



TOWN OF TOPSFIELD

REQUEST FOR PROPOSALS FOR REUSE OF

10 SCHOOL AVENUE PROPERTY

OCTOBER 18, 2023



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I. Project Summary

A. Introduction

The Town of Topsfield ("Town") is pleased to present this Request For Proposals ("RFP") for the sale and reuse of 10 School Avenue, a Town-owned property located in the heart of downtown Topsfield. The sale of the property was made possible by a vote of the Town's May 8, 2021 Annual Town Meeting, which authorized the Select Board to dispose of the 10 School Avenue parcel ("subject property") subject to any terms and conditions it deems appropriate.

The subject property, with its significant land area, existing buildings and location within the Town center, affords an excellent opportunity for adaptive reuse. Detailed information about the property and its buildings is provided in C. below. Photos of the site are provided on page 3 and a Location & Site Map are provided in Appendix N. *(Note: The rendering on the cover page is the artist's vision of what the subject property might look like upon its reuse. Its primary purpose is to illustrate the Town's objectives for the property, which include reuse of the building, if feasible, and the provision of pedestrian access and attractive landscaping. It is not meant to dictate the specific manner in which the property is redeveloped.)*

This is the second time the Town has solicited proposals for the acquisition and reuse of 10 School Avenue; the first RFP, which was issued in September of 2022, did not engender any responses. From discussions with potentially interested parties, the Town learned that two major concerns for potential buyers were the limitations of the site relative to wastewater disposal and on-site parking. The Town was also aware that the Topsfield Zoning Bylaw did not allow at least one desirable potential reuse of the subject property, and some of its other requirements were not optimal for its desired reuse. This updated RFP addresses all of these issues, as described in Section II.

This RFP has six components: I. Project Summary; II. Development Guidelines; III. Submission Requirements; IV. Proposal Review and Selection Process; V. Performance Requirements; and VI. Appendices.

B. Project Goal and Objectives

In requesting proposals from the development community for the reuse of 10 School Avenue, the Town's goal is that the property becomes a key component of the ongoing revitalization of Downtown Topsfield. To achieve this goal, the reuse of the subject property would satisfy the following objectives:

- Serve as a downtown destination for both residents and visitors alike
- Generate significant foot traffic for the downtown, ideally in both the day time and evening hours
- Create a commercial or mixed use (commercial/residential) which meets identified Town needs and interests
- Reuse the former fire station/highway garage at appropriate scale for site, neighborhood and Town at-large*

*The rationale for the Town's interest in reusing the former fire station/highway garage building is two-fold: first, as explained further in C. below, environmental constraints on the property would likely increase if the existing building is demolished and rebuilt; second, reusing the building rather than demolishing it will provide some degree of continuity with the previous incarnation of the property, even though the use will have changed. The overriding goal of the RFP, however, is to achieve the redevelopment of the site. Thus, if a project proposer determines that the reuse of the building is either infeasible or inconsistent with its development plans for the site, the Town will consider a proposal that involves the demolition of the principal building on the property, provided that the proposer makes a convincing argument for why the building should not be reused, and can demonstrate that its proposal has a good probability of achieving permitting approval.

- Create both short-term and long-term jobs
- Provide a financial benefit to Town, including real estate taxes, and purchase or lease payments
- Provide safe pedestrian access to the property from Main Street
- Apply the highest quality of physical planning and design in all aspects of the project, including the use of renewable energy sources and alternative building materials as feasible

C. Property Description

Descriptions of various aspects of the subject property, including its buildings, are provided below.

Lot Area, Dimensions, and Frontage: The subject property*, also known as Assessor’s Map 41, Lot 60, is 57,639 square feet in area, and contains two vacant buildings: a former fire station/highway garage and an accessory building. It is located at the terminus of the School Avenue right-of-way (ROW), and possesses about 127 feet of frontage on the westerly side of School Avenue. The subject property's western side boundary line is about 280 feet in length (the lower 118 feet of which extends along School Brook); its rear property line is approximately 250 feet in length; and its eastern side boundary is 210 feet in length. Other dimensions of the subject property are provided in the Table in II.B.

Abutting Properties: The subject property is bordered by: the Topsfield Municipal Fire Station property to the east/northeast; three single-family residential lots to the north; five lots to the west, of which three are commercial in use and two are residential; School Avenue to the southwest; and to the southeast, on the opposite side of School Avenue, a one acre, privately-held vacant land parcel for which the Town holds an option to purchase, as described in Section II of this RFP.

Property Soils: See Essex County Soil Map in Appendix A, which shows the soil types for the subject property and the abutting one-acre vacant parcel.

Roads, Access and Parking: School Avenue is a public way with a ROW of 30 feet and a variable paved width, with an average width of approximately 22 feet. Although the School Avenue ROW terminates at the subject property, a paved drive continues beyond the ROW, first in a 30-foot wide access easement, and then in a 20-foot wide access easement that extends to the Town's current fire station property at 27 High Street (shown on plan sheet 3 of Appendix B).

Vehicular access to the subject property is provided from its frontage on School Avenue and the afore-mentioned access easement. At present, there is no dedicated pedestrian access to the subject property, although pedestrians can reach the site by walking down School Avenue from Main Street.

At present, 11 parking spaces are delineated on the subject property. Substantially more spaces could be created on the abutting one-acre parcel if the proponent chooses to exercise the option described in Section II. In addition, Section 4.12 of the Topsfield Zoning Bylaw ("Bylaw") allows non-residential uses within 500 feet of public parking (on- or off-street) to count those spaces toward the off-street parking spaces required by the Bylaw. There are 44 public parking spaces on Main Street within 500 feet of 10 School Avenue, which are lightly used during the evening hours.

*Until late 2021, the subject property was part of a larger, 93,035 square foot parcel known as 27 High Street, on which the current Topsfield Fire Station is located. The approved definitive subdivision plan that divided off the subject property was recorded in the Essex Registry of Deeds on November 12, 2021, at Book 40479, Plan 557.

PHOTOS OF 10 SCHOOL AVENUE PROPERTY



Front view of subject property; School Avenue on right



Side view of subject property; accessory building in rear



Block party at subject property; May 2023

Historical Use of Property: The principal building was built in 1941 as the Town's municipal fire station. This use continued until 1969, when the Town built the current fire station at 27 High Street. The building was then converted into a Highway Garage, which was used to store equipment and other supplies and materials used by the Topsfield Department of Public Works. The building has had limited use since 2001, when a new highway garage was built elsewhere in town, and is now largely vacant. Although the building is over 75 years of age, its rehabilitation does not need to conform to federal or local guidelines for restoring historic buildings. Because of its municipal use history, however, the property does have some historical significance.

Wastewater Disposal: The subject property has an on-site disposal system, but it is not Title 5 compliant, and the reuse of the subject property will require the installation of a Title 5 septic system. (The Town does not have a public sanitary sewer system.) The Town conducted soil testing of the subject property in 2001, and three acceptable percolation test results were achieved. (See Appendix C.) Additional passing percolation tests will be required to obtain approval of a Title V system for the new use, but the existing data suggests that those results are achievable.

Natural Gas: A natural gas service line is provided to the building. At one time there were three 500-gallon gas tanks on the property, but they were all removed, in compliance with environmental regulations, prior to 2000.

Environmental Conditions: In January of 2001 Clean Soils Environmental Ltd. of Ipswich, MA issued a Limited Subsurface Investigation Report (LSIR) for the subject property. It concluded that a relatively minor but reportable condition existed, and recommended additional subsurface testing to determine if the contamination could be left in place. Upon further testing, Clean Soils Environmental submitted a Class B-1 Response Action Outcome Statement (RAOS) to the Massachusetts Department of Environmental Protection (DEP) in March of 2021 (see Appendix D for the LSIR and Appendix E for the RAOS). The Data Portal on the Massachusetts Executive Office of Environmental Affairs website lists 10 School Avenue as a closed site. Since 2001 the Town's use of the subject property has been limited to inert storage.

Zoning: The subject property is located within the Business District Village (BV), a mixed-use zoning district in downtown Topsfield. The BV District allows a range of commercial and residential uses, some by-right, and some by special permit. For purposes of this RFP, the allowable uses for the subject property and the adjacent one-acre vacant lot are described in II.B and III. B. below.

Wetlands Jurisdiction: Because School Brook runs along more than 40% of the subject property's western boundary line, a portion of the property is jurisdictional under the State Wetlands Protection Act and/or the Rivers Protection Act. A majority of the property is within the 200-foot Riverfront Area, while more than one-third of the subject property is within the 100-foot buffer zone, including a portion of the principal building. (A plan sheet showing the areas of jurisdiction is shown on plan sheet 2 in Appendix B.) As such, the reuse of the subject property will require approval from the Topsfield Conservation Commission. The Topsfield Wetlands Bylaw allows development in jurisdictional areas on land that is "degraded," and because a significant portion of the subject property is paved, redevelopment is permissible subject to certain conditions.

General Description of Buildings: The principal building is a 1^{1/2} story concrete frame, brick-faced structure, with 5,912 square feet of gross floor area, a finished area of 4,610 s.f. (including a 325 s.f. mezzanine.), and a gable roof with asphalt shingles. The building has been minimally used for the past 22 years, and its condition is listed as fair on the Town's Property Assessment Card. Other information about the principal building:

- **Floors:** The portion of the building with the large gable end has a concrete surface. The floor in the remainder of the building has a coal patch surface.
- **Walls and Ceiling Surfaces:** Brick and cinder block

- **Water Service:** Connected to Topsfield public water distribution system
- **Electric Service:** The principal building has 200 amperes electric service.
- **Heat Fuel:** The original fuel source was coal but it was later converted to oil. The underground oil tanks were removed a number of years ago.
- **Handicapped Accessibility:** Building was not constructed to be handicapped accessible, but garage bays in the principal building are at grade.

The accessory building is a one-story, wood-frame structure, 768 square feet in area.

D. Town Profile

Located in northeastern Massachusetts in the geographical center of Essex County, Topsfield is less than a 20-mile drive to Boston and New Hampshire via I-95 and Route One, both of which run through town. Route 97 also traverses the town, providing east/west access directly into the downtown.

Topsfield is a historic New England town with a town common and a business district located in its center. Although its population is modest (6,569 residents as of 2020), almost 70,000 people live either in Topsfield and the abutting communities of Danvers, Ipswich, Hamilton, Wenham, Boxford and Middleton, and nearly 250,000 live in the municipalities those towns abut. Topsfield's population is highly educated, with a median annual income (\$144,258). The average annual income of its adjacent communities is just under \$130,000. As such, there is a high level of discretionary income in Topsfield and its surrounding towns.

Besides its many historic buildings, significant open space and recreation land, and excellent schools, Topsfield hosts a number of annual events, none more notable than the Topsfield Fair, America's oldest country fair. Each year it draws more than half a million visitors during its 11-day operation in early October.

In recent years, the Town has been purposeful in its efforts to enhance and expand both its downtown business district and the business corridor district along Route One. Recent accomplishments and projects in progress in downtown Topsfield include general beautification of the streetscape (including the installation of smartly designed solar-powered lamp posts), development of standardized streetscape design regulations, branding, and the design of uniform wayfinding signs that were installed summer of 2023.

For more information about the Town, see Appendix G.

E. Queries/Information Requests

Queries or information requests regarding the RFP should be directed to either:

Kevin Harutunian, Town Administrator kharutunian@topsfield-ma.gov 978-887-1500	OR	Debra Morong, Purchasing Agent/Special Project Coord. dmorong@topsfield-ma.gov 978-887-1504
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F. Information Session/Site Tour

The Town will conduct a tour of the 10 School Avenue property on October 31, 2023 at 11 am. Questions about the property and/or RFP will be addressed at this time, and any answers provided will be forwarded to all parties who inquired about the RFP. All potential respondents to the RFP are strongly encouraged to attend the information session/site tour, although attendance is not required.

Requests to tour the property at an alternative time should be directed to Kevin Harutunian or Debra Morong.

G. Request For Proposals Timeline

The timeline for the RFP process described herein is as follows:

1.	Release of RFP	October 18, 2023
2.	Information Session/Site Visit	October 31, 2023
3.	RFP Submittal Due Date	December 7, 2023
4.	Comparative review/ranking of submissions	Complete by January 5, 2024
5.	Interviews of top-ranked proponents	Complete by February 2, 2024
6.	Conditional designation of a developer*	Complete by March 1, 2024

II. Development Guidelines

This section describes the guidelines the Town has established for the reuse of the subject property.

A. Allowable Uses

The Town will consider proposals for the subject property that contain one or more of the following uses:

- Restaurants, Full Service
- Mixed Uses (i.e., restaurant/retail and residential)
- Pub Brewery with or without Beverage Manufacturing
- Tavern
- Retail Establishments Allowed in B-V District

B. Preferred Reuses

Although all of the uses listed immediately above have the potential to be responsive to the goal and objectives outlined on page 3 of this RFP, the Town believes that a strong proposal for a Full-Service Restaurant (with potentially a Pub Brewery with associated Beverage Manufacturing), especially one that would likely generate a regional draw, would be most responsive. Equally responsive would be a strong proposal for these same uses, with residential units on the upper floor(s). As such, these are the preferred reuses for the subject property, and the comparative criteria (described on page 14) that will be employed by the Selection Committee favors a full-service restaurant and/or a Pub Brewery with associated Beverage Manufacturing (with or without a residential component) that is also strongly responsive to the Town's stated goal and objectives for the property.

The Town, however, does not discourage potential respondents who are considering submitting proposals for an allowable use other than the preferred reuses. A strongly responsive proposal for such a use(s) could potentially receive a higher rating than a full-service restaurant (with or without dwelling units) that overall is less responsive to the Town's stated goals and objectives for the subject property.

*After the conditional designation of a developer, the Town will enter into negotiations on a P&S agreement, as described in Section V.A. of this RFP.

C. Rationale for Establishing Allowable Uses

The Town's rationale for establishing the allowable uses listed in A. is based in part on a recent community survey of Topsfield. Conducted in the spring of 2022, the survey received 264 responses, with a good cross section of responses by household size and age. The survey showed strong support for increased business activity, especially for a full-service restaurant and retail uses. A remarkable 98% of respondents wanted to have at least one full-service, wait-staff restaurant in downtown Topsfield, with over 80% expressing interest in seeing another retail store in the downtown. Thus, the survey suggests there is strong community support for the downtown becoming more of a dining and retail destination. Along with the Town population's high disposable income and the survey result indicating that nearly 50% of respondents intend to patronize Topsfield-based businesses four or more times a week (nearly twice as often as pre-pandemic numbers), there is good reason for a restaurant or retail developer to expect strong local demand. *

The Town's designation of a full-service restaurant as the preferred reuse is based not only on the community survey but also on favorable market conditions, including: low competition (there are no full-service restaurants in Topsfield, only two percent of businesses in Topsfield are in food service, and more than half of the survey respondents travel more than 20 minutes to dine out); strong potential customer base (besides high disposable income, nearly 70% of survey respondents dine out four or more times a month); a supportive local government; and an ample number of available liquor licenses. (See Appendix G for full results of Community Survey.)

D. Development Constraints

As with any property, the reuse of 10 School Avenue must comply with the Town's zoning requirements, as well as any other applicable local or state regulations. From a zoning perspective, the existing use is far below the maximum density limits. The B-V District, within which the subject property lies, allows a building area up to 40% of the lot area, while requiring at least 40% of the lot to be open space (defined in the Bylaw as "the space on a lot unoccupied by buildings, swimming pools, and terraced areas, not devoted to streets, driveways, or off-street parking or load space."). The existing building area is just eight percent of the lot area, or only 20% of the maximum allowance. The provided open space constitutes 63% of the lot, or 57% more than the required minimum. Thus, the existing building could be significantly enlarged while easily maintaining compliance with the zoning density requirements, especially given the ability to apply the 44 public on-street parking spaces located within 500 feet of the subject property toward the parking requirement. (one off-street space for every five seats in a full-service restaurant, or one space for every 250 sq. ft., excluding storage, for a retail use), as well as the possibility of significantly expanding the land area of the existing lot by merging it with an adjacent one-acre vacant lot (see E. below).

In the case of the subject property, the more limiting condition for redevelopment appears to be wastewater disposal. The percolation tests on the property suggest that the site can accommodate a Title Five septic system, but it may not support the level of development allowed by zoning. Thus, we encourage interested parties to examine the site's development potential of the site in this regard.

*To demonstrate the citizenry's strong support for a food and beverage reuse of the former fire station, the Town held two “block parties” on the site this past spring with beer, wine and made to order food. As evidenced by the photo on page 3, the events were very well-attended, and the enthusiasm for a long-term food and beverage reuse of the subject property was palpable.

E. Opportunity to Expand Development Potential of Subject Property

Should potential bidders determine that their planned development is more feasible with additional septic capacity and/or additional off-street parking, the Town has provided an opportunity for these objectives to be met by acquiring 35R Main Street (Parcel 41 on Assessor's Map 133), the adjacent one-acre, vacant lot (also located within the B-V District), and merging it with the Subject Property. On June 26, 2023, pursuant to the May 2, 2023 Annual Town Meeting's approval of Article 29, the Topsfield Select Board entered into a three-year option with the owner of 35R Main Street (see Appendix L) to purchase the property for \$175,000. The exercise of the option would likely occur by the Select Board transferring it to the successful bidder as part of the Subject Property's disposition. Soil tests conducted on 35R Main Street suggest that its soils are not only capable of supporting a Title Five septic system, but from a percolation perspective are superior to the soils on the Subject Property. (See Appendix M)

F. Lot Dimensional Requirements

The Bylaw establishes the following dimensional requirements for lots within the B-V Zone:

Dimensional Requirements -- Business District Village (B-V)		
Item	Required	10 School Avenue (Lot 60A)
Minimum lot area	20,000 square feet	57,639 square feet
Minimum lot frontage	100 feet	130.3 feet
Minimum lot depth	100 feet	261.4 feet
Front yard setback	40 feet	30.1 feet
Side yard setback	30 feet*	51.4 feet
Rear yard setback	30 feet*	78 +/- feet
Maximum height	35 feet	<35 feet
Maximum stories	2 ^{1/2}	1 ^{1/2}
Maximum building area %	40%	7.9%
Minimum open space %	30%	63%

*Except when adjacent to residential use or district, in which case the yard setback will increase to 50 feet.

As shown in the above table, the dimensions of the subject property exceed the minimum requirements or are below the maximum allowance in each instance, except for the front yard setback, which is about ten feet less than the stated requirement. However, Section 4.07.G of the zoning bylaw allows front yard setbacks to be reduced to the average of other lots on a street. Based on the existing setbacks on School Avenue, as well as precedent in applying this provision, the Town expects that the Topsfield Zoning Board of Appeals (ZBA) will find the subject property's existing front yard setback to be compliant with the Bylaw.

G. Site and Building Design Guidelines

One of the Town’s objectives for the development of the subject property is that the highest quality of physical planning and design be applied in all aspects of the project. To help proposers satisfy this objective, the following guidelines are offered:

- Site and architectural designs should strive to complement both the building and the development patterns found in the surrounding neighborhood.
- Architectural designs should, to the extent feasible, promote the use of renewable energy sources and alternative building materials to the extent feasible.
- Proposals are encouraged, in both the design and concept, to reflect in some manner the history of the subject property as the former location of the Town's fire station.

H. Financial Guidelines/Considerations

Proposers for the reuse of the subject property are asked to address or consider the following financial guidelines when preparing their proposals:

- Market Feasibility: Reuse proposal should demonstrate sufficient market demand to make project feasible.
- Economic Viability: Reuse proposal should address why project has capacity for long-term economic viability.
- Financing Feasibility: Private investment in the property, including both private debt and private equity financing, are a requirement of any proposal. Proposers should demonstrate their ability to finance the project, both the physical elements of the project as well as the working capital needed to make reuse of the subject property successful.
- Transaction Terms: The Town will entertain proposals that seek to acquire the fee of the subject property. No minimum acceptable price has been established for the property, but the closer the offered price is to the subject property's established assessed value, the more advantageous the fee proposal will be deemed by the Town.
- Ownership Identification and Structure: Proposals shall describe the structure of the ownership entity anticipated to hold ownership interest in the property. Provided information should include: names, contact information and business affiliations of all principals; disclosure of all parties who may have a direct or indirect financial interest in the project (using the disclosure form provided in Appendix H); whether the ownership entity is expected to be an individual, a partnership, a corporation (profit or non-profit) or a joint venture; and the jurisdiction under whose laws the ownership entity is or would be organized. The Town prefers to enter into an agreement with a single entity.

I. Disclosures and Limiting Conditions

This RFP is subject to the process outlined herein. While all provided information was gathered from sources deemed to be reliable, the Town makes no representation or warranty as to its accuracy or completeness. Thus, prospective proposers are encouraged to undertake their own review and reach their own conclusions concerning the property's physical condition, environmental concerns, use potential, and any other development and ownership considerations.

If applicable, proponents shall provide information regarding any legal or administrative actions -- past, pending, or threatened -- which could relate to the conduct of the proponent’s (or its principals' or affiliates') business and/or their compliance with laws.

Disclosure is required of any past or present affiliations of the proponent, proponent team members or proponent employees with the Town of Topsfield. Any disclosures should include the nature and duration of the affiliation, including a disclosure of existing or past public contracts in Topsfield, the contracting parties, scope of the contract, and period of performance.

In its selection of a proposer, the Town reserves the right to: negotiate with any and all proponents, including single proposers or development teams; waive portions of the RFP not required by law; waive any informalities in the proposals; or reject any or all proposals if it determines that doing so serves the best interests of the Town. The Town may also, with the consent of the authorized representative of the lead proponent of a team, negotiate with one or more of the team members.

The property and building are presented in “as-is condition,” except that any vehicles or equipment stored on the property will be removed by the Town prior to the execution of a purchase and sale agreement with the selected proposer.

III. Submittal Requirements

Proposals submitted pursuant to this RFP should meet the submittal requirements described below. Project proponents may provide additional information within their submitted narrative or as appendices if they believe it will strengthen their submittals and is relevant to the RFP's selection process.

A. Transmittal Letter

A one-page letter of transmittal signed by the principal(s) of the proposer which describes the proponent’s interest in the property and intentions for its future use. The letter should be addressed to Kevin Harutunian, Town Administrator.

B. Development Team

A description of the development team, the individuals to be involved in the reuse of the subject property, and their relative experience. It shall include the following:

Contact Information: Name, email address, mailing address and phone number of the proposer(s) and any person authorized to act on their behalf. (If the proposer is not an individual doing business under his/her name, a description of the form and status of the organization acting as the proponent shall be provided.)

Similar Projects: Summary of the development team’s experience with similar projects, and its ability to pursue and successfully complete permits, financing, marketing, design, and construction.

Organizational Structure: Description of the organizational structure of the development team which identifies the principals and any partners or others expected to participate in the project.

C. Proposal Narrative and Project Description

Narrative that describes the proposed project, how it meets the project goal and objectives listed in Section I.B., and the guidelines set forth in Section II. It shall include an overview of the proposal and the market niche the project intends to serve. The project overview should include a description of the proposed building use and any preliminary ideas about building alterations and site layout, as well as a description of the target market (e.g., tenants and other end users) and the strategy for marketing to these groups.

In addition to the above components, the proposal narrative may contain any other information which the proponent deems is necessary for the Town to fully understand the proposed use.

D. Conceptual Plans

A conceptual plan of the site and building(s) to illustrate the proponents' thinking on how subject property should be provided, along with a rendering of the proposed design.

E. Implementation Plan and Project Timeline

A description on how the proposal will be implemented, including but not limited to:

- Preliminary development schedule, including key milestones, required approvals and projected completion/occupancy time frames
- Summary of required land use, environmental, operational and other governmental or regulatory approvals, including zoning, development, and environmental permits
- Description of work in each phase of the proposal, as outlined in Section V.C. of this RFP

F. Market and Financial Feasibility

A description of how the proposal will achieve market and financial feasibility. It should include: estimated development costs; projected operating budget; method of financing; and sufficient information to demonstrate the proponent’s ability to finance the project, including a letter of intent from a lending institution.

G. References

Contact information for at least four individuals who have worked directly with the proposer on similar projects to the one proposed in response to this RFP.

H. Other Required Information

In addition to the above information, respondents shall complete and submit the following forms, which are included as Appendix J to this RFP:

- Non-Collusion Certificate
- Tax Compliance Certificate
- Certificate of Corporate Authority (if applicable)

I. Form of Submittal

Proposals in response to this RFP shall be submitted in an envelope that is marked on the outside as follows:

**10 School Avenue Proposal
Do Not Open Until December 7, 2023 at 2 p.m.**

The envelope shall contain one original and two hard copies of the proposal, as well as a thumb drive that contains a PDF of the proposal. Thumb drives will be returned to proposers upon request.

J. Submittal Deadline

The deadline for submitting proposals in response to this RFP is **2 pm on Thursday, December 7, 2023**. Submittals may be mailed or hand delivered to the following address:

**Topsfield Town Hall, First Floor
8 West Common Street
Topsfield, MA 01983
Attention: Kevin Harutunian, Town Administrator**

IV. Proposal Review and Selection Process

A. General

The selection of the preferred developer will be done in accordance with the M.G.L. Chapter 30B Request for Proposals (RFP) procurement process for the disposition of real property. The Town will consider not just the amount of the bid but also the proponent's qualifications and the responsiveness of the proposal to the guidelines, objectives, and requirements set forth in the RFP. Thus, the Town is not obligated to select the proposal with the highest bid price if another proposal with a lower bid amount better satisfies the selection criteria and other described requirements.

The proposals will be reviewed by a Selection Committee comprised of the following: Town Administrator; Planning Board Chair; member of Town's Economic and Community Development Committee (ECDC); member of the Topsfield Community Partnership (TCP); Town Purchasing Director; consultant assisting Town with the RFP process; and one at-large member of the community. In conducting its review, the Selection Committee will use the comparative criteria described in B. below. In addition to reviewing the submitted proposals, the Selection Committee may also conduct interviews of the highest ranked submittals.

B. Proposal Evaluation Criteria

The criteria to be used by the Town in evaluating the proposals are described below. The criteria emphasize the importance of the proponents’ qualifications, ability to complete the project, and the fulfillment of the Town’s stated goal, objectives, and guidelines.

1. Minimum Criteria: Each proposal must fulfill the following criteria:

- Provides information requested in the RFP, including required references
- Demonstrates prior development experience as described in the RFP

Proposals that fail to meet the Minimum Criteria will be removed from further consideration.

2. Comparative Criteria: Each proposal that meets the Minimum Criteria will be reviewed by the Selection Committee using the comparative criteria described below.

The comparative criteria are as follows:

- 1) Amount of price offer
- 2) Project's financial viability, including financing and development/management plans
- 3) Strength of references
- 4) Quality of proposed site and building design concepts, including approach to accessibility
- 5) Protection and enhancement of surrounding environment and neighborhood
- 6) Amount of economic benefit for the Town to be derived from the proposed reuse
- 7) Preferred use status

3. Evaluation Ratings: Ratings of *Highly Advantageous*, *Advantageous*, *Not Advantageous*, or *Unacceptable* will be given to each proposal based on its responsiveness to the comparative criteria described above. The ratings are as follows:

RATING	DEFINITION
Highly Advantageous	1) price offer approximates fair market value; 2) financing, property development & management plans all first-rate; 3) references are outstanding; 4) site and building design concepts are excellent and dedicated pedestrian access is provided; 5) enhances property and is sensitive to surrounding uses; 6) generates substantial annual tax revenue, job creation and foot traffic; 7) proposal is strong and for one of the two preferred uses.
Advantageous	1) price offer is at least 50% of fair market value; 2) financial viability is demonstrated; 3) references are good; 4) proposed site and building design concepts are good and pedestrian access is accommodated; 5) minimum impact on surrounding uses; 6) generates significant annual tax revenue, job creation, and foot traffic; 7) proposal is strong and is for one of the allowed uses.
Not Advantageous	1) price offer is significantly less than 50% of fair market value; 2) financial viability is questionable; 3) references are fair; 4) design concepts below average and accessibility insufficient; 5) sensitivity to surrounding environment only fair; 6) provides minimum economic benefit; 7) proposal is only fair and is for an uninspiring allowable use.
Unacceptable	1) price offer is less than 10% of fair market value; 2) does not demonstrate financial viability; 3) references are poor; 4) design concepts are lacking and no accessibility provided; 5) design concepts are not sensitive to neighborhood and surrounding environment; 6) provides no clear economic benefit; 7) proposal is poor and has a weak allowable use.

C. Rule for Award

The most advantageous proposal from a responsible and responsive respondent submitted in response to this RFP, taking into consideration price and all other evaluation criteria set forth herein, will be selected.

D. Selection Process Schedule

Step One: Threshold Review

Proposals submitted by the submittal deadline will be screened by the Town Administrator and RFP process planning consultant for adherence to the Town’s submittal requirements and to the Minimum Criteria described in B. above. Proposals that are determined to have met these requirements will be submitted to the Selection Committee for the next step of the review process.

Step Two: Comparative Review

The Committee will review the remaining proposals using the comparative criteria outlined in IV.B.

Step Three: Interviews and Final Ranking

Based on its review of the proposals, the Selection Committee may choose to interview one or more of the respondents. Following the interview process the Selection Committee will undertake a final ranking of proposals, and then forward this information to the Select Board with a recommendation. The Committee will base its recommendation regarding a final designated developer upon the information provided in the RFP, any interview, references and additional information requested by the Committee, and on any other information from publicly available and verifiable sources.

Step Four: Designation of Preferred Developer

The final designation of a developer shall be made by the Select Board, which will rely heavily upon the recommendation of the Selection Committee when making its decision.

V. Performance Requirements

A. Execution of Agreement with Town

After the Town has selected the developer for the subject property, the two parties will enter into an agreement that will delineate the terms and conditions of the property disposition. At the time of the agreement's execution, the developer will be required to make a \$10,000 non-refundable deposit to secure the property. A draft copy of the Purchase & Sales Agreement is provided in Appendix K.

B. Permitting Approvals

The selected developer is responsible for obtaining the necessary approvals to proceed to the reuse/development of the subject property. To the extent feasible and appropriate, however, the Town will work with the developer to facilitate his/her obtaining local approvals in a timely manner.

This will include a meeting between the selected developer and the Town's Project Review Team, comprised of the Town Administrator, Conservation Agent, Fire Chief, Police Chief, DPW Director, Health Inspector, and Building Inspector. The purpose of the meeting will be for staff to identify the various steps in the approval process and to answer any questions the developer has about that process. Because this is an early stage review, the developer need only submit a sketch plan of the proposed reuse to initiate the meeting. Input gathered at the meeting will help the developer make informed decisions about the permitting process.

When the first RFP was issued both of the stated preferred reuses of the property (i.e., full-service restaurant or full-service restaurant with residential units on upper floor) required a special permit from the ZBA, and the two additional preferred uses identified in this revised RFP (brew pub or taproom selling product brewed on-site, with or without a residential component) were not allowed by the zoning bylaw. Topsfield's Annual Town Meeting on May 2, 2023, however, amended the bylaw by removing the special permit requirement for Full-Service Restaurants in the B-V District, and allowing a Tavern, Pub Brewery and Beverage Manufacturing uses by special permit in the B-V District. The zoning bylaw continues to allow the permitted retail uses by right, with one exception ("specialty retail foods," which requires a ZBA special permit). The B-V District, within which the subject property is located, requires site plan review from the Planning Board for all non-residential uses, and a special permit for mixed commercial/residential uses.

Information about the special permit process is provided on pages 53-56 of the Bylaw. Any questions about the process should be directed to Lynne Bermudez, the Town's ZBA Coordinator, at lbermudez@topsfield-ma.gov or 617-797-2135.

Regardless of the proposed use, the developer will need, as previously noted, to obtain approval from the Conservation Commission ("Commission"). The first step in that process is to delineate the wetland boundaries on the property and submit the delineation to the Commission for approval, along with an Abbreviated Notice of Resource Area Delineation form (ANRAD). The second step is the submittal of a Notice of Intent (NOI) application to the Commission, after the developer has submitted an application for any other required local approval. Potential respondents to this RFP who would like more information about the Commission's approval process are encouraged to talk to the Town's Conservation Agent, Heidi Gaffney. She may be reached at 978-887-1510 or at hgaffney@topsfield-ma.gov. Her office hours are Mondays and Wednesdays, 9 am to noon.

Once local approvals have been obtained, the developer may apply for a building permit from the Town's Inspectional Services Department.

C. Timeline After Developer Selection

As indicated in Section I.G. of this RFP, the Town intends to conditionally select the developer of the subject property by March 28, 2024, and execute a p & s agreement with the selected developer by May 10, 2024. Upon execution, the next phases of the process, as well as the completion timeline, shall be as follows:

Phase 1: This phase shall include pre-construction assessment of the existing condition of the Premises, completion of all architectural and engineering designs and/or renderings concerning the adaptive reuse of the Premises, as described in the Buyer’s proposal and as agreed upon by the Town, obtaining approval of all local permits (including those required by the Conservation Commission and if applicable, the ZBA). and application for building permits for project construction. This phase shall be completed within nine months of the execution of the Purchase & Sale Agreement.

Phase 2: This phase shall include all demolition, construction, electrical, plumbing, and other structural work necessary to render the Premises suitable for the adaptive reuse of the Premises, as described in the Buyer’s proposal and as agreed upon by the Town. This phase may begin upon the completion of Phase 1 and it shall be completed within sixteen months of Phase 1's completion.

Phase 3: This phase shall include all landscaping, equipment installation, interior decoration, painting, and any other finishing work necessary to render the Premises suitable for the adaptive reuse of the Premises, as described in the Buyer’s proposal and as agreed upon by the Town. This shall be completed within six months from the completion of Phase 2. Phase 3 may proceed parallel to Phase 2 as permitted by law and consistent with the permit(s)s issued by the Town Building Inspector and any other local permitting authorities.

Further information about the completion requirements for the above phases is provided in condition 5 of the P & S agreement in Appendix J.

The timeline for the development and completion of the reuse of the subject property, as described above, is summarized in the table below.

Milestone	Complete By
Conditional Selection of Developer	March 1, 2024
Execution of P & S Agreement w/ Town	May 10, 2024
Secure All Required Permits/Approvals (Phase 1)	February 17, 2025
Commence Construction (Phase 2)	Within 6 months of completion of phase 1, but no later than August, 2025
Complete Construction (Phase 3)	Within 16 months of completion of phase 2, but no later December, 2026
Initiate Reuse	Within 6 months of completion of phase 3, but no later than August, 2027

VI. Appendices

Appendix A: Soil Map of 10 School Avenue and Surrounding Parcels

Appendix B: School Avenue Definitive Subdivision Plan

Appendix C: Soil Suitability Assessment for On-Site Sewage Disposal

Appendix D: Limited Subsurface Investigation Report

Appendix E: Class B-1 Response Action Outcome Statement

Appendix F: By-Right and Conditional Uses Allowed by Zoning

<https://www.topsfield-ma.gov/zoning-board-appeals/files/article-iii-use-regulations-4>

Appendix G: Town Profile

Appendix H: Spring 2022 Community Survey

Appendix I: Disclosure Statement for Transaction with a Public Agency Concerning Real Property

Appendix J: Required Certificates

https://www.seekonk-ma.gov/sites/g/files/vyhlif1191/f/pages/adw.rfp_procurement_certification_forms.pdf

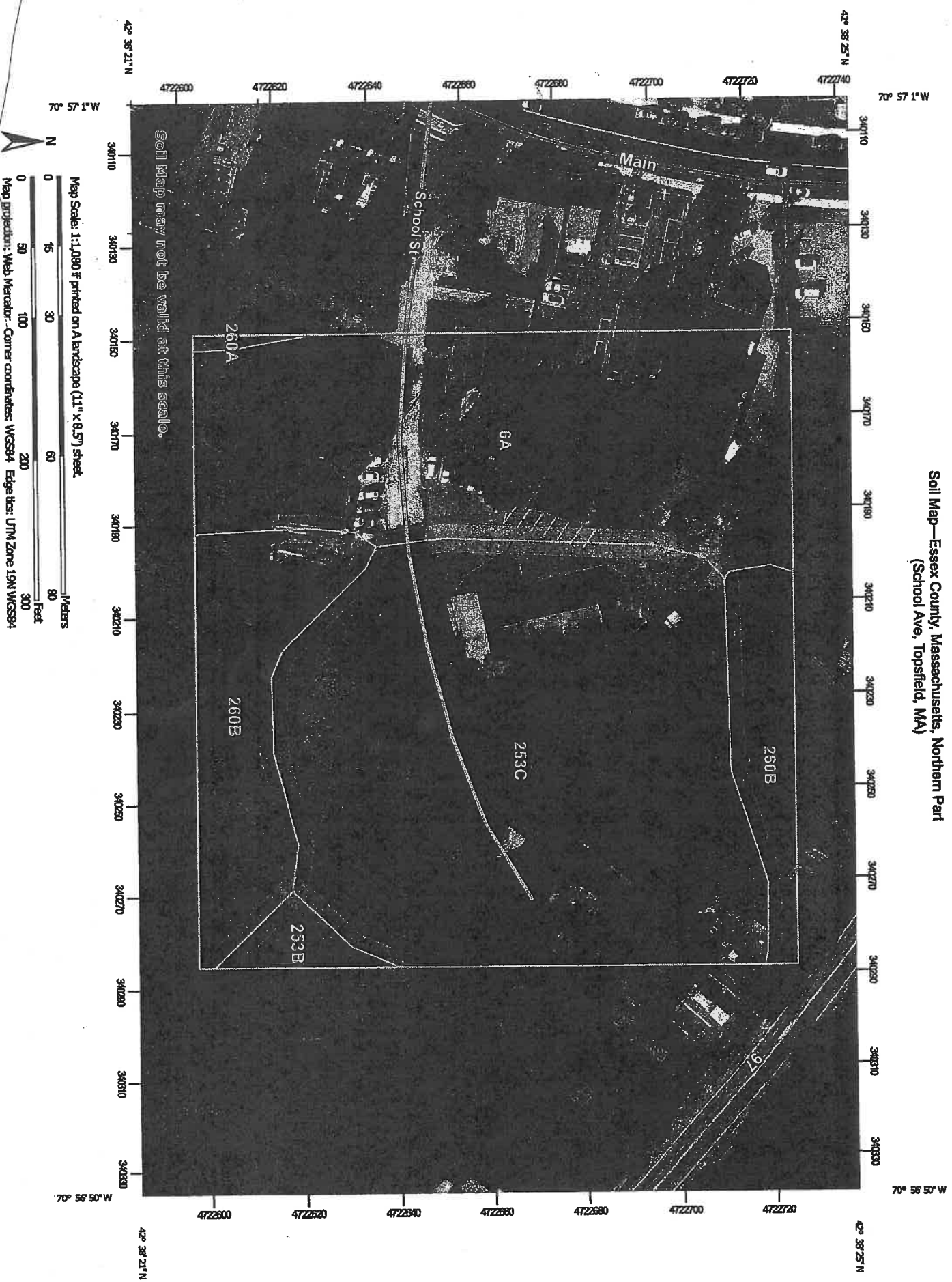
Appendix K: Draft Purchase & Sale Agreement

Appendix L: Option to Purchase 35R Main Parcel

Appendix M: Soil Suitability Assessment for On-Site Sewage Disposal -- 35R Main Parcel

Appendix N: Location & Site Map of Subject Property

Soil Map—Essex County, Massachusetts, Northern Part
(School Ave, Topsfield, MA)



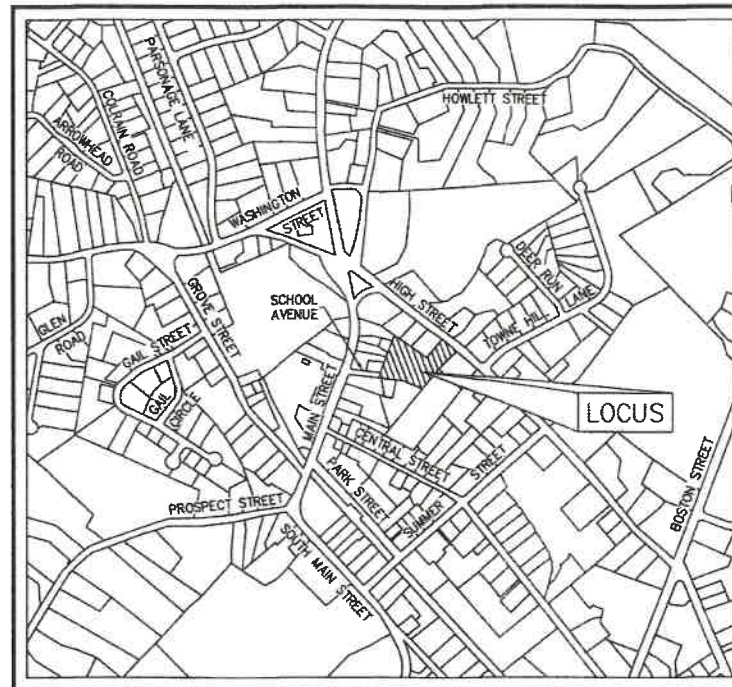
Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
6A	Scarboro mucky fine sandy loam, 0 to 3 percent slopes	1.4	33.0%
253B	Hinckley loamy sand, 3 to 8 percent slopes	0.1	1.7%
253C	Hinckley loamy sand, 8 to 15 percent slopes	2.1	48.3%
260A	Sudbury fine sandy loam, 0 to 3 percent slopes	0.0	0.3%
260B	Sudbury fine sandy loam, 3 to 8 percent slopes	0.7	16.7%
Totals for Area of Interest		4.3	100.0%

DEFINITIVE SUBDIVISION PLAN

27 High Street
(A.K.A. 10 School Avenue)
Topsfield, Massachusetts 01983

FOR TOWN OF TOPSFIELD



LOCUS MAP

SCALE 1 INCH = 600 FEET
0 300 600 1200 2400

RECORD OWNER:

TOWN OF TOPSFIELD
8 WEST COMMON STREET
TOPSFIELD, MA

APPLICANT:

TOWN OF TOPSFIELD
8 WEST COMMON STREET
TOPSFIELD, MA

CIVIL ENGINEER/LAND SURVEYOR:

HANCOCK ASSOCIATES
185 CENTRE STREET
DANVERS, MA 01923
(978) 777-3050

SHEET INDEX

SHEET 1	DF-1	TITLE SHEET
SHEET 2	DF-2	EXISTING CONDITIONS
SHEET 3	DF-3	DEFINITIVE PLAN OF LAND
SHEET 4	DF-4	PLAN AND PROFILE

ZONING TABULATION

CURRENT ZONING MAP: JANUARY 1, 2018			
ASSESSOR INFORMATION: MAP 41, LOT 60			
ZONING CLASSIFICATION: CENTRAL RESIDENTIAL (CR)			
TOTAL LOT AREA: 93,035± S.F.			
DIMENSIONAL REQUIREMENTS - CENTRAL RESIDENTIAL (CR) DISTRICT			
ITEM (BYLAW REFERENCE)	REQUIRED	LOT 60B	LOT 60A
MINIMUM LOT AREA (ART. IV)	20,000 S.F.	57,639 S.F.	32,430 S.F.
MINIMUM LOT FRONTAGE (ART. IV)	100 FEET	130.3 FEET	134.63 FEET
MINIMUM LOT DEPTH (ART. IV)	120 FEET	261.4 FEET	251.7 FEET
MINIMUM FRONT YARD (ART. IV)	20 FEET	30.1 FEET	43.1 FEET
MINIMUM SIDE YARD (ART. IV)	10 FEET	51.4 FEET	16.7 FEET
MINIMUM REAR YARD (ART. IV)	30 FEET	40.1 FEET	61.8 FEET
MAXIMUM HEIGHT (ART. IV)	35 FEET	<35 FEET	<35 FEET
MAXIMUM STORES (ART. IV)	2 1/2	1 1/2	2 1/2
MAXIMUM BUILDING AREA % (ART. IV)	40	7.9	13.6
MINIMUM OPEN SPACE % (ART. IV)	40	63	40

I CERTIFY THAT 20 DAYS HAVE ELAPSED SINCE
PLANNING BOARD APPROVAL AND THAT NO
APPEAL HAS BEEN FILED IN THIS OFFICE.

TOPSFIELD TOWN CLERK

APPROVAL UNDER THE SUBDIVISION
CONTROL LAW REQUIRED.

TOPSFIELD PLANNING BOARD

DATE: _____

I CERTIFY THAT THIS PLAN CONFORMS TO THE
RULES AND REGULATIONS OF THE REGISTERS
OF DEEDS.

DATE: _____ PROFESSIONAL LAND SURVEYOR
FOR REGISTRY USE

#27 HIGH
STREET

(A.K.A. #10 School Ave.)
Topsfield, Massachusetts 01983

ASSESSOR'S

MAP LOT
41 60

PREPARED FOR:

TOWN
OF
TOPSFIELD

8 West Common Street
Topsfield, Massachusetts 01983

HANCOCK
ASSOCIATES

Civil Engineers

Land Surveyors

Wetland Scientists

185 CENTRE STREET, DANVERS, MA 01923
VOICE (978) 777-3050, FAX (978) 774-7816
WWW.HANCOCKASSOCIATES.COM



NO.	BY	APP	DATE	ISSUE/REVISION DESCRIPTION
1	CEW		3/11/21	DESIGN BY: CEW
2	AS SHOWN			DRAWN BY: DJR
3	APPROVED BY: CEW			CHECK BY: JP

TITLE
SHEET

PLAT DATE: Mar 11, 2021 1:40 pm
PLAT TO: plat_and_vldm 20 Projects\31053-Town of Topsfield\reg\DWG

DWG: 24553DF.dwg
LAYOUT: 75
SHEET: 1 OF 4

DF-1

PROJECT NO.: 24553

WAIVER REQUEST LIST:

- SECTION 4.3.2.e: "A NONREFUNDABLE FEE IN ACCORDANCE WITH THE FEE SCHEDULE SHALL BE PAYABLE TO THE TOWN OF TOPSFIELD AT THE TIME OF SUBMISSION..."
PROPOSED: A WAIVER TO THE \$4,000 FEE (PER FEE SCHEDULE) IS REQUESTED DUE TO THE TOWN'S OWNERSHIP OF THE PROPERTY AND INVOLVEMENT IN THE DEFINITIVE SUBDIVISION PROCESS.
- SECTION 4.3.2.g: "ONE COPY OF THE TEST PIT LOGS TO THE PLANNING BOARD, THE REVIEWING ENGINEER AND THE BOARD OF HEALTH."
PROPOSED: NO WORK PROPOSED, THEREFORE TEST PIT LOGS ARE NOT NECESSARY.
- SECTION 4.3.2.h: "ONE COPY OF THE STORMWATER MANAGEMENT REPORTS TO THE PLANNING BOARD, HIGHWAY DEPARTMENT, AND REVIEWING ENGINEER."
PROPOSED: NO WORK PROPOSED, THEREFORE A STORMWATER REPORT IS NOT NECESSARY.
- SECTION 4.3.2.i: "IN CONNECTION WITH ANY DEFINITIVE PLAN, THE APPLICANT SHALL ALSO SUBMIT AN ENVIRONMENTAL IMPACT STATEMENT (THE "STATEMENT") WHICH SHALL... CLEARLY SHOW THE RELATION OF THE PROPOSED PROJECT TO THE TOTAL ENVIRONMENT OF THE TOWN AND ITS INHABITANTS."
PROPOSED: NO WORK PROPOSED, THEREFORE AN ENVIRONMENTAL IMPACT STATEMENT IS NOT NECESSARY.
- SECTION 4.4.3: "SOIL SURVEYS TO ESTABLISH THE SUITABILITY OF THE LAND FOR THE PROPOSED STORM AND SANITARY SEWERAGE INSTALLATIONS SHALL BE SUBMITTED."
PROPOSED: NO WORK PROPOSED, THEREFORE SOIL SURVEYS ARE NOT NECESSARY.
- SECTION 5.1.2: "CROSS SECTIONS SHALL BE IN ACCORDANCE WITH THE STANDARDS AS SHOWN ON PLATES 1 AND 2."
PROPOSED: ALLOW EXISTING ROAD CONFIGURATION ON SCHOOL AVENUE AND 27 HIGH STREET TO SERVE SUBDIVISION.
- SECTION 5.1.3: ALIGNMENT, GRADE, DEAD END, AND INTERSECTIONS SHALL BE IN ACCORDANCE WITH THE STANDARDS IN TABLE 1 (SUBDIVISION MINOR STREET):
 - REQUIRED: RIGHT-OF-WAY = 50 FEET; PROPOSED = 30± FEET
 - REQUIRED: PAVEMENT = 26 FEET; PROPOSED = 18.5± TO 30.35±
 - REQUIRED: MAXIMUM GRADE = 8.0%; PROPOSED = 8.37%
 - REQUIRED: MINIMUM TURNAROUND RADIUS AT ROADWAY EDGE = 55 FEET; PROPOSED = NO TURNAROUND ON SCHOOL AVE.
 - REQUIRED: MINIMUM TURNAROUND RADIUS AT PROPERTY LINE = 65 FEET; PROPOSED = NO TURNAROUND ON SCHOOL AVE.
 - FOR THE DEPARTMENT ACCESS: AN ACCESS ALSEMENT FROM LOT 60A WILL BE UTILIZED.
 - REQUIRED: MINIMUM SIGHT DISTANCE = 200 FEET; PROPOSED = EXISTING SIGHT DISTANCE TO SERVE SUBDIVISION.
- SECTION 5.1.5: SITE AND EARTHWORK
 - SECTION 5.1.5.a (MASSDOT SECTION 100)
 - SECTION 5.1.5.c (GRADING)
 - SECTION 5.1.5.d (CLEARING)
 - SECTION 5.1.5.e (TOPSOIL)
 - SECTION 5.1.5.h (SUBGRADE)PROPOSED: NO WORK PROPOSED, ALLOW EXISTING GRADES AND SUBGRADE TO SERVE SUBDIVISION.
- SECTION 5.1.6 - PAVEMENT STRUCTURE
 - SECTION 5.1.6.a (MASSDOT SECTION 400)
 - SECTION 5.1.6.b (GRAVEL BASE COURSE)
 - SECTION 5.1.6.c (CRUSHED STONE BASE)
 - SECTION 5.1.6.d (SHOULDER COURSE)PROPOSED: ALLOW EXISTING PAVEMENT STRUCTURE ON SCHOOL AVENUE AND 27 HIGH STREET TO SERVE SUBDIVISION.
- SECTION 5.1.7: "DRIVEWAY APRONS SHALL BE PAVED, PROVIDED WITH A BITUMINOUS CONCRETE BERM AND SO GRADED TO PROVIDE POSITIVE DRAINAGE TOWARDS STREETS BY THE DEVELOPER AND/OR OWNER FROM THE EDGE OF PUBLIC ROADWAY TO THE PROPERTY LINE."
PROPOSED: ALLOW EXISTING GRADING ON DRIVEWAYS OF ADJUTING LOTS TO REMAIN ALONG WITH EXISTING DRAINAGE PATTERNS TO SERVE THE SUBDIVISION.
- SECTION 5.2: "SHOULDERS SHALL NOT BE ALLOWED IN PLACE OF SIDEWALKS, CURBS, AND GRASS STRIPS SHOWN ON PLATES 1 AND 2 UNLESS PERMISSION IS SPECIFICALLY GRANTED BY THE BOARD. WHEN PERMITTED, THEY SHALL BE CONSTRUCTED OF GRAVEL, IN ACCORDANCE WITH SECTION 5.1.5.b, COVERED WITH 6 INCHES OF LOAM TO THE REQUIRED WIDTH. THEY SHALL BE BROUGHT TO A FINISHED GRADE FLUSH WITH THAT OF THE ADJACENT PAVEMENT OR CURBING."
PROPOSED: AS IN WAIVER REQUEST TO 5.1.2, ALLOW EXISTING ROAD CONFIGURATION ON SCHOOL AVENUE AND 27 HIGH STREET TO SERVE SUBDIVISION.
- SECTION 5.3: "BITUMINOUS CONCRETE BERM SHALL CONFORM TO THE MATERIALS AND CONSTRUCTION METHODS AS SPECIFIED IN SECTION 470 OF THE STANDARD SPECIFICATIONS AND IS INDICATED ON PLATES 1 AND 2. IT SHALL BE INSTALLED ALONG BOTH EDGES OF ALL ROADWAYS IN TYPE II SUBDIVISIONS... THE BOARD MAY REQUIRE THAT IT ALSO BE INSTALLED ALONG ONE OR BOTH SIDES OF ALL ROADWAYS IN TYPE I SUBDIVISIONS."
PROPOSED: NO WORK PROPOSED, ALLOW EXISTING DRAINAGE PATTERNS AND PAVEMENT TO SERVE SUBDIVISION.
- SECTION 5.4 - SIDEWALKS
 - SECTION 5.4.1: "BITUMINOUS CONCRETE SIDEWALKS SHALL CONFORM TO THE MATERIAL AND CONSTRUCTION METHODS AS SPECIFIED IN SECTION 701 OF THE STANDARD SPECIFICATIONS AND AS INDICATED ON PLATES 1 AND 2."
 - SECTION 5.4.2: "SIDEWALKS MAY BE CONSTRUCTED ONLY ON ONE SIDE OF THE ROADWAY AT THE PROPERTY LINE ON MINOR STREETS AS INDICATED ON PLATE 1 UNLESS, IN THE OPINION OF THE BOARD, THEY ARE NOT WARRANTED."
 - SECTION 5.4.3: (LIFT DEPTHS, MATERIAL REQUIREMENTS AND DEPTHS)PROPOSED: NO SIDEWALK PROPOSED DUE TO RESTRICTIVE WIDTH OF RIGHT-OF-WAY ALONG STREAM CROSSING AND ADJUTING RESIDENTIAL LOTS.
- SECTION 5.5 - GRASS STRIPS
 - SECTION 5.5.1 (LOCATION BASED ON PLATES 1 AND 2)
 - SECTION 5.5.2 (FINISHED GRADE)
 - SECTION 5.5.3 (SHADE TREES)
 - SECTION 5.5.4 (LOAM AND SEED)PROPOSED: NO SIDEWALK PROPOSED, THEREFORE NO GRASS STRIP IS PROPOSED.
- SECTION 5.9: "UNDERGROUND DISTRIBUTION SYSTEMS SHALL BE PROVIDED FOR ALL UTILITY SYSTEMS BOTH PUBLIC AND PRIVATE, INCLUDING WATER, SANITARY SEWERAGE, DRAINAGE, ELECTRICAL, TELEPHONE, TELEVISION, AND ANY SIMILAR SUCH SYSTEMS."
PROPOSED: ALLOW EXISTING UNDERGROUND UTILITY CONFIGURATION AND OVERHEAD WIRES TO SERVE SUBDIVISION.
- SECTION 5.12.1.b: "ALL UTILITY LINES SHALL BE INSTALLED IN THE LOCATION INDICATED AND WITH THE MINIMUM COVER AS SHOWN ON PLATES 1 AND 2."
PROPOSED: ALLOW EXISTING UTILITY CONFIGURATION TO SERVE SUBDIVISION.
- SECTION 5.12.1.f: "ALL LOT CONNECTIONS SHALL BE INSTALLED TO THE RIGHT-OF-WAY LINE, MARKED OR SURVEYED SO AS TO BE EASILY LOCATED IN THE FUTURE."
PROPOSED: ALLOW EXISTING UTILITY CONFIGURATION TO SERVE SUBDIVISION.
- SECTION 5.12.2 - WATER
 - SECTION 5.12.2.a: "THE APPLICANT SHALL CONNECT TO THE PUBLIC WATER SYSTEM..."
 - SECTION 5.12.2.c: "WATER PIPE DIAMETER SHALL NOT BE LESS THAN 8 INCHES..."
 - SECTION 5.12.2.d: "HYDRANTS SHALL BE LOCATED AT EACH STREET INTERSECTION AND NOT MORE THAN 500 FEET APART. EACH HYDRANT SHALL BE SERVED DIRECTLY FROM THE WATER MAIN."PROPOSED: ALLOW EXISTING HYDRANT AT EXISTING 1 1/2 STORY BRICK BUILDING TO SERVE SUBDIVISION. ALLOW EXISTING 8" WATER LINE SERVING THE 1 1/2 STORY BRICK BUILDING TO SERVE SUBDIVISION.
- SECTION 5.12.3 - DRAINAGE
 - SECTION 5.12.3.a: "THE CONSTRUCTION OF THE DRAINAGE SYSTEM, INCLUDING METHODS OF CONSTRUCTION AND QUALITY OF MATERIALS USED, SHALL BE IN CONFORMITY WITH THE DEFINITIVE PLAN AND SECTION 200 OF THE STANDARD SPECIFICATIONS."
 - SECTION 5.12.3.b (DRAIN PIPE CAPACITY AND RUNOFF CALCULATIONS)
 - SECTION 5.12.3.c (FLOOD IMPACT ANALYSIS)
 - SECTION 5.12.3.d: "THE DRAINAGE SYSTEM SHALL NOT WRONGFULLY OVERBURDEN CONTINUOUS EXISTING DRAINAGE SYSTEMS, EITHER NATURAL OR ARTIFICIAL."
 - SECTION 5.12.3.e (DRAIN PIPE MATERIAL)
 - SECTION 5.12.3.f: "STORMWATER RUNOFF SHALL NOT BE PERMITTED TO FLOW UPON THE ROAD SURFACE FOR A LONGER DISTANCE THAN 300 FEET BEFORE IT ENTERS THE UNDERGROUND SYSTEM... CATCH BASINS SHALL BE LOCATED ON BOTH SIDES OF THE ROADWAY ON CONTINUOUS GRADES AT INTERVALS OF NOT MORE THAN 300 FEET AT ALL SAGS IN THE ROADWAY AND NEAR THE CORNERS OF THE ROADWAY AT INTERSECTING STREETS... GRANITE CURB INLETS CONFORMING TO SECTION 500 OF THE STANDARD SPECIFICATIONS SHALL BE INSTALLED AT ALL ROADWAY CATCH BASINS BUT SHALL NOT BE REQUIRED FOR AREA CATCH BASINS."
 - SECTION 5.12.3.g (EXISTING AND PROPOSED PEAK FLOW AND HYDROGRAPH)
 - SECTION 5.12.3.h (PIPE TRENCHING)
 - SECTION 5.12.3.i (MANHOLES AND CATCHBASINS)
 - SECTION 5.12.3.m (DRAIN MANHOLE LOCATIONS)
 - SECTION 5.12.3.n (FRAMES AND COVERS)PROPOSED: ALLOW EXISTING DRAINAGE SYSTEM, WHICH CONSISTS OF TWO (2) CATCH BASINS THAT PRESUMABLY OUTLET VIA PIPES OF UNKNOWN SIZE AND MATERIAL DIRECTLY TO THE STREAM TO CONTINUE TO SERVE THE SUBDIVISION. ALLOW STORMWATER RUNOFF TO FLOW FOR APPROXIMATELY 325 FEET TO EXISTING CATCH BASINS. EXISTING CATCH BASINS DO NOT HAVE GRANITE CURB INLETS, SINCE NO WORK PROPOSED, RUNOFF CALCULATIONS ARE NOT NECESSARY.
- SECTION 5.12.4.b: "PRIVATE ON-LOT SEWERAGE SYSTEMS SHALL BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE BOARD OF HEALTH OF THE TOWN OF TOPSFIELD AND ARTICLES OF THE SANITARY CODE OF THE COMMONWEALTH OF MASSACHUSETTS."
PROPOSED: ALLOW EXISTING SEWAGE DISPOSAL SYSTEMS ON-SITE TO SERVE THE SUBDIVISION. EXISTING BUILDINGS ARE TO REMAIN ON-SITE.
- SECTION 5.20 - TREE PLANTING
 - SECTION 5.20.1 (TREE SPECIES, QUANTITY, AND SPACING)
 - SECTION 5.20.2 (BRUSH CLEARING)
 - SECTION 5.20.3 (TREE HEALTH AND LIABILITY)
 - SECTION 5.20.4 (BANK STABILIZATION)PROPOSED: ALLOW EXISTING LAWN AND SHRUBBERY ON SCHOOL AVENUE AND 27 HIGH STREET TO SERVE THE SUBDIVISION. NO STREET TREES ARE PROPOSED.
- SECTION 5.21: "AS-BUILT PLANS SHOWING THE LOCATION, GRADES, AND OTHER SIGNIFICANT INFORMATION REGARDING UTILITIES AND ROADS SHALL BE PREPARED BY THE APPLICANT AND SUBMITTED TO THE BOARD WITHIN SIX MONTHS FOLLOWING THE FINAL APPROVAL..."
PROPOSED: NO WORK PROPOSED, THEREFORE AN AS-BUILT IS NOT REQUIRED.

- 64 -
 SURFACE CONTOUR
 STONE WALL
 EDGE OF PAVEMENT
 CHAIN LINK FENCE
 WIRE FENCE
 WOOD FENCE
 86.75
 88.25
 CURB WITH TOP AND BOTTOM
 CURB ELEVATION
 EDGE OF WOODED AREA
 8"Ø
 12"Ø
 SEWERLINE & MANHOLE WITH PIPE
 SIZE, MATERIAL & FLOW DIRECTION
 DRAINLINE WITH PIPE SIZE, MATERIAL
 & FLOW DIRECTION, CATCHBASIN,
 MANHOLE & ROUND CATCHBASIN
 6"Ø
 10"Ø
 WATER MANHOLE, WATER MAIN
 WITH SIZE, TEE, GATE VALVE &
 FIRE HYDRANT
 GAS MAIN WITH SIZE
 & GATE VALVE
 #181
 ØHW
 EXISTING UTILITY POLE WITH DESIGNATION
 OVERHEAD WIRES AND GUY POLE
 RETAINING WALL
 STONE RETAINING WALL
 56.6
 HW #181A/101
 LIMIT OF BORDERING VEGETATED WETLAND
 WITH FLAG NUMBER AND ELEVATION
 LIMIT OF 100-FOOT WETLAND BUFFER ZONE
 & 100' INNER RIPARIAN
 LIMIT OF 200-FOOT RIVERFRONT
 LIMIT OF 100-YEAR FLOOD PLAIN
 98.8
 93.2
 RETAINING WALL WITH TOP
 AND BOTTOM ELEVATIONS
 68.7
 SPOT ELEVATION
 63.7
 12"Ø
 PROMINENT DECIDUOUS TREE
 WITH ELEVATION, SIZE AND SPECIES
 63.2
 18"Ø
 PROMINENT CONIFEROUS TREE
 WITH ELEVATION, SIZE AND SPECIES
 LIGHT POLE
 CB
 CATCH BASIN
 GM
 GAS METER
 CU
 CONNECTION UNKNOWN
 BOLLARD
 SIGN
 (R)
 RECORD
 (C)
 CALCULATED
 (R/H)
 RECORD AND HELD
 (M)
 FIELD MEASURED
 (S)
 SET
 (FD)
 FOUND
 DMSB
 DRILL HOLE IN STONE BOUND
 I. PIPE
 IRON PIPE
 LROD
 IRON ROD
 COR. BRD.
 WOOD CORNER BOARD
 COR. CONC. BLK.
 CORNER CONCRETE BLOCK
 VGC
 VERTICAL GRANITE CURB
 BB
 BITUMINOUS BERM
 CC
 CONCRETE CURB
 BIT. CONC.
 BITUMINOUS CONCRETE
 CLF
 CHAIN LINK FENCE
 BC
 BOTTOM OF CURB
 TC
 TOP OF CURB
 CTR. SB.
 CENTER STONE BOUND

MASSACHUSETTS STATE PLANE COORDINATE SYSTEM (NAD 83)

- 1) ELEVATIONS SHOWN HEREON REFER TO NAVD OF 1988. SAID DATUM WAS ESTABLISHED UTILIZING GPS.
- 2) UNDERGROUND UTILITIES SHOWN HEREON ARE COMPILED FROM FIELD LOCATIONS OF STRUCTURES AND FROM AVAILABLE RECORD INFORMATION ON FILE AT THE TOWN ENGINEERING OFFICES, TOWN D.P.W., MASS HIGHWAY DEPT. AND UTILITY COMPANIES. OTHER UNDERGROUND UTILITIES MAY EXIST. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE LOCATION, SIZE & ELEVATION OF ALL UTILITIES WITHIN THE AREA OF PROPOSED WORK AND TO CONTACT "DIG-SAFE" AT 811 AT LEAST 72 HOURS PRIOR TO ANY EXCAVATION, DEMOLITION OR CONSTRUCTION.
- 3) LIMITS OF BORDERING VEGETATED WETLANDS SHOWN HEREON WERE DELINEATED BY HANCOCK ASSOCIATES ON 2/11/2021 AND LOCATED BY FIELD SURVEY.
- 4) APPROXIMATE LOCATION OF DPW GARAGE SEPTIC SYSTEM BASED ON PAROLE EVIDENCE BY TOWN OF TOPSFIELD. IT IS RECOMMENDED THAT SAID LOCATION BE VERIFIED BY THE OWNER. SEE NOTE 2.
- 5) RECORDS SHOWING LOCATION OF GAS LINE ARE SCHEMATIC IN NATURE AS RUNNING ALONG THE EDGE OF PAVEMENT. LOCATION OF GAS LINE SHOWN HEREON SHOULD BE CONSIDERED APPROXIMATE. SEE NOTE 2.
- 6) SHOW WAS ON SITE AT THE TIME OF SURVEY. SOME SITE DETAIL MAY HAVE BEEN OBSCURED AND NOT SHOWN HEREON.
- 7) BUILDING OFFSETS SHOWN TO CORNER BRICK UNLESS OTHERWISE NOTED.

PARCEL ID: 41-60

DEED BOOK 741, PAGE 284

THE INHABITANTS OF THE TOWN OF TOPSFIELD

CENTRAL RESIDENTIAL DISTRICT

(A.K.A. #10 School Ave.)
Topsfield, Massachusetts 01983

PREPARED FOR

8 West Common Street
Topsfield, Massachusetts 01983

Civil Engineers
Land Surveyors
Wetland Scientists

185 CENTRE STREET, DANVERS, MA 01923
VOICE (978) 777-3050, FAX (978) 774-7816
WWW.HANCOCKASSOCIATES.COM



NO.	BY	APP	DATE	ISSUE/REVISION DESCRIPTION
DATE: 3/11/2021				DRAWN BY: MMM
SCALE: 1" = 20'				CHECK BY: SRJ

**EXISTING CONDITIONS
PLAN OF LAND
IN
TOPSFIELD, MA**

PLOT DATE: Mar 12, 2021 1:24 pm
PATH: F:\CM JD Projects\20553-Town of Tumbler Bay\Draws\

DWC: 24553 no dup

DATE: 2400000.000

LAYOUT: EC

SHEET: 2 OF 4

DF-2

24553

ELEVATION BENCH MARKS		
DATE: NOV08(SEE NOTE 1)		
NO.	DESCRIPTION	ELEV.
1.	DOORWAY CENTER CONC. THRESHOLD	63.71
2.	UTILITY POLE #4: MAGNETIC NAIL (1.0'A.G.)	76.93
3.		

