Minutes: Submerged Closed Loop Heat Exchangers Advisory Committee

Date April 3, 2025, 9 – 11:30 a.m.

Location Hybrid Teams Meeting; Metropolitan Council, Room LLA, 390 Robert St. N., Saint Paul, MN 55101

Attendees **In Person:** Danny Nubbe (Certified Representative), David Henrich (Advisory Council on Wells and Borings), David Traut (Certified Representative), Jim Lubratt (Geothermal Professional), Keith Larson (Geothermal Professional), Luke Norell (alternate – Professional Association), Ryan SanCartier (Professional Association), Todd Blomstrom (City Representative), Willy Miley (Geothermal Professional),

Virtual: Aaron Meyer (Professional Association), Bjorn Olson (alternate – City Representative), Don VanKeulen (Delegated Well Program Representative), Jay Egg (Geothermal Professional), Jeff Luehrs (Delegated Well Program Representative), Mike Steffl (Certified Representative),

MDH: Jon Olson (WMS Technical Unit Supervisor), Avery Guertin (WMS Regulatory Coordinator), Jennifer Weier (WMS Hydrologist Supervisor), Kara Dennis (WMS Hydrologist)

Acronyms and Terms

SCLHE – Submerged Closed Loop Heat Exchangers

WMS – Well Management Section

Welcome and updates

Guertin thanked members for coming together to share suggestions and comments on behalf of themselves and their constituencies. Guertin provided an update on the current SCLHE rulemaking. The Order on Adoption was submitted to the Office of Administrative Hearings. Members will be informed of advancement of the current SCLHE rulemaking.

Members briefly introduced themselves. Luke Norell is present as an alternate for Jeremy McConkey, representing a professional association. Bjorn Olson is present as an alternate for Luke Hollenkamp, representing a city.

Overview of water-well regulation (Avery Guertin, Regulatory Coordinator))

Guertin provided a high-level overview on well types regulated by Minnesota law, including dewatering wells, environmental wells, and water-supply wells. Isolation distances are not applicable for dewatering wells and environmental wells. All water-supply wells must conform to well construction standards and isolation distances to protect public health (drinking water) and groundwater. Water-supply wells are designated by use type: potable and non-potable. Non-potable wells have four exemptions to water-supply well construction requirements – minimum casing depth, sediment limits, lead prohibition, and water quality sample requirements.

Larson asked how sensitive wells are defined. Weier described situations in which a water-supply well may be considered a sensitive well according to Minnesota Rules, chapter 4725 *(Minnesota Rules, section 4725.0100, subp. 43a)*.

Miley added that remedial wells are considered water-supply wells in Minnesota Rules, chapter 4725. Weier provided some background on the definition of a remedial well in Minnesota Rules. Minnesota Statutes, Chapter 103I, was updated in 2017, and remedial wells are now regulated as environmental wells instead of water-supply wells. Minnesota Rules, Chapter 4725, has not yet been updated to reflect the 2017 statutory changes. Statute ultimately overrides rule.

Henrich, Miley, and Traut commented that the definition of a water-supply well can be limiting for the SCLHE technology. Traut said that the Minnesota Plumbing Code (Minnesota Rule, chapter 4717) seems to be more readily updated to accommodate new technology. In Minnesota Statutes, Chapter 103I, a SCLHE is installed within a water-supply well. Changing the well type a SCLHE is installed within would require a statutory change. Olson acknowledged the desire to explore another well type for installing a SCLHE within and explained that addressing statutory changes is outside the scope of this committee.

Members discussed the importance of understanding how wells are constructed when discussing potential changes to isolation distances. Olson stressed the importance of staying on topic with the limited time this committee has and concerns over spending too much time on well construction. Weier explained that there are many nuances with well construction requirements in the rules based on geology. Henrich stated that isolation distances do not take into consideration geology and potential upgradient sources of contamination. A well constructed in sandy material will be more sensitive than a well constructed into bedrock.

Committee member discussion

Henrich asked if there is a minimum water-supply well construction requirement that would alleviate the need for required isolation distances from potential contamination sources. Traut stated that SCLHEs could have a reduced isolation distance requirement, but that the isolation distance should be based on geology. He brought up how septic design is based on a soil percolation test. He added a separate designation for a well used for a SCLHE would add clarity. Weier agreed that a soil percolation

test is important to septic design. She asked for clarity from Traut if he was suggesting if isolation distances should be determined site-by site based on geology and soil testing. Traut responded by suggesting that these systems should be assessed site by site.

Henrich said there is a well-defined process for updating [converting] existing domestic wells to public water-supply wells and advocated that a process could be created to convert wells used for SCLHEs to other well types if they have their own category. Larson asked if SCLHEs should be considered differently because they might be under a greater pressure than a traditional water-supply well due to the piping that is installed into the SCLHE. Miley and Henrich provided some context on the construction of a SCLHE. They asserted that operation of a SCLHE does not create a cone of depression and does not create the movement contaminants in an aquifer.

