

EP-22-0026_1 Eagle Rising Filing No. 1 Final Plat
Location: E½ Section 29, T12S, R65W, 6th P.M.
38.9785, -104.6898
El Paso County File No. SF2225

With this referral, CGS received a request to provide Review Comments (Email August 2, 2022); Final Plat (MS Civil Consultants, Inc., June 30, 2022); and Soil, Geology, and Geologic Hazard Study (Entech Engineering, Inc., June 29, 2022).

The Eagle Rising Filing No. 1 Final Plat (38.9785, -104.6898) does not contain any identified geologic hazards or unusual geotechnical constraints that would preclude the proposed development of 8 single-family residential lots on approximately 28.30 acres. The site is not located in an area designated as a floodplain per FEMA, however, Cottonwood Creek (FEMA Floodway Area Zone AE, Map Number 08041C0527G, December 7, 2018) is located to the southeast of the site. As noted in Entech's report, geologic conditions that will impose some constraints on development include areas of seasonal and potentially seasonal shallow groundwater areas, drainage areas, floodplains, areas of ponded water, artificial fill, potentially expansive soils, areas of downslope creep, potentially unstable slopes, and shallow bedrock. Entech's assessment of the geologic hazards and constraints is valid; CGS offers the following comments/concerns and recommendations:

Shallow Groundwater. As stated on page 7 in Entech's report, groundwater was encountered at 7 and 14.5 feet. CGS agrees with Entech "Fluctuation in groundwater conditions may occur due to variations in rainfall and other factors not readily apparent at this time." Also, "Due to the lot size, it is anticipated these areas could be avoided by structures." However, shallow groundwater with potential impacts to below-grade inhabitable areas, including basements, occurs within the site that was not discussed in Entech's study. 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. Monitoring/observations of groundwater fluctuations have not been conducted, and Entech's drilling program and subsequent groundwater measurements were last obtained in 2014.

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. The extent of the yearly variation in depth to groundwater must be known to determine basement feasibility.

CGS recommends the county require a groundwater monitoring/observation program that includes observations through fall, winter, and spring to be effective. This monitoring/observation program should be conducted immediately and/or before the installation of public infrastructure to determine if basements are feasible and understand the effect groundwater will have on public infrastructure. Below-grade areas must maintain a minimum separation distance of 3 feet between the bottom of the foundation and the maximum anticipated groundwater levels.

CGS recommends a plat note be added that no basements or inhabitable below-grade areas are allowed unless groundwater monitoring (through the annual seasonal fluctuations) before construction demonstrates that below-grade areas can maintain a minimum of 3 feet between the bottom of the foundation and the groundwater, or site grading indicates that it will mitigate the depth to groundwater.

CGS agrees with Entech on page 9, “*In areas where high subsurface moisture conditions are anticipated periodically, a subsurface perimeter drain will be necessary to help prevent the intrusion of water into areas located below grade.*” 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**.

Potentially Unstable Slopes and Downslope Creep. As indicated in Entech’s report (page 10), in reference to potentially unstable slopes, “some of the very steep slopes along the north pond area and a cut-slope in the central area on Lot 4 have been identified as potentially unstable.” CGS agrees with Entech’s recommendation, “Structures should be located a minimum of 20 feet (sic) from any potentially unstable slope unless stabilized,” and “Due to the size of the lots, it is anticipated these areas can be avoided by construction.” Careful consideration of the placement of structures and improvements is recommended to avoid potentially unstable slopes and downslope creep areas.

Comments uploaded to El Paso County Development Application Review on 8/18/2022 by Amy Crandall, P.E., Engineering Geologist, Colorado Geological Survey (acrandall@mines.edu).