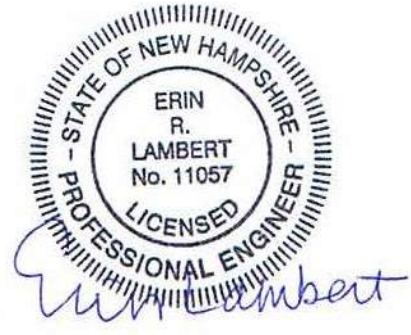
Wilcox & Barton INC.
CIVIL • ENVIRONMENTAL • GEOTECHNICAL

STORMWATER MANAGEMENT PLAN
for

Banks Chevrolet Parking Lot Reconstruction
234 Airport Road
Concord, NH 03301

Prepared for:
Banks Chevrolet
C/O Fred Booth
137 Manchester Street
Concord, NH 03301

Prepared by:
Wilcox & Barton, Inc.
2 Home Ave.
Concord, NH 03301
Contact: Erin Lambert, PE, (603) 369-4190 x527



Wilcox & Barton, Inc.
Project No.: BACC0005

November 19, 2025
Last Revised: February 17, 2026

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1.0 NHDES ALTERATION OF TERRAIN APPLICATION

ALTERATION OF TERRAIN PERMIT APPLICATION

Water Division / Land Resources Management

Check the status of your application

RSA / Rule: RSA 485-A:17, Env-Wq 1500

Administrative Use Only	Administrative Use Only	Administrative Use Only	File Number:
			Check No.
			Amount:
			Initials:

1. APPLICANT INFORMATION (INTENDED PERMIT HOLDER)			
Applicant Name: Banks Chevrolet/Daval Realty Associates LLC		Contact Name: Fred Booth	
Email: Fred.Booth@banksautos.com		Daytime Telephone: (603) 229-4004	
Mailing Address: 137 Manchester Street			
Town/City: Concord		State: NH	ZIP Code: 03301
2. APPLICANT'S AGENT INFORMATION If none, check here: ☒			
Agent's Name:		Contact Name:	
Email:		Daytime Telephone:	
Address:			
Town/City:		State:	ZIP Code:
3. PROPERTY OWNER INFORMATION (IF DIFFERENT FROM APPLICANT) Check here if more than one property owner, and attach additional sheets as necessary: ☐			
Owner's Name:		Contact Name:	
Email:		Daytime Telephone:	
Mailing Address:			
Town/City:		State:	ZIP Code:
4. PROPERTY OWNER'S AGENT INFORMATION If none, check here: ☒			
Business Name:		Contact Name:	
Email:		Daytime Telephone:	
Address:			
Town/City:		State:	ZIP Code:
5. CONSULTANT INFORMATION If none, check here: ☐			
Engineering Firm: Wilcox & Barton, Inc.		Contact Name: Erin Lambert, P.E.	
Email: ELambert@wilcoxandbarton.com		Daytime Telephone: (603) 731-9883	
Address: 2 Home Ave			
Town/City: Concord		State: NH	ZIP Code: 03301

6. PROJECT TYPE

☐ Excavation Only ☐ Residential ■ Commercial ☐ Golf Course ☐ School ☐ Municipal
☐ Agricultural ☐ Land Conversion ☐ Other:

7. PROJECT LOCATION INFORMATION

Project Name: Banks Chevrolet Parking Lot Reconstruction

Street/Road Address: 234 Airport Road

Town/City: Concord	County: Merrimack

Tax Map: 782	Block: Z	Lot Number: 8	Unit:

Post-development, will the proposed project withdraw from or directly discharge to any of the following? If yes, identify the purpose.

1. Stream or Wetland Purpose:	☐ Yes ☐ Withdrawal ☐ Discharge ■ No
2. Artificial pond created by impounding a stream or wetland Purpose:	☐ Yes ☐ Withdrawal ☐ Discharge ■ No
3. Unlined pond dug into the water table Purpose:	☐ Yes ☐ Withdrawal ☐ Discharge ■ No

Post-development, will the proposed project discharge to:
- Within one-quarter mile of a surface water impaired for phosphorus and/or nitrogen? ■ No ☐ **Yes**
- Within one-quarter mile of a Class A surface water or within the watershed area of an Outstanding Resource Water? ■ No ☐ **Yes**
- Within one-quarter mile of a lake or pond not covered previously? ■ No ☐ **Yes**

Is the project a High Load area? ☐ Yes ■ No
If yes, specify the type of high load land use or activity:

Is the project within a Water Supply Intake Protection Area (WSIPA)? ☐ Yes ■ No
Is the project within a Groundwater Protection Area (GPA)? ■ Yes ☐ No
Will the well setbacks identified in Env-Wq 1508.02 be met? ■ Yes ☐ No
For more details on the restrictions in these areas, read Chapter 3.1 in Volume 2 of the NH Stormwater Manual.

Is any part of the property within the 100-year floodplain? ☐ Yes ■ No
If yes: Cut volume: cubic feet within the 100-year floodplain.
Fill volume: cubic feet within the 100-year floodplain.

☐ Project *is* within **¼ mile of a designated river** Name of River:
■ Project *is not* within ¼ mile of a designated river.

☐ Project *is* within a Coastal/Great Bay Region community.
■ Project *is not* within a Coastal/Great Bay Region community.

8. BRIEF PROJECT DESCRIPTION (PLEASE DO NOT REPLY "SEE ATTACHED")

The project involves paving an existing gravel parking area to be used for employee parking at 234 Airport Road in Concord to support the Banks Chevrolet Car Dealership located across Old Suncook Road. The redevelopment of the gravel parking area results in an overall decrease of impervious cover to the site that will be transitioned to landscaped areas (24,170 SF decrease). Supporting infrastructure including stormwater improvements, lighting, and landscaping are proposed.

9. IF APPLICABLE, DESCRIBE ANY WORK STARTED PRIOR TO RECEIVING PERMIT.

N/A

10. ADDITIONAL REQUIRED INFORMATION

A. Date a copy of the application was sent to the municipality, as required by Env-Wq 1503.05(e) (Env-Wq 1503.05(c)(6), requires proof that a completed application form, checklist, plans and specifications, and all other supporting materials have been sent or delivered to the governing body of each municipality in which the project is proposed): 11/19/2025

(Attach proof of delivery)

B. Date a copy of the application was sent to the local river advisory committee, if required by Env-Wq 1503.05(e) (Env-Wq 1503.05(c)(6), requires proof that a completed application form, checklist, plans and specifications, and all other supporting materials have been sent or delivered to the Local River Advisory Committee, if the project is within ¼ mile of a designated river): N/A

(Attach proof of delivery)

C. Type of plan required: ☐ Land Conversion ■ Detailed Development ☐ Excavation, Grading and Reclamation ☐ Steep Slope

D. Additional plans required: ■ Stormwater Drainage and Hydrologic Soil Groups ☐ Source Control ☐ Chloride Management

E. Total area of disturbance, in square feet 82,600 SF (redevelopment for Banks Chevrolet across street in 2020).

F. Additional impervious cover as a result of the project, in square feet (use "-"to indicate a net reduction in impervious coverage). - 24,170 SF (decrease to site)

Total final impervious cover, in square feet 118,110 SF

G. Total undisturbed cover, in square feet 220,335 SF

H. Number of lots proposed: 1

I. Total length of roadway, in linear feet: 0

J. Name(s) of receiving water(s): Merrimack River

K. Identify all other NHDES permits required for the project. For each, indicate whether an application has been filed and is pending. If the required approval has been issued, provide the permit number, registration date, or approval letter number, as applicable.

Type of Approval	Application Filed?	Pending?	If Issued
1. Water Supply Approval	☐ Yes ☐ No ■ N/A	☐	Permit number:
2. Wetlands Permit	☐ Yes ☐ No ■ N/A	☐	Permit number:
3. Shoreland Permit	☐ Yes ☐ No ■ N/A	☐	Registration date:
4. UIC Registration	■ Yes ☐ No ☐ N/A	x	Approval letter date:
5. Large/Small Community Well Approval	☐ Yes ☐ No ■ N/A	☐	Permit number:
6. Large Groundwater Withdrawal Permit	☐ Yes ☐ No ■ N/A	☐	Permit number:
7. Other:	☐ Yes x No		

L. List all species identified by the Natural Heritage Bureau as threatened or endangered or of concern:

Frosted Elfin, Karner Blue Butterfly, Pitch Pine, Clasping Milkweed, Golden Heather, Houghton's Umbrella Sedge, Upright False Bindweed, Wild Lupine.

Vertebrate Species: Eastern Hognose Snake, Eastern Meadowlark, Grasshopper Sparrow, Northern Black Racer, Northern Leopard Frog, Spotted Turtle, and Wood Turtle.

M. Using the NHDES OneStop Data Mapper with the Surface Water Impairment layer turned on, list the impairments identified for each receiving water. If no pollutants are listed, enter "N/A."

N/A

N. Did the applicant or applicant's agent have a pre-application meeting with Alteration of Terrain Bureau staff?

☐ Yes ■ No If yes, name of staff member:

O. Will blasting of bedrock be required? ☐ Yes ■ No If yes, estimated quantity of blast rock in cubic yards:
If yes, standard blasting Best Management Practices notes must be placed on the plans.

NOTE: If greater than 5,000 cubic yards of blast rock will be generated, a groundwater monitoring program must be developed and submitted to NHDES. Contact Alteration of Terrain Bureau staff for additional detail.

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PO Box 95, Concord, NH 03303-0095
des.nh.gov

11. CHECK ALL APPLICATION ATTACHMENTS THAT APPLY (SUBMIT WITH APPLICATION IN THE ORDER LISTED BELOW)

LOOSE:

- ■ Signed application form, with attached proof(s) of delivery.
- ■ Check for the application fee, calculated using the fee schedule available on the NHDES Land Development page.
- ■ Color copy of a USGS map with the property boundaries outlined (1" = 2,000' scale).
- ■ If the applicant is not the property owner, proof that the applicant will have a legal right to undertake the project on the property if a permit is issued to the applicant.

BOUND, IN A REPORT, IN THE FOLLOWING ORDER:

- ■ Copy of the signed application form and application checklist.
- ■ Copy of the check.
- ■ Copy of the USGS map with the property boundaries outlined (1" = 2,000' scale).
- ■ Narrative of the project with a summary table of the peak discharge rate for the off-site discharge points.
- ■ Printout of NHDES OneStop Mapper with "Surface Water Impairments" layer turned on.
- ■ Printout of NHDES OneStop Mapper with Alteration of Terrain screening layers turned on.
- ■ Printout of Natural Heritage Bureau DataCheck Tool letter and any relevant correspondence with New Hampshire Fish and Game.
- ■ USDA Web Soil Survey Map with project's watershed outlined.
- ■ Aerial photograph (1" = 2,000' scale with the site boundaries outlined).
- ■ Photographs representative of the site.
- ■ Groundwater recharge volume calculations (include one Best Management Practices worksheet per permit application).
- ■ Drainage analysis, stamped by a professional engineer (see "Application Checklist" at the end of this document).
- ■ Riprap apron or other energy dissipation or stability calculations.
- ■ Site Specific Soil Survey report, stamped and with a certification note prepared by the soil scientist that the survey was done in accordance with the Site Specific Soil Mapping standards of the Society of Soil Scientists of Northern New England.
- ■ Infiltration Feasibility Report (example online) [Env-Wq 1503.08(f)(3)].
- ■ Registration and Notification Form for Stormwater Infiltration to Groundwater (UIC Registration-for underground systems only, including drywells and trenches).
- ■ Inspection and maintenance manual with, if applicable, long term maintenance agreements [Env-Wq 1503.08(g)].
- ☐ Source control plan.

PLANS:

- ■ One set of design plans on 34 - 36" by 22 - 24" white paper (see Application Checklist for details).
- ■ Pre- and post-development color-coded soil plans on 11" x 17" (see Application Checklist for details).
- ■ Pre- and post-construction drainage area plans on 34 - 36" by 22 - 24" white paper (see Application Checklist for details).

100-YEAR FLOODPLAIN REPORT:

- ☐ All information required in Env-Wq 1503.09, submitted as a separate report.

ADDITIONAL INFORMATION RE: NUTRIENTS, CLIMATE

- ☐ See Application Checklist (Attachment A) for details.

- ■ **REVIEW APPLICATION FOR COMPLETENESS. CONFIRM INFORMATION LISTED ON THE APPLICATION IS INCLUDED WITH SUBMITTAL.**

12. REQUIRED SIGNATURES

By signing below, I certify that:

- The information contained in or otherwise submitted with this application is true, complete, and not misleading to the best of my knowledge and belief;
- I understand that the submission of false, incomplete, or misleading information constitutes grounds for the department to deny the application, revoke any permit that is granted based on the information, and/or refer the matter to the board of professional engineers established by RSA 310-A:3 if I am a professional engineer; and
- I understand that I am subject to the penalties specified in New Hampshire law for falsification in official matters, currently RSA 641:3.

☒ **APPLICANT** ☐ **APPLICANT'S AGENT:**

Signature: Frederick H. Booth Date: 11/17/25

Name (print or type): FREDERICK H. BOOTH Title: "

☐ PROPERTY OWNER ☐ PROPERTY OWNER'S AGENT:

Signature: _____ Date:

Name (print or type): Title:

lrm@des.nh.gov or (603) 271-2147
PO Box 95, Concord, NH 03303-0095
des.nh.gov

ALTERATION OF TERRAIN PERMIT ATTACHMENT A: APPLICATION CHECKLIST

Check each box to indicate the item has been provided, or indicate why it does not apply.

DESIGN PLANS

- ■ Plans printed on 34 - 36" by 22 - 24" white paper.
- ■ Professional Engineer stamp.
- ■ Wetland delineation.
- ■ Temporary erosion control measures.
- ■ Treatment for all stormwater runoff from impervious surfaces such as roadways (including gravel roadways), parking areas, and nonresidential roof runoff. Guidance on treatment BMPs can be found in Volume 2, Chapter 4 of the New Hampshire Stormwater Management Manual.
- ■ Pre-existing 2-foot contours.
- ■ Proposed 2-foot contours.
- ■ Drainage easements protecting the drainage/treatment structures.
- ■ Compliance with state statute governing fill and dredge in wetlands, RSA 482- A. Note that artificial detention in wetlands is prohibited.
- ■ Compliance with the New Hampshire Shoreland Protection Act, RSA 483-B.
- ☐ Benching – needed if you have more than 20 feet change in elevation on a 2:1 slope, 30 feet change in elevation on a 3:1 slope, 40 feet change in elevation on a 4:1 slope.
- ■ Check to see if any proposed ponds require state dam permits.

DETAILS

- ■ Typical roadway cross-section.
- ■ Detention basin with inverts noted on the outlet structure.
- ■ Stone berm level spreader.
- ■ Outlet protection – riprap aprons.
- ■ A general installation detail for an erosion control blanket.
- ■ Silt fences or mulch berm.
- ■ Storm drain inlet protection. Note that since hay bales must be embedded 4 inches into the ground, they are not to be used on hard surfaces such as pavement.
- ■ Hay bale barriers.
- ■ Stone check dams.
- ■ Gravel construction exit.
- ■ Temporary sediment trap.
- ■ The treatment BMPs proposed.
- ■ Any innovative BMPs proposed.

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CONSTRUCTION SEQUENCE / EROSION CONTROL

■ Note that the project must be managed to meet the requirements and intent of RSA 430:53 and Agr 3800 relative to invasive species.

■ Note that perimeter controls shall be installed prior to earth moving operations.

■ Note that temporary water diversion (swales, basins, etc.) must be used as necessary until areas are stabilized.

■ Note that ponds and swales shall be installed early on in the construction sequence (before rough grading the site).

■ Note that all ditches and swales shall be stabilized prior to directing runoff to them.

■ Note that all roadways and parking lots shall be stabilized within 72 hours of achieving finished grade.

■ Note that all cut and fill slopes shall be seeded or loamed within 72 hours of achieving finished grade

■ Note that all erosion controls shall be inspected weekly AND after every half-inch of rainfall.

■ Note the limits on the open area allowed, see Env-Wq 1505.02 for detailed information.

Example note: The smallest practical area shall be disturbed during construction, but in no case shall exceed 5 acres at any one time before disturbed areas are stabilized.

■ Note the definition of the word “stable.”

Example note: An area shall be considered stable if one of the following has occurred:

- Base course gravels have been installed in areas to be paved.
- A minimum of 85 percent vegetated growth has been established.
- A minimum of 3 inches of non-erosive material such stone or riprap has been installed.
- Or, erosion control blankets have been properly installed.

■ Note the limit of time an area may be exposed.

Example note: All areas shall be stabilized within 45 days of initial disturbance.

■ Provide temporary and permanent seeding specifications. Note that although reed canary grass is listed in the Green Book; it is a problematic species according to the Wetlands Bureau and therefore should not be specified.

■ Provide winter construction notes that meet or exceed our standards.

Standard Winter Notes:

- All proposed vegetated areas that do not exhibit a minimum of 85 percent vegetative growth by October 15, or which are disturbed after October 15, shall be stabilized by seeding and installing erosion control blankets on slopes greater than 3:1, and seeding and placing 3 to 4 tons of mulch per acre, secured with anchored netting, elsewhere. The installation of erosion control blankets or mulch and netting shall not occur over accumulated snow or on frozen ground and shall be completed in advance of thaw or spring melt events.
- All ditches or swales which do not exhibit a minimum of 85 percent vegetative growth by October 15, or which are disturbed after October 15, shall be stabilized temporarily with stone or erosion control blankets appropriate for the design flow conditions.
- After October 15, incomplete road or parking surfaces where work has stopped for the winter season shall be protected with a minimum of 3 inches of crushed gravel per NHDOT item 304.3.

■ Note at the end of the construction sequence that “Lot disturbance, other than that shown on the approved plans, shall not commence until after the roadway has the base course to design elevation and the associated drainage is complete and stable.” – This note is applicable to single/duplex family subdivisions, when lot development is not part of the permit.

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DRAINAGE ANALYSES

Please provide double-side 8 ½" × 11" sheets where possible but, **do not** reduce the text such that more than one page fits on one side.

☐ Professional Engineer stamp.

☐ Rainfall amount obtained from the Northeast Regional Climate Center. Include extreme precipitation table as obtained from this source.

☐ Drainage analyses, in the following order:

- Pre-development analysis: Drainage diagram.
- Pre-development analysis: Area Listing and Soil Listing.
- Pre-development analysis: Node listing 1-year (if applicable), 2-year, 10-year and 50-year.
- Pre-development analysis: Full summary of the 10-year storm.
- Post-development analysis: Drainage diagram.
- Post-development analysis: Area Listing and Soil Listing.
- Post-development analysis: Node listing for the 2-year, 10-year and 50-year.
- Post-development analysis: Full summary of the 10-year storm.

☐ Review the Area Listing and Soil Listing reports

- Hydrologic Soil Groups (HSG) match the HSGs on the soil maps provided.
- There is the same or less HSG A soil area after development (check for each HSG).
- There is the same or less "woods" cover in the post-development.
- Undeveloped land was assumed to be in "good" condition.
- The amount of impervious cover in the analyses is correct.

Note: A good check is to subtract the total impervious area used in the pre-analysis from the total impervious area used in the post-analysis. For residential projects without demolition occurring, a good check is to take this change in impervious area, subtract out the roadway and divide the remaining by the number of houses or units proposed. Do these numbers make sense?

☐ Check the storage input used to model the ponds.

☐ Check to see if the artificial berms pass the 50-year storm, i.e., make sure the constructed berms on ponds are not overtopped.

☐ Check the outlet structure proposed and make sure it matches that modeled.

☐ Check to see if the total areas in the pre and post analyses are same.

☐ Confirm the correct NRCS storm type was modeled (Coos, Carroll and Grafton counties are Type II, all others Type III).

PRE- AND POST-CONSTRUCTION DRAINAGE AREA PLANS

☐ Plans printed on 34 - 36" by 22 - 24" on white paper.

☐ Submit these plans separate from the soil plans.

☐ A north arrow.

☐ A scale.

☐ Labeled subcatchments, reaches and ponds.

- [x] Tc lines.
- [x] A clear delineation of the subcatchment boundaries.
- [x] Roadway station numbers.
- [x] Culverts and other conveyance structures.

PRE- AND POST-CONSTRUCTION COLOR-CODED SOIL PLANS

- [x] 11” × 17” sheets suitable, as long as it is readable.
- [x] Submit these plans separate from the drainage area plans.
- [x] A north arrow.
- [x] A scale.
- [x] Name of the soil scientist who performed the survey and date the soil survey took place.
- [x] 2-foot contours (5-foot contours if application is for a gravel pit) as well as other surveyed features.
- [x] Delineation of the soil boundaries and wetland boundaries.
- [x] Delineation of the subcatchment boundaries.
- [x] Soil series symbols (e.g., 26).
- [x] A key or legend identifying each soil series symbol and its associated soil series name (for example: 26 = Windsor).
- [x] The hydrologic soil group color coding (A = Green, B = yellow, C= orange, D=red, Water=blue, and Impervious = gray).

Please note that excavation projects (including gravel pits) have similar requirements to those above, with the following common exceptions or additions:

- [ ] Drainage report is not needed if site does not have off-site flow.
- [ ] 5-foot contours are allowed rather than 2-foot.
- [ ] No Professional Engineer stamp is needed on the plans.
- [ ] Add a note to the plans that the applicant must provide NHDES a written update of the project and revised plans documenting the project status every five years from the date of the Alteration of Terrain permit.
- [ ] Add reclamation notes.
- [ ] A description of the subsurface conditions to the planned depth of excavation, including the elevation of the location of the Seasonal High Water Table (SHWT), as observed and described by a certified soil scientist, or an individual holding a valid permit as a permitted designer as issued by the department’s Subsurface Systems Bureau.

For more resources, refer to the Natural Resources Conservation Service’s Vegetating New Hampshire Sand and Gravel Pits publication.

lrm@des.nh.gov or (603) 271-2147
PO Box 95, Concord, NH 03303-0095
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THE FACE OF THIS DOCUMENT HAS A COLORED BACKGROUND ON WHITE PAPER

BANKS
CHEVROLET-CADILLAC
P.O. BOX 473 • 137 MANCHESTER STREET
CONCORD, N.H. 03301

54-7022
2114

MERRIMACK COUNTY SAVINGS BANK

CHECK# 23628

23628

PAY **NINE HUNDRED THIRTEEN DOLLARS AND 00/100**

DATE	AMOUNT
11/14/25	$913.00

TO THE ORDER OF TREASURER STATE OF NEW HAMPSHIRE

BANKS CHEVROLET-CADILLAC, LLC

SECURITY FEATURES INCLUDED DETAILS ON BACK

MP

MP

AUTHORIZED SIGNATURE

⑈023628⑈ ⑆211470225⑆ 3200244600⑈

NAME	NUMBER	DATE

TREASURER STATE OF NEW HAMPSHIRE 11/14/25

11/14/25 274 913.00 LOT

REMITTANCE ADVICE
DETACH AND RETAIN

BANKS
CHEVROLET-CADILLAC, LLC.
P.O. BOX 473 • 137 MANCHESTER STREET
CONCORD, N.H. 03301 • PHONE 603/224-4055

CHECK NO.	NET AMOUNT	
23628		$913.00

The Reynolds and Reynolds Company ERALZRAPCE CC215812 Q (05/22)

Wilcox & Barton INC.
CIVIL • ENVIRONMENTAL • GEOTECHNICAL

Acknowledgement of Receipt

On behalf of the City of Concord, I hereby acknowledge receipt of the Alteration of Terrain Application and site-specific Stormwater Management Plan for the proposed site plan at 234 Airport Road, Concord, New Hampshire, prepared by Wilcox & Barton, Inc. and dated November 19, 2025.

Stephanie N. Verdile Assistant City Planner Zoning 11/19/25
Name and Title Date

WWW.WILCOXANDBARTON.COM
2 Home Avenue, Concord, NH 03301 • Ph: (603) 369-4190 | (888) 777-5805 • Fax: (603) 369-6639
Offices In: New Hampshire • Vermont • Massachusetts • Connecticut • Hawaii

2.0 PROJECT NARRATIVE

2.1 Project Description

The project consists of paving an existing gravel parking area which supports the Banks Chevrolet car dealership. The parking area is located on Tax Map 782Z Lot 8 (project parcel), with a street address of 234 Airport Road in Concord, while the existing dealership it supports is located across the street at 137 Manchester Street in Concord. The parking area is used for employee parking. Site improvements include the paved parking area, lighting, landscaping, and stormwater management systems.

Currently, the use of the existing project area is for employee parking accessory to a principal retail use, the Banks Chevrolet dealership. One portion of this subject parcel is paved while the other is gravel. The project area includes the gravel parking portion. There is wooded cover to the rear of the property, adjacent to Sanel Park. The parcel has frontage along both Old Suncook Road and Airport Road and has five driveway locations along Old Suncook Road.

The impervious area of the site is currently 132,930 SF. The project reduces the impervious cover on site by 19,333 SF. The final impervious area on site will be 113,597 SF.

The project area for the purposes of AoT permitting includes land within the City right-of way. Construction activities are expected to disturb approximately 82,600 SF of land and decrease the impervious cover by approximately 24,170 SF to the project property. The project area impervious cover will be 118,110 SF post-construction. The new impervious cover calculation considers the compacted gravel parking as impervious per the Alteration of Terrain regulations, which is why there is an overall decrease of impervious cover. Though the current area of disturbance is below 100,000 SF, the expanded vehicle storage and parking for the dealership occurred in 2020 and therefore necessitates an Alteration of Terrain permit application by being within a ten year period. The proposed stormwater management system for the parking areas consists of one infiltration gallery with an affiliated isolator row, which provides water quality treatment, quantity reduction, and rate control to pre-development levels.

2.2 Site Soils

According to the Natural Resources Conservation Service (NRCS), the on-site soils for the property consist entirely of Windsor loamy sand, which has a Hydrologic Soil Group (HSG) rating of A. On Old Suncook Road, the NRCS soil distinction is considered “Urban Land”, which is not designated a specific HSG Rating. The HSG A soils located on-site, and in the report, have an infiltration rate measured at 6.0-20 inches/hour. The proposed location for the subsurface infiltration gallery is situated within Type A soils. Accordingly, the infiltration rate was modeled at 3 inches per hour, incorporating a safety factor of 2.

It was found at the abutting Banks Chevrolet dealership parcel that the on-site soils exceeded the maximum infiltration rate of 10 in/hr (before the factor of safety is implemented), so it is anticipated that the soils on the project parcel will also exceed the maximum rate of 10 in/hr and therefore likely require amendment of on-site soil. For this reason, the supporting civil plan set

reflects amended soil requirement information, if applicable. The requirement for the soil amendment will be confirmed via the confirmatory test pits and on-site infiltration testing, which shall be completed at the start of construction. Test pits and infiltration testing cannot be performed prior to construction due to the existing use of the site and due to the expected necessary depth of the test pits. The test pits for the abutting Banks Chevrolet property were in excess of 13'. This would greatly disturb the existing parking lot and ongoing use of the project parcel, and the site soils are homogeneous,.

The project parcel's stormwater management design includes information from the abutting property and from the NRCS soil information. To be conservative, the packaged stormwater management design reflects the lower default design infiltration rate of 3 in/hr (Layout A) but also includes the design option of an amended soil with 4.5 in/hr (Layout B). The secondary design option (with amended soil) is listed in both the Construction Details and Stormwater Management Plan in case the testing proves soil amendment is needed. Refer to Site-Specific Soil Report and Infiltration Feasibility Report for more soil information.

2.3 **Pre-Development Watershed**

The pre-development watershed consists of the entire project area, which includes the entirety of the parcel to the property boundary lines and some portion of the upland wooded area. The existing project area is developed with a gravel parking area for employees. Other portions of the project parcel include a paved parking lot, and the remaining are undeveloped with mostly wooded landcover. There are no known wetlands on the project parcel. The parcel also includes some portion of grass and woods located on the eastern part of the property along Airport Road.

The watershed drains to the south toward Old Suncook Road with some natural low points located in the wooded areas. The site's topography directs runoff to three existing dry wells on-site, two existing catch basins on-site, and through the wooded/lawn area on the eastern side of the property. From there, the collected stormwater is conveyed to the existing closed drainage system along Old Suncook Road. As a result, the pre-development watershed has been directed to one point of interest (POI) at the roadway's closed drainage system.

The proposed project extents are within the existing gravel parking lot, which is where the three dry well systems are located. Based on knowledge of the on-site soil, it is understood that the area is capable of fully handling and discarding all influent flow to the three dry wells within the footprints of the systems. For this reason, no runoff from the dry wells is modeled to the downstream point of interest at the off-site roadway. See the pre-development stormwater plan for sub-watershed boundaries and POI locations.

2.4 **Post-Development Watershed**

The post-development watershed consists of the same area as the pre-development watershed. Post-development cover will consist of paved parking areas, landscaped areas, and naturally vegetated areas. Construction of the project will not change the locations of the POI(s), though the drainage areas to each will change.

The project proposes one stormwater management system that will pre-treat and treat stormwater runoff to remove pollutants and detain peak flows to levels below the pre-development watershed conditions. To the maximum extent feasible, all runoff from the new impervious areas will be collected in the subsurface infiltration gallery. Pre-treatment is provided in the isolator rows at the subsurface infiltration gallery.

POI #1: The POI #1 post-development watershed will include the project parcel and portions of the northern abutting properties including the proposed paved parking area, existing paved parking area, grassed areas, and wooded areas. The proposed parking lot area will eliminate the three existing dry well systems and will include the proposed stormwater management system – one subsurface infiltration gallery. The stormwater management system in POI #1 is centrally located within the proposed parking lot to adequately handle the runoff from the proposed impervious areas to the maximum extent feasible. The treatment system effectively discards all runoff within the footprint of the gallery and therefore does not direct any runoff off the project parcel and to the POI.

The subsurface infiltration gallery is sized to treat the water quality volume – WQV through the storage capacity of the chambers and surrounding stone and is confirmed that the system does not overtop during the 50-year storm event. The system also is checked for the 100-year storm event, which does not overtop the cover stone for the system. The native material beneath the subsurface infiltration gallery may need to be amended, pending confirmatory test pits and infiltration testing, to ensure that the maximum infiltration rate does not exceed the regulated 10 in/hr. If the soil amendment is required, the secondary infiltration gallery design option with amended soils, shall be constructed (Layout B). The alternate layout, Layout B, can be found detailed on sheet C5.3, Construction Details. The drainage system reflects the estimated seasonal high-water table and affiliated infiltration rate in the footprint of the system based on neighboring test pits and NRCS/Site-Specific soil information. These design criteria are reflected in the drainage model. Confirmatory test pits shall be performed at the start of construction due to the necessary depth of the test pit and the homogeneous nature of the on-site soils. Refer to Site-Specific Soil Report and Infiltration Feasibility Report for more information on the estimated seasonal high-water table.

2.5 **Schedule**

Project construction is planned to commence in Spring 2026 following all applicable state and local permits.

2.6 **Points of Interest**

There is one point of interest in the hydraulic model. Please see the pre-development and post-development watershed section for descriptions of the points of interest.

2.7 Erosion Sediment Control/Site Stabilization

The methods to be used to control sediment migration and erosion of the site include use of tracking control pads, temporary sedimentation basins, silt fence, landscaping, hydro-seeding, and erosion control matting (if applicable) in accordance with best management practices.

The contractor will be responsible for all temporary erosion and sediment control measures during construction, while the property owner will be ultimately responsible for maintaining all permanent erosion and sediment control measures as may be required.

2.8 Water Quality

During construction activities, silt fence, mulch berms, temporary sedimentation basins, erosion control matting, and seeding/mulching will maintain the quality of stormwater leaving the site. Runoff from disturbed areas shall be directed to depressions to infiltrate into the groundwater and allow for settling of sediment/pollutants. After construction is completed and the site is stabilized, stormwater quality will be maintained by infiltration through the native/amended materials beneath the subsurface infiltration gallery. Pretreatment is provided in the proposed isolator rows before entering the respective treatment system.

2.9 Summary of Results

POI		Peak Discharge					
		2-yr		10-yr	25-yr	50-yr	100-yr
		Peak Q	Discharged Volume	Peak Q	Peak Q	Peak Q	Peak Q
#1	Pre	3.98 cfs	0.53 ac-ft	5.94 cfs	7.47 cfs	8.91 cfs	10.77 cfs
	Post	3.80 cfs	0.50 ac-ft	5.67 cfs	7.12 cfs	8.56 cfs	10.44 cfs

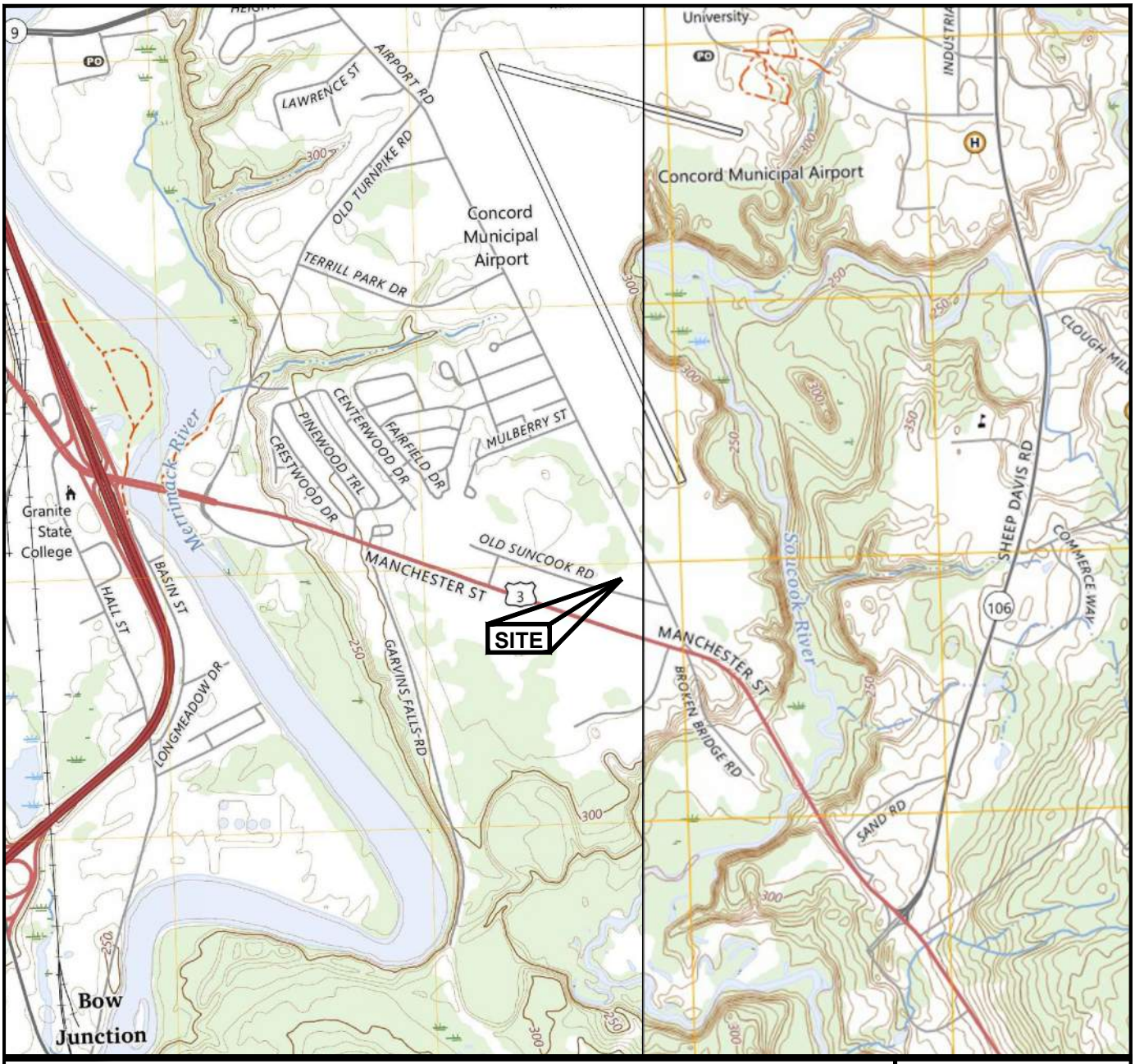
2.10 Conclusions

The preceding table and following calculations indicate that the post-development peak flow rates of the property will be attenuated to a value below the pre- development peak flow in the 2-year, 10-year, 25-year, 50-year, and 100-year. Stormwater is collected in the proposed subsurface infiltration gallery; and treated by means of infiltration prior to entering the groundwater table.

The proposed design meets the Env-Wq 1507.05 Channel Protection Requirement for peak flow rates. The 2-year, 24-hour post-development peak flow rates at all points of interest are less than the 2-year, 24-hour pre-development peak flow rates and/or has not increased over the pre-development volume by more than 0.1 acre-feet. Calculations are included for the 2-year, 10-year, 25-year, 50-year, and 100-year events.

3.0 WEB GIS INFORMATION

3.1 USGS Location Map
3.2 AoT Screening Layers Map
3.3 NHDES Screening Layers Map



SCALE: 1:24,000

1 1/2 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 .5 0 1 KILOMETER

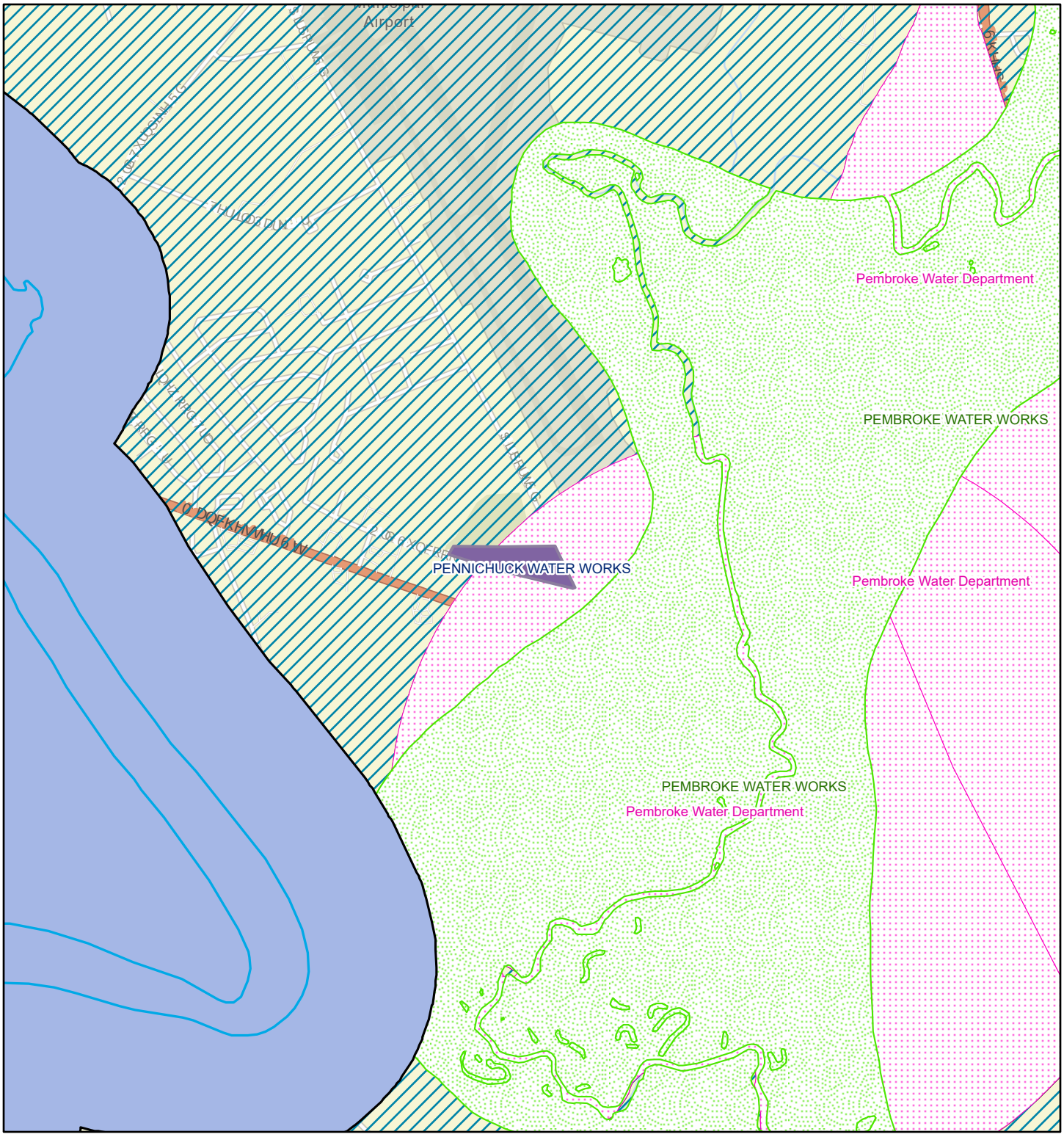
CONTOUR INTERVAL 10 FEET
NORTH AMERICAN VERTICAL DATUM OF 1988

DATE 11/19/2025	SCALE AS SHOWN	FILE BACC0005-LOCATION MAP
APPROVED BY ERL	DRAWN BY RPSB	REVISED
OWNER NAME BANKS CHEVROLET		JOB NUMBER BACC0005
LOCATION BANKS CHEVROLET PARKING LOT RECONSTRUCTION 234 AIRPORT ROAD CONCORD, NH 03301 MAP 782, BLOCK Z, LOT 8		MAP SOURCE SUNCOOK, NH CONCORD, NH USGS QUAD 2024

Wilcox & Barton INC.
CIVIL · ENVIRONMENTAL · GEOTECHNICAL

SITE LOCATION MAP

AoT Screening Layers Map



8/18/2025, 10:25:39 AM

1:24,000

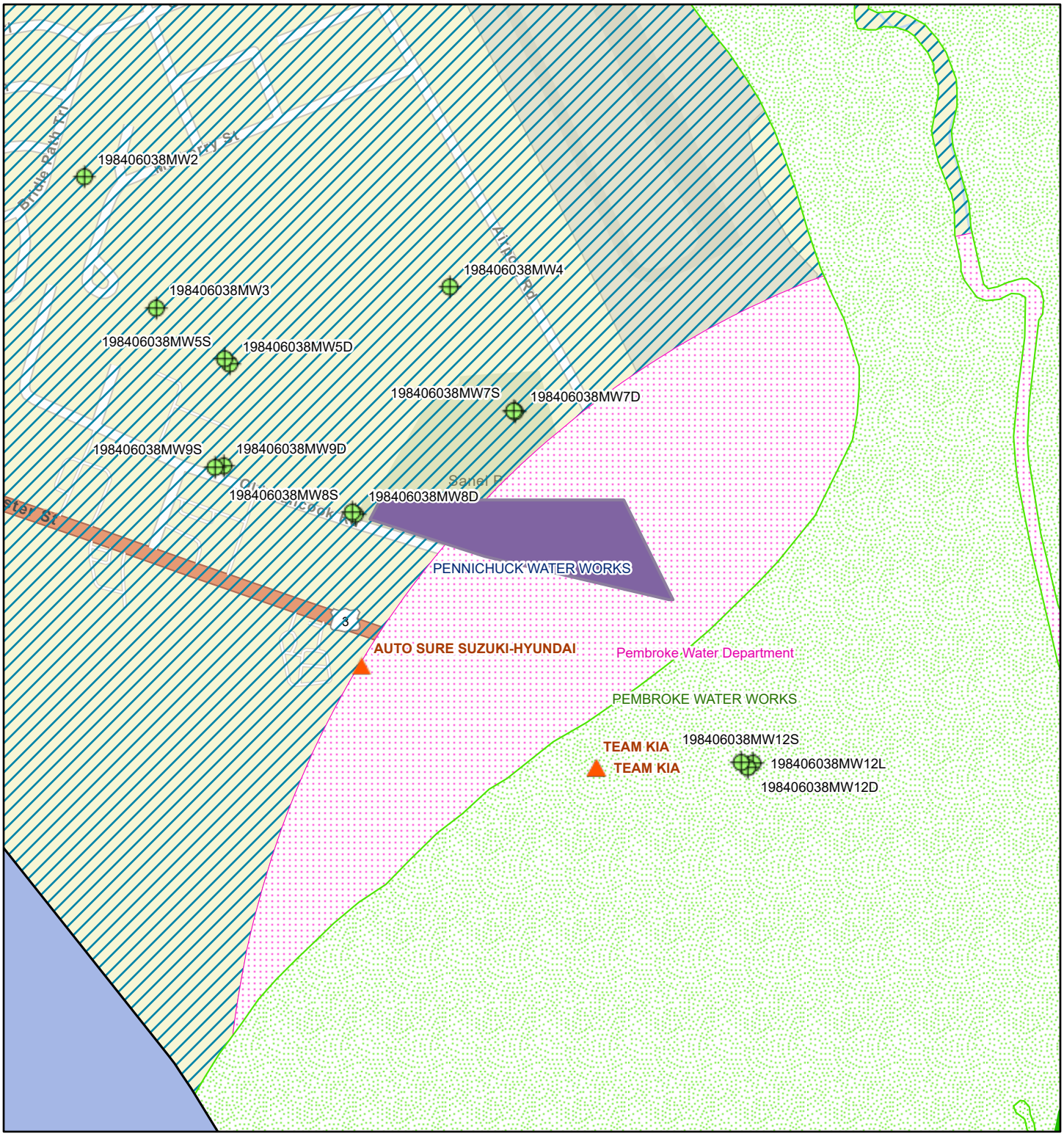
0 0.15 0.3 0.6 mi

0 0.23 0.45 0.9 km

- Designated Rivers
- Designated River Corridor
- Groundwater Classification Areas GA2
- Groundwater Classification Areas GAA
- Source Water Protection Areas
- Wellhead Protection Areas

Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, (c) OpenStreetMap contributors, and the GIS User Community

NHDES Screening Layers Map



8/19/2025, 9:59:20 AM

1:10,000

0 0.05 0.1 0.2 mi

0 0.1 0.2 0.4 km

- Sanitary Protection Areas
- Designated River Corridor
- Environmental Monitoring Sites Secure
- Local Potential Contamination Sources
- Groundwater Classification Areas GA2
- Groundwater Classification Areas GAA
- Source Water Protection Areas
- Wellhead Protection Areas

Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community

4.0 NH NATURAL HERITAGE BUREAU REVIEW

DataCheck Results Letter
For NHDES Ecological Review

To: Kim Harrington
2 Home Ave
Concord, NH 03301
kharrington@wilcoxandbarton.com

From: Ecological Review Section
NH Department of Environmental Services
Main Contact: Maddie Severance - EcologicalReviews@des.nh.gov

cc: NHFG Review, David Simmons

Date: 08/28/2025 (valid until 08/28/2026)
Re: DataCheck Review by NHDES Ecological Review Section and NH Fish & Game
Permits: MUNICIPAL POR - Concord, NHDES - Alteration of Terrain Permit, USEPA - Stormwater Pollution Prevention

DCT ID: DCT25-2394

Town: Concord
Location: 234 Airport Road

Project Description: The existing gravel parking area at the parcel located at 234 Airport Road in Concord, NH is proposed to be developed with a paved parking area for the display and storage of vehicles for sale. The proposed footprint will be similar but not identical to the existing footprint. The existing gravel area is approximately 65,000 sf.

Next Steps for Applicant:

NHDES's Ecological Review Section has searched the Natural Heritage Bureau's (NHB) database of rare species and exemplary natural communities. Please carefully read the comments below and the consultation requirements on the following page.

Plant and Natural Community Comments: Please provide proposed plans and representatvie photos of the proposed impact areas.

Wildlife Comments: Please refer to NHFG consultation requirements below.

Plant and Natural Community Consultation

If this DataCheck letter includes records of rare plants and/or natural communities/systems, please contact the Ecological Review Section and provide any requested supplementary materials by emailing EcologicalReviews@des.nh.gov.

If this DataCheck letter DOES NOT include any records of rare plants and/or natural communities/systems, no further consultation with the Ecological Review Section regarding rare plants and/or natural communities/systems is required.

Wildlife Consultation

If this DataCheck letter DOES NOT include ANY wildlife species records, then, based on the information submitted, no further consultation with the NH Fish and Game Department (NHFG) pursuant to Fis 1004 is required.

If this DataCheck letter includes a record for a threatened (T) or endangered (E) wildlife species, consultation with the New Hampshire Fish and Game Department under Fis 1004 may be required. To review the Fis 1000 rules (effective February 3, 2022), please go to https://www.wildlife.nh.gov/wildlife-and-habitat/nongame-and-endangered-species/environmental-review. All requests for consultation and submittals should be sent via email to NHFGreview@wildlife.nh.gov or can be sent by mail, and must include the DataCheck results letter number and "Fis 1004 consultation request" in the subject line.

