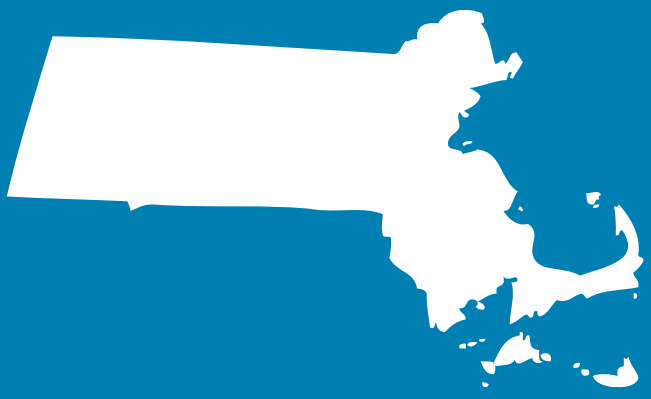

MassDEP Private Well Program Report

Considerations Related to Establishing a Statewide Private Well Program

March 2026

MassDEP

Weston & Sampson

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Executive Summary

Over 500,000 residents in Massachusetts rely on approximately 275,000 private wells for their drinking water. The Massachusetts Department of Environmental Protection (MassDEP) Drinking Water Program provides guidance and educational materials to assist private well owners, without dedicated funding or regulatory authority over private wells.

In 2024, the Massachusetts Legislature directed MassDEP to explore the development of a statewide private well program. This study responds to that directive by providing an inventory of existing state and local programs related to private wells, a review of six case studies from other states, and four potential statewide program scenarios, each with cost estimates and implementation considerations.

The four scenarios range in scope, responsibility, and cost. Each scenario includes detailed cost estimate modeling and analysis of potential impacts to the Commonwealth, municipalities and local Boards of Health (BOHs), and private well owners. Estimated costs and level of effort (LOE) vary significantly, with Scenario 1 being the least resource intensive and Scenario 4 representing full regulatory and administrative buildout at the state level.

- **Scenario 1: Expand Guidelines and Outreach:** Enhances current MassDEP technical guidance and educational efforts with dedicated staff, funding, and resources.
- **Scenario 2: Create Funding Program:** Establishes financial assistance for private well owners to test and remediate contamination, modeled after MassDEP's Community Septic Management Program.
- **Scenario 3: Local BOH Implementation:** Develops enforceable statewide regulations that are administered and enforced locally by BOHs, similar to Massachusetts's Title 5 septic system program.
- **Scenario 4A/4B: State-Run Program:** Creates a comprehensive, centralized program fully operated by the state, including testing and remediation requirements. The primary difference between Scenarios 4A and 4B is that Scenario 4A only includes water quality testing and remediation requirements; whereas, Scenario 4B includes additional requirements from MassDEP's Model Board of Health Regulations for Private Wells, such as well construction and minimum well yield requirements.

This report provides the foundational information and costing scenarios needed for decision-makers to evaluate potential approaches.

A comparison of estimated costs and LOE for each scenario are shown in the graphic and in Table 1 below. The wide variation in estimated costs to private well owners is based on an assessment of two different sets of water quality testing requirements and two different potential categories of private wells to be regulated. See the Scenarios for a Massachusetts Statewide Private Drinking Water Well Program section for more details. This report estimates costs in Year 1 and through Year 5 for illustrative purposes; it should be noted that costs projected for each program proposal scenario would be incurred each year for the duration of the program.

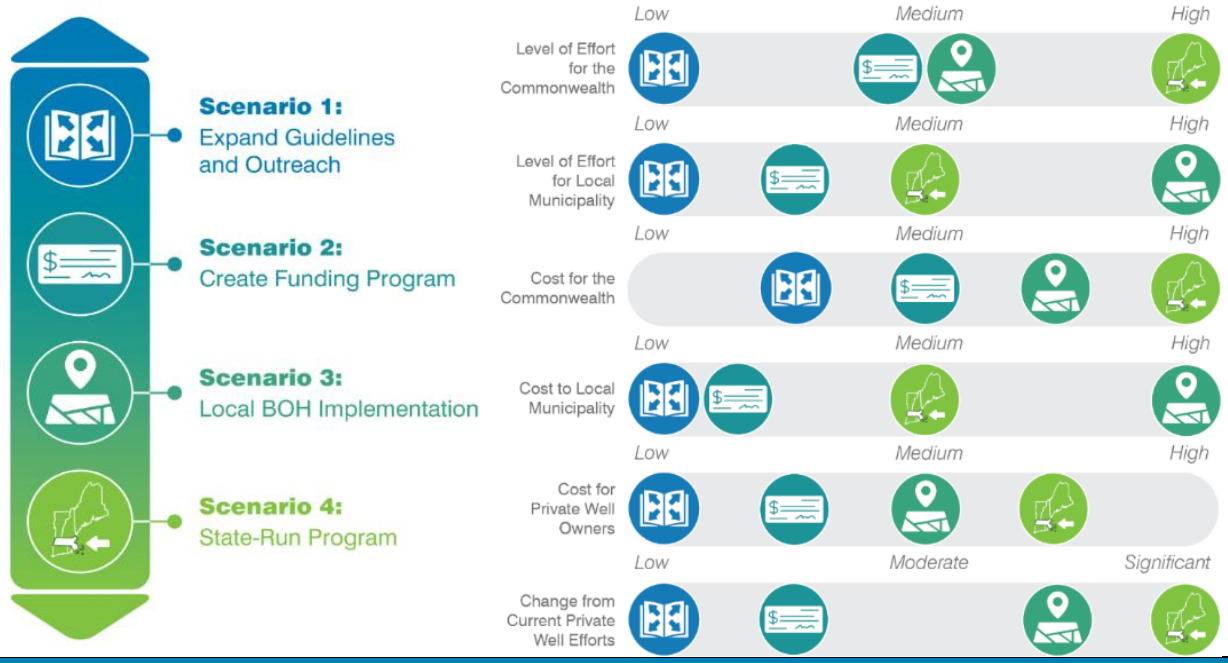


Table 1. Estimated Cost Summary for Private Well Programs

Scenario	Commonwealth		Municipalities		Private Well Owners	
	Year 1	5 Year Total	Year 1	5 Year Total	Year 1	5 Year Total
1	$396,000	$1,780,000	None		None	
2	$216,000	$1,166,000	$3,796,000	$20,498,000	$677,000	$8,909,000
3	$1,201,000*	$6,128,000	$6,493,000	$31,354,000	$14,960,000 to $172,354,000 †	$105,931,000 to $1,041,229,000 †
4A	$4,571,000*	$23,821,000	None			
4B	$7,516,000*	$39,726,000	None			

* Year 1 cost to the Commonwealth does not include the estimated Pre-Program year cost to develop regulations and outreach material prior to the implementation of the regulatory program in Year 1. Estimated Pre-Program year costs are $589,000 for Scenario 3 and $2,362,000 for Scenarios 4A and 4B.
† The large range of Year 1 and 5 Year Total costs to private well owners are due to whether the regulations will only apply to newly constructed wells and wells associated with property transfers or to all existing wells.

Introduction

Over 500,000 residents in Massachusetts rely on approximatey 275,000 private wells for their drinking water. **Private drinking water wells are not subject to the same statewide regulations as public water systems**. This report presents considerations related to potential creation of a statewide program to ensure safe drinking water for residents relying on private wells.

As defined in the MassDEP Private Well Guidelines, a **private water supply** is a system that provides water for human consumption, if such system has less than **15 service connections** and either **serves less than 25 individuals** or serves an average of 25 or more individuals daily for less than 60 days of the year.

Potential Contaminants in Private Drinking Water Wells

Private drinking water wells are susceptible to contamination from various sources, including:

- Landfill leachate
- Malfunctioning septic systems
- Leaks from underground fuel tanks
- Fertilizers and pesticides
- Stormwater runoff/road salting
- Naturally occurring metals and radiologicals
- Spills/releases of oil and hazardous materials
- Animal waste
- Industrial facilities
- Other

Private Wellhead
(Massachusetts River Alliance)

These sources may contribute **to a range of pollutants that have the potential to impact human health if consumed**. Pollutants including bacteria, nitrate/nitrite, Volatile Organic Compounds (VOCs), Per- and polyfluoroalkyl substances (PFAS), and naturally occurring contaminants such as manganese, arsenic, uranium, and radon, have been found in private drinking water wells in Massachusetts and pose potential negative health effects if consumed at concentrations exceeding public drinking water maximum contaminant levels (MCLs) or other Massachusetts Department of Environmental Protection (MassDEP) health-based standards.

Current Massachusetts Drinking Water Program

MassDEP administers the Drinking Water Program which ensures that public water systems in Massachusetts provide safe drinking water. This program enforces federal and state regulations (310 CMR 22.00) including the federal Safe Drinking Water Act and monitors water quality for various contaminants. Key aspects of this program include regulation, inspections, and enforcement; water quality monitoring and standards, new source approvals, technical assistance, drinking water supply protection requirements, and public education.

Massachusetts state regulations related to private drinking water wells are currently limited to requiring well drillers to be certified by the State, establishing minimum setbacks for septic systems from private wells, and requiring cleanup and/or mitigation measures for wells impacted by releases of oil and/or hazardous materials. Other than these limited areas of regulatory coverage, Massachusetts does not have a statewide program to regulate private drinking water wells. MassDEP's Drinking Water Program provides guidance and educational materials to municipalities and private well owners. Other state and local programs in Massachusetts that provide resources and online data for private well owners are described later in this report.

Statewide Private Well Program Study

In 2024, the Massachusetts Legislature provided funding requiring "that not less than $100,000 shall be expended for the department of environmental protection to conduct a study related to the creation of a statewide program to ensure safe drinking water for residents relying on private wells"(Chapter 140 of the Acts of 2024). MassDEP contracted with Weston and Sampson to conduct the study described in this report. To support that work, this study was developed and includes the following elements:

- A summary of current Massachusetts state programs that address drinking water in both public and private drinking water well systems.
- A discussion of six case studies to gain insight into considerations for developing a private drinking water well program in Massachusetts.
- A summary of four potential scenarios for a statewide private drinking water well program in Massachusetts, including cost estimates for each of those scenarios.

Summary of Massachusetts Statewide Private Well Program Scenarios

The graphic below depicts the four scenarios outlined in this report. Estimated program costs, level of effort (LOE), and the relative change from current private well efforts in Massachusetts are discussed for each scenario. Examples from existing and proposed programs in Massachusetts and other U.S. states are provided for context.

Scenario 1: Expand Guidelines and Outreach

Expanding the current MassDEP Drinking Water Program.

Scenario 2: Create Funding Program

Creating a funding program targeted at sampling private drinking water wells and mitigating contaminated wells.

Scenario 3: Local BOH Implementation

Developing a program similar to Massachusetts's current Title 5 Septic System Program to regulate private wells.

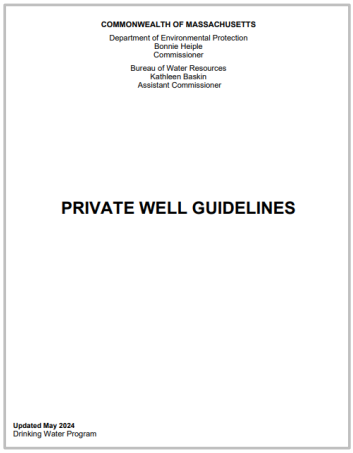
Scenario 4: State-Run Program

Creating a full state-run program similar to MassDEP's current Drinking Water Program for public water systems that could be directed to regulate private well water quality.

Current Massachusetts Drinking Water Programs

Currently, individual well owners and local authorities in Massachusetts are responsible for the water quality and maintenance of private drinking water wells. State and local programs in Massachusetts that provide resources and online data for private drinking water well owners are described below.

Massachusetts Department of Environmental Protection


COMMONWEALTH OF MASSACHUSETTS
Department of Environmental Protection
Bonnie Heiple
Commissioner
Bureau of Water Resources
Kathleen Baskin
Assistant Commissioner

PRIVATE WELL GUIDELINES

Updated May 2024
Drinking Water Program

MassDEP is granted general responsibility for protecting public drinking water supplies within the Commonwealth under Chapter 111 of the Massachusetts General Laws. MassDEP has a comprehensive Drinking Water Program to ensure that public water systems provide safe and potable drinking water. The MassDEP Drinking Water Program **does not regulate private drinking water wells but does provide informational materials and guidance to local Boards of Health (BOHs), well drillers, and well owners** in the Private Well Guidelines and in multiple fact sheets regarding treatment options for certain contaminants. The guidelines define private water supplies, assist well drillers with recommended construction standards, and provide useful information for well owners. MassDEP's Drinking Water Program also provides Model Board of Health Regulations for Private Wells for use by local BOHs in adopting a municipal regulation governing private wells within their borders.

