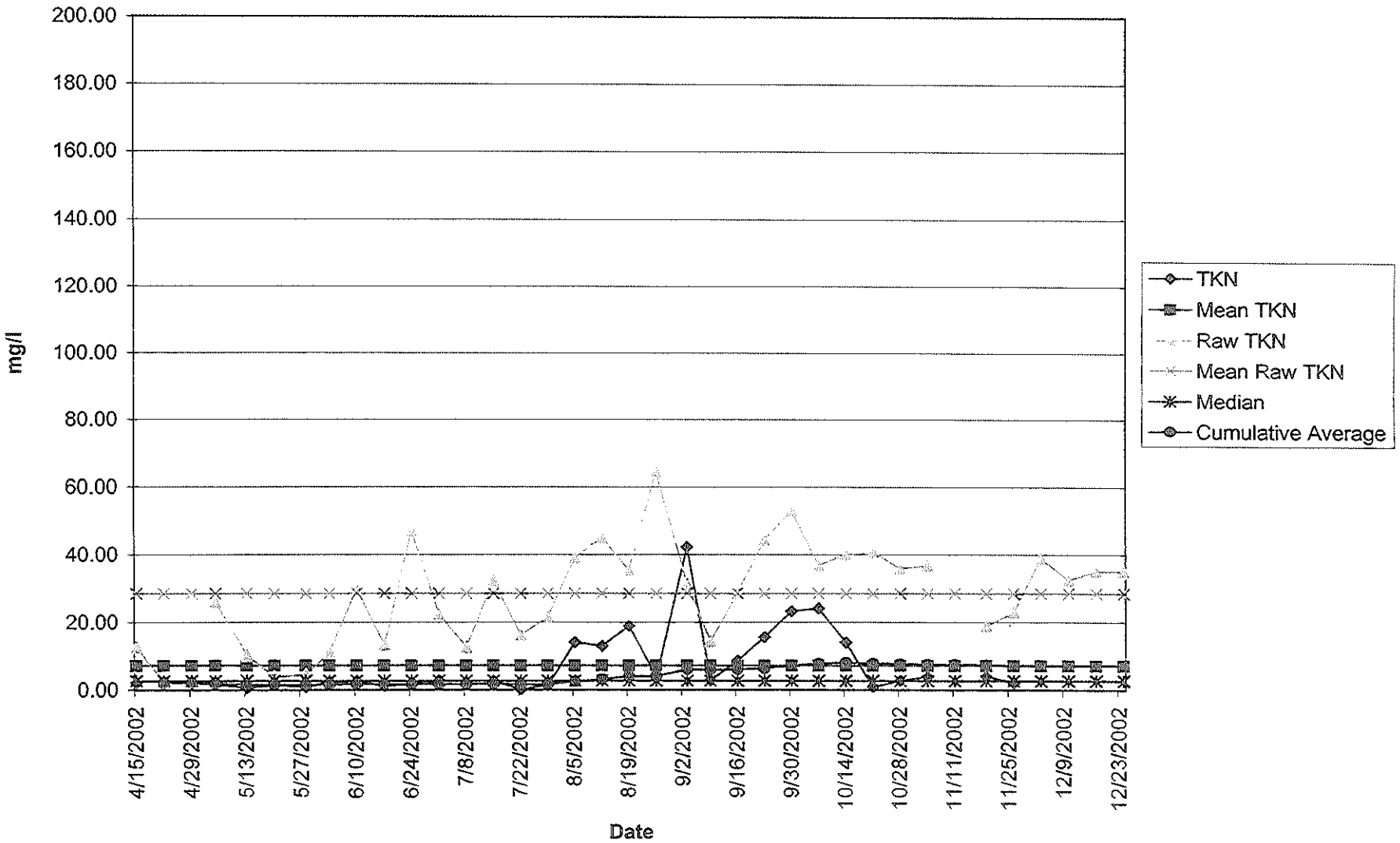
Appendix I

Graphical data

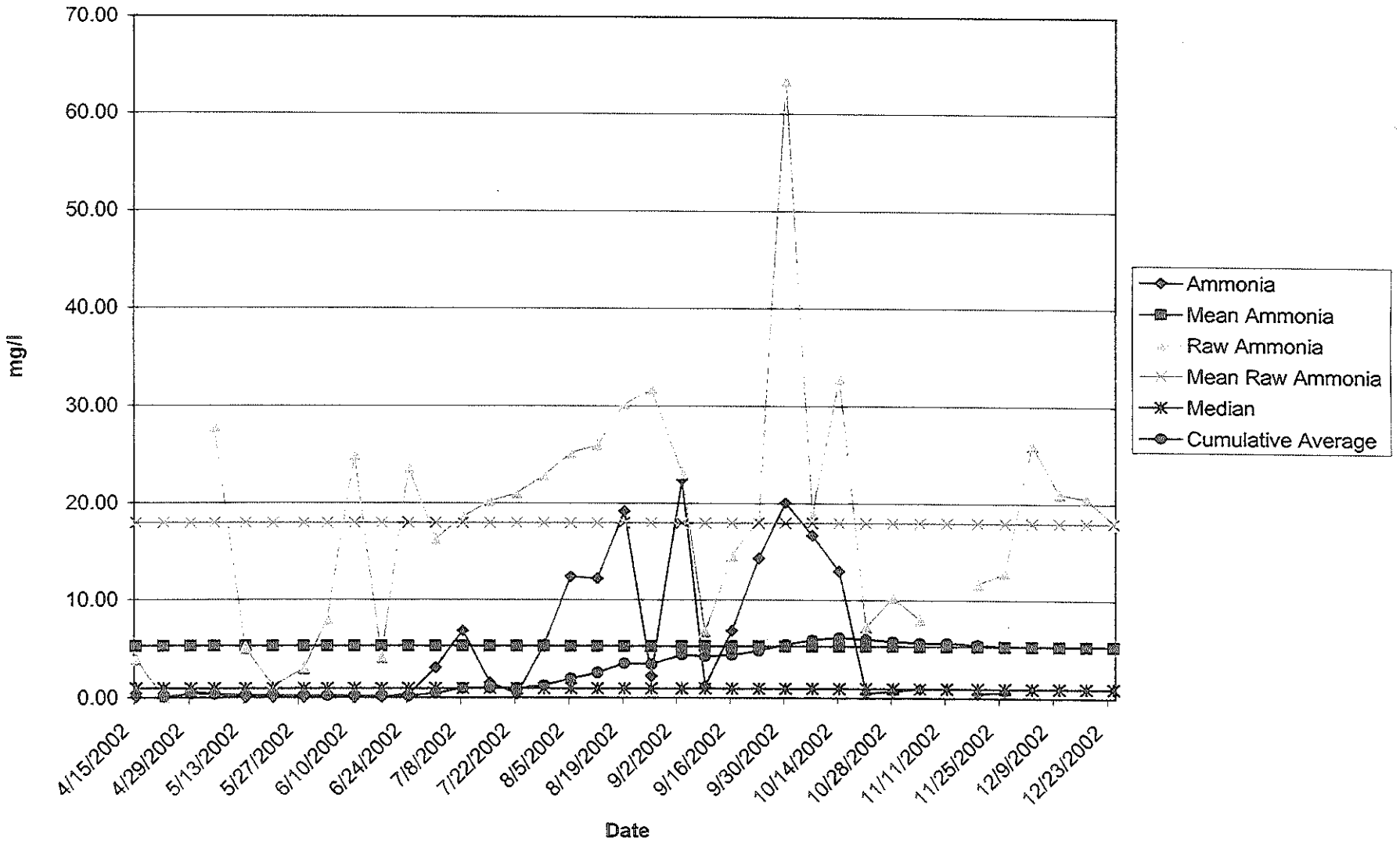
Aqua Safe Fecal Coliform



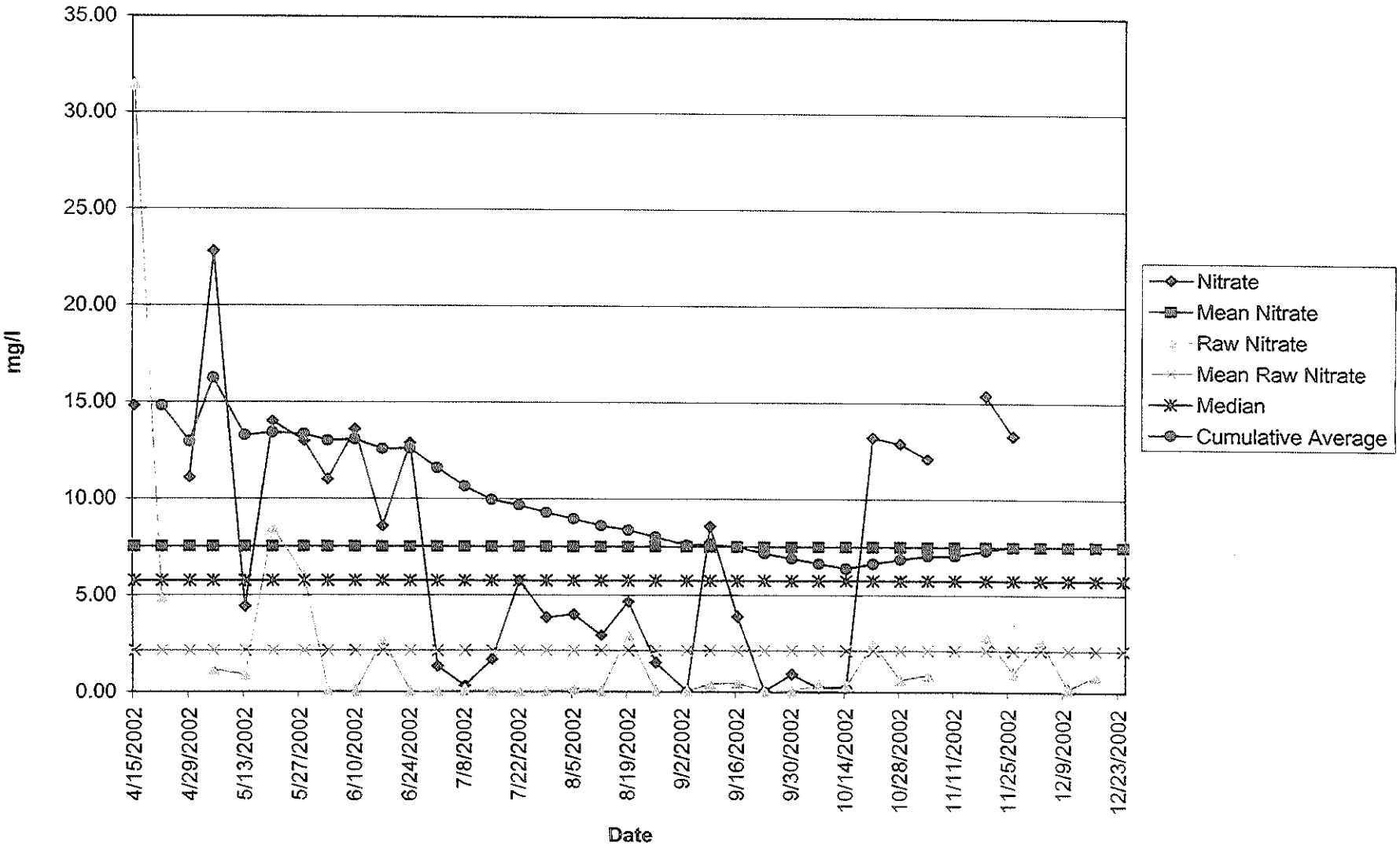
Aqua Safe Total Kjeldahl Nitrogen



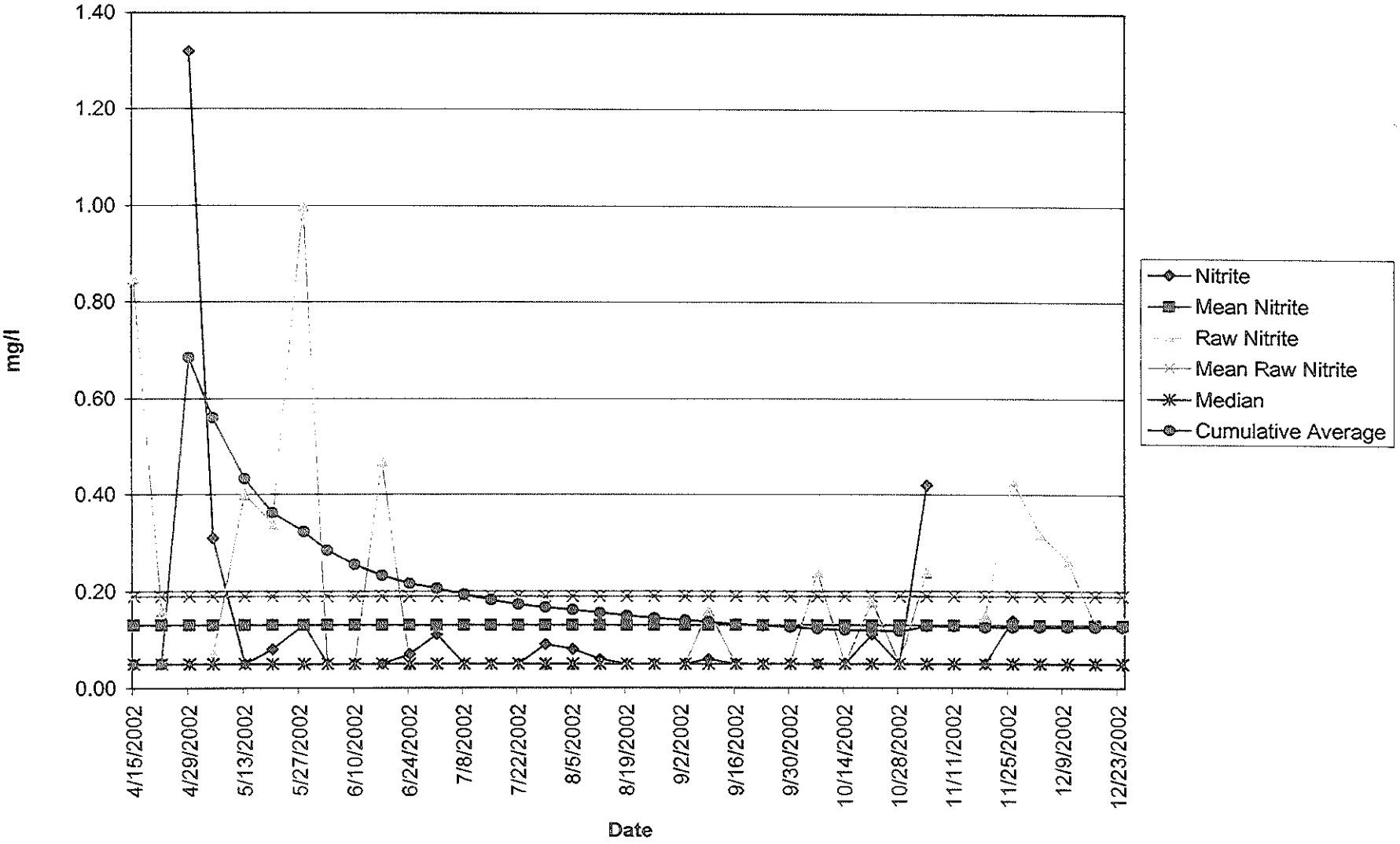
Aqua Safe Ammonia Nitrogen