If the DataCheck response letter does not include a threatened or endangered wildlife species but includes other wildlife species (e.g., Species of Special Concern), consultation under Fis 1004 is not required; however, some species are protected under other state laws or rules, so coordination with NH Fish & Game is highly recommended or may be required for certain permits. While some permitting processes are exempt from required consultation under Fis 1004 (e.g., *statutory permit by notification, permit by rule, permit by notification, routine roadway registration, docking structure registration, or conditional authorization by rule*), coordination with NH Fish & Game may still be required under the rules governing those specific permitting processes, and it is recommended you contact the applicable permitting agency. For projects not requiring consultation under Fis 1004, but where additional coordination with NH Fish and Game is requested, please email NHFGreview@wildlife.nh.gov, and include the DataCheck results letter number and "review request" in the email subject line.
Contact NH Fish & Game at (603) 271-0467 with questions.

Federal ESA Compliance

This letter does not constitute compliance with the federal Endangered Species Act (ESA). There may be occurrences of federally listed species in New Hampshire that are not included on the NH DataCheck Letter. For compliance with the federal Endangered Species Act (ESA), please visit the US Fish and Wildlife Service's (USFWS) Information for Planning and Consultation website (https://ipac.ecosphere.fws.gov/; IPaC) for an official list of federally listed species that may be present in your project area. If a federal agency is involved in your project through funding, permit, or other authorization, coordinate your IPaC results with your point of contact at the agency for further ESA review. If there is no federal agency nexus to your project, and you determine through IPaC, habitat evaluations, etc. that a project may cause take of a federally listed species, we recommend coordinating with the USFWS' New England Field Office (newengland@fws.gov; 603-223-2541).

NHB Database Records:
The following record(s) have been documented in the vicinity of the proposed project. Please refer to this list when coordinating.

Invertebrate Species	**State[1]**	**Federal**	**Notes**
Frosted Elfin (*Callophrys irus*)*	E	--	Contact the NH Fish & Game Dept (see above).
Karner Blue Butterfly (*Lycaeides melissa samuelis*)*	E	E	Contact the NH Fish & Game Dept and the US Fish & Wildlife Service (see above).

Natural Community	**State[1]**	**Federal**	**Notes**
Pitch pine - scrub oak woodland: Merrimack Valley variant*	--	--	

Plant species	**State[1]**	**Federal**	**Notes**
clasping milkweed (*Asclepias amplexicaulis*)*	T	--	This species grows in sandplains and disturbed openings, and is sensitive to disturbances that eliminate its habitat.
golden heather (*Hudsonia ericoides*)*	E	--	Probably sensitive to trampling. Shade-intolerant.
Houghton's umbrella sedge (*Cyperus houghtonii*)*	E	--	Threats include destruction of natural habitat, fire suppresion and/or succession, trampling by hikers, and off-road vehicles. However, since the plants require open habitat, some disturbances (e.g., logging, mowing, and even off-road vehicle use) could actually benefit populations. Site-specific evaluation of conditions will aid in the conservation of this species.
upright false bindweed (*Calystegia spithamaea ssp. spithamaea*)	E	--	This species occurs in dry forests, thin woods, sandplains, and disturbed openings. Threats would include development of its habitat or recreational use that directly impacted the plants.
wild lupine (*Lupinus perennis ssp. perennis*)	T	--	This wildflower grows in extremely dry, sandy openings and is easily identified in the field (see any wildflower guide) between early May and August. It is tolerant of surrounding disturbance and depends upon periodic mowing (or, historically, wildfire) to eliminate trees that would otherwise shade it out. It does not transplant well due to a tap root that can be more than three feet long.

Vertebrate species	**State[1]**	**Federal**	**Notes**

Eastern Hognose Snake (*Heterodon platirhinos*)*	E	--	Contact the NH Fish & Game Dept (see above).
Eastern Meadowlark (*Sturnella magna*)*	T	--	Contact the NH Fish & Game Dept (see above).
Grasshopper Sparrow (*Ammodramus savannarum*)*	T	--	Contact the NH Fish & Game Dept (see above).
Northern Black Racer (*Coluber constrictor constrictor*)*	T	--	Contact the NH Fish & Game Dept (see above).
Northern Leopard Frog (*Lithobates pipiens*)*	SC	--	Contact the NH Fish & Game Dept (see above).
Spotted Turtle (*Clemmys guttata*)*	T	--	Contact the NH Fish & Game Dept (see above).
Wood Turtle (*Glyptemys insculpta*)*	SC	--	Contact the NH Fish & Game Dept (see above).

[1]Codes: "E" = Endangered, "T" = Threatened, "SC" = Special Concern, "--" = an exemplary natural community, or a rare species tracked by NH Natural Heritage that has not yet been added to the official state list.
An asterisk (*) indicates that the most recent report for that occurrence was 20 or more years ago.

For all animal reviews, refer to 'Wildlife Consultation' section above. For all federally-listed species, refer to the 'Federal ESA Compliance' section above.

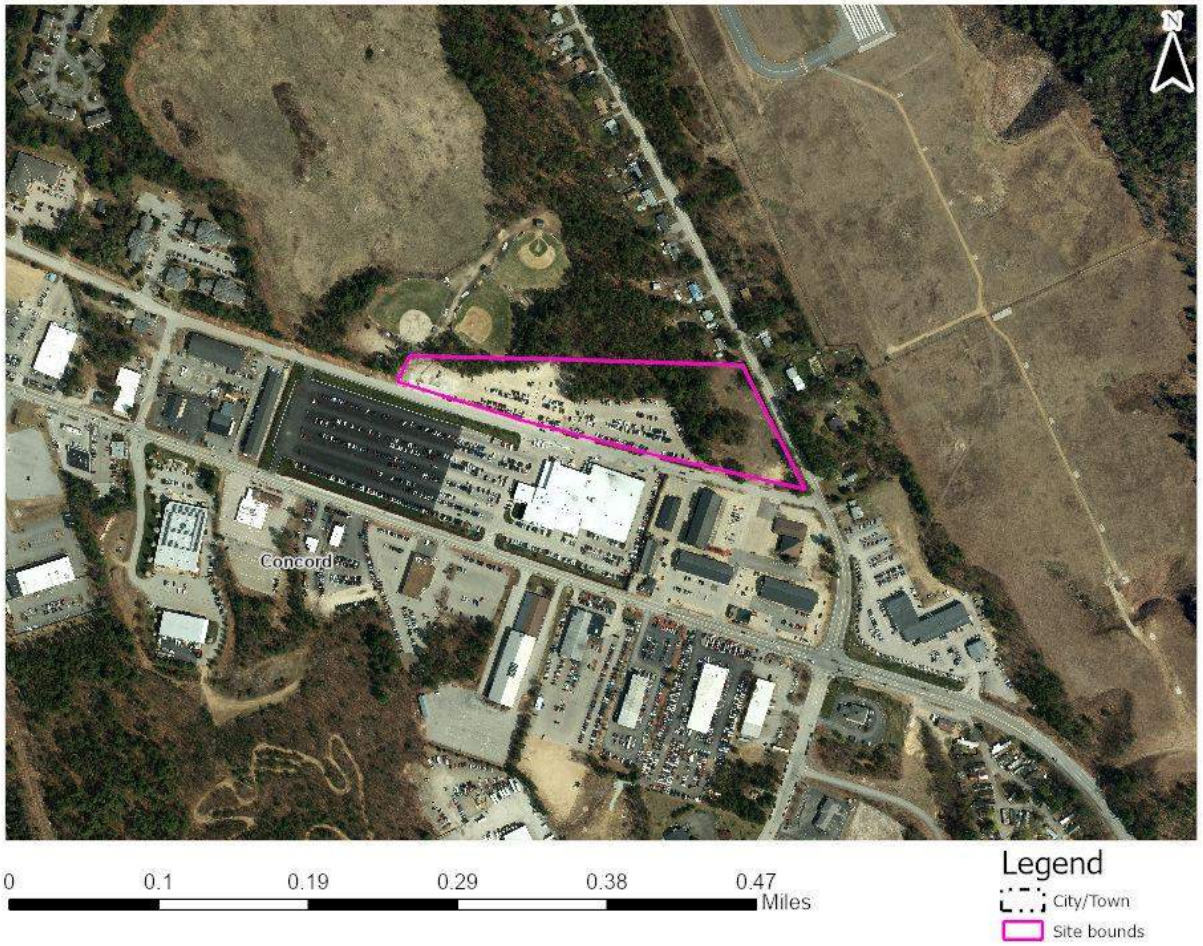
Disclaimer: NHB's database can only tell you of known occurrences that have been reported to NHFG/NHB. Known occurrences are based on information gathered by qualified biologists or members of the public, reported to our offices, and verified by NHB/NHFG.
However, many areas have never been surveyed, or have only been surveyed for certain species.
Surveys are recommended to determine what species/natural communities are present onsite.

DataCheck Results Letter
For NHDES Ecological Review

Please note: Effective June 10th, 2025, DataCheck letters will no longer include specific locations of rare species and exemplary natural communities. Changes to the map have been made to reflect this update.

Important: The list of rare species and exemplary natural communities that may be impacted by the project is included. Please refer to that list when coordinating.

DCT25-2394



5.0 NRCS SOIL INFORMATION

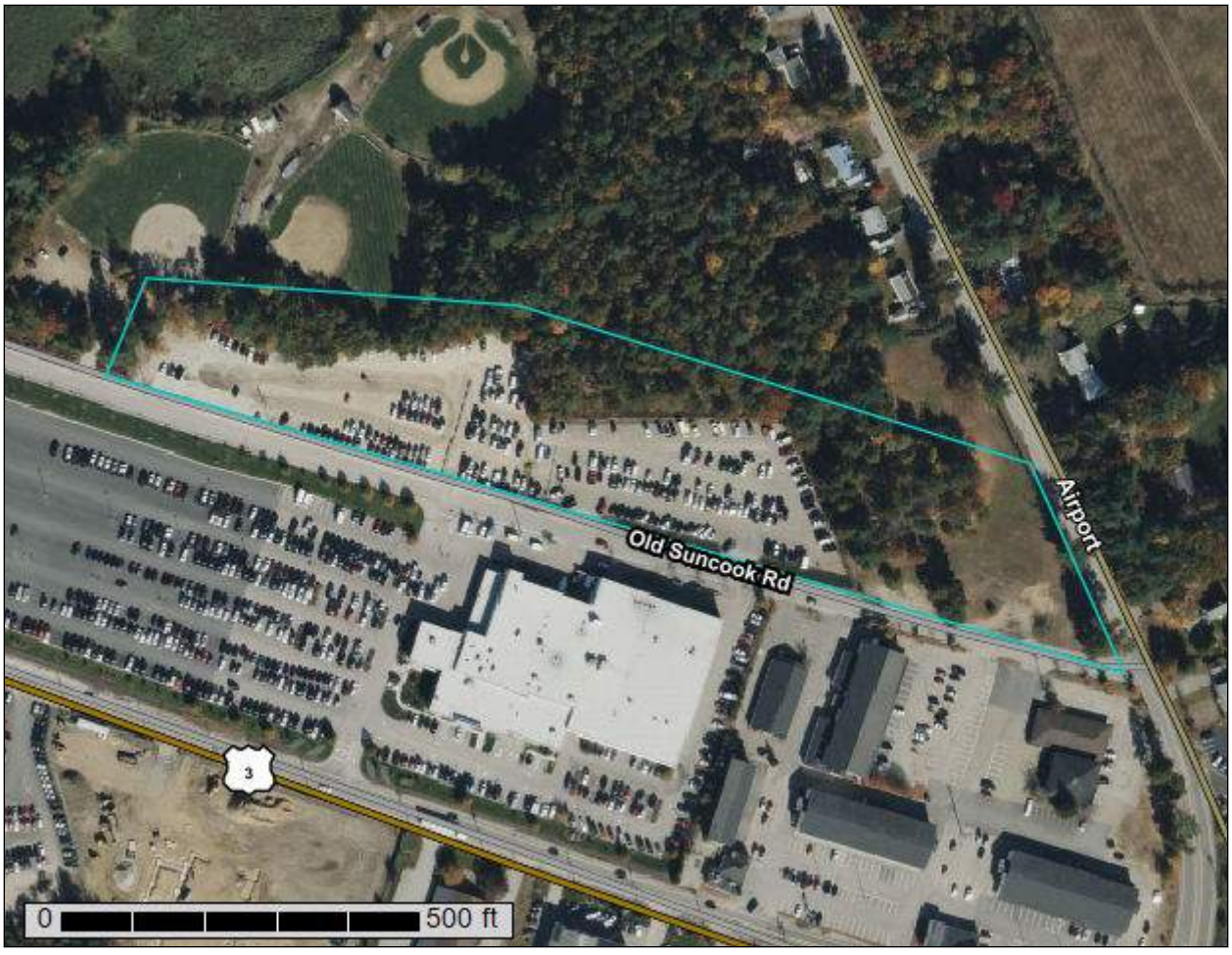
United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Merrimack and Belknap Counties, New Hampshire



October 30, 2025

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map



Map Scale: 1:2,380 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 35 70 140 210

Feet: 0 100 200 400 600

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Merrimack and Belknap Counties, New Hampshire
Survey Area Data: Version 31, Sep 10, 2025

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Oct 6, 2022—Oct 22, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND

MAP INFORMATION

imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
26A	Windsor loamy sand, 0 to 3 percent slopes	6.2	85.1%
699B	Urban land, 0 to 8 percent slopes	1.1	14.9%
Totals for Area of Interest		**7.2**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however,

onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Merrimack and Belknap Counties, New Hampshire

26A—Windsor loamy sand, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2svkg
Elevation: 0 to 990 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Farmland of local importance

Map Unit Composition

Windsor, loamy sand, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Windsor, Loamy Sand

Setting

Landform: Outwash plains, outwash terraces, deltas, dunes
Landform position (three-dimensional): Tread, riser
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex
Parent material: Loose sandy glaciofluvial deposits derived from granite and/or loose sandy glaciofluvial deposits derived from schist and/or loose sandy glaciofluvial deposits derived from gneiss

Typical profile

O - 0 to 1 inches: moderately decomposed plant material
A - 1 to 3 inches: loamy sand
Bw - 3 to 25 inches: loamy sand
C - 25 to 65 inches: sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: A
Ecological site: F144AY022MA - Dry Outwash
Hydric soil rating: No

Minor Components

Deerfield, loamy sand

Percent of map unit: 10 percent
Landform: Deltas, terraces, outwash plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Hinckley, loamy sand

Percent of map unit: 5 percent
Landform: Deltas, kames, eskers, outwash plains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Head slope, nose slope, side slope, crest, rise
Down-slope shape: Convex
Across-slope shape: Convex, linear
Hydric soil rating: No

699B—Urban land, 0 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9dmm
Elevation: 200 to 1,970 feet
Mean annual precipitation: 40 to 50 inches
Mean annual air temperature: 37 to 52 degrees F
Frost-free period: 90 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition

Urban land: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Urban Land

Typical profile

H1 - 0 to 6 inches: variable

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8s
Hydric soil rating: Unranked

Minor Components

Udipsamments

Percent of map unit: 10 percent

Landform: Terraces
Hydric soil rating: No

Soil Information for All Uses

Soil Properties and Qualities

The Soil Properties and Qualities section includes various soil properties and qualities displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each property or quality.

Soil Qualities and Features

Soil qualities are behavior and performance attributes that are not directly measured, but are inferred from observations of dynamic conditions and from soil properties. Example soil qualities include natural drainage, and frost action. Soil features are attributes that are not directly part of the soil. Example soil features include slope and depth to restrictive layer. These features can greatly impact the use and management of the soil.

Hydrologic Soil Group

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Custom Soil Resource Report
Map—Hydrologic Soil Group



MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Lines

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Points

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

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Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

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Soil Survey Area: Merrimack and Belknap Counties, New Hampshire
Survey Area Data: Version 31, Sep 10, 2025

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Oct 6, 2022—Oct 22, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND	MAP INFORMATION
	imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
26A	Windsor loamy sand, 0 to 3 percent slopes	A	6.2	85.1%
699B	Urban land, 0 to 8 percent slopes		1.1	14.9%
Totals for Area of Interest			**7.2**	**100.0%**

Rating Options—Hydrologic Soil Group

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

References

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6.0 AERIAL SITE PHOTOGRAPH



SCALE: 1: 3,600

0.1 0.05 0 0.1 0.2 MILE

150 0 150 300 450 600 750 900 FEET

0.1 .05 0 0.1 0.2 KILOMETER

DATE 11/19/2025	SCALE AS SHOWN	FILE BACC0005-LOCATION MAP	Wilcox & Barton INC. CIVIL · ENVIRONMENTAL · GEOTECHNICAL
APPROVED BY ERL	DRAWN BY RPSB	REVISED	
OWNER NAME BANKS CHEVROLET		JOB NUMBER BACC0005	
LOCATION BANKS CHEVROLET PARKING LOT RECONSTRUCTION 234 AIRPORT ROAD CONCORD, NH 03301 MAP 782, BLOCK Z, LOT 8		MAP SOURCE CONCORD 2020, NH ARCGIS	AERIAL MAP

7.0 SITE PHOTOGRAPHS

EXISTING PHOTOS – BANKS CHEVROLET PARKING LOT RECONSTRUCTION
234 AIRPORT RD, CONCORD, NH



Figure 1: Western view at western end of property onto Old Suncook Road.



Figure 2: Eastern view of existing gravel parking area.



Figure 3: Property's frontage along Old Suncook Road, facing west.



Figure 4: Property's frontage along Old Suncook Road, facing east.



Figure 5: Northern view at rear of existing paved parking area to remain.



Figure 6: Southern view of existing gravel parking area and dry well location.



Figure 7: Eastern view at gravel parking area extents – facing existing paved parking lot to remain.



Figure 8: Eastern view of adjacent vegetation at gravel parking area, minor tree cutting proposed adjacent to existing gravel parking area.



Figure 9: Grassed area between Old Suncook Road and Airport Road (no disturbance proposed in this area).



Figure 10: Wooded area between Old Suncook Road and Airport Road (no disturbance proposed in this area).



Figure 11: Northwestern view of property's frontage along Airport Road (no disturbance proposed in this area).

8.0 SITE DESIGN CRITERIA

8.1 Groundwater recharge volume calculations
8.2 BMP calculation worksheets

GROUNDWATER RECHARGE VOLUME (GRV)
(Env-Wq 1504.12)

-	ac	Area of HSG A soil that was replaced by impervious cover	0.40"
-	ac	Area of HSG B soil that was replaced by impervious cover	0.25"
-	ac	Area of HSG C soil that was replaced by impervious cover	0.10"
-	ac	Area of HSG D soil or impervious cover that was replaced by impervious cover	0.0"
-	inches	Rd = Weighted groundwater recharge depth	
-	ac-in	GRV = AI * Rd	
-	cf	GRV conversion (ac-in x 43,560 sf/ac x 1ft/12”)	
	← Y/N	Is a stage-storage table attached showing that the GRV can be stored below the lowest invert of the outlet structure (if applicable)? Multiple stormwater control measures may be used to meet the GRV requirements.	

Provide calculations/discussion below showing that the project meets the groundwater recharge requirements (Env-Wq 1507.04):

An overall decrease in impervious cover is proposed. The infiltration gallery-1 infiltrates 12,050 CF during the 2-yr storm event.

Summary for Pond AMH-1: ACCESS MANHOLE-1

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=82)

Inflow Area = 22,601 sf,100.00% Impervious, Inflow Depth = 5.95" for 50-yr event
Inflow = 3.17 cfs @ 12.07 hrs, Volume= 11,209 cf
Outflow = 3.17 cfs @ 12.07 hrs, Volume= 11,202 cf, Atten= 0%, Lag= 0.0 min
Primary = 3.17 cfs @ 12.07 hrs, Volume= 11,202 cf
Routed to Pond P1 : SUBSURFACE INFILTRATION GALLERY-1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 322.17' @ 13.96 hrs
Flood Elev= 327.52'

Device	Routing	Invert	Outlet Devices
#1	Primary	319.29'	**24.0" Round Culvert** L= 4.0' Ke= 0.500 Inlet / Outlet Invert= 319.29' / 319.29' S= 0.0000 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf

Primary OutFlow Max=0.00 cfs @ 12.07 hrs HW=320.30' TW=320.38' (Dynamic Tailwater)
1=Culvert (Controls 0.00 cfs)

Summary for Pond AMH-2: ACCESS MANHOLE-2

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=69)

Inflow Area = 33,148 sf,100.00% Impervious, Inflow Depth = 5.95" for 50-yr event
Inflow = 4.65 cfs @ 12.07 hrs, Volume= 16,440 cf
Outflow = 4.65 cfs @ 12.07 hrs, Volume= 16,437 cf, Atten= 0%, Lag= 0.0 min
Primary = 4.65 cfs @ 12.07 hrs, Volume= 16,437 cf
Routed to Pond P1 : SUBSURFACE INFILTRATION GALLERY-1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 322.17' @ 13.96 hrs
Flood Elev= 326.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	319.29'	**24.0" Round Culvert** L= 4.0' Ke= 0.500 Inlet / Outlet Invert= 319.29' / 319.29' S= 0.0000 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf

Primary OutFlow Max=2.45 cfs @ 12.07 hrs HW=320.47' TW=320.38' (Dynamic Tailwater)
└**1=Culvert** (Outlet Controls 2.45 cfs @ 1.83 fps)

INFILTRATION PRACTICE CRITERIA
(Env-Wq 1508.07)

Type/Node Name: **Infiltration Gallery-1 (Layout A)**

Enter the type of infiltration practice (such as basin, trench) and the node name in the drainage analysis, if applicable.

yes		Have you reviewed Env-Wq 1508.07(a) to ensure that infiltration is allowed?	**← yes**
1.28	ac	A = Area draining to the practice	
1.28	ac	A_I = Impervious area draining to the practice	
1.00	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.95	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
1.22	ac-in	WQV= 1" x Rv x A	
4,414	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
1,104	cf	25% x WQV (check calc for sediment forebay volume)	
isolator row		Method of pretreatment? (not required for clean or roof runoff)	
	cf	V_{SED} = Sediment forebay volume, if used for pretreatment	**≥ 25%WQV**
14,028	cf	V = Volume[1] (attach a stage-storage table)	**≥ WQV**
4,675	sf	A_{SA} = Surface area of the bottom of the pond	
3.00	iph	$Ksat_{DESIGN}$ = Design infiltration rate[2]	
3.8	hours	T_{DRAIN} = Drain time = V / (A_{SA} * I_{DESIGN})	**≤ 72-hrs**
318.37	feet	E_{BTM} = Elevation of the bottom of the basin	
315.37	feet	E_{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
315.37	feet	E_{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
3.00	feet	D_{SHWT} = Separation from SHWT	**≥ *** [3]
3.0	feet	D_{ROCK} = Separation from bedrock	**≥ *** [3]
	ft	D_{amend} = Depth of amended soil, if applicable due high infiltation rate	**≥ 24"**
	ft	D_T = Depth of trench, if trench proposed	**4 - 10 ft**
yes	Yes/No	If a trench or underground system is proposed, has observation well been provided?	**←yes**
		If a trench is proposed, does material meet Env-Wq 1508.07(k)(2) requirements.[4]	**← yes**
	Yes/No	If a basin is proposed, Is the perimeter curvilinear, and basin floor flat?	**← yes**
	:1	If a basin is proposed, pond side slopes.	**≥3:1**
320.58	ft	Peak elevation of the 10-year storm event (infiltration can be used in analysis)	
322.17	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
322.87	ft	Elevation of the top of the practice (if a basin, this is the elevation of the berm)	
YES		10 peak elevation ≤ Elevation of the top of the trench?[5]	**← yes**
YES		If a basin is proposed, 50-year peak elevation ≤ Elevation of berm?	**← yes**

1. Volume below the lowest invert of the outlet structure and excludes forebay volume
2. $Ksat_{DESIGN}$ includes a factor of safety. See Env-Wq 1504.14 for requirements for determining the infiltr. rate
3. 1' separation if treatment not required; 4' for treatment in GPAs & WSIPAs; & 3' in all other areas.
4. Clean, washed well graded diameter of 1.5 to 3 inches above the in-situ soil.
5. If 50-year peak elevation exceeds top of trench, the overflow must be routed in HydroCAD as secondary discharge.

Designer's Notes: Note: Isolator Row volume: 1 row of 21 chambers = 4,297 CF, exceeds 25% WQV (complies).

Stage-Area-Storage for Pond P1: SUBSURFACE INFILTRATION GALLERY-1

Elevation (feet)	Wetted (sq-ft)	Storage (cubic-feet)
318.37	4,675	0
318.47	4,712	187
318.57	4,750	374
318.67	4,787	561
318.77	4,824	748
318.87	4,861	935
318.97	4,899	1,122
319.07	4,936	1,309
319.17	4,973	1,603
319.27	5,010	2,004
319.37	5,047	2,403
319.47	5,085	2,800
319.57	5,122	3,196
319.67	5,159	3,590
319.77	5,196	3,983
319.87	5,234	4,373
319.97	5,271	4,762
320.07	5,308	5,148
320.17	5,345	5,532
320.27	5,383	5,914
320.37	5,420	6,293
320.47	5,457	6,669
320.57	5,494	7,042
320.67	5,532	7,413
320.77	5,569	7,780
320.87	5,606	8,143
320.97	5,643	8,503
321.07	5,680	8,859
321.17	5,718	9,210
321.27	5,755	9,557
321.37	5,792	9,900
321.47	5,829	10,237
321.57	5,867	10,569
321.67	5,904	10,895
321.77	5,941	11,214
321.87	5,978	11,527
321.97	6,016	11,831
322.07	6,053	12,128
322.17	6,090	12,416
322.27	6,127	12,692
322.37	6,165	12,956
322.47	6,202	13,202
322.57	6,239	13,427
322.67	6,276	13,636
322.77	6,314	13,837
322.87	6,351	14,028
322.97	6,388	14,215
323.07	6,425	14,402
323.17	6,462	14,589
323.27	6,500	14,776
323.37	6,537	14,963
323.47	6,574	15,150
323.57	6,611	15,337
323.67	6,649	15,524
323.77	6,686	15,711
323.87	**6,723**	**15,898**

Summary for Pond IR: ISOLATOR ROW CHECK

[43] Hint: Has no inflow (Outflow=Zero)

Volume	Invert	Avail.Storage	Storage Description
#1A	318.37'	1,958 cf	**8.42'W x 156.27'L x 5.50'H Field A** 7,234 cf Overall - 2,339 cf Embedded = 4,895 cf x 40.0% Voids
#2A	319.12'	2,339 cf	**ADS_StormTech MC-3500 d +Cap** x 21 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap Cap Storage= 14.9 cf x 2 x 1 rows = 29.8 cf
		4,297 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	318.37'	**3.000 in/hr Exfiltration over Wetted area**

Discarded OutFlow Max=0.00 cfs @ 0.00 hrs HW=0.00' (Free Discharge)
↑—**1=Exfiltration** (Controls 0.00 cfs)

INFILTRATION PRACTICE CRITERIA
(Env-Wq 1508.07)

Type/Node Name: **Amended Soil Gallery-1 (Layout B)**

Enter the type of infiltration practice (such as basin, trench) and the node name in the drainage analysis, if applicable.

yes		Have you reviewed Env-Wq 1508.07(a) to ensure that infiltration is allowed?	**← yes**
1.28	ac	A = Area draining to the practice	
1.28	ac	A_I = Impervious area draining to the practice	
1.00	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.95	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
1.22	ac-in	WQV= 1" x Rv x A	
4,414	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
1,104	cf	25% x WQV (check calc for sediment forebay volume)	
isolator row		Method of pretreatment? (not required for clean or roof runoff)	
	cf	V_{SED} = Sediment forebay volume, if used for pretreatment	**≥ 25%WQV**
12,728	cf	V = Volume[1] (attach a stage-storage table)	**≥ WQV**
4,246	sf	A_{SA} = Surface area of the bottom of the pond	
3.00	iph	$Ksat_{DESIGN}$ = Design infiltration rate[2]	
4.2	hours	T_{DRAIN} = Drain time = V / (A_{SA} * I_{DESIGN})	**≤ 72-hrs**
318.37	feet	E_{BTM} = Elevation of the bottom of the basin	
315.37	feet	E_{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
315.37	feet	E_{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
3.00	feet	D_{SHWT} = Separation from SHWT	**≥ *** [3]
3.0	feet	D_{ROCK} = Separation from bedrock	**≥ *** [3]
	ft	D_{amend} = Depth of amended soil, if applicable due high infiltation rate	**≥ 24"**
	ft	D_T = Depth of trench, if trench proposed	**4 - 10 ft**
yes	Yes/No	If a trench or underground system is proposed, has observation well been provided?	**←yes**
		If a trench is proposed, does material meet Env-Wq 1508.07(k)(2) requirements.[4]	**← yes**
	Yes/No	If a basin is proposed, Is the perimeter curvilinear, and basin floor flat?	**← yes**
	:1	If a basin is proposed, pond side slopes.	**≥3:1**
320.51	ft	Peak elevation of the 10-year storm event (infiltration can be used in analysis)	
321.99	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
322.87	ft	Elevation of the top of the practice (if a basin, this is the elevation of the berm)	
YES		10 peak elevation ≤ Elevation of the top of the trench?[5]	**← yes**
YES		If a basin is proposed, 50-year peak elevation ≤ Elevation of berm?	**← yes**

1. Volume below the lowest invert of the outlet structure and excludes forebay volume
2. $Ksat_{DESIGN}$ includes a factor of safety. See Env-Wq 1504.14 for requirements for determining the infiltr. rate
3. 1' separation if treatment not required; 4' for treatment in GPAs & WSIPAs; & 3' in all other areas.
4. Clean, washed well graded diameter of 1.5 to 3 inches above the in-situ soil.
5. If 50-year peak elevation exceeds top of trench, the overflow must be routed in HydroCAD as secondary discharge.

Designer's Notes: Note: Isolator Row volume: 1 row of 19 chambers = 3,899 CF, exceeds 25% WQV (complies).

Stage-Area-Storage for Pond add/alt: AMENDED SOIL - GALLERY-1

Elevation (feet)	Wetted (sq-ft)	Storage (cubic-feet)
318.37	4,246	0
318.47	4,280	170
318.57	4,315	340
318.67	4,349	510
318.77	4,384	679
318.87	4,418	849
318.97	4,452	1,019
319.07	4,487	1,189
319.17	4,521	1,456
319.27	4,555	1,819
319.37	4,590	2,181
319.47	4,624	2,542
319.57	4,659	2,901
319.67	4,693	3,258
319.77	4,727	3,614
319.87	4,762	3,968
319.97	4,796	4,321
320.07	4,830	4,671
320.17	4,865	5,019
320.27	4,899	5,366
320.37	4,933	5,709
320.47	4,968	6,051
320.57	5,002	6,390
320.67	5,037	6,725
320.77	5,071	7,058
320.87	5,105	7,388
320.97	5,140	7,714
321.07	5,174	8,037
321.17	5,208	8,356
321.27	5,243	8,671
321.37	5,277	8,982
321.47	5,312	9,288
321.57	5,346	9,589
321.67	5,380	9,884
321.77	5,415	10,174
321.87	5,449	10,458
321.97	5,483	10,734
322.07	5,518	11,003
322.17	5,552	11,264
322.27	5,586	11,515
322.37	5,621	11,755
322.47	5,655	11,978
322.57	5,690	12,182
322.67	5,724	12,372
322.77	5,758	12,554
322.87	5,793	12,728
322.97	5,827	12,898
323.07	5,861	13,068
323.17	5,896	13,238
323.27	5,930	13,408
323.37	5,965	13,577
323.47	5,999	13,747
323.57	6,033	13,917
323.67	6,068	14,087
323.77	6,102	14,257
323.87	**6,136**	**14,427**

Summary for Pond IR: ISOLATOR ROW CHECK

[43] Hint: Has no inflow (Outflow=Zero)

Volume	Invert	Avail.Storage	Storage Description
#1A	318.37'	1,781 cf	**8.42'W x 141.93'L x 5.50'H Field A** 6,570 cf Overall - 2,119 cf Embedded = 4,451 cf x 40.0% Voids
#2A	319.12'	2,119 cf	**ADS_StormTech MC-3500 d +Cap** x 19 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap Cap Storage= 14.9 cf x 2 x 1 rows = 29.8 cf
		3,899 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	318.37'	**3.000 in/hr Exfiltration over Wetted area**

Discarded OutFlow Max=0.00 cfs @ 0.00 hrs HW=0.00' (Free Discharge)
↑—**1=Exfiltration** (Controls 0.00 cfs)

9.0 HYDRAULIC CALCULATIONS

9.1 Extreme Precipitations
9.2 Pre-Development Stormwater Plan – SW.1
9.3 Post-Development Stormwater Plan – SW.2
9.4 Pre-development Conditions
- 9.4.1 Drainage Diagram
- 9.4.2 Area Listing
- 9.4.3 Soil Listing
- 9.4.4 2-yr Node Listing
- 9.4.5 10-yr Node Listing
- 9.4.6 25-yr Node Listing
- 9.4.7 50-yr Node Listing
- 9.4.8 100-yr Node Listing
- 9.4.9 10-yr Storm Full Summary

9.5 Post-Development Conditions
- 9.5.1 Drainage Diagram
- 9.5.2 Area Listing
- 9.5.3 Soil Listing
- 9.5.4 2-yr Node Listing
- 9.5.5 10-yr Node Listing
- 9.5.6 25-yr Node Listing
- 9.5.7 50-yr Node Listing
- 9.5.8 100-yr Node Listing
- 9.5.9 10-yr Storm Full Summary
- 9.5.10 Infiltration Gallery-1 Secondary Analysis – Amended Soil (Layout B)

Extreme Precipitation Tables

Northeast Regional Climate Center

Data represents point estimates calculated from partial duration series. All precipitation amounts are displayed in inches.

Metadata for Point	
Smoothing	Yes
State	
Location	
Latitude	43.189 degrees North
Longitude	71.5 degrees West
Elevation	90 feet
Date/Time	Mon Jul 28 2025 13:15:37 GMT-0400 (Eastern Daylight Time)

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day
1yr	0.25	0.39	0.48	0.64	0.79	1.00	**1yr**	0.69	0.98	1.16	1.47	1.86	2.37	2.58	**1yr**	2.09	2.48	2.90	3.59	4.13
2yr	0.31	0.48	0.60	0.79	1.00	1.25	**2yr**	0.86	1.15	1.45	1.81	2.26	2.82	3.16	**2yr**	2.50	3.04	3.52	4.20	4.80
5yr	0.37	0.58	0.73	0.98	1.25	1.58	**5yr**	1.08	1.44	1.83	2.29	2.84	3.53	4.01	**5yr**	3.12	3.85	4.45	5.23	5.92
10yr	0.42	0.66	0.84	1.14	1.48	1.89	**10yr**	1.28	1.71	2.19	2.74	3.39	4.17	4.80	**10yr**	3.69	4.62	5.32	6.17	6.94
25yr	0.50	0.79	1.01	1.39	1.85	2.38	**25yr**	1.59	2.15	2.77	3.46	4.27	5.22	6.10	**25yr**	4.62	5.87	6.74	7.69	8.58
50yr	0.57	0.91	1.17	1.63	2.19	2.84	**50yr**	1.89	2.55	3.31	4.13	5.09	6.19	7.32	**50yr**	5.48	7.04	8.07	9.08	10.06
100yr	0.64	1.04	1.35	1.91	2.60	3.39	**100yr**	2.24	3.02	3.97	4.94	6.06	7.34	8.78	**100yr**	6.49	8.45	9.66	10.73	11.82
200yr	0.74	1.21	1.57	2.24	3.09	4.04	**200yr**	2.66	3.59	4.73	5.90	7.21	8.70	10.55	**200yr**	7.70	10.14	11.56	12.69	13.88
500yr	0.89	1.46	1.91	2.77	3.87	5.11	**500yr**	3.34	4.52	5.99	7.45	9.09	10.92	13.44	**500yr**	9.66	12.92	14.69	15.85	17.18

Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day
1yr	0.21	0.32	0.39	0.52	0.64	0.88	**1yr**	0.55	0.86	1.06	1.37	1.59	2.04	2.44	**1yr**	1.81	2.35	2.67	3.31	3.88
2yr	0.30	0.47	0.58	0.78	0.96	1.15	**2yr**	0.83	1.12	1.31	1.73	2.19	2.75	3.06	**2yr**	2.44	2.95	3.42	4.09	4.68
5yr	0.35	0.53	0.66	0.91	1.16	1.37	**5yr**	1.00	1.34	1.54	2.00	2.56	3.31	3.72	**5yr**	2.93	3.58	4.15	4.90	5.57
10yr	0.38	0.59	0.73	1.02	1.32	1.56	**10yr**	1.14	1.52	1.75	2.25	2.87	3.80	4.32	**10yr**	3.37	4.16	4.80	5.61	6.38
25yr	0.44	0.67	0.84	1.19	1.57	1.82	**25yr**	1.36	1.78	2.07	2.62	3.35	4.56	5.25	**25yr**	4.04	5.05	5.78	6.73	7.63
50yr	0.49	0.74	0.92	1.33	1.79	2.04	**50yr**	1.54	2.00	2.36	2.95	3.77	5.24	6.09	**50yr**	4.64	5.85	6.64	7.70	8.75
100yr	0.55	0.83	1.04	1.50	2.06	2.32	**100yr**	1.77	2.26	2.70	3.32	4.24	6.02	7.06	**100yr**	5.32	6.79	7.64	8.83	10.02
200yr	0.61	0.92	1.16	1.68	2.35	2.59	**200yr**	2.02	2.54	3.07	3.73	4.78	6.92	8.19	**200yr**	6.12	7.88	8.76	10.14	11.47
500yr	0.71	1.06	1.36	1.97	2.81	3.03	**500yr**	2.42	2.96	3.66	4.37	5.61	8.30	9.95	**500yr**	7.35	9.57	10.45	12.19	13.77

Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day
1yr	0.29	0.44	0.54	0.73	0.90	1.08	**1yr**	0.77	1.05	1.19	1.58	1.99	2.49	2.75	**1yr**	2.21	2.64	3.14	3.81	4.34
2yr	0.33	0.50	0.62	0.84	1.03	1.24	**2yr**	0.89	1.21	1.39	1.83	2.32	2.91	3.25	**2yr**	2.57	3.13	3.64	4.32	4.94
5yr	0.40	0.62	0.77	1.06	1.35	1.57	**5yr**	1.17	1.53	1.78	2.29	2.91	3.74	4.30	**5yr**	3.31	4.14	4.75	5.54	6.28
10yr	0.48	0.74	0.92	1.29	1.66	1.90	**10yr**	1.44	1.86	2.15	2.72	3.47	4.55	5.32	**10yr**	4.03	5.12	5.87	6.70	7.58
25yr	0.62	0.94	1.17	1.67	2.20	2.47	**25yr**	1.90	2.42	2.77	3.41	4.36	5.89	7.06	**25yr**	5.22	6.79	7.73	8.61	9.66
50yr	0.73	1.12	1.39	2.00	2.69	3.02	**50yr**	2.32	2.95	3.33	4.07	5.18	7.17	8.74	**50yr**	6.35	8.40	9.53	10.43	11.63
100yr	0.89	1.34	1.68	2.43	3.33	3.68	**100yr**	2.88	3.60	4.03	4.84	6.17	8.75	10.84	**100yr**	7.74	10.42	11.79	12.63	14.00
200yr	1.06	1.60	2.03	2.94	4.10	4.49	**200yr**	3.53	4.39	4.86	5.77	7.36	10.65	13.42	**200yr**	9.42	12.90	14.61	15.31	16.84
500yr	1.37	2.03	2.62	3.80	5.40	5.86	**500yr**	4.66	5.73	6.25	7.29	9.30	13.84	17.85	**500yr**	12.25	17.16	19.40	19.75	21.52

Powered by ACIS Northeast Regional Climate Center



STORMWATER PLAN LEGEND

- SUBCATCHMENT NODE
- POND NODE
- REACH NODE
- POINT OF INTEREST NODE
- PRE-DEVELOPMENT SUBWATERSHED BOUNDARY
- PRE-DEVELOPMENT SUBWATERSHED TIME OF CONCENTRATION

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

Wilcox & Barton INC.
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CONCORD, NH 03301
603-369-4190
www.wilcoxandbarton.com

REVISION HISTORY
1. REVISED IN RESPONSE TO NHDES ECOLOGICAL REVIEW SECTION COMMENTS (12/09/2025)
2. REVISED TO COMPLY WITH RESIDENTIAL SCREENING (12/19/2025)
3. REVISED IN RESPONSE TO CITY OF CONCORD AND NHDES AOT COMMENTS (02/17/2026)

ISSUED FOR

PERMITTING

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OWNER

DAVAL REALTY ASSOCIATES LLC / BANKS CHEVROLET

137 MANCHESTER ST CONCORD, NH 03301

SITE

BANKS CHEVROLET PARKING LOT RECONSTRUCTION

234 AIRPORT ROAD CONCORD, NH 03301

MBLU: 782/Z/8

DRAWING TITLE

PRE-DEVELOPMENT WATERSHED PLAN

SCALE	DATE
1" = 50'	11/19/2025

DRAFTED BY	CHECKED BY	PROJECT MGR	PROJECT NO.
KAD	ERL	ERL	BACC0005

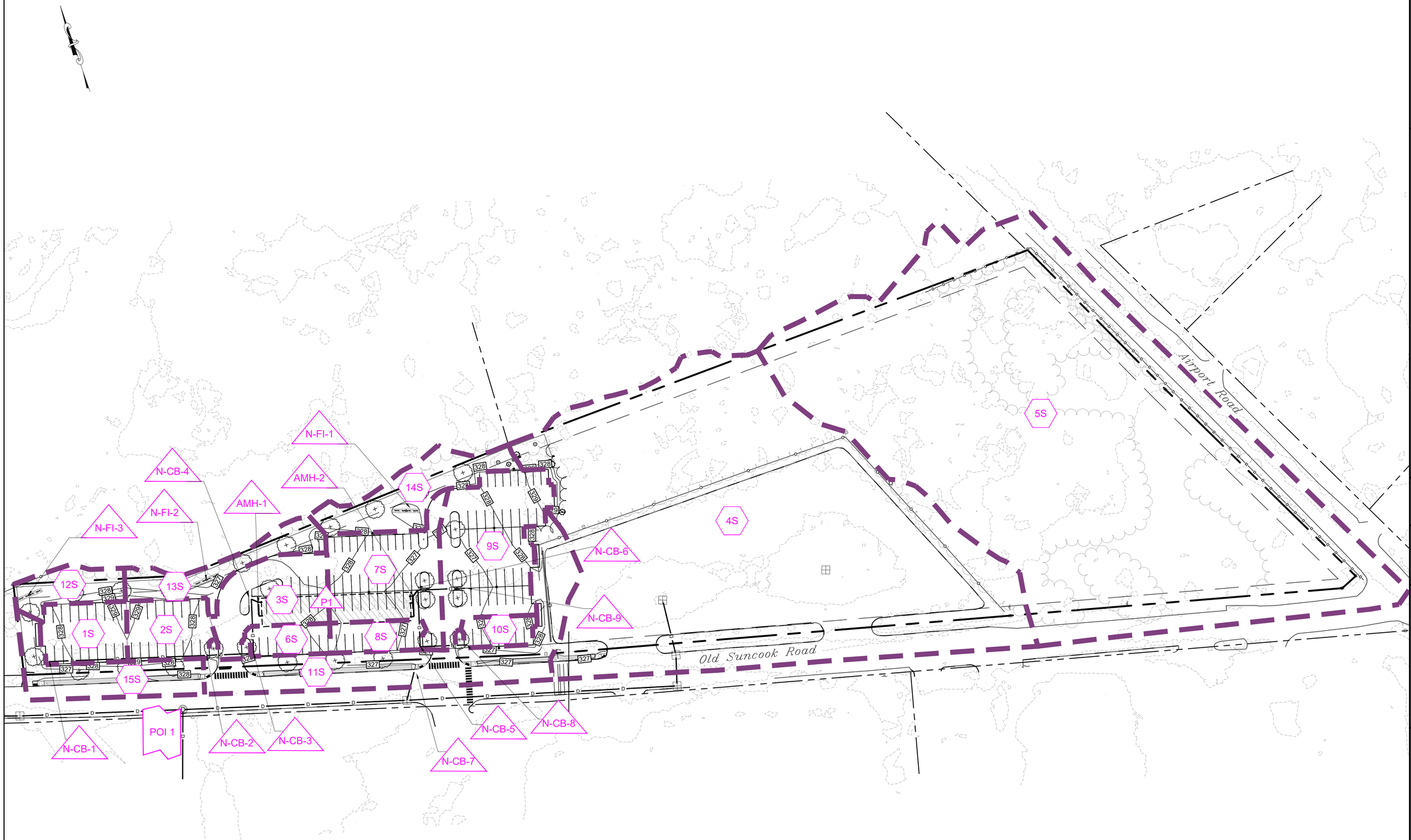
STATE OF NEW HAMPSHIRE – ERIN R. LAMBERT No. 11057 LICENSED PROFESSIONAL ENGINEER

ENGINEER: ERIN R. LAMBERT
NH P.E. #11057

SHEET NO.

SW1

01 OF 02



STORMWATER PLAN LEGEND

- SUBCATCHMENT NODE
- POND NODE
- REACH NODE
- POINT OF INTEREST NODE
- PRE-DEVELOPMENT SUBWATERSHED BOUNDARY
- PRE-DEVELOPMENT SUBWATERSHED TIME OF CONCENTRATION

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

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ISSUED FOR

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OWNER

DAVAL REALTY ASSOCIATES LLC / BANKS CHEVROLET

137 MANCHESTER ST CONCORD, NH 03301

SITE

BANKS CHEVROLET PARKING LOT RECONSTRUCTION

234 AIRPORT ROAD CONCORD, NH 03301

MBLU: 782/Z/8

DRAWING TITLE

POST-DEVELOPMENT WATERSHED PLAN

SCALE	DATE
1" = 50'	11/19/2025

DRAFTED BY	CHECKED BY	PROJECT MGR	PROJECT NO.
KAD	ERL	ERL	BACC0005

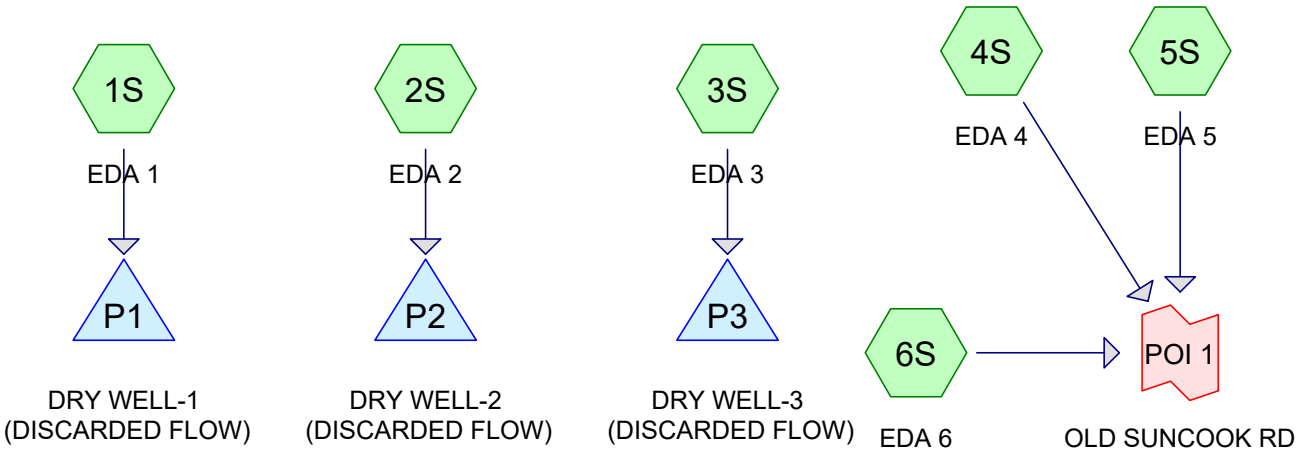
STATE OF NEW HAMPSHIRE – ERIN R. LAMBERT No. 11057 LICENSED PROFESSIONAL ENGINEER

ENGINEER: ERIN R. LAMBERT
NH P.E. #11057

SHEET NO.