There are some existing regulations applicable to private drinking water wells. These include:

- *310 CMR 46.00 "Certification of Well Drillers and Filing of Well Completion Reports"* mandates that well drillers must be certified annually by MassDEP. This regulation also requires drillers to submit a report detailing well construction within 30 days. Failure to comply with these requirements may result in penalties, including the revocation of a driller's certification.
- Under *310 CMR 27.00 "Underground Injection Control"* it is illegal to inject wastewater into Underground Injection Control (UIC) wells that would endanger Underground Sources of Drinking Water. MassDEP Drinking Water Program's UIC program has developed guidelines establishing recommended setback distances between UIC wells and private drinking water wells and water supply lines.
- *310 CMR 15.000 "Septic Systems"* establishes minimum standards for the location, construction, and maintenance of on-site sewage disposal systems (septic systems) through a program known as Title 5, including set-back distances for private wells from septic systems.
- MassDEP recommends regular water quality testing for private wells, though this is not legally required. Public water suppliers must test their water through MassDEP-certified laboratories under *310 CMR 22.00 "Drinking Water"* and *310 CMR 42.00 "Certification and Operation of Environmental Analysis Laboratories"* and while private well owners are not

subject to these requirements, these regulations include water quality standards that can be used to interpret results of tests performed on private well water samples.

Massachusetts Department of Agricultural Resources

The Massachusetts Department of Agricultural Resources (MDAR), through its Pesticide Board, established a statewide and uniform regulatory process under *333 CMR 11.00 "Rights of Way Management"* to minimize the uses of, and potential impacts from herbicides in rights-of-way on human health and the environment while allowing for the benefits to public safety by the selective use of herbicides. The area within 50 feet of an identified private well is a designated No-spray Area, and herbicide application within a distance between 50 feet and 100 feet of an identified private well is only permitted if specific conditions are met pursuant to the regulations. The perimeter of any sensitive areas that are not readily identifiable on the right-of-way, such as private wells, must be identified by the applicant with a clearly visible marker system prior to herbicide application.

Massachusetts Department of Public Health

The Massachusetts Department of Public Health (DPH) plays a key role in regulating drinking water through *MGL Chapter 111, Section 127A*. Under this law, property owners must provide safe drinking water from either a public water system or an approved private source.

Massachusetts Boards of Health Authority

Local BOHs are responsible for the regulation of private drinking water wells, but local regulations are varied, often outdated, or in some cases nonexistent. BOHs can take action to enforce regulations, including ordering compliance with local regulations, or taking other actions deemed appropriate by the respective BOH. Not all of the 351 municipalities in Massachusetts have private drinking water well regulations or requirements for drinking water quality testing. Testing regularity and reporting guidelines vary by municipality.

Well Owner Authority

Owners of private wells are responsible for ensuring the quality of their drinking water and addressing any contamination concerns. Barring the existence of local private drinking water well regulations, well owners determine how to assess and maintain their drinking water quality.

Program Case Studies

State private drinking water well programs in the U.S. range from online data and educational materials to comprehensive sampling programs. Six state programs were reviewed through an assessment of online resources and other studies (see Appendix C) related to each program to gain insight into considerations for developing a private drinking water well program in Massachusetts. These six case studies are not limited to private drinking water well programs, as other statewide programs (such as Title 5 in Massachusetts) can provide insight into the development of a similar

program addressing private drinking water wells. The case studies are described in detail in the following sections. Program overviews are provided in the table below.

Case Study	Program Overview	Program Components					
		Authority	Regulations	Sampling	Data Portal	Outreach	Funding
Massachusetts's Title 5 Septic System Program	Program that regulates the proper siting, construction, and maintenance of septic systems.	✓	✓			✓	
New Hampshire's OneStop	Online platform that consolidates environmental information and data from various programs				✓	✓	
Maine's Private Well Safe Drinking Water Fund	Funding mechanism established for private drinking water well testing and treatment.					✓	✓
Florida's Well Surveillance Program	Program that identifies and tests private wells in areas of known or suspected contamination.	✓		✓	✓	✓	
Maryland's Private Well Safety Act of 2023	Regulations that establish additional water quality testing standards for each county or specific area, develop an online portal for data management, and conduct a funding study.	✓	✓	✓	✓	✓	✓
Rhode Island's Private Well Program	Regulations that require private well owners to regularly sample their wells.	✓	✓	✓	✓	✓	✓

Massachusetts's Title 5 Septic System Program – A Case Study

Program Overview	**The Massachusetts Title 5 Septic System Program,** implemented in 1985, **regulates the proper siting, construction, and maintenance of onsite wastewater disposal systems (septic systems)** to protect public health and the environment. The Title 5 program is administered by local BOHs with technical oversight and guidance from MassDEP.
Program Detail	The key aspects of Title 5 include the following: • **Permitting and inspection** of new systems and expanded systems. • **Inspection of existing systems** during property transfers, change of use, expansion of use, or increase in design capacity. • **Certification** of compliant systems. • **Upgrade and repair requirements** for failing systems. • **Educational resources** to ensure proper maintenance. • **Allowance for innovative and alternative systems** in environmentally sensitive areas.
Authority	Title 5 regulations are administered either locally by BOHs or by MassDEP, depending on the type and/or ownership of the facility. **Local BOHs receive technical assistance and oversight support from MassDEP, as needed.** This framework operates under Massachusetts state law, ensuring compliance with environmental and public health standards for wastewater and septic systems**.** In rare cases where the local BOH does not enforce Title 5 regulations, MassDEP has authority to conduct enforcement.
Implementation	Local BOHs issue permits, conduct inspections, and address violations while MassDEP provides oversight and technical assistance.
Program Costs	• **State costs:** Funded through state appropriations and permit fees. • **Homeowner costs:**

Massachusetts's Title 5 Septic System Program – A Case Study

- Installation of compliant septic systems, ranging from $25,000 to $100,000
- Local BOHs charge fees for inspections, ranging from $25-$400, and $50-$325 for permits.

Challenges and Adaptations

While largely considered successful, the program has faced challenges, including:

- High cost to property owners associated with installation of the septic systems.
- Initial resistance from some property owners due to inspection and upgrade costs.
- Difficulties in enforcing regulations in some municipalities.
- Balancing environmental protection with economic considerations.

In response, the program has evolved, **introducing tax credits for system repairs and replacements, and refining regulations** to address specific regional concerns, such as nitrogen sensitivity in certain specified coastal areas.

Title 5 provides some guidance for those properties served by private drinking water wells. Specifically, it requires a well water analysis for fecal coliform, ammonia nitrogen, and nitrate nitrogen for those wells that are located greater than 50 feet but less than 100 feet from a subsurface disposal system. Private wells are not allowed within 50 feet of a subsurface disposal system.

New Hampshire's OneStop – A Case Study

Program Overview	**The NHDES OneStop platform is a user-friendly, online, searchable database that consolidates environmental information and data** from various New Hampshire Department of Environmental Services (NHDES) programs.
Program Detail	OneStop provides access to a wide range of environmental fields, including surface water and groundwater quality data, Geographic Information System (GIS) mapping, permits, geological survey data, and licensed well and pump contractors. The database includes sampling results for public water system sources and **available private drinking water well records, with details on construction, location, depth, and geology**. Private drinking water sampling is currently not required by state law in New Hampshire, and private well testing results are not maintained in OneStop. Key data aspects and requirements are outlined as follows: • Requires accessibility to a range of desktop machines, laptops, servers, and printing/plotting devices, Global Positioning System (GPS) units, scanner, and data archiving systems. • Surveys and Data Collectors. • ArcGIS online.
Authority	The webpage and data platform is managed and controlled by NHDES.
Implementation	New Hampshire's OneStop is part of the GRANIT system, which is the state's GIS clearinghouse. **NHDES adopted GRANIT's infrastructure to create the OneStop.** NHDES enforces data accuracy and public access through the mapper, ensuring that it complies with environmental regulations.

New Hampshire's OneStop – A Case Study

Program Costs

Specific costs to run the OneStop platform are difficult to estimate as they are part of the larger NHDES GRANIT system. After initial setup of the OneStop platform, annual maintenance and operation costs for running the NHDES GRANIT program have been estimated by New Hampshire's Office of Energy and Planning (OEP) at approximately $70,000 in addition to six full-time staff. Federal grants from agencies such as FEMA or USGS are utilized for data layer development and technology upgrades. Other state agencies provide an additional $20,000 - $25,000 per year to sustain core services, as well as varying amounts to support project-specific activities. Total cost: approximately $2 million per year.

Challenges and Adaptations

- High cost of initial set-up of the system.
- Ongoing staffing and system upgrades support is needed to ensure data are continuously available.
- Ongoing funding source.

In Massachusetts, water quality testing results for public water system sources are available through the Massachusetts Executive Office of Energy and Environmental Affairs (EEA) Data Portal. The EEA Data Portal also provides Well Completion Reports for all well types, including private wells. MassDEP provides an online **Well Location Viewer** mapping tool that identifies locations for which Well Completion Reports are available. Other information, such as source locations and protection areas, is stored in MassGIS, Massachusetts's statewide GIS site, and can be viewed by users without GIS software through the MassMapper online mapping tool.

Maine's Private Well Safe Drinking Water Fund – A Case Study

Program Overview	The **Private Well Safe Drinking Water Fund** was established under Title 22: Health and Welfare in 2017 to ensure safe drinking water for residents by **providing grants, technical assistance and funding for private drinking water well testing and treatment**. The fund is a non-lapsing entity within the Department of Health and Human Services (DHHS), meaning the fund retains any unspent money. The fund is supported by fees collected from residential private drinking water well drilling and testing and other funds accepted by the state.
Program Detail	The fund aims to enhance the safety of drinking water from private wells across the state through the following: • Establishing **grant programs** for eligible homeowners and landlords to test wells and mitigate contamination. • Providing **technical assistance and guidance** to private well owners. Though the program encourages water quality sampling, **testing is voluntary and done at the expense of the private well owner except for low-income residents.**
Authority	The fund was established within the Maine DHHS.
Implementation	DHHS is responsible for establishing an advisory committee to assist the Division of Environmental Health in expending funds. Technical assistance is provided by the Maine Drinking Water Program.
Program Costs	**The program is funded by fees collected from water quality sampling and from other funds accepted by the DHHS Commissioner or allocated or appropriated by the Legislature.** Donations or grants from any source may also be accepted. In August 2020, a $2 fee was added to residential private drinking water well tests. This mandatory fee is in addition to the total cost of the test. The fee may not exceed $10.
Challenges and Adaptations	While the fund has succeeded in allocating funds to private well safety, **continuing to motivate private well owners to participate in education and testing programs requires ongoing effort.** This fund does not provide funding to treat contaminated wells.

Florida's Well Surveillance Program – A Case Study

Program Overview	**The Well Surveillance Program** was developed in response to leaking petroleum storage tanks through statewide coordination between the Department of Health (DOH) and the Department of Environmental Protection (DEP). Funded by DEP-DOH contracts, it **identifies and tests private wells within ¼ mile and public wells within ½ mile of known leaking tanks**. Contaminated wells trigger immediate health advisories.
Program Detail	The Program, also known as the "State Underground Petroleum Environmental Response Act (SUPER Act)," includes **surveys to identify drinking water wells around areas of known or suspected contamination.** Once identified, these wells are sampled to assess water quality. Owners of private drinking water wells with levels of human-made contaminants greater than federal and/or state standards are **offered assistance through Florida DEP's Water Supply Restoration Funding Program** and are either provided with a filter to treat the contaminant or connected to a central water source. All compiled data can be found on the Florida DOH site, where well and facility data are accessible.
Authority	The DEP oversees clean-up activities for petroleum facilities. DOH provides field and laboratory services, toxicological risk assessments, investigations, and education of the public.
Implementation	The program is implemented through a **partnership between the Florida DOH and the DEP**. It is managed and enforced by the DEP through environmental corrective actions such as notices of violations and consent orders.
Program Costs	Sampling is performed under a Florida DEP contract administered through the DOH in Tallahassee. The program is funded through a reimbursement formula designed by the state. Well surveys can range from $25-$1,120 depending on site location and criteria met by standards found in Florida's health fee schedule under this program. The survey costs only include drinking water sample collection.
	• Scale of monitoring in high-risk zones.

Florida's Well Surveillance Program – A Case Study

Challenges and Adaptations

- Dependence on state funding mechanism.
- Ensuring compliance from private well owners.
- Balancing rapid response with lab testing timelines.

With one-time funding approved by the Legislature and administered by the Baker-Polito Administration in 2019 and 2020, MassDEP launched the Free PFAS Laboratory Analyses Program for Private Wells in collaboration with the University of Massachusetts. PFAS are a group of man-made chemicals used in a variety of consumer products and industries such as water-resistant clothing and non-stick cookware. PFAS are considered emerging contaminants and have been linked to a variety of health risks. The program, which concluded June 30, 2022, was established to 1) determine the extent of PFAS-impacted water across the Commonwealth and 2) provide free PFAS analysis of private drinking water to select private wells in 85 municipalities in which 60% or more residences are served by private wells. Key elements of the program included outreach and informational meetings, technical assistance materials, sampling, and communication of results and follow-up actions.

