THE TOWN OF LYSANDER

Lysander Data Center Advisory Committee Meeting

July 31st 2026

Water Use Concerns

Water Concerns from the spreadsheet

- Water overall priority: 2.5
  - Water Pollution (including PFAs) 2.5
  - Water Usage 2.7
  - Residential Water Pressure 2.1
  - Ground Water Levels 1.8
  - Who pays for Infrastructure upgrades? 3.0
  - Waste Water Handling and treatment 3.0
  - An additional item was suggested last week to discuss stormwater runoff

Background:

- The previously approved warehouse required water and sewer lines to be built out to the site
- The planning board typically requires developers to pay for any required infrastructure additions
- The town does not have its own municipal water system
- The town’s waste water treatment is handled by the county
- Existing town code covers storm water and runoff

Town vs County Water Responsibilities

- County provides municipal water (OCWA)
- County provides waste water management (WEP)
- Town can mandate connection to municipal water supplies
- Town can regulate the use of wells including limits on large-scale water withdrawals
- During droughts towns can mandate limits on outdoor water use, including withdrawals from wells

Why do they need so much water?

- We’re not sure how much water they’ll actually need. we haven’t seen a proposal at this time.
- Data Centers often use water for cooling

Let’s take a step back

Server Cooling

Server Cooling – Air (for small data centers)

- The simplest method runs cold air over the servers to cool the chips
- The heated air is run through a chiller and recycled
- Air (convection) is not a particularly good way to remove a lot of heat quickly
- Works for smaller data centers with fewer servers with space between them
- Heat from the chiller is handled outside of the server room

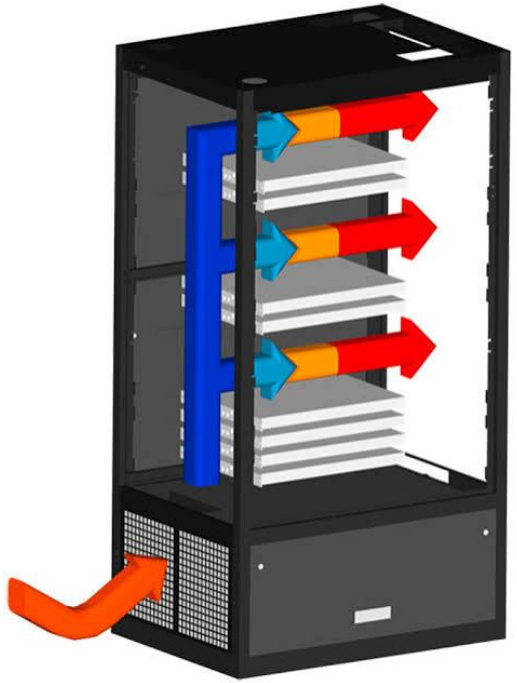

Image source: UptimeRacks.com

Server Cooling – Rear Door Heat Exchangers (for relatively small data centers)

- This is an upgrade to the simple cooled air model
- The heated air from the server is run through a liquid cooled heat exchanger mounted to the back of the server rack.
- This system is more efficient but still relies on air convection between the servers and the heat exchanger
- Works for smaller data centers where the servers can be mounted closer together
- Heat from the heat exchanger is handled outside of the server room

Image source: Stulz.com

Server Cooling – Direct Liquid Cooling

- This is an upgrade to the rear door heat exchanger model
- The chips are cooled by running liquid directly to the chips.
- Liquid conduction is significantly more efficient at removing heat than air convection
- Allows the servers to be packed tightly together
- The liquid is run through a chiller and recirculated
- Heat from the chiller is handled outside of the computer room