Luehrs reminded the members that there is a variance process, which can allow for lessened isolation distance requirements and differing construction requirements from those regulated in rule. This can allow for an assessment of site conditions when evaluating proposed alternatives to construction requirements. A variance is a formal process to get an exception from a rule requirement. MDH is authorized to consider alternatives from rule requirements but not statute requirements. Lubratt asked about variance process, and Weier provided an overview of the variance process for the members. Henrich added that variance can be denied, and we should not rely on the variance process. He advocated for updated isolation distance requirements for SCLHE water-supply wells.

VanKeulen expressed concern about the SCLHE and the geothermal pump and inject wells. He described the potential for the SCLHE to move contaminants vertically throughout the aquifer profile. His concern addressed that these systems may be installed or constructed within an aquifer also used for a public water supply (providing drinking water to people) or within a well head protection plan area. He advocated in these situations that the isolation distances should be greater than current requirements in rule.

SanCartier asked about the history of the isolation distance requirements in rule. He described how “codes” are often updated based on new or emerging technologies or changes to industry standards. Weier provided members with some background on how isolation distances were determined in rule. Many of the existing isolation distance requirements were determined in 1974, when the rules regarding isolation distances were first written. Isolation distances are meant to protect drinking water wells and groundwater resources and are a minimum standard. Minnesota Rules specify exceeding the isolation distances when possible. While not present at the time the isolation distances were developed, the assumptions are that practical considerations, like lot sizes, were incorporated while still maintaining the maximum possible distance from sources of contamination. Nubbe added his desire to specify isolation distances that are based on site soil and geology.

Larson asked MDH about what types of variances are approved, how many are received, and how many are rejected. Weier provided a high-level overview of the variance program, explaining that MDH usually issues between 100-200 (around 150) variances per year. Variances are issued for all different

kinds of wells, but most variance are issued for wells that cannot meet the isolation distance requirements, most commonly on small lots.

Traut shared with members that SCLHEs and water-supply wells will have a different impact on the movement of water within the aquifer. He stated that there are more sources of contamination and demand for water today than there were when rules were first adopted setting isolation distance requirements.

Lubratt asked members if changes in groundwater pressure and temperature can create changes in the microbiology of groundwater. He asked if the impacts on biogeochemistry from a SCLHE system has been studied. Henrich responded stating that oxygen is most impactful on changing the biogeochemistry of groundwater, and SCHLE systems are not changing the redox conditions of the groundwater because they are not creating drawdown. Members discussed that microbes may not be activated until the groundwater temperature reaches 80 to 90 degrees Fahrenheit. Miley added that Darcy Solutions' SCLHE systems do not usually increase groundwater temperature more than 10 to 15 degrees Fahrenheit within 500 feet radial distance from a water-supply well used for a SCLHE. He stated that there is no groundwater temperature change occurring in the aquifer at 500 feet from the well. Guertin asked for clarification on how the temperature was determined, and Miley responded that it was determined using a groundwater model. Traut, Nubbe, and Leuhrs provided additional information on groundwater chemistry and microbes, and how those changes are based on the redox conditions in the groundwater. Nubbe added that water chemistry can vary greatly from well to well.

Lubratt asked members if there is a required setback between an SCLHE well and the property line or a requirement to notify neighboring property owners if a SCLHE will be installed near a property line. Weier responded that there is currently no isolation distance requirement from a property line in Minnesota Rules. Larson expressed concern with this situation and added that he thought there should be a notification process as a neighboring SCLHE could impact a neighbor's heating and cooling capacity from their well. Henrich responded that there is no requirement for an existing well or geothermal system to notify a neighboring property owner when the well is constructed, or a geothermal system is installed. Traut and Nubbe described situations where they have encountered groundwater at elevated temperatures. Nubbe said that based on the varieties of groundwater conditions and geology, there should be some nuances included in this rulemaking effort.

Meyer asked Miley about the geologic materials used in the model to evaluate the thermal influence from a water-supply wells used for a SCLHE, which produced the result of a radial thermal influence within 500 feet of the well. He also asked about the screen separation distance. Miley said that the model used the geology of the Prairie du Chien aquifer. He said that there is usually a 20 feet space between the screen sections of the SCLHE. Henrich added that the screen spacing is highly variable based on geology. Olson asked if Miley could provide some of these data at a future meeting.

Traut asked about the process to update or amend a variance. Weier provided some context about the process of updating a variance when construction conditions differ from the initial application.

Guertin acknowledged the helpful discussion during the past meetings and urged members to consider bringing forward recommendations for possible changes to screen configurations and isolation distances. Guertin asked members if it made sense to reserve some time during the meeting planned for April 14 to hear suggested changes to the existing isolation distances. Meyers asked if MDH can provide a justification or SONAR [Statement of Needs and Reasonableness] language for the existing isolation distance requirements at the next meeting.

Open Forum

There are no members of the public in attendance.

Adjournment

Next meeting: April 14, 2025, from 9 – 11:30 a.m.

Meeting will be held at:

Metropolitan Council
390 Robert St. N., Room LLA
St. Paul, MN 55101
wellrules.mdh@state.mn.us
www.health.state.mn.us

4/10/2025

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