APPROVAL UNDER THE SUBDIVISION
CONTROL LAW IS REQUIRED.
TOPSFIELD PLANNING BOARD

DATE: _____

SCALE: 1" = 20'



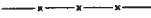
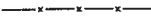





















3/11/21
DATE

Scott R. Luther
PROFESSIONAL LAND SURVEYOR

I CERTIFY THAT 20 DAYS HAVE ELAPSED SINCE
PLANNING BOARD APPROVAL AND THAT NO
APPEAL HAS BEEN FILED IN THIS OFFICE.

TOPSFIELD TOWN CLERK

LEGEND

-  CHAIN LINK FENCE
 WIRE FENCE
 WOOD FENCE
 RETAINING WALL
 STONE RETAINING WALL
 LIMIT OF BORDERING VEGETATED WETLAND WITH FLAG NUMBER AND ELEVATION
 LIMIT OF 100-FOOT WETLAND BUFFER ZONE & 100' INNER RIPARIAN
 LIMIT OF 200-FOOT RIVERFRONT
 LIMIT OF 100-YEAR FLOOD PLAIN
 RECORD
 CALCULATED
 RECORD AND HELD
 FIELD MEASURED
 FOUND
 DRILL HOLE IN STONE BOUND
 IRON PIPE
 IRON ROD
 DRILL HOLE
 RAIL ROAD SPIKE
 TO BE SET
 CENTER STONE BOUND
 WOOD CORNER BOARD
 CORNER CONCRETE BLOCK

LIMIT OF 100'
 WETLAND BUFFER
 ZONE AND
 INNER-RIPARIAN
 JENNIFER CARUSO
 DEED BK.35953, PG.81
 PLAN 223 OF 1974
 100' FROM TOP OF BANK
 186.01'(R/M)
SCHOOL AVENUE
 (PUBLIC - VARIABLE WIDTH)

37 MAIN STREET
CONDOMINIUM
DEED BK.20291, PG.387
PLAN BK. 365, PLAN 19

1 STORY WOOD BUILDING
"BOX-TOP SHOP" TOPSFIELD-BOXFORD
COMMUNITY CLUB
DEED BK.5469 PG.44

JAMES S. PRICE, INC., FRANK
IOVANELLA, PRES.
DEED BK.23653, PG.184
LOT 28
PLAN BK.411, PLAN 70
PLAN BK.360, PLAN 59

NOTES:

- 1) THE PURPOSE OF THIS PLAN IS TO DIVIDE THE PROPERTY DESCRIBED IN DEED BOOK 741, PAGE 284 INTO TWO LOTS.
- 2) TOWN OF TOPSFIELD WAS UNABLE TO PRODUCE A LAYOUT FOR SCHOOL AVENUE. ABUTTING PLANS HELD FOR SCHOOL AVE. LIMITS.
- 3) BUILDING OFFSETS SHOWN TO CORNER BRICK UNLESS OTHERWISE NOTED.

ASSESSORS:

PARCEL ID: 41-60

REFERENCES:

DEED BOOK 741. PAGE 284

RECORD OWNER:

THE INHABITANTS OF THE TOWN OF TOPSFIELD

ZONING:

CENTRAL RESIDENTIAL DISTRICT

#27 HIGH STREET

(A.K.A. #10 School Ave.)
Topsfield, Massachusetts 01983

PREPARED FOR:

TOWN
OF
TOPSFIELD

8 West Common Street
Topsfield, Massachusetts 01983

HANCOCK
ASSOCIATES

Civil Engineers

Land Surveyors

Wetland Scientists

185 CENTRE STREET, DANVERS, MA 01923
VOICE (978) 777-3050, FAX (978) 774-7816
WWW.HANCOCKASSOCIATES.COM



NO.	BY	APP	DATE	ISSUE/REVISION DESCRIPTION
-----	----	-----	------	----------------------------

DATE: 3/11/2021

SCALE: 1" = 20'

PLAN OF LAND
IN
TOPSFIELD, MA

PLOT DATE: Mar 14, 2021 1:23 pm
 FILE: F:\CHS 3D Projects\24553-Town of Topsham\Survey\DWG\

DWG: 24553ec.dwg

DATE: 2/15/2004

LAYOUT: Plan of Lan

SHEET: 3 OF 4

PROJECT NO.

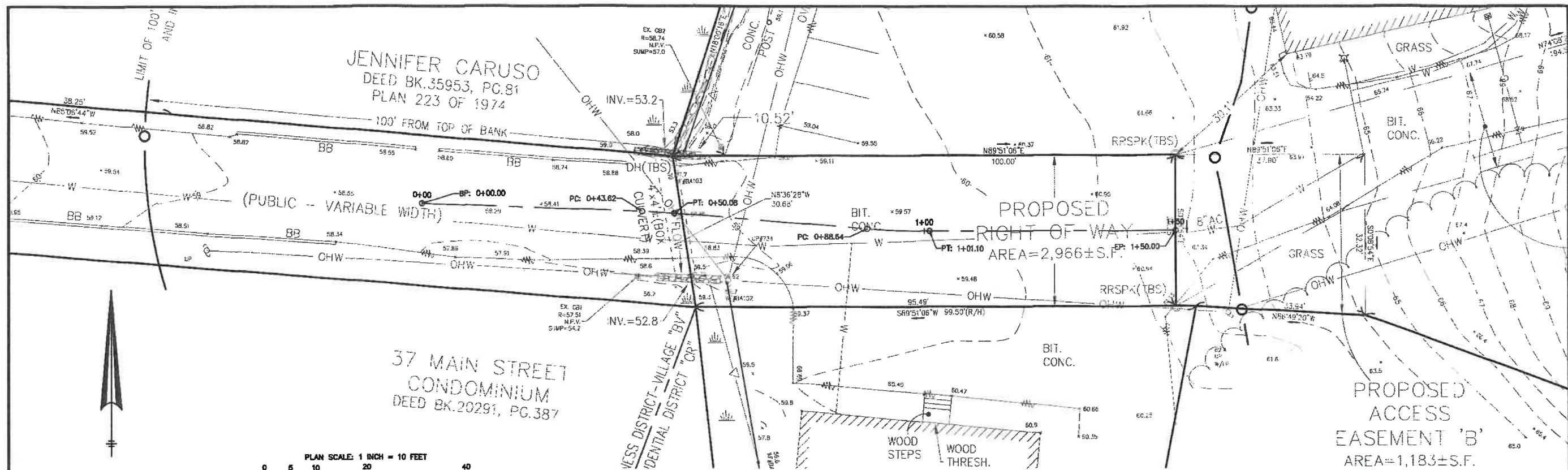
DF-3

PROJECT NO.	04553
-------------	-------

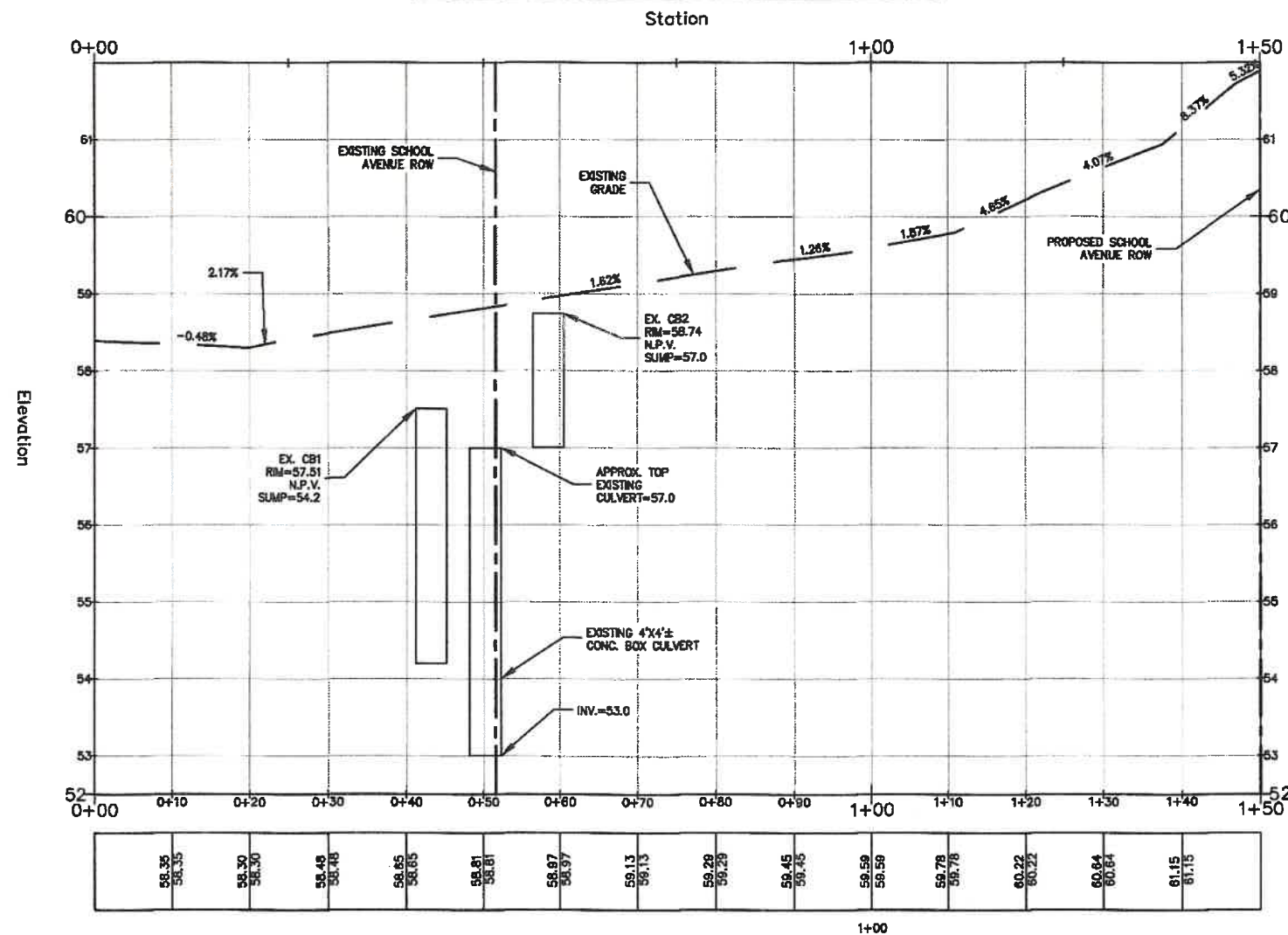
APPROVAL UNDER THE SUBDIVISION
CONTROL LAW IS REQUIRED.
TOPSFIELD PLANNING BOARD

DATE: _____

SCALE: 1" = 20'

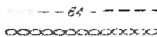


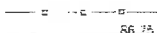


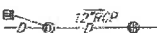


School Avenue Extension PROFILE



- LEGEND**

- EXISTING**

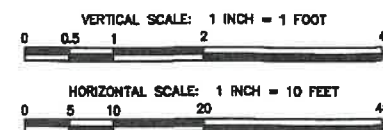
- 
SURFACE CONTOUR
STONE WALL

EDGE OF PAVEMENT

CHAIN LINK FENCE

WIRE FENCE

WOOD FENCE

CURB WITH TOP AND BOTTOM CURB ELEVATION

EDGE OF WOODED AREA
SEWERLINE & MANHOLE WITH PIPE SIZE, MATERIAL, & FLOW DIRECTION
DRAINLINE WITH PIPE SIZE, MATERIAL & FLOW DIRECTION, CATCHBASIN, MANHOLE & ROUND CATCHBASIN
WATER MANHOLE, WATER MAIN WITH SIZE, TEE, GATE VALVE & FIRE HYDRANT
GAS MAIN WITH SIZE & GATE VALVE
EXISTING UTILITY POLE WITH DESIGNATION OVERHEAD WIRES AND GUY POLE
RETAINING WALL
STONE RETAINING WALL
LIMIT OF BORDERING VEGETATED WETLAND WITH FLAG NUMBER AND ELEVATION
LIMIT OF 100-FOOT WETLAND BUFFER ZONE & 100' INNER RIPARIAN
LIMIT OF 200-FOOT RIVERFRONT
LIMIT OF 100-YEAR FLOOD PLAIN
RETAINING WALL WITH TOP AND BOTTOM ELEVATIONS
SPOT ELEVATION
PROMINENT DECIDUOUS TREE WITH ELEVATION, SIZE AND SPECIES
PROMINENT CONIFEROUS TREE WITH ELEVATION, SIZE AND SPECIES
LIGHT POLE
CATCH BASIN
GAS METER

NOTES:

1. CONTRACTOR SHALL CONTACT DIG-SAFE FOR UNDERGROUND UTILITY MARKING AT 1-888-344-7233 AT LEAST 72 HOURS PRIOR TO COMMENCEMENT OF ANY WORK.
2. NO PHYSICAL IMPROVEMENTS ARE PROPOSED BY THIS PLAN.

APPROVAL UNDER THE SUBDIVISION
CONTROL LAW REQUIRED.
TOPSFIELD PLANNING BOARD

DATE: _____



#27 HIGH STREET

(A.K.A. #10 School Ave.)
Topsfield, Massachusetts 01983

ADDRESS:

<u>MAP</u>	<u>LOT</u>
41	60

PREPARED FOR:

**TOWN
OF
TOPSFIELD**

8 West Common Street
Topsfield, Massachusetts 01983

HANCOCK
ASSOCIATES

Civil Engineers

Land Surveyors

Wetland Scientists

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NO.	BY	APP	DATE	ISSUE/REVISION DESCRIPTION
DATE:			3/11/21	DESIGN BY: CEW
SCALE:			1" = 20'	DRAWN BY: DJR
APPROV. BY:			CEW	CHECK BY: JP

PLAN AND PROFILE

FILED: Mar 11, 2021 11:27 pm

DWG: 245530F.dwg

LAYOUT: PP

SHEET: 4 OF 4

PROJECT NO.:

DF-4

24553



HAYES ENGINEERING, INC.
603 SALEM STREET
WAKEFIELD, MA 01880
(781) 246-2800
FAX (781) 246-7596

FORM 11 - SOIL EVALUATOR FORM
Page 1 of 3

No. T-1

Date: _____

JOB FILE

TOP0205

Commonwealth of Massachusetts
TOPSFIELD, Massachusetts

Soil Suitability Assessment for On-site Sewage Disposal

Performed By: Gordon Rogerson Date: 5-4-01
Witnessed By: Joe Downing

Location Address or Lot # <u>School Ate</u>	Owner's Name, Address, and Telephone # <u>Town of Topsfield</u> <u>8 W. Common</u> <u>Topsfield, Ma</u> <u>To Roberto Knight</u> <u>Selectman</u>
New Construction <input type="checkbox"/> Repair <input checked="" type="checkbox"/>	

Office Review

Published Soil Survey Available: No ☐ Yes ☐
Year Published _____ Publication Scale _____ Soil Map Unit Sr B
Drainage Class _____ Soil Limitations Sudbury fsl
Surficial Geologic Report Available: No ☐ Yes ☐ Sandy mixed mesic
Year Published _____ Publication Scale _____ aquic Distrochrepts
Geologic Material (Map Unit) _____ INCEPTISOL
Landform _____
Flood Insurance Rate Map: _____
Above 500 year flood boundary No ☐ Yes ☐
Within 500 year flood boundary No ☐ Yes ☐
Within 100 year flood boundary No ☐ Yes ☐
Wetland Area:
National Wetland Inventory Map (map unit) _____
Wetlands Conservancy Program Map (map unit) _____

Current Water Resource Conditions (USGS): Month

Range : Above Normal ☐ Normal ☐ Below Normal ☐

Other References Reviewed: _____



Location Address or Lot No. SCHOOL AVE

On-site Review

Deep Hole Number T-1 Date: 5-4-01 Time: _____ Weather: _____
 Location (identify on site plan) _____
 Land Use _____ Slope (%) _____ Surface Stones _____
 Vegetation _____
 Landform _____
 Position on landscape (sketch on the back) _____
 Distances from:
 Open Water Body _____ feet Drainage way _____ feet
 Possible Wet Area _____ feet Property Line _____ feet
 Drinking Water Well _____ feet Other _____

DEEP OBSERVATION HOLE LOG*							
Depth from Surface (Inches)	Soil Horizon	Soil Texture (USDA)	Soil Color (Munsell)	Soil Mottling	Other (Structure, Stones, Boulders, Consistency, % Gravel)		
0 - 30	Fill	—	—	—	—	—	—
30 - 66	C ₁	SI	2.5Y 5/4		gr	mfr	
66 - 78	C ₂	IS	10YR 4/4		1.5g	mfr	
78 - 120	C ₃	SI	2.5Y 5/4		blk	mfr	

* MINIMUM OF 2 HOLES REQUIRED AT EVERY PROPOSED DISPOSAL AREA

Parent Material (geologic) Glacial till Depth to Bedrock: _____
 Depth to Groundwater: _____ Standing Water in the Hole: No Weeping from Pit Face: No
 Estimated Seasonal High Ground Water: 78"





Location Address or Lot No. SCHOOL AVE
TOPSFIELD, MA

Determination for Seasonal High Water Table

Observation Hole Number: T-1
Method Used: _____

- ☐ Depth observed standing in observation hole _____ inches
☐ Depth weeping from side of observation hole _____ inches
☐ Depth to soil mottles 78 inches
☐ Ground water adjustment _____ feet

Index Well Number _____ Reading Date _____ Index well level _____
Adjustment factor _____ Adjusted ground water level _____

Depth of Naturally Occurring Pervious Material

Does at least four feet of naturally occurring pervious material exist in all areas observed throughout the area proposed for the soil absorption system? Yes

If not, what is the depth of naturally occurring pervious material? _____

Certification

I certify that on Nov. 1994 (date) I have passed the soil evaluator examination approved by the Department of Environmental Protection and that the above analysis was performed by me consistent with the required training, expertise and experience described in 310 CMR 15.017.

Signature Borden R. Jepsen Date 5/4/01

DESCRIPTION OF HORIZONS

TEXTURE:

gravel —g
very coarse sand —vcos
coarse sand —cos
sand —s
fine sand —fs
very fine sand —vfs
loamy coarse sand —lcos
loamy sand —ls
loamy fine sand —lfs
sandy loam —sl
fine sandy loam —fsl
very fine sandy loam —vfsl

gravely sandy loam —gs1
loam —l
gravely loam —gl
stony loam —sl
silt —s
silt loam —sl
clay loam —cl
silty clay loam —scl
sandy clay loam —sc1
stony clay loam —stcl
silty clay —sc
clay —c

STRUCTURE:

Grade: _____
structureless —0
weak —1
moderate —2
strong —3

Size: _____
very fine —vf
fine —f
medium —m
coarse —c
very coarse —vc

Form or Type: _____
platy —pl
prismatic —pr
columnar —cpr
blocky —bk
angular blocky —abk
subangular blocky —sbk
granular —gr
single grain —sg
massive —m

CONSISTENCE:

Not soil: _____
nonsticky —ns
slightly sticky —ns
sticky —s
very sticky —vs
nonplastic —np
slightly plastic —sp
plastic —p

Moist soil: _____
loose —l
very friable —vfr
friable —fr
firm —f
very firm —vfr
extremely firm —efr

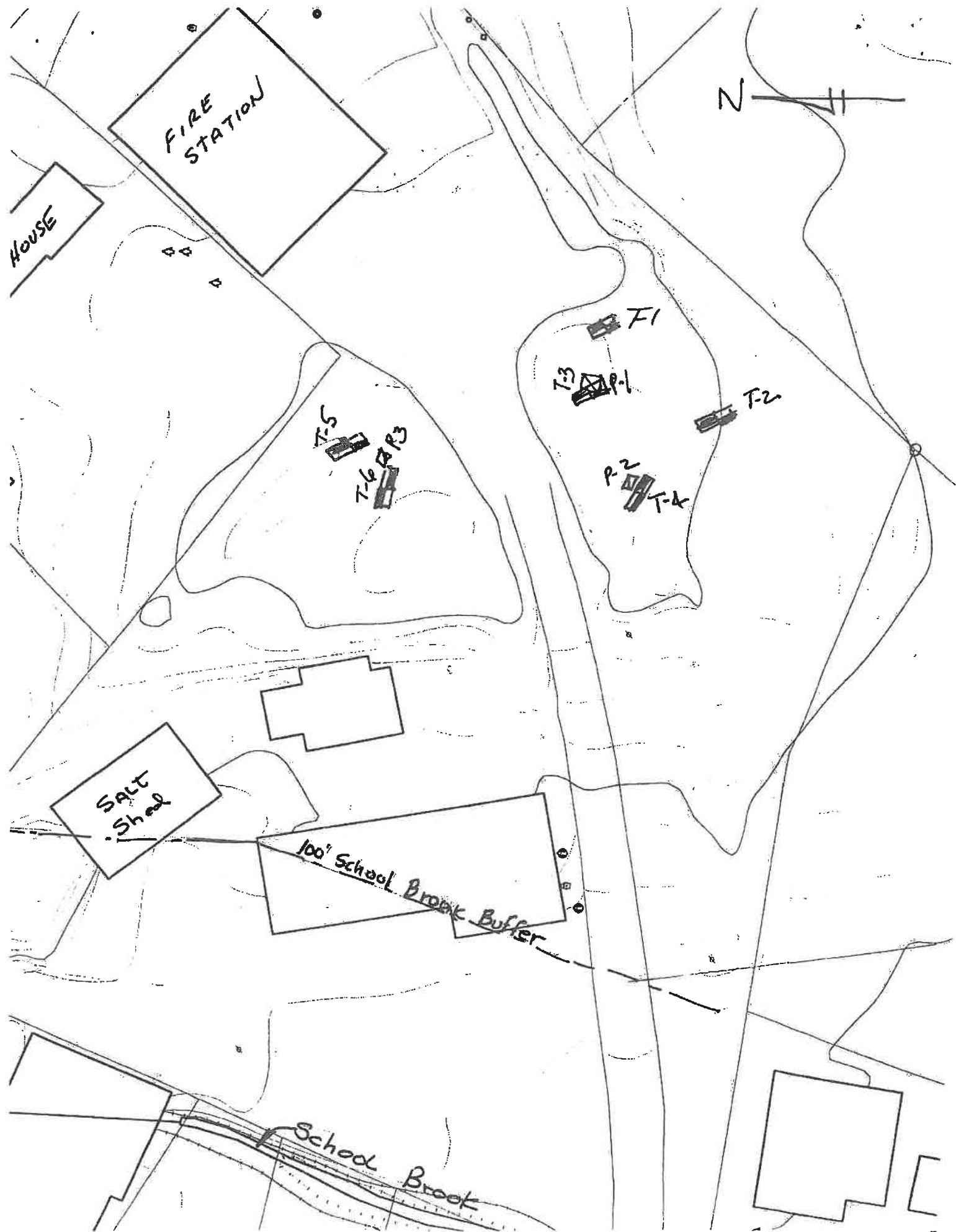
Dry soil: _____
loose —l
soft —s
slightly hard —sh
hard —h
very hard —vh
extremely hard —eh

MOTTLING:

Abundance: _____
few —f (0-25)
common —c (25-50%)
many —m (50-100%)

Size: _____
fine —f
medium —m
coarse —c

Contrast: _____
faint —f
distinct —d
prominent —p





HAYES ENGINEERING, INC.
603 SALEM STREET
WAKEFIELD, MA 01880
(781) 246-2800
FAX (781) 246-7596

FORM 11 - SOIL EVALUATOR FORM
Page 1 of 3

No. T-2

Date: _____

JOB FILE

Topo205

Commonwealth of Massachusetts

TOPSFIELD, Massachusetts

Soil Suitability Assessment for On-site Sewage Disposal

Performed By: Gordon Rogerson

Date: 5-4-01

Witnessed By: Joe Downey

Location Address or Lot # <u>School Ave.</u>	Owner's Name, Address, and Telephone # <u>Roberta Knight.</u> <u>c/o Selectman</u> <u>B W. Commack</u> <u>Topsofield, Ma</u>
New Construction <input type="checkbox"/> Repair <input checked="" type="checkbox"/>	

Office Review

Published Soil Survey Available: No ☐ Yes ☐

Year Published _____ Publication Scale _____

Drainage Class _____ Soil Limitations _____

Surficial Geologic Report Available: No ☐ Yes ☐

Year Published _____ Publication Scale _____

Geologic Material (Map Unit) _____

Landform _____

Flood Insurance Rate Map: _____

Above 500 year flood boundary No ☐ Yes ☐

Within 500 year flood boundary No ☐ Yes ☐

Within 100 year flood boundary No ☐ Yes ☐

Wetland Area:

National Wetland Inventory Map (map unit) _____

Wetlands Conservancy Program Map (map unit) _____

Current Water Resource Conditions (USGS): Month

Range : Above Normal ☐ Normal ☐ Below Normal ☐

Other References Reviewed: _____



Location Address or Lot No. School SUE

On-site Review

Deep Hole Number T-2 Date: S-4-01 Time: Weather: Sunny 90°
 Location (identify on site plan)
 Land Use Slope (%) B Surface Stones: NO
 Vegetation
 Landform
 Position on landscape (sketch on the back)
 Distances from:
 Open Water Body 7200 feet Drainage way feet
 Possible Wet Area 7200 feet Property Line feet
 Drinking Water Well feet Other

DEEP OBSERVATION HOLE LOG*

Depth from Surface (Inches)	Soil Horizon	Soil Texture (USDA)	Soil Color (Munsell)	Soil Mottling	Other (Structure, Stones, Boulders, Consistency, % Gravel)		
0-6	A	fsl	10YR 3/3		gr	mfr	0/0/0
6-24	Bw	fsl	10YR 5/6		gr	mfr	0/0/0
24-60	C ₁	sl	2.5Y 6/4		gr	mfr	0/5/0/0
60-120	C ₂	sl	2.5Y 7/4		blk	mfi	0/5/5/0

* MINIMUM OF 2 HOLES REQUIRED AT EVERY PROPOSED DISPOSAL AREA

Parent Material (geologic) Glacial fill Depth to Bedrock:
 Depth to Groundwater: Standing Water in the Hole: No Weeping from Pit Face: No
 Estimated Seasonal High Ground Water: 28'





Location Address or Lot No. SCHOOL AVE
TOPSFIELD, MA

Determination for Seasonal High Water Table

Observation Hole Number: T-2
Method Used:

- ☐ Depth observed standing in observation hole inches
☐ Depth weeping from side of observation hole inches
☐ Depth to soil mottles, 28 inches
☐ Ground water adjustment feet

Index Well Number Reading Date Index well level
Adjustment factor Adjusted ground water level

Depth of Naturally Occurring Pervious Material

Does at least four feet of naturally occurring pervious material exist in all areas observed throughout the area proposed for the soil absorption system? yes

If not, what is the depth of naturally occurring pervious material?

Certification

I certify that on Nov. 1994 (date) I have passed the soil evaluator examination approved by the Department of Environmental Protection and that the above analysis was performed by me consistent with the required training, expertise and experience described in 310 CMR 15.017.

Signature Jordan Rogers Date 5/4/01

DESCRIPTION OF HORIZONS

TEXTURE:

gravel
very coarse sand
coarse sand
sand
fine sand
very fine sand
loamy coarse sand
loamy sand
loamy fine sand
sandy loam
fine sandy loam
very fine sandy loam

gravely sandy loam
loam
gravely loam
stony loam
silt
silt loam
clay loam
silty clay loam
sandy clay loam
stony clay loam
silty clay
clay

STRUCTURE:

Grade:
structureless
weak
moderate
strong

Size:
very fine
fine
medium
coarse
very coarse

Form or Type:
platy
prismatic
columnar
blocky
angular blocky
subangular blocky
granular
single grain
massive

CONSISTENCE:

Wet soil:
nonsticky
slightly sticky
sticky
very sticky
nonplastic
slightly plastic
plastic

Moist soil:
loose
very friable
friable
firm
very firm
extremely firm

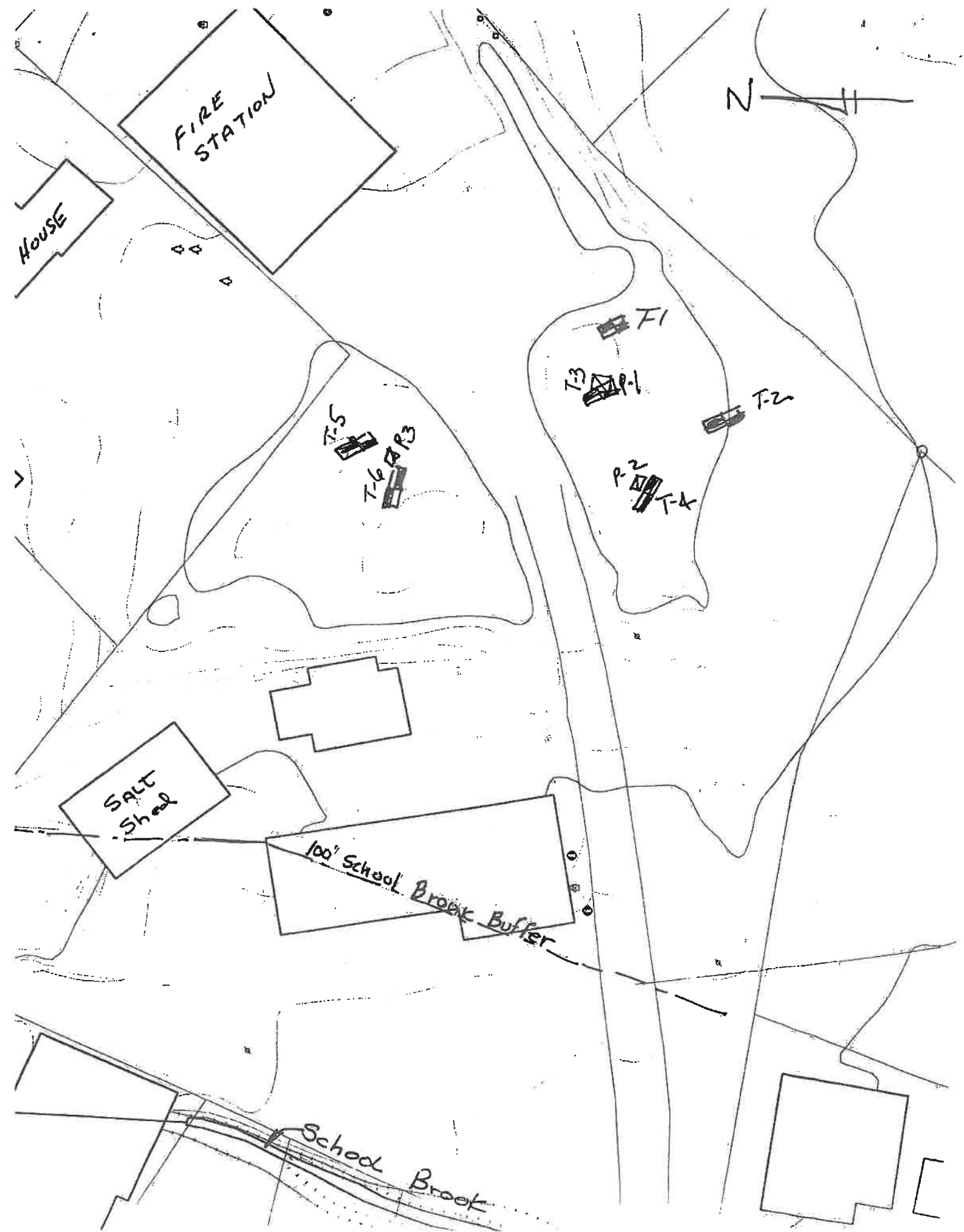
Dry soil:
loose
soft
slightly hard
hard
very hard
extremely hard

MOTTLING:

Abundance:
few
common
many

Size:
fine
medium
coarse

Contrast:
faint
distinct
prominent





HAYES ENGINEERING, INC.
603 SALEM STREET
WAKEFIELD, MA 01880
(781) 246-2800
FAX (781) 246-7596

FORM 11 - SOIL EVALUATOR FORM
Page 1 of 3

No. T-3

Date: _____

JOB FILE

Top 0205

Commonwealth of Massachusetts
TOPSFIELD, Massachusetts

Soil Suitability Assessment for On-site Sewage Disposal

Performed By: Gordon Rogers Date: 5-4-01
Witnessed By: Joe Downing

Location Address or Lot # <u>School Ave.</u>	Owner's Name, Address, and Telephone # <u>Town of Topsfield</u> <u>8 W. Common</u> <u>Roberta</u> <u>Topsfield, Ma.</u> <u>Knight</u> <u>c/o Selectman</u>
New Construction <input type="checkbox"/> Repair <input type="checkbox"/>	

Office Review

Published Soil Survey Available: No ☐ Yes ☐

Year Published _____ Publication Scale _____ Soil Map Unit SrB

Drainage Class _____ Soil Limitations Sudbury fsl

Surficial Geologic Report Available: No ☐ Yes ☐ Sandy mixed, mesic

Year Published _____ Publication Scale _____ Aquic Districhepts

Geologic Material (Map Unit) _____ INCEPTISOL

Landform _____

Flood Insurance Rate Map: _____

Above 500 year flood boundary No ☐ Yes ☐

Within 500 year flood boundary No ☐ Yes ☐

Within 100 year flood boundary No ☐ Yes ☐

Wetland Area:

National Wetland Inventory Map (map unit) _____

Wetlands Conservancy Program Map (map unit) _____

Current Water Resource Conditions (USGS): Month

Range : Above Normal ☐ Normal ☐ Below Normal ☐

Other References Reviewed: _____



Location Address or Lot No. School Ave

On-site Review

Deep Hole Number T-3 Date: 5-4-01 Time: _____ Weather: Sunay 90°

Location (identify on site plan) _____

Land Use _____ Slope (%) _____ Surface Stones _____

Vegetation _____

Landform _____

Position on landscape (sketch on the back)

Distances from:

Open Water Body 7200 feet Drainage way _____ feet

Possible Wet Area 7200 feet Property Line _____ feet

Drinking Water Well _____ feet Other _____

DEEP OBSERVATION HOLE LOG*

Depth from Surface (Inches)	Soil Horizon	Soil Texture (USDA)	Soil Color (Munsell)	Soil Mottling	Other (Structure, Stones, Boulders, Consistency, % Gravel)		
0-6	A	fs	10YR 3/3		gr	mfr	0/0/0
6-20	Bw	sl	10YR 6/6		gr	mfr	10/0/0
20-34	C ₁	ls	7.5YR 6/6		gr	mfr	20/5/0
34-120	Cd	sl	2.5Y 5/1	10YR 6/8 5Y 1/3	blk	mfr	10/5/0/0

* MINIMUM OF 2 HOLES REQUIRED AT EVERY PROPOSED DISPOSAL AREA

Parent Material (geologic) Glacial till Depth to Bedrock: _____

Depth to Groundwater: Standing Water in the Hole: No Weeping from Pit Face: No

Estimated Seasonal High Ground Water: 43"



HAYES ENGINEERING, INC.
603 SALEM STREET
WAKEFIELD, MA 01880
(781) 246-2800
FAX (781) 246-7596



FORM 11 - SOIL EVALUATOR FORM
Page 3 of 3



DEP APPROVED FORM - 12/07/95

Location Address or Lot No. SCHOOL AVE
TOPSFIELD, MA

Determination for Seasonal High Water Table

Observation Hole Number: T-3
Method Used:

- ☐ Depth observed standing in observation hole inches
☐ Depth weeping from side of observation hole inches
☐ Depth to soil mottles, 43 inches
☐ Ground water adjustment feet

Index Well Number Reading Date Index well level
Adjustment factor Adjusted ground water level

Depth of Naturally Occurring Pervious Material

Does at least four feet of naturally occurring pervious material exist in all areas observed throughout the area proposed for the soil absorption system? yes

If not, what is the depth of naturally occurring pervious material?

Certification

I certify that on Nov. 1994 (date) I have passed the soil evaluator examination approved by the Department of Environmental Protection and that the above analysis was performed by me consistent with the required training, expertise and experience described in 310 CMR 15.017.

Signature [Signature] Date 5/4/01

DESCRIPTION OF HORIZONS

TEXTURE:

gravel
very coarse sand
coarse sand
sand
fine sand
very fine sand
loamy coarse sand
loamy sand
loamy fine sand
sandy loam
fine sandy loam
very fine sandy loam

gravely sandy loam
loam
gravely loam
stony loam
silt
silt loam
clay loam
silty clay loam
sandy clay loam
stony clay loam
silty clay
clay

STRUCTURE:

Grade:
structureless
weak
moderate
strong

Size:
very fine
fine
medium
coarse
very coarse

Form or Type:
platy
prismatic
columnar
blocky
angular blocky
subangular blocky
granular
single grain
massive

CONSISTENCE:

Moist soil:
nonsticky
slightly sticky
sticky
very sticky
nonplastic
slightly plastic
plastic

Moist soil:
loose
very friable
friable
firm
very firm
extremely firm

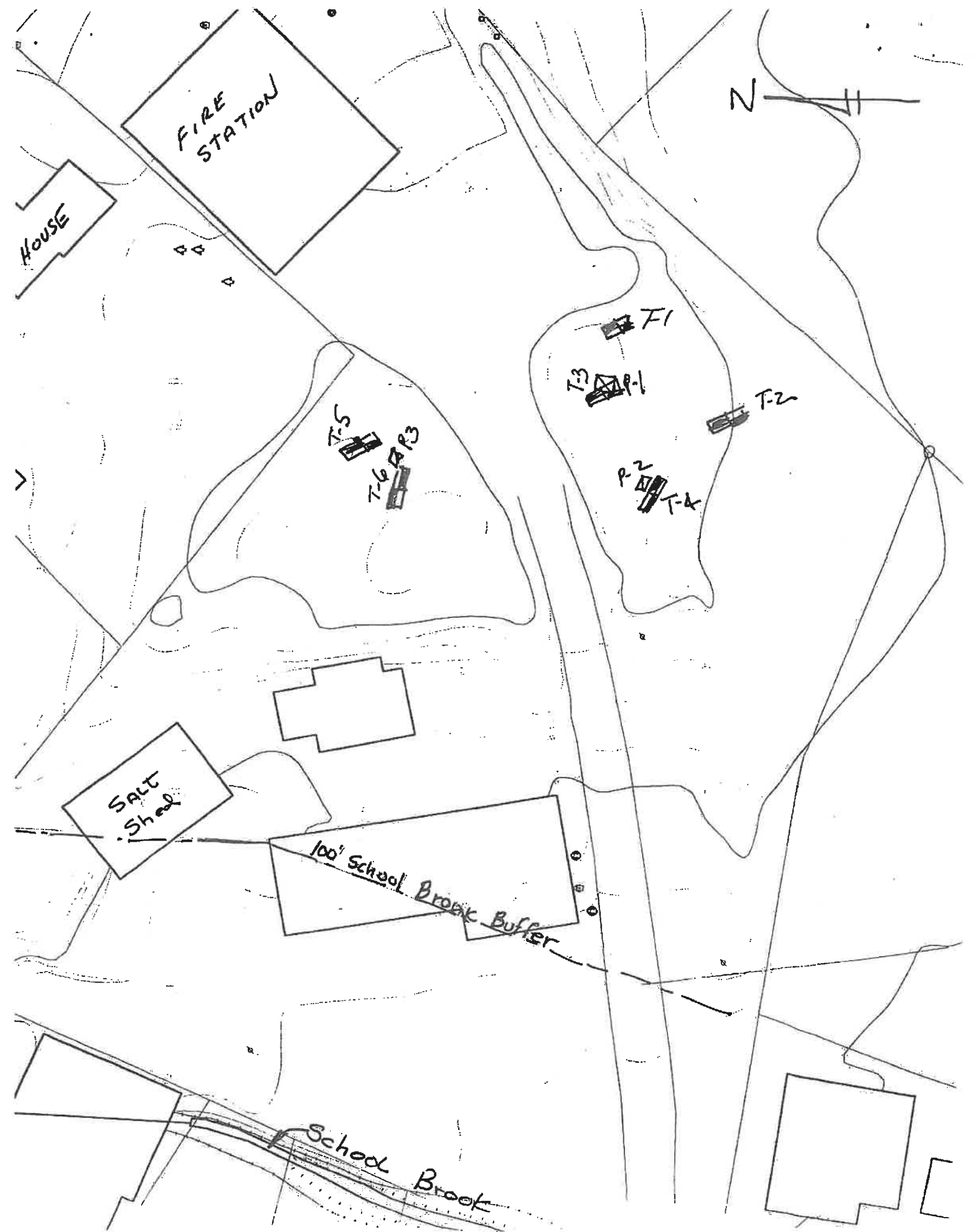
Dry soil:
loose
soft
slightly hard
hard
very hard
extremely hard

MOTTLING:

Abundance:
few
common
many

Size:
fine
medium
coarse

Contrast:
faint
distinct
prominent



HAYES ENGINEERING, INC.
603 SALEM STREET
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(781) 246-2800
FAX (781) 246-7596



FORM 12 - PERCOLATION TEST

Location Address or Lot No. School Ave

JOB FILE TOP0205 TOPSFIELD, Massachusetts
COMMONWEALTH OF MASSACHUSETTS

Percolation Test*		
Date: <u>5-4-01</u>		Time: _____
Observation Hole #	<u>P-1</u>	
Depth of Perc	<u>50" + 18" = 63"</u>	
Start Pre-soak	<u>9:50</u>	
End Pre-soak		
Time at 12"	<u>10:05</u>	<u>11 @ 10:11</u> <u>10 @ 10:18</u>
Time at 9"	<u>10:28 (23)</u>	<u>8 @ 10:38</u> <u>7 @ 10:47</u>
Time at 6"	<u>10:57</u>	
Time (9"-6")	<u>29 min</u>	
Rate Min./Inch	<u>10 m/i</u>	

* Minimum of 1 percolation test must be performed in both the primary area AND reserve area.

Site Passed ☒ Site Failed ☐ Abandoned ☐

Performed By: Gordon Rogersau

Witnessed By: Joe Downing

Comments: _____





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FORM 11 - SOIL EVALUATOR FORM
Page 1 of 3

No. T4

Date: _____

JOB FILE

TOP0205

Commonwealth of Massachusetts
TOPSFIELD, Massachusetts

Soil Suitability Assessment for On-site Sewage Disposal

Performed By: Gordon Rogerson

Date: 5-4-01

Witnessed By: Joe Downing

Location Address or Lot # <u>School Ave</u>	Owner's Name, Address, and Telephone # <u>Roberta Knight</u> <u>c/o Selectmen</u> <u>8 W. Common</u> <u>Topsfield Ma</u>
New Construction <input type="checkbox"/> Repair <input checked="" type="checkbox"/>	

Office Review

Published Soil Survey Available: No ☐ Yes ☐

Year Published _____ Publication Scale _____

Drainage Class _____ Soil Limitations _____

Surficial Geologic Report Available: No ☐ Yes ☐

Year Published _____ Publication Scale _____

Geologic Material (Map Unit) _____

Landform _____

Flood Insurance Rate Map: _____

Above 500 year flood boundary No ☐ Yes ☐

Within 500 year flood boundary No ☐ Yes ☐

Within 100 year flood boundary No ☐ Yes ☐

Wetland Area:

National Wetland Inventory Map (map unit) _____

Wetlands Conservancy Program Map (map unit) _____

Current Water Resource Conditions (USGS): Month _____

Range :Above Normal ☐ Normal ☐ Below Normal ☐

Other References Reviewed: _____



Location Address or Lot No. School Ave

On-site Review

Deep Hole Number T-4 Date: 6-4-01 Time: _____ Weather: Sunny 90°
 Location (identify on site plan) _____
 Land Use _____ Slope (%) B Surface Stones No
 Vegetation _____
 Landform _____
 Position on landscape (sketch on the back)
 Distances from:
 Open Water Body 7200 feet Drainage way _____ feet
 Possible Wet Area: 7200 feet Property Line _____ feet
 Drinking Water Well _____ feet Other _____

DEEP OBSERVATION HOLE LOG*							
Depth from Surface (Inches)	Soil Horizon	Soil Texture (USDA)	Soil Color (Munsell)	Soil Mottling	Other (Structure, Stones, Boulders, Consistency, % Gravel)		
0 - 6	A	fsl	10YR 3/3		gr	mfr	cl/dl
6 - 14	Bw	sl	10YR 6/6		gr	mfr	cl/dl
14 - 120	C	g's	7.5YR 6/6		gr	mfr	20/50/0

* MINIMUM OF 2 HOLES REQUIRED AT EVERY PROPOSED DISPOSAL AREA

Parent Material (geologic) 1st Contact Depth to Bedrock: _____
 Depth to Groundwater: Standing Water in the Hole: NO Weeping from Pit Face: NO
 Estimated Seasonal High Ground Water: NO





Location Address or Lot No. School Ave

JOB FILE COMMONWEALTH OF MASSACHUSETTS
Top 0205 TOPSFIELD, Massachusetts

Percolation Test*		
Date: <u>5-4-01</u>		Time:
Observation Hole #	<u>P2</u>	
Depth of Perc	<u>48' + 18" = 66"</u>	
Start Pre-soak	<u>1:00</u>	
End Pre-soak		
Time at 12"	<u>1:15</u>	
Time at 9"	<u>1:35 (20)</u>	<u>8 @ 1:44</u> <u>9 @ 1:57</u>
Time at 6"	<u>2:12</u>	
Time (9"-6")	<u>37</u>	
Rate Min./Inch	<u>13 m/l</u>	

* Minimum of 1 percolation test must be performed in both the primary area AND reserve area.

Site Passed ☒ Site Failed ☐ Abandoned ☐

Performed By: Gordon Rogerson

Witnessed By: Joe Downing

Comments:



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FORM 11 - SOIL EVALUATOR FORM
Page 3 of 3



DEP APPROVED FORM - 12/07/95

Location Address or Lot No. SCHOOL AVE
TOPSFIELD, MA

Determination for Seasonal High Water Table

Observation Hole Number: T-4
Method Used: _____

- ☐ Depth observed standing in observation hole _____ inches
☐ Depth weeping from side of observation hole _____ inches
☐ Depth to soil mottles _____ inches
☐ Ground water adjustment _____ feet

Index Well Number _____ Reading Date _____ Index well level _____
Adjustment factor _____ Adjusted ground water level _____

Depth of Naturally Occurring Pervious Material

Does at least four feet of naturally occurring pervious material exist in all areas observed throughout the area proposed for the soil absorption system? yes

If not, what is the depth of naturally occurring pervious material? _____

Certification

I certify that on Nov. 1994 (date) I have passed the soil evaluator examination approved by the Department of Environmental Protection and that the above analysis was performed by me consistent with the required training, expertise and experience described in 310 CMR 15.017.

Signature [Signature] Date 5/4/01

DESCRIPTION OF HORIZONS

TEXTURE:

gravel _____
very coarse sand _____
coarse sand _____
sand _____
fine sand _____
very fine sand _____
loamy coarse sand _____
loamy sand _____
loamy fine sand _____
sandy loam _____
fine sandy loam _____
very fine sandy loam _____

gravelly sandy loam _____
loam _____
gravelly loam _____
stony loam _____
silt _____
silt loam _____
clay loam _____
silty clay loam _____
sandy clay loam _____
stony clay loam _____
silty clay _____
clay _____

STRUCTURE:

Grade: _____
structureless _____
weak _____
moderate _____
strong _____

Size: _____
very fine _____
fine _____
medium _____
coarse _____
very coarse _____

Form or Type: _____
platy _____
prismatic _____
columnar _____
blocky _____
angular blocky _____
subangular blocky _____
granular _____
single grain _____
massive _____

MOTTLING:

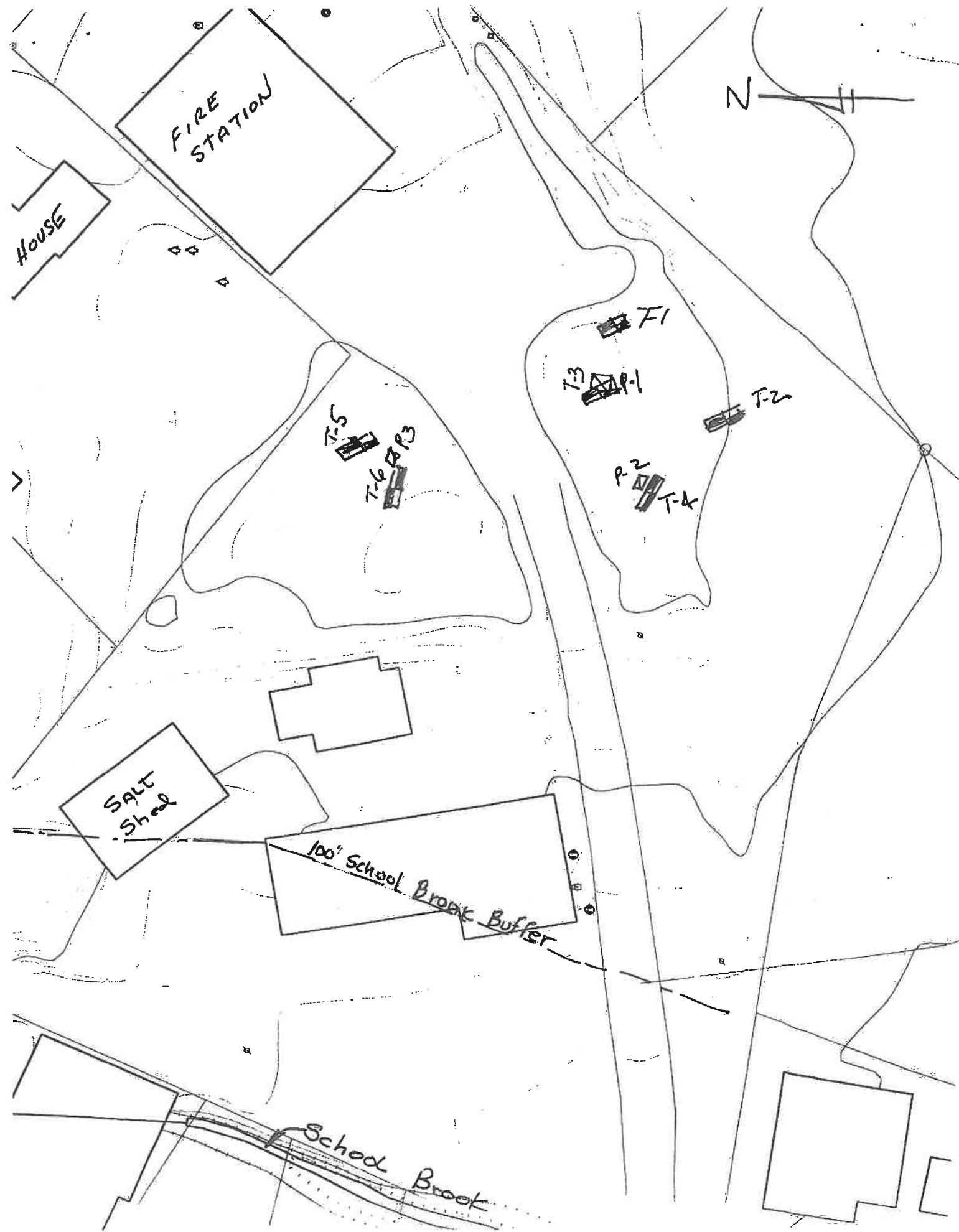
Abundance: _____
few _____
common _____
many _____

Size: _____
fine _____
medium _____
coarse _____

Contrast: _____
faint _____
distinct _____
prominent _____

CONSISTENCE:

Moist soil: _____
loose _____
very friable _____
friable _____
firm _____
very firm _____
extremely firm _____
Dry soil: _____
loose _____
soft _____
slightly hard _____
hard _____
very hard _____
extremely hard _____





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FORM II - SOIL EVALUATOR FORM
Page 1 of 3

No. T-5

Date: _____

JOB FILE

Topo205

Commonwealth of Massachusetts
TOPSFIELD, Massachusetts

Soil Suitability Assessment for On-site Sewage Disposal

Performed By: Gordon Rogers Date: 5-4-0
Witnessed By: Joe Downing

Location Address or Lot # <u>School Ave</u>	Owner's Name, Address, and Telephone # <u>Roberta Knight.</u> <u>c/o Selectman</u> <u>8 W. Common</u> <u>Topsfield, ma</u>
New Construction <input type="checkbox"/> Repair <input checked="" type="checkbox"/>	

Office Review

Published Soil Survey Available: No ☐ Yes ☐
Year Published _____ Publication Scale _____ Soil Map Unit _____
Drainage Class _____ Soil Limitations _____
Surficial Geologic Report Available: No ☐ Yes ☐
Year Published _____ Publication Scale _____
Geologic Material (Map Unit) _____
Landform _____
Flood Insurance Rate Map: _____
Above 500 year flood boundary No ☐ Yes ☐
Within 500 year flood boundary No ☐ Yes ☐
Within 100 year flood boundary No ☐ Yes ☐
Wetland Area:
National Wetland Inventory Map (map unit) _____
Wetlands Conservancy Program Map (map unit) _____

Current Water Resource Conditions (USGS): Month

Range : Above Normal ☐ Normal ☐ Below Normal ☐

Other References Reviewed: _____



Location Address or Lot No. School Ave

On-site Review

Deep Hole Number T-5 Date: 5-4-01 Time: _____ Weather: Sunny 90°
 Location (identify on site plan) _____
 Land Use _____ Slope (%) A Surface Stones No
 Vegetation _____
 Landform _____
 Position on landscape (sketch on the back) _____
 Distances from:
 Open Water Body 7200 feet Drainage way _____ feet
 Possible Wet Area 7200 feet Property Line _____ feet
 Drinking Water Well _____ feet Other _____

DEEP OBSERVATION HOLE LOG*						
Depth from Surface (Inches)	Soil Horizon	Soil Texture (USDA)	Soil Color (Munsell)	Soil Mottling	Other (Structure, Stones, Boulders, Consistency, % Gravel)	
0-4	A	fsl	10YR 3/3		gr	mlt
4-54	C ₁	ls	7.5YR 6/6		gr	mlt
54-120	C ₂	gr-sl	7.5YR 6/6		gr	mlt

* MINIMUM OF 2 HOLES REQUIRED AT EVERY PROPOSED DISPOSAL AREA

Parent Material (geologic) Glacial till Depth to Bedrock: _____
 Depth to Groundwater: _____ Standing Water in the Hole: No Weeping from Pit Face: No
 Estimated Seasonal High Ground Water: 54"



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WAKEFIELD, MA 01880
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FORM 11 - SOIL EVALUATOR FORM
Page 3 of 3



DEP APPROVED FORM - 12/07/95

Location Address or Lot No. SCHOOL AVE
TOPSFIELD, MA

Determination for Seasonal High Water Table

Observation Hole Number: T-5
Method Used:

- ☐ Depth observed standing in observation hole inches
☐ Depth weeping from side of observation hole inches
☐ Depth to soil mottles, 54 inches
☐ Ground water adjustment feet

Index Well Number Reading Date Index well level
Adjustment factor Adjusted ground water level

Depth of Naturally Occurring Pervious Material

Does at least four feet of naturally occurring pervious material exist in all areas observed throughout the area proposed for the soil absorption system? No

If not, what is the depth of naturally occurring pervious material?

Certification

I certify that on Nov. 1994 (date) I have passed the soil evaluator examination approved by the Department of Environmental Protection and that the above analysis was performed by me consistent with the required training, expertise and experience described in 310 CMR 15.017

Signature [Signature] Date 5/4/01

DESCRIPTION OF HORIZONS

TEXTURE:

gravel
very coarse sand
coarse sand
sand
fine sand
very fine sand
loamy coarse sand
loamy sand
loamy fine sand
sandy loam
fine sandy loam
very fine sandy loam

gravelly sandy loam
loam
gravelly loam
stony loam
silt
silt loam
clay loam
silty clay loam
sandy clay loam
stony clay loam
silty clay
clay

STRUCTURE:

Grade:
structureless
weak
moderate
strong

Size:
very fine
fine
medium
coarse
very coarse

Form or Type:
platy
prismatic
columnar
blocky
angular blocky
subangular blocky
granular
single grain
massive

CONSISTENCE:

Not soil:
nonsticky
slightly sticky
sticky
very sticky
nonplastic
slightly plastic
plastic

Moist soil:
loose
very friable
friable
firm
very firm
extremely firm

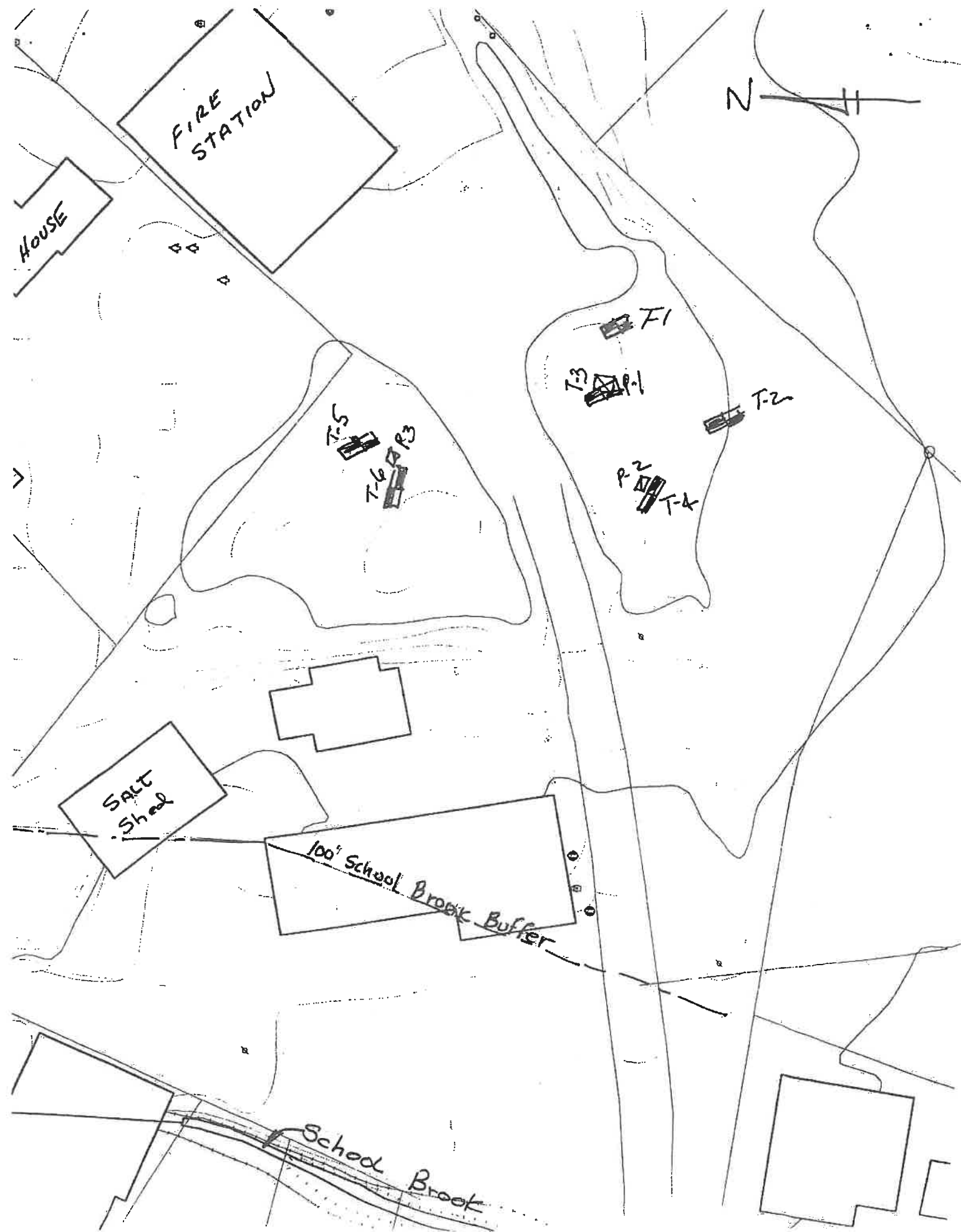
Dry soil:
loose
soft
slightly hard
hard
very hard
extremely hard

MOTTLING:

Abundance:
few
common
many

Size:
fine
medium
coarse

Contrast:
faint
distinct
prominent





Location Address or Lot No. School Ave

JOB FILE
Topo205 Topfield, Massachusetts
COMMONWEALTH OF MASSACHUSETTS

Percolation Test*		
Date: <u>5-4-01</u>		Time:
Observation Hole #	<u>P3</u>	
Depth of Perc	<u>48" / 16" = 64'</u>	
Start Pre-soak	<u>11:17</u>	
End Pre-soak		
Time at 12" @ 11"	<u>11:39</u>	
Time at 9" @	<u>1:09</u>	
Time at 6"	<u>90 min for 2 inches</u>	
Time (9"-6")		
Rate Min./Inch		

* Minimum of 1 percolation test must be performed in both the primary area AND reserve area.

Site Passed ☐ Site Failed ☒ Abandoned ☐

Performed By: Gordon Rogerson

Witnessed By: Joe Downing

Comments:





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FORM 11 - SOIL EVALUATOR FORM
Page 1 of 3

No. T-6

Date: _____

JOB FILE

TOPOZ05

Commonwealth of Massachusetts
TOPSFIELD, Massachusetts

Soil Suitability Assessment for On-site Sewage Disposal

Performed By: Gordon Rogers Date: 5-4-0
Witnessed By: Joe Downing

Location Address or Lot # <u>School Ave</u>	Owner's Name, Address, and Telephone # <u>Roberta Knight</u> <u>40 Selectman</u> <u>B.W. Common</u> <u>TOPSFIELD MA</u>
New Construction <input type="checkbox"/> Repair <input checked="" type="checkbox"/>	

Office Review

Published Soil Survey Available: No ☐ Yes ☐

Year Published _____ Publication Scale _____ Soil Map Unit _____

Drainage Class _____ Soil Limitations _____

Surficial Geologic Report Available: No ☐ Yes ☐

Year Published _____ Publication Scale _____

Geologic Material (Map Unit) _____

Landform _____

Flood Insurance Rate Map: _____

Above 500 year flood boundary No ☐ Yes ☐

Within 500 year flood boundary No ☐ Yes ☐

Within 100 year flood boundary No ☐ Yes ☐

Wetland Area:

National Wetland Inventory Map (map unit) _____

Wetlands Conservancy Program Map (map unit) _____

Current Water Resource Conditions (USGS): Month

Range: Above Normal ☐ Normal ☐ Below Normal ☐

Other References Reviewed: _____



Location Address or Lot No. School Ave

On-site Review

Deep Hole Number T-6 Date: 5-4-01 Time: _____ Weather: Sunny 90°
 Location (identify on site plan) _____
 Land Use _____ Slope (%) A Surface Stones No
 Vegetation _____
 Landform _____
 Position on landscape (sketch on the back) _____
 Distances from:
 Open Water Body 7200 feet Drainage way _____ feet
 Possible Wet Area 7200 feet Property Line _____ feet
 Drinking Water Well _____ feet Other _____

DEEP OBSERVATION HOLE LOG							
Depth from Surface (Inches)	Soil Horizon	Soil Texture (USDA)	Soil Color (Munsell)	Soil Mottling	Other (Structure, Stones, Boulders, Consistency, % Gravel)		
0-18	A	fs	10YR 3/5		gr	mf	0/0/0
18-68	C ₁	ls	7.5YR 6/6		gl	mf	20/0/0
68-120	C ₂	grs	7.5YR 6/6		gr	mf	10/0/5/0

* MINIMUM OF 2 HOLES REQUIRED AT EVERY PROPOSED DISPOSAL AREA

Parent Material (geologic) Glacial till Depth to Bedrock: _____
 Depth to Groundwater: _____ Standing Water in the Hole: No Weeping from Pit Face: No
 Estimated Seasonal High Ground Water: 68"





Location Address or Lot No. SCHOOL AVE
TOPSFIELD, MA

Determination for Seasonal High Water Table

Observation Hole Number: _____

Method Used: _____

- ☐ Depth observed standing in observation hole _____ inches
☐ Depth weeping from side of observation hole _____ inches
☐ Depth to soil mottles, 68 inches
☐ Ground water adjustment _____ feet

Index Well Number _____ Reading Date _____ Index well level _____

Adjustment factor _____ Adjusted ground water level _____

Depth of Naturally Occurring Pervious Material

Does at least four feet of naturally occurring pervious material exist in all areas observed throughout the area proposed for the soil absorption system? NO

If not, what is the depth of naturally occurring pervious material? _____

Certification

I certify that on Nov. 1994 (date) I have passed the soil evaluator examination approved by the Department of Environmental Protection and that the above analysis was performed by me consistent with the required training, expertise and experience described in 310 CMR 15.017.

