Tinkham Garage Superfund Site
Londonderry, NH

United States Environmental Protection Agency

U.S. EPA SUPERFUND PROGRAM AT EPA NEW ENGLAND

The Superfund Program protects human health and the environment by investigating and cleaning up often-abandoned hazardous waste sites and engaging communnites throughout the process. Many of these sites are complex and need long-term cleanup actions. Those responsible for contamination are held liable for clean up costs. EPA strives to return previously contaminated land and groundwater to productive use.

YOUR OPINION COUNTS

Opportunities to Comment on EPA's Proposed Cleanup Plan

EPA will be accepting public comments on this proposed cleanup plan from July 11, 2025, through August 12, 2025. EPA is seeking input on all of the alternatives and the rationale for the preferred alternative. New information or public input that EPA learns during the public comment period could result in the selection of a final remedial action that differs from the preferred alternative. You don't have to be a technical expert to comment. If you have a concern, suggestion, or preference regarding this Proposed Plan, EPA wants to hear from you before making a final decision on how to protect your community.

EPA also is requesting public comment concerning its wetland and floodplain findings. See page 5 for more details. Comments can be submitted by mail or online via https://www.regulations.gov (Docket ID No. EPA–R01–SFUND–2025–0117). People also can offer oral or written comments at the formal public hearing (see page 5 for details). If you have specific participation needs for the public meeting and hearing, questions about the meeting facility and its accessibility, or questions on how to comment, please contact Aaron Shaheen.

Public Informational Meeting
July 10, 2025, at 6:00 p.m.

Formal Public Hearing
July 29, 2025, at 6:00 p.m.

Londonderry Town Hall
Moose Hill Council Chambers, Rm 268
Mammoth Road B.
Londonderry, NH 03053

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June 2025

CLEANUP PROPOSAL SNAPSHOT

The United States Environmental Protection Agency (EPA), in consultation with the New Hampshire Department of Environmental Services (NHDES), issues this Proposed Plan for an interim remedy at the Tinkham Garage Superfund Site (the Site) in Londonderry, New Hampshire. The proposed approach generally includes the following components:

- Extension of the existing municipal water line into certain target neighborhoods where groundwater is used as a drinking water source, and connections of homes impacted or potentially impacted by the site-related contaminants of concern that were not previously connected to the existing water line.
- Continued long-term monitoring of groundwater at the Site to assess the progress and effectiveness of remedial actions.
- Continued periodic reviews, at a minimum of every five years, to assess the protectiveness of the remedy would continue at the Site.

This preferred alternative would prevent exposure to Site-related contaminants of concern by providing a permanent alternative water source to properties currently relying on groundwater as their drinking water source and whose households are located within target neighborhoods with documented contamination.

The estimated cost of the preferred alternative is $6.8 million. It is estimated that it may take up to 2-3 years for the design and construction of the waterline and the connection of homes within these neighborhoods to the water line.
A more detailed description of this proposal is outlined below and in the Focused Feasibility Study (FFS), available in the Administrative Record (see below).

In accordance with Section 117 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the law that established the Superfund program, this document summarizes EPA's cleanup proposal. A copy of EPA's Proposed Plan may be viewed on the Site web page at www.epa.gov/superfund/Tinkham.
For detailed information on the interim options evaluated for alternative water at the Site, see the Focused Feasibility Study (FFS) Report developed for the Tinkham Garage Superfund Site and other documents contained in the Site's Administrative Record available for review online at www.epa.gov/superfund/tinkham. Access to the internet is available at Leach Library, 276 Mammoth Road, Londonderry, NH 03053, and at the EPA New England Records Center, 5 Post Office Sq., First Floor, Boston, Massachusetts.

A CLOSER LOOK AT EPA'S PROPOSED CLEANUP APPROACH

The November 2024 Remedial Investigation (RI) Summary Memorandum, available in the Administrative Record, summarizes the currently known nature and extent of contamination at the Site. Risk related to current and future ingestion of groundwater as drinking water within the target neighborhoods was assessed and an FFS Report was prepared, which identified options (also called "alternatives") that EPA considered for the interim remedy. The FFS evaluated both temporary options (provision of bottled water and installation of Point of Entry Treatment (POET) systems as well as a permanent option (connection to a water line) to protect human health and the environment by mitigating unacceptable risk from exposure (ingestion) of Site-related contaminants found in groundwater used as drinking water.

Although the alternatives evaluated in the FFS would minimize or mitigate exposure to groundwater used as drinking water within the neighborhoods proximate to the Tinkham Garage Site, such alternatives would only constitute an interim remedy while additional information continues to be collected and evaluated to fully assess remaining risks that may be present at the Site and the options for Site cleanup, including an assessment of the time that may be needed to achieve aquifer restoration by additional remedial measures.

Based upon the alternatives evaluated in the FFS, EPA is proposing the following interim risk mitigation action for the Site:

EPA's preferred alternative is Alternative 4, Municipal Water Line Extension, as described in the FFS. The preferred alternative includes the following components:

- Extension of an existing municipal water line that currently runs within the Site into the target neighborhoods to provide a permanent alternative water source for each resident that is currently relying on groundwater as their drinking water source. The target neighborhoods include residences located along Ross Drive, Tokanel Drive, and Gail Road (the "Ross/Tokanel neighborhood"), residences located along Gilcreast Avenue, and residences along Albany Avenue, Boston Avenue, and Charleston Avenue (the "Boston/Charleston/Albany neighborhood") not previously connected to the water line required by the EPA in 2016.

- Disconnection of private water supply wells to reduce stresses on the bedrock aquifer and to prevent future exposure of the contaminated groundwater, or modification of the water supply well for future long-term groundwater monitoring activities at the Site as may be proposed to and agreed to by the resident.

- Continued performance of activities under previous decision documents, including long-term monitoring of groundwater to assess the progress and effectiveness of remedial actions and

periodic reviews, at a minimum of every 5 years, to assess the protectiveness of the Site remedy.

Estimated Cost

The estimated total present value of this proposed interim action for alternative water, including the design, construction, and connection of households to the water line, is $6,800,000. Once connected, each resident will be required to pay for their water usage per agreements with the local municipal water purveyor (Pennichuck Coporation). The proposed approach is discussed in the FFS in greater detail.

Potential Community Impacts

Impacts to the community are expected to be limited, though it is expected it could take 2-3 years to complete field investigations, surveys, and subsequently design and construct the water line extension and connections to each household. Bottled water provisions currently in place would continue for residences until water line connections are completed.

Short-term impacts to the community and Site workers include potential inhalation of airborne contaminants during the construction and associated management activities. The minor risks to workers and the community would be temporary and mitigated through the implementation of dust control measures as needed (e.g., water sprays, truck and stockpile covers) and erosion control during activities associated with stormwater management. Access to the work area(s) will be restricted to Site workers and authorized personnel only. Precautions will be taken with regards to noise, dust, and construction hazards. Precautions will also be taken to protect public and private infrastructure through use of Dig Safe and administrative controls (access agreements, etc.). The potential for localized releases of vapors during excavation are not anticipated to impact the community. Construction will have short-term effects on the community from increased site activity including the operation of trucks and construction vehicles on local streets and construction-related noise. Shallow bedrock is likely present in several locations along the proposed alignment of the water line extension which may require blasting or ripping of the bedrock in certain sections. Additionally, short-term effects will occur on individual properties including the operation of construction equipment when connecting the homes to the water line and performing restoration actions of the properties, as warranted. The work will be performed during typical business hours to minimize impacts from noise in nearby residential areas.

Design and implementation of the remedy will require communication and coordination with various stakeholders (e.g., Town of Londonderry, Pennichuck Water Works, Inc. (local water purveyor), impacted residents, as well as surrounding community residents, businesses and landowners, and utility companies). EPA integrates community input when conducting Superfund investigations and selecting remedial alternatives. EPA's proposed interim remedial alternative will advance protections at the Site and enhance potential for future reuse and economic benefit to the community.

EPA IS ASKING FOR PUBLIC COMMENTS ON THE FOLLOWING PROPOSED DETERMINATION:

Floodplain and Wetlands Impacts

Before EPA can select an alternative, federal regulations at 44 C.F.R. Part 9, implementing requirements under Executive Order 11988 (Floodplain Management), requires EPA to make a determination that there is no practicable alternative to temporary activities that affect or result in the occupancy and modification of wetlands or the 100- and 500-year floodplain. Through its analysis of alternatives, EPA has determined that the proposed action, as well as the majority of the Site and areas of groundwater impacted by contaminants of concern, are not within the current Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map for the Town of Londonderry 100- or 500-year floodplains. Parts of the neighborhood nearest Beaver Brook and its associated wetlands are located within the FEMA 100- and 500-year floodplain, however EPA has determined that the proposed interim remedy will not have impact on wetlands or floodplain areas, and utilization of best management practices and any mitigation measures will be taken, if required.

Federal regulations at 44 C.F.R. Part 9 also require EPA to specifically solicit public comment on its proposal to impact floodplain resources. Through this Proposed Plan, EPA is specifically soliciting comments concerning its determination that the Preferred Alternative is (1) unlikely to affect wetlands, and EPA will use, as necessary best management practices to minimize any harmful impacts to wetland resources; and (2) protective of floodplain resources.

SITE DESCRIPTION AND HISTORY

Site Description

Located in Londonderry, New Hampshire, the roughly 375-acre Site is comprised of residential, commercial, and undeveloped conservation land. In addition to the 13-unit Woodland Village Condominium complex (formerly the Londonderry Green Apartments) to the west, there are single family homes along Mercury and McAllister Drives to the north, along Gilcreast Road and the Boston/ Charleston/Albany neighborhood to the northeast, and the Ross/Tokanel neighborhood to the south and southeast. In January 2003, Gilcreast Realty Holdings II, LLC purchased the 95-acre area in the central portion of the Site for development into active senior housing called 'The Nevins.' The Nevins Retirement Cooperative Association owns the land upon which individually owned residential structures were constructed from about 2005 through 2013 (see figure 1).

The Tinkham Realty office and Tinkham Garage are located in the northeastern portion of the Site. In 2003, land to the northeast of these properties was sold and a commercial retail development was constructed that contains Home Depot, Staples, The 99 Restaurant, and Dunkin' Donuts. A portion of

the former source area where hazardous substances were released to the environment, south and east of the Tinkham Garage, extends beneath the western end of the parking lot of these properties.

The topography of the Site is relatively flat, and surface drainage is from north to south. Several unnamed streams and intermittent tributaries collect and direct precipitation and discharge groundwater from the Site southward, eventually discharging off-site to Beaver Brook. These streams and tributaries passed through the Site and historically and currently pass through the Ross/Tokanel neighborhood towards the large wetlands southwest of the neighborhood and towards Beaver Brook. The large wetland area located southwest of the Site, where the unnamed streams enter Beaver Brook, eventually discharges to the Merrimack River farther south.

