Engineer & Driller Collaboration

Presented by Brian Urlaub

Geothermal: The Genius Renewable

Live at Groundwater Week in partnership with NGWA

Las Vegas, NV
December 5-7, 2023
CEUs for this workshop

Be sure to scan the QR for Tuesday, Wednesday, and Thursday workshops to get points towards your IGSHPA certification CEUs
Test Bores

• Finding the local drilling contractors that have experience with geothermal can be a challenge.

• Doing initial research to get a handle on the site geology/formation and what could be the possible drill depth.

• Make sure drilling contractors are comfortable with drill depths, pipe sizes, grout type, and what methodology will be used to determine site spoils/water management.

• We are finding that in many areas we need to have water samples taken to determine water quality and potential contamination issues (arsenic for example) and if that will need to be mitigated.
Designing projects that are constructable!

• Understanding the work force capabilities is key!

• Designing a system that the awarded contractor doesn’t come back with a lot of VE items — that makes for contentious meetings, and no one wins in front of the client.
  • Vaults vs. Manifolds vs. direct buried valves
  • Bore Layout and circuiting layouts
    • Discuss before final issuance of drawings on trenching/installation
    • The system should be installed close to how its drawn-on plan

• Should site spoils/water management be included in design docs?
  • Generally, means and methods are not part of engineering.
How to do circuit layouts that make sense?
Forsythe Middle School - Michigan
Prairie Island Project – Red Wing, MN
Prairie Island Project – Red Wing, MN

Project Specifications:
• Open Loop with Supply & Re-Injection wells
  • 7 Supply
  • 14 Re-Injection
  • 150’ Deep
  • 7000GPM

• Converting Existing CEP to GSHP CEP
  • Converting from high-temp HW to low-temp HW (130F)
  • Serving Casino Floors
  • Eagle Tower Hotel
  • Water Park

• Peak Loads
  • Cooling = 3000 tons
  • Heating = 2300 tons
Open Loop Well Design Collaboration

• Working together developing testing procedures and schedule to ensure that the proper information is obtained.
  • Pumping rates versus mounding/draw down.
  • Flexibility between engineering specifications and onsite conditions, being able to adapt to keep the process moving.

• Collaboration between engineer, driller and screen manufacturer for proper screen length, slot size, availability, and cost.

• Being clear upfront about the proper data needed from tests results to ensure that data can be collected and analyzed.

• Schedule – understanding timing for both engineering work and testing procedures as each step will wait for info from the previous step.

• Understanding the challenges with constructing wells in certain formations that need to be discussed and agreed upon before final design i.e. casing, grouting, well development.
Testing Procedures

• With deeper bore holes and GLHE systems under buildings it is even more critical to write very good specs for the testing procedures.

• We have been getting push back from contractors on testing to higher pressures and following ASTM procedures.
  • The “we have always done it this way” is the typical comment

• Doing flow testing on the HX’s before connecting to laterals
  • This has been a challenge to get the correct specification and process down

• Using Hydrostatic testing vs. Pneumatic testing (especially in winter) has been a challenge.

• Flushing & Purging large systems, working with contractors to make sure they have the equipment to do the work or what it will take.
Questions or Comments?

Thank you for attending a presentation by Brian Urlaub

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