THE INDUSTRIAL WASTEWATER ADVISOR

A2 Water Process Solutions

A Newsletter on Water & Wastewater Treatment for Recovery and Reuse

Greetings from the President

Many of you have noticed a distinct difference in A_2 Water Process Solutions this year. It is, perhaps, hard to place, but something is going on...

Based on ongoing projects currently under contract, 2001 will be our best year to date by an evident multiple. We have delivered some very impressive solutions and are in the process of designing and engineering several more. For us, the difference is simple: Our success in the water treatment market is becoming better known and as we become better known, our customers look to us for more of their water treatment needs.

The changes at A_2 manifest themselves in several places:

1. We are adding new products and innovative developments to our existing technologies that allow us to compete in a broader range of applications and projects;

2. We are adding more technical staff to help with the design, engineering, and manufacturing of key products and large projects;

3. We have modified our sales strategies to utilize aggressive, targeted, representation and cost effective demo and piloting programs;

4. We are increasing our technical support by reassessing the allocation of our diversified staff as a means to provide customers with real time support.

The best way to articulate the difference in A_2 is to say that we are "quietly confident"; not just confident in our products and services (we have always had that), rather, we are confident in our success – our ability to be successful. We are very competitive and our proprietary products add significant value to our water treatment packages. It is evident that the challenges we face are meeting the demand for the practical, innovative, and competitive packages we offer.

Yes, there is a change (thank you for noticing). We hope you can see and *feel* the changes at A_2 and we hope that these changes will benefit you.

Brad Simmons, *President*

WHY USE CHEMICAL COAGULANTS.

■ **Zeta (Z or ζ) is the sixth letter in the Greek alphabet. Zeta potential describes the interaction of charges around a particle. Particles of turbidity and color have an electric charge, usually negative. This charge attracts a compact layer of oppositely charged ions close to it and a more diffused layer of oppositely charge ions further away. These two ionic layers form an electrostatic potential around which the particle repels other particles. Chemical coagulants are added to the water to compress this double electrical layer and reduce the barrier to agglomeration.** ■

Innovative Products – Practical Solutions

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A_2 Around the World

The International Maritime Organization is in the process of setting new standards for ballast water treatment and discharge. The problem is evident in nearly every major port around the world: Ballast water is carrying approximately 3,000 different non-native life forms into marine areas without proper biological immunity. These non-native life forms are damaging or destroying the local marine life.

Consider the zebra mussel problem in the Great Lakes, or the plankton problem on Australia's Barrier Reef. These organisms are not inherent in their new environments. Rather, they have been carried to these new environments through ballast water used on ships and discharged in "foreign" ports. The problem is reaching dangerous proportions; organisms once contained – and a necessary part of the ecosystem in their native environments – are now becoming serious threats to marine ecosystems in other parts of the world.

A_2 is taking an active role in the team led by our partner, Arkal in Israel, to work with academics, industry leaders, maritime organizations and governmental authorities to develop a water treatment system designed to treat ballast water and eliminate the problem of bio-invasions around the world.

Who, What, Where: A_2 Fare

WHO: To encourage the sales growth of "integrated water treatment systems", A_2 has enlisted the technical expertise of Mr. Greg Terry of RO Technologies. Mr. Terry will act as a technical consultant for new technologies integration.

Due to the tremendous growth in the water treatment market in Mexico, A_2 has developed an agreement with Industrias Islas of Monterrey to develop the RO pretreatment market in Mexico. Industrias Islas will work together with Industrias Maran to increase the visibility of A_2 products in Mexico.

WHAT: A_2 has recently been awarded a large water treatment project for the Trex Company in Winchester, Virginia. The project includes all the water treatment systems for their proprietary polyethylene recycling unit. This system is the "first of its kind" and puts Trex and A_2 at the forefront of reuse and recycling systems.

WHERE: A_2 was recently seen in Israel at a week long sales and marketing conference with our partner companies: Arkal of Israel and Berkal of Germany. A_2 presented the development of in-line clarification techniques and discussed the growth of integrated water treatment systems worldwide.

Information and Adaptation: A_2 Review

Water is the life blood of a power plant. Water may be used to spin turbines, cool turbines, effectively control gas emissions or it may be used as a product (steam) for sale to other processes. The effective use of water in a power plant begins with purification and does not end until it has been used (and in many cases reused) and is discharged. To purify this "life blood" influent water must be treated. Treatment can be expensive and should be designed for each plant's particular needs.

Influent water quality varies with its source. Surface water is usually higher in oxygen and in organic and inorganic suspended solids, while it is lower in hardness and total dissolved solids. Well or aquifer water is usually higher in carbon dioxide, total dissolved solids and hardness but lower in suspended solids. Treatment must address each of these contaminant parameters.

The purity of the water also varies from plant to plant. Physical filtration may be the only treatment required for some waters, such as water in hydroelectric plants. For low pressure boilers or cooling water, the requirements are considerably higher, but much less stringent than a high pressure boiler or nuclear facility.

EPRI (Electric Power Research Institute), in concert with leading power producers, are continually looking at the use of water in power generation. Criteria for water quality and its impact on cost effective power generation is constantly being challenged, and new technologies for water treatment, instrumentation and controls are being evaluated. For more information on power generation, please reference the EPRI web site at www.epri.com.