Site History

The Tinkham Garage Superfund Site is one of four Cannon Engineering Superfund Sites. The Cannon Engineering Bridgewater (CEC) Site in Bridgewater, MA, is associated with three other Superfund Sites through operations and disposal practices: the Tinkham Garage Site in Londonderry, NH, the Sylvester Site in Nashua, NH and the Cannon Engineering Plymouth Harbor Site, in Plymouth, MA. The Tinkham Garage served as a facility for the storage, maintenance, and cleaning of tanker trucks associated with Tinkham Enterprises. It is understood that Tinkham Enterprises was approached by Cannon Engineering to haul and dispose of liquid chemical wastes from the Cannon Engineering Corporation Bridgewater Site in 1977 or 1978. Industries associated with the Cannon Engineering Bridgewater Site and the disposal of hazardous substances in Massachusetts and New Hampshire have been held accountable under CERCLA for the cleanup of four Superfund Sites via Consent Decrees, which required the Cannons Sites Group (CSG) to contribute to cleanup costs and/or to undertake response activities.

The Site has been the subject of numerous investigations and remedial activities since the initial complaint in April 1978, when a resident along Ross Drive alerted the Town of septic odors and excessive foam in a small brook crossing Ross Drive and in their water supply well. This led the Town to the Tinkham Garage as the source. Tinkham Enterprises operated a fleet of tanker trucks that were used to transport septic and liquid industrial wastes to disposal sites. The Health Department investigation revealed that liquids and sludges associated with tanker truck washings, as well as oily materials, had been dumped behind the garage. Wastes contained in the tanker trucks included septage, detergents, acids, oils, and hazardous substances. The fields near the Tinkham Garage slope towards Ross Drive and are abutted by woody swampy areas. Drainage from the swamp flows into Ross Drive and through the neighborhood. Aerial photographs from June 1978 indicate numerous trenches extending from the rear of Tinkham Garage southeastward toward the wetland area. A subsequent citizen complaint to the New Hampshire Water Supply and Pollution Control Commission (now NHDES) resulted in that department issuing an order to clean up the site by removing surface contamination. As part of this initial cleanup, a diversion trench was excavated along the existing surface water stream to redirect surface water runoff from behind the Tinkham Garage away from Ross Drive and toward the west.

Initial field investigations by the EPA in 1981 indicated that groundwater, soil, and surface water were contaminated with several volatile organic compounds (VOCs) and other hazardous substances and noted that groundwater in the vicinity of the Site was being used for drinking water. In January 1983, the drinking

water supply well (Londonderry Green Supply Well) servicing the Londonderry Green Apartments (now Woodland Village Condominiums) and several residential supply wells along Mercury and McAllister Drives were removed from service because of documented VOC contamination. Bottled water and point of entry treatment systems were temporarily provided until a feasibility study could be completed and a municipal pipeline could be extended to affected homes. The VOCs identified at the Site included gasoline constituents benzene, toluene, ethylbenzene, and xylene (BTEX) as well as chlorinated solvents, including tetrachloroethene (PCE), trichloroethene (TCE), and their associated breakdown products.

In September 1983, the Site was added to the National Priorities List. A Remedial Investigation as to the source(s) of the contamination was completed in January 1986 and documented VOC contamination in the overburden and bedrock aquifers as well as in soil and surface water. Investigations determined that tanker truck washings were released behind the Tinkham Garage property to the south and to the east. Within the condominium area, disposal was allegedly directed into the leach fields as well as into a "solvent swale" situated between buildings E/F and the stream which runs north to south within the condominium property. Soils from the failed leach fields were excavated and deposited behind building C. A Feasibility Study was completed in September 1986 to evaluate remedial alternatives to address contamination found in soil, groundwater, and surface water. A Record of Decision documenting EPA's cleanup plan was filed shortly after. A Consent Decree that required the responsible parties to implement the remedial action, among other things, was administered by the District Court and became effective on August 14, 1989. The remedial action for soils began in 1994 and included excavation of contaminated leach field soils and placement of those soils over the source area contaminated soils east of the Tinkham Garage and the removal of VOCs from those shallow soils using vacuum extraction. Groundwater was addressed through extraction and off-site treatment to reduce concentrations, mitigate further releases and eliminate or minimize threats posed to public health from the source areas.

In 2003, EPA modified the groundwater remedy from active extraction to natural attenuation and long-term monitoring. This change was documented in an Explanation of Significant Differences, which also established that the State of New Hampshire's 1993 Groundwater Management Permit Program (at the time ENV-Ws410) satisfied the Institutional Controls (IC) objective though establishment of a Groundwater Management Zone (GMZ), within which use of groundwater would be monitored and managed until ambient water quality standards were attained. The first Groundwater Management Permit (GMP) was issued for the Site to the CSG by the State of New Hampshire on October 30, 2002 (GWP-199004008-L-001), is typically reissued every 5 years and was recently reissued in October 2024.

In 2008, 1,4-dioxane, an emerging contaminant associated with chlorinated solvents of the type found at the Site, was first identified in Site groundwater and added to the monitoring of groundwater at the Site. Investigations to assess contaminant concentrations in discrete fractures within the Site were conducted in 2014 to help establish an understanding of contaminant distribution and migration pathways. Additional investigations confirmed the widespread presence of 1,4-dioxane in groundwater across the Site, with the highest concentrations found in a bedrock wells proximate to the Tinkham Garage field, with a high concentration of 1,510 ug/L in fractures at 90 feet below grade.

Also in 2014, the State of New Hampshire alerted EPA of VOC, including 1,4-dioxane, contamination east of the Site in residential wells along Boston and Charleston Avenues. In 2016, EPA issued another

Explanation of Significant Differences, which established a 3 ug/l cleanup level for 1,4-dioxane in groundwater, required that five households along Boston and Charleston Avenues be connected to the nearby water line and required the responsible parties for the Site perform supplemental investigations as to the nature and extent of residual contamination at the Site and assess potential migration pathways specifically within the bedrock aquifer, which was the source of drinking water for several neighborhoods near the Site.

Monitoring of household wells in the Ross/Tokanel neighborhood in 2018 and 2019, indicated the presence of 1,4-dioxane. Previously, monitoring of wells at households along Ross Drive had not detected 1,4-dioxane above the detection limit in 2009. NHDES lowered the Ambient Groundwater Quality Standards (AGQS) for 1,4-dioxane in September 2018 from 3 ug/L to 0.32 ug/L. The 2018 and 2019 sampling indicated that 11 household water supply wells exceeded this newly lowered standard. Monitoring of household wells continued and in 2024, wells at 13 households were found to exceed the New Hampshire AGQS and another 10 residential water supply wells had detections below the AGQS. The data demonstrates that 1,4-dioxane has and continues to migrate into the neighborhood consistent with the groundwater migration pathways being evaluated at the Site. The widespread distribution of 1,4-dioxane also suggests that on-site pumping as well as continued pumping from residential water supply wells may be influencing the migration of contaminants into the neighborhood as well as the spread of contaminants within the bedrock aquifer across the neighborhood. Homes with well samples that currently exceed the New Hampshire AGQS for 1,4- dioxane within the neighborhoods have been offered bottled water from CSG as a temporary mitigation measure.

In November 2016, EPA issued a Lifetime Health Advisory for two per- and polyfluoroalkyl substances (PFAS): perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS). In May 2018, EPA requested that source area groundwater monitoring wells be sampled for PFAS to assess whether PFAS may be present at the Site. PFAS have been widely used in many industrial processes, such as the those whose wastes were disposed at the Tinkham Garage Site, as well as in consumer products, and are often found in septic wastes. In the fall of 2018, PFAS were detected in groundwater within Site source areas, in groundwater across the Site, and detected in residential water supply wells within the Ross/Tokanel neighborhood as well as the Boston/Charleston/Albany neighborhood. Both groundwater monitoring and water supply sampling has continued at the Site. Currently, 65 households with detections above federal and/or state standards have been offered bottled water by the Responsible Parties or by the Agencies as a temporary mitigation measure while investigations continue. PFAS and 1,4-dioxane have been documented in groundwater within the Site and in nearby neighborhoods and in residential water supply wells across the neighborhoods at levels which exceed state and federal drinking water standards; the result of which was an expanding concern for the continued use of groundwater as a drinking water source within the neighborhoods.

An RI Summary Memorandum was prepared in 2024, which summarizes historical activities and ongoing remedial investigations at the Site and presents a conceptual site model based on information collected to date, which documents historical releases at the Site and potential migration pathways. (See Figure 2) A risk evaluation was performed to assess risks related to ingestion of groundwater used a drinking water by residents within nearby neighborhoods. The risk evaluation informed the Focused Feasibility Study (FFS), which was prepared in 2025 and considers remedial options to mitigate current and future exposure to

contaminated groundwater as an interim remedial measure while on-going investigations are being completed before a final remedial action is selected for the Site.

CURRENT AND FUTURE LAND USE

Prior to the completion of Interstate I-93 in 1962, most of the Tinkham Garage Site consisted of agricultural fields, undeveloped wooded land, and wetlands. Soon after 1962, residential and commercial development began along Route 102. In the early to mid-1970s, the Londonderry Green Apartments (now Woodland Village Condominiums) and single-family homes were constructed on and around the Site, including in the Ross/Tokanel neighborhood located to the south and Boston/Charleston/Albany neighborhood to the east. In the mid-2000s the Nevins development was constructed within the center portion of the Site. The 90-acre wetlands located east and southeast of the Tinkham Garage remain as conservation land, while the northeastern portion of the Site is a popular shopping center. Public water supply lines provide potable water to residents living in the Woodland Village Condominiums, Mercury and McCallister Drives, the Nevins, as well as provides water to the shopping center. Similarly, sewer lines have been installed to replace the Woodland Village Condominium leach fields and as part of the Nevins development to collect and direct wastewater to the nearby Derry Publicly Owned Treatment Works (POTW). Three new residential developments recently constructed, or currently undergoing construction, on lands near the Site, will utilize public water line connections for their water supply.

There are approximately 89 residences that are located within the Ross/Tokanel neighborhood and the Boston/Charleston/Albany neighborhood which continue to rely on groundwater as their drinking water source.

WHY CLEANUP IS NEEDED

EPA has determined that there are current and future potential threats to human health at the Site from ingestion of groundwater used as drinking water. Contaminants of concern in groundwater and in tapwater include 1,4-dioxane and PFAS. Contaminants released at the Site infiltrated the ground surface, migrating into subsurface soil and into bedrock, contaminating groundwater in the overburden and in bedrock beneath the Site and/or were transported as runoff into surface water pathways accentuated during precipitation events. Once in bedrock, contaminants are transported through interconnecting fractures within the bedrock. Groundwater moves through the Site primarily to the south, southeast, and southwest through the neighborhoods, and towards Beaver Brook. Pumping from wells also influences groundwater and contaminant migration along pathways situated east to west. The bedrock groundwater plume along migration pathways may be continuing to expand due to natural flow and continued pumping in the Ross/Tokanel neighborhood and nearby areas. A full description of the Site conceptual site model can be found in the RI Summary Memorandum.