Maryland's Private Well Safety Act of 2023 – A Case Study

Program Overview	Maryland's **Private Well Safety Act of 2023** mandates the Maryland Department of the Environment (MDE) to **adopt regulations that establish additional water quality testing standards for each county or specific area, develop an online portal for data management, and conduct a funding study for groundwater monitoring**.
Program Detail	Details of the Private Well Safety Act include: • **Water Quality Testing Standards**: MDE is required to adopt additional regulations pertaining to water quality testing standards for private drinking water wells by December 31, 2026. • **Online Data Portal**: Subject to funding availability and collaboration with the Department of Information Technology, MDE must develop an online portal to receive, store, and provide public access to private drinking water well water quality testing results and certificates of potability. • **Real Estate Transaction Requirements**: Before the sale of properties with private drinking water wells, the purchaser must conduct water quality testing and review results with the seller/vendor. • **Residential Rental Property**: Owners of rental properties that are served by a private drinking water well are required to **provide water quality testing every three years and disclose results to tenants.** If testing reveals a result greater than the MCL, or allowable concentration in drinking water, the property owner is required to notify MDE, provide an approved alternative potable water supply, and resolve the contamination issue within 60 days. • **Funding Study**: MDE must conduct a study to explore long-term funding options for a private drinking water well grant fund.
Authority	The Private Well Safety Act is managed by MDE with assistance from the Maryland Department of Health and local health departments. **Local health departments have the authority to enforce certain provisions of the Act and collect civil penalties**.
	The Private Well Safety Act is implemented and enforced at the county level and establishes several key provisions.

Maryland's Private Well Safety Act of 2023 – A Case Study

Implementation	
Program Costs	• **Statewide**: General fund expenditures are projected to increase by at least $186,800 in fiscal year 2025, with subsequent annual increases reflecting factors such as inflation and ongoing operational costs. • **Local Health Departments**: The Maryland Association of County Health Officers quantified the economic impact as costing $370,000 annually (without fringe and overhead costs) if each of the 24 county health departments in Maryland hired staff to enforce the Private Well Safety Act. • **Private Sector**: Property purchasers will incur costs associated with mandatory water quality testing during real estate transactions. • **Residential Rental Property Owners**: Property owners' expenditures will increase as they will need to conduct testing every three years.
Challenges and Adaptations	• Creation of the data portal requires multi-department collaboration and is subject to available funds. • Some property owners may be unaware of the new testing and notification requirements or lack the resources to conduct regular testing and remediation. • Local health departments have the authority to enforce this Act and collect penalties, but this is not required. If a local health department chooses to not enforce this Act, then tenants using private well water as drinking water are not subject to the protections under the Private Well Safety Act. • Local health departments will need to hire additional staff if they choose to enforce the law.

Rhode Island's Private Well Regulations – Abridged Case Study

The following information is summarized from RCAP Solution's Revised Research Memo for the Safe Drinking Water Coalition, dated November 7, 2024. The memo outlines Rhode Island's **Private Well Program.**

Program Overview	Rhode Island's Private Well Program is designed to protect and promote the health and safety of residents who rely on private drinking water wells through licensing, training, and oversight.
Program Detail	• **Licensing**: Issues licenses to private well samplers and water quality interpreters. • **Training & Guidance**: Provides support to professionals working with private wells. • **Regulatory Oversight**: Ensures compliance with well water testing laws and regulations. • **Education**: Informs well owners about regular maintenance testing and safe water practices. • **Collaboration**: Works with local and state agencies to align private well regulations. • **Data Reporting**: Publishes analytical results from well testing for public access. • **Instructions, Manuals, Procedures:** Provides instructions for various well test kits.
Authority	Authority was granted to Rhode Island's Office of Private Well Water Contamination within the State's DOH, by R.I. General Laws § 23-1-5.3 in 1988.

Implementation	The Office of Private Well Water Contamination passed regulation 216-RICR-50-05-2 "Private Drinking Water Systems"
	• **Financial Assistance Programs:**
	  ○ No additional funding or financial assistance programs were established for private drinking water well owners.
	  ○ State provides a 15% off coupon for well testing packages completed by state-certified labs.

Rhode Island's Private Well Regulations – Abridged Case Study

The following information is summarized from RCAP Solution's Revised Research Memo for the Safe Drinking Water Coalition, dated November 7, 2024. The memo outlines Rhode Island's **Private Well Program**.

- **Testing Requirements for Real Estate Transactions:**
  - Potential property buyers must test private wells for coliform bacteria, fluoride, iron, lead, manganese, nitrate, nitrite, and turbidity prior to sale.
  - Existing property owners must provide to potential buyers all water quality data of the property for the prior ten years.
  - All new private drinking water wells require testing.
- **Sanctions/Penalties for Non-Compliance with Testing Requirement**
  - Failure to include the private well testing provisions within the Purchase and Sale agreement as well as failure to provide previous testing results does not create any defect in title.
- **Tenant Protections**
  - Neither the state law nor the regulation includes any explicit protections for tenants.
- **Testing Costs**
  - $95 for annual test
  - $280 for 3- to 5-year test kit
  - $410 for 5- to 10-year test kit
  - Additional contaminants $5-$200

Program Costs

- **Statewide:** The Director of Rhode Island DOH is authorized to establish fees related to the costs incurred in operating the program (licensing, laboratory, and administrative service fees). The exact cost and staffing requirements of the program is unknown.
- **Well Owners**: Private well owners are financially responsible for water quality testing and treatment options.

Challenges and Adaptations

The statute lacks tenant protection and does not include broader enforcement measures beyond the buyer's right to void a real estate transaction.

Legislative Authority to Regulate Private Wells

The authority for implementing a statewide private drinking water well program may reside in different state agencies. In some cases, local BOHs may act as agents for a state agency, operating programs on a municipal or county level. For example, the Massachusetts Title 5 Septic System Program, implemented in 1985, is the State Environmental Code that governs the proper siting, construction, and maintenance of onsite sanitary wastewater disposal systems to protect public health and the environment. **MassDEP is responsible for overseeing and enforcing the regulations outlined in Title 5, including approving innovative technologies and providing guidance for local regulations. Local BOHs administer and enforce Title 5 within their municipality.** They handle permit applications, inspections, and other related tasks. More information about the Title 5 program is provided in the Case Studies section of this report.

The Florida Well Surveillance Program is a public health initiative that monitors and identifies potential contamination threats to drinking water sources throughout the state. This program is implemented by local County Health Departments working in conjunction with the Florida DOH for well surveys, sampling, and lab analysis. This program focuses exclusively on human-made chemicals, such as petroleum hydrocarbons and other toxic contaminants. The Florida DEP provides funding and assistance for remediating contaminated sites and manages data and mapping efforts.

Maryland's Private Well Safety Act of 2023 was adopted on April 10, 2023 and mandates that MDE adopt regulations by the end of 2026 for water quality monitoring requirements for private drinking water wells throughout the state. Local health departments have the authority to enforce this Act and collect penalties, but they are not required to do so.

MassDEP currently administers the Drinking Water Program which regulates public water systems. MassDEP does not regulate private wells. Thoughtful consideration would need to be given when assigning the appropriate state agency statutory authority to establish a statewide private well program in Massachusetts. A statewide program could also involve coordination between the state and local BOHs to administer and enforce the program. The MassDEP Drinking Water Program regulates public water systems, including public water supply wells. The MassDEP Drinking Water Program provides support for private well issues through public education and by providing guidance to local BOHs through their Private Well Guidelines and Model Board of Health Regulations, though this private

well-related support work is not directly funded. The Massachusetts DPH serves as advisors to local BOHs for many public health issues, including septic systems and drinking water.

For a statewide private well program, **Massachusetts could consider using the Title 5 program as a model, assigning legislative authority to an appropriate state agency to develop regulations and to serve as the lead enforcement agency, with regulatory implementation and enforcement by local BOHs.** This is discussed in Scenario 3 below (Local BOH Implementation).

Components of a Statewide Private Well Program

There are multiple components that could be included in a statewide private drinking water well program, such as water quality standards and guidelines or regulations, a water quality sampling program, an online data portal or other data management tools to display and organize sampling results, an enforcement mechanism for sampling requirements, financial assistance for water quality testing and/or remediation, and public education and outreach for private well owners and local BOHs. These components and their potential applicability for inclusion in a statewide private well program in Massachusetts are discussed below.

Enforcement

A statewide regulatory program that requires specific actions from the private well owner must have statutory authority with regulations that describe how requirements will be enforced. Typical enforcement actions include issuance of a notice of non-compliance or administrative consent order, with or without penalty, for mandating specific corrective actions in a set timeframe.

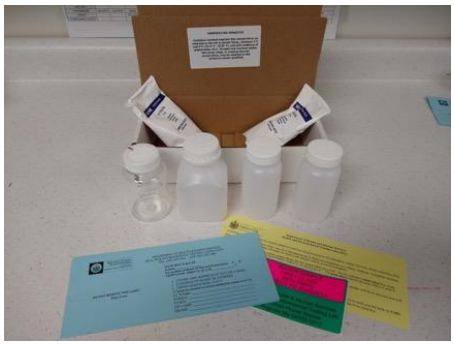
The Florida Well Surveillance Program is implemented through a partnership between the Florida DOH and DEP. It is managed and enforced by the DEP through environmental corrective actions, such as notices of violations and consent orders.

MassDEP is responsible for the enforcement of drinking water regulations for public water supplies. As there are currently no drinking water regulations for private wells, there is no need for enforcement. Current requirements for public water supplies through the MassDEP Drinking Water Program require tiered public notification for violations that may pose health risks and enforcement actions that may include administrative orders and civil penalties.

As an example of a program being administered by local authorities, local BOHs administer and enforce Title 5 regulations within their municipality. They handle permit applications, inspections, and other related tasks including enforcement. When a septic system fails to meet Title 5 standards, enforcement actions include a letter of non-compliance, a list of corrective actions, and potentially fines. In rare cases when local BOHs do not enforce Title 5 regulations, MassDEP has the authority to take enforcement actions.

For a statewide private well program, **Massachusetts could consider the Title 5 program as a model**. Regulations could be developed with MassDEP or DPH serving as the lead agency and with administration and enforcement by local BOHs with guidance to local BOHs provided by MassDEP and/or DPH.

Water Quality Standards and Sampling



Well Evaluation Test Kit

A statewide private drinking water well program may include developing regulations and standards for contaminants that have the potential to impact drinking water from private wells. Statewide private well sampling programs for other states include requirements for inspection and testing during property transfer. Other sampling programs require private well testing on residential rental properties and notification to tenants, or the development of a statewide groundwater monitoring program.

Maryland's Private Well Safety Act of 2023 will require water quality testing and disclosure of the results for rental properties and during real estate transactions. For real estate transactions, testing must be completed before the property sale and the results must be disclosed to the buyer. For rental properties, testing must be completed every three years. If results exceed MDE regulatory standards, rental property owners must notify MDE and the tenants, provide an alternative drinking water source, and resolve the contamination issue within 60 days.

The Florida Well Surveillance Program, is a public health initiative that monitors and identifies areas where contaminated drinking water is suspected and includes surveys to locate private wells within a certain radius of potential contamination sources. Identified wells are sampled for contaminants.

Massachusetts has Drinking Water Regulations for public water systems which include testing requirements and drinking water standards (Massachusetts Drinking Water Regulations). **Similar standards for private wells could be considered for adoption.**

Other considerations when **creating regulations for private wells** could include testing requirements for residential rental units and during property transfer. Under Title 5 regulations in Massachusetts, inspection of an existing septic system can occur at or within two years prior to the sale. The buyer must be notified of the inspection results. There are some exceptions, such as property transfer between certain family members.

MassDEP already encourages current and prospective homeowners to test private wells. Information on recommended tests and testing frequency is provided in the Drinking Water

Program's online guidance document Protect Your Family: A Guide to Water Quality Testing for Private Wells. Use of a MassDEP-certified laboratory is recommended, and a list of laboratories offering drinking water analytical services for private well owners and residential customers is available on MassDEP's website (Laboratory Availability Survey Private Well Owners).

Careful consideration would need to be given to imposing new requirements on individual residents/homeowners, particularly since they would involve new and ongoing costs. Consideration should also be given to any point-of-sale or property transfer and related notification requirements.

Online Data Portal

Developing an online data portal or adapting the EEA Data Portal to share information about private wells could be considered in creating a statewide private well program. These types of data portals can range from simple systems that allow a user to retrieve water quality test results by entering parcel addresses, to online data mapping viewers that present a map with a GIS parcel data layer such that the user can zoom in on an area and retrieve water quality test results for parcels of interest.

