Susquehanna Golf Course

Alternatives Analysis

Proposed Surface Water Withdrawal Example Project

Note: This is a sample report and project; to be used for example purposes only.

Prepared By: (Project Sponsor)
Date:

ALTERNATIVES ANALYSIS FOR SUSQUEHANNA GOLF COURSE

Susquehanna Golf Course (SGC) has prepared the following Alternatives Analysis as part of its application, per 18 CFR § 806.14(b)(1)(v): *For new projects and major modifications to increase a withdrawal, the application shall include an alternatives analysis for a withdrawal proposed in settings with a drainage area of 50 miles square or less, or in a waterway with exceptional water quality.* SGC filed a surface water withdrawal application for the operation and expansion of it golf course. The project is located in Middle Paxton Township, Dauphin County, Pennsylvania. Prior to submission, SGC participated in a pre-application meeting with Susquehanna River Basin Commission (SRBC) staff to discuss the project, including this Alternatives Analysis. SRBC staff provided general details about water availability at or near the project location, which SGC used in its application and this analysis.

Description of Project

SGC is an existing 9-hole golf course, located in the foothills of Cold Mountain along Cold Creek, a tributary to Mill Run, approximately 5 miles upstream of the Susquehanna River, near Harrisburg, Pennsylvania. SGC irrigates its tees, greens, and fairways with water from a below grade 300,000-gallon storage tank, located beneath its pump house, supplied by a withdrawal from Cold Creek located on SGC's property. Peak historic withdrawal from Cold Creek is 150,000 gallons per day (gpd). SGC does not have an SRBC approval because the project was constructed in 1962 and predates SRBC regulations. SGC is proposing to increase the withdrawal to a peak day of 300,000 gpd (at 208 gallons per minute [gpm]) in order to expand the golf course to 18 holes, and to better maintain tees, greens, and fairways during primary golf season (April through October). Due to this expansion, SGC is seeking SRBC approval for this withdrawal and associated consumptive use of the irrigation water.

SGC's surface water application proposes to relocate the surface water withdrawal to Mill Run as opposed to requesting the increased withdrawal from its existing location on Cold Creek (9 square mile [mi^2] drainage area and Exceptional Value [EV] water quality). This is because Mill Run is comparatively a larger waterbody (49 mi^2) with larger flows available more often during the year and is not classified as exceptional water quality. The withdrawal would be located approximately 100 feet below the confluence of Cold Creek and Mill Run, and transported to a pump house via a buried 6-inch waterline and stored in the existing storage tank. The contributing drainage area to the proposed withdrawal location on Mill Run is the reason this Alternatives Analysis has been prepared and submitted to SRBC. SGC has looked at the technical and economic feasibility of the project, as well as its effect on water resources under the SRBC's *Guidelines for Preparing an Alternatives Analysis* (Policy No. 2017-01).

Analysis of Technical and Economic Feasibility and Water Resources

The proposed project's location is at [insert coordinates] and is situated at the front acreage of SGC's property by the front lawns and entry drive. The withdrawal site on Mill Run is accessible and it can accommodate installation of a larger submerged suction strainer. A 600-foot extension of the existing buried waterline from the pump house to this new intake

location is required. The existing below grade storage tank would be used to store this increased volume of withdrawal for irrigation purposes. It is not expected that permitting for the land disturbance or stream encroachment would be an issue on Mill Run considering its Cold Water Fishery (CWF) stream designation.

The project is economically feasible, given that SGC already owns the land at the withdrawal location. SGC has already planned for the purchase and installation of a larger submerged suction strainer to accommodate the increased withdrawal rate. Estimated cost for the waterline purchase and expansion from the pump house to the new intake location is $9,000.

The proposed withdrawal location on Mill Run has a 49 mi^2 contributing drainage area Aquatic Resource Class (ARC) 2 and is classified as a CWF at this location. It should be noted that at a 49 mi^2 drainage area, this withdrawal location is 1 mi^2 less than the next higher class of ARC 3 streams, which range from $\geq$50 mi^2 and <200 mi^2 and are characterized as "small rivers." Mill Run does not host wild trout in this section of the watercourse and is listed as impaired for aquatic life use by an unknown source of sedimentation. Mill Run can support SGC's water needs with its larger and more sustainable flows. Discussions with SRBC staff indicated that passby flows for this location would occur less often than for the project's Alternative 1 location on the smaller Cold Creek because the watershed is larger and not EV.

