



CITY OF WASILLA

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COUNCIL MEMORANDUM NO. 91-93

FROM: Deputy Administrator

DATE: November 21, 1991

RE: Review of Sewage Treatment Facility

Council has had an opportunity to review the report prepared by Council's consultant on the proposed Recirculating Granular Media Filter (RGMF). They will have further opportunity to discuss the report during the meeting of November 25, 1991.

The consultant's report supports the concept of increasing the sewage treatment capability by constructing the RGMF. The next step is for Council to determine "who" or "how" should we go about preparing the final design and cost estimates. Some of the obvious options are:

- (1) Do nothing.
- (2) Advertise for letters of interest and statements of qualifications (we can expect more than 10 responses for a project of this size).
- (3) Negotiate with Gilfilian Engineering (if they are interested in the work).
- (4) Negotiate a contract with any other engineer of Council's choice.

The advertising for an engineer selection, negotiations and contract approval can easily take two months. Once an engineering contract is approved by Council we can reasonably expect about two months to complete the design work. I believe we would be prudent to have a final cost estimate and plans to demonstrate to our legislators some accurate data early into the legislative session. We should make our best efforts to secure funding to begin construction by August 1, 1992.

If Council elects not to take the steps necessary to complete construction to increase the capacity of the sewage treatment system before next winter, I believe that serious adverse consequences could result. Thus, the recommendation is to select an engineer and proceed with the project as rapidly as possible. Administration believes that Gilfilian Engineering is best qualified for this project and, at one time, made a very reasonable estimate for design cost.



Robert E. Harris
Deputy Administrator

Approved Option #3
11/25/91

November 12, 1991

Bob Harris
Deputy Administrator
City of Wasilla
290 E. Herning Avenue
Wasilla, Alaska 99687

Re: Wasilla Sewage Treatment Facility Expansion
Project Review

Dear Mr. Harris:

The following report is presented to fulfill the requirements of our contract with the City dated October 31, 1991. Exhibit A, of the contract, detailed the scope of our professional services as follows:

Provide professional opinion regarding the following aspects of a proposal and preliminary plans prepared by Gilfilian Engineering to construct a Recirculating Granular Media Filter (RGMF) to provide sewage treatment for the City of Wasilla's public sewer system:

- (a) Will the proposed RGMF provide adequate treatment to the effluent at the treatment plant to enable discharge into surface waters and meet proposed D.E.C. permit conditions at the design flows?
- (b) Is the preliminary construction budget prepared by Gilfilian Engineering reasonably accurate?

To fulfill the requirements of the contract I held several information gathering meetings. One with you and two with Mr. Gilfilian. Our meeting was one of general operation and a tour of the treatment facility. The meetings with Mr. Gilfilian were to review the engineering data that has been generated to date. I would like to state at this time that Mr. Gilfilian was both very gracious and professional. He opened all of his files to my review to include all rough drafts and working notes.

It is important for an engineer to become familiar with the operation of a sewage treatment facility before he designs any improvements to that system. I spent a good deal of time acquainting myself with the history of this treatment facility. After reviewing all of the data, I concur with Mr.

Gilfilian's statement that the present system is failing. I believe that the data presented in the 1987 Annual Report definitely indicated a problem at the facility. This was strongly supported in the Performance Evaluation presented in 1988. The City's treatment system is presently in a failure mode. I am basing this statement on the recent tests performed on Bed Number 4.

Basically, the City contracted for a treatment system that was "experimental". Leach fields were not experimental; but, the STEP system combined with a leaching facility of this size was. This enabled the City to receive EPA funding for the project. As near as I can determine, the design engineers used current (1983) design parameters to size the facility. These design parameters included hydraulic loading only, they did not consider organic loading. This resulted in the original design application rate of 1.5 gallons per day per square foot (gpd/SF). About the time that the project was bid, the designers became aware of new information and lowered the loading rate to 0.7 gpd/SF. In effect, the system was downgraded from 440,000 gpd to 220,000 gpd. Thus, the system was halved in size without Council approval. The system has been operated at approximately 0.3 gpd/SF. This is only 20% of the original design loading rate and 50% of revised designed loading rates. At this greatly reduced level of operation, the facility has been shown to be marginally successful at treating Wasilla's waste. More importantly, at this loading level, the system can only handle approximately 100,000 gpd. This is the present influent rate to the facility. Therefore, the system is presently fully loaded and not operating as expected.