Signature [Signature] Date 5/4/01

DESCRIPTION OF HORIZONS

TEXTURE:

gravel -----g
very coarse sand -----vcs
coarse sand -----cs
sand -----s
fine sand -----fs
very fine sand -----vfs
loamy coarse sand -----lcs
loamy sand -----ls
loamy fine sand -----lfs
sandy loam -----sl
fine sandy loam -----fsl
very fine sandy loam -----vfl

gravelly sandy loam -----gs
loam -----l
gravelly loam -----gl
stony loam -----sl
silt -----s
silt loam -----sl
clay loam -----cl
silty clay loam -----scl
sandy clay loam -----sc
stony clay loam -----stcl
silty clay -----sc
clay -----c

STRUCTURE:

Grade: -----
structureless -----0
weak -----1
moderate -----2
strong -----3

Size:

very fine -----vf
fine -----f
medium -----m
coarse -----c
very coarse -----vc

Form or Type:

platy -----pl
prismatic -----pr
columnar -----cpr
blocky -----bk
angular blocky -----abk
subangular blocky -----sbk
granular -----gr
single grain -----sg
massive -----m

CONSISTENCE:

Not soil: -----
nonsticky -----nso
slightly sticky -----ss
sticky -----s
very sticky -----vss
nonplastic -----npo
slightly plastic -----spo
plastic -----p

Moist soil:

loose -----sl
very friable -----svfr
friable -----fr
firm -----fl
very firm -----svfl
extremely firm -----svfl

Dry soil:

loose -----dl
soft -----ds
slightly hard -----dsh
hard -----dh
very hard -----dvh
extremely hard -----dsh

MOTTLING:

Abundance: -----
few -----f (0-25)
common -----c (25-50)
many -----m (50-100)

Size:

fine -----f
medium -----m
coarse -----c

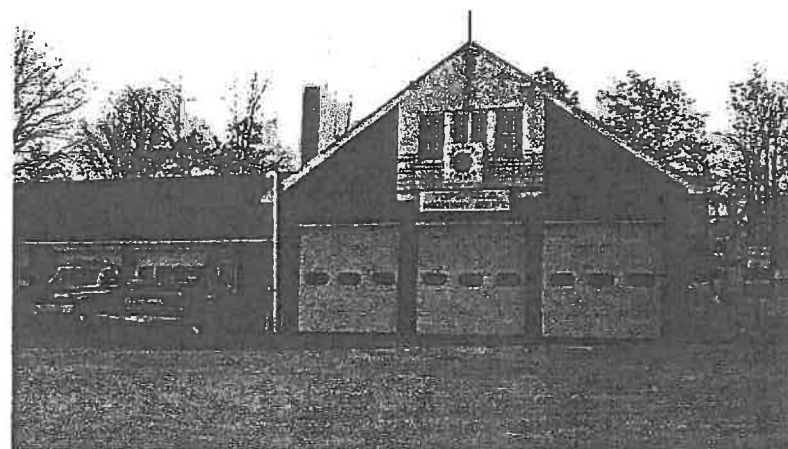
Contrast:

faint -----f
distinct -----d
prominent -----p



LIMITED SUBSURFACE INVESTIGATION REPORT

**FORMER HIGHWAY DEPARTMENT GARAGE
INJECTION WELL AREA**



Picture of the Former Highway Department Garage w/ Floor Drain

Prepared for:
Mr. David Bond, Highway Superintendent
Town of Topsfield
Department of Public Works
279 Boston Street
Topsfield, MA 01983

CSE Project No. 2000.34

January 3, 2001

Oil & Hazardous Waste Assessment & Cleanup Professionals

POST OFFICE BOX 591, IPSWICH, MA 01938

Voice: 978.356.1177 Fax: 978.356.1849 E-mail: info@cleansoils.com Web site: <http://www.cleansoils.com>

1.0 INTRODUCTION

Clean Soils Environmental, Ltd. (CSE) is pleased to submit this report to the Town of Topsfield (the "Client") concerning the results of a Limited Subsurface Investigation (Investigation) conducted during the months of November and December 2000 at the former Topsfield Highway Department maintenance garage on School Avenue in Topsfield, hereafter referred to as the "Property".

The area of the Property impacted by contamination (discussed below) will hereafter be referred to as the "Disposal Site." The approximate location of the Disposal Site is shown on Figure 1 in Appendix A. The investigation was associated with the closure of a Class V injection well located in front of the garage, adjacent to the School Brook. This injection well served as the discharge for one floor drain located inside the garage. The injection well system includes one floor drain, oil/water separator, cesspool, and vent according to Mr. David Bond, Highway Superintendent. The approximate location of the injection well system is shown on Figure 1 in Appendix A. Photographs 1, 3, and 4 in Appendix E show the locations of the floor drain, oil/water separator, and injection well at the Property.

CSE was informed by Mr. Bond that the floor drain and the oil/water separator both have concrete walls and a floor. Therefore, contamination entering the floor drain can only discharge to the environment via the injection well (cesspool). Thus, this investigation focused on the area in the vicinity of the injection well.

2.0 BACKGROUND

On October 29, 1999, the Department of Environmental Protection (DEP) conducted a compliance audit at the Property. On December 7, 1999, DEP issued a Notice of Noncompliance (NON) for violations of 310 CMR 30.00 (Hazardous Waste regulations) and 310 CMR 27.00 (Industrial Wastewater regulations). A copy of the NON is provided in Appendix F. CSE understands that the Hazardous Waste issues have been resolved while the Industrial Wastewater issue has not. The remaining Industrial Wastewater

issue concerns one injection well, referred to in the NON as a "cesspool", which is connected to a floor drain inside the garage via an oil/water separator. According to 310 CMR 27.05, the cesspool constitutes a Class V injection well. According to 310 CMR 27.04, the Class V injection well at the Property is prohibited and therefore must be closed. Since the Topsfield Highway Department has been in the process of relocating from this garage to another facility, CSE understands that the DEP has extended the Town's compliance deadlines. The location of the floor drain, oil/water separator and injection well at the Property are shown on Figure 1 in Appendix A.

A DEP Site Scoring Map showing sensitive environmental areas in the vicinity of the injection well is provided as Figure 2 in Appendix A. In addition, Mr. Bond informed CSE that the Property is not located within a Zone I, II, or III of the Town Drinking Water Supply. Furthermore, Mr. Bond informed CSE that School Brook is not a tributary to a Class A Surface Water Body. Therefore, CSE has determined based on this information that groundwater in the area of the Property is not used for drinking water.

On November 7, 2000, CSE visited the Property to observe the floor drain system that included an oil/water separator and a Class V injection well. The floor drain is no longer in use, and CSE was informed that the walls and bottom of the floor drain and the oil/water separator are tight concrete subsurface containers and thus are not themselves injection wells. The oil/water separator has been cleaned out and the pipe leading to the Class V injection well has been sealed, according to Mr. Bond.

The close proximity of School Brook (a perennial stream located approximately 45 feet downgradient from the injection well) suggested that the water table was shallow in the area of the injection well. If significant contamination had entered the injection well and was subsequently discharged to the environment, it would have likely impacted soil and groundwater in the vicinity of the injection well and may have reached School Brook.

CSE therefore conducted an investigation of soil and groundwater in the immediate vicinity and downgradient of the injection well. The purpose of this limited subsurface investigation was to determine if a DEP Reportable Condition existed at this portion of

the Property. The investigation was conducted under the approval of the Topsfield Conservation Commission via Emergency Certification. A copy of this Emergency Certification is included in Appendix F.

3.0 LIMITED SUBSURFACE SITE INVESTIGATION

The limited subsurface investigation included the advancement of soil borings, collection of soil samples for field screening and laboratory analysis, installation/development of groundwater monitoring wells, collection of groundwater samples, and laboratory analysis of collected groundwater. The main purpose of this investigation was to determine if the discharge from the floor drain significantly contaminated soil and/or groundwater in the vicinity of the injection well shown on Figure 1 in Appendix A.

3.1 *Advancement Of Soil Borings*

On November 30, 2000, Soil Exploration Corp. of Leominster, MA, under the direction and oversight of CSE, advanced eight soil borings (identified as B1 through B8) via Direct Push Drilling Technology at the Property.

All soil borings were advanced to a maximum depth of 11 feet below the ground surface except for soil boring B1, which was advanced to 14 feet below the ground surface.

The locations of all borings at the Property are shown on Figure 1 in Appendix A.

3.2 *Collection Of Soil Samples For Field Screening Analysis*

On November 30, 2000, CSE collected 37 soil samples at the Property. These soil samples were collected at 2-foot intervals continuously from each soil boring (soil borings B1 – B8) as it was advanced. These soil samples were screened for Total Organic Vapors (TOV) with a Photoionization Detector (PID) using the Headspace Screening Procedure enclosed in Appendix F. TOV readings ranged from 0.0 – 2.0 parts per million by volume (ppmv). The majority of the TOV readings were 0 ppmv.

The headspace screening results are shown on Table 1 in Appendix B. The PID results also appear in the field boring logs provided in Appendix C.

3.3 Collection Of Soil Samples For Laboratory Analysis

On November 30, 2000, CSE collected three soil samples (i.e., one soil sample from soil borings B1, B6, and B8) for laboratory analysis. The soil sample collected from B1, closest to and downgradient of the injection well, was analyzed for Volatile Petroleum Hydrocarbons (VPH), Extractable Petroleum Hydrocarbons (EPH) fractions with target analytes, RCRA-8 Metals, Volatile Organic Compounds (VOCs), and Polychlorinated Biphenyls (PCBs). The gravel (believed to be fill) at soil boring B2 was too loose to obtain a sufficient sample. Therefore, a soil sample for laboratory analysis was collected from soil boring B8 instead. A soil sample was also collected from soil boring B6 to evaluate the downgradient migration of contamination toward School Brook from the injection well. The results of the field headspace screening indicated that significant TOVs were not present in the soil obtained from soil boring B6 and B8. Therefore, these samples were only analyzed for EPH, VOCs, and RCRA-8 Metals. Laboratory analyses were conducted by Groundwater Analytical Laboratories of Buzzards Bay, MA.

Please see Table 1 in Appendix B for the analysis performed on each sample and Table 2 in Appendix B for the corresponding tabulated laboratory soil results. Photographs 5 and 6 taken during the Investigation are provided in Appendix E and show the soil from 3 to 7 feet below the ground surface collected from soil borings B4 and B6.

3.4 Installation And Sampling Of Small Diameter Monitoring Wells

On November 30, 2000, soil borings B1, B5, and B7 were converted to ¾-inch inner-diameter monitoring wells identified as MW1, MW2, and MW3, respectively. Monitoring well MW1 was installed directly next to and downgradient from the injection well. Monitoring wells MW2 and MW3 were installed to assess groundwater downgradient of the injection well.

Monitoring wells were installed by Soil Exploration, a Massachusetts Certified Well Driller. The monitoring wells were constructed of 0.010-inch machine slotted, small-diameter PVC well screen and solid PVC riser. The top and bottom of the well screen was installed approximately 5 feet above and 5 feet below the water table, respectively. The water table was approximately 5 feet below the ground surface in the area of the injection well. The annular space around the screen was filled with #2 sand to at least one foot above the well screen. A watertight locking road box was installed at each monitoring well location. A concrete seal was installed around the road box to complete the installation of each monitoring well. Figure 1 in Appendix A shows the locations of these three monitoring wells at the Property.

3.5 Development Of Monitoring Wells

On November 30, 2000, CSE developed the three monitoring by removing at least three well volumes of groundwater from each monitoring well. The purpose of this well development was to remove silt and to enhance the hydraulic connection between the well screen, filter pack, and the aquifer.

CSE used a peristaltic pump with dedicated tubing to remove the groundwater from monitoring wells MW1, MW2, and MW3.

3.6 Collection Of Groundwater Samples From The Monitoring Wells for Laboratory Analysis

On December 6, 2000, CSE collected a total of three groundwater samples (identified as MW1, MW2 and MW3), one from each of the three monitoring well at the Property.

CSE used a battery-operated peristaltic pump and dedicated HDPE tubing to purge three well volumes from the monitoring wells. The purging was conducted to remove stagnant groundwater from the monitoring wells prior to sampling.

Following purging, CSE collected a groundwater sample from each monitoring well. The groundwater samples were collected in laboratory grade sample bottles

using a peristaltic pump and dedicated tubing. The purged groundwater from each monitoring well was discharged back into the monitoring well from which it was purged following sample collection.

Evidence of contamination (i.e., petroleum sheen or odors) was not observed on the groundwater during sampling. Therefore, it is unlikely that significant VPH parameters are present in the groundwater at the Property, and therefore VPH analysis was not conducted on the groundwater samples. However, the three groundwater samples were analyzed for EPH, VOCs, and Total RCRA-8 Metals. The groundwater samples were collected without filtering and analyzed for Total RCRA-8 Metals as a conservative measure.

It should be noted that VPH target analytes are also included in the VOCs target compound list. Groundwater analyses were conducted by Groundwater Analytical Laboratories of Buzzards Bay, MA. Please see Table 3 in Appendix B for a summary of the groundwater analytical results. Copies of the Laboratory reports are provided in Appendix D.

3.7 Collection Of An Additional Groundwater Sample From Monitoring Well MW1 For Laboratory Analysis

In accordance with 310 CMR 40.0317(14) groundwater may be re-sampled if the sampling procedure employed did not accurately characterize site conditions. In this case, the Total RCRA-8 Metals analysis conducted on the unfiltered groundwater sample collected on December 6, 2000 from monitoring well MW1 did not accurately characterize the concentrations of metals *dissolved* in the groundwater at the Property.

Therefore, on December 15, 2000, an additional groundwater sample was collected from monitoring well MW1 using the method described in Section 3.6 of this report. However, unlike the groundwater sample collected on December 6, 2000 from monitoring well MW1, this groundwater sample was filtered in the field to remove excess sediment and was analyzed for *dissolved* rather than *total* RCRA-8 Metals. The Dissolved RCRA-8 Metals analysis accurately identifies

the concentrations of metals actually dissolved in the groundwater, which can migrate off-site.

The Total RCRA-8 Metals analysis conducted on groundwater collected from MW1 on December 6, 2000 indicated that a DEP 120-day reportable condition might be present in groundwater at the Property due to elevated concentrations of total lead. However, according to 310 CMR 40.0362(1), the DEP 120-day reportable conditions for groundwater are based on *dissolved* (rather than total) concentrations of contaminants in groundwater. Therefore, the results from the Dissolved RCRA-8 Metals analysis on groundwater collected from monitoring well MW1 on December 15, 2000 demonstrate that there is not a 120-day reportable condition for any of the 8 metals included in the Dissolved RCRA-8 Metals analysis. This analysis was also conducted by Groundwater Analytical Laboratories of Buzzards Bay, MA. Please see Table 3 in Appendix B for a summary of the groundwater analytical results. Copies of the Laboratory reports are provided in Appendix D.

4.0 DISPOSAL SITE

The investigation determined that the Disposal Site is relatively small as compared to what was assumed in CSE's proposal for this project. The Disposal Site was determined by this investigation to be localized in the immediate vicinity of the injection well. Therefore, the Disposal Site does not include School Brook as originally assumed. The location and approximate size of the Disposal Site is shown on Figure 1 in Appendix A.

A thin layer of impacted soil (approximately 4 inches thick and dark brown) was noted in the immediate vicinity of the injection well (see Photographs 5 and 6 in Appendix E). This layer of impacted soil was encountered at a depth of approximately 5 feet below the ground surface, which corresponds to the approximate depth of the water table. CSE did not note a petroleum odor on this impacted layer, but a septic odor was noted. All jar-headspace field screening results conducted on this impacted layer of soil were below 10 ppmv.

The investigation also determined that groundwater in not part of the Disposal Site and that groundwater has not been significantly impacted.

5.0 DEPARTMENT OF ENVIRONMENTAL PROTECTION REPORTABLE CONDITION

CSE tabulated the laboratory soil and groundwater data on Tables 2 and 3 in Appendix B and compared the results to their applicable DEP Reportable Concentrations in accordance with 310 CMR 40.1600. The RCS-1 Reportable Concentrations for soil apply because the release area is within 500 feet of a residence. Since the Disposal Site is not a potential drinking water source, according to the Town of Topsfield and Figure 2 (i.e., GIS Map), the RCGW-2 Reportable Concentrations for groundwater apply.

Although the concentrations of contaminants present in the vicinity of the injection well were lower than what might be expected, there were two exceedances of the DEP RCS-1 Reportable Concentrations. The concentration of the C₁₁-C₂₂ aromatic EPH fraction detected in soil from soil boring B1, 210 milligrams per kilogram (mg/kg), exceeded the RCS-1 Reportable Concentration of 200 mg/kg. The arsenic concentration in soil of 32 mg/kg from soil boring B6 also exceeded the RCS-1 Reportable Concentration of 30 mg/kg.

The above mentioned data indicates that a DEP 120-day reportable condition was discovered at the Property according to DEP regulations 310 CMR 40.0361. Therefore, notification to the DEP will be required within 120 days from December 15, 2000 (the time of knowledge of the reportable condition) unless the Town of Topsfield conducts a Limited Removal Action (LRA) according to 310 CMR 40.0318 before such time.

6.0 LIMITED REMOVAL ACTION

In this case, an LRA would include the excavation, removal, and disposal of the impacted soil. CSE would anticipate the excavation and removal of approximately 5 to 10 tons of contaminated soil. Removal of groundwater would also likely be required since the

contaminated soil is in the vicinity of the water table. At this time, CSE would propose re-injecting the groundwater back into the ground after completing the LRA.

However, CSE understands that the Town of Topsfield would like to leave the contamination in-place, if possible, without conducting an LRA. Therefore, CSE has prepared the following recommendations (see Section 8.0) to attempt to achieve this goal.

7.0 LICENSED SITE PROFESSIONAL OPINION

The investigation determined that a 120-day reportable condition for soil exists at the Property in the immediate vicinity of the injection well. The concentration of the C₁₁-C₂₂ aromatic EPH fraction at soil boring B1 of 210 mg/kg exceeds the applicable DEP 120-day Reportable Concentration of 200 mg/kg, and the arsenic concentration at soil boring B6 of 32 mg/kg exceeds the Reportable Concentration of 30 mg/kg. However, a reportable condition for groundwater was not discovered at the Property.

Furthermore, the Disposal Site is relatively small both horizontally and vertically which may indicate that the oil/water separator for the floor drain system was functioning as designed and pretreated the industrial wastewater from the floor drain before being injected into the ground via the injection well.

Nevertheless, the above data indicates that written notification must be filed with the DEP's Northeast Regional Office by April 14, 2001. However, no notification to DEP is required if the Disposal Site is cleaned up under an LRA, according to 310 CMR 40.0318, prior to April 14, 2001. DEP designed LRAs to clean up small reportable releases that impacted soil only. LRAs cannot be used if a reportable condition exists in groundwater.

However, since the concentration of contamination at the Property is relatively low (just above the DEP Reportable Concentrations), CSE will make the following recommendations to attempt to close this case without conducting an LRA or any excavation at the Property.

8.0 RECOMMENDATIONS

Additional work will be required to address the 120-Day reportable condition at the Property. This additional work will include limited additional assessment of soil at the bottom of the injection well. The outcome of this recommended work will be used to make a final determination if the contaminated soil can stay in-place without conducting an LRA to remove the reportable condition according to 310 CMR 40.0318. This recommendation is being made since CSE believes that the Town of Topsfield would prefer to leave the contamination in-place, if possible. Therefore, the additional testing of soil at the bottom of the injection well and the evaluation of the all of the data using a Method 1 Risk Characterization according to 310 CMR 40.0900 may determine that the contaminated soil can stay in-place without conducting an LRA.

However, notification to DEP will still be required and the preparation and submittal of a Class B-1 Response Action Outcome (RAO) Statement (i.e. Closure Report) would still be required if all goes well with this approach.

\$1700- The following recommendations include a strategy to conduct some limited additional testing to make a final determination on how to proceed with the closure of the injection well

1. As soon as possible (i.e., by January 15, 2001) collect one additional soil sample with a Hand Auger from the bottom of the injection well.
2. Laboratory analyze this soil sample for TOVs, EPH, VPH, VOCs, RCRA-8 Metals, and PCBs. This recommendation assumes that all of the sludge in the bottom of the injection well is removed giving CSE easy access the soil in the bottom of the injection well.
3. Conduct a Method 1 Risk Characterization to compare the average concentrations (i.e., the Exposure Point Concentration) in soil to the DEP Method 1 Risk Characterization Cleanup Standards, and

4. Prepare a letter report with the results of this additional proposed work at the Property. At this point, a final recommendation will be made to determine if the contaminated soil can be left in-place. It is possible, however, that the results of additional analysis from the bottom of the injection well are such that the Disposal Site cannot be closed without some form of remediation or cleanup.

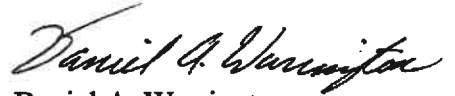
It is CSE's hope that the average concentration of soil contamination will allow the Town to leave the contaminated soil in-place. CSE is relatively confident that if the levels of petroleum and arsenic contamination in soil at the bottom of the injection well are not significantly elevated, the goal to attempt to close this case and the injection well will be achievable without conducting an LRA.

\$1700 } At your request, CSE will be happy to prepare an additional proposal to conduct the above recommendations.

If you have any questions, please do not hesitate to call.

Respectfully submitted,
CLEAN SOILS ENVIRONMENTAL, LTD.


William H. Mitchell, Jr., LSP
President


Daniel A. Warrington
Environmental Engineer

March 9, 2001

Ms. Amy Brewer, Data Entry Group
Department of Environmental Protection (DEP)
Bureau of Waste Site Cleanup
205 Lowell Street
Wilmington, MA 01887

Re Class B-1 Response Action Outcome Statement
Former Town of Topsfield Highway Department Garage
10 School Avenue
Topsfield, MA 01983
DEP RTN Not Yet Assigned 3-20554
CSE Project No. 2000.34

Dear Ms. Brewer


Clean Soils Environmental, Ltd. (CSE) is pleased to submit this Class B-1 Response Action Outcome (RAO) Statement regarding the above-referenced property. The following are enclosed:

- Release Notification Form (RNF) Transmittal Form (BWSC-103).
- RAO Submittal Form (BWSC-104), and
- Class B-1 RAO Statement (Written Report)

CSE has enclosed the original BWSC Transmittal Forms with original signature(s) in the attached plastic liner immediately following this cover letter for your administrative review. Therefore, please do not administratively review any other BWSC Transmittal Forms that could be attached to this submittal. Since this RAO is being submitted less than 120 days from Notification, the \$750.00 RAO filing fee is not required.

Respectfully submitted,
CLEAN SOILS ENVIRONMENTAL, LTD.


William H. Mitchell, Jr., LSP
President/Geologist


Daniel A. Warrington
Environmental Engineer


cc Mr. David Bond, Town of Topsfield Highway Superintendent

Oil & Hazardous Waste Assessment & Cleanup Professionals

POST OFFICE BOX 591, IPSWICH, MA 01938

Voice: 978-356-1177 Fax: 978-356-1849 E-mail: info@cleansoils.com Web site: http://www.cleansoils.com

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	Massachusetts Department of Environmental Protection Bureau of Waste Site Cleanup	BWSC-104
RESPONSE ACTION OUTCOME (RAO) STATEMENT & DOWNGRADIANT PROPERTY STATUS TRANSMITTAL FORM <small>Pursuant to 310 CMR 40.0180 (Subpart B), 40.0580 (Subpart E) & 40.1056 (Subpart J)</small>		<small>Release Tracking Number</small> 3-20554
A. SITE OR DOWNGRADIANT PROPERTY LOCATION:		
<small>Site Name: (optional)</small> _____		
<small>Street:</small> <u>10 School Avenue</u>		<small>Location Aid:</small> <u>Former Highway Dept. Garage</u>
<small>City/Town:</small> <u>Topsfield</u>		<small>ZIP Code:</small> <u>01983</u>
<input type="checkbox"/> Check here if this Site location is Tier Classified. If a Tier I Permit has been issued, state the Permit Number: _____		
<small>Related Release Tracking Numbers that this Form Addresses:</small> _____		
<small>If submitting an RAO Statement, you must document the location of the Site or the location and boundaries of the Disposal Site subject to this Statement. If submitting an RAO Statement for a PORTION of a Disposal Site, you must document the location and boundaries for both the portion subject to this submittal and, to the extent defined, the entire Disposal Site. If submitting a Downgradient Property Status Submittal, you must provide a site plan of the property subject to the submittal and, to the extent defined, the Disposal Site.</small>		
B. THIS FORM IS BEING USED TO: (check all that apply)		
<input checked="" type="checkbox"/> Submit a Response Action Outcome (RAO) Statement (complete Sections A, B, C, D, E, F, H, I, J and L).		
<input type="checkbox"/> Check here if this is a revised RAO Statement. Date of Prior Submittal: _____		
<input type="checkbox"/> Check here if any Response Actions remain to be taken to address conditions associated with any of the Releases whose Release Tracking Numbers are listed above. This RAO Statement will record only an RAO-Partial Statement for those Release Tracking Numbers.		
<small>Specify Affected Release Tracking Numbers:</small> _____		
<input type="checkbox"/> Submit an optional Phase I Completion Statement supporting an RAO Statement or Downgradient Property Status Submittal (complete Sections A, B, H, I, J, and L).		
<input type="checkbox"/> Submit a Downgradient Property Status Submittal (complete Sections A, B, G, H, I, J and K).		
<input type="checkbox"/> Check here if this is a revised Downgradient Property Status Submittal. Date of Prior Submittal: _____		
<input type="checkbox"/> Submit a Termination of a Downgradient Property Status Submittal (complete Sections A, B, I, J and L).		
<input type="checkbox"/> Submit a Periodic Review Opinion evaluating the status of a Temporary Solution (complete Sections A, B, H, I, J and L).		
<small>Specify one:</small> <input type="checkbox"/> For a Class C RAO <input type="checkbox"/> For a Waiver Completion Statement indicating a Temporary Solution		
<small>Provide Submittal Date of RAO Statement or Waiver Completion Statement:</small> _____		
<small>You must attach all supporting documentation required for each use of form indicated, including copies of any Legal Notices and Notices to Public Officials required by 310 CMR 40.1400.</small>		
C. DESCRIPTION OF RESPONSE ACTIONS: (check all that apply)		
<input checked="" type="checkbox"/> Assessment and/or Monitoring Only	<input type="checkbox"/> Deployment of Absorbent or Contaminant Materials	
<input type="checkbox"/> Removal of Contaminated Soils	<input type="checkbox"/> Temporary Covers or Caps	
<input type="checkbox"/> Re-use, Recycling or Treatment	<input type="checkbox"/> Bioremediation	
<input type="radio"/> On Site <input type="radio"/> Off Site Est. Vol.: _____ cubic yards	<input type="checkbox"/> Soil Vapor Extraction	
<small>Describe:</small> _____	<input type="checkbox"/> Structure Enclosure System	
<input type="checkbox"/> Landfill <input type="radio"/> Cover <input type="radio"/> Disposal Est. Vol.: _____ cubic yards	<input type="checkbox"/> Product or NAPL Recovery	
<input type="checkbox"/> Removal of Drums, Tanks or Containers	<input type="checkbox"/> Groundwater Treatment Systems	
<small>Describe:</small> _____	<input type="checkbox"/> Air Sparging	
<input type="checkbox"/> Removal of Other Contaminated Media	<input type="checkbox"/> Temporary Water Supplies	
<small>Specify Type and Volume:</small> _____	<input type="checkbox"/> Temporary Evacuation or Relocation of Residents	
<input type="checkbox"/> Other Response Actions	<input type="checkbox"/> Fencing and Sign Posting	
<small>Describe:</small> _____		
SECTION C IS CONTINUED ON THE NEXT PAGE.		

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Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC-104

RESPONSE ACTION OUTCOME (RAO) STATEMENT &
DOWNGRADE PROPERTY STATUS TRANSMITTAL FORM

Pursuant to 310 CMR 40.0180 (Subpart B), 40.0580 (Subpart E) & 40.1056 (Subpart J)

Release Tracking Number

3-20554

C. DESCRIPTION OF RESPONSE ACTIONS: (continued)

☐ Check here if any Response Action(s) that serve as the basis for this RAO Statement involve the use of Innovative Technologies. (DEP is interested in using this information to create an Innovative Technologies Clearinghouse.)

Describe Technologies: _____

D. TRANSPORT OF REMEDIATION WASTE: (if Remediation Waste was sent to an off-site facility, answer the following questions)

Name of Facility: _____

Town and State: _____

Quantity of Remediation Waste Transported to Date: _____

E. RESPONSE ACTION OUTCOME CLASS:

Specify the Class of Response Action Outcome that applies to the Site or Disposal Site. Select **ONLY** one Class:

☐ Class A-1 RAO: Specify one of the following:

☐ Contamination has been reduced to background levels. ☐ A Threat of Release has been eliminated.

☐ Class A-2 RAO: You **MUST** provide justification that reducing contamination to background levels is infeasible.

☐ Class A-3 RAO: You **MUST** provide both an implemented Activity and Use Limitation (AUL) and justification that reducing contamination to background levels is infeasible.

If applicable, provide the earlier of the AUL expiration date or date the design life of the remedy will end: _____

☒ Class B-1 RAO: Specify one of the following:

☐ Contamination is consistent with background levels ☒ Contamination is **NOT** consistent with background levels.

☐ Class B-2 RAO: You **MUST** provide an implemented AUL.

If applicable, provide the AUL expiration date: _____

☐ Class C RAO: ☐ Check here if you will conduct post-RAO Operation, Maintenance and Monitoring at the Site.

Specify One: ☐ Passive Operation and Maintenance ☐ Monitoring Only

☐ Active Operation and Maintenance (defined at 310 CMR 40.0006)

F. RESPONSE ACTION OUTCOME INFORMATION:

☐ If an RAO Compliance Fee is required, check here to certify that the fee has been submitted. You **MUST** attach a photocopy of the payment.

☐ Check here if submitting one or more AULs. You must attach an AUL Transmittal Form (BWSC-113) and a copy of each implemented AUL related to this RAO Statement. Specify the type of AUL(s) below: (required for all Class A-3 RAOs and Class B-2 RAOs)

☐ Notice of Activity and Use Limitation

☐ Grant of Environmental Restriction

Number of AULs attached: _____

Specify the Risk Characterization Method(s) used to achieve the RAO described above and all Soil and Groundwater Categories applicable to the Site.

More than one Soil Category and more than one Groundwater Category may apply at a Site.

Be sure to check off all **APPLICABLE** categories, even if more stringent soil and groundwater standards were met.

Risk Characterization Method(s) Used:

☒ Method 1

☐ Method 2

☐ Method 3

Soil Category(ies) Applicable:

☐ S-1

☐ S-2

☒ S-3

Groundwater Category(ies) Applicable:

☐ GW-1

☐ GW-2

☒ GW-3

> When submitting any Class A-1 RAO or a Class B-1 RAO where contamination is consistent with background levels, do **NOT** specify a Risk Characterization Method.

> When submitting any Class A-2 RAO or a Class B-1 RAO where contamination is **NOT** consistent with background levels, you cannot use an AUL to maintain a level of no significant risk. Therefore, you must meet S-1 Soil Standards, if using Risk Characterization Method 1.

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Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC-104

RESPONSE ACTION OUTCOME (RAO) STATEMENT &
DOWNGRADIANT PROPERTY STATUS TRANSMITTAL FORM
Pursuant to 310 CMR 40.0180 (Subpart B), 40.0580 (Subpart E) & 40.1056 (Subpart J)

Release Tracking Number

3-20554

G. DOWNGRADIANT PROPERTY STATUS SUBMITTAL:

☐ If a Downgradient Property Status Submittal Compliance Fee is required, check here to certify that the fee has been submitted. You MUST attach a photocopy of the payment.

☐ Check here if a Release(s) of Oil or Hazardous Material(s), other than that which is the subject of this submittal, has occurred at this property.

Release Tracking Number(s): _____

☐ Check here if the Releases identified above require further Response Actions pursuant to 310 CMR 40.0000.

Required documentation for a Downgradient Property Status Submittal includes, but is not limited to, copies of notices provided to owners and operators of both upgradient and downgradient abutting properties and of any known or suspected source properties.

H. LSP OPINION:

I attest under the pains and penalties of perjury that I have personally examined and am familiar with this transmittal form, including any and all documents accompanying this submittal. In my professional opinion and judgment based upon application of (i) the standard of care in 309 CMR 4.02(1), (ii) the applicable provisions of 309 CMR 4.02(2) and (3), and (iii) the provisions of 309 CMR 4.03(5), to the best of my knowledge, information and belief,

> if Section B indicates that a Downgradient Property Status Submittal is being provided, the response action(s) that is (are) the subject of this submittal (i) has (have) been developed and implemented in accordance with the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000, (ii) is (are) appropriate and reasonable to accomplish the purposes of such response action(s) as set forth in 310 CMR 40.0183(2)(b), and (iii) complies(y) with the identified provisions of all orders, permits, and approvals identified in this submittal;

> if Section B indicates that either an RAO Statement, Phase I Completion Statement and/or Periodic Review Opinion is being provided, the response action(s) that is (are) the subject of this submittal (i) has (have) been developed and implemented in accordance with the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000, (ii) is (are) appropriate and reasonable to accomplish the purposes of such response action(s) as set forth in the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000, and (iii) complies(y) with the identified provisions of all orders, permits, and approvals identified in this submittal.

I am aware that significant penalties may result, including, but not limited to, possible fines and imprisonment, if I submit information which I know to be false, inaccurate or materially incomplete.

☒ Check here if the Response Action(s) on which this opinion is based, if any, are (were) subject to any order(s), permit(s) and/or approval(s) issued by DEP or EPA. If the box is checked, you MUST attach a statement identifying the applicable provisions thereof.

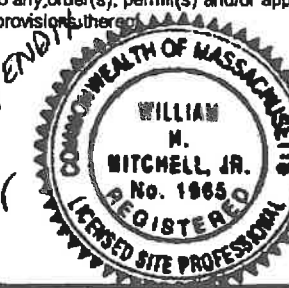
LSP Name: William H. Mitchell, Jr. LSP #: 1965 Stamp:

Telephone: (978) 356-1177 Ext.: _____

FAX (optional): (978) 356-1849

Signature: _____

Date: 3/9/01



I. PERSON MAKING SUBMITTAL:

Name of Organization: Town of Topsfield Highway Department

Name of Contact: David Bond Title: Highway Superintendent

Street: 279 Boston Street

City/Town: Topsfield State: MA ZIP Code: 01983

Telephone: (978) 887-1542 Ext.: _____ FAX (optional): (978) 887-1543

J. RELATIONSHIP TO SITE OF PERSON MAKING SUBMITTAL: (check one)

☒ RP or PRP Specify: ☒ Owner ☐ Operator ☐ Generator ☐ Transporter Other RP or PRP: _____

☐ Fiduciary, Secured Lender or Municipality with Exempt Status (as defined by M.G.L. c. 21E, s. 2)

☐ Agency or Public Utility on a Right of Way (as defined by M.G.L. c. 21E, s. 5(j))

☐ Any Other Person Submitting This Form Specify Relationship: _____

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Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC-104

RESPONSE ACTION OUTCOME (RAO) STATEMENT &
DOWNGRAIDENT PROPERTY STATUS TRANSMITTAL FORM
Pursuant to 310 CMR 40.0180 (Subpart B), 40.0580 (Subpart E) & 40.1056 (Subpart J)

Release Tracking Number

3-20554

K. CERTIFICATION OF PERSON SUBMITTING DOWNGRAIDENT PROPERTY STATUS SUBMITTAL:

I, _____, attest under the pains and penalties of perjury (i) that I have personally examined and am familiar with the information contained in this submittal, including any and all documents accompanying this transmittal form; (ii) that, based on my inquiry of the/those individual(s) immediately responsible for obtaining the information, the material information contained herein is, to the best of my knowledge, information and belief, true, accurate and complete; (iii) that, to the best of my knowledge, information and belief, the person(s) or entity(ies) on whose behalf this submittal is made satisfy(ies) the criteria in 310 CMR 40.0183(2); (iv) that the person(s) or entity(ies) on whose behalf this submittal is made have provided notice in accordance with 310 CMR 40.0183(5); and (v) that I am fully authorized to make this attestation on behalf of the person(s) or entity(ies) legally responsible for this submittal. The person(s) or entity(ies) on whose behalf this submittal is made is/are aware that there are significant penalties, including, but not limited to, possible fines and imprisonment, for willfully submitting false, inaccurate, or incomplete information.

By: _____ Title: _____
(signature)

For: _____ Date: _____
(print name of person or entity recorded in Section I)

Enter address of the person providing certification, if different from address recorded in Section I:

Street: _____

City/Town: _____ State: _____ ZIP Code: _____

Telephone: _____ Ext.: _____ FAX: (optional) _____

L. CERTIFICATION OF PERSON MAKING SUBMITTAL:

If you are completing only a Downgradient Property Status Submittal, you do not need to complete this section of the form.

I, David Bond, attest under the pains and penalties of perjury (i) that I have personally examined and am familiar with the information contained in this submittal, including any and all documents accompanying this transmittal form; (ii) that, based on my inquiry of those individuals immediately responsible for obtaining the information, the material information contained in this submittal is, to the best of my knowledge and belief, true, accurate and complete, and (iii) that I am fully authorized to make this attestation on behalf of the entity legally responsible for this submittal. The person or entity on whose behalf this submittal is made am/is aware that there are significant penalties, including, but not limited to, possible fines and imprisonment, for willfully submitting false, inaccurate, or incomplete information.

By: David M. Bond Title: Highway Superintendent
(signature)

For: Town of Topsfield Highway Department Date: 3-15-01
(print name of person or entity recorded in Section I)

Enter address of the person providing certification, if different from address recorded in Section I:

Street: _____

City/Town: _____ State: _____ ZIP Code: _____

Telephone: _____ Ext.: _____ FAX: (optional) _____

YOU MUST COMPLETE ALL RELEVANT SECTIONS OF THIS FORM OR DEP MAY RETURN THE DOCUMENT AS INCOMPLETE. IF YOU SUBMIT AN INCOMPLETE FORM, YOU MAY BE PENALIZED FOR MISSING A REQUIRED DEADLINE, AND YOU MAY INCUR ADDITIONAL COMPLIANCE FEES.



CLASS B -1 RESPONSE ACTION OUTCOME STATEMENT

In accordance with the Massachusetts Contingency Plan (MCP)

For

Town of Topsfield Highway Department
Former Highway Department Garage
10 School Avenue
Topsfield, MA 01983

Release Tracking Number (Not Yet Assigned)



Prepared for:
Town of Topsfield Highway Department
279 Boston Street
Topsfield, MA 01983

CSE Project No. 2000.34

March 9, 2001

Oil & Hazardous Waste Assessment & Cleanup Professionals

POST OFFICE BOX 591 IPSWICH, MA 01938
Voice: 978-356-1177 Fax: 978-356-1849 E-mail: info@cleansoils.com Web site: <http://www.cleansoils.com>

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DETAILS

1.0 EXECUTIVE SUMMARY

Clean Soils Environmental, Ltd. (CSE) is pleased to submit this Class B-1 Response Action Outcome (RAO) Statement for the property at 10 School Avenue in Topsfield, MA, hereafter referred to as the "Property". A Class B-1 RAO can be submitted when a reporting condition according to 310 CMR 40.0315 is discovered and neither remedial actions nor an Activity and Use Limitation is required to achieve or maintain a level of "No Significant Risk" according to 310 CMR 40.1045.

The location of the Property is shown on Figure 1 in Appendix A. The approximate location of the portion of the Property impacted by a release of oil and/or hazardous materials (OHM) from a floor-drain, hereafter referred to as the "Disposal Site", is shown on Figure 3 in Appendix A.

The Property is the former Town of Topsfield Highway Department Garage that was used by the Topsfield Highway Department until their recent move to a different location. The Property is currently vacant.

On October 29, 1999, the DEP Northeast Regional Office conducted a compliance audit at the Property and determined that untreated industrial effluent was being illegally discharged to the environment from the floor drain in the garage building that discharged through an oil/water separator to a Class V injection well. Please see Appendix F for a copy of the Notice of Noncompliance that was mailed to the Town of Topsfield documenting the above mentioned injection well.

On February 10, 2000, Safety-Kleen of Marlborough, MA removed 166 gallons of oily sludge (MADEP MA01 waste) from the oil/water separator at the Property under manifest number MAM086821. This action was conducted in conformance with DEP's 1994 guidance entitled *Massachusetts Closure Requirements for Shallow Injection Wells*.

On November 7, 2000, Safety-Kleen removed 600 gallons of oily sludge (MADEP MA01 waste) from the injection well at the Property under manifest number MAM396581. This action was conducted in conformance with DEP's 1994 guidance entitled *Massachusetts Closure Requirements for Shallow Injection Wells*.

On November 30, 2000, CSE conducted a Limited Subsurface Investigation at the Property to determine whether historic discharges to the injection well significantly impacted the environment. The Limited Subsurface Investigation included the advancement of soil borings and the installation of monitoring wells in the vicinity of the injection well. The Limited Subsurface Investigation determined that a 120-day DEP Reportable Condition existed at the Property due to levels of contamination detected in soil. However, the concentrations of the two contaminants detected above their reportable concentrations only slightly exceeded their respective Reportable Concentrations.

On January 24, 2001, CSE collected a soil sample from the bottom of the injection well at the Property. This soil sample was laboratory analyzed and the results were used along with the laboratory results from the November 30, 2000 Limited Subsurface Investigation to determine the exposure point concentration (EPC) in soil for the detected contaminants. In this case, the EPC for detected contaminants were below DEP's conservative Method 1 Risk Characterization Cleanup Standards which indicates that a conditions of "No Significant Risk" exist at the Disposal Site without conducting any remedial actions.

2.0 DISPOSAL SITE LOCATION AND DESCRIPTION

The Property is the former Topsfield Highway Department Garage located at 10 School Avenue in Topsfield, MA and is located in a mixed commercial/residential area. The building at the Property is a brick garage building with 7 bays.

Subsurface soils at the Property consist of sandy fill, silty sand, and sandy silt. The closest open water body to the Disposal Site is School Brook which is a small (approximately 4 feet wide) culverted brook that flows from north to south and is located approximately 50 feet to the west of the injection well at the Property. School Brook feeds into the Ipswich River approximately one mile southeast of the Property. Please see Figures 1 and 2 in Appendix A for the approximate location of the Property and School Brook. Please see Figure 3 in Appendix A for the approximate location of the Disposal Site at the Property.

3.0 DESCRIPTION OF THE RELEASE

CSE has determined, with input from David Bond (Town of Topsfield Highway Superintendent) that the source of the release at the Property is fuel and motor oil that has dripped into the floor drain from Highway Vehicles parked in the garage. Mr. Bond said that vehicles were sometimes washed in the garage. According to Mr. Bond, the floor drain was hooked up to the oil/water separator and to the injection well when it was installed approximately 20 years ago. Therefore, CSE believes that the source of the release at the Property has been ongoing for approximately the last 20 years. Please see Figure 3 in Appendix A for a Limited Site Plan showing the location of the floor drain, injection well, and oil/water separator at the Property.

4.0 SUMMARY OF RESPONSE ACTIONS CONDUCTED

4.1 Identification of a Reportable Condition and Notification

The proximity of residences to the Property indicated that the RCS-1 MADEP Reportable Concentrations applied to soil at the Disposal Site. Laboratory results for soil samples B1 showed an exceedence of the RCS-1 Reportable Concentration for the C₁₁ – C₂₂ aromatic EPH fraction. Soil sample B6 exceeded the RCS-1 Reportable Concentration for Arsenic. Both exceedances were slight (see Table 2). This information was

provided to the Topsfield Highway Department (the PRP) in a letter report dated January 3, 2001. However, CSE verbally informed the PRP of the Reportable Condition before this letter report was delivered. Therefore, CSE is conservatively placing the Time of Knowledge for this release at December 8, 2000, which is the date that CSE received the laboratory reports showing the exceedances. Since a 120-day reporting condition exists at the Property, the DEP Notification deadline is April 6, 2001. This RAO submittal therefore contains a written release notification (form BWSC-103) for this release.

4.2 *Determination of Extent of Disposal Site*

On November 30, 2000, CSE conducted a Limited Subsurface Investigation to determine if the discharge from the floor drain significantly contaminated soil and/or groundwater in the vicinity of the injection well shown on Figure 3 in Appendix A. The Limited Subsurface Investigation included the advancement of soil borings, collection of soil samples for field screening and laboratory analysis, installation/development of groundwater monitoring wells, collection of groundwater samples, and laboratory analysis of collected groundwater.

4.2.1 *Advancement of Soil Borings*

On November 30, 2000, Soil Exploration Corp. of Leominster, MA, under the direction and oversight of CSE, advanced eight soil borings (identified as B1 through B8) via Direct Push Drilling Technology at the Property. (Please see Figure 3.)

All soil borings were advanced to a maximum depth of 11 feet below the ground surface except for soil boring B1, which was advanced to 14 feet below the ground surface.

The locations of all borings at the Property are shown on Figure 3 in Appendix A.

4.2.2 Collection of Soil Samples for Field Screening Analysis

On November 30, 2000, CSE collected 37 soil samples at the Property. These soil samples were collected at 2-foot intervals continuously from each soil boring (soil borings B1 – B8) as it was advanced. These soil samples were screened for Total Organic Vapors (TOV) with a Photoionization Detector (PID) using the Headspace Screening Procedure enclosed in Appendix G. TOV readings ranged from 0.0 – 2.0 parts per million by volume (ppmv). The majority of the TOV readings were 0 ppmv. Table 1 in Appendix A shows the sample name, headspace readings, date of collection, and the depth at which the 37 soil samples were collected at the Property.

4.2.3 Collection of Soil Samples for Laboratory Analysis

On November 30, 2000, CSE collected three soil samples (i.e., one soil sample from soil borings B1, B6, and B8) for laboratory analysis. The soil sample collected from B1, closest to and downgradient of the injection well, was analyzed for Volatile Petroleum Hydrocarbons (VPH), Extractable Petroleum Hydrocarbons (EPH) fractions with target analytes, RCRA-8 Metals, Volatile Organic Compounds (VOCs), and Polychlorinated Biphenyls (PCBs). The gravel (believed to be fill) at soil boring B2 was too loose to obtain a sufficient sample. Therefore, a soil sample for laboratory analysis was collected from soil boring B8 instead. A soil sample was also collected from soil boring B6 to evaluate the downgradient migration of contamination toward School Brook from the injection well. The results of the field

headspace screening indicated that significant TOVs were not present in the soil obtained from soil boring B6 and B8. Therefore, these samples were only analyzed for EPH, VOCs, and RCRA-8 Metals. Laboratory analyses were conducted by Groundwater Analytical Laboratories of Buzzards Bay, MA.

Please see Table 1 in Appendix B for the analysis performed on each sample and Table 2 in Appendix B for the corresponding tabulated laboratory soil results. Photographs 5 and 6 taken during the Limited Subsurface Investigation are provided in Appendix D and show the soil from 3 to 7 feet below the ground surface collected from soil borings B4 and B6.

4.2.4 Installation and Sampling of Small Diameter Monitoring Wells

On November 30, 2000, soil borings B1, B5, and B7 were converted to ¾-inch inner-diameter monitoring wells identified as MW1, MW2, and MW3, respectively. Monitoring well MW1 was installed directly next to and downgradient from the injection well. Monitoring wells MW2 and MW3 were installed to assess groundwater downgradient of the injection well.

Monitoring wells were installed by Soil Exploration, a Massachusetts Certified Well Driller. The monitoring wells were constructed of 0.010-inch machine slotted, small-diameter PVC well screen and solid PVC riser. The top and bottom of the well screen was installed approximately 5 feet above and 5 feet below the water table, respectively. The water table was approximately 5 feet below the ground surface in the area of the injection well. The annular space around the screen was filled with #2 sand to at least one foot above the well screen. A watertight locking road box was

installed at each monitoring well location. A concrete seal was installed around the road box to complete the installation of each monitoring well. Figure 3 in Appendix A shows the locations of these three monitoring wells at the Property. The monitoring well construction details are show in Appendix G.

4.2.5 Development of Monitoring Wells

On November 30, 2000, CSE developed the three monitoring by removing at least three well volumes of groundwater from each monitoring well. The purpose of this well development was to remove silt and to enhance the hydraulic connection between the well screen, filter pack, and the aquifer.

CSE used a peristaltic pump with dedicated tubing to remove the groundwater from monitoring wells MW1, MW2, and MW3.

4.2.6 Collection of Groundwater Samples for Laboratory Analysis

On December 6, 2000, CSE collected a total of three groundwater samples (identified as MW1, MW2 and MW3), one from each of the three monitoring wells at the Property.

CSE used a battery-operated peristaltic pump and dedicated HDPE tubing to purge three well volumes from the monitoring wells. The purging was conducted to remove stagnant groundwater from the monitoring wells prior to sampling.

Following purging, CSE collected a groundwater sample from each monitoring well. The groundwater samples were collected in laboratory grade sample bottles using a peristaltic pump and dedicated tubing. The purged groundwater from each monitoring

well was discharged back into the monitoring well from which it was purged following sample collection.

Evidence of contamination (i.e., petroleum sheen or odors) was not observed on the groundwater during sampling. Therefore, it is unlikely that significant VPH parameters are present in the groundwater at the Property, and therefore VPH analysis was not conducted on the groundwater samples. However, the three groundwater samples were analyzed for EPH, VOCs, and Total RCRA-8 Metals. The groundwater samples were collected without filtering and analyzed for Total RCRA-8 Metals as a conservative measure.

It should be noted that VPH target analytes are also included in the VOCs target compound list. Groundwater analyses were conducted by Groundwater Analytical Laboratories of Buzzards Bay, MA. Please see Table 3 in Appendix B for a summary of the groundwater analytical results. Copies of the laboratory reports are provided in Appendix C.

4.2.7 Collection of An Additional Groundwater Sample from MW1 for Laboratory Analysis

In accordance with 310 CMR 40.0317(14) groundwater may be re-sampled if the sampling procedure employed did not accurately characterize site conditions. In this case, the Total RCRA-8 Metals analysis conducted on the unfiltered groundwater sample collected on December 6, 2000 from monitoring well MW1 did not accurately characterize the concentrations of metals *dissolved* in the groundwater at the Property.

Therefore, on December 15, 2000, an additional groundwater sample was collected from monitoring well MW1 using the method described in Section 4.2.6 of this report. However, unlike the groundwater sample collected on December 6, 2000 from monitoring well MW1, this groundwater sample was filtered in the field to remove excess sediment and was analyzed for *dissolved* rather than *total* RCRA-8 Metals. The Dissolved RCRA-8 Metals analysis accurately identifies the concentrations of metals actually dissolved in the groundwater, which can migrate off-site.

The Total RCRA-8 Metals analysis conducted on groundwater collected from MW1 on December 6, 2000 indicated that a DEP 120-day reportable condition might be present in groundwater at the Property due to elevated concentrations of total lead. However, according to 310 CMR 40.0362(1), the DEP 120-day reportable conditions for groundwater are based on *dissolved* (rather than total) concentrations of contaminants in groundwater. Therefore, the results from the Dissolved RCRA-8 Metals analysis on groundwater collected from monitoring well MW1 on December 15, 2000 demonstrate that there is not a 120-day reportable condition for any of the 8 metals included in the Dissolved RCRA-8 Metals analysis. This analysis was also conducted by Groundwater Analytical Laboratories of Buzzards Bay, MA. Please see Table 3 in Appendix B for a summary of the groundwater analytical results. Copies of the laboratory reports are provided in Appendix C.

4.2.8 Collection of Soil Sample from Bottom of Injection Well

On January 24, 2001, CSE collected one soil sample (identified as "IW") from the bottom of the injection well at approximately 5.8 feet bgs. The soil sample was collected with a stainless steel hand

auger. CSE collected this soil sample in order to assess impact in the middle of the injection well to make a determination as to whether the contaminated soil at the Disposal Site was at a level of "No Significant Risk". Soil sample IW was screened in the field via Headspace Analysis for TOVs and was sent to Groundwater Analytical for laboratory analysis for EPH with Targets, VPH, VOCs by 8260B, RCRA-8 Metals, and PCBs. Please see Tables 1 & 2 in Appendix B for headspace and laboratory results. Copies of the laboratory reports are provided in Appendix C.

5.0 CONCEPTUAL SITE MODEL

The Limited Subsurface Investigation indicated that the Disposal Site is localized to the immediate vicinity of the injection well at the Property as shown on Figure 3 in Appendix A. A thin layer of impacted soil (approximately 4 inches thick) was observed in the immediate vicinity of the injection well (see Photographs 5 and 6 in Appendix D) from approximately 5 to 5.5 feet below the ground surface. This depth corresponds roughly to the top of the water table. Significant groundwater contamination was not observed in the vicinity of the injection well.

Therefore, the Disposal Site is relatively small both horizontally and vertically which may indicate that the oil/water separator for the floor drain system was functioning as designed and pretreated the effluent from the floor drain before it was injected into the ground via the injection well.

6.0 REMEDIAL WASTE MANAGEMENT

Remediation was not conducted and therefore no remedial waste has been generated.

7.0 METHOD 1 RISK CHARACTERIZATION

A Method 1 Risk Characterization may be used to characterize the risk of harm to health, public welfare, and the environment at disposal sites where assessments conducted in accordance with 310 CMR 40.0000 have determined that the presence of oil and/or hazardous material is limited to soil and/or groundwater. School Brook (surface water body) is close to the Disposal Site, however it is not part of the Disposal Site.

7.1 Contaminants of Concern (COC)

Contaminants of Concern (COC) are defined (in DEP's 1995 guidance document entitled "Guidance For Disposal Site Risk Characterization") as "*all chemicals detected at the site...*" The release at the Property was characterized as drippings of fuel and motor oil from Topsfield Highway Department vehicles garaged in the building. Since these may include gasoline, diesel fuel, and lubricating oil, a wide range of contaminants could have potentially been discharged to the Disposal Site. Therefore, laboratory analyses was conducted for VPH, EPH with Targets, 8 RCRA Heavy Metals, PCBs and Volatile Organic Compounds in accordance with the Massachusetts Underground Injection Control (UIC) Program guidance. On the basis of the results of laboratory analysis, the COC are identified as follows:

- EPH Fraction C₉ – C₁₈ Aliphatics,
- EPH Fraction C₁₉ – C₃₆ Aliphatics,
- EPH Fraction C₁₁ – C₂₂ Aromatics,
- Fluoranthene
- Pyrene
- Arsenic
- Chromium
- Barium

- Lead
- 1,1-Dichloroethane

The objective of the Limited Subsurface Investigation was to characterize the concentrations of the COC in the Disposal Site in order to determine if a condition of No Significant Risk existed.

7.2 Identification of Background Conditions

Background is defined in the MCP (310 CMR 40.0006) as those levels of oil and hazardous materials that would exist in the absence of the disposal site of concern which are:

- a) ubiquitous and consistently present in the environment at and in the vicinity of the disposal site of concern; and
- b) attributable to geologic or ecological conditions, atmospheric deposition, industrial process, engine emissions, fill materials containing wood or coal ash, and/or petroleum residues that are incident of the normal operation of motor vehicles.

The background levels of the COC in groundwater in the vicinity of the Disposal Site is conservatively taken to be non-detect.

Concentrations of the COC were also below detection limits in soil samples collected at comparable depth to the release in soil adjacent to the Disposal Site. Therefore, background concentrations of the COC in soil are also non-detect.

7.3 Determination of Applicable Soil and Groundwater Categories

The Disposal Site is located completely within the former Town of Topsfield Highway Department Garage property. The surrounding properties are mostly residential. The Disposal Site is located more than 3 feet below the ground surface and the surface of the Disposal Site is paved.

Children are generally not present at the DPW Yard and therefore the Disposal Site is classified as "Adults Only Present". Workers do not reside at the DPW yard but are present for 8-hour sifts at the Disposal Site. No digging, planting, or other soil intensive activities normally occur at the Disposal Site. The Disposal Site therefore has a low frequency and intensity of use. According to DEP regulations (310 CMR 40.0933(9)) soil at the Disposal Site is categorized as S-3.

The water table is less than 15 feet from the ground surface and the Disposal Site is greater than 30 feet from any occupied dwelling. The Disposal Site is not located in a drinking water resource area according to the GIS Map enclosed in Appendix A as Figure 2. Furthermore, municipal water serve the Property and surrounding area, and no private drinking water wells have been identified in the vicinity of the Property. Therefore, CSE has categorized groundwater as GW-3 at the Disposal Site.

7.4 Surrounding Receptors

The surrounding receptors to this release include construction or utility workers conducting excavation at the Disposal Site. Since the Disposal Site is localized, residents of abutting properties are not potential receptors.

7.4.1 Potential Human Receptors

The Property is not residential but some of the abutting parcels are residential and are located as close as 100 feet from the Disposal Site. The Limited Subsurface Investigation conducted by CSE determined that the extent of the Disposal Site did not extend outside of the Topsfield Highway Department Property, and therefore people living in nearby dwellings are not potential receptors.

In addition to construction workers, trespassers through the Property are also considered potential receptors for short-term exposures to the contamination.

7.4.2 Potential Environmental Receptors

School Brook (a small culverted brook) is located approximately 40 feet west of the Disposal Site. Potential environmental receptors are the plant and animal species that live in School Brook, or exist for a portion of their life cycle in the brook. Since the brook drains directly into the Ipswich River, plants and animals associated with the river are also potential environmental receptors.

However, the Disposal Site is localized and analytical results from soil/groundwater from borings/monitoring wells (i.e., B5/MW2 & B7/MW3) advanced between the Disposal Site and the brook demonstrate that impact to the brook is not likely.

7.5 Determination of Exposure Pathways

Exposure Pathways identified for the Disposal Site are as follows:

1. Contact with contaminated soil during possible future excavation.
2. Contact with groundwater during possible future excavation.

The Property as well as the immediate vicinity is served by municipal water. No private drinking water wells have been identified in the vicinity of the Property and the Property is not in a Zone II of a public drinking water supply. Therefore, drinking water is not considered an Exposure Pathway.

7.6 *Determination of Exposure Point Concentrations (EPC) and Comparison to the Cleanup Standards*

7.6.1 Soil

All the soil in the Disposal Site is categorized as S-3 soil. Therefore, one exposure point can be considered for soil. The results of soil samples submitted for confirmatory laboratory analysis are summarized in Table 2 of Appendix B. Copies of the laboratory results are provided in Appendix C. The soil sample locations are conservative (i.e. collected where the highest PID reading was recorded or where evidence of contamination was physically observed during drilling). All of the soil results can therefore be averaged together to calculate a set of exposure point concentrations for the COC. However, in this case, CSE was more conservative and did not average the results from soil samples B6 and B8 (both were non-detect) when calculating the EPC for the EPH hydrocarbon fractions.

The exposure point concentrations for the contaminants of concern were compared to the applicable S-3/GW-3 standards. Table 2 in Appendix B shows that the average exposure point concentration for the COC are below the S-3/GW-3 Method 1 Risk Characterization cleanup standards. The average exposure point concentrations are also compared to the S-1/GW-3 soil cleanup standards, which are protective of unrestricted use. The fact that the average exposure point concentrations meet the Method 1 S-1/GW-3 standards indicates that a condition of "No Significant Risk" has been achieved at the Disposal Site for soil without the use of an AUL.

7.6.2 Groundwater

CSE collected a groundwater sample from the three monitoring wells (MW1, MW2, and MW3) installed at the Property. Monitoring well MW1 was conservatively placed approximately 2 feet from the injection well (i.e., source of the release) between the injection well and School Brook.

The results of the groundwater analysis are compared to the applicable GW-3 standards on Table 3 in Appendix B. The concentrations of the COC detected in groundwater from each of the monitoring wells at the Disposal Site do not exceed the applicable Method 1 Risk Characterization cleanup standards and therefore groundwater does not constitute a significant risk to human or environmental receptors.

7.7 Risk of Harm to Safety

The present condition at the Property does not present a risk of harm to safety. In this case, the Method 1 Risk Characterization was used to show that the Disposal Site does not present a Significant Risk of harm to health, safety, public welfare, and the environment.

The floor drain that was the source of the contamination at the Disposal Site has been removed from service pursuant to 310 CMR 40.1003(5). According to David Bond, Topsfield Highway Superintendent, the floor drain in the garage has been sealed with concrete and the catch basin, oil/water separator, and injection well have been filled with clean sand.

The exposure point concentrations of the COC meet the applicable Method 1 Risk Characterization Cleanup Standards for both soil and groundwater. The fact that soil and groundwater concentrations are below the S-1/GW-3 (soil) and GW-3 (groundwater) Method 1 Risk Characterization Cleanup

Standards indicates that a condition of No Significant Risk for unrestricted use has been achieved at the Disposal Site. This allows site closure without the need for an Activity and Use Limitation on the Property to protect human and environmental receptors in the foreseeable future.

8.0 RESPONSE ACTION OUTCOME

The level of oil and hazardous material in the environment at the Disposal Site is below the Method 1 Risk Characterization Cleanup Standards and thus a permanent solution has been achieved at the Disposal Site with no remediation. Therefore, a condition of No Significant Risk exists at the Disposal Site and Class B-1 RAO has been achieved. No further response actions are required.

8.1 Control of Source of Contamination

On February 21, 2001, the Town of Topsfield filled the catch basin (under the floor drain in the garage), the oil/water separator, and the injection well with clean sand. These three filled areas were capped with approximately six inches of concrete. In other words, the floor-drain system at the Property has been filled with clean sand and sealed with concrete. These activities were conducted as per the verbal instructions of DEP's Ron Stelling (UIC Program).

The closure and sealing of the floor drain system constitutes control of the source of the contamination.

8.2 Feasibility Of Reducing Residual Contamination To Background Levels And Cost/Benefit Analysis

The concentrations of contaminants remaining at the Disposal Site meet the applicable Method 1 Cleanup Standards and therefore do not pose a condition of Significant Risk. Since a condition of No Significant Risk has been achieved, the environmental benefit that might be gained from

additional remediation is negligible. The additional costs required to remove the residual concentrations of contamination to background levels is substantial and disproportionate to the incremental benefit of risk reduction, environmental restoration, and monetary and non-pecuniary values. The costs of additional remedial response actions are not justified by the benefits and are therefore considered technologically infeasible.

8.3 Performance Standard

CSE believes that the response action (i.e., environmental assessment) completed to date:

- (1) is sufficient in scope, detail, and level of effort to characterize and remove the risk of harm to health, safety, public welfare, and the environment;
- (2) is consistent with Response Action Performance Standards (RAPS);
- (3) is commensurate with the nature and extent of the release;
- (4) demonstrates the requirements of the applicable class of RAO; and
- (5) conforms with applicable requirements and procedures for conducting response actions specified in the MCP.

8.4 Public Notice

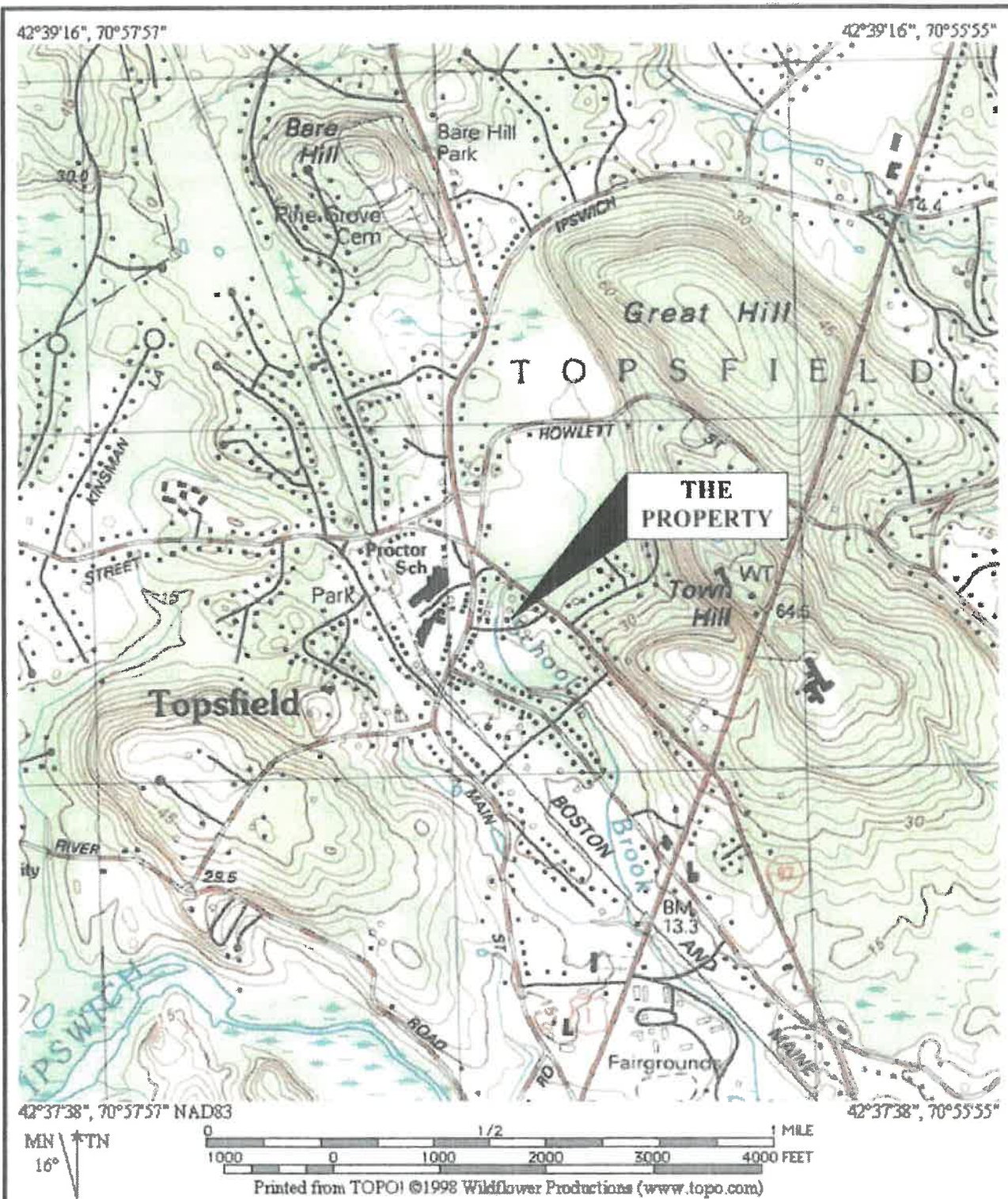
CSE has given public notice of this Class B-1 RAO to the Topsfield Board Of Health (BOH) and the Topsfield Chief Municipal Officer (CMO). A copy of this public notice is enclosed in Appendix E.

9.0 LICENSED SITE PROFESSIONAL OPINION

It is the opinion of CSE's LSP that a level of No Significant Risk of harm to health, safety, public welfare, and the environment exists at the Disposal Site. A level of No Significant Risk was determined to exist at the Disposal Site because the concentrations of the contaminants of concern met the applicable Method 1 Risk Characterization Cleanup Standards. This RAO is categorized as a Class B-1 and requires no Activity and Use Limitation at the Property. This is a permanent solution and no further action is required.

It should be noted that CSE reserves the right to revise this opinion in light of any additional information regarding the Property or Disposal Site that may be collected in the future.