The NHDES OneStop platform is a user-friendly, online, and searchable data mapping tool that consolidates environmental information and data from various NHDES programs. This program is part of the New Hampshire's statewide GIS clearinghouse, NH GRANIT. For drinking water, OneStop provides information on public water supplies and private drinking water well construction and site conditions.

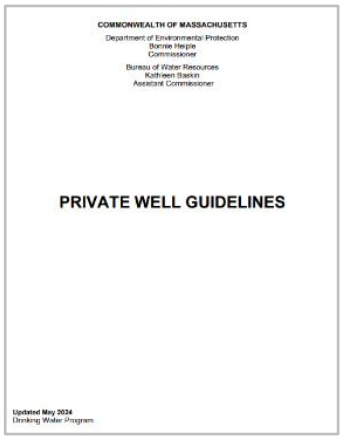
In Massachusetts, testing results for public water system sources are available through the Massachusetts EEA Data Portal. Other information, such as source locations and protection areas, is stored in MassGIS, Massachusetts's statewide GIS site and can be viewed by users without GIS software through the MassMapper online mapping tool. Including private well water quality testing data in the EEA Data Portal would involve **expanding the capabilities of this portal and the eDEP system used by MassDEP-certified laboratories for the submittal of public water system test results, or the creation of a new data submittal system for private well data**. A legal analysis related to providing private well data on a public portal would need to be performed and considered, as should potential concerns from individual residents/homeowners about information sharing and confidentiality.

Public Education and Outreach

Any statewide program should include a comprehensive public education and outreach program. Successful programs often include a combination of technical assistance, information about potential and emerging contaminants, and general education programs for residents.

Rhode Island's Private Well Program provides a range of resources for private well owners. Detailed fact sheets and online information provide recommendations for well testing, maintenance, repairs, and construction to educate the public. The program also licenses private well samplers and water interpreters to assure accuracy of required testing results and resources for interpreting the results.

MassDEP provides information and guidance to local BOHs, well drillers, and well owners through the Private Well Guidelines and other fact sheets. These guidelines define private water supplies, assist well drillers with recommended construction standards, and provide useful information for well owners. MassDEP recommends regular water quality testing for private wells and provides Model BOH Regulations and other templates, including pumping tests and water quality reports for private wells, that can be adapted by local BOHs.


COMMONWEALTH OF MASSACHUSETTS
Department of Environmental Protection
Bonnie Heiple
Commissioner
Bureau of Water Resources
Kathleen Baskin
Assistant Commissioner

PRIVATE WELL GUIDELINES

Updated May 2024
Drinking Water Program

Educational materials or model regulations for private wells are developed by MassDEP's Drinking Water Program. Because the program's legislative mandate includes public water supplies, materials developed for private wells are currently outside the scope of any specific legislative mandate and **the program currently receives no dedicated funding to develop and disseminate those materials.**

With additional funding and staffing, **Massachusetts could expand the focus of this program to maintain up-to-date guidance documents, provide technical assistance to local BOHs and private well owners, and produce and distribute educational materials to address private well issues.**

Financial Assistance

Developing a program to fund private well remediation, repair, and replacement efforts is an important consideration, as the cost of these mitigating measures may be difficult for homeowners to bear. State funding programs may include loans or grants.

The Florida Well Surveillance Program, provides remediation assistance through the Water Supply Restoration Funding Program. If water sampling results reveal human-made contaminants at concentrations that exceed drinking water quality standards, the program will identify alternatives and fund the most cost-effective restoration or replacement project for that private well. Solutions may include connection to a public water system, installing a filter system to remove the contaminants, and/or providing bottled-water delivery service on a temporary basis during restoration.

Though most current drinking water mitigation funding programs in Massachusetts are focused on public water systems, one temporary program allows for private wells to be included in special cases:

- **Emerging Contaminants in Small or Disadvantaged Communities**: This grant program, funded by the Infrastructure Investment and Jobs Act, targets small or disadvantaged public water systems impacted by contaminants such as PFAS. The program provides grant funding for the planning, design and construction of treatment or remediation solutions for emerging contaminants so that small and disadvantaged communities have access to safe and clean drinking water. This program includes a special eligibility case to connect households with private wells to a community public water system that meets the definition of small and/or disadvantaged. This program is in its fourth year of five.

To address issues discovered through the Title 5 program, the Massachusetts Community Septic Management Program provides financial assistance to homeowners with failing septic systems. This program provides low-cost loans for the development of a Community Inspection Plan or a Local Septic Management Plan. These loans assist in the repair, replacement, or upgrade of septic systems, including conventional Title 5 systems, innovative/alternative systems, or connections to existing sewer lines. Homeowners repay the loans over time. A tax credit of up to $6,000 over 4 years is also provided to help defray the cost of septic repairs to a primary residence. This program is administered by MassDEP and the MA Clean Water Trust. **A similar funding mechanism could be developed to address treatment and private well replacement or public water connection projects.**

Considerations for a Massachusetts Statewide Private Drinking Water Well Program

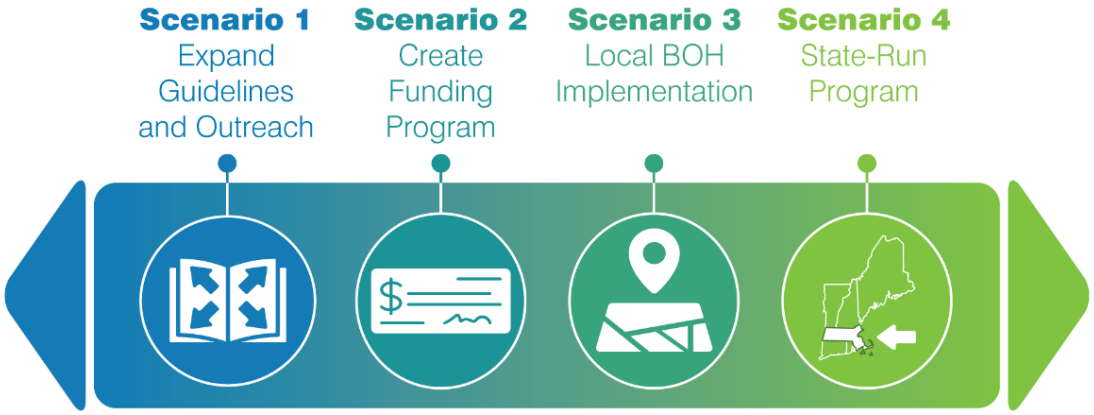
As noted in the previous two sections, there are multiple considerations concerning potential development of a statewide program. These include:

- **Would the program be regulatory or non-regulatory?** Potential options include:
    - Establish a non-regulatory program (e.g. .guidelines, training sessions, technical advice, etc.).
    - Establish a regulatory program that is primarily administered and enforced by local BOHs, similar to the Title 5 model for the regulation of on-site sewage treatment and disposal systems.
    - Establish a regulatory program that is primarily administered and enforced by MassDEP or Massachusetts DPH, similar to MassDEP's Drinking Water Program for the regulation of public water systems.
- **Who would be the regulatory entity?** For Massachusetts, options include MassDEP, Massachusetts DPH, local BOHs, or a combination.
- **What would a statewide program cost ?** Considerations include costs to the state regulatory agency administering a statewide program, local governments (primarily local BOHs), and private well owners.
- **What would be included in statewide regulations or guidelines if developed?** Potential options include:
    - Well setback distances
    - Well construction standards
    - Well capacity
    - Testing parameters
    - Testing frequency
    - Remediation/treatment requirements
- **Are there regulatory or other limitations to providing public information about private homes?** A mandate or requirement for private well drinking water quality data to be uploaded to an online data portal may be necessary to make information publicly available. Similar to public water system data, MassDEP-certified laboratories could be required to upload water quality test results through MassDEP's eDEP electronic filing system, where they would be made available to the public through the EEA Data Portal.

- **Should remediation assistance, or other financial assistance, be provided by the Commonwealth?** Financial support for testing and implementing state-approved solutions, such as water treatment filters or public water system connection, may be needed.

Scenarios for a Massachusetts Statewide Private Drinking Water Well Program

Four scenarios for a Massachusetts statewide private drinking water well program are outlined below. The scenarios may be considered individually, in tandem, or rolled out in a stepwise manner. Development considerations are discussed in each section below.



Scenario Development

For each scenario, a **description of the scenario components** and **considerations and assumptions** made to develop the scenario are provided. In addition, each scenario has a table outlining **estimated costs** (Year 1 costs to implement the program and the total five-year costs) and **relative LOE** for three key stakeholders. Scenarios 3 and 4 also include Pre-Program year costs to the Commonwealth that are associated with developing regulations and outreach material in advance of the Year 1 implementation of the regulatory program. Stakeholders include:

- Commonwealth of Massachusetts
- Local BOHs
- Private Well Owners

Scenario Assumptions

To develop and estimate costs for the four scenarios, assumptions about the scope and magnitude of each scenario had to be made. These assumptions were developed through discussions with MassDEP staff and municipal staff, and through a review of available online data, shown in the Appendix C.

For all scenarios, the following assumption was made:

- **Staffing Costs**: To calculate the cost impact of hiring additional staff members, a full-time equivalent (**FTE**) value was used. FTE is a standardized metric that measures the workload of employees, particularly helpful when part-time or contract workers are involved, by converting their hours worked into the equivalent number of full-time employees. Utilizing an FTE value is crucial since some programs may not require "whole number" employees, and it is a way to understand the increased amount of workload. For example, one FTE represents the hiring of one additional employee or distributing the workload of one FTE among existing staff. The latter would require a shift in duties to accommodate the additional workload. **Table A-1 in Appendix A details the FTE salary amount used for various staff members at the state and local level**.

Scenarios 3 and 4 incorporate **well water quality testing/sampling and well treatment, repair and/or maintenance**. Costs for these activities depend on which private wells are regulated, requirements of the sampling plan (i.e., list of contaminants/analytes to be tested and frequency of testing), and laboratory analysis results. Assumptions specific to Scenarios 3 and 4 are summarized below and shown in detail in Appendix A, with additional source information in Appendix C.

- **Well Groups:** For the purposes of evaluating total costs incurred by private well owners, two private well groups were created, as follows: 1) newly installed wells and those transferred to new owners through real estate transactions, identified as "Only new and transferred private wells" in Table 2. below and 2) existing private wells, identified as "Existing private wells". Assumptions regarding the number of private wells that require testing and treatment, repair and/or maintenance are discussed below.
    - Newly installed wells and wells associated with property transfers wouldl be sampled, totaling an estimated 10,000 wells each year. Of these wells, 30% (3,000 wells) would need treatment, repair and/or maintenance. Specifically, the approximated breakdown is 2,500 wells per year would require treatment and 500 wells per year would require repair.

- Existing wells would be sampled over five years, as it is unrealistic to expect to sample an estimated 275,546 wells in the first year of a statewide regulatory program given laboratory capacity, etc. By distributing the sampling efforts over five years, approximately 55,109 existing wells would be sampled each year. It is assumed that 30% of existing wells (16,600± wells per year) would require treatment and 5% of existing wells (2,800± wells per year) would need repair.

- **Sampling Plans:** Two different sampling plan options are presented for consideration. These options include: 1) a plan that mimics the testing requirements currently included in MassDEP's Model BOH Regulations for Private Wells, identified as "Model BOH" in Table 2. and 2) a plan that mimics the testing requirements of public water systems pursuant to the Massachusetts Drinking Water Regulations at 310 CMR 22.00 but with some common-sense restrictions, identified as "PWS" in Table 2.

  Laboratory analytical costs were determined through discussions with MassDEP-certified laboratories. MassDEP provided the estimated average cost of confirmatory testing that may be necessary if one or more contaminant is detected above drinking water standards. Sampling costs for the individual well owner will vary from this average cost estimate depending on the extent of regulatory requirements and the contaminant of concern identified in the test results.

Table 2. below shows the estimated costs to private well owners for the first five years of a statewide regulatory program based on the assumptions outlined above and shown in detail in Appendix A tables. Other specific assumptions are described within each scenario. All sources are outlined in Appendix C at the end of this report.

Table 2. Estimated Private Well Owner Costs				
Activity	**Well Group**	**Sampling Plan**	**Year 1 Total**	**5-Year Total**
Well Water Quality Testing/Sampling	Only new and transferred private wells*	Model BOH‡	$8,850,000	$72,940,000
		PWS§	$23,850,000	$149,100,000
	Existing private wells†	Model BOH‡	$50,183,000	$408,175,000
		PWS§	$132,846,000	$827,885,000
Well Treatment, Repair and/or Maintenance	Only new and transferred private wells*	Not applicable	$6,110,000	$32,991,000
	Existing private wells†	Not applicable	$39,508,000	$213,344,000

* Newly installed wells and wells associated with real estate transfers (estimated 10,000 wells/year).