OTHER ALTERNATIVES CONSIDERED

Alternative 1 – Existing Withdrawal Location on Cold Creek

SGC assessed its first alternative as a proposed increase to its existing withdrawal on Cold Creek by installing a larger suction strainer and utilizing its existing water storage and irrigation infrastructure.

Analysis of Technical and Economic Feasibility and Water Resources

The proposed withdrawal location for this alternative would be at [insert coordinates], the existing location on Cold Creek. This site is accessible and can accommodate installation of the submerged suction strainer needed to withdraw the requested volume of water. It is expected that permitting for the land disturbance or stream encroachment could be an issue on Cold Creek considering its EV stream designation.

The total estimated cost for the expansion of the golf course is $1.5 million. Utilization of this existing site is SGC's least costly alternative because it can use most of its existing infrastructure. The estimated costs for this alternative consist of the replacement of the existing suction strainer in Cold Creek with a larger suction strainer for approximately $2,500.

Cold Creek is classified as an EV stream, with a Class B naturally reproducing wild trout population, to its confluence with Mill Run. The contributing drainage area to Cold Creek at the point of this alternative withdrawal is 9 mi^2 and is within a headwaters ARC 1.

While SGC believes that it could withdraw up to 300,000 gpd from Cold Creek for use in irrigation, the withdrawal would be subject to a passby due to being an ARC 1, and that passby would likely be elevated because of the stream's EV water quality classification. Thus, water will be far less available than at the Mill Run proposed site, especially during summer months, which are SGC's most important, economically. Because the withdrawal from Mill Run provides more water during these critical summer months of operation, is lesser water quality, and is technically and economically feasible, SGC determines that Alternative 1 does not pose a more reasonable alternative than its proposed project for its surface water withdrawal.

Alternative 2 – Use of Wastewater Treatment Plant Effluent

SGC assessed its second alternative as relocating its surface water withdrawal to the downstream Mill Run Wastewater Treatment Plant's (WWTP's) discharge location on Mill Run. This withdrawal would reuse the treated wastewater from the WWTP discharge.

Analysis of Technical and Economic Feasibility and Water Resources

To use the WWTP treated wastewater, SGC would need to extend the waterline from SGC's property, approximately 3,000 feet downstream to the WWTP's discharge pipe into Mill Run (insert coordinates). This design includes direct collection of the treated effluent into the waterline, and construction of a booster pump adjacent to the collection point. SGC would need to construct a 1-acre pond on the course to store the effluent for distribution to the irrigation system because the existing below grade storage tank is not designed for effluent storage. This alternative would also require a distribution pump in the pond and additional water distribution lines to both the existing and the expanded irrigation lines. A fountain and several bubblers will need to be installed in the pond to increase oxygen in the water in order to prevent and reduce algae growth. Daily water quality testing of the effluent would be needed to monitor for salts and pH, both of which can be harmful to turf grass. Lastly, SGC would need to post signs throughout the course stating that the irrigation water is effluent.

The installation costs are significantly higher due to the infrastructure needs for this option. SGC would also need to secure a permanent easement with annual access lease rights with the WWTP. This estimated cost is $10,000 for the easement and a lease payment of $3,000 annually. SGC believes the costs for this alternative would require an outlay of $260,000-$300,000 plus recurring annual costs of $3,000/year.

Use of treated wastewater in lieu of freshwater for the golf course's irrigation needs would represent beneficial reuse of treated wastewater and would conserve freshwater. This water would always be available for SGC's use and would not be subject to a passby requirement. Because this alternative would greatly add to the cost of SGC's golf course expansion project, and SGC believes adequate water can be withdrawn from its proposed project location without harm to the water resources of the Susquehanna River Basin, this alternative was rejected.

Extent of Investigation and Rationale for the Proposed Project

SGC examined the technical, economic, and water resources aspects of the proposed withdrawal at the proposed project location, of proposing to increase the withdrawal at the existing location, and of reuse of wastewater from a nearby treatment plant. As there is no public water supply service available at SGC's location, these are the only potentially feasible alternatives considered.

After a pre-application meeting with SRBC, SGC selected the Mill Run site as its proposed project (the preferred alternative). The Mill Run site is a more sustainable water supply due to its larger drainage area, larger flows, and lesser water quality than Cold Creek. It also avoids stricter passby flow requirements that would likely be required for the Cold Creek withdrawal location. The proposed project is within the project's budget while Alternative 2, the reuse of treated wastewater from the nearby treatment plant, far exceeds the project's budget and has been rejected.