



Massachusetts Water Resources Authority

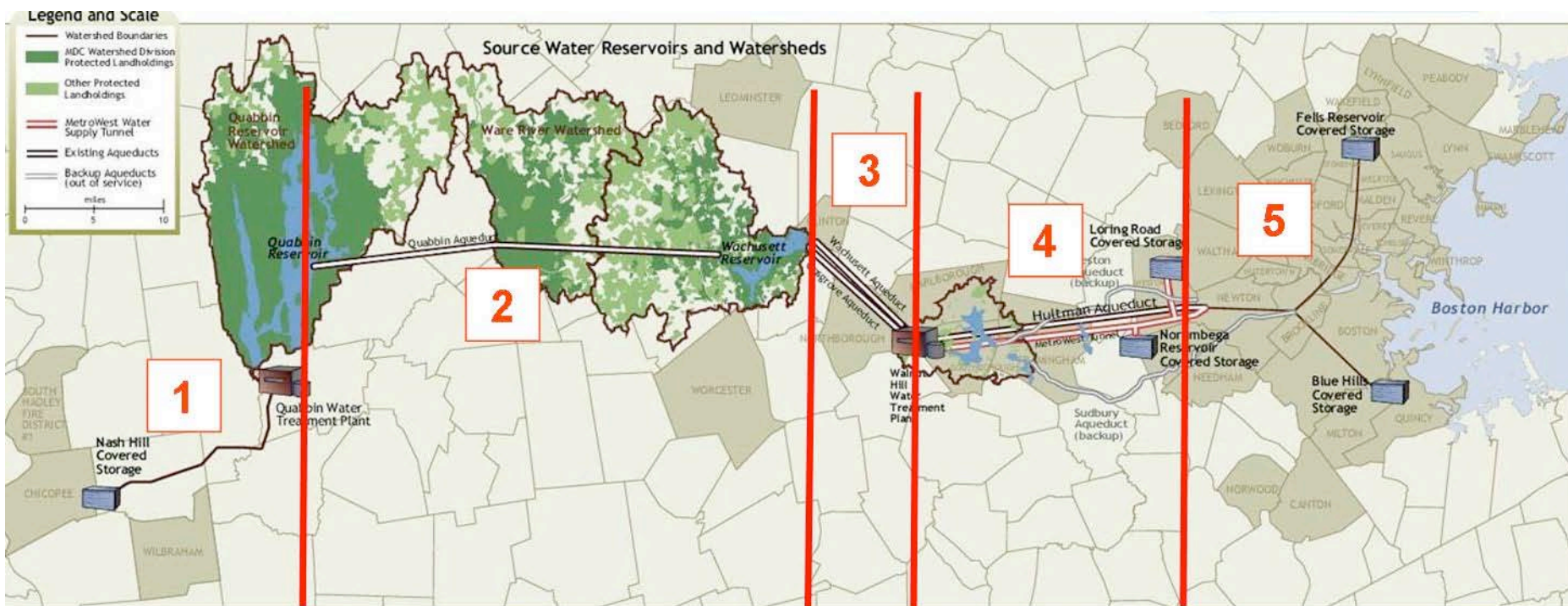
Cosgrove Tunnel Redundancy Project

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Water Transmission System



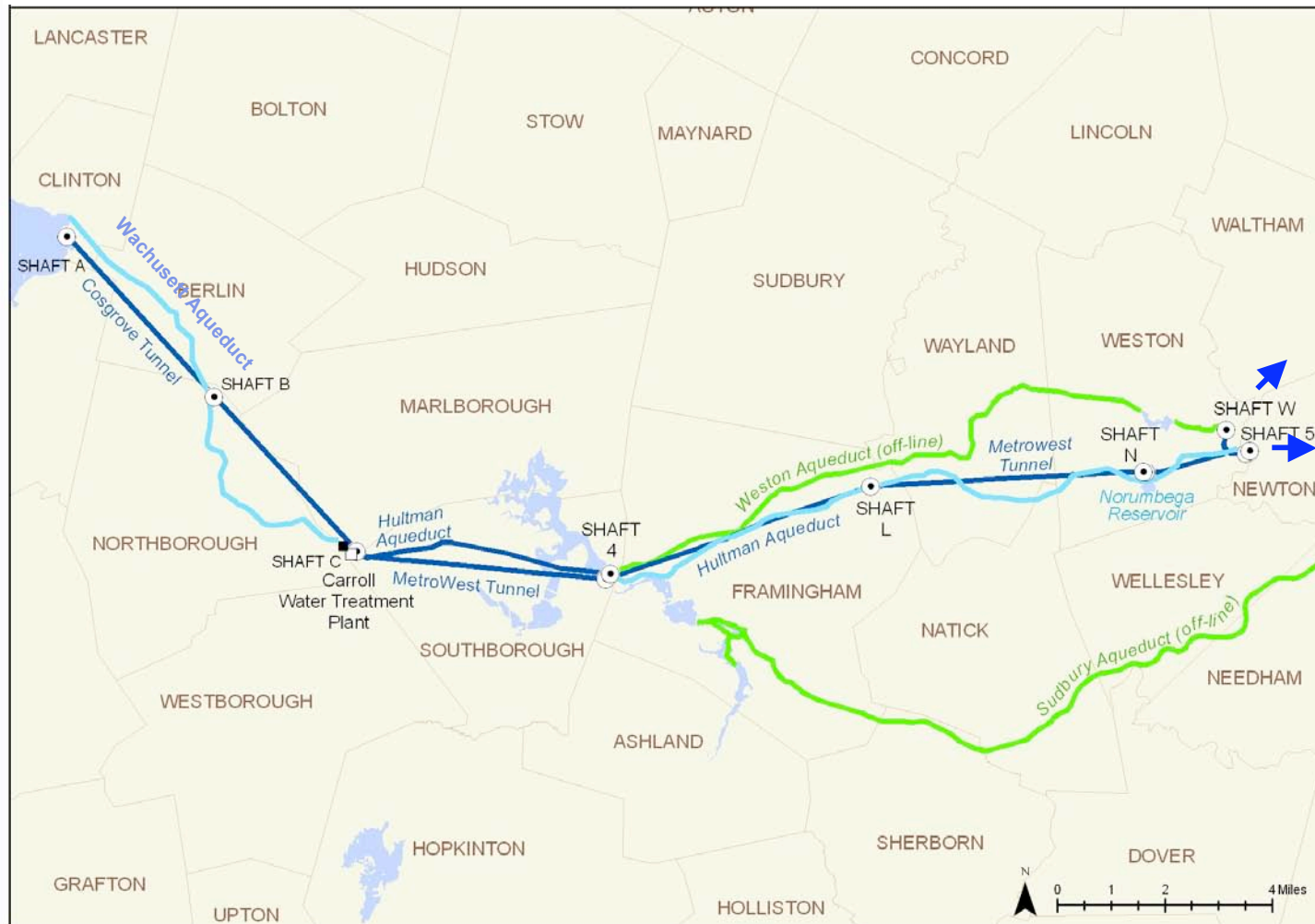


Transmission System From Wachusett Res to CWTP

- **Cosgrove Tunnel**
 - **Single supply line**
 - **Needs repair work**
- **Wachusett Aqueduct**
 - **Off line**
 - **Gradeline Aqueduct: Cannot supply CWTP**



Water Transmission System (Waschusett Res to Weston)