PFAS and 1,4-dioxane are present in bedrock groundwater within the Boston/Charleston/Albany, Gilcreast Road, and Ross/Tokanel neighborhoods. The majority of all households sampled had detectable levels of PFAS (specifically PFOA and PFOS) in their drinking water. Residents in these neighborhoods use groundwater as their source of potable water, relying on individual supply wells that

tap the bedrock aquifer. The risk evaluation performed by EPA has concluded that concentrations of PFAS and 1,4-dioxane found in bedrock groundwater within the target neighborhoods present unacceptable risk with regard to both cancer and non-cancer risks for residential receptors. Therefore, there is a need for an interim remedial action to mitigate ongoing ingestion of contaminated groundwater by residents. Mitigation of exposure to PFAS and 1,4-dioxane via ingestion would remove or otherwise significantly reduce risk to residents living near the Site.

Site Contaminants

The primary contaminants of concern in groundwater within the target neighborhoods include the following:

1,4-Dioxane: 1,4-Dioxane is a synthetic industrial chemical that was widely used as a stabilizer of chlorinated solvents such as the kind found at the Site. 1,4-Dioxane can be produced as a byproduct and may remain present in consumer and commercial products, including soaps and detergents, cleaning products, antifreeze, textile dyes, and paints/lacquers. 1,4-Dioxane is released to the environment from industrial releases and from consumer and commercial products that are washed down the drain or disposed of in landfills. 1,4-Dioxane is completely miscible in water, is highly mobile, and does not readily biodegrade in the environment. 1,4-Dioxane has been detected in groundwater and in water supply wells at the Site. (See Figure 3)

Per- and Polyfluoroalkyl Substances (PFAS): Per- and polyfluoroalkyl substances (PFAS) are a group of human-made chemicals that have been used in industry and consumer products since the 1940s. PFAS are used in many industrial processes including plating, electronics, and certain textile and paper manufacturers and found in a wide range of consumer products such as non-stick products (e.g., Teflon cookware), pizza boxes, stain- and water-repellent fabrics, polishes, waxes, paints, and cleaning products. Another source of PFAS in the environment is fire-fighting foams. PFAS compounds are very persistent in the environment – meaning they do not break down and can accumulate over time. Compounds routinely detected in Site groundwater and in water supply wells that pose a human health risk include the two most widely used PFAS: perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS). (See Figure 4)

HOW IS RISK TO PEOPLE EXPRESSED?

Every person has a baseline (non-Site related) risk, or likelihood, for cancer and non-cancer health effects (health effects other than cancer) to occur, which can vary between individuals due to many different factors such as diet, lifestyle, and genetics. As part of the Superfund process, EPA performs a human health risk assessment to evaluate the likelihood for both cancer and non-cancer health effects to occur due to exposure to chemicals at a site. EPA also considers how multiple chemicals with similar effects may affect risk to human health when there are many different chemicals found at a site. Estimates for risk from cancer-causing agents and non-cancer hazards (chemicals that may cause harmful effects other than cancer) are expressed differently.

The cancer risk estimate describes the extra risk or likelihood of developing cancer for a person exposed to chemicals at a site and does not include a person's baseline risk of developing cancer due to other causes. For example, exposure to a particular site-related cancer-causing chemical may present a 1 in 1,000,000 increased chance of causing cancer over an estimated lifetime of 70 years. This can also be expressed as one-in-a-million or 1×10^{-6} increased lifetime cancer risk. The EPA acceptable risk range for cancer risk is 1×10^{-6} (1 in 1,000,000) to 1×10^{-4} (1 in 10,000). A cancer risk above 1 in 10,000 (or 1×10^{-4}) is generally unacceptable. This means that more than one person out of 10,000 people with the same exposure would develop cancer over a lifetime. In general, site-related risks higher than this range would require consideration of cleanup alternatives.

Non-cancer health effects (e.g., nervous system or respiratory effects) can result from exposures to chemicals from a contaminated site. These effects are evaluated separately from cancer. Estimates of risk for non-cancer effects are expressed as a ratio which compares the level of exposure to a toxicity value which is identified by EPA scientists to represent a level that is not likely to result in harmful effects if a person is exposed over a long period of time. This ratio is known as a hazard quotient. A hazard quotient is a value that indicates whether chronic health effects are likely from exposure to one chemical. If there are exposures to multiple chemicals, the hazard quotient for each chemical is added up to calculate a hazard index. When the hazard index or hazard quotient is less than 1, non-cancer health effects are not expected for people exposed to chemicals from the site. A hazard quotient or hazard index greater than 1 means that non-cancer health effects may be possible and generally would require consideration of cleanup alternatives.

Exposure Pathways & Potential Risk

The presence of contamination does not necessarily mean there is risk to people or the environment. A risk can only result if there is current exposure or potential for future exposure to site related chemicals. Exposure occurs when people or other living organisms eat, drink, breathe, or have direct contact with a substance or waste material. Based on existing or reasonably anticipated future land use at a site, EPA evaluates the relevant site-specific exposure scenarios to determine potential risk, appropriate cleanup levels for contaminants, and potential cleanup approaches, all of which are documented in a feasibility study. And prior to making determinations on cleanup approaches, EPA may, as here, evaluate risk mitigation approaches to address exposure as an interim measure.

A human health risk evaluation memorandum has been prepared for the Site, which evaluated current and future potential risk related to exposure (ingestion) to groundwater used as drinking water within the target neighborhoods. The risk evaluation memorandum can be found in Appendix A of the FFS (June 2025). This assessment evaluated a completed exposure scenario related to the Tinkham Garage Superfund Site to determine if there are current or potential future unacceptable risks to humans. Because this is an interim action which addresses one exposure scenario identified at the Site, the risk evaluation only assessed the potential for exposure to Site contaminants through the ingestion of groundwater used as drinking water.

Human Health Risks

A residential tapwater scenario was used for the risk evaluation, which assumes potable uses of water such as drinking and bathing and that a person may be exposed to contaminants through ingestion, dermal, and inhalation routes. Residents within the Ross/Tokanel neighborhood and the Boston/Charleston/Albany neighborhood as well as those on Gilcreast Road, who are not currently connected to a municipal water line, utilize groundwater as their potable water source via private water supply wells. The risk evaluation was performed for groundwater used as drinking water and utilized private well data collected from approximately 80 residences in these neighborhoods for 1,4-dioxane and selected PFAS compounds, including PFOA, PFOS, perfluorononanoic acid (PFNA), perfluorobutanesulfonic acid (PFBS), perfluorobutanoic acid (PFBA), perfluorohexanesulfonic acid (PFHxS), and perfluorohexanoic acid (PFHxA).

Based on the results of the risk evaluation, EPA determined that ingestion of groundwater as a drinking water source poses an unacceptable human health risk exceeding EPA's acceptable cancer risk range of 10^{-6} to 10^{-4} and/or non-cancer HI of 1.

Specifically, the risk evaluation determined that the use of groundwater as drinking water (tap water) would result in a cancer risk of 4.93×10^{-3}, exceeding EPA's acceptable risk range and a non-cancer risk hazard index of 24.2, exceeding EPA's hazard index target of 1. The primary contributors to cancer risks include PFOA, PFOS and 1,4-dioxane, and the contributors to non-cancer risks include PFOA and PFOS and several other PFAS compounds. The risk evaluation, its results and conclusions, form the basis for taking action and was used to develop the alternatives presented in the FFS Report.

Basis for Taking Action

It is EPA's current judgent that the preferred alternative identified in this Proposed Plan is necessary to protect public health or welfare or the environment from actual or threatened releases of hazardous substances and pollutants or contaminants into the environment from the Site which may present an imminent and substantial endangerment to public health or welfare.

CLEANUP ALTERNATIVES CONSIDERED

Remedial Action Objectives

Once possible exposure pathways and potential risks have been identified, alternatives are developed to reduce and/or mitigate the identified unacceptable risks and achieve site-specific Remedial Action Objectives (RAOs). This Tinkham Garage Site interim action does not modify or alter the existing RAOs for the Site, as outlined in the 1986 Record of Decision (ROD), as amended, which addressed cleanup of Site groundwater and soils. This Proposed Plan identifies specific RAOs for an interim remedy, which specifically addresses unacceptable risks from exposure (ingestion) through the use of groundwater as drinking water within the target neighborhoods near the Site.

The RAOs for the interim remedy at the Site are as follows:

- Prevent current and potential future exposure to Site contaminants in groundwater (including 1,4-dioxane and PFAS) via ingestion of groundwater from individual supply wells at levels that pose an unacceptable risk.
- Reduce or minimize continued migration of contaminated groundwater from the Site by reducing the hydraulic stresses on the bedrock aquifer via removal from service of those residential water supply wells that continue to draw groundwater for household use.

Once remedial action objectives have been determined, response actions to meet these objectives are then identified, and potential alternatives are developed that may be effective at minimizing or eliminating unacceptable risk. The remedial alternatives developed for the Site in the FFS are listed below and EPA's preferred alternative is indicated. EPA and NHDES have had substantive discussions regarding the Site and the cleanup. EPA has received input indicating that NHDES supports EPA's proposed cleanup plan.

Remedial Alternatives

Exposure from ingestion of groundwater as tapwater within the target neighborhoods presents an unacceptable risk. Each of the alternatives described below address risk mitigation through the provision of an alternative water supply to replace use of groundwater as a drinking water source for residents living within the target neighborhoods. The term "alternative water supply" refers to both the provision of a new water supply and treatment or redistribution of an existing water supply.

Alternative 1 - No Action

Alternative 1, the No Action alternative, is required to be evaluated and is used as a baseline for comparison to other alternatives as required by the National Contingency Plan (NCP). "No Action," as used in the FFS, means no additional actions to maintain or improve current conditions at the Site, limit migration of groundwater contaminants, or to limit direct contact of humans to Site contaminants in groundwater. Under this alternative, no additional action would be taken to address risk to human receptors and RAOs would not be achieved. Any reduction in toxicity or concentration of contaminants would occur solely because of on-going natural processes. Long-term monitoring of groundwater and Five-Year Reviews of the Site are currently being performed for the existing remedy and would continue to be required because contaminants of concern would remain on-site at concentrations exceeding levels that would allow for unrestricted use and exposure. There is no cost estimated as part of this alternative.

Alternative 2 – Bottled Water

Alternative 2 involves providing an alternate drinking water supply to impacted residents in the target neighborhoods through the provision of bottled water. Bottled water would be offered to households that are currently not connected to a municipal water supply. This includes all households who continue to rely on the bedrock aquifer for their drinking water source within the Boston/Charleston/Albany neighborhood, Gilcreast Road, and the Ross/Tokanel neighborhoods. Because the provision of bottled water would require continued pumping of groundwater from the individual wells for other household uses, this alternative would continue to stress the bedrock aquifer and would not minimize contaminant migration.