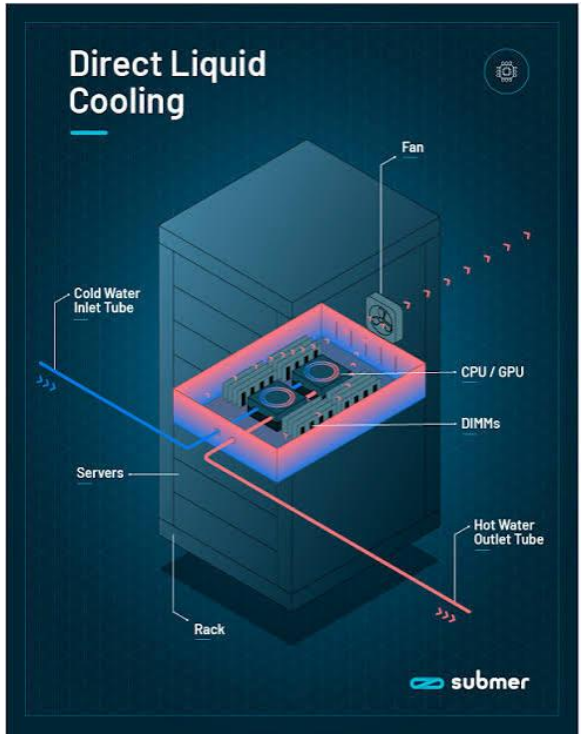

Image source: Submer.com

Server Cooling - Immersive

- The systems are completely submerged in a non-electrically conductive liquid
- The liquid efficiently transfers heat from the equipment
- The fluid is pumped through a chiller and recirculated around the servers
- Allows all components to be equally cooled
- Extremely efficient, but can be expensive and requires specially designed equipment, training, and handling
- The heat from the chiller is handled outside of the server room

Image source: GigaLight.com

Here's what I didn't make clear last time:

- In all of these scenarios (except some basic versions of the first air-only one) the coolant inside the server room stays in its own closed loop.
- It's run through a heat exchanger or chiller before the heat is disposed of using a separate coolant loop
- Common Data Center external cooling methods are:
  - Evaporative Cooling (open or semi-closed loop)
  - Dry Cooling (closed loop)
  - GeoThermal Cooling (closed loop)
  - Heat Recovery (closed loop)

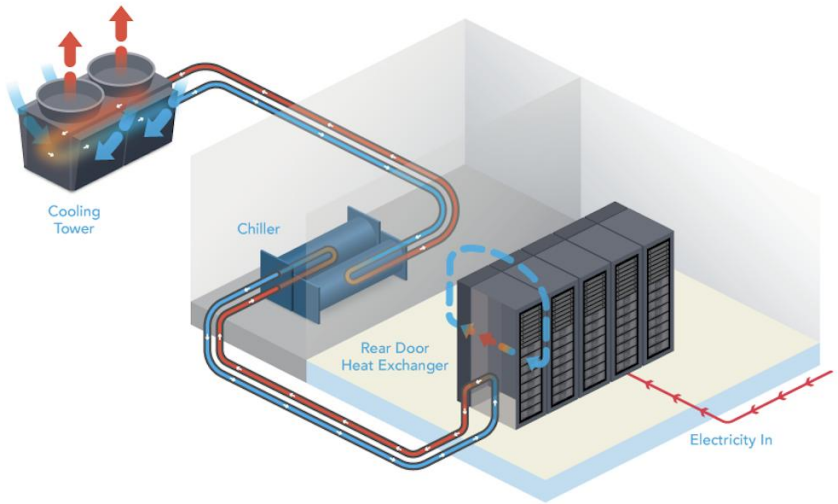

Image source: UpsiteTechnologies

External Cooling

Evaporative Cooling

- Heat from the data center is cooled by water evaporation in the cooling tower
- It's a low cost, effective cooling method when outside temps and humidity are not too high
- It's quiet
- However it's extremely wasteful of water
- The heat island effect can be mitigated by making the towers taller