Appendix A
FIGURES



MA DEP - Bureau of Waste Site Cleanup

Site Scoring Map: 500 feet & 0.5 Mile Radii

SITE NAME:
Former DPW Yard
10 School Avenue
Topsfield, MA 01983
423823n 705552ew

Site Location

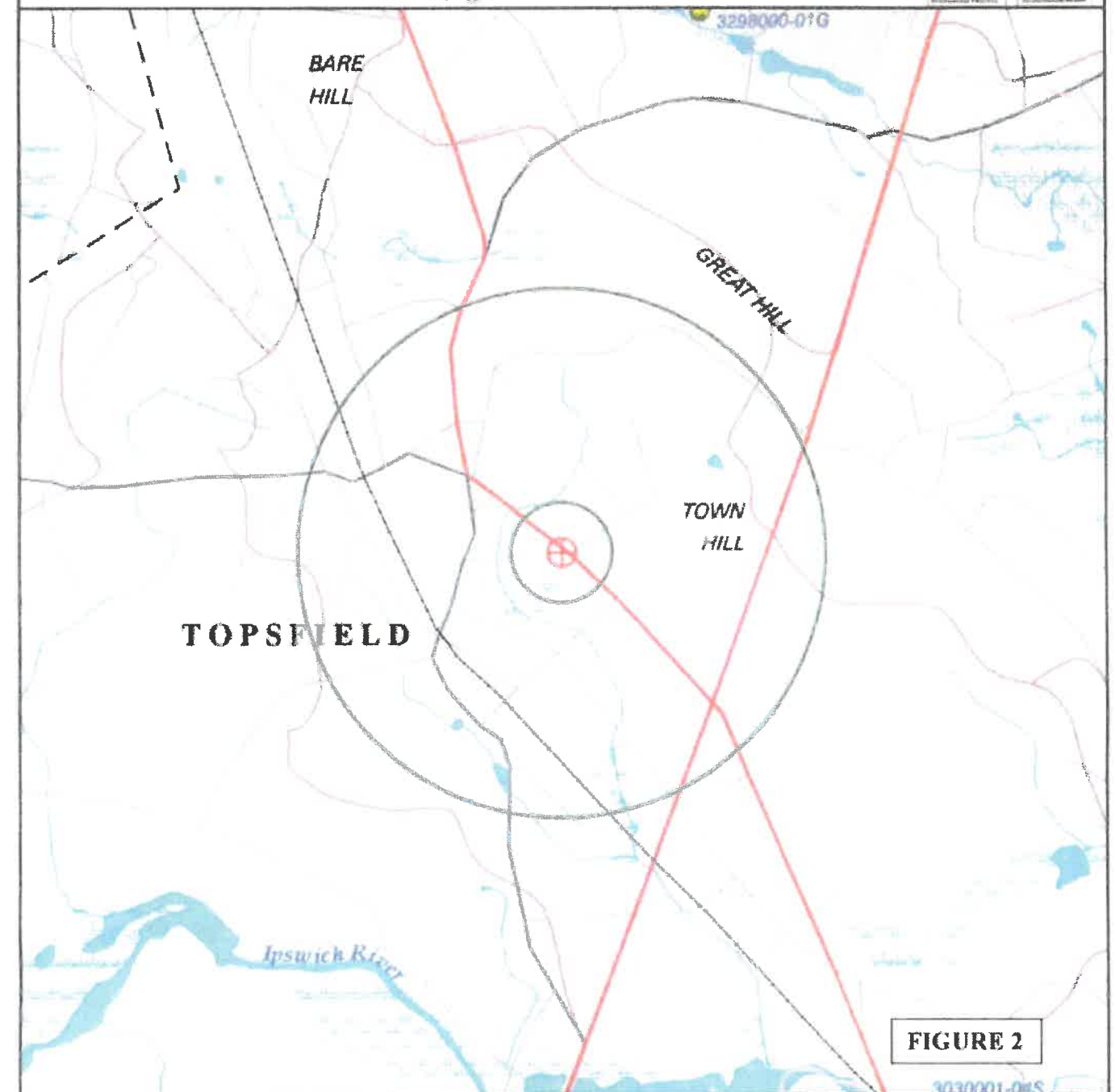
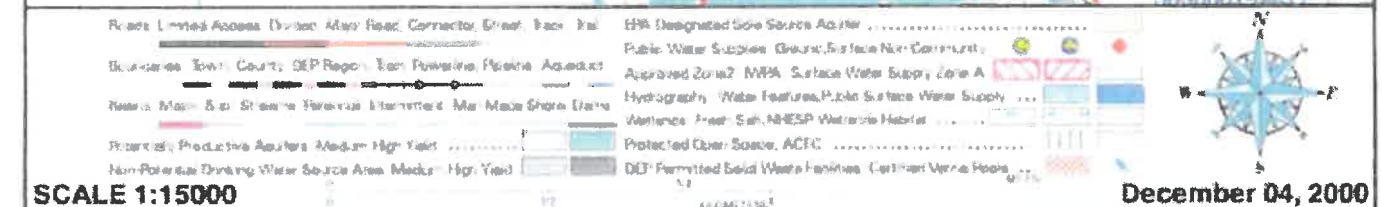


FIGURE 2



NRS SCORING MAP DATA SOURCES

AQUIFERS: USGS-WRD/MassGIS, 1:48,000.

Automated by MassGIS from the USGS Water Resources Div. Hydrologic Atlas series manuscripts. The definitions of high and medium yield vary among basins. Source dates 1977 to 1988.

SOLE SOURCE AQUIFERS: US EPA/MA

DEP/MassGIS, various scales. They are defined by EPA as aquifers that are the 'sole or principal source' of drinking water for a given aquifer service area. Last updated July 1993.

NON POTENTIAL DRINKING WATER SOURCE

AREAS: DEP-BWSC (Bureau of Waste Site Cleanup).

Those portions of high and medium yield aquifers which may not be considered as areas of groundwater conducive to the locations of public water supplies. Please refer to the MCP guidelines for the definitions of these areas.

DEP APPROVED ZONE IIS: MA DEP, 1:25,000.

As stated in 310 CMR 22.02 that area of an aquifer which contributes water to a well under the most severe pumping and recharge conditions that can be realistically anticipated. Digitized from data provided to DEP in approved hydrologic engineering reports. Data is updated continuously.

INTERIM WELLHEAD PROTECTION AREAS:

DEP-DWS (Division of Water Supply), 1:25,000. These polygons represent an interim Zone II for a groundwater source until an actual one is approved by the DEP Division of Water Supply. The radius of an IWPA varies according to the approved pumping rate. Updated in parallel with the Public Water Supplies data.

PUBLIC WATER SUPPLIES: DEP-DWS, 1:25,000.

Community and non-community surface and withdrawal points were field collected using Global Positioning System receivers. The attributes were added from the DEP Division of Water Supply database. Continuously updated.

HYDROGRAPHY: USGS/MassGIS, 1:25000 USGS

Digital Line Graph (DLG) data, modified by MassGIS. Approximately 40% of the data was provided by USGS and the remainder was created by MassGIS to USGS specifications. Source dates 1977-1997.

DRAINAGE BASINS: USGS-WRD/MassGIS,

1:24,000. Automated by MassGIS from USGS Water Resources Division manuscripts with approximately 2400 sub-basins as interpreted from 1:24,000 USGS quadrangle contour lines. 1987-1993.

WETLANDS: UMass Amherst RMP/MassGIS,

1:25,000. Includes nonforested wetlands extracted from the 1971-1991 Land Use datalayer which was photointerpreted from Summer CIR photography. Interpretation was not done in stereo. Also includes, in most areas, forested wetlands from USGS Digital Line Graph (DLG) data.

PROTECTED OPEN SPACE: EOE (Executive

Office of Environmental Affairs) MassGIS, 1:25,000. Includes federal, state, county, municipal, non profit, and protected private conservation and outdoor recreation lands. Ongoing updates.

ACECs: DEM, 1:25,000. Areas of Critical

Environmental Concern are areas designated by the Secretary of ECEA as having a number of valuable environmental features coexisting. Projects in ACECs are subject to the highest standards of review and performance. Last updated October 1996.

ROADS: USGS/MassGIS/MHD, 1:100,000.

Massgis extracted roads from the USGS Transportation DLG files. MA Highway Dept. updated roads through 1997. MassGIS and MA DEP GIS group further edited this layer. Numbered routes are part of the state, US or Interstate highway systems.

POLITICAL BOUNDARIES: MassGIS/USGS,

1:25,000. This datalayer was digitized by MassGIS from mylar USGS quads. Source date is approximately 1985.

DEP PERMITTED SOLID WASTE FACILITIES:

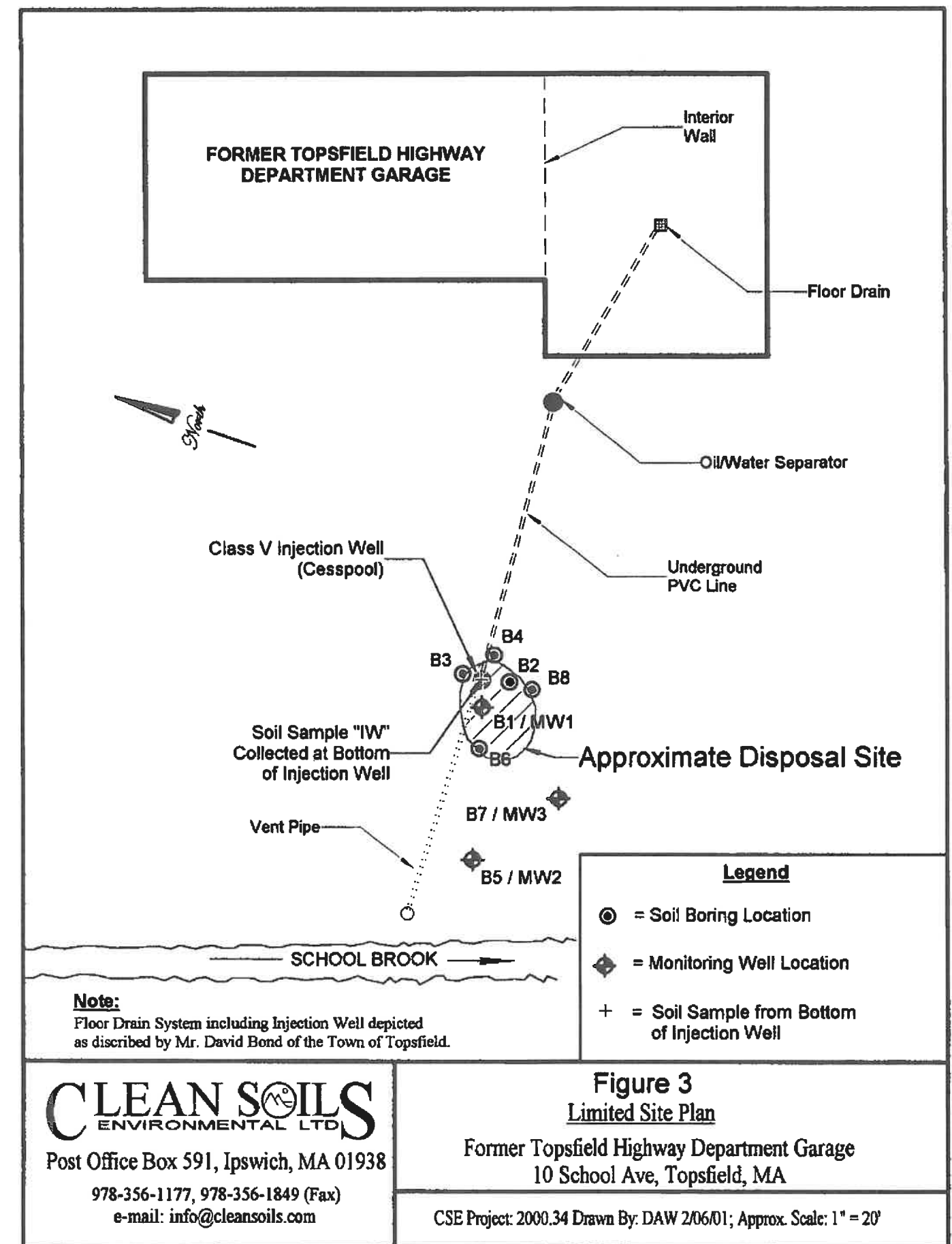
DEP-DSW (Division of Solid Waste), 1:25,000. Includes only facilities regulated since 1971. Data includes sanitary landfills, transfer stations and recycling or composting facilities. Facility boundaries were compiled or approximate facility point locations drafted onto USGS quadrangles and automated by the DEP Division of Solid Waste. Last updated 1997.

NHESP ESTIMATED HABITATS OF RARE

WETLANDS WILDLIFE: Polygons show estimated habitats for all processed occurrences of rare wetlands wildlife. Data collected by Natural Heritage & Endangered Species Program and compiled at 1:24000 or 1:25000 scale. For use with Wetlands Protection Act Only. Effective Jan. 1, 1997 through Dec. 31, 1998.

NHESP CERTIFIED VERNAL POOLS: Points

show all vernal pools certified by NHESP/MADFW (Fisheries and Wildlife) as of September 25, 1996. Data compiled at 1:24000 or 1:25000 scale. Effective January 1, 1997 through December 31, 1998.



Appendix B
TABLES

Table 1 INDEX OF FIELD SCREENING AND LABORATORY SAMPLES Former Highway Department Garage, 10 School Ave., Topsfield, MA, CSE Project No. 2000.34											
Sample Location Identification	Sample Depth (ft)*	Sample Type	Date Collected	Headspace Screening Result (ppmv)	Lab Analyses					Figure Reference	Table Reference
					VPH (fractions only)	EPH/PAH	VOCs	RCRA-8 Metals	PCBs		
B1	1 - 3	SSS	11/30/2000	0.0						3	
	3 - 7	SSS	11/30/2000	1.1	X	X	X	X	X	3	2
	7 - 11	SSS	11/30/2000	0.0						3	
	11 - 14	SSS	11/30/2000	0.0						3	
B2	1 - 3	SSS	11/30/2000	0.0						3	
	3 - 7	SSS	11/30/2000	0.0						3	
	7 - 9	SSS	11/30/2000	0.0						3	
	9 - 11	SSS	11/30/2000	0.0						3	
B3	1 - 3	SSS	11/30/2000	0.0						3	
	3 - 7	SSS	11/30/2000	0.0						3	
	7 - 9	SSS	11/30/2000	0.0						3	
	9 - 11	SSS	11/30/2000	0.0						3	
B4	1 - 3	SSS	11/30/2000	0.0						3	
	3 - 5	SSS	11/30/2000	0.0						3	
	5 - 7	SSS	11/30/2000	0.0						3	
	7 - 9	SSS	11/30/2000	0.0						3	
B5	1 - 3	SSS	11/30/2000	0.0						3	
	3 - 5	SSS	11/30/2000	0.0						3	
	5 - 7	SSS	11/30/2000	0.0						3	
	7 - 9	SSS	11/30/2000	0.0						3	
B6	1 - 3	SSS	11/30/2000	0.6						3	
	3 - 5	SSS	11/30/2000	2.0						3	
	5 - 7	SSS	11/30/2000	1.8		X	X	X		3	2
	7 - 9	SSS	11/30/2000	1.5						3	
B7	1 - 3	SSS	11/30/2000	0.5						3	
	3 - 5	SSS	11/30/2000	0.7						3	
	5 - 7	SSS	11/30/2000	0.8						3	
	7 - 9	SSS	11/30/2000	1.6						3	
B8	1 - 3	SSS	11/30/2000	0.5						3	
	3 - 5	SSS	11/30/2000	0.6						3	
	5 - 7	SSS	11/30/2000	0.5		X	X	X		3	2
	7 - 9	SSS	11/30/2000	0.5						3	
B8	1 - 3	SSS	11/30/2000	0.4						3	
	3 - 5	SSS	11/30/2000	0.6						3	
	5 - 7	SSS	11/30/2000	0.5		X	X	X		3	2
	7 - 9	SSS	11/30/2000	0.5						3	
B8	1 - 3	SSS	11/30/2000	0.8						3	
	3 - 5	SSS	11/30/2000	0.8						3	
	5 - 7	SSS	11/30/2000	0.5		X	X	X		3	2
	7 - 9	SSS	11/30/2000	0.5						3	
IW	5.8	GS	01/24/2001	0.2	X	X	X	X	X	3	2
MW1	4.63**	GW	12/06/2000	N/A		X	X	X		3	3
MW2	5.25**	GW	12/06/2000	N/A		X	X	X		3	3
MW3	4.96**	GW	12/06/2000	N/A		X	X	X		3	3
MW1 (retest)	4.92**	GW	12/15/2000	N/A				X		3	3

* All sample depths are approximately from top of ground surface (elevation 0).
** Depth to groundwater from top of riser (approximately ground surface)

Sample locations are shown on Figure 3.

MADEP = Massachusetts Department of Environmental Protection
N/A = Not Applicable
GW = Ground Water Sample
SSS = Split Spoon Soil Sample
GS = Grab Soil Sample
ppmv = parts per million by volume
PCB = Polychlorinated biphenyls
IW = Injection Well

RCRA = Resource Conservation and Recovery Act
EPH = Extractable Petroleum Hydrocarbons (MADEP)
PAH = Polynuclear Aromatic Hydrocarbons (MADEP)
VPH = Volatile Petroleum Hydrocarbons (MADEP)
VOC = Volatile Organic Compounds
MW1 = Monitoring Well MW1
B1 = Soil Boring B1

Table 2 LABORATORY RESULTS FOR SOIL FROM THE INSTALLATION OF BORINGS AND MONITORING WELLS

Table 1 LABORATORY RESULTS FOR SOIL FROM THE INSTALLATION OF COBRAGE AND MONITORING WELLS

Former Highway, Columbia County, 18 School Ave., Troy, NY, CSE Project No. 2003-24	Request RCL-1	Request RCL-2	Request RCL-3	Request RCL-4	Request RCL-5	Request RCL-6	Request RCL-7	Request RCL-8	Request RCL-9	Request RCL-10	Request RCL-11	Request RCL-12	Request RCL-13	Request RCL-14	Request RCL-15	Request RCL-16	Request RCL-17	Request RCL-18	Request RCL-19	Request RCL-20	Request RCL-21	Request RCL-22	Request RCL-23	Request RCL-24	Request RCL-25	Request RCL-26	Request RCL-27	Request RCL-28	Request RCL-29	Request RCL-30	Request RCL-31	Request RCL-32	Request RCL-33	Request RCL-34	Request RCL-35	Request RCL-36	Request RCL-37	Request RCL-38	Request RCL-39	Request RCL-40	Request RCL-41	Request RCL-42	Request RCL-43	Request RCL-44	Request RCL-45	Request RCL-46	Request RCL-47	Request RCL-48	Request RCL-49	Request RCL-50	Request RCL-51	Request RCL-52	Request RCL-53	Request RCL-54	Request RCL-55	Request RCL-56	Request RCL-57	Request RCL-58	Request RCL-59	Request RCL-60	Request RCL-61	Request RCL-62	Request RCL-63	Request RCL-64	Request RCL-65	Request RCL-66	Request RCL-67	Request RCL-68	Request RCL-69	Request RCL-70	Request RCL-71	Request RCL-72	Request RCL-73	Request RCL-74	Request RCL-75	Request RCL-76	Request RCL-77	Request RCL-78	Request RCL-79	Request RCL-80	Request RCL-81	Request RCL-82	Request RCL-83	Request RCL-84	Request RCL-85	Request RCL-86	Request RCL-87	Request RCL-88	Request RCL-89	Request RCL-90	Request RCL-91	Request RCL-92	Request RCL-93	Request RCL-94	Request RCL-95	Request RCL-96	Request RCL-97	Request RCL-98	Request RCL-99	Request RCL-100	Request RCL-101	Request RCL-102	Request RCL-103	Request RCL-104	Request RCL-105	Request RCL-106	Request RCL-107	Request RCL-108	Request RCL-109	Request RCL-110	Request RCL-111	Request RCL-112	Request RCL-113	Request RCL-114	Request RCL-115	Request RCL-116	Request RCL-117	Request RCL-118	Request RCL-119	Request RCL-120	Request RCL-121	Request RCL-122	Request RCL-123	Request RCL-124	Request RCL-125	Request RCL-126	Request RCL-127	Request RCL-128	Request RCL-129	Request RCL-130	Request RCL-131	Request RCL-132	Request RCL-133	Request RCL-134	Request RCL-135	Request RCL-136	Request RCL-137	Request RCL-138	Request RCL-139	Request RCL-140	Request RCL-141	Request RCL-142	Request RCL-143	Request RCL-144	Request RCL-145	Request RCL-146	Request RCL-147	Request RCL-148	Request RCL-149	Request RCL-150	Request RCL-151	Request RCL-152	Request RCL-153	Request RCL-154	Request RCL-155	Request RCL-156	Request RCL-157	Request RCL-158	Request RCL-159	Request RCL-160	Request RCL-161	Request RCL-162	Request RCL-163	Request RCL-164	Request RCL-165	Request RCL-166	Request RCL-167	Request RCL-168	Request RCL-169	Request RCL-170	Request RCL-171	Request RCL-172	Request RCL-173	Request RCL-174	Request RCL-175	Request RCL-176	Request RCL-177	Request RCL-178	Request RCL-179	Request RCL-180	Request RCL-181	Request RCL-182	Request RCL-183	Request RCL-184	Request RCL-185	Request RCL-186	Request RCL-187	Request RCL-188	Request RCL-189	Request RCL-190	Request RCL-191	Request RCL-192	Request RCL-193	Request RCL-194	Request RCL-195	Request RCL-196	Request RCL-197	Request RCL-198	Request RCL-199	Request RCL-200	Request RCL-201	Request RCL-202	Request RCL-203	Request RCL-204	Request RCL-205	Request RCL-206	Request RCL-207	Request RCL-208	Request RCL-209	Request RCL-210	Request RCL-211	Request RCL-212	Request RCL-213	Request RCL-214	Request RCL-215	Request RCL-216	Request RCL-217	Request RCL-218	Request RCL-219	Request RCL-220	Request RCL-221	Request RCL-222	Request RCL-223	Request RCL-224	Request RCL-225	Request RCL-226	Request RCL-227	Request RCL-228	Request RCL-229	Request RCL-230	Request RCL-231	Request RCL-232	Request RCL-233	Request RCL-234	Request RCL-235	Request RCL-236	Request RCL-237	Request RCL-238	Request RCL-239	Request RCL-240	Request RCL-241	Request RCL-242	Request RCL-243	Request RCL-244	Request RCL-245	Request RCL-246	Request RCL-247	Request RCL-248	Request RCL-249	Request RCL-250	Request RCL-251	Request RCL-252	Request RCL-253	Request RCL-254	Request RCL-255	Request RCL-256	Request RCL-257	Request RCL-258	Request RCL-259	Request RCL-260	Request RCL-261	Request RCL-262	Request RCL-263	Request RCL-264	Request RCL-265	Request RCL-266	Request RCL-267	Request RCL-268	Request RCL-269	Request RCL-270	Request RCL-271	Request RCL-272	Request RCL-273	Request RCL-274	Request RCL-275	Request RCL-276	Request RCL-277	Request RCL-278	Request RCL-279	Request RCL-280	Request RCL-281	Request RCL-282	Request RCL-283	Request RCL-284	Request RCL-285	Request RCL-286	Request RCL-287	Request RCL-288	Request RCL-289	Request RCL-290	Request RCL-291	Request RCL-292	Request RCL-293	Request RCL-294	Request RCL-295	Request RCL-296	Request RCL-297	Request RCL-298	Request RCL-299	Request RCL-300	Request RCL-301	Request RCL-302	Request RCL-303	Request RCL-304	Request RCL-305	Request RCL-306	Request RCL-307	Request RCL-308	Request RCL-309	Request RCL-310	Request RCL-311	Request RCL-312	Request RCL-313	Request RCL-314	Request RCL-315	Request RCL-316	Request RCL-317	Request RCL-318	Request RCL-319	Request RCL-320	Request RCL-321	Request RCL-322	Request RCL-323	Request RCL-324	Request RCL-325	Request RCL-326	Request RCL-327	Request RCL-328	Request RCL-329	Request RCL-330	Request RCL-331	Request RCL-332	Request RCL-333	Request RCL-334	Request RCL-335	Request RCL-336	Request RCL-337	Request RCL-338	Request RCL-339	Request RCL-340	Request RCL-341	Request RCL-342	Request RCL-343	Request RCL-344	Request RCL-345	Request RCL-346	Request RCL-347	Request RCL-348	Request RCL-349	Request RCL-350	Request RCL-351	Request RCL-352	Request RCL-353	Request RCL-354	Request RCL-355	Request RCL-356	Request RCL-357	Request RCL-358	Request RCL-359	Request RCL-360	Request RCL-361	Request RCL-362	Request RCL-363	Request RCL-364	Request RCL-365	Request RCL-366	Request RCL-367	Request RCL-368	Request RCL-369	Request RCL-370	Request RCL-371	Request RCL-372	Request RCL-373	Request RCL-374	Request RCL-375	Request RCL-376	Request RCL-377	Request RCL-378	Request RCL-379	Request RCL-380	Request RCL-381	Request RCL-382	Request RCL-383	Request RCL-384	Request RCL-385	Request RCL-386	Request RCL-387	Request RCL-388	Request RCL-389	Request RCL-390	Request RCL-391	Request RCL-392	Request RCL-393	Request RCL-394	Request RCL-395	Request RCL-396	Request RCL-397	Request RCL-398	Request RCL-399	Request RCL-400	Request RCL-401	Request RCL-402	Request RCL-403	Request RCL-404	Request RCL-405	Request RCL-406	Request RCL-407	Request RCL-408	Request RCL-409	Request RCL-410	Request RCL-411	Request RCL-412	Request RCL-413	Request RCL-414	Request RCL-415	Request RCL-416	Request RCL-417	Request RCL-418	Request RCL-419	Request RCL-420	Request RCL-421	Request RCL-422	Request RCL-423	Request RCL-424	Request RCL-425	Request RCL-426	Request RCL-427	Request RCL-428	Request RCL-429	Request RCL-430	Request RCL-431	Request RCL-432	Request RCL-433	Request RCL-434	Request RCL-435	Request RCL-436	Request RCL-437	Request RCL-438	Request RCL-439	Request RCL-440	Request RCL-441	Request RCL-442	Request RCL-443	Request RCL-444	Request RCL-445	Request RCL-446	Request RCL-447	Request RCL-448	Request RCL-449	Request RCL-450	Request RCL-451	Request RCL-452	Request RCL-453	Request RCL-454	Request RCL-455	Request RCL-456	Request RCL-457	Request RCL-458	Request RCL-459	Request RCL-460	Request RCL-461	Request RCL-462	Request RCL-463	Request RCL-464	Request RCL-465	Request RCL-466	Request RCL-467	Request RCL-468	Request RCL-469	Request RCL-470	Request RCL-471	Request RCL-472	Request RCL-473	Request RCL-474	Request RCL-475	Request RCL-476	Request RCL-477	Request RCL-478	Request RCL-479	Request RCL-480	Request RCL-481	Request RCL-482	Request RCL-483	Request RCL-484	Request RCL-485	Request RCL-486	Request RCL-487	Request RCL-488	Request RCL-489	Request RCL-490	Request RCL-491	Request RCL-492	Request RCL-493	Request RCL-494	Request RCL-495	Request RCL-496	Request RCL-497	Request RCL-498	Request RCL-499	Request RCL-500	Request RCL-501	Request RCL-502	Request RCL-503	Request RCL-504	Request RCL-505	Request RCL-506	Request RCL-507	Request RCL-508	Request RCL-509	Request RCL-510	Request RCL-511	Request RCL-512	Request RCL-513	Request RCL-514	Request RCL-515	Request RCL-516	Request RCL-517	Request RCL-518	Request RCL-519	Request RCL-520	Request RCL-521	Request RCL-522	Request RCL-523	Request RCL-524	Request RCL-525	Request RCL-526	Request RCL-527	Request RCL-528	Request RCL-529	Request RCL-530	Request RCL-531	Request RCL-532	Request RCL-533	Request RCL-534	Request RCL-535	Request RCL-536	Request RCL-537	Request RCL-538	Request RCL-539	Request RCL-540	Request RCL-541	Request RCL-542	Request RCL-543	Request RCL-544	Request RCL-545	Request RCL-546	Request RCL-547	Request RCL-548	Request RCL-549
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Table 3 LABORATORY RESULTS FOR GROUNDWATER FROM MONITORING WELLS AT THE PROPERTY
Former Highway Department Garage, 10 School Ave., Tisbury, MA, CSE Project No. 2000-34

TABLE 3 LABORATORY RESULTS FOR GROUNDWATER FROM MONITORING WELLS AT THE PROPERTY

Treating Technology	CW-4	Former Engineered Supplemental Disposal, 10 Boston Ave., Weymouth, MA, CSE Project No. 2003-14	Extract RCOW-27	MADEP Method 1	MADEP Method 1	MADEP Method 1
Extractable Petroleum - Hydrocarbons and Foreign Analytes	C 1, C 2, 11, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000					

Groundwater sample locations are shown in Figure 1.
Analytical Safety: Safety protocols will be followed for the detection limit (DL), or below Reporting Limit (BRL).
Sample Analyzed for: Total Aromatics and Total Aromatics and Total Aromatics of dissolved groundwater concentrations. MWV was not analyzed for Dissolved Aromatics on 12/15/2002.
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CLEAN SOILS ENVIRONMENTAL, LTD

Appendix C
LABORATORY REPORTS

**GROUNDWATER
ANALYTICAL**

Groundwater Analytical, Inc.
P.O. Box 1200
228 Main Street
Buzzards Bay, MA 02532
Telephone (508) 759-4441
FAX (508) 759-4475

February 1, 2001

Mr. William Mitchell
Clean Soils Environmental
P.O. Box 591
Ipswich, MA 01938

Project: Topsfield DPW/2000.34
Lab ID: 38725
Sampled: 01-22-01 and 01-24-01

Dear Bill:

Enclosed are the Volatile Petroleum Hydrocarbons, Extractable Petroleum Hydrocarbons, Metals, PCBs and Volatile Organics Analyses performed for the above referenced project. This project was processed for Priority One Week turnaround.

This letter authorizes the release of the analytical results, and should be considered a part of this report. This report contains a project narrative indicating project changes and non-conformances, a brief description of the Quality Assurance/Quality Control procedures employed by our laboratory, and a statement of our state certifications.

I attest under the pains and penalties of perjury that, based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.

Should you have any questions concerning this report, please do not hesitate to contact me.

Sincerely,



Jonathan R. Sanford
President

JRS/amb
Enclosures

GROUNDWATER ANALYTICAL

EPA Method 8082 Polychlorinated Biphenyls (PCBs) by GC/ECD

Field ID:	IW	Laboratory ID:	38725-01
Project:	Topsfield DPW/2000.34	QC Batch ID:	PB-1226-M
Client:	Clean Soils Environmental	Sampled:	01-24-01
Container:	250 mL Glass	Received:	01-25-01
Preservation:	Cool	Extracted:	01-26-01
Matrix:	Soil	Analyzed:	01-30-01
% Moisture:	17	Dilution Factor:	1

CAS Number	Analyte	Concentration	Units	Reporting Limit
12674-11-2	Aroclor 1016	BRL	ug/Kg	96
11104-28-2	Aroclor 1221	BRL	ug/Kg	96
11141-16-5	Aroclor 1232	BRL	ug/Kg	96
53469-21-9	Aroclor 1242	BRL	ug/Kg	96
12672-29-6	Aroclor 1248	BRL	ug/Kg	96
11097-69-1	Aroclor 1254	BRL	ug/Kg	96
11096-82-5	Aroclor 1260	BRL	ug/Kg	96

QC Surrogate Compound	Recovery	QC Limits
Tetrachloro- <i>m</i> -xylene	68 %	25 - 121 %
Decachlorobiphenyl	98 %	28 - 138 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996). Analyte list as Aroclor analytes formerly specified by EPA Method 8080A. Results are reported on a dry weight basis.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample dilution, percent moisture and sample size.

**GROUNDWATER
ANALYTICAL**

Trace Metals by ICP-AES and CVAA

Field ID: IW
Project: Topsfield DPW/2000.34
Client: Clean Soils Environmental
Container: 250 mL Glass
Preservation: Cool
Matrix: Soil

Laboratory ID: 38725-01
Sampled: 01-24-01
Received: 01-25-01
% Solids 83

CAS Number	Analyte	Concentration	Units	Reporting Limit	Analyzed	QC Batch	Method
7440-38-2	Arsenic, Total	BRL	mg/Kg	6.1	01-26-01	MM-01214-S	6010B
7440-39-3	Barium, Total	BRL	mg/Kg	24	01-26-01	MM-01214-S	6010B
7440-43-9	Cadmium, Total	BRL	mg/Kg	0.61	01-26-01	MM-01214-S	6010B
7440-47-3	Chromium, Total	16	mg/Kg	12	01-26-01	MM-01214-S	6010B
7439-92-1	Lead, Total	BRL	mg/Kg	12	01-26-01	MM-01214-S	6010B
7439-97-6	Mercury, Total	BRL	mg/Kg	0.059	01-26-01	MP-0926-S	7471A
7782-49-2	Selenium, Total	BRL	mg/Kg	12	01-26-01	MM-01214-S	6010B
7440-22-4	Silver, Total	BRL	mg/Kg	6.1	01-26-01	MM-01214-S	6010B

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Results are reported on a dry weight basis.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions.
Reporting limits are adjusted for sample dilution and sample size.

GROUNDWATER ANALYTICAL

Massachusetts DEP EPH Method Extractable Petroleum Hydrocarbons by GC/FID

Field ID:	IW	Laboratory ID:	38725-02
Project:	Topsfield DPW/2000.34	QC Batch ID:	EP-1096-M
Client:	Clean Soils Environmental	Sampled:	01-24-01
Container:	120 mL Amber Glass	Received:	01-25-01
Preservation:	Cool	Extracted:	01-26-01
Matrix:	Soil	Analyzed:	01-30-01
% Moisture:	20	Dilution Factor:	Aliphatic: 1 Aromatic: 1

EPH Ranges	Concentration	Units	Reporting Limit
n-C9 to n-C18 Aliphatic Hydrocarbons †	97	mg/Kg	34
n-C19 to n-C36 Aliphatic Hydrocarbons †	390	mg/Kg	34
n-C11 to n-C22 Aromatic Hydrocarbons †‡	150	mg/Kg	34
Unadjusted n-C11 to n-C22 Aromatic Hydrocarbons †	150	mg/Kg	34

CAS Number	Target Analytes	Concentration	Units	Reporting Limit
91-20-3	Naphthalene	BRL	mg/Kg	0.57
91-57-6	2-Methylnaphthalene	BRL	mg/Kg	0.57
85-01-8	Phenanthrene	BRL	mg/Kg	0.57
83-32-9	Acenaphthene	BRL	mg/Kg	0.57
208-96-8	Acenaphthylene	BRL	mg/Kg	0.57
86-73-7	Fluorene	BRL	mg/Kg	0.57
120-12-7	Anthracene	BRL	mg/Kg	0.57
206-44-0	Fluoranthene	BRL	mg/Kg	0.57
129-00-0	Pyrene	BRL	mg/Kg	0.57
56-55-3	Benzo[a]anthracene	BRL	mg/Kg	0.57
218-01-9	Chrysene	BRL	mg/Kg	0.57
205-99-2	Benzo[b]fluoranthene	BRL	mg/Kg	0.57
207-08-9	Benzo[k]fluoranthene	BRL	mg/Kg	0.57
50-32-8	Benzo[a]pyrene	BRL	mg/Kg	0.57
193-39-5	Indeno[1,2,3-c,d]pyrene	BRL	mg/Kg	0.57
53-70-3	Dibenzo[a,h]anthracene	BRL	mg/Kg	0.57
191-24-2	Benzo[g,h,i]perylene	BRL	mg/Kg	0.57

QC Surrogate Compounds	Recovery	QC Limits
Fractionation:		
2-Fluorobiphenyl	84 %	40 - 140 %
2-Bromonaphthalene	72 %	40 - 140 %
Extraction:		
Chloro-octadecane	57 %	40 - 140 %
ortho-Terphenyl	72 %	40 - 140 %

QA/QC Certification	
1. Were all QA/QC procedures required by the method followed?	Yes
2. Were all performance/acceptance standards for the required QA/QC procedures achieved?	Yes
3. Were any significant modifications made to the method, as specified in Section 11.3.1.1?	Yes
Method non-conformances indicated above are detailed below on this data report, or in the accompanying project narrative and project quality control report. Release of this data is authorized by the accompanying signed project cover letter. The accompanying cover letter, project narrative and quality control report are considered part of this data report.	

Method Reference: Method for the Determination of Extractable Petroleum Hydrocarbons, MA DEP (1998). Results are calculated on a dry weight basis. Method modified by use of microwave accelerated solvent extraction technique.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample dilution, percent moisture and sample size.

† Hydrocarbon range data excludes concentrations of any surrogate(s) and/or internal standards eluting in that range.

‡ n-C11 to n-C22 Aromatic Hydrocarbons range data excludes the method target analyte concentrations.

**GROUNDWATER
ANALYTICAL**

**Massachusetts DEP VPH Method
Volatile Petroleum Hydrocarbons by GC/PID/FID**

Field ID:	IW	Laboratory ID:	38725-03
Project:	Topsfield DPW/2000.34	QC Batch ID:	VG1-1189-E
Client:	Clean Soils Environmental	Sampled:	01-24-01
Container:	60 mL Glass Vial	Received:	01-25-01
Preservation:	Methanol / Cool	Analyzed:	01-30-01
Matrix:	Soil	Dilution Factor:	1
% Moisture:	22		

VPH Ranges	Concentration	Units	Reporting Limit
n-C5 to n-C8 Aliphatic Hydrocarbons †	BRL	mg/Kg	1.5
n-C9 to n-C12 Aliphatic Hydrocarbons †⊗	5.5	mg/Kg	1.5
n-C9 to n-C10 Aromatic Hydrocarbons †	7.6	mg/Kg	1.5
Unadjusted n-C5 to n-C8 Aliphatic Hydrocarbons †	BRL	mg/Kg	1.5
Unadjusted n-C9 to n-C12 Aliphatic Hydrocarbons †	13	mg/Kg	1.5
QC Surrogate Compounds		Recovery	QC Limits %
2,5-Dibromotoluene (PID)		94 %	70 - 130 %
2,5-Dibromotoluene (FID)		93 %	70 - 130 %

QA/QC Certification	
1. Were all QA/QC procedures required by the method followed?	Yes
2. Were all performance/acceptance standards for the required QA/QC procedures achieved?	Yes
3. Were any significant modifications made to the method, as specified in Section 11.3.2.1?	No
Method non-conformances indicated above are detailed below on this data report, or in the accompanying project narrative and project quality control report. Release of this data is authorized by the accompanying signed project cover letter. The accompanying cover letter, project narrative and quality control report are considered part of this data report.	

Method Reference:	Method for the Determination of Volatile Petroleum Hydrocarbons, MA DEP (1998). Results are calculated on a dry weight basis.
Report Notations:	<p>BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample dilution, percent moisture and sample size.</p> <p>† Hydrocarbon range data excludes concentrations of any surrogate(s) and/or internal standards eluting in that range.</p> <p>◇ n-C5 to n-C8 Aliphatic Hydrocarbons range data excludes the method target analyte concentrations.</p> <p>⊗ n-C9 to n-C12 Aliphatic Hydrocarbons range data excludes the method target analyte concentrations and the concentration for the n-C9 to n-C10 Aromatic Hydrocarbons range.</p> <p>⌘ Analyte elutes in the n-C5 to n-C8 Aliphatic Hydrocarbons range.</p> <p>‡ Analyte elutes in the n-C9 to n-C12 Aliphatic Hydrocarbons range.</p>

**GROUNDWATER
ANALYTICAL**

**EPA Method 8260B
TCL Volatile Organics by GC/MS**

Field ID: IW
Project: Topsfield DPW/2000.34
Client: Clean Soils Environmental Ltd.
Container: 40 mL VOA Vial
Preservation: Methanol/Cool
Matrix: Soil
% Moisture: 22

Laboratory ID: 38725-04
QC Batch ID: VMT-1915-S
Sampled: 01-24-01
Received: 01-25-01
Analyzed: 01-29-01
Dilution Factor: 1

CAS Number	Analyte	Concentration	Units	Reporting Limit
74-87-3	Chloromethane	BRL	ug/Kg	570
75-01-4	Vinyl Chloride	BRL	ug/Kg	570
74-83-9	Bromomethane	BRL	ug/Kg	570
75-00-3	Chloroethane	BRL	ug/Kg	570
75-35-4	1,1-Dichloroethene	BRL	ug/Kg	280
67-64-1	Acetone	BRL	ug/Kg	2,800
75-15-0	Carbon Disulfide	BRL	ug/Kg	2,800
75-09-2	Methylene Chloride	BRL	ug/Kg	1,100
156-60-5	trans- 1,2-Dichloroethene	BRL	ug/Kg	280
1634-04-4	Methyl tert- butyl Ether (MTBE) °	BRL	ug/Kg	280
75-34-3	1,1-Dichloroethane	BRL	ug/Kg	280
156-59-2	cis- 1,2-Dichloroethene	BRL	ug/Kg	280
78-93-3	2-Butanone (MEK)	BRL	ug/Kg	2,800
67-66-3	Chloroform	BRL	ug/Kg	280
71-55-6	1,1,1-Trichloroethane	BRL	ug/Kg	280
56-23-5	Carbon Tetrachloride	BRL	ug/Kg	280
71-43-2	Benzene	BRL	ug/Kg	280
107-06-2	1,2-Dichloroethane	BRL	ug/Kg	280
79-01-6	Trichloroethene	BRL	ug/Kg	280
78-87-5	1,2-Dichloropropane	BRL	ug/Kg	280
75-27-4	Bromodichloromethane	BRL	ug/Kg	280
10061-01-5	cis- 1,3-Dichloropropene	BRL	ug/Kg	280
108-10-1	4-Methyl-2-Pentanone (MIBK)	BRL	ug/Kg	2,800
108-88-3	Toluene	BRL	ug/Kg	280
10061-02-6	trans- 1,3-Dichloropropene	BRL	ug/Kg	280
79-00-5	1,1,2-Trichloroethane	BRL	ug/Kg	280
127-18-4	Tetrachloroethene	BRL	ug/Kg	280
591-78-6	2-Hexanone	BRL	ug/Kg	2,800
124-48-1	Dibromochloromethane	BRL	ug/Kg	280
108-90-7	Chlorobenzene	BRL	ug/Kg	280
100-41-4	Ethylbenzene	BRL	ug/Kg	280
108-38-3/106-42-3	meta- Xylene and para- Xylene	BRL	ug/Kg	280
95-47-6	ortho- Xylene	BRL	ug/Kg	280
100-42-5	Styrene	BRL	ug/Kg	280
75-25-2	Bromoform	BRL	ug/Kg	280
79-34-5	1,1,2,2-Tetrachloroethane	BRL	ug/Kg	280

QC Surrogate Compounds	Recovery %	QC Limits
Dibromofluoromethane	101 %	80 - 120 %
1,2-Dichloroethane-d ₄	99 %	80 - 120 %
Toluene-d ₈	101 %	81 - 117 %
4-Bromofluorobenzene	93 %	74 - 121 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996). Analyte list as specified by the Target Compound List (TCL) of the US EPA Contract Laboratory Program. Results are reported on a dry weight basis. Analysis performed utilizing methanol extraction technique.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions.
Reporting limits are adjusted for sample dilution, percent moisture and sample size.
° Indicates additional target analyte.

GROUNDWATER
ANALYTICAL

Massachusetts DEP VPH Method
Volatile Petroleum Hydrocarbons by GC/PID/FID

Field ID:	Trip Blank	Laboratory ID:	38725-05
Project:	Topsfield DPW/2000.34	QC Batch ID:	VG1-1189-E
Client:	Clean Soils Environmental	Sampled:	01-24-01
Container:	60 mL Glass Vial	Received:	01-25-01
Preservation:	Cool	Analyzed:	01-30-01
Matrix:	Methanol	Dilution Factor:	1
% Moisture:	N/A		

VPH Ranges	Concentration	Units	Reporting Limit
n-C5 to n-C8 Aliphatic Hydrocarbons [†]	BRL	mg/Kg	1.0
n-C9 to n-C12 Aliphatic Hydrocarbons ^{†⊕}	BRL	mg/Kg	1.0
n-C9 to n-C10 Aromatic Hydrocarbons [‡]	BRL	mg/Kg	1.0
Unadjusted n-C5 to n-C8 Aliphatic Hydrocarbons [†]	BRL	mg/Kg	1.0
Unadjusted n-C9 to n-C12 Aliphatic Hydrocarbons [†]	BRL	mg/Kg	1.0

QC Surrogate Compounds	Recovery	QC Limits
2,5-Dibromotoluene (PID)	100 %	70 - 130 %
2,5-Dibromotoluene (FID)	97 %	70 - 130 %

QA/QC Certification	
1. Were all QA/QC procedures required by the method followed?	Yes
2. Were all performance/acceptance standards for the required QA/QC procedures achieved?	Yes
3. Were any significant modifications made to the method, as specified in Section 11.3.2.1?	No
Method non-conformances indicated above are detailed below on this data report, or in the accompanying project narrative and project quality control report. Release of this data is authorized by the accompanying signed project cover letter. The accompanying cover letter, project narrative and quality control report are considered part of this data report.	

Method Reference:	Method for the Determination of Volatile Petroleum Hydrocarbons, MA DEP (1998). Results are calculated on a wet weight basis.
Report Notations:	<div>BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample dilution, percent moisture and sample size.</div> <div>† Hydrocarbon range data excludes concentrations of any surrogate(s) and/or internal standards eluting in that range.</div> <div>⊖ n-C5 to n-C8 Aliphatic Hydrocarbons range data excludes the method target analyte concentrations.</div> <div>⊕ n-C9 to n-C12 Aliphatic Hydrocarbons range data excludes the method target analyte concentrations and the concentration for the n-C9 to n-C10 Aromatic Hydrocarbons range.</div> <div>‡ Analyte elutes in the n-C5 to n-C8 Aliphatic Hydrocarbons range.</div> <div>‡ Analyte elutes in the n-C9 to n-C12 Aliphatic Hydrocarbons range.</div>

GROUNDWATER
ANALYTICAL

EPA Method 8260B
TCL Volatile Organics by GC/MS

Field ID: Trip Blank Laboratory ID: 38725-06
Project: Topsfield DPW/2000.34 QC Batch ID: VM1-1915-S
Client: Clean Soils Environmental Ltd. Sampled: 01-24-01
Container: 40 mL VOA Vial Received: 01-25-01
Preservation: Cool Analyzed: 01-29-01
Matrix: Methanol Dilution Factor: 1
% Moisture: N/A

CAS Number	Analyte	Concentration	Units	Reporting Limit
74-87-3	Chloromethane	BRL	ug/Kg	500
75-01-4	Vinyl Chloride	BRL	ug/Kg	500
74-83-9	Bromomethane	BRL	ug/Kg	500
75-00-3	Chloroethane	BRL	ug/Kg	500
75-35-4	1,1-Dichloroethene	BRL	ug/Kg	250
67-64-1	Acetone	BRL	ug/Kg	2,500
75-15-0	Carbon Disulfide	BRL	ug/Kg	2,500
75-09-2	Methylene Chloride	BRL	ug/Kg	1,000
156-60-5	trans- 1,2-Dichloroethene	BRL	ug/Kg	250
1634-04-4	Methyl tert-butyl Ether (MTBE) °	BRL	ug/Kg	250
75-34-3	1,1-Dichloroethane	BRL	ug/Kg	250
156-59-2	cis- 1,2-Dichloroethene	BRL	ug/Kg	250
78-93-3	2-Butanone (MEK)	BRL	ug/Kg	2,500
67-66-3	Chloroform	BRL	ug/Kg	250
71-55-6	1,1,1-Trichloroethane	BRL	ug/Kg	250
56-23-5	Carbon Tetrachloride	BRL	ug/Kg	250
71-43-2	Benzene	BRL	ug/Kg	250
107-06-2	1,2-Dichloroethane	BRL	ug/Kg	250
79-01-6	Trichloroethene	BRL	ug/Kg	250
78-87-5	1,2-Dichloropropane	BRL	ug/Kg	250
75-27-4	Bromodichloromethane	BRL	ug/Kg	250
10061-01-5	cis- 1,3-Dichloropropene	BRL	ug/Kg	250
108-10-1	4-Methyl-2-Pentanone (MIBK)	BRL	ug/Kg	2,500
108-88-3	Toluene	BRL	ug/Kg	250
10061-02-6	trans- 1,3-Dichloropropene	BRL	ug/Kg	250
79-00-5	1,1,2-Trichloroethane	BRL	ug/Kg	250
127-18-4	Tetrachloroethene	BRL	ug/Kg	250
591-78-6	2-Hexanone	BRL	ug/Kg	2,500
124-48-1	Dibromochloromethane	BRL	ug/Kg	250
108-90-7	Chlorobenzene	BRL	ug/Kg	250
100-41-4	Ethylbenzene	BRL	ug/Kg	250
108-38-3/106-42-3	meta- Xylene and para- Xylene	BRL	ug/Kg	250
95-47-6	ortho- Xylene	BRL	ug/Kg	250
100-42-5	Styrene	BRL	ug/Kg	250
75-25-2	Bromoform	BRL	ug/Kg	250
79-34-5	1,1,2,2-Tetrachloroethane	BRL	ug/Kg	250
QC Surrogate Compounds		Recovery	QC Limits	
Dibromofluoromethane		98 %	80 - 120 %	
1,2-Dichloroethane-d ₄		96 %	80 - 120 %	
Toluene-d ₈		98 %	81 - 117 %	
4-Bromofluorobenzene		94 %	74 - 121 %	

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996). Analyte list as specified by the Target Compound List (TCL) of the US EPA Contract Laboratory Program. Results are reported on a wet weight basis. Analysis performed utilizing methanol extraction technique.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions.
Reporting limits are adjusted for sample dilution, percent moisture and sample size.
° Indicates additional target analyte.

GROUNDWATER ANALYTICAL

Project Narrative

Project: Topsfield DPW/2000.34
Client: Clean Soils Environmental

Lab ID: 38725
Received: 01-25-01

A. Physical Condition of Sample(s)

This project was received by the laboratory in satisfactory condition. The sample(s) were received undamaged in appropriate containers with the correct preservation.

B. Project Documentation

This project was accompanied by satisfactory Chain of Custody documentation. The sample container label(s) agreed with the Chain of Custody.

C. Analysis of Sample(s)

No analytical anomalies or non-conformances were noted by the laboratory during the processing of these sample(s). All data contained within this report are released without qualification.

GROUNDWATER ANALYTICAL

Quality Assurance/Quality Control

A. Program Overview

Groundwater Analytical conducts an active Quality Assurance program to ensure the production of high quality, valid data. This program closely follows the guidance provided by *Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans*, US EPA QAMS-005/80 (1980), and *Test Methods for Evaluating Solid Waste*, US EPA, SW-846, Update III (1996).

Quality Control protocols include written Standard Operating Procedures (SOPs) developed for each analytical method. SOPs are derived from US EPA methodologies and other established references. Standards are prepared from commercially obtained reference materials of certified purity, and documented for traceability.

Quality Assessment protocols for most organic analyses include a minimum of one laboratory control sample, one method blank, one matrix spike sample, and one sample duplicate for each sample preparation batch. All samples, standards, blanks, laboratory control samples, matrix spikes and sample duplicates are spiked with internal standards and surrogate compounds. All instrument sequences begin with an initial calibration verification standard and a blank; and excepting GC/MS sequences, all sequences close with a continuing calibration standard. GC/MS systems are tuned to appropriate ion abundance criteria daily, or for each 12 hour operating period, whichever is more frequent.

Quality Assessment protocols for most inorganic analyses include a minimum of one laboratory control sample, one method blank, one matrix spike sample, and one sample duplicate for each sample preparation batch. Standard curves are derived from one reagent blank and four concentration levels. Curve validity is verified by standard recoveries within plus or minus ten percent of the curve.

B. Definitions

Batches are used as the basic unit for Quality Assessment. A Batch is defined as twenty or fewer samples of the same matrix which are prepared together for the same analysis, using the same lots of reagents and the same techniques or manipulations, all within the same continuum of time, up to but not exceeding 24 hours.

Laboratory Control Samples are used to assess the accuracy of the analytical method. A Laboratory Control Sample consists of reagent water or sodium sulfate spiked with a group of target analytes representative of the method analytes. Accuracy is defined as the degree of agreement of the measured value with the true or expected value. Percent Recoveries for the Laboratory Control Samples are calculated to assess accuracy.

Method Blanks are used to assess the level of contamination present in the analytical system. Method Blanks consist of reagent water or an aliquot of sodium sulfate. Method Blanks are taken through all the appropriate steps of an analytical method. Sample data reported is not corrected for blank contamination.

Surrogate Compounds are used to assess the effectiveness of an analytical method in dealing with each sample matrix. Surrogate Compounds are organic compounds which are similar to the target analytes of interest in chemical behavior, but which are not normally found in environmental samples. Percent Recoveries are calculated for each Surrogate Compound.

**GROUNDWATER
ANALYTICAL**

**Quality Control Report
Laboratory Control Sample**

Category: MA DEP EPH Method
QC Batch ID: EP-1096-M
Matrix: Soil
Units: mg/Kg

CAS Number	Analyte	Spiked	Measured	Recovery	QC Limits
111-84-2	n-Nonane (C9)	5.0	2.4	47 %	40 - 140 %
629-59-4	n-Tetradecane (C14)	5.0	2.7	55 %	40 - 140 %
629-92-5	n-Nonadecane (C19)	5.0	3.6	73 %	40 - 140 %
112-95-8	n-Eicosane (C20)	5.0	3.8	76 %	40 - 140 %
630-02-4	n-Octacosane (C28)	5.0	4.3	86 %	40 - 140 %
91-20-3	Naphthalene	5.0	2.6	53 %	40 - 140 %
83-32-9	Acenaphthene	5.0	3.1	61 %	40 - 140 %
120-12-7	Anthracene	5.0	4.4	88 %	40 - 140 %
129-00-0	Pyrene	5.0	4.5	90 %	40 - 140 %
218-01-9	Chrysene	5.0	5.0	100 %	40 - 140 %

QC Surrogate Compounds		Recovery	QC Limits
Fractionation:	2-Fluorobiphenyl	93 %	40 - 140 %
	2-Bromonaphthalene	61 %	40 - 140 %
Extraction:	Chloro-octadecane	75 %	40 - 140 %
	ortho-Terphenyl	84 %	40 - 140 %

Method Reference: Method for the Determination of Extractable Petroleum Hydrocarbons, MA DEP (1998).

Report Notations: All calculations performed prior to rounding. Quality Control Limits are defined by the methodology, or alternatively based upon the historical average recovery plus or minus three standard deviation units.

GROUNDWATER ANALYTICAL

Quality Control Report Method Blank

Category: MA DEP EPH Method
QC Batch ID: EP-1096-M
Matrix: Soil

EPH Ranges	Concentration	Units	Reporting Limit
n-C9 to n-C18 Aliphatic Hydrocarbons †	BRL	mg/Kg	30
n-C19 to n-C36 Aliphatic Hydrocarbons †	BRL	mg/Kg	30
n-C11 to n-C22 Aromatic Hydrocarbons † 0	BRL	mg/Kg	30
Unadjusted n-C11 to n-C22 Aromatic Hydrocarbons †	BRL	mg/Kg	30

CAS Number	Target Analytes	Concentration	Units	Reporting Limit
91-20-3	Naphthalene	BRL	mg/Kg	0.50
91-57-6	2-Methylnaphthalene	BRL	mg/Kg	0.50
85-01-8	Phenanthrene	BRL	mg/Kg	0.50
83-32-9	Acenaphthene	BRL	mg/Kg	0.50
208-96-8	Acenaphthylene	BRL	mg/Kg	0.50
86-73-7	Fluorene	BRL	mg/Kg	0.50
120-12-7	Anthracene	BRL	mg/Kg	0.50
206-44-0	Fluoranthene	BRL	mg/Kg	0.50
129-00-0	Pyrene	BRL	mg/Kg	0.50
56-55-3	Benzo[a]anthracene	BRL	mg/Kg	0.50
218-01-9	Chrysene	BRL	mg/Kg	0.50
205-99-2	Benzo[b]fluoranthene	BRL	mg/Kg	0.50
207-08-9	Benzo[k]fluoranthene	BRL	mg/Kg	0.50
50-32-8	Benzo[a]pyrene	BRL	mg/Kg	0.50
193-39-5	Indeno[1,2,3-c,d]pyrene	BRL	mg/Kg	0.50
53-70-3	Dibenzo[a,h]anthracene	BRL	mg/Kg	0.50
191-24-2	Benzo[g,h,i]perylene	BRL	mg/Kg	0.50

QC Surrogate Compounds		Recovery	QC Limits
Fractionation:	2-Fluorobiphenyl	86 %	40 - 140 %
	2-Bromonaphthalene	79 %	40 - 140 %
Extraction:	Chloro-octadecane	80 %	40 - 140 %
	ortho-Terphenyl	79 %	40 - 140 %

Method Reference: Method for the Determination of Extractable Petroleum Hydrocarbons, MA DEP (1998).

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample dilution, percent moisture and sample size.

† Hydrocarbon range data excludes concentrations of any surrogate(s) and/or internal standards eluting in that range.

0 n-C11 to n-C22 Aromatic Hydrocarbons range data excludes the method target analyte concentrations.

**GROUNDWATER
ANALYTICAL**

**Quality Control Report
Laboratory Control Sample**

Category: Metals
Matrix: Soil

CAS Number	Analyte	Method	QC Batch	Units	Spiked	Measured	Recovery	QC Limits
7440-38-2	Arsenic	6010B	MM-1214-SL	mg/Kg	100	92	92 %	80 - 120 %
7440-39-3	Barium	6010B	MM-1214-SL	mg/Kg	100	86	86 %	80 - 120 %
7440-43-9	Cadmium	6010B	MM-1214-SL	mg/Kg	100	88	88 %	80 - 120 %
7440-47-3	Chromium	6010B	MM-1214-SL	mg/Kg	100	91	91 %	80 - 120 %
7439-92-1	Lead	6010B	MM-1214-SL	mg/Kg	100	88	88 %	80 - 120 %
7439-97-6	Mercury	7471A	MP-0926-SL	mg/Kg	0.250	0.253	101 %	80 - 120 %
7782-49-2	Selenium	6010B	MM-1214-SL	mg/Kg	100	98	98 %	80 - 120 %
7440-22-4	Silver	6010B	MM-1214-SL	mg/Kg	5.0	4.6	91 %	80 - 120 %

Method References: Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Update III (1996).
Report Notations: All calculations performed prior to rounding. Quality Control Limits are defined by the methodology,
or alternatively based upon the historical average recovery plus or minus three standard deviation units.

**GROUNDWATER
ANALYTICAL**

**Quality Control Report
Method Blank**

Category: Metals
Matrix: Soil

CAS Number	Analyte	Result	Units	Reporting Limit	QC Batch	Method
7440-38-2	Arsenic	BRL	mg/Kg	5.0	MM-1214-SB	6010B
7440-39-3	Barium	BRL	mg/Kg	20	MM-1214-SB	6010B
7440-43-9	Cadmium	BRL	mg/Kg	0.50	MM-1214-SB	6010B
7440-47-3	Chromium	BRL	mg/Kg	10	MM-1214-SB	6010B
7439-92-1	Lead	BRL	mg/Kg	10	MM-1214-SB	6010B
7439-97-6	Mercury	BRL	mg/Kg	0.050	MP-0926-SB	7471A
7782-49-2	Selenium	BRL	mg/Kg	10	MM-1214-SB	6010B
7440-22-4	Silver	BRL	mg/Kg	5.0	MM-1214-SB	6010B

Method References: Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Update III (1996).

Report Notations: BRL Indicates result, if any, is below reporting limit for analyte. Reporting limit is the lowest value that can be reliably quantified under routine laboratory operating conditions.
Reporting limits are adjusted for sample dilution and sample size.

**GROUNDWATER
ANALYTICAL**

**Quality Control Report
Laboratory Control Sample**

Category: MA DEP VPH Method
QC Batch ID: VG1-1189-E
Matrix: Soil
Units: mg/Kg

CAS Number	Analyte	Spiked	Measured	Recovery	QC Limits
1634-04-4	Methyl tert-butyl Ether	2.5	2.7	106%	70 - 130 %
71-43-2	Benzene	2.5	2.7	106%	70 - 130 %
108-88-3	Toluene	2.5	2.8	112%	70 - 130 %
100-41-4	Ethylbenzene	2.5	2.7	108%	70 - 130 %
108-38-3 and 106-42-3	meta- Xylene and para - Xylene	5.0	5.7	114%	70 - 130 %
95-47-6	ortho- Xylene	2.5	2.7	110%	70 - 130 %
91-20-3	Naphthalene	2.5	2.8	113%	70 - 130 %

QC Surrogate Compounds	Recovery	QC Limits
2,5-Dibromotoluene (PID)	103 %	70 - 130 %
2,5-Dibromotoluene (FID)	101 %	70 - 130 %

Method Reference: Method for the Determination of Volatile Petroleum Hydrocarbons, MA DEP (1998).
Report Notations: All calculations performed prior to rounding. Quality Control Limits are defined by the methodology,
or alternatively based upon the historical average recovery plus or minus three standard deviation units.

**GROUNDWATER
ANALYTICAL**

**Quality Control Report
Method Blank**

Category: MA DEP VPH Method
QC Batch ID: VG1-1189-E
Matrix: Soil

VPH Ranges	Concentration	Units	Reporting Limit
n-C5 to n-C8 Aliphatic Hydrocarbons [†] ⊖	BRL	mg/Kg	1.0
n-C9 to n-C12 Aliphatic Hydrocarbons [†] ⊗	BRL	mg/Kg	1.0
n-C9 to n-C10 Aromatic Hydrocarbons [†]	BRL	mg/Kg	1.0
Unadjusted n-C5 to n-C8 Aliphatic Hydrocarbons [†]	BRL	mg/Kg	1.0
Unadjusted n-C9 to n-C12 Aliphatic Hydrocarbons [†]	BRL	mg/Kg	1.0

QC Surrogate Compounds	Recovery	QC Limits
2,5-Dibromotoluene (PID)	111 %	70 - 130 %
2,5-Dibromotoluene (FID)	107 %	70 - 130 %

Method Reference: Method for the Determination of Volatile Petroleum Hydrocarbons, MA DEP (1998).

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample dilution, percent moisture and sample size.

† Hydrocarbon range data excludes concentrations of any surrogate(s) and/or internal standards eluting in that range.

⊖ n-C5 to n-C8 Aliphatic Hydrocarbons range data excludes the method target analyte concentrations.

⊗ n-C9 to n-C12 Aliphatic Hydrocarbons range data excludes the method target analyte concentrations and the concentration for the n-C9 to n-C10 Aromatic Hydrocarbons range.

⌵ Analyte elutes in the n-C5 to n-C8 Aliphatic Hydrocarbons range.

‡ Analyte elutes in the n-C9 to n-C12 Aliphatic Hydrocarbons range.

**GROUNDWATER
ANALYTICAL**

**Quality Control Report
Laboratory Control Sample**

Category: EPA Method 8082
QC Batch ID: PB-1226-M
Matrix: Soil
Units: ug/Kg

CAS Number	Analyte	Spiked	Measured	Recovery	QC Limits
11097-69-1	Aroclor 1254	330	280	83%	70 - 130 %
QC Surrogate Compound		Recovery %		QC Limits	
Tetrachloro-m-xylene		82%		25 - 121 %	
Decachlorobiphenyl		81%		28 - 138 %	

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996). Results are calculated on a dry weight basis.

Report Notations: All calculations performed prior to rounding. Quality Control Limits are defined by the methodology, or alternatively based upon the historical average recovery plus or minus three standard deviation units.

**GROUNDWATER
ANALYTICAL**

**Quality Control Report
Method Blank**

Category: EPA Method 8082
QC Batch ID: PB-1226-M
Matrix: Soil

CAS Number	Analyte	Concentration	Units	Reporting Limit
12674-11-2	Aroclor 1016	BRL	ug/Kg	80
11104-28-2	Aroclor 1221	BRL	ug/Kg	80
11141-16-5	Aroclor 1232	BRL	ug/Kg	80
53469-21-9	Aroclor 1242	BRL	ug/Kg	80
12672-29-6	Aroclor 1248	BRL	ug/Kg	80
11097-69-1	Aroclor 1254	BRL	ug/Kg	80
11096-82-5	Aroclor 1260	BRL	ug/Kg	80

QC Surrogate Compound	Recovery %	QC Limits %
Tetrachloro- <i>m</i> -xylene	72 %	25 - 121 %
Decachlorobiphenyl	76 %	28 - 138 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996). Analyte list as Aroclor analytes formerly specified by EPA Method 8080A. Results are reported on a dry weight basis.

Report Notations: BRL indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample dilution, percent moisture and sample size.

**GROUNDWATER
ANALYTICAL**

**Quality Control Report
Laboratory Control Sample**

Category: EPA Method 8260B
QC Batch ID: VM1-1915-SL
Matrix: Soil
Units: ug/Kg

CAS Number	Analyte	Spiked	Measured	Recovery	QC Limits
75-35-4	1,1-Dichloroethene	2,500	2,600	103 %	70 - 130 %
71-43-2	Benzene	2,500	2,600	104 %	70 - 130 %
79-01-6	Trichloroethene	2,500	2,500	101 %	70 - 130 %
108-88-3	Toluene	2,500	2,600	106 %	70 - 130 %
108-90-7	Chlorobenzene	2,500	2,700	108 %	70 - 130 %

QC Surrogate Compounds	Recovery	QC Limits
Dibromofluoromethane	98 %	80 - 120 %
1,2-Dichloroethane-d ₄	105 %	80 - 120 %
Toluene-d ₈	96 %	81 - 117 %
4-Bromofluorobenzene	96 %	74 - 121 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).

Report Notations: All calculations performed prior to rounding. Quality Control Limits are defined by the methodology, or alternatively based upon the historical average recovery plus or minus three standard deviation units.

**GROUNDWATER
ANALYTICAL**

**Quality Control Report
Method Blank**

Category: EPA Method 8260B
QC Batch ID: VM1-1915-SB
Matrix: Soil

CAS Number	Analyte	Concentration	Units	Reporting Limit
74-87-3	Chloromethane	BRL	ug/Kg	500
75-01-4	Vinyl Chloride	BRL	ug/Kg	500
74-83-9	Bromomethane	BRL	ug/Kg	500
75-00-3	Chloroethane	BRL	ug/Kg	500
75-35-4	1,1-Dichloroethene	BRL	ug/Kg	250
67-64-1	Acetone	BRL	ug/Kg	2,500
75-15-0	Carbon Disulfide	BRL	ug/Kg	2,500
75-09-2	Methylene Chloride	BRL	ug/Kg	1,000
156-60-5	trans- 1,2-Dichloroethene	BRL	ug/Kg	250
1634-04-4	Methyl tert- butyl Ether (MTBE) °	BRL	ug/Kg	250
75-34-3	1,1-Dichloroethane	BRL	ug/Kg	250
156-59-2	cis- 1,2-Dichloroethene	BRL	ug/Kg	250
78-93-3	2-Butanone (MEK)	BRL	ug/Kg	2,500
67-66-3	Chloroform	BRL	ug/Kg	250
71-55-6	1,1,1-Trichloroethane	BRL	ug/Kg	250
56-23-5	Carbon Tetrachloride	BRL	ug/Kg	250
71-43-2	Benzene	BRL	ug/Kg	250
107-06-2	1,2-Dichloroethane	BRL	ug/Kg	250
79-01-6	Trichloroethene	BRL	ug/Kg	250
78-87-5	1,2-Dichloropropane	BRL	ug/Kg	250
75-27-4	Bromodichloromethane	BRL	ug/Kg	250
10061-01-5	cis- 1,3-Dichloropropene	BRL	ug/Kg	250
108-10-1	4-Methyl-2-Pentanone (MIBK)	BRL	ug/Kg	2,500
108-88-3	Toluene	BRL	ug/Kg	250
10061-02-6	trans- 1,3-Dichloropropene	BRL	ug/Kg	250
79-00-5	1,1,2-Trichloroethane	BRL	ug/Kg	250
127-18-4	Tetrachloroethene	BRL	ug/Kg	250
591-78-6	2-Hexanone	BRL	ug/Kg	2,500
124-48-1	Dibromochloromethane	BRL	ug/Kg	250
108-90-7	Chlorobenzene	BRL	ug/Kg	250
100-41-4	Ethylbenzene	BRL	ug/Kg	250
108-38-3/106-42-3	meta- Xylene and para- Xylene	BRL	ug/Kg	250
95-47-6	ortho- Xylene	BRL	ug/Kg	250
100-42-5	Styrene	BRL	ug/Kg	250
75-25-2	Bromoform	BRL	ug/Kg	250
79-34-5	1,1,2,2-Tetrachloroethane	BRL	ug/Kg	250
QC Surrogate Compounds		Recovery	QC Limits	
Dibromofluoromethane		98 %	80 - 120 %	
1,2-Dichloroethane-d ₄		101 %	80 - 120 %	
Toluene-d ₈		97 %	81 - 117 %	
4-Bromofluorobenzene		95 %	74 - 121 %	

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996). Analyte list as specified by the Target Compound List (TCL) of the US EPA Contract Laboratory Program. Results are reported on a dry weight basis. Analysis performed utilizing methanol extraction technique.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample dilution, percent moisture and sample size.

