



# Deadlier than The Bomb

By  
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For decades it has been known central sewage plants that incubate bacteria to eat sewage solids were not doing an adequate job. Millions of people have been sickened because of the systems shortcomings, but we were willing to put up for the mostly minor inconvenience the partially treated sewage was creating.

This is no longer acceptable. The so called secondary treatment is breeding immune pathogens by the trillions. One person carrying these 'new' pathogens, then flushing his toilet could pass material into the secondary treatment incubator, breeding contaminated, immune pathogens and also passing on immunity to formerly benign bacteria. The one ill person is capable of starting an epidemic worse than the 1918 flu epidemic. We already have pandemics killing as many as 70% of those stricken. We must eliminate the incubator.

John Alexander Research has been seeking the answer for 40 years. We are not foolish enough to think we are the only ones capable of finding solutions. We do have answers that will not only eliminate secondary treatment but will go much further. We can eliminate the sludge disposal problems, help reduce global warming, reduce energy demand, solve the water shortage problems and for many, reduce utility bills and help relieve the financial burden of the country.

The agglutinator was invented, or rather evolved, based on work done by giants of the past. The concept of physical chemical sewage treatment has been known for many years. The main reason of non acceptance was scarcity, cost and danger. John Alexander Research has found unlimited quantities of the necessary chemicals to activate the system, which not only creates the proper reaction, but supplies virtually all the needed energy. The needed chemicals could even be taken from sea water at slightly more cost. The extraction process could also displace much of the demand for coal and oil without contamination.

The agglutinator function is twofold. It allows precipitation of virtually all solids. Based on our concept, we call this Ph pasteurization. Both the precipitated solids and the recovered water are pathogen free, as determined by the largest virology labs. They always hasten to state that man is not sure he has identified all viruses. We suggest no one ingest the recovered water. We have developed another method of producing safe, delicious drinking water for about 3 cents per gallon, available to most people on earth

The sludge being pathogen free has become one of our most valuable resources. We can make pathogen free fertilizer that can be distributed even in drip irrigation systems. We can use it for a substitute for coal and can create building products from it.

The agglutinator has the capability of utilizing septic tanks without use of leach lines. We highly recommend the survival of septic tanks and leach lines as the safest and least expensive way to reduce the potential of spreading deadly pathogens. For central sewage plants already in existence, we recommend eliminating the secondary stage by merely installing an agglutinator. This reduces operating costs and the need for more real estate.

We believe the domestic water shortage can be eliminated by separating gray water from black water. If toilets are flushed with gray water, the in house use of water is reduced by 42%, on average. If greater water saving is needed, an in-situ agglutinator can be added, which then reduces the water need by roughly 80%. A cistern to hold roof runoff, along with recycling, could eliminate the need for any municipal sewer or water.

Industrial water can be recycled in-situ in order to reduce water and sewer charges. The removal of heavy metals facilitates their reuse. A&W Smelters has been doing this for 30 years. There is no need for industry to be concerned about their water supply being cut off, or being fined for contamination. The money saved makes this one of the best investments a company could make, so it is not a hard sell.

Agriculture is our biggest user of water. The agglutinator is capable of reducing ag water demand by more than 50%. Energy requirements can be reduced by as much as 75%. The vast contaminated aquifer from leach lines and runoff water can be recycled----making trillions of gallons of water available. This also recovers much of the waste created by selenium and salt contamination.

Dairies, pigs and chicken farm problems are being forced to close down. They produce odors, flies and add to global warming. They contaminate aquifers and use about 50 gallons of water per cow per day. It is possible to recycle 80% of this water. Odors can be stopped including global warming gasses. No evaporation ponds would be required. The sludge is also pathogen and odor free and can be used as fuel, fertilizer and building materials. The savings in land area alone would pay for most agglutination systems.

# Results of Treatment

## By the Alexander Agglutinator

### MUNICIPAL SEWAGE

#### SAMPLE 2

TEST PARAMETER	RAW SEWAGE	EFFLUENT PRODUCT	% REDUCTION
	QUANTITY VALUES	QUANTITY VALUES	
pH Units	10.9	7.8	
Specific Conductance, (@ 25°C) Micromhos/cm	4650	650	86.0
Total Dissolved solids, mg/l	2350	404	82.8
Suspended Solids, mg/l	384	1.0	99.7
BOD, 5 day @ 20°C, mg/l	490	16.0	96.7
Dissolved Oxygen, mg/l 1)			
	5.1	8.3	
Chemical Oxygen Demand, mg/l	741	6.0	99.2
Total Kjeldahl Nitrogen, mg/l	98.0	5.32	94.6
Ammonia Nitrogen (as N), mg/l	50.4	4.20	91.7
Organic Nitrogen, (as N), mg/l	47.0	1.12	97.6
Nitrate Nitrogen, (as N), mg/l	0.45	0.05	88.9
Sodium (as Na), mg/l	750	47.0	93.7
MBAS (Surfactants), mg/l	14.0	0.1	99.3
Turbidity, Jackson Units		500	
Phosphates, Total (as PO <sub>4</sub> ), mg/l		5.9	
Chlorides (as Cl), mg/l		207	
Sulfates (as So <sub>4</sub> ), mg/l		200	
Alkalinity (as CaCO <sub>3</sub> )			
Hydroxide, mg/l		608	
Carbonate, mg/l		888	
Bicarbonate, mg/l		0	
Total		1496	

