

After reading the Strand Report, it sounds like Glencoe should quickly build the pipes and secure water supply from Highland Park, given the engineer's caution that Glencoe's current plant could be subject to a "long term outage," and most of the construction options involve taking water from Highland Park anyway.

The reference in the study to pursuing a connection with Highland Park to insure against any "long term outage" was in conjunction with either rehabilitating the current water plant or constructing a new water plant on the lakefront. The recommendation is to build a supply connection with Highland Park as part of and in advance of these alternatives. This would allow water to be supplied to the Village should any unanticipated impacts to the major water transmission mains or other plant process equipment occur during construction.

When looking at the Strand PowerPoint presentation to the Village Board, why do demolition costs for the current water plant vary from \$351,000 for the Highland Park option up to \$569,000 for inland plant options such as the current Public Works garage?

The total opinion of probable construction costs for the construction of a new membrane filtration plant on the existing Public Works Garage site on Temple Court includes the cost for demolishing the existing Public Works Garage in addition to the cost for demolishing the existing water plant. The other alternatives, including the Highland Park option, only include the cost for demolishing the existing water plant.

Strand had given the Village cost estimates of options for producing 6 million gallons per day (mgd). Are there diminishing returns in water plant construction? Does it cost about the same to build a new 6 mgd plant as it does a 10 mgd or 4 mgd water plant?

When evaluating plant capacity and probable cost, a 6 mgd water plant (a plant with the capacity to produce 6 million gallons of water per day) is only one design element among many that were considered in the development of the probable costs for this study. Other factors considered within the evaluation include equipment redundancy, pumping efficiency, water system demands and storage volumes. It is Strand Associates opinion that the rated production capacity of a 6 mgd water plant is a minimum requirement for a future water plant in Glencoe. If future expansion required additional treatment capacity, membrane filtration provides a unique opportunity to save on expansion costs and minimize construction impact compared to a conventional treatment plant expansion. In other words, this technology allows us to increase capacity at a later time, without undergoing another substantial construction project.

Section Five, pages five to 14 of the Strand Report says if Glencoe builds a new water plant using membrane filtration for any of the lakefront building options, it would require about \$500,000 in improvements in the road leading down to the beach so the road "could accommodate flatbed and container types of trucks" bringing filters and supplies to the plant. Would trucks pass through residential neighborhoods?

The referenced comment in the report refers to the fact that any alternative that includes construction at the lakefront will likely require some improvements to the ramp to accommodate flatbed and container-type trucks that would be used on a temporary basis during the construction period only. If a new water plant is constructed, the Village anticipates that delivery traffic would increase during construction, but would return to what the Village currently experiences today with our current water

plant. Currently, the width of the ramp is only 11.5 feet at the half-way house, making it difficult for any vehicle larger than a pickup truck to safely navigate from Hazel Avenue to the plant at the beach level. The estimated improvement costs anticipate that the modifications necessary for safe construction access would also provide safety enhancements for daily vehicle operations that are consistent with current vehicle traffic.

On pages 5 to 24 of the Strand Report, there is a discussion that the new technology they are suggesting for constructing any of the new building options will require a "backwash" process that will use and then flush into our sanitary sewers up to 72,000 gallons per day of lake water that isn't being used by our current water plant. Strand engineers say Glencoe sewers have the "reported" capacity to be able to handle this daily discharge, presumably without backing water into residential basements. Are we sure of this? Also, the engineers strongly suggest that if any of these options are chosen, Glencoe should upgrade its sanitary sewer connection with the MWRD interceptor (pages 5 to 25). However the cost of this connector upgrade isn't included in any of Strand's cost estimates. How much does the Village think such an upgrade would cost? Do we need to waste lake water every day in this volume just to wash these plastic filters?

The process of backwashing filters is a fundamental maintenance requirement of all filtration processes, including the Village's current treatment process. Backwashing is the process of cleaning the filter material of the organics removed from the raw Lake Michigan water. In the current conventional filtration plant, the Village currently backwashes the filters as-needed, based on a number of factors including the length of time the filter has been in service and the clarity of the water after it has passed through the filters. All water currently used in backwashing the six filters at the existing plant is returned to the beginning of the treatment process. No backwash water is discharged to the Metropolitan Water Reclamation District (MWRD) sanitary sewer system with our current process. The only time the Plant currently discharges to the MWRD is during our annual cleaning of the recycling basin, flocculation basin, and settling basin.

The membrane filtration process presented in the Strand Report discharges a more constant stream of backwash water compared to the existing gravity filtration process. Based on the proposed size of a new water plant, and the volume of backwash water that could be recycled back into the plant process, the estimated discharge of up to 72,000 gallons per day to the MWRD is within the stated capacity of the system. This is one of the areas that we have highlighted as part of the next phase of due diligence prior to the Board making a final decision if a new water plant utilizing membrane filtration is constructed at the lakefront.

On page 34 of the Strand PowerPoint presentation from March 19, 2015, the footprint of building a new water plant on the Glencoe Public Works site looks huge and takes up lots of parking. Would a new plant have several stories?

The Public Works Garage Site alternatives provide a conceptual site plan for a new water plant as well as adequate ground space for delivery and operations. The existing 0.8 acre parcel where the Public Works garage is currently located on Temple Court is not adequate. If this alternative is ultimately selected, preliminary engineering design would refine the details of the site including the specific location of the plant facility, access for material deliveries and site perimeter security.

Below grade construction of water supply structures, including treatment plant facilities, is not a requirement or recommendation for security reasons and may create an increased risk of contamination and damage from flooding. The EPA requires that certain specific treatment process infrastructure must be constructed no less than two feet above the groundwater table, which has an impact on how much of a new water plant facility can be built below grade. Overall site plans have not been finalized at this time, but in general, building a water plant on one level allows a lower architectural profile, improves access and maintenance to all plant features, and will decrease construction costs for a less complicated site. The advantages of a single story water plant at any of the proposed locations will need to be compared with the cost/availability of additional property, access to utilities, and other factors that have been evaluated with the Public Works and lakefront sites.

The Strand report includes hundreds of thousands of dollars for "homeland security" for all of the construction options. Is there a difference between how lakefront and inland facilities can be secured?

The security measures and related cost estimates discussed in the Strand Report are based on recommended features that should be included with any water plant facility regardless of location. Homeland Security and other regulatory bodies spell out security measures that should be followed at any location with critical infrastructure. There are no regulations or restrictions (or even guidance) preventing the construction of a water plant on the lakefront due to any greater susceptibility of the plant from malicious behavior. There are many water plants located along the shores of Lake Michigan as well as the other Great Lakes. Regardless of plant location, many water utilities that draw water from Lake Michigan must have features that extend out into the lake from the lakeshore, which are also vulnerable.

The Village, like all other communities with intake and water treatment facilities along Lake Michigan, must consider a level of security and vigilance that protects the water system against a variety of threats, both natural and anthropogenic. While specific details of the Village's current security provisions are not appropriate for public discussion, it is important to recognize that security measures will be incorporated into all alternate options presented in the study.