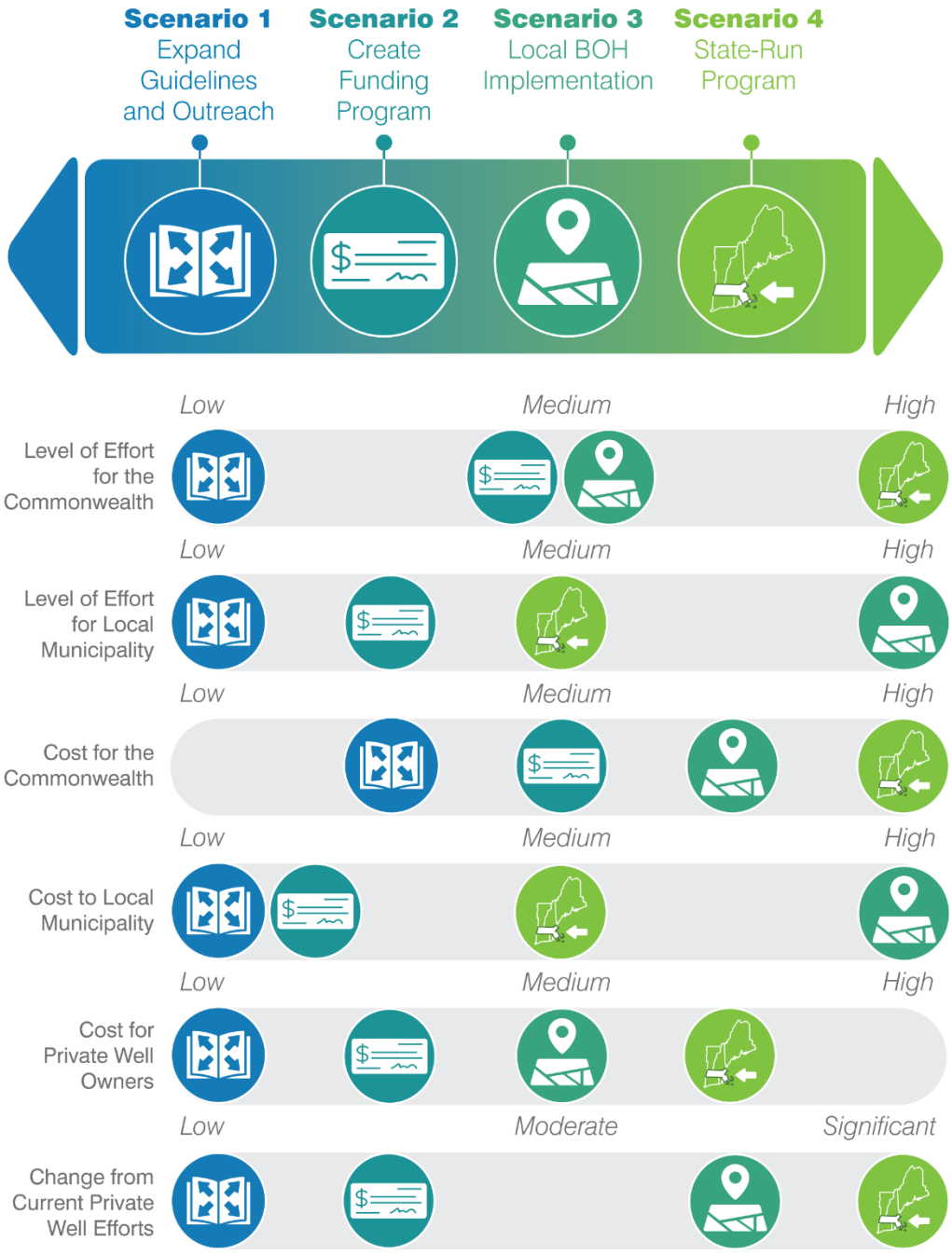
† Existing wells (testing of all 275,546 wells spread out over 5 years at a rate of 55,109 wells/yr).

‡ Wells are sampled for contaminants per MassDEP's *Model BOH Regulations for Private Wells.* See Table A-2 in Appendix A for a breakdown of the cost per private well owner.

§ Wells are sampled for contaminants required for a community public water system, pursuant to the Massachusetts Drinking Water Regulations (310 CMR 22.00). Sampling frequencies adjusted downward to reflect a more realistic regulatory scenario for private wells. See Table A-3 in Appendix A for a breakdown of the cost per private well owner.

Program Comparison

The graphic below denotes each of the four scenarios with their corresponding icon to allow a visual comparison for various topics, including level of effort, cost, and change from current level of private well guidance provided by MassDEP. All scenarios are described in detail in the sections that follow.



Scenario 1: Expand Guidelines and Outreach

Create a program to expand current guidance and outreach efforts.

The MassDEP Drinking Water Program currently provides guidance and limited outreach regarding private wells. As previously noted, because the current program's legislative mandate only includes public water supplies, materials developed for private wells are currently outside the scope of any specific legislative mandate and **the program currently receives no dedicated funding to develop and disseminate those materials.**

In this scenario, **MassDEP would provide enhanced technical information, outreach and education to local BOHs, well drillers, and well owners** through a funded staff position.

Scenario 1 Development Considerations

Expanded guidance and outreach would complement any additional program components.

Scenario 1 Cost Estimate

Table 3. below presents a summary of the total estimated cost and relative LOE for the first five years of this program (costs have been rounded for ease of comparison). As this program would expand the existing guidelines and outreach performed by the Commonwealth, **there would be no anticipated cost to local BOHs or homeowners.**

For this scenario, primary costs include **staffing costs to run the program and upfront costs for a consultant to develop materials.** A breakdown of expenses, sources, and assumptions are provided in detail in Table B-1 in Appendix B.

Table 3. Scenario 1: Expand Guidelines and Outreach
Total Estimated Costs and Relative LOE

Entity	Year 1 Cost	5 Year Total Cost	Level of Effort
Commonwealth of Massachusetts	$396,000	$1,780,000	Low
Local Boards of Health	None		Low
Private Well Owners	None		Low

Scenario 2: Create Funding Program

Develop a funding program to assist private well owners with remediation efforts.

In this scenario, the Commonwealth of Massachusetts would **develop a funding program** for remediation modeled after the Community Septic Management Program. That program, funded by the Clean Water Trust and administered by MassDEP, provides financial assistance to homeowners with failing septic systems identified through Title 5. A similar funding program would be established to **assist private well owners with the cost of installing drinking water treatment for contaminants exceeding regulatory standards**. This funding program could either be a standalone program, or it could be combined with the implementation of Scenarios 1, 3, or 4. This funding program would not be used to eliminate the liability of responsible parties and potentially responsible parties from any obligations that they may have under the Massachusetts Contingency Plan, 310 CMR 40.0000, to pay for the installation and operation of systems designed to treat water withdrawn from private drinking water wells contaminated by releases of oil and/or hazardous materials. Other program funding considerations could include free/subsidized water quality sampling based on a resident's health risk or income status.

Scenario 2 Development Considerations

This program could initially target known areas of concern for potential contamination or low-income areas and then be expanded to include other portions of the state.

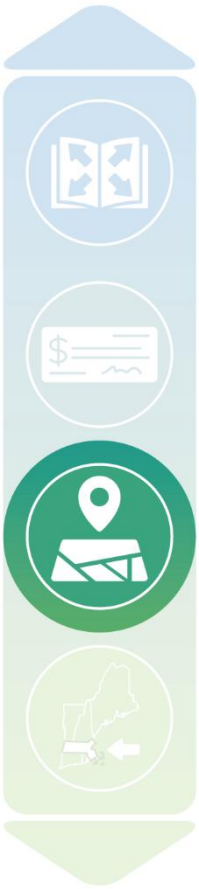
Scenario 2 Cost Estimate

Table 4. below presents a summary of the total estimated cost and relative LOE for startup (pre-program) and the first five years of implementing this program (costs have been rounded for ease of comparison). For the assumptions used in this cost scenario, **$5 million in funding per year is required by the Legislature** as it often takes many years before a fund is self-sustained from loan repayments. This scenario **will have anticipated costs to the state, local BOHs, and homeowners:**

- **Commonwealth**: Pre-program costs consist of startup tasks such as outreach, legal fees for developing regulations to run the program, and staffing costs for MassDEP. Costs in future years include staffing and legal consultation, as needed.
- **Local BOHs**: Costs to local BOHs include staffing to run the program.
- **Private Well Owners:** Costs to homeowners include loan repayment and administrative fees.

Table 4. Scenario 2: Create Funding Program Total Estimated Costs and Relative LOE				
Entity	**Pre-Program**	**Year 1**	**5 Year Total**	**Level of Effort**
Commonwealth of Massachusetts	$393,000	$216,000	$1,166,000	Medium
Local Boards of Health	None	$3,796,000	$20,498,000	Low to Medium
Private Well Owners	None	$677,000	$8,909,000	Medium to High

A breakdown of expenses, sources, and assumptions are detailed in Tables B-2 through B-4 in Appendix B.



Scenario 3: Local BOH Implementation

Collaborate with local BOHs, similar to the Title 5 Septic System Program.

In this scenario, a statewide program for private drinking water wells authorized by the Legislature would be modeled after the existing Title 5 Septic System Program. This scenario would include MassDEP or DPH developing private drinking water well regulations and collaborating with **local BOHs for implementation and enforcement of the program**. Other components may include:

- ✓ Required testing of new wells or replacement wells.
- ✓ Required testing by seller at property transfer with notification requirements to potential buyers.
- ✓ Required testing by rental property owners with notification requirements to renters/tenants.
- ✓ Required testing of all existing wells.
- ✓ Allowances by local BOHs for water quality sampling at properties that may be at risk for contamination due to location or presence of a sensitive population (e.g. severely compromised immune system, infant, pregnant).

Scenario 3 Development Considerations

- Any program requiring coordination by local BOHs should consider the additional burden placed on the municipalities for tracking and enforcement.
- Development of a program modeled after the Title 5 program would require similar authorizing legislation.
- Any program requiring water quality sampling should consider a funding mechanism to assist property owners with the cost of remediation (See Scenario 2: Create Funding Program).
- Any program requiring sampling could also require the use of MassDEP-certified laboratories; therefore, the capacity of those laboratories should be considered when planning rollout of the regulatory requirements.
- Initial outreach would be needed for regulation development and release of the program.

Scenario 3 Cost Estimate

Anticipated costs to the Commonwealth, local BOHs and private well owners are discussed below.

- **Commonwealth**: Pre-program costs consist of startup tasks, such as developing program regulations and outreach material. Costs in future years include staffing, consultant fees, and legal consultation, as needed.
- **Local BOHs**: Costs to local BOHs include staffing to run the program, travel for BOH agents, and legal fees for regulation development and enforcement.
- **Private Well Owners:** Costs to homeowners include water quality testing, treatment, and well repair/maintenance and are provided as a range depending on the contaminants tested and the frequency of testing, as described in the Assumptions section above.

Table 5. below presents the total estimated costs and relative LOE for startup (pre-program) and the first five years of implementing this program (costs have been rounded for ease of comparison). A detailed breakdown of costs for the Commonwealth and local BOHs is provided in Tables B-5 and B-6 in Appendix B. A detailed breakdown of costs to private well owners is shown in Tables A-8 and A-9 in Appendix A.

Table 5. Scenario 3: Local BOH Implementation
Total Estimated Costs and Relative LOE

Entity		Pre-Program	Year 1	5 Year Total	Level of Effort
Commonwealth of Massachusetts		$589,000	$1,201,000	$6,128,000	Medium
Local Boards of Health		None	$6,493,000	$31,354,000	High
Private Well Owners	A*	None	$14,960,000	$105,931,000	Medium to High
	B*		$89,691,000	$621,519,000	
	C*		$29,960, 000	$182,091,000	
	D*		$172,354,000	$1,041,229,000	

* See Table 2 in Scenario Assumptions section above for a breakdown of water quality testing vs. treatment and repairs costs. Private Well Owners cost estimates are provided for the following scenarios:

- A – Only new wells and property transfer wells require testing per Model BOH Private Well Regulations.
- B – All existing wells require testing per Model BOH regulations.
- C - Only new wells and property transfer wells require testing similar to what is required for community public water supplies.
- D - All existing wells require testing similar to what is required for community public water supplies.

Scenario 4: State-Run Program

Develop a state-run private well program, similar to the current Drinking Water Program for public water supplies.