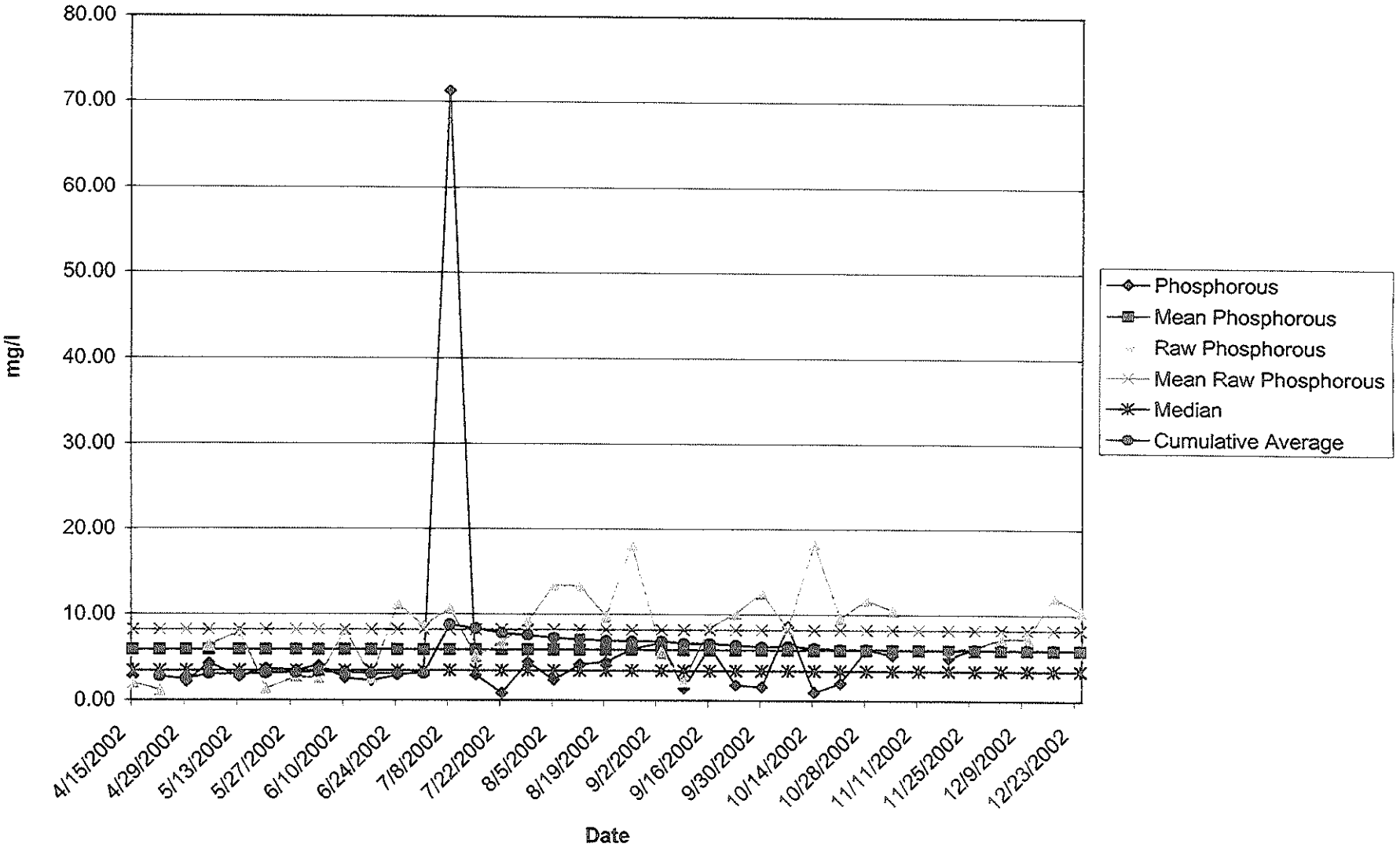
Aqua Safe Nitrate Nitrogen



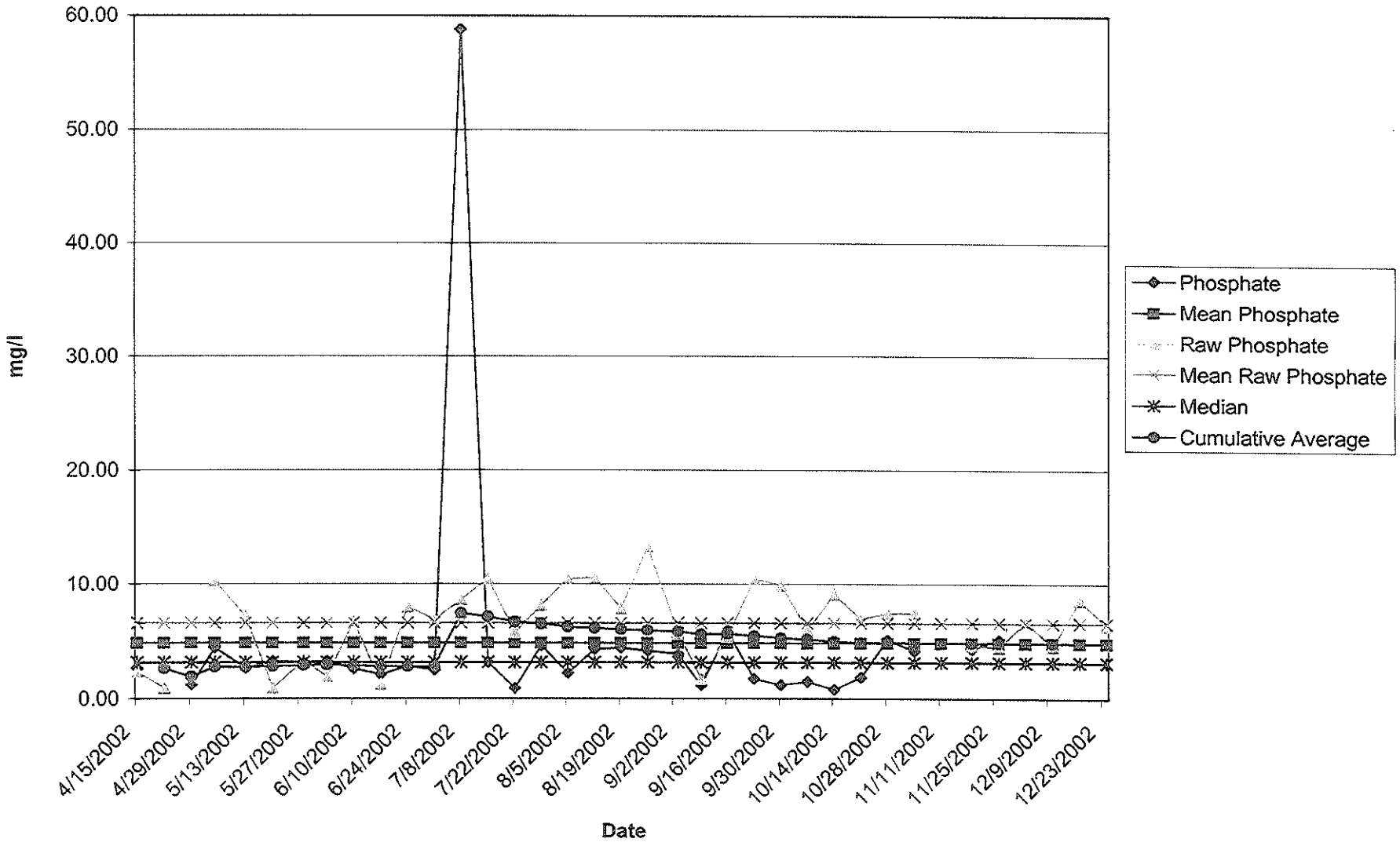
Aqua Safe Nitrite Nitrogen



Aqua Safe Total Phosphorus



Aqua Safe Phosphate



Appendix II

Tabular data

The data in these tables are the reported values from the laboratory results. The numbers in the text portion of this report have been modified to take into account appropriate significant figures for averages and calculations and therefore may vary slightly from the numbers in the tables. Percent reductions reported in the text are usually rounded to the nearest whole number when referring to percentage (the second decimal point in the fraction before converting to a percentage). Due to the number of samples and the sampling frequency, the percentages should be considered a guide for planning or evaluating purposes.