Currently bottled water is being offered to residents in the Ross/Tokanel, Gilcreast, and Boston/Charleston neighborhoods by the CSG or the Agencies as a temporary action following detection of Site contaminants, in compliance with the NHDES Contaminated Site Management Rules. This alternative and the estimated costs allow for the offering of bottled water to all households within the target neighborhoods utilizing groundwater as drinking water until such time as a permanent alternative water source in the former of a connection to a nearby water line occurs or until groundwater is restored to drinking water quality. For cost purposes, an estimated 89 households reside within those target neighborhoods. It was assumed that each household would be provided with monthly shipments of 10 cases of six 1–gallon jugs (60 gallons) and 5 cases of 0.5-liter bottles.

Monitoring of Site groundwater would continue under the 1986 ROD (as amended), as part of on-going remedial investigations, and as a component of the GMP. No additional costs for monitoring are included in this Alternative because monitoring is already part of ongoing work.

CERCLA Five-Year Reviews, which are currently being performed every 5 years for the existing remedy, will continue and will also assess the protectiveness of the selected interim remedy. Data collected as part of on-going monitoring efforts would be used to support the Five-Year Review. No additional costs are included for Five Year Reviews because they are already being performed.

For cost estimate purposes, Alternative 2 includes providing bottled water to all 89 households within the targeted neighborhoods for a period of 30 years. There are no upfront capital costs for this alternative, only the monthly cost of providing the bottled water. The total estimated cost for Alternative 2 is approximately $2,800,000.

Alternative 3 – Residential Well Treatment via Point of Entry Treatment Systems

Alternative 3 requires the installation and use of Point of Entry Treatment (POET) systems at individual residences to remove contaminants from groundwater pumped from private water supply wells within the target neighborhoods. POET systems can provide effective treatment of groundwater to protect residents from exposure to PFAS and 1,4-dioxane. For cost purposes, an estimated 89 households within the target neighborhoods would receive a POET system, as well as associated long-term monitoring, operation, and maintenance. The POET systems would be installed in-line at each home to treat water from the water supply wells, so treated water would be available for all household uses including showering, bathing, dish washing, etc. The installation of POET systems is used as a temporary measure to mitigate human health risks resulting from ingestion of contaminated groundwater until groundwater attains drinking water quality and treatment is no longer needed or a permanent alternate water supply is provided. Because POET systems require continued pumping of groundwater from the individual wells, this alternative would continue to stress the bedrock aquifer and would not minimize contaminant migration.

The configuration of each POET system would need to be custom designed for each individual residence based on the type and concentration of groundwater contaminants in the specific private well and on the configuration of the well pump and plumbing system in the residence. POET systems typically consist of multiple vessels that contain a treatment medium, such as granular activated carbon (GAC), that

absorbs the contaminants from the water. Other system components include a flow meter, cartridge filter, interconnecting piping, valves, fittings, and pressure gauges.

Treatment for 1,4-dioxane and PFAS would require the typical POET system to include at a minimum: a particle filter to remove particulates and at least two GAC vessels for a lead/lag system to remove 1,4-dioxane and PFAS. While activated carbon generally provides effective removal of PFAS at the range of concentrations detected in private wells at the Site, its effectiveness for removal of 1,4-dioxane is more limited. However, because the 1,4-dioxane concentrations in the private wells to be treated are relatively low, the use of GAC for this application is deemed to be acceptable.

Monitoring of groundwater quality in the residential wells within the target neighborhoods under the GMP would continue in order to document contaminant concentrations in the water supply wells. This would allow for continued assessment and future modification of POET systems if required. Samples collected from the private residential water supply wells would be analyzed for VOCs, PFAS, and 1,4-dioxane. In addition, samples would also be collected from the sampling ports between the two carbon vessels and from the effluent of the POET system. These systems would require scheduled maintenance (changeout of the filter cartridges and GAC) and monitoring to ensure they are operating properly and reducing concentrations below drinking water standards. The results of all sampling events would be reported to the residents and regulatory agencies.

Monitoring of Site groundwater quality would continue under the 1986 ROD (as amended), as part of on-going remedial investigations, and as a component of the GMP. No additional costs for monitoring are included in this Alternative because monitoring is already part of ongoing work.

CERCLA Five-Year Reviews, which are currently being performed every 5 years for the existing remedy, will continue and will also assess the protectiveness of the selected interim remedy. Data collected as part of on-going long-term monitoring efforts would be used to support the Five-Year Review. No additional costs are included for Five Year Reviews because they are already being performed.

For cost estimate purposes, Alternative 3 includes the design and installation of POET systems in 89 homes within the target neighborhoods, O&M of the POET systems for 30 years, including monitoring to ensure effectiveness of each system. The upfront capital cost for this alternative is estimated at approximately $892,492. The annual O&M cost for the POET systems (including annual changeout of the treatment media), periodic repairs of the POET systems, and annual costs associated with monitoring is approximately $436,850. The total estimated cost for Alternative 3 is approximately $8,000,000.

Alternative 4 – Extension of and Connection to a Municipal Water Line – PREFERRED ALTERNATIVE

Alternative 4 consists of extending an existing municipal water line that currently runs within the Site, along Gilcreast Road and within portions of the Boston/Charleston/Albany neighborhood, into the target neighborhoods to provide a permanent alternate water source for residents that are currently relying on groundwater as their drinking water source within the target neighborhoods. Use of a water line would reduce or remove the continuous pumping from residential wells that draw contaminants along known bedrock fractures into and within the neighborhoods. The connection of receptors in the

target neighborhoods to the water line would minimize stresses on the aquifer, which over time may reduce the overall plume extent by minimizing contaminant migration from the Site.

Under Alternative 4, it would be expected that the existing water line on Gilcreast Road would be extended into the Ross/Tokanel neighborhood and into the Boston/Albany/Charleston neighborhood, and that all households within these target neighborhoods would be connected to the municipal water line. For cost purposes, an estimated 89 homes would be connected to municipal water under this alternative.

The total estimated length of the water line extension is 8,300 linear feet. Design and installation of the water line extension would need to be coordinated with the local water purveyor (Pennichuck Corporation). The proposed layout of the water line extension is shown on Figure 5. Water line installation would consist of road opening and trenching to a depth below the frost line (approximately 4-5 ft); installation, connection, and testing of the new water pipe; backfill; and road restoration. Blasting of bedrock or other means for removal of bedrock may be required in portions of the Ross/Tokanel neighborhood to attain the proper installation depth for the water line. It has been estimated that 30% of the construction along Ross Drive and the end of Tokanel Drive (~2,500 linear feet) would be impeded by bedrock and require blasting or other means for removal of bedrock (see Figure 5) for the locations requiring bedrock removal). Design and construction of the water line would require an upfront capital investment and specialized engineering, but once installed would be largely maintenance-free.

Once the water line is extended into the neighborhoods, each residence would require a unique plan for connection to the water line. That plan would include interior as well as exterior plumbing considerations, and landscape impacts and restoration. Upon completion of the water line extension, connection to all residences, and removal of the residential wells from service or modification to a groundwater monitoring well, there would be immediate and long-term risk mitigation to human health. There would be minimal long-term operation and maintenance (O&M) costs related to the water line. Consistent with EPA policy, following the connections and property restoration, the on-going costs (payments) for the water provided to each household would be the responsibility of each resident.

Following connection to the municipal water line, private water supply wells would be disconnected and removed from service to prevent future exposure to the contaminated groundwater or modified and used for future long-term monitoring activities at the Site with the approval of the homeowner. Long-term monitoring of groundwater to confirm protectiveness of the interim remedy would not be required, as this is a permanent alternative water supply. Long-term monitoring of groundwater would continue, however, as a component of the initial remedy, as amended.

CERCLA Five-Year Reviews, which are currently being performed every 5 years for the existing remedy, will continue and will also assess the protectiveness of the selected interim remedy. Data collected as part of on-going long-term monitoring efforts would be used to support the Five-Year Review. No additional costs are included for Five Year Reviews because they are already being performed.

For cost estimate purposes, it was assumed that shallow bedrock would be present along approximately 30% of the proposed alignment (~2,500 linear feet) and would require removal (blasting, etc.) to install

the water line in those areas. The total estimated cost of Alternative 4, which includes upfront capital cost for design, construction and connection of the homes to the water line extension, is estimated at approximately $6,832,000.

THE NINE CRITERIA FOR CHOOSING A CLEANUP PLAN

EPA uses nine criteria to evaluate cleanup alternatives and select a final cleanup plan. EPA has already evaluated how well each of the cleanup alternatives developed for the Tinkham Garage Superfund Site meet the first seven criteria in the FFS. EPA has received input indicating that NHDES supports the proposed interim remedy. Once comments from the State and the community are received and considered following a public comment period, EPA will select the interim remedy plan and document its selection in a Record of Decision Amendment for the Site.

1. Overall protection of human health and the environment: Will the alternative protect you and plant and animal life on and near the Site? EPA will not choose a cleanup plan that does not meet this basic criterion.
2. Compliance with Applicable or Relevant and Appropriate Requirements (ARARs): Does the alternative meet federal and state environmental statutes, regulations and requirements? The plan must meet this criterion unless a waiver is invoked.
3. Long-term effectiveness and permanence: Will the alternative be protective in the long-term? Is the alternative temporary or permanent and will there be adequate controls?
4. Reduction of toxicity, mobility or volume through treatment: Using treatment, does the alternative reduce the harmful effects of the contaminants, the spread of contaminants, and the amount of contaminated material?
5. Short-term effectiveness: How soon will site risks be adequately reduced? Could the cleanup cause short-term hazards to workers, residents or the environment?
6. Implementability: Is the alternative technically feasible? Are the right goods and services (i.e., treatment equipment, space at an approved disposal facility) available?
7. Cost: What is the total cost of an alternative over time? EPA must select a plan that provides necessary protection for a reasonable cost.
8. State acceptance: Do State environmental agencies agree with EPA's proposal?
9. Community acceptance: What support, objections, suggestions or modifications did the public offer during the comment period?

CLEANUP ALTERNATIVES COMPARISON

The alternatives were compared with each other to identify how well each alternative meets EPA's evaluation criteria. The State and community acceptance criteria will be evaluated once feedback is received during the public comment period.

The following discussion and Table 1 present a general comparison summary of the alternatives.[1] Detailed evaluations and comparisons of alternatives are included in the FFS.

Comparative Analysis of Alternatives

Overall Protection of Human Health and the Environment

Alternative 1 (No Action) would not be protective of human health. Exposure to contaminated groundwater through ingestion as drinking water would remain as an exposure pathway, which would not be mitigated, and continued expansion of the groundwater plume is possible. Alternatives 2, 3, and 4 would all provide adequate protection of human health, and include both temporary and permanent actions, with Alternative 4 providing the greatest overall protection.

Alternative 2 (Bottled Water) would provide safe drinking water to mitigate the ingestion risk from drinking and cooking with contaminated groundwater, but it would not address risks associated with incidental ingestion during showering or bathing.