There are claims that the system has not been operated per the Operations and Maintenance Manual. While this may be technically true, it has no bearing on the Plant's performance. In fact, if the system had been blindly operated by the "book", you would probably have total failure at this time. This failure would have affected the ground water and put the City in a very difficult position. I could find no evidence that the system was operated in a manner that was either detrimental or hazardous to the public. To the contrary, as soon as the City was aware that Bed Number 9 was adversely affecting the ground water, it was taken off line and not used. It was only briefly put back on line to prove that failure to the regulatory agencies. As with any new technology, the operation of the facility cannot be directed by a set of absolute rules, but rather, successful performance must govern the ultimate operational mode.

For some reason, EPA has decided to measure the system's performance by the number of gallons of liquid passing through it. They are not considering the quality of the effluent. This position is simply neither acceptable or defensible. It makes no sense to say that the City's system

is working as designed if the City can pour so many gallons a day into a hole and have the waste disappear. The waste must be treated. For the Environmental Protection Agency to disregard treatment is unconscionable.

With all of the above in mind, I most strongly recommend that the City do something to increase its ability to treat sewage. The sewage treatment facility is at capacity today and may act as a limiting factor in area growth. Additional treatment capacity must be added to the facility now. You have been granted a discharge permit that will allow you to discharge up to 130,000 gpd, I do not believe that your facility can adequately treat this amount of waste on a continuous basis.

Per the City's direction, Gilfilian Engineering investigated alternative methods of sewage treatment. These methods of treatment included facultative lagoons, an aerated lagoon system, a modified activated sludge system and RGMFs. Also, they reviewed the possibility of adding additional seepage beds for additional treatment. Due to environmental, geographical and funding limitations, the RGMF system was chosen. I concur in this selection. It would appear that this treatment method would best serve the City's needs at the most reasonable cost. The other methods of treatment either have high land requirements and/or high operational costs associated with them. It serves no useful purpose to double the number of seepage beds at the facility. This would only allow you to treat 200,000 gpd while expending the rest of the available land area at the present site. The proposed RGMF will be able to treat at least 200,000 gpd in an area equal to about 1.6 beds.

The Council has requested that I address the reliability of the RGMF system. This method of treatment is still relatively new. It is slightly more advanced than the infiltration beds were when they were proposed for the City. The major difference is that design parameters for the beds were in the process of being downgraded, while the design parameters for the recirculating filters are being increased. That is, the filters are performing better than first anticipated, so the design factors tend to be conservative. The design before the Council has been rated by Mr. Gilfilian to accept 200,000 gpd with a factor of safety of two. That means that it could treat as many as 400,000 gpd with only minor changes in pump cycles. Given the parameters used for design and the method used for design, I find nothing that would lead me to believe that the proposed system will not successfully treat at least 200,000 gpd. In fact, the innovative use of the existing clarifier will decrease construction costs and allow for future expansion.

I next reviewed the preliminary cost estimate dated April 18, 1991 which totaled \$ 1,247,000. It is very important to understand exactly what this cost estimate represented. These monies would construct a RGMF using force account labor by the City. It did not represent a competitive bid situation with contractors paying prevailing wages. This was a construction alternative being investigated by the administration to reduce costs and still provide additional treatment. The design, estimated below, does not have a cover and would be for summer use only. A roof or an alternative to a roof could be included in the final design, but this would increase the cost. The emphasis on the design was to get a system in place as soon as possible for a limited amount of money. Most importantly, the previous estimate did not represent a fixed final design. That is, there still are no exact quantities or final design. This preliminary cost estimate was a ball park number at best. The following cost estimate is my estimate of cost for the preliminary design that was presented to the City. I am assuming that the construction contract will be bid on the open market and the City will have little to do with the actual construction. There has been a good deal of site work completed on-site. I have allowed for this work in my estimate. I also considered that the City would supply the outfall pipe while the Contractor installs it.

PRELIMINARY COST ESTIMATE

Site grading and finish grading	\$ 165,000
Clarifier Modification	50,000
Yard Piping & Pumping System	150,000
Recirculating Granular Media Filters	775,000
Outfall Discharge System	20,000
Total Construction Estimate	\$1,160,000
Final Design, Permitting, Construction Inspection & Contract Administration	\$ 87,000
Municipal Administration	23,200
Subtotal Project Cost	\$1,270,200
Project Contingency	\$ 127,020
Estimated Total Project Cost	\$1,397,220

In summary, my investigation has revealed the following:

There has been no misuse of the existing treatment facility.

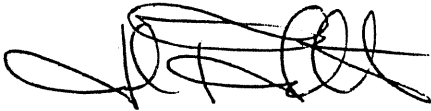
The existing treatment facility is at capacity and needs modification.

The RGMF appears to be the best choice available for the modification.

The budget for this modification should be \$1,400,000.

If you have any questions or if I can be of any further service, please feel free to contact me at any time.

Respectfully submitted,



John T. Felton, P.E.
Partner

JTF/sl