Aqua Safe

Fecals

DATE	Fecal	Mean	Median	Cumulative Average
	colonies/100 ml	colonies/100 ml	colonies/100 ml	colonies/100 ml
4/29/2002	10.00	6998.73	2200.00	
5/5/2002	260.00	6998.73	2200.00	135.00
5/13/2002	240.00	6998.73	2200.00	170.00
5/20/2002	10.00	6998.73	2200.00	130.00
5/28/2002	5000.00	6998.73	2200.00	1104.00
6/3/2002	4000.00	6998.73	2200.00	1586.67
6/10/2002	50.00	6998.73	2200.00	1367.14
6/17/2002	200.00	6998.73	2200.00	1221.25
6/24/2002	730.00	6998.73	2200.00	1166.67
7/1/2002	5600.00	6998.73	2200.00	1610.00
7/8/2002	80000.00	6998.73	2200.00	8736.36
7/15/2002	3200.00	6998.73	2200.00	8275.00
7/22/2002	3100.00	6998.73	2200.00	7876.92
7/29/2002	4450.00	6998.73	2200.00	7632.14
8/5/2002	5600.00	6998.73	2200.00	7496.67
8/12/2002	168.00	6998.73	2200.00	7038.63
8/19/2002	500.00	6998.73	2200.00	6654.00
8/26/2002	2390.00	6998.73	2200.00	6417.11
9/3/2002	7950.00	6998.73	2200.00	6497.79
9/9/2002	1350.00	6998.73	2200.00	6240.40
9/16/2002	70.00	6998.73	2200.00	5946.57
9/23/2002	480.00	6998.73	2200.00	5698.09
9/30/2002	6100.00	6998.73	2200.00	5715.57
10/7/2002		6998.73	2200.00	5715.57
10/14/2002	23200.00	6998.73	2200.00	6444.08
10/21/2002	4650.00	6998.73	2200.00	6372.32
10/28/2002	6400.00	6998.73	2200.00	6373.38
11/4/2002	50.00	6998.73	2200.00	6139.19
11/11/2002		6998.73	2200.00	6139.19
11/19/2002	20000.00	6998.73	2200.00	6634.21
11/26/2002	40000.00	6998.73	2200.00	7784.76
12/3/2002	1900.00	6998.73	2200.00	7588.60
12/10/2002	2200.00	6998.73	2200.00	7414.77
12/17/2002	800.00	6998.73	2200.00	7208.06
12/24/2002	300.00	6998.73	2200.00	6998.73

Aqua Safe

TKN

DATE	TKN	Mean TKN	Raw TKN	Mean Raw TKN	Median	Cumulative Average
	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
4/15/2002	2.15	7.25	12.70	28.46	2.72	
4/22/2002		7.25	2.18	28.46	2.72	2.15
4/29/2002	2.05	7.25		28.46	2.72	2.10
5/5/2002	1.62	7.25	26.00	28.46	2.72	1.94
5/13/2002	0.50	7.25	10.30	28.46	2.72	1.58
5/20/2002	1.42	7.25	3.89	28.46	2.72	1.55
5/28/2002	0.84	7.25	4.54	28.46	2.72	1.43
6/3/2002	2.38	7.25	11.20	28.46	2.72	1.57
6/10/2002	2.64	7.25	29.90	28.46	2.72	1.70
6/17/2002	1.09	7.25	13.30	28.46	2.72	1.63
6/24/2002	1.74	7.25	47.10	28.46	2.72	1.64
7/1/2002	2.80	7.25	22.30	28.46	2.72	1.75
7/8/2002		7.25	12.60	28.46	2.72	1.75
7/15/2002	2.61	7.25	32.40	28.46	2.72	1.82
7/22/2002	0.05	7.25	16.20	28.46	2.72	1.68
7/29/2002	1.40	7.25	21.60	28.46	2.72	1.66
8/5/2002	14.00	7.25	39.10	28.46	2.72	2.49
8/12/2002	12.90	7.25	45.20	28.46	2.72	3.14
8/19/2002	18.90	7.25	35.40	28.46	2.72	4.06
8/26/2002	3.83	7.25	64.60	28.46	2.72	4.05
9/3/2002	42.30	7.25	31.20	28.46	2.72	6.06
9/9/2002	2.83	7.25	14.30	28.46	2.72	5.90
9/16/2002	8.68	7.25	28.60	28.46	2.72	6.03
9/23/2002	15.60	7.25	44.40	28.46	2.72	6.47
9/30/2002	23.30	7.25	53.00	28.46	2.72	7.20
10/7/2002	24.10	7.25	36.90	28.46	2.72	7.91
10/14/2002	14.00	7.25	40.10	28.46	2.72	8.15
10/21/2002	0.86	7.25	40.80	28.46	2.72	7.87
10/28/2002	2.80	7.25	36.00	28.46	2.72	7.68
11/4/2002	3.93	7.25	36.80	28.46	2.72	7.55
11/11/2002		7.25		28.46	2.72	7.55
11/19/2002	4.03	7.25	18.90	28.46	2.72	7.43
11/26/2002	2.12	7.25	23.00	28.46	2.72	7.25
12/3/2002		7.25	39.00	28.46	2.72	7.25
12/10/2002		7.25	32.50	28.46	2.72	7.25
12/17/2002		7.25	35.10	28.46	2.72	7.25
12/24/2002		7.25	35.10	28.46	2.72	7.25

Aqua Safe

Ammonia

DATE	Ammonia	Mean Ammonia	Raw Ammonia	Mean Raw Ammonia	Median	Cumulative Average
	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
4/15/2002	0.08	5.25	3.87	17.96	0.95	
4/22/2002		5.25	0.05	17.96	0.95	0.08
4/29/2002	0.64	5.25		17.96	0.95	0.36
5/5/2002	0.33	5.25	27.90	17.96	0.95	0.35
5/13/2002	0.05	5.25	4.97	17.96	0.95	0.28
5/20/2002	0.05	5.25	1.27	17.96	0.95	0.23
5/28/2002	0.05	5.25	3.00	17.96	0.95	0.20
6/3/2002	0.23	5.25	8.02	17.96	0.95	0.20
6/10/2002	0.05	5.25	25.00	17.96	0.95	0.19
6/17/2002	0.05	5.25	4.10	17.96	0.95	0.17
6/24/2002	0.33	5.25	23.70	17.96	0.95	0.19
7/1/2002	3.05	5.25	16.30	17.96	0.95	0.45
7/8/2002	6.84	5.25	18.60	17.96	0.95	0.98
7/15/2002	1.56	5.25	20.20	17.96	0.95	1.02
7/22/2002	0.40	5.25	21.10	17.96	0.95	0.98
7/29/2002	5.33	5.25	22.90	17.96	0.95	1.27
8/5/2002	12.40	5.25	25.20	17.96	0.95	1.97
8/12/2002	12.20	5.25	26.00	17.96	0.95	2.57
8/19/2002	19.20	5.25	30.20	17.96	0.95	3.49
8/26/2002	2.22	5.25	31.80	17.96	0.95	3.42
9/3/2002	22.50	5.25	23.20	17.96	0.95	4.38
9/9/2002	1.18	5.25	6.73	17.96	0.95	4.23
9/16/2002	6.83	5.25	14.60	17.96	0.95	4.34
9/23/2002	14.30	5.25	18.40	17.96	0.95	4.78
9/30/2002	20.10	5.25	63.50	17.96	0.95	5.42
10/7/2002	16.70	5.25	19.00	17.96	0.95	5.87
10/14/2002	13.00	5.25	32.90	17.96	0.95	6.14
10/21/2002	0.51	5.25	7.25	17.96	0.95	5.93
10/28/2002	0.67	5.25	10.30	17.96	0.95	5.74
11/4/2002	0.95	5.25	8.03	17.96	0.95	5.58
11/11/2002		5.25		17.96	0.95	5.58
11/19/2002	0.46	5.25	11.70	17.96	0.95	5.41
11/26/2002	0.64	5.25	12.80	17.96	0.95	5.25
12/3/2002		5.25	26.10	17.96	0.95	5.25
12/10/2002		5.25	21.10	17.96	0.95	5.25
12/17/2002		5.25	20.60	17.96	0.95	5.25
12/24/2002		5.25	18.10	17.96	0.95	5.25