Alternative 3 (POET Systems) would treat all groundwater entering the homes and provide clean water for all household uses, mitigating all current and future risk to residents. Performance of monitoring and O&M would be required under Alternative 3 to ensure that the POET systems continue to operate properly. Because Alternative 3 would not remove residential water supply wells from service, it does not achieve the RAO of reducing hydraulic stresses on the bedrock aquifer and does not reduce or minimize continued migration of contaminated groundwater from the Site. Alternatives 2 and 3 offer temporary actions until such time as groundwater attains drinking water quality in the future or a permanent alternative water is provided.

Alternative 4 (Water Line) would provide the highest level of protection to human health as it would mitigate or remove exposure to groundwater used as drinking water and therefore mitigate all risk associated with household use of groundwater. Extension of and connection to a nearby water line would provide a permanent alternate source of water for all household uses. Alternative 4 would not require any O&M or monitoring to ensure protectiveness and so is the most straightforward for the residents.

Compliance with ARARs

Each alternative must be assessed to determine whether it can attain ARARs under federal and State environmental or facility siting laws or provide grounds for invoking a pertinent waiver. This action is an interim remedy to mitigate exposure to Site contamination through the provision of an alternative water supply and is not expected to attain chemical-specific ARARs for groundwater throughout the Site.

Alternative 1 takes no action and as a result, there are no ARARs associated with this alternative. Alternatives 2, 3, and 4 would comply with the substantive requirements of any chemical-specific, location-specific, and action-specific ARARs that are either applicable or relevant and appropriate to

[1] Table 1 is not a substitute for the detailed alternatives analysis included in the Focused Feasibility Study. It is an evaluation summary intended to be helpful for the public.

each alternative. A complete listing of ARARs and to be considered criteria for the selected interim remedial action will be provided in a ROD Amendment subsequent to this Proposed Plan.

Long-Term Effectiveness and Permanence

Alternative 1 (No Action) would have no expected long-term effectiveness in reducing risk to human receptors exposed to contaminated groundwater.

Alternative 2 (Bottled Water) would mitigate most ingestion risk but would not address incidental ingestion or dermal contact associated with showering and bathing. While bottled water may be an effective temporary response to mitigate exposures, its long-term effectiveness and permanence may be limited due to the inconvenience to residents, as well as the time frame which may be required for residents to rely on bottled water until a permanent water source is provided or until groundwater returns to drinking water quality in the future, and effectiveness is expected to diminish over time.

Alternative 3 (POETs) would mitigate risk by treating the (groundwater) well water in the home prior to use. This alternative would significantly reduce the risk of ingestion of contaminated groundwater and have the added advantage of eliminating other contact (dermal contact) as well. It would have some impact on the residential users as it would involve the addition of treatment equipment into their residence and integration of that equipment into their existing plumbing. Residents would be involved with coordination of maintenance work on the POET systems over the long term. However, there would likely be less inconvenience of use and long-term compliance would likely be higher than for Alternative 2 (Bottled Water). Monitoring is included with Alternative 3 (POET Systems) to ensure that the systems are working properly and effectively mitigating risk and to assess the need to replace spent media. While use of POET systems may be an effective temporary response to mitigate ingestion exposures, its long-term effectiveness and permanence may be limited due to the inconvenience to residents related to O&M requirements, as well as the time frame for these systems to remain in place until groundwater returns to drinking water quality in the future. Additionally, Alternative 3 is not effective at reducing migration of contaminated groundwater from the Site, as residences will continue to draw groundwater for household use.

Alternative 4 (Water Line) provides the greatest long-term effectiveness and permanence and will prevent ingestion of and other contact with (dermal contact) contaminated groundwater by connecting all homes in the target neighborhoods to a municipal water line. Under this alternative, residents would pay for the municipal water and any O&M of the pipeline would be performed by the local water purveyor using those fees, providing a high level of confidence that the system will remain effective. Residents would need to pay for the alternate water supply based on their household usage.

Reduction of Toxicity, Mobility, and/or Volume Through Treatment

There would be no reduction of the toxicity, mobility or volume under Alternative 1 (No Action) and Alternative 2 (Bottled Water) because those alternatives do not include any treatment of the contaminated groundwater and allow for continued use of water supply wells, which may allow for continued migration and may extend the contaminant plume migration. Alternative 4 also does not provide treatment of groundwater. However, the removal of the water supply wells would be expected to minimize migration into and across the neighborhoods. Alternative 3 (POET Systems) would reduce

concentrations in groundwater used as drinking water through treatment. However, continued use of water supply wells may allow for continued migration from the Site into and across the neighborhoods. Alternative 2 (Bottled Water) and Alternative 4 (Water Line) each provide an alternate source of drinking water obtained offsite, while Alternative 3 (POETs) treats the on-site current source of drinking water.

Short-Term Effectiveness

Alternative 1 (No Action) does not have any short-term effectiveness because it does not provide any mitigation of the risk from ingestion of contaminated groundwater. It also does not present any risks during implementation because it does not involve any work.

Alternative 2 (Bottled Water) would be effective in the short-term at reducing human health risk from ingestion of contaminated groundwater. The short-term impacts associated with implementation of this alternative include an increase in truck traffic in the residential neighborhoods resulting from the delivery of the bottled water. Bottled water would be delivered on a set schedule, and it is estimated that weekly deliveries would be needed to service all homes. This frequency is unlikely to represent a measurable increase in risk when compared to routine package delivery trucks (UPS, Amazon, FedEx, etc.) and other services such as fuel oil and propane that service these neighborhoods.

Alternative 3 (POET Systems) would have limited short-term effectiveness because it will take time to meet with each homeowner, develop a house-specific POET design, procure the necessary materials and an installation contractor, and complete the installation. This process would likely take a year or more to complete for all homes. However, upon installation each household, well water would begin receiving treatment. Short-term effectiveness is less of a concern at this Site because most impacted residents would continue to be provided with bottled water until their POET system is installed and operational. Short-term risks associated with implementation of this alternative would include increased truck traffic from the contractors accessing the neighborhood and working in residences to install and maintain the systems. This impact would not likely be significant. There would be relatively small short-term impacts during routine maintenance of the POET systems.

The design and construction of Alternative 4 (Water Line), which will include field investigations, survey and subsequently design of the water line extension, and connections to each household, may take 2-3 years. Short-term effectiveness is less of a concern at this Site because most residents are currently already being offered bottled water, which would continue until the connections of all households are completed. Alternative 4 is associated with greater short-term impacts than the other alternatives. Short-term risks associated with this alternative include primarily risks to workers associated with excavation and subsurface construction. There may also be risks of worker exposure to contaminated groundwater and/or soil during installation of the water line in areas where shallow groundwater is present. Precautions must be taken to protect site workers from any noise, dust, and construction hazards. Precautions must also be taken to protect public and private infrastructure through use of a Dig Safe permit and through administrative controls (access agreements, etc.). Construction will have short-term effects on the community because of increased site activity including the operation of more trucks and construction vehicles on local streets and construction-related noise. Additionally, minor short-term

effects will occur on individual properties including the operation of construction equipment when connecting the homes to the water line.

Implementability

Alternative 1 (No Action) does not require any implementation.

Alternative 2 (Bottled Water) involves only delivery of bottled water to the residents within the targeted neighborhoods. Provision of bottled water is currently being implemented at the Site without difficulty; and the source of the bottled water is in compliance with drinking water regulations. Therefore, there are no concerns with the implementation of this alternative.

Alternative 3 (POET Systems) involves the design and installation of POET systems in homes and associated O&M. It also requires monitoring to ensure adequate treatment. Routine maintenance would include replacement of treatment media; non-routine maintenance would include repair or replacement of malfunctioning systems. The materials and supplies needed to construct and install POET systems are readily available, as are the technical staff needed to design and install them. There are no concerns with the implementation of this alternative.

Alternative 4 (Water Line) involves the design and construction of a municipal water line extension into and throughout the targeted neighborhoods to provide alternate drinking water (municipal source) to all households. This alternative uses standard engineering and construction services which have been implemented previously at the Site. Design and construction of the water line extension would require coordination with the local water purveyor (Pennichuck Corporation). Water line design and installation is a straightforward civil engineering project. The engineering expertise to complete the design is available locally. Similarly, the pipe, connections, and equipment needed for construction are widely available. There are numerous local construction companies that are capable and experienced in water line construction. Shallow bedrock is likely present in several locations along the proposed alignment of the water line extension. While this will complicate the design and installation of the water line, possibly requiring blasting or ripping of the bedrock, this type of work is routinely performed locally and the services, equipment, and materials needed to remove the bedrock are available locally.

Cost

This criterion evaluates the estimated costs of each alternative, including capital costs, O&M costs, and total project present-worth costs. Capital costs include those for construction, equipment, materials and services, waste disposal, engineering, startup/shakedown costs, and contingencies associated with initial construction of the remedy. Annual O&M costs include operating supplies and labor costs, maintenance materials and labor, auxiliary materials and energy, disposal of treatment residuals, purchased services, administrative costs, contingency funds, rehabilitation costs, and performance monitoring. For purposes of estimating costs in this FFS, a period of 30 years has been assumed per EPA guidance (EPA, 1988). The cost for long-term groundwater monitoring as well as CERCLA Five Year Reviews has not been included because they are already being performed as part of the current remedy. The cost estimates were calculated using an inflation rate of 2.8% and a discount rate of 4.5% based on current financial market conditions. Market volatility would affect the estimated cost for the alternatives.

Based on present-worth cost estimates, the least expensive alternative is Alternative 1 (No Action) with a cost of $0. Alternative 2 (Bottled Water) has the next lowest cost, with a present worth cost of approximately $2,800,000. Alternative 4 (Water Line) has the third lowest cost, with a present worth cost of approximately $6,800,000. Alternative 3 (POET Systems) is the most expensive alternative, requiring more extensive long-term operation and maintenance, and with a present worth cost of approximately $8,000,000.

WHY EPA RECOMMENDS THIS PROPOSED CLEANUP PLAN

Based on review of residential water supply monitoring results the conceptual site model for the Site summarized in the RI Summary Memorandum, the human health risk evaluation conducted to assess exposure and risk for receptors at the Site, and the evaluation of alternatives as part of the FFS, EPA recommends Alternative 4 (Water Line) as the proposed interim action plan. EPA believes that the proposed interim action plan achieves the best overall balance among EPA's nine criteria (excluding State and community acceptance which will be considered following a public comment period) used to evaluate the various alternatives presented in the FFS. The proposed interim action plan meets the objectives or RAOs established for the interim remedy. EPA and NHDES have had substantive discussions regarding the Site, the on-going cleanup, and the proposed interim action to mitigate risk from ingestion of groundwater used as drinking water in the target neighborhoods. EPA has received input indicating that NHDES supports the proposed interim action plan. EPA's proposed plan is based on current information that is presented in this plan and supporting documentation; however, the preferred alternative and interim action plan can change in response to public comment and/or new information.