SW2

02 OF 02



Subcat Reach Pond Link

Routing Diagram for PRE-DEVELOPMENT_BACC0005
Prepared by Wilcox & Barton, Inc, Printed 11/13/2025
HydroCAD® 10.20-7a s/n 08777 © 2025 HydroCAD Software Solutions LLC

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-yr	Type III 24-hr		Default	24.00	1	2.82	2

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
67,655	39	>75% Grass cover, Good, HSG A (1S, 2S, 3S, 4S, 5S, 6S)
995	98	EXISTING BUILDING (5S)
73,475	98	EXISTING COMPACTED GRAVEL (1S, 2S, 3S, 6S)
102,974	98	EXISTING PAVEMENT (1S, 3S, 4S, 5S, 6S)
129,932	30	Woods, Good, HSG A (1S, 2S, 3S, 4S, 5S)
375,031	**64**	**TOTAL AREA**

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
197,587	HSG A	1S, 2S, 3S, 4S, 5S, 6S
0	HSG B	
0	HSG C	
0	HSG D	
177,444	Other	1S, 2S, 3S, 4S, 5S, 6S
375,031		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover
67,655	0	0	0	0	67,655	>75% Grass cover, Good
0	0	0	0	995	995	EXISTING BUILDING
0	0	0	0	73,475	73,475	EXISTING COMPACTED GRAVEL
0	0	0	0	102,974	102,974	EXISTING PAVEMENT
129,932	0	0	0	0	129,932	Woods, Good
197,587	**0**	**0**	**0**	**177,444**	**375,031**	**TOTAL AREA**

Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: EDA 1 Runoff Area=35,720 sf 94.49% Impervious Runoff Depth=2.45"
Tc=5.0 min CN=WQ Runoff=2.13 cfs 7,282 cf

Subcatchment 2S: EDA 2 Runoff Area=12,068 sf 91.36% Impervious Runoff Depth=2.37"
Tc=5.0 min CN=WQ Runoff=0.69 cfs 2,379 cf

Subcatchment 3S: EDA 3 Runoff Area=30,665 sf 82.03% Impervious Runoff Depth=2.12"
Tc=5.0 min CN=WQ Runoff=1.59 cfs 5,427 cf

Subcatchment 4S: EDA 4 Runoff Area=120,594 sf 56.40% Impervious Runoff Depth=1.46"
Flow Length=222' Tc=20.3 min CN=WQ Runoff=2.88 cfs 14,674 cf

Subcatchment 5S: EDA 5 Runoff Area=152,846 sf 11.20% Impervious Runoff Depth=0.29"
Flow Length=310' Tc=30.7 min CN=WQ Runoff=0.61 cfs 3,692 cf

Subcatchment 6S: EDA 6 Runoff Area=23,138 sf 96.77% Impervious Runoff Depth=2.51"
Tc=5.0 min CN=WQ Runoff=1.41 cfs 4,831 cf

Pond P1: DRY WELL-1 (DISCARDED FLOW) Inflow=2.13 cfs 7,282 cf
Primary=2.13 cfs 7,282 cf

Pond P2: DRY WELL-2 (DISCARDED FLOW) Inflow=0.69 cfs 2,379 cf
Primary=0.69 cfs 2,379 cf

Pond P3: DRY WELL-3 (DISCARDED FLOW) Inflow=1.59 cfs 5,427 cf
Primary=1.59 cfs 5,427 cf

Link POI 1: OLD SUNCOOK RD Inflow=3.98 cfs 23,197 cf
Primary=3.98 cfs 23,197 cf

Total Runoff Area = 375,031 sf Runoff Volume = 38,284 cf Average Runoff Depth = 1.23"
52.69% Pervious = 197,587 sf 47.31% Impervious = 177,444 sf

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	10-yr	Type III 24-hr		Default	24.00	1	4.17	2

Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: EDA 1 Runoff Area=35,720 sf 94.49% Impervious Runoff Depth=3.72"
Tc=5.0 min CN=WQ Runoff=3.17 cfs 11,073 cf

Subcatchment 2S: EDA 2 Runoff Area=12,068 sf 91.36% Impervious Runoff Depth=3.60"
Tc=5.0 min CN=WQ Runoff=1.04 cfs 3,618 cf

Subcatchment 3S: EDA 3 Runoff Area=30,665 sf 82.03% Impervious Runoff Depth=3.23"
Tc=5.0 min CN=WQ Runoff=2.37 cfs 8,262 cf

Subcatchment 4S: EDA 4 Runoff Area=120,594 sf 56.40% Impervious Runoff Depth=2.23"
Flow Length=222' Tc=20.3 min CN=WQ Runoff=4.30 cfs 22,380 cf

Subcatchment 5S: EDA 5 Runoff Area=152,846 sf 11.20% Impervious Runoff Depth=0.46"
Flow Length=310' Tc=30.7 min CN=WQ Runoff=0.91 cfs 5,871 cf

Subcatchment 6S: EDA 6 Runoff Area=23,138 sf 96.77% Impervious Runoff Depth=3.81"
Tc=5.0 min CN=WQ Runoff=2.11 cfs 7,346 cf

Pond P1: DRY WELL-1 (DISCARDED FLOW) Inflow=3.17 cfs 11,073 cf
Primary=3.17 cfs 11,073 cf

Pond P2: DRY WELL-2 (DISCARDED FLOW) Inflow=1.04 cfs 3,618 cf
Primary=1.04 cfs 3,618 cf

Pond P3: DRY WELL-3 (DISCARDED FLOW) Inflow=2.37 cfs 8,262 cf
Primary=2.37 cfs 8,262 cf

Link POI 1: OLD SUNCOOK RD Inflow=5.94 cfs 35,596 cf
Primary=5.94 cfs 35,596 cf

Total Runoff Area = 375,031 sf Runoff Volume = 58,549 cf Average Runoff Depth = 1.87"
52.69% Pervious = 197,587 sf 47.31% Impervious = 177,444 sf

Summary for Subcatchment 1S: EDA 1

[49] Hint: Tc<2dt may require smaller dt

Runoff = 3.17 cfs @ 12.07 hrs, Volume= 11,073 cf, Depth= 3.72"
Routed to Pond P1 : DRY WELL-1 (DISCARDED FLOW)

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.17"

	Area (sf)	CN	Description
*	9,905	98	EXISTING PAVEMENT
*	23,847	98	EXISTING COMPACTED GRAVEL
	1,118	39	>75% Grass cover, Good, HSG A
	850	30	Woods, Good, HSG A
	35,720		Weighted Average
	1,968		5.51% Pervious Area
	33,752		94.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment 2S: EDA 2

[49] Hint: Tc<2dt may require smaller dt

Runoff = 1.04 cfs @ 12.07 hrs, Volume= 3,618 cf, Depth= 3.60"
Routed to Pond P2 : DRY WELL-2 (DISCARDED FLOW)

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.17"

	Area (sf)	CN	Description
*	11,025	98	EXISTING COMPACTED GRAVEL
	548	39	>75% Grass cover, Good, HSG A
	495	30	Woods, Good, HSG A
	12,068		Weighted Average
	1,043		8.64% Pervious Area
	11,025		91.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment 3S: EDA 3

[49] Hint: Tc<2dt may require smaller dt

Runoff = 2.37 cfs @ 12.07 hrs, Volume= 8,262 cf, Depth= 3.23"
Routed to Pond P3 : DRY WELL-3 (DISCARDED FLOW)

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.17"

	Area (sf)	CN	Description
*	1,762	98	EXISTING PAVEMENT
*	23,391	98	EXISTING COMPACTED GRAVEL
	2,717	39	>75% Grass cover, Good, HSG A
	2,795	30	Woods, Good, HSG A
	30,665		Weighted Average
	5,512		17.97% Pervious Area
	25,153		82.03% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment 4S: EDA 4

Runoff = 4.30 cfs @ 12.27 hrs, Volume= 22,380 cf, Depth= 2.23"
Routed to Link POI 1 : OLD SUNCOOK RD

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.17"

	Area (sf)	CN	Description
*	68,012	98	EXISTING PAVEMENT
	14,576	39	>75% Grass cover, Good, HSG A
	38,006	30	Woods, Good, HSG A
	120,594		Weighted Average
	52,582		43.60% Pervious Area
	68,012		56.40% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.3	50	0.0100	0.05		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.82"
2.3	70	0.0100	0.50		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.2	12	0.0150	0.86		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.5	90	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
20.3	222	Total			

Summary for Subcatchment 5S: EDA 5

Runoff = 0.91 cfs @ 12.40 hrs, Volume= 5,871 cf, Depth= 0.46"
Routed to Link POI 1 : OLD SUNCOOK RD

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.17"

	Area (sf)	CN	Description
*	16,117	98	EXISTING PAVEMENT
*	995	98	EXISTING BUILDING
	47,948	39	>75% Grass cover, Good, HSG A
	87,786	30	Woods, Good, HSG A
	152,846		Weighted Average
	135,734		88.80% Pervious Area
	17,112		11.20% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.0	50	0.0220	0.04		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 2.82"
8.7	260	0.0100	0.50		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
30.7	310	Total			

Summary for Subcatchment 6S: EDA 6

[49] Hint: Tc<2dt may require smaller dt

Runoff = 2.11 cfs @ 12.07 hrs, Volume= 7,346 cf, Depth= 3.81"
Routed to Link POI 1 : OLD SUNCOOK RD

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.17"

	Area (sf)	CN	Description
*	7,178	98	EXISTING PAVEMENT
*	15,212	98	EXISTING COMPACTED GRAVEL
	748	39	>75% Grass cover, Good, HSG A
	23,138		Weighted Average
	748		3.23% Pervious Area
	22,390		96.77% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Pond P1: DRY WELL-1 (DISCARDED FLOW)

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 35,720 sf, 94.49% Impervious, Inflow Depth = 3.72" for 10-yr event
Inflow = 3.17 cfs @ 12.07 hrs, Volume= 11,073 cf
Primary = 3.17 cfs @ 12.07 hrs, Volume= 11,073 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Summary for Pond P2: DRY WELL-2 (DISCARDED FLOW)

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 12,068 sf, 91.36% Impervious, Inflow Depth = 3.60" for 10-yr event
Inflow = 1.04 cfs @ 12.07 hrs, Volume= 3,618 cf
Primary = 1.04 cfs @ 12.07 hrs, Volume= 3,618 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Summary for Pond P3: DRY WELL-3 (DISCARDED FLOW)

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 30,665 sf, 82.03% Impervious, Inflow Depth = 3.23" for 10-yr event
Inflow = 2.37 cfs @ 12.07 hrs, Volume= 8,262 cf
Primary = 2.37 cfs @ 12.07 hrs, Volume= 8,262 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Summary for Link POI 1: OLD SUNCOOK RD

Inflow Area = 296,578 sf, 36.25% Impervious, Inflow Depth = 1.44" for 10-yr event
Inflow = 5.94 cfs @ 12.26 hrs, Volume= 35,596 cf
Primary = 5.94 cfs @ 12.26 hrs, Volume= 35,596 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	25-yr	Type III 24-hr		Default	24.00	1	5.22	2

Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: EDA 1 Runoff Area=35,720 sf 94.49% Impervious Runoff Depth=4.72"
Tc=5.0 min CN=WQ Runoff=3.98 cfs 14,039 cf

Subcatchment 2S: EDA 2 Runoff Area=12,068 sf 91.36% Impervious Runoff Depth=4.56"
Tc=5.0 min CN=WQ Runoff=1.30 cfs 4,590 cf

Subcatchment 3S: EDA 3 Runoff Area=30,665 sf 82.03% Impervious Runoff Depth=4.11"
Tc=5.0 min CN=WQ Runoff=2.97 cfs 10,503 cf

Subcatchment 4S: EDA 4 Runoff Area=120,594 sf 56.40% Impervious Runoff Depth=2.84"
Flow Length=222' Tc=20.3 min CN=WQ Runoff=5.40 cfs 28,581 cf

Subcatchment 5S: EDA 5 Runoff Area=152,846 sf 11.20% Impervious Runoff Depth=0.64"
Flow Length=310' Tc=30.7 min CN=WQ Runoff=1.14 cfs 8,185 cf

Subcatchment 6S: EDA 6 Runoff Area=23,138 sf 96.77% Impervious Runoff Depth=4.83"
Tc=5.0 min CN=WQ Runoff=2.64 cfs 9,313 cf

Pond P1: DRY WELL-1 (DISCARDED FLOW) Inflow=3.98 cfs 14,039 cf
Primary=3.98 cfs 14,039 cf

Pond P2: DRY WELL-2 (DISCARDED FLOW) Inflow=1.30 cfs 4,590 cf
Primary=1.30 cfs 4,590 cf

Pond P3: DRY WELL-3 (DISCARDED FLOW) Inflow=2.97 cfs 10,503 cf
Primary=2.97 cfs 10,503 cf

Link POI 1: OLD SUNCOOK RD Inflow=7.47 cfs 46,079 cf
Primary=7.47 cfs 46,079 cf

Total Runoff Area = 375,031 sf Runoff Volume = 75,211 cf Average Runoff Depth = 2.41"
52.69% Pervious = 197,587 sf 47.31% Impervious = 177,444 sf

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	50-yr	Type III 24-hr		Default	24.00	1	6.19	2

Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: EDA 1 Runoff Area=35,720 sf 94.49% Impervious Runoff Depth=5.64"
Tc=5.0 min CN=WQ Runoff=4.73 cfs 16,793 cf

Subcatchment 2S: EDA 2 Runoff Area=12,068 sf 91.36% Impervious Runoff Depth=5.46"
Tc=5.0 min CN=WQ Runoff=1.55 cfs 5,495 cf

Subcatchment 3S: EDA 3 Runoff Area=30,665 sf 82.03% Impervious Runoff Depth=4.93"
Tc=5.0 min CN=WQ Runoff=3.53 cfs 12,610 cf

Subcatchment 4S: EDA 4 Runoff Area=120,594 sf 56.40% Impervious Runoff Depth=3.45"
Flow Length=222' Tc=20.3 min CN=WQ Runoff=6.44 cfs 34,637 cf

Subcatchment 5S: EDA 5 Runoff Area=152,846 sf 11.20% Impervious Runoff Depth=0.88"
Flow Length=310' Tc=30.7 min CN=WQ Runoff=1.44 cfs 11,173 cf

Subcatchment 6S: EDA 6 Runoff Area=23,138 sf 96.77% Impervious Runoff Depth=5.78"
Tc=5.0 min CN=WQ Runoff=3.14 cfs 11,136 cf

Pond P1: DRY WELL-1 (DISCARDED FLOW) Inflow=4.73 cfs 16,793 cf
Primary=4.73 cfs 16,793 cf

Pond P2: DRY WELL-2 (DISCARDED FLOW) Inflow=1.55 cfs 5,495 cf
Primary=1.55 cfs 5,495 cf

Pond P3: DRY WELL-3 (DISCARDED FLOW) Inflow=3.53 cfs 12,610 cf
Primary=3.53 cfs 12,610 cf

Link POI 1: OLD SUNCOOK RD Inflow=8.91 cfs 56,945 cf
Primary=8.91 cfs 56,945 cf

Total Runoff Area = 375,031 sf Runoff Volume = 91,844 cf Average Runoff Depth = 2.94"
52.69% Pervious = 197,587 sf 47.31% Impervious = 177,444 sf

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	100-yr	Type III 24-hr		Default	24.00	1	7.34	2

Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: EDA 1 Runoff Area=35,720 sf 94.49% Impervious Runoff Depth=6.74"
Tc=5.0 min CN=WQ Runoff=5.63 cfs 20,074 cf

Subcatchment 2S: EDA 2 Runoff Area=12,068 sf 91.36% Impervious Runoff Depth=6.54"
Tc=5.0 min CN=WQ Runoff=1.84 cfs 6,576 cf

Subcatchment 3S: EDA 3 Runoff Area=30,665 sf 82.03% Impervious Runoff Depth=5.93"
Tc=5.0 min CN=WQ Runoff=4.21 cfs 15,150 cf

Subcatchment 4S: EDA 4 Runoff Area=120,594 sf 56.40% Impervious Runoff Depth=4.20"
Flow Length=222' Tc=20.3 min CN=WQ Runoff=7.72 cfs 42,200 cf

Subcatchment 5S: EDA 5 Runoff Area=152,846 sf 11.20% Impervious Runoff Depth=1.23"
Flow Length=310' Tc=30.7 min CN=WQ Runoff=1.93 cfs 15,706 cf

Subcatchment 6S: EDA 6 Runoff Area=23,138 sf 96.77% Impervious Runoff Depth=6.90"
Tc=5.0 min CN=WQ Runoff=3.73 cfs 13,304 cf

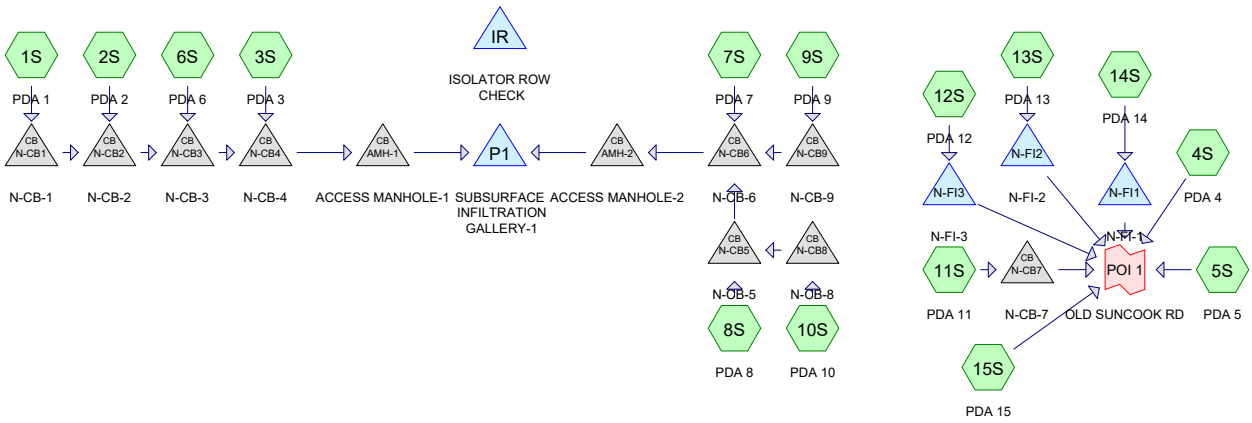
Pond P1: DRY WELL-1 (DISCARDED FLOW) Inflow=5.63 cfs 20,074 cf
Primary=5.63 cfs 20,074 cf

Pond P2: DRY WELL-2 (DISCARDED FLOW) Inflow=1.84 cfs 6,576 cf
Primary=1.84 cfs 6,576 cf

Pond P3: DRY WELL-3 (DISCARDED FLOW) Inflow=4.21 cfs 15,150 cf
Primary=4.21 cfs 15,150 cf

Link POI 1: OLD SUNCOOK RD Inflow=10.77 cfs 71,210 cf
Primary=10.77 cfs 71,210 cf

Total Runoff Area = 375,031 sf Runoff Volume = 113,011 cf Average Runoff Depth = 3.62"
52.69% Pervious = 197,587 sf 47.31% Impervious = 177,444 sf



Subcat Reach Pond Link

Routing Diagram for POST-DEVELOPMENT_BACC0005
Prepared by Wilcox & Barton, Inc, Printed 2/17/2026
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Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-yr	Type III 24-hr		Default	24.00	1	2.82	2

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
91,657	39	>75% Grass cover, Good, HSG A (4S, 5S, 11S, 12S, 13S, 14S, 15S)
995	98	EXISTING BUILDING (5S)
96,535	98	EXISTING PAVEMENT (4S, 5S, 11S, 15S)
55,749	98	PROPOSED PARKING LOT (1S, 2S, 3S, 6S, 7S, 8S, 9S, 10S)
2,572	98	PROPOSED SIDEWALK (4S, 11S, 15S)
127,523	30	Woods, Good, HSG A (4S, 5S, 12S, 13S, 14S)
375,031	**60**	**TOTAL AREA**

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
219,180	HSG A	4S, 5S, 11S, 12S, 13S, 14S, 15S
0	HSG B	
0	HSG C	
0	HSG D	
155,851	Other	1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S, 9S, 10S, 11S, 15S
375,031		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover
91,657	0	0	0	0	91,657	>75% Grass cover, Good
0	0	0	0	995	995	EXISTING BUILDING
0	0	0	0	96,535	96,535	EXISTING PAVEMENT
0	0	0	0	55,749	55,749	PROPOSED PARKING LOT
0	0	0	0	2,572	2,572	PROPOSED SIDEWALK
127,523	0	0	0	0	127,523	Woods, Good
219,180	**0**	**0**	**0**	**155,851**	**375,031**	**TOTAL AREA**

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)	Node Name
1	AMH-1	319.29	319.29	4.0	0.0000	0.012	0.0	24.0	0.0	
2	AMH-2	319.29	319.29	4.0	0.0000	0.012	0.0	24.0	0.0	
3	N-CB1	323.63	322.82	162.0	0.0050	0.012	0.0	12.0	0.0	
4	N-CB2	322.72	322.50	45.0	0.0049	0.012	0.0	12.0	0.0	
5	N-CB3	322.40	322.14	53.0	0.0049	0.012	0.0	12.0	0.0	
6	N-CB4	321.89	321.87	4.0	0.0050	0.012	0.0	15.0	0.0	
7	N-CB5	322.17	321.90	55.0	0.0049	0.012	0.0	12.0	0.0	
8	N-CB6	321.40	321.37	4.0	0.0075	0.012	0.0	18.0	0.0	
9	N-CB7	322.70	322.40	27.0	0.0111	0.012	0.0	12.0	0.0	
10	N-CB8	322.50	322.27	45.0	0.0051	0.012	0.0	12.0	0.0	
11	N-CB9	322.41	322.19	45.0	0.0049	0.012	0.0	12.0	0.0	

Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: PDA 1 Runoff Area=5,546 sf 100.00% Impervious Runoff Depth=2.59"
Tc=5.0 min CN=98 Runoff=0.35 cfs 1,197 cf

Subcatchment2S: PDA 2 Runoff Area=5,524 sf 100.00% Impervious Runoff Depth=2.59"
Tc=5.0 min CN=98 Runoff=0.35 cfs 1,192 cf

Subcatchment3S: PDA 3 Runoff Area=8,829 sf 100.00% Impervious Runoff Depth=2.59"
Tc=5.0 min CN=98 Runoff=0.56 cfs 1,905 cf

Subcatchment4S: PDA 4 Runoff Area=119,868 sf 56.98% Impervious Runoff Depth=1.48"
Flow Length=222' Tc=20.3 min CN=WQ Runoff=2.89 cfs 14,737 cf

Subcatchment5S: PDA 5 Runoff Area=152,846 sf 11.20% Impervious Runoff Depth=0.29"
Flow Length=310' Tc=30.7 min CN=WQ Runoff=0.61 cfs 3,692 cf

Subcatchment6S: PDA 6 Runoff Area=2,702 sf 100.00% Impervious Runoff Depth=2.59"
Tc=5.0 min CN=98 Runoff=0.17 cfs 583 cf

Subcatchment7S: PDA 7 Runoff Area=12,362 sf 100.00% Impervious Runoff Depth=2.59"
Tc=5.0 min CN=98 Runoff=0.78 cfs 2,667 cf

Subcatchment8S: PDA 8 Runoff Area=3,084 sf 100.00% Impervious Runoff Depth=2.59"
Tc=5.0 min CN=98 Runoff=0.19 cfs 665 cf

Subcatchment9S: PDA 9 Runoff Area=15,358 sf 100.00% Impervious Runoff Depth=2.59"
Tc=5.0 min CN=98 Runoff=0.97 cfs 3,314 cf

Subcatchment10S: PDA 10 Runoff Area=2,344 sf 100.00% Impervious Runoff Depth=2.59"
Tc=5.0 min CN=98 Runoff=0.15 cfs 506 cf

Subcatchment11S: PDA 11 Runoff Area=19,491 sf 56.05% Impervious Runoff Depth=1.45"
Tc=5.0 min CN=WQ Runoff=0.69 cfs 2,357 cf

Subcatchment12S: PDA 12 Runoff Area=4,276 sf 0.00% Impervious Runoff Depth=0.00"
Tc=5.0 min CN=WQ Runoff=0.00 cfs 0 cf

Subcatchment13S: PDA 13 Runoff Area=6,170 sf 0.00% Impervious Runoff Depth=0.00"
Tc=5.0 min CN=WQ Runoff=0.00 cfs 0 cf

Subcatchment14S: PDA 14 Runoff Area=8,434 sf 0.00% Impervious Runoff Depth=0.00"
Tc=5.0 min CN=WQ Runoff=0.00 cfs 0 cf

Subcatchment15S: PDA 15 Runoff Area=8,197 sf 45.88% Impervious Runoff Depth=1.19"
Tc=5.0 min CN=WQ Runoff=0.24 cfs 811 cf

Pond AMH-1: ACCESS MANHOLE-1 Peak Elev=319.92' Inflow=1.42 cfs 4,876 cf
24.0" Round Culvert n=0.012 L=4.0' S=0.0000 '/' Outflow=1.42 cfs 4,876 cf

Pond AMH-2: ACCESS MANHOLE-2 Peak Elev=320.06' Inflow=2.09 cfs 7,152 cf
24.0" Round Culvert n=0.012 L=4.0' S=0.0000 '/' Outflow=2.09 cfs 7,152 cf

Pond IR: ISOLATOR ROW CHECK Peak Elev=0.00' Storage=0 cf
Discarded=0.00 cfs 0 cf

Pond N-CB1: N-CB-1 Peak Elev=323.97' Inflow=0.35 cfs 1,197 cf
12.0" Round Culvert n=0.012 L=162.0' S=0.0050 '/' Outflow=0.35 cfs 1,197 cf

Pond N-CB2: N-CB-2 Peak Elev=323.23' Inflow=0.70 cfs 2,388 cf
12.0" Round Culvert n=0.012 L=45.0' S=0.0049 '/' Outflow=0.70 cfs 2,388 cf

Pond N-CB3: N-CB-3 Peak Elev=322.96' Inflow=0.87 cfs 2,971 cf
12.0" Round Culvert n=0.012 L=53.0' S=0.0049 '/' Outflow=0.87 cfs 2,971 cf

Pond N-CB4: N-CB-4 Peak Elev=322.61' Inflow=1.42 cfs 4,876 cf
15.0" Round Culvert n=0.012 L=4.0' S=0.0050 '/' Outflow=1.42 cfs 4,876 cf

Pond N-CB5: N-CB-5 Peak Elev=322.51' Inflow=0.34 cfs 1,171 cf
12.0" Round Culvert n=0.012 L=55.0' S=0.0049 '/' Outflow=0.34 cfs 1,171 cf

Pond N-CB6: N-CB-6 Peak Elev=322.22' Inflow=2.09 cfs 7,152 cf
18.0" Round Culvert n=0.012 L=4.0' S=0.0075 '/' Outflow=2.09 cfs 7,152 cf

Pond N-CB7: N-CB-7 Peak Elev=323.13' Inflow=0.69 cfs 2,357 cf
12.0" Round Culvert n=0.012 L=27.0' S=0.0111 '/' Outflow=0.69 cfs 2,357 cf

Pond N-CB8: N-CB-8 Peak Elev=322.72' Inflow=0.15 cfs 506 cf
12.0" Round Culvert n=0.012 L=45.0' S=0.0051 '/' Outflow=0.15 cfs 506 cf

Pond N-CB9: N-CB-9 Peak Elev=323.00' Inflow=0.97 cfs 3,314 cf
12.0" Round Culvert n=0.012 L=45.0' S=0.0049 '/' Outflow=0.97 cfs 3,314 cf

Pond N-FI1: N-FI-1 Peak Elev=322.15' Storage=0 cf Inflow=0.00 cfs 0 cf
Discarded=0.00 cfs 0 cf Primary=0.00 cfs 0 cf Outflow=0.00 cfs 0 cf

Pond N-FI2: N-FI-2 Peak Elev=322.35' Storage=0 cf Inflow=0.00 cfs 0 cf
Discarded=0.00 cfs 0 cf Primary=0.00 cfs 0 cf Outflow=0.00 cfs 0 cf

Pond N-FI3: N-FI-3 Peak Elev=322.45' Storage=0 cf Inflow=0.00 cfs 0 cf
Discarded=0.00 cfs 0 cf Primary=0.00 cfs 0 cf Outflow=0.00 cfs 0 cf

Pond P1: SUBSURFACE INFILTRATION Peak Elev=319.78' Storage=4,017 cf Inflow=3.51 cfs 12,028 cf
Outflow=0.36 cfs 12,050 cf

Link POI 1: OLD SUNCOOK RD Inflow=3.80 cfs 21,598 cf
Primary=3.80 cfs 21,598 cf

Total Runoff Area = 375,031 sf Runoff Volume = 33,626 cf Average Runoff Depth = 1.08"
58.44% Pervious = 219,180 sf 41.56% Impervious = 155,851 sf

Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: PDA 1 Runoff Area=5,546 sf 100.00% Impervious Runoff Depth=3.93"
Tc=5.0 min CN=98 Runoff=0.52 cfs 1,818 cf

Subcatchment2S: PDA 2 Runoff Area=5,524 sf 100.00% Impervious Runoff Depth=3.93"
Tc=5.0 min CN=98 Runoff=0.52 cfs 1,811 cf

Subcatchment3S: PDA 3 Runoff Area=8,829 sf 100.00% Impervious Runoff Depth=3.93"
Tc=5.0 min CN=98 Runoff=0.83 cfs 2,895 cf

Subcatchment4S: PDA 4 Runoff Area=119,868 sf 56.98% Impervious Runoff Depth=2.25"
Flow Length=222' Tc=20.3 min CN=WQ Runoff=4.32 cfs 22,474 cf

Subcatchment5S: PDA 5 Runoff Area=152,846 sf 11.20% Impervious Runoff Depth=0.46"
Flow Length=310' Tc=30.7 min CN=WQ Runoff=0.91 cfs 5,871 cf

Subcatchment6S: PDA 6 Runoff Area=2,702 sf 100.00% Impervious Runoff Depth=3.93"
Tc=5.0 min CN=98 Runoff=0.25 cfs 886 cf

Subcatchment7S: PDA 7 Runoff Area=12,362 sf 100.00% Impervious Runoff Depth=3.93"
Tc=5.0 min CN=98 Runoff=1.16 cfs 4,053 cf

Subcatchment8S: PDA 8 Runoff Area=3,084 sf 100.00% Impervious Runoff Depth=3.93"
Tc=5.0 min CN=98 Runoff=0.29 cfs 1,011 cf

Subcatchment9S: PDA 9 Runoff Area=15,358 sf 100.00% Impervious Runoff Depth=3.93"
Tc=5.0 min CN=98 Runoff=1.44 cfs 5,036 cf

Subcatchment10S: PDA 10 Runoff Area=2,344 sf 100.00% Impervious Runoff Depth=3.93"
Tc=5.0 min CN=98 Runoff=0.22 cfs 769 cf

Subcatchment11S: PDA 11 Runoff Area=19,491 sf 56.05% Impervious Runoff Depth=2.23"
Tc=5.0 min CN=WQ Runoff=1.03 cfs 3,629 cf

Subcatchment12S: PDA 12 Runoff Area=4,276 sf 0.00% Impervious Runoff Depth=0.06"
Tc=5.0 min CN=WQ Runoff=0.00 cfs 21 cf

Subcatchment13S: PDA 13 Runoff Area=6,170 sf 0.00% Impervious Runoff Depth=0.06"
Tc=5.0 min CN=WQ Runoff=0.00 cfs 29 cf

Subcatchment14S: PDA 14 Runoff Area=8,434 sf 0.00% Impervious Runoff Depth=0.05"
Tc=5.0 min CN=WQ Runoff=0.00 cfs 39 cf

Subcatchment15S: PDA 15 Runoff Area=8,197 sf 45.88% Impervious Runoff Depth=1.84"
Tc=5.0 min CN=WQ Runoff=0.35 cfs 1,257 cf

Pond AMH-1: ACCESS MANHOLE-1 Peak Elev=320.58' Inflow=2.13 cfs 7,411 cf
24.0" Round Culvert n=0.012 L=4.0' S=0.0000 '/' Outflow=2.13 cfs 7,411 cf

Pond AMH-2: ACCESS MANHOLE-2 Peak Elev=320.58' Inflow=3.12 cfs 10,869 cf
24.0" Round Culvert n=0.012 L=4.0' S=0.0000 '/' Outflow=3.12 cfs 10,869 cf

Pond IR: ISOLATOR ROW CHECK Peak Elev=0.00' Storage=0 cf
Discarded=0.00 cfs 0 cf

Pond N-CB1: N-CB-1 Peak Elev=324.05' Inflow=0.52 cfs 1,818 cf
12.0" Round Culvert n=0.012 L=162.0' S=0.0050 '/' Outflow=0.52 cfs 1,818 cf

Pond N-CB2: N-CB-2 Peak Elev=323.37' Inflow=1.04 cfs 3,630 cf
12.0" Round Culvert n=0.012 L=45.0' S=0.0049 '/' Outflow=1.04 cfs 3,630 cf

Pond N-CB3: N-CB-3 Peak Elev=323.13' Inflow=1.29 cfs 4,516 cf
12.0" Round Culvert n=0.012 L=53.0' S=0.0049 '/' Outflow=1.29 cfs 4,516 cf

Pond N-CB4: N-CB-4 Peak Elev=322.79' Inflow=2.13 cfs 7,411 cf
15.0" Round Culvert n=0.012 L=4.0' S=0.0050 '/' Outflow=2.13 cfs 7,411 cf

Pond N-CB5: N-CB-5 Peak Elev=322.63' Inflow=0.51 cfs 1,780 cf
12.0" Round Culvert n=0.012 L=55.0' S=0.0049 '/' Outflow=0.51 cfs 1,780 cf

Pond N-CB6: N-CB-6 Peak Elev=322.42' Inflow=3.12 cfs 10,869 cf
18.0" Round Culvert n=0.012 L=4.0' S=0.0075 '/' Outflow=3.12 cfs 10,869 cf

Pond N-CB7: N-CB-7 Peak Elev=323.24' Inflow=1.03 cfs 3,629 cf
12.0" Round Culvert n=0.012 L=27.0' S=0.0111 '/' Outflow=1.03 cfs 3,629 cf

Pond N-CB8: N-CB-8 Peak Elev=322.78' Inflow=0.22 cfs 769 cf
12.0" Round Culvert n=0.012 L=45.0' S=0.0051 '/' Outflow=0.22 cfs 769 cf

Pond N-CB9: N-CB-9 Peak Elev=323.16' Inflow=1.44 cfs 5,036 cf
12.0" Round Culvert n=0.012 L=45.0' S=0.0049 '/' Outflow=1.44 cfs 5,036 cf

Pond N-FI1: N-FI-1 Peak Elev=322.15' Storage=0 cf Inflow=0.00 cfs 39 cf
Discarded=0.00 cfs 39 cf Primary=0.00 cfs 0 cf Outflow=0.00 cfs 39 cf

Pond N-FI2: N-FI-2 Peak Elev=322.35' Storage=0 cf Inflow=0.00 cfs 29 cf
Discarded=0.00 cfs 29 cf Primary=0.00 cfs 0 cf Outflow=0.00 cfs 29 cf

Pond N-FI3: N-FI-3 Peak Elev=322.45' Storage=0 cf Inflow=0.00 cfs 21 cf
Discarded=0.00 cfs 21 cf Primary=0.00 cfs 0 cf Outflow=0.00 cfs 21 cf

Pond P1: SUBSURFACE INFILTRATION Peak Elev=320.58' Storage=7,071 cf Inflow=5.24 cfs 18,280 cf
Outflow=0.38 cfs 18,284 cf

Link POI 1: OLD SUNCOOK RD Inflow=5.67 cfs 33,231 cf
Primary=5.67 cfs 33,231 cf

Total Runoff Area = 375,031 sf Runoff Volume = 51,599 cf Average Runoff Depth = 1.65"
58.44% Pervious = 219,180 sf 41.56% Impervious = 155,851 sf

Summary for Subcatchment 1S: PDA 1

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.52 cfs @ 12.07 hrs, Volume= 1,818 cf, Depth= 3.93"
Routed to Pond N-CB1 : N-CB-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.17"

	Area (sf)	CN	Description
*	5,546	98	PROPOSED PARKING LOT
	5,546		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment 2S: PDA 2

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.52 cfs @ 12.07 hrs, Volume= 1,811 cf, Depth= 3.93"
Routed to Pond N-CB2 : N-CB-2

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.17"

	Area (sf)	CN	Description
*	5,524	98	PROPOSED PARKING LOT
	5,524		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment 3S: PDA 3

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.83 cfs @ 12.07 hrs, Volume= 2,895 cf, Depth= 3.93"
Routed to Pond N-CB4 : N-CB-4

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.17"

	Area (sf)	CN	Description
*	8,829	98	PROPOSED PARKING LOT
	8,829		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment 4S: PDA 4

Runoff = 4.32 cfs @ 12.27 hrs, Volume= 22,474 cf, Depth= 2.25"
Routed to Link POI 1 : OLD SUNCOOK RD

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.17"

	Area (sf)	CN	Description
*	68,012	98	EXISTING PAVEMENT
*	292	98	PROPOSED SIDEWALK
	14,284	39	>75% Grass cover, Good, HSG A
	37,280	30	Woods, Good, HSG A
	119,868		Weighted Average
	51,564		43.02% Pervious Area
	68,304		56.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.3	50	0.0100	0.05		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.82"
2.3	70	0.0100	0.50		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.2	12	0.0150	0.86		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.5	90	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
20.3	222	Total			

Summary for Subcatchment 5S: PDA 5

Runoff = 0.91 cfs @ 12.40 hrs, Volume= 5,871 cf, Depth= 0.46"
Routed to Link POI 1 : OLD SUNCOOK RD

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.17"

	Area (sf)	CN	Description
*	16,117	98	EXISTING PAVEMENT
*	995	98	EXISTING BUILDING
	47,948	39	>75% Grass cover, Good, HSG A
	87,786	30	Woods, Good, HSG A
	152,846		Weighted Average
	135,734		88.80% Pervious Area
	17,112		11.20% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.0	50	0.0220	0.04		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 2.82"
8.7	260	0.0100	0.50		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
30.7	310	Total			

Summary for Subcatchment 6S: PDA 6

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.25 cfs @ 12.07 hrs, Volume= 886 cf, Depth= 3.93"
Routed to Pond N-CB3 : N-CB-3

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.17"

	Area (sf)	CN	Description
*	2,702	98	PROPOSED PARKING LOT
	2,702		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment 7S: PDA 7

[49] Hint: Tc<2dt may require smaller dt

Runoff = 1.16 cfs @ 12.07 hrs, Volume= 4,053 cf, Depth= 3.93"
Routed to Pond N-CB6 : N-CB-6

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.17"

	Area (sf)	CN	Description
*	12,362	98	PROPOSED PARKING LOT
	12,362		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment 8S: PDA 8

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.29 cfs @ 12.07 hrs, Volume= 1,011 cf, Depth= 3.93"
Routed to Pond N-CB5 : N-CB-5

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.17"

	Area (sf)	CN	Description
*	3,084	98	PROPOSED PARKING LOT
	3,084		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment 9S: PDA 9

[49] Hint: Tc<2dt may require smaller dt

Runoff = 1.44 cfs @ 12.07 hrs, Volume= 5,036 cf, Depth= 3.93"
Routed to Pond N-CB9 : N-CB-9

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.17"

	Area (sf)	CN	Description
*	15,358	98	PROPOSED PARKING LOT
	15,358		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment 10S: PDA 10

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.22 cfs @ 12.07 hrs, Volume= 769 cf, Depth= 3.93"
Routed to Pond N-CB8 : N-CB-8

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.17"

	Area (sf)	CN	Description
*	2,344	98	PROPOSED PARKING LOT
	2,344		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment 11S: PDA 11

[49] Hint: Tc<2dt may require smaller dt

Runoff = 1.03 cfs @ 12.07 hrs, Volume= 3,629 cf, Depth= 2.23"
Routed to Pond N-CB7 : N-CB-7

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.17"

	Area (sf)	CN	Description
*	9,543	98	EXISTING PAVEMENT
*	1,382	98	PROPOSED SIDEWALK
	8,566	39	>75% Grass cover, Good, HSG A
	19,491		Weighted Average
	8,566		43.95% Pervious Area
	10,925		56.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment 12S: PDA 12

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.00 cfs @ 15.20 hrs, Volume= 21 cf, Depth= 0.06"
Routed to Pond N-FI3 : N-FI-3

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.17"

Area (sf)	CN	Description
376	30	Woods, Good, HSG A
3,900	39	>75% Grass cover, Good, HSG A
4,276		Weighted Average
4,276		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment 13S: PDA 13

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.00 cfs @ 15.20 hrs, Volume= 29 cf, Depth= 0.06"
Routed to Pond N-FI2 : N-FI-2

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.17"

Area (sf)	CN	Description
765	30	Woods, Good, HSG A
5,405	39	>75% Grass cover, Good, HSG A
6,170		Weighted Average
6,170		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment 14S: PDA 14

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.00 cfs @ 15.20 hrs, Volume= 39 cf, Depth= 0.05"
Routed to Pond N-FI1 : N-FI-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.17"

Area (sf)	CN	Description
1,316	30	Woods, Good, HSG A
7,118	39	>75% Grass cover, Good, HSG A
8,434		Weighted Average
8,434		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment 15S: PDA 15

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.35 cfs @ 12.07 hrs, Volume= 1,257 cf, Depth= 1.84"
Routed to Link POI 1 : OLD SUNCOOK RD

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.17"

	Area (sf)	CN	Description
*	2,863	98	EXISTING PAVEMENT
*	898	98	PROPOSED SIDEWALK
	4,436	39	>75% Grass cover, Good, HSG A
	8,197		Weighted Average
	4,436		54.12% Pervious Area
	3,761		45.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Pond AMH-1: ACCESS MANHOLE-1

Inflow Area = 22,601 sf,100.00% Impervious, Inflow Depth = 3.93" for 10-yr event
Inflow = 2.13 cfs @ 12.07 hrs, Volume= 7,411 cf
Outflow = 2.13 cfs @ 12.07 hrs, Volume= 7,411 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.13 cfs @ 12.07 hrs, Volume= 7,411 cf
Routed to Pond P1 : SUBSURFACE INFILTRATION GALLERY-1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 320.58' @ 13.21 hrs
Flood Elev= 327.52'

Device	Routing	Invert	Outlet Devices
#1	Primary	319.29'	**24.0" Round Culvert** L= 4.0' Ke= 0.500 Inlet / Outlet Invert= 319.29' / 319.29' S= 0.0000 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf

Primary OutFlow Max=2.05 cfs @ 12.07 hrs HW=320.05' TW=319.65' (Dynamic Tailwater)
1=Culvert (Barrel Controls 2.05 cfs @ 2.78 fps)

Summary for Pond AMH-2: ACCESS MANHOLE-2

Inflow Area = 33,148 sf,100.00% Impervious, Inflow Depth = 3.93" for 10-yr event
Inflow = 3.12 cfs @ 12.07 hrs, Volume= 10,869 cf
Outflow = 3.12 cfs @ 12.07 hrs, Volume= 10,869 cf, Atten= 0%, Lag= 0.0 min
Primary = 3.12 cfs @ 12.07 hrs, Volume= 10,869 cf
Routed to Pond P1 : SUBSURFACE INFILTRATION GALLERY-1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 320.58' @ 13.21 hrs
Flood Elev= 326.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	319.29'	**24.0" Round Culvert** L= 4.0' Ke= 0.500 Inlet / Outlet Invert= 319.29' / 319.29' S= 0.0000 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf

Primary OutFlow Max=3.00 cfs @ 12.07 hrs HW=320.22' TW=319.65' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 3.00 cfs @ 3.09 fps)

Summary for Pond IR: ISOLATOR ROW CHECK

[43] Hint: Has no inflow (Outflow=Zero)

Volume	Invert	Avail.Storage	Storage Description
#1A	318.37'	1,958 cf	**8.42'W x 156.27'L x 5.50'H Field A** 7,234 cf Overall - 2,339 cf Embedded = 4,895 cf x 40.0% Voids
#2A	319.12'	2,339 cf	**ADS_StormTech MC-3500 d +Cap**x 21 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap Cap Storage= 14.9 cf x 2 x 1 rows = 29.8 cf
		4,297 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	318.37'	**3.000 in/hr Exfiltration over Wetted area**

Discarded OutFlow Max=0.00 cfs @ 0.00 hrs HW=0.00' (Free Discharge)
↑—**1=Exfiltration** (Controls 0.00 cfs)

Summary for Pond N-CB1: N-CB-1

Inflow Area = 5,546 sf,100.00% Impervious, Inflow Depth = 3.93" for 10-yr event
Inflow = 0.52 cfs @ 12.07 hrs, Volume= 1,818 cf
Outflow = 0.52 cfs @ 12.07 hrs, Volume= 1,818 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.52 cfs @ 12.07 hrs, Volume= 1,818 cf
Routed to Pond N-CB2 : N-CB-2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 324.05' @ 12.08 hrs
Flood Elev= 327.63'

Device	Routing	Invert	Outlet Devices
#1	Primary	323.63'	**12.0" Round Culvert** L= 162.0' Ke= 0.500 Inlet / Outlet Invert= 323.63' / 322.82' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.48 cfs @ 12.07 hrs HW=324.04' TW=323.35' (Dynamic Tailwater)
└**1=Culvert** (Outlet Controls 0.48 cfs @ 2.30 fps)

Summary for Pond N-CB2: N-CB-2

Inflow Area = 11,070 sf,100.00% Impervious, Inflow Depth = 3.93" for 10-yr event
Inflow = 1.04 cfs @ 12.07 hrs, Volume= 3,630 cf
Outflow = 1.04 cfs @ 12.07 hrs, Volume= 3,630 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.04 cfs @ 12.07 hrs, Volume= 3,630 cf
Routed to Pond N-CB3 : N-CB-3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 323.37' @ 12.10 hrs
Flood Elev= 327.63'

Device	Routing	Invert	Outlet Devices
#1	Primary	322.72'	**12.0" Round Culvert** L= 45.0' Ke= 0.500 Inlet / Outlet Invert= 322.72' / 322.50' S= 0.0049 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.87 cfs @ 12.07 hrs HW=323.35' TW=323.10' (Dynamic Tailwater)
└**1=Culvert** (Outlet Controls 0.87 cfs @ 2.39 fps)

Summary for Pond N-CB3: N-CB-3

Inflow Area = 13,772 sf,100.00% Impervious, Inflow Depth = 3.93" for 10-yr event
Inflow = 1.29 cfs @ 12.07 hrs, Volume= 4,516 cf
Outflow = 1.29 cfs @ 12.07 hrs, Volume= 4,516 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.29 cfs @ 12.07 hrs, Volume= 4,516 cf
Routed to Pond N-CB4 : N-CB-4

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 323.13' @ 12.09 hrs
Flood Elev= 327.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	322.40'	**12.0" Round Culvert** L= 53.0' Ke= 0.500 Inlet / Outlet Invert= 322.40' / 322.14' S= 0.0049 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=1.15 cfs @ 12.07 hrs HW=323.10' TW=322.77' (Dynamic Tailwater)
└**1=Culvert** (Outlet Controls 1.15 cfs @ 2.74 fps)

Summary for Pond N-CB4: N-CB-4

Inflow Area = 22,601 sf,100.00% Impervious, Inflow Depth = 3.93" for 10-yr event
Inflow = 2.13 cfs @ 12.07 hrs, Volume= 7,411 cf
Outflow = 2.13 cfs @ 12.07 hrs, Volume= 7,411 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.13 cfs @ 12.07 hrs, Volume= 7,411 cf
Routed to Pond AMH-1 : ACCESS MANHOLE-1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 322.79' @ 12.07 hrs
Flood Elev= 327.34'

Device	Routing	Invert	Outlet Devices
#1	Primary	321.89'	**15.0" Round Culvert** L= 4.0' Ke= 0.500 Inlet / Outlet Invert= 321.89' / 321.87' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=2.05 cfs @ 12.07 hrs HW=322.77' TW=320.05' (Dynamic Tailwater)
↑**1=Culvert** (Barrel Controls 2.05 cfs @ 3.13 fps)

Summary for Pond N-CB5: N-CB-5

Inflow Area = 5,428 sf,100.00% Impervious, Inflow Depth = 3.93" for 10-yr event
Inflow = 0.51 cfs @ 12.07 hrs, Volume= 1,780 cf
Outflow = 0.51 cfs @ 12.07 hrs, Volume= 1,780 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.51 cfs @ 12.07 hrs, Volume= 1,780 cf
Routed to Pond N-CB6 : N-CB-6

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 322.63' @ 12.10 hrs
Flood Elev= 326.65'

Device	Routing	Invert	Outlet Devices
#1	Primary	322.17'	**12.0" Round Culvert** L= 55.0' Ke= 0.500 Inlet / Outlet Invert= 322.17' / 321.90' S= 0.0049 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.41 cfs @ 12.07 hrs HW=322.60' TW=322.40' (Dynamic Tailwater)
↑**1=Culvert** (Outlet Controls 0.41 cfs @ 1.86 fps)

Summary for Pond N-CB6: N-CB-6

Inflow Area = 33,148 sf,100.00% Impervious, Inflow Depth = 3.93" for 10-yr event
Inflow = 3.12 cfs @ 12.07 hrs, Volume= 10,869 cf
Outflow = 3.12 cfs @ 12.07 hrs, Volume= 10,869 cf, Atten= 0%, Lag= 0.0 min
Primary = 3.12 cfs @ 12.07 hrs, Volume= 10,869 cf
Routed to Pond AMH-2 : ACCESS MANHOLE-2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 322.42' @ 12.07 hrs
Flood Elev= 326.46'

