TECHNICAL MEMORANDUM

DATE January 2, 2019 **Project No.** 18111754

TO Derek Marshall, PE, LEED AP, Associate
Dewberry

CC

FROM Brent B. Waters, Principal Hydrogeologist, Golder **EMAIL bwaters@golder.com**

RE: ANALYSIS OF LONG-TERM 50,000 GPD WITHDRAWAL FROM PROPOSED SOLAR FACILITY - SPECIAL USE PERMIT SUP18-0001, 2, AND 3.

The following memo addresses a supplemental question on the potential impact of long-term or permanent withdrawals of up to 50,000 gallons per day (gpd) at the proposed solar facility. The applicant's current proposal for water use self-limits withdraw to no more than 50,000 gpd daily for a maximum 10-day period in the event County water cannot be provided. Planning staff inquired whether a withdraw of 50,000 gpd could be withdrawn for several years without impact to existing groundwater users.

Aquifer testing performed on the subject property indicates that the fractured bedrock aquifer beneath the facility is moderately productive with 3 drilled wells that yielded 135 gallons per minute (gpm), 73 gpm, and 63 gpm. For reference, 50,000 gpd is equal to 35 gpm. Each well was pumped continuously for 3 days and sustained the pumping rates indicated above. Based on limited observation well data, the estimated radius of influence (ROI) of ERS-3 was approximately 2,400 feet after pumping at 135 gpm for 3 days (Figure 10 of the applicant's Hydrogeologic Summary Report). The estimated radius of influence of ERS-7 was approximately 2,000 feet after pumping at 73 gpm for 3 days (Figure 14 of the applicant's Hydrogeologic Summary Report). Simulations completed by the applicant suggested that actual ROI could extend much further, up to 4,500 feet or more, under continuous pumping scenarios however these simulations did not account for groundwater recharge.

In our previous memo, Golder estimated that up to 10 inches of precipitation each year (in/yr) likely recharges the groundwater aquifers underlying the site. We estimated that the entire 6,335 acre property likely receives approximately 4.7 million gallons of recharge per day on an annual average basis. This infiltrating water replaces pumped well water, stablizing and preventing the expansion of the drawdown cone that forms around a pumped well. Assuming the full 10 in/yr of infiltrating precipitation recharges the entire aquifer system (saprolite and fractured bedrock aquifers) surrounding the pumping well, then it can be calculated that a recharge area of approximately 68 acres is required to stablize a withdrawal of 50,000 gpd. This is equivalent to a circular area with a radius of approximately 980 feet. When groundwater recharge is accounted for, it is probable that the drawdown cone and ROI will not extend out as far as 4,500 feet. In fact, we believe that the ROI will likely stabilize at around 2,200 feet assuming that approximately 20 percent of the groundwater recharge, or around 2 in/yr, will effective infiltrate and recharge the fractured bedrock aquifer beneath the saprolite. Figure 1 illustrates the probable ROI using these assumptions. The predicted ROIs do not extend beyond the property boundary and do not appear to intersect any offsite residential buildings. Even if the ROI did intersect offsite homes, the drawdown impacts would likely be minimal and would not adversely impact residential well use.

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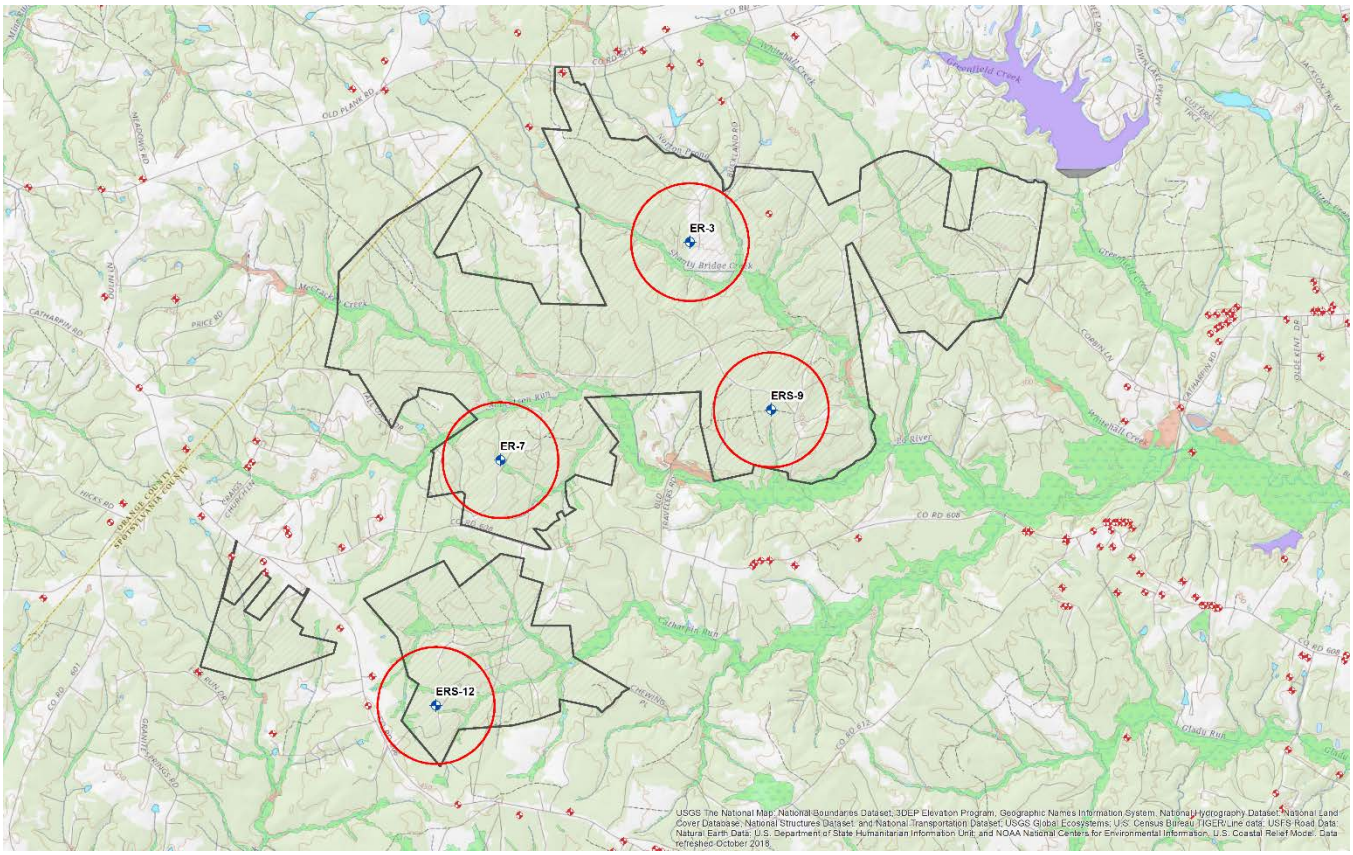

Figure 1 - Map illustrating the estimated radius of influence (ROI=2,200 feet) from site production wells.

We hope that the results of this study provide valuable insight into the subsurface conditions at the subject site and look forward to continued work on this important project. Please do not hesitate to contact us if you have any questions or would like to discuss our findings in more detail.

Brent B. Waters, CPG
Principal Hydrogeologist

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