

**SUPPLEMENT TO FLOW REGULATING POND
OPERATING AND ADDING SLUDGE MANAGEMENT
REMOVAL AND DISPOSAL PLAN WITH MILESTONE SCHEDULE
STUTT GART, ARKANSAS
DECEMBER 2018 - JANUARY 2019**

General Situation Currently:

During the week of December 17, 2018, Stuttgart experienced a 5-inch rain event that caused inflow raising the flow regulation pond level up to maximum capacity but did not overflow the pond levee. The department personnel have installed rain gauges suggested in the original pond operating plan.

The 5-inch rainfall event came with about 3 inches of rain in first 1½ to 2 hours, then lighter rainfall over extended period. The TV meteorologist says the calendar year 2018 is the 4th highest amount of rainfall recorded since records began at about 71 inches total precipitation. Normally, Arkansas receives an average of just under 50 inches; but this year the rainfall is about 20 inches above average and is the root cause for flow regulation pond level being at maximum capacity. The plant operating staff is returning about 1.0 MGD through the treatment plant for treatment and discharge. At this rate, it will take about 30 days to lower the pond level near minimum level without any more heavy rains. This is unrealistic, but the plant staff will continue working to lower pond level barring heavy rains or equipment breakdowns.

Sludge Removal and Disposal Plan:

Another of the aspirating aerators in the flow regulation pond has failed. The wastewater manager has decided to replace the failed aspirating aerator with a Lagoon Master Sludge Activating Aerator. According to the manufacturer's literature (attached), it features only 4 Hp (3KW) at maximum energy use; no propellers or shafts underwater to foul; no belts or gearboxes to break or require maintenance; made of non-corrosive materials of construction--anodized aluminum, HDPE, and stainless steel. Benefits are continuously move the lagoon/pond water along the bottom causing vertical mixing; for complete de-stratification, oxidation and odor elimination; algae bloom reduction; and natural sludge digestion; delivers more dissolved oxygen to the water per hour (15 lbs.); lowers energy costs by up to 80%; practically maintenance free for years; eliminates trapped nitrogen and

Page 2

ammonia gases; and improves BOD/COD counts. Over 9 million gallons of water movement in a 24-hour period: a) guarantees continual water turnover and de-stratification throughout the lagoon, mixes algae and eliminates blue-green algae stratification and b) moves all the lagoon's sludge in a slow, non-violent manner allowing for sludge turnover for continual degradation by indigenous bacteria. The only maintenance on a lagoon master is to clean two air intake filters annually. c) Quiescent water forces turbulent surface flowing water to fall until it hits the sludge on the bottom. This turbulence on the bottom begins sludge fluidization. Opposite shore turns water toward the intake of the aerator, which pulls 9 million gallons of water through itself per day. This flowing water completes the fluidization of the sludge. The new Lagoon Master Sludge Activating Aerator is due to arrive in Stuttgart in mid January 2019.

When the flow regulating pond level is down, near low level, the Lagoon Master can be turned on and begin fluidizing the sludge. Subject to the amount of rainfall, it is believed that the Lagoon Master can fluidize the sludge around the Lagoon Master after about a week continuous operation, then start pumping the fluidized sludge at about 100 to 120 gpm into contact basin mixing with cationic polymer and fresh water to improve separation of sludge from the supernatant. The supernatant will flow back into the flow regulating pond. The sludge will continue to a mobile belt press system. Here the sludge moisture will be reduced to 2 or 3% and form sludge cake to be placed temporarily on concrete drying pad for pickup by front end loader and carried to dewatering oven to convert the sludge cake to pelletized Class A soil conditioner and weak fertilizer.