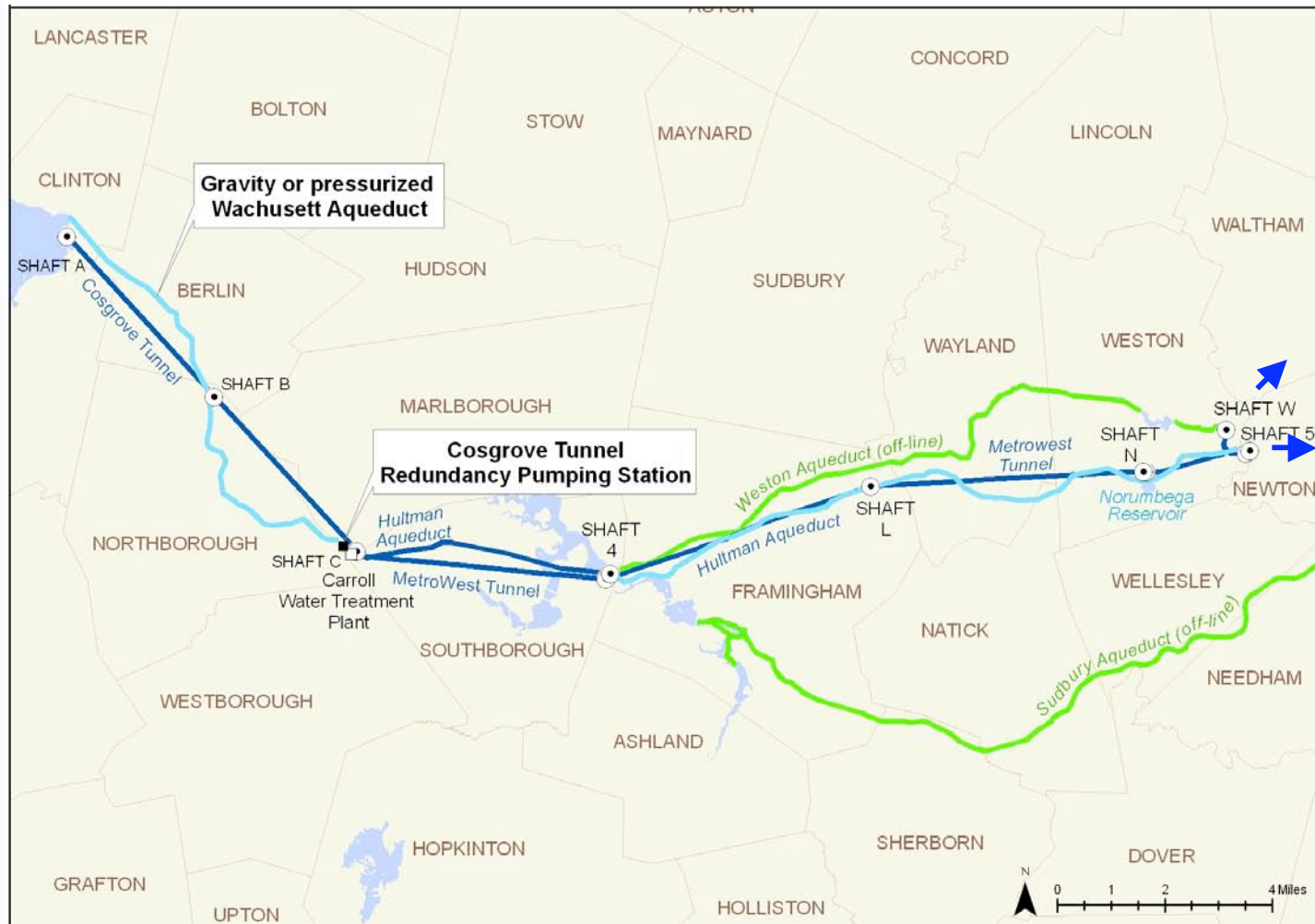


Cosgrove Tunnel Redundancy Alternatives

- **Pressurize Wachusett Aqueduct**
- **Construct Pump Station at Terminus of Wachusett Aqueduct**



