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To: [Rules Coordinator](#)
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[COMMENTS-TO-TITLE-16-SB-786-IGSHPA-TGWA-LOCKED.pdf](#)

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Rules Coordinator, Texas Railroad Commission

The ground source heat pump (GSHP) industry has been very active in the state of Texas since the 1980s with thousands of installations. This includes a 2012 GSHP installation in the Governor's mansion that heats, cools, and generates hot water for the building (see below). Former President and Texas Governor Bush has a GSHP system at his ranch in Caldwell. The industry has long history of establishing and updating standards to ensure system quality and environmental welfare. A broad collation of stakeholders is near the end of the process of publishing revised standards through the American National Standards Institute (ANSI) and the Canadian Standard Association (CSA). The document is ANSI/CSA-448 – Design and installation of ground source heat pump systems for commercial and residential buildings.

You will note the standards associations and the two primary professional organizations involved with the technology, the American Society of Heating, Refrigerating and Air-conditioning Engineers (ASHRAE) and the International Ground Source Heat Pump Association (IGSHPA) refer to the systems as "ground source" rather than "geothermal". These two organizations, along with ANSI and CSA, also use the term "ground heat exchanger" (GHE) rather than "geothermal injection wells".

The term injection does not fully capture the workings of these systems since heat pumps also withdrawn heat from the ground to warm buildings in the winter and heat water year-round. These systems use the same thermal fusion high-density polyethylene (HDPE) piping systems as used in natural gas distribution. The same grouts as used in the water well industry with enhancements are also applied.

The term "geothermal" was unfortunately (in my opinion) assigned to the industry by the US Department of Energy. It was done in the early 1980s primarily to channel research and development funds through their established Geothermal Division. Many of those involved with the design and installation of these systems object to the technically incorrect term "geothermal".

The short time frame in which the SB 786 regulations were developed and absence of inclusion of the industry knowledge contained in the ANSI/CSI standard is of concern. As written the current regulations would likely add significant costs to GSHPs and seriously damage the industry and job growth that accompanies it.

Furthermore, the majority of the GSHP systems in Texas are in K-12 schools. When done in a quality manor, closed-loop GSHPs will last over 30 years, save schools millions of dollars, and require minimal maintenance (no outdoor components). At the end of the 30+ year life of the above ground equipment, the ground heat exchanger will likely be available for a second and third life.

I am not aware of any environmental damage done in Texas by ground heat exchangers installed according to CSA-448 standards. Since there are thousands of GHEs installed within a 50-mile radius of the Governor's Mansion, it would be prudent to investigate and verify the effectiveness of the existing installation practices in the ANSI/CSA-448 standard.

I recommend to pause the promulgation of SB 786 until a thorough consideration of ANSI/CSA-448 and investigation of existing installations be conducted. If this is not possible, I recommend accepting the attached [COMMENTS TO TITLE 16 & sb786 – IGSHPA – TGWA](#).

Steve Kavanaugh, Professor Emeritus of Mechanical Engineering

Fellow ASHRAE, Fellow ASME and lived in three homes with GSHP systems beginning in 1960 in Groves, TX.

