February 8, 2026

Members of the Senate Natural Resources & Energy Committee,

I am writing to respond to testimony presented by Michael Covey in opposition to S.224 that made a number of technical assertions about the City of Barre, the Dix Reservoir, and the adequacy and regulatory posture of Barre's drinking water system. I offer this clarification based on my professional experience designing, constructing, and evaluating surface water treatment facilities in Vermont and across New England, including the City of Barre's system.

I served as Principal-in-Charge for the design and construction management of Barre's surface water treatment facility, a 6.0 million-gallon-per-day rapid sand filtration plant. That work included full process design for filtration, corrosion control, residual handling through on-site freeze-drying, process water recycling, and complete SCADA control of the facility and associated remote stations. I have also designed or reviewed surface water treatment facilities for Montpelier, St Johnsbury, Brattleboro, Bennington, and numerous other communities. I am therefore familiar not only with Barre's system, but with the federal and state regulatory assumptions and risk-based design principles that govern conventional surface water treatment.

Several technical claims made during the testimony require correction.

First, federal compliance for surface water systems is conditional, not absolute. Conventional surface water treatment facilities are required under federal drinking water rules to achieve a minimum 99.9 percent, or three-log, removal or inactivation of pathogens. Barre's facility meets that requirement only because the raw water quality remains within the assumptions used in the plant's design basis. Compliance is not a binary condition in which the existence of a treatment plant guarantees safety under all circumstances. If raw water conditions change, the plant can fall out of compliance without any operational failure or negligence on the part of the municipality.

Second, surface water treatment systems are designed around probabilistic risk, not worst-case or unknown events. Design criteria assume predictable influent characteristics within defined ranges. They do not account for episodic, unanticipated, or malicious inputs. A single high-impact event, such as a fuel spill or chemical introduction, is sufficient to defeat conventional treatment. There is no advance warning before such an event From a systems and data perspective, treatment plants are designed around expected distributions, not outliers. Large, concentrated events materially increase the probability of those outliers.

Third, the dominant risk associated with increased activity at a raw water source is chemical, not biological. Petroleum hydrocarbons and related compounds represent the most serious threat because they pass through conventional treatment processes largely unchanged. While biological risks can often be managed through filtration and disinfection, many chemical contaminants cannot. Gasoline derivatives can appear in finished drinking water at concentrations close to those present in the raw water. Emphasizing the absence of Giardia or Cryptosporidium incidents or zebra mussels, or pointing to the existence of treatment infrastructure, misses the primary risk pathway entirely.

Fourth, the suggestion that advanced treatment upgrades are a routine or incremental option is incorrect. Moving from conventional treatment to advanced treatment technologies, such as membrane filtration capable of four-log or five-log removal, represents a categorical redesign of a water system. These are multi-million-dollar capital decisions with long-term financial implications for ratepayers. Such upgrades are not neutral choices; they are forced redesigns triggered when source protection assumptions are no longer valid. For instance, in St. Johnsbury, Vermont officials considered upgrading their conventional water treatment facility using either an advanced treatment facility using membranes or replacing the existing conventional treatment units with new conventional treatment units. Although substantially more costly, local officials decided to construct an advanced treatment facility. A key consideration was the loss of local control of the raw water impoundment and related watershed when the state opened recreational use of these areas.

Fifth, Barre's approach is consistent with professional norms across New England. Most surface water systems in the region own the full perimeter of their raw water impoundments and require substantial buffer distances, often on the order of 1,000 feet or more from intakes. In professional discussions with peers throughout the region, unrestricted recreational use of active drinking water reservoirs is widely viewed as inconsistent with best practices for source protection. In fact, colleagues in the New England water works community have expressed disbelief that such uses are permitted at all.

Sixth, water quality monitoring is largely retrospective, not preventative. Many contaminants of concern are detected only after exposure has already occurred. Online analyzers do not flag petroleum compounds or many synthetic organics in real time. By the time a problem is identified through monitoring, contaminants may already be in the treatment process or distribution system. The idea that treatment plants will simply "catch" problems as they arise does not reflect operational reality.

Finally, regulatory consequences attach immediately when a system falls out of compliance. This is not theoretical. Noncompliance can trigger state intervention, enforcement actions, mandated capital upgrades, and public notice requirements. From a professional standpoint, actions taken to preserve raw water quality should be understood as preventative compliance and risk management, not discretionary caution.

I appreciate the Committee's attention to this clarification and submit it to help ensure your deliberations on S.224 are informed by accurate scientific, engineering, and regulatory context. I would be happy to answer questions or provide additional details if helpful.

Respectfully,

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Principal-in-Charge for Design and Construction Management, City of Barre Drinking Water Treatment Facility