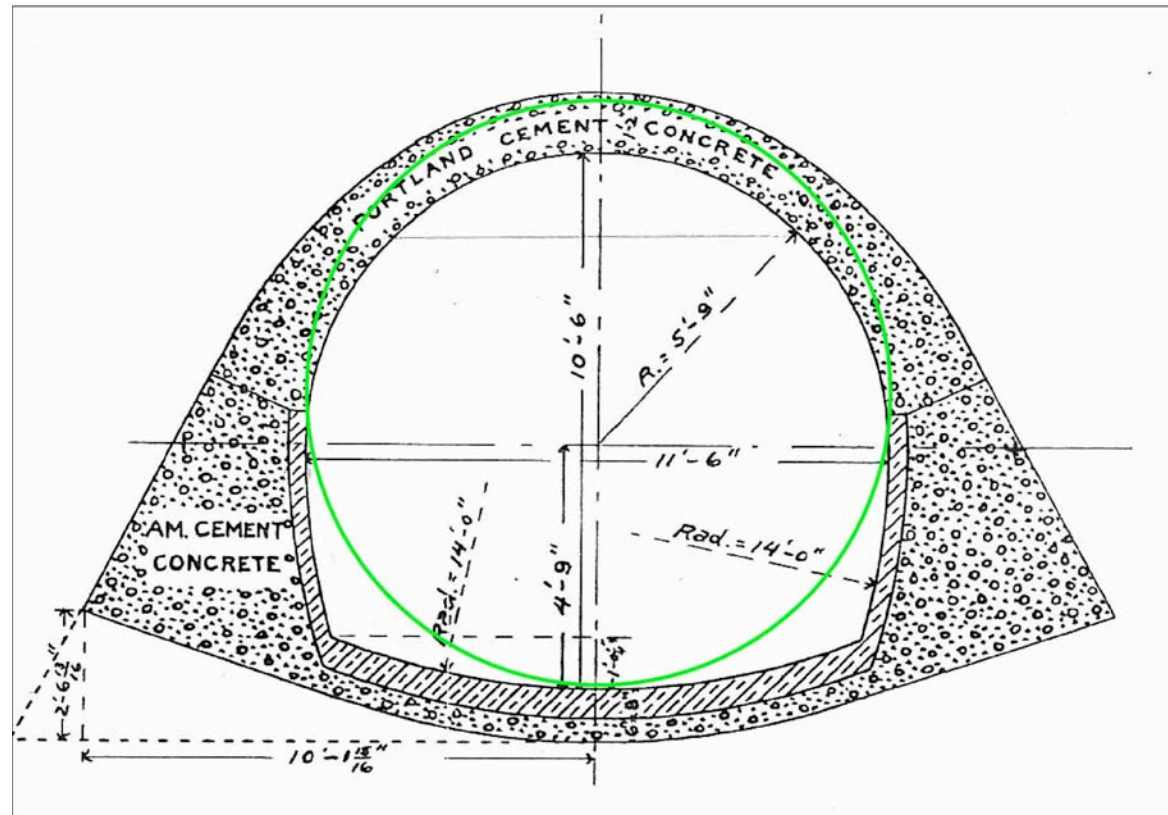
Cosgrove Redundancy Alternatives





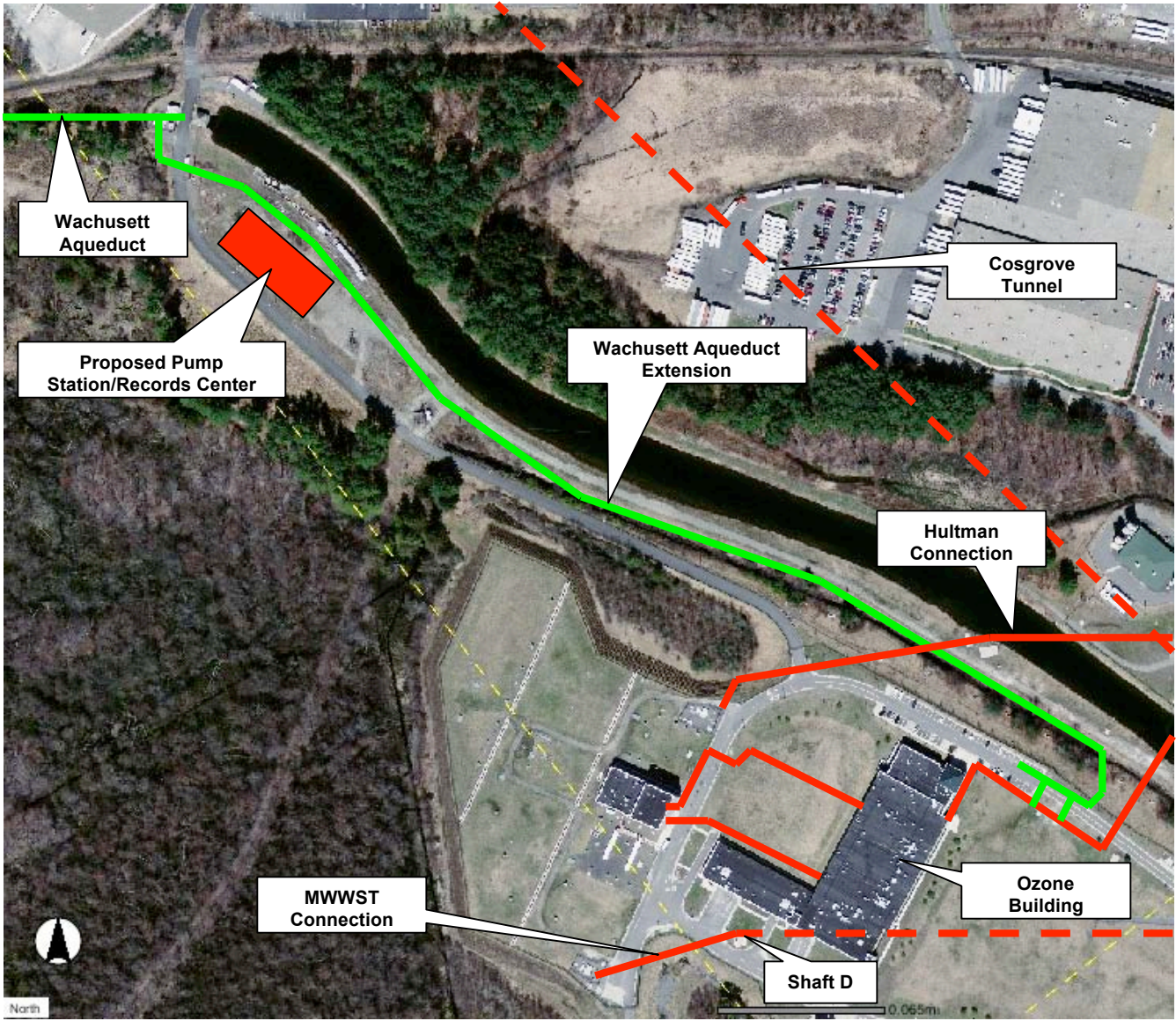
Typical Aqueduct in Earth Section

**120" Pipe in Aqueduct
Alignment**



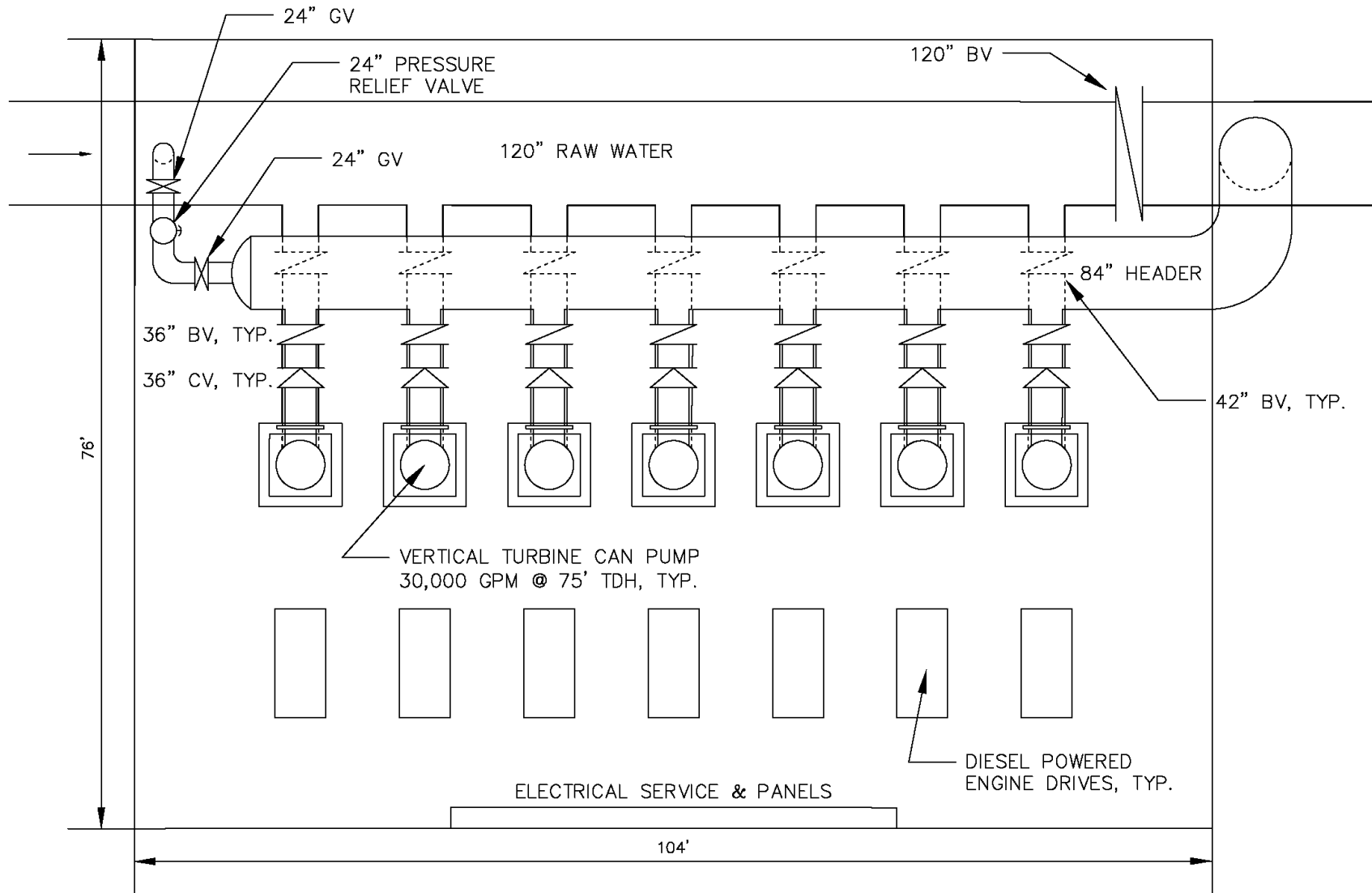


Carroll WTP Site





Pumping Station Concept





Comparison of Alternatives

Alternative Description	Capacity with Wachusett Reservoir Full and No Filtration at the CWTP* (MGD)	Capacity with Wachusett Reservoir Full and Filtration at the CWTP* (MGD)	Estimated Construction Cost
Gravity Aqueduct & Pumping Station	240	240	\$48M
96-inch Pressurized Wachusett Aqueduct	278	248	\$156M
108-inch Pressurized Wachusett Aqueduct	339	303	\$169M
120-inch Pressurized Wachusett Aqueduct	394	351	\$203M



