

Interconnection Roadmap

What is an Interconnection?

An “interconnection” is any physical, hydraulic connection between two or more public water systems (PWSs). Interconnections may be:

- Emergency or active
- Temporary or permanent
- Unidirectional or bidirectional

Purposes of Interconnections

Interconnections are commonly distinguished between “Emergency” and “Active” or every-day use.

Emergency Interconnections: Established in anticipation of an emergency event, allowing one PWS to supply another with water for a temporary duration. Emergency interconnections may also include raw or finished water interconnections to replenish surface water supplies in a drought.

Active Interconnections: Established for use on an as-needed, non-emergency basis, daily or periodically, so that a PWS may routinely supplement or fully supply another public water system’s water.

Emergency interconnections are not considered “available water” for water supply planning purposes and do not require a Diversion Permit from the Connecticut Department of Energy and Environmental Protection (CT DEEP) if only operated for firefighting or during a State-declared public water supply emergency. The Connecticut Department of Public Health (CT DPH) requires a Sale of Excess Water Permit for emergency interconnections.

Water supplied by an *active interconnection* with a purchased water agreement may be considered available water by the purchaser. The seller must include the full, contracted amount as a demand (or reduction in supply) in its water supply planning.

Active interconnections require a Sale of Excess Water Permit from CT DPH. If the interconnection is between distribution systems or service areas and operated at a maximum day of more than 50,000 gallons per day (gpd), a diversion permit from CT DEEP is required.

When is an Interconnection Prudent?

| Emergency | Active |
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| <ul style="list-style-type: none"> • Excess supply is available. • PWSs are proximate. • Potential for durational water quantity issues exist with one or both PWSs. • Temporary disruptions are planned for one or both PWSs. • An interconnection will Improve system resilience to drought, climate change, and equipment failure. | <ul style="list-style-type: none"> • Excess supply is available. • PWSs are proximate. • An interconnection will ensure an adequate or reliable water supply. • Finished water quality of the donor PWS is comparable to the receiving PWS. • An interconnection will improve system resilience to drought, climate change, and equipment failure. |

What are some Common Deterrents to Interconnecting?

- Differences in finished water quality.
- Difficulty navigating various permitting processes.
- Environmental impacts (inter-basin transfers or increased source withdrawals).
- Design, construction, and operating costs.
- Pressure gradient issues.
- Fire protection considerations.
- Monitoring/logistical issues.
- Political constraints and “turf” concerns amongst PWSs or customers.
- Public concern over costs.
- Concerns from the supplying PWS over dedicating water that may not be used or purchased.

Planning an Interconnection

The Integrated Reports for the three PWSMAs discuss planning considerations and give guidance for cost estimates.

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| Routing Evaluation (Cost = up to \$100,000) |
| <ul style="list-style-type: none"> • Evaluate routing alternatives. • Consider system needs at each potential interconnection point (eg: pump stations). • Investigate the site in greater detail to account for impediments (eg: shallow bedrock). |
| Permitting and Environmental Analysis (Cost = \$50,000 - \$500,000) |
| <ul style="list-style-type: none"> • <i>See Sale of Excess Water Permit and Diversion Permit guidance.</i> • Local zoning and wetlands approvals may be required. • Connecticut Environmental Protection Act (CEPA) review may be required for State-funded projects. • Plans will also be reviewed by CT DPH to evaluate engineering design. |
| Engineering Design (Cost = \$100,000 - \$500,000, highly variable) |
| <ul style="list-style-type: none"> • Design of piping, pump stations, pressure-reducing valves, additional treatment if necessary, and needed connections. • Specification of pipe sizing and layout, pump station layout, and location and layout of any storage facilities. • Design costs are highly variable, depending on the scope and setting of the project. |
| Construction (Cost = typically over \$1,000,000, but highly variable) |
| <ul style="list-style-type: none"> • Informed by the project design but subject to change and unforeseen issues. • Purchase and installation of all piping, pumping stations, valves, meters, and other improvements and facilities necessary to complete the interconnection. • Includes required inspections, traffic control, etc., as well as land acquisition. |
| On-going Maintenance |
| <ul style="list-style-type: none"> • Includes predictable costs such as property taxes (for investor-owned utilities), land leasing if necessary, electricity, water treatment, and regulatory compliance costs. • Also includes capital improvement costs such as replacing equipment and facilities. |

