

EP-20-0075 Grandview Reserve 1200 PUDSP

File No. PUDSP2110

S Section 21 and portion of N½ Section 28, T12S, R64W, 6th P.M.

38.9854, -104.5547

Grandview Reserve Filing 1.

Comments uploaded to El Paso County Development Application Review on 4/6/2022:

...

CGS previously reviewed the Grandview Reserve, Filing 1 preliminary plan/PUD, and provided comments to the county dated January 14, 2022. However, since our review, CTL Thompson revised their Geologic Hazard Evaluation and Preliminary Geotechnical Investigation for the Grandview Reserve, Filing 1 (revised March 14, 2022). Other documents provided with this referral include Drainage A & B plans (HR Green, March 8, 2022), Letter of Intent (HR Green, March 15, 2022), PUD/Preliminary Plan (Galloway, March 15, 2022), and other documents. We offer the following comments and recommendations based on the updated documents.

Shallow groundwater and basement feasibility: CTL observed groundwater in their borings (drilled in December 2020, November and December 2021, and February 2022) at shallow depths (4 to 16.5 feet measured days after drilling), which, depending on grading plans, may preclude full depth basement construction unless mitigation is implemented. The drilling dates are in the winter months when seasonal groundwater levels are generally the lowest. CTL states on page 6, “*Groundwater may develop and fluctuate seasonally and rise in response to development, precipitation, and landscape irrigation.*” Per El Paso’s Engineering Criteria Manual (Appendix C, Section D.6), the seasonal variations and recommendations concerning groundwater level fluctuation should be discussed in the Geologic Hazards Report.

CTL states on page 7, “*Current groundwater depths indicate proximity of groundwater to basement level foundation systems may be a concern, particularly near drainages. The presence of shallow groundwater can impact basement level construction.*” In CTL’s January 6, 2022 version of their report, they stated (page 7), “*The depth to groundwater will also be impacted by proposed grading and depth of foundations*” and “*This condition can be mitigated through use of foundation drains, active underdrains (if allowed and installed by the developer), or cut-off drains.*” However, these mitigation methods were excluded from their revised report. CTL now only recommends that “*Groundwater levels should be further evaluated at the time of lot-specific Soils and Foundation Investigations*” and indicates on page 16 that no underdrains will be constructed.

Mitigation for shallow groundwater often becomes guesswork due to the inexact method of determining its impact on inhabitable below-grade areas (basements and crawlspaces). Groundwater measurements in test borings are limited to the time of year measured (a snapshot) and are inherently inaccurate in predicting depth to groundwater during the engineering life of a structure/development. This is why we are concerned with measuring groundwater levels solely during the lot-specific investigations. The extent of the yearly variation in depth to groundwater must be known to determine basement feasibility.

CTL provided two new figures in the revised report illustrating groundwater conditions (Fig. 3) and basement construction recommendations (Fig. 4). Both figures are helpful in visualizing groundwater levels within the site development. However, as previously stated, the groundwater depths only provide a snapshot of the groundwater levels. Without observing the groundwater levels over time (to determine

seasonal fluctuations), it is difficult to come to the same conclusion as CTL. In addition, no revised mitigation measures were presented by CTL, only that groundwater “may” or “is expected to” impact basement construction. Therefore, **CGS recommends the county require groundwater monitoring/observation to verify that proposed floor levels are at least three feet above maximum anticipated groundwater levels and maintained year-round.** This monitoring/observation program should be conducted immediately and/or before the installation of public infrastructure **to determine if basements are feasible, to design detention ponds, and understand the effect groundwater will have on public infrastructure.** This monitoring should include observations through fall, winter, and spring to be effective. It is outside the scope of CGS’s review to determine whether the 3-ft minimum separation distance exists. If site grades cannot be raised to maintain the minimum separation distance, **then full-depth basements should not be allowed, and a statement indicating “No Basements” be shown on the preliminary plat.**

CTL states on page 16, *“Foundation drains should be constructed around the lowest excavation levels of basement and/or crawlspace areas and should discharge to a positive gravity outlet or to a sump where water can be removed by pumping. No underdrains are planned for this development.”* CTL has removed the statement *“Where locally high groundwater is present, below slab drainage layers may be appropriate”* and *“these drains could be connected to an underdrain system”* from their revised report. Individual foundation perimeter drains are needed around any below-grade (basement) space, **if determined to be feasible,** and may discharge to a positive outfall or connection to an underdrain system if constructed. **Individual foundation perimeter drains are intended to handle small amounts of intermittent water and should not be used to mitigate a persistent shallow groundwater condition.**

In CGS’s past reviews during sketch plan submittal (May 13, 2019), we emphasized the need for a groundwater collection or underdrain system beneath the sanitary sewer system, similar to that used in some areas of Meridian Ranch to the west. If basements are being considered for this development, CGS recommends incorporating an underdrain system in the project design.

Existing Channel B: As noted in the Letter of Intent, Drainage B is proposed to be realigned as a naturalized stream. Specific plans for the existing alignment that will be filled were not provided in our review of the documents. **CGS recommends that the existing channel alignment be further evaluated** to determine the effect of these systems (i.e., groundwater conditions, differential settlement, etc.) on future development. Since water will tend to convert back to its natural pathway, drain systems should be included in the design, i.e., piped, burrito drain, etc.

Submitted 4/6/2022 by Amy Crandall, P.E., Engineering Geologist, Colorado Geological Survey (303-384-2632 or acrandall@mines.edu)