EP-24-0010 Owl Marketplace Filing 1
NE¼ SE¼ Section 1, T13S, R65W, 6th Meridian
39.9459, -104.6082
File Number: VR2321
Final plat to create one residential lot into five (5) commercial lots.

With this referral, we received a request to provide Review Comments (Email dated November 2, 2023); Construction Drawings (Drexel, Barrell & CO., August 4, 2023); Final Drainage Report (Drexel, Barrell & CO., August 2023); Final Plat (Drexel, Barrell & CO., May 30, 2023); Soils and Geology Study (Entech Engineering, Inc., June 22, 2023); and other documents.

As noted on page 1 of Entech's report, the geologic conditions that will impose constraints on development include potentially expansive soils, shallow bedrock, seasonally shallow groundwater, and a mapped floodplain. A designated FEMA floodplain associated with an Unnamed Tributary to Black Squirrel Creek as determined by the Flood Insurance Rate Map (FIRM) (Map Number 08041C0553G, December 7, 2018) traverses the site. Entech's characteristics of the site geology and preliminary geotechnical recommendations appear appropriate to address the potential geologic constraints identified at this site. However, we offer the following comments and recommendations.

1. Entech's Figure 6 shows geologic hazards and constraints within certain areas of the property. However, only Tbs (Black Squirrel Formation) is shown in the eastern portion of the lots. Based on our review of Entech's boring logs, seasonal shallow water and expansive soils should also be included in this area. The legend should be updated to include missing symbols (sw, fp, and w) and the correct description of Tbs (Black Squirrel, not Pierre Shale). CGS recommends that Figure 6 be updated and a note added to the final plat listing the geologic hazards and constraints, along with mitigation measures.

2. The FEMA floodplain (Zone A) is associated with a large majority of the site. Based on the referral documents, a 10'x 6' box culvert will be installed to reroute the drainage around the northern and western sides of the site. Even so, the updated FEMA floodplain easement and any setbacks should be included in the final plat.

3. The building envelopes and their location in relation to the existing drainage were not provided in the plans. Entech states (page 9), "*it is anticipated that the shallow water areas will be mitigated with site grading and the installation of the box culvert, however, additional site investigation should be conducted following the installation of the box culvert and prior to construction on the new lots.*" CGS has concerns with future improvements constructed over the existing drainage, even following grading operations, as this natural drainage can be an area where water will continue to migrate. CGS recommends that if lots are planned (or allowed) within/near the existing drainage (after rerouting and site grading occurs), these areas be further evaluated during site-specific geotechnical investigations to determine the impact (i.e., groundwater conditions, differential settlement, etc.) on future development. It would be prudent to install a drain system within the existing drainage prior to grading operations.

4. Groundwater was encountered in Entech's borings at depths of 10 to 16.5 feet during drilling operations and at depths of 2.5 and 6.25 feet when measured following drilling. Due to the shallow groundwater conditions at this site, **no basements should be allowed**.

5. CGS agrees with Entech (page 6): "Fluctuation in groundwater conditions may occur due to variations in rainfall and other factors not readily apparent at this time," and with their recommendation (page 8), "**A minimum separation of 3 feet between foundation components and groundwater levels are recommended**."

6. Note 28 of the Construction Drawings references a report prepared by Ground Engineering. This note should be updated to Entech's soil and geology report for this site.

Submitted 11/21/2023 by Amy Crandall, Colorado Geological Survey: acrandall@mines.edu