This Proposed Plan includes a summary in general terms of why EPA recommends this proposed interim action plan at the Site. For more detail, refer to the FFS Report.

Alternative 4 (Municipal Water Line Extension) is EPA's preferred alternative for the following reasons:

- Provides the highest level of protection and long-term effectiveness, as it mitigates exposure to groundwater used as drinking water, and for other household uses, by providing a permanent alternative water source.
- Requires no long-term operation and maintenance or monitoring.
- Will meet substantive requirements of all action-specific and location-specific ARARs.
- Will reduce stresses on the aquifer and therefore will reduce plume mobility and volume, although it will not satisfy CERCLA's statutory preference for treatment.
- Has no significant implementability issues, as engineering and construction services and a local water purveyor is available, and an existing water line is located nearby.
- Is cost-effective at mitigating use of groundwater as drinking water where the existing groundwater source is considered to present an unacceptable risk.

EPA expects the preferred alternative to satisfy statutory requirements of CERCLA Section 121(b). EPA believes that this proposed interim action to mitigate risks from ingestion of groundwater used as

drinking water is protective of human health and the environment and will achieve the Site-specific objectives in a reasonable timeframe. The proposed interim action complies with federal and state environmental regulations that are ARARs and is cost-effective. Further, this preferred alternative will reduce the mobility, and volume of contaminated groundwater through removal of stresses on the aquifer caused by water supply pumping and utilizes a permanent solution to provide alternative water. Treatment is not a principal element of the proposed action due to the limited scope of the interim remedy. This interim action, while not addressing groundwater directly, will be considered a part of and not be inconsistent with any final groundwater remedy that may be required.

WHAT IS A FORMAL COMMENT?

EPA will accept public comments during a 30-day formal public comment period. EPA considers and uses these comments to improve its cleanup approach.

EPA will hold an informational meeting on July 10, 2025, prior to the start of the formal public comment period on July 11, 2025. During the formal comment period, EPA will accept written comments via mail or online via regulations.gov (Docket ID No. EPA–R01–SFUND–2025–0117). (See below for further instructions on how to send us your comments.)

Additionally, oral comments may be made during the formal Public Hearing on July 29, 2025, during which a stenographer will record all offered comments during the hearing. EPA will not respond to your comments during the formal Public Hearing.

EPA will review the transcript of all formal oral comments received during the hearing, and all written comments received during the formal comment period, before making a final cleanup decision. Formal comments made during the comment period will become part of the official public record and Administrative Record for EPA's final cleanup plan decision. A copy of the transcript of the hearing will be placed in the Administrative Record and be publicly accessible. EPA will prepare a Responsiveness Summary of significant comments, criticisms, and new relevant information submitted during the public comment period, and EPA's responses to each issue. The Responsiveness Summary will be included in EPA's decision document, referred to as the Record of Decision, specifying EPA's final selected interim remedial action. The Record of Decision and Responsiveness Summary will be made available to the public online at www.epa.gov/superfund/tinkham. Access to the internet is available at Leach Library in Londonderry, New Hampshire and the EPA New England Records Center at the addresses listed below. EPA will announce the final decision on the cleanup plan through the local media and via its website.

FOR MORE DETAILED INFORMATION:

The Administrative Record, which includes all documents that EPA has considered or relied upon in proposing this cleanup plan for the Tinkham Garage Superfund Site, is available via computer for public review and comment at the following locations:

EPA Records and Information Center
5 Post Office Square, First Floor
Boston, MA 02109-3912
617-918-1440

Leach Library
276 Mammoth Road
Londonderry, NH 03053
603-432-1132
https://www.londonderrynh.gov/leach-library

Information is also available for review online at www.epa.gov/superfund/tinkham.

SEND US YOUR COMMENTS

Provide EPA with your comments about the Proposed Plan for the Tinkham Garage Superfund Site.

Submit comments by mail, postmarked no later than August 12, 2025, to:

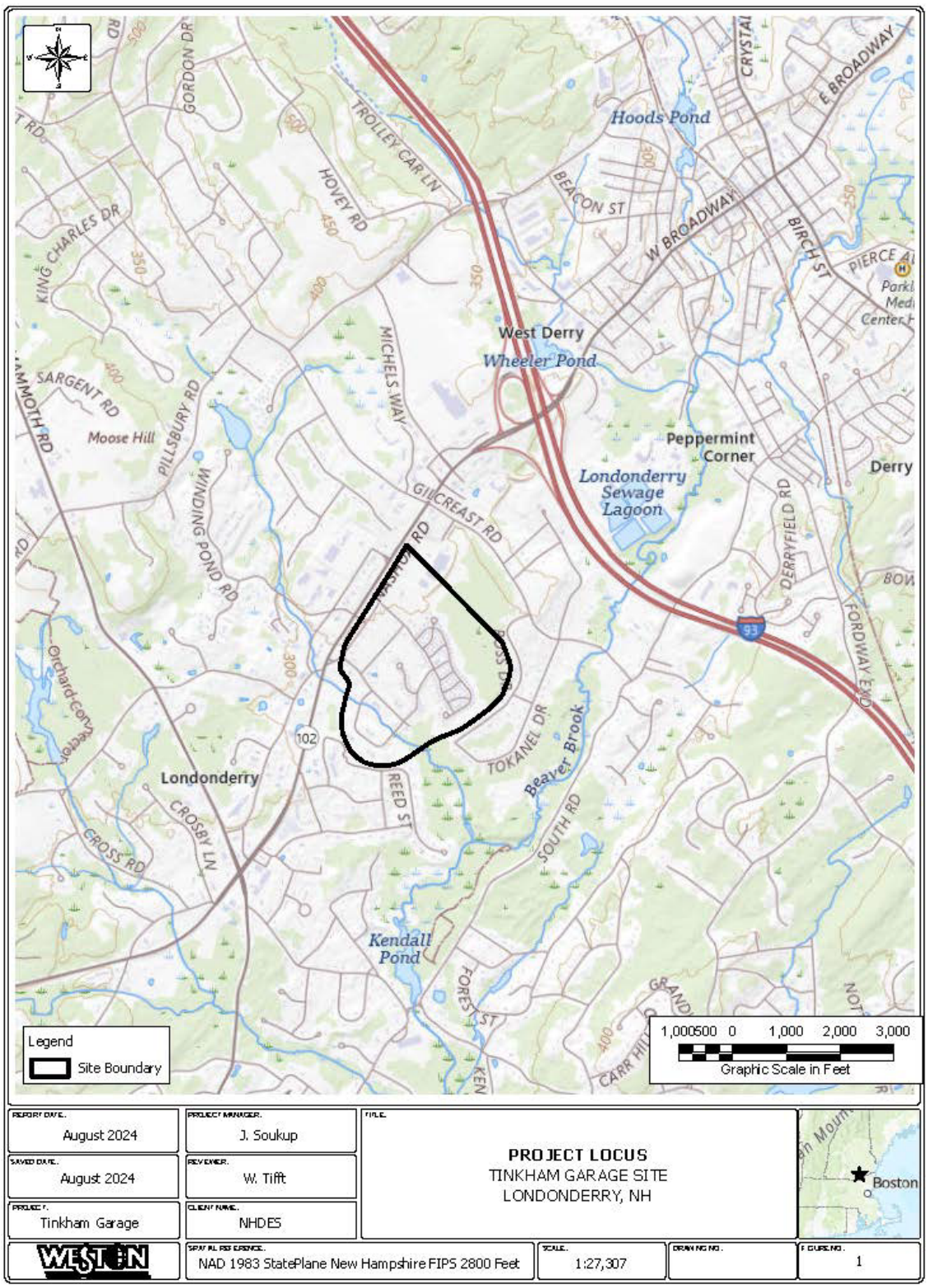
Cheryl Sprague
EPA New England
5 Post Office Square, Suite 100
Mail Code: 07-1
Boston, MA 02109-3912

Or submit comments online no later than August 12, 2025, to https://www.regulations.gov (Docket ID No. EPA–R01–SFUND–2025–0117). Please follow the online instructions for submitting comments. Once submitted, comments cannot be edited or removed from Regulations.gov. Do not submit electronically any information you consider to be Confidential Business Information (CBI) or other information whose disclosure is restricted by statute. The written comment is considered the official comment and should include discussion of all points you wish to make. EPA will generally not consider comments or supporting materials located outside of the primary submission. For the full EPA public comment policy, information about CBI or multimedia submissions, and general guidance on making effective comments, see https://www.epa.gov/dockets/commenting-epadockets. Any personally identifiable information (e.g., name, address, phone number) included in the comment form or in an attachment may be publicly disclosed in a docket or on the internet (via Regulations.gov, a federal agency website, or a third-party, nongovernment website with access to publicly disclosed data on Regulations.gov). By submitting a

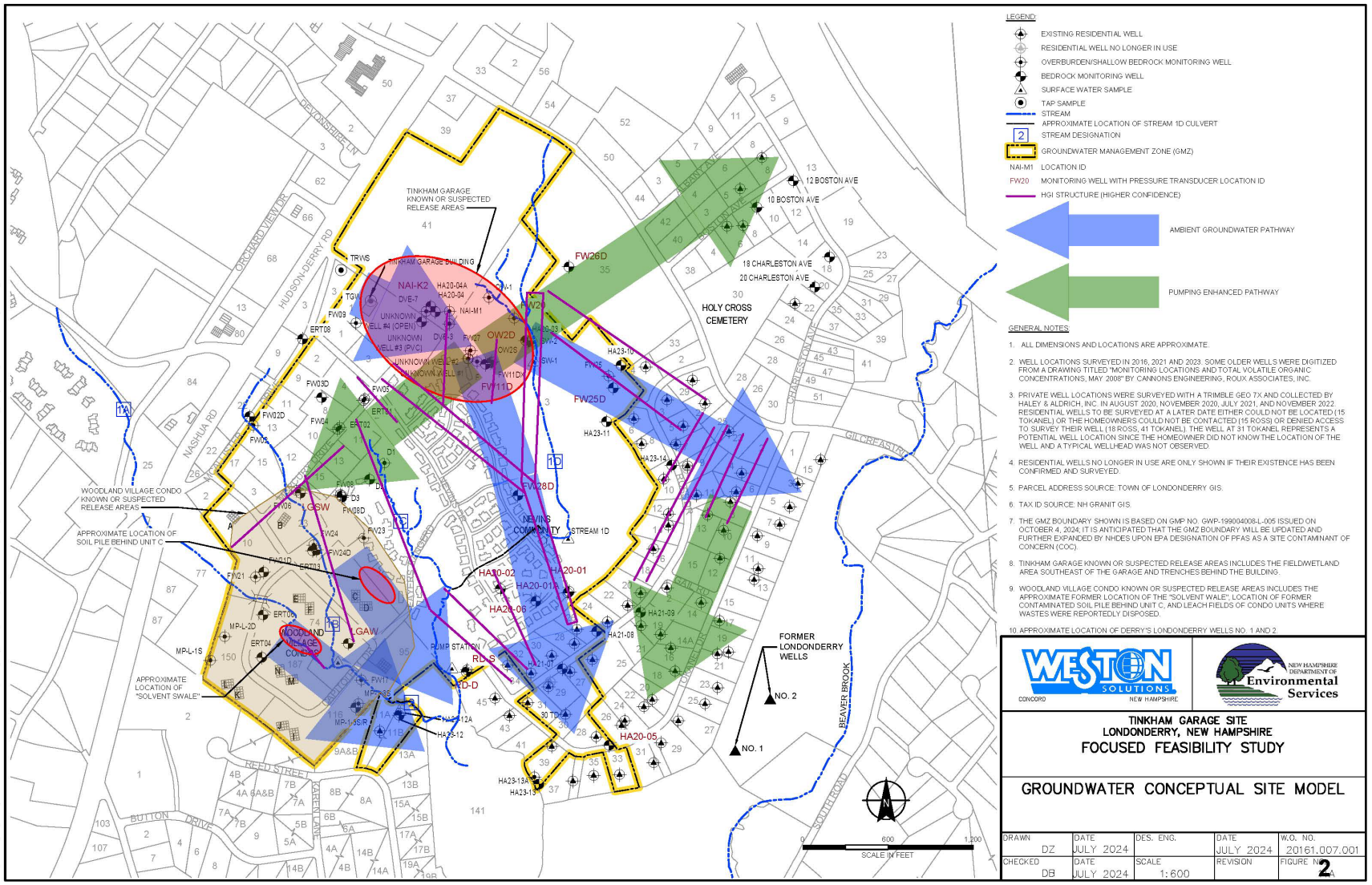
comment, you agree to the terms of participation, available at https://www.regulations.gov/user-notice, and privacy notice, available at https://www.regulations.gov/privacy-notice