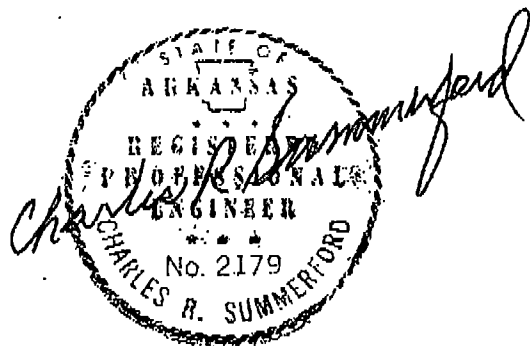
Update on Local Situation:

With the amount of rainfall in December 2018 and continuing into early January, the Flow Regulation Pond is full and in danger of overtopping levee. We understand the manager is preparing to discharge partially treated wastewater to avoid overtopping the levee and will be reporting problems to ADEQ. The weather forecast for tomorrow, January 3rd is for 90% percent chance of rain with a 2-inch accumulation. To successfully remove and treat the sludge, the flow regulation pond needs to be near minimum level, which is not possible with heavy rain every two or three

Page 3

days. The rain pattern must change to drier times and allow about 30 days to pump back wastewater from pond into treatment plant, then begin effort to remove and treat sludge for another two-month period of relatively dry period. If we assume the rainy season changes to dry period in April, it would be possible to start the sludge removal process maybe in June and July with completion about end of August 2019.

OFFICE OF:
SUMMERFORD ENGINEERING, INC.
CONSULTING ENGINEERS
ARKADELPHIA, ARKANSAS





Tommy Lawson
Stuttgart Municipal Water
Stuttgart, AR
Cell: (870)673-4111
Email stuttgartarwater@centurytel.net

24 September 2018

Tommy,

Per your phone request, please find the following quotation for a 2.2 - Meter Mobile Belt Filter Presses and ancillary equipment. In our proposal I will include a belt press technician, just in case you want to have support to help get the dewatering going. This quote, and all ancillary equipment, will be quoted on an "as available" basis at the time the project.

Aspen Rentals, Inc. provides only the highest quality wastewater treatment equipment designed to comply with all industrial plant safety standards throughout the U.S. and Canada. Aspen Rentals is a Texas Corporation. A 2-liter (or more) sample of the sludge can be sent to our facility for testing. Our lab facility address is 23603 N. Hwy 288 Angleton, TX 77515 (Attn: Johannes Johnson). Our phone number is (979) 864-3990. Fax number is (979) 864-3998. Our e-mail address is aspenrentals@abcglobal.net

Once you have had a chance to review the enclosed proposal, please call me at (505) 670-5968 if you have any questions or comments. We would welcome the opportunity to work with you and provide the equipment to ensure a successful project.

