

SEWT 9-26-22

Good afternoon Carrie,

Thanks again for your time spent in conversation concerning some changes that I'm considering for Manila's sewage system.

I have attached a map showing Manila's existing treatment. The original ponds were the two shown on the right side. There was a curtain that divided the second pond to make it three ponds in series. Somewhere along the way, Manila was probably having discharge problems and someone developed the idea to add the three-acre ponds on the west side and then use curtains and piping to make a rather elaborate serpentine flow as I have shown.

Since I've been involved with Manila, we have been seeing violations in BOD, TSS and fecal. If this flow pattern had been intact and a population of 3,000, they should be getting better results.

Recently we had a contractor check on the main curtain on the south end of the original first pond and he found less than adequate weights which could have been contributing to short circuiting. The same was true of the second curtain in the first pond. Further, the curtain in the northernmost of the three 3.0-acre ponds added is not even connected; its floating around in the pond. All of this means that the original serpentine flow pattern is hardly working. Also, I've been told that the original redesign included a header-lateral system placed in the bottom of the first pond with a 15 h.p. blower. Along the way this was replaced by three floating 5 h.p. aerators that do not appear to be located in an ideal spot.

Here is my proposal. Start with a population of 3,000: 0.17 lbs of BOD per person per day is 510 lbs per day. Fifteen horsepower at 2.0 lbs of Oxygen per horsepower per hour is 720 lbs per day which is sufficient. I propose that we relocated the aerators as shown on the second drawing, remove the long curtain that does not have sufficient weight to seal off at the bottom but will be sufficient to help create a counterclockwise flow pattern around the first pond which is now 7.6 acres with one curtain relocated and the short one removed. At 4.5' of depth and a flow of 300,000 gallons per day, we should have 35-day detention time in the first aerated lagoon. This should provide approximately 60% reduction in BOD.

Now if we eliminate the levee between the southernmost new ponds that were added, we would have 6.0 acres. The remaining 40% of 510 lbs of BOD would be approximately 200 lbs. This would provide a loading of approximately 30 lbs of BOD per acre per day. Now the remaining 3.0-acre pond and the original last pond would act as the third pond in series. This eliminates the floating baffles and should provide better, more uniform loading on the pond.

The Chlorine residual will not comply with their final discharge limits. The problem here is the discharge pump is the point of adding Chlorine. The short distance through the discharge force main does not provide enough time as samples are collected inside the building. Not only do we need to provide for additional Chlorine contact, we need to provide for de-Chlorination. At their discharge pump rate of approximately 300 gallons per minute, thirty-minute detention time is about 1,500 cubic feet. I am planning on adding 100 feet of 36" concrete pipe starting near the northeast corner of this final pond and running west toward the discharge building. I will put a manhole on both ends of this 36" pipe and put the discharge pump in the westernmost manhole. Now we will have 30-minute contact time and by adding Sodium Bisulfite at the discharge pump, then as the flow goes through the discharge building they can continue to collect their samples at the same place. I am currently trying to price the concrete pipe placed just outside the pond levee to a depth that will guarantee submergence when I open the east end of the pipe to the pond.

I know this is long but my basic question is do I need a construction permit to do this work?

As always, I appreciate your kind attention to my worrisome projects.

Jerome Alford, P.E.