

RBC SERVICES UPDATE

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RBCs & CLARIFIER OPERATIONS

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As some very basic information, the RBC process was conceived in Europe in 1900. Due to an initial lack of knowledge in this technology however, the first commercial RBC plant did not go into operation until 1960. The first RBC plant in the U.S. went into operation in 1969. Along with other customary unit processes, wastewater treatment plants using RBCs were generally designed to include both primary and secondary clarification.

As opposed to suspended solids reactors, such as activated sludge, fixed film reactors - such as RBCs, do not require storage of sludge in the clarifiers for return process. Unless the process is set up as RBC/SC (Solids Contact), the quicker sludge is removed from the clarifiers, the better.

Occasionally, some plants have reported problems with certain effluent parameters. In many of these cases, RBC operations were being questioned for a decrease in overall plant performance. Further investigation however, revealed that a thick sludge blanket was being maintained in the clarifiers causing poor performance. In fact, almost every occurrence of this problem was caused by methods of clarifier operation, and not a problem with the RBCs.

Simply put, a chain reaction of events occurs. Starting with the primary clarifier, when thick sludge blankets are maintained, the sludge may turn septic, which depletes oxygen levels and may also gas up clumps of solids, indicating storage of old sludge. The septic condition of the mixed liquor created causes beggiatoa to form on the first stages of the RBCs, inhibits healthy biomass growth and decreases treatment efficiency.

In primary and secondary clarifiers, considerations of efficiency deal with depth, floor slope, the bottom scraper mechanism and the sludge hopper. Then again, it may be a simple matter of modifying sludge "wasting" procedures.

If wasting is done automatically, or manually for that matter, scheduling could be modified to increase occurrence and decrease duration. This will keep the blanket to a minimum and help eliminate septic conditions. However, if "rat-holing" occurs at the hopper, you end up wasting water instead of sludge. In any case, be aware of the overall conditions of the clarifiers. Problems may arise and should always be investigated.

The RBC process is well known for creating solids which settle well in the secondary clarifiers. Usually being the final step for solids removal, configuration and operation of the secondary clarifier is critical in producing quality effluent.

However, if problems are experienced regarding solids carry-over or de-nitrification in the secondary clarifier, there are modifications which can be made to correct the problems.

At standard municipal wastewater facilities, the function of the RBC process is to convert Soluble BOD to solids, and in others cases, to provide nitrification as well. That's it! Problems with effluent SS, turbidity, disinfection or high fecal counts are not attributable to the RBC process.

If you are experiencing any of these problems, we would like to hear from you. Whether you operate circular or rectangular clarifiers, we very well may have the information which can help get your system back on track.

Regarding disinfection, in the recent past, due to safety considerations concerning bulk gas chlorine, alternate additives have been used which may not provide the results anticipated. This may occur particularly when the final RBC stages are nitrifying. Again, slight modifications can be made to correct the problem.

Fixed film process, including RBCs, remains as one of the most efficient, cost effective and easy to operate forms of wastewater treatment. Regardless of the problems which may be experienced at most any RBC facility, or the questions you may have, there are always solutions and answers.

RBC Services has been working exclusively with RBC plant operations for the past 20 years. We offer our experience for operational support, field service and quality replacement equipment to keep your RBCs operating efficiently and effectively for now and into the future.

As a reminder, if your plant includes rectangular chain and scraper sludge collectors, we have a complete selection of replacement metallic and non-metallic components; chains, sprockets, wear devices and flights, plus wall bearings.

Whatever your problems, questions or equipment needs, give me a call. We can help provide the solutions, the answers, and the parts.