Device	Routing	Invert	Outlet Devices
#1	Primary	321.40'	**18.0" Round Culvert** L= 4.0' Ke= 0.500 Inlet / Outlet Invert= 321.40' / 321.37' S= 0.0075 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=3.00 cfs @ 12.07 hrs HW=322.40' TW=320.22' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 3.00 cfs @ 3.40 fps)

Summary for Pond N-CB7: N-CB-7

Inflow Area = 19,491 sf, 56.05% Impervious, Inflow Depth = 2.23" for 10-yr event
Inflow = 1.03 cfs @ 12.07 hrs, Volume= 3,629 cf
Outflow = 1.03 cfs @ 12.07 hrs, Volume= 3,629 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.03 cfs @ 12.07 hrs, Volume= 3,629 cf
Routed to Link POI 1 : OLD SUNCOOK RD

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 323.24' @ 12.07 hrs
Flood Elev= 326.68'

Device	Routing	Invert	Outlet Devices
#1	Primary	322.70'	**12.0" Round Culvert** L= 27.0' Ke= 0.500 Inlet / Outlet Invert= 322.70' / 322.40' S= 0.0111 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.99 cfs @ 12.07 hrs HW=323.23' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 0.99 cfs @ 3.41 fps)

Summary for Pond N-CB8: N-CB-8

Inflow Area = 2,344 sf,100.00% Impervious, Inflow Depth = 3.93" for 10-yr event
Inflow = 0.22 cfs @ 12.07 hrs, Volume= 769 cf
Outflow = 0.22 cfs @ 12.07 hrs, Volume= 769 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.22 cfs @ 12.07 hrs, Volume= 769 cf
Routed to Pond N-CB5 : N-CB-5

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 322.78' @ 12.10 hrs
Flood Elev= 326.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	322.50'	**12.0" Round Culvert** L= 45.0' Ke= 0.500 Inlet / Outlet Invert= 322.50' / 322.27' S= 0.0051 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.18 cfs @ 12.07 hrs HW=322.78' TW=322.60' (Dynamic Tailwater)
└**1=Culvert** (Outlet Controls 0.18 cfs @ 1.56 fps)

Summary for Pond N-CB9: N-CB-9

Inflow Area = 15,358 sf,100.00% Impervious, Inflow Depth = 3.93" for 10-yr event
Inflow = 1.44 cfs @ 12.07 hrs, Volume= 5,036 cf
Outflow = 1.44 cfs @ 12.07 hrs, Volume= 5,036 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.44 cfs @ 12.07 hrs, Volume= 5,036 cf
Routed to Pond N-CB6 : N-CB-6

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 323.16' @ 12.07 hrs
Flood Elev= 326.41'

Device	Routing	Invert	Outlet Devices
#1	Primary	322.41'	**12.0" Round Culvert** L= 45.0' Ke= 0.500 Inlet / Outlet Invert= 322.41' / 322.19' S= 0.0049 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=1.39 cfs @ 12.07 hrs HW=323.14' TW=322.40' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 1.39 cfs @ 3.15 fps)

Summary for Pond N-FI1: N-FI-1

Inflow Area = 8,434 sf, 0.00% Impervious, Inflow Depth = 0.05" for 10-yr event
Inflow = 0.00 cfs @ 15.20 hrs, Volume= 39 cf
Outflow = 0.00 cfs @ 15.20 hrs, Volume= 39 cf, Atten= 0%, Lag= 0.0 min
Discarded = 0.00 cfs @ 15.20 hrs, Volume= 39 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Link POI 1 : OLD SUNCOOK RD

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 322.15' @ 0.00 hrs Surf.Area= 86 sf Storage= 0 cf
Flood Elev= 326.90' Surf.Area= 86 sf Storage= 71 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.0 min (1,094.5 - 1,094.5)

Volume	Invert	Avail.Storage	Storage Description
#1	322.15'	67 cf	**4.00'W x 10.75'L x 2.00'H Prismatoid** x 2 172 cf Overall - 4 cf Embedded = 168 cf x 40.0% Voids
#2	322.90'	4 cf	**6.0" Round Pipe Storage** x 2 Inside #1 L= 10.7'
		71 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	322.15'	**3.000 in/hr Exfiltration over Wetted area**
#2	Primary	323.90'	**1.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Discarded OutFlow Max=0.00 cfs @ 15.20 hrs HW=322.15' (Free Discharge)
└**1=Exfiltration** (Passes 0.00 cfs of 0.01 cfs potential flow)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=322.15' TW=0.00' (Dynamic Tailwater)
└**2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond N-FI2: N-FI-2

[92] Warning: Device #2 is above defined storage

Inflow Area = 6,170 sf, 0.00% Impervious, Inflow Depth = 0.06" for 10-yr event
Inflow = 0.00 cfs @ 15.20 hrs, Volume= 29 cf
Outflow = 0.00 cfs @ 15.20 hrs, Volume= 29 cf, Atten= 0%, Lag= 0.0 min
Discarded = 0.00 cfs @ 15.20 hrs, Volume= 29 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Link POI 1 : OLD SUNCOOK RD

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 322.35' @ 0.00 hrs Surf.Area= 86 sf Storage= 0 cf
Flood Elev= 327.09' Surf.Area= 86 sf Storage= 71 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.0 min (1,094.5 - 1,094.5)

Volume	Invert	Avail.Storage	Storage Description
#1	322.35'	67 cf	**4.00'W x 10.75'L x 2.00'H Prismatoid** x 2 172 cf Overall - 4 cf Embedded = 168 cf x 40.0% Voids
#2	323.10'	4 cf	**6.0" Round Pipe Storage** x 2 Inside #1 L= 10.7'
		71 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	322.35'	**3.000 in/hr Exfiltration over Wetted area**
#2	Primary	324.35'	**1.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Discarded OutFlow Max=0.00 cfs @ 15.20 hrs HW=322.35' (Free Discharge)
↑**1=Exfiltration** (Passes 0.00 cfs of 0.01 cfs potential flow)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=322.35' TW=0.00' (Dynamic Tailwater)
↑**2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond N-FI3: N-FI-3

[92] Warning: Device #2 is above defined storage

Inflow Area = 4,276 sf, 0.00% Impervious, Inflow Depth = 0.06" for 10-yr event
Inflow = 0.00 cfs @ 15.20 hrs, Volume= 21 cf
Outflow = 0.00 cfs @ 15.20 hrs, Volume= 21 cf, Atten= 0%, Lag= 0.0 min
Discarded = 0.00 cfs @ 15.20 hrs, Volume= 21 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Link POI 1 : OLD SUNCOOK RD

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 322.45' @ 0.00 hrs Surf.Area= 86 sf Storage= 0 cf
Flood Elev= 327.24' Surf.Area= 86 sf Storage= 71 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Center-of-Mass det. time= 0.0 min (1,094.5 - 1,094.5)

Volume	Invert	Avail.Storage	Storage Description
#1	322.45'	67 cf	**4.00'W x 10.75'L x 2.00'H Prismatoid** x 2 172 cf Overall - 4 cf Embedded = 168 cf x 40.0% Voids
#2	323.20'	4 cf	**6.0" Round Pipe Storage** x 2 Inside #1 L= 10.7'
		71 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	322.45'	**3.000 in/hr Exfiltration over Wetted area**
#2	Primary	324.45'	**1.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Discarded OutFlow Max=0.00 cfs @ 15.20 hrs HW=322.45' (Free Discharge)
↑—**1=Exfiltration** (Passes 0.00 cfs of 0.01 cfs potential flow)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=322.45' TW=0.00' (Dynamic Tailwater)
↑—**2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond P1: SUBSURFACE INFILTRATION GALLERY-1

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=21)
[80] Warning: Exceeded Pond AMH-1 by 0.07' @ 12.20 hrs (1.34 cfs 3,832 cf)
[80] Warning: Exceeded Pond AMH-2 by 0.05' @ 12.35 hrs (1.60 cfs 3,334 cf)

Inflow Area = 55,749 sf,100.00% Impervious, Inflow Depth = 3.93" for 10-yr event
Inflow = 5.24 cfs @ 12.07 hrs, Volume= 18,280 cf
Outflow = 0.38 cfs @ 13.16 hrs, Volume= 18,284 cf, Atten= 93%, Lag= 65.3 min
Discarded = 0.38 cfs @ 13.16 hrs, Volume= 18,284 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 320.58' @ 13.16 hrs Surf.Area= 4,675 sf Storage= 7,071 cf
Flood Elev= 323.87' Surf.Area= 4,675 sf Storage= 15,898 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 143.0 min (893.3 - 750.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	318.37'	6,543 cf	**29.92'W x 156.27'L x 5.50'H Field A** 25,713 cf Overall - 9,355 cf Embedded = 16,358 cf x 40.0% Voids
#2A	319.12'	9,355 cf	**ADS_StormTech MC-3500 d +Cap** x 84 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap 84 Chambers in 4 Rows Cap Storage= 14.9 cf x 2 x 4 rows = 119.2 cf
		15,898 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	318.37'	**3.000 in/hr Exfiltration over Wetted area**

Discarded OutFlow Max=0.38 cfs @ 13.16 hrs HW=320.58' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.38 cfs)

Summary for Link POI 1: OLD SUNCOOK RD

Inflow Area = 319,282 sf, 31.35% Impervious, Inflow Depth = 1.25" for 10-yr event
Inflow = 5.67 cfs @ 12.27 hrs, Volume= 33,231 cf
Primary = 5.67 cfs @ 12.27 hrs, Volume= 33,231 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: PDA 1 Runoff Area=5,546 sf 100.00% Impervious Runoff Depth=4.98"
Tc=5.0 min CN=98 Runoff=0.65 cfs 2,303 cf

Subcatchment2S: PDA 2 Runoff Area=5,524 sf 100.00% Impervious Runoff Depth=4.98"
Tc=5.0 min CN=98 Runoff=0.65 cfs 2,294 cf

Subcatchment3S: PDA 3 Runoff Area=8,829 sf 100.00% Impervious Runoff Depth=4.98"
Tc=5.0 min CN=98 Runoff=1.04 cfs 3,666 cf

Subcatchment4S: PDA 4 Runoff Area=119,868 sf 56.98% Impervious Runoff Depth=2.87"
Flow Length=222' Tc=20.3 min CN=WQ Runoff=5.43 cfs 28,696 cf

Subcatchment5S: PDA 5 Runoff Area=152,846 sf 11.20% Impervious Runoff Depth=0.64"
Flow Length=310' Tc=30.7 min CN=WQ Runoff=1.14 cfs 8,185 cf

Subcatchment6S: PDA 6 Runoff Area=2,702 sf 100.00% Impervious Runoff Depth=4.98"
Tc=5.0 min CN=98 Runoff=0.32 cfs 1,122 cf

Subcatchment7S: PDA 7 Runoff Area=12,362 sf 100.00% Impervious Runoff Depth=4.98"
Tc=5.0 min CN=98 Runoff=1.46 cfs 5,133 cf

Subcatchment8S: PDA 8 Runoff Area=3,084 sf 100.00% Impervious Runoff Depth=4.98"
Tc=5.0 min CN=98 Runoff=0.36 cfs 1,281 cf

Subcatchment9S: PDA 9 Runoff Area=15,358 sf 100.00% Impervious Runoff Depth=4.98"
Tc=5.0 min CN=98 Runoff=1.81 cfs 6,377 cf

Subcatchment10S: PDA 10 Runoff Area=2,344 sf 100.00% Impervious Runoff Depth=4.98"
Tc=5.0 min CN=98 Runoff=0.28 cfs 973 cf

Subcatchment11S: PDA 11 Runoff Area=19,491 sf 56.05% Impervious Runoff Depth=2.90"
Tc=5.0 min CN=WQ Runoff=1.29 cfs 4,713 cf

Subcatchment12S: PDA 12 Runoff Area=4,276 sf 0.00% Impervious Runoff Depth=0.23"
Tc=5.0 min CN=WQ Runoff=0.01 cfs 81 cf

Subcatchment13S: PDA 13 Runoff Area=6,170 sf 0.00% Impervious Runoff Depth=0.22"
Tc=5.0 min CN=WQ Runoff=0.01 cfs 112 cf

Subcatchment14S: PDA 14 Runoff Area=8,434 sf 0.00% Impervious Runoff Depth=0.21"
Tc=5.0 min CN=WQ Runoff=0.01 cfs 148 cf

Subcatchment15S: PDA 15 Runoff Area=8,197 sf 45.88% Impervious Runoff Depth=2.42"
Tc=5.0 min CN=WQ Runoff=0.44 cfs 1,653 cf

Pond AMH-1: ACCESS MANHOLE-1 Peak Elev=321.33' Inflow=2.67 cfs 9,385 cf
24.0" Round Culvert n=0.012 L=4.0' S=0.0000 '/' Outflow=2.67 cfs 9,389 cf

Pond AMH-2: ACCESS MANHOLE-2 Peak Elev=321.33' Inflow=3.91 cfs 13,764 cf
24.0" Round Culvert n=0.012 L=4.0' S=0.0000 '/' Outflow=3.91 cfs 13,768 cf

Pond IR: ISOLATOR ROW CHECK Peak Elev=0.00' Storage=0 cf
Discarded=0.00 cfs 0 cf

Pond N-CB1: N-CB-1 Peak Elev=324.11' Inflow=0.65 cfs 2,303 cf
12.0" Round Culvert n=0.012 L=162.0' S=0.0050 '/' Outflow=0.65 cfs 2,303 cf

Pond N-CB2: N-CB-2 Peak Elev=323.48' Inflow=1.31 cfs 4,597 cf
12.0" Round Culvert n=0.012 L=45.0' S=0.0049 '/' Outflow=1.31 cfs 4,597 cf

Pond N-CB3: N-CB-3 Peak Elev=323.25' Inflow=1.63 cfs 5,719 cf
12.0" Round Culvert n=0.012 L=53.0' S=0.0049 '/' Outflow=1.63 cfs 5,719 cf

Pond N-CB4: N-CB-4 Peak Elev=322.92' Inflow=2.67 cfs 9,385 cf
15.0" Round Culvert n=0.012 L=4.0' S=0.0050 '/' Outflow=2.67 cfs 9,385 cf

Pond N-CB5: N-CB-5 Peak Elev=322.73' Inflow=0.64 cfs 2,254 cf
12.0" Round Culvert n=0.012 L=55.0' S=0.0049 '/' Outflow=0.64 cfs 2,254 cf

Pond N-CB6: N-CB-6 Peak Elev=322.57' Inflow=3.91 cfs 13,764 cf
18.0" Round Culvert n=0.012 L=4.0' S=0.0075 '/' Outflow=3.91 cfs 13,764 cf

Pond N-CB7: N-CB-7 Peak Elev=323.32' Inflow=1.29 cfs 4,713 cf
12.0" Round Culvert n=0.012 L=27.0' S=0.0111 '/' Outflow=1.29 cfs 4,713 cf

Pond N-CB8: N-CB-8 Peak Elev=322.84' Inflow=0.28 cfs 973 cf
12.0" Round Culvert n=0.012 L=45.0' S=0.0051 '/' Outflow=0.28 cfs 973 cf

Pond N-CB9: N-CB-9 Peak Elev=323.28' Inflow=1.81 cfs 6,377 cf
12.0" Round Culvert n=0.012 L=45.0' S=0.0049 '/' Outflow=1.81 cfs 6,377 cf

Pond N-FI1: N-FI-1 Peak Elev=322.25' Storage=3 cf Inflow=0.01 cfs 148 cf
Discarded=0.01 cfs 148 cf Primary=0.00 cfs 0 cf Outflow=0.01 cfs 148 cf

Pond N-FI2: N-FI-2 Peak Elev=322.38' Storage=1 cf Inflow=0.01 cfs 112 cf
Discarded=0.01 cfs 112 cf Primary=0.00 cfs 0 cf Outflow=0.01 cfs 112 cf

Pond N-FI3: N-FI-3 Peak Elev=322.45' Storage=0 cf Inflow=0.01 cfs 81 cf
Discarded=0.01 cfs 81 cf Primary=0.00 cfs 0 cf Outflow=0.01 cfs 81 cf

Pond P1: SUBSURFACE INFILTRATION Peak Elev=321.33' Storage=9,762 cf Inflow=6.58 cfs 23,157 cf
Outflow=0.40 cfs 23,184 cf

Link POI 1: OLD SUNCOOK RD Inflow=7.12 cfs 43,247 cf
Primary=7.12 cfs 43,247 cf

Total Runoff Area = 375,031 sf Runoff Volume = 66,736 cf Average Runoff Depth = 2.14"
58.44% Pervious = 219,180 sf 41.56% Impervious = 155,851 sf

Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: PDA 1 Runoff Area=5,546 sf 100.00% Impervious Runoff Depth=5.95"
Tc=5.0 min CN=98 Runoff=0.78 cfs 2,751 cf

Subcatchment2S: PDA 2 Runoff Area=5,524 sf 100.00% Impervious Runoff Depth=5.95"
Tc=5.0 min CN=98 Runoff=0.77 cfs 2,740 cf

Subcatchment3S: PDA 3 Runoff Area=8,829 sf 100.00% Impervious Runoff Depth=5.95"
Tc=5.0 min CN=98 Runoff=1.24 cfs 4,379 cf

Subcatchment4S: PDA 4 Runoff Area=119,868 sf 56.98% Impervious Runoff Depth=3.48"
Flow Length=222' Tc=20.3 min CN=WQ Runoff=6.47 cfs 34,764 cf

Subcatchment5S: PDA 5 Runoff Area=152,846 sf 11.20% Impervious Runoff Depth=0.88"
Flow Length=310' Tc=30.7 min CN=WQ Runoff=1.44 cfs 11,173 cf

Subcatchment6S: PDA 6 Runoff Area=2,702 sf 100.00% Impervious Runoff Depth=5.95"
Tc=5.0 min CN=98 Runoff=0.38 cfs 1,340 cf

Subcatchment7S: PDA 7 Runoff Area=12,362 sf 100.00% Impervious Runoff Depth=5.95"
Tc=5.0 min CN=98 Runoff=1.73 cfs 6,131 cf

Subcatchment8S: PDA 8 Runoff Area=3,084 sf 100.00% Impervious Runoff Depth=5.95"
Tc=5.0 min CN=98 Runoff=0.43 cfs 1,530 cf

Subcatchment9S: PDA 9 Runoff Area=15,358 sf 100.00% Impervious Runoff Depth=5.95"
Tc=5.0 min CN=98 Runoff=2.15 cfs 7,617 cf

Subcatchment10S: PDA 10 Runoff Area=2,344 sf 100.00% Impervious Runoff Depth=5.95"
Tc=5.0 min CN=98 Runoff=0.33 cfs 1,163 cf

Subcatchment11S: PDA 11 Runoff Area=19,491 sf 56.05% Impervious Runoff Depth=3.56"
Tc=5.0 min CN=WQ Runoff=1.54 cfs 5,776 cf

Subcatchment12S: PDA 12 Runoff Area=4,276 sf 0.00% Impervious Runoff Depth=0.47"
Tc=5.0 min CN=WQ Runoff=0.02 cfs 166 cf

Subcatchment13S: PDA 13 Runoff Area=6,170 sf 0.00% Impervious Runoff Depth=0.45"
Tc=5.0 min CN=WQ Runoff=0.03 cfs 232 cf

Subcatchment14S: PDA 14 Runoff Area=8,434 sf 0.00% Impervious Runoff Depth=0.44"
Tc=5.0 min CN=WQ Runoff=0.03 cfs 308 cf

Subcatchment15S: PDA 15 Runoff Area=8,197 sf 45.88% Impervious Runoff Depth=3.00"
Tc=5.0 min CN=WQ Runoff=0.53 cfs 2,051 cf

Pond AMH-1: ACCESS MANHOLE-1 Peak Elev=322.17' Inflow=3.17 cfs 11,209 cf
24.0" Round Culvert n=0.012 L=4.0' S=0.0000 '/' Outflow=3.17 cfs 11,195 cf

Pond AMH-2: ACCESS MANHOLE-2 Peak Elev=322.17' Inflow=4.65 cfs 16,440 cf
24.0" Round Culvert n=0.012 L=4.0' S=0.0000 '/' Outflow=4.65 cfs 16,440 cf

Pond IR: ISOLATOR ROW CHECK Peak Elev=0.00' Storage=0 cf
Discarded=0.00 cfs 0 cf

Pond N-CB1: N-CB-1 Peak Elev=324.17' Inflow=0.78 cfs 2,751 cf
12.0" Round Culvert n=0.012 L=162.0' S=0.0050 '/' Outflow=0.78 cfs 2,751 cf

Pond N-CB2: N-CB-2 Peak Elev=323.58' Inflow=1.55 cfs 5,490 cf
12.0" Round Culvert n=0.012 L=45.0' S=0.0049 '/' Outflow=1.55 cfs 5,490 cf

Pond N-CB3: N-CB-3 Peak Elev=323.37' Inflow=1.93 cfs 6,831 cf
12.0" Round Culvert n=0.012 L=53.0' S=0.0049 '/' Outflow=1.93 cfs 6,831 cf

Pond N-CB4: N-CB-4 Peak Elev=323.03' Inflow=3.17 cfs 11,209 cf
15.0" Round Culvert n=0.012 L=4.0' S=0.0050 '/' Outflow=3.17 cfs 11,209 cf

Pond N-CB5: N-CB-5 Peak Elev=322.83' Inflow=0.76 cfs 2,692 cf
12.0" Round Culvert n=0.012 L=55.0' S=0.0049 '/' Outflow=0.76 cfs 2,692 cf

Pond N-CB6: N-CB-6 Peak Elev=322.70' Inflow=4.65 cfs 16,440 cf
18.0" Round Culvert n=0.012 L=4.0' S=0.0075 '/' Outflow=4.65 cfs 16,440 cf

Pond N-CB7: N-CB-7 Peak Elev=323.40' Inflow=1.54 cfs 5,776 cf
12.0" Round Culvert n=0.012 L=27.0' S=0.0111 '/' Outflow=1.54 cfs 5,776 cf

Pond N-CB8: N-CB-8 Peak Elev=322.91' Inflow=0.33 cfs 1,163 cf
12.0" Round Culvert n=0.012 L=45.0' S=0.0051 '/' Outflow=0.33 cfs 1,163 cf

Pond N-CB9: N-CB-9 Peak Elev=323.39' Inflow=2.15 cfs 7,617 cf
12.0" Round Culvert n=0.012 L=45.0' S=0.0049 '/' Outflow=2.15 cfs 7,617 cf

Pond N-FI1: N-FI-1 Peak Elev=323.45' Storage=47 cf Inflow=0.03 cfs 308 cf
Discarded=0.01 cfs 308 cf Primary=0.00 cfs 0 cf Outflow=0.01 cfs 308 cf

Pond N-FI2: N-FI-2 Peak Elev=323.20' Storage=29 cf Inflow=0.03 cfs 232 cf
Discarded=0.01 cfs 232 cf Primary=0.00 cfs 0 cf Outflow=0.01 cfs 232 cf

Pond N-FI3: N-FI-3 Peak Elev=322.93' Storage=17 cf Inflow=0.02 cfs 166 cf
Discarded=0.01 cfs 166 cf Primary=0.00 cfs 0 cf Outflow=0.01 cfs 166 cf

Pond P1: SUBSURFACE INFILTRATION Peak Elev=322.17' Storage=12,426 cf Inflow=7.82 cfs 27,635 cf
Outflow=0.42 cfs 27,639 cf

Link POI 1: OLD SUNCOOK RD Inflow=8.56 cfs 53,763 cf
Primary=8.56 cfs 53,763 cf

Total Runoff Area = 375,031 sf Runoff Volume = 82,118 cf Average Runoff Depth = 2.63"
58.44% Pervious = 219,180 sf 41.56% Impervious = 155,851 sf

Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: PDA 1 Runoff Area=5,546 sf 100.00% Impervious Runoff Depth=7.10"
Tc=5.0 min CN=98 Runoff=0.92 cfs 3,282 cf

Subcatchment2S: PDA 2 Runoff Area=5,524 sf 100.00% Impervious Runoff Depth=7.10"
Tc=5.0 min CN=98 Runoff=0.92 cfs 3,269 cf

Subcatchment3S: PDA 3 Runoff Area=8,829 sf 100.00% Impervious Runoff Depth=7.10"
Tc=5.0 min CN=98 Runoff=1.47 cfs 5,224 cf

Subcatchment4S: PDA 4 Runoff Area=119,868 sf 56.98% Impervious Runoff Depth=4.24"
Flow Length=222' Tc=20.3 min CN=WQ Runoff=7.75 cfs 42,334 cf

Subcatchment5S: PDA 5 Runoff Area=152,846 sf 11.20% Impervious Runoff Depth=1.23"
Flow Length=310' Tc=30.7 min CN=WQ Runoff=1.93 cfs 15,706 cf

Subcatchment6S: PDA 6 Runoff Area=2,702 sf 100.00% Impervious Runoff Depth=7.10"
Tc=5.0 min CN=98 Runoff=0.45 cfs 1,599 cf

Subcatchment7S: PDA 7 Runoff Area=12,362 sf 100.00% Impervious Runoff Depth=7.10"
Tc=5.0 min CN=98 Runoff=2.06 cfs 7,315 cf

Subcatchment8S: PDA 8 Runoff Area=3,084 sf 100.00% Impervious Runoff Depth=7.10"
Tc=5.0 min CN=98 Runoff=0.51 cfs 1,825 cf

Subcatchment9S: PDA 9 Runoff Area=15,358 sf 100.00% Impervious Runoff Depth=7.10"
Tc=5.0 min CN=98 Runoff=2.56 cfs 9,088 cf

Subcatchment10S: PDA 10 Runoff Area=2,344 sf 100.00% Impervious Runoff Depth=7.10"
Tc=5.0 min CN=98 Runoff=0.39 cfs 1,387 cf

Subcatchment11S: PDA 11 Runoff Area=19,491 sf 56.05% Impervious Runoff Depth=4.37"
Tc=5.0 min CN=WQ Runoff=1.91 cfs 7,102 cf

Subcatchment12S: PDA 12 Runoff Area=4,276 sf 0.00% Impervious Runoff Depth=0.84"
Tc=5.0 min CN=WQ Runoff=0.05 cfs 299 cf

Subcatchment13S: PDA 13 Runoff Area=6,170 sf 0.00% Impervious Runoff Depth=0.82"
Tc=5.0 min CN=WQ Runoff=0.07 cfs 420 cf

Subcatchment14S: PDA 14 Runoff Area=8,434 sf 0.00% Impervious Runoff Depth=0.80"
Tc=5.0 min CN=WQ Runoff=0.10 cfs 560 cf

Subcatchment15S: PDA 15 Runoff Area=8,197 sf 45.88% Impervious Runoff Depth=3.74"
Tc=5.0 min CN=WQ Runoff=0.67 cfs 2,556 cf

Pond AMH-1: ACCESS MANHOLE-1 Peak Elev=323.75' Inflow=3.76 cfs 13,373 cf
24.0" Round Culvert n=0.012 L=4.0' S=0.0000 '/' Outflow=3.76 cfs 13,356 cf

Pond AMH-2: ACCESS MANHOLE-2 Peak Elev=323.75' Inflow=5.52 cfs 19,614 cf
24.0" Round Culvert n=0.012 L=4.0' S=0.0000 '/' Outflow=5.52 cfs 19,614 cf

Pond IR: ISOLATOR ROW CHECK Peak Elev=0.00' Storage=0 cf
Discarded=0.00 cfs 0 cf

Pond N-CB1: N-CB-1 Peak Elev=324.23' Inflow=0.92 cfs 3,282 cf
12.0" Round Culvert n=0.012 L=162.0' S=0.0050 '/' Outflow=0.92 cfs 3,282 cf

Pond N-CB2: N-CB-2 Peak Elev=323.75' Inflow=1.84 cfs 6,550 cf
12.0" Round Culvert n=0.012 L=45.0' S=0.0049 '/' Outflow=1.84 cfs 6,550 cf

Pond N-CB3: N-CB-3 Peak Elev=323.75' Inflow=2.29 cfs 8,149 cf
12.0" Round Culvert n=0.012 L=53.0' S=0.0049 '/' Outflow=2.29 cfs 8,149 cf

Pond N-CB4: N-CB-4 Peak Elev=323.75' Inflow=3.76 cfs 13,373 cf
15.0" Round Culvert n=0.012 L=4.0' S=0.0050 '/' Outflow=3.76 cfs 13,373 cf

Pond N-CB5: N-CB-5 Peak Elev=323.75' Inflow=0.90 cfs 3,212 cf
12.0" Round Culvert n=0.012 L=55.0' S=0.0049 '/' Outflow=0.90 cfs 3,212 cf

Pond N-CB6: N-CB-6 Peak Elev=323.75' Inflow=5.52 cfs 19,614 cf
18.0" Round Culvert n=0.012 L=4.0' S=0.0075 '/' Outflow=5.52 cfs 19,614 cf

Pond N-CB7: N-CB-7 Peak Elev=323.50' Inflow=1.91 cfs 7,102 cf
12.0" Round Culvert n=0.012 L=27.0' S=0.0111 '/' Outflow=1.91 cfs 7,102 cf

Pond N-CB8: N-CB-8 Peak Elev=323.75' Inflow=0.39 cfs 1,387 cf
12.0" Round Culvert n=0.012 L=45.0' S=0.0051 '/' Outflow=0.39 cfs 1,387 cf

Pond N-CB9: N-CB-9 Peak Elev=323.75' Inflow=2.56 cfs 9,088 cf
12.0" Round Culvert n=0.012 L=45.0' S=0.0049 '/' Outflow=2.56 cfs 9,088 cf

Pond N-FI1: N-FI-1 Peak Elev=323.97' Storage=65 cf Inflow=0.10 cfs 560 cf
Discarded=0.01 cfs 442 cf Primary=0.06 cfs 119 cf Outflow=0.08 cfs 560 cf

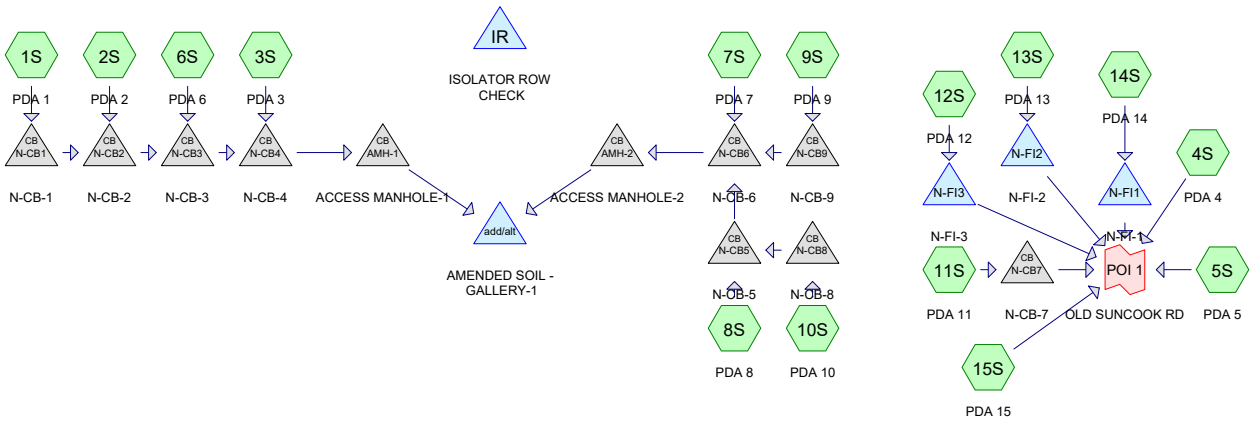
Pond N-FI2: N-FI-2 Peak Elev=324.41' Storage=71 cf Inflow=0.07 cfs 420 cf
Discarded=0.01 cfs 392 cf Primary=0.05 cfs 28 cf Outflow=0.06 cfs 420 cf

Pond N-FI3: N-FI-3 Peak Elev=324.11' Storage=60 cf Inflow=0.05 cfs 299 cf
Discarded=0.01 cfs 299 cf Primary=0.00 cfs 0 cf Outflow=0.01 cfs 299 cf

Pond P1: SUBSURFACE INFILTRATION Peak Elev=323.75' Storage=15,676 cf Inflow=9.28 cfs 32,970 cf
Outflow=0.46 cfs 32,994 cf

Link POI 1: OLD SUNCOOK RD Inflow=10.44 cfs 67,845 cf
Primary=10.44 cfs 67,845 cf

Total Runoff Area = 375,031 sf Runoff Volume = 101,966 cf Average Runoff Depth = 3.26"
58.44% Pervious = 219,180 sf 41.56% Impervious = 155,851 sf



Subcat Reach Pond Link

Routing Diagram for POST-DEVELOPMENT_AMENDED SOIL_BACC0005

Prepared by Wilcox & Barton, Inc, Printed 2/17/2026

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Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	10-yr	Type III 24-hr		Default	24.00	1	4.17	2

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
91,657	39	>75% Grass cover, Good, HSG A (4S, 5S, 11S, 12S, 13S, 14S, 15S)
995	98	EXISTING BUILDING (5S)
96,535	98	EXISTING PAVEMENT (4S, 5S, 11S, 15S)
55,749	98	PROPOSED PARKING LOT (1S, 2S, 3S, 6S, 7S, 8S, 9S, 10S)
2,572	98	PROPOSED SIDEWALK (4S, 11S, 15S)
127,523	30	Woods, Good, HSG A (4S, 5S, 12S, 13S, 14S)
375,031	**60**	**TOTAL AREA**

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
219,180	HSG A	4S, 5S, 11S, 12S, 13S, 14S, 15S
0	HSG B	
0	HSG C	
0	HSG D	
155,851	Other	1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S, 9S, 10S, 11S, 15S
375,031		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover
91,657	0	0	0	0	91,657	>75% Grass cover, Good
0	0	0	0	995	995	EXISTING BUILDING
0	0	0	0	96,535	96,535	EXISTING PAVEMENT
0	0	0	0	55,749	55,749	PROPOSED PARKING LOT
0	0	0	0	2,572	2,572	PROPOSED SIDEWALK
127,523	0	0	0	0	127,523	Woods, Good
219,180	**0**	**0**	**0**	**155,851**	**375,031**	**TOTAL AREA**

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)	Node Name
1	AMH-1	319.29	319.29	4.0	0.0000	0.012	0.0	24.0	0.0	
2	AMH-2	319.29	319.29	4.0	0.0000	0.012	0.0	24.0	0.0	
3	N-CB1	323.63	322.82	162.0	0.0050	0.012	0.0	12.0	0.0	
4	N-CB2	322.72	322.50	45.0	0.0049	0.012	0.0	12.0	0.0	
5	N-CB3	322.40	322.14	53.0	0.0049	0.012	0.0	12.0	0.0	
6	N-CB4	321.89	321.87	4.0	0.0050	0.012	0.0	15.0	0.0	
7	N-CB5	322.17	321.90	55.0	0.0049	0.012	0.0	12.0	0.0	
8	N-CB6	321.40	321.37	4.0	0.0075	0.012	0.0	18.0	0.0	
9	N-CB7	322.70	322.40	27.0	0.0111	0.012	0.0	12.0	0.0	
10	N-CB8	322.50	322.27	45.0	0.0051	0.012	0.0	12.0	0.0	
11	N-CB9	322.41	322.19	45.0	0.0049	0.012	0.0	12.0	0.0	

Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: PDA 1 Runoff Area=5,546 sf 100.00% Impervious Runoff Depth=3.93"
Tc=5.0 min CN=98 Runoff=0.52 cfs 1,818 cf

Subcatchment2S: PDA 2 Runoff Area=5,524 sf 100.00% Impervious Runoff Depth=3.93"
Tc=5.0 min CN=98 Runoff=0.52 cfs 1,811 cf

Subcatchment3S: PDA 3 Runoff Area=8,829 sf 100.00% Impervious Runoff Depth=3.93"
Tc=5.0 min CN=98 Runoff=0.83 cfs 2,895 cf

Subcatchment4S: PDA 4 Runoff Area=119,868 sf 56.98% Impervious Runoff Depth=2.25"
Flow Length=222' Tc=20.3 min CN=WQ Runoff=4.32 cfs 22,474 cf

Subcatchment5S: PDA 5 Runoff Area=152,846 sf 11.20% Impervious Runoff Depth=0.46"
Flow Length=310' Tc=30.7 min CN=WQ Runoff=0.91 cfs 5,871 cf

Subcatchment6S: PDA 6 Runoff Area=2,702 sf 100.00% Impervious Runoff Depth=3.93"
Tc=5.0 min CN=98 Runoff=0.25 cfs 886 cf

Subcatchment7S: PDA 7 Runoff Area=12,362 sf 100.00% Impervious Runoff Depth=3.93"
Tc=5.0 min CN=98 Runoff=1.16 cfs 4,053 cf

Subcatchment8S: PDA 8 Runoff Area=3,084 sf 100.00% Impervious Runoff Depth=3.93"
Tc=5.0 min CN=98 Runoff=0.29 cfs 1,011 cf

Subcatchment9S: PDA 9 Runoff Area=15,358 sf 100.00% Impervious Runoff Depth=3.93"
Tc=5.0 min CN=98 Runoff=1.44 cfs 5,036 cf

Subcatchment10S: PDA 10 Runoff Area=2,344 sf 100.00% Impervious Runoff Depth=3.93"
Tc=5.0 min CN=98 Runoff=0.22 cfs 769 cf

Subcatchment11S: PDA 11 Runoff Area=19,491 sf 56.05% Impervious Runoff Depth=2.23"
Tc=5.0 min CN=WQ Runoff=1.03 cfs 3,629 cf

Subcatchment12S: PDA 12 Runoff Area=4,276 sf 0.00% Impervious Runoff Depth=0.06"
Tc=5.0 min CN=WQ Runoff=0.00 cfs 21 cf

Subcatchment13S: PDA 13 Runoff Area=6,170 sf 0.00% Impervious Runoff Depth=0.06"
Tc=5.0 min CN=WQ Runoff=0.00 cfs 29 cf

Subcatchment14S: PDA 14 Runoff Area=8,434 sf 0.00% Impervious Runoff Depth=0.05"
Tc=5.0 min CN=WQ Runoff=0.00 cfs 39 cf

Subcatchment15S: PDA 15 Runoff Area=8,197 sf 45.88% Impervious Runoff Depth=1.84"
Tc=5.0 min CN=WQ Runoff=0.35 cfs 1,257 cf

Pond add/alt: AMENDED SOIL - GALLERY-1 Peak Elev=320.51' Storage=6,179 cf Inflow=5.24 cfs 18,280 cf
Outflow=0.52 cfs 18,300 cf

Pond AMH-1: ACCESS MANHOLE-1 Peak Elev=320.51' Inflow=2.13 cfs 7,411 cf
24.0" Round Culvert n=0.012 L=4.0' S=0.0000 '/' Outflow=2.13 cfs 7,411 cf

Pond AMH-2: ACCESS MANHOLE-2 Peak Elev=320.51' Inflow=3.12 cfs 10,869 cf
24.0" Round Culvert n=0.012 L=4.0' S=0.0000 '/' Outflow=3.12 cfs 10,869 cf

Pond IR: ISOLATOR ROW CHECK Peak Elev=0.00' Storage=0 cf
Discarded=0.00 cfs 0 cf

Pond N-CB1: N-CB-1 Peak Elev=324.05' Inflow=0.52 cfs 1,818 cf
12.0" Round Culvert n=0.012 L=162.0' S=0.0050 '/' Outflow=0.52 cfs 1,818 cf

Pond N-CB2: N-CB-2 Peak Elev=323.37' Inflow=1.04 cfs 3,630 cf
12.0" Round Culvert n=0.012 L=45.0' S=0.0049 '/' Outflow=1.04 cfs 3,630 cf

Pond N-CB3: N-CB-3 Peak Elev=323.13' Inflow=1.29 cfs 4,516 cf
12.0" Round Culvert n=0.012 L=53.0' S=0.0049 '/' Outflow=1.29 cfs 4,516 cf

Pond N-CB4: N-CB-4 Peak Elev=322.79' Inflow=2.13 cfs 7,411 cf
15.0" Round Culvert n=0.012 L=4.0' S=0.0050 '/' Outflow=2.13 cfs 7,411 cf

Pond N-CB5: N-CB-5 Peak Elev=322.63' Inflow=0.51 cfs 1,780 cf
12.0" Round Culvert n=0.012 L=55.0' S=0.0049 '/' Outflow=0.51 cfs 1,780 cf

Pond N-CB6: N-CB-6 Peak Elev=322.42' Inflow=3.12 cfs 10,869 cf
18.0" Round Culvert n=0.012 L=4.0' S=0.0075 '/' Outflow=3.12 cfs 10,869 cf

Pond N-CB7: N-CB-7 Peak Elev=323.24' Inflow=1.03 cfs 3,629 cf
12.0" Round Culvert n=0.012 L=27.0' S=0.0111 '/' Outflow=1.03 cfs 3,629 cf

Pond N-CB8: N-CB-8 Peak Elev=322.78' Inflow=0.22 cfs 769 cf
12.0" Round Culvert n=0.012 L=45.0' S=0.0051 '/' Outflow=0.22 cfs 769 cf

Pond N-CB9: N-CB-9 Peak Elev=323.16' Inflow=1.44 cfs 5,036 cf
12.0" Round Culvert n=0.012 L=45.0' S=0.0049 '/' Outflow=1.44 cfs 5,036 cf

Pond N-FI1: N-FI-1 Peak Elev=322.15' Storage=0 cf Inflow=0.00 cfs 39 cf
Discarded=0.00 cfs 39 cf Primary=0.00 cfs 0 cf Outflow=0.00 cfs 39 cf

Pond N-FI2: N-FI-2 Peak Elev=322.35' Storage=0 cf Inflow=0.00 cfs 29 cf
Discarded=0.00 cfs 29 cf Primary=0.00 cfs 0 cf Outflow=0.00 cfs 29 cf

Pond N-FI3: N-FI-3 Peak Elev=322.45' Storage=0 cf Inflow=0.00 cfs 21 cf
Discarded=0.00 cfs 21 cf Primary=0.00 cfs 0 cf Outflow=0.00 cfs 21 cf

Link POI 1: OLD SUNCOOK RD Inflow=5.67 cfs 33,231 cf
Primary=5.67 cfs 33,231 cf

Total Runoff Area = 375,031 sf Runoff Volume = 51,599 cf Average Runoff Depth = 1.65"
58.44% Pervious = 219,180 sf 41.56% Impervious = 155,851 sf

Summary for Subcatchment 1S: PDA 1

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.52 cfs @ 12.07 hrs, Volume= 1,818 cf, Depth= 3.93"
Routed to Pond N-CB1 : N-CB-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.17"

	Area (sf)	CN	Description
*	5,546	98	PROPOSED PARKING LOT
	5,546		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment 2S: PDA 2

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.52 cfs @ 12.07 hrs, Volume= 1,811 cf, Depth= 3.93"
Routed to Pond N-CB2 : N-CB-2

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.17"

	Area (sf)	CN	Description
*	5,524	98	PROPOSED PARKING LOT
	5,524		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment 3S: PDA 3

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.83 cfs @ 12.07 hrs, Volume= 2,895 cf, Depth= 3.93"
Routed to Pond N-CB4 : N-CB-4

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.17"

	Area (sf)	CN	Description
*	8,829	98	PROPOSED PARKING LOT
	8,829		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment 4S: PDA 4

Runoff = 4.32 cfs @ 12.27 hrs, Volume= 22,474 cf, Depth= 2.25"
Routed to Link POI 1 : OLD SUNCOOK RD

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.17"

	Area (sf)	CN	Description
*	68,012	98	EXISTING PAVEMENT
*	292	98	PROPOSED SIDEWALK
	14,284	39	>75% Grass cover, Good, HSG A
	37,280	30	Woods, Good, HSG A
	119,868		Weighted Average
	51,564		43.02% Pervious Area
	68,304		56.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.3	50	0.0100	0.05		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.82"
2.3	70	0.0100	0.50		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.2	12	0.0150	0.86		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.5	90	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
20.3	222	Total			

Summary for Subcatchment 5S: PDA 5

Runoff = 0.91 cfs @ 12.40 hrs, Volume= 5,871 cf, Depth= 0.46"
Routed to Link POI 1 : OLD SUNCOOK RD

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.17"

	Area (sf)	CN	Description
*	16,117	98	EXISTING PAVEMENT
*	995	98	EXISTING BUILDING
	47,948	39	>75% Grass cover, Good, HSG A
	87,786	30	Woods, Good, HSG A
	152,846		Weighted Average
	135,734		88.80% Pervious Area
	17,112		11.20% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.0	50	0.0220	0.04		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 2.82"
8.7	260	0.0100	0.50		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
30.7	310	Total			

Summary for Subcatchment 6S: PDA 6

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.25 cfs @ 12.07 hrs, Volume= 886 cf, Depth= 3.93"
Routed to Pond N-CB3 : N-CB-3

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.17"

	Area (sf)	CN	Description
*	2,702	98	PROPOSED PARKING LOT
	2,702		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment 7S: PDA 7

[49] Hint: Tc<2dt may require smaller dt

Runoff = 1.16 cfs @ 12.07 hrs, Volume= 4,053 cf, Depth= 3.93"
Routed to Pond N-CB6 : N-CB-6

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.17"

	Area (sf)	CN	Description
*	12,362	98	PROPOSED PARKING LOT
	12,362		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment 8S: PDA 8

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.29 cfs @ 12.07 hrs, Volume= 1,011 cf, Depth= 3.93"
Routed to Pond N-CB5 : N-CB-5

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.17"

	Area (sf)	CN	Description
*	3,084	98	PROPOSED PARKING LOT
	3,084		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment 9S: PDA 9

[49] Hint: Tc<2dt may require smaller dt

Runoff = 1.44 cfs @ 12.07 hrs, Volume= 5,036 cf, Depth= 3.93"
Routed to Pond N-CB9 : N-CB-9

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.17"

	Area (sf)	CN	Description
*	15,358	98	PROPOSED PARKING LOT
	15,358		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment 10S: PDA 10

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.22 cfs @ 12.07 hrs, Volume= 769 cf, Depth= 3.93"
Routed to Pond N-CB8 : N-CB-8

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.17"

	Area (sf)	CN	Description
*	2,344	98	PROPOSED PARKING LOT
	2,344		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment 11S: PDA 11

[49] Hint: Tc<2dt may require smaller dt

Runoff = 1.03 cfs @ 12.07 hrs, Volume= 3,629 cf, Depth= 2.23"
Routed to Pond N-CB7 : N-CB-7

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.17"

	Area (sf)	CN	Description
*	9,543	98	EXISTING PAVEMENT
*	1,382	98	PROPOSED SIDEWALK
	8,566	39	>75% Grass cover, Good, HSG A
	19,491		Weighted Average
	8,566		43.95% Pervious Area
	10,925		56.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment 12S: PDA 12

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.00 cfs @ 15.20 hrs, Volume= 21 cf, Depth= 0.06"
Routed to Pond N-FI3 : N-FI-3

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.17"

Area (sf)	CN	Description
376	30	Woods, Good, HSG A
3,900	39	>75% Grass cover, Good, HSG A
4,276		Weighted Average
4,276		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment 13S: PDA 13

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.00 cfs @ 15.20 hrs, Volume= 29 cf, Depth= 0.06"
Routed to Pond N-FI2 : N-FI-2

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.17"

Area (sf)	CN	Description
765	30	Woods, Good, HSG A
5,405	39	>75% Grass cover, Good, HSG A
6,170		Weighted Average
6,170		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment 14S: PDA 14

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.00 cfs @ 15.20 hrs, Volume= 39 cf, Depth= 0.05"
Routed to Pond N-FI1 : N-FI-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.17"

Area (sf)	CN	Description
1,316	30	Woods, Good, HSG A
7,118	39	>75% Grass cover, Good, HSG A
8,434		Weighted Average
8,434		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment 15S: PDA 15

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.35 cfs @ 12.07 hrs, Volume= 1,257 cf, Depth= 1.84"
Routed to Link POI 1 : OLD SUNCOOK RD

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.17"

	Area (sf)	CN	Description
*	2,863	98	EXISTING PAVEMENT
*	898	98	PROPOSED SIDEWALK
	4,436	39	>75% Grass cover, Good, HSG A
	8,197		Weighted Average
	4,436		54.12% Pervious Area
	3,761		45.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Pond add/alt: AMENDED SOIL - GALLERY-1

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=54)
[80] Warning: Exceeded Pond AMH-1 by 0.07' @ 12.20 hrs (1.35 cfs 2,810 cf)
[80] Warning: Exceeded Pond AMH-2 by 0.05' @ 12.30 hrs (1.45 cfs 2,329 cf)