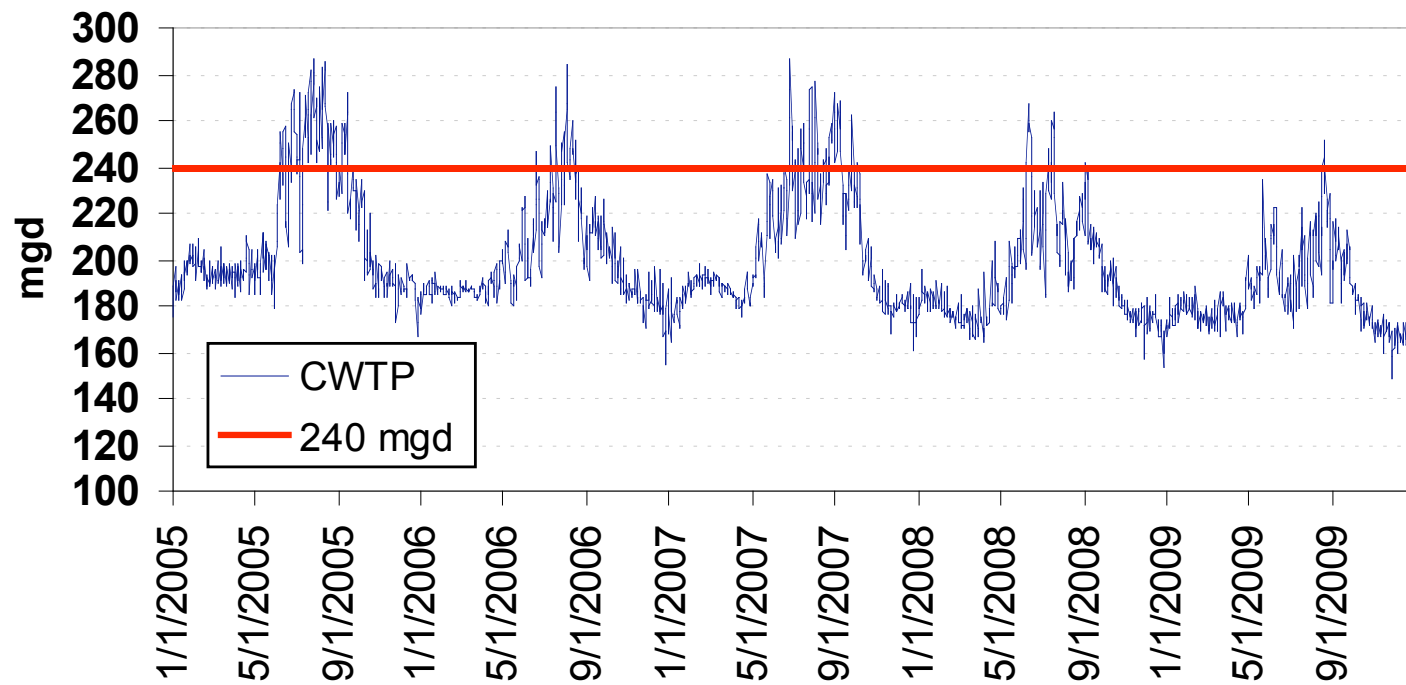
Pumping Station Capacity – 240 MGD

- Average day demand: 185 – 212 mgd
- Maximum day demand: 251 to 287 mgd
- Unrestricted redundant supply of fully treated water for at least eight months during the lower-demand fall/winter/spring period
- During high-demand periods
 - substantial demand reductions
 - mandatory restrictions on outdoor use
 - supply limitations to some partial user communities



Historical Water Use - CWTP

CWTP Daily Demand





Construction Schedule

Redundancy (Wachusett Reservoir to Shaft 5 Weston)

	Start	Finish
• Hultman Aqueduct Repairs	9/2009	9/2014
• Pumping Station	7/2013	6/2015