DATE	Nitrate	Mean Nitrate	Raw Nitrate	Mean Raw Nitrate	Median	Cumulative Average
	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
4/15/2002	14.80	7.52	31.50	2.13	5.76	
4/22/2002		7.52	4.89	2.13	5.76	14.80
4/29/2002	11.10	7.52		2.13	5.76	12.95
5/5/2002	22.80	7.52	1.17	2.13	5.76	16.23
5/13/2002	4.40	7.52	0.88	2.13	5.76	13.28
5/20/2002	14.00	7.52	8.51	2.13	5.76	13.42
5/28/2002	13.00	7.52	5.97	2.13	5.76	13.35
6/3/2002	11.00	7.52	0.06	2.13	5.76	13.01
6/10/2002	13.60	7.52	0.05	2.13	5.76	13.09
6/17/2002	8.56	7.52	2.68	2.13	5.76	12.58
6/24/2002	12.90	7.52	0.05	2.13	5.76	12.62
7/1/2002	1.32	7.52	0.05	2.13	5.76	11.59
7/8/2002	0.33	7.52	0.09	2.13	5.76	10.65
7/15/2002	1.66	7.52	0.05	2.13	5.76	9.96
7/22/2002	5.76	7.52	0.05	2.13	5.76	9.66
7/29/2002	3.84	7.52	0.05	2.13	5.76	9.27
8/5/2002	4.00	7.52	0.17	2.13	5.76	8.94
8/12/2002	2.92	7.52	0.05	2.13	5.76	8.59
8/19/2002	4.66	7.52	2.95	2.13	5.76	8.37
8/26/2002	1.51	7.52	0.05	2.13	5.76	8.01
9/3/2002	0.05	7.52	0.05	2.13	5.76	7.61
9/9/2002	8.56	7.52	0.42	2.13	5.76	7.66
9/16/2002	3.90	7.52	0.49	2.13	5.76	7.49
9/23/2002	0.05	7.52	0.05	2.13	5.76	7.16
9/30/2002	0.93	7.52	0.05	2.13	5.76	6.90
10/7/2002	0.21	7.52	0.37	2.13	5.76	6.63
10/14/2002	0.24	7.52	0.31	2.13	5.76	6.39
10/21/2002	13.20	7.52	2.46	2.13	5.76	6.64
10/28/2002	12.90	7.52	0.64	2.13	5.76	6.86
11/4/2002	12.10	7.52	0.90	2.13	5.76	7.04
11/11/2002		7.52		2.13	5.76	7.04
11/19/2002	15.40	7.52	2.86	2.13	5.76	7.32
11/26/2002	13.30	7.52	0.98	2.13	5.76	7.52
12/3/2002		7.52	2.62	2.13	5.76	7.52
12/10/2002		7.52	0.19	2.13	5.76	7.52
12/17/2002		7.52	0.85	2.13	5.76	7.52
12/24/2002		7.52		2.13	5.76	7.52

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Nitrite

DATE	Nitrite	Mean Nitrite	Raw Nitrite	Mean Raw Nitrite	Median	Cumulative Average
	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
4/15/2002	0.05	0.13	0.85	0.19	0.05	
4/22/2002		0.13	0.16	0.19	0.05	0.05
4/29/2002	1.32	0.13		0.19	0.05	0.69
5/5/2002	0.31	0.13	0.07	0.19	0.05	0.56
5/13/2002	0.05	0.13	0.40	0.19	0.05	0.43
5/20/2002	0.08	0.13	0.34	0.19	0.05	0.36
5/28/2002	0.13	0.13	1.00	0.19	0.05	0.32
6/3/2002	0.05	0.13	0.05	0.19	0.05	0.28
6/10/2002	0.05	0.13	0.05	0.19	0.05	0.26
6/17/2002	0.05	0.13	0.47	0.19	0.05	0.23
6/24/2002	0.07	0.13	0.05	0.19	0.05	0.22
7/1/2002	0.11	0.13	0.05	0.19	0.05	0.21
7/8/2002	0.05	0.13	0.05	0.19	0.05	0.19
7/15/2002	0.05	0.13	0.05	0.19	0.05	0.18
7/22/2002	0.05	0.13	0.05	0.19	0.05	0.17
7/29/2002	0.09	0.13	0.05	0.19	0.05	0.17
8/5/2002	0.08	0.13	0.05	0.19	0.05	0.16
8/12/2002	0.06	0.13	0.05	0.19	0.05	0.16
8/19/2002	0.05	0.13	0.05	0.19	0.05	0.15
8/26/2002	0.05	0.13	0.05	0.19	0.05	0.14
9/3/2002	0.05	0.13	0.05	0.19	0.05	0.14
9/9/2002	0.06	0.13	0.16	0.19	0.05	0.14
9/16/2002	0.05	0.13	0.05	0.19	0.05	0.13
9/23/2002	0.05	0.13	0.05	0.19	0.05	0.13
9/30/2002	0.05	0.13	0.05	0.19	0.05	0.13
10/7/2002	0.05	0.13	0.24	0.19	0.05	0.12
10/14/2002	0.05	0.13	0.05	0.19	0.05	0.12
10/21/2002	0.11	0.13	0.18	0.19	0.05	0.12
10/28/2002	0.05	0.13	0.05	0.19	0.05	0.12
11/4/2002	0.42	0.13	0.24	0.19	0.05	0.13
11/11/2002		0.13		0.19	0.05	0.13
11/19/2002	0.05	0.13	0.15	0.19	0.05	0.12
11/26/2002	0.14	0.13	0.43	0.19	0.05	0.13
12/3/2002		0.13	0.32	0.19	0.05	0.13
12/10/2002		0.13	0.27	0.19	0.05	0.13
12/17/2002		0.13	0.13	0.19	0.05	0.13
12/24/2002		0.13		0.19	0.05	0.13