Sincerely,
ASPEN RENTALS, INC

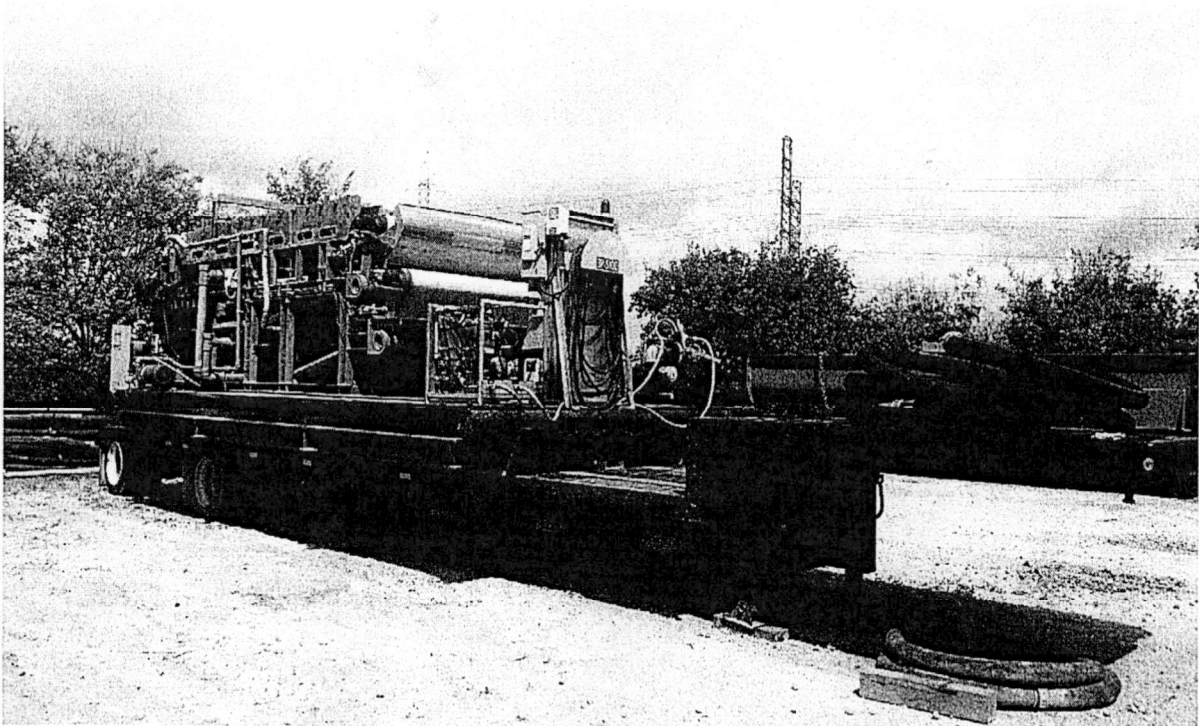
Katie Goff

Katie Goff
Business Operations Manager

RENTAL EQUIPMENT

Our proposed rental dewatering equipment will be a 2.2-meter, Mobile belt filter press. The belt press trailer is 49 ft. long complete with an automated flash blending polymer unit, sludge feed pump, VFD electronic controls and control room and a sludge discharge auger (8-10 ft. high & 9 ft. out). The press will require a 480 three phase, 100-amp breaker power supply although continuous usage is about 75 amps. The control rooms are heated and air-conditioned. Water requirements are fresh water at 100 gpm and 45 and up psi. Hoses for sludge feed are available upon request.

Note: Belts will be in good condition. Parts will be shipped overnight; installation of parts and maintenance of the press are the responsibility of the renter. Techs are available for repairs if needed.



Aspen Rentals Belt Press – or similar unit

Rental Costs

The prices for 2-month minimum rental, as described under the above conditions and responsibilities are as follows. Up to 24 hours per day usage at these prices.

1. 2.2-meter trailer or skid mounted belt press – Month-to-Month
(monthly rate for 24 Hr./day operation of Press) \$12,500/month per press

2. (Optional) 4” Skid Mounted Filtrate Pump w/VFD – Month-to-Month
(monthly rate for 24 Hr./day operation of Pump) \$2,300/month per pump

4. Belt Press Tech (Work, standby and travel) \$1100/Day (min 12-hour day)
includes all hotel, Per diem, truck (airline not included and billed at cost + 20%)

5. Approximate Transportation (558 miles) \$ 2,571/ Each way
*(Angleton, TX to Stuttgart, AR. for quoting purposes) – so rate may vary slightly.
(Customer may arrange own trucking to save 3rd party markup costs.)
40’ Stacking conveyors require a separate transport on a flatbed.*

Contract terms for payment are:

- Mobilization costs are due upon delivery of press to jobsite and Demobilization costs are due upon return date of press to Aspen Rentals facility (Angleton, TX).
- Monthly rentals are due upon date described in monthly billing invoice.

MAINTENANCE ITEMS

Electrical parts press parts and motors will be shipped overnight for to be put on by your maintenance personnel.

SETUP

Our Belt Press Technician will require a forklift and some labor for setup. An electrician may be required depending on electrical available at the site location.

SECURITY DEPOSIT

A security deposit of 1-month rental fee per equipment item is required. The fee will be refunded following return and inspection of the unit.