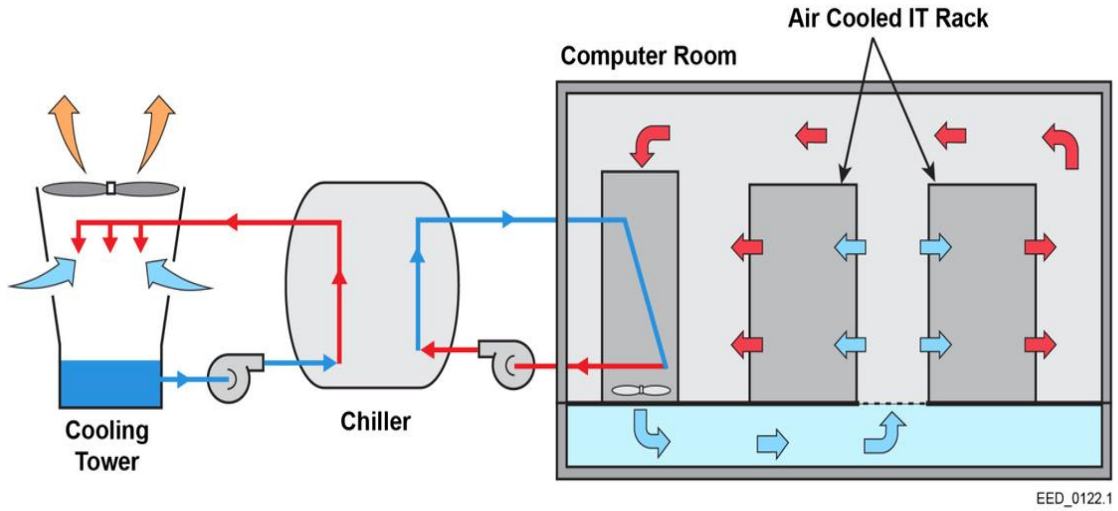

Figure 1: Schematic of a Typical Data Center Evaporative Cooling System

Image courtesy of US Department of Energy

Dry Cooling

- Pumps the liquid coolant through metal fins where air can carry the heat away (a car radiator is a good example)
- Uses external fans on heat exchangers
- Very efficient in terms water usage as this is a closed loop system
- More expensive than evaporative cooling

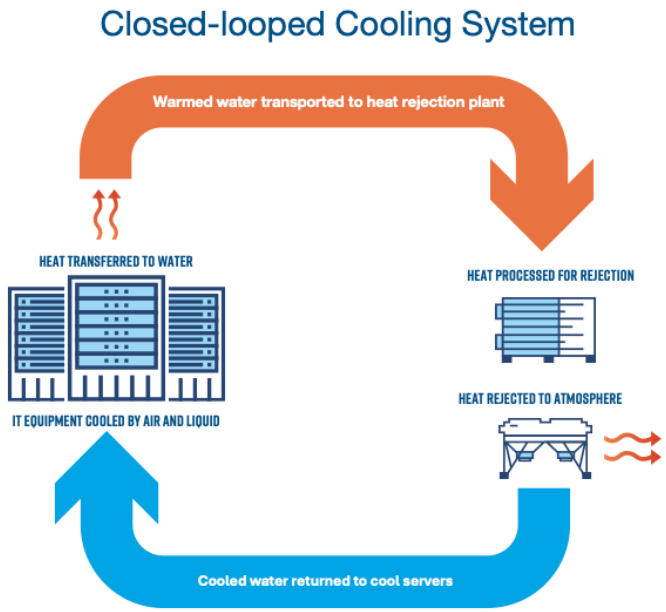

Image source: US Data Centers Today

Geothermal Cooling

- A version of closed loop cooling, except the liquid is cooled by running it underground
- Very efficient
- Up front costs can be high
- Minimizes the “heat Island” effect that may occur with the two prior systems