° Indicates additional target analyte.

GROUNDWATER ANALYTICAL

Certifications and Approvals

CONNECTICUT, Department of Health Services, PH-0586

Potable Water, Wastewater/Trade Waste, Sewage/Effluent, and Soil

pH, Conductivity, Acidity, Alkalinity, Hardness, Chloride, Fluoride, Ammonia, Kjeldahl Nitrogen, Nitrate, Nitrite, Orthophosphate, Total Dissolved Solids, Cyanide, Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Total Chromium, Hexavalent Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Molybdenum, Nickel, Potassium, Selenium, Silver, Sodium, Thallium, Tin, Titanium, Vanadium, Zinc, Purgeable Halocarbons, Purgeable Aromatics, Pesticides, PCBs, PCBs in Oil, Ethylene Dibromide, Phenols, Oil and Grease.

MAINE, Department of Human Services, MA103

Drinking Water

Reciprocal certification in accordance with Massachusetts certification for drinking water analytes.

Waste Water

Reciprocal certification in accordance with Massachusetts certification for waste water analytes.

MASSACHUSETTS, Department of Environmental Protection, M-MA-103

Potable Water

Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Copper, Lead, Mercury, Nickel, Selenium, Thallium, Nitrate-N, Nitrite-N, Fluoride, Sodium, Sulfate, Cyanide, Turbidity, Residual Free Chlorine, Calcium, Total Alkalinity, Total Dissolved Solids, pH, Trihalomethanes, Volatile Organic Compounds, 1,2-Dibromoethane, 1,2-Dibromo-3-chloropropane, Total Coliform, Fecal Coliform, Heterotrophic Plate Count, E-Coli

Non-Potable Water

Aluminum, Antimony, Arsenic, Beryllium, Cadmium, Chromium, Cobalt, Copper, Iron, Lead, Manganese, Mercury, Molybdenum, Nickel, Selenium, Silver, Strontium, Thallium, Titanium, Vanadium, Zinc, pH, Specific Conductance, Total Dissolved Solids, Total Hardness, Calcium, Magnesium, Sodium, Potassium, Total Alkalinity, Chloride, Fluoride, Sulfate, Ammonia-N, Nitrate-N, Kjeldahl-N, Orthophosphate, Total Phosphorus, Chemical Oxygen Demand, Biochemical Oxygen Demand, Total Cyanide, Non-Filterable Residue, Total Residual Chlorine, Oil and Grease, Total Phenolics, Volatile Halocarbons, Volatile Aromatics, Chlordane, Aldrin, Dieldrin, DDD, DDE, DDT, Heptachlor, Heptachlor Epoxide, Polychlorinated Biphenyls (water), Polychlorinated Biphenyls (oil).

MICHIGAN, Department of Environmental Quality

Drinking Water

Trihalomethanes, Regulated and Unregulated Volatile Organic Compounds by EPA Method 524.2; 1,2-Dibromoethane, 1,2-Dibromo-3-chloropropane by EPA Method 504.1

NEW HAMPSHIRE, Department of Environmental Services, 202798

Drinking Water

Metals by Graphite Furnace, Metals by ICP, Mercury, Nitrite-N, Orthophosphate, Residual Free Chlorine, Turbidity, Total Filterable Residue, Calcium Hardness, pH, Alkalinity, Sodium, Sulfate, Total Cyanide, Insecticides, Herbicides, Base/Neutrals, Trihalomethanes, Volatile Organics, Vinyl Chloride, DBCP, EDB, Nitrate-N.

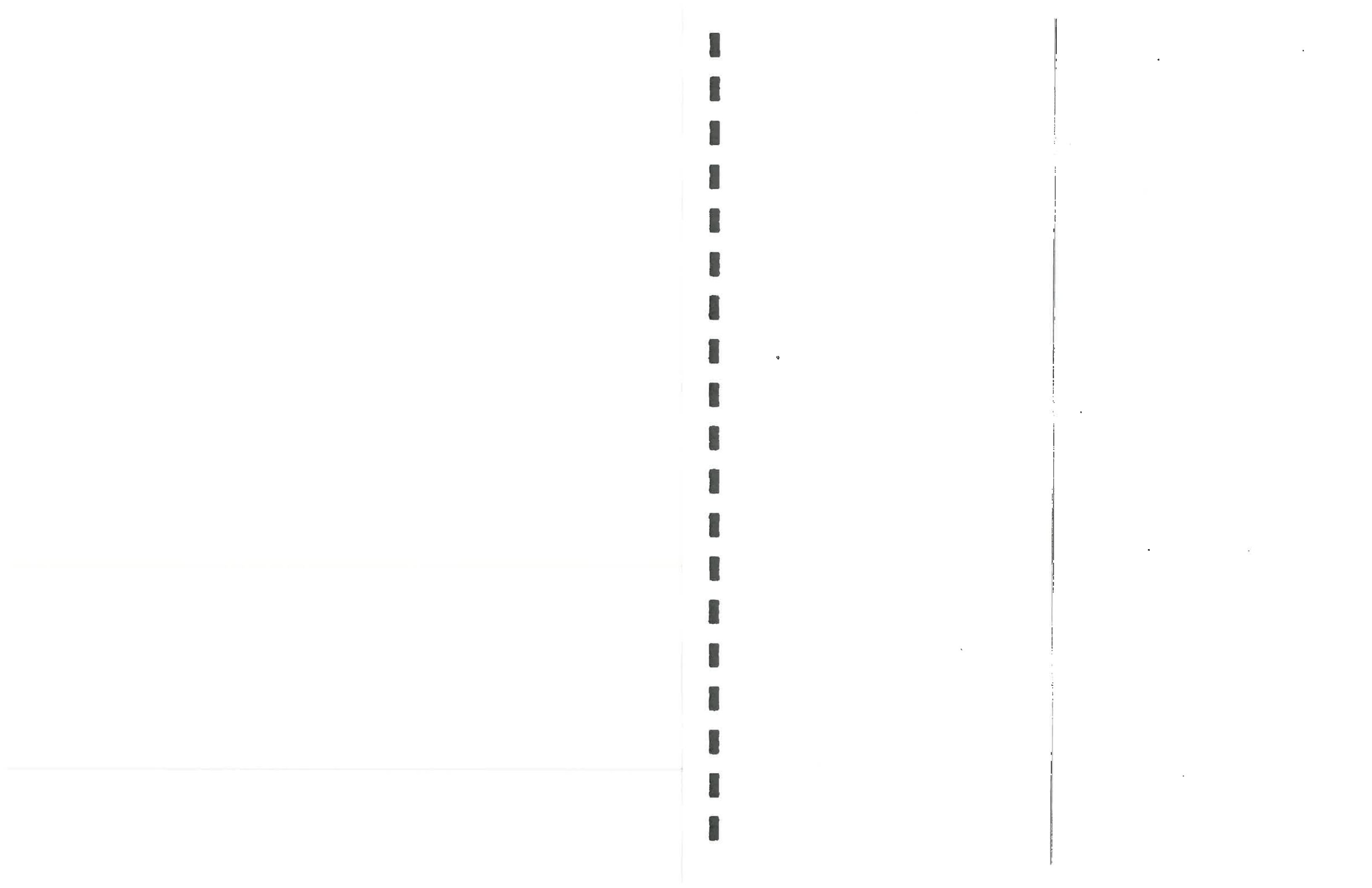
Wastewater

Metals by Graphite Furnace, Metals by ICP, Mercury, pH, Specific Conductivity, TDS, Total Hardness, Calcium, Magnesium, Sodium, Potassium, Total Alkalinity, Chloride, Fluoride, Sulfate, Ammonia-N, Nitrate-N, Orthophosphate, TKN, Total Phosphorus, COD, BOD, Non-Filterable Residue, Oil & Grease, Total Phenolics, Total Residual Chlorine, PCBs in Water, PCBs in Oil, Pesticides, Volatile Organics, Total Cyanide.

RHODE ISLAND, Department of Health, 54

Surface Water, Air, Wastewater, Potable Water, Sewage

Chemistry: Organic and Inorganic



GROUNDWATER ANALYTICAL

Groundwater Analytical, Inc.
P.O. Box 1200
228 Main Street
Buzzards Bay, MA 02532
Telephone (508) 759-4441
FAX (508) 759-4475

December 22, 2000

Mr. Alex B. Pancic
Clean Soils Environmental
P.O. Box 591
Ipswich, MA 01938

Project: Topsfield DPW/2000.34
Lab ID: 38012
Sampled: 12-15-00

Dear Alex:

Enclosed is the Metals Analysis performed for the above referenced project. This project was processed for Priority One Week turnaround.

This letter authorizes the release of the analytical results, and should be considered a part of this report. This report contains a project narrative indicating project changes and non-conformances, a brief description of the Quality Assurance/Quality Control procedures employed by our laboratory, and a statement of our state certifications.

I attest under the pains and penalties of perjury that, based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.

Should you have any questions concerning this report, please do not hesitate to contact me.

Sincerely,



Jonathan R. Sanford
President

JRS/ss
Enclosures

**GROUNDWATER
ANALYTICAL**

Trace Metals by ICP-AES and CVAA

Field ID: MW1
Project: Topsfield DPW/2000.34
Client: Clean Soils Environmental
Container: 500 mL Plastic
Preservation: HNO3 / Cool
Matrix: Aqueous

Laboratory ID: 38012-01
Sampled: 12-15-00
Received: 12-15-00
Preserved: 12-15-00

CAS Number	Analyte	Concentration	Units	Reporting Limit	Analyzed	QCBatch	Method
7440-38-2	Arsenic, Dissolved	0.02	mg/L	0.02	12-18-00	MM-1219-W	6010B
7440-39-3	Barium, Dissolved	0.8	mg/L	0.2	12-18-00	MM-1219-W	6010B
7440-43-9	Cadmium, Dissolved	BRL	mg/L	0.005	12-18-00	MM-1219-W	6010B
7440-47-3	Chromium, Dissolved	BRL	mg/L	0.01	12-18-00	MM-1219-W	6010B
7439-92-1	Lead, Dissolved	BRL	mg/L	0.005	12-18-00	MM-1219-W	6010B
7439-97-6	Mercury, Dissolved	BRL	mg/L	0.0002	12-20-00	MP-0890-W	7470A
7782-49-2	Selenium, Dissolved	BRL	mg/L	0.01	12-18-00	MM-1219-W	6010B
7440-22-4	Silver, Dissolved	BRL	mg/L	0.01	12-21-00	MM-1219-W	6010B

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample dilution and sample size.

GROUNDWATER ANALYTICAL

Project Narrative

Project: Topsfield DPW/2000.34
Client: Clean Soil Environmental

Lab ID: 38012
Received: 12-15-00

A. Physical Condition of Sample(s)

This project was received by the laboratory in satisfactory condition, and the sample(s) were received undamaged in appropriate containers with the correct preservation, except for the following non-conformance(s):

1. Sample 38012-01 for Metals analysis was not received preserved. The sample was preserved with HN03 upon receipt by the laboratory.

B. Project Documentation

This project was accompanied by satisfactory Chain of Custody documentation. The sample container label(s) agreed with the Chain of Custody.

C. Analysis of Sample(s)

No analytical anomalies or non-conformances were noted by the laboratory during the processing of these sample(s). All data contained within this report are released without qualification.

GROUNDWATER ANALYTICAL

228 Main Street, P.O. Box 1200
Buzzards Bay, MA 02532
Telephone (508) 759-4441
FAX (508) 759-4475

**CHAIN-OF-CUSTODY RECORD
AND WORK ORDER**

No 42599

Project Name: Topfield DPW
Project Number: 2000-34
Sampler Name: DAN WARREN
Project Manager: Alex Pomic
Firm: Clean Soils Environmental, Ltd.
Address: P.O. Box 591
City/State/Zip: Ipswich MA 01938
Telephone: (978) 356-1177

☐ STANDARD (10 Business Days)
☒ P-PRIORITY (5 Business Days)
☐ RUSH (RAN)
(Rush requires Rush Authorization Number)
Please FAX ☒ YES ☐ NO
FAX Number: (978) 356-1847
BILLING
Purchase Order No.: GWA Reference No.:

☐ STANDARD (10 Business Days)
☒ P-PRIORITY (5 Business Days)
☐ RUSH (RAN)
(Rush requires Rush Authorization Number)
Please FAX ☒ YES ☐ NO
FAX Number: (978) 356-1847
BILLING
Purchase Order No.: GWA Reference No.:

☐ STANDARD (10 Business Days)
☒ P-PRIORITY (5 Business Days)
☐ RUSH (RAN)
(Rush requires Rush Authorization Number)
Please FAX ☒ YES ☐ NO
FAX Number: (978) 356-1847
BILLING
Purchase Order No.: GWA Reference No.:

INSTRUCTIONS: Use separate line for each container (except replicates).

Sampling	Matrix	Type	Container(s)	Preservation	Field	LABORATORY NUMBER (Lab Use Only)	Options	Values	Submittals	Preservation/Condition	Media	Analysis Information	Notes	General Chemistry	Other
SLURRY	WATER	COMPOSITE	1000 mL (1000 mL)	1000 mL (1000 mL)	1000 mL (1000 mL)	38912	1000 mL (1000 mL)	1000 mL (1000 mL)	1000 mL (1000 mL)	1000 mL (1000 mL)	1000 mL (1000 mL)	1000 mL (1000 mL)	1000 mL (1000 mL)	1000 mL (1000 mL)	1000 mL (1000 mL)

REMARKS / SPECIAL INSTRUCTIONS

Please filter ~~and~~ preserve
on receipt. Sample was
filtered in the field.
NOTE TO CSE STAFF - THIS
IS A RESAMPLE OF MW2

DATA QUALITY OBJECTIVES

Regulatory Program
☐ Safe Drinking Water Act
☐ MA DEP Form
☐ NPDES/Clean Water Act
Specify State: MA
☐ RCRA/Haz. Waste Char.
☐ RCRA MGP (310 CMR 4.0)
Reportable Concentrations
☐ RCRA - 1 ☐ RCS - 1
☐ RCRA - 2 ☐ RCS - 2
☐ MA Dredge Disposal
☐ NH ☐ RI ☐ CT ☐ ME
Specify Category:

Project Specific QC

Many regulatory programs and EPA methods require project specific QC. Project specific QC includes Sample Duplicates, Matrix Spikes, and/or Matrix Spike Duplicates. Laboratory QC is not project specific unless prearranged. Project specific QC samples are charged on a per sample basis. For water samples, each MS, MSD and Sample Duplicate requires an additional sample aliquot.
Project Specific QC Required
☐ Sample Duplicate
☐ Matrix Spike
☐ Matrix Spike Duplicate
Selection of QC Sample
☐ Selected by laboratory
☐ Please use sample:

CHAIN-OF-CUSTODY RECORD

NOTE: All samples submitted subject to Standard Terms and Conditions on reverse hereof
Relinquished by Sampler: [Signature] Date: 12/15/12 Time: 12:40 Received by: [Signature] Receipt Temperature: 7.3 °C
Relinquished by: [Signature] Date: 12/15/12 Time: 12:40 Received by: [Signature] Shipping/Airbill Number:
Relinquished by: [Signature] Date: 12/15/12 Time: 12:40 Received by: [Signature] Custody Seal/Cooler Seal Number:
Method of Shipment: ☒ Express Mail ☐ Federal Express ☐ UPS ☐ Hand

GROUNDWATER ANALYTICAL

Quality Assurance/Quality Control

A. Program Overview

Groundwater Analytical conducts an active Quality Assurance program to ensure the production of high quality, valid data. This program closely follows the guidance provided by *Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans*, US EPA QAMS-005/80 (1980), and *Test Methods for Evaluating Solid Waste*, US EPA, SW-846, Update III (1996).

Quality Control protocols include written Standard Operating Procedures (SOPs) developed for each analytical method. SOPs are derived from US EPA methodologies and other established references. Standards are prepared from commercially obtained reference materials of certified purity, and documented for traceability.

Quality Assessment protocols for most organic analyses include a minimum of one laboratory control sample, one method blank, one matrix spike sample, and one sample duplicate for each sample preparation batch. All samples, standards, blanks, laboratory control samples, matrix spikes and sample duplicates are spiked with internal standards and surrogate compounds. All instrument sequences begin with an initial calibration verification standard and a blank; and excepting GC/MS sequences, all sequences close with a continuing calibration standard. GC/MS systems are tuned to appropriate ion abundance criteria daily, or for each 12 hour operating period, whichever is more frequent.

Quality Assessment protocols for most inorganic analyses include a minimum of one laboratory control sample, one method blank, one matrix spike sample, and one sample duplicate for each sample preparation batch. Standard curves are derived from one reagent blank and four concentration levels. Curve validity is verified by standard recoveries within plus or minus ten percent of the curve.

B. Definitions

Batches are used as the basic unit for Quality Assessment. A Batch is defined as twenty or fewer samples of the same matrix which are prepared together for the same analysis, using the same lots of reagents and the same techniques or manipulations, all within the same continuum of time, up to but not exceeding 24 hours.

Laboratory Control Samples are used to assess the accuracy of the analytical method. A Laboratory Control Sample consists of reagent water or sodium sulfate spiked with a group of target analytes representative of the method analytes. Accuracy is defined as the degree of agreement of the measured value with the true or expected value. Percent Recoveries for the Laboratory Control Samples are calculated to assess accuracy.

Method Blanks are used to assess the level of contamination present in the analytical system. Method Blanks consist of reagent water or an aliquot of sodium sulfate. Method Blanks are taken through all the appropriate steps of an analytical method. Sample data reported is not corrected for blank contamination.

Surrogate Compounds are used to assess the effectiveness of an analytical method in dealing with each sample matrix. Surrogate Compounds are organic compounds which are similar to the target analytes of interest in chemical behavior, but which are not normally found in environmental samples. Percent Recoveries are calculated for each Surrogate Compound.

GROUNDWATER ANALYTICAL

Quality Control Report Laboratory Control Sample

Category: Metals
Matrix: Aqueous

CAS Number	Analyte	Method	QC Batch	Units	Spiked	Measured	Recovery	QC Limits
7440-38-2	Arsenic	6010B	MM-1219-WL	mg/L	1.00	1.05	105 %	80 - 120 %
7440-39-3	Barium	6010B	MM-1219-WL	mg/L	1.00	0.99	99 %	80 - 120 %
7440-43-9	Cadmium	6010B	MM-1219-WL	mg/L	1.00	1.06	106 %	80 - 120 %
7440-47-3	Chromium	6010B	MM-1219-WL	mg/L	1.00	0.99	99 %	80 - 120 %
7439-92-1	Lead	6010B	MM-1219-WL	mg/L	1.00	1.04	104 %	80 - 120 %
7782-49-2	Selenium	6010B	MM-1219-WL	mg/L	1.00	1.05	105 %	80 - 120 %
7440-22-4	Silver	6010B	MM-1219-WL	mg/L	1.00	1.04	104 %	80 - 120 %
7439-97-6	Mercury	7470A	MP-0890-WL	mg/L	0.00100	0.00102	102 %	80 - 120 %

Method References: Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Update III (1996).

Report Notations: All calculations performed prior to rounding. Quality Control Limits are defined by the methodology, or alternatively based upon the historical average recovery plus or minus three standard deviation units.

**GROUNDWATER
ANALYTICAL**

**Quality Control Report
Method Blank**

Category: Metals
Matrix: Aqueous

CAS Number	Analyte	Result	Units	Reporting Limit	QC Batch	Method
7440-38-2	Arsenic	BRL	mg/L	0.02	MM-1219-WB	6010B
7440-39-3	Barium	BRL	mg/L	0.2	MM-1219-WB	6010B
7440-43-9	Cadmium	BRL	mg/L	0.005	MM-1219-WB	6010B
7440-47-3	Chromium	BRL	mg/L	0.01	MM-1219-WB	6010B
7439-92-1	Lead	BRL	mg/L	0.005	MM-1219-WB	6010B
7782-49-2	Selenium	BRL	mg/L	0.01	MM-1219-WB	6010B
7440-22-4	Silver	BRL	mg/L	0.01	MM-1219-WB	6010B
7439-97-6	Mercury	BRL	mg/L	0.0002	MP-0890-WB	7470A

Method References: Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Update III (1996).

Report Notations: BRL Indicates result, if any, is below reporting limit for analyte. Reporting limit is the lowest value that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample dilution and sample size.

GROUNDWATER ANALYTICAL

Certifications and Approvals

CONNECTICUT, Department of Health Services, PH-0586

Potable Water, Wastewater/Trade Waste, Sewage/Effluent, and Soil

pH, Conductivity, Acidity, Alkalinity, Hardness, Chloride, Fluoride, Ammonia, Kjeldahl Nitrogen, Nitrate, Nitrite, Orthophosphate, Total Dissolved Solids, Cyanide, Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Total Chromium, Hexavalent Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Molybdenum, Nickel, Potassium, Selenium, Silver, Sodium, Thallium, Tin, Titanium, Vanadium, Zinc, Purgeable Halocarbons, Purgeable Aromatics, Pesticides, PCBs, PCBs in Oil, Ethylene Dibromide, Phenols, Oil and Grease.

MAINE, Department of Human Services, MA103

Drinking Water

Reciprocal certification in accordance with Massachusetts certification for drinking water analytes.

Waste Water

Reciprocal certification in accordance with Massachusetts certification for waste water analytes.

MASSACHUSETTS, Department of Environmental Protection, M-MA-103

Potable Water

Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Copper, Lead, Mercury, Nickel, Selenium, Thallium, Nitrate-N, Nitrite-N, Fluoride, Sodium, Sulfate, Cyanide, Turbidity, Residual Free Chlorine, Calcium, Total Alkalinity, Total Dissolved Solids, pH, Trihalomethanes, Volatile Organic Compounds, 1,2-Dibromoethane, 1,2-Dibromo-3-chloropropane, Total Coliform, Fecal Coliform, Heterotrophic Plate Count, E-Coli

Non-Potable Water

Aluminum, Antimony, Arsenic, Beryllium, Cadmium, Chromium, Cobalt, Copper, Iron, Lead, Manganese, Mercury, Molybdenum, Nickel, Selenium, Silver, Strontium, Thallium, Titanium, Vanadium, Zinc, pH, Specific Conductance, Total Dissolved Solids, Total Hardness, Calcium, Magnesium, Sodium, Potassium, Total Alkalinity, Chloride, Fluoride, Sulfate, Ammonia-N, Nitrate-N, Kjeldahl-N, Orthophosphate, Total Phosphorus, Chemical Oxygen Demand, Biochemical Oxygen Demand, Total Cyanide, Non-Filterable Residue, Total Residual Chlorine, Oil and Grease, Total Phenolics, Volatile Halocarbons, Volatile Aromatics, Chlordane, Aldrin, Dieldrin, DDD, DDE, DDT, Heptachlor, Heptachlor Epoxide, Polychlorinated Biphenyls (water), Polychlorinated Biphenyls (oil).

MICHIGAN, Department of Environmental Quality

Drinking Water

Trihalomethanes, Regulated and Unregulated Volatile Organic Compounds by EPA Method 524.2; 1,2-Dibromoethane, 1,2-Dibromo-3-chloropropane by EPA Method 504.1

NEW HAMPSHIRE, Department of Environmental Services, 202798

Drinking Water

Metals by Graphite Furnace, Metals by ICP, Mercury, Nitrite-N, Orthophosphate, Residual Free Chlorine, Turbidity, Total Filterable Residue, Calcium Hardness, pH, Alkalinity, Sodium, Sulfate, Total Cyanide, Insecticides, Herbicides, Base/Neutrals, Trihalomethanes, Volatile Organics, Vinyl Chloride, DBCP, EDB, Nitrate-N.

Wastewater

Metals by Graphite Furnace, Metals by ICP, Mercury, pH, Specific Conductivity, TDS, Total Hardness, Calcium, Magnesium, Sodium, Potassium, Total Alkalinity, Chloride, Fluoride, Sulfate, Ammonia-N, Nitrate-N, Orthophosphate, TKN, Total Phosphorus, COD, BOD, Non-Filterable Residue, Oil & Grease, Total Phenolics, Total Residual Chlorine, PCBs in Water, PCBs in Oil, Pesticides, Volatile Organics, Total Cyanide.

RHODE ISLAND, Department of Health, 54

Surface Water, Air, Wastewater, Potable Water, Sewage

Chemistry: Organic and Inorganic

GROUNDWATER ANALYTICAL

Groundwater Analytical, Inc.
P.O. Box 1200
228 Main Street
Buzzards Bay, MA 02532

Telephone (508) 759-4441
FAX (508) 759-4475

December 13, 2000

Mr. Alexander Pancic
Clean Soils Environmental
P.O. Box 591
Ipswich, MA 01938

Project: Topsfield DPW/2000.34
Lab ID: 37768
Sampled: 12-06-00

Dear Alex:

Enclosed are the Volatile Organics, Metals and Extractable Petroleum Hydrocarbons Analyses performed for the above referenced project. This project was processed for Priority One Week turnaround.

This letter authorizes the release of the analytical results, and should be considered a part of this report. This report contains a project narrative indicating project changes and non-conformances, a brief description of the Quality Assurance/Quality Control procedures employed by our laboratory, and a statement of our state certifications.

I attest under the pains and penalties of perjury that, based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.

Should you have any questions concerning this report, please do not hesitate to contact me.

Sincerely,



Jonathan R. Sanford
President

JRS/amb
Enclosures

**GROUNDWATER
ANALYTICAL**

**Massachusetts DEP EPH Method
Extractable Petroleum Hydrocarbons by GC/FID**

Field ID:	MW1	Laboratory ID:	37768-08
Project:	Topsfield DPW/2000.34	QC Batch ID:	EP-0770-F
Client:	Clean Soils Environmental	Sampled:	12-06-00
Container:	1 L Amber Glass	Received:	12-06-00
Preservation:	H2SO4 / Cool	Extracted:	12-07-00
Matrix:	Aqueous	Analyzed:	12-11-00
		Dilution Factor:	Aliphatic: 1 Aromatic: 1

EPH Ranges	Concentration	Units	Reporting Limit
n-C9 to n-C18 Aliphatic Hydrocarbons †	BRL	ug/L	500
n-C19 to n-C36 Aliphatic Hydrocarbons †	BRL	ug/L	500
n-C11 to n-C22 Aromatic Hydrocarbons † ‡	340	ug/L	200
Unadjusted n-C11 to n-C22 Aromatic Hydrocarbons †	350	ug/L	200

CAS Number	Target Analytes	Concentration	Units	Reporting Limit
91-20-3	Naphthalene	BRL	ug/L	10
91-57-6	2-Methylnaphthalene	BRL	ug/L	5
85-01-8	Phenanthrene	BRL	ug/L	10
83-32-9	Acenaphthene	BRL	ug/L	10
208-96-8	Acenaphthylene	BRL	ug/L	10
86-73-7	Fluorene	BRL	ug/L	10
120-12-7	Anthracene	BRL	ug/L	10
206-44-0	Fluoranthene	BRL	ug/L	10
129-00-0	Pyrene	BRL	ug/L	10
56-55-3	Benzo[a]anthracene	BRL	ug/L	10
218-01-9	Chrysene	BRL	ug/L	10
205-99-2	Benzo[b]fluoranthene	BRL	ug/L	10
207-08-9	Benzo[k]fluoranthene	BRL	ug/L	10
50-32-8	Benzo[a]pyrene	BRL	ug/L	10
193-39-5	Indeno[1,2,3-c,d]pyrene	BRL	ug/L	10
53-70-3	Dibenzo[a,h]anthracene	BRL	ug/L	10
191-24-2	Benzo[g,h,i]perylene	BRL	ug/L	10

QC Surrogate Compounds		Recovery	QC Limits
Fractionation:	2-Fluorobiphenyl	75 %	40 - 140 %
	2-Bromonaphthalene	81 %	40 - 140 %
Extraction:	Chloro-octadecane	65 %	40 - 140 %
	ortho-Terphenyl	84 %	40 - 140 %

QA/QC Certification	
1. Were all QA/QC procedures required by the method followed?	Yes
2. Were all performance/acceptance standards for the required QA/QC procedures achieved?	Yes
3. Were any significant modifications made to the method, as specified in Section 11.3?	No
Method non-conformances indicated above are detailed below on this data report, or in the accompanying project narrative and project quality control report. Release of this data is authorized by the accompanying signed project cover letter. The accompanying cover letter, project narrative and quality control report are considered part of this data report.	

Method Reference: Method for the Determination of Extractable Petroleum Hydrocarbons, MA DEP (1998). Extraction performed utilizing separatory funnel technique.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample dilution and sample size.

† Hydrocarbon range data excludes concentrations of any surrogate(s) and/or internal standards eluting in that range.

‡ n-C11 to n-C22 Aromatic Hydrocarbons range data excludes the method target analyte concentrations.

**GROUNDWATER
ANALYTICAL**

Trace Metals by ICP-AES and CVAA

Field ID: MW-1 Laboratory ID: 37768-05
Project: Topsfield DPW/2000.34 Sampled: 12-06-00
Client: Clean Soils Environmental Received: 12-06-00
Container: 500 mL Plastic Preserved: 12-06-00
Preservation: HNO3 / Cool
Matrix: Aqueous

CAS Number	Analyte	Concentration	Units	Reporting Limit	Analyzed	QC Batch	Method
7440-38-2	Arsenic, Total	0.03	mg/L	0.02	12-07-00	MM-1213-W	6010B
7440-39-3	Barium, Total	BRL	mg/L	0.2	12-07-00	MM-1213-W	6010B
7440-43-9	Cadmium, Total	BRL	mg/L	0.005	12-07-00	MM-1213-W	6010B
7440-47-3	Chromium, Total	0.01	mg/L	0.01	12-07-00	MM-1213-W	6010B
7439-92-1	Lead, Total	0.031	mg/L	0.005	12-07-00	MM-1213-W	6010B
7439-97-6	Mercury, Total	BRL	mg/L	0.0002	12-07-00	MP-0882-W	7470A
7782-49-2	Selenium, Total	BRL	mg/L	0.01	12-07-00	MM-1213-W	6010B
7440-22-4	Silver, Total	BRL	mg/L	0.01	12-07-00	MM-1213-W	6010B

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample dilution and sample size.

**GROUNDWATER
ANALYTICAL**

**EPA Method 8260B
TCL Volatile Organics by GC/MS**

Field ID: MW1
Project: Topsfield DPW/2000.34
Client: Clean Soils Environmental
Container: 40 mL VOA Vial
Preservation: HCl / Cool
Matrix: Aqueous

Laboratory ID: 37768-01
QC Batch ID: VM4-1591-W
Sampled: 12-06-00
Received: 12-06-00
Analyzed: 12-09-00
Dilution Factor: 1

CAS Number	Analyte	Concentration	Units	Reporting Limit
74-87-3	Chloromethane	BRL	ug/L	0.5
75-01-4	Vinyl Chloride	BRL	ug/L	0.5
74-83-9	Bromomethane	BRL	ug/L	0.5
75-00-3	Chloroethane	BRL	ug/L	0.5
75-35-4	1,1-Dichloroethene	BRL	ug/L	0.5
67-64-1	Acetone	BRL	ug/L	5
75-15-0	Carbon Disulfide	BRL	ug/L	5
75-09-2	Methylene Chloride	BRL	ug/L	2
156-60-5	trans- 1,2-Dichloroethene	BRL	ug/L	0.5
75-34-3	1,1-Dichloroethane	BRL	ug/L	0.5
156-59-2	cis- 1,2-Dichloroethene	BRL	ug/L	0.5
78-93-3	2-Butanone (MEK)	BRL	ug/L	5
67-66-3	Chloroform	BRL	ug/L	0.5
71-55-6	1,1,1-Trichloroethane	BRL	ug/L	0.5
56-23-5	Carbon Tetrachloride	BRL	ug/L	0.5
71-43-2	Benzene	BRL	ug/L	0.5
107-06-2	1,2-Dichloroethane	BRL	ug/L	0.5
79-01-6	Trichloroethene	BRL	ug/L	0.5
78-87-5	1,2-Dichloropropane	BRL	ug/L	0.5
75-27-4	Bromodichloromethane	BRL	ug/L	0.5
10061-01-5	cis- 1,3-Dichloropropene	BRL	ug/L	0.5
108-10-1	4-Methyl-2-Pentanone (MIBK)	BRL	ug/L	5
108-88-3	Toluene	BRL	ug/L	0.5
10061-02-6	trans- 1,3-Dichloropropene	BRL	ug/L	0.5
79-00-5	1,1,2-Trichloroethane	BRL	ug/L	0.5
127-18-4	Tetrachloroethene	BRL	ug/L	0.5
591-78-6	2-Hexanone	BRL	ug/L	5
124-48-1	Dibromochloromethane	BRL	ug/L	0.5
108-90-7	Chlorobenzene	BRL	ug/L	0.5
100-41-4	Ethylbenzene	BRL	ug/L	0.5
108-38-3/106-42-3	meta- Xylene and para- Xylene	BRL	ug/L	0.5
95-47-6	ortho- Xylene	BRL	ug/L	0.5
100-42-5	Styrene	BRL	ug/L	0.5
75-25-2	Bromoform	BRL	ug/L	0.5
79-34-5	1,1,2,2-Tetrachloroethane	BRL	ug/L	0.5
1634-04-4	Methyl tert- butyl Ether (MTBE) *	BRL	ug/L	0.5

QC Surrogate Compounds	Recovery	QC Limits
Dibromofluoromethane	102 %	86 - 118 %
1,2-Dichloroethane-d ₄	108 %	80 - 120 %
Toluene-d ₈	99 %	88 - 110 %
4-Bromofluorobenzene	96 %	86 - 115 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996). Analyte list as specified by the Target Compound List (TCL) of the US EPA Contract Laboratory Program. Analysis performed utilizing 25mL sample purge volume.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample dilution and sample size.
* Indicates additional target analyte.

**GROUNDWATER
ANALYTICAL**

**Massachusetts DEP EPH Method
Extractable Petroleum Hydrocarbons by GC/FID**

Field ID:	MW2	Laboratory ID:	37768-09
Project:	Topsfield DPW/2000.34	QC Batch ID:	EP-0770-F
Client:	Clean Soils Environmental	Sampled:	12-06-00
Container:	1 L Amber Glass	Received:	12-06-00
Preservation:	H2SO4 / Cool	Extracted:	12-07-00
Matrix:	Aqueous	Analyzed:	12-11-00
		Dilution Factor:	Aliphatic: 1 Aromatic: 1

EPH Ranges	Concentration	Units	Reporting Limit
n-C9 to n-C18 Aliphatic Hydrocarbons †	BRL	ug/L	500
n-C19 to n-C36 Aliphatic Hydrocarbons †	BRL	ug/L	500
n-C11 to n-C22 Aromatic Hydrocarbons † 0	BRL	ug/L	200
Unadjusted n-C11 to n-C22 Aromatic Hydrocarbons †	BRL	ug/L	200

CAS Number	Target Analytes	Concentration	Units	Reporting Limit
91-20-3	Naphthalene	BRL	ug/L	10
91-57-6	2-Methylnaphthalene	BRL	ug/L	5
85-01-8	Phenanthrene	BRL	ug/L	10
83-32-9	Acenaphthene	BRL	ug/L	10
208-96-8	Acenaphthylene	BRL	ug/L	10
86-73-7	Fluorene	BRL	ug/L	10
120-12-7	Anthracene	BRL	ug/L	10
206-44-0	Fluoranthene	BRL	ug/L	10
129-00-0	Pyrene	BRL	ug/L	10
56-55-3	Benzo[a]anthracene	BRL	ug/L	10
218-01-9	Chrysene	BRL	ug/L	10
205-99-2	Benzo[b]fluoranthene	BRL	ug/L	10
207-08-9	Benzo[k]fluoranthene	BRL	ug/L	10
50-32-8	Benzo[a]pyrene	BRL	ug/L	10
193-39-5	Indeno[1,2,3-c,d]pyrene	BRL	ug/L	10
53-70-3	Dibenzo[a,h]anthracene	BRL	ug/L	10
191-24-2	Benzo[g,h,i]perylene	BRL	ug/L	10

QC Surrogate Compounds	Recovery	QC Limits
Fractionation: 2-Fluorobiphenyl	77 %	40 - 140 %
2-Bromonaphthalene	79 %	40 - 140 %
Extraction: Chloro-octadecane	63 %	40 - 140 %
ortho-Terphenyl	80 %	40 - 140 %

QA/QC Certification	
1. Were all QA/QC procedures required by the method followed?	Yes
2. Were all performance/acceptance standards for the required QA/QC procedures achieved?	Yes
3. Were any significant modifications made to the method, as specified in Section 11.3?	No
Method non-conformances indicated above are detailed below on this data report, or in the accompanying project narrative and project quality control report. Release of this data is authorized by the accompanying signed project cover letter. The accompanying cover letter, project narrative and quality control report are considered part of this data report.	

Method Reference: Method for the Determination of Extractable Petroleum Hydrocarbons, MA DEP (1998). Extraction performed utilizing separatory funnel technique.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample dilution and sample size.

† Hydrocarbon range data excludes concentrations of any surrogate(s) and/or internal standards eluting in that range.

0 n-C11 to n-C22 Aromatic Hydrocarbons range data excludes the method target analyte concentrations.

**GROUNDWATER
ANALYTICAL**

Trace Metals by ICP-AES and CVAA

Field ID: MW-2
Project: Topsfield DPW/2000.34
Client: Clean Soils Environmental
Container: 500 mL Plastic
Preservation: HNO3 / Cool
Matrix: Aqueous

Laboratory ID: 37768-06
Sampled: 12-06-00
Received: 12-06-00
Preserved: 12-06-00

CAS Number	Analyte	Concentration	Units	Reporting Limit	Analyzed	QC Batch	Method
7440-38-2	Arsenic, Total	0.04	mg/L	0.02	12-07-00	MM-1213-W	6010B
7440-39-3	Barium, Total	BRL	mg/L	0.2	12-07-00	MM-1213-W	6010B
7440-43-9	Cadmium, Total	BRL	mg/L	0.005	12-07-00	MM-1213-W	6010B
7440-47-3	Chromium, Total	BRL	mg/L	0.01	12-07-00	MM-1213-W	6010B
7439-92-1	Lead, Total	0.017	mg/L	0.005	12-07-00	MM-1213-W	6010B
7439-97-6	Mercury, Total	BRL	mg/L	0.0002	12-07-00	MP-0882-W	7470A
7782-49-2	Selenium, Total	BRL	mg/L	0.01	12-07-00	MM-1213-W	6010B
7440-22-4	Silver, Total	BRL	mg/L	0.01	12-07-00	MM-1213-W	6010B

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample dilution and sample size.

**GROUNDWATER
ANALYTICAL**

**EPA Method 8260B
TCL Volatile Organics by GC/MS**

Field ID: MW2 Laboratory ID: 37768-02
Project: Topsfield DPW/2000.34 QC Batch ID: VM4-1591-W
Client: Clean Soils Environmental Sampled: 12-06-00
Container: 40 mL VOA Vial Received: 12-06-00
Preservation: HCl / Cool Analyzed: 12-09-00
Matrix: Aqueous Dilution Factor: 1

CAS Number	Analyte	Concentration	Units	Reporting Limit
74-87-3	Chloromethane	BRL	ug/L	0.5
75-01-4	Vinyl Chloride	BRL	ug/L	0.5
74-83-9	Bromomethane	BRL	ug/L	0.5
75-00-3	Chloroethane	BRL	ug/L	0.5
75-35-4	1,1-Dichloroethene	BRL	ug/L	0.5
67-64-1	Acetone	BRL	ug/L	5
75-15-0	Carbon Disulfide	BRL	ug/L	5
75-09-2	Methylene Chloride	BRL	ug/L	2
156-60-5	trans- 1,2-Dichloroethene	BRL	ug/L	0.5
75-34-3	1,1-Dichloroethane	4	ug/L	0.5
156-59-2	cis- 1,2-Dichloroethene	BRL	ug/L	0.5
78-93-3	2-Butanone (MEK)	BRL	ug/L	5
67-66-3	Chloroform	BRL	ug/L	0.5
71-55-6	1,1,1-Trichloroethane	BRL	ug/L	0.5
56-23-5	Carbon Tetrachloride	BRL	ug/L	0.5
71-43-2	Benzene	BRL	ug/L	0.5
107-06-2	1,2-Dichloroethane	BRL	ug/L	0.5
79-01-6	Trichloroethene	BRL	ug/L	0.5
78-87-5	1,2-Dichloropropane	BRL	ug/L	0.5
75-27-4	Bromodichloromethane	BRL	ug/L	0.5
10061-01-5	cis- 1,3-Dichloropropene	BRL	ug/L	0.5
108-10-1	4-Methyl-2-Pentanone (MIBK)	BRL	ug/L	5
108-88-3	Toluene	BRL	ug/L	0.5
10061-02-6	trans- 1,3-Dichloropropene	BRL	ug/L	0.5
79-00-5	1,1,2-Trichloroethane	BRL	ug/L	0.5
127-18-4	Tetrachloroethene	BRL	ug/L	0.5
591-78-6	2-Hexanone	BRL	ug/L	5
124-48-1	Dibromochloromethane	BRL	ug/L	0.5
108-90-7	Chlorobenzene	BRL	ug/L	0.5
100-41-4	Ethylbenzene	BRL	ug/L	0.5
108-38-3/106-42-3	meta- Xylene and para- Xylene	BRL	ug/L	0.5
95-47-6	ortho- Xylene	BRL	ug/L	0.5
100-42-5	Styrene	BRL	ug/L	0.5
75-25-2	Bromoform	BRL	ug/L	0.5
79-34-5	1,1,2,2-Tetrachloroethane	BRL	ug/L	0.5
1634-04-4	Methyl tert- butyl Ether (MTBE) *	BRL	ug/L	0.5

QC Surrogate Compounds	Recovery	QC Limits
Dibromofluoromethane	100 %	86 - 118 %
1,2-Dichloroethane-d ₄	101 %	80 - 120 %
Toluene-d ₈	100 %	88 - 110 %
4-Bromofluorobenzene	100 %	86 - 115 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996). Analyte list as specified by the Target Compound List (TCL) of the US EPA Contract Laboratory Program. Analysis performed utilizing 25mL sample purge volume.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample dilution and sample size.
0 Indicates additional target analyte.

**GROUNDWATER
ANALYTICAL**

**Massachusetts DEP EPH Method
Extractable Petroleum Hydrocarbons by GC/FID**

Field ID:	MW3	Laboratory ID:	37768-10
Project:	Topsfield DPW/2000.34	QC Batch ID:	EP-0770-F
Client:	Clean Soils Environmental	Sampled:	12-06-00
Container:	1 L Amber Glass	Received:	12-06-00
Preservation:	H2SO4 / Cool	Extracted:	12-07-00
Matrix:	Aqueous	Analyzed:	12-11-00
		Dilution Factor:	Aliphatic: 1 Aromatic: 1

EPH Ranges	Concentration	Units	Reporting Limit
n-C9 to n-C18 Aliphatic Hydrocarbons †	BRL	ug/L	500
n-C19 to n-C36 Aliphatic Hydrocarbons †	BRL	ug/L	500
n-C11 to n-C22 Aromatic Hydrocarbons † ◊	BRL	ug/L	200
Unadjusted n-C11 to n-C22 Aromatic Hydrocarbons †	BRL	ug/L	200

CAS Number	Target Analytes	Concentration	Units	Reporting Limit
91-20-3	Naphthalene	BRL	ug/L	10
91-57-6	2-Methylnaphthalene	BRL	ug/L	5
85-01-8	Phenanthrene	BRL	ug/L	10
83-32-9	Acenaphthene	BRL	ug/L	10
208-96-8	Acenaphthylene	BRL	ug/L	10
86-73-7	Fluorene	BRL	ug/L	10
120-12-7	Anthracene	BRL	ug/L	10
206-44-0	Fluoranthene	BRL	ug/L	10
129-00-0	Pyrene	BRL	ug/L	10
56-55-3	Benzo[a]anthracene	BRL	ug/L	10
218-01-9	Chrysene	BRL	ug/L	10
205-99-2	Benzo[b]fluoranthene	BRL	ug/L	10
207-08-9	Benzo[k]fluoranthene	BRL	ug/L	10
50-32-8	Benzo[a]pyrene	BRL	ug/L	10
193-39-5	Indeno[1,2,3-c,d]pyrene	BRL	ug/L	10
53-70-3	Dibenzo[a,h]anthracene	BRL	ug/L	10
191-24-2	Benzo[g,h,i]perylene	BRL	ug/L	10

QC Surrogate Compounds		Recovery	QC Limits
Fractionation:	2-Fluorobiphenyl	79 %	40 - 140 %
	2-Bromonaphthalene	81 %	40 - 140 %
Extraction:	Chloro-octadecane	66 %	40 - 140 %
	ortho -Terphenyl	77 %	40 - 140 %

QA/QC Certification	
1. Were all QA/QC procedures required by the method followed?	Yes
2. Were all performance/acceptance standards for the required QA/QC procedures achieved?	Yes
3. Were any significant modifications made to the method, as specified in Section 11.3?	No
Method non-conformances indicated above are detailed below on this data report, or in the accompanying project narrative and project quality control report. Release of this data is authorized by the accompanying signed project cover letter. The accompanying cover letter, project narrative and quality control report are considered part of this data report.	

Method Reference: Method for the Determination of Extractable Petroleum Hydrocarbons, MA DEP (1998). Extraction performed utilizing separatory funnel technique.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample dilution and sample size.

† Hydrocarbon range data excludes concentrations of any surrogate(s) and/or internal standards eluting in that range.

◊ n-C11 to n-C22 Aromatic Hydrocarbons range data excludes the method target analyte concentrations.

**GROUNDWATER
ANALYTICAL**

Trace Metals by ICP-AES and CVAA

Field ID: MW-3

Project: Topsfield DPW/2000.34

Client: Clean Soils Environmental

Container: 500 mL Plastic

Preservation: HNO3 / Cool

Matrix: Aqueous

Laboratory ID: 37768-07

Sampled: 12-06-00

Received: 12-06-00

Preserved: 12-06-00

CAS Number	Analyte	Concentration	Units	Reporting Limit	Analyzed	QC Batch	Method
7440-38-2	Arsenic, Total	0.03	mg/L	0.02	12-07-00	MM-1213-W	6010B
7440-39-3	Barium, Total	BRL	mg/L	0.2	12-07-00	MM-1213-W	6010B
7440-43-9	Cadmium, Total	BRL	mg/L	0.005	12-07-00	MM-1213-W	6010B
7440-47-3	Chromium, Total	0.01	mg/L	0.01	12-07-00	MM-1213-W	6010B
7439-92-1	Lead, Total	0.007	mg/L	0.005	12-07-00	MM-1213-W	6010B
7439-97-6	Mercury, Total	BRL	mg/L	0.0002	12-07-00	MP-0882-W	7470A
7782-49-2	Selenium, Total	BRL	mg/L	0.01	12-07-00	MM-1213-W	6010B
7440-22-4	Silver, Total	BRL	mg/L	0.01	12-07-00	MM-1213-W	6010B

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample dilution and sample size.

GROUNDWATER ANALYTICAL

EPA Method 8260B TCL Volatile Organics by GC/MS

Field ID: MW3
Project: Topsfield DPW/2000.34
Client: Clean Soils Environmental
Container: 40 mL VOA Vial
Preservation: HCl / Cool
Matrix: Aqueous

Laboratory ID: 37768-03
QC Batch ID: VM4-1591-W
Sampled: 12-06-00
Received: 12-06-00
Analyzed: 12-09-00
Dilution Factor: 1

CAS Number	Analyte	Concentration	Units	Reporting Limit
74-87-3	Chloromethane	BRL	ug/L	0.5
75-01-4	Vinyl Chloride	BRL	ug/L	0.5
74-83-9	Bromomethane	BRL	ug/L	0.5
75-00-3	Chloroethane	BRL	ug/L	0.5
75-35-4	1,1-Dichloroethene	BRL	ug/L	0.5
67-64-1	Acetone	BRL	ug/L	5
75-15-0	Carbon Disulfide	BRL	ug/L	5
75-09-2	Methylene Chloride	BRL	ug/L	2
156-60-5	trans-1,2-Dichloroethene	BRL	ug/L	0.5
75-34-3	1,1-Dichloroethane	5	ug/L	0.5
156-59-2	cis-1,2-Dichloroethene	BRL	ug/L	0.5
78-93-3	2-Butanone (MEK)	BRL	ug/L	5
67-66-3	Chloroform	BRL	ug/L	0.5
71-55-6	1,1,1-Trichloroethane	BRL	ug/L	0.5
56-23-5	Carbon Tetrachloride	BRL	ug/L	0.5
71-43-2	Benzene	BRL	ug/L	0.5
107-06-2	1,2-Dichloroethane	BRL	ug/L	0.5
79-01-6	Trichloroethene	BRL	ug/L	0.5
78-87-5	1,2-Dichloropropane	BRL	ug/L	0.5
75-27-4	Bromodichloromethane	BRL	ug/L	0.5
10061-01-5	cis-1,3-Dichloropropene	BRL	ug/L	0.5
108-10-1	4-Methyl-2-Pentanone (MIBK)	BRL	ug/L	5
108-88-3	Toluene	BRL	ug/L	0.5
10061-02-6	trans-1,3-Dichloropropene	BRL	ug/L	0.5
79-00-5	1,1,2-Trichloroethane	BRL	ug/L	0.5
127-18-4	Tetrachloroethene	BRL	ug/L	0.5
591-78-6	2-Hexanone	BRL	ug/L	5
124-48-1	Dibromochloromethane	BRL	ug/L	0.5
108-90-7	Chlorobenzene	BRL	ug/L	0.5
100-41-4	Ethylbenzene	BRL	ug/L	0.5
108-38-3/106-42-3	meta-Xylene and para-Xylene	BRL	ug/L	0.5
95-47-6	ortho-Xylene	BRL	ug/L	0.5
100-42-5	Styrene	BRL	ug/L	0.5
75-25-2	Bromoform	BRL	ug/L	0.5
79-34-5	1,1,2,2-Tetrachloroethane	BRL	ug/L	0.5
1634-04-4	Methyl tert-butyl Ether (MTBE) ^o	BRL	ug/L	0.5

QC Surrogate Compounds	Recovery %	QC Limits
Dibromofluoromethane	102 %	86 - 118 %
1,2-Dichloroethane-d ₄	103 %	80 - 120 %
Toluene-d ₈	99 %	88 - 110 %
4-Bromofluorobenzene	100 %	86 - 115 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996). Analyte list as specified by the Target Compound List (TCL) of the US EPA Contract Laboratory Program. Analysis performed utilizing 25mL sample purge volume.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample dilution and sample size.

^o Indicates additional target analyte.

**GROUNDWATER
ANALYTICAL**

**EPA Method 8260B
TCL Volatile Organics by GC/MS**

Field ID: Trip Blank Laboratory ID: 37768-04
Project: Topsfield DPW/2000.34 QC Batch ID: VM4-1591-W
Client: Clean Soils Environmental Sampled: 12-06-00
Container: 40 mL VOA Vial Received: 12-06-00
Preservation: HCl / Cool Analyzed: 12-09-00
Matrix: Aqueous Dilution Factor: 1

CAS Number	Analyte	Concentration	Units	Reporting Limit
74-87-3	Chloromethane	BRL	ug/L	0.5
75-01-4	Vinyl Chloride	BRL	ug/L	0.5
74-83-9	Bromomethane	BRL	ug/L	0.5
75-00-3	Chloroethane	BRL	ug/L	0.5
75-35-4	1,1-Dichloroethene	BRL	ug/L	0.5
67-64-1	Acetone	BRL	ug/L	5
75-15-0	Carbon Disulfide	BRL	ug/L	5
75-09-2	Methylene Chloride	BRL	ug/L	2
156-60-5	trans- 1,2-Dichloroethene	BRL	ug/L	0.5
75-34-3	1,1-Dichloroethane	BRL	ug/L	0.5
156-59-2	cis- 1,2-Dichloroethene	BRL	ug/L	0.5
78-93-3	2-Butanone (MEK)	BRL	ug/L	5
67-66-3	Chloroform	BRL	ug/L	0.5
71-55-6	1,1,1-Trichloroethane	BRL	ug/L	0.5
56-23-5	Carbon Tetrachloride	BRL	ug/L	0.5
71-43-2	Benzene	BRL	ug/L	0.5
107-06-2	1,2-Dichloroethane	BRL	ug/L	0.5
79-01-6	Trichloroethene	BRL	ug/L	0.5
78-87-5	1,2-Dichloropropane	BRL	ug/L	0.5
75-27-4	Bromodichloromethane	BRL	ug/L	0.5
10061-01-5	cis- 1,3-Dichloropropene	BRL	ug/L	0.5
108-10-1	4-Methyl-2-Pentanone (MIBK)	BRL	ug/L	5
108-88-3	Toluene	BRL	ug/L	0.5
10061-02-6	trans- 1,3-Dichloropropene	BRL	ug/L	0.5
79-00-5	1,1,2-Trichloroethane	BRL	ug/L	0.5
127-18-4	Tetrachloroethene	BRL	ug/L	0.5
591-78-6	2-Hexanone	BRL	ug/L	5
124-48-1	Dibromochloromethane	BRL	ug/L	0.5
108-90-7	Chlorobenzene	BRL	ug/L	0.5
100-41-4	Ethylbenzene	BRL	ug/L	0.5
108-38-3/106-42-3	meta- Xylene and para- Xylene	BRL	ug/L	0.5
95-47-6	ortho- Xylene	BRL	ug/L	0.5
100-42-5	Styrene	BRL	ug/L	0.5
75-25-2	Bromoform	BRL	ug/L	0.5
79-34-5	1,1,2,2-Tetrachloroethane	BRL	ug/L	0.5
1634-04-4	Methyl tert- butyl Ether (MTBE) ^o	BRL	ug/L	0.5

QC Surrogate Compounds	Recovery	QC Limits
Dibromofluoromethane	98 %	86 - 118 %
1,2-Dichloroethane-d ₄	103 %	80 - 120 %
Toluene-d ₈	99 %	88 - 110 %
4-Bromofluorobenzene	101 %	86 - 115 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996). Analyte list as specified by the Target Compound List (TCL) of the US EPA Contract Laboratory Program. Analysis performed utilizing 25mL sample purge volume.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample dilution and sample size.
^o Indicates additional target analyte.

GROUNDWATER ANALYTICAL

Project Narrative

Project: **Topsfield DPW/2000.34**
Client: **Clean Soils Environmental**

Lab ID: **37768**
Received: **12-06-00**

A. Physical Condition of Sample(s)

This project was received by the laboratory in satisfactory condition. The sample(s) were received undamaged in appropriate containers with the correct preservation.

B. Project Documentation

This project was accompanied by satisfactory Chain of Custody documentation. The sample container label(s) agreed with the Chain of Custody.

C. Analysis of Sample(s)

No analytical anomalies or non-conformances were noted by the laboratory during the processing of these sample(s). All data contained within this report are released without qualification.

GROUNDWATER ANALYTICAL

Quality Assurance/Quality Control

A. Program Overview

Groundwater Analytical conducts an active Quality Assurance program to ensure the production of high quality, valid data. This program closely follows the guidance provided by *Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans*, US EPA QAMS-005/80 (1980), and *Test Methods for Evaluating Solid Waste*, US EPA, SW-846, Update III (1996).

Quality Control protocols include written Standard Operating Procedures (SOPs) developed for each analytical method. SOPs are derived from US EPA methodologies and other established references. Standards are prepared from commercially obtained reference materials of certified purity, and documented for traceability.

Quality Assessment protocols for most organic analyses include a minimum of one laboratory control sample, one method blank, one matrix spike sample, and one sample duplicate for each sample preparation batch. All samples, standards, blanks, laboratory control samples, matrix spikes and sample duplicates are spiked with internal standards and surrogate compounds. All instrument sequences begin with an initial calibration verification standard and a blank; and excepting GC/MS sequences, all sequences close with a continuing calibration standard. GC/MS systems are tuned to appropriate ion abundance criteria daily, or for each 12 hour operating period, whichever is more frequent.

Quality Assessment protocols for most inorganic analyses include a minimum of one laboratory control sample, one method blank, one matrix spike sample, and one sample duplicate for each sample preparation batch. Standard curves are derived from one reagent blank and four concentration levels. Curve validity is verified by standard recoveries within plus or minus ten percent of the curve.

B. Definitions

Batches are used as the basic unit for Quality Assessment. A Batch is defined as twenty or fewer samples of the same matrix which are prepared together for the same analysis, using the same lots of reagents and the same techniques or manipulations, all within the same continuum of time, up to but not exceeding 24 hours.

Laboratory Control Samples are used to assess the accuracy of the analytical method. A Laboratory Control Sample consists of reagent water or sodium sulfate spiked with a group of target analytes representative of the method analytes. Accuracy is defined as the degree of agreement of the measured value with the true or expected value. Percent Recoveries for the Laboratory Control Samples are calculated to assess accuracy.

Method Blanks are used to assess the level of contamination present in the analytical system. Method Blanks consist of reagent water or an aliquot of sodium sulfate. Method Blanks are taken through all the appropriate steps of an analytical method. Sample data reported is not corrected for blank contamination.

Surrogate Compounds are used to assess the effectiveness of an analytical method in dealing with each sample matrix. Surrogate Compounds are organic compounds which are similar to the target analytes of interest in chemical behavior, but which are not normally found in environmental samples. Percent Recoveries are calculated for each Surrogate Compound.

GROUNDWATER ANALYTICAL

Quality Control Report Laboratory Control Sample

Category: EPA Method 8260B
QC Batch ID: VM4-1591-WL
Matrix: Aqueous
Units: ug/L

CAS Number	Analyte	Spiked	Measured	Recovery	QC Limits
75-35-4	1,1-Dichloroethene	10	7	73 %	70 - 130 %
71-43-2	Benzene	10	8	81 %	70 - 130 %
79-01-6	Trichloroethene	10	8	79 %	70 - 130 %
108-88-3	Toluene	10	8	82 %	70 - 130 %
108-90-7	Chlorobenzene	10	8	83 %	70 - 130 %

QC Surrogate Compounds	Recovery	QC Limits
Dibromofluoromethane	99 %	86 - 118 %
1,2-Dichloroethane-d ₄	96 %	80 - 120 %
Toluene-d ₈	101 %	88 - 110 %
4-Bromofluorobenzene	100 %	86 - 115 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).

Report Notations: All calculations performed prior to rounding. Quality Control Limits are defined by the methodology, or alternatively based upon the historical average recovery plus or minus three standard deviation units.

**GROUNDWATER
ANALYTICAL**

**Quality Control Report
Method Blank**

Category: EPA Method 8260B
QC Batch ID: VM4-1591-WB
Matrix: Aqueous

CAS Number	Analyte	Concentration	Units	Reporting Limit
74-87-3	Chloromethane	BRL	ug/L	0.5
75-01-4	Vinyl Chloride	BRL	ug/L	0.5
74-83-9	Bromomethane	BRL	ug/L	0.5
75-00-3	Chloroethane	BRL	ug/L	0.5
75-35-4	1,1-Dichloroethene	BRL	ug/L	0.5
67-64-1	Acetone	BRL	ug/L	5
75-15-0	Carbon Disulfide	BRL	ug/L	5
75-09-2	Methylene Chloride	BRL	ug/L	2
156-60-5	trans- 1,2-Dichloroethene	BRL	ug/L	0.5
1634-04-4	Methyl tert- butyl Ether (MTBE) ⁰	BRL	ug/L	0.5
75-34-3	1,1-Dichloroethane	BRL	ug/L	0.5
156-59-2	cis- 1,2-Dichloroethene	BRL	ug/L	0.5
78-93-3	2-Butanone (MEK)	BRL	ug/L	5
67-66-3	Chloroform	BRL	ug/L	0.5
71-55-6	1,1,1-Trichloroethane	BRL	ug/L	0.5
56-23-5	Carbon Tetrachloride	BRL	ug/L	0.5
71-43-2	Benzene	BRL	ug/L	0.5
107-06-2	1,2-Dichloroethane	BRL	ug/L	0.5
79-01-6	Trichloroethene	BRL	ug/L	0.5
78-87-5	1,2-Dichloropropane	BRL	ug/L	0.5
75-27-4	Bromodichloromethane	BRL	ug/L	0.5
10061-01-5	cis- 1,3-Dichloropropene	BRL	ug/L	0.5
108-10-1	4-Methyl-2-Pentanone (MIBK)	BRL	ug/L	5
108-88-3	Toluene	BRL	ug/L	0.5
10061-02-6	trans- 1,3-Dichloropropene	BRL	ug/L	0.5
79-00-5	1,1,2-Trichloroethane	BRL	ug/L	0.5
127-18-4	Tetrachloroethene	BRL	ug/L	0.5
591-78-6	2-Hexanone	BRL	ug/L	5
124-48-1	Dibromochloromethane	BRL	ug/L	0.5
108-90-7	Chlorobenzene	BRL	ug/L	0.5
100-41-4	Ethylbenzene	BRL	ug/L	0.5
108-38-3/106-42-3	meta- Xylene and para- Xylene	BRL	ug/L	0.5
95-47-6	ortho- Xylene	BRL	ug/L	0.5
100-42-5	Styrene	BRL	ug/L	0.5
75-25-2	Bromoform	BRL	ug/L	0.5
79-34-5	1,1,2,2-Tetrachloroethane	BRL	ug/L	0.5
QC Surrogate Compounds		Recovery %	QC Limits	
Dibromofluoromethane		96 %	86 - 118 %	
1,2-Dichloroethane-d ₄		96 %	80 - 120 %	
Toluene-d ₈		98 %	88 - 110 %	
4-Bromofluorobenzene		100 %	86 - 115 %	

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996). Analyte list as specified by the Target Compound List (TCL) of the US EPA Contract Laboratory Program. Analysis performed utilizing 25mL sample purge volume.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample dilution, percent moisture and sample size.

0 Indicates additional target analyte.

**GROUNDWATER
ANALYTICAL**

**Quality Control Report
Laboratory Control Sample**

Category: **Metals**
Matrix: **Aqueous**

CAS Number	Analyte	Method	QC Batch	Units	Spiked	Measured	Recovery	QC Limits
7440-38-2	Arsenic	6010B	MM-1213-WL	mg/L	1.0	0.98	98 %	80 - 120 %
7440-39-3	Barium	6010B	MM-1213-WL	mg/l	1.0	0.95	95 %	80 - 120 %
7440-43-9	Cadmium	6010B	MM-1213-WL	mg/L	1.0	0.99	99 %	80 - 120 %
7440-47-3	Chromium	6010B	MM-1213-WL	mg/L	1.0	0.99	99 %	80 - 120 %
7439-92-1	Lead	6010B	MM-1213-WL	mg/L	1.0	0.99	99 %	80 - 120 %
7439-97-6	Mercury	7470A	MP-0882-WL	mg/L	0.0010	0.0010	98 %	80 - 120 %
7782-49-2	Selenium	6010B	MM-1213-WL	mg/L	1.0	1.0	97 %	80 - 120 %
7440-22-4	Silver	6010B	MM-1213-WL	mg/L	1.0	0.93	93 %	80 - 120 %

Method References: Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Update III (1996).

Report Notations: All calculations performed prior to rounding. Quality Control Limits are defined by the methodology, or alternatively based upon the historical average recovery plus or minus three standard deviation units.

**GROUNDWATER
ANALYTICAL**

**Quality Control Report
Method Blank**

Category: Metals
Matrix: Aqueous

CAS Number	Analyte	Result	Units	Reporting Limit	QC Batch	Method
7440-38-2	Arsenic	BRL	mg/L	0.02	MM-1213-WB	6010B
7440-39-3	Barium	BRL	mg/L	0.20	MM-1213-WB	6010B
7440-43-9	Cadmium	BRL	mg/L	0.005	MM-1213-WB	6010B
7440-47-3	Chromium	BRL	mg/L	0.01	MM-1213-WB	6010B
7439-92-1	Lead	BRL	mg/L	0.005	MM-1213-WB	6010B
7439-97-6	Mercury	BRL	mg/L	0.0002	MP-0882-WB	7470A
7782-49-2	Selenium	BRL	mg/L	0.01	MM-1213-WB	6010B
7440-22-4	Silver	BRL	mg/L	0.01	MM-1213-WB	6010B

Method References: Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Update III (1996).

Report Notations: BRL Indicates result, if any, is below reporting limit for analyte. Reporting limit is the lowest value that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample dilution and sample size.

