September 4, 2020

Director Julie Murphy
Commissioner Bill Gonzalez
Commissioner Karin McGowan
Commissioner John Messner
Commissioner Priya Nanjappa
Commissioner Jeff Robbins
Colorado Oil and Gas Conservation Commission

RE: Geological hazards

Dear COGCC Director and Commissioners,

As professional Environmental and Engineering Geologists and Geological and Geotechnical Engineers in the state of Colorado, we are deeply concerned by the COGCC staff's resistance to adopting a common sense rule to protect all Coloradans from the impacts of geological hazards (geohazards for short). Colorado is fraught with geohazards, yet the COGCC rules currently only address geohazards from the perspective of protecting underground oil and gas assets.

Dr. David Noe, professional geologist formerly with the oil and gas industry and the Colorado Geological Survey (CGS), who has mapped numerous geohazardous areas throughout the State for the CGS, and reviewed numerous development applications for geohazards, testified to the Commission on August 26, 2020 regarding the deficiency in COGCC’s process for reviewing geohazards. In his testimony he found the geohazards evaluation and mitigation/approval process described by COGCC staff to be alarmingly inadequate when compared to what is done for other industries in Colorado that involve construction of high-cost-and-value facilities and infrastructure (such as subdivisions, highways, railroads, and mines).

A proper geohazard investigation requires several steps: on-site site reconnaissance and mapping, on-site soil sampling and testing, mitigation modeling, and mitigation design. In particular Dr. Noe identified the following deficiencies:

- **Usage of geologic and geohazard maps as sole source of decision-making data regarding geohazard avoidance and mitigation.** Geologic and geohazard maps are a valuable first-pass tool, in that they can indicate what hazards may be present and would need to be evaluated in a subsequent investigation. However, there are severe drawbacks to using them as the sole sources of decision-making data regarding geohazard mitigation:
  - most Geo-Hazard maps are regional in nature, and as such are not at a sufficiently detailed scale for doing onsite evaluations (for example regional maps often do not identify all landslides in the area);
the maps could be out of date, in that later or more-detailed geologic mapping data may not be included;
not all possible geohazards are mapped as single-factor compilation maps (Most people assume that everything that could have been made into a map has actually been done – there are numerous geohazard maps that simply don’t yet exist); and
detailed maps at scales of 1:24,000, which are useful for site-specific investigations, have only been made for about 25% of the state of Colorado. Even the existing maps must be looked at in some detail to ascertain which geohazards may be present.

• No requirement to consider geohazards as a contributing factor to a leak, spill, or accident. All other major types of infrastructure in Colorado incur frequent and occasionally severe damage from geohazards. For Staff to say that oil and gas infrastructure has been completely untouched and undamaged, is a cause for alarm. When there is no requirement to consider geohazards as a contributing factor to a leak, spill, or accident, then there’s no reason to believe that this would be considered or noted by Staff.

• Geohazard investigations or plans are unnecessary for all areas of Colorado. Staff indicated that due to the variability of geology in the State, that a rule requiring disclosure of site specific geohazard information is unnecessary. Geohazard investigations or plans are appropriate for all areas of Colorado. They can be scaled with the simplicity or complexity of the site. A “simple” site located on the plains may require a minimal but concise and proper investigation. A “complex” site in western Colorado may require more work and assessment. (Beware, though, that significant geohazards may exist anywhere and require a full review; for example: a seemingly “simple” site in southeastern Colorado that is located near the Cheraw fault may require a complex seismology mitigation assessment.)

For the reasons above we urge you to adopt common sense rules that 1) require land use reviews with CGS; 2) require the operator to submit site specific geohazard information; 3) require an alternate location analysis if a development project is proposed in a geohazard area or could trigger a geohazard event; 4) require seismic and landslide monitoring, if deemed appropriate; and 5) presume that a development proposal is subject to denial if the CGS recommends denial or identifying potential adverse potential adverse impacts. It is time for the COGCC to bring geohazard review and analysis for oil and gas development to the same level as other industries.

Signed,

Kevin Mininger
Geological Engineer
Denver, CO

Richard M. Wenzel III, P.E., P.G.
Professional Engineer I
Colorado Department of Transportation
Blackhawk, CO
James Gilbert
Principal
Kumar & Associates, Inc.
Denver, CO

Robert Lee
Denver, CO

Leyla Safari
Staff Engineer
Yeh and Associates
Denver, CO

Adam Tschida
Boulder, CO

William C. Hoffmann, Jr., P.E., FACEC
Senior Engineering Consultant
CTLIThompson, Inc.
Colorado Springs, CO

Robert Kirkham
Principal
GeoLogical Solutions
Alamosa, CO