Guidelines for Use and Maintenance of Interconnections

- 1) Conduct hydraulic analysis of the two systems to determine pipe size that is adequate to transmit the water required at a predetermined differential pressure.
- 2) Equip the interconnection with a meter that is sized to properly measure the anticipated flow and that has isolating valves.
- 3) Provide a coupling to permit removal of the pipes or meter if required.
- 4) Provide a bypass for emergency use to allow the interconnection to be used at times when the meter is out of service.
- 5) Provide taps on each side of the meter isolating valves to check pressures prior to use and to empty pipes for dismantling for meter service and calibration.
- 6) Provide nearby hydrants for use in water sampling, flushing, and flow measurement.
- 7) Provide a meter pit, if possible, with manhole covers capable of being easily opened for purposes of meter reading, valve adjustment, and flushing.

Agreements between Systems

It is best to have a written agreement in place that defines the responsibilities of both parties to an interconnection. While some older interconnections may be based on a verbal or long-standing agreement, new interconnections should be clearly defined, since they are essentially a commitment against the supplying party's available water. A receiving utility may account purchased water as part of its available water, provided that the contract provides for reliable delivery. (*Integrated Reports*)

Occasionally, interconnections between a small system and a large supplying system function as a normal metered connection, with the small system having all the rights and privileges of any other customer.

The Integrated Reports of the three PWSMAs discuss common elements found in interconnection agreements:

Common Elements of Interconnection Agreements

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| <ul style="list-style-type: none"> • Term of agreement. • Location and type of water (raw or finished). • Apportionment of cost of design and construction of the interconnection. • Apportionment of maintenance costs, testing, flushing, etc. • Quantity of water to be taken under a variety of conditions. • Time of day or time of year restrictions. | <ul style="list-style-type: none"> • Metering devices required. • Price of water and mechanism for future price adjustments. • Frequency of payment. • Minimum purchases or standby charges. • Pressure range of water at point of transfer. • Factors mitigating the contract. • Notice required to terminate. |
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State Permitting**SALE OF EXCESS WATER PERMIT – CGS §22a-358 – CT DPH**

Whenever a PWS has water reserves exceeding those required to maintain an abundant supply, it may sell excess water to another utility with approval by CT DPH.

- Four permit categories: Daily, Emergency, Seasonal, and Supplemental.
- Permit may define limits on daily, monthly, and annual sales.
- There is no minimum threshold for a Sale of Excess Water Permit; it applies to any sale.
- Ten-year permit.

DIVERSION PERMIT – CGS §22a-365 through 379 – CT DEEP

Whenever a PWS withdraws water from a source or diverts water from one distribution system or service area to another, in excess of 50,000 gpd, it is required to obtain a Diversion Permit from CT DEEP.

- PWSs may obtain authorization under the General Permit for Diversion of Water for Consumptive Use Authorization Required Categories, if such activities will have minimal environmental effects.
- An interconnections is eligible for a General Permit if it is for less than 1.0 mgd provided (1) the need for water and long-term availability of supply are consistent with any applicable, approved water supply plan prepared pursuant to Section 25-32d of the Connecticut General Statutes, and any applicable, approved Coordinated Water System Plan prepared pursuant to Section 25-33h of the Connecticut General Statutes, and (2) such transfer does not result in an increase in the rate or quantity of withdrawal from the relevant water supply sources in excess of the rate or quantity registered with or permitted by the Commissioner pursuant to Sections 22a-368 or 22a-378a of the Connecticut General Statutes.
- CT DEEP may issue emergency or temporary authorizations for regulated activities (CGS §22a-6k). An emergency authorization may be issued for up to 90 days (continuous or not), and there are no duration limits for a temporary authorization.

Emergency Authorizations:

- May be issued for any diversion activity.
- No time limit for activity.
- Activity is necessary to prevent, abate, or mitigate an imminent threat to the environment or human health. *Can be limited by condition to protect the environment and/or human health.*
- Activity is consistent with certain federal environmental protection acts (eg: Water Pollution Control Act).
- No requirement for submittal of sufficient information for determination.
- Fees may be waived.

Temporary Authorizations:

- May only be issued for General Permit activities.
- May continue for up to 90 days (continuous or not). No issuance or renewal granted for an activity that was previously issued a Temporary Authorization in the last 12 months.
- Activity must not pose a significant threat to the environment or human health, and is necessary to protect the public interest. *Can be limited by condition to protect the environment and/or human health.*
- Activity is consistent with certain federal environmental protection acts (eg: Water Pollution Control Act).
- Requires submittal of sufficient information for determination.