

Land Subsidence and Earth Fissures in Cedar Valley, Iron County, Utah

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by Tyler Knudsen, Utah Geological Survey

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(SALT LAKE CITY, Utah) - A just-released report from the Utah Geological Survey (UGS) shows the ground has been sinking in some areas around Cedar City for decades. The comprehensive 116-page report presents the results of an investigation of land subsidence and earth fissures in Cedar Valley, Iron County, Utah, primarily due to groundwater pumping. "The sediments in the Cedar Valley that form the groundwater aquifer contain a significant amount of fine-grained silt and clay sediments. Those sediments become compacted when water is removed and the ground begins to sink," said Tyler Knudsen, UGS project geologist.

Long-term groundwater pumping, or mining, has lowered the water table in the Cedar Valley aquifer by as much as 114 feet since 1939. The groundwater mining has caused the fine-grained sediments to permanently compact resulting in the permanent loss of aquifer storage capacity and subsidence over an approximately 100 square mile area of the valley floor. "Because the ground does not subside evenly, earth fissures or deep ground cracks, have formed," said Knudsen. The subsidence has caused a total of more than eight miles of earth fissures to form. The earth fissures have been most noticeable in a partially developed subdivision in Enoch, Utah. It marks the first documented instance of subsidence and earth fissures affecting an urban area in Utah. Ground subsidence and earth fissures associated with groundwater mining in other arid southwestern states (Arizona, Nevada, and California) have caused tens of millions of dollars damage to homes, other buildings, roads, railroads, pipelines, canals, and dams. "Continued groundwater mining will likely cause the subsiding area of Cedar Valley to expand and new earth fissures to form, which may eventually impact other developed areas in Cedar Valley."

The report suggests possible aquifer management options to bring average annual groundwater discharge and recharge into balance to stop further land subsidence and earth-fissure formation. The report also includes recommended guidelines for conducting subsidence-and earth-fissure-hazard investigations prior to new development in subsiding areas.

The report was produced with support from the Central Iron County Water Conservancy District.

Investigation of Land Subsidence and Earth Fissures in Cedar Valley, Iron County, Utah (UGS Special Study 150) is available on a CD (116 p., 1 appendix) for \$19.95, which is also available as print on demand; the report also can be viewed on the UGS website at <http://geology.utah.gov/online/ss/ss-150.pdf>.