Inflow Area = 55,749 sf,100.00% Impervious, Inflow Depth = 3.93" for 10-yr event
Inflow = 5.24 cfs @ 12.07 hrs, Volume= 18,280 cf
Outflow = 0.52 cfs @ 12.82 hrs, Volume= 18,300 cf, Atten= 90%, Lag= 44.9 min
Discarded = 0.52 cfs @ 12.82 hrs, Volume= 18,300 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 320.51' @ 12.82 hrs Surf.Area= 4,246 sf Storage= 6,179 cf
Flood Elev= 323.87' Surf.Area= 4,246 sf Storage= 14,427 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 82.7 min (833.0 - 750.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	318.37'	5,951 cf	**29.92'W x 141.93'L x 5.50'H Field A** 23,353 cf Overall - 8,476 cf Embedded = 14,878 cf x 40.0% Voids
#2A	319.12'	8,476 cf	**ADS_StormTech MC-3500 d +Cap** x 76 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap 76 Chambers in 4 Rows Cap Storage= 14.9 cf x 2 x 4 rows = 119.2 cf
		14,427 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	318.37'	**4.500 in/hr Exfiltration over Wetted area**

Discarded OutFlow Max=0.52 cfs @ 12.82 hrs HW=320.51' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.52 cfs)

Summary for Pond AMH-1: ACCESS MANHOLE-1

Inflow Area = 22,601 sf,100.00% Impervious, Inflow Depth = 3.93" for 10-yr event
Inflow = 2.13 cfs @ 12.07 hrs, Volume= 7,411 cf
Outflow = 2.13 cfs @ 12.07 hrs, Volume= 7,411 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.13 cfs @ 12.07 hrs, Volume= 7,411 cf
Routed to Pond add/alt : AMENDED SOIL - GALLERY-1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 320.51' @ 12.87 hrs
Flood Elev= 327.52'

Device	Routing	Invert	Outlet Devices
#1	Primary	319.29'	**24.0" Round Culvert** L= 4.0' Ke= 0.500 Inlet / Outlet Invert= 319.29' / 319.29' S= 0.0000 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf

Primary OutFlow Max=2.05 cfs @ 12.07 hrs HW=320.05' TW=319.62' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 2.05 cfs @ 2.78 fps)

Summary for Pond AMH-2: ACCESS MANHOLE-2

Inflow Area = 33,148 sf,100.00% Impervious, Inflow Depth = 3.93" for 10-yr event
Inflow = 3.12 cfs @ 12.07 hrs, Volume= 10,869 cf
Outflow = 3.12 cfs @ 12.07 hrs, Volume= 10,869 cf, Atten= 0%, Lag= 0.0 min
Primary = 3.12 cfs @ 12.07 hrs, Volume= 10,869 cf
Routed to Pond add/alt : AMENDED SOIL - GALLERY-1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 320.51' @ 12.86 hrs
Flood Elev= 326.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	319.29'	**24.0" Round Culvert** L= 4.0' Ke= 0.500 Inlet / Outlet Invert= 319.29' / 319.29' S= 0.0000 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf

Primary OutFlow Max=3.00 cfs @ 12.07 hrs HW=320.22' TW=319.62' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 3.00 cfs @ 3.09 fps)

Summary for Pond IR: ISOLATOR ROW CHECK

[43] Hint: Has no inflow (Outflow=Zero)

Volume	Invert	Avail.Storage	Storage Description
#1A	318.37'	1,781 cf	**8.42'W x 141.93'L x 5.50'H Field A** 6,570 cf Overall - 2,119 cf Embedded = 4,451 cf x 40.0% Voids
#2A	319.12'	2,119 cf	**ADS_StormTech MC-3500 d +Cap**x 19 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap Cap Storage= 14.9 cf x 2 x 1 rows = 29.8 cf
		3,899 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	318.37'	**3.000 in/hr Exfiltration over Wetted area**

Discarded OutFlow Max=0.00 cfs @ 0.00 hrs HW=0.00' (Free Discharge)
1=Exfiltration (Controls 0.00 cfs)

Summary for Pond N-CB1: N-CB-1

Inflow Area = 5,546 sf,100.00% Impervious, Inflow Depth = 3.93" for 10-yr event
Inflow = 0.52 cfs @ 12.07 hrs, Volume= 1,818 cf
Outflow = 0.52 cfs @ 12.07 hrs, Volume= 1,818 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.52 cfs @ 12.07 hrs, Volume= 1,818 cf
Routed to Pond N-CB2 : N-CB-2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 324.05' @ 12.08 hrs
Flood Elev= 327.63'

Device	Routing	Invert	Outlet Devices
#1	Primary	323.63'	**12.0" Round Culvert** L= 162.0' Ke= 0.500 Inlet / Outlet Invert= 323.63' / 322.82' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.48 cfs @ 12.07 hrs HW=324.04' TW=323.35' (Dynamic Tailwater)
1=Culvert (Outlet Controls 0.48 cfs @ 2.30 fps)

Summary for Pond N-CB2: N-CB-2

Inflow Area = 11,070 sf,100.00% Impervious, Inflow Depth = 3.93" for 10-yr event
Inflow = 1.04 cfs @ 12.07 hrs, Volume= 3,630 cf
Outflow = 1.04 cfs @ 12.07 hrs, Volume= 3,630 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.04 cfs @ 12.07 hrs, Volume= 3,630 cf
Routed to Pond N-CB3 : N-CB-3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 323.37' @ 12.10 hrs
Flood Elev= 327.63'

Device	Routing	Invert	Outlet Devices
#1	Primary	322.72'	**12.0" Round Culvert** L= 45.0' Ke= 0.500 Inlet / Outlet Invert= 322.72' / 322.50' S= 0.0049 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.87 cfs @ 12.07 hrs HW=323.35' TW=323.10' (Dynamic Tailwater)
1=Culvert (Outlet Controls 0.87 cfs @ 2.39 fps)

Summary for Pond N-CB3: N-CB-3

Inflow Area = 13,772 sf,100.00% Impervious, Inflow Depth = 3.93" for 10-yr event
Inflow = 1.29 cfs @ 12.07 hrs, Volume= 4,516 cf
Outflow = 1.29 cfs @ 12.07 hrs, Volume= 4,516 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.29 cfs @ 12.07 hrs, Volume= 4,516 cf
Routed to Pond N-CB4 : N-CB-4

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 323.13' @ 12.09 hrs
Flood Elev= 327.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	322.40'	**12.0" Round Culvert** L= 53.0' Ke= 0.500 Inlet / Outlet Invert= 322.40' / 322.14' S= 0.0049 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=1.15 cfs @ 12.07 hrs HW=323.10' TW=322.77' (Dynamic Tailwater)
1=Culvert (Outlet Controls 1.15 cfs @ 2.74 fps)

Summary for Pond N-CB4: N-CB-4

Inflow Area = 22,601 sf,100.00% Impervious, Inflow Depth = 3.93" for 10-yr event
Inflow = 2.13 cfs @ 12.07 hrs, Volume= 7,411 cf
Outflow = 2.13 cfs @ 12.07 hrs, Volume= 7,411 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.13 cfs @ 12.07 hrs, Volume= 7,411 cf
Routed to Pond AMH-1 : ACCESS MANHOLE-1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 322.79' @ 12.07 hrs
Flood Elev= 327.34'

Device	Routing	Invert	Outlet Devices
#1	Primary	321.89'	**15.0" Round Culvert** L= 4.0' Ke= 0.500 Inlet / Outlet Invert= 321.89' / 321.87' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=2.05 cfs @ 12.07 hrs HW=322.77' TW=320.05' (Dynamic Tailwater)
1=Culvert (Barrel Controls 2.05 cfs @ 3.13 fps)

Summary for Pond N-CB5: N-CB-5

Inflow Area = 5,428 sf,100.00% Impervious, Inflow Depth = 3.93" for 10-yr event
Inflow = 0.51 cfs @ 12.07 hrs, Volume= 1,780 cf
Outflow = 0.51 cfs @ 12.07 hrs, Volume= 1,780 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.51 cfs @ 12.07 hrs, Volume= 1,780 cf
Routed to Pond N-CB6 : N-CB-6

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 322.63' @ 12.10 hrs
Flood Elev= 326.65'

Device	Routing	Invert	Outlet Devices
#1	Primary	322.17'	**12.0" Round Culvert** L= 55.0' Ke= 0.500 Inlet / Outlet Invert= 322.17' / 321.90' S= 0.0049 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.41 cfs @ 12.07 hrs HW=322.60' TW=322.40' (Dynamic Tailwater)
1=Culvert (Outlet Controls 0.41 cfs @ 1.86 fps)

Summary for Pond N-CB6: N-CB-6

Inflow Area = 33,148 sf,100.00% Impervious, Inflow Depth = 3.93" for 10-yr event
Inflow = 3.12 cfs @ 12.07 hrs, Volume= 10,869 cf
Outflow = 3.12 cfs @ 12.07 hrs, Volume= 10,869 cf, Atten= 0%, Lag= 0.0 min
Primary = 3.12 cfs @ 12.07 hrs, Volume= 10,869 cf
Routed to Pond AMH-2 : ACCESS MANHOLE-2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 322.42' @ 12.07 hrs
Flood Elev= 326.46'

Device	Routing	Invert	Outlet Devices
#1	Primary	321.40'	**18.0" Round Culvert** L= 4.0' Ke= 0.500 Inlet / Outlet Invert= 321.40' / 321.37' S= 0.0075 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=3.00 cfs @ 12.07 hrs HW=322.40' TW=320.22' (Dynamic Tailwater)
1=Culvert (Barrel Controls 3.00 cfs @ 3.40 fps)

Summary for Pond N-CB7: N-CB-7

Inflow Area = 19,491 sf, 56.05% Impervious, Inflow Depth = 2.23" for 10-yr event
Inflow = 1.03 cfs @ 12.07 hrs, Volume= 3,629 cf
Outflow = 1.03 cfs @ 12.07 hrs, Volume= 3,629 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.03 cfs @ 12.07 hrs, Volume= 3,629 cf
Routed to Link POI 1 : OLD SUNCOOK RD

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Peak Elev= 323.24' @ 12.07 hrs
Flood Elev= 326.68'

Device	Routing	Invert	Outlet Devices
#1	Primary	322.70'	**12.0" Round Culvert** L= 27.0' Ke= 0.500 Inlet / Outlet Invert= 322.70' / 322.40' S= 0.0111 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.99 cfs @ 12.07 hrs HW=323.23' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 0.99 cfs @ 3.41 fps)

Summary for Pond N-CB8: N-CB-8

Inflow Area = 2,344 sf,100.00% Impervious, Inflow Depth = 3.93" for 10-yr event
Inflow = 0.22 cfs @ 12.07 hrs, Volume= 769 cf
Outflow = 0.22 cfs @ 12.07 hrs, Volume= 769 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.22 cfs @ 12.07 hrs, Volume= 769 cf
Routed to Pond N-CB5 : N-CB-5

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 322.78' @ 12.10 hrs
Flood Elev= 326.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	322.50'	**12.0" Round Culvert** L= 45.0' Ke= 0.500 Inlet / Outlet Invert= 322.50' / 322.27' S= 0.0051 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.18 cfs @ 12.07 hrs HW=322.78' TW=322.60' (Dynamic Tailwater)
↑—**1=Culvert** (Outlet Controls 0.18 cfs @ 1.56 fps)

Summary for Pond N-CB9: N-CB-9

Inflow Area = 15,358 sf,100.00% Impervious, Inflow Depth = 3.93" for 10-yr event
Inflow = 1.44 cfs @ 12.07 hrs, Volume= 5,036 cf
Outflow = 1.44 cfs @ 12.07 hrs, Volume= 5,036 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.44 cfs @ 12.07 hrs, Volume= 5,036 cf
Routed to Pond N-CB6 : N-CB-6

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 323.16' @ 12.07 hrs
Flood Elev= 326.41'

Device	Routing	Invert	Outlet Devices
#1	Primary	322.41'	**12.0" Round Culvert** L= 45.0' Ke= 0.500 Inlet / Outlet Invert= 322.41' / 322.19' S= 0.0049 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=1.39 cfs @ 12.07 hrs HW=323.14' TW=322.40' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 1.39 cfs @ 3.15 fps)

Summary for Pond N-FI1: N-FI-1

Inflow Area = 8,434 sf, 0.00% Impervious, Inflow Depth = 0.05" for 10-yr event
Inflow = 0.00 cfs @ 15.20 hrs, Volume= 39 cf
Outflow = 0.00 cfs @ 15.20 hrs, Volume= 39 cf, Atten= 0%, Lag= 0.0 min
Discarded = 0.00 cfs @ 15.20 hrs, Volume= 39 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Link POI 1 : OLD SUNCOOK RD

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 322.15' @ 0.00 hrs Surf.Area= 86 sf Storage= 0 cf
Flood Elev= 326.90' Surf.Area= 86 sf Storage= 71 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.0 min (1,094.5 - 1,094.5)

Volume	Invert	Avail.Storage	Storage Description
#1	322.15'	67 cf	**4.00'W x 10.75'L x 2.00'H Prismatoid** x 2 172 cf Overall - 4 cf Embedded = 168 cf x 40.0% Voids
#2	322.90'	4 cf	**6.0" Round Pipe Storage** x 2 Inside #1 L= 10.7'
		71 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	322.15'	**3.000 in/hr Exfiltration over Wetted area**
#2	Primary	323.90'	**1.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Discarded OutFlow Max=0.00 cfs @ 15.20 hrs HW=322.15' (Free Discharge)
↑—**1=Exfiltration** (Passes 0.00 cfs of 0.01 cfs potential flow)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=322.15' TW=0.00' (Dynamic Tailwater)
↑—**2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond N-FI2: N-FI-2

[92] Warning: Device #2 is above defined storage

Inflow Area = 6,170 sf, 0.00% Impervious, Inflow Depth = 0.06" for 10-yr event
Inflow = 0.00 cfs @ 15.20 hrs, Volume= 29 cf
Outflow = 0.00 cfs @ 15.20 hrs, Volume= 29 cf, Atten= 0%, Lag= 0.0 min
Discarded = 0.00 cfs @ 15.20 hrs, Volume= 29 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Link POI 1 : OLD SUNCOOK RD

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 322.35' @ 0.00 hrs Surf.Area= 86 sf Storage= 0 cf
Flood Elev= 327.09' Surf.Area= 86 sf Storage= 71 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.0 min (1,094.5 - 1,094.5)

Volume	Invert	Avail.Storage	Storage Description
#1	322.35'	67 cf	**4.00'W x 10.75'L x 2.00'H Prismatoid** x 2 172 cf Overall - 4 cf Embedded = 168 cf x 40.0% Voids
#2	323.10'	4 cf	**6.0" Round Pipe Storage** x 2 Inside #1 L= 10.7'
		71 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	322.35'	**3.000 in/hr Exfiltration over Wetted area**
#2	Primary	324.35'	**1.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Discarded OutFlow Max=0.00 cfs @ 15.20 hrs HW=322.35' (Free Discharge)
1=Exfiltration (Passes 0.00 cfs of 0.01 cfs potential flow)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=322.35' TW=0.00' (Dynamic Tailwater)
2=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond N-FI3: N-FI-3

[92] Warning: Device #2 is above defined storage

Inflow Area = 4,276 sf, 0.00% Impervious, Inflow Depth = 0.06" for 10-yr event
Inflow = 0.00 cfs @ 15.20 hrs, Volume= 21 cf
Outflow = 0.00 cfs @ 15.20 hrs, Volume= 21 cf, Atten= 0%, Lag= 0.0 min
Discarded = 0.00 cfs @ 15.20 hrs, Volume= 21 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Link POI 1 : OLD SUNCOOK RD

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 322.45' @ 0.00 hrs Surf.Area= 86 sf Storage= 0 cf
Flood Elev= 327.24' Surf.Area= 86 sf Storage= 71 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.0 min (1,094.5 - 1,094.5)

Volume	Invert	Avail.Storage	Storage Description
#1	322.45'	67 cf	**4.00'W x 10.75'L x 2.00'H Prismatoid** x 2 172 cf Overall - 4 cf Embedded = 168 cf x 40.0% Voids
#2	323.20'	4 cf	**6.0" Round Pipe Storage** x 2 Inside #1 L= 10.7'
		71 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	322.45'	**3.000 in/hr Exfiltration over Wetted area**
#2	Primary	324.45'	**1.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Discarded OutFlow Max=0.00 cfs @ 15.20 hrs HW=322.45' (Free Discharge)
1=Exfiltration (Passes 0.00 cfs of 0.01 cfs potential flow)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=322.45' TW=0.00' (Dynamic Tailwater)
2=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Link POI 1: OLD SUNCOOK RD

Inflow Area = 319,282 sf, 31.35% Impervious, Inflow Depth = 1.25" for 10-yr event
Inflow = 5.67 cfs @ 12.27 hrs, Volume= 33,231 cf
Primary = 5.67 cfs @ 12.27 hrs, Volume= 33,231 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: PDA 1 Runoff Area=5,546 sf 100.00% Impervious Runoff Depth=5.95"
Tc=5.0 min CN=98 Runoff=0.78 cfs 2,751 cf

Subcatchment2S: PDA 2 Runoff Area=5,524 sf 100.00% Impervious Runoff Depth=5.95"
Tc=5.0 min CN=98 Runoff=0.77 cfs 2,740 cf

Subcatchment3S: PDA 3 Runoff Area=8,829 sf 100.00% Impervious Runoff Depth=5.95"
Tc=5.0 min CN=98 Runoff=1.24 cfs 4,379 cf

Subcatchment4S: PDA 4 Runoff Area=119,868 sf 56.98% Impervious Runoff Depth=3.48"
Flow Length=222' Tc=20.3 min CN=WQ Runoff=6.47 cfs 34,764 cf

Subcatchment5S: PDA 5 Runoff Area=152,846 sf 11.20% Impervious Runoff Depth=0.88"
Flow Length=310' Tc=30.7 min CN=WQ Runoff=1.44 cfs 11,173 cf

Subcatchment6S: PDA 6 Runoff Area=2,702 sf 100.00% Impervious Runoff Depth=5.95"
Tc=5.0 min CN=98 Runoff=0.38 cfs 1,340 cf

Subcatchment7S: PDA 7 Runoff Area=12,362 sf 100.00% Impervious Runoff Depth=5.95"
Tc=5.0 min CN=98 Runoff=1.73 cfs 6,131 cf

Subcatchment8S: PDA 8 Runoff Area=3,084 sf 100.00% Impervious Runoff Depth=5.95"
Tc=5.0 min CN=98 Runoff=0.43 cfs 1,530 cf

Subcatchment9S: PDA 9 Runoff Area=15,358 sf 100.00% Impervious Runoff Depth=5.95"
Tc=5.0 min CN=98 Runoff=2.15 cfs 7,617 cf

Subcatchment10S: PDA 10 Runoff Area=2,344 sf 100.00% Impervious Runoff Depth=5.95"
Tc=5.0 min CN=98 Runoff=0.33 cfs 1,163 cf

Subcatchment11S: PDA 11 Runoff Area=19,491 sf 56.05% Impervious Runoff Depth=3.56"
Tc=5.0 min CN=WQ Runoff=1.54 cfs 5,776 cf

Subcatchment12S: PDA 12 Runoff Area=4,276 sf 0.00% Impervious Runoff Depth=0.47"
Tc=5.0 min CN=WQ Runoff=0.02 cfs 166 cf

Subcatchment13S: PDA 13 Runoff Area=6,170 sf 0.00% Impervious Runoff Depth=0.45"
Tc=5.0 min CN=WQ Runoff=0.03 cfs 232 cf

Subcatchment14S: PDA 14 Runoff Area=8,434 sf 0.00% Impervious Runoff Depth=0.44"
Tc=5.0 min CN=WQ Runoff=0.03 cfs 308 cf

Subcatchment15S: PDA 15 Runoff Area=8,197 sf 45.88% Impervious Runoff Depth=3.00"
Tc=5.0 min CN=WQ Runoff=0.53 cfs 2,051 cf

Pond add/alt: AMENDED SOIL - Peak Elev=321.99' Storage=10,782 cf Inflow=7.82 cfs 27,645 cf
Outflow=0.57 cfs 27,673 cf

Pond AMH-1: ACCESS MANHOLE-1 Peak Elev=321.99' Inflow=3.17 cfs 11,209 cf
24.0" Round Culvert n=0.012 L=4.0' S=0.0000 '/' Outflow=3.17 cfs 11,204 cf

Pond AMH-2: ACCESS MANHOLE-2 Peak Elev=321.99' Inflow=4.65 cfs 16,440 cf
24.0" Round Culvert n=0.012 L=4.0' S=0.0000 '/' Outflow=4.65 cfs 16,440 cf

Pond IR: ISOLATOR ROW CHECK Peak Elev=0.00' Storage=0 cf
Discarded=0.00 cfs 0 cf

Pond N-CB1: N-CB-1 Peak Elev=324.17' Inflow=0.78 cfs 2,751 cf
12.0" Round Culvert n=0.012 L=162.0' S=0.0050 '/' Outflow=0.78 cfs 2,751 cf

Pond N-CB2: N-CB-2 Peak Elev=323.58' Inflow=1.55 cfs 5,490 cf
12.0" Round Culvert n=0.012 L=45.0' S=0.0049 '/' Outflow=1.55 cfs 5,490 cf

Pond N-CB3: N-CB-3 Peak Elev=323.37' Inflow=1.93 cfs 6,831 cf
12.0" Round Culvert n=0.012 L=53.0' S=0.0049 '/' Outflow=1.93 cfs 6,831 cf

Pond N-CB4: N-CB-4 Peak Elev=323.03' Inflow=3.17 cfs 11,209 cf
15.0" Round Culvert n=0.012 L=4.0' S=0.0050 '/' Outflow=3.17 cfs 11,209 cf

Pond N-CB5: N-CB-5 Peak Elev=322.83' Inflow=0.76 cfs 2,692 cf
12.0" Round Culvert n=0.012 L=55.0' S=0.0049 '/' Outflow=0.76 cfs 2,692 cf

Pond N-CB6: N-CB-6 Peak Elev=322.70' Inflow=4.65 cfs 16,440 cf
18.0" Round Culvert n=0.012 L=4.0' S=0.0075 '/' Outflow=4.65 cfs 16,440 cf

Pond N-CB7: N-CB-7 Peak Elev=323.40' Inflow=1.54 cfs 5,776 cf
12.0" Round Culvert n=0.012 L=27.0' S=0.0111 '/' Outflow=1.54 cfs 5,776 cf

Pond N-CB8: N-CB-8 Peak Elev=322.91' Inflow=0.33 cfs 1,163 cf
12.0" Round Culvert n=0.012 L=45.0' S=0.0051 '/' Outflow=0.33 cfs 1,163 cf

Pond N-CB9: N-CB-9 Peak Elev=323.39' Inflow=2.15 cfs 7,617 cf
12.0" Round Culvert n=0.012 L=45.0' S=0.0049 '/' Outflow=2.15 cfs 7,617 cf

Pond N-FI1: N-FI-1 Peak Elev=323.45' Storage=47 cf Inflow=0.03 cfs 308 cf
Discarded=0.01 cfs 308 cf Primary=0.00 cfs 0 cf Outflow=0.01 cfs 308 cf

Pond N-FI2: N-FI-2 Peak Elev=323.20' Storage=29 cf Inflow=0.03 cfs 232 cf
Discarded=0.01 cfs 232 cf Primary=0.00 cfs 0 cf Outflow=0.01 cfs 232 cf

Pond N-FI3: N-FI-3 Peak Elev=322.93' Storage=17 cf Inflow=0.02 cfs 166 cf
Discarded=0.01 cfs 166 cf Primary=0.00 cfs 0 cf Outflow=0.01 cfs 166 cf

Link POI 1: OLD SUNCOOK RD Inflow=8.56 cfs 53,763 cf
Primary=8.56 cfs 53,763 cf

Total Runoff Area = 375,031 sf Runoff Volume = 82,118 cf Average Runoff Depth = 2.63"
58.44% Pervious = 219,180 sf 41.56% Impervious = 155,851 sf

Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: PDA 1 Runoff Area=5,546 sf 100.00% Impervious Runoff Depth=7.10"
Tc=5.0 min CN=98 Runoff=0.92 cfs 3,282 cf

Subcatchment2S: PDA 2 Runoff Area=5,524 sf 100.00% Impervious Runoff Depth=7.10"
Tc=5.0 min CN=98 Runoff=0.92 cfs 3,269 cf

Subcatchment3S: PDA 3 Runoff Area=8,829 sf 100.00% Impervious Runoff Depth=7.10"
Tc=5.0 min CN=98 Runoff=1.47 cfs 5,224 cf

Subcatchment4S: PDA 4 Runoff Area=119,868 sf 56.98% Impervious Runoff Depth=4.24"
Flow Length=222' Tc=20.3 min CN=WQ Runoff=7.75 cfs 42,334 cf

Subcatchment5S: PDA 5 Runoff Area=152,846 sf 11.20% Impervious Runoff Depth=1.23"
Flow Length=310' Tc=30.7 min CN=WQ Runoff=1.93 cfs 15,706 cf

Subcatchment6S: PDA 6 Runoff Area=2,702 sf 100.00% Impervious Runoff Depth=7.10"
Tc=5.0 min CN=98 Runoff=0.45 cfs 1,599 cf

Subcatchment7S: PDA 7 Runoff Area=12,362 sf 100.00% Impervious Runoff Depth=7.10"
Tc=5.0 min CN=98 Runoff=2.06 cfs 7,315 cf

Subcatchment8S: PDA 8 Runoff Area=3,084 sf 100.00% Impervious Runoff Depth=7.10"
Tc=5.0 min CN=98 Runoff=0.51 cfs 1,825 cf

Subcatchment9S: PDA 9 Runoff Area=15,358 sf 100.00% Impervious Runoff Depth=7.10"
Tc=5.0 min CN=98 Runoff=2.56 cfs 9,088 cf

Subcatchment10S: PDA 10 Runoff Area=2,344 sf 100.00% Impervious Runoff Depth=7.10"
Tc=5.0 min CN=98 Runoff=0.39 cfs 1,387 cf

Subcatchment11S: PDA 11 Runoff Area=19,491 sf 56.05% Impervious Runoff Depth=4.37"
Tc=5.0 min CN=WQ Runoff=1.91 cfs 7,102 cf

Subcatchment12S: PDA 12 Runoff Area=4,276 sf 0.00% Impervious Runoff Depth=0.84"
Tc=5.0 min CN=WQ Runoff=0.05 cfs 299 cf

Subcatchment13S: PDA 13 Runoff Area=6,170 sf 0.00% Impervious Runoff Depth=0.82"
Tc=5.0 min CN=WQ Runoff=0.07 cfs 420 cf

Subcatchment14S: PDA 14 Runoff Area=8,434 sf 0.00% Impervious Runoff Depth=0.80"
Tc=5.0 min CN=WQ Runoff=0.10 cfs 560 cf

Subcatchment15S: PDA 15 Runoff Area=8,197 sf 45.88% Impervious Runoff Depth=3.74"
Tc=5.0 min CN=WQ Runoff=0.67 cfs 2,556 cf

Pond add/alt: AMENDED SOIL - Peak Elev=323.39' Storage=13,617 cf Inflow=9.28 cfs 32,982 cf
Outflow=0.62 cfs 32,986 cf

Pond AMH-1: ACCESS MANHOLE-1 Peak Elev=323.39' Inflow=3.76 cfs 13,373 cf
24.0" Round Culvert n=0.012 L=4.0' S=0.0000 '/' Outflow=3.76 cfs 13,368 cf

Pond AMH-2: ACCESS MANHOLE-2 Peak Elev=323.39' Inflow=5.52 cfs 19,614 cf
24.0" Round Culvert n=0.012 L=4.0' S=0.0000 '/' Outflow=5.52 cfs 19,614 cf

Pond IR: ISOLATOR ROW CHECK Peak Elev=0.00' Storage=0 cf
Discarded=0.00 cfs 0 cf

Pond N-CB1: N-CB-1 Peak Elev=324.23' Inflow=0.92 cfs 3,282 cf
12.0" Round Culvert n=0.012 L=162.0' S=0.0050 '/' Outflow=0.92 cfs 3,282 cf

Pond N-CB2: N-CB-2 Peak Elev=323.71' Inflow=1.84 cfs 6,550 cf
12.0" Round Culvert n=0.012 L=45.0' S=0.0049 '/' Outflow=1.84 cfs 6,550 cf

Pond N-CB3: N-CB-3 Peak Elev=323.52' Inflow=2.29 cfs 8,149 cf
12.0" Round Culvert n=0.012 L=53.0' S=0.0049 '/' Outflow=2.29 cfs 8,149 cf

Pond N-CB4: N-CB-4 Peak Elev=323.40' Inflow=3.76 cfs 13,373 cf
15.0" Round Culvert n=0.012 L=4.0' S=0.0050 '/' Outflow=3.76 cfs 13,373 cf

Pond N-CB5: N-CB-5 Peak Elev=323.40' Inflow=0.90 cfs 3,212 cf
12.0" Round Culvert n=0.012 L=55.0' S=0.0049 '/' Outflow=0.90 cfs 3,212 cf

Pond N-CB6: N-CB-6 Peak Elev=323.40' Inflow=5.52 cfs 19,614 cf
18.0" Round Culvert n=0.012 L=4.0' S=0.0075 '/' Outflow=5.52 cfs 19,614 cf

Pond N-CB7: N-CB-7 Peak Elev=323.50' Inflow=1.91 cfs 7,102 cf
12.0" Round Culvert n=0.012 L=27.0' S=0.0111 '/' Outflow=1.91 cfs 7,102 cf

Pond N-CB8: N-CB-8 Peak Elev=323.40' Inflow=0.39 cfs 1,387 cf
12.0" Round Culvert n=0.012 L=45.0' S=0.0051 '/' Outflow=0.39 cfs 1,387 cf

Pond N-CB9: N-CB-9 Peak Elev=323.52' Inflow=2.56 cfs 9,088 cf
12.0" Round Culvert n=0.012 L=45.0' S=0.0049 '/' Outflow=2.56 cfs 9,088 cf

Pond N-FI1: N-FI-1 Peak Elev=323.97' Storage=65 cf Inflow=0.10 cfs 560 cf
Discarded=0.01 cfs 442 cf Primary=0.06 cfs 119 cf Outflow=0.08 cfs 560 cf

Pond N-FI2: N-FI-2 Peak Elev=324.41' Storage=71 cf Inflow=0.07 cfs 420 cf
Discarded=0.01 cfs 392 cf Primary=0.05 cfs 28 cf Outflow=0.06 cfs 420 cf

Pond N-FI3: N-FI-3 Peak Elev=324.11' Storage=60 cf Inflow=0.05 cfs 299 cf
Discarded=0.01 cfs 299 cf Primary=0.00 cfs 0 cf Outflow=0.01 cfs 299 cf

Link POI 1: OLD SUNCOOK RD Inflow=10.44 cfs 67,845 cf
Primary=10.44 cfs 67,845 cf

Total Runoff Area = 375,031 sf Runoff Volume = 101,966 cf Average Runoff Depth = 3.26"
58.44% Pervious = 219,180 sf 41.56% Impervious = 155,851 sf

10.0 SITE-SPECIFIC SOIL REPORT

TES ENVIRONMENTAL CONSULTANTS, L.L.C.

Environmental Planning and Permitting
Soil and Wetlands Investigation

SITE-SPECIFIC SOIL SURVEY REPORT

performed at

Daval Realty Associates, LLC and
Banks Chevrolet-Cadillac Property
Tax Map/Block 782/Z, Lot 8
234 Airport Road
Concord, NH

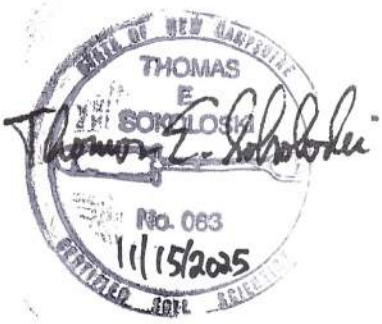
prepared for

Wilcox & Barton, Inc.
2 Home Avenue
Concord, NH 03301

TES Project # 25-0044

1494 Route 3A, Unit 1
Bow, NH 03304
(603) 856-8925

tom@tesenviro.comcastbiz.net



November 15, 2025

Ms. Erin Lambert, PE, LEED AP
Wilcox & Barton, Inc.
2 Home Avenue
Concord, NH 03301

RE: Site Specific Soil Map – Daval Realty Associates, LLC/Banks Chevrolet-Cadillac Property
Tax Map/Block 782/Z, Lot 8
234 Airport Road, Concord, New Hampshire

Dear Ms. Lambert:

On November 14, 2025 I performed field work on the above-referenced property at 234 Airport Road in Concord, New Hampshire for a Site Specific Soil Survey as you requested. The Site Specific Soil Survey comprised the entire 7.08-acre parcel which was depicted on an existing conditions plan provided by your office (survey by Holden Engineering & Surveying, Inc.). This plan had a scale of 1" = 40' and 2-foot contour intervals (the entire parcel is nearly level). This soil survey was prepared to support a New Hampshire Alteration of Terrain permit application for a planned expansion of and improvements to existing automobile parking areas on the site.

The subject parcel is bounded by Airport Road to the east, Old Suncook Road to the south, residential properties along Airport Road, office buildings off Old Suncook Road to the west, and forest and athletic fields to the north. Concord Airport is located to the east of Airport Road.

This Soil Survey was completed utilizing SSSNNE Special Publication No. 3, Version 7.0, "Site-Specific Soil Mapping Standards for New Hampshire and Vermont", July 2021. The soil legend used for this soil map conforms to the New Hampshire State-Wide Numerical Soils Legend, Issue #10 (January 2011) established and maintained by the Natural Resources Conservation Service.

Field work for this soil survey included the examination of many soil profiles via hand dug test pits and auger borings taken at intervals sufficient to delineate the boundaries between soil map units. No New Hampshire Wetlands Bureau jurisdictional wetlands were observed to be present on or adjacent to the survey area. Readily-identifiable property boundaries and markers, utility poles, fences, pavement, catch basins, tree lines, jersey barrier walls, and other development features on and adjacent to the site were utilized for locational control for the soil survey.

The Soil Survey of Merrimack and Belknap Counties, New Hampshire (USDA – Natural Resource Conservation Service) was reviewed (via Web Soil Survey) prior to site work for reference. This publication indicates that the soils across almost the entire mapping area consist of Windsor loamy sand (26A), with Urban Land (699B) in a narrow strip along Old Suncook Road. Windsor loamy sand is a sandy, excessively drained soil formed in glaciofluvial deposits. The Urban Land map unit depicts mostly developed soils (paved and/or buildings) without specifying underlying soil types, however, for this site, it may be safely concluded that the soils underlying the site pavement consists of the natural substrata of Windsor loamy sand, as all

undisturbed soils surrounding the property are indicated as such or similar but disturbed soils. No other soils were observed during the Site Specific Soil Survey.

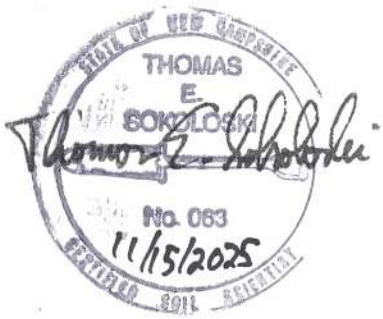
The following report includes a Site Specific Soil Map Key with Hydrologic Soil Groups and attached soil map unit descriptions. The general soil conditions on the site consist of nearly level, sandy glacial outwash deposits, approximately half of which (the western half) has been developed as automobile parking areas, either paved with asphalt or having a man-made gravel surface. Mature, mostly evergreen forest exists to the north and east of a central asphalt-paved parking area extending north from Old Suncook Road, and a smaller area of maintained grassland exists along the Airport Road lot frontage.

If you have any questions regarding the soils on this site and the accompanying report, please contact our office.

Very truly yours,

Thomas E. Sokoloski

Thomas E. Sokoloski
Certified Soil Scientist #063



SITE SPECIFIC SOIL MAP UNIT KEY

Symbol*	Map Unit	Slope Class	Drainage Class	HISS Symbol	Hydro. Soil Group
26B	Windsor loamy sand	0-8%	Excessively	111BH	A
400B/abaaa	Udorthents, sandy	0-8%	Excessively	161BH	A
400B/hbhaa	Udorthents, sandy	0-8%	Undeterminable**	761BH	A

* Refer to accompanying report for 5-unit supplemental symbol explanation.

** Assumed to be excessively drained as in adjacent unpaved soils.

This detailed Site-Specific Soil Map, prepared on November 14, 2025 by Thomas E. Sokoloski, Certified Soil Scientist #063 of TES Environmental Consultants, L.L.C. in Bow, New Hampshire, conforms to the standards of SSSNNE Publication No. 3, Version 7.0, "Site-Specific Soil Mapping Standards for New Hampshire and Vermont", July 2021. This map has been prepared to comply with soil mapping requirements of RSA 485 A: 17 and NHDES Env-Wq 1500, Alteration of Terrain. See accompanying report for methodology, map symbol legend, and interpretations. Use of the map symbol denominators for disturbed or altered soils, where given, is at the discretion of the Certified Soil Scientist.

This map product is within the technical standards of the National Cooperative Soil Survey. It is a special purpose product, intended for use in support of a New Hampshire Alteration Terrain permit application. It was produced by a certified Soil Scientist, and is not a product of the USDA Natural Resources Conservation Service. There is a narrative report that accompanies this map.

Supplemental Symbols

The five components of the Disturbed Soil Mapping Unit Supplement are as follows:

Symbol 1: Drainage Class
a-Excessively Well Drained
b-Somewhat Excessively Drained
c-Well Drained
d-Moderately Well Drained
e-Somewhat Poorly Drained
f-Poorly Drained
g-Very Poorly Drained
h-Not Determined

Symbol 2 -: Parent Material (of naturally formed soil only, if present)
a-No natural soil within 60"
b-Glaciofluvial Deposits (outwash/terraces of sand or sand and gravel)
c-Glacial Till Material (active ice)
d-Glaciolacustrine very fine sand and silt deposits (glacial lakes)
e-Loamy/sandy over silt/clay deposits
f-Marine Silt and clay deposits (ocean waters)
g-Alluvial Deposits (floodplains)
h-Organic Materials-Fresh water Bogs, etc
i- Organic Materials-Tidal Marsh

Symbol 3: Restrictive/Impervious Layers
a-None
b-Bouldery surface with more than 15% of the surface covered with boulders
c-Mineral restrictive layer(s) are present in the soil profile less than 40 inches below the soil surface such as hardpan, platy structure or clayey texture with consistence of at least firm, i.e. more than 20 newtons. For other examples of soil characteristics that qualify for restrictive layer, see "Soil Manual for Site evaluations in NH" 2nd Ed., page 3-17, figure 2-14
d-Bedrock in the soil profile 0-20 inches
e-Bedrock in the soil profile 20-60 inches
f-Areas where depth to bedrock is so variable that a single soil type cannot be applied, will be mapped as a complex of soil types
g-Subject to Flooding
h –man-made impervious surface including pavement, concrete, or built-up surfaces (i.e. buildings) with no morphological restrictive layer within control section

Symbol 4 Estimated Ksat* (most restrictive layer excluding symbol 3h above).
a- High
b-Moderate
c-Low
d-Not determined
*See "Guidelines for Ksat Class Placement" in Chapter 3 of the Soil Survey Manual, USDA

Symbol 5: Hydrologic Soil Group*
a-Group A
b-Group B
c-Group C
d-Group D
e-Not determined

*excluding man-made impervious/restrictive layers

SITE SPECIFIC SOIL MAP UNIT DESCRIPTIONS

Map Unit Symbol: 26

Map Unit Name: Windsor loamy sand

Landscape Settings: Outwash plains and terraces

Surface Features: None

Drainage Class: Excessively

Parent Material: Sandy glaciofluvial deposits (outwash)

Complex: Yes ( ) No (X)

Nature of Dissimilar Inclusions, Locations and Estimated Percent:

None.

Additional Notes:

Typical observed soil profile description:

Depth	Horizon	Color	Texture	Structure	Consistency	Redox	Notes
0-10"	A	10YR 3/2	Sandy loam	Granular	Very friable	None	
10-22"	Bw1	10YR 5/6	Sandy loam*	Blocky	Friable	None	
22-40"+	Bw2	10YR 5/6	Grav. loamy sand	Single grain	Loose	None	

*The Bw1 horizon in some areas was loamy sand.

Tax Map/Block 482/Z, Lot 8. Undisturbed upland evergreen forest, north-central and eastern portions of mapping area, and maintained grassland, eastern side of parcel. SHWT > 40".

Thomas E. Sokoloski 11/14/2025

SITE SPECIFIC SOIL MAP UNIT DESCRIPTIONS

Map Unit Symbol: 400B/abaaa

Map Unit Name: Udorthents, sandy

Landscape Settings: Excavated, regraded or filled land surfaces

Surface Features: Fill or regraded soil; parking or landscaped areas

Drainage Class: Excessively

Parent Material: Sandy glaciofluvial deposits (outwash)

Complex: Yes ( ) No (X)

Nature of Dissimilar Inclusions, Locations and Estimated Percent:

Small, narrow areas of disturbed soils without the placed gravel surface exist in the area surrounding the asphalt-paved parking area in the south-central portion of the parcel along Old Suncook Road and small areas of landscaping or turnouts along Old Suncook Road.

Additional Notes:

Typical observed soil profile description:

Depth	Horizon	Color	Texture	Structure	Consistency	Redox	Notes
0-10"	F	2.5Y 5/1	Gravel	Single grain	Friable	None	Packed fill
10-24"	Bw1	10YR 5/6	Sandy loam	Blocky	Friable	None	
24-40"+	Bw2	10YR 5/6	Grav. loamy sand	Single grain	Loose	None	

Tax Map/Block 482/Z, Lot 8. Soils altered by regrading, and filling; car parking area in western portion of site, and other locations of disturbed soils across mapping area; SHWT > 40".

Thomas E. Sokoloski 11/14/2025

SITE SPECIFIC SOIL MAP UNIT DESCRIPTIONS

Map Unit Symbol: 400B/hbhaa

Map Unit Name: Udorthents, sandy

Landscape Settings: Developed land surfaces

Surface Features: Asphalt pavement - impervious surfaces

Drainage Class: Undeterminable (assumed to be excessively drained as are adjacent soils)

Parent Material: Sandy glaciofluvial deposits (outwash)

Complex: Yes ( ) No (X)

Nature of Dissimilar Inclusions, Locations and Estimated Percent:

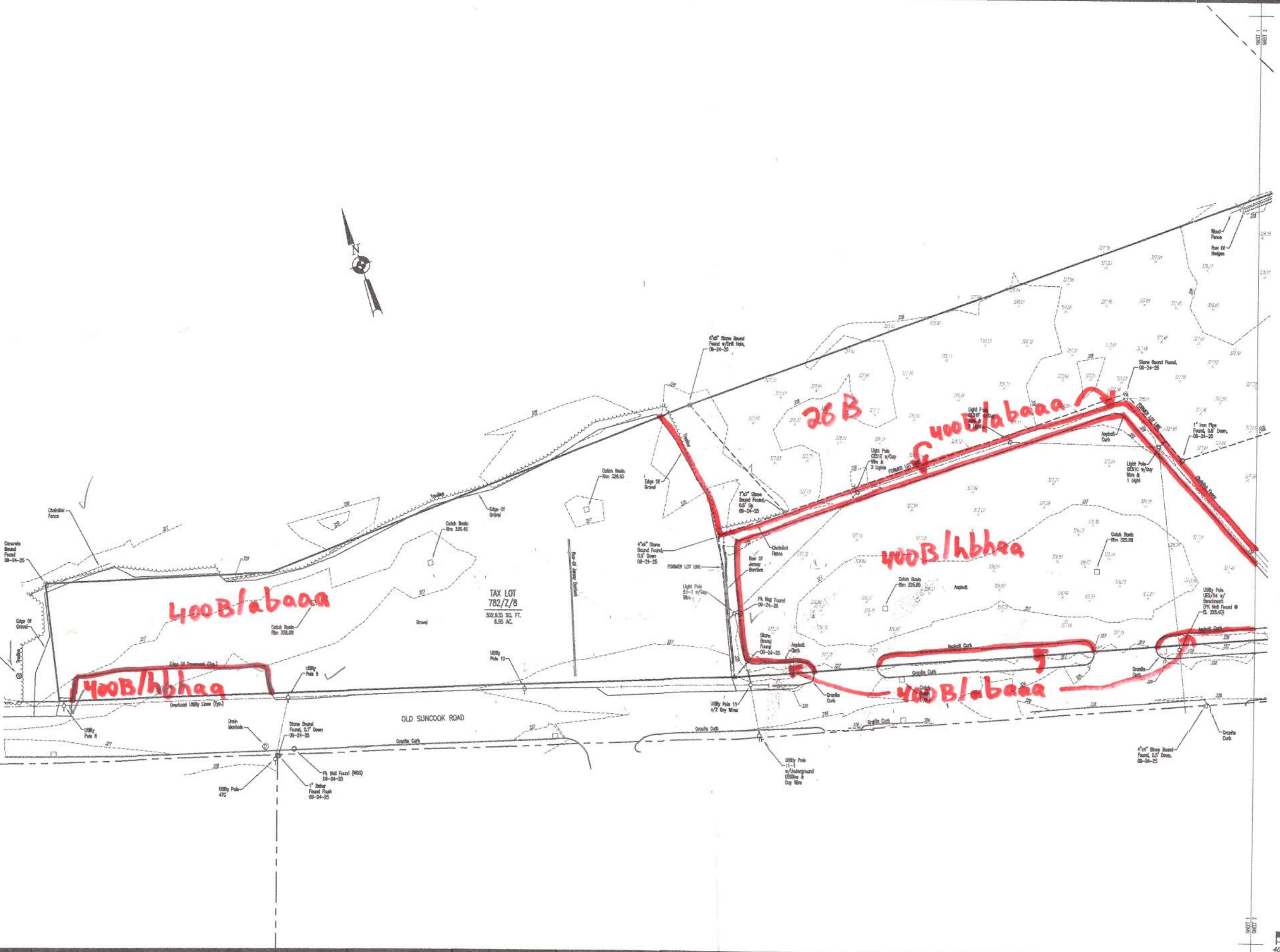
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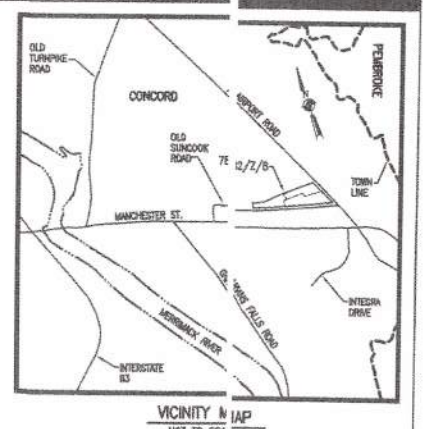
Additional Notes:

Soil profile not observed due to pavement. All surrounding, undeveloped soils known to have subsoils and substrata consisting of glaciofluvial sand and gravel.

Tax Map/Block 482/Z, Lot 8. Developed soils at a car-parking area in south-central portion of parcel along Old Suncook Road with impervious surface of asphalt; SHWT > 40", assumed.

Thomas E. Sokoloski 11/14/2025





VICINITY MAP
NOT TO SCALE

PLAN REFERENCES:

1. "OLD SUNCOOK ROAD RIGHT OF WAY ACQUISITION MAP" DATED MAY 1873 BY CITY OF CONCORD, NEW HAMPSHIRE ENGINEERING DIVISION, FILE NO. 1604
2. "LAND TO BE LEASED OT CONCORD LITTLE LEAGUE" DATED MARCH 1974 BY CITY OF CONCORD, NEW HAMPSHIRE ENGINEERING DIVISION, FILE NO. 1682
3. "SANEL REALTY CO., INC., TRACTS 4371-F & 4487-A" DATED APRIL, 1959 BY E.N. ROBERTS, CITY OF CONCORD FILE NO. 1586

NOTES:

1. REFERENCE THIS PARCEL AS CITY OF CONCORD TAX LOT 782/2/8 OWNED BY DAVAL REALTY ASSOCIATES, 137 MANCHESTER STREET, CONCORD, NH 03301.
2. DEED REFERENCE: SEE NOTICE OF LOT CONSOLIDATION, BOOK 3743, PAGE 515, AS RECORDED AT THE MERRIMACK COUNTY REGISTRY OF DEEDS.
3. AREA OF PARCEL: 302,935 SQUARE FEET, OR 6.95 ACRES.
4. THIS SURVEY WAS AN ACTUAL ON THE GROUND TOPOGRAPHIC SURVEY PERFORMED BY HOLDEN ENGINEERING & SURVEYING, INC. IN SEPTEMBER, 2025 FOR THE PURPOSE OF DEPICTING EXISTING SITE CONDITIONS ON THE SUBJECT PROPERTY.
5. THE HORIZONTAL SURVEY DATUM IS TIED TO THE NH STATE PLANE COORDINATE SYSTEM AND THE VERTICAL SURVEY DATUM IS TIED TO NAVD 1988 DATUM.