Acronyms

AGQS	Ambient Groundwater Quality Standards
BTEX	benzene, toluene, ethylbenzene, and xylene
CEC	Cannon Engineering Corporation
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	contaminant of concern
CSG	Cannons Sites Group
CSM	Conceptual Site Model
EPA	United States Environmental Protection Agency
FS	Feasibility Study
FFS	Focused Feasibility Study
GMP	Groundwater Management Permit
GMZ	Groundwater Management Zone
MCL	Maximum Contaminant Level
MCLG	Maximum Contaminant Level Goals
mg/kg	milligram per kilogram
mg/L	milligrams per liter
MNA	monitored natural attenuation
NHDES	New Hampshire Department of Environmental Services
PCB	polychlorinated biphenyls
PCE	tetrachloroethene
PFAS	per- and polyfluoroalkyl substances
PFBS	perfluorobutanesulfonic acid
PFPeA	perfluoropentanoic acid
PFHxS	perfluorohexane sulfonic acid
PFNA	perfluorononanoic acid
PFOA	perfluorooctanoic acid
PFOS	perfluorooctane sulfonic acid
POET	point-of-entry treatment
RI	Remedial Investigation
ROD	Record of Decision
Site	Tinkham Garage Superfund Site
TCE	trichloroethene
1,1,1-TCA	1,1,1-trichloroethane
VOC	volatile organic compound



REPORT DATE: August 2024	PROJECT MANAGER: J. Soukup	TITLE: PROJECT LOCUS TINKHAM GARAGE SITE LONDONDERRY, NH	
SAVED DATE: August 2024	REVIEWER: W. Tifft		
PROJECT: Tinkham Garage	CLIENT NAME: NHDES		
WESTON	SPATIAL REFERENCE: NAD 1983 StatePlane New Hampshire FIPS 2800 Feet	SCALE: 1:27,307	DRAWING NO.: FIGURE NO.: 1



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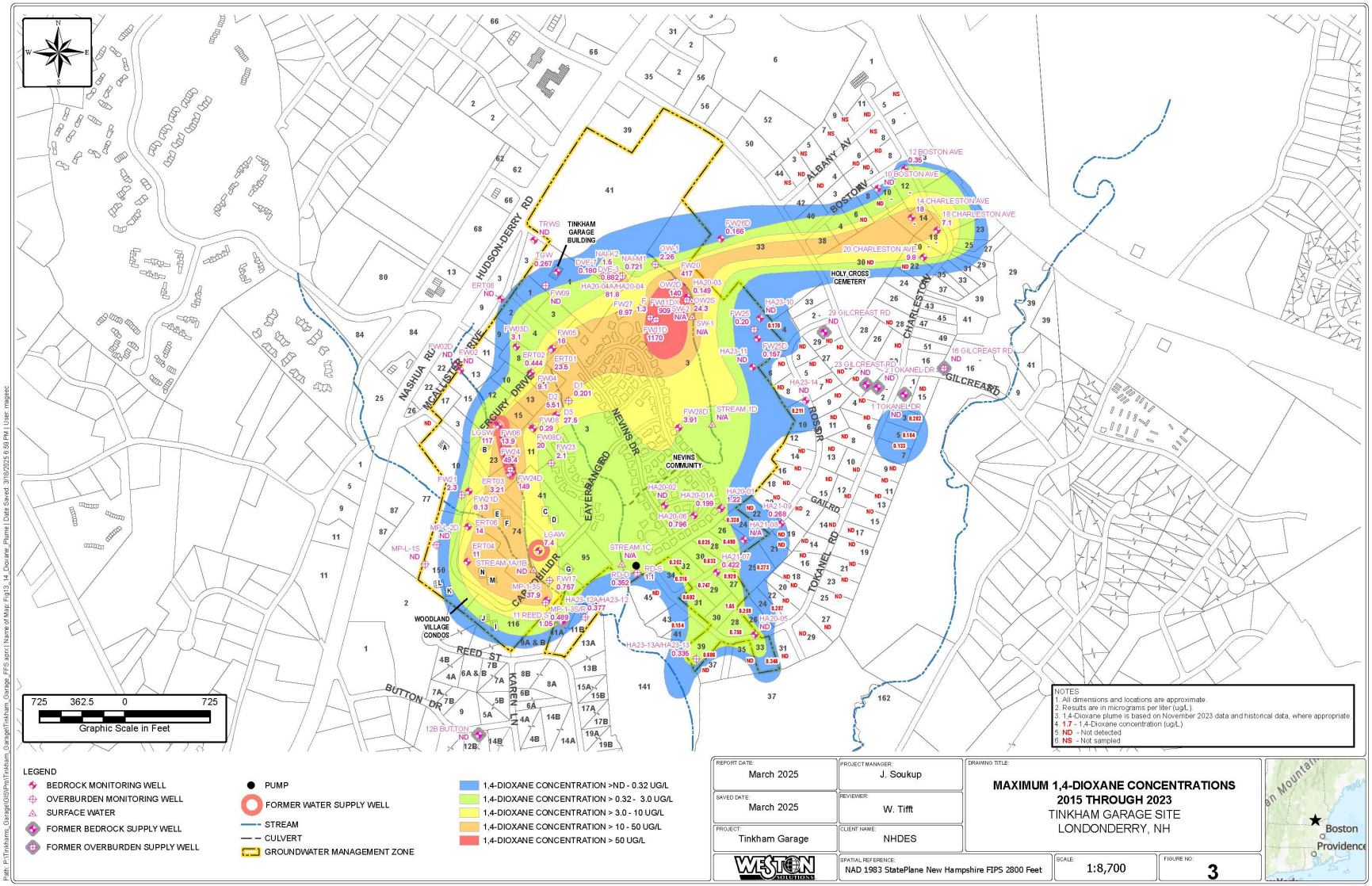
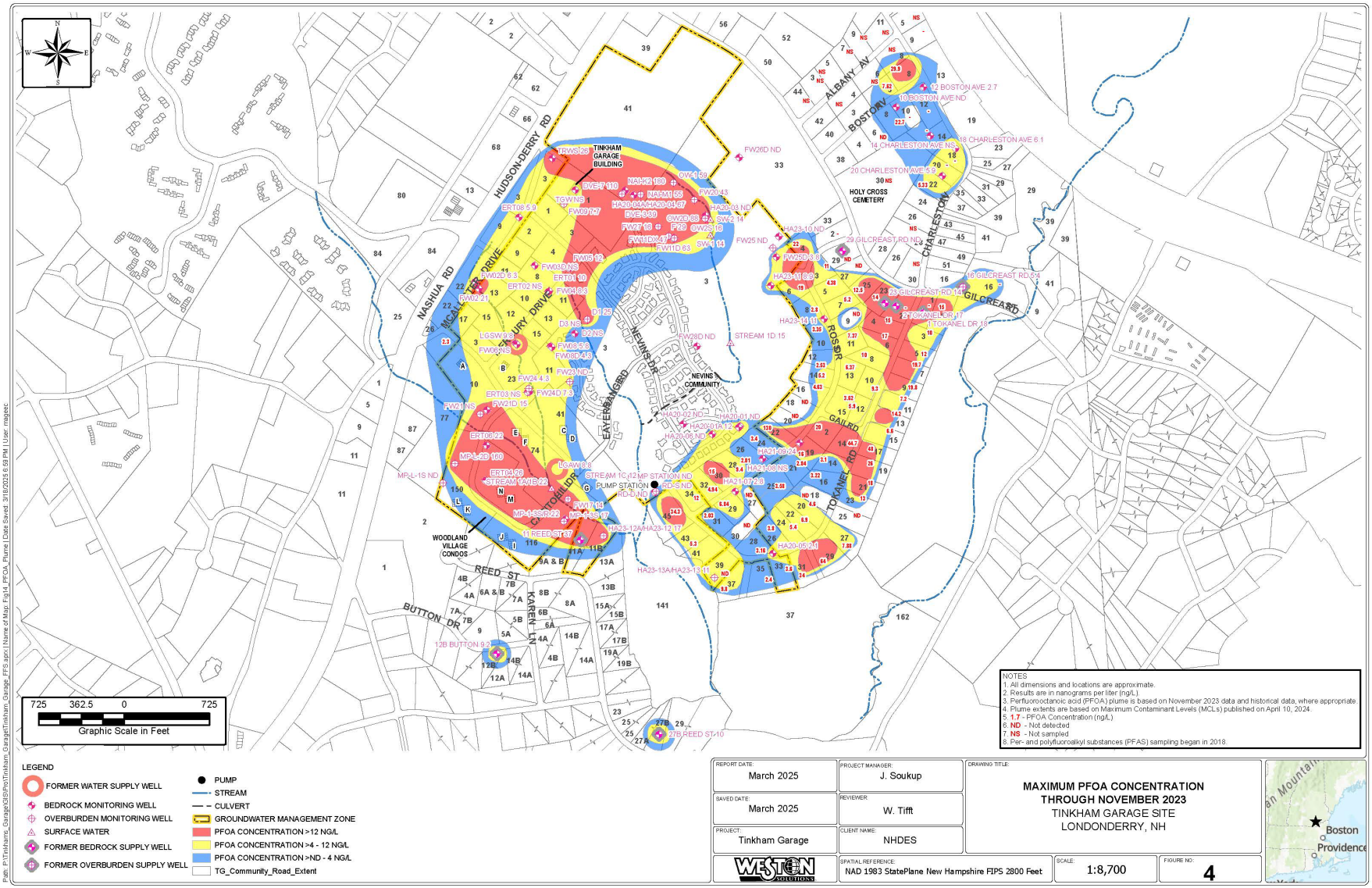
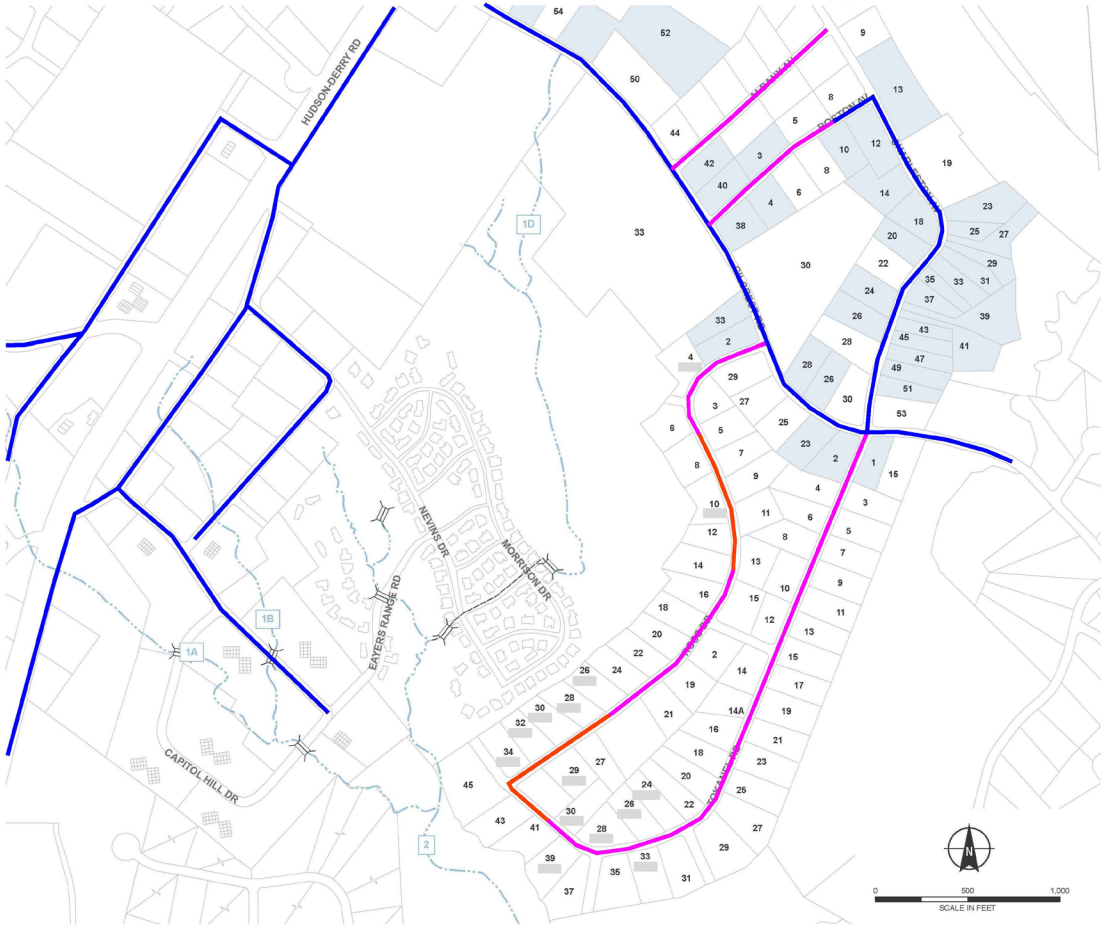