Scenario 4 involves MassDEP or DPH developing a statewide program for private drinking water wells authorized by the Legislature. This scenario could include the development of private drinking water well regulations and relying on a state agency for implementation and enforcement of the program. Since this program would operate entirely at the state level, **there are no anticipated costs to local BOHs.** Specific programmatic requirements may include:

- ✓ Testing of new wells or replacement wells.
- ✓ Testing by seller at property transfer with notification requirements to potential buyers.
- ✓ Testing by rental property owners with notification requirements to renters/tenants.
- ✓ Testing of all existing wells.
- ✓ Licensing of private well samplers and water quality interpreters (similar to Rhode Island's program)

Two scenarios were considered for this program, as listed below:

- **Scenario 4A:** Statewide regulations include water quality testing and treatment/remediation.
- **Scenario 4B:** Statewide regulations include water quality testing, treatment/remediation, and additional requirements included in MassDEP's Model Board of Health Regulations for Private Wells. Those additional requirements include well construction and minimum well yield requirements.

The primary difference between Scenarios 4A and 4B is the staff for the Commonwealth, as Scenario 4B would require a higher level of staffing to regulate additional well construction and minimum well yield requirements for the construction of new wells.

Scenario 4 Development Considerations

- Many of the considerations discussed in Scenario 3 would also apply to Scenario 4.
- A new state-run program would have significant upfront costs and long-term needs for programmatic financing.
- This program would require authorizing legislation.

Scenario 4 Cost Estimate

Anticipated costs to the Commonwealth, local BOHs and private well owners are discussed below.

- **Commonwealth**: Pre-program costs consist of startup tasks, such as developing program regulations and outreach material, data portal development, certification of well samplers and results interpreters, and staffing and travel costs for MassDEP. Costs during years of program implementation include staffing, consultant fees, certification and data portal maintenance, and legal consultation as needed.
- **Local BOHs**: There are no anticipated costs to local BOHs though additional effort by current staff to inform the public and answer questions is likely.
- **Private Well Owners:** Costs to homeowners include sampling, treatment, and well repair/maintenance and are provided as a range depending on the contaminants tested and the frequency of testing, as described in the Assumptions section above.

Table 6. below presents the total estimated costs and relative LOE for startup (pre-program) and the first five years of implementing this program (costs have been rounded for ease of comparison).

Table 6. Scenario 4: State-Run Program
Total Estimated Costs and Relative LOE

Entity		Pre-Program	Year 1	5 Year Total	Level of Effort
Commonwealth of Massachusetts	4A*	$2,362,000	$4,571,000	$23,821,000	High
	4B†	$2,362,000	$7,516,000	$39,726,000	
Local Boards of Health		None			Medium
Private Well Owners	A‡	None	$14,960,000	$105,931,000	Medium to High
	B‡		$89,691,000	$621,519,000	
	C‡		$29,960, 000	$182,091,000	
	D‡		$172,354,000	$1,041,229,000	

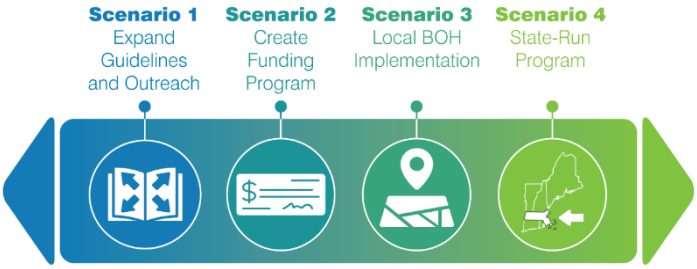
* Costs for Scenario 4A are for statewide regulations that only include water quality testing and treatment/remediation requirements.
† Costs for Scenario 4B include the same water quality testing and treatment/remediation requirements plus additional requirements included in MassDEP's Model Board of Health Regulations for Private Wells (i.e. well construction and minimum well yield requirements).
‡ See Table 2 in Scenario Assumptions section above for a breakdown of water quality testing vs. treatment and repairs costs. Private Well Owners cost estimates are provided for the following scenarios:

- A – Only new wells and property transfer wells require testing per Model BOH Private Well Regulations.
- B – All existing wells require testing per Model BOH regulations.
- C - Only new wells and property transfer wells require testing similar to what is required for community public water supplies.
- D - All existing wells require testing similar to what is required for community public water supplies.

A detailed breakdown of costs for the Commonwealth and Local BOHs is provided in Tables B-7 and B-8 in Appendix B. A detailed breakdown of costs to private well owners is shown in Tables A-8 and A-9 in Appendix A.

Conclusions

MassDEP conducted a review of the current state of private drinking water well oversight in Massachusetts and, as directed by the Legislature, outlined potential approaches and considerations associated with potential establishment of a statewide program. Through a review of existing state and local programs, analysis of comparable efforts in other states, and the development of four potential new program scenarios, the report presents the necessary context and data to inform future decision-making.



The four scenarios range in scope, responsibility, and cost:

- **Scenario 1: Expand Guidelines and Outreach**
  - Enhances current MassDEP technical guidance and educational efforts with dedicated staff, funding, and resources.
- **Scenario 2: Create Funding Program**
  - Establishes financial assistance for private well owners to test and remediate contamination, modeled after MassDEP's Community Septic Management Program.
- **Scenario 3: Local BOH Implementation**
  - Develops statewide regulations that are administered and enforced locally by BOHs, similar to Massachusetts's Title 5 septic system program.
- **Scenario 4A/4B: State-Run Program**
  - Creates a comprehensive, centralized program fully operated by the state, including testing and remediation requirements.

The report does not make specific recommendations but provides possible program components, implementation considerations, and cost estimates to support discussions around the feasibility, structure, and scope of a potential statewide program. The information is intended to help the Commonwealth evaluate the needs, and options associated with potential establishment of a statewide private well drinking water program in Massachusetts.

A summary of costs and relative level of effort between scenarios are shown in Table 7. and the graphic below:

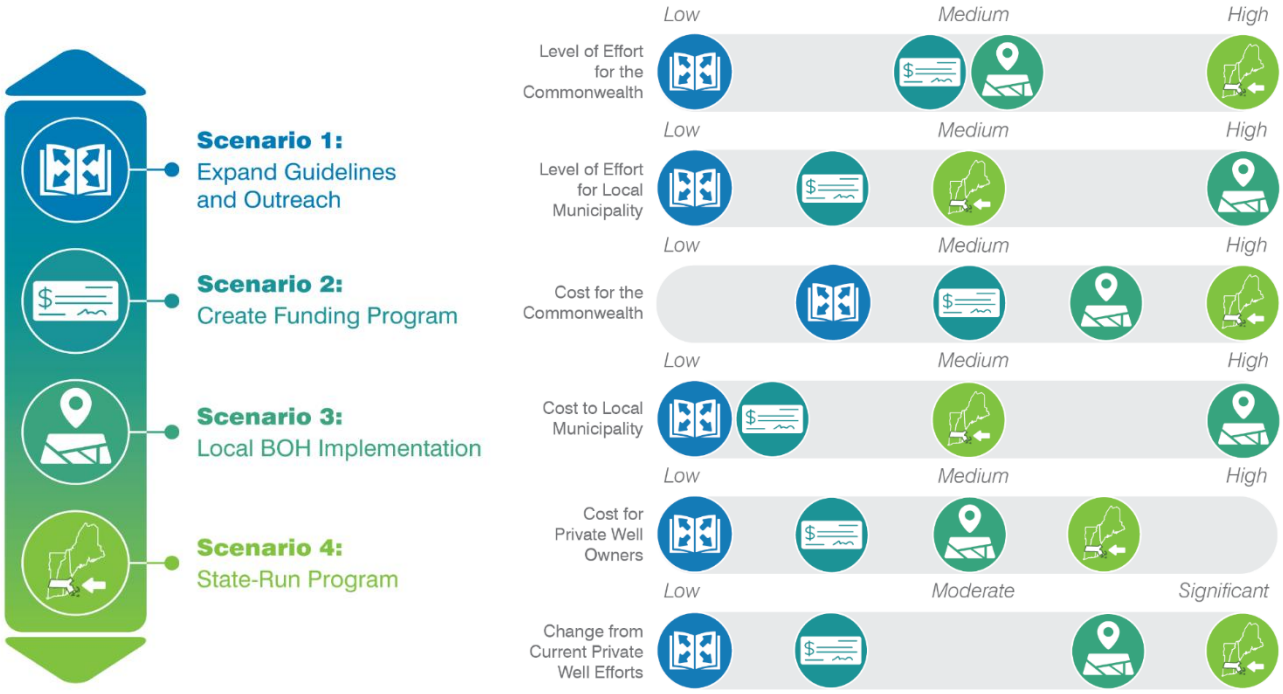


Table 7. Estimated Cost Summary for Private Well Programs

Scenario	Commonwealth*		Municipalities		Private Well Owners	
	Year 1	5 Year Total	Year 1	5 Year Total	Year 1	5 Year Total
1	$396,000	$1,780,000	None		None	None
2	$216,000	$1,166,000	$3,796,000	$20,498,000	$677,000	$8,909,000
3	$1,201,000	$6,128,000	$6,493,000	$31,354,000	$14,960,000 to $172,354,000†	$105,931,000 To $1,041,229,000†
4A	$4,571,000	$23,821,000	None			
4B	$7,516,000	$39,726,000	None			

* Year 1 cost to the Commonwealth does not include the estimated Pre-Program year cost to develop regulations and outreach material prior to the implementation of the regulatory program in Year 1. Estimated Pre-Program year costs are $589,000 for Scenario 3 and $2,362,000 for Scenarios 4A and 4B.

† Wide range of costs based on the level of regulations ultimately adopted for each Scenario.

Appendices

Appendix A: Supplemental Information
Appendix B: Program Cost Breakdown
Appendix C: Source Annex

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Appendix A: Supplemental Information

Table A-1. Full Time Equivalent Salary & Department Costs per Employee Type	
Type	**Salary**
MassDEP Staff Member	$196,356
MassDEP Legal Counsel	$196,356
Municipal Staff Member	$108,147
Municipal Legal Counsel	$160,000

Table A-2. Cost per Well Owner for Water Testing Required by Model Board of Health Regulations*

Parameter	Testing Frequency	Cost Per Sample (from lab)	Annual Cost	Year 1 Cost	Total 5 Year Cost
Arsenic	First year only	$35	$0	$35	$35
Chloride	Once every 10 years	$25	$0	$25	$25
Conductivity	Annual	$20	$20	$20	$100
Copper	First year only	$12	$0	$12	$12
E. Coli Bacteria	Annual	$55	$55	$55	$275
Fluoride	First year only	$25	$0	$25	$25
Hardness	Once every 10 years	$30	$0	$30	$30
Iron	Annual	$35	$35	$35	$175
Lead	First year only	$35	$0	$35	$35
Sodium	Annual	$15	$15	$15	$75
Manganese	First year only	$12	$0	$12	$12
Nitrate/Nitrite	Annual	$45	$45	$45	$225
PFAS	Once every 10 years	$330	$0	$330	$330
pH	Annual	$15	$15	$15	$15
Radon and Gross Alpha Screen	First year only	$12	$0	$12	$12
Total Coliform Bacteria	Annual	$55	$55	$55	$275

* Wells are sampled for contaminants per MassDEP's Model BOH Regulations for Private Wells.