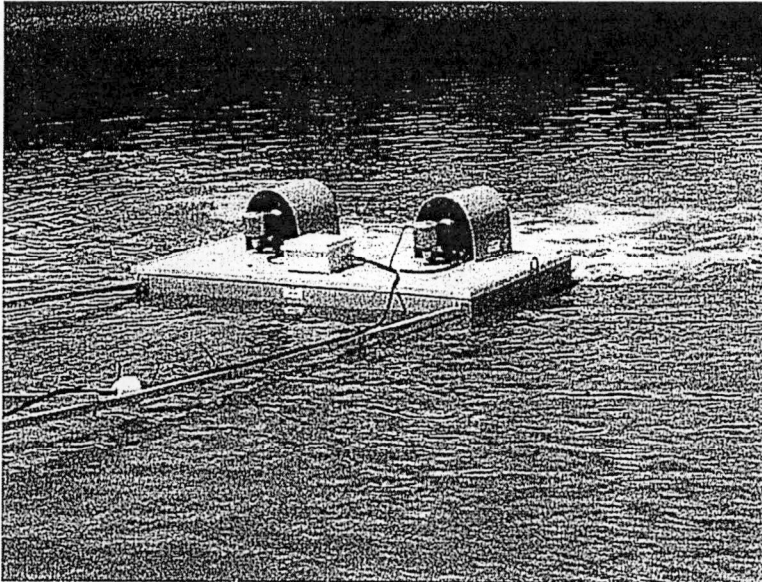
POLYMER SALES

Aspen Rentals has a relationship with Aspen Polymers to provide polymer for any project. We can do lab sampling and bench testing of sludge and determine polymer and chemistry dosage.

We can also provide crossover polymers for any existing polymer being used. Please ask for a quote.

LAGOON MASTER™

Sludge Activating Aerator

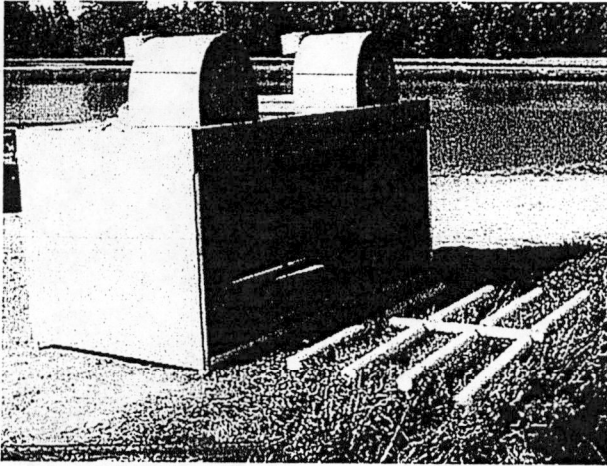


- Utilizes only 4 HP (3kW) of energy per 1 to 4 acres of water
- Moves water along the bottom to slightly lift the sludge and activate it
- Eliminates sludge gas and provides the microbes with oxygen for sludge degradation
- Provides up to 15 lbs (7kg) of DO to the sludge and water column
- Improves water quality
- Reduces maintenance costs

The Reliant **LAGOON MASTER** Water-Moving and Sludge Activating Aeration System is not just an aerator, but it continuously, and slowly, moves water along the bottom of a lagoon/pond delivering large amounts of dissolved oxygen (DO) using a minimum of energy. When compared to standard paddlewheel, vortex, hose diffusion, spray (fountain), or aspirating aerators, the **LAGOON MASTER** is more efficient, less costly to operate, and requires less maintenance.

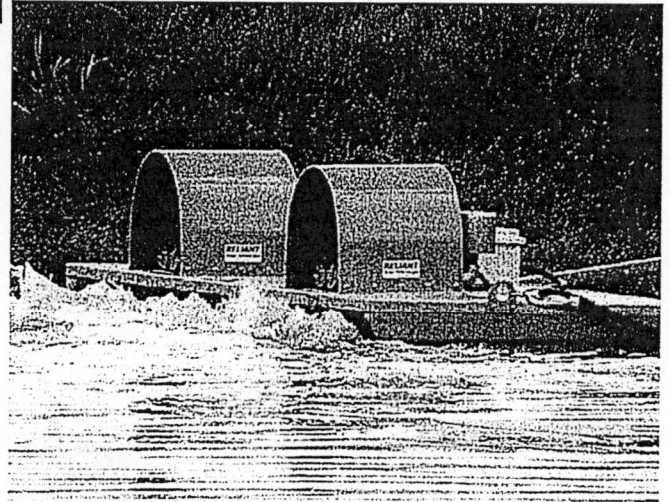
The **LAGOON MASTER** is a two-phase system which utilizes two 2 HP (1.5 kW) regenerative blowers. Phase 1, using one of the blowers, is the water moving phase, continuously pushing water along the bottom within 1 to 4 acres (.4-1.6 hectares) (depending upon water depth) of a pond or lagoon. Phase 2 is a second 2 HP (1.5 kW) blower that provides DO at a rate that exceeds other surface or diffused air aeration systems designed for shallow water ponds or lagoons.