**GROUNDWATER
ANALYTICAL**

**Quality Control Report
Laboratory Control Sample**

Category: MA DEP EPH Method
QC Batch ID: EP-0770-F
Matrix: Water
Units: ug/L

CAS Number	Analyte	Spiked	Measured	Recovery	QC Limits
111-84-2	n-Nonane (C9)	50	24	47 %	40 - 140 %
629-59-4	n-Tetradecane (C14)	50	34	68 %	40 - 140 %
629-92-5	n-Nonadecane (C19)	50	39	78 %	40 - 140 %
112-95-8	n-Eicosane (C20)	50	40	80 %	40 - 140 %
630-02-4	n-Octacosane (C28)	50	38	77 %	40 - 140 %
91-20-3	Naphthalene	50	32	65 %	40 - 140 %
83-32-9	Acenaphthene	50	38	76 %	40 - 140 %
120-12-7	Anthracene	50	50	99 %	40 - 140 %
129-00-0	Pyrene	50	47	95 %	40 - 140 %
218-01-9	Chrysene	50	53	105 %	40 - 140 %

QC Surrogate Compounds		Recovery	QC Limits
Fractionation:	2-Fluorobiphenyl	88 %	40 - 140 %
	2-Bromonaphthalene	94 %	40 - 140 %
Extraction:	Chloro-octadecane	78 %	40 - 140 %
	ortho-Terphenyl	98 %	40 - 140 %

Method Reference: Method for the Determination of Extractable Petroleum Hydrocarbons, MA DEP (1998).
Report Notations: All calculations performed prior to rounding. Quality Control Limits are defined by the methodology, or alternatively based upon the historical average recovery plus or minus three standard deviation units.

GROUNDWATER
ANALYTICAL

Quality Control Report
Method Blank

Category: MA DEP EPH Method
QC Batch ID: EP-0770-F
Matrix: Water

EPH Ranges	Concentration	Units	Reporting Limit
n-C9 to n-C18 Aliphatic Hydrocarbons †	BRL	ug/L	500
n-C19 to n-C36 Aliphatic Hydrocarbons †	BRL	ug/L	500
n-C11 to n-C22 Aromatic Hydrocarbons † ^o	BRL	ug/L	200
Unadjusted n-C11 to n-C22 Aromatic Hydrocarbons †	BRL	ug/L	200

CAS Number	Target Analytes	Concentration	Units	Reporting Limit
91-20-3	Naphthalene	BRL	ug/L	10
91-57-6	2-Methylnaphthalene	BRL	ug/L	5
85-01-8	Phenanthrene	BRL	ug/L	10
83-32-9	Acenaphthene	BRL	ug/L	10
208-96-8	Acenaphthylene	BRL	ug/L	10
86-73-7	Fluorene	BRL	ug/L	10
120-12-7	Anthracene	BRL	ug/L	10
206-44-0	Fluoranthene	BRL	ug/L	10
129-00-0	Pyrene	BRL	ug/L	10
56-55-3	Benzo[a]anthracene	BRL	ug/L	10
218-01-9	Chrysene	BRL	ug/L	10
205-99-2	Benzo[b]fluoranthene	BRL	ug/L	10
207-08-9	Benzo[k]fluoranthene	BRL	ug/L	10
50-32-8	Benzo[a]pyrene	BRL	ug/L	10
193-39-5	Indeno[1,2,3-c,d]pyrene	BRL	ug/L	10
53-70-3	Dibenzo[a,h]anthracene	BRL	ug/L	10
191-24-2	Benzo[g,h,i]perylene	BRL	ug/L	10

QC Surrogate Compounds		Recovery	QC Limits
Fractionation:	2-Fluorobiphenyl	87 %	40 - 140 %
	2-Bromonaphthalene	88 %	40 - 140 %
Extraction:	Chloro-octadecane	79 %	40 - 140 %
	ortho-Terphenyl	90 %	40 - 140 %

Method Reference: Method for the Determination of Extractable Petroleum Hydrocarbons, MA DEP (1998).

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample dilution and sample size.

† Hydrocarbon range data excludes concentrations of any surrogate(s) and/or internal standards eluting in that range.

o n-C11 to n-C22 Aromatic Hydrocarbons range data excludes the method target analyte concentrations.

Certifications and Approvals

CONNECTICUT, Department of Health Services, PH-0586

Potable Water, Wastewater/Trade Waste, Sewage/Effluent, and Soil

pH, Conductivity, Acidity, Alkalinity, Hardness, Chloride, Fluoride, Ammonia, Kjeldahl Nitrogen, Nitrate, Nitrite, Orthophosphate, Total Dissolved Solids, Cyanide, Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Total Chromium, Hexavalent Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Molybdenum, Nickel, Potassium, Selenium, Silver, Sodium, Thallium, Tin, Titanium, Vanadium, Zinc, Purgeable Halocarbons, Purgeable Aromatics, Pesticides, PCBs, PCBs in Oil, Ethylene Dibromide, Phenols, Oil and Grease.

MAINE, Department of Human Services, MA103

Drinking Water

Reciprocal certification in accordance with Massachusetts certification for drinking water analytes.

Waste Water

Reciprocal certification in accordance with Massachusetts certification for waste water analytes.

MASSACHUSETTS, Department of Environmental Protection, M-MA-103

Potable Water

Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Copper, Lead, Mercury, Nickel, Selenium, Thallium, Nitrate-N, Nitrite-N, Fluoride, Sodium, Sulfate, Cyanide, Turbidity, Residual Free Chlorine, Calcium, Total Alkalinity, Total Dissolved Solids, pH, Trihalomethanes, Volatile Organic Compounds, 1,2-Dibromoethane, 1,2-Dibromo-3-chloropropane, Total Coliform, Fecal Coliform, Heterotrophic Plate Count, E-Coli

Non-Potable Water

Aluminum, Antimony, Arsenic, Beryllium, Cadmium, Chromium, Cobalt, Copper, Iron, Lead, Manganese, Mercury, Molybdenum, Nickel, Selenium, Silver, Strontium, Thallium, Titanium, Vanadium, Zinc, pH, Specific Conductance, Total Dissolved Solids, Total Hardness, Calcium, Magnesium, Sodium, Potassium, Total Alkalinity, Chloride, Fluoride, Sulfate, Ammonia-N, Nitrate-N, Kjeldahl-N, Orthophosphate, Total Phosphorus, Chemical Oxygen Demand, Biochemical Oxygen Demand, Total Cyanide, Non-Filterable Residue, Total Residual Chlorine, Oil and Grease, Total Phenolics, Volatile Halocarbons, Volatile Aromatics, Chlordane, Aldrin, Dieldrin, DDD, DDE, DDT, Heptachlor, Heptachlor Epoxide, Polychlorinated Biphenyls (water), Polychlorinated Biphenyls (oil).

MICHIGAN, Department of Environmental Quality

Drinking Water

Trihalomethanes, Regulated and Unregulated Volatile Organic Compounds by EPA Method 524.2; 1,2-Dibromoethane, 1,2-Dibromo-3-chloropropane by EPA Method 504.1

NEW HAMPSHIRE, Department of Environmental Services, 202798

Drinking Water

Metals by Graphite Furnace, Metals by ICP, Mercury, Nitrite-N, Orthophosphate, Residual Free Chlorine, Turbidity, Total Filterable Residue, Calcium Hardness, pH, Alkalinity, Sodium, Sulfate, Total Cyanide, Insecticides, Herbicides, Base/Neutrals, Trihalomethanes, Volatile Organics, Vinyl Chloride, DBCP, EDB, Nitrate-N.

Wastewater

Metals by Graphite Furnace, Metals by ICP, Mercury, pH, Specific Conductivity, TDS, Total Hardness, Calcium, Magnesium, Sodium, Potassium, Total Alkalinity, Chloride, Fluoride, Sulfate, Ammonia-N, Nitrate-N, Orthophosphate, TKN, Total Phosphorus, COD, BOD, Non-Filterable Residue, Oil & Grease, Total Phenolics, Total Residual Chlorine, PCBs in Water, PCBs in Oil, Pesticides, Volatile Organics, Total Cyanide.

RHODE ISLAND, Department of Health, 54

Surface Water, Air, Wastewater, Potable Water, Sewage

Chemistry: Organic and Inorganic

**GROUNDWATER
ANALYTICAL**

Groundwater Analytical, Inc.
P.O. Box 1200
228 Main Street
Buzzards Bay, MA 02532

Telephone (508) 759-4441
FAX (508) 759-4475

December 8, 2000

Mr. Alexander Pancic
Clean Soils Environmental
P.O. Box 591
Ipswich, MA 01938

Project: Topsfield DPW Yard/2000.34
Lab ID: 37700
Sampled: 11-30-00

Dear Alex:

Enclosed are the PCBs, Extractable Petroleum Hydrocarbons, Hydrocarbon Fingerprint, Metals, Volatile Organics, and Metals Analyses performed for the above referenced project. This project was processed for Priority One Week turnaround.

This letter authorizes the release of the analytical results, and should be considered a part of this report. This report contains a project narrative indicating project changes and non-conformances, a brief description of the Quality Assurance/Quality Control procedures employed by our laboratory, and a statement of our state certifications.

I attest under the pains and penalties of perjury that, based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.

Should you have any questions concerning this report, please do not hesitate to contact me.

Sincerely,



Jonathan R. Sanford
President

JRS/myr
Enclosures

**GROUNDWATER
ANALYTICAL**

**Massachusetts DEP VPH Method
Volatile Petroleum Hydrocarbons by GC/PID/FID**

Field ID: B-1
Project: Topsfield DPW Yard/2000.34
Client: Clean Soils Environment
Container: 60 mL Glass Vial
Preservation: Methanol / Cool
Matrix: Soil
% Moisture: 17

Laboratory ID: 37700-05
QC Batch ID: VG1-1161-E
Sampled: 11-30-00
Received: 12-01-00
Analyzed: 12-05-00
Dilution Factor: 1

VPH Ranges	Concentration	Units	Reporting Limit
n-C5 to n-C8 Aliphatic Hydrocarbons [†]	BRL	mg/Kg	1.0
n-C9 to n-C12 Aliphatic Hydrocarbons [†]	BRL	mg/Kg	1.0
n-C9 to n-C10 Aromatic Hydrocarbons [†]	BRL	mg/Kg	1.0
Unadjusted n-C5 to n-C8 Aliphatic Hydrocarbons [†]	BRL	mg/Kg	1.0
Unadjusted n-C9 to n-C12 Aliphatic Hydrocarbons [†]	1.2	mg/Kg	1.0
QC Surrogate Compounds			
2,5-Dibromotoluene (PID)	94 %	70 - 130 %	
2,5-Dibromotoluene (FID)	98 %	70 - 130 %	

QA/QC Certification	
1. Were all QA/QC procedures required by the method followed?	Yes
2. Were all performance/acceptance standards for the required QA/QC procedures achieved?	Yes
3. Were any significant modifications made to the method, as specified in Section 11.3.2.17	No
Method non-conformances indicated above are detailed below on this data report, or in the accompanying project narrative and project quality control report. Release of this data is authorized by the accompanying signed project cover letter. The accompanying cover letter, project narrative and quality control report are considered part of this data report.	

Method Reference: Method for the Determination of Volatile Petroleum Hydrocarbons, MA DEP (1998). Results are calculated on a dry weight basis.

Report Notations:

BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample dilution, percent moisture and sample size.

† Hydrocarbon range data excludes concentrations of any surrogate(s) and/or internal standards eluting in that range.

◊ n-C5 to n-C8 Aliphatic Hydrocarbons range data excludes the method target analyte concentrations.

⊗ n-C9 to n-C12 Aliphatic Hydrocarbons range data excludes the method target analyte concentrations and the concentration for the n-C9 to n-C10 Aromatic Hydrocarbons range.

⌘ Analyte elutes in the n-C5 to n-C8 Aliphatic Hydrocarbons range.

‡ Analyte elutes in the n-C9 to n-C12 Aliphatic Hydrocarbons range.

GROUNDWATER ANALYTICAL

EPA Method 8260B TCL Volatile Organics by GC/MS

Field ID: B1
Project: Topsfield DPW Yard/2000.34
Client: Clean Soils Environmental
Container: 40 mL VOA Vial
Preservation: NaHSO₄ / Cool
Matrix: Soil
% Moisture: 17

Laboratory ID: 37700-01
QC Batch ID: VM5-1360-S
Sampled: 11-30-00
Received: 12-01-00
Analyzed: 12-05-00
Dilution Factor: 1

CAS Number	Analyte	Concentration	Units	Reporting Limit
74-87-3	Chloromethane	BRL	ug/Kg	10
75-01-4	Vinyl Chloride	BRL	ug/Kg	10
74-83-9	Bromomethane	BRL	ug/Kg	10
75-00-3	Chloroethane	BRL	ug/Kg	10
75-35-4	1,1-Dichloroethene	BRL	ug/Kg	5
67-64-1	Acetone	BRL	ug/Kg	200
75-15-0	Carbon Disulfide	BRL	ug/Kg	50
75-09-2	Methylene Chloride	BRL	ug/Kg	10
156-60-5	trans- 1,2-Dichloroethene	BRL	ug/Kg	5
1634-04-4	Methyl tert- butyl Ether (MTBE)	BRL	ug/Kg	5
75-34-3	1,1-Dichloroethane	BRL	ug/Kg	5
156-59-2	cis- 1,2-Dichloroethene	BRL	ug/Kg	5
78-93-3	2-Butanone (MEK)	BRL	ug/Kg	50
67-66-3	Chloroform	BRL	ug/Kg	5
71-55-6	1,1,1-Trichloroethane	BRL	ug/Kg	5
56-23-5	Carbon Tetrachloride	BRL	ug/Kg	5
71-43-2	Benzene	BRL	ug/Kg	5
107-06-2	1,2-Dichloroethane	BRL	ug/Kg	5
79-01-6	Trichloroethene	BRL	ug/Kg	5
78-87-5	1,2-Dichloropropane	BRL	ug/Kg	5
75-27-4	Bromodichloromethane	BRL	ug/Kg	5
10061-01-5	cis- 1,3-Dichloropropene	BRL	ug/Kg	5
108-10-1	4-Methyl-2-Pentanone (MIBK)	BRL	ug/Kg	50
108-88-3	Toluene	BRL	ug/Kg	5
10061-02-6	trans- 1,3-Dichloropropene	BRL	ug/Kg	5
79-00-5	1,1,2-Trichloroethane	BRL	ug/Kg	5
127-18-4	Tetrachloroethene	BRL	ug/Kg	5
591-78-6	2-Hexanone	BRL	ug/Kg	50
124-48-1	Dibromochloromethane	BRL	ug/Kg	5
108-90-7	Chlorobenzene	BRL	ug/Kg	5
100-41-4	Ethylbenzene	BRL	ug/Kg	5
108-38-3/106-42-3	meta- Xylene and para- Xylene	BRL	ug/Kg	5
95-47-6	ortho- Xylene	BRL	ug/Kg	5
100-42-5	Styrene	BRL	ug/Kg	5
75-25-2	Bromoform	BRL	ug/Kg	5
79-34-5	1,1,2,2-Tetrachloroethane	BRL	ug/Kg	5
QC Surrogate Compounds		Recovery	QC Limits	
Dibromofluoromethane		103 %	80 - 120 %	
1,2-Dichloroethane-d ₄		116 %	80 - 120 %	
Toluene-d ₈		99 %	81 - 117 %	
4-Bromofluorobenzene		97 %	74 - 121 %	

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996). Analyte list as specified by the Target Compound List (TCL) of the US EPA Contract Laboratory Program. Results are reported on a dry weight basis.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample dilution, percent moisture and sample size.
◊ Indicates additional target analyte.

**GROUNDWATER
ANALYTICAL**

**Massachusetts DEP EPH Method
Extractable Petroleum Hydrocarbons by GC/FID**

Field ID:	B1	Laboratory ID:	37700-07
Project:	Topsfield DPW Yard/2000.34	QC Batch ID:	EP-1062-M
Client:	Clean Soils Environmental	Sampled:	11-30-00
Container:	120 mL Amber Glass	Received:	12-01-00
Preservation:	Cool	Extracted:	12-04-00
Matrix:	Soil	Analyzed:	12-05-00
% Moisture:	17	Dilution Factor:	Aliphatic: 1 Aromatic: 1

EPH Ranges	Concentration	Units	Reporting Limit
n-C9 to n-C18 Aliphatic Hydrocarbons [†]	86	mg/Kg	36
n-C19 to n-C36 Aliphatic Hydrocarbons [†]	350	mg/Kg	36
n-C11 to n-C22 Aromatic Hydrocarbons [†] ^o	210	mg/Kg	36
Unadjusted n-C11 to n-C22 Aromatic Hydrocarbons [†]	210	mg/Kg	36

CAS Number	Target Analytes	Concentration	Units	Reporting Limit
91-20-3	Naphthalene	BRL	mg/Kg	0.60
91-57-6	2-Methylnaphthalene	BRL	mg/Kg	0.60
85-01-8	Phenanthrene	BRL	mg/Kg	0.60
83-32-9	Acenaphthene	BRL	mg/Kg	0.60
208-96-8	Acenaphthylene	BRL	mg/Kg	0.60
86-73-7	Fluorene	BRL	mg/Kg	0.60
120-12-7	Anthracene	BRL	mg/Kg	0.60
206-44-0	Fluoranthene	0.67	mg/Kg	0.60
129-00-0	Pyrene	0.69	mg/Kg	0.60
56-55-3	Benzo[a]anthracene	BRL	mg/Kg	0.60
218-01-9	Chrysene	BRL	mg/Kg	0.60
205-99-2	Benzo[b]fluoranthene	BRL	mg/Kg	0.60
207-08-9	Benzo[k]fluoranthene	BRL	mg/Kg	0.60
50-32-8	Benzo[a]pyrene	BRL	mg/Kg	0.60
193-39-5	Indeno[1,2,3-c,d]pyrene	BRL	mg/Kg	0.60
53-70-3	Dibenzo[a,h]anthracene	BRL	mg/Kg	0.60
191-24-2	Benzo[g,h,i]perylene	BRL	mg/Kg	0.60

QC Surrogate Compounds	Recovery	QC Limits
Fractionation: 2-Fluorobiphenyl	86 %	40 - 140 %
2-Bromonaphthalene	90 %	40 - 140 %
Extraction: Chloro-octadecane	65 %	40 - 140 %
ortho-Terphenyl	79 %	40 - 140 %

QA/QC Certification	
1. Were all QA/QC procedures required by the method followed?	Yes
2. Were all performance/acceptance standards for the required QA/QC procedures achieved?	Yes
3. Were any significant modifications made to the method, as specified in Section 11.3.1.1?	Yes
Method non-conformances indicated above are detailed below on this data report, or in the accompanying project narrative and project quality control report. Release of this data is authorized by the accompanying signed project cover letter. The accompanying cover letter, project narrative and quality control report are considered part of this data report.	

Method Reference: Method for the Determination of Extractable Petroleum Hydrocarbons, MA DEP (1998). Results are calculated on a dry weight basis. Method modified by use of microwave accelerated solvent extraction technique.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample dilution, percent moisture and sample size.

† Hydrocarbon range data excludes concentrations of any surrogate(s) and/or internal standards eluting in that range.

o n-C11 to n-C22 Aromatic Hydrocarbons range data excludes the method target analyte concentrations.

**GROUNDWATER
ANALYTICAL**

Trace Metals by ICP-AES and CVAA

Field ID: B1
Project: Topsfield DPW Yard/2000.34
Client: Clean Soils Environmental
Container: 250 mL Glass
Preservation: Cool
Matrix: Soil

Laboratory ID: 37700-10
Sampled: 11-30-00
Received: 12-01-00
% Solids: 83

CAS Number	Analyte	Concentration	Units	Reporting Limit	Analyzed On	QC Batch	Method
7440-38-2	Arsenic, Total	8.2	mg/Kg	5.9	12-05-00	MM-01175-S	6010B
7440-39-3	Barium, Total	BRL	mg/Kg	24	12-05-00	MM-01175-S	6010B
7440-43-9	Cadmium, Total	BRL	mg/Kg	0.59	12-05-00	MM-01175-S	6010B
7440-47-3	Chromium, Total	13	mg/Kg	12	12-05-00	MM-01175-S	6010B
7439-92-1	Lead, Total	BRL	mg/Kg	12	12-05-00	MM-01175-S	6010B
7439-97-6	Mercury, Total	BRL	mg/Kg	0.058	12-05-00	MP-0890-S	7471A
7782-49-2	Selenium, Total	BRL	mg/Kg	12	12-05-00	MM-01175-S	6010B
7440-22-4	Silver, Total	BRL	mg/Kg	5.9	12-05-00	MM-01175-S	6010B

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Results are reported on a dry weight basis.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions.
Reporting limits are adjusted for sample dilution and sample size.

GROUNDWATER ANALYTICAL

EPA Method 8082 Polychlorinated Biphenyls (PCBs) by GC/ECD

Field ID:	B1	Laboratory ID:	37700-10
Project:	Topsfield DPW Yard/2000.34	QC Batch ID:	PB-1192-M
Client:	Clean Soils Environmental	Sampled:	11-30-00
Container:	250 mL Glass	Received:	12-01-00
Preservation:	Cool	Extracted:	12-05-00
Matrix:	Soil	Analyzed:	12-06-00
% Moisture:	17	Dilution Factor:	1

CAS Number	Analyte	Concentration	Units	Reporting Limit
12674-11-2	Aroclor 1016	BRL	ug/Kg	93
11104-28-2	Aroclor 1221	BRL	ug/Kg	93
11141-16-5	Aroclor 1232	BRL	ug/Kg	93
53469-21-9	Aroclor 1242	BRL	ug/Kg	93
12672-29-6	Aroclor 1248	BRL	ug/Kg	93
11097-69-1	Aroclor 1254	BRL	ug/Kg	93
11096-82-5	Aroclor 1260	BRL	ug/Kg	93

QC Surrogate Compound	Recovery	QC Limits
Tetrachloro- <i>m</i> -xylene	81 %	25 - 121 %
Decachlorobiphenyl	102 %	28 - 138 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996). Analyte list as Aroclor analytes formerly specified by EPA Method 8080A. Results are reported on a dry weight basis.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample dilution, percent moisture and sample size.

GROUNDWATER ANALYTICAL

EPA Method 8260B TCL Volatile Organics by GC/MS

Field ID:	B6	Laboratory ID:	37700-02
Project:	Topsfield DPW Yard/2000.34	QC Batch ID:	VM5-1360-S
Client:	Clean Soils Environmental	Sampled:	11-30-00
Container:	40 mL VOA Vial	Received:	12-01-00
Preservation:	NaHSO4 / Cool	Analyzed:	12-05-00
Matrix:	Soil	Dilution Factor:	1
% Moisture:	29		

CAS Number	Analyte	Concentration	Units	Reporting Limit
74-87-3	Chloromethane	BRL	ug/Kg	13
75-01-4	Vinyl Chloride	BRL	ug/Kg	13
74-83-9	Bromomethane	BRL	ug/Kg	13
75-00-3	Chloroethane	BRL	ug/Kg	13
75-35-4	1,1-Dichloroethene	BRL	ug/Kg	7
67-64-1	Acetone	BRL	ug/Kg	260
75-15-0	Carbon Disulfide	BRL	ug/Kg	65
75-09-2	Methylene Chloride	BRL	ug/Kg	13
156-60-5	trans- 1,2-Dichloroethene	BRL	ug/Kg	7
1634-04-4	Methyl tert- butyl Ether (MTBE) °	BRL	ug/Kg	7
75-34-3	1,1-Dichloroethane	BRL	ug/Kg	7
156-59-2	cis- 1,2-Dichloroethene	BRL	ug/Kg	7
78-93-3	2-Butanone (MEK)	BRL	ug/Kg	65
67-66-3	Chloroform	BRL	ug/Kg	7
71-55-6	1,1,1-Trichloroethane	BRL	ug/Kg	7
56-23-5	Carbon Tetrachloride	BRL	ug/Kg	7
71-43-2	Benzene	BRL	ug/Kg	7
107-06-2	1,2-Dichloroethane	BRL	ug/Kg	7
79-01-6	Trichloroethene	BRL	ug/Kg	7
78-87-5	1,2-Dichloropropane	BRL	ug/Kg	7
75-27-4	Bromodichloromethane	BRL	ug/Kg	7
10061-01-5	cis- 1,3-Dichloropropene	BRL	ug/Kg	7
108-10-1	4-Methyl-2-Pentanone (MIBK)	BRL	ug/Kg	65
108-88-3	Toluene	BRL	ug/Kg	7
10061-02-6	trans- 1,3-Dichloropropene	BRL	ug/Kg	7
79-00-5	1,1,2-Trichloroethane	BRL	ug/Kg	7
127-18-4	Tetrachloroethene	BRL	ug/Kg	7
591-78-6	2-Hexanone	BRL	ug/Kg	65
124-48-1	Dibromochloromethane	BRL	ug/Kg	7
108-90-7	Chlorobenzene	BRL	ug/Kg	7
100-41-4	Ethylbenzene	BRL	ug/Kg	7
108-38-3/106-42-3	meta- Xylene and para- Xylene	BRL	ug/Kg	7
95-47-6	ortho- Xylene	BRL	ug/Kg	7
100-42-5	Styrene	BRL	ug/Kg	7
75-25-2	Bromoform	BRL	ug/Kg	7
79-34-5	1,1,2,2-Tetrachloroethane	BRL	ug/Kg	7

QC Surrogate Compounds	Recovery	QC Limits
Dibromofluoromethane	102 %	80 - 120 %
1,2-Dichloroethane-d ₄	118 %	80 - 120 %
Toluene-d ₈	100 %	81 - 117 %
4-Bromofluorobenzene	99 %	74 - 121 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996). Analyte list as specified by the Target Compound List (TCL) of the US EPA Contract Laboratory Program. Results are reported on a dry weight basis.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample dilution, percent moisture and sample size.
 ° Indicates additional target analyte.

GROUNDWATER ANALYTICAL

Massachusetts DEP EPH Method Extractable Petroleum Hydrocarbons by GC/FID

Field ID:	86	Laboratory ID:	37700-08
Project:	Topsfield DPW Yard/2000.34	QC Batch ID:	EP-1062-M
Client:	Clean Soils Environmental	Sampled:	11-30-00
Container:	120 mL Amber Glass	Received:	12-01-00
Preservation:	Cool	Extracted:	12-04-00
Matrix:	Soil	Analyzed:	12-06-00
% Moisture:	29	Dilution Factor:	Aliphatic: 1 Aromatic: 1

EPH Ranges	Concentration	Units	Reporting Limit
n-C9 to n-C18 Aliphatic Hydrocarbons [†]	BRL	mg/Kg	42
n-C19 to n-C36 Aliphatic Hydrocarbons [†]	BRL	mg/Kg	42
n-C11 to n-C22 Aromatic Hydrocarbons ^{†,‡}	BRL	mg/Kg	42
Unadjusted n-C11 to n-C22 Aromatic Hydrocarbons [†]	BRL	mg/Kg	42

CAS Number	Target Analytes	Concentration	Units	Reporting Limit
91-20-3	Naphthalene	BRL	mg/Kg	0.69
91-57-6	2-Methylnaphthalene	BRL	mg/Kg	0.69
85-01-8	Phenanthrene	BRL	mg/Kg	0.69
83-32-9	Acenaphthene	BRL	mg/Kg	0.69
208-96-8	Acenaphthylene	BRL	mg/Kg	0.69
86-73-7	Fluorene	BRL	mg/Kg	0.69
120-12-7	Anthracene	BRL	mg/Kg	0.69
206-44-0	Fluoranthene	BRL	mg/Kg	0.69
129-00-0	Pyrene	BRL	mg/Kg	0.69
56-55-3	Benzo[a]anthracene	BRL	mg/Kg	0.69
218-01-9	Chrysene	BRL	mg/Kg	0.69
205-99-2	Benzo[b]fluoranthene	BRL	mg/Kg	0.69
207-08-9	Benzo[k]fluoranthene	BRL	mg/Kg	0.69
50-32-8	Benzo[a]pyrene	BRL	mg/Kg	0.69
193-39-5	Indeno[1,2,3-c,d]pyrene	BRL	mg/Kg	0.69
53-70-3	Dibenzo[a,h]anthracene	BRL	mg/Kg	0.69
191-24-2	Benzo[g,h,i]perylene	BRL	mg/Kg	0.69

QC Surrogate Compounds	Recovery	QC Limits
Fractionation: 2-Fluorobiphenyl	84 %	40 - 140 %
2-Bromonaphthalene	83 %	40 - 140 %
Extraction: Chloro-octadecane	62 %	40 - 140 %
ortho-Terphenyl	79 %	40 - 140 %

QA/QC Certification	
1. Were all QA/QC procedures required by the method followed?	Yes
2. Were all performance/acceptance standards for the required QA/QC procedures achieved?	Yes
3. Were any significant modifications made to the method, as specified in Section 11.3.1.1?	Yes
Method non-conformances indicated above are detailed below on this data report, or in the accompanying project narrative and project quality control report. Release of this data is authorized by the accompanying signed project cover letter. The accompanying cover letter, project narrative and quality control report are considered part of this data report.	

Method Reference: Method for the Determination of Extractable Petroleum Hydrocarbons, MA DEP (1998). Results are calculated on a dry weight basis. Method modified by use of microwave accelerated solvent extraction technique.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample dilution, percent moisture and sample size.

† Hydrocarbon range data excludes concentrations of any surrogate(s) and/or internal standards eluting in that range.

‡ n-C11 to n-C22 Aromatic Hydrocarbons range data excludes the method target analyte concentrations.

GROUNDWATER
ANALYTICAL

Trace Metals by ICP-AES and CVAA

Field ID: 86
Project: Topsfield DPW Yard/2000.34
Client: Clean Soils Environmental
Container: 250 mL Glass
Preservation: Cool
Matrix: Soil

Laboratory ID: 37700-11
Sampled: 11-30-00
Received: 12-01-00
% Solids 84

CAS Number	Analyte	Concentration	Units	Reporting Limit	Analyzed	QC Batch	Method
7440-38-2	Arsenic, Total	32	mg/Kg	5.8	12-05-00	MM-01175-S	6010B
7440-39-3	Barium, Total	49	mg/Kg	23	12-05-00	MM-01175-S	6010B
7440-43-9	Cadmium, Total	BRL	mg/Kg	0.58	12-05-00	MM-01175-S	6010B
7440-47-3	Chromium, Total	19	mg/Kg	12	12-05-00	MM-01175-S	6010B
7439-92-1	Lead, Total	BRL	mg/Kg	12	12-05-00	MM-01175-S	6010B
7439-97-6	Mercury, Total	BRL	mg/Kg	0.062	12-05-00	MP-0890-S	7471A
7782-49-2	Selenium, Total	BRL	mg/Kg	12	12-05-00	MM-01175-S	6010B
7440-22-4	Silver, Total	BRL	mg/Kg	5.8	12-05-00	MM-01175-S	6010B

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Results are reported on a dry weight basis.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions.
Reporting limits are adjusted for sample dilution and sample size.

GROUNDWATER ANALYTICAL

Massachusetts DEP EPH Method Extractable Petroleum Hydrocarbons by GC/FID

Field ID:	B8	Laboratory ID:	37700-09
Project:	Topsfield DPW Yard/2000.34	QC Batch ID:	EP-1062-M
Client:	Clean Soils Environmental	Sampled:	11-30-00
Container:	120 mL Amber Glass	Received:	12-01-00
Preservation:	Cool	Extracted:	12-04-00
Matrix:	Soil	Analyzed:	12-06-00
% Moisture:	16	Dilution Factor:	Aliphatic: 1 Aromatic: 1

EPH Ranges	Concentration	Units	Reporting Limit
n-C9 to n-C18 Aliphatic Hydrocarbons	BRL	mg/Kg	34
n-C19 to n-C36 Aliphatic Hydrocarbons	BRL	mg/Kg	34
n-C11 to n-C22 Aromatic Hydrocarbons [†]	BRL	mg/Kg	34
Unadjusted n-C11 to n-C22 Aromatic Hydrocarbons [†]	BRL	mg/Kg	34

CAS Number	Target Analytes	Concentration	Units	Reporting Limit
91-20-3	Naphthalene	BRL	mg/Kg	0.56
91-57-6	2-Methylnaphthalene	BRL	mg/Kg	0.56
85-01-8	Phenanthrene	BRL	mg/Kg	0.56
83-32-9	Acenaphthene	BRL	mg/Kg	0.56
208-96-8	Acenaphthylene	BRL	mg/Kg	0.56
86-73-7	Fluorene	BRL	mg/Kg	0.56
120-12-7	Anthracene	BRL	mg/Kg	0.56
206-44-0	Fluoranthene	BRL	mg/Kg	0.56
129-00-0	Pyrene	BRL	mg/Kg	0.56
56-55-3	Benzo[a]anthracene	BRL	mg/Kg	0.56
218-01-9	Chrysene	BRL	mg/Kg	0.56
205-99-2	Benzo[b]fluoranthene	BRL	mg/Kg	0.56
207-08-9	Benzo[k]fluoranthene	BRL	mg/Kg	0.56
50-32-8	Benzo[a]pyrene	BRL	mg/Kg	0.56
193-39-5	Indeno[1,2,3-c,d]pyrene	BRL	mg/Kg	0.56
53-70-3	Dibenzo[a,h]anthracene	BRL	mg/Kg	0.56
191-24-2	Benzo[g,h,i]perylene	BRL	mg/Kg	0.56

QC Surrogate Compounds	Recovery	QC Limits
Fractionation:		
2-Fluorobiphenyl	80 %	40 - 140 %
2-Bromonaphthalene	80 %	40 - 140 %
Extraction:		
Chloro-octadecane	72 %	40 - 140 %
ortho-Terphenyl	77 %	40 - 140 %

QA/QC Certification	
1. Were all QA/QC procedures required by the method followed?	Yes
2. Were all performance/acceptance standards for the required QA/QC procedures achieved?	Yes
3. Were any significant modifications made to the method, as specified in Section 11.3.1.1?	Yes
Method non-conformances indicated above are detailed below on this data report, or in the accompanying project narrative and project quality control report. Release of this data is authorized by the accompanying signed project cover letter. The accompanying cover letter, project narrative and quality control report are considered part of this data report.	

Method Reference: Method for the Determination of Extractable Petroleum Hydrocarbons, MA DEP (1998). Results are calculated on a dry weight basis. Method modified by use of microwave accelerated solvent extraction technique.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample dilution, percent moisture and sample size.

† Hydrocarbon range data excludes concentrations of any surrogate(s) and/or internal standards eluting in that range.

◊ n-C11 to n-C22 Aromatic Hydrocarbons range data excludes the method target analyte concentrations.

GROUNDWATER ANALYTICAL

EPA Method 8260B TCL Volatile Organics by GC/MS

Field ID: B8
Project: Topsfield DPW Yard/2000.34
Client: Clean Soils Environmental
Container: 40 mL VOA Vial
Preservation: NaHSO4 / Cool
Matrix: Soil
% Moisture: 16

Laboratory ID: 37700-03
QC Batch ID: VM5-1360-S
Sampled: 11-30-00
Received: 12-01-00
Analyzed: 12-05-00
Dilution Factor: 1

CAS Number	Analyte	Concentration	Units	Reporting Limit
74-87-3	Chloromethane	BRL	ug/Kg	10
75-01-4	Vinyl Chloride	BRL	ug/Kg	10
74-83-9	Bromomethane	BRL	ug/Kg	10
75-00-3	Chloroethane	BRL	ug/Kg	10
75-35-4	1,1-Dichloroethene	BRL	ug/Kg	5
67-64-1	Acetone	BRL	ug/Kg	200
75-15-0	Carbon Disulfide	BRL	ug/Kg	50
75-09-2	Methylene Chloride	BRL	ug/Kg	10
156-60-5	trans-1,2-Dichloroethene	BRL	ug/Kg	5
1634-04-4	Methyl tert-butyl Ether (MTBE) ⁰	BRL	ug/Kg	5
75-34-3	1,1-Dichloroethane	BRL	ug/Kg	5
156-59-2	cis-1,2-Dichloroethene	BRL	ug/Kg	5
78-93-3	2-Butanone (MEK)	BRL	ug/Kg	50
67-66-3	Chloroform	BRL	ug/Kg	5
71-55-6	1,1,1-Trichloroethane	BRL	ug/Kg	5
56-23-5	Carbon Tetrachloride	BRL	ug/Kg	5
71-43-2	Benzene	BRL	ug/Kg	5
107-06-2	1,2-Dichloroethane	BRL	ug/Kg	5
79-01-6	Trichloroethene	BRL	ug/Kg	5
78-87-5	1,2-Dichloropropane	BRL	ug/Kg	5
75-27-4	Bromodichloromethane	BRL	ug/Kg	5
10061-01-5	cis-1,3-Dichloropropene	BRL	ug/Kg	5
108-10-1	4-Methyl-2-Pentanone (MIBK)	BRL	ug/Kg	50
108-88-3	Toluene	BRL	ug/Kg	5
10061-02-6	trans-1,3-Dichloropropene	BRL	ug/Kg	5
79-00-5	1,1,2-Trichloroethane	BRL	ug/Kg	5
127-18-4	Tetrachloroethene	BRL	ug/Kg	5
591-78-6	2-Hexanone	BRL	ug/Kg	50
124-48-1	Dibromochloromethane	BRL	ug/Kg	5
108-90-7	Chlorobenzene	BRL	ug/Kg	5
100-41-4	Ethylbenzene	BRL	ug/Kg	5
108-38-3/106-42-3	meta-Xylene and para-Xylene	BRL	ug/Kg	5
95-47-6	ortho-Xylene	BRL	ug/Kg	5
100-42-5	Styrene	BRL	ug/Kg	5
75-25-2	Bromoform	BRL	ug/Kg	5
79-34-5	1,1,2,2-Tetrachloroethane	BRL	ug/Kg	5

QC Surrogate Compounds	Recovery	QC Limits
Dibromofluoromethane	103 %	80 - 120 %
1,2-Dichloroethane-d ₄	114 %	80 - 120 %
Toluene-d ₈	100 %	81 - 117 %
4-Bromofluorobenzene	98 %	74 - 121 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996). Analyte list as specified by the Target Compound List (TCL) of the US EPA Contract Laboratory Program. Results are reported on a dry weight basis.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions.
Reporting limits are adjusted for sample dilution, percent moisture and sample size.
0 Indicates additional target analyte.

**GROUNDWATER
ANALYTICAL**

Trace Metals by ICP-AES and CVAA

Field ID: B8
Project: Topsfield DPW Yard/2000.34
Client: Clean Soils Environmental
Container: 250 mL Glass
Preservation: Cool
Matrix: Soil

Laboratory ID: 37700-12
Sampled: 11-30-00
Received: 12-01-00
% Solids 86

CAS Number	Analyte	Concentration	Units	Reporting Limit	Analyzed	QC Batch	Method
7440-38-2	Arsenic, Total	22	mg/Kg	5.7	12-05-00	MM-01175-S	6010B
7440-39-3	Barium, Total	38	mg/Kg	23	12-05-00	MM-01175-S	6010B
7440-43-9	Cadmium, Total	BRL	mg/Kg	0.57	12-05-00	MM-01175-S	6010B
7440-47-3	Chromium, Total	12	mg/Kg	11	12-05-00	MM-01175-S	6010B
7439-92-1	Lead, Total	BRL	mg/Kg	11	12-05-00	MM-01175-S	6010B
7439-97-6	Mercury, Total	BRL	mg/Kg	0.068	12-05-00	MP-0890-S	7471A
7782-49-2	Selenium, Total	BRL	mg/Kg	11	12-05-00	MM-01175-S	6010B
7440-22-4	Silver, Total	BRL	mg/Kg	5.7	12-05-00	MM-01175-S	6010B

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Results are reported on a dry weight basis.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions.
Reporting limits are adjusted for sample dilution and sample size.

**GROUNDWATER
ANALYTICAL**

**Massachusetts DEP VPH Method
Volatile Petroleum Hydrocarbons by GC/PID/FID**

Field ID:	Trip Blank	Laboratory ID:	37700-06
Project:	Topsfield DPW Yard/2000.34	QC Batch ID:	VG1-1161-E
Client:	Clean Soils Environmental	Sampled:	11-30-00
Container:	60 mL Glass	Received:	12-01-00
Preservation:	Cool	Analyzed:	12-05-00
Matrix:	Methanol	Dilution Factor:	1
% Moisture:	N/A		

VPH Ranges	Concentration	Units	Reporting Limit
n-C5 to n-C8 Aliphatic Hydrocarbons †	BRL	mg/Kg	1.0
n-C9 to n-C12 Aliphatic Hydrocarbons †	BRL	mg/Kg	1.0
n-C9 to n-C10 Aromatic Hydrocarbons †	BRL	mg/Kg	1.0
Unadjusted n-C5 to n-C8 Aliphatic Hydrocarbons †	BRL	mg/Kg	1.0
Unadjusted n-C9 to n-C12 Aliphatic Hydrocarbons †	BRL	mg/Kg	1.0

QC Surrogate Compounds	Recovery	QC Limits
2,5-Dibromotoluene (PID)	112 %	70 - 130 %
2,5-Dibromotoluene (FID)	106 %	70 - 130 %

QA/QC Certification	
1. Were all QA/QC procedures required by the method followed?	Yes
2. Were all performance/acceptance standards for the required QA/QC procedures achieved?	Yes
3. Were any significant modifications made to the method, as specified in Section 11.3.2.1?	No
Method non-conformances indicated above are detailed below on this data report, or in the accompanying project narrative and project quality control report. Release of this data is authorized by the accompanying signed project cover letter. The accompanying cover letter, project narrative and quality control report are considered part of this data report.	

Method Reference: Method for the Determination of Volatile Petroleum Hydrocarbons, MA DEP (1998). Results are calculated on a wet weight basis.

Report Notations:

BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample dilution, percent moisture and sample size.

† Hydrocarbon range data excludes concentrations of any surrogate(s) and/or internal standards eluting in that range.

◊ n-C5 to n-C8 Aliphatic Hydrocarbons range data excludes the method target analyte concentrations.

⊗ n-C9 to n-C12 Aliphatic Hydrocarbons range data excludes the method target analyte concentrations and the concentration for the n-C9 to n-C10 Aromatic Hydrocarbons range.

⌘ Analyte elutes in the n-C5 to n-C8 Aliphatic Hydrocarbons range.

‡ Analyte elutes in the n-C9 to n-C12 Aliphatic Hydrocarbons range.

GROUNDWATER ANALYTICAL

EPA Method 8260B TCL Volatile Organics by GC/MS

Field ID:	Trip Blank	Laboratory ID:	37700-04
Project:	Topsfield DPW Yard/2000.34	QC Batch ID:	VM1-1895-5
Client:	Clean Soils Environmental	Sampled:	11-30-00
Container:	60 mL Glass	Received:	12-01-00
Preservation:	Cool	Analyzed:	12-06-00
Matrix:	Methanol	Dilution Factor:	1
% Moisture:	N/A		

CAS Number	Analyte	Concentration	Units	Reporting Limit
74-87-3	Chloromethane	BRL	ug/Kg	500
75-01-4	Vinyl Chloride	BRL	ug/Kg	500
74-83-9	Bromomethane	BRL	ug/Kg	500
75-00-3	Chloroethane	BRL	ug/Kg	500
75-35-4	1,1-Dichloroethene	BRL	ug/Kg	250
67-64-1	Acetone	BRL	ug/Kg	2,500
75-15-0	Carbon Disulfide	BRL	ug/Kg	2,500
75-09-2	Methylene Chloride	BRL	ug/Kg	250
156-60-5	trans-1,2-Dichloroethene	BRL	ug/Kg	250
75-34-3	1,1-Dichloroethane	BRL	ug/Kg	250
156-59-2	cis-1,2-Dichloroethene	BRL	ug/Kg	250
78-93-3	2-Butanone (MEK)	BRL	ug/Kg	2,500
67-66-3	Chloroform	BRL	ug/Kg	250
71-55-6	1,1,1-Trichloroethane	BRL	ug/Kg	250
56-23-5	Carbon Tetrachloride	BRL	ug/Kg	250
71-43-2	Benzene	BRL	ug/Kg	250
107-06-2	1,2-Dichloroethane	BRL	ug/Kg	250
79-01-6	Trichloroethene	BRL	ug/Kg	250
78-87-5	1,2-Dichloropropane	BRL	ug/Kg	250
75-27-4	Bromodichloromethane	BRL	ug/Kg	250
10061-01-5	cis-1,3-Dichloropropene	BRL	ug/Kg	250
108-10-1	4-Methyl-2-Pentanone (MIBK)	BRL	ug/Kg	2,500
108-88-3	Toluene	BRL	ug/Kg	250
10061-02-6	trans-1,3-Dichloropropene	BRL	ug/Kg	250
79-00-5	1,1,2-Trichloroethane	BRL	ug/Kg	250
127-18-4	Tetrachloroethene	BRL	ug/Kg	250
591-78-6	2-Hexanone	BRL	ug/Kg	2,500
124-48-1	Dibromochloromethane	BRL	ug/Kg	250
108-90-7	Chlorobenzene	BRL	ug/Kg	250
100-41-4	Ethylbenzene	BRL	ug/Kg	250
108-38-3/106-42-3	meta-Xylene and para-Xylene	BRL	ug/Kg	250
95-47-6	ortho-Xylene	BRL	ug/Kg	250
100-42-5	Styrene	BRL	ug/Kg	250
75-25-2	Bromoform	BRL	ug/Kg	250
79-34-5	1,1,2,2-Tetrachloroethane	BRL	ug/Kg	250
QC Surrogate Compounds	Recovery	QC Limits		
Dibromofluoromethane	97 %	80 - 120 %		
1,2-Dichloroethane-d ₄	95 %	80 - 120 %		
Toluene-d ₈	99 %	81 - 117 %		
4-Bromofluorobenzene	93 %	74 - 121 %		

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996). Analyte list as specified by the Target Compound List (TCL) of the US EPA Contract Laboratory Program. Results are reported on a wet weight basis. Analysis performed utilizing methanol extraction technique.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample dilution, percent moisture and sample size.

GROUNDWATER ANALYTICAL

Project Narrative

Project: Topsfield DPW Yard/2000.34
Client: Clean Soils Environmental

Lab ID: 37700
Received: 12-01-00

A. Physical Condition of Sample(s)

This project was received by the laboratory in satisfactory condition. The sample(s) were received undamaged in appropriate containers with the correct preservation.

B. Project Documentation

This project was accompanied by satisfactory Chain of Custody documentation. The sample container label(s) agreed with the Chain of Custody.

C. Analysis of Sample(s)

No analytical anomalies or non-conformances were noted by the laboratory during the processing of these sample(s). All data contained within this report are released without qualification.

228 Main Street, P.O. Box 1200
Buzzards Bay, MA 02532
Telephone (508) 759-4441
FAX (508) 759-4475

CHAIN-OF-CUSTODY RECORD AND WORK ORDER

No 42596

TURNAROUND				ANALYSIS REQUEST			
Project Name: <u>Typified DAW Yard</u> Address: <u>P.O. Box 591</u> City / State / Zip: <u>Spawich, MA 01938</u> Telephone: <u>(978) 356-1177</u> Project Manager: <u>Alfredo Pavia</u>				STANDARD (10 Business Days) <input checked="" type="checkbox"/> PRIORITY (5 Business Days) <input checked="" type="checkbox"/> RUSH (RAN-) <small>(Rush requires Rush Authorization Number)</small> Please FAX YES FAX Number: <u>(978) 356-1849</u>			
Purchase Order No.: _____ GWA Reference No.: _____ BILLING				General Chemistry <input type="checkbox"/> pH <input type="checkbox"/> Dissolved Oxygen <input type="checkbox"/> Conductivity <input type="checkbox"/> Total Solids <input type="checkbox"/> Suspended Solids <input type="checkbox"/> Total Phosphorus <input type="checkbox"/> Ammonia Nitrogen <input type="checkbox"/> Nitrate Nitrogen <input type="checkbox"/> Nitrite Nitrogen <input type="checkbox"/> Cyanide <input type="checkbox"/> Fluoride <input type="checkbox"/> Sulfate <input type="checkbox"/> Chloride <input type="checkbox"/> Mercury <input type="checkbox"/> Selenium <input type="checkbox"/> Cadmium <input type="checkbox"/> Chromium <input type="checkbox"/> Copper <input type="checkbox"/> Lead <input type="checkbox"/> Manganese <input type="checkbox"/> Nickel <input type="checkbox"/> Silver <input type="checkbox"/> Vanadium <input type="checkbox"/> Zinc <input type="checkbox"/> Barium <input type="checkbox"/> Bismuth <input 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GROUNDWATER ANALYTICAL

Quality Assurance/Quality Control

A. Program Overview

Groundwater Analytical conducts an active Quality Assurance program to ensure the production of high quality, valid data. This program closely follows the guidance provided by *Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans*, US EPA QAMS-005/80 (1980), and *Test Methods for Evaluating Solid Waste*, US EPA, SW-846, Update III (1996).

Quality Control protocols include written Standard Operating Procedures (SOPs) developed for each analytical method. SOPs are derived from US EPA methodologies and other established references. Standards are prepared from commercially obtained reference materials of certified purity, and documented for traceability.

Quality Assessment protocols for most organic analyses include a minimum of one laboratory control sample, one method blank, one matrix spike sample, and one sample duplicate for each sample preparation batch. All samples, standards, blanks, laboratory control samples, matrix spikes and sample duplicates are spiked with internal standards and surrogate compounds. All instrument sequences begin with an initial calibration verification standard and a blank; and excepting GC/MS sequences, all sequences close with a continuing calibration standard. GC/MS systems are tuned to appropriate ion abundance criteria daily, or for each 12 hour operating period, whichever is more frequent.

Quality Assessment protocols for most inorganic analyses include a minimum of one laboratory control sample, one method blank, one matrix spike sample, and one sample duplicate for each sample preparation batch. Standard curves are derived from one reagent blank and four concentration levels. Curve validity is verified by standard recoveries within plus or minus ten percent of the curve.

B. Definitions

Batches are used as the basic unit for Quality Assessment. A Batch is defined as twenty or fewer samples of the same matrix which are prepared together for the same analysis, using the same lots of reagents and the same techniques or manipulations, all within the same continuum of time, up to but not exceeding 24 hours.

Laboratory Control Samples are used to assess the accuracy of the analytical method. A Laboratory Control Sample consists of reagent water or sodium sulfate spiked with a group of target analytes representative of the method analytes. Accuracy is defined as the degree of agreement of the measured value with the true or expected value. Percent Recoveries for the Laboratory Control Samples are calculated to assess accuracy.

Method Blanks are used to assess the level of contamination present in the analytical system. Method Blanks consist of reagent water or an aliquot of sodium sulfate. Method Blanks are taken through all the appropriate steps of an analytical method. Sample data reported is not corrected for blank contamination.

Surrogate Compounds are used to assess the effectiveness of an analytical method in dealing with each sample matrix. Surrogate Compounds are organic compounds which are similar to the target analytes of interest in chemical behavior, but which are not normally found in environmental samples. Percent Recoveries are calculated for each Surrogate Compound.

GROUNDWATER ANALYTICAL

Quality Control Report Laboratory Control Sample

Category: EPA Method 8260B
QC Batch ID: VM5-1360-SL
Matrix: Soil
Units: ug/Kg

CAS Number	Analyte	Spiked	Measured	Recovery	QC Limits
75-35-4	1,1-Dichloroethene	50	45	89 %	70 - 130 %
71-43-2	Benzene	50	45	90 %	70 - 130 %
79-01-6	Trichloroethene	50	44	88 %	70 - 130 %
108-88-3	Toluene	50	45	90 %	70 - 130 %
108-90-7	Chlorobenzene	50	45	91 %	70 - 130 %

QC Surrogate Compounds	Recovery	QC Limits
Dibromofluoromethane	99 %	80 - 120 %
1,2-Dichloroethane-d ₄	98 %	80 - 120 %
Toluene-d ₈	100 %	81 - 117 %
4-Bromofluorobenzene	101 %	74 - 121 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).

Report Notations: All calculations performed prior to rounding. Quality Control Limits are defined by the methodology, or alternatively based upon the historical average recovery plus or minus three standard deviation units.

GROUNDWATER ANALYTICAL

Quality Control Report Method Blank

Category: EPA Method 8260B
QC Batch ID: VM5-1360-SB
Matrix: Soil

CAS Number	Analyte	Concentration	Units	Reporting Limit
74-87-3	Chloromethane	BRL	ug/Kg	10
75-01-4	Vinyl Chloride	BRL	ug/Kg	10
74-83-9	Bromomethane	BRL	ug/Kg	10
75-00-3	Chloroethane	BRL	ug/Kg	10
75-35-4	1,1-Dichloroethene	BRL	ug/Kg	5
67-64-1	Acetone	BRL	ug/Kg	50
75-15-0	Carbon Disulfide	BRL	ug/Kg	50
75-09-2	Methylene Chloride	BRL	ug/Kg	10
156-60-5	trans-1,2-Dichloroethene	BRL	ug/Kg	5
1634-04-4	Methyl tert-butyl Ether (MTBE) ^o	BRL	ug/Kg	5
75-34-3	1,1-Dichloroethane	BRL	ug/Kg	5
156-59-2	cis-1,2-Dichloroethene	BRL	ug/Kg	5
78-93-3	2-Butanone (MEK)	BRL	ug/Kg	50
67-66-3	Chloroform	BRL	ug/Kg	5
71-55-6	1,1,1-Trichloroethane	BRL	ug/Kg	5
56-23-5	Carbon Tetrachloride	BRL	ug/Kg	5
71-43-2	Benzene	BRL	ug/Kg	5
107-06-2	1,2-Dichloroethane	BRL	ug/Kg	5
79-01-6	Trichloroethene	BRL	ug/Kg	5
78-87-5	1,2-Dichloropropane	BRL	ug/Kg	5
75-27-4	Bromodichloromethane	BRL	ug/Kg	5
10061-01-5	cis-1,3-Dichloropropene	BRL	ug/Kg	5
108-10-1	4-Methyl-2-Pentanone (MIBK)	BRL	ug/Kg	50
108-88-3	Toluene	BRL	ug/Kg	5
10061-02-6	trans-1,3-Dichloropropene	BRL	ug/Kg	5
79-00-5	1,1,2-Trichloroethane	BRL	ug/Kg	5
127-18-4	Tetrachloroethene	BRL	ug/Kg	5
591-78-6	2-Hexanone	BRL	ug/Kg	50
124-48-1	Dibromochloromethane	BRL	ug/Kg	5
108-90-7	Chlorobenzene	BRL	ug/Kg	5
100-41-4	Ethylbenzene	BRL	ug/Kg	5
108-38-3/106-42-3	meta-Xylene and para-Xylene	BRL	ug/Kg	5
95-47-6	ortho-Xylene	BRL	ug/Kg	5
100-42-5	Styrene	BRL	ug/Kg	5
75-25-2	Bromoform	BRL	ug/Kg	5
79-34-5	1,1,2,2-Tetrachloroethane	BRL	ug/Kg	5
QC Surrogate Compounds		Recovery	QC Limits	
Dibromofluoromethane		101 %	80 - 120 %	
1,2-Dichloroethane-d ₄		100 %	80 - 120 %	
Toluene-d ₈		100 %	81 - 117 %	
4-Bromofluorobenzene		101 %	74 - 121 %	

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996). Analyte list as specified by the Target Compound List (TCL) of the US EPA Contract Laboratory Program. Results are reported on a dry weight basis.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample dilution, percent moisture and sample size.

^o Indicates additional target analyte.

GROUNDWATER ANALYTICAL

Quality Control Report Laboratory Control Sample

Category: EPA Method 8260B
QC Batch ID: VM1-1895-SL
Matrix: Soil
Units: ug/Kg

CAS Number	Analyte	Spiked	Measured	Recovery	QC Limits
75-35-4	1,1-Dichloroethene	2,500	2,600	104 %	70 - 130 %
71-43-2	Benzene	2,500	2,500	100 %	70 - 130 %
79-01-6	Trichloroethene	2,500	2,500	99 %	70 - 130 %
108-88-3	Toluene	2,500	2,500	100 %	70 - 130 %
108-90-7	Chlorobenzene	2,500	2,600	105 %	70 - 130 %

QC Surrogate Compounds	Recovery	QC Limits
Dibromofluoromethane	97 %	80 - 120 %
1,2-Dichloroethane-d ₄	105 %	80 - 120 %
Toluene-d ₈	96 %	81 - 117 %
4-Bromofluorobenzene	97 %	74 - 121 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).

Report Notations: All calculations performed prior to rounding. Quality Control Limits are defined by the methodology, or alternatively based upon the historical average recovery plus or minus three standard deviation units.

**GROUNDWATER
ANALYTICAL**

**Quality Control Report
Method Blank**

Category: EPA Method 8260B
QC Batch ID: VM1-1895-SB
Matrix: Soil

CAS Number	Analyte	Concentration	Units	Reporting Limit
74-87-3	Chloromethane	BRL	ug/Kg	500
75-01-4	Vinyl Chloride	BRL	ug/Kg	500
74-83-9	Bromomethane	BRL	ug/Kg	500
75-00-3	Chloroethane	BRL	ug/Kg	500
75-35-4	1,1-Dichloroethene	BRL	ug/Kg	250
67-64-1	Acetone	BRL	ug/Kg	2,500
75-15-0	Carbon Disulfide	BRL	ug/Kg	2,500
75-09-2	Methylene Chloride	BRL	ug/Kg	250
156-60-5	trans- 1,2-Dichloroethene	BRL	ug/Kg	250
1634-04-4	Methyl tert- butyl Ether (MTBE) °	BRL	ug/Kg	250
75-34-3	1,1-Dichloroethane	BRL	ug/Kg	250
156-59-2	cis- 1,2-Dichloroethene	BRL	ug/Kg	250
78-93-3	2-Butanone (MEK)	BRL	ug/Kg	2,500
67-66-3	Chloroform	BRL	ug/Kg	250
71-55-6	1,1,1-Trichloroethane	BRL	ug/Kg	250
56-23-5	Carbon Tetrachloride	BRL	ug/Kg	250
71-43-2	Benzene	BRL	ug/Kg	250
107-06-2	1,2-Dichloroethane	BRL	ug/Kg	250
79-01-6	Trichloroethene	BRL	ug/Kg	250
78-87-5	1,2-Dichloropropane	BRL	ug/Kg	250
75-27-4	Bromodichloromethane	BRL	ug/Kg	250
10061-01-5	cis- 1,3-Dichloropropene	BRL	ug/Kg	250
108-10-1	4-Methyl-2-Pentanone (MIBK)	BRL	ug/Kg	2,500
108-88-3	Toluene	BRL	ug/Kg	250
10061-02-6	trans- 1,3-Dichloropropene	BRL	ug/Kg	250
79-00-5	1,1,2-Trichloroethane	BRL	ug/Kg	250
127-18-4	Tetrachloroethene	BRL	ug/Kg	250
591-78-6	2-Hexanone	BRL	ug/Kg	2,500
124-48-1	Dibromochloromethane	BRL	ug/Kg	250
108-90-7	Chlorobenzene	BRL	ug/Kg	250
100-41-4	Ethylbenzene	BRL	ug/Kg	250
108-38-3/106-42-3	meta- Xylene and para- Xylene	BRL	ug/Kg	250
95-47-6	ortho- Xylene	BRL	ug/Kg	250
100-42-5	Styrene	BRL	ug/Kg	250
75-25-2	Bromoform	BRL	ug/Kg	250
79-34-5	1,1,2,2-Tetrachloroethane	BRL	ug/Kg	250
QC Surrogate Compounds		Recovery	QC Limits	
Dibromofluoromethane		99 %	80 - 120 %	
1,2-Dichloroethane-d ₄		105 %	80 - 120 %	
Toluene-d ₈		96 %	81 - 117 %	
4-Bromofluorobenzene		91 %	74 - 121 %	

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996). Analyte list as specified by the Target Compound List (TCL) of the US EPA Contract Laboratory Program. Results are reported on a dry weight basis. Analysis performed utilizing methanol extraction technique.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample dilution, percent moisture and sample size.

° Indicates additional target analyte.

**GROUNDWATER
ANALYTICAL**

**Quality Control Report
Method Blank**

Category: MA DEP VPH Method
QC Batch ID: VG1-1161-E
Matrix: Soil

VPH Ranges	Concentration	Units	Reporting Limit
n-C5 to n-C8 Aliphatic Hydrocarbons †	BRL	mg/Kg	1.0
n-C9 to n-C12 Aliphatic Hydrocarbons †	BRL	mg/Kg	1.0
n-C9 to n-C10 Aromatic Hydrocarbons †	BRL	mg/Kg	1.0
Unadjusted n-C5 to n-C8 Aliphatic Hydrocarbons †	BRL	mg/Kg	1.0
Unadjusted n-C9 to n-C12 Aliphatic Hydrocarbons †	BRL	mg/Kg	1.0

CAS Number	Target Analytes	Concentration	Units	Reporting Limit
1634-04-4	Methyl tert-butyl Ether	BRL	mg/Kg	0.10
71-43-2	Benzene	BRL	mg/Kg	0.10
108-88-3	Toluene	BRL	mg/Kg	0.10
100-41-4	Ethylbenzene	BRL	mg/Kg	0.10
108-38-3 and 106-42-3	meta- Xylene and para- Xylene	BRL	mg/Kg	0.10
95-47-6	ortho- Xylene	BRL	mg/Kg	0.10
91-20-3	Naphthalene	BRL	mg/Kg	0.50

QC Surrogate Compounds	Recovery	QC Limits
2,5-Dibromotoluene (PID)	108 %	70 - 130 %
2,5-Dibromotoluene (FID)	104 %	70 - 130 %

Method Reference: Method for the Determination of Volatile Petroleum Hydrocarbons, MA DEP (1998).

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample dilution, percent moisture and sample size.

† Hydrocarbon range data excludes concentrations of any surrogate(s) and/or internal standards eluting in that range.

◇ n-C5 to n-C8 Aliphatic Hydrocarbons range data excludes the method target analyte concentrations.

⊗ n-C9 to n-C12 Aliphatic Hydrocarbons range data excludes the method target analyte concentrations and the concentration for the n-C9 to n-C10 Aromatic Hydrocarbons range.

± Analyte elutes in the n-C5 to n-C8 Aliphatic Hydrocarbons range.

‡ Analyte elutes in the n-C9 to n-C12 Aliphatic Hydrocarbons range.

**GROUNDWATER
ANALYTICAL**

**Quality Control Report
Method Blank**

Category: MA DEP VPH Method
QC Batch ID: VG1-1161-E
Matrix: Soil

VPH Ranges	Concentration	Units	Reporting Limit
n-C5 to n-C8 Aliphatic Hydrocarbons [†]	BRL	mg/Kg	1.0
n-C9 to n-C12 Aliphatic Hydrocarbons ^{†⊗}	BRL	mg/Kg	1.0
n-C9 to n-C10 Aromatic Hydrocarbons [†]	BRL	mg/Kg	1.0
Unadjusted n-C5 to n-C8 Aliphatic Hydrocarbons [†]	BRL	mg/Kg	1.0
Unadjusted n-C9 to n-C12 Aliphatic Hydrocarbons [†]	BRL	mg/Kg	1.0

CAS Number	Target Analytes	Concentration	Units	Reporting Limit
1634-04-4	Methyl tert-butyl Ether [‡]	BRL	mg/Kg	0.10
71-43-2	Benzene [‡]	BRL	mg/Kg	0.10
108-88-3	Toluene [‡]	BRL	mg/Kg	0.10
100-41-4	Ethylbenzene [‡]	BRL	mg/Kg	0.10
108-38-3 and 106-42-3	meta- Xylene and para- Xylene [‡]	BRL	mg/Kg	0.10
95-47-6	ortho- Xylene [‡]	BRL	mg/Kg	0.10
91-20-3	Naphthalene	BRL	mg/Kg	0.50

QC Surrogate Compounds	Recovery	QC Limits
2,5-Dibromotoluene (PID)	108 %	70 - 130 %
2,5-Dibromotoluene (FID)	104 %	70 - 130 %

Method Reference: Method for the Determination of Volatile Petroleum Hydrocarbons, MA DEP (1998).

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample dilution, percent moisture and sample size.

† Hydrocarbon range data excludes concentrations of any surrogate(s) and/or internal standards eluting in that range.

⊙ n-C5 to n-C8 Aliphatic Hydrocarbons range data excludes the method target analyte concentrations.

⊗ n-C9 to n-C12 Aliphatic Hydrocarbons range data excludes the method target analyte concentrations and the concentration for the n-C9 to n-C10 Aromatic Hydrocarbons range.

‡ Analyte elutes in the n-C5 to n-C8 Aliphatic Hydrocarbons range.

‡ Analyte elutes in the n-C9 to n-C12 Aliphatic Hydrocarbons range.

**GROUNDWATER
ANALYTICAL**

**Quality Control Report
Laboratory Control Sample**

Category: MA DEP VPH Method
QC Batch ID: VG1-1161-E
Matrix: Soil
Units: mg/Kg

CAS Number	Analyte	Spiked	Measured	Recovery %	QC Limits
1634-04-4	Methyl tert-butyl Ether	2.5	2.4	96%	70 - 130 %
71-43-2	Benzene	2.5	2.5	101%	70 - 130 %
108-88-3	Toluene	2.5	2.7	107%	70 - 130 %
100-41-4	Ethylbenzene	2.5	2.5	100%	70 - 130 %
108-38-3 and 106-42-3	meta- Xylene and para - Xylene	5.0	5.4	109%	70 - 130 %
95-47-6	ortho- Xylene	2.5	2.6	104%	70 - 130 %
91-20-3	Naphthalene	2.5	2.4	98%	70 - 130 %

QC Surrogate Compounds	Recovery %	QC Limits
2,5-Dibromotoluene (PID)	99 %	70 - 130 %
2,5-Dibromotoluene (FID)	98 %	70 - 130 %

Method Reference: Method for the Determination of Volatile Petroleum Hydrocarbons, MA DEP (1998).
Report Notations: All calculations performed prior to rounding. Quality Control Limits are defined by the methodology,
or alternatively based upon the historical average recovery plus or minus three standard deviation units.

GROUNDWATER ANALYTICAL

Quality Control Report Laboratory Control Sample

Category: MA DEP EPH Method
QC Batch ID: EP-1062-M
Matrix: Soil
Units: mg/Kg

CAS Number	Analyte	Spiked	Measured	Recovery	QC Limits
111-84-2	n-Nonane (C9)	5.0	2.1	41 %	40 - 140 %
629-59-4	n-Tetradecane (C14)	5.0	3.5	70 %	40 - 140 %
629-92-5	n-Nonadecane (C19)	5.0	3.8	75 %	40 - 140 %
112-95-8	n-Eicosane (C20)	5.0	4.2	85 %	40 - 140 %
630-02-4	n-Octacosane (C28)	5.0	4.1	81 %	40 - 140 %
91-20-3	Naphthalene	5.0	2.6	52 %	40 - 140 %
83-32-9	Acenaphthene	5.0	3.1	63 %	40 - 140 %
120-12-7	Anthracene	5.0	3.9	78 %	40 - 140 %
129-00-0	Pyrene	5.0	3.8	76 %	40 - 140 %
218-01-9	Chrysene	5.0	4.0	81 %	40 - 140 %

QC Surrogate Compounds	Recovery	QC Limits
Fractionation:		
2-Fluorobiphenyl	74 %	40 - 140 %
2-Bromonaphthalene	73 %	40 - 140 %
Extraction:		
Chloro-octadecane	81 %	40 - 140 %
ortho-Terphenyl	83 %	40 - 140 %

Method Reference: Method for the Determination of Extractable Petroleum Hydrocarbons, MA DEP (1998).