SCALE: 1"=40'
40 0 40 80 120

HOLDEN ENGINEERING & SURVEYING, Inc.

56 Old Suncook Road - Unit #4
PO Box 480 Concord, N.H. 03302
(603) 225-6449

3 Constitution Drive
Bedford, N.H. 03110
(603) 472-2678

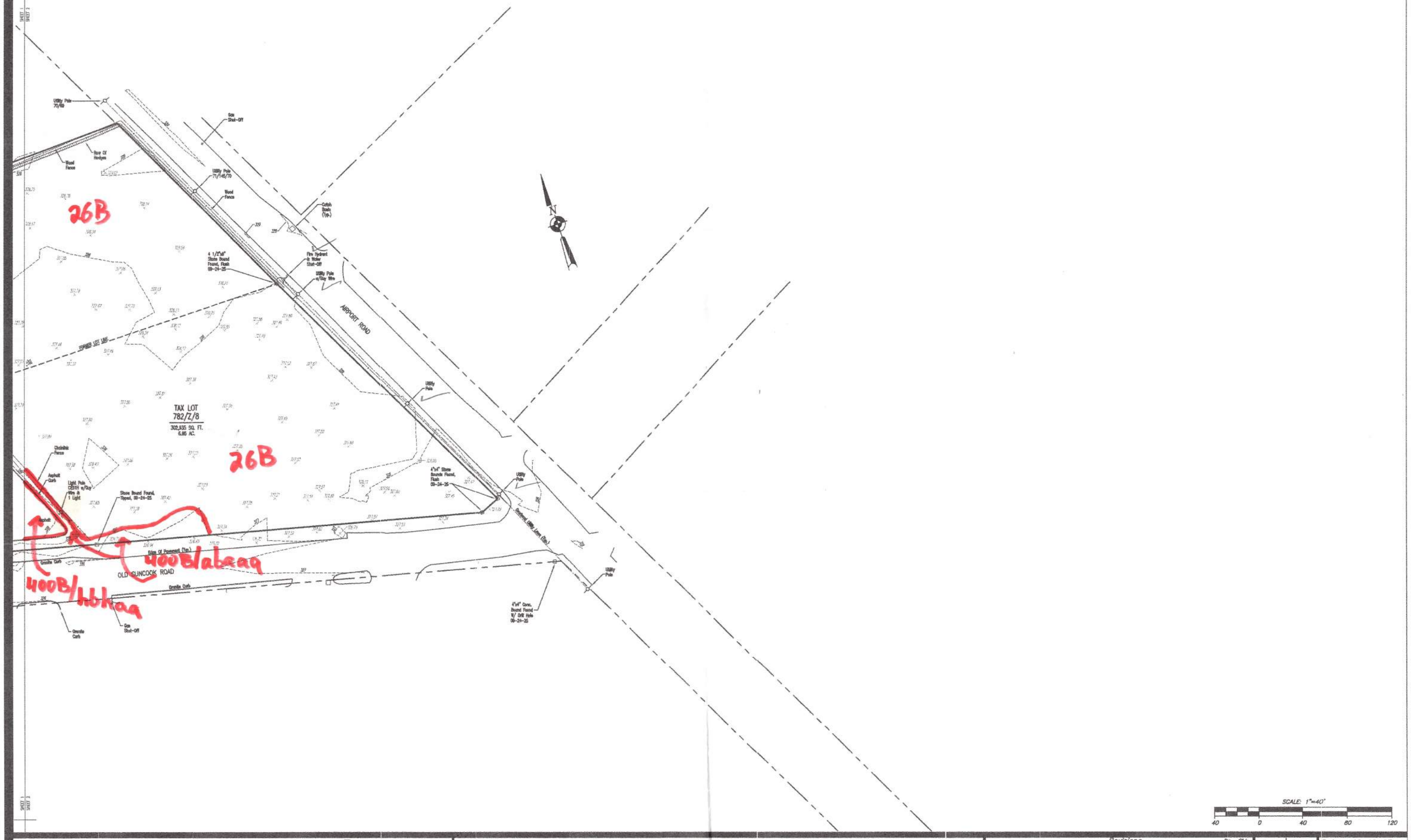
EXISTING CONDITIONS PLAN
BANKS CHEVROLET – CADILLAC
CONCORD, NH

Date:	Revisions Description	Dr. By	Chk. By

Book	Page

Date: 10-16-25
Scale: 1"=40'
Dr. By: DS Ck By: LR
Job No. 2520435
Sheet no 1 of 2

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(603) 225-6419

9 Constitution Drive
Bedford, N.H. 03110
(603) 472-2073

EXISTING CONDITIONS PLAN
BANKS CHEVROLET — CADILLAC
CONCORD, NH

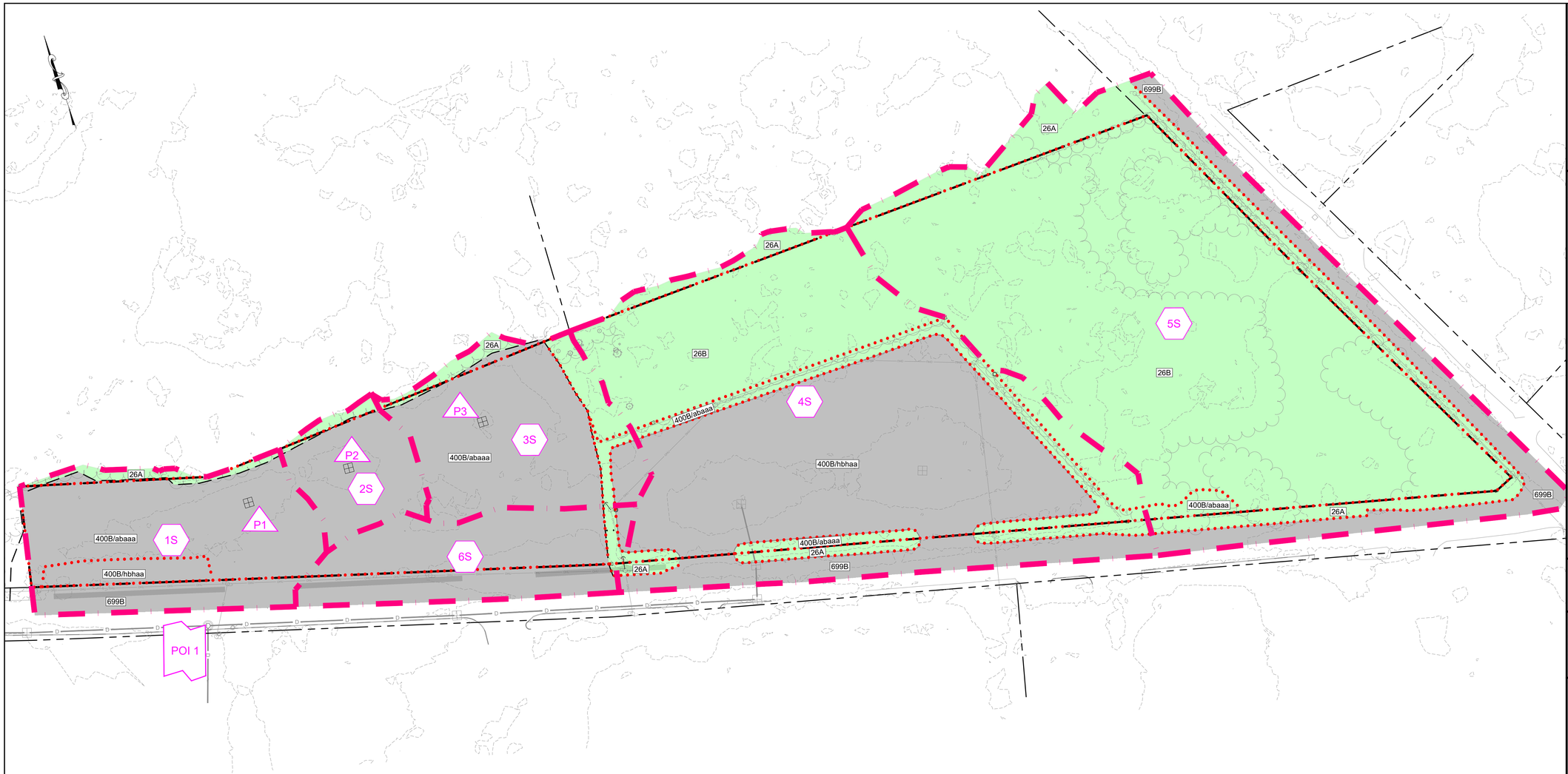
Date:	Revisions Description	Dr. By	Chk. By

Book	Page

Date: 10-16-25
Scale: 1"=40'
Dr. By: DS Ck By: LR
Job No. 2520435
Sheet no 2 of 2

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X-BASE



SSSNNE SOIL MAP LEGEND

- HYDROLOGIC GROUP A
- IMPERVIOUS COVER
- SOIL TYPE BOUNDARY

STORMWATER PLAN LEGEND

- SUBCATCHMENT NODE
- POINT OF INTEREST NODE
- SUBWATERSHED BOUNDARY

PLAN NOTES:

1. EXISTING CONDITIONS, TOPOGRAPHICAL INFORMATION, NORTH ORIENTATION, AND COORDINATE VALUES DEPICTED ON THESE DRAWINGS ARE BASED ON PLANS TITLED "EXISTING CONDITIONS PLAN - BANKS CHEVROLET-CADILLAC - CONCORD, NH" PREPARED FOR BANKS CHEVROLET, DATED OCTOBER 16, 2025, PROVIDED TO WILCOX & BARTON, INC. BY HOLDEN ENGINEERING & SURVEYING, INC.

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

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603-369-4190
www.wilcoxandbarton.com

REVISION HISTORY
1. REVISED IN RESPONSE TO NHDES ECOLOGICAL REVIEW SECTION COMMENTS (12/09/2025)
2. REVISED TO COMPLY WITH RESIDENTIAL SCREENING (12/19/2025)
3. REVISED IN RESPONSE TO CITY OF CONCORD AND NHDES AOT COMMENTS (02/17/2026)

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OWNER

DAVAL REALTY ASSOCIATES LLC / BANKS CHEVROLET

137 MANCHESTER ST CONCORD, NH 03301

SITE

BANKS CHEVROLET PARKING LOT RECONSTRUCTION

234 AIRPORT ROAD CONCORD, NH 03301

MBLU: 782/Z/8

DRAWING TITLE

PRE-DEVELOPMENT SOILS MAP

SCALE	DATE
1" = 40'	11/19/2025

DRAFTED BY	CHECKED BY	PROJECT MGR	PROJECT NO.
KAD	ERL	ERL	BACC0005

STATE OF NEW HAMPSHIRE · ERIN R. LAMBERT No. 11057 LICENSED PROFESSIONAL ENGINEER

ENGINEER: ERIN R. LAMBERT
NH P.E. #11057

SHEET NO.

SM1

01 OF 02



SSSNNE SOIL MAP LEGEND

- HYDROLOGIC GROUP A
- IMPERVIOUS COVER
- SOIL TYPE BOUNDARY

STORMWATER PLAN LEGEND

- SUBCATCHMENT NODE
- POINT OF INTEREST NODE
- SUBWATERSHED BOUNDARY

PLAN NOTES:

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GRAPHIC SCALE

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(IN FEET)
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OWNER

DAVAL REALTY ASSOCIATES LLC / BANKS CHEVROLET

137 MANCHESTER ST CONCORD, NH 03301

SITE

BANKS CHEVROLET PARKING LOT RECONSTRUCTION

234 AIRPORT ROAD CONCORD, NH 03301

MBLU: 782/Z/8

DRAWING TITLE

POST-DEVELOPMENT SOILS MAP

SCALE	DATE
1" = 40'	11/19/2025

DRAFTED BY	CHECKED BY	PROJECT MGR	PROJECT NO.
KAD	ERL	ERL	BACC0005

ERIN R. LAMBERT No. 11057 LICENSED PROFESSIONAL ENGINEER - STATE OF NEW HAMPSHIRE

ENGINEER: ERIN R. LAMBERT
NH P.E. #11057

SHEET NO.

SM2

02 OF 02

11.0 INFILTRATION FEASIBILITY REPORT

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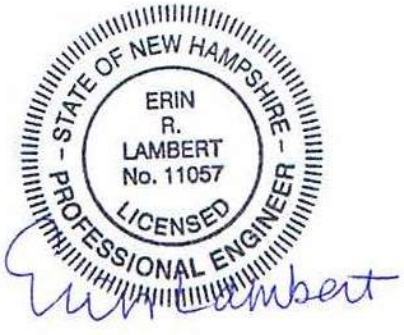
INFILTRATION FEASIBILITY REPORT

for

Banks Chevrolet Parking Lot Reconstruction
234 Airport Road
Concord, NH 03301

Prepared for:
Banks Chevrolet
C/O Fred Booth
137 Manchester Street
Concord, NH 03301

Prepared by:
Wilcox & Barton, Inc.
2 Home Ave.
Concord, New Hampshire 03301
Contact: Erin R. Lambert, PE, (603) 369-4190 x527



Wilcox & Barton, Inc.
Project No.: BACC0005

November 19, 2025

1.0 LOCATION OF THE PRACTICE 3
2.0 EXISTING TOPOGRAPHY AT THE LOCATION OF THE PRACTICES 3
3.0 TEST PIT LOCATIONS 3
4.0 SEASONAL HIGH WATER (SHWT) AND BEDROCK ELEVATIONS 3
5.0 PROFILE DESCRIPTION AND SOILS 4
6.0 SUMMARY OF DATA USED TO DETERMINE THE INFILTRATION RATE 4

1.0 LOCATION OF THE PRACTICE

This project proposes multiple systems that require infiltration to function properly. The systems are identified on the plans as Infiltration Gallery-1, Field Inlet-1, Field Inlet-2, and Field Inlet-3. Currently the project area is served by three dry wells that manage a portion of the runoff through infiltration. The eastern portion of the project is proposed to be maintained, will not be disturbed, and will remain paved with two catch basin locations directing flow to the closed drainage system at Old Suncook Road.

Infiltration Gallery-1: This gallery is in the central area of the proposed redeveloped parking lot. The gallery captures runoff from the proposed parking lot area via catch basins. In total, the system collects drainage runoff from 1.28 acres of influent area, consisting of all impervious surfaces. Please see Grading & Drainage Plans for more information on the infiltration gallery-1 location.

Field Inlets-1-3: Field Inlets 1–3 are located on the northern side of the property within the grassed landscaped areas. Each inlet consists of a field inlet directed to two 6-inch perforated pipes embedded in a stone trench. These systems are not intended for stormwater treatment but rather to collect runoff from the rear landscaped areas of the project site for disconnecting stormwater runoff. Please see Grading & Drainage Plans for more information on the field inlet's location.

2.0 EXISTING TOPOGRAPHY AT THE LOCATION OF THE PRACTICES

The current topography of the infiltration practice areas is situated on mostly disturbed/developed land with existing compacted gravel and paved areas, characterized by gradual slopes ranging from 0.5% to 5% towards the southern property boundary line. The site's existing vegetation in this area includes wooded and grassed areas surrounding the existing development, supported by well-draining soils.

3.0 TEST PIT LOCATIONS

Confirmatory test pits will be performed at the start of construction at the location of the infiltration treatment system, Infiltration Gallery-1. Test pit logs will be submitted to the City of Concord and NHDES Alteration of Terrain Bureau to confirm the design criteria as required. Please see the Site-Specific Soil Survey Report for more information.

4.0 SEASONAL HIGH WATER (SHWT) AND BEDROCK ELEVATIONS

The on-site soils indicate well-draining soil around the infiltration practices, with SHWT observed at depths of 80" and greater. The soil information is enclosed here to the NHDES Alteration of Terrain Bureau to verify the minimum separation of 3-feet from the bottom of the infiltration system to the elevation of seasonal high water and bedrock. Test pit logs will be submitted to the City of Concord and NHDES Alteration of Terrain Bureau to supplement the soil information.

5.0 PROFILE DESCRIPTION AND SOILS

Please refer to "Site-Specific Soil Survey Report".

6.0 SUMMARY OF DATA USED TO DETERMINE THE INFILTRATION RATE

The project area includes hydrologic soil group (HSG) 'A' soils near the proposed infiltration practices with default Ksat values ranging from 6 to 20 in/hr at both high and low soil horizons. For modeling purposes, an infiltration rate of 3 in/hr was used, incorporating a factor of safety of 2. Previous testing conducted at the adjacent Banks Chevrolet dealership parcel reflected infiltration rates exceeding the maximum allowable rate of 10 in/hr (prior to applying the factor of safety). Based on this information, similar soil conditions are anticipated on the project site, which may require on-site soil amendment at the treatment system location. The civil plan set has been prepared to reflect these potential amendment requirements, which are detailed via Layout B in the Construction Details. Confirmatory test pits and on-site infiltration rate testing will be performed prior to construction, and the results will be submitted to the NHDES Alteration of Terrain Bureau to verify the assumed design infiltration rate and affiliated infiltration gallery configuration. Both gallery configurations (Layout A and Layout B) require impermeable liners be installed at all sidewalls of Infiltration Gallery-1 due to soils being HSG A, as reflected in sheet C5.3, Construction Details.

REGISTRATION AND NOTIFICATION FORM FOR STORMWATER INFILTRATION TO GROUNDWATER (5H1)

Groundwater Discharge Program

RSA/Rule: RSA 485-A:6, VII; 485:3, X; Env-Wq 402

Applicant Information

Name: Banks Chevrolet/Daval Realty Associates LLC	Daytime Phone: 603-229-4004	
Mailing Address: 137 Manchester Street		
City: Concord	State: NH	ZIP: 03301
Contact Person Name: Fred Booth	Email: fred.booth@banksautos.com	
Contact Person Phone Number: 603-229-4004	Fax Number:	

Facility Information

Name: Banks Chevrolet Parking Lot Reconstruction		
Address: 234 Airport Road		
City: Concord	State: NH	ZIP: 03301
Property Tax Map: 782 Block Z	Lot Number: 8	
Latitude & Longitude of discharge point(s): 43.190, -71.503		

Facility Owner Information (complete only if different than applicant)

Owner Name:	Daytime Phone:	
Mailing Address:		
City/Town:	State:	ZIP:
Contact Person Name:	Email:	
Contact Person Phone Number:	Fax Number:	

Property Owner (complete only if different then Applicant)

Name:	Daytime Phone:	
Mailing Address:		
City:	State:	ZIP:
Contact Person Name:	Email:	
Contact Person Phone Number:	Fax Number:	

Facility Operator's Information (complete only if different than applicant)

Facility Operator Name:	Daytime Phone:	
Mailing Address:		
City:	State:	ZIP:

Complete this form if you are using a drywell or other subsurface infiltration structures to recharge stormwater to the ground or groundwater. If a completed Underground Injection Control (UIC) registration form was submitted to the Alteration of Terrain Bureau for this project, then one is not required to be sent directly to the Drinking Water and Groundwater Bureau (DWGB).

REGISTRATION AND NOTIFICATION FORM FOR STORMWATER INFILTRATION TO GROUNDWATER (attach additional sheets, as necessary, for responses to questions below)

Please provide a complete description of the facility including historic uses, any former contamination and/or ongoing remedial action at the site.
The project involves paving an existing gravel parking area to be used for employee parking at 234 Airport Road in Concord to support the Banks Chevrolet Car Dealership located across Old Suncook Road. The redevelopment of the gravel parking area results in an overall decrease of impervious cover to the site that will be transitioned to landscaped areas (24,170 SF). Supporting infrastructure including stormwater improvements, lighting, and landscaping are proposed. There are no known former contamination and no ongoing remedial action at the site.

Please provide information concerning the location of the infiltration activity, include Locus map (i.e. USGS map).
One subsurface infiltration gallery is proposed on-site to collect runoff from the redeveloped parking lot area. The location of the subsurface infiltration gallery is within the existing development and is centrally located in the proposed parking lot area. Minimal tree clearing (approximately 3,600 SF) is proposed at the rear of the project area to allow space for the northeastern corner of the parking lot. The overall impervious cover to the site is decreased in the proposed redevelopment conditions by 24,170 SF. Please see the attached Grading & Drainage Plan for reference.

Please describe the pretreatment system, if any, and capacity of the system.
Pretreatment of stormwater is provided in the isolator row of the subsurface infiltration gallery. The practice is sized to accommodate the necessary Water Quality Volume from the contributing drainage area. The practice is designed to control the 50-year storm event to match pre-development drainage conditions and is designed to not overtop during the 100-year storm event.

Please describe the materials and products used for the subsurface infiltration structure (i.e., pipe and stone leachfield, plastic chamber units, concrete drywell, etc.).
The proposed subsurface infiltration gallery is an ADS Stormtech MC-3500 system. The system includes the Stormtech chamber (45” high chamber), ADS geosynthetic non-woven geotextile fabric, and crushed stone surrounding the chamber system. Please see attached Construction Details for more information on the ADS Stormtech MC-3500 system.

Please describe the disposal method and location. Include a site plan showing: the infiltration structure, any other on-site infiltration structures, dimensions, depth to groundwater (if known), adjacent septic system(s), and drinking water source(s).
The proposed subsurface infiltration gallery is designed to fully infiltrate the runoff within the gallery footprint. No outlet is included in the proposed gallery; the system is designed to not overtop the chambers and stone cover during the 100-year storm event. Refer to plans accompanying the Alteration of Terrain Permit application.

Please provide information concerning methods and schedule for periodic inspection and/or maintenance.
Refer to the Inspection & Maintenance Manual for the requirements for the practice.

Applicant/Owner Certification Statement and Signature

By signing this application, the signer certifies that the information contained in or otherwise submitted with this application is true, complete and not misleading to the best of the signer's knowledge and belief.

By signing this application, the signer understands that submission of false, incomplete or misleading information is grounds for:

- **Denying the application;**
- **Revoking any application that is granted based on the information; and**
- **If the signer is acting as or on behalf of a listed engineer as defined in Env-C 502.10, debarring the listed engineer from the roster.**

By signing the application, the signer and applicant agree to comply with all applicable rules and conditions of this permit and to not discharge to the holding tank(s) until written permission from the department has been received.

Laurence Booth — **Signature of Facility Owner or Contact**

11/17/25 — **Date**

12.0 INSPECTION AND MAINTENANCE MANUAL

Wilcox & Barton INC.

CIVIL • ENVIRONMENTAL • GEOTECHNICAL

INSPECTION AND MAINTENANCE MANUAL

for

Banks Chevrolet Parking Lot Reconstruction
234 Airport Road
Concord, NH 03301

Prepared for:
Banks Chevrolet
C/O Fred Booth
137 Manchester Street
Concord, NH 03301

Prepared by:
Wilcox & Barton, Inc.
2 Home Ave.
Concord, New Hampshire 03301
Contact: Erin R. Lambert, PE, (603) 369-4190 x527



Wilcox & Barton, Inc.
Project No.: BACC0005

November 19, 2025
Last Revised: February 17, 2026

INSPECTION AND MAINTENANCE PROCEDURES

RESPONSIBLE PARTIES
Inspection/Maintenance/Record Keeping:

Applicant - Developer of Banks Chevrolet:
Banks Chevrolet
C/O Fred Booth
137 Manchester Street
Concord, NH 03301
(603) 229-4004
Fred.Booth@banksautos.com

INSPECTION SCHEDULE

Catch Basins / Access Manholes	Each catch basin/access manhole will be inspected when the system is installed and prior to directing stormwater to it. Structure inverts will be measured and documented at this time as a baseline reference for future inspections. Catch basins will be inspected every three months (minimum) and after major storm events exceeding 2.5 inches in a 24-hour period. Inspection results will be recorded using the Inspection Forms included at the end of this document. A photograph of each practice shall be taken at the time of inspection and included with the Inspection Form.
Infiltration Gallery	The infiltration gallery will be inspected when the system is installed and prior to directing storm water to it. The isolator row will be inspected via the inspection port annually (minimum). If, upon visual inspection, it is found that sediment has accumulated, a stadia rod will be inserted to determine the depth of sediment. Inlet/outlet structures and manifolds will be inspected annually (minimum). Inspection results will be recorded using the Inspection Forms included at the end of this document. A photograph of each practice area shall be taken at the time of inspection and included with the Inspection Form.
Field Inlet - Infiltration Trench Systems (Nyloplast Inlet Basin with ADS Perforated Pipe)	Each infiltration trench will be inspected when the system is installed and prior to directing stormwater to it. The infiltration trenches will be inspected twice annually (minimum) and after major storm events exceeding 2.5 inches in a 24-hour period. Trash and debris shall be removed at each inspection. At least once annually, the system shall be inspected for drawdown time. Inspection results will be recorded using the Inspection Forms included at the end of this document. A photograph of each practice shall be taken at the time of inspection and included with the Inspection Form.

MAINTENANCE PROCEDURES

Catch Basins / Access Manholes	Debris will be removed from catch basin inlet grates, and inlet/outlet pipes inside the structures. Sediment will be removed from the interior of the structures by vac truck when the depth of sediment exceeds 25% of the structure diameter. Water and sediment from cleanout procedures must be disposed of in accordance with federal, state, and local regulations at an approved off-site disposal facility, and must not be discharged into sanitary sewer systems. Maintenance will be recorded in the Inspection and Maintenance Log included at the end of this document.
Infiltration Gallery	When the average depth of sediment in the isolator row exceeds 3 inches, clean out will be performed with the JetVac process. Trash and debris will be removed from the inlet/outlet structures when observed during inspections. Maintenance will be recorded in the Inspection and Maintenance Log included at the end of this document. If the infiltration system does not drain within 72 hours, a qualified professional shall be consulted.
Field Inlet - Infiltration Trench Systems (Nyloplast Inlet Basin with ADS Perforated Pipe)	When the average depth of sediment in the field inlet exceeds half depth of inlet structure, sediment laden material will be removed and replaced. Trash and debris will be removed from the area when observed during inspections. Maintenance will be recorded in the Inspection and Maintenance Log included at the end of this document. If dewatering times exceed 72 hours following a rainfall event, then a qualified professional shall assess the condition of the facility to determine measures required to restore infiltration function.

RECORD KEEPING

Record keeping and inspection/maintenance activity will begin upon completion of all terrain activities that direct stormwater to the practices described herein. All records, including records from maintenance subcontractors, will be maintained by Banks Chevrolet and shall be sent annually to New Hampshire Department of Environmental Services (NHDES) Alteration of Terrain Bureau. Banks Chevrolet will be responsible for ensuring the effectiveness of the stormwater practices during construction. Following construction, long-term record keeping shall continue to be the responsibility of Banks Chevrolet.

WINTER MAINTENANCE

The proposed site plan for Banks Chevrolet, 234 Airport Road in Concord, NH proposes paved parking areas for employee parking. Paved surfaces are located within Groundwater Classification Areas. Stormwater runoff from the site is collected through catch basins and field inlets, which treat and infiltrate the majority of the project area's runoff. Excess runoff is discharged to the existing closed drainage system in Old Suncook Road, which ultimately drains to the Merrimack River. The stormwater runoff within the project area is managed through infiltration practices.

All winter maintenance contractors shall record salt usage by vehicle for each storm and periodically compare the usage rates to confirm spreader calibrations. All winter maintenance contractors shall record storm response data, including date, air temperature, ground surface temperature, storm start and end time, snow fall total, salt usage, application rates, application times, and plow times to be compared and analyzed by the applicators and property managers to improve and minimize salt use. The attached "Deicing and Anti-Icing Log" shall be used as a guide.

INVASIVE SPECIES MAINTENANCE

The site shall be inspected and monitored for the presence of invasive plants during maintenance activities. If invasive plants are found on-site, they will need to be controlled and removed in a safe and effective manner. In order to determine how to effectively remove the invasive plant(s), the reproduction of that particular plant type needs to be determined. The methodology of removal and disposal shall adhere to the guidelines set forth by UNH Cooperative Extension, located in "Methods for Disposing Non-Native Invasive Plants," which is attached to this manual for reference.

Catch Basin/Access Manhole Inspection Form

General Information	
Date of Inspection	
Inspector's Name(s)	
Inspector's Title(s)	
Type of Inspection: ❑ Routine (quarterly) ❑ Post-storm event	

Structure ID	Blockage?	Floatable Debris?	Visible Damage?	Depth of Buildup*	Odor?	Maintenance Required? Provide detail below
Access Manhole-1	❑Yes ❑No	❑Yes ❑No	❑Yes ❑No		❑Petroleum ❑Sewage ❑Other	❑Yes ❑No
Access Manhole-2	❑Yes ❑No	❑Yes ❑No	❑Yes ❑No		❑Petroleum ❑Sewage ❑Other	❑Yes ❑No
Catch Basin-1	❑Yes ❑No	❑Yes ❑No	❑Yes ❑No		❑Petroleum ❑Sewage ❑Other	❑Yes ❑No
Catch Basin-2	❑Yes ❑No	❑Yes ❑No	❑Yes ❑No		❑Petroleum ❑Sewage ❑Other	❑Yes ❑No
Catch Basin-3	❑Yes ❑No	❑Yes ❑No	❑Yes ❑No		❑Petroleum ❑Sewage ❑Other	❑Yes ❑No
Catch Basin-4	❑Yes ❑No	❑Yes ❑No	❑Yes ❑No		❑Petroleum ❑Sewage ❑Other	❑Yes ❑No
Catch Basin-5	❑Yes ❑No	❑Yes ❑No	❑Yes ❑No		❑Petroleum ❑Sewage ❑Other	❑Yes ❑No
Catch Basin-6	❑Yes ❑No	❑Yes ❑No	❑Yes ❑No		❑Petroleum ❑Sewage ❑Other	❑Yes ❑No
Catch Basin-7	❑Yes ❑No	❑Yes ❑No	❑Yes ❑No		❑Petroleum ❑Sewage ❑Other	❑Yes ❑No
Catch Basin-8	❑Yes ❑No	❑Yes ❑No	❑Yes ❑No		❑Petroleum ❑Sewage ❑Other	❑Yes ❑No
Catch Basin-9	❑Yes ❑No	❑Yes ❑No	❑Yes ❑No		❑Petroleum ❑Sewage ❑Other	❑Yes ❑No

Corrective Action Needed and Notes

If the depth of sediment buildup in the bottom of the structure* ***has reached approximately 25% of the diameter of the structure, the unit requires cleaning.*

** A photograph of each structure shall be taken at the time of inspection and included with this form.*

Field Inlet - Infiltration Trench System Inspection Form

General Information	
Date of Inspection	
Location of Field Inlet Infiltration Trench (Field Inlet 1-3)	
Inspector's Name(s)	
Inspector's Title(s)	
Type of Inspection:	❑ Routine (annually) ❑ Other

ID	Trash/ Debris?	Visible Sediment?	Depth of Sediment Buildup*	Maintenance Required? Provide detail below
Field Inlet-1 System	❑Yes ❑No	❑Yes ❑No		❑Yes ❑No
Field Inlet-2 System	❑Yes ❑No	❑Yes ❑No		❑Yes ❑No
Field Inlet-3 System	❑Yes ❑No	❑Yes ❑No		❑Yes ❑No

Visible Damage:

❑Inlet

❑Outlet

❑None

Describe:

Corrective Action Needed and Notes

** If the average depth of sediment buildup exceeds half the depth of the inlet structure**, the unit requires cleaning.***

** If settlement, erosion, seepage, animal burrows, woody vegetation, and/or other conditions that could degrade the embankment and reduce its stability for impounding water, **immediate corrective action should be implemented.***

** A photograph of each system shall be taken at the time of inspection and included with this form.*

Infiltration Gallery System Inspection Form

General Information	
Date of Inspection	
Location of Infiltration Gallery (Infiltration Gallery-1)	
Inspector's Name(s)	
Inspector's Title(s)	
Type of Inspection: ❑ Routine (annually) ❑ Other	

ID	Trash/ Debris?	Visible Sediment?	Depth of Sediment Buildup*	Maintenance Required? Provide detail below
Infiltration Gallery 1	❑Yes ❑No	❑Yes ❑No		❑Yes ❑No

Visible Damage:

❑Inlet

❑Outlet

❑None

Describe:

Corrective Action Needed and Notes

** If the average depth of sediment buildup exceeds 3 inches**, the unit requires cleaning.***

** If settlement, erosion, seepage, animal burrows, woody vegetation, and/or other conditions that could degrade the embankment or site topography and reduce its stability for impounding water,* ***immediate corrective action should be implemented.***

** A photograph of the system area (including inspection port location) shall be taken at the time of inspection and included with this form.*

Inspection and Maintenance Log

Date:			
Performed by:			
Practice:	Catch Basin/Manhole ❑ Inspection ❑ Maintenance	Field Inlet System ❑ Inspection ❑ Maintenance	Infiltration Gallery ❑ Inspection ❑ Maintenance
Date:			
Performed by:			
Practice:	Catch Basin/Manhole ❑ Inspection ❑ Maintenance	Field Inlet System ❑ Inspection ❑ Maintenance	Infiltration Gallery ❑ Inspection ❑ Maintenance
Date:			
Performed by:			
Practice:	Catch Basin/Manhole ❑ Inspection ❑ Maintenance	Field Inlet System ❑ Inspection ❑ Maintenance	Infiltration Gallery ❑ Inspection ❑ Maintenance
Date:			
Performed by:			
Practice:	Catch Basin/Manhole ❑ Inspection ❑ Maintenance	Field Inlet System ❑ Inspection ❑ Maintenance	Infiltration Gallery ❑ Inspection ❑ Maintenance
Date:			
Performed by:			
Practice:	Catch Basin/Manhole ❑ Inspection ❑ Maintenance	Field Inlet System ❑ Inspection ❑ Maintenance	Infiltration Gallery ❑ Inspection ❑ Maintenance

Winter Maintenance Policy Checklist for Contractors

Recommended Practice	Y	N	Comments
Develop a Winter Maintenance Policy Plan outlining procedures for the preservation of the surface facilities and stating the adopted practices for salt minimization.			
Use de-/anti-icing logs with noted application rates, material usage totals, equipment calibration record, and material specifications (brine mix ratio, ice melt manufacturer recommendations, etc.).			
Record and log site storm event data including date, air temperature, ground surface temperature, storm start and end time, and snow fall/rain fall totals.			
Record total salt usage, application rates, application times, and plow times to improve current and future salt minimization efforts on site.			
Develop Winter Maintenance Policy training program for applicators.			
Use anti-icing pretreatment where applicable prior to snowstorm events.			
Plow/shovel areas before beginning de-icing activities.			
Use wet materials. Establish pre-wetting procedures and inspection checks for quality control.			
Do not apply sodium chloride (road salt) for pavement temperatures below 15˚ F. If possible, wait for warmer temperatures before deicing. Consult manufacturer specifications for deicer applications below 0˚ F.			
Use salt for melting and only use sand for traction in hazardous areas.			
Outside storage of salt, sand, and other like winter maintenance materials shall not be permitted on the property.			
Sweep up areas of sand application and dispose of properly.			

Checklist is adapted from UNH Technology Transfer Center's "Training Materials for Best Management Practices for Winter Road, Parking Lot, and Sidewalk Maintenance" dated January 31, 2014 in partnership with NHDES and NHDOT.

Deicing and Anti-Icing Log

Log No. (Year-Truck/Spreader ID-Entry #):

Facility Information

Site: Banks Chevrolet Parking Lot Reconstruction: 234 Airport Rd, Concord NH

Facility Manager/Contact: Fred Booth

Street: 137 Manchester Street Phone: 603-229-4004

City, State: Concord, NH E-Mail: Fred.Booth@banksautos.com

General Information

Contractor Company Name: _____

Manager/Operator: _____

NH Certified Salt Applicator: ( ) Yes ( ) No **If yes, certification number:** _____

Street: _____ Phone: _____

City, State: _____ E-Mail: _____

Storm Start Date: _____ Storm End Date: _____

Total Snowfall / Rainfall (inches): Freezing Rain: ( ) Yes ( ) No

Applicator Information

Date: _____ Activity Start Time: _____ End Time: _____

Air Temperature: _____ Ground Surface Temperature: _____

Performed by: _____ Truck/Spreader ID: _____

Spreader Calibration Date: _____ Application Rate: _____

Location(s): _____

_____

_____

Use: ( ) Deicing ( ) Anti-Icing Fluid/Material: _____

Using salt? ( ) Yes ( ) No If yes, is salt pre-wetted? ( ) Yes ( ) No

Using Brine? ( ) Yes ( ) No If yes, what is the mix ratio? _____

Manufacturer / Distribution Plant: _____

Address / Location: _____

Phone: E-Mail:

Additional Notes / Corrective Actions Taken

_____

_____

_____

_____

_____

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_____

_____

_____

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_____

_____

_____

CONTROL OF INVASIVE PLANTS

During maintenance activities, check for the presence of invasive plants and remove in a safe manner as described on the following pages. They should be controlled as described on the following pages.

Background:

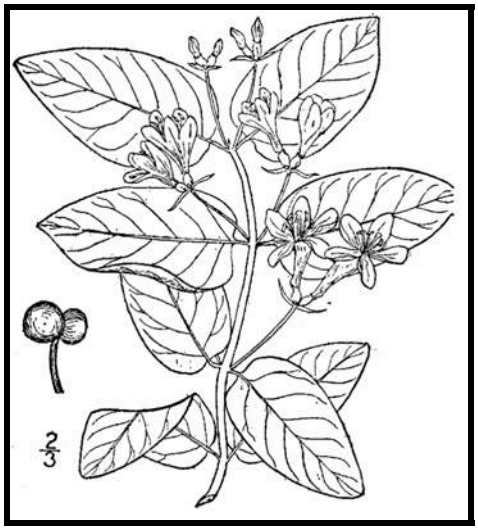
Invasive plants are introduced, alien, or non-native plants, which have been moved by people from their native habitat to a new area. Some exotic plants are imported for human use such as landscaping, erosion control, or food crops. They also can arrive as "hitchhikers" among shipments of other plants, seeds, packing materials, or fresh produce. Some exotic plants become invasive and cause harm by:

- becoming weedy and overgrown;
- killing established shade trees;
- obstructing pipes and drainage systems;
- forming dense beds in water;
- lowering water levels in lakes, streams, and wetlands;
- destroying natural communities;
- promoting erosion on stream banks and hillsides; and
- resisting control except by hazardous chemical.

UNIVERSITY of NEW HAMPSHIRE COOPERATIVE EXTENSION

Methods for Disposing Non-Native Invasive Plants

Prepared by the Invasives Species Outreach Group, volunteers interested in helping people control invasive plants. Assistance provided by the Piscataquog Land Conservancy and the NH Invasives Species Committee. Edited by Karen Bennett, Extension Forestry Professor and Specialist.



Tatarian honeysuckle
Lonicera tatarica
USDA-NRCS PLANTS Database / Britton, N.L., and A. Brown. 1913. *An illustrated flora of the northern United States, Canada and the British Possessions*. Vol. 3: 282.

Non-native invasive plants crowd out natives in natural and managed landscapes. They cost taxpayers billions of dollars each year from lost agricultural and forest crops, decreased biodiversity, impacts to natural resources and the environment, and the cost to control and eradicate them.

Invasive plants grow well even in less than desirable conditions such as sandy soils along roadsides, shaded wooded areas, and in wetlands. In ideal conditions, they grow and spread even faster. There are many ways to remove these non-native invasives, but once removed, care is needed to dispose the removed plant material so the plants don't grow where disposed.

Knowing how a particular plant reproduces indicates its method of spread and helps determine the appropriate disposal method. Most are spread by seed and are dispersed by wind, water, animals, or people. Some reproduce by vegetative means from pieces of stems or roots forming new plants. Others spread through both seed and vegetative means.

Because movement and disposal of viable plant parts is restricted (see NH Regulations), viable invasive parts can't be brought to most transfer stations in the state. Check with your transfer station to see if there is an approved, designated area for invasives disposal. This fact sheet gives recommendations for rendering plant parts non-viable.

Control of invasives is beyond the scope of this fact sheet. For information about control visit www.nhinvasives.org or contact your UNH Cooperative Extension office.

New Hampshire Regulations

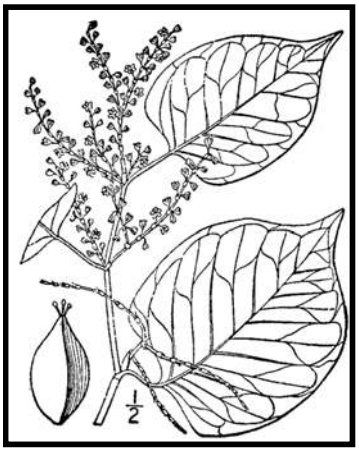
Prohibited invasive species shall only be disposed of in a manner that renders them nonliving and nonviable. (Agr. 3802.04)

No person shall collect, transport, import, export, move, buy, sell, distribute, propagate or transplant any living and viable portion of any plant species, which includes all of their cultivars and varieties, listed in Table 3800.1 of the New Hampshire prohibited invasive species list. (Agr 3802.01)

How and When to Dispose of Invasives?

To prevent seed from spreading remove invasive plants before seeds are set (produced). Some plants continue to grow, flower and set seed even after pulling or cutting. Seeds can remain viable in the ground for many years. If the plant has flowers or seeds, place the flowers and seeds in a heavy plastic bag "head first" at the weeding site and transport to the disposal site. The following are general descriptions of disposal methods. See the chart for recommendations by species.

Burning: Large woody branches and trunks can be used as firewood or burned in piles. For outside burning, a written fire permit from the local forest fire warden is required unless the ground is covered in snow. Brush larger than 5 inches in diameter can't be burned. Invasive plants with easily airborne seeds like black swallow-wort with mature seed pods (indicated by their brown color) shouldn't be burned as the seeds may disperse by the hot air created by the fire.



Japanese knotweed
Polygonum cuspidatum
USDA-NRCS PLANTS Database / Britton, N.L., and A. Brown. 1913. *An illustrated flora of the northern United States, Canada and the British Possessions*. Vol. 1: 676.

Bagging (solarization): Use this technique with softer-tissue plants. Use heavy black or clear plastic bags (contractor grade), making sure that no parts of the plants poke through. Allow the bags to sit in the sun for several weeks and on dark pavement for the best effect.

Tarping and Drying: Pile material on a sheet of plastic and cover with a tarp, fastening the tarp to the ground and monitoring it for escapes. Let the material dry for several weeks, or until it is clearly nonviable.

Chipping: Use this method for woody plants that don't reproduce vegetatively.

Burying: This is risky, but can be done with watchful diligence. Lay thick plastic in a deep pit before placing the cut up plant material in the hole. Place the material away from the edge of the plastic before covering it with more heavy plastic. Eliminate as much air as possible and toss in soil to weight down the material in the pit. Note that the top of the buried material should be at least three feet underground. Japanese knotweed should be at least 5 feet underground!

Drowning: Fill a large barrel with water and place soft-tissue plants in the water. Check after a few weeks and look for rotted plant material (roots, stems, leaves, flowers). Well-rotted plant material may be composted. A word of caution- seeds may still be viable after using this method. Do this before seeds are set. This method isn't used often. Be prepared for an awful stink!

Composting: Invasive plants can take root in compost. Don't compost any invasives unless you know there is no viable (living) plant material left. Use one of the above techniques (bagging, tarping, drying, chipping, or drowning) to render the plants nonviable before composting. Closely examine the plant before composting and avoid composting seeds.

Be diligent looking for seedlings for *years* in areas where removal and disposal took place.

Suggested Disposal Methods for Non-Native Invasive Plants

This table provides information concerning the disposal of removed invasive plant material. If the infestation is treated with herbicide and left in place, these guidelines don't apply. Don't bring invasives to a local transfer station, unless there is a designated area for their disposal, or they have been rendered non-viable. This listing includes wetland and upland plants from the New Hampshire Prohibited Invasive Species List. The disposal of aquatic plants isn't addressed.

<table>
<tr><th>Woody Plants</th><th>Method of Reproducing</th><th>Methods of Disposal</th></tr>
<tr><td rowspan="2">Norway maple
(Acer platanoides)
European barberry
(Berberis vulgaris)
Japanese barberry
(Berberis thunbergii)
autumn olive
(Elaeagnus umbellata)
burning bush
(Euonymus alatus)
Morrow's honeysuckle
(Lonicera morrowii)
Tatarian honeysuckle
(Lonicera tatarica)
showy bush honeysuckle
(Lonicera x bella)
common buckthorn
(Rhamnus cathartica)
glossy buckthorn
(Frangula alnus)</td><td rowspan="2">Fruit and Seeds
  </td><td>Prior to fruit/seed ripening
Seedlings and small plants
▪ Pull or cut and leave on site with roots exposed. No special care needed.
Larger plants
▪ Use as firewood.
▪ Make a brush pile.
▪ Chip.
▪ Burn.</td></tr>
<tr><td>After fruit/seed is ripe
Don't remove from site.
▪ Burn.
▪ Make a covered brush pile.
▪ Chip once all fruit has dropped from branches.
▪ Leave resulting chips on site and monitor.</td></tr>
<tr><td rowspan="2">oriental bittersweet
(Celastrus orbiculatus)
multiflora rose
(Rosa multiflora)</td><td rowspan="2">Fruits, Seeds, Plant Fragments
  </td><td>Prior to fruit/seed ripening
Seedlings and small plants
▪ Pull or cut and leave on site with roots exposed. No special care needed.
Larger plants
▪ Make a brush pile.
▪ Burn.</td></tr>
<tr><td>After fruit/seed is ripe
Don't remove from site.
▪ Burn.
▪ Make a covered brush pile.
▪ Chip – only after material has fully dried (1 year) and all fruit has dropped from branches. Leave resulting chips on site and monitor.</td></tr>
</table>

Non-Woody Plants	Method of Reproducing	Methods of Disposal
garlic mustard *(Alliaria petiolata)* spotted knapweed *(Centaurea maculosa)* ▪ Sap of related knapweed can cause skin irritation and tumors. Wear gloves when handling. black swallow-wort *(Cynanchum nigrum)* ▪ May cause skin rash. Wear gloves and long sleeves when handling. pale swallow-wort *(Cynanchum rossicum)* giant hogweed *(Heracleum mantegazzianum)* ▪ Can cause major skin rash. Wear gloves and long sleeves when handling. dame's rocket *(Hesperis matronalis)* perennial pepperweed *(Lepidium latifolium)* purple loosestrife *(Lythrum salicaria)* Japanese stilt grass *(Microstegium vimineum)* mile-a-minute weed *(Polygonum perfoliatum)*	**Fruits and Seeds** 	**Prior to flowering** Depends on scale of infestation Small infestation ▪ Pull or cut plant and leave on site with roots exposed. Large infestation ▪ Pull or cut plant and pile. (You can pile onto or cover with plastic sheeting). ▪ Monitor. Remove any re-sprouting material. **During and following flowering** Do nothing until the following year or remove flowering heads and bag and let rot. Small infestation ▪ Pull or cut plant and leave on site with roots exposed. Large infestation ▪ Pull or cut plant and pile remaining material. (You can pile onto plastic or cover with plastic sheeting). ▪ Monitor. Remove any re-sprouting material.
common reed (*Phragmites australis*) Japanese knotweed *(Polygonum cuspidatum)* Bohemian knotweed *(Polygonum x bohemicum)*	**Fruits, Seeds, Plant Fragments** Primary means of spread in these species is by plant parts. Although all care should be given to preventing the dispersal of seed during control activities, the presence of seed doesn't materially influence disposal activities.	**Small infestation** ▪ Bag all plant material and let rot. ▪ Never pile and use resulting material as compost. ▪ Burn. **Large infestation** ▪ Remove material to unsuitable habitat (dry, hot and sunny or dry and shaded location) and scatter or pile. ▪ Monitor and remove any sprouting material. ▪ Pile, let dry, and burn.

January 2010

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Isolator® Row Plus
O&M Manual



ADS StormTech™

The Isolator® Row Plus

Introduction

An important component of any Stormwater Pollution Prevention Plan is inspection and maintenance. The StormTech Isolator Row Plus is a technique to inexpensively enhance Total Suspended Solids (TSS), Total Phosphorus (TP), Total Petroluem Hydrocarbons (TPH) and Total Nitrogen (TN) removal with easy access for inspection and maintenance.

The Isolator Row Plus

The Isolator Row Plus is a row of StormTech chambers, either SC-160, SC-310, DC-780, SC-800, MC-3500, MC-4500 or MC-7200 models, are lined with filter fabric and connected to a closely located manhole for easy access. The fabric lined chambers provide for sediment settling and filtration as stormwater rises in the Isolator Row Plus and passes through the filter fabric. The open bottom chambers allow stormwater to flow vertically out of the chambers. Sediments are captured in the Isolator Row Plus protecting the adjacent stone and chambers storage areas from sediment accumulation.