The use of this new, proven, aeration technology will (1) provide better overall water quality through continual oxidation and the elimination of odors, (2) eliminate the zero-oxygen dead-zone on the lagoon/pond bottom, (3) provide constantly moving water to assist in organic sludge breakdown, and (4) provide dissolved oxygen at a controlled rate in order to save energy and oxidize waste gases. One 8' (2.4 meter) **LAGOON MASTER** will move over 9 million gallons (34,100 cu meters) of water in a 24 hour period.

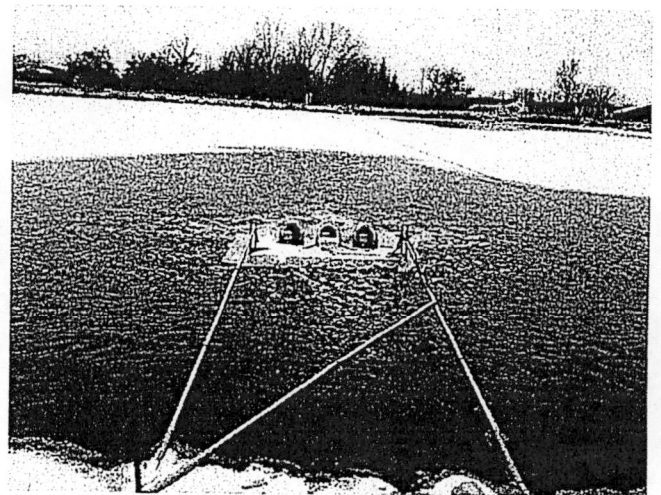


The **LAGOON MASTER** out of the water, ready for installation. Weighing less than 1100 pounds (499 kg), it is simple to install because it floats in less than 5 feet (1.5m) of water depth. It can be tethered to the bank or out in the lagoon, whichever is preferred.

In the water, the **LAGOON MASTER** provides a low profile. Notice that there is very little white water in front of the unit. An unspoken rule never heard from other aerator manufacturers is that "white water is wasted energy and oxygen." This lack of white water speaks volumes of the efficiency of this lagoon water moving and aeration system.



For ponds and lagoons that freeze during the winter, the **LAGOON MASTER** can be provided with an 'Ice Option'. This option utilizes a third blower and an extra external manifold that will provide a continuous bubble curtain around the **LAGOON MASTER** so that it floats normally, even when it is surrounded by ice.

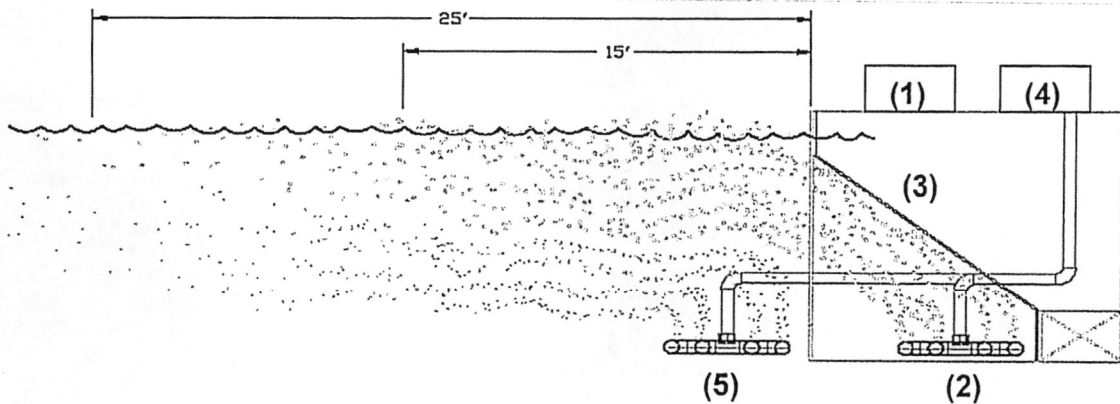


Maintenance



Blower intake filters are stainless steel and only require cleaning once or twice per year, not replaced.