Report Notations: All calculations performed prior to rounding. Quality Control Limits are defined by the methodology, or alternatively based upon the historical average recovery plus or minus three standard deviation units.

**GROUNDWATER
ANALYTICAL**

**Quality Control Report
Method Blank**

Category: MA DEP EPH Method
QC Batch ID: EP-1062-M
Matrix: Soil

EPH Ranges	Concentration	Units	Reporting Limit
n-C9 to n-C18 Aliphatic Hydrocarbons [†]	BRL	mg/Kg	30
n-C19 to n-C36 Aliphatic Hydrocarbons [†]	BRL	mg/Kg	30
n-C11 to n-C22 Aromatic Hydrocarbons ^{† 0}	BRL	mg/Kg	30
Unadjusted n-C11 to n-C22 Aromatic Hydrocarbons [†]	BRL	mg/Kg	30

CAS Number	Target Analytes	Concentration	Units	Reporting Limit
91-20-3	Naphthalene	BRL	mg/Kg	0.50
91-57-6	2-Methylnaphthalene	BRL	mg/Kg	0.50
85-01-8	Phenanthrene	BRL	mg/Kg	0.50
83-32-9	Acenaphthene	BRL	mg/Kg	0.50
208-96-8	Acenaphthylene	BRL	mg/Kg	0.50
86-73-7	Fluorene	BRL	mg/Kg	0.50
120-12-7	Anthracene	BRL	mg/Kg	0.50
206-44-0	Fluoranthene	BRL	mg/Kg	0.50
129-00-0	Pyrene	BRL	mg/Kg	0.50
56-55-3	Benzo[a]anthracene	BRL	mg/Kg	0.50
218-01-9	Chrysene	BRL	mg/Kg	0.50
205-99-2	Benzo[b]fluoranthene	BRL	mg/Kg	0.50
207-08-9	Benzo[k]fluoranthene	BRL	mg/Kg	0.50
50-32-8	Benzo[a]pyrene	BRL	mg/Kg	0.50
193-39-5	Indeno[1,2,3-c,d]pyrene	BRL	mg/Kg	0.50
53-70-3	Dibenzo[a,h]anthracene	BRL	mg/Kg	0.50
191-24-2	Benzo[g,h,i]perylene	BRL	mg/Kg	0.50

QC Surrogate Compounds	Recovery	QC Limits
Fractionation:		
2-Fluorobiphenyl	70 %	40 - 140 %
2-Bromonaphthalene	68 %	40 - 140 %
Extraction:		
Chloro-octadecane	83 %	40 - 140 %
ortho-Terphenyl	71 %	40 - 140 %

Method Reference: Method for the Determination of Extractable Petroleum Hydrocarbons, MA DEP (1998).

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample dilution, percent moisture and sample size.

† Hydrocarbon range data excludes concentrations of any surrogate(s) and/or internal standards eluting in that range.

0 n-C11 to n-C22 Aromatic Hydrocarbons range data excludes the method target analyte concentrations.

**GROUNDWATER
ANALYTICAL**

**Quality Control Report
Laboratory Control Sample**

Category: Metals
Matrix: Soil

CAS Number	Analyte	Method	QC Batch	Units	Spiked	Measured	Recovery	QC Limits
7440-38-2	Arsenic	6010B	MM-1175-SL	mg/Kg	100	89	89 %	80 - 120 %
7440-39-3	Barium	6010B	MM-1175-SL	mg/Kg	100	89	89 %	80 - 120 %
7440-43-9	Cadmium	6010B	MM-1175-SL	mg/Kg	100	88	88 %	80 - 120 %
7440-47-3	Chromium	6010B	MM-1175-SL	mg/Kg	100	90	90 %	80 - 120 %
7439-92-1	Lead	6010B	MM-1175-SL	mg/Kg	100	82	82 %	80 - 120 %
7439-97-6	Mercury	7471A	MP-0890-SL	mg/Kg	0.25	0.26	104 %	80 - 120 %
7782-49-2	Selenium	6010B	MM-1175-SL	mg/Kg	100	86	86 %	80 - 120 %
7440-22-4	Silver	6010B	MM-1175-SL	mg/Kg	100	86	86 %	80 - 120 %

Method References: Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Update III (1996).
Report Notations: All calculations performed prior to rounding. Quality Control Limits are defined by the methodology, or alternatively based upon the historical average recovery plus or minus three standard deviation units.

**GROUNDWATER
ANALYTICAL**

**Quality Control Report
Method Blank**

Category: Metals
Matrix: Soil

CAS Number	Analyte	Result	Units	Reporting Limit	QC Batch	Method
7440-38-2	Arsenic	BRL	mg/Kg	5.0	MM1175-SB	6010B
7440-39-3	Barium	BRL	mg/Kg	20	MM1175-SB	6010B
7440-43-9	Cadmium	BRL	mg/Kg	0.50	MM1175-SB	6010B
7440-47-3	Chromium	BRL	mg/Kg	10	MM1175-SB	6010B
7439-92-1	Lead	BRL	mg/Kg	10	MM1175-SB	6010B
7439-97-6	Mercury	BRL	mg/Kg	0.05	MP-0890-SB	7471A
7782-49-2	Selenium	BRL	mg/Kg	10	MM1175-SB	6010B
7440-22-4	Silver	BRL	mg/Kg	5.0	MM1175-SB	6010B

Method References: Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Update III (1996).

Report Notations: BRL Indicates result, if any, is below reporting limit for analyte. Reporting limit is the lowest value that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample dilution and sample size.

GROUNDWATER ANALYTICAL

Certifications and Approvals

CONNECTICUT, Department of Health Services, PH-0586

Potable Water, Wastewater/Trade Waste, Sewage/Effluent, and Soil

pH, Conductivity, Acidity, Alkalinity, Hardness, Chloride, Fluoride, Ammonia, Kjeldahl Nitrogen, Nitrate, Nitrite, Orthophosphate, Total Dissolved Solids, Cyanide, Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Total Chromium, Hexavalent Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Molybdenum, Nickel, Potassium, Selenium, Silver, Sodium, Thallium, Tin, Titanium, Vanadium, Zinc, Purgeable Halocarbons, Purgeable Aromatics, Pesticides, PCBs, PCBs in Oil, Ethylene Dibromide, Phenols, Oil and Grease.

MAINE, Department of Human Services, MA103

Drinking Water

Reciprocal certification in accordance with Massachusetts certification for drinking water analytes.

Waste Water

Reciprocal certification in accordance with Massachusetts certification for waste water analytes.

MASSACHUSETTS, Department of Environmental Protection, M-MA-103

Potable Water

Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Copper, Lead, Mercury, Nickel, Selenium, Thallium, Nitrate-N, Nitrite-N, Fluoride, Sodium, Sulfate, Cyanide, Turbidity, Residual Free Chlorine, Calcium, Total Alkalinity, Total Dissolved Solids, pH, Trihalomethanes, Volatile Organic Compounds, 1,2-Dibromoethane, 1,2-Dibromo-3-chloropropane, Total Coliform, Fecal Coliform, Heterotrophic Plate Count, E-Coli

Non-Potable Water

Aluminum, Antimony, Arsenic, Beryllium, Cadmium, Chromium, Cobalt, Copper, Iron, Lead, Manganese, Mercury, Molybdenum, Nickel, Selenium, Silver, Strontium, Thallium, Titanium, Vanadium, Zinc, pH, Specific Conductance, Total Dissolved Solids, Total Hardness, Calcium, Magnesium, Sodium, Potassium, Total Alkalinity, Chloride, Fluoride, Sulfate, Ammonia-N, Nitrate-N, Kjeldahl-N, Orthophosphate, Total Phosphorus, Chemical Oxygen Demand, Biochemical Oxygen Demand, Total Cyanide, Non-Filterable Residue, Total Residual Chlorine, Oil and Grease, Total Phenolics, Volatile Halocarbons, Volatile Aromatics, Chlordane, Aldrin, Dieldrin, DDD, DDE, DDT, Heptachlor, Heptachlor Epoxide, Polychlorinated Biphenyls (water), Polychlorinated Biphenyls (oil).

MICHIGAN, Department of Environmental Quality

Drinking Water

Trihalomethanes, Regulated and Unregulated Volatile Organic Compounds by EPA Method 524.2; 1,2-Dibromoethane, 1,2-Dibromo-3-chloropropane by EPA Method 504.1

NEW HAMPSHIRE, Department of Environmental Services, 202798

Drinking Water

Metals by Graphite Furnace, Metals by ICP, Mercury, Nitrite-N, Orthophosphate, Residual Free Chlorine, Turbidity, Total Filterable Residue, Calcium Hardness, pH, Alkalinity, Sodium, Sulfate, Total Cyanide, Insecticides, Herbicides, Base/Neutrals, Trihalomethanes, Volatile Organics, Vinyl Chloride, DBCP, EDB, Nitrate-N.

Wastewater

Metals by Graphite Furnace, Metals by ICP, Mercury, pH, Specific Conductivity, TDS, Total Hardness, Calcium, Magnesium, Sodium, Potassium, Total Alkalinity, Chloride, Fluoride, Sulfate, Ammonia-N, Nitrate-N, Orthophosphate, TKN, Total Phosphorus, COD, BOD, Non-Filterable Residue, Oil & Grease, Total Phenolics, Total Residual Chlorine, PCBs in Water, PCBs in Oil, Pesticides, Volatile Organics, Total Cyanide.

RHODE ISLAND, Department of Health, 54

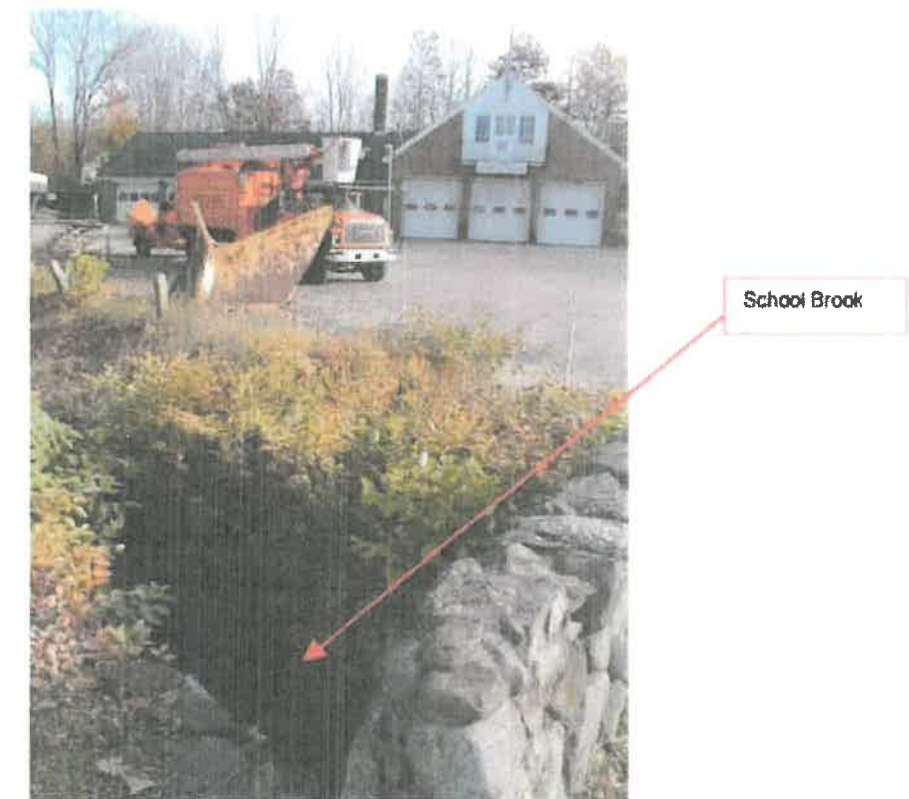
Surface Water, Air, Wastewater, Potable Water, Sewage

Chemistry: Organic and Inorganic

Appendix D
PHOTOGRAPHS



Photograph 1. Former Topsfield Highway Department Garage



Photograph 2. School Brook adjacent to the Property



Floor Drain

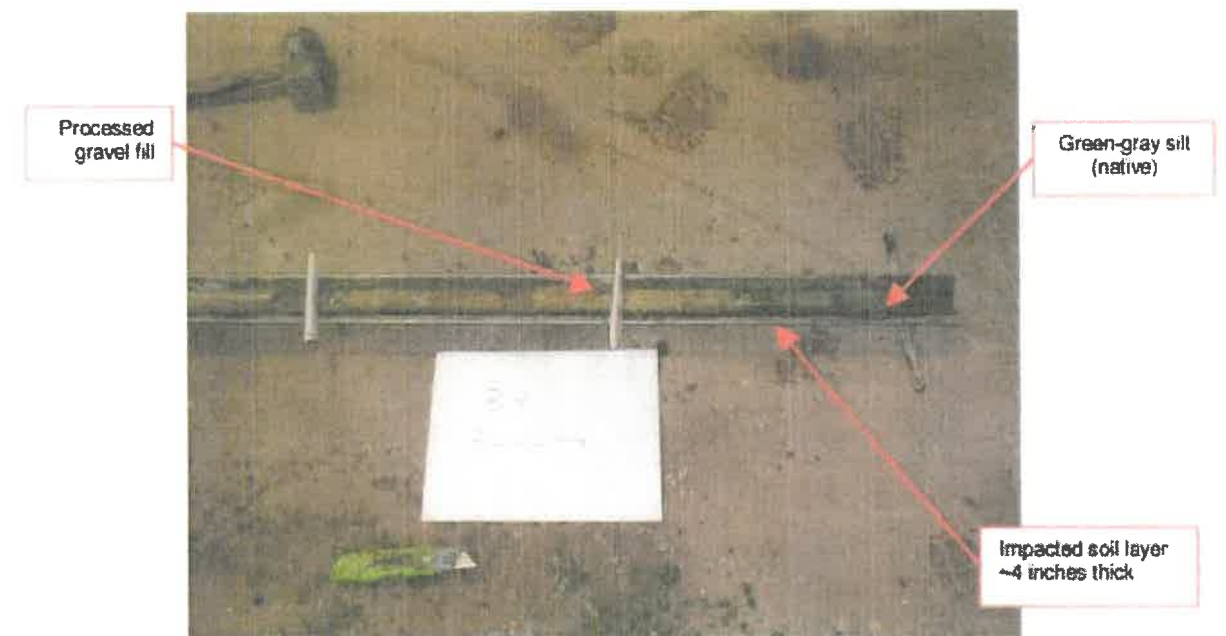
Photograph 3. Floor drain inside garage



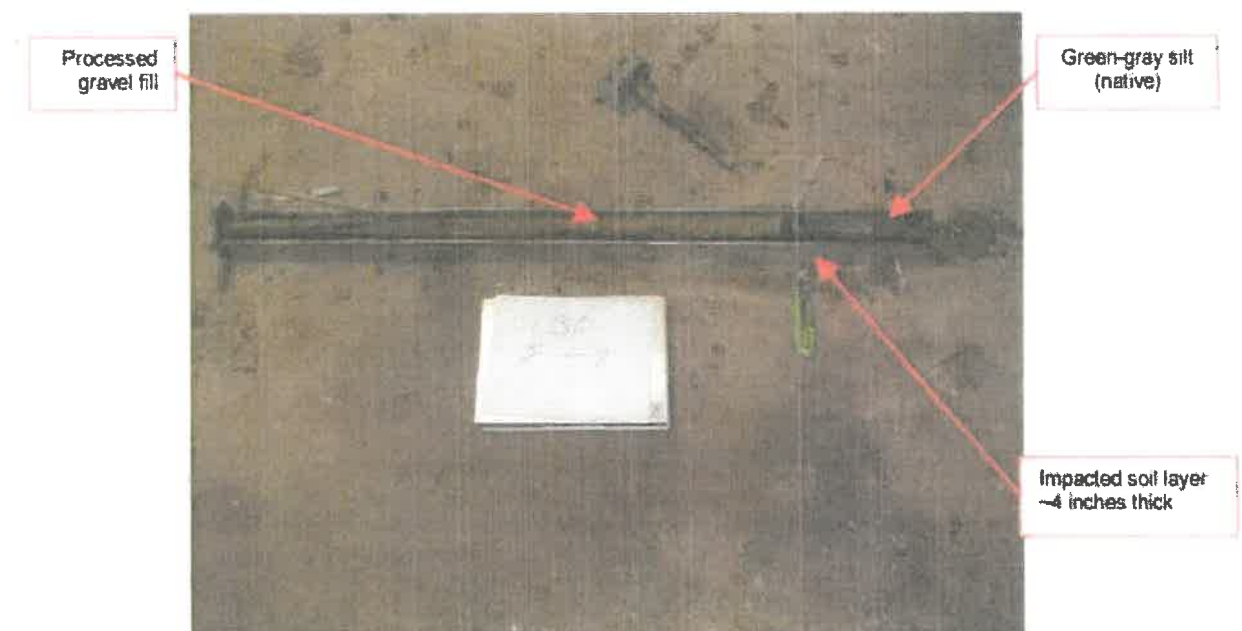
Inlet pipe

Water level inside
injection well
approximately 4.6
feet below ground
surface

Photograph 4. Injection well with inlet shown



Photograph 5. Split spoon sample from boring B4 collected from 3-7 feet bgs.



Photograph 6. Split spoon sample from boring B6 collected from 3-7 feet bgs.

CLEAN SOILS ENVIRONMENTAL LTD

Appendix E
PUBLIC NOTICE

CLEAN SOILS

ENVIRONMENTAL LTD.

March 9, 2001

Ms. Roberta Knight, Executive Secretary to the Board of Selectmen
Ms. Leo Cormier, Health Agent
Town of Topsfield
Town Hall
8 West Common Street
Topsfield, MA 01983
978-887-1502 (Fax)

VIA FAX ONLY

Re: Notice of a Class B-1 Response Action Outcome Statement
Former Town of Topsfield Highway Department Garage
10 School Avenue
Topsfield, MA
DEP RTN Not Yet Assigned
CSE Project No. 2000.34

Dear Ms. Knight and Mr. Cormier:

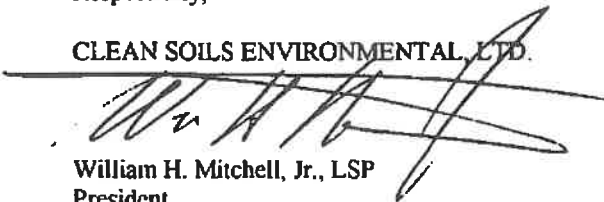
The Massachusetts Contingency Plan requires that people conducting response actions associated with releases of oil and/or hazardous material (OHM) notify you when a Response Action Outcome (RAO) Statement (i.e., closure report) is submitted to the Department of Environmental Protection (DEP).

A release of OHM associated with historic discharges from a floor drain at the former Topsfield Highway Department garage impacted soil and groundwater at the above-mentioned location. "Assessment Only Activities" (i.e., soil and groundwater testing) were conducted according to 310 CMR 40.0000. Clean Soils Environmental, Ltd. recently completed the RAO, which is on file at DEP's Northeast Regional Office in Wilmington, MA.

Therefore, a permanent solution was achieved by completing a Class B-1 RAO. If you are interested in reviewing the RAO statement, please set up a file review appointment with Ms. Holly Migliacci at DEP (978-661-7600).

Respectfully,

CLEAN SOILS ENVIRONMENTAL, LTD.


William H. Mitchell, Jr., LSP
President

cc: DEP, Northeast Regional Office

Oil & Hazardous Waste Assessment & Cleanup Professionals

POST OFFICE BOX 591, IPSWICH, MA 01938

Voice: 978.356.1177 Fax: 978.356.1849 E-mail: info@cleansoils.com Web site: <http://www.cleansoils.com>

CLEAN SOILS ENVIRONMENTAL, LTD

Appendix F

NOTICE OF NONCOMPLIANCE



ARGEO PAUL CELLUCCI
Governor

JANE SWIFT
Lieutenant Governor

77
COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION
Metropolitan Boston – Northeast Regional Office

BOB DURAND
Secretary

DEC 07 1999

LAUREN A. LISS
Commissioner

Town of Topsfield
Highway Department
10 School Avenue
Topsfield, MA 01983

Attn: David M. Bond

RE: BWP - TOPSFIELD
NONCOMPLIANCE with M.G.L.
Chapters 21C & 21 §43 (2)
310 CMR 30.000
314 CMR 3.00-7.00
MV9788871542
VSQG-Waste Oil
VSQG-Hazardous Waste
IWW-Non-notifier
FMF Facility #326886
File No: NON-NE-99-9166-2A

RE: NOTICE OF NONCOMPLIANCE

ENCLOSED IS AN IMPORTANT NOTICE. FAILURE TO TAKE ADEQUATE ACTION IN RESPONSE TO THIS NOTICE COULD RESULT IN SERIOUS LEGAL CONSEQUENCES.

Dear Mr. Bond:

Department personnel have observed that on October 29, 1999, activity occurred at Town of Topsfield, Highway Department, 10 School Ave., Topsfield, Massachusetts in noncompliance with one or more laws, regulations, orders, licenses, permits, or approvals enforced by the Department.

Enclosed is a Notice of Noncompliance, which describes (1) the activity referred to above, (2) the requirements violated, (3) the action the Department now wants you to take, and (4) the deadline for taking such action. An administrative penalty may be assessed for every day from now on that you are in noncompliance with the requirements described in this Notice of Noncompliance.

Notwithstanding this Notice of Noncompliance, the Department reserves the right to exercise the full extent of its legal authority in order to obtain full compliance with all applicable requirements, including, but not limited to, criminal prosecution, civil action including court-imposed civil penalties, or administrative penalties assessed by the Department.

This information is available in alternate format by calling our ADA Coordinator at (617) 574-6572.

205A Lowell St. Wilmington, MA 01887 • Phone (978) 661-7800 • Fax (978) 661-7815 • TDD# (978) 661-7879

Printed on Recycled Paper

Topsfield Highway Department
Page 2

SOURCE REDUCTION OPPORTUNITIES

You may be able to cut environmentally driven costs and possibly reduce the regulatory requirements and fees applied to your firm if you eliminate or reduce the use of toxic materials or the generation of wastes (referred to as "source reduction"). As a result, you may save money, and improve quality and productivity.

Moreover, tracking annual usage of toxic substances and other inputs, if you are not already doing so, may lead to identification of additional source reduction opportunities.

For further information on source reduction of toxics and other waste you may contact:

- * the Office of Technical Assistance (617-727-3260) for free, confidential technical assistance including on-site assessments, financial evaluations, and other resources.
- * DEP's Toxics Use Reduction Implementation Team (617-292-5870) for guidance material on TUR planning.
- * the Toxics Use Reduction Institute (978-934-3262) for courses for certified Toxics Use Reduction Planners.

Should you have any questions relative to this matter, contact David P. LaBrode of this office at the letterhead address or by calling (978) 661-7632.

Very truly yours,



Edward J. Pawlowski
Chief, Compliance and Enforcement
Bureau of Waste Prevention

EDPL/DPL/ml-topspdw

Certified Mail

non-topspdw

cc: Fire Dept., High Street, Topsfield, MA 01983
Board of Health, Town Hall, Topsfield, MA 01983
Town of Topsfield, Town Hall, 8 West Common Street, Topsfield, MA 01983
ATTN: Roberta Knight, Executive Secretary
OTA, 100 Cambridge St., Suite 2109, Boston, MA 02108
Attn: Richard Bizzozero
NERO - LaBrode, Stelline

Topsfield Highway Department
Notice of Noncompliance

NOTICE OF NONCOMPLIANCE
NONCOMPLIANCE SUMMARY

NAME OF ENTITY IN NONCOMPLIANCE: Town of Topsfield, Highway Department

LOCATION WHERE NONCOMPLIANCE OCCURRED OR WAS OBSERVED: 10
School Avenue, Topsfield, Massachusetts

DATE WHEN NONCOMPLIANCE WAS OBSERVED: October 29, 1999

**DESCRIPTION OF NONCOMPLIANCE AND OF THE REQUIREMENTS NOT
COMPLIED WITH:**

Personnel from the Department conducted a compliance inspection at **Town of
Topsfield, Highway Department**. The following are the observed violations:

HAZARDOUS WASTE

(1) 310 CMR 30.353(5): On the inspection date, it was noted that the Topsfield Highway Department is accumulating hazardous waste and waste oil but is not registered with the Department as a Very Small Quantity Generator (VSQG) of hazardous waste and waste oil. The regulation requires...A very small quantity generator shall register with the Department by notifying the department in writing of its activity involving hazardous waste or regulated recyclable material. If the Department prescribes a form for such registration, the generator shall use such form when submitting such registration. Such a registration shall be signed and submitted in compliance with 310 CMR 30.006 and 30.009. The generator shall follow such procedures as may be required, requested or authorized by the Department to obtain and keep his status as a very small quantity generator. If the very small quantity generator intends to transfer custody or possession of the hazardous waste or regulated recyclable material to another person or persons, the registration shall set forth the name, address, and EPA identification number, if applicable, of each such person. If the very small quantity generator intends to itself treat or recycle the hazardous waste or regulated recyclable material, the registration shall set forth the process by which the hazardous waste or regulated recyclable material shall be treated or recycled. If the site has an EPA identification number, or has been assigned an identification number by DEP, that number shall be included in the registration. An identification number for the site is required if the very small quantity generator is using a manifest.

(2) 310 CMR 30.331(1): Facility signed Copy's (Copy 1 of four part manifests and Copy 3 of eight part manifests) were not available for review. The regulation requires that...a generator shall keep a Copy of each manifest, signed in compliance with 310 CMR 30.314 through 30.316, for three years after the waste was accepted by the initial transporter or until the generator receives a signed copy from the designated

Topsfield Highway Department
Notice of Noncompliance
Page 2

facility which received the waste. The generator shall keep, for at least three years from the date the waste was accepted by the initial transporter, the Copy of the manifest signed by the owner or operator of the facility which received the waste.

(3) 310 CMR 30.302: On the inspection date, it was noted that the Topsfield Highway Department was accumulating/storing a one-gallon container of unknown contents located next to the outside 275-gallon waste oil tank. The regulation requires...Any person who generates a waste shall determine if that waste is a hazardous waste, as identified or otherwise described in 310 CMR 30.100, as follows:

(1) First, determine whether his waste is excluded from regulation pursuant to 310 CMR 30.104.

(2) Next, determine if the waste is listed as a hazardous waste in 310 CMR 30.130 through 30.136.

(3) If the waste is not listed as a hazardous waste in 310 CMR 30.130 through 30.136, determine whether the waste is hazardous waste pursuant to 310 CMR 30.120 through 30.125 by doing either of the following:

(a) Testing the waste according to the methods set forth in 310 CMR 30.151 through 30.156 or according to an equivalent method approved by the Administrator of EPA pursuant to 40 CFR Section 260.21 and by the Department.

(b) Applying knowledge of the hazardous characteristics of the waste in light of the materials or the process used.

(4) If the waste is determined to be hazardous, determine, using the methods described in 310 CMR 30.302(3) and 310 CMR 30.791, whether the waste is subject to the land disposal restrictions set forth in 310 CMR 30.750.

(4) 310 CMR 30.253(9)(b), (refers to 30.353(9)): On the inspection date, receipts for waste oil shipped offsite to Boxford Department of Public Works were not being kept onsite. The regulation requires...If a hazardous waste manifest does not accompany a shipment of hazardous waste generated and transported by a very small quantity generator to a person described in 310 CMR 30.355(8), the person receiving that material shall give to the very small quantity generator delivering the material, and the very small quantity generator delivering the material shall receive from the person receiving the material, a receipt for the material. Said receipt shall set forth the content and quantity of the material and the date of delivery. Said receipt shall be signed by both the person receiving the material and the very small quantity generator delivering the material. Said receipt shall consist of two copies, one each for the person

Topsfield Highway Department
Notice of Noncompliance
Page 3

receiving the material and the very small quantity generator delivering the material. The person receiving the material and the very small quantity generator delivering shall keep these receipts in their records for at least three years after possession of the material is transferred from the very small quantity generator to the person receiving the material. Such records shall be furnished upon request of, employee, or representative of the Department, or of the EPA. This period shall be extended automatically during the course of any unresolved enforcement action regarding the activity in question, or as requested or ordered by the Department.

(5) M.G.L., CHAPTER 21C, MASSACHUSETTS HAZARDOUS WASTE MANAGEMENT ACT, Section 5: Wastewater contaminated with oily water and sludge, (settled solids) has been illegally disposed of through an improperly maintained oil/water separator. The Law stipulates that... No person shall collect, transport, store, dispose of, treat, use or transport hazardous waste in a manner which could endanger human health, safety or welfare, or the environment.

(6) 310 CMR 30.253(5)(c), (refers to 30.353(6)(g)), (refers to 30.682): The following containers of waste oil were not marked with the words "Hazardous Waste" "Waste Oil", or "Toxic":

- one 55-gallon container located in the garage.
- one 275-gallon above ground tank

The regulation requires that...Throughout the period of storage, the side of each container of hazardous waste shall be clearly labelled and marked in a manner which identifies, in words, the hazardous waste(s) being stored in that container (e.g., acetone, toluene), and the hazard(s) associated with the waste (e.g., ignitable, toxic, dangerous when wet). Each container shall also be marked with the words "Hazardous Waste". Containers accumulating waste oil (in VSQG quantities) shall be marked with following information:

- (1) The words "Hazardous Waste";
- (2) The words "Waste Oil";
- (3) The word "Toxic";.

Marks and labels shall be placed on the sides of each tank or container in such a manner that they are clearly visible for inspection.

(7) 310 CMR 30.253(5)(c), (refers to 30.353(6)(h)), (refers to 30.685(1)): A fifty five-gallon container used for the accumulation of waste oil was found to be open.

Topsfield Highway Department
Notice of Noncompliance
Page 4

The regulation requires that...a container holding hazardous waste shall always be closed during storage, except when waste is being added or removed. In the event that Federal, State or local law or regulation requires a container to be vented, the container shall be vented in a manner that does not present a threat to public health, safety or welfare, or the environment.

(8) 310 CMR 30.253(5)(c), (refers to 30.353(6)(h)), (refers to 30.340(1)(f)): On the inspection date, the following containers of waste oil were observed being accumulated on a surface which is not impervious:

- one 55-gallon container located in the garage.
- one 275-gallon above ground tank.

The regulation requires...underlying all containers and all above-ground tanks in which hazardous waste is accumulated shall be a surface that is designed and at all times operated so that it is free of cracks and gaps and is sufficiently impervious to contain leaks, spills, and accumulated precipitation until the collected material is detected and removed. All aboveground tanks shall be placed so that all the surface beneath each such tank can be inspected for spills and structural integrity.

(9) 310 CMR 30.253(5)(c), (refers to 30.353(3)(h)), (refers to 30.340(1)(g)): Waste oil is being accumulated outdoors in a 275-gallon above ground tank in an area which is not bermed. The regulation requires that...if a generator accumulates hazardous waste in containers or above-ground tanks which are outdoors, such containers and above-ground tanks shall be located at all times in an area that has a containment system that is designed and at all times operated so that it has the capacity to contain either 10% of the total possible contained volume of the containers and above-ground tanks, or 110% of the volume of the largest container or above ground-tank, whichever is greater. Without limiting the generality of the foregoing, the generator shall promptly remove from the area all accumulated spillage and/or precipitation.

(10) 310 CMR 30.253(5)(c), (refers to 30.353(6)(h)), (refers to 30.340(1)(j)): A sign with the words "WASTE OIL" was not posted in the waste oil accumulation areas. The regulation requires that...all areas where waste oil and/or used oil fuel is accumulated or stored shall have posted at all times a sign with the words "WASTE OIL", in capital letters at least one inch high.

(11) 310 CMR 30.253(5)(c), (refers to 30.353(6)(h)), (refers to 30.340(1)(k)): The waste oil accumulation areas were not marked clearly from generation areas. The regulation requires that...all areas where wastes are accumulated for the purposes of

Topsfield Highway Department
Notice of Noncompliance
Page 5

complying with 310 CMR 30.000 generally shall be clearly marked (e.g., by a clearly visible line or piece of tape on the floor, or by a gate or fence, or by a sign at the boundary of a clearly distinguishable area) so that they are clearly distinguishable at all times from all specific points of generation where wastes are initially accumulated solely for the purpose of 310 CMR 30.340(4), and from all areas at the site of generation where wastes are not accumulated.

(12) 310 CMR 30.253(5)(c), (refers to 30.353(6)(h)), (refers to 30.340(1)(i)): On the inspection date, the waste oil accumulation area located outside of the main garage was lacking in appropriate security measures. Specifically, the area was open with no means of preventing unauthorized entry. The regulation requires...All areas where wastes are accumulated shall be operated with appropriate security measures at all times to prevent the unknowing entry of persons, reduce as much as possible the unauthorized entry of persons, and prevent the entry of livestock into such areas.

INDUSTRIAL WASTEWATER

Untreated industrial effluent (from the facility's floor drains) is illegally being discharged to groundwater, (via an oil/water separator system and cesspool).

The requirements state respectively:

- (1) M.G.L. c.21, s.43(2) provides, in part, as follows:

"No person shall discharge pollutants into waters of the Commonwealth nor construct, install, modify, operate or maintain an outlet for such discharge or any treatment works, without a currently valid permit issued by the Director. No person shall engage in any other activity that may reasonably be expected to result, directly or indirectly, in discharge of pollutants into waters of the Commonwealth, nor construct, effect, maintain, modify or use any sewer extension or connection, without a currently valid permit issued by the Director, unless exempted by regulation of the Director."

- (2) 314 CMR 5.03 provides in part as follows:

"No person shall discharge pollutants to ground waters of the Commonwealth without a currently valid permit from the director pursuant to M.G.L. c. 21, s. 43 and 314 CMR 5.00, unless exempted in 314 CMR 5.05. No person shall construct, install, modify, operate or maintain an outlet for such a discharge or any treatment works required to treat such discharge without having first obtained a discharge permit in accordance with this

Topsfield Highway Department
Notice of Noncompliance
Page 6

subsection and written approval from the Department for such activity. Any person who discharges or proposes to discharge to ground waters of the Commonwealth may obtain a permit by filing the appropriate application forms in accordance with 314 CMR 5.00 and 2.00."

(3) 310 CMR 27.04 provides in part as follows:

"No underground injection shall be allowed where a Class V well causes or allows movement of fluid containing any pollutant into underground sources of drinking water and the presence of that pollutant causes or is likely to cause a violation of any Massachusetts Drinking Water Regulation, 310 CMR 22.00, or which in the opinion of the Department adversely affects or is likely to adversely affect the health of persons."

(4) 310 CMR 27.05 provides in part as follows:

"Class V wells shall include but not be limited to the following types:

- a. Dry wells, seepage pits, and leaching pits used for the introduction of waste fluids, other than those treated in septic systems.
- b. Dry wells or leaching pits used to dispose of septic system effluents.

(5) Activities which constitute discharges of pollutants requiring a permit under 314 CMR 5.03(1) include, but are not limited to:

- a. Any facility which discharges a liquid effluent onto or below the land surface;
- b. Any facility which discharges a liquid effluent to a percolation pit, pond or lagoon;
- c. Any facility which discharges a liquid effluent via subsurface leaching facilities including but not limited to: leaching pits, galleries, chambers, trenches, fields, and pipes;
- d. Any facility which discharges a liquid effluent into a class V injection well as defined in 310 CMR 27.00; or
- e. Any facility with an associated unlined pit, pond, lagoon, or surface impoundment in which wastewaters or sludges are collected, stored, treated, or disposed and from which a liquid portion seeps into the ground.

Topsfield Highway Department
Notice of Noncompliance
Page 7

ACTION TO BE TAKEN, AND THE DEADLINE FOR TAKING SUCH ACTION:

HAZARDOUS WASTE

(1) Immediately upon receipt of this Notice, notify as a very small quantity generator of hazardous waste and a very small quantity generator of waste oil by submitting the notification form. The proper notification forms were filled out during the October 29, 1999 inspection.

(2) Immediately upon receipt of this Notice, keep appropriate Copy 1's and 3's of all hazardous waste manifests, in accordance with the above referenced regulation. Photocopies of the missing facility signed manifest(s) shall be obtained from the destination facility identified on the hazardous waste manifest(s) and sent to this office. Within thirty (30) days of your receipt of this Notice, this office must be in receipt of written confirmation that this has been done.

(3) Immediately upon receipt of this Notice, determine if the waste in question is a hazardous waste, and make arrangements for its proper disposal. Within thirty (30) days of your receipt of this Notice, this office must be in receipt of written confirmation that this has been done.

(4) Immediately upon receipt of this Notice, keep appropriate receipts of all hazardous waste shipments, in accordance with the above referenced regulation. Within thirty (30) days of your receipt of this Notice, this office must be in receipt of written confirmation that this has been done.

(5) Immediately upon receipt of this Notice, clean out the oil/water separator that Topsfield Highway Department has on site. These wastes must be shipped off-site for legal disposal via a licensed hazardous waste transporter using a Massachusetts Hazardous Waste Manifest. Within thirty (30) days of your receipt of this Notice, this Office must be in receipt of written confirmation that this has been done, and will continue to be done. In addition, the Department requires that photocopies of the completed manifest(s) be forwarded to this office as soon as the shipment is made.

(6) Immediately upon receipt of this Notice, mark the above referenced containers with the required information. Within thirty (30) days of your receipt of this Notice, this office must receive from you written confirmation that this has been done, and will continue to be done.

(7) Immediately upon receipt of this Notice, close all containers accumulating waste oil, and continue to keep them closed except when waste is being added or

Topsfield Highway Department
Notice of Noncompliance
Page 8

removed. Within thirty (30) days of your receipt of this Notice, this office must be in receipt of written confirmation that this has been done, and will continue to be done.

(8) and (9) immediately upon receipt of this Notice, modify the waste oil accumulation areas to come into compliance with the above referenced regulation. Within thirty (30) days of your receipt of this Notice, this office must be in receipt of written confirmation that this has been done.

(10) Immediately upon receipt of this Notice, post a sign with the words "WASTE OIL", in accordance with the above referenced regulation. Within thirty (30) days of your receipt of this Notice, this office must be in receipt of written confirmation that this has been done.

(11) Immediately upon receipt of this Notice, clearly distinguish waste accumulation areas from areas where wastes are not accumulated. Within thirty (30) days of your receipt of this Notice, this office must be in receipt of written confirmation that this has been done.

(12) Immediately upon receipt of this Notice, secure the outside waste oil accumulation area from unauthorized entry. Within thirty (30) days of your receipt of this Notice, this office must be in receipt of written confirmation that this has been done.

INDUSTRIAL WASTEWATER

(1) Within fifteen (15) days of receipt of this Notice, temporarily plug the points of entry to the injection well and cease using the injection well for the discharge or disposal of any substance.

(2) Within thirty (30) days of receipt of this Notice, submit to Ron Stelline at this office a plan for approval for permanently closing the injection well(s) according to the following criteria:

- a. Decommissioning injection well-All floor drains (or other points of entry to the injection wells) shall be either:
 - i. Sealed within 60 days of the date of this Notice in accordance with the state plumbing code, 248 CMR 2.09(1)(c)(3). Before commencing work, a revised DEP Form WS1 (Notice of Plumbing Inspector Approval to Seal Floor Drain) must be filed with Ron Stelline at this office; or,
 - ii. connected within 6 months of this Notice to a municipal sewer system (if available) in accordance with a permit issued by the

Topsfield Highway Department
Notice of Noncompliance
Page 9

Department and/or local sewer authority under 314 CMR 7.00 and/or local sewer regulations; or,


iii. Connected within 6 months of this Notice to a DEP approved holding tank.

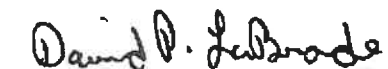
b. Required Remedial Activities-Remove sludge and perform excavation, sampling, and other remedial activities in accordance with the process described in the "UIC Package", which includes "Massachusetts closure Requirements For Shallow Injection Wells. Call the DEP Service Center at (978) 661-7678 for the Closure Package. Within 120 days of this Notice, submit to the Department the results of sampling conducted and information to Ron Stelling of the UIC Program at the letterhead address.

(3) When all work specified in items (1) and (2) has been completed, submit a completed and signed UIC Notification Form to Ron Stelling of the Department's UIC Program at the letterhead address.

(4) Within thirty (30) days of receipt of this Notice this office must be in receipt of written confirmation as to the actions taken or planned to correct the industrial wastewater violation(s) cited herein. Please direct your response to David LaBrode.

DATE: Dec 6, 1999


Edward J. Pawlowski
Chief, Compliance and Enforcement
Bureau of Waste Prevention


David P. LaBrode
Environmental Analyst

Certified Mail

Appendix G

**HEADSPACE SCREENING PROCEDURE &
MONITORING WELL CONSTRUCTION DETAILS**



Headspace Screening Procedures

Clean Soils Environmental, Ltd. (CSE) screened soil samples for Total Organic Vapors (TOVs) with a portable photoionization detector (PID) calibrated with isobutylene to a benzene equivalent. The soil sample screening was performed by filling a pre-cleaned 16 oz. glass mason jar or a dedicated 16 oz. zip lock bag approximately half-full with a soil sample, covering the jar top with two layers of aluminum foil and then tightening the screw cap or using the zip lock to tightly seal the bag. The soil sample was vigorously shaken and then allowed to sit for a minimum of ten minutes at approximately 25°C. The headspace (i.e., air in the top of the container) was then screened by puncturing the aluminum seal or the zip lock bag with the portable PID Photovac MicroTip probe, inserting the probe tip to a distance approximately one-half the headspace depth, drawing a headspace air sample, and recording the highest reading displayed on the PID display.



BORING, JAR-HEADSPACE LOG, WELL CONSTRUCTION DETAILS

PAGE 1 OF 1

[illegible]

Oil & Hazardous Waste Assessment & Cleanup Professionals

POST OFFICE BOX 591, IPSWICH, MA 01938

Voice: 978.356.1177 Fax: 978.356.1849 E-mail: info@cleansoils.com Web site: <http://www.cleansoils.com>

Background on Topsfield

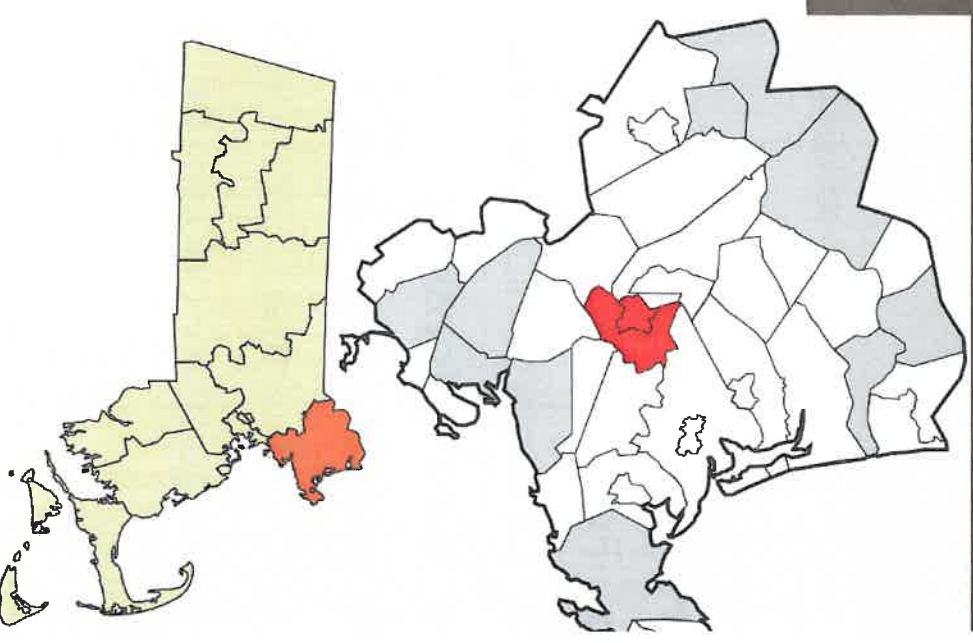
- ▶ Location
- ▶ Population
- ▶ Demographics: Local and Regional
- ▶ Explore Topsfield
- ▶ Housing Information
- ▶ Our Business Community
- ▶ Regulatory and more



Questions and Comments please email:
johnian@topsfield-ma.gov

Location

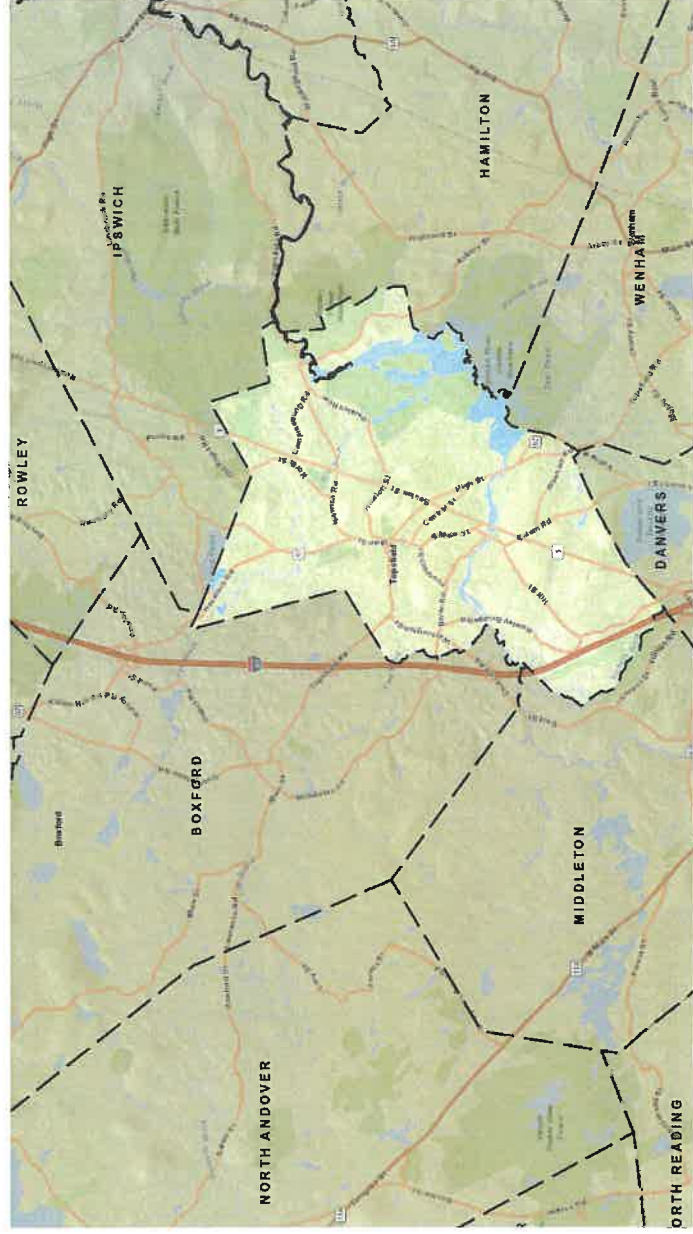
- ▶ Topsfield is the geographical center of Essex County MA
- ▶ Accessibility
 - ▶ Interstate 95
 - ▶ Rt. 1
 - ▶ Rt. 97
- ▶ Easy access to Boston (less than 20 miles driving)
- ▶ Easy access to New Hampshire (less than 20 miles driving to the state boarder)



estions and Comments please email:
jnlian@topsfield-ma.gov

Populations of Surrounding Communities

- ▶ **6,569** Topsfield residents (as of 2020)
- ▶ Almost **70,000** people live in Topsfield or in an adjacent community:
 - ▶ Danvers, Ipswich, Middleton, Boxford, Hamilton and Wenham
- ▶ Total of **245,000+** people live in communities adjacent to or immediately outside of Topsfield:
 - ▶ Adjacent + Beverly, Peabody, North Andover, North Reading, Georgetown, Rowley, Manchester-By-The-Sea and Essex
- ▶ **798,698** people in Essex County (2020)



Questions and Comments please email:
info@topsfield-ma.gov

Demographics

- ▶ Average age is 43.2 years old
- ▶ Highly Educated
 - ▶ 98% residents with High School Diplomas
 - ▶ 66% residents with a Bachelor's Degree or higher
- ▶ Average Median Income (2020)
 - ▶ Essex County Household: \$82,225
 - ▶ Average Adjacent Communities Household: \$129,421
 - ▶ Topsfield Household: \$144,258
- ▶ High Level of Discretionary Income in Topsfield and surrounding communities

Questions and Comments please email:
jnlian@topsfield-ma.gov

Explore Topsfield

Historic

Open Space and
Recreation

Outstanding Schools

Town Events....



Questions and Comments please email:
jnlian@topsfield-ma.gov

Annual Town Events

- ▶ Flower Expo
- ▶ Memorial Day Parade
- ▶ Strawberry Festival – this Saturday
- ▶ **NEW** Summer Farmers/Artisan Markets
- ▶ Tomato Festival
- ▶ Holiday on the Green
- ▶ Ice Rink on the Common

- ▶ Focused on placemaking and activating our spaces!!

Questions and Comments please email:
jnlian@topsfeld-ma.gov



**Topfield
Fair**
Sept. 30 – Oct. 10, 2022



Founded in 1818

Known as America's oldest
country fair

500,000+ visitors during 11
days in October each year

Strong partnership between
the Town and the Fair



Questions and Comments please email:
anjian@topfield-ma.gov

Housing

- ▶ 2,159 Housing Units (2020)
- ▶ Predominantly Single Family Units
- ▶ Average Home Sale Price is \$720k
- ▶ Lack of inventory to meet the demand
- ▶ Currently two 40B projects in processes
 - ▶ Topsfield will have greater than 10% of its units considered affordable
- ▶ 2021 named one of North Shore Magazine's "8 Top Neighborhoods to live north of Boston"

estions and Comments please email:
jnlian@topsfield-ma.gov



Business Community

- ▶ 4,811 Businesses within 15 minute drive of downtown Topsfield (as of 2018)
- ▶ Existing Business Downtown and Route 1
- ▶ Businesses that have recently opened Downtown
 - ▶ Perfectly Imperfect Gift Shoppe
 - ▶ Zumi's Espresso
 - ▶ COMING SOON: A new Art Studio with classes
- ▶ Needs: Restaurants, Health and Personal Care and Food Market (2019 Downtown Revitalization Study)

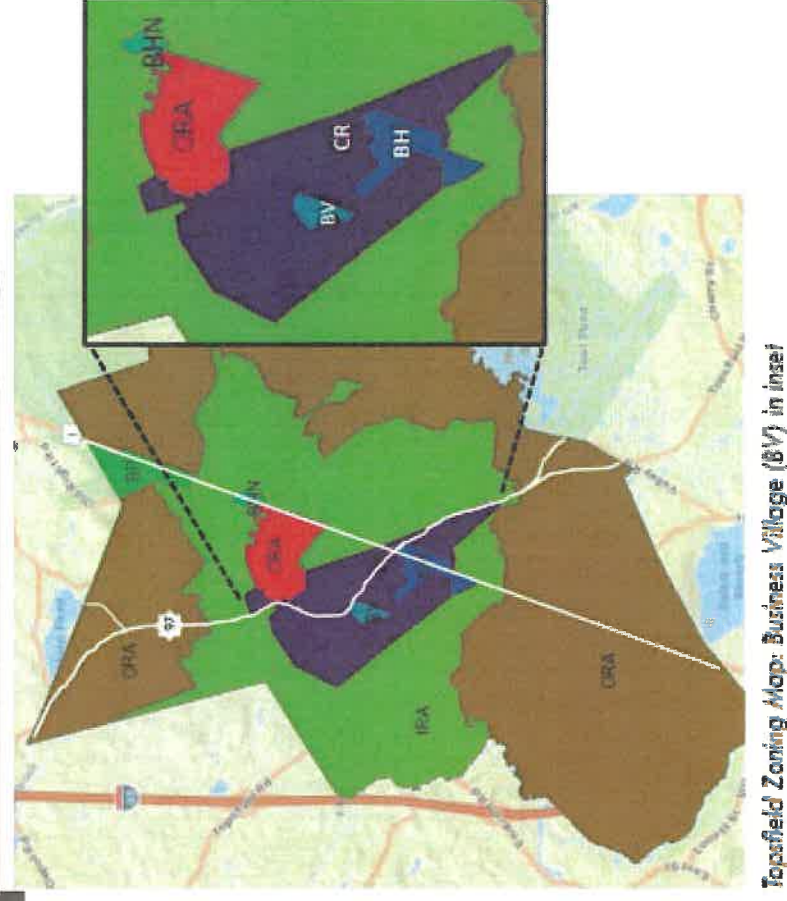
Regulatory and More

- ▶ Zoning
- ▶ Traffic Counts
- ▶ Liquor Licenses
- ▶ 2019 Downtown Revitalization Strategic Plan
- ▶ Support by the Town
- ▶ Community Survey

Questions and Comments please email:
jnlian@toppsfield-ma.gov

Zoning

- ▶ Existing Zoning
 - ▶ **Business Highway District (BH)**
 - ▶ **Business Village District (BV)**
 - ▶ Central Residential (CRA)
 - ▶ Inner Residential and Agriculture District (IRA)
 - ▶ Outlying Residential and Agricultural District (ORA)
 - ▶ **Business Park District (BP)**
 - ▶ Elderly Housing District (EHD)
 - ▶ **Business Highway District North (BHN)**
- ▶ Comprehensive Master Plan coming 2022!



Questions and Comments please email:
janian@topsfield-ma.gov

Traffic Counts

- ▶ Route 1 (at the Fairgrounds)
 - ▶ 104,354 total vehicle trips (Sept. 1, 2020 through Sept. 18 2020)
 - ▶ 115,331 total vehicle trips (May 21, 2022 through May 29, 2022)
- ▶ Route 97/Main Street (near the Topsfield Common)
 - ▶ 47,470 total vehicle trips (May 31, 2021 through June 7, 2021)
 - ▶ 88,890 total vehicle trips (May 21, 2022 through May 31, 2022)

estions and Comments please email:
njan@topsfield-ma.gov

Liquor Licenses

- ▶ Currently Taken
 - ▶ Three (3) All Alcohol
 - ▶ One (1) Beer and Wine
 - ▶ Two (2) Retail
 - ▶ One (1) Winery
- ▶ **Currently Available**
 - ▶ **Five (5) All Alcohol**
 - ▶ **Two (2) Retail**
- ▶ Competitive Annual Cost
 - ▶ \$1,200/annual for All Alcohol, Retail or Beer and Wine

Questions and Comments please email:
jninan@topsfield-ma.gov

2019 MAPC Study - Downtown Revitalization Strategic Plan

- ▶ **Vision:** A welcoming downtown village where Topsfield residents and visitors of all ages can live, work, gather and shop.

- ▶ **Goals:**

- ▶ 1. Attract new businesses to the district
- ▶ 2. Increase the customer base to support downtown businesses
- ▶ 3. Enhance the look, feel and safety of the district
- ▶ 4. Increase community-building events
- ▶ 5. Expand town capabilities and resources to achieve goals

Support by the Town

- ▶ New Water Treatment Facility
- ▶ 2019 Downtown Parking Study
 - ▶ Typical 40% - 50% utilization rate downtown
- ▶ Project Review Team
- ▶ Creation of the ECDC and TCP
- ▶ Flower Planters, Parklet and General Beautification
- ▶ Downtown Streetscape Design and Standardization
- ▶ Branding
- ▶ New Website
- ▶ New Social Media Platforms
- ▶ Innovative/Smart City Approach:
 - ▶ Solar Lights
 - ▶ Solar Bench
 - ▶ EV Charging Stations
 - ▶ Electrification of Town Vehicle Fleet
- ▶ Grants
- ▶ More

estions and Comments please email:
jnlian@toppsfield-ma.gov

Competitive Grants Received 2019 -2021

Downtown Revitalization Strategic Plan/Parking Study	\$ 45,000
Design/Purchase of 20 Solar Lights	\$146,000
Purchase of Spring Flowers for Solar Lights	\$ 5,000
Solar Bench	\$ 5,000
Purchase of 21 planters for Main St.	\$ 15,000
Sidewalk Repairs/Extensions – Grove St. and Washington St.	\$ 384,000
Bump outs and Main Street Fall Decorations	\$ 2,000
Outdoor Eating Parklet	\$ 3,000
Installation of EV Charging Stations	\$ 45,000
Wayfinding Signs	\$ 100,000
Master Plan	\$ 100,000
Washington street Improvements	\$400,000
Main Street Holiday Trees	<u>\$ 3,000</u>
	\$1,250,000

estions and Comments please email:
njan@topsfeld-ma.gov

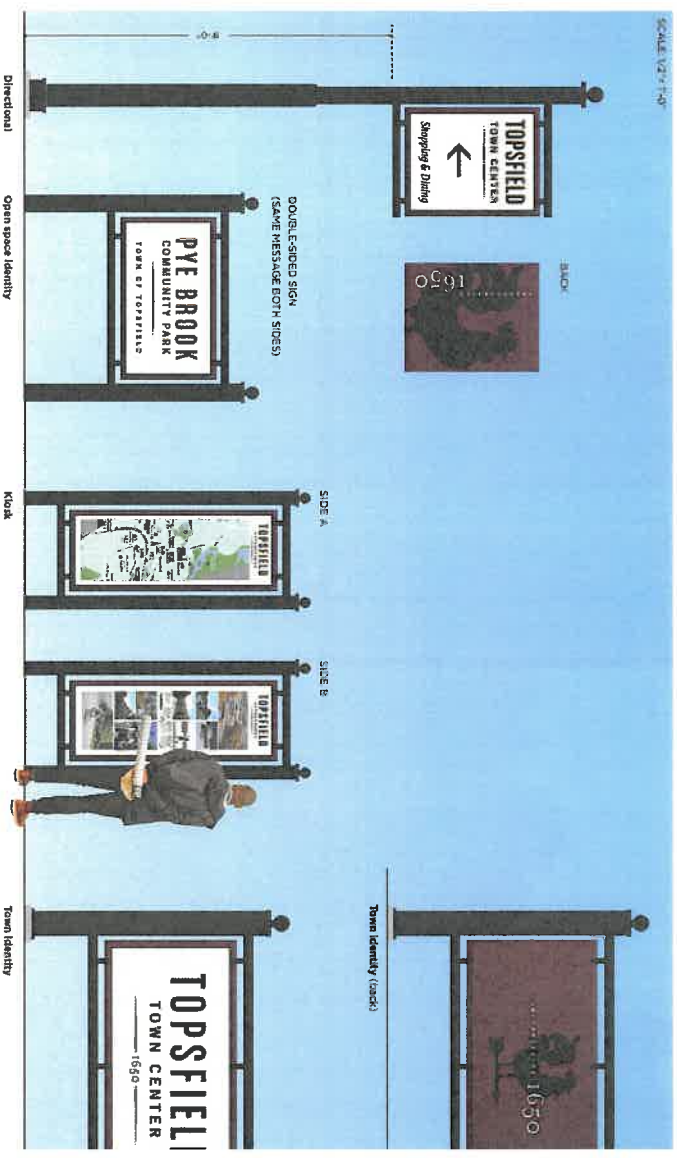


estions and Comments please email:
jnlian@topsfield-ma.gov

What's to Come?

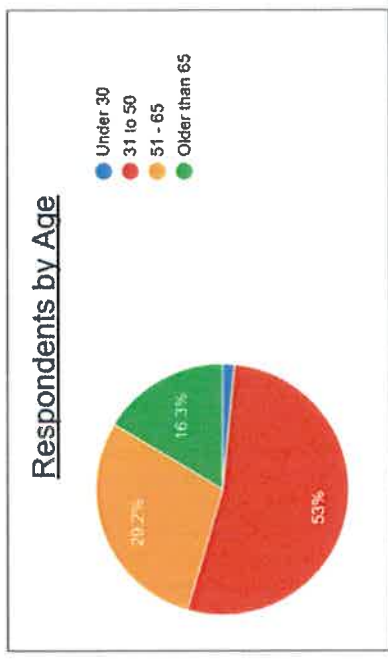
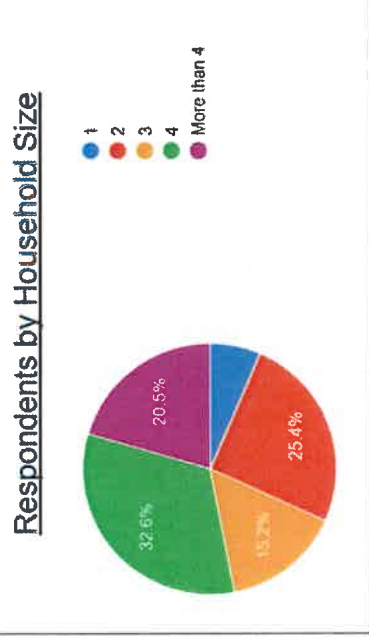
- ▶ Wayfinding Signs Installation
- ▶ Master Plan Implementation
- ▶ Infrastructure Improvements on Washington Street
- ▶ Music and Up-lighting Downtown
- ▶ Additional Place Making
 - ▶ Expand Outdoor Dining
 - ▶ Create a Pocket Park Downtown
- ▶ Regular Farmers/Artisan Markets

estions and Comments please email:
junian@topsfeld-ma.gov



Community Survey, Spring 2022

- ▶ 264 Survey Respondents
- ▶ Marketed via Town Website and Social Media
- ▶ 95% of Respondents were Topsfield Residents
- ▶ Achieved good cross-section of Respondents by household size and age

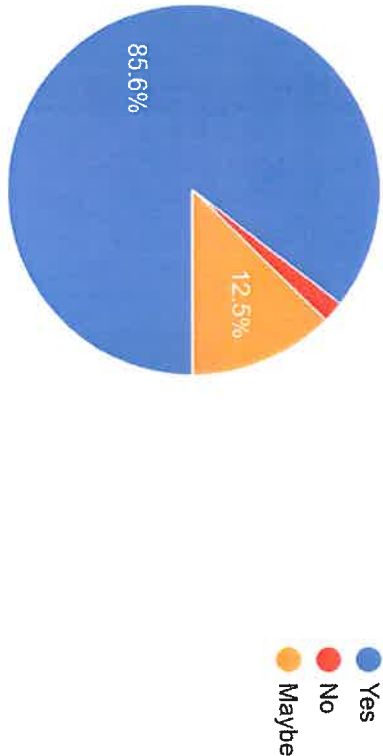


For Questions and Comments please email:
kharutunian@topsfield-ma.gov

Community Survey, Spring 2022

- ▶ Respondents overwhelmingly support increased business activity in Topsfield

Do you want there to be more businesses in Topsfield?
263 responses

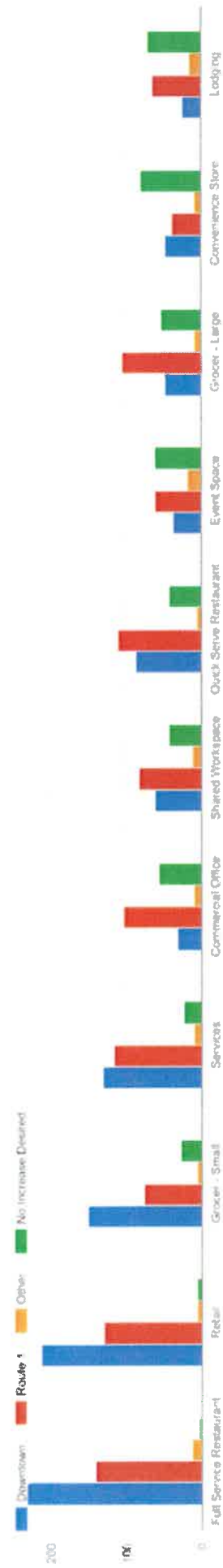


For Questions and Comments please email
khorutunian@topsfield-ma.gov

Community Survey, Spring 2022

- ▶ Respondents support increased business activity in both the Downtown and Route 1, especially for Restaurants and Retail

In what region of town would you like to see increase in business activity by the following types of business?

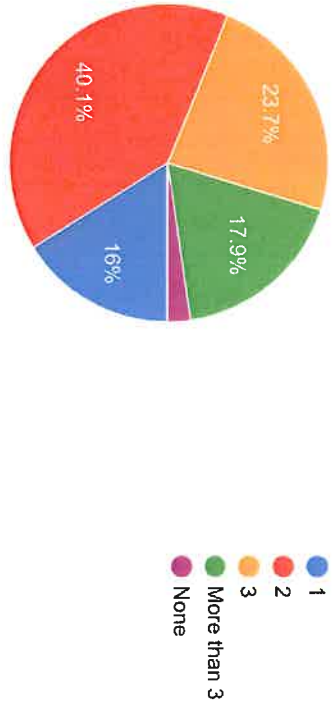


For Questions and Comments please email:
kharutunian@topsfeld-ma.gov

Community Survey, Spring 2022

Strong desire for Full Service Restaurants in Topsfield

How many full-service wait-staff restaurants do you want to have in Topsfield?
262 responses



For Questions and Comments please email:
kharutunian@topsfield-ma.gov

Community Survey, Spring 2022

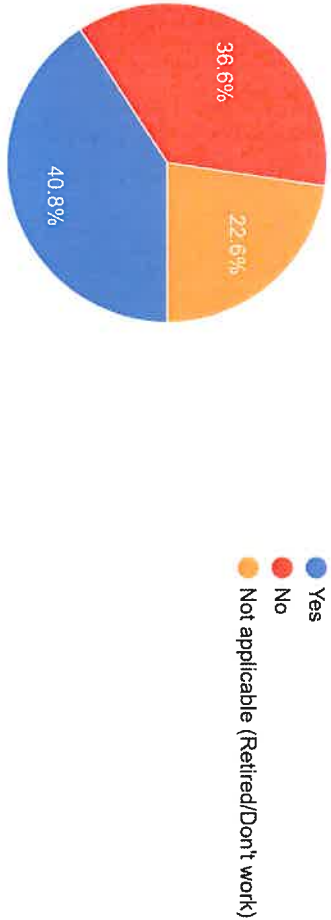
- ▶ Market conditions are favorable for Restaurants
 - ▶ Low Competition
 - ▶ Food Service currently only makes up around 2% of Topsfield Businesses
 - ▶ Over 55% of Survey Respondents travel more than 20 minutes to dine out!
 - ▶ Strong Potential Customer Base
 - ▶ Almost 70% of Survey Respondents dine out 4 or more times a month
 - ▶ 57% of Survey Respondents spend more than \$200 dining out each month
 - ▶ Low Barriers to Entry
 - ▶ Supportive local government
 - ▶ Liquor licenses available

For Questions and Comments please email:
kharutunian@topsfield-ma.gov

Community Survey, Spring 2022

▶ Commuting behavior has changed since the pandemic: **More Residents stay local**

Do you now expect to work more days from home than prior to the pandemic?
265 responses



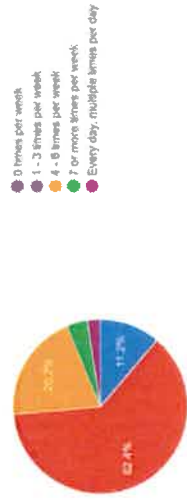
For Questions and Comments please email:
kharutunian@topsfeld-ma.gov

Community Survey, Spring 2022

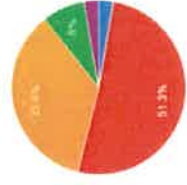
▶ Shopping habits have changed since the Pandemic: **More Residents want to shop local**

- Prior to the pandemic: **26.4%** of Respondents patronized Topsfield-based businesses 4 or more times a week
- Post pandemic: **46.1%** of Respondents intend to patronize Topsfield-based businesses 4 or more times a week

Before pandemic, on average, how many times per week did you patronize Topsfield-based businesses?
258 responses



Going forward, assuming a "return to normal" or a stabilized "new normal," on average how many times per week do you intend to patronize Topsfield-based businesses?
263 responses



For Questions and Comments please email:
kharutunian@topsfield-ma.gov

Community Survey, Spring 2022

"It would be nice to have a restaurant as there appears to be a lot of liquor licenses available and those that would greatly enjoy one have to drive to Rowley or Danvers to enjoy this"

"Restaurants please."