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Phosphorous

DATE	Phosphorous	Mean Phosphorous	Raw Phosphorous	Mean Raw Phosphorous	Median	Cumulative Average
	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
4/15/2002	2.77	5.87	2.05	8.21	3.46	
4/22/2002		5.87	1.16	8.21	3.46	2.77
4/29/2002	2.15	5.87		8.21	3.46	2.46
5/5/2002	4.31	5.87	6.40	8.21	3.46	3.08
5/13/2002	2.70	5.87	7.98	8.21	3.46	2.98
5/20/2002	3.69	5.87	1.33	8.21	3.46	3.12
5/28/2002	3.46	5.87	2.70	8.21	3.46	3.18
6/3/2002	4.01	5.87	2.57	8.21	3.46	3.30
6/10/2002	2.55	5.87	8.19	8.21	3.46	3.21
6/17/2002	2.27	5.87	2.57	8.21	3.46	3.10
6/24/2002	2.89	5.87	11.20	8.21	3.46	3.08
7/1/2002	3.30	5.87	8.62	8.21	3.46	3.10
7/8/2002	71.30	5.87	10.70	8.21	3.46	8.78
7/15/2002	2.92	5.87	5.03	8.21	3.46	8.33
7/22/2002	0.84	5.87	6.70	8.21	3.46	7.80
7/29/2002	4.43	5.87	9.18	8.21	3.46	7.57
8/5/2002	2.36	5.87	13.40	8.21	3.46	7.25
8/12/2002	4.15	5.87	13.30	8.21	3.46	7.06
8/19/2002	4.48	5.87	9.73	8.21	3.46	6.92
8/26/2002	5.91	5.87	18.20	8.21	3.46	6.87
9/3/2002	6.69	5.87	5.49	8.21	3.46	6.86
9/9/2002	1.42	5.87	2.34	8.21	3.46	6.60
9/16/2002	6.22	5.87	8.48	8.21	3.46	6.58
9/23/2002	1.81	5.87	10.10	8.21	3.46	6.38
9/30/2002	1.61	5.87	12.50	8.21	3.46	6.18
10/7/2002	8.62	5.87	8.36	8.21	3.46	6.27
10/14/2002	0.98	5.87	18.30	8.21	3.46	6.07
10/21/2002	2.03	5.87	9.57	8.21	3.46	5.92
10/28/2002	5.92	5.87	11.70	8.21	3.46	5.92
11/4/2002	5.26	5.87	10.50	8.21	3.46	5.90
11/11/2002		5.87		8.21	3.46	5.90
11/19/2002	4.98	5.87	5.88	8.21	3.46	5.87
11/26/2002	6.06	5.87	6.10	8.21	3.46	5.87
12/3/2002		5.87	7.26	8.21	3.46	5.87
12/10/2002		5.87	7.26	8.21	3.46	5.87
12/17/2002		5.87	12.10	8.21	3.46	5.87
12/24/2002		5.87	10.40	8.21	3.46	5.87

DATE	Phosphate	Mean Phosphate	Raw Phosphate	Mean Raw Phosphate	Median	Cumulative Average
	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
4/15/2002	2.64	4.84	2.40	6.60	3.18	
4/22/2002		4.84	0.93	6.60	3.18	2.64
4/29/2002	1.23	4.84		6.60	3.18	1.94
5/5/2002	4.42	4.84	10.30	6.60	3.18	2.76
5/13/2002	2.69	4.84	7.19	6.60	3.18	2.75
5/20/2002	3.23	4.84	0.94	6.60	3.18	2.84
5/28/2002	3.20	4.84	3.35	6.60	3.18	2.90
6/3/2002	3.27	4.84	1.92	6.60	3.18	2.95
6/10/2002	2.62	4.84	6.79	6.60	3.18	2.91
6/17/2002	2.11	4.84	1.23	6.60	3.18	2.82
6/24/2002	2.83	4.84	8.02	6.60	3.18	2.82
7/1/2002	2.50	4.84	6.89	6.60	3.18	2.79
7/8/2002	58.80	4.84	8.63	6.60	3.18	7.46
7/15/2002	3.18	4.84	10.50	6.60	3.18	7.13
7/22/2002	0.91	4.84	5.78	6.60	3.18	6.69
7/29/2002	4.61	4.84	8.14	6.60	3.18	6.55
8/5/2002	2.23	4.84	10.50	6.60	3.18	6.28
8/12/2002	4.29	4.84	10.60	6.60	3.18	6.16
8/19/2002	4.40	4.84	7.88	6.60	3.18	6.06
8/26/2002	4.15	4.84	13.30	6.60	3.18	5.96
9/3/2002	3.88	4.84	5.71	6.60	3.18	5.86
9/9/2002	1.17	4.84	1.78	6.60	3.18	5.64
9/16/2002	5.86	4.84	5.44	6.60	3.18	5.65
9/23/2002	1.75	4.84	10.50	6.60	3.18	5.48
9/30/2002	1.21	4.84	9.91	6.60	3.18	5.30
10/7/2002	1.50	4.84	5.98	6.60	3.18	5.15
10/14/2002	0.83	4.84	9.12	6.60	3.18	4.98
10/21/2002	1.88	4.84	6.96	6.60	3.18	4.87
10/28/2002	5.13	4.84	7.50	6.60	3.18	4.88
11/4/2002	4.15	4.84	7.50	6.60	3.18	4.85
11/11/2002		4.84		6.60	3.18	4.85
11/19/2002	4.32	4.84	4.63	6.60	3.18	4.83
11/26/2002	5.15	4.84	4.46	6.60	3.18	4.84
12/3/2002		4.84	6.76	6.60	3.18	4.84
12/10/2002		4.84	4.58	6.60	3.18	4.84
12/17/2002		4.84	8.64	6.60	3.18	4.84
12/24/2002		4.84	6.41	6.60	3.18	4.84