- 1) Dissolved Oxygen value reported corresponds to amount found when sample was received  
Three days elapsed between the date sample was taken and the date received
- 2) Values published are from tests carried out by Quality Water Laboratories, Bellflower, California  
Laboratory No. 5298, April 30, 1976 on municipal sewage from Fountain Valley, California

## **DRUG RESISTANT BACTERIA IN CONVENTIONAL WATER TREATMENT SYSTEMS**

Contrary to popular myth, many pathogens survive their passage through a sewer treatment plant unscathed, thus remaining to constitute an increased public health risk. The fact that this situation has been accepted may be attributed, in part, to economics and antiquated water quality standards. Nonetheless, readily available scientific and medical literature is replete with data demonstrating and confirming this fact. Studies reported in the scientific and medical literature dating back to at least the 1970s show failure of treatment to kill or remove all pathogenic bacteria. Thus, this is hardly new knowledge [Fontaine, et al., (1976); Grabow, et al., (1973); Linton, et al., (1974); Walter et al., (1985)]

These surviving pathogenic bacteria often include bacteria resistant to individual and multiple antibiotic drugs. Multiple drug

resistant bacteria are particularly problematic due to the decreasing number of therapeutic options. Scientists have been able to distinguish resistant bacteria from those still sensitive to antibiotics, and resistance has been demonstrated in various species of bacteria for antibiotics including tetracycline, kanamycin, chloramphenicol and streptomycin, ampicillin, nalidixic acid, rifampicin, and sulfisoxazole. Even more recently the big gun—vancomycin—seems to be in trouble. From a total of 900 separate tests, over half contained multi-drug resistant plasmids, or DNA strands containing specific genetic information coding for drug resistant traits.

A less understood and even more troubling mechanism for the transfer of multi-drug resistant bacteria is also found at the local sewer treatment plant. As bacteria wind their way through these treatment processes, the selective pressures against them increase. In consequence, there is a greater effort by bacteria to pass on survival enhancing genetic information. Additionally, as the environmental stresses increase, the bacteria up-regulate numerous other survival mechanisms to assure that they and their genetic material survive. These survival mechanisms can include increased chlorine resistance.

In one of the several published studies looking at the perpetuation of multiple drug resistance in sewage, researchers followed bacteria through a sewer treatment works. Fecal coliforms were the test organism. These bacteria were isolated at various locations in the plant as the sewage was passing through the treatment process. They were isolated from: a) the inlet, b) the primary sedimentation tank, c) the activated sludge digestion tank, d) the final settling tank, e) the outlet, and f) the return activated sludge drain. They were then examined for multi-drug antibiotic resistance. The study looked for the presence of drug resistant plasmids or mobile genetic elements (MGE's). [Nielsen, et al., (7,8)]

While this is interesting, there was a new finding that raised considerable concern. The further along that the wastewater had progressed through the treatment process, the greater the tendency was to encounter multi-resistant strains. Additionally, the study demonstrated that these multi-resistant bacteria also simultaneously carried and then passed around their multiple transferable drug-resistance plasmids (MGE's). Thus, the take-home message is that drug resistance and the transfer of multi-drug resistance among and between species occurs in wastewater

treatment plants. [Nippon Koshu Eisei Zasshi 1990 Feb,37(2);83-90.] This information is now over a decade old.

Previous studies have shown that waste effluents from hospitals contain higher levels of antibiotic-resistant enteric bacteria than waste effluents derived from other sources [1,2,3,4,5,6]. Centers dealing with the very sick, the very old, and the immunocompromised are generally regarded as centers for the development and perpetuation of drug resistant pathogens. These centers also utilize vast amounts of chemo-therapeutic agents and other materials that may foster increased resistance. Their untreated discharge to the local sewer system is thus a concern because of the likelihood of introducing MGE's with new and more virulent traits. Additionally, if the sewer mains are leaking, this increases the potential risk for materials reaching the environment, aquifer, rivers, or beach and ocean.

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