ADS Isolator Row and Plus fabric are placed between the stone and the Isolator Row Plus chambers. The woven geotextile provides a media for stormwater filtration, a durable surface for maintenance, prevents scour of the underlying stone and remains intact during high pressure jetting.

The Isolator Row Plus is designed to capture the “first flush” runoff and offers the versatility to be sized on a volume basis or a flow-rate basis. An upstream manhole provides access to the Isolator Row Plus and includes a high/low concept such that stormwater flow rates or volumes that exceed the capacity of the Isolator Row Plus bypass through a manifold to the other chambers. This is achieved with an elevated bypass manifold or a high-flow weir. This creates a differential between the Isolator Row Plus row of chambers and the manifold to the rest of the system, thus allowing for settlement time in the Isolator Row Plus. After Stormwater flows through the Isolator Row Plus and into the rest of the chamber system it is either exfiltrated into the soils below or passed at a controlled rate through an outlet manifold and outlet control structure.

The Isolator Row Plus Flamp™ is a flared end ramp apparatus attached to the inlet pipe on the inside of the chamber end cap. The FLAMP provides a smooth transition from pipe invert to fabric bottom. It is configured to improve chamber function performance by enhancing outflow of solid debris that would otherwise collect at the chamber's end, or more difficult to remove and require confined space entry into the chamber area. It also serves to improve the fluid and solid flow into the access pipe during maintenance and cleaning and to guide cleaning and inspection equipment back into the inlet pipe when complete.

The Isolator Row Plus may be part of a treatment train system. The treatment train design and pretreatment device selection by the design engineer is often driven by regulatory requirements. Whether pretreatment is used or not, StormTech recommend using the Isolator Row Plus to minimize maintenance requirements and maintenance costs.

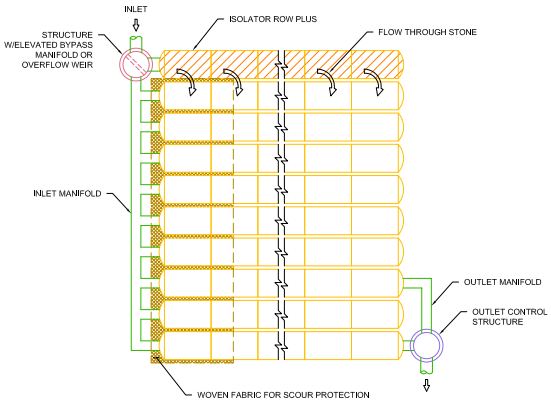
Note: *See the StormTech Design Manual for detailed information on designing inlets for a StormTech system, including the Isolator Row Plus.*



Looking down the Isolator Row Plus from the manhole opening, ADS Plus Fabric is shown between the chamber and stone base.



StormTech Isolator Row Plus with Overflow Structure (not to scale)



Isolator Row Plus Inspection/Maintenance

Inspection

The frequency of inspection and maintenance varies by location. A routine inspection schedule needs to be established for each individual location based upon site specific variables. The type of land use (i.e. industrial, commercial, residential), anticipated pollutant load, percent imperviousness, climate, etc. all play a critical role in determining the actual frequency of inspection and maintenance practices.

At a minimum, StormTech recommends annual inspections. Initially, the Isolator Row Plus should be inspected every 6 months for the first year of operation. For subsequent years, the inspection should be adjusted based upon previous observation of sediment deposition.

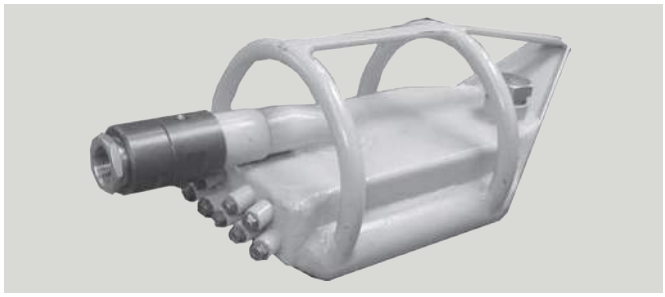
The Isolator Row Plus incorporates a combination of standard manhole(s) and strategically located inspection ports (as needed). The inspection ports allow for easy access to the system from the surface, eliminating the need to perform a confined space entry for inspection purposes.

If upon visual inspection it is found that sediment has accumulated, a stadia rod should be inserted to determine the depth of sediment. When the average depth of sediment exceeds 3" (75 mm) throughout the length of the Isolator Row Plus, clean-out should be performed.

Maintenance

The Isolator Row Plus was designed to reduce the cost of periodic maintenance. By “isolating” sediments to just one row, costs are dramatically reduced by eliminating the need to clean out each row of the entire storage bed. If inspection indicates the potential need for maintenance, access is provided via a manhole(s) located on the end(s) of the row for cleanout. If entry into the manhole is required, please follow local and OSHA rules for a confined space entry.

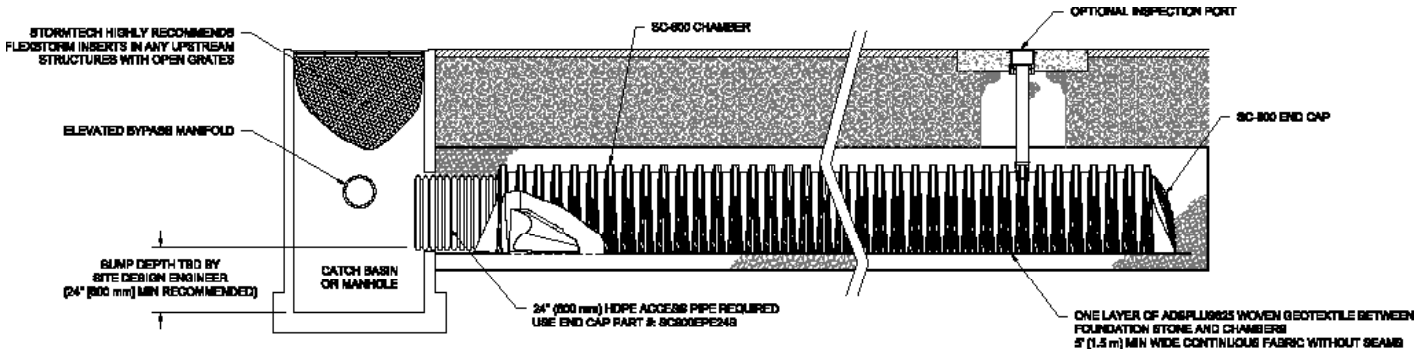
Maintenance is accomplished with the JetVac process. The JetVac process utilizes a high pressure water nozzle to propel itself down the Isolator Row Plus while scouring and suspending sediments. As the nozzle is retrieved, the captured pollutants are flushed back into the manhole for vacuuming. Most sewer and pipe maintenance companies have vacuum/JetVac combination vehicles. Selection of an appropriate JetVac nozzle will improve maintenance efficiency. Fixed nozzles designed for culverts or large diameter pipe cleaning are preferable. Rear facing jets with an effective spread of at least 45” are best. StormTech recommends a maximum nozzle pressure of 2000 psi be utilized during cleaning. JetVac reels can vary in length. For ease of maintenance, ADS recommends Isolator Row Plus lengths up to 200' (61 m). **The JetVac process shall only be performed on StormTech Isolator Row Plus that have ADS Plus Fabric (as specified by StormTech) over their angular base stone.**







StormTech Isolator Row Plus (*not to scale*)



Isolator Row Plus Step By Step Maintenance Procedures

Step 1

Inspect Isolator Row Plus for sediment.

A) Inspection ports (if present)
   i. Remove lid from floor box frame
   ii. Remove cap from inspection riser
   iii. Using a flashlight and stadia rod,measure depth of sediment and record results on maintenance log.
   iv. If sediment is at or above 3 inch depth, proceed to Step 2. If not, proceed to Step 3.

B) All Isolator Row Plus
   i. Remove cover from manhole at upstream end of Isolator Row Plus
   ii. Using a flashlight, inspect down Isolator Row Plus through outlet pipe
      1. Mirrors on poles or cameras may be used to avoid a confined space entry
      2. Follow OSHA regulations for confined space entry if entering manhole
   iii. If sediment is at or above the lower row of sidewall holes (approximately 3 inches), proceed to Step 2.
   If not, proceed to Step 3.

Step 2

Clean out Isolator Row Plus using the JetVac process.

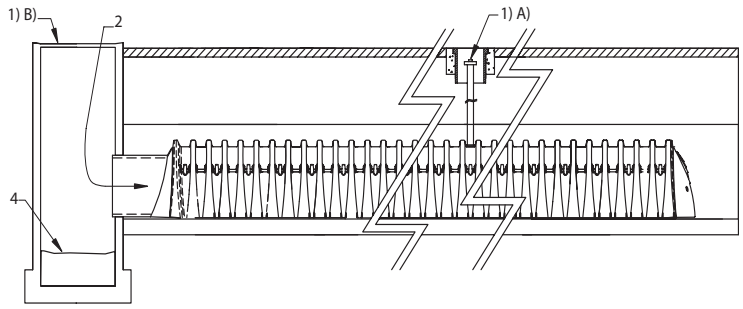
A) A fixed floor cleaning nozzle with rear facing nozzle spread of 45 inches or more is preferable
B) Apply multiple passes of JetVac until backflush water is clean
C) Vacuum manhole sump as required

Step 3

Replace all caps, lids and covers, record observations and actions.

Step 4

Inspect & clean catch basins and manholes upstream of the StormTech system.

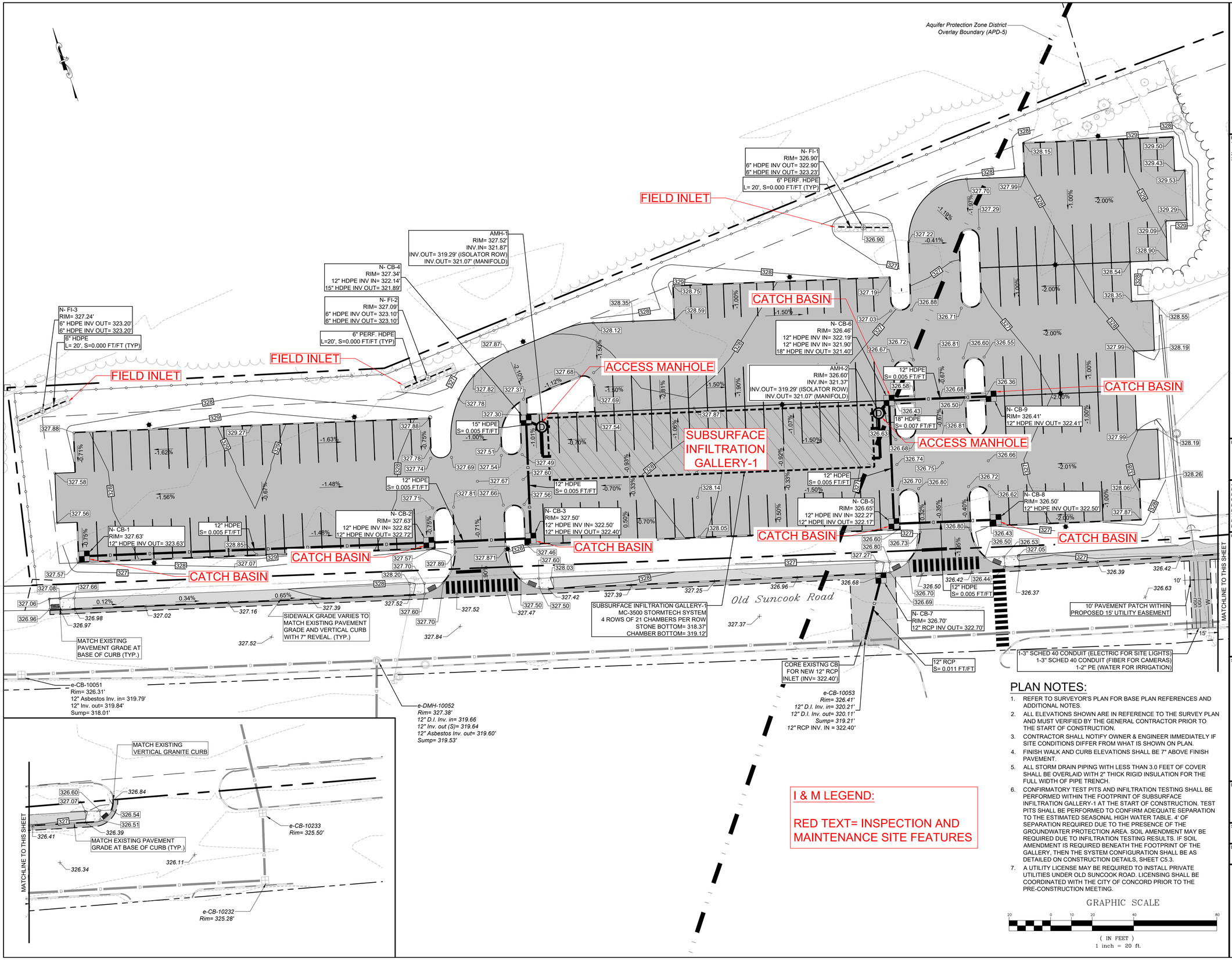


Sample Maintenance Log

Date	Stadia Rod Readings		Sedi-ment Depth (1)–(2)	Observations/Actions	Inspector
	Fixed point to chamber bottom (1)	Fixed point to top of sediment (2)			
3/15/11	6.3 ft	none		New installation. Fixed point is CI frame at grade	DJM
9/24/11		6.2	0.1 ft	Some grit felt	SM
6/20/13		5.8	0.5 ft	Mucky feel, debris visible in manhole and in Isolator Row Plus, maintenance due	NV
7/7/13	6.3 ft		0	System jetted and vacuumed	DJM

adspipe.com
800-821-6710

ADS "Terms and Conditions of Sale" are available on the ADS website, www.adspipe.com
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I & M LEGEND:

RED TEXT= INSPECTION AND MAINTENANCE SITE FEATURES

PLAN NOTES:

1. REFER TO SURVEYOR'S PLAN FOR BASE PLAN REFERENCES AND ADDITIONAL NOTES.
2. ALL ELEVATIONS SHOWN ARE IN REFERENCE TO THE SURVEY PLAN AND MUST VERIFIED BY THE GENERAL CONTRACTOR PRIOR TO THE START OF CONSTRUCTION.
3. CONTRACTOR SHALL NOTIFY OWNER & ENGINEER IMMEDIATELY IF SITE CONDITIONS DIFFER FROM WHAT IS SHOWN ON PLAN.
4. FINISH WALK AND CURB ELEVATIONS SHALL BE 7" ABOVE FINISH PAVEMENT.
5. ALL STORM DRAIN PIPING WITH LESS THAN 3.0 FEET OF COVER SHALL BE OVERLAID WITH 2" THICK RIGID INSULATION FOR THE FULL WIDTH OF PIPE TRENCH.
6. CONFIRMATORY TEST PITS AND INFILTRATION TESTING SHALL BE PERFORMED WITHIN THE FOOTPRINT OF SUBSURFACE INFILTRATION GALLERY-1 AT THE START OF CONSTRUCTION. TEST PITS SHALL BE PERFORMED TO CONFIRM ADEQUATE SEPARATION TO THE ESTIMATED SEASONAL HIGH WATER TABLE. 4' OF SEPARATION REQUIRED DUE TO THE PRESENCE OF THE GROUNDWATER PROTECTION AREA. SOIL AMENDMENT MAY BE REQUIRED DUE TO INFILTRATION TESTING RESULTS. IF SOIL AMENDMENT IS REQUIRED BENEATH THE FOOTPRINT OF THE GALLERY, THEN THE SYSTEM CONFIGURATION SHALL BE AS DETAILED ON CONSTRUCTION DETAILS, SHEET C5.3.
7. A UTILITY LICENSE MAY BE REQUIRED TO INSTALL PRIVATE UTILITIES UNDER OLD SUNCOOK ROAD. LICENSING SHALL BE COORDINATED WITH THE CITY OF CONCORD PRIOR TO THE PRE-CONSTRUCTION MEETING.

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

Wilcox & Barton INC.
CIVIL · ENVIRONMENTAL · GEOTECHNICAL

2 HOME AVENUE
CONCORD, NH 03301
603-369-4190
www.wilcoxandbarton.com

REVISION HISTORY
1. REVISED IN RESPONSE TO NHDES ECOLOGICAL REVIEW SECTION COMMENTS (12/09/2025)
2. REVISED TO COMPLY WITH RESIDENTIAL SCREENING (12/19/2025)
3. REVISED IN RESPONSE TO CITY OF CONCORD AND NHDES AOT COMMENTS (02/17/2026)

ISSUED FOR

PERMITTING

ALL DOCUMENTS PREPARED BY WILCOX & BARTON, INC. ARE INSTRUMENTS OF SERVICE IN RESPECT OF THE PROJECT. THEY ARE NOT INTENDED OR REPRESENTED TO BE SUITABLE FOR REUSE BY OWNER OR OTHERS. ANY REUSE WITHOUT WRITTEN VERIFICATION OR ADAPTATION BY WILCOX & BARTON, INC. FOR THE SPECIFIC PURPOSE INTENDED WILL BE AT OWNER'S SOLE RISK AND WITHOUT LIABILITY OR LEGAL EXPOSURE TO WILCOX & BARTON, INC. OWNER SHALL INDEMNIFY AND HOLD HARMLESS WILCOX & BARTON, INC. FROM ALL CLAIMS, DAMAGES, LOSSES AND EXPENSES ARISING OUT OF OR RESULTING THEREFROM.

OWNER

DAVAL REALTY ASSOCIATES LLC / BANKS CHEVROLET

137 MANCHESTER ST
CONCORD, NH 03301

SITE

BANKS CHEVROLET PARKING LOT RECONSTRUCTION

234 AIRPORT ROAD
CONCORD, NH 03301

MBLU: 782/Z/8

DRAWING TITLE

INSPECTION & MAINTENANCE PLAN

SCALE	DATE
1" = 20'	11/19/2025

DRAFTED BY	CHECKED BY	PROJECT MGR	PROJECT NO.
KAD	ERL	ERL	BACC0005

STATE OF NEW HAMPSHIRE
ERIN R. LAMBERT
No. 11057
LICENSED
PROFESSIONAL ENGINEER

ENGINEER: ERIN R. LAMBERT
NH P.E. #11057

SHEET NO.

C1

01 OF 01

13.0 SALT MINIMIZATION PLAN

Wilcox & Barton INC.
CIVIL • ENVIRONMENTAL • GEOTECHNICAL

SALT MINIMIZATION PLAN
for

Banks Chevrolet Parking Lot Reconstruction
234 Airport Road
Concord, NH 03301

Prepared for:
Banks Chevrolet
C/O Fred Booth
137 Manchester Street
Concord, NH 03301

Prepared by:
Wilcox & Barton, Inc.
2 Home Ave.
Concord, New Hampshire 03301
Contact: Erin Lambert, PE, (603) 369-4190 x527

Wilcox & Barton, Inc.
Project No.: BACC0005

November 19, 2025

Background

The project consists of paving an existing gravel parking area which supports the Banks Chevrolet car dealership. The parking area (project parcel) is located on Tax Map 782 Block Z Lot 8, with a street address of 234 Airport Road in Concord, while the existing dealership it supports is located across the street at 137 Manchester Street in Concord. Site improvements include the paved parking area, lighting, landscaping, and a stormwater management system. The existing project parcel is currently used for employee parking associated with the dealership. One portion of this parking area is paved while the other is gravel. The project area extent is at the gravel parking area only; the existing paved parking lot will remain unchanged. There is wooded cover to the rear of the property, adjacent to Sanel Park. The parcel has frontage along both Old Suncook Road and Airport Road and has five driveway locations along Old Suncook Road.

The presence of snow and ice on roadways, parking lots, and/or sidewalks creates a public safety concern – hence, the need for using salt and other deicing measures. However, salt (specifically the chloride in salt) can have a negative impact to plants, wildlife, aquatic species, surface water, and groundwater. The objective of this Salt Minimization Plan is to reduce the amount of chloride entering the surface waterbody and other environmentally significant areas while still maintaining roadway and site safety.

Project Area Description

The Banks Chevrolet Parking Lot Reconstruction project is an existing development consisting of one gravel parking lot and one paved parking lot to support the Banks Chevrolet car dealership. The existing gravel parking area to be reconstructed is located on the western portion of the project parcel. The existing paved parking lot on the eastern portion of the parcel will remain unchanged. The project parcel is located at 234 Airport Road in Concord, NH.

Access to the site is through the southern property line off Old Suncook Road at five driveway locations. Old Suncook Road is a public City maintained roadway (Class V roadway). Four driveways are proposed to be maintained with the parking lot reconstruction, which shall be graded to provide adequate access and circulation to the proposed parking area.

The Banks Chevrolet Parking Lot Reconstruction project is in the Highway Commercial zoning district and covers 6.95 acres of land. The proposed project area is approximately 2.3 acres. The redevelopment decreases the impervious cover by approximately 24,170 square feet for the overall project parcel.

The proposed redeveloped parking area will be serviced via conduits crossing Old Suncook Road for the water service for irrigational use and the electrical service for the lighting. The existing gravel area is to be redeveloped with paved parking, which shall direct runoff to the maximum extent feasible to the proposed subsurface infiltration system. One underground infiltration gallery shall be installed to collect and treat stormwater runoff from the proposed project area to provide necessary pretreatment and treatment on-site. The project requires a NHDES Alteration of Terrain Permit which has been submitted.

Responsibility

Banks Chevrolet and all property managers are responsible for implementing and complying with the Salt Minimization Plan; reviewing the success of the Plan; and continuing to update the Plan as new requirements, practices, and products are developed. A copy of this Plan shall be given to all personnel that are involved with winter maintenance within the Banks Chevrolet development for mandatory implementation.

Certifications

All salt applicators within the Banks Chevrolet property shall be current NHDES Certified Green SnowPro applicators or equivalent. Salt applicators are responsible for maintaining their annual certification. Information on these certifications can be found in the links provided below:

- https://www.des.nh.gov/land/roads/road-salt-reduction/green-snowpro-certification
- https://t2.unh.edu/green-snowpro-salt-applicator-certification-training

Weather Monitoring

Winter maintenance contractors and salt applicators employed within the Banks Chevrolet property shall monitor storm events using National Weather Service (http://www.noaa.gov), local TV stations, and website weather information. All vehicles used for the application of road salt or brining, and pre-wetting solution shall be equipped with an annually calibrated air and ground surface temperature monitor. Air and ground temperatures shall be monitored throughout the day to ensure that the operators are making informed decisions as to when and to what extent materials are applied to the roadways, parking lots and sidewalks.

Pretreatment and Treatment of Parking Lots and Roadways

Apply pre-wetted deicer, salt brine, or liquid deicers to parking lot prior frost or snow accumulation to prevent icing. Pre-wetting paved areas have been shown to limit the amount of salt needed in most snowstorms. Salt brine or liquid deicers shall not be applied before a rainstorm, but they can be applied before a light freezing drizzle. For more information, refer to attached Anti-Icing and Pre-wetting NH Best Management Practices sheets from the Technology Transfer Center at UNH.

If snow accumulates prior to salting the parking lot within Banks Chevrolet property, the surfaces should be plowed before applying deicers. Snow shall be stored in the designated areas on the civil plan set attached. Only apply salt to pavement surface or icy surfaces to prevent or reduce icing as necessary. Pavement surface temperature shall be monitored in parking lots and roadways. If pavement temperature is below 15º F, winter maintenance contractors shall only use pre-wetted salt or brining solution. Dry salt (sodium chloride) will not melt fast enough at these temperatures.

Note that winter sanding of non-porous pavement shall only be permitted in hazardous areas to provide traction.

Plowing

Plow operations should be timed to allow maximum melting by salt before snow is plowed off the parking lot. Snow piles shall not be located on top of catch basins. Within the parking redevelopment, snow piles should be stored at and adjacent to the parking lot as much as possible so that solids can be recovered after the snow melts.

Equipment & Equipment Calibration

Spreaders used within the Banks Chevrolet property shall be equipped with ground speed control applicators to regulate the amount of salt discharged consistently. All equipment utilized for the application of pre-wetted deicer, liquid chemical, and road salt aggregate should be calibrated each fall. Equipment should be checked after each storm and recalibrated if necessary. For more information, refer to attached Hydraulic-Run Spreader Calibration and Pony Motor-Run Spreader Calibration NH Best Management Practices sheets from the Technology Transfer Center at UNH.

Documentation

All winter maintenance contractors shall record salt usage by vehicle for each storm and periodically compare the usage rates to confirm spreader calibrations. All winter maintenance contractors shall record storm response data, including date, air temperature, ground surface temperature, storm start and end time, snow fall total, salt usage, application rates, application times, and plow times to be compared and analyzed by the applicators and property managers to improve the salt minimization process. The attached "Winter Maintenance Policy Checklist for Contractors" and “Deicing and Anti-Icing Log” shall be used as a guide.

WINTER MAINTENANCE POLICY CHECKLIST FOR CONTRACTORS

Winter Maintenance Policy Checklist for Contractors

Recommended Practice	Y	N	Comments
Develop a Winter Maintenance Policy Plan outlining procedures for the preservation of the surface facilities and stating the adopted practices for salt minimization.			
Use de-/anti-icing logs with noted application rates, material usage totals, equipment calibration record, and material specifications (brine mix ratio, ice melt manufacturer recommendations, etc.).			
Record and log site storm event data including date, air temperature, ground surface temperature, storm start and end time, and snow fall/rain fall totals.			
Record total salt usage, application rates, application times, and plow times to improve current and future salt minimization efforts on site.			
Develop Winter Maintenance Policy training program for applicators.			
Use anti-icing pretreatment where applicable prior to snowstorm events.			
Plow/shovel areas before beginning de-icing activities.			
Use wet materials. Establish pre-wetting procedures and inspection checks for quality control.			
Do not apply sodium chloride (road salt) for pavement temperatures below 15˚ F. If possible, wait for warmer temperatures before deicing. Consult manufacturer specifications for deicer applications below 0˚ F.			
Use salt for melting and only use sand for traction in hazardous areas.			
Outside storage of salt, sand, and other like winter maintenance materials shall not be permitted on the property.			
Sweep up areas of sand application and dispose of properly.			

Checklist is adapted from UNH Technology Transfer Center's "Training Materials for Best Management Practices for Winter Road, Parking Lot, and Sidewalk Maintenance" dated January 31, 2014 in partnership with NHDES and NHDOT.

DEICING AND ANTI-ICING LOG

Deicing and Anti-Icing Log

Log No. (Year-Truck/Spreader ID-Entry #):

Facility Information

Site: Banks Chevrolet Parking Lot Reconstruction: 234 Airport Rd, Concord NH

Facility Manager/Contact: Fred Booth

Street: 137 Manchester Street Phone: 603-229-4004

City, State: Concord, NH E-Mail: Fred.Booth@banksautos.com

General Information

Contractor Company Name: _____

Manager/Operator: _____

NH Certified Salt Applicator: ( ) Yes ( ) No **If yes, certification number:** _____

Street: _____ Phone: _____

City, State: _____ E-Mail: _____

Storm Start Date: _____ Storm End Date: _____

Total Snowfall / Rainfall (inches): Freezing Rain: ( ) Yes ( ) No

Applicator Information

Date: _____ Activity Start Time: _____ End Time: _____

Air Temperature: _____ Ground Surface Temperature: _____

Performed by: _____ Truck/Spreader ID: _____

Spreader Calibration Date: _____ Application Rate: _____

Location(s): _____

_____

_____

Use: ( ) Deicing ( ) Anti-Icing Fluid/Material: _____

Using salt? ( ) Yes ( ) No If yes, is salt pre-wetted? ( ) Yes ( ) No

Using Brine? ( ) Yes ( ) No If yes, what is the mix ratio? _____

Manufacturer / Distribution Plant: _____

Address / Location: _____

Phone: E-Mail:

Additional Notes / Corrective Actions Taken

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

NHDES HIRING A NH CERTIFIED GREEN SNOWPRO APPLICATOR FLYER



Hiring a NH Certified Green SnowPro as your snow removal contractor will help protect you and your company from slip and fall claims arising from snow and ice conditions.

What can you do?

Look for a certified salt applicator at http://des.nh.gov/organization/divisions/water/wmb/was/salt-reduction-initiative/salt-applicator-certification.htm or ask your current contractor to take the Green SnowPro course and become certified.

How can your organization benefit from the certification?

Reduce Your Liability

Under RSA 508:22, certified applicators **and those who hire them** are granted liability protection from claims arising from snow and ice conditions (slip and fall claims).

Certified Green SnowPros

NH Certified Green SnowPros are leaders in the snow removal industry who are trained in the most up to date technologies and snow management practices to ensure a high level of service and safety to their customers.

Reduce Impacts to Local Waterbodies

Once in our water supplies, there is no practical way to remove salt. Certified Green SnowPros are trained in salt reduction practices to help ensure clean water for future generations.

Why is salt reduction important?

As of 2014, 46 water bodies in New Hampshire are polluted with chloride due to road salt application. In several watersheds analyzed in the southern I-93 corridor, more than 50% of the salt load comes from private roads and parking lots. The other major sources are state and local roads and highways.

Training

For upcoming Green SnowPro Training dates http://t2.unh.edu/green-snowpro-training-and-certification

For more information:

Visit www.des.nh.gov and see “Road Salt Reduction” under the A-Z list.

***Contact**: Salt Coordinator*
salt@des.nh.gov
(603) 271-5329

UNH TECHNOLOGY TRANSFER CENTER SALT REDUCTION BMP INFORMATION SHEETS

Training Materials for Best Management Practices

for

Winter Road, Parking Lot, and Sidewalk Maintenance



Date of Publication: January 31, 2014



Green SnowPro

Salt Reduction for Parking Lots and Private Roads

A UNH T² Center Workshop

UNH Technology Transfer Center
33 Academic Way
Durham, NH 03824

800-423-0060 (NH only)
603-862-2826
Fax: 603-862-0620
www.t2.unh.edu
t2.center@unh.edu

University of New Hampshire

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

New Hampshire Technology Transfer Center

About Us

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Joined in 2018.

Stephanie Cottrell
LTAP Coordinator
Joined in 2015

Butch Leel
Senior Training Instructor
Joined in 2007

Kate Politano
Program Assistant
Joined in 2018

Student Workers
UNH undergraduate and graduate students.

Our Mission

To foster a safe, efficient, and environmentally sound surface transportation system by improving skills and increasing knowledge of the transportation workforce and decision makers.

Training Opportunities: Over 80 workshops are offered annually in NH. Most are one-day and offer 5 Roads Scholar hours.

Website: **t2.unh.edu** provides information on the T² Center, LTAP training and workshops, Roads Scholar Program, newsletter, affiliate groups, and trade resource links.

Newsletter: *Road Business* is published quarterly and features technical, safety and management articles.

Technical Assistance: Personalized technical assistance is available through phone, fax, email, or walk-ins.

Mailing Lists: To receive copies of our newsletter, *Road Business*, or for other mailings call 603-862-2826 or email t2.center@unh.edu.

Listserv: PW.net is for anyone concerned with Public Works. To subscribe to this free list, send an email to t2.center@unh.edu.

University of New Hampshire

New Hampshire DOT Department of Transportation

U.S. Department of Transportation Federal Highway Administration

LTAP Local & Tribal Technical Assistance Program

New Hampshire LTAP

Congress established the Local Technical Assistance Program (LTAP) in 1982 to provide services to US cities and towns that maintain roads and bridges. Every US State and Puerto Rico has an established LTAP Center and Regional Center that serve Tribal Governments.

NH LTAP Program Supporters

Federal Highway Administration
NH Department of Transportation
University of New Hampshire

NH Local Technical Assistance Program

(NH LTAP)

At the

UNH Technology Transfer Center



The NH LTAP Roads Scholar Program provides for:

- Recognition of training and achievement across various levels.
- Coverage of subjects essential to effective road management.

Recognition

As individuals achieve a level in the program, the NH LTAP recognizes them in several ways:

*Official letters sent to supervisor and town selectmen

*Name published in Road Business and Roads Scholar Directory

*Master Roads Scholars are featured in Road Business

*Material awards

Technology Transfer Center

33 Academic Way
Durham, NH 03284

1-800-423-0060 (NH)
603-862-2826
Fax: 603-862-0620
t2.center@unh.edu
www.t2.unh.edu

NH LTAP
Roads Scholar Program Levels

Levels	Contact Hours
Safety Champion	20 Safety hours
1. Roads Scholar I	25
2. Roads Scholar II	50*

*Requires the following hours in the specified subject areas:
20 Technical
5 Supervisory
10 Safety
5 Environmental

3. Senior Roads Scholar	75
4. Master Roads Scholar	100
5. Master Roads Scholar II	150 and Safety Champion Award
6. Advanced Master Roads Scholar	200**

**"Along with earning the minimum required 200 Road Scholar hours, the objective of earning this prestigious level of achievement is to participate in, and help improve, the working lives of your colleagues and the public works community. Your passion for this field is evident by your commitment to professional growth and development. In order to reach the Advanced Master Roads Scholar level, you must submit a request of intent to the LTAP Advisory Board for approval. Upon approval, a member of the Advisory Board will contact you to discuss what type of outreach initiative you would most like to participate in.* Think of this as a Capstone project of sorts. Whether your passion is to instruct, mentor, develop outreach programs, inspire teenagers in this field, or bring innovations to your community or others, this Advanced Master Roads Scholar program encourages you to dig deep to find a meaningful and supportive way to help other members of your PW community attain similar goals and achievements.

**You may present your own idea or concept that fits this description at the time of making your intent known.*

Electives

A maximum of 10 hours can be awarded for any training conducted by an approved institution. To receive credit for outside hours, deliver a copy of your certificate with specified hours to us.

Training Quality and CEUs

For training activity quality assurance, the NH LTAP has adopted the criteria of the International Association for Continuing Education. This association, in addition to setting standards for high quality training, also governs the issuance of continuing education units (CEUs). By fulfilling their standards, NH LTAP work-shops and seminars qualify for the issuance for CEUs.

NH LTAP
has
Facebook, Twitter and YouTube!

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- Get relevant news & updates, reminders, and tips.
- Find and follow other professionals who attend our training
- Be the first to learn about upcoming workshops

@nhltap

- Stay informed of our activities
- Be the first to know about special events and promotions
- See photos from our workshops and other events
- Learn about what others in your trade are doing.
- Share local news with your colleagues

UNH Technology Transfer Center (T2)

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t2.center@unh.edu
https://www.facebook.com/NewHampshireLTAP
https://twitter.com/nhltap
https://www.youtube.com/user/unht2ctr

Anti-Icing

NH Best Management Practices

GET OUT EARLY

Typically anti-icing is most effective if applied 1-2 hours before the precipitation begins however it can be applied up to 24 hours in advance.

TRY IT FIRST

Trying anti-icing for the first time? Make a 23.3% brine solution and before a storm spray pavement on your own property using a masonry/ plant sprayer. Use this experiment to determine how best to use it with your clients.

LEAVE SOME PAVEMENT BARE

It's always best to use stream nozzles instead of fan tip to avoid creating a slippery condition. If the anti-icing liquid freezes the bare pavement will still provide a traction surface.

USE A FILTER

Having a filter in your liquid dispensing system will reduce clogs in your nozzle. Automotive in line fuel filters work quiet well. If your liquid dispenser is not functioning properly be sure to check the filter first.

A Proactive Treatment

Anti-Icing before a storm is very similar to using a non-stick spray on a pan before cooking. Just like a non-stick spray prevents food from bonding to the pan, anti-icing prevents snow and ice from bonding to the pavement so that it can be plowed away. Anti-icing can save you money as it costs 50% less than reactive deicing.





Make Your Own Salt Brine

When making brine it is important to add enough salt to produce a 23.3% solution which freezes around 0°F. Roughly 2.5lb per gallon of water will produce a 23.3% solution. You can verify using a salometer (~$20) a 23.3% solution will have a specific gravity of 1.176, or 85% salinity. Consult the Brine Making BMP sheet for more info.

How Much Should I Use and When?

You can apply brine up to 24 hours in advance of the storm. Typical application rates range from 0.5 to 0.75 gallon per 1000 sq.ft. (10' x 100' area). Other chemicals such as magnesium are also available—consult your supplier for application rates. Anti-icing is not advised prior to freezing rain events.





Getting Started

Try making your own salt brine by putting 13 lb of salt in 5 gallons of water to get a 23.3% salt brine solution. Mix the brine until all of the salt is dissolved. Using a masonry sprayer apply the liquid several hours before a storm. Start by applying about 0.25—0.5 gallons to a 10' x 50' area. Adjust the application rates based on your experience. Being careful not to over apply and cause a slippery condition.

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New Hampshire DOT

New Hampshire Technology Transfer Center

Pre-wetting

NH Best Management Practices

PRE-WETTING?

Pre-wetting is the process of coating a solid de-icer with a liquid before it is spread on a roadway.

WHY PRE-WET?

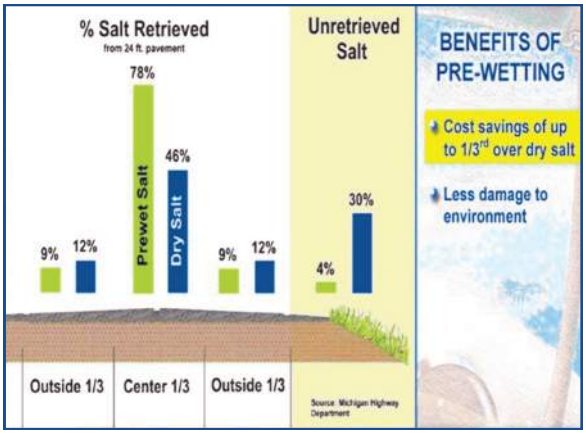
De-icing chemicals must form a brine before they can begin melting ice. Pre-wetting your chemicals accelerates the brine making process, which improves the melting action of the material. Pre-wetting also reduces bounce and scatter of material during spreading, and reduces the total amount of de-icer needed to obtain the desired results.

REDUCED RATES

If you are pre-wetting, don't forget to reduce your application rates accordingly. Reductions in the range of 15-20% are typical.

HOW MUCH LIQUID?

A good rule of thumb is to use 8-10 gallons of pre-wetting liquid for every ton of de-icer. For other chemicals, such as magnesium chloride, consult your supplier for application rates

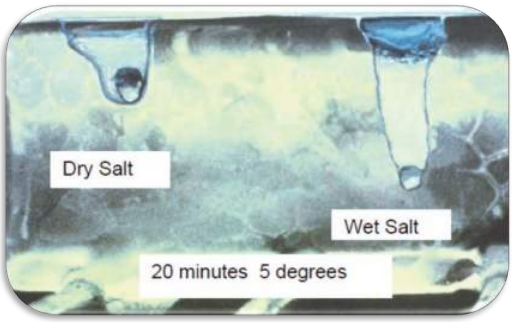


Pre-wetting Liquids

You have a few options for pre-wetting liquids. The most commonly used is a 23% sodium chloride brine solution. Calcium chloride at 32% solution is also used, as well as Magic Minus Zero™ and other patented products.

Getting Started

Wet the pile! There are two ways to pre-wet your de-icing chemicals. The easiest way to get started with pre-wetting is to spread your salt pile, spray it with pre-wetting liquid, mix it around, and re-pile it. More advanced truck mounted pre-wet systems can be installed on your trucks if you decide to make the investment.



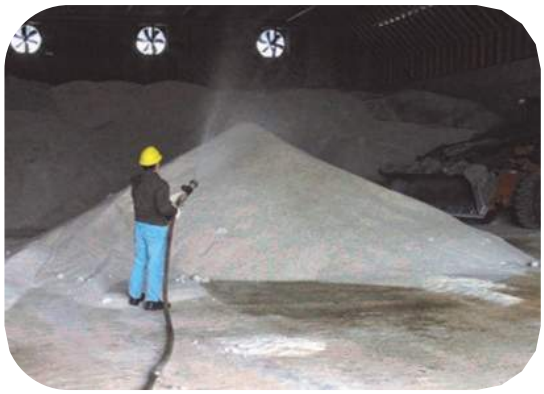
Source: Wisconsin DOT Transportation Bulletin

Spraying the Pile

This is the easiest and most cost effective way to get started in pre-wetting. The first step is to spread your salt pile on a flat, impermeable surface. Next, spray the salt while it is spread out, and mix it around to ensure adequate and consistent liquid coverage. After the salt is sufficiently covered, re-stack the salt in your storage shed for later use.

Truck Mounted Systems

These systems are mounted in the truck bed and coat the de-icer with liquid as it comes off the conveyor/auger onto the spinner. These systems have the benefit of applying liquid only to the material you use as you use it. However, these systems must be installed on every truck that will be used to spread pre-wetted material.





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How Salt Works

NH Best Management Practices

BE PROACTIVE - ANTI-ICE

Anti-icing is the proactive method of preventing snow and ice from bonding to pavement. It can be more than 50% more efficient than deicing. See the NH Anti-Icing Factsheet for more information.

PRE-WETTING FOR FASTER ACTING SALT

Adding brine to salt before you apply it to pavement jump starts the melting process which means your pavement will be clear sooner. See the Pre-wetting Fact Sheet for more information.

KNOW YOUR LIMITS

Dry salt becomes ineffective below 15°F if possible wait until the temperature rises before applying salt. At 30°F 1 lb of salt can melt 46.3 lb of ice in 5 minutes. At 15°F 1 lb of salt can melt 6.3 lb of ice in 1 hour.

PLOW FIRST

Always plow before applying any kind of chemical deicer to avoid pushing it away!

How Do We Melt Ice?

Ice can be melted by increasing the temperature, or lowering the freezing point of the water. It's not cost effective to use heat to melt ice on our roads so we use chemicals to reduce the freezing point—anything that will dissolve in water will work, including: salt, sugar, even alcohol!



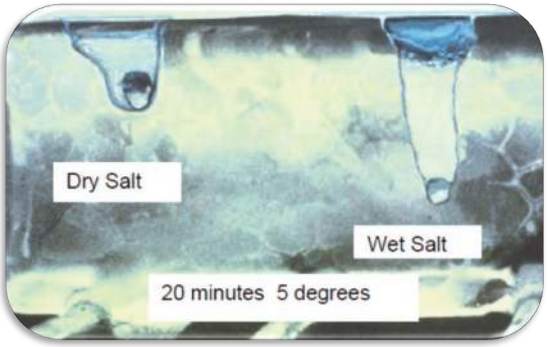


Why Use Salt?

Salt (Sodium Chloride) is the cheapest and most readily available chemical that efficiently melts ice and can be easily applied to our roadways and parking lots. However salt does corrode our cars and bridges, contaminates drinking water and pollutes our streams. Alternatives include potassium acetate, and calcium magnesium acetate (CMA), — all of which are considerably more expensive than calcium chloride, and have their own environmental concerns.

Brine Makes It Happen

The first step in melting ice is the formation of a brine. Salt crystals pull water molecules out of ice formation which creates a brine with a lower freeze point. Once the brine is formed melting is greatly accelerated. Save time and money by pre-wetting your salt with a brine before it hits the pavement to jump start melting! See the Pre-Wetting fact sheet for more information.



Source: Wisconsin DOT Transportation Bulletin #22



Save $$ and the Environment

In New Hampshire there are over 40 watersheds currently contaminated from road salt. As the pavement temperature drops more salt is required. As the pavement temperature rises less salt is required. Save money and the environment by using only what is needed to do the job. See NH application rate charts for recommended rates.

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Material Storage and Housekeeping

NH Best Management Practices

IMPERMEABLE SURFACE STORAGE

Store salt and liquids on an impermeable surface to prevent groundwater contamination.

COVERED STORAGE AREAS

If possible, store your salt in a covered shed to prevent runoff. If there is not a shed available, cover your salt pile well with an impermeable membrane or tarp.

SECONDARY CONTAINMENT

Keep your liquids in an appropriate storage container. Secondary containment should be used incase a leak develops in the primary container.

PROPER DRAINAGE & COLLECTION

Protect your ground water supply! A drainage system should be in place to collect runoff from your salt pile, as well as to collect any liquids that may escape containment. Remember, the collected liquid can be used as a base for salt brine.

Proper Material Storage

Proper storage of materials (especially chemicals) is essential. If impermeable surfaces are NOT used in your storage facilities and brine infiltrates the ground or groundwater, you need to register with the DES under the Groundwater Discharge Permit and Registration Rules, Env-Wq 402. It is a free registration used for tracking potential contaminant sources.





Secondary Containment

Secondary containment for your liquid storage is a HIGHLY recommended technique to help reduce soil and groundwater contamination. If a tank Begins leak, the secondary containment prevents liquid from seeping into sensitive environments.



Liquid Storage

Brine stored using holding tanks must be managed so that there are no releases to drains, groundwater or surface water.


ENVIRONMENTAL
Fact Sheet
Environmental Services

Storage and Management of Deicing Materials

NHDES Fact Sheet DWGB-22-30

This fact sheet outlines the basic required specifications for salt and chemical storage facilities. For additional information, please contact the Drinking Water and Groundwater Bureau at (603)271-2513 or dwgbinfo@des.nh.gov, or visit their website at: http://des.nh.gov/organization/divisions/water/dwgb/index.html. *The Salt Storage Handbook* contains more information and guidelines that should be referenced.

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New Hampshire DOT

New Hampshire Technology Transfer Center

Pony Motor-Run Spreader Calibration

NH Best Management Practices

WHY CALIBRATE?

You can't reduce your salt use if you don't know how much salt you actually use! The goal of calibrating is to know how much material you are putting down on a roadway or parking lot for every setting on your truck that you use. This is why calibrating your equipment is the first step to reducing salt use and saving money!

REMEMBER:

Each truck must be independently calibrated for each material it will be used to spread (the salt calibration card *will* be different than the sand calibration card).

Calibrations should be preformed annually, or after a spreader is serviced.

CALCULATIONS:

There are a few simple calculations you must perform in order to complete the calibration. Once all of the necessary data is recorded, head back inside and warm up! Refer to the reverse side of this fact sheet for calculation instructions.



Step 1: Load the Truck

Partially load the truck. Half of a full load should be more than adequate for calibration purposes.



Step 2: Set Your Controls

Gate Height: Set the gate height to its lowest practical setting to start (approximately 1" to 1.5"). After the truck is calibrated for the lowest gate setting, calibrate for each 1/2" increment greater than the lowest setting. Continue until all gate settings you use are calibrated.

Engine Speed: Set the pony motor speed to the maximum setting, or to the setting you would normally use.



Step 3: Measure Spread Width

Measure the width that the material covers during spreading. Do this for each gate setting you are calibrating. Round your numbers to the nearest half foot and record them in column "**W**" of the calibration chart (see reverse side).



Step 4: Collect & Weigh Material

You will need either a sheet of canvas, a tarp, or a bucket to collect the material that is dispensed from the spreader, as well as a scale. Weight the object you are using to collect the material in, and record that value in the purple box above the discharge rate column. Collect material for 1 minute. Weigh the collected material and subtract the weight of the tarp/canvas/bucket. Record this value in the first purple column of the calibration chart. Do this 3 times for each gate opening that is typically used. Average these three values together and record in the orange column in the calibration chart.

Step 5: Perform Calculations

Go inside and calculate your discharge rate using the calibration chart for each truck speed and gate setting you normally use. Refer to the reverse side of this fact sheet for calculation instructions. The formula you will be using is shown below:

$$D = \frac{B \times C}{A}$$

Step 6: Distribute Completed Calibration Cards!

Put a copy of the calibration card in the truck you just calibrated. Also, leave a copy of the calibration card in the office so you have a copy incase the original is damaged.

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New Hampshire DOT

T2 New Hampshire Technology Transfer Center

Calibration Chart (Pony Motor Type)

Material: _____ Truck/Spreader ID: _____

Date: _____ Performed by: _____

Tarp/Canvas/Bucket Weight: _____

Gate Opening	W	A	Discharge Rate (lb/min.)			B	D					
	Spread Width (ft.)	5.28 × W	Run 1	Run 2	Run 3	Average Discharge Rate *((Run1 + Run2 + Run3)/3)*	Pounds of Material Discharged per 1000 square ft. *(D = B × C ÷ A)*					
							5 mph (C = 12)	10 mph (C = 6)	15 mph (C = 4)	20 mph (C = 3)	25 mph (C = 2.4)	30 mph (C = 2)
1”												
1.5”												
2”												
2.5”												
3”												
EX	14	5.28 × 14= **73.92**	87	92	93	(87+92+93)÷3= **90.67**	12 × 90.67 ÷ 73.92= **14.72**	6 × 90.67 ÷ 73.92= **7.36**	4 × 90.67 ÷ 73.92= **4.91**	3 × 90.67 ÷ 73.92= **3.68**	2.4 × 90.67 ÷ 73.92= **2.94**	2 × 90.67 ÷ 73.92= **2.45**

Calculation Instructions: Multiply the spread width from column **W** by **5.28** and record the answer in column **A**. For each gate setting, add **Run 1**, **Run 2**, and **Run 3** together. Divide the result by **3** and record in column **B** to get the average discharge rate. To find the pounds of material discharge per 1000 square feet, you must know the number of minutes it takes to travel one mile at every truck speed you intend to calibrate for. These numbers are designated as variable “**C**”. The “**C**” value for each travel speed is shown in red under that given speed. Multiply column **B** by the “**C**” value for that speed and divide by the **A** column to find the number of pounds of material discharged per 1000 square feet for the given speed. Record these numbers in the **D** columns. The full equation is shown here:

$$D = \frac{B \times C}{A}$$

Hydraulic-Run Spreader Calibration

NH Best Management Practices

WHY CALIBRATE?