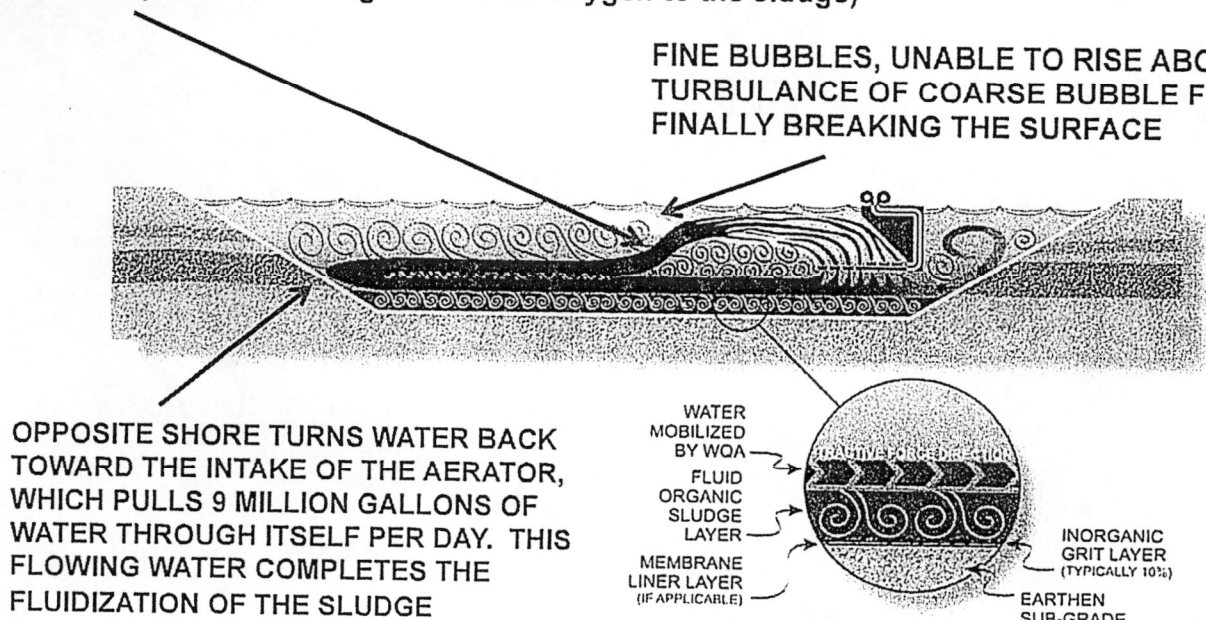
HOW DOES THE *LAGOON MASTER* WORK?



The key, and patented, elements of the *LAGOON MASTER* is its two regenerative blowers, each connected to a set of bubble-forming diffuser grids. The Phase 1 blower (1) runs 24 hours per day and feeds the rear-most diffuser grid (2) which allows large 1-2 cm. bubbles to rise quickly into a 45° baffle (3), pushing water at a velocity capable of moving over 9 million gallons (34,100 cu meters) of water per day. These large bubbles stay on the surface for up to 25' (7.6 meters) in front of the *LAGOON MASTER*. When the Phase 2 blower (4) is initiated, either manually or automatically, it feeds air to the industrial diffuser grid (5) located forward of the base of the *LAGOON MASTER*. The bubbles emitted from the diffusers are approximately .8 mm in diameter. These small bubbles are kept underwater for up to 35' (10.7 meters) due to their inability to rise above the larger, faster and horizontally moving bubbles caused by the primary, coarse bubble diffuser. The 25' to 35' (7.6 to 10.7 meters) of residence time for the small bubbles, at 1 atmosphere of pressure, allows for oxygen diffusion into the water, providing the addition of continuous increases in dissolved oxygen.