Total Cost to Sample a Single Well	Annual Cost	Year 1 Cost	Year 5 Cost
	$240	$756	$1,656
Rounded Estimates	$240	$760	$1,660

Table A-3. Cost per Well Owner if Testing Requirements are Similar to those of Community Public Water Systems*						
Parameter	**Testing Frequency**	**Cost Per Sample (from lab)**	**Annual Cost**	**Every 3 Year Cost**	**Year 1 Cost**	**Total 5 Year Cost**
Aluminum	Once	$12	$0	$0	$12	$12
Antimony	Every nine years	$35	$0	$0	$35	$35
Arsenic	Every nine years	$35	$0	$0	$35	$35
Barium	Every nine years	$15	$0	$0	$15	$15
Beryllium	Every nine years	$15	$0	$0	$15	$15
Cadmium	Every nine years	$15	$0	$0	$15	$15
Chloride	Once	$25	$0	$0	$25	$25
Chromium	Every nine years	$15	$0	$0	$15	$15
Copper	Once	$12	$0	$0	$12	$12
Cyanide	Every nine years	$45	$0	$0	$45	$45
E. Coli Bacteria	Annual	$55	$55	$0	$55	$275
Fluoride	Every nine years	$25	$0	$0	$25	$25
Hardness	Once	$30	$0	$0	$30	$30
Iron	Once	$35	$0	$0	$35	$35
Lead	Once every 3 years	$35	$0	$35	$35	$70
Manganese	Once	$12	$0	$0	$12	$12
Mercury	Every nine years	$30	$0	$0	$30	$30
Nickel	Every nine years	$15	$0	$0	$15	$15
Nitrate/Nitrite	Annual	$45	$45	$0	$45	$225
Odor	Once	$40	$0	$0	$40	$40
Perchlorate	Every nine years	$26	$0	$0	$26	$26
PFAS	Every nine years	$330	$0	$0	$330	$330
pH	Once	$15	$0	$0	$15	$15
Radon and Gross Alpha Screen	Every nine years	$12	$0	$0	$12	$12
Selenium	Every nine years	$35	$0	$0	$35	$35
Silver	Once	$12	$0	$0	$12	$12
SOCs	Once	$1,000	$0	$0	$1,000	$1,000
Sodium	Every three years	$15	$0	$15	$15	$30
Sulfate	Once	$25	$0	$0	$25	$25
TDS	Once	$15	$0	$0	$15	$15
Thallium	Every nine years	$35	$0	$0	$35	$35
Total Coliform Bacteria	Annual	$55	$55	$0	$55	$275
VOCs	Every three years	$125	$0	$125	$125	$250
Zinc	Once	$12	$0	$0	$12	$12
* Wells are sampled for contaminants required for a			Annual Cost	Every 3 Year Cost	Year 1 Cost	Year 5 Cost

Table A-3. Cost per Well Owner if Testing Requirements are Similar to those of Community Public Water Systems*						
Parameter	**Testing Frequency**	**Cost Per Sample (from lab)**	**Annual Cost**	**Every 3 Year Cost**	**Year 1 Cost**	**Total 5 Year Cost**
community public water system, pursuant to the Massachusetts Drinking Water Regulations (310 CMR 22.00). Sampling frequences adjusted downward to reflect a more realistic regulatory scenario for private wells.		Total Cost to Sample a Single Well				
			$155	$175	$2,258	$3,053
		Rounded Estimates	$160	$180	$2,260	$3,060

Table A-4. Testing/Sampling Costs Per Well	
PWS Initial Year's Cost*	**BOH Initial Year's Cost†**
$2,260	$760
PWS Annual Cost*	**BOH Annual Cost†**
$160	$240
PWS Every 3YR Cost*	**BOH Every 3YR Cost†**
$180	Not Applicable
Cost Per Sample for Additional Testing‡	
$250.00	

Notes:
* "PWS" indicates that sampling requirements are similar to those required for community public water systems.
† "BOH" indicates that sampling requirements are identical to those stipulated in MassDEP's Model BOH Regulations for Private Wells.
‡ MassDEP provided equation to estimate cost of additional testing (2nd and 3rd tests):

$$Cost\ per\ test = \frac{1}{3}[\$110\ (bacteria\ sample\ cost) + \$45\ (average\ cost\ of\ other\ contaminants) + \$600\ (PFAS\ sample + field\ blank\ analysis] = \$250$$

Table A-5. Treatment & Repair Costs	
Type	**Average Cost of Treatment/Repair Per Well ($)**
Minor Water Quality Repair	300
Intermediate Water Quality Repair	2,400
Major Water Quality Repair	4,000
Minor Well Structural Repair	800
Well Decommissioning	4,000
New Well	21,000

Table A-6. Treatment & Repair Costs	
Type	**Costs**
Treatment/Remediation Costs	Low Cost - $50 to $500 (Under Sink) Medium Cost - $800 to $4000 (Cartridge), $1,500 to $5,000 (Aeration) High Cost - $15,000 to $20,000 (New Drilled Wel)
Well Maintenance and Inspection	Low Cost - $150 to $350 (Pump testing/flow rate checks) Medium Cost - $350 to $500 (Professional well evaluation with sampling) High Cost - $450 to $700 (Camera inspection or professional well evaluation with sampling)
Well Repair of Upgrades	Low Cost - $75 to $250 (Replace well cap or sanitary seal) Medium Cost - $500-$1,500 (Full wellhead assembly replacement) High Cost - $3,000 to $5,000 (Pump replacement)
Well Disinfection	Low Cost - $24 to $130 (At home chlorine disinfection) High Cost - $400 to $650 (Professional services for more advanced treatment)
Well Decommissioning	Low Cost - $500 (Shallow/small-diameter well) Medium Cost - $2,800 (150 foot deep well) Large Cost - $5,000 (Deep/wide-diameter well)

Table A-7. Treatment, Repair, and Maintenance Costs if all Existing Wells are Regulated*						
Type	**% of Wells†**	**Number of Wells Per Year**	**Assumptions**	**Average Cost of Treatment/Repair Per Well**	**1-YR Cost to Well Owners**	**5-YR Cost to Well Owners**
Minor Water Quality Repair	38.5%	7469	Minor water quality issue that can be fixed with well disinfection or purchase of under sink system	$300	$2,240,700	$12,099,780
Intermediate Water Quality Repair	12.0%	2328	Intermediate water quality issue that can be fixed with a cartridge system	$2,400	$5,587,200	$30,170,880
Major Water Quality Repair	35.0%	6790	Major water quality issue that can be fixed with whole house granular activated carbon system	$4,000	$27,160,000	$146,664,000
Minor Well Structural Repair	13.5%	2619	Minor repair that can be fixed by sealing, grouting, or seal replacement	$800	$2,095,200	$11,314,080
Well Decommissioning	0.5%	97	When damage goes beyond minor and major repair, when a well needs to be closed	$4,000	$388,000	$2,095,200
New Well	0.5%	97	When repair/treatment/remediation is not an option. Cost includes the installation of a new well and new well pump.	$21,000	$2,037,000	$10,999,800
				Total	**$39,508,100**	**$213,343,740**

* Above cost estimates are based on all existing wells being tested for water quality over the first 5 years of implementation of the private well program and that approximately 35% of the wells tested each year will require some form of water treatment or well repair, maintenance, or replacement (estimated 19,400 total wells per year requiring mitigation)

† The "% of Wells" column indicates the percentage of the 19,400 wells per year that are estimated to require the specified mitigation.

Table A-8. Cost Scenario 2: Treatment, Repair, and Maintenance Costs if only New Wells and Transferred Wells are Regulated*						
Type	**% of Wells†**	**Number of Wells Per Year**	**Assumptions**	**Average Cost of Treatment/Repair Per Well**	**1-YR Cost to Well Owners**	**5-YR Cost to Well Owners**
Minor Water Quality Repair	38.5%	1155	Minor water quality issue that can be fixed with well disinfection or purchase of under sink system	$300	$346,500	$1,871,100
Intermediate Water Quality Repair	12%	360	Intermediate water quality issue that can be fixed with a cartridge system	$2,400	$864,000	$4,665,600
Major Water Quality Repair	35%	1050	Major water quality issue that can be fixed with whole house granular activated carbon system	$4,000	$4,200,000	$22,680,000
Minor Well Structural Repair	13.5%	405	Minor repair that can be fixed by sealing, grouting, or seal replacement	$800	$324,000	$1,749,600
Well Decommissioning	0.5%	15	When damage goes beyond minor and major repair, when a well needs to be closed	$4,000	$60,000	$324,000
New Well	0.5%	15	When repair/treatment/remediation is not an option. Cost includes the installation of a new well and new well pump.	$21,000	$315,000	$1,701,000
				Total	**$6,109,500**	**$32,991,300**

* Above cost estimates are based on all newly installed wells and wells associated with real estate transfers (estimated 10,000 wells/year) requiring water quality testing and approximately 30% of the wells tested each year will require some form of water treatment, well repair, maintenance, or replacement (estimated 3,000 total wells per year requiring mitigation).

† The "% of Wells" column indicates the percentage of the 3,000 wells per year that are estimated to require the mitigation specified for that row.

Table A-9. Cost Scenario 1: Existing Wells (Testing and Sampling Costs)					
Type	Number of wells (per year)	Year 1 Cost - PWS	Year 5 Cost - PWS	Year 1 Cost - BOH	Year 5 Cost - BOH
Initial testing	55,109*	$124,546,340	$791,365,240	$41,882,840	$371,655,096
2nd & 3rd testing	16,600†	$8,300,000	$36,520,000	$8,300,000	$36,520,000
	Total	$132,846,340	$827,885,240	$50,182,840	$408,175,096

* The 55,109 wells initially tested per year represent 20% of the estimated 275,546 existing private wells.
† The 16,600 wells receiving 2nd and 3rd rounds of testing per year represent the estimated 30% of the 55,109 wells tested per year that will exceed one or more health-based drinking water standard.

Table A-10. Cost Scenario 2: New Wells and/or Transferred Wells (Testing and Sampling Costs)					
Type	Number of wells (per year)	Year 1 Cost - PWS	Year 5 Cost - PWS	Year 1 Cost - BOH	Year 5 Cost - BOH
Initial testing	10,000*	$22,600,000	$143,600,000	$7,600,000	$67,440,000
2nd & 3rd testing	2,500†	$1,250,000	$5,500,000	$1,250,000	$5,500,000
	Total	$23,850,000	$149,100,000	$8,850,000	$72,940,000

* The 10,000 wells initially tested per year represent the estimated annual number of newly installed wells and wells associated with real estate transfers.
† The 2,500 wells receiving 2nd and 3rd rounds of testing per year represent the estimated 25% of the 10,000 wells tested per year that will exceed one or more health-based drinking water standard.

Appendix B: Program Cost Breakdown

Table B-1. Scenario 1 – Expand Guidelines and Outreach

Cost to the Commonwealth of Massachusetts

Expenses	Source	Assumptions	Year 1 Startup Staff - FTE	Year 1 Startup Costs	Maintenance Staff - FTE	Annual Maintenance Costs (includes inflation)	Total 5-YR Costs
Salary Cost (inc. Fringe, OH, Payroll Taxes)	Joe Cerutti (MassDEP)		1	$196,356	1	$215,992	$1,060,322
Consultant/Other Contract Cost Develop new simplified material, create hard copy mailings or brochures, social media, respond to questions/requests	Steve Roy (W&S); Yvette DePeiza (MassDEP)	Need to hire an external contractor to develop new/updated materials, Year 2-5 costs include funds for contractor to develop training and additional money to periodically produce updated or new material		$200,000		$130,000	$720,000
		TOTAL Budget		**$396,356**		**$345,992**	**$1,780,322**

Note: As this program would only expand the existing guidelines and outreach performed by the Commonwealth, there would be no anticipated costs to local BOHs or homeowners.

Table B-2. Scenario 2 – Create Funding Program Cost to the Commonwealth of Massachusetts									
Expenses	**Source**	**Assumptions**	**Pre-Program Staff - FTE**	**Pre-Program Year Costs**	**Year 1 Startup Staff - FTE**	**Year 1 Startup Costs**	**Maintenance Staff - FTE**	**Annual Maintenance Costs (includes inflation)**	**Total 5-YR Costs**
Salary Cost (inc. Fringe, OH, Payroll Taxes) Public outreach included	Joe Cerutti (DEP); Michele Higgins (DEP) and Robin McNamara (DEP)		1	$196,356	1	$196,356	1	$215,992	$1,060,322
Legal Develop regulations, develop funding program parameters	Steve Roy (W&S)	Will need enabling legislation to establish program and develop regulations. Assume multiple rounds of review with one attorney in Year 1 and one tenth attorney in Years 2-5	1	$196,356	0.1	$19,636	0.1	$21,599	$106,032
		TOTAL Budget		**$392,712**		**$215,992**		**$237,591**	**$1,166,355**

Table B-3. Scenario 2 – Create Funding Program

Cost to Local Boards of Health, Statewide

Expenses	Source	Assumptions	Year 1 Startup Staff - FTE	Year 1 Startup Costs	Maintenance Staff - FTE	Annual Maintenance Costs (includes inflation)	Total 5-YR Costs
Salary Cost (inc. Fringe, OH, Payroll Taxes) Application process; developing community plans; reviewing homeowner applications; distributing loans, distributing information to private well owners, printed material, website development or maintenance, mailings, community workshops or webinars	Nantucket BOH; Cape Cod Aquifund; Nashoba BOH	Assume 1/10 FTE per municipality	35	$3,795,960	35	$4,175,556	$20,498,182
		TOTAL Budget		**$3,795,960**		**$4,175,556**	**$20,498,182**

Table B-4. Scenario 2 – Create Funding Program

Cost to Private Well Owners

Expenses	Source	Assumptions	Year 1 Loan Payment Costs	Total 5-YR Loan Repayment Costs
Betterment Loans	Nantucket BOH; Cape Cod Aquifund	Loan with 2% interest rate with 10-year repayment term; Assume 1000 loans at $5,000/loan per year	$552,000	$8,284,000
Administrative Fees Application process; permit process	Nantucket BOH	Homeowner/applicant required to pay all application fees; Homeowner required to schedule and pay all inspection fees to get approval for funds release; Assume $125/loan for administrative fees paid by homeowner/applicant	$125,000	$625,000
		TOTAL Budget	$677,000	$8,909,000

Note: $5 million total available, estimated 1,000 loans per year averaging $5,000 per loan. The total loan repayment amount on a 10-year loan for $5,000 would be $5,523. The actual interest rates and terms of the loans for the implemented loan program may vary from the assumptions made in this table. Assuming one year's worth of $5 million in loans is issued at the beginning of each year of the program.