You can't reduce your salt use if you don't know how much salt you actually use! The goal of calibrating is to know how much material you are putting down on a roadway or parking lot for every setting on your truck that you use. This is why calibrating your equipment is the first step to reducing salt use and saving money!

REMEMBER:

Each truck must be independently calibrated for each material it will be used to spread (the salt calibration chart *will* be different than the sand calibration chart).

Calibrations should be preformed annually, or after a spreader is serviced.

CALCULATIONS:

There are a few simple calculations you must perform in order to complete the calibration. Once all of the necessary data is recorded, head back inside and warm up! Refer to the reverse side of this fact sheet for calculation instructions.



Step 1: Load the Truck

Partially load the truck. Half of a full load should be more than adequate for calibration purposes.



Step 2: Set Your Controls

Gate Height: Set the gate height to its lowest practical setting (~ 2"). This should be kept constant throughout the calibration process. If you find that not enough material is dispensed with this setting, try 2.5" to 3".

Engine Speed: Warm the truck up and run the engine at the typical rate seen during spreading (approximately 2000 rpm).



Step 3: Measure Spread Width

Measure the width that the material covers during spreading. Do this for each conveyor/auger setting you are calibrating. Round your numbers to the nearest half foot and record them in column "**W**" of the calibration chart (see reverse side).



Step 4: Collect & Weigh Material

You will need either a sheet of canvas, a tarp, or a bucket to collect the material that is dispensed from the spreader, as well as a scale. Weight the object you are using to collect the material in, and record that value in the purple box above the discharge rate column. Collect material for 1 minute. Weigh the collected material and subtract the weight of the tarp/canvas/bucket. Record this value in the first purple column of the calibration chart. Do this 3 times for each conveyor/auger setting that is typically used. Average these three values together and record in the orange column in the calibration chart.

Step 5: Perform Calculations

Go inside and calculate your discharge rate using the calibration chart for each truck speed and conveyor/auger setting you normally use. Refer to the reverse side of this fact sheet for calculation instructions. The formula you will be using is shown below:

$$D = \frac{B \times C}{A}$$

Step 6: Distribute Completed Calibration Cards!

Put a copy of the calibration chart in the truck you just calibrated. Also, leave a copy of the calibration chart in the office so you have a copy incase the original is damaged.

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New Hampshire DOT

New Hampshire Technology Transfer Center

Calibration Chart (Hydraulic Type)

Material: _____ Truck/Spreader ID: _____

Date: _____ Performed by: _____

Tarp/Canvas/Bucket Weight: _____

Conveyor or Auger Setting	W	A	Discharge Rate (lb/min.)			B	D					
	Spread Width (ft.)	5.28 × W	Run 1	Run 2	Run 3	Average Discharge Rate *((Run1 + Run2 + Run3)/3)*	Pounds of Material Discharged per 1000 square ft. *(D = B × C ÷ A)*					
							5 mph (C = 12)	10 mph (C = 6)	15 mph (C = 4)	20 mph (C = 3)	25 mph (C = 2.4)	30 mph (C = 2)
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5												
EX	14	5.28 × 14= **73.92**	87	92	93	(87+92+93)÷3= **90.67**	12 × 90.67 ÷ 73.92= **14.72**	6 × 90.67 ÷ 73.92= **7.36**	4 × 90.67 ÷ 73.92= **4.91**	3 × 90.67 ÷ 73.92= **3.68**	2.4 × 90.67 ÷ 73.92= **2.94**	2 × 90.67 ÷ 73.92= **2.45**

Calculation Instructions: Multiply the spread width from column **W** by **5.28** and record the answer in column **A**. For each conveyor/auger setting, add **Run 1**, **Run 2**, and **Run 3** together. Divide the result by **3** and record in column **B** to get the average discharge rate. To find the pounds of material discharge per 1000 square feet, you must know the number of minutes it takes to travel one mile at every truck speed you intend to calibrate for. These numbers are designated as variable "**C**". The "**C**" value for each travel speed is shown in red under that given speed. Multiply column **B** by the "**C**" value for that speed and divide by the **A** column to find the number of pounds of material discharged per 1000 square feet for the given speed. Record these numbers in the **D** columns. The full equation is shown here:

$$D = \frac{B \times C}{A}$$

Brine Making

NH Best Management Practices

GET THE LOWEST FREEZE POINT

When salt brine is 23% salt (measured with a hydrometer: 1.176, or with a salimeter: 85%) it has the lowest freeze point possible (about 0°F).

BRINE STORAGE

23% brine solution may be stored outside, however if temperatures get below 0°F the brine may freeze. A circulator pump will reduce the risk of freezing. If possible store brine indoors to eliminate risk of freezing.

COST OF BRINE

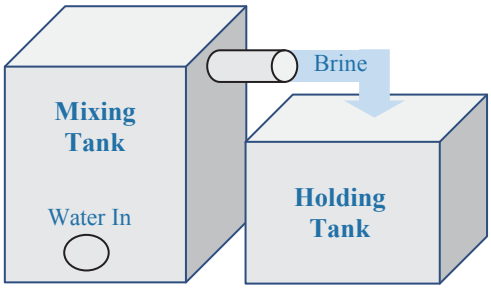
Calcium chloride brine costs about 7¢ / gallon (assuming $58/ton for salt) after you have your equipment setup.

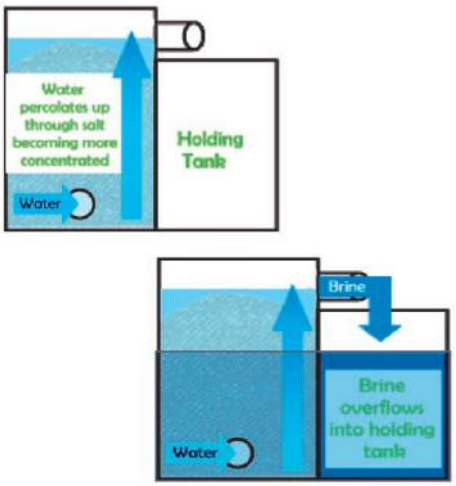
MULTIPLE USES

Brine can be used directly for anti-icing, for prewetting salt as it is dispensed from your truck, or to pretreat salt before it is loaded into your truck. Brine can be safely stored for up to a year, however, the concentration should be tested before use.

What Do You Need?

Brine making is a fairly simple process—the only ingredients are salt and water, and the only equipment you'll need is an open top mixing tank, a holding tank, a small pump, and a salimeter.



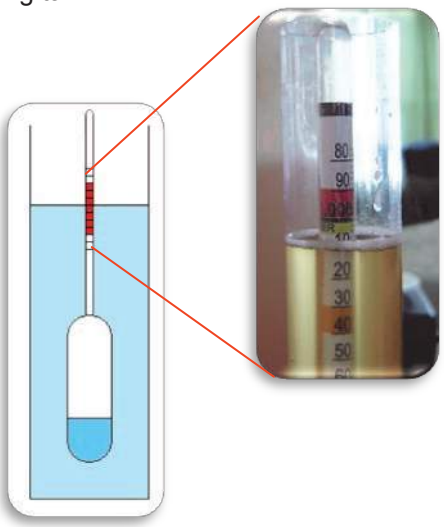


Images courtesy of Iowa DOT

Step 1: Fill Mixing Tank

Add Salt: Add about 2.5 lb of salt per gallon of water you plan to add. Make sure your mixing tank has a large opening to make adding salt easy.

Add Water: Slowly add water from the bottom of your brine mixing tank. This will allow it to percolate up through the salt and overflow into the holding tank.



Step 2: Check Concentration

Float a hydrometer or salimeter directly in your holding tank and read the value at the surface of the water. The number should be either 85% or 1.176 depending on the units of your device.

If the values are too low, pump some brine from your holding tank back into the mixing tank and allow it to overflow. If values are too high simply add some fresh water



Quality Control & Documentation

Make sure that you record the date when you create each batch of brine and document who mixed it and checked the concentration. It is also a good idea to note the final concentration. These records should be kept for at least two years to protect your group in the event of litigation.

Produced in partnership with:

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

New Hampshire DOT

New Hampshire Technology Transfer Center

Safe and *Sustainable* Snowfighting



Safe and *Sustainable* Snowfighting

The Snowfighter's Handbook

A Practical Guide for Snow and Ice Control

Dedicated to the people
who provide safety and mobility
*on roads in winter — **the snowfighters***

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PUBLISHED BY THE SALT INSTITUTE: The Salt Institute is a North American based non-profit trade association dedicated to advancing the many benefits of salt, particularly to ensure winter roadway safety, quality water and healthy nutrition. See saltinstitute.org and safewinterroads.org for more information.

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FOREWORD

This manual, prepared by the Salt Institute is dedicated to the thousands of men and women in public works agencies at all levels whose task is providing safe streets and highways during winter storms.

The modern snowfighter must be accountable for meeting the community's needs for safety and mobility, as well as the safeguarding of our environment.

We commend all those agencies practicing the Safe and Sustainable Snowfighting approach to snow and ice control, which emphasizes getting the most from every application of deicing salt while maintaining the safest roads possible in the most economical way, and protecting the environment.

Every winter, over 115,000 people are injured and over 1,000 are killed on snowy or icy American roads. Clear roads protect lives and commerce and salt is a necessary strategic resource.

- Road salting and effective plowing can reduce injury crashes by up to 88%.
- The economic impact of snow-related closures far exceeds the cost of timely snow removal. A one day major snowstorm that shuts down roads can cost a state between $300 and $700 million in indirect costs.
- Deicing pays for itself within the first 25 minutes after salt is applied.

Modern strategies to effectively deal with winter road hazards depend upon having the most up-to-date information of expected weather conditions, the timely deployment of anti-icing to prevent ice-pavement bonding, properly calibrated application of road salt, improved equipment, automatic spreader controls, sufficient covered storage, and stockpile logistics to make salting of roads the most effective and safest customer-driven method for snow and ice control.

Environmental problems concerning use and storage of salt need not exist if there is a balanced approach to the use of salt for snow and ice control — one that demonstrates excellent practices in achieving safety, mobility and care for the environment.

The Snowfighter's Handbook was originally published in 1967. It has been widely accepted as a recommendation for proper salting procedures and techniques.

The purpose of this manual is to provide the snowfighter with information and suggestions for combating winter storms.

The *Sustainable Snowfighting* methods contained in this manual are the cornerstones of an effective winter maintenance program which will help snowfighters provide the public with the most effective snow and ice control program possible at the lowest overall cost and least impact on the environment.

Two other practical publications, *Highway Salt and Our Environment* and *The Salt Storage Handbook,* are also available from the Salt Institute. Two websites, saltinstitute.org and safewinterroads.org, are further resources.



1 HOW IMPORTANT IS THE WINTER MAINTENANCE FUNCTION?

Snow and ice control is often the single largest cost item in the maintenance budget for streets and highways. In a recent year, snow removal in 33 snow belt states accounted for 20-25% of total maintenance costs and almost 5% of all highway expenditures.

For this reason, and because of its impact on public safety and essential mobility, snow and ice control deserves special attention from top highway management as well as from those in maintenance at all levels.

With nearly 300 million motor vehicles registered in the U.S., and more than four million miles of roads and streets, more must be done with the winter maintenance dollar than simply providing traction over ice and snow.

Most Canadian road authorities have an even tougher job than their U.S. counterparts. Canada's commerce and industry depend upon safe transportation and communication throughout the vast nation. Yet, Canadian winters threaten for six months every year, with colder temperatures and more frequent snows than in the United States.

The common practice for snow and ice control on many miles of streets and highways is removal of these substances as soon as possible to provide safe pavement through Sustainable Snowfighting. Nearly every state, province, city and toll road in the snow belt has some mileage on a clear pavement program. These facts about our motorized economy show why:

- Motorists now travel more than three trillion vehicle miles each year.
- More than 75% of workers who commute drive to work.
- More than 80% of intercity travel is by motor vehicle.
- Suburban growth has drastically increased traffic densities on most street and highway systems.
- Access to retailers, service establishments and other businesses is often wholly dependent on auto or truck transportation.
- Just-in-time manufacturing practices require reliable highway access for economic efficiency and competitiveness in snow belt areas.
- Web-based sales are pushing incredible parcel delivery growth.
- Increasing traffic volumes, the reliance of our society on daily mobility and the urgency of moving emergency vehicles without delay demand efficient snow and ice removal to keep traffic moving all year around.

Sustainable Snowfighting provides safe pavement in an environmentally sensitive manner. By preventing the bonding of snow and ice to pavement and clearing all snow and ice from pavements as soon as possible, snow fighting materials are used most efficiently with minimal loss to the environment. Benefits of this high maintenance are apparent:

- Traffic keeps moving.
- Commerce and industry go on at near-normal pace.
- There are fewer accidents, injuries and deaths.
- Minimal environmental impact.
- Emergency vehicles get through.

The public is less tolerant of failure in snow and ice control than in any other highway or street department function. A snowstorm affects the entire community — often entire states. Unless a storm is handled capably by maintenance forces, it can upset considerably the daily routines of individuals, endangering public safety and adversely affecting business and commerce. ❄



2 TRAIN FOR TEAMWORK

Maintenance people typically feel a keen obligation to the traveling public. They have a kind of esprit de corps that comes only with training and experience.

Proper training for maintenance personnel is vital. It provides the know-how to get the job done and encouragement to perform in a way that brings praise rather than discredit to your organization.

Many maintenance organizations conduct training courses in the early fall months to assure that:

- Equipment operators fully understand how to operate and maintain plows, spreaders, loaders and other equipment used for winter maintenance.
- All employees are thoroughly familiar with their responsibilities.
- All employees receive a full review of snow removal schedules, snow routes and personnel and equipment assignments.
- Dry-runs are made over areas to be covered during actual snowfighting operations.
- All employees understand how salt works in snow and ice so they know how, when and in what amounts it should be applied.

The underlying theme of all training sessions should be the Sustainable Snowfighting concept, which includes:

- Concern for public safety
- Concern for mobility and commerce
- Concern for the environment
- Proper covered storage
- Good maintenance of storage areas
- Good equipment maintenance and knowledge of equipment
- Proper spreader calibration
- Proper salt application

Every agency should have a fall meeting.

A session on snow and ice removal well ahead of winter gives a chance to discuss your plans with the people expected to carry them out. This meeting is a refresher course on snowfighting tactics for experienced employees and an introduction to winter maintenance for new personnel.

This meeting gives management a chance for a formal review of the previous winter's operation with operators and supervising personnel. Use it to determine what may have gone wrong last winter, and then make corrections for the coming season.

Promote a free exchange of ideas at the fall meeting. Encourage all personnel to speak up. New ideas and better tactics can come out of this session. ❄

Suggested Program Outline For Fall Training Sessions

I. The Importance of Coordination
- Know Your Plowing and Spreading Routes
- Effective Radio Communication
- The Storm Warning System
- Working with Police, Other Public Agencies and the Media

II. Equipment — Its Operation and Maintenance
- Plows
- Spreaders, Sprayers and Their Controls
- Loaders
- Emergency Repair and Refueling Stations
- The Importance of Preventive Maintenance

III. Application Procedures
- How Salt Works
- How and When to Salt
- Anti-Icing vs Deicing
- Application Rates
- Special Storm Conditions
- Special Deicing Problems (Bridges, Elevated Curves, Ramps, Intersections)
- When to Re-Apply Salt

IV. Review of Winter Maintenance Policy
- Snow Emergency Routes
- Parking Ordinances
- Procedures for Helping Motorists
- Importance of Personal Public Relations by Maintenance Personnel

V. On-the-job Safety
- Safety Equipment
- Safety Practices

VI. Discussion, Questions and Answers
To assure yourself that your department is ready for winter, you might have superintendents or foremen complete a check list showing their progress in pre-winter preparations.

3 Making Equipment Count

Equipment can make or break a maintenance organization. It must be suited to the job – and it's a tough job. Winter operations require the highest level of equipment maintenance.

It is a good idea to review equipment needs immediately after each winter season, when they are fresh in your mind. If new equipment is required, it can be ordered with good assurance of delivery prior to the next winter season.

A secret to successful winter maintenance is the ability to fight storms with equipment already on hand. The key is proper equipment maintenance. Snow and ice control equipment should never be stored without being cleaned. It should be inspected for possible repairs, and repaired if necessary.

In Fall training sessions, discuss each type and class of equipment which employees will operate. Go over strengths and weaknesses of each. Describe performance capabilities, load and weight limits, specifications, safety considerations, attachments and modifications.

If possible, assign each operator to a specific spreader, plow or loader. Man and machine make a better team when they work together regularly. The feeling that a vehicle "belongs" to an employee also will make an operator show more responsibility for its upkeep.

In some organizations, it may be necessary to switch operators from one piece of equipment to another. Then management must depend on a system of checks to ensure that equipment is properly operated and maintained.

Thoroughly inspect all equipment during late summer or early fall. Make all repairs and order stocks of parts not locally available. Pay particular attention to these components:

- Inspect condition of moldboard and cutting edge of all snowplows. Order adequate stocks of parts for all types of plows.
- Inspect snowplow hoists and under-body blades. Check air and hydraulic hoses and other critical parts of power units and obtain adequate replacement stocks.
- Mount, load and test all spreaders and sprayers. Make necessary repairs and order critical parts. Calibrate all spreaders and lace the calibration card on a visor or in the glove compartment of the truck. Supervisors should have copies of all calibration cards on file.
- Inspect all vehicle lighting, including wiring and sockets on headlights, tail lights, stop lights and turn signals. (Warning lights must be visible from all sides, whether bodies are raised or lowered.)
- Make sure sufficient stocks of tire chains, tires, spreader repair parts and other miscellaneous supplies are on hand.
- Make sure all personnel are familiar with spreader/sprayer controls, whether manual or automatic.

To keep equipment in top condition, establish a regular maintenance routine to be followed all winter. Equipment operators should inspect vehicles after each storm and report needed repairs to the garage or to the staff mechanic. Spreaders will need to be recalibrated after repair to the hydraulic system.

The first step in vehicle maintenance is to make sure every operator knows what to expect of each piece of equipment. Operators should check these items carefully.

Spreaders /Sprayers – Inspect pumps, hoses, controls, and fittings. Check spinners, augers, and auxiliary engines.

Controls - The two major components of any hydraulic system are the pump and the controls, whether manual or automatic. All operators should become thoroughly familiar with spreader controls. No two hydraulic systems are exactly the same. Therefore, controls may differ from truck to truck. Know your equipment and how the auger or conveyor and the spinner react at carious settings.

Plows – Carefully inspect blades after each use. If blade wear begins eating into the moldboard, it will be very costly to replace. Remember that snow plow blades do not wear evenly. Replace blades when they are badly worn at any point! Have operators check blade wear during storms.



(Right-hand plows wear most rapidly on the left side, while the opposite is true for left-hand plows. Reversible plows may show wear on either side, depending upon operating time in each position.)

All Electrical Equipment — Inspect and service all lighting and electrical equipment regularly, including wiring and sockets. Carry ample stocks of parts for rotating flasher units, including lenses and lamps. Faulty wiring and failure of alternators, generators and batteries cause the most downtime in winter maintenance vehicles. Nothing is more terrifying and dangerous than a stalled and darkened vehicle in a winter storm.

Safety Equipment — Make sure there are flashlights, flares, flags and safety vests in truck cabs. A first aid kit is also a good idea. It is preferable to wear hardhats at all times and don't start out without securing seat belts.

All vehicle operators should know the location and telephone numbers of emergency repair and refueling stations. Qualified personnel should be on hand in garages during storms to carry out minor repairs promptly or make a start on major repairs. ***Replenish spare parts inventories immediately following storms.***

Equipment needs vary markedly. How many plows, spreaders or sprayers are necessary for each mile of pavement depends upon snowfall, frequency of storms, traffic and topography. How much equipment an agency can afford is an important consideration as well. A straight salt program requires less equipment than one using abrasives, or alternative deicers.

Despite careful planning, equipment on hand may be inadequate in certain situations. *Don't be caught short!* Compile a list of all rental equipment available from contractors or haulers during snow emergencies. List specifications, rental rates and the names, addresses and telephone numbers of owners.

Establish ground rules for contracting for this equipment. It is important that every supervisor understands who has the authority to call rental equipment into action.



Arrange before winter to borrow equipment and operators in emergencies from local military installations, reserve units or neighboring maintenance agencies. Determine which officer is responsible for specific equipment and negotiate details for its use, if it is needed. It is difficult to know when a blizzard will strike, requiring tracked vehicles or other heavy equipment. Training sessions should include operators who may be brought in during emergencies, whether contract operators and/or equipment. They should also include other departments such as sewer and water or the park service. In fact, anyone capable of driving a plow and/or spreader should be trained and included whenever possible.

Warning! Before permitting rented or loaned equipment to operate, make sure your department is protected from liability for property damage or injuries resulting from accidents, and that insurance coverage is adequate and complies with all state and local laws or ordinances.

Preventive maintenance is crucial! After each storm, all equipment must be cleaned, washed and allowed to dry. When dry, components such as chains, sprockets, hinges, spinners and other moving parts should be coated with used motor oil, diesel fuel or kerosene. Grease all bearings.

Check hydraulics and quick disconnects for leakage. All washing and maintenance must be conducted in specific areas to protect the equipment and to allow capture and treatment/recycling of washwater.

The versatile underbody plow is very valuable in snowfighting. In light snow, it can run at fairly high speeds with safety. It can usually be purchased economically. The underbody blade is also a good training tool for new operators. ❄

4 OTHER PRE-WINTER PLANNING



All major arteries and feeders, including interstates, primary and secondary roads should be included in an agency's *Sustainable Snowfighting* program. Primary routes should have higher priority than secondary roads.

Only someone thoroughly familiar with a given locality can assign levels of maintenance and schedule performance of the work for optimum results. Local traffic patterns, traffic volume, the needs of local industry and business and special problems created by topography or climate must be considered.

However, here are a few recommendations for determining required levels of maintenance:

- Many agencies determine maintenance levels based on average daily traffic (ADT)
- Give priority to important local arterials, including school bus routes, access roads to industrial parks or major plants, mail delivery routes and streets leading to hospitals, fire stations and maintenance garages.
- Provide safe pavement on all truck routes that carry heavy vehicles around a city or through selected sections. Remember that these routes require around the clock attention.
- Carry levels of maintenance to logical stopping points, such as traffic signals, intersections or slow speed zones. This priority gives motorists time to adjust to the shift in maintenance levels.
- Make sure maintenance sections link or overlap. Leaving a gap between sections on a high-speed roadway can present potentially hazardous conditions.

Interstate and expressway routes that pass through or near cities carry increased traffic volumes onto city arterials. Ramps and other approaches to major city routes need special attention. A bare street or road is worthless unless traffic can get on and off. Plow and salt ramps of major arterials early in storms.

After thorough planning has been done, post a master-map showing routes, snow plowing and salting schedules and equipment and operator assignments.

For added control, give each driver an individual map of his route or area. Be sure to update maps each year to show new roads, interchanges, streets, bridges and governmental boundary lines.

For top efficiency in scheduling operations, aim for maximum equipment and manpower utilization. Try setting up salt routes that bring spreaders back to storage sites as they empty. It may be desirable to stockpile salt at several locations so spreaders won't waste time deadheading.

Spreading rates differ based on types of storm, weather conditions and operational procedures. Application rates generally range from 300 to 800 lb per two-lane mile. ***For convenience in estimating your season needs, the following chart is based on four 500 lb applications per storm.***

Mark the spots that won't be there. Before winter, mark all structures, such as drop inlets, catch basins, ends of curbing and guardrail and fire hydrants. Once covered with snow, they will be difficult or impossible to see from a plowing or spreading vehicle. Use special markers to pinpoint locations of drains and waterways that must be opened after each storm.

Where does snow fencing go? Only practical experience and analysis can tell where to erect snow fencing. Where it is placed depends entirely upon topography, prevailing winds and existing vegetation. Fencing should never be erected nearer than 75 to 100 ft from the centerline. It always is placed on the side of the roadway from which prevailing winter winds blow and should be perpendicular to wind direction, not necessarily parallel to the road. Positioning of snow fencing may be changed from one year to the next. Slopes, grading and tree growth often alter placement.

Notify property owners. Remember to contact property owners before erecting snow fence outside rights-of-way. In long fence sections, leave an occasional gap so livestock can go through. It is good community relations and will prevent damage to fencing as well.

Tons of Salt Required Per Season

(Based on 4 applications of 500 lb per 2-lane mile per storm)

No. of Storms	Miles of Two-lane Highway on Clear Pavement						
	100	**200**	**300**	**400**	**500**	**600**	**700**
4	400	800	1200	1600	2000	2400	2800
6	600	1200	1800	2400	3000	3600	4200
8	800	1600	2400	3200	4000	4800	5600
10	1000	2000	3000	4000	5000	6000	7000
12	1200	2400	3600	4800	6000	7200	8400
14	1400	2800	4200	5600	7000	8400	9200
16	1600	3200	4800	6400	8000	9600	10,200
18	1800	3600	5400	7200	9000	10,800	11,600
20	2000	4000	6000	8000	10,000	12,000	14,000

Note: Minimum storage requirement is usually 3/4 of annual salt use.
This chart is computed on the basis of one ton of salt per two-lane mile per storm, or four 500 lb applications per storm.
Note: These are average figures. Conditions in some areas require several times the salt needed in some other areas.

5 KNOW DIFFERENT TYPES OF SNOW

In spots where unusual drifting is expected, place one or more rows of fence, with the second line parallel to and about 50 ft from the first. ***What about "self-help" barrels?*** Many public works agencies place "self-help" salt barrels at critical points where motorists are likely to have tough going during winter.

Eliminate runoff from stored salt. Improper stockpiling of salt is responsible for as much as 80% of environmental problems associated with salt use. Rain and melting snow can carry salt from uncovered piles into the ground and nearby bodies of water and possibly cause chloride build-up.

Salt piles ***must*** be covered on an impermeable pad. Salt users usually prefer permanent structures on asphalt pads with proper drainage. Temporary waterproof coverings can be effective if tended carefully. Covering salt also helps avoid loss of material through leaching and caking. Also, salt without cakes and lumps spreads with no difficulty.

Snow occurs when water vapor in an air mass is cooled below freezing. Density of snow varies greatly. Some storms produce wet snow like wet sand, others dry snow like sawdust. Wet or heavy snow can often be plowed away. Time is of the essence. Use of reliable weather forecasting services allows for crew readiness in advance of storms. Salt should be applied as soon as snow or ice begins to accumulate.

Winter storms produce a number of hazardous conditions other than snow. Even without rain, ice may occur when moist air contacts a cold surface, particularly on bridge decks. Rain may freeze as it falls on pavement. Frozen rain falls as sleet or hail; it may stick to pavements.

There are roughly five major kinds of storms, as shown in the "Stormfighting Practices" box. Each requires a somewhat different approach. Everyone on the maintenance force should know these basic kinds of storms and how to combat them.

Stormfighting Practices

The following chart is designed to combat various types of storms. Local conditions and policies will be the final determining factor.

Condition 1 **Temperature** Near 30 **Precipitation** Snow, sleet or freezing rain **Road Surface** Wet	If snow or sleet, apply salt at 500 lb per two-lane mile. If snow or sleet continues and accumulates, plow and salt simultaneously. If freezing rain, apply salt at 200 lb per two-lane mile. If rain continues to freeze, re-apply salt at 200 lb per two-lane mile. Consider anti-icing procedures.
Condition 2 **Temperature** Below 30 or falling **Precipitation** Snow, sleet or freezing rain **Road Surface** Wet or Sticky	Apply salt at 300-800 lb per two-lane mile, depending on accumulation rate. As snowfall continues and accumulates, plow and repeat salt application. If freezing rain, apply salt at 200-400 lb per two-lane mile. Consider anti-icing and deicing procedures as warranted.
Condition 3 **Temperature** Below 20 and falling **Precipitation** Dry Snow **Road Surface** Dry	Plow as soon as possible. Do not apply salt. Continue to plow and patrol to check for wet, packed or icy spots; treat them with heavy salt applications.
Condition 4 **Temperature** Below 20 **Precipitation** Snow, sleet or freezing rain **Road Surface** Wet	Apply salt at 600-800 lb per two-lane mile, as required. If snow or sleet continues and accumulates, plow and salt simultaneously. If temperature starts to rise, apply salt at 500-600 lb per two-lane mile, wait for salt to react before plowing. Continue until safe pavement is obtained.
Condition 5 **Temperature** Below 10 **Precipitation** Snow or freezing rain **Road Surface** Accumulation of packed snow or ice	Apply salt at rate of 800 lb per two-lane mile or salt-treated abrasives at rate of 1500 to 2000 lb per two-lane mile. When snow or ice becomes mealy or slushy, plow. Repeat application and plowing as necessary.

Note: The light, 200 lb application called for in Condition 1 and 2 must be repeated often for the duration of the condition.

Most storms occur under Conditions 1, 2, or 3. But variations in temperature, precipitation, pavement condition or other factors are common. Management must depend upon well-trained maintenance crews to use initiative and imagination in coping with unforeseen problems.

Pavement will often freeze dry following a storm, if the last salt application is properly timed. Often, moisture on the pavement will turn to vapor and disappear as it freezes, leaving a completely clear, dry surface.

Keep an eye on the weather. Proper preparation for a storm is not possible unless management anticipates when it will arrive, how long it will last and the nature of its special characteristics. Arrange with the U.S. Weather Bureau, a local airport weather station or a private forecasting service to get complete, detailed reports during winter.

Some maintenance departments hire a private forecaster to assure a balanced and more localized weather picture. Some progressive agencies are using pavement sensors and local weather instruments to receive instantaneous road and atmospheric conditions for more precise snow and ice control operations.

It may also be useful to call 511 to get road conditions. Some states also have excellent 511 websites such as Minnesota (www.511MN.org) or Wisconsin (www.511WI.org) where road and travel conditions are described. In addition, the National Weather Service has a website (http://www.nws.noaa.gov/) that provides a comprehensive report of both local and surrounding conditions.

While weather conditions are generally measured 30 ft above ground, it is critical in snowfighting to know what is happening where the rubber meets the road. Pavement temperatures are what counts when determining application rates. This requires some type of road surface sensors or gaining access to the Road Weather Information System (RWIS).

There are a variety of electronic sensors that can be used to measure surface temperatures. Hand-held or truck-mounted infrared, laser-based sensors are able to quickly get a pavement temperature and are very useful in establishing application rates.

RWIS is a system consisting of several meteorological stations strategically located alongside the highway that allows the DOTs to make more informed decisions during winter storms. Specialized equipment and computer programs monitor air and pavement temperature to make forecasts regarding how the winter storms will impact the highways. This provides the opportunity to make optimal use of materials, equipment and staff, and practice anti-icing and deicing techniques perfected through years of experience.

Any changes in weather conditions should be relayed to all personnel. If late afternoon reports indicate possibility of overnight snowfall, prepare equipment by attaching snowplows and spreaders before the workday ends. If weather forecasts indicate, a certain portion of the work force should remain on duty to start fighting the storm when it arrives. If the forecast indicates snow during the night, the work force should be sent home to get some rest, but alerted that they may be called back during the night. Arrange with the highway patrol, local police, sheriff's department or weather service to notify key personnel of storms that develop late at night. Ensure that someone is responsible for relaying the alert to the entire maintenance force, if and when the need arises. ❄

Pounds of Ice Melted Per Pound of Salt

Temperature Degrees F	One Pound of Sodium Chloride (Salt)
30	46.3 lb of ice
25	14.4 lb of ice
20	8.6 lb of ice
15	6.3 lb of ice
10	4.9 lb of ice
5	4.1 lb of ice
0	3.7 lb of ice
-6	3.2 lb of ice

Application of Salt

Rate of Application Per Two-Lane Mile	Coverage Per Cu. Yd. of Salt Per Two-Lane Mile
800 lb	2 1/2
700 lb	2 3/4
600 lb	3
500 lb	4
400 lb	5
300 lb	6
200 lb	10

Note: Salt meeting ASTM Specification D632 weighs approximately 80 lb per cubic foot.

6 CALIBRATION

Different materials will spread at different rates at the same setting, so spreaders must be calibrated with the material that will be used.

Spreader Calibration Procedure

Calibration of spreaders is simply calculating the pounds per mile actually discharged at various spreader control settings and truck speeds. It is carried out by first counting the number of auger or conveyor shaft revolutions per minute, measuring the salt discharged in one revolution, then multiplying the two and finally multiplying the discharge rate by the minutes it takes to travel one mile. An excellent example of a calibration chart in spreadsheet format can be found on the Salt Institute website. Operational spreadsheets can be found on the same page. A sample calibration chart is on this page.

With hopper-type spreaders, specific gate openings must be calibrated. Measure from floor of conveyor to bottom edge of gate.

Each spreader must be calibrated individually; even the same models can vary widely at the same setting.

Equipment needed:

1. Scale for weighing
2. Canvas or bucket/collection device
3. Chalk, crayon or other marker
4. Watch with second hand

Calibration steps:

1. Warm truck's hydraulic oil to normal operating temperature with spreader system running.
2. Put partial load of salt on truck.
3. Mark shaft end of auger or conveyor.
4. Dump salt on auger or conveyor.
5. Rev truck engine to operating RPM (at least 2000 RPM).
6. Count number of shaft revolutions per minute at each spreader control setting, and record.
7. Collect salt for one revolution & weigh, deducting weight of container. (For greater accuracy, collect salt for several revolutions and divide by this number of turns to get the weight for one revolution.) This can be accomplished at idle or very low engine RPM. Multiply shaft RPM (Column A) by discharge per revolution (Column B) to get discharge rate in pounds per minute (Column C), then multiply discharge rate by minutes to travel one mile at various truck speeds to get pounds discharged per mile.*

*For example, at 20 MPH with 30 Shaft RPM and 7 lb discharge – 30 x 7 = 210 x 3.00 = 630 lb per mile.

Calibrating Automatic Controls

Automatic controls come with factory calibration cards that indicate the proper rate of spread for each setting. However, when there is a need to calibrate, use the following steps:

1. Remove or turn off spinner.
2. Set auger on given number, such as No. 2.
3. Tie sack or heavy canvas under discharge chute.
4. Mark specific distance, such as 100 or 1,000 ft.
5. Drive that distance with spreader operating.
6. Weigh salt collected in sack or canvas.
7. Multiply weight of salt by 5.3 (in case of 1,000 ft) or 52.8 (in case of 100 ft).

This will be the amount of salt discharged per mile, which remains constant regardless of speed, but calibration must be done for each control setting.

Calibration Chart

Agency: _____

Location: _____

Truck No.: _____ Spreader No.: _____

Date: _____ By: _____

Gate Opening (Hopper Type Spreaders)				Pounds Discharged Per Mile								
	A	B	C	Minutes to Travel One Mile								
Control Setting	Shaft RPM (Loaded)	Discharge Per Revolution (Pounds)	Discharge Rate (lb/min)	5 mph x 12.00	10 mph x 6.00	15 mph x 4.00	20 mph x 3.00	25 mph x 2.40	30 mph x 2.00	35 mph x 1.71	40 mph x 1.50	45 mph x 1.33
1		This weight remains constant										
2												
3												
4												
5												
6												
7												
8												
9												

10												

7 RECOMMENDATIONS FOR SALT APPLICATION

Timing is crucial in applying salt. Ideally, brine is sprayed as an anti-icing treatment prior to the storm's arrival. If that is not possible, then salt should be spread as soon as a storm begins in order to prevent bonding of snow or ice to the pavement. The salt will quickly produce brine or keep snow mealy, allowing for efficient plowing.

The melting action of salt applied early in a storm works from the pavement surface up so snow and ice do not form hardpack.

There are times and storm conditions where salt alone is the only answer to keeping the pavements clear. For example, freezing rain cannot be plowed and salt is the only solution for clearing the roads when it occurs.

Anti-icing is rapidly becoming the best and most popular means of preventing ice-pavement bonding.

The best advice is to be prepared to mobilize all forces as soon as a winter storm approaches.

There are no easy answers or solutions with snow and ice control because there are too many variables. It has been estimated there are over 66,666 different storm conditions – pavement temperature, ambient temperature, pavement type, solar radiation, traffic volume, traffic speed, wind direction and velocity, type of precipitation, topography, lake or ocean effect, shaded areas (by mountains, trees or buildings) and wind chill factor, to name a few.

Snow and ice control is a very complex issue and those people on the front line need the best information possible.

Salt is usually applied at the rate of 300 to 800 lb per two-lane mile. As temperatures drop, either the quantity of salt or the frequency of application must be increased.

Anti-icing, that is spraying brine on pavement before the storm arrives, requires anywhere from 1/3 to 1/4 the material of deicing, making it the most cost-effective option for improving winter traffic safety.



Ideally, with any deicer, at the end of the storm all material should be completely used. Since storm forecasting is not precise, some residue may remain on the surface after some storms. That residue, if not blown off or washed away, will be effective in helping prevent bonding of ice and snow in the next storm. A deicer only has residual effect if too much was applied for the storm condition.

Prewetting salt with brine speeds the reaction time of salt and also keeps salt from bouncing off the road so more of it is available to do the work. See Section 10, page 18, for details on this deicing procedure.

There may also be a combination of applications of any of the above. Most agencies agree that early anti-icing spraying is most effective and that prewetting of salt provides a faster, higher level of service at all temperatures.

Spreading can be done full-width or windrow. Both have strengths depending on conditions. Pay special attention to spinner speeds. A spinner that revolves too fast will throw salt over a wide area, possibly wasting material. You may correct overthrow by adjusting the drop location on the spinner by using your directional baffles or reducing spinner speed. Traffic density and highway design largely determine the spreading pattern required.

A **windrow** of salt applied in a 4-8 ft strip along the centerline is effective on two-lane pavements with a low to medium traffic count. Less salt is wasted with this pattern and quickly gives vehicles clear pavement under at least two wheels. Traffic will soon move some salt off the centerline and the salt brine will move toward both shoulders for added melting across the entire road width.

The **full-width** spreading pattern is used most often on multiple-lane pavements with medium to high traffic volumes. Melting action is obtained over the full pavement width. Vehicles tend to stay in line to clear wheel paths in the lanes.

Often the full width pattern is used when trying to get salt down under a storm. But be careful not to waste salt when using this pattern.

Play the wind in spreading. A strong wind blowing across a street or highway can cause salt to drift as it comes out of the spreader, pushing it onto the shoulder or into a gutter. This is particularly true in rural areas where there are few windbreaks. How the wind affects spreading depends on both wind velocity and pavement condition. Spreader operators should play the wind to put salt where it will do the most good.

Because of the much greater control inherent to the spray process, anti-icing is best applied with full-width stream nozzle systems to maintain a small width of bare pavement to reduce slipperiness. A fan spray is not recommended and care must be exercised during windy conditions.

Give salt time to work. Time plowing operations to allow maximum melting by salt. When you plow salt off the pavement, you waste the deicing material and increase the cost of snow removal.

Know when to plow and reapply salt. The need for another salt application can be determined by watching melting snow kicked out behind vehicle tires. If the slush is soft and fans out like water, the salt is still working. Once the slush begins to stiffen and is thrown directly to the rear of vehicle tires, it is time to plow and spread more salt.

Has the weather changed? Remember that salt application rates may have to be increased at night, on sunless days and when the temperature drops sharply. Without the sun, the effect of solar radiation and warmth is lost. At night, traffic usually diminishes, minimizing another heat source that helps melt ice and snow. It is important to remember that pavement temperatures are seldom the same as air temperatures — a critical thought when choosing the options for snow and ice control — it is the pavement that will be treated.

Don't overlook salt's anti-skid value. For years, maintenance people have observed that salt, applied as an ice melter, also gives anti-skid protection. Tests conducted in cooperation with the National Safety Council show that salt, applied at normal deicing rates, gives as much anti-skid protection as abrasives. The anti-skid effect of salt is immediate as it starts melting snow or ice.

Safeguard the environment. The way salt is spread can make the difference between whether the public appreciates or condemns snowfighters' efforts. Misuse ignores concern for the environment. Proper calibration of spreading equipment and good storage can avoid most problems.

There is no correlation between yearly snowfall and the total quantity of salt used. The type of storm dictates frequency of application and total amount of salt necessary. A freezing rain or ice storm may require enormous amounts of salt, perhaps even more than a prolonged snowstorm. There is no way to combat freezing rain other than salt use. ❄



8 SPECIAL SPREADING AND PLOWING PROBLEMS

Salt bridges first. Bridges freeze long before road surfaces because they do not hold warmth as a roadbed does, since cold air reaches both the top and bottom surfaces of bridge decks. They should receive early attention and an application of salt. Bridge decks may ice over even when there is no precipitation because of high humidity and low temperatures. (Or under certain other conditions, bridges will frost over without precipitation and must be salted.)



Salt on the high side of elevated curves. Salt brine will flow down and across a banked curve. If salt is spread down the centerline, everything above it will remain icy. Spread salt on the high side of the curve and let gravity do the rest of the work. Leave no gaps.

Operators must go beyond their assigned areas, if necessary, to plow or salt a gap that has not been treated for some reason. A short, neglected stretch of roadway can be very hazardous to an unsuspecting motorist.

Watch for drifting. In continued high winds, maintain a patrol to watch for drifting and slick spots, even after the pavement has been cleared. Treat icy buildups with a salt application. If the highway has a blacktop or stabilized shoulder, drifting may be controlled with a salt application on the shoulder to form a melting barrier.

During some very low temperature storms with dry blowing snow, the use of salt may not be appropriate. The dry snow may blow off the pavement if no salt is used.

Avoid slick conditions from buildup of ice or packed snow by applying a salt application heavy enough to prevent refreezing.

Traffic icing is very dangerous. Occasionally, under certain weather conditions, a paper-thin sheet of ice forms in wheel paths on a bare pavement even when pavement looks clear. This black ice formation can be deadly. Maintenance operators should be instructed to watch for this condition and to apply salt immediately when it is detected.

Get equipment on the road. Once a word of an impending storm has been received and plows are mounted and trucks loaded, get vehicles out of the yard and onto their plowing and spreading sections as soon as possible. Delay in getting to critical areas may cause severe traffic tie-ups.

Make a list of trouble spots that operators should salt first during storms. Make sure all personnel understand that bridges, intersections, ramps, hills and curves come first. Have operators patrol highways rather than wait at maintenance areas for direction.

It is far better to have equipment on the road when snow begins than in the maintenance yard. Nothing is more reassuring to motorists than to see anti-icing sprayers or loaded spreaders and plows patrolling prior to storms.

Give interchanges special attention. Salt on and off-ramps as quickly as possible. A safe road or street is of little value without safe entrances and exits. Can trucks be kept out of the way? Intelligent transportation systems have been developed to do just that.

Basic management controls such as truck navigation, traffic light controls, container management systems, variable message signs or speed cameras as well as monitoring applications such as security CCTV systems which have been designed to manage trucking logistics. Additionally, predictive techniques are being developed, to allow advanced modeling and comparison with historical baseline data. ❄

9 ANTI-ICING

A relatively new weapon in the sustainable snowfighting arsenal in North America is anti-icing. But it has a long history of keeping European roads safe and passable.

Anti-icing differs significantly from deicing because brine is applied before precipitation to prevent the formation or development of bonded snow and ice on the road surface. It is a proactive approach to snowfighting and is often the first in a series of strategies employed for a winter storm. By applying freezing point depressant materials before a storm it is possible to prevent the bond from forming between the pavement and snow or ice. Research has shown that timely applications of anti-icing materials can cut the cost of maintaining a safe road surface by 90% compared to traditional deicing. Liquid sodium chloride (NaCl) is the most effective choice for anti-icing above 15°F.

Anti-icing has many advantages.

- Anti-icing returns road surfaces to normal faster, resulting in fewer accidents and delays.
- Anti-icing can reduce airborne dust and salt particulates.
- Salt needs moisture to be effective. Applying brine jumpstarts the melting process.
- Brine sticks to the road surface. It will not be as easily blown off the road by wind or traffic, so material is more efficiently used.
- If the storm is delayed, salt residue remains on the road ready to begin work when precipitation begins.
- Crews can begin treatment in advance of a storm. Because anti-icing prevents the bonding of snow and ice to pavement, snowfighters have less work to maintain safe roadways as the storm progresses.
- Increased efficiency results in use of less deicer and manpower, therefore lowering the cost of maintaining safe road conditions. The use of less deicing materials also minimizes environmental concerns.

Products available for use in an anti-icing program are sodium chloride, calcium chloride, magnesium chloride, potassium acetate, and calcium magnesium acetate.

Each product has its own advantages and disadvantages. The most common material in use is sodium chloride (salt) in the form of a brine made from a mixture of rock salt and water. Salt brine is effective to -6°F and is a proven anti-icing agent in use throughout the snowbelt.

Some agencies use calcium or magnesium chloride in a brine solution which is effective down to -6° F, but is more than six times more expensive than salt, and is more difficult to handle. Also, calcium and magnesium chloride residue on road surfaces can attract moisture at lower relative humidity than salt resulting in dangerous, slippery conditions under certain circumstances.

Salt Brine Manufacture

Salt brine is made by mixing rock salt or solar salt with water. The process is simple: the resulting brine should be approximately 23% NaCl.

The proportion of salt to water is critical to the effectiveness of the brine. Too much or too little salt affects the freeze point depressing qualities of the brine. The proper brine mixture is 23.3% salt content by weight. This is the concentration at which salt brine has the lowest freezing point, -6° F. Can we keep adding salt to water until the freezing point goes down much further? No. The solubility of salt in water decreases with decreasing temperature. We eventually reach what is called the eutectic point. This is the point at which a solution achieves a maximum salt concentration. Any colder and salt will begin to leave the solution and raise the freezing point. At the eutectic temperature, ice, saltwater, and solid salt exist in equilibrium. For water, the eutectic temperature is -6° F. The percentage of salt is measured with a salometer, a specialized hydrometer, until a 88.3% measurement on the salometer is obtained. This results in the proper 23.3% salt content.

Commercial brine makers are available at a cost of approximately $5,000. Many agencies have made their own brine makers using water tanks and PVC pipe for substantially lower cost. Brine is usually made at the local maintenance facility sites and stored in large tanks in locations convenient for loading into saddle tanks on the sides of the V-box or anti-icing equipment. It is essential to clean out brine makers after brine is prepared to reduce the potential for corrosion.

Application Equipment

Brine applicators are commercially available for about $1,500. Some agencies have manufactured their own application equipment using large tanks and PVC piping. Some equipment is designed to be

Hydrometer/Salometer Chart for Salt Brine

% Salt	Hydrometer Specific Gravity	Salometer Using 0-100%
0	1.000	0
1	1.007	4
2	1.014	7
3	1.021	11
4	1.028	15
5	1.036	19
6	1.043	22
7	1.051	26
8	1.059	30
9	1.067	33
10	1.074	37
11	1.082	41
12	1.089	44
13	1.097	48
14	1.104	52
15	1.112	56
16	1.119	59
17	1.127	63
18	1.135	67
19	1.143	70
20	1.152	74
21	1.159	78
22	1.168	81
23	1.176	85
24	1.184	89
25	1.193	93
26	1.201	96
27	-	100

loaded onto the bed of spreading trucks, towed behind maintenance equipment or permanently mounted on truck beds. It can be as simple as a gravity fed spraying system with a operator controlled cut-off valve or a more complex (and more controllable) pump driven sprayer system. Fan sprayers are not recommended. Control should be available to vary spreading rates from 25 to 60 gallons per lane mile.

If large, horizontal tanks are used in the design, consider installing baffles inside the tanks to help prevent the liquid from suddenly shifting in the tank, creating a hazardous control situation for the operator.

Application

Accurate weather and road surface information are critical for the efficient use of anti-icing materials. Road surface temperatures, precipitation amounts and form, wind conditions, and road environment (sunlight exposure, surface condition, bridges, etc.) all affect the use and application of anti-icing measures.

Understanding the freeze point depressing qualities of brine is important to its use and application as an anti-icing agent. (See the Phase diagram below.) As you can see from the chart, the minimum freeze point of salt brine is -6°F at a concentration of 23.3%. Road surface temperatures are indicated on the side of the chart, solution concentrations along the bottom. The line represents the freeze point of the solution at a given temperature. The colored portion in the center of the chart shows the melting range of brine solutions. The area to the left shows the results of a solution with too little salt, the road surface will refreeze unless more salt brine