HOW THE *LAGOON MASTER*, IS DIFFERENT FROM OTHER SURFACE AERATORS

QUIESCENT WATER FORCES TURBULANT SURFACE FLOWING WATER TO FALL UNTIL IT HITS THE SLUDGE ON THE BOTTOM. THIS TURBULANCE ON THE BOTTOM BEGINS SLUDGE FLUIDIZATION. (Note how the falling flow of water drops through the oxygenated bubble plume and brings dissolved oxygen to the sludge)



***LAGOON MASTER* Lagoon/Pond Aerator**

Features

- Only 4 HP (3 kW) at maximum energy use
- No propellers or shafts underwater to foul
- No belts or gearboxes to break or require maintenance
- Non-corrosive materials of construction—Anodized aluminum, HDPE, Stainless Steel

Benefits

- Continuously moves the lagoon/pond water along the bottom, causing vertical mixing, for complete de-stratification, oxidation and odor elimination, algae bloom reduction, and natural sludge digestion.
- Delivers more dissolved oxygen to the water per hour
- Lowers energy costs by up to 80%
- Practically maintenance free for years
- Eliminates trapped nitrogen and ammonia gases, and improves BOD/COD counts

ADVANTAGES OVER OTHER LAGOON AERATION SYSTEMS

- Less energy usage on an annual basis - per area covered.
- Over 9 million gallons (34,100,m3) of water movement in a 24 hour period.
 - Guarantees continual water turnover and de-stratification throughout the lagoon – mixes algae and eliminates blue-green algae stratification.
 - Moves ALL the lagoon's sludge in a slow, non-violent manner – allowing for sludge turnover for continual degradation by the indigenous bacteria.
- No annual motor maintenance—oil changes, belt changes, etc. The only maintenance on a ***LAGOON MASTER*** is to clean two air intake filters annually.
- The addition of up to 15 pounds (6.8 kg) of dissolved oxygen per hour.

THE *LAGOON MASTER* LAGOON/POND AERATOR

Finally, a lagoon or pond aerator that is designed for function rather than power.

The ***LAGOON MASTER*** Water-Moving Aerator provides the ability to re-habilitate waste lagoons by providing a cost effective way to break-down sludge naturally, using minimal energy, and putting aeration throughout the water column – where it is required. Algae blooms are reduced and DO is continuously provided to the bottom sludge to enhance natural organic digestion.

ASK US ABOUT OUR MUNICIPAL/INDUSTRIAL LEASING PROGRAM

RELIANT

Water Technologies

141 Robert E. Lee Blvd. - #284
New Orleans, LA 70124
Tel 504-400-1239
FAX 504-242-8887

sales@reliantwater.us.com
www.reliantwater.us.com

Represented by -

Stuttgart Municipal Water

From: admin@aspen-rentals.com
Sent: Monday, September 24, 2018 8:37 AM
To: stuttgartarwater@centurytel.net
Cc: 'Robi Booth'; 'Kirk Johnson'
Subject: Quotation
Attachments: Quote 0918015.docx

Tommy,

Thank you for reaching out to Aspen rentals for your rental needs. As per phone conversation, we do have an Ashbrook skid available.

Should you have any additional questions please reach out to Kirk Johnson at (512)373-6160 or myself.

We look forward to working with you on your project.

Thank You,

Katie Goff

Business Operations Manager

Aspen Rentals Inc.

23603 N Highway 288

Angleton, TX 77515

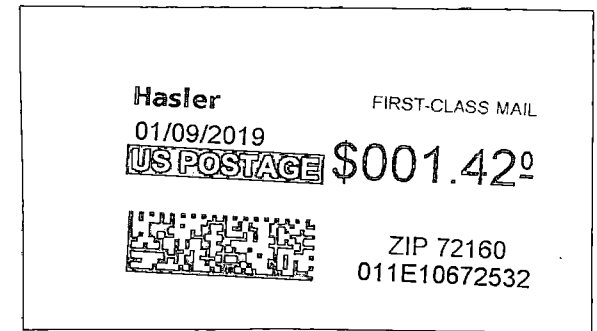
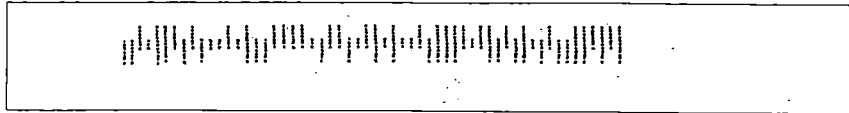
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Stuttgart Municipal Water Works
PO Box 130
Stuttgart, AR 72160



Arkansas Dept. of Environmental Quality
ATTN: Richard Healy
5301 Northshore Drive
North Little Rock, AR 72118-5317