"There needs to be more business geared toward people hanging out for more than 5 minutes so that people can see each other in town purposefully, but also meet organically while frequenting these businesses."

"Please focus on destination restaurants that can pull traffic for downtown. We have enough quick service/fast food and need sit down options. Ideally 1-2 "good" restaurants can serve as anchors for other retail/services downtown."

"We like consistent good food and a "good pour" of wine. We enjoy to stay local and just get out for a nice meal."

"Prefer businesses that will provide services for residents of Topsfield and neighboring towns as well as those that can contribute to the tax base in an appropriate manner reflecting the residential character of the town. Mix of businesses should promote walkability downtown (smaller shops, restaurants) as a dining and retail destination, and continued larger businesses (light industrial, chain stores, shopping centers) on the highly trafficked Route 1 corridor."

For Questions and Comments please email:
kharutunian@topsfield-ma.gov

**DISCLOSURE STATEMENT FOR
TRANSACTION WITH A PUBLIC AGENCY CONCERNING REAL PROPERTY
M.G.L. c. 7C, s. 38 (formerly M.G.L. c. 7, s. 40J)**

INSTRUCTION SHEET

NOTE: The Division of Capital Asset Management and Maintenance (DCAMM) shall have no responsibility for insuring that the Disclosure Statement has been properly completed as required by law. Acceptance by DCAMM of a Disclosure Statement for filing does not constitute DCAMM's approval of this Disclosure Statement or the information contained therein. Please carefully read M.G.L. c. 7C, s. 38 which is reprinted in Section 8 of this Disclosure Statement.

Section (1): Identify the real property, including its street address, and city or town. If there is no street address then identify the property in some other manner such as the nearest cross street and its tax assessors' parcel number.

Section (2): Identify the type of transaction to which this Disclosure Statement pertains —such as a sale, purchase, lease, etc.

Section (3): Insert the exact legal name of the Public Agency participating in this Transaction with the Disclosing Party. The Public Agency may be a Department of the Commonwealth of Massachusetts, or some other public entity. Please do not abbreviate.

Section (4): Insert the exact legal name of the Disclosing Party. Indicate whether the Disclosing Party is an individual, tenants in common, tenants by the entirety, corporation, general partnership, limited partnership, LLC, or other entity. If the Disclosing Party is the trustees of a trust then identify the trustees by name, indicate that they are trustees, and add the name of the trust.

Section (5): Indicate the role of the Disclosing Party in the transaction by checking one of the blanks. If the Disclosing Party's role in the transaction is not covered by one of the listed roles then describe the role in words.

Section (6): List the names and addresses of every legal entity and every natural person that has or will have a direct or indirect beneficial interest in the real property. The only exceptions are those stated in the first paragraph of the statute that is reprinted in Section 8 of this Disclosure Statement. If the Disclosing Party is another public entity such as a city or town, insert "inhabitants of the (name of public entity)." If the Disclosing Party is a non-profit with no individual persons having any beneficial interest then indicate the purpose or type of the non-profit entity. If additional space is needed, please attach a separate sheet and incorporate it by reference into Section 6.

Section (7): Check "NONE" in the box if none of the persons mentioned in Section 6 is employed by DCAMM or an official elected to public office in the Commonwealth of Massachusetts. Otherwise list any parties disclosed in Section 6 that are employees of DCAMM or an official elected to public office.

Section (8): The individual signing this statement on behalf of the Disclosing Party acknowledges that he/she has read the included provisions of Chapter 7C, Section 38 (formerly Chapter 7, Section 40J) of the General Laws of Massachusetts.

Section (9): Make sure that this Disclosure Statement is signed by all required parties. If the Disclosing Party is a corporation, please make sure that this Disclosure Statement is signed by a duly authorized officer of the corporation as required by the statute reprinted in Section 8 of this Disclosure Statement.

DCAMM's acceptance of a statement for filing does not signify any opinion by DCAMM that the statement complies with applicable law.

This completed and signed Disclosure Statement should be mailed or otherwise delivered to:

Deputy Commissioner for Real Estate
Division of Capital Asset Management and Maintenance
One Ashburton Place, 15th Floor, Boston, MA 02108

**DISCLOSURE STATEMENT FOR
TRANSACTION WITH A PUBLIC AGENCY CONCERNING REAL PROPERTY
M.G.L. c. 7C, s. 38 (formerly M.G.L. c. 7, s. 40J)**

The undersigned party to a real property transaction with a public agency hereby discloses and certifies, under pains and penalties of perjury, the following information as required by law:

- (1) REAL PROPERTY:
- (2) TYPE OF TRANSACTION, AGREEMENT, or DOCUMENT:
- (3) PUBLIC AGENCY PARTICIPATING in TRANSACTION:
- (4) DISCLOSING PARTY'S NAME AND TYPE OF ENTITY:
- (5) ROLE OF DISCLOSING PARTY (Check appropriate role):

☐ Lessor/Landlord

☐ Lessee/Tenant

☐ Seller/Grantor

☐ Buyer/Grantee

☐ Other (Please describe): _____
- (6) The names and addresses of all persons and individuals who have or will have a direct or indirect beneficial interest in the real property excluding only 1) a stockholder of a corporation the stock of which is listed for sale to the general public with the securities and exchange commission, if such stockholder holds less than ten per cent of the outstanding stock entitled to vote at the annual meeting of such corporation or 2) an owner of a time share that has an interest in a leasehold condominium meeting all of the conditions specified in M.G.L. c. 7C, s. 38, are hereby disclosed as follows (attach additional pages if necessary):

NAMERESIDENCE

(7) None of the above- named persons is an employee of the Division of Capital Asset Management and Maintenance or an official elected to public office in the Commonwealth of Massachusetts, except as listed below (Check "NONE" if NONE):

☐ NONE

NAME:POSITION:

DCAMM 2019-02-14

**DISCLOSURE STATEMENT FOR
TRANSACTION WITH A PUBLIC AGENCY CONCERNING REAL PROPERTY
M.G.L. c. 7C, s. 38 (formerly M.G.L. c. 7, s. 40J)**

- (8) The individual signing this statement on behalf of the above-named party acknowledges that he/she has read the following provisions of Chapter 7C, Section 38 (formerly Chapter 7, Section 40J) of the General Laws of Massachusetts:

No agreement to rent or to sell real property to or to rent or purchase real property from a public agency, and no renewal or extension of such agreement, shall be valid and no payment shall be made to the lessor or seller of such property unless a statement, signed, under the penalties of perjury, has been filed by the lessor, lessee, seller or purchaser, and in the case of a corporation by a duly authorized officer thereof giving the true names and addresses of all persons who have or will have a direct or indirect beneficial interest in said property with the commissioner of capital asset management and maintenance. The provisions of this section shall not apply to any stockholder of a corporation the stock of which is listed for sale to the general public with the securities and exchange commission, if such stockholder holds less than ten per cent of the outstanding stock entitled to vote at the annual meeting of such corporation. In the case of an agreement to rent property from a public agency where the lessee's interest is held by the organization of unit owners of a leasehold condominium created under chapter one hundred and eighty-three A, and time-shares are created in the leasehold condominium under chapter one hundred and eighty-three B, the provisions of this section shall not apply to an owner of a time-share in the leasehold condominium who (i) acquires the time-share on or after a bona fide arms length transfer of such time-share made after the rental agreement with the public agency is executed and (ii) who holds less than three percent of the votes entitled to vote at the annual meeting of such organization of unit owners. A disclosure statement shall also be made in writing, under penalty of perjury, during the term of a rental agreement in case of any change of interest in such property, as provided for above, within thirty days of such change.

Any official elected to public office in the commonwealth, or any employee of the division of capital asset management and maintenance disclosing beneficial interest in real property pursuant to this section, shall identify his position as part of the disclosure statement. The commissioner shall notify the state ethics commission of such names, and shall make copies of any and all disclosure statements received available to the state ethics commission upon request.

The commissioner shall keep a copy of each disclosure statement received available for public inspection during regular business hours.

- (9) This Disclosure Statement is hereby signed under penalties of perjury.

PRINT NAME OF DISCLOSING PARTY (from Section 4, above)

AUTHORIZED SIGNATURE of DISCLOSING PARTY DATE (MM / DD / YYYY)

PRINT NAME & TITLE of AUTHORIZED SIGNER

Appendix K

PURCHASE AND SALE AGREEMENT

1. Information and Definitions.

- (a) DATE OF AGREEMENT: _____, 2022
- (b) PREMISES: 10 School Avenue, Topsfield, MA
- (c) SELLER: **Town of Topsfield, Massachusetts**
Address: Town Hall, 8 W Common St, Topsfield, MA 01983
Attn: Kevin Harutunian, Town Administrator
- (d) SELLER'S Attorney: Lee S. Smith, Esq.
KP Law, P.C.
Address: 101 Arch Street, 12th Floor
Boston, MA 02110

Phone: 617-654-1809

E-mail address: lsmith@k-plaw.com
- (e) BUYER:

Address:

BUYER'S Attorney:

Phone:

E-Mail Address:
- (f) PURCHASE PRICE: The agreed purchase price for the Premises is _____ Dollars (\$XXX,000.00)
which is to be paid at the time of delivery of the deed by certified
or bank check or by wire transfer.
- (g) DEPOSIT: Ten thousand Dollars (\$10,000.00) to be held in
escrow by KP Law, P.C.
- (h) CLOSING DATE: 30 days from the BUYER'S receipt of any and all applicable
permits and approvals necessary or required for the BUYER to
develop the Premises for its intended use(s), as described in the
BUYER's proposal and as agreed upon by the Town. BUYER
shall provide SELLER with written notice that all necessary or
required permits and approvals have been obtained. Time is of
the essence of this Agreement.
- (i) PLACE: Town Hall, 8 West Common Street, Topsfield, MA 01983, or a
closing by mail, by mutual agreement of the parties.

(j) TITLE: Release Deed

(k) BROKER: None

2. Premises, Buildings, Structures, Improvements, Fixtures. Included in the sale as part of said Premises are the buildings and improvements thereon, if any. All personal property of the SELLER not included in the sale shall be removed from the Premises at least two (2) days before the Closing.

3. Title Deed. The Premises are to be conveyed by a good and sufficient release deed running to BUYER.

The deed to the Premises shall convey a good and clear record and marketable title thereto, free from encumbrances, except:

- (a) Provisions of existing building and zoning laws;
- (b) Such taxes for the then-current year as are not due and payable on the date of the delivery of such deed, except as set forth herein;
- (c) Any liens for municipal betterments assessed after the date of this Agreement; and
- (d) Easements, restrictions and reservations of record, if any.

4. Deed/Plans. SELLER shall prepare the deed and all other Closing Documents pertaining to SELLER. BUYER shall prepare all other Closing Documents pertaining to BUYER. If said deed refers to a plan necessary to be recorded therewith BUYER shall deliver such plan with the deed in a form adequate for recording or registration.

5. SELLER's Right of Entry and Right of Reversion. The Premises shall be conveyed from SELLER to BUYER subject to a condition subsequent, with the possibility of a reverter retained by SELLER. SELLER shall have the right to enter upon the Premises (with title and all rights to the Premises being transferred to the name of the SELLER) upon the occurrence of the following events: BUYER (or its successor's in title) fails to develop the Premises in accordance with the following schedule, each beginning on the date on which the deed from SELLER to BUYER is recorded with the Registry:

- A. Phase 1 shall be completed within nine (9) months of the execution of this Agreement. Phase 1 shall include pre-construction assessment of the existing condition of the Premises, completion of all architectural and engineering designs and/or renderings concerning the adaptive reuse of the Premises, as described in the Buyer's proposal and as agreed upon by the Town, obtaining approval of all local permits (including those required by the Conservation Commission and if applicable, the ZBA), and application for building permits for such construction.
- B. Phase 2 shall be completed within sixteen (16) months from the completion of Phase 1. Commencement of Phase 2 may begin upon the completion of Phase 1. Phase 2 shall include all demolition, construction, electrical, plumbing, and other structural work necessary to render the Premises suitable for the adaptive reuse of the Premises, as described in the Buyer's proposal and as agreed upon by the Town.

- C. Phase 3 shall be completed within six (6) months from the completion of Phase 2. Phase 3 may proceed parallel to Phase 2 as permitted in by law and consistent with any and all necessary permits issued by the Town Building Inspector. Phase 3 shall include all landscaping, equipment installation, interior decoration, painting, and any other finishing work necessary to render the Premises suitable for the adaptive reuse of the Premises, as described in the Buyer's proposal and as agreed upon by the Town.

In the event that either Phase 1 or Phase 2 are not completed within the time described above, then the SELLER may provide not less than sixty (60) days' written notice to the BUYER of its intent to exercise its Right of Entry and Reverter. If, at the end of such notice period, the BUYER has not complied with the requirements set forth herein, the SELLER may re-enter the Premises and retake all rights, title, interest and possession in and to the Premises by executing and recording a Certificate of Entry with the Registry. Upon recording said Certificate of Entry, title to the Premises and any improvements thereon shall revert to and vest in the SELLER without any necessity for suit or without the necessity of a deed from the BUYER to the SELLER, free from any and all mortgages and other encumbrances.

Notwithstanding the above, in the event that the BUYER is unable to meet the Phase 1 or Phase 2 scheduling deadlines set forth above as the result of force majeure event(s), such as acts of God, war, government regulations prohibiting the project to proceed due to COVID-19 or otherwise, government declared disaster or state of emergency, civil disorder, epidemics, landslides, hurricanes, floods, lightning, earthquakes, acts of civil disorder, national or regional strikes or labor disputes, or other circumstances not reasonably within the BUYER'S control and which could not have been avoided by reasonable measures, then SELLER'S right of entry and right of reversion as described above shall be temporarily suspended but only for such period of time as is reasonably required by such force majeure event(s). BUYER shall be obligated to resume the performance of its obligations hereunder as soon as is practical after the occurrence of force majeure event(s). BUYER shall give the SELLER written notice describing the particulars of such occurrence, including an estimation of its expected duration and probable impact on the performance of the BUYER'S obligations hereunder, and shall continue to furnish timely and regular reports with respect thereto during the continuation of and upon the termination of force majeure event(s).

The provisions of this section shall survive the Closing.

6. Closing Costs. At the closing, SELLER shall pay the cost of obtaining and recording and/or filing such instruments as are necessary to establish SELLER'S good and clear record and marketable title and SELLER'S authority to convey same and any other usual and customary closing costs and expenses incurred by SELLER. At the closing, BUYER shall pay the recording and filing fees incurred in connection with recording the deed and such instruments as are necessary to establish BUYER'S acceptance of the deed and authority to so accept, the cost and expenses of any commitment and the title insurance policies issued pursuant to the commitment, if any, and the fees and expenses of BUYER'S attorneys and any other usual and customary closing costs and expenses incurred by BUYER with regard to the purchase. SELLER shall be responsible for his attorney's fees.
7. Registered Title. In addition to the foregoing, if the title to said Premises is registered, said deed shall be in a form sufficient to entitle BUYER to a certificate of title of said Premises, and

SELLER shall deliver with said deed all instruments, if any, necessary to enable BUYER to obtain such certificate of title.

8. Possession and Control of Premises. Full possession of said Premises free of all tenants and occupants, except as herein provided, is to be delivered at the time of the delivery of the deed, said Premises to be then (a) in the same condition as they are in as of the date of this agreement, excepting only reasonable use and wear thereof, and (b) not in violation of zoning laws, and (c) in compliance with provisions of any instrument referred to in Section 3 hereof.
9. Right to Inspect. BUYER shall be entitled to inspect said Premises, upon at least forty-eight (48) hours prior notice to SELLER, which notice may be oral notice, prior to the delivery of the deed in order to determine whether the condition thereof complies with the terms of this Agreement. Any such inspection shall not interfere with the current tenant's use and enjoyment of the Premises (if any).
10. Extension to Perfect Title or Make Premises Conform. If SELLER shall be unable to give title or to make conveyance, or to deliver possession of the Premises, all as herein stipulated, or if at the time of the delivery of the deed the Premises do not conform with the provisions hereof, then SELLER shall use reasonable efforts to remove any defects in title (at SELLER'S sole expense), or to deliver possession as provided herein, or to make the said Premises conform to the provisions hereof, as the case may be, and thereupon the time for performance hereof shall be extended for thirty (30) calendar days or such time as the BUYER and SELLER mutually agree.
11. Failure to Perfect Title or Make Premises Conform. If at the expiration of the extended time BUYER and SELLER shall have failed so to remove any defects in title, deliver possession, or make the Premises conform, as the case may be, all as herein agreed, then all obligations of the parties hereto shall cease and this Agreement shall be void without recourse to the parties hereto.
12. BUYER'S Election to Accept Title. If SELLER shall be unable to give title or to make conveyance, or to deliver possession of the Premises, all as herein stipulated, or if at the time of the delivery of the deed the Premises do not conform with the provisions hereof, then BUYER shall have the election, at either the original or any extended time for performance, to accept such title as SELLER can deliver to the said Premises in their then condition and to pay therefor the purchase price, without deduction, in which case SELLER shall convey such title, except that in the event of such conveyance in accord with the provisions of this clause, if the said Premises shall have been damaged by fire or casualty insured against, then SELLER shall, unless SELLER has previously restored the Premises to their former condition, either:
 - (a) pay over or assign to BUYER, on delivery of the deed, all amounts recovered or recoverable on account of such insurance, less any amounts reasonably expended by SELLER for any partial restoration, or
 - (b) if a holder of a mortgage on said Premises shall not permit the insurance proceeds or a part thereof to be used to restore the said Premises to their former condition or to be so paid over or assigned, give to BUYER a credit against the purchase price, on delivery of the deed, equal to said amounts so recovered or recoverable and retained by the holder of the said mortgage less any amount reasonably expended by SELLER for any partial restoration.

If BUYER declines to so elect to accept such title as SELLER can deliver to the said Premises in their then condition and to pay therefor the purchase price, without deduction, then all obligations of the parties hereto shall cease and this Agreement shall be void without recourse to the parties.

13. Acceptance of Deed. The acceptance and recording of the deed to the Premises by BUYER shall be deemed to be a full performance and discharge of every agreement and obligation herein contained or expressed, except such as are, by the terms hereof, to be performed after the delivery of said deed.
14. Insurance. Until the delivery of the deed, SELLER shall maintain insurance on the Premises as it presently has.
15. Use of Money to Clear Title. To enable SELLER to make conveyance as herein provided, SELLER may, at the time of delivery of this deed, use the purchase money or any portion thereof to clear the title of any or all encumbrances or interests, provided that all instruments so procured are recorded simultaneously with the delivery of said deed, or, if an institutional mortgage only, within a reasonable time thereafter in accordance with customary Massachusetts conveyancing practices.
16. Adjustments. A payment in lieu of taxes shall be paid in accordance with G.L. c. 44, §63A as of the day of performance of this Agreement and the amount thereof shall be added to the purchase price payable by BUYER at the time of delivery of the deed. Said payment shall be calculated based upon the sales price. Buyer's obligation to make payments in lieu of taxes shall terminate upon the effective date of the assessment and taxation of the Premises upon the Buyer as taxable real estate. All other adjustments, including any outstanding charges for water, sewer, refuse or similar applicable charges shall be made as of the Closing Date.
17. BUYER'S Contingencies. BUYER'S obligation to perform under this Agreement is subject to the following conditions, at BUYER'S option:
 - (a) A satisfactory review and report of the environmental condition of the Premises and title examination not later than _____, 2022; and
 - (b) BUYER and SELLER shall have complied with the disclosure provisions of G.L. c.7C, §38. SELLER hereby agrees to execute a "Disclosure of Beneficial Interests in Real Property Transaction" certificate as required by G.L.c.7C, §38;

In the event SELLER grants the BUYER and its agents access to the property before closing, BUYER hereby indemnifies and holds SELLER harmless from and against all injuries, claims, loss, demands, causes and/or actions, costs and expenses, liability and damages, including reasonable attorney's fees, caused or in any way related to BUYER or BUYERS' designees, agents, employees, contractors, and licensees entry on the property, and under no circumstances shall BUYER and/or BUYERS' agent be allowed to make any sort of alterations to the Property during said grant of access. This indemnity shall survive closing and delivery of the deed hereunder or termination of this Agreement.

18. Title to Premises. Notwithstanding anything herein contained, the Premises shall not be considered to be in compliance with the provisions of this Agreement with respect to title unless:

- (a) No building, structure or improvement of any kind, including driveways and utilities, belonging to any person or entity encroaches upon or under the Premises from other premises;
 - (b) Title to the Premises is insurable, for the benefit of BUYER, by a title insurance company acceptable to BUYER, in a fee owner's policy of title insurance at normal premium rates, in the American Land Title Association form currently in use; and
 - (c) All means of access to the Premises shall be located completely within the boundary lines of said Premises and shall not encroach upon or under property of any other person or entity.
19. Closing Documents; Affidavits, etc. BUYER and SELLER each agree to execute and provide such additional and further instruments and documents, including without limitation, authority documents, as may be consistent with this Agreement and customarily and reasonably required by SELLER as a Massachusetts municipal corporation and by BUYER and/or BUYER'S title insurance company to complete the transactions described in this Agreement.
20. Title Standards. Any matter or practice arising under or relating to this Agreement which is the subject of a title standard or a practice standard of the Real Estate Bar Association at the time for delivery of the deed shall be covered by said title standard or practice standard to the extent applicable.
21. Acceptance of Premises; Inspection Rights. AS-IS Condition. BUYER agrees that if it purchases the Premises pursuant to the terms hereof, it shall have accepted the Premises in their as-is condition, without any representations or warranties other than are set forth herein. BUYER shall have the right to inspect the Premises in accordance with the provisions hereof. BUYER acknowledges that SELLER has no responsibility for hazardous waste, oil, hazardous material or hazardous substances, as those terms are defined by any applicable law, rule or regulation, including, without limitation, the Massachusetts Oil and Hazardous Materials Release Prevention and Response Act, M.G.L. c. 21E, the Massachusetts Hazardous Waste Management Act, M.G.L. c. 21C, the Comprehensive Environmental Response, Compensation and Liability Act, as amended, 42 U.S.C. §§ 9601 et seq. and the Resource Conservation and Recovery Act, as amended, 42 U.S.C. §§ 6901 et seq. (herein collectively referred to as "Hazardous Waste") on, in, under or emitting from the premises or for any other condition or defect on the premises. The provisions of this Section shall survive delivery of the deed.
22. Notices. Any notice required or permitted to be given under this Agreement shall be in writing and signed by the party or the party's attorney or agent and shall be deemed to have been given: when delivered by hand, sent by registered or certified mail, return receipt requested, postage prepaid; sent by express courier service such as Federal Express, or upon confirmed facsimile transmission (provided such facsimile notice is promptly followed by other acceptable means of sending notice), to the other party with a copy to the other party's attorney at the addresses set forth in Section 1. Notices sent by email shall be deemed received only upon receipt of an acknowledging email reply to the sender from the recipient.
23. Condition of Premises at Closing. Except as herein provided, SELLER agrees to deliver the Premises at the time of delivery of SELLER'S deed in a condition substantially similar to its condition at the time of the signing of this Agreement, removing all of SELLER'S personal

property therefrom which is not being sold to BUYER, or left for its benefit, and consented to by it.

24. Default. In the event that SELLER fails to sell the Premises and fulfill the obligations set forth herein, the BUYER'S sole and exclusive remedy shall be to terminate this Agreement with written notice to the SELLER, whereupon the parties shall have no further obligations under this Agreement except for those obligations, if any, that are expressly stated herein to survive said termination of this Agreement.

In the event that BUYER fails to purchase the Premises and fulfill the obligations set forth herein, the SELLER'S sole and exclusive remedy shall be to retain the BUYER'S deposit as liquidated damages and to terminate this Agreement with written notice to the SELLER, whereupon the parties shall have no further obligations under this Agreement except for those obligations, if any, that are expressly stated herein to survive said termination of this Agreement.

25. Brokers. BUYER and SELLER each represent and warrant to the other that each has not contacted any real estate broker other than (NONE) in connection with this transaction and was not directed to the other as a result of any services or facilities of any real estate broker, and shall defend, indemnify the other against and hold the other harmless, to the extent permitted by law, from any claim, loss, damage, costs or liabilities for any brokerage commission or fee which may be asserted against the other by any broker in connection with this transaction. The provisions of this section shall survive delivery of the deed.
26. Extensions. BUYER and SELLER hereby authorize their respective attorneys (as the case may be) to execute on their behalf any extensions to the time for performance and any change of location and/or time for delivery of the deed. BUYER and SELLER shall be able to rely upon the signature of said attorneys as binding unless they have actual knowledge before the execution or other consent to such extensions, that either party has disclaimed the authority granted herein to bind them. For purposes of this Agreement, facsimile or scanned signatures shall be construed as original.
27. Casualty, Condemnation. Notwithstanding anything herein to the contrary, in the event of any damage to or destruction of the Premises or any part thereof by fire, vandalism or other casualty, or in the event of a taking of all or part of the Premises by eminent domain by any entity, then at BUYER'S sole and absolute discretion, this Agreement may be terminated, without recourse against the parties. All risk of loss shall remain with SELLER until the delivery and recording of the deed.
28. Recording of this Agreement. In the event the BUYER records a copy of the Purchase and Sale Agreement, SELLER may at SELLER'S option declare this Agreement null and void and BUYER shall be deemed to be in default of its obligations hereunder.
29. Errors. If any errors or omissions are found to have occurred in any calculations or figures used in the settlement statement signed by the parties (or would have been included if not for any such error or omission) and notice thereof is given within six (6) months of the date of delivery of the deed to the party to be charged, then such party agrees to make payment to correct the error or omission.

30. Construction of Agreement. This instrument, executed in multiple counterparts, is to be construed as a Massachusetts contract, is to take effect as a sealed instrument, sets forth the entire contract between the parties, is binding upon and inures to the benefit of the parties hereto and their respective successors and assigns, and may be canceled, modified or amended only by a written instrument executed by both SELLER and BUYER. Any claims arising under this Agreement shall be brought in the courts of the Commonwealth of Massachusetts.
31. Captions. The captions and headings throughout this Agreement are for convenience of reference only and the words contained therein shall in no way be held or deemed to define, limit, explain, modify, amplify or add to the interpretation, construction or meaning of any provisions of, or the scope or intent of this Agreement, nor in any way affect this Agreement, and shall have no legal effect.
32. Prior Agreements. The Request for Proposals issued by the SELLER and the BUYER'S response thereto is incorporated herein by reference. All other prior agreements of the parties are hereby superseded and shall have no further force and effect.
33. Governing Law. This Agreement and all Exhibits thereto shall be governed in accordance with Massachusetts law, to whose jurisdictions the parties hereto submit. This Agreement and the parties' obligations hereunder are subject to compliance with the applicable provisions of M.G.L. c. 30B.

(Remainder of page intentionally left blank. Signature pages follow.)

In Witness whereof, the parties hereto sign this Purchase and Sale Agreement under seal as of this _____ day of _____, 2022.

SELLER:
TOWN OF TOPSFIELD

BUYER

By: _____

By: _____

Approved as to form:
Town Counsel

Lee S. Smith, Esq.
KP Law, P.C.

OPTION TO PURCHASE AGREEMENT

This Option to Purchase Agreement (this "Agreement") is entered into on this 26 day of June, 2023, by and between **James S. Price, Inc.**, a Massachusetts corporation with an address of 5 Turnpike Road, Ipswich, Massachusetts 01938 (the "Grantor"), and the **Town of Topsfield** (the "Town") a municipal corporation duly organized under the laws of the Commonwealth of Massachusetts, and acting by and through its Select Board, having a usual place of business at Topsfield Town Hall, 8 West Common Street, Topsfield, Massachusetts 01983 (collectively, the "Parties").

Recitals

Whereas, Grantor is the owner of the property located at 35R Main Street, Topsfield, Massachusetts, identified on Topsfield Assessor's Map 41 as Lot 133, and described in a deed recorded with the Southern Essex District Registry of Deeds in Book 23653, Page 184 (the "Property"); and

Whereas, the Town is the owner of the property located at 10 School Avenue, Topsfield, Massachusetts, identified on Topsfield Assessor's Map 41 as Lot 60, and described in a deed recorded with the Southern Essex District Registry of Deeds in Book 40479, Page 547 (the "Town Property"); and

Whereas, the Town Property is adjacent to the Property; and

Whereas, the Town plans to issue a Request for Proposals ("RFP") for the sale of the Town Property for future development; and

Whereas, the Town Property would benefit from the use of the Property for future development of the Town Property; and

Whereas, the Town desires to obtain an Option to Purchase the Property so that the Town may sell or assign it to the individual or entity whose proposal is selected in the RFP process to allow them to use the Property for septic, parking, sitting areas, walking paths and other similar types of use. Construction of residential dwelling or commercial building shall be prohibited on the Property; and;

Whereas, the Town will record the Option with the Essex County Registry of Deeds within sixty (60) days following Town Meeting approval, and;

Whereas, Grantor is amenable to conveying the Option to Purchase to the Town for this purpose.

NOW, THEREFORE, for good and valuable consideration, the receipt and sufficiency of which are acknowledged, the parties hereby agree as follows:

Agreement

1. Option to Purchase. In exchange for the sum of One Dollar (\$1.00) paid by the Town to Grantor (the "Option Payment"), Grantor grants to the Town the option to acquire all of Grantor's right, title and interest in the Property (the "Option"). In the event that the Town fails to exercise the Option within the periods set forth in Sections 2 and 4, or, having timely exercised its Option, fails to close within the time set forth in Section 2, the Option shall terminate and be of no further force and effect.

2. Exercise of the Option. The Option may be exercised by written notice from the Town to Grantor (the "Option Notice") at any time within sixty (60) days of the selection of a winning proposal for the disposition of the Town Property by the Town. Thereafter, the parties shall enter into a purchase and sale agreement substantially on the terms and conditions, including the Closing Conditions, set forth in Exhibit A, attached hereto and incorporated herein (the "Purchase Terms"), and the Town shall have 120 days from the date the parties enter into said purchase and sale agreement to satisfy the Closing Conditions and to purchase the Property.

3. Purchase Price. The purchase price of the Property shall be One Hundred and Seventy-Five Thousand Dollars (\$175,000.00), to be paid at the closing date.

4. Option Term. Notwithstanding any other provision in this Agreement, this Option shall terminate if the Town has not exercised its right to purchase the Property within Three (3) years from the recording of this Agreement with the Southern Essex Registry of Deeds.

5. Option Conditions. The Grantor's obligation to grant the Option to the Town shall be contingent on the satisfaction of the condition that the Town shall have obtained a favorable vote of Town Meeting, authorizing the acquisition of the Property, and appropriating the Option Payment.

6. Closing Conditions. The Town's obligation to purchase the Property shall be contingent on the satisfaction of the following conditions (collectively, the "Closing Conditions"): (a) The Town shall have obtained a favorable vote of Town Meeting, authorizing the acquisition of the Property, and appropriating the purchase price thereof, and, if applicable, approval at an election of a debt exclusion pursuant to G.L. c. 59, §21C, so-called proposition 2 ½, for this purpose; (b) The Town shall have inspected the condition of the Property and title to the Property and be satisfied with the condition thereof, in its sole and absolute discretion; (c) the RFP must have been issued and a winning proposal must have been selected by the Town; and (d) Compliance with the provisions of G.L. c. 30B (the Uniform Procurement Act) for acquisition of real property. For acquisition of real property determined to be unique, thirty (30) days shall have elapsed since the date of publication of the Town's determination of uniqueness in the Central Register, without objection.



If the Town transfers or assigns its rights under this Agreement to a third party who elects to exercise the Option, then conditions 6(a) and 6(d) shall not apply. However, conditions 6(b) and 6(c) shall still apply.

7. Closing. Closing on the sale of the Property pursuant to the Town's exercise of the Option ("Closing") shall occur by the conveyance from Grantor to the Town of the fee simple interest in the Property, together with the performance by the Town on the one hand and Grantor on the other of the various obligations to be performed under this Agreement at Closing, including the payment of the purchase price by the Town.

8. Deed; Plans. Grantor shall prepare the deed. If said deed refers to a plan necessary to be recorded therewith, Grantor shall deliver such plan with the deed in form adequate for recording or registration.

9. Possession and Control of the Property. Full possession of said Property, free of all tenants and occupants, is to be delivered at the time of the delivery of the deed, said Property to be then: (a) In the same condition as it now is, reasonable use and wear thereof excepted, and (b) Not in violation of any building and zoning laws, and (c) In compliance with provisions of any instrument referred to in this Agreement. The Town shall be entitled to inspect said Property personally before the Closing in order to determine whether the condition thereof complies with the terms of this clause.

10. Irrevocable Option. Grantor acknowledges and agrees that it cannot revoke the rights granted to the Town under this Agreement. Grantor agrees not to sell or otherwise transfer or dispose of the Property or any part thereof to any third party, except in compliance with the provisions of this Agreement, prior to the expiration of the Option Term.

11. Recording of Option. The Town shall record this Option with the Southern Essex Registry of Deeds and provide Grantor with a copy.

12. Successors and Assigns. The Town, in its sole discretion, may assign all of its rights pursuant to the Option to a third party under the same terms and conditions of this Agreement. This Agreement shall be binding upon Grantor and Grantor's heirs, successors and assigns, and upon any person acquiring any interest in the Property as a result of insolvency, bankruptcy, foreclosure, or any other involuntary transfer or assignment, or by death, or otherwise by operation of law.

13. Notice. Any notice required or permitted to be given under this Agreement shall be in writing and signed by the party or the party's attorney or agent and shall be deemed to have been given: (a) when delivered by hand, or (b) when sent by Federal Express or other similar courier service, or (c) when mailed by certified mail, return receipt requested, or (d) upon electronically confirmed receipt of facsimile delivery (provided that such facsimile delivery is promptly followed by one of the other permitted forms of notice contained herein), to the party at the address first set forth above.

14. Time Periods. If any of the dates by which any right must be exercised or notice given falls on a Saturday, Sunday, or holiday on which Town offices are closed, such rights shall be exercised or notice given by the next business day on which Town Hall is open.

15. Severability. The provisions of this Agreement are severable. If a court of competent jurisdiction rules that any provision of this Agreement is invalid or unenforceable, such provision shall be replaced by another provision which is valid and enforceable and most closely approximates and gives effect to the intent of the invalid or unenforceable provision. Furthermore, such ruling shall not affect the validity or enforceability of any other provision of this Agreement.

16. Controlling Law. This Agreement shall be governed by the laws of the Commonwealth of Massachusetts and all disputes shall be brought in the courts of Essex County.

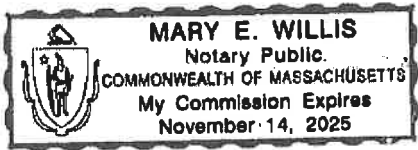
[signature page follows]

Two handwritten signatures are present at the bottom right of the page. The first signature is a stylized, cursive mark that appears to be 'J. A.'. The second signature is a more fluid, cursive mark that appears to be 'UW'.

COMMONWEALTH OF MASSACHUSETTS

Essex, ss.

On this 26th day of June, 2023, before me, the undersigned notary public, personally appeared Cameron K. Brown, member of the Topsfield Select Board, as aforesaid, who proved to me through satisfactory evidence of identification, which was Driver's License, to be the person whose name is signed on the preceding or attached documentarily and acknowledged to me that he/she/they signed it voluntarily for its stated purposes on behalf of the Town of Topsfield.



Mary E. Willis
Notary Public
My Commission Expires: Nov. 14, 2025

Handwritten initials

EXHIBIT A

Option to Purchase – Purchase Terms

If the Town exercise its option to purchase the Property, Grantor and the Town shall enter into a purchase and sale agreement substantially on the terms set forth herein.

1. Title to Property. The Property shall be conveyed by Grantor to the Town by a good and sufficient quitclaim deed conveying a good and clear record and marketable and insurable title to the Property free from all encumbrances except (i) taxes to be paid beyond or past the Closing Date, it being acknowledged that taxes owed as of the Closing Date shall be paid by Grantor, (ii) any lien for municipal betterments assessed after the date that the price of the Property has been finalized, (iii) provisions of local building and zoning laws, and (iv) all easements, restrictions, covenants and agreements of record provided the same do not interfere with the Town's intended use of the Property.

2. Registered Title. If the title to said Property is registered, said deed shall be in a form sufficient to entitle the Town to a Certificate of Title of said Property, and Grantor shall deliver with said deed all instruments, if any, necessary to enable the Town to obtain such Certificate of Title.

3. Extension to Perfect Title or Make Property Conform. If Grantor shall be unable to give title or to make conveyance, or to deliver possession of the Property, all as herein stipulated, or if at the time of the delivery of the deed the Property does not conform with the provisions hereof, then Grantor shall use reasonable efforts to remove any defects in title, or to deliver possession as provided herein, or to make the said Property conform to the provisions hereof, as the case may be, and thereupon the time for performance hereof shall be extended for a period of thirty (30) days. Reasonable efforts shall not require Grantor to expend more than \$1,000.00 in the aggregate.

4. Failure to Perfect Title or Make Property Conform. If at the expiration of the extended time Grantor shall have failed so to remove any defects in title, deliver possession, or make the Property conform, as the case may be, all as herein agreed, then all obligations of the parties hereto shall cease and this Agreement shall be void without recourse to the parties hereto.

5. Town's Election to Accept Title. The Town shall have the election, at either the original or any extended time for performance, to accept such title as Grantor can deliver to the said Property in its then condition and to pay therefore the purchase price, in which case Grantor shall convey such title.

6. Acceptance of Deed. The acceptance of a deed by the Town, or its assignee or nominee as the case may be, shall be deemed to be a full performance and discharge of every agreement and obligation herein contained or expressed, except such as are, by the terms hereof, to be performed after the delivery of said deed.



7. Use of Money to Clear Title. To enable Grantor to make conveyance as herein provided, Grantor may, at the time of delivery of this deed, use the purchase money or any portion thereof to clear the title of any or all encumbrances or interests, provided that all instruments so procured are recorded simultaneously with the delivery of said deed, or, if an institutional mortgage, within a reasonable time thereafter in accordance with customary Massachusetts conveyancing practices.

8. Adjustments. Taxes for the then-current fiscal year shall be apportioned as follows: if taxes are outstanding as of the closing date, taxes will be apportioned as of the closing date in accordance with G.L. c. 59, §72A; if, however, Grantor has paid taxes through and past the closing date, such payments shall not be refunded, it being acknowledged that the Town has no funds to refund Grantor for such taxes paid and the Town, being tax exempt, has no obligation to pay taxes upon acquisition of the Property. Utilities, if any, shall be adjusted at closing.

9. Brokers. The Town and Grantor each represent and warrant to the other that each has not contacted any real estate broker in connection with this transaction and agree to defend, indemnify the other against and hold the other harmless, to the extent permitted by law, from any claim, loss, damage, costs or liabilities for any brokerage commission or fee which may be asserted against the other by any broker in connection with this transaction. The provisions of this paragraph shall survive delivery of the deed.

10. Title to Property. Notwithstanding anything herein contained, the Property shall not be considered to be in compliance with the provisions of this Agreement with respect to title unless: (a) no building, structure or improvement of any kind belonging to any person or entity encroaches upon or under the Property from other premises; (b) title to the Property is insurable, for the benefit of the Town, by a title insurance company acceptable to the Town, in a fee owner's policy of title insurance at normal premium rates, in the American Land Title Association form currently in use; (c) all structures and improvements and all means of access to the Property shall not encroach upon or under any property not within the lot lines of the Property; and (d) the Property abuts a public way, duly laid out or accepted as such by the Town of Topsfield unless there is a recorded easement or other recorded agreement pertaining to said means of access, and said easements and/or agreements are on terms satisfactory to the Town in its sole and absolute discretion.

11. Affidavits, etc. Grantor shall provide to the Town together with the deed to the Property: (a) Affidavits and indemnities with respect to due authority, parties in possession and mechanic's liens to induce the Town's title insurance company to issue lender's and owner's policies of title insurance without exception for those matters; (b) An affidavit, satisfying the requirements of Section 1445 of the Internal Revenue Code and regulations issued thereunder, which states, under penalty of perjury, Grantor's United States taxpayer identification number, that Grantor is not a foreign person, and Grantor's address; (c) IRS Form W 8 or Form W 9, as applicable, with Grantor's tax identification number, and an affidavit furnishing the information required for the filing of Form 1099S with the Internal Revenue Services and stating Grantor is not subject to back up withholding; (d) a Disclosure of Beneficial Interest form, as required under G.L. c.7C, §38; and (e) Such additional and further instruments and documents as may be

customarily and reasonably required by the Town and/or the Town's title insurance company to complete the transactions described in this Agreement.

12. Title Standards. Any matter or practice arising under or relating to this Agreement which is the subject of a title standard or a practice standard of the Real Estate Bar Association for Massachusetts at the time for delivery of the deed shall be covered by said title standard or practice standard to the extent applicable.

13. Inspection Rights. The Town or the Town's agents shall have the right, upon at least twenty-four (24) hours prior notice to Grantor, which notice may be oral notice, to enter the Property, including any buildings thereon, from time to time at the Town's own risk for the purposes of conducting surveys, inspections, and tests, including environmental site assessments. The Town, to the extent permitted by law, shall hold Grantor harmless against any claim by the Town of any harm to the Town arising from said entry and shall repair any damage caused by the Town to the Property to substantially the same condition as prior to such entry if the closing does not occur. The Town's performance hereunder is expressly conditional, at the Town's option, upon the Town being satisfied, at its sole discretion, with the condition of the Property and on not having found on the Property any oil, hazardous waste or hazardous material, or other materials hazardous to health and safety. In the event hazardous waste, hazardous material, or other hazardous substance is found, or the Town is otherwise not satisfied with the Property, the Town shall have the right, to be exercised in its sole and absolute discretion, to terminate the Agreement without recourse by the closing date.

Handwritten signatures in black ink, appearing to be initials or names, located at the bottom right of the page.

COMMONWEALTH OF MASSACHUSETTS

TOPSFIELD, MASSACHUSETTS

SOIL SUITABILITY ASSESSMENT FOR NEW CONSTRUCTION OF ON-SITE WASTEWATER DISPOSAL SYSTEM

SITE INFORMATION

Monday, June 9th, 2014

Street Address: #35 Main Street (rear) City/Town: Topsfield State: Massachusetts Zip Code: 01983

County: Essex Land Use: Residential Owner: Mr. Frank Iovannella

Latitude: ~42°38'22.2"N Longitude: ~70°56'56.1"W Elevation: ~93' AMSL

PUBLISHED SOIL DATA AND MAP UNIT DESCRIPTION

Physiographic Division: Appalachian Highlands Physio. Province: New England Physio. Section: Seaboard lowland section

Soil map unit: 260B – Sudbury fine sandy loam (sandy, mixed, mesic, Aquic Dystrachrepts), 3-8% slopes

NRCS/USDA web soil survey: Essex County, Massachusetts, Northern part Map Scale: 1:400'

Soil hydric or upland: Upland Average depth to water table: 66" Depth to restrictive feature: >100"

Frequency of flooding: None Frequency of ponding: None Available water capacity: Low (-4.7")

Drainage Class: Moderately well drained Hydrologic Soil Group: B Ksat: High (2.00 – 6.00 in/hr)

Soil limitations: Loose substratum, low available water capacity, high saturated hydraulic conductivity, deep water tables

WETLAND AREA & USGS WELL MEASUREMENTS

National Wetland Inventory Map: NA Wetlands Conservancy Program: NA Bordering vegetative wetland: >50 feet

Current Water Resource Condition (USGS): Well Site # 423845070542501-MA- TOW 1, Topsfield, MA

Well completed in Sand and gravel aquifers and ice-contact deposits, including kames and eskers

Well depth: 22.50 feet Borehole depth: 22.60 feet Land surface altitude: 130.00 feet above NGVD29

Most recent data value: 10.81' on 05/27/14 (depth to water level in feet below land surface) Range: Normal

NATIONAL FLOOD INSURANCE RATE MAP

Above 500 year flood boundary? Yes Within 500 year flood boundary? No Within 100 year flood boundary? No

SURFICIAL GEOLOGY:

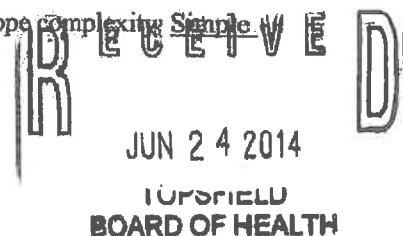
Surficial geology map: Qcs: Collapsed stratified sand deposits Map scale: 1:24,000'

Geologic parent material: Loose sandy and gravelly glaciofluvial deposits Geomorphic landform: Terrace of outwash plain

Landform position (2D): Flat terrace/ footslope Landform position (3D): Tread, rise

Slope gradient: ~3-6% Down slope shape: Convex Across slope shape: Convex Slope complexity: Simple

Bedrock outcropping in vicinity: None Glacial erratics in vicinity: None



TP14-1 DEEP OBSERVATION HOLE

#35 Main Street (rear), Topsfield, Massachusetts

Date: June 9, 2014

Time: 09:15

Weather: Overcast, muggy, 75°F, calm.

Position on landscape: Toe slope of terrace Slope aspect: Southerly Vegetation: Lightly wooded

Property line: 10+ feet Drainage way: 50+ feet Drinking water well: 100+ feet

Wetlands: 100+ feet Open water body: 200+ feet Abutting septic system: 20+ feet

SOIL PROFILE ► TP14-1

Depth below land surface (inches)	Soil Horizon/ Layer	Soil Texture (USDA/ NRCS)	Soil Color (EarthColors)	Redoxomorphic Features from ESHGWT	Consistence, grade, size, structure, grain size, soil moisture state, roots, horizon boundary, clasts, stratification, artifacts, restrictive features, etc.
00 → 13"	A _p	Sandy Loam	10YR3/2 very dark brown	none observed	Very friable, fine to medium granular structure (moderate grade), silty cohesive matrix, fine grained mineral content, damp matrix, many fine to medium grass and shrub roots, free of clasts, clear wavy boundary.
12 → 24"	B _w	Loamy Sand	10YR5/6 yellowish brown	none observed	Very friable, fine to medium blocky structure (moderate grade), gritty, weak cohesive matrix, fine to medium grained mineral content, damp matrix, few fine to medium tree and shrub roots, free of clasts, diffuse smooth boundary.
24 → 90"	C	Loamy Sand gravelly	7.5YR5/4 brown	@61" c,2,p	Friable, massive structure, stable matrix, weakly stratified, mixed fine to coarse grained sand, poorly graded, damp matrix, imbricated clasts, ~40% gravel and 30% cobbles (well-rounded to sub- rounded gravel and cobbles), no observed apparent groundwater, observed seasonal high water table at 61" and no bedrock refusal at test hole depth.

Depth to bedrock: > 90" Hydrologic Soil Group: B Drainage Class: Moderately well drained

Soil map unit: 260A – Sudbury fine sandy loam (sandy, mixed, mesic, Aquic Dystrochrepts), 0-3% slopes.

TP14-1 DEEP OBSERVATION HOLE

#35 Main Street (rear), Topsfield, Massachusetts

DEPTH TO APPARENT/ PHREATIC GROUNDWATER TABLE: Not Observed

Apparent water seeping from pit face: _____ (Below land surface) Depth to stabilized apparent water: _____ (Below land surface)

Soil moisture state: Damp

ESTIMATED SEASONAL HIGH GROUNDWATER TABLE:

Depth of Estimated Seasonal High Groundwater Table: 61" (below land surface)

Type: Masses on grain surfaces Abundance: Common Size: Medium Contrast: Prominent

Shape: Irregular/ stringy and spherical Moisture state: Damp Location: C matrix

Hardness: Soft Boundary: Diffuse Concentration color: 7.5R 5/8 (dark red) Reduction color: 5PB 5/1 (bluish gray)

DETERMINATION OF HIGH GROUNDWATER ELEVATION

Observed depth to stabilized phreatic water: _____ inches below grade

Observed water weeping from side of deep hole: _____ inches below grade

Observed depth to redoximorphic features: 61" inches below grade

Groundwater adjustment: _____

DEPTH OF NATURALLY OCCURRING PERVIOUS MATERIAL: ► 6.41 feet

Depth of naturally occurring pervious material in TP14-1 Upper boundary: 13"
Lower boundary: 90"

Certification

I certify that I am currently approved by the Department of Environmental Protection pursuant to 310 CMR 15.017 to conduct evaluations and that the above analysis has been performed by me consistent with the required training, expertise and experience described in 310 CMR 15.017. I further certify that the results of my soil evaluation, as indicated in the attached Soil Evaluation Form, are accurate and in accordance with 310 CMR 15.017.

Alexander F. Parker License #1848

Printed name of evaluator & license number

Mr. John Coulon, Town of Topsfield Public Health Agent.

Town of Topsfield witness

June 1998

Date of Soil Evaluator Certification

06/09/14

Date of soil testing

TP14-2 DEEP OBSERVATION HOLE

#35 Main Street (rear), Topsfield, Massachusetts

Date: June 9, 2014

Time: 09:55

Weather: Overcast, muggy, 75°F, calm.

Position on landscape: Toe slope of terrace Slope aspect: Southerly Vegetation: Lightly wooded

Property line: 10+ feet Drainage way: 50+ feet Drinking water well: 100+ feet

Wetlands: 100+ feet Open water body: 200+ feet Abutting septic system: 20+ feet

SOIL PROFILE ▶ TP14-2

Depth below land surface (inches)	Soil Horizon/ Layer	Soil Texture (USDA/ NRCS)	Soil Color (EarthColors)	Redoxomorphic Features from ESHGWT	Consistence, grade, size, structure, grain size, soil moisture state, roots, horizon boundary, clasts, stratification, artifacts, restrictive features, etc.
00 → 17"	A _p	Sandy Loam	10YR3/2 very dark brown	none observed	Very friable, fine to medium granular structure (moderate grade), silty cohesive matrix, fine grained mineral content, damp matrix, many fine to medium grass and shrub roots, free of clasts, clear wavy boundary.
17 → 92"	C	Loamy Sand gravelly	7.5YR5/4 brown	@72" c,2,p	Friable, massive structure, stable matrix, weakly stratified, mixed fine to coarse grained sand, poorly graded, damp matrix, imbricated clasts, ~40% gravel and 30% cobbles (well-rounded to sub- rounded gravel and cobbles), no observed apparent groundwater, observed seasonal high water table at 72" and no bedrock refusal at test hole depth.

Depth to bedrock: > 92" Hydrologic Soil Group: B Drainage Class: Moderately well drained

Soil map unit: 260A – Sudbury fine sandy loam (sandy, mixed, mesic, Aquic Dystrochrepts), 0-3% slopes.

TP14-2 DEEP OBSERVATION HOLE

#35 Main Street (rear), Topsfield, Massachusetts

DEPTH TO APPARENT/ PHREATIC GROUNDWATER TABLE: Not Observed

Apparent water seeping from pit face: _____ (Below land surface) Depth to stabilized apparent water: _____ (Below land surface)

Soil moisture state: Damp

ESTIMATED SEASONAL HIGH GROUNDWATER TABLE:

Depth of Estimated Seasonal High Groundwater Table: 72" (below land surface)

Type: Masses on grain surfaces Abundance: Common Size: Medium Contrast: Prominent

Shape: Irregular/ stringy and spherical Moisture state: Damp Location: C matrix

Hardness: Soft Boundary: Diffuse Concentration color: 7.5R 5/8 (dark red) Reduction color: 5PB 5/1 (bluish gray)

DETERMINATION OF HIGH GROUNDWATER ELEVATION

Observed depth to stabilized phreatic water: _____ inches below grade

Observed water weeping from side of deep hole: _____ inches below grade

Observed depth to redoximorphic features: 72" inches below grade

Groundwater adjustment: _____

DEPTH OF NATURALLY OCCURRING PERVIOUS MATERIAL: ► 6.41 feet

Depth of naturally occurring pervious material in TP14-2 Upper boundary: 13"

Lower boundary: 90"

Certification

I certify that I am currently approved by the Department of Environmental Protection pursuant to 310 CMR 15.017 to conduct evaluations and that the above analysis has been performed by me consistent with the required training, expertise and experience described in 310 CMR 15.017. I further certify that the results of my soil evaluation, as indicated in the attached Soil Evaluation Form, are accurate and in accordance with 310 CMR 15.017.

Alexander F. Parker License # 1848

Printed name of evaluator & license number

Mr. John Coulon, Town of Topsfield Public Health Agent.

Town of Topsfield witness

June 1998

Date of Soil Evaluator Certification

06/09/14

Date of soil testing

TP14-3 DEEP OBSERVATION HOLE

#35 Main Street (rear), Topsfield, Massachusetts

Date: June 9, 2014
Time: 10:40
Weather: Overcast, muggy, 75°F, calm.
Position on landscape: Toe slope of terrace Slope aspect: Southerly Vegetation: Lightly wooded
Property line: 10+ feet Drainage way: 50+ feet Drinking water well: 100+ feet
Wetlands: 100+ feet Open water body: 200+ feet Abutting septic system: 20+ feet

SOIL PROFILE ► TP14-3

Depth below land surface (inches)	Soil Horizon/ Layer	Soil Texture (USDA/NRCS)	Soil Color (EarthColors)	Redoxomorphic Features from ESHGWT	Consistence, grade, size, structure, grain size, soil moisture state, roots, horizon boundary, clasts, stratification, artifacts, restrictive features, etc.
00 → 13"	A _p	Sandy Loam	10YR3/2 very dark brown	none observed	Very friable, fine to medium granular structure (moderate grade), silty cohesive matrix, fine grained mineral content, damp matrix, many fine to medium grass and shrub roots, free of clasts, clear wavy boundary.
13 → 24"	B _w	Loamy Sand	10YR5/6 yellowish brown	none observed	Very friable, fine to medium blocky structure (moderate grade), gritty, weak cohesive matrix, fine to medium grained mineral content, damp matrix, few fine to medium tree and shrub roots, free of clasts, diffuse smooth boundary.
24 → 90"	C	Loamy Sand gravelly	7.5YR5/4 brown	@61" c,2,p	Friable, massive structure, stable matrix, weakly stratified, mixed fine to coarse grained sand, poorly graded, damp matrix, imbricated clasts, ~40% gravel and 30% cobbles (well-rounded to sub- rounded gravel and cobbles), no observed apparent groundwater, observed seasonal high water table at 61" and no bedrock refusal at test hole depth.

Depth to bedrock: > 90" Hydrologic Soil Group: B Drainage Class: Moderately well drained
Soil map unit: 260A – Sudbury fine sandy loam (sandy, mixed, mesic, Aquic Dystrochrepts), 0-3% slopes.

TP14-3 DEEP OBSERVATION HOLE

#35 Main Street (rear), Topsfield, Massachusetts

DEPTH TO APPARENT/ PHREATIC GROUNDWATER TABLE: Not Observed

Apparent water seeping from pit face: _____ (Below land surface) Depth to stabilized apparent water: _____ (Below land surface)

Soil moisture state: Damp

ESTIMATED SEASONAL HIGH GROUNDWATER TABLE:

Depth of Estimated Seasonal High Groundwater Table: 61" (below land surface)

Type: Masses on grain surfaces Abundance: Common Size: Medium Contrast: Prominent

Shape: Irregular/ stringy and spherical Moisture state: Damp Location: C matrix

Hardness: Soft Boundary: Diffuse Concentration color: 7.5R 5/8 (dark red) Reduction color: 5PB 5/1 (bluish gray)

DETERMINATION OF HIGH GROUNDWATER ELEVATION

Observed depth to stabilized phreatic water: _____ inches below grade

Observed water weeping from side of deep hole: _____ inches below grade

Observed depth to redoximorphic features: 61" inches below grade

Groundwater adjustment: _____

DEPTH OF NATURALLY OCCURRING PERVIOUS MATERIAL: ► 6.41 feet

Depth of naturally occurring pervious material in TP14-1 Upper boundary: 13"

Lower boundary: 90"

Certification

I certify that I am currently approved by the Department of Environmental Protection pursuant to 310 CMR 15.017 to conduct evaluations and that the above analysis has been performed by me consistent with the required training, expertise and experience described in 310 CMR 15.017. I further certify that the results of my soil evaluation, as indicated in the attached Soil Evaluation Form, are accurate and in accordance with 310 CMR 15.017.

Alexander F. Parker License # 11848

Printed name of evaluator & license number

June 1998

Date of Soil Evaluator Certification

Mr. John Coulon, Town of Topsfield Public Health Agent.

Town of Topsfield witness

06/09/14

Date of soil testing

TP14-4 DEEP OBSERVATION HOLE

#35 Main Street (rear), Topsfield, Massachusetts

Date: June 9, 2014

Time: 11:21

Weather: Overcast, muggy, 75°F, calm.

Position on landscape: Toe slope of terrace Slope aspect: Southerly Vegetation: Lightly wooded

Property line: 10+ feet Drainage way: 50+ feet Drinking water well: 100+ feet

Wetlands: 100+ feet Open water body: 200+ feet Abutting septic system: 20+ feet

SOIL PROFILE ► TP14-4

Depth below land surface (inches)	Soil Horizon/ Layer	Soil Texture (USDA/NRCS)	Soil Color (EarthColors)	Redoxomorphic Features from ESHGWT	Consistence, grade, size, structure, grain size, soil moisture state, roots, horizon boundary, clasts, stratification, artifacts, restrictive features, etc.
00 → 10"	A _p	Sandy Loam	10YR3/2 very dark brown	none observed	Very friable, fine to medium granular structure (moderate grade), silty cohesive matrix, fine grained mineral content, damp matrix, many fine to medium grass and shrub roots, free of clasts, clear wavy boundary.
10 → 19"	B _w	Loamy Sand	10YR5/6 yellowish brown	none observed	Very friable, fine to medium blocky structure (moderate grade), gritty, weak cohesive matrix, fine to medium grained mineral content, damp matrix, few fine to medium tree and shrub roots, free of clasts, diffuse smooth boundary.
19 → 91"	C	Loamy Sand gravelly	7.5YR5/4 brown	@59" c,2,p	Friable, massive structure, stable matrix, weakly stratified, mixed fine to coarse grained sand, poorly graded, damp matrix, imbricated clasts, ~40% gravel and 30% cobbles (well-rounded to sub- rounded gravel and cobbles), no observed apparent groundwater, observed seasonal high water table at 59" and no bedrock refusal at test hole depth.

Depth to bedrock: > 91" Hydrologic Soil Group: B Drainage Class: Moderately well drained

Soil map unit: 260A – Sudbury fine sandy loam (sandy, mixed, mesic, Aquic Dystrachrepts), 0-3% slopes.

TP14-4 DEEP OBSERVATION HOLE

#35 Main Street (rear), Topsfield, Massachusetts

DEPTH TO APPARENT/ PHREATIC GROUNDWATER TABLE: Not Observed

Apparent water seeping from pit face: _____ (Below land surface) Depth to stabilized apparent water: _____ (Below land surface)

Soil moisture state: Damp

ESTIMATED SEASONAL HIGH GROUNDWATER TABLE:

Depth of Estimated Seasonal High Groundwater Table: 59 (below land surface)

Type: Masses on grain surfaces Abundance: Common Size: Medium Contrast: Prominent

Shape: Irregular/ stringy and spherical Moisture state: Damp Location: C matrix

Hardness: Soft Boundary: Diffuse Concentration color: 7.5R 5/8 (dark red) Reduction color: 5PB 5/1 (bluish gray)

DETERMINATION OF HIGH GROUNDWATER ELEVATION

Observed depth to stabilized phreatic water: _____ inches below grade

Observed water weeping from side of deep hole: _____ inches below grade

Observed depth to redoximorphic features: 59" inches below grade

Groundwater adjustment: _____

DEPTH OF NATURALLY OCCURRING PERVIOUS MATERIAL: ► 6.75 feet

Depth of naturally occurring pervious material in TP14-4 Upper boundary: 13"
Lower boundary: 90"

Certification

I certify that I am currently approved by the Department of Environmental Protection pursuant to 310 CMR 15.017 to conduct evaluations and that the above analysis has been performed by me consistent with the required training, expertise and experience described in 310 CMR 15.017. I further certify that the results of my soil evaluation, as indicated in the attached Soil Evaluation Form, are accurate and in accordance with 310 CMR 15.017.

Alexander F. Parker License #1848

Printed name of evaluator & license number

June 1998

Date of Soil Evaluator Certification

Mr. John Coulon, Town of Topsfield Public Health Agent.

Town of Topsfield witness

06/09/14

Date of soil testing

COMMONWEALTH OF MASSACHUSETTS

TOPSFIELD, MASSACHUSETTS

SOIL SUITABILITY ASSESSMENT PERCOLATION TEST

#35 Main Street (rear), Topsfield, Massachusetts

<u>Percolation Test</u>	<u>Percolation Test 1</u> TP14-2	<u>Percolation Test 2</u> TP14-4
Depth of test:	Depth to shelf: 37" 55" Depth of hole: 18"	Depth to shelf: 44" 62" Depth of hole: 18"
Start presoak:	13:20	13:58
End presoak:	13:35	14:13
Time at 12"→	13:35	14:13
Time at 9"→	13:38	14:17
Time at 8"→	13:39	14:24
Time at 7"→	13:40	14:30
Time at 6"→	13:42	14:36
Total time 7" to 6"→	2 minutes	6 minutes
Rate (minutes per inch)	2.0 MPI	6.0 MPI

Alexander F. Parker License #1848
Printed name of evaluator & license number

06/09/14
Date of percolation testing

Mr. John Coulon, Town of Topsfield Public Health Agent
Town of Topsfield witness



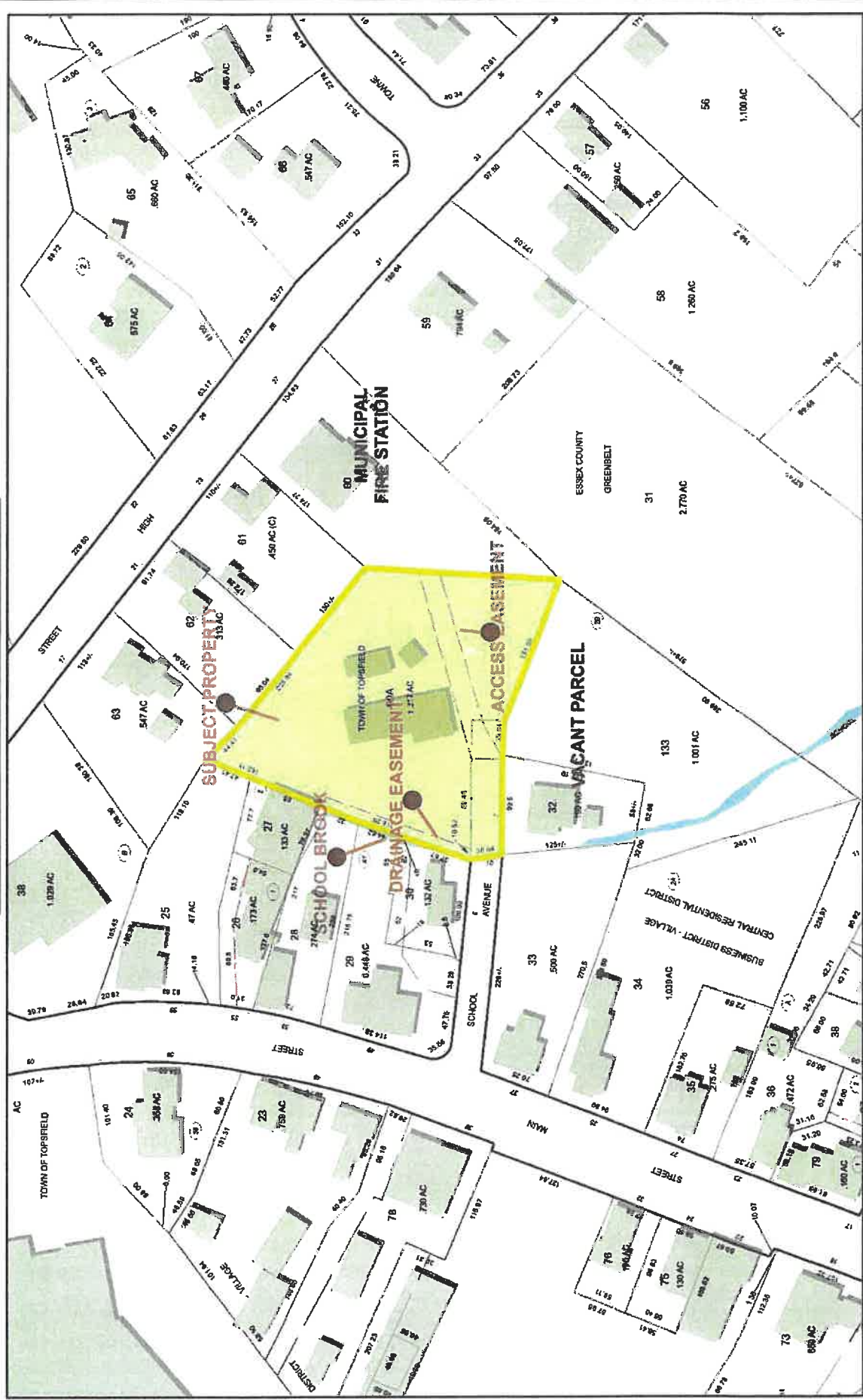
10 SCHOOL AVE

414

276

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