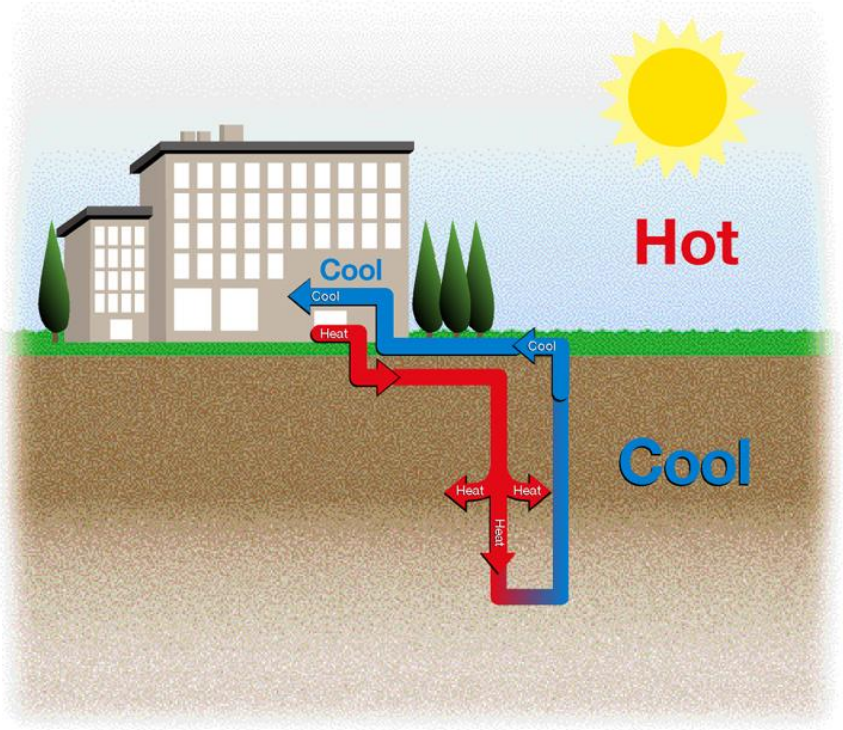

Image source: HeatSpring Magazine

Heat Recovery Cooling

- A version of closed loop cooling, except the liquid is cooled as part c a heating district
- Provides a tangible community benefit
- Up front costs can be high
- Minimizes the “heat Island” effect
- Can be used in conjunction with the other methods

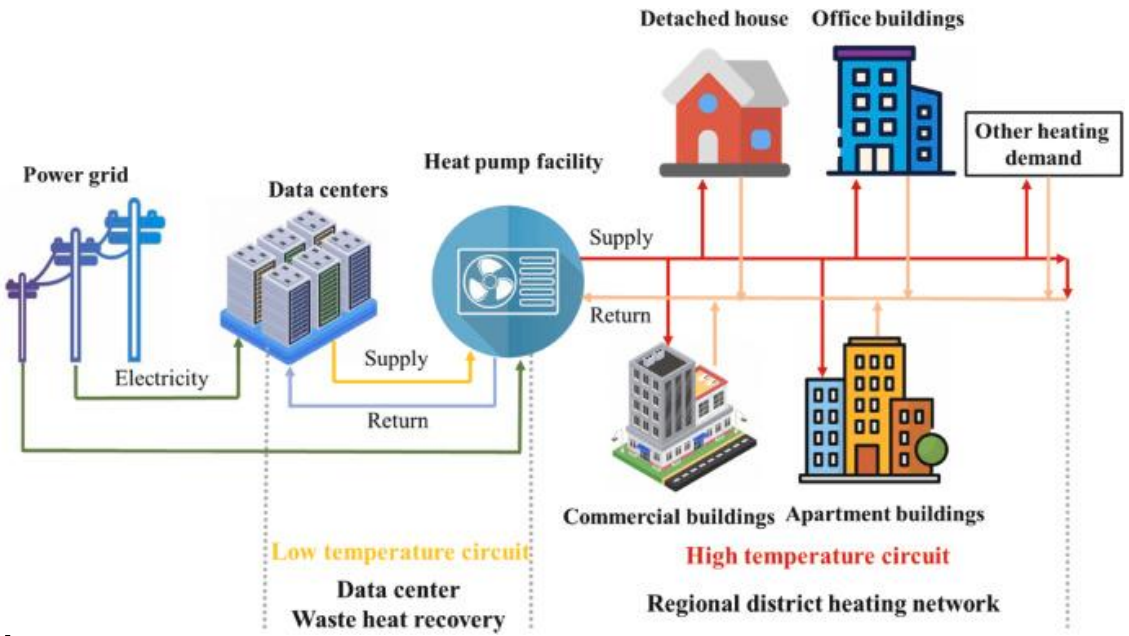

Image source: ScienceDirect.com

Water Use Recommendations

Water Usage Recommendation Options for discussion

- Require one of the closed loop cooling system options – No evaporative systems
- Require the option of using captured heat for nearby projects (household, agricultural, commercial, or industrial)

  ✳Recommend that the developer is required to pay for infrastructure upgrades

  ✳Recommend that the developer is required to fund offset projects for any large scale water use (find/repair large leaks in the municipal system, system upgrades, etc)

- Require a study about the impact of any large scale water use before site plan approval (impact to water availability, quality, and pressure, etc)
- Require the use of municipal water on site – No wells
- Other

Next Steps

Next Steps

- Continue today’s discussion on water usage
- Begin talking about waste water and storm water concerns and recommendations
- What did we miss?
- What needs clarification?

Thank You