

Entech Responses to Colorado Geological Survey comments dated 10.26.2021

Shallow groundwater and basement feasibility.

Shallow groundwater and basement feasibility. As indicated in the Letter of Intent (August 2021), "Some areas of Phase 2 were found to be impacted by shallow groundwater, and certain lots were prohibited from having basements as mitigation. None of these lots are within Filing 3..." However, groundwater was encountered in TB-2 (within Filing 3 near Lots 16 and 17) at a depth of 7 feet below grade.

According to the grading plan, the area around TB-2 will not be filled during grading operations. The feasibility of basements for Filing 3 due to shallow groundwater, seasonally shallow groundwater, and perched groundwater on shallow bedrock is not discussed in Entech's report.

RESPONSE: Groundwater was encountered at depths of 7 to 12 feet below the existing surface grade. Test Boring No. 2 located along the southern side of the site had the highest groundwater level, and was drilled during a period of increased precipitation in 2019. A minimum separation of 3 feet between foundations and highest seasonal groundwater level is recommended. The potential for perched groundwater conditions on the shallow bedrock exist on this site. It is our understanding an underdrain system will be installed along the sanitary sewer on the site. Individual building drains can be tied into the underdrain. Recent test borings (1A and 2A) showed water at 12 and greater than 20 feet. Test boring logs are included in the report (Appendix B).

Entech states on page 18, "Additional investigation is recommended after grading and the storm sewer is installed to evaluate groundwater conditions." In our experience, groundwater monitoring prior to development is useful for establishing a baseline for groundwater levels and the extent to which they can vary. CGS continues to recommend the county require groundwater monitoring/observation to obtain groundwater data that can also be used to determine the feasibility of basements. Entech should provide further discussion in their report regarding if basements are feasible for Filing 3 and/or if an underdrain system could be employed for this site. Proposed floor levels should be at least three feet above maximum anticipated groundwater levels and maintained year-round.

RESPONSE: A sewer underdrain is planned for the filing. See comments from No. 1 above regarding the recent test borings.

As stated on page 11 of Entech's report, "Subsurface perimeter drains may be necessary to prevent the intrusion of water into areas below grade." Individual foundation perimeter drains are needed around any below-grade (basement) space, if determined to be feasible, and that discharges to an underdrain system that gravity discharges to a daylight outfall. Individual foundation perimeter drains are intended to handle small amounts of intermittent, perched water and may NOT be used as sole mitigation of persistent shallow groundwater conditions. CGS agrees with Entech on page 18, "Where basements are considered, interceptor and underslab drains may be necessary."

RESPONSE: As stated above, it is our understanding an underdrain system will be installed along the sanitary sewer on the site, and the individual building drains can be tied into the underdrain. Final drain recommendations should be made at the time of the excavation observations. If lots require underslab drains, they can be connected into the sewer underdrain.