

Northeast Regional Geothermal Workshop

Review of Existing Regulations in New England and New York

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MassDEP – Drinking Water Program

Open-Loop Regulations

State	CT	ME	MA	NH	NY	RI	VT
UIC Registration/permit Required	X	X	X	X	X	X	X
Residential exemption from UIC		X			?	X	
Water withdrawal reporting/registration/permitting requirement	X		X	X	?		X
Water quality testing requirement	X	X	X	X	Not always	X	X
Annual water quality monitoring requirement	X			X			X
Requires the use of a state licensed well driller	X	X	X	X & licensed pump installer	X		X
Well construction standards	proposed standards	draft regulations	X	X	under development		X

Open-Loop Setback Distances

(only where different from drinking water well setbacks in feet)

State	Private Drinking Water Well	Public Water Well	Public Surface Water	Surface Water	Leaching Septic	Watertight Septic Tank	Property boundary	State Rights of Way	Water Line	Sewer Line	Building foundations
MA	25	100-400			25	25	10		10	10	
NH					75	75	75	50			
RI	100	400	200	50-150	25						10

Open-Loop Lab Analytical Requirements

State	VOCs	Diesel Organics	Gasoline Organics	Oil & Grease	Arsenic	Lead	Copper	Zinc	Al, Ba, Be, Cd, Cr, Hg, Ni, Se, Ag,	Nitrate	Nitrite	Gross Alpha	Uranium	Radium	Na & Cl	Fe	Mn	pH	Temp.	TDS
				X		X	X	X										X		
	X	X	X		X	X	R						X		X		X			
	X				X	X	X			X	X	X	X	X	X	X	X	X		
	X				X	X	X	X	X				X			X	X	X	X	X
																			X	

Open-Loop System Bleed Flow Requirements

- NH, ME, and MA indicate that return flow should go to the same aquifer from which it was withdrawn
- Mass. requires justification for bleeding $> 5\%$ of return flow to a different aquifer
- Draft Maine Well Driller Rules regarding system bleed:
 - Should not exceed 1 gpm per acre
 - Recommend no bleed for < 1 acre lots

Closed-Loop & Direct Exchange Regulations

State	CT	ME	MA	NH	NY	RI	VT
UIC registration/permit required		X	X	X			
Residential exemption from UIC		X					
Well construction standards	proposed standards	draft regulations	X				X
Ground-loop additive requirements	proposed standards	R	X	draft regulations			
Requires the use of a state licensed well driller	X	X	X	X	?		X

Closed-Loop Setback Distances (feet)

State	Private Drinking Water Well	Public Water Well	Leaching Septic	Watertight Septic Tank	Property boundary	Surface water	Water Line	Sewer Line	Drain line
CT (draft)	25 - 50	25 - 200	50	25		10		10-50	10
ME (draft)	45	45 - 200	50 - 100	30	10				
MA	50	100 - 400	25	25	10	10	10	10	
NH	50								

Closed-Loop Antifreeze

State	Propylene Glycol	Ethanol	Methanol	Potassium Acetate	Calcium Magnesium Acetate (CMA)
CT (draft)	X			X	
ME	R				
MA	X	X			
NH (draft)	X	X	X	X	X

Direct Exchange Refrigerants

State	R-22	R-134A	R-407C	R-410A	May not contain a regulated substance
CT (draft)		X	X	X	
MA	X	X	X		
NH (draft)					X

Closed-Loop Tube/Pipe Materials

State	High density polyethylene (HDPE)	Copper w/ cathodic protection	fiberglass	PEXa
CT (draft)	X	X		
ME (draft)	X			X
MA	X	X	X	
NH	X		X	

Closed-Loop Grouting Requirements

State	CT (draft)	ME (draft)	MA	NH
High solids bentonite slurry	X	X	X	X
Bentonite & sand	X	X	X	X
Cement & sand or concrete	Only for DX	?	Only for DX	X
Neat cement	Only for DX	?	Only for DX	
Grout 111 (Brookhaven National Laboratories)	Only for DX			
Maximum thermal conductivity of 10^{-7} cm/sec	X	X	X	
Installed via tremie pipe from bottom	X	X	X	X

New York Requirements

- Only state of the 7 where the UIC registration is with the EPA
- No reporting requirements for closed-loop < 500 feet deep
- NY DEC, Division of Water requires pre-notification and well completion reports for open-loop < 500 ft deep
- Part 602 permit also required for all open-loop of > 45 gpm installed on Long Island
- NY DEC, Division of Mineral Resources regulates all open-loop > 500 feet deep.

Water Withdrawal Reporting/Registration/Permitting

- CT DEP Groundwater Withdrawal Permit
 - Must file for permit for any groundwater withdrawal > 50,000 gpd unless returned to same aquifer within 250 feet from the withdrawal point
- MassDEP Water Management Act Form I – determination of non-consumptive use:
 - required for open-loop system design rate > 100,000 gpd (70 gpm) (threshold applies to both groundwater and surface water withdrawals)

Water Withdrawal Reporting/Registration/Permitting

- NHDES Water Use Registration and Reporting Program
 - Systems that withdrawal and discharge more than 20,000 gallons per day must report monthly water use on a quarterly basis.
- NHDES Groundwater Withdrawal Program
 - Systems where the difference in the volume of water extracted and returned to an aquifer is more than 57,600 gallons per day, must obtain a large groundwater withdrawal permit.

Water Withdrawal Reporting/Registration/Permitting

- VT DEC Groundwater Withdrawal Program
 - Exemptions for residential use and standing column wells
 - Otherwise
 - Must file groundwater report if average > 20,000 gpd withdrawal in 1 month
 - New withdrawals starting July 1, 2010 for > 57,600 gpd require a Groundwater Withdrawal Permit
 - For grandfathered withdrawals, increases of 25% or 57,600 gpd (whichever is smaller) requires Groundwater Withdrawal Permit

Dual Use Geothermal/Potable

- Connecticut requires:
 - reduced backpressure control valve prior to the heat pump but after the tee separating geothermal from potable water flow
- MassDEP requires:
 - Pump intake below return pipe outlet
 - Backpressure backflow prevention device in same location as for Connecticut
- NHDES only allows for 1 to 2 unit residential