& Expertise Experience

In-line Clarification: A_2 has a different Idea.

Clarification has been the primary means of water treatment for many years. The idea consists of settling the suspended matter from the water. The principle of clarification is that some suspended matter will settle out of the water on its' own, some will require help. Settlement of suspended matter can be enhanced through a series of steps comprising clarification: coagulation, flocculation and sedimentation.

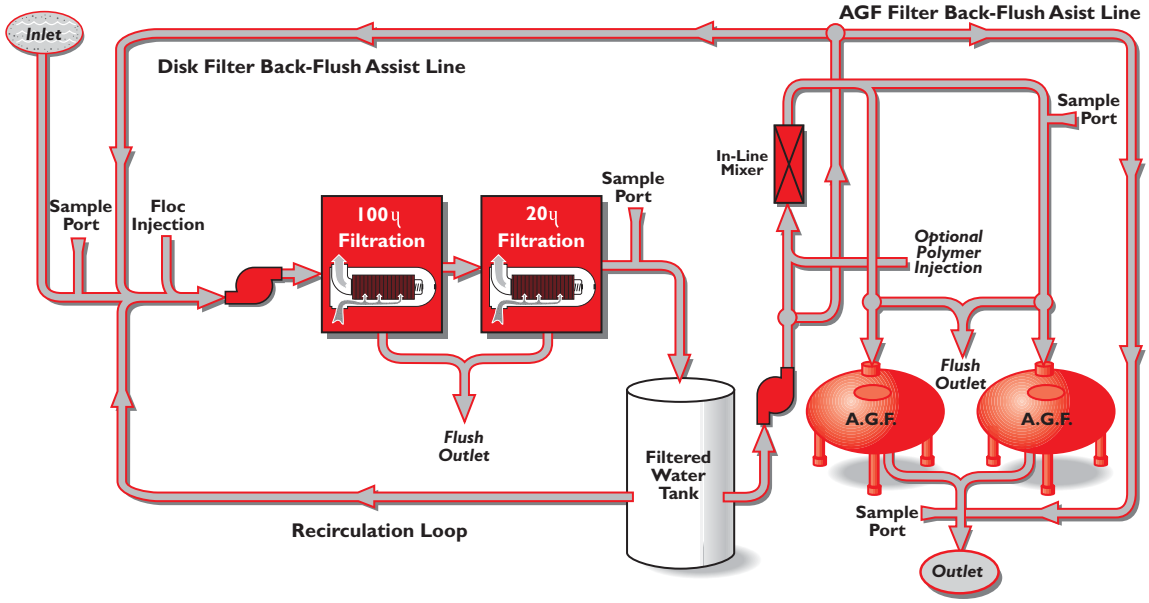
In the case of chemical/mechanical clarification, the three steps of clarification may be broadly classified. Coagulation uses chemicals to neutralize opposing particle charges, allowing them to come together to create larger – settleable – particles. Flocculation is the process whereby these neutralized particles are agglomerated into settleable "floc." Sedimentation is the mechanical or physical process used to eliminate these "floc" from the water.

Clarification is normally completed in three steps:
1. Using chemical injection to introduce pH control, coagulants, and floccullants;
2. Mechanical mixing to ensure chemical contact with suspended matter; retention tanks to allow time for chemical reaction;
3. A clarifier to allow time for floc to develop and settle; and filtration to remove any suspended solids carried over from the clarifier.

Clarification has the benefit of removing many types of suspended matter from water. However, clarification has some limitations, including, the size or "footprint" of the equipment, the time required to correct upset conditions,
the capital cost of the equipment, the permanence of the equipment, and the operating costs associated with conventional clarification. A_2 has developed an alternative method for clarification, a method we refer to as "in-line clarification". In-line clarification uses traditional clarification chemicals, but adds them in-line and then filters out the resulting "floc" without a clarifier.

The process is quite simple. Flocculation chemicals are added to the raw water stream in-line. The water is then filtered through A_2's proprietary Spin Disk filtration to remove agglomerated suspended solids. Additional chemical treatment with polymer coagulants can then be used to coagulate and agglomerate remaining suspended matter before final filtration. Final filtration is achieved using A_2's proprietary media filters.

The in-line clarification process is cost effective, easily expanded (or contracted), flexible in terms of chemical additives, easy to maintain, and provides <1NTU effluent water with a very low silt density index. The treatment is effective and the results are clear!



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A Renewable Resource

Our new facility in Gregory Texas is bigger and better. The 12,000 Ft² building is very well equipped to inventory, design, and manufacture state-of-the-art water treatment systems.

Like all renewable resources, we will be back again soon. Our next quarterly issue will include the following information:

- *Vacuum Ring Pumps: Water problems need not prevent the effective use of these innovative pumps.*
- *Zeolites: Considered a "fringe" filtration media... until now. How A_2 is using zeolite to improve filtration and water treatment systems.*

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If you would like more information about any of the topics in our newsletter or if you would like to learn more about the technical capabilities of A_2 Water Process Solutions, please contact Wayne Odegard of A_2 at (281) 334-3246.