TINKHAM GARAGE BUILDING
HOLY CROSS CEMETERY
NEVINS COMMUNITY
WOODLAND VILLAGE CONDOS
HUDSON-DERRY RD
NASHUA RD
MCALLISTER DRIVE
ERCURY DRIVE
EATHERBANGRD
NEVINS DR
CASTNEILDR
REED ST
BUTTON DR
KAREN LN
ALBANY AV
BOSTON AV
CHARLESTON
ROSS DR
GAILRD
TOKANEL RD
GILCREARD
12 BOSTON AVE
10 BOSTON AVE
14 CHARLESTON AVE
18 CHARLESTON AVE
20 CHARLESTON AVE
29 GILCREAST RD
16 GILCREAST RD
28 GILCREAST RD
7 TOKANEL DR
11 TOKANEL DR
725 362.5 0 725
Graphic Scale in Feet
NOTES
1. All dimensions and locations are approximate.
2. Results are in micrograms per liter (ug/L).
3. 1,4-Dioxane plume is based on November 2023 data and historical data, where appropriate.
4. 1.7 - 1,4-Dioxane concentration (ug/L)
5. ND - Not detected
6. NS - Not sampled
LEGEND
BEDROCK MONITORING WELL
OVERBURDEN MONITORING WELL
SURFACE WATER
FORMER BEDROCK SUPPLY WELL
FORMER OVERBURDEN SUPPLY WELL
PUMP
FORMER WATER SUPPLY WELL
STREAM
CULVERT
GROUNDWATER MANAGEMENT ZONE
1,4-DIOXANE CONCENTRATION >ND - 0.32 UG/L
1,4-DIOXANE CONCENTRATION > 0.32 - 3.0 UG/L
1,4-DIOXANE CONCENTRATION > 3.0 - 10 UG/L
1,4-DIOXANE CONCENTRATION > 10 - 50 UG/L
1,4-DIOXANE CONCENTRATION > 50 UG/L
REPORT DATE: March 2025
PROJECT MANAGER: J. Soukup
SAVED DATE: March 2025
REVIEWER: W. Tifft
PROJECT: Tinkham Garage
CLIENT NAME: NHDES
DRAWING TITLE:
MAXIMUM 1,4-DIOXANE CONCENTRATIONS
2015 THROUGH 2023
TINKHAM GARAGE SITE
LONDONDERRY, NH
SPATIAL REFERENCE: NAD 1983 StatePlane New Hampshire FIPS 2800 Feet
SCALE: 1:8,700
FIGURE NO: 3
Boston
Providence


TINKHAM GARAGE BUILDING
HOLY CROSS CEMETERY
NEVINS COMMUNITY
WOODLAND VILLAGE CONDOS
PUMP STATION
HUDSON-DERRY RD
NASHUA RD
MCALLISTER DRIVE
NEWINS DR
FAY LEBANON RD
CLINTON HILL DR
REED ST
BUTTON DR
KAREN LN
ALBANY AV
BOSTON AV
CHARLESTON
GILCREAST RD
ROSS DR
GAIL RD
TOKANEL RD
725 362.5 0 725
Graphic Scale in Feet
LEGEND
FORMER WATER SUPPLY WELL
BEDROCK MONITORING WELL
OVERBURDEN MONITORING WELL
SURFACE WATER
FORMER BEDROCK SUPPLY WELL
FORMER OVERBURDEN SUPPLY WELL
PUMP
STREAM
CULVERT
GROUNDWATER MANAGEMENT ZONE
PFOA CONCENTRATION >12 NG/L
PFOA CONCENTRATION >4 - 12 NG/L
PFOA CONCENTRATION >ND - 4 NG/L
TG_Community_Road_Extent
NOTES
1. All dimensions and locations are approximate.
2. Results are in nanograms per liter (ng/L).
3. Perfluorooctanoic acid (PFOA) plume is based on November 2023 data and historical data, where appropriate.
4. Plume extents are based on Maximum Contaminant Levels (MCLs) published on April 10, 2024.
5. 1.7 - PFOA Concentration (ng/L)
6. ND - Not detected
7. NS - Not sampled
8. Per- and polyfluoroalkyl substances (PFAS) sampling began in 2018.
REPORT DATE: March 2025
PROJECT MANAGER: J. Soukup
DRAWING TITLE: MAXIMUM PFOA CONCENTRATION THROUGH NOVEMBER 2023 TINKHAM GARAGE SITE LONDONDERRY, NH
SAVED DATE: March 2025
REVIEWER: W. Tifft
PROJECT: Tinkham Garage
CLIENT NAME: NHDES
SPATIAL REFERENCE: NAD 1983 StatePlane New Hampshire FIPS 2800 Feet
SCALE: 1:8,700
FIGURE NO: 4
Boston
Providence
Path: P:\Tinkhams_Garage\GIS\ProjTinkham_Garage\Tinkham_Garage_PFS.aprx | Name of Map: Fig14_PFOA_Plume | Date Saved: 3/18/2025 6:58 PM | User: mspec



GRAPHIC SCALE
600 300 0 300 600
APPROXIMATE SCALE IN FEET

LEGEND

- EXISTING WATER LINE
- NEW WATER LINE
- NEW WATER LINE REQUIRING BEDROCK BLASTING

WESTON SOLUTIONS
CONCORD NEW HAMPSHIRE

TINKHAM GARAGE SITE
LONDONDERR Y , NEW HAMPSHIRE

PROPOSED WATER LINE

DRAWN	DATE	DES. ENG.	DATE	W.O. NO.
DCH	JAN 2023			20139.007.002
CHECKED	DATE	SCALE	REVISION	FIGURE NO.
NW	JAN 2023	AS SHOWN		5

Table 2
Comparative Analysis Summary of Remedial Alternatives
Tinkham Garage Superfund Site, Londonderry, NH

		Threshold Criteria		Balancing Criteria				
		Protection of Human Health & Env.	Compliance with ARARs	Long-Term Effective-ness	Reduction through Treatment	Short-Term Effectiveness	Implement-ability	Cost
Alternative Description								Total Net Present Value*
GW-1	No Action	N	N	●	N/A	N/A	●●●	$0
GW-2	Bottled Water	Y	Y	●●	N/A	●●●	●●●	$2,800,000
GW-3	Point of Entry Treatment Systems (POETS)	Y	Y	●●	●●	●●	●●	$8,000,000
GW-4 Preferred Alternative	**Waterline Extension**	Y	Y	●●●	N/A	●●	●●●	**$6,800,000**

Please refer to the Focused Feasibility Study Report for further discussion regarding comparison of various alternative.

Y = Alternative passes this criterion
N = Alternative fails this criterion

● = Least favorable
●● = Moderately favorable
●●● = Most favorable

*= Costs represent total net present value (discounted with an annual rate of 4.5%) and are generally rounded to significant figures. The total net present value is the complete costs including capital, and annual operation and maintenance over 30 years. The remedial cost estimates present a feasibility level estimate and are intended to provide an accuracy of +50% to -30%.