Table B-5. Scenario 3 – Local BOH Implementation

Cost to the Commonwealth of Massachusetts

Expenses	Source	Assumptions	Pre-Program Staff - FTE	Pre-Program Year Costs	Year 1 Startup Staff - FTE	Year 1 Startup Costs	Maintenance Staff - FTE	Annual Maintenance Costs (includes inflation)	Total 5-YR Costs
Salary Cost (inc. Fringe, OH, Payroll Taxes) Work with RCAP Solutions, In Person Events, Social Media Presence, Sending Hard Copy Materials, BOH Coordination about new available material and new program requirements	FTE salary value from MassDEP	MassDEP estimates 2 FTE for pre-program effort and 1 coordinator per region (4 total) plus 1 coordinator to oversee all regions for startup and maintenance effort	2	$392,712	5	$981,780	5	$1,079,958	$5,301,612
Legal Develop regulations	Joe Cerutti (MassDEP); Steve Roy (W&S)	Will need enabling legislation to establish program and develop regulations. Assume multiple rounds of review with one attorney in Year 1 and one tenth in Years 2-5	1	$196,356	0.1	$19,636	0.1	$21,599	$106,032
Consultant/Other Contract Cost Coordination with external consultants	Steve Roy (W&S); Joe Cerutti (MassDEP)	Need to hire an external contractor to develop new/updated materials, Year 2-5 costs include funds provided to RCAP for training and additional money to periodically produce updated or new material				$200,000		$130,000	$720,000
		TOTAL Budget		**$589,068**		**$1,201,416**		**$1,231,557**	**$6,127,644**

Table B-6. Scenario 3 – Local BOH Implementation

Cost to Local Boards of Health

Expenses	Source	Assumptions	Year 1 Startup Staff - FTE	Year 1 Startup Costs	Maintenance Staff - FTE	Annual Maintenance Costs (includes inflation)	Total 5-YR Costs
Salary Cost (inc. Fringe, OH, Payroll Taxes)	Jim Gareffi (Nashoba BOH), Harvard BOH, Stowe BOH	Assumed 3-5 hours/week per municipality	42	$4,555,152	42	$5,010,667	$24,597,819
Legal Develop additional regulations specific to municipality needs; Enforcement mechanism	Gloucester BOH agent, Harvard BOH	BOH will have authority to develop additional regulations; assume time for hearing process for enforcement; Harvard, MA $55,000 total budget for legal per year (assume 10% ($5,500/year) of legal is related to private wells); Assuming $160,000 legal counsel FTE with $5,500/year/municipality is approximately 0.03 legal FTE per municipality	10.5	$1,684,800	5.3	$926,640	$5,391,360
Travel Cost Travel time for inspections	Hawley BOH agent	Assume same amount of vehicles per municipality as staff per municipality (0.12) vehicle per municipality - lease of $500/car per month to include gas/maintenance		$252,720		$277,992	$1,364,688
		TOTAL Budget		**$6,492,672**		**$6,215,299**	**$31,353,867**

Table B-7. Scenario 4A – State-Run Program

Cost to the Commonwealth of Massachusetts

Expenses	Source	Assumptions	Pre-Program Staff - FTE	Pre-Program Year Costs	Year 1 Startup Staff - FTE	Year 1 Startup Costs	Maintenance Staff - FTE	Annual Maintenance Costs (includes inflation)	Total 5-YR Costs
Salary Cost (inc. Fringe, OH, Payroll Taxes) Provide staff for training sessions, sign certificates, inspections		MassDEP estimated staffing requirements including certification FTE; public outreach	4	$785,424	20	$3,927,120	20	$4,319,832	$21,206,448
Legal Develop regulations	Joe Cerutti (MassDEP); Steve Roy (W&S)	Will need enabling legislation to establish program and develop regulations. Assume multiple rounds of review with two attorneys in Year 1 and 1/4 of an attorney to maintain in Years 2-5	2	$392,712	0.25	$49,089	0.25	$53,998	$265,081
Consultant/Other Contract Cost Coordination with external consultants	Steve Roy (W&S); Joe Cerutti (MassDEP)	300K for consultant to map out programmatic tasks for a workflow for the FTEs and 200K for contractor to develop materials for public outreach; part of startup costs but minimal recurring; Year 2-5 costs include funds for contractor to develop training and additional money to periodically produce updated or new material		$300,000		$200,000		$150,000	$800,000
Travel Cost						$48,000		$52,800	$259,200

Table B-7. Scenario 4A – State-Run Program									
Cost to the Commonwealth of Massachusetts									
Vehicle and equipment costs for MassDEP staff		2 vehicles per region - lease of $500/car per month to include gas/maintenance							
Certification One time cash infusion and maintenance costs	Lealdon Langley (MassDEP); John J. Murphy (MassDEP); Christina Stringer (NEWIPCC)	One time cash infusion required to start the program, ,the contracted program administrator will charge a fee for renewals, the contractor won't be able to maintain the program on permit and renewal fees alone				$150,000		$20,000	$230,000
Data Portal Expansion of data portal to include private well data	Robert Leonard (EEA), Nicole Galambos (MassDEP), Andrew Durham (MassDEP); Joe Cerutti (MassDEP)	Assumes that all electronic reporting forms will be "cloned" from existing eDEP forms used to report public drinking water analytical results. MassDEP used the most recent example of cloning an existing eDEP drinking water quality test results reporting form for another MassDEP program to develop this estimate.	4.5	$883,602	1	$196,356	1	$215,992	$1,060,322
		TOTAL Budget		**$2,361,738**		**$4,570,565**		**$4,812,622**	**$23,821,051**
Note: Cost estimate assumes regulations will only include water quality testing and treatment/remediation requirements.									

Table B-8. Scenario 4B – State-Run Program

Cost to the Commonwealth of Massachusetts

Expenses	Source	Assumptions	Pre-Program Staff - FTE	Pre-Program Year Costs	Year 1 Startup Staff - FTE	Year 1 Startup Costs	Maintenance Staff - FTE	Annual Maintenance Costs (includes inflation)	Total 5-YR Costs
Salary Cost (inc. Fringe, OH, Payroll Taxes) Provide staff for training sessions, sign certificates, inspections		MassDEP estimated staffing requirements including certification FTE; public outreach	4	$785,424	35	$6,872,460	35	$7,559,706	$37,111,284
Legal Develop regulations	Joe Cerutti (MassDEP); Steve Roy (W&S)	Will need enabling legislation to establish program and develop regulations. Assume multiple rounds of review with two attorneys in Year 1 and 1/4 of an attorney to maintain in Years 2-5	2	$392,712	0.25	$49,089	0.25	$53,998	$265,081
Consultant/Other Contract Cost Coordination with external consultants	Steve Roy (W&S); Joe Cerutti (MassDEP)	300K for consultant to map out programmatic tasks for a workflow for the FTEs and 200K for contractor to develop materials for public outreach; part of startup costs but minimal recurring; Year 2-5 costs include funds provided to RCAP for training and additional money to periodically produce updated or new material		$300,000		$200,000		$150,000	$800,000
Travel Cost						$48,000		$52,800	$259,200

Table B-8. Scenario 4B – State-Run Program									
Cost to the Commonwealth of Massachusetts									
Vehicle and equipment costs for MassDEP staff		2 vehicles per region - lease of $500/car per month to include gas/maintenance							
Certification One time cash infusion and maintenance fees	Lealdon Langley (MassDEP); John J. Murphy (MassDEP); Christina Stringer (NEWIPCC)	One time cash infusion required to start the program, NEWIPCC will charge a fee for renewals, NEWIPCC won't be able to maintain the program on permit and renewal fees alone				$150,000		$20,000	$230,000
Data Portal Expansion of data portal to include private well data	Robert Leonard (EEA), Nicole Galambos (MassDEP), Andrew Durham (MassDEP); Joe Cerutti (MassDEP)	Assumes that all electronic reporting forms will be "cloned" from existing eDEP forms used to report public drinking water analytical results. MassDEP used the most recent example of cloning an existing eDEP drinking water quality test results reporting form for another MassDEP program to develop this estimate.	4.5	$883,602	1	$196,356	1	$215,992	$1,060,322
		TOTAL Budget		**$2,361,738**		**$7,515,905**		**$8,052,496**	**$39,725,887**
Note: Cost estimate assumes regulations will include water quality testing, treatment/remediation, and all other requirements included in MassDEP's *Model Board of Health Regulations for Private Wells.*									

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Appendix C: Source Annex

Topic	Source
RCAP Solutions	Description of their work with a link to their report Revised Research Memo. 11.7.24 Evaluation Report CFSDW Press Kit
National Library of Medicine	Reviewed “A State-By-State Comparison of Policies that Protect Well Users”
OneStop	Reviewed online database.
MassDEP Title 5	Reviewed online information and spoke with Tony Capachietti to get general information on Title 5, spoke with John Murphy and Lealdon Langley about certification side of Title 5. Lealdon Langley provided summary of Title 5 training and FTE amount spent on Title 5 program.
MassDEP Community Septic Management Program	Reviewed online information and spoke with Robin McNamara and Michele Higgins to get information on how the program operates at MassDEP, funding structure, staffing requirements, and public outreach.
MassDEP Drinking Water Program	Reviewed online information and used as supplemental information
New England Interstate Water Pollution Control Commission (NEIWPCC)	Reviewed online information and spoke with Michelle Jenkins to get information on how much it costs to become a certified System Inspector and Soil Evaluator.
Franklin County Cooperative Public Health Service	Spoke with Glen Ayers to get information on local private well regulations, cost to board of health, and staffing requirements. Gathered information about travel time and cost, and staff hourly rate.
Nantucket BOH	Spoke with Tomeka Gary about Nantucket’s involvement with the Community Septic Management Program, costs to Nantucket to administer the program, and staffing requirements.
Gloucester BOH	Spoke with Gabrielle White about private well regulation in Gloucester, public outreach, and staffing requirements.
Nashoba Associated BOH	Spoke with Jim Garreffi about cost to BOH to regulate private wells, staffing requirements, and public outreach.
Cape Cod Aquifund	Reviewed online information and spoke with Alice Ryan and Pilar Ahmann to get information on how the Community Septic Management Program is administered at the local (community) level. Gathered information on homeowner interest rates and typical loan amount.

Topic	Source
Clean Water Trust	Reviewed online information and spoke with Nate Keenan about how the Clean Water Trust operates and what would be required for the Clean Water Trust to expand to include private water supplies.
EPA U.S. Private Domestic Wells (2020)	Rupsa Roy (Weston & Sampson) used available EPA GIS data to estimate number of private wells in Massachusetts. This value was used in the cost estimation.
Location of Private Wells Across the State of MA	Rupsa Roy (Weston & Sampson) created exhibit using EPA U.S. Private Domestic Wells GIS data.
Percent Population in Census Block Groups using Private Wells Across the State of MA	Rupsa Roy (Weston & Sampson) created exhibit using EPA U.S. Private Domestic Wells GIS data.
Locations of Private Wells within Low Income ($32,150) Census Block Groups	Rupsa Roy (Weston & Sampson) created exhibit using EPA U.S. Private Domestic Wells GIS data, 2025 Federal Poverty Line, and US Census (2020) data.
FTE Salary in MA	Average annual FTE in Massachusetts is $108,147 from ZipRecruiter. This value was used for the municipal/board of health FTE in the cost estimation.
Data Portal	Meeting with Andrew Durham (MassDEP) and Joe Cerutti (MassDEP) to understand cost and effort to create data portal for private well water quality testing results. Email communication with Robert Leonard (EEA) to get staffing estimates for effort to establish data portal for private well program.
Shannon Nakama (Rhode Island Private Well Program)	Meeting with Shannon Nakama and Joe Cerutti (MassDEP) to understand Rhode Island Private Well Program.
Treatment, Remediation, Maintenance Costs	Communication with various environmental and water quality remediation companies around the United States supplemented with online information. Resources: US Water Systems, Culligan, Consumer Report, Brewer Well & Pump, Advanced Tech Water Systems, Wave Inspection Services, Home Advisor, Clean Water Pump and Well Service, Welgard, Brown Well Supply, CDC, Skillings & Sons LLC, NorthEast Water Wells, Spartan Environmental Drilling, Bay State Pump Company, Clear Water Pump and Well Service
Testing and Sampling Costs	Weston & Sampson created spreadsheet with researched costs for various line items that MassDEP reviewed. Conversations with various MassDEP certified state labs. See Appendix A.

Topic	Source
	MA Laboratories: Pace Analytical Northeast Environmental Laboratory Quabbin Analytical Laboratory Biomarine Research Corporation Eurofins Portsmouth Resources: MassDEP Drinking Water Parameters and Guidelines Drinking water Program Testing Requirements for Public Water Systems Model BOH Regulations for Private Wells