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Phosphate

DATE	Phosphate	Mean Phosphate	Raw Phosphate	Mean Raw Phosphate	Median	Cumulative Average
	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
4/15/2002	2.64	4.84	2.40	6.60	3.18	
4/22/2002		4.84	0.93	6.60	3.18	2.64
4/29/2002	1.23	4.84		6.60	3.18	1.94
5/5/2002	4.42	4.84	10.30	6.60	3.18	2.76
5/13/2002	2.69	4.84	7.19	6.60	3.18	2.75
5/20/2002	3.23	4.84	0.94	6.60	3.18	2.84
5/28/2002	3.20	4.84	3.35	6.60	3.18	2.90
6/3/2002	3.27	4.84	1.92	6.60	3.18	2.95
6/10/2002	2.62	4.84	6.79	6.60	3.18	2.91
6/17/2002	2.11	4.84	1.23	6.60	3.18	2.82
6/24/2002	2.83	4.84	8.02	6.60	3.18	2.82
7/1/2002	2.50	4.84	6.89	6.60	3.18	2.79
7/8/2002	58.80	4.84	8.63	6.60	3.18	7.46
7/15/2002	3.18	4.84	10.50	6.60	3.18	7.13
7/22/2002	0.91	4.84	5.78	6.60	3.18	6.69
7/29/2002	4.61	4.84	8.14	6.60	3.18	6.55
8/5/2002	2.23	4.84	10.50	6.60	3.18	6.28
8/12/2002	4.29	4.84	10.60	6.60	3.18	6.16
8/19/2002	4.40	4.84	7.88	6.60	3.18	6.06
8/26/2002	4.15	4.84	13.30	6.60	3.18	5.96
9/3/2002	3.88	4.84	5.71	6.60	3.18	5.86
9/9/2002	1.17	4.84	1.78	6.60	3.18	5.64
9/16/2002	5.86	4.84	5.44	6.60	3.18	5.65
9/23/2002	1.75	4.84	10.50	6.60	3.18	5.48
9/30/2002	1.21	4.84	9.91	6.60	3.18	5.30
10/7/2002	1.50	4.84	5.98	6.60	3.18	5.15
10/14/2002	0.83	4.84	9.12	6.60	3.18	4.98
10/21/2002	1.88	4.84	6.96	6.60	3.18	4.87
10/28/2002	5.13	4.84	7.50	6.60	3.18	4.88
11/4/2002	4.15	4.84	7.50	6.60	3.18	4.85
11/11/2002		4.84		6.60	3.18	4.85
11/19/2002	4.32	4.84	4.63	6.60	3.18	4.83
11/26/2002	5.15	4.84	4.46	6.60	3.18	4.84
12/3/2002		4.84	6.76	6.60	3.18	4.84
12/10/2002		4.84	4.58	6.60	3.18	4.84
12/17/2002		4.84	8.64	6.60	3.18	4.84
12/24/2002		4.84	6.41	6.60	3.18	4.84

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Phosphorous

DATE	Phosphorous	Mean Phosphorous	Raw Phosphorous	Mean Raw Phosphorous	Median	Cumulative Average
	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
4/15/2002	2.77	5.87	2.05	8.21	3.46	
4/22/2002		5.87	1.16	8.21	3.46	2.77
4/29/2002	2.15	5.87		8.21	3.46	2.46
5/5/2002	4.31	5.87	6.40	8.21	3.46	3.08
5/13/2002	2.70	5.87	7.98	8.21	3.46	2.98
5/20/2002	3.69	5.87	1.33	8.21	3.46	3.12
5/28/2002	3.46	5.87	2.70	8.21	3.46	3.18
6/3/2002	4.01	5.87	2.57	8.21	3.46	3.30
6/10/2002	2.55	5.87	8.19	8.21	3.46	3.21
6/17/2002	2.27	5.87	2.57	8.21	3.46	3.10
6/24/2002	2.89	5.87	11.20	8.21	3.46	3.08
7/1/2002	3.30	5.87	8.62	8.21	3.46	3.10
7/8/2002	71.30	5.87	10.70	8.21	3.46	8.78
7/15/2002	2.92	5.87	5.03	8.21	3.46	8.33
7/22/2002	0.84	5.87	6.70	8.21	3.46	7.80
7/29/2002	4.43	5.87	9.18	8.21	3.46	7.57
8/5/2002	2.36	5.87	13.40	8.21	3.46	7.25
8/12/2002	4.15	5.87	13.30	8.21	3.46	7.06
8/19/2002	4.48	5.87	9.73	8.21	3.46	6.92
8/26/2002	5.91	5.87	18.20	8.21	3.46	6.87
9/3/2002	6.69	5.87	5.49	8.21	3.46	6.86
9/9/2002	1.42	5.87	2.34	8.21	3.46	6.60
9/16/2002	6.22	5.87	8.48	8.21	3.46	6.58
9/23/2002	1.81	5.87	10.10	8.21	3.46	6.38
9/30/2002	1.61	5.87	12.50	8.21	3.46	6.18
10/7/2002	8.62	5.87	8.36	8.21	3.46	6.27
10/14/2002	0.98	5.87	18.30	8.21	3.46	6.07
10/21/2002	2.03	5.87	9.57	8.21	3.46	5.92
10/28/2002	5.92	5.87	11.70	8.21	3.46	5.92
11/4/2002	5.26	5.87	10.50	8.21	3.46	5.90
11/11/2002		5.87		8.21	3.46	5.90
11/19/2002	4.98	5.87	5.88	8.21	3.46	5.87
11/26/2002	6.06	5.87	6.10	8.21	3.46	5.87
12/3/2002		5.87	7.26	8.21	3.46	5.87
12/10/2002		5.87	7.26	8.21	3.46	5.87
12/17/2002		5.87	12.10	8.21	3.46	5.87
12/24/2002		5.87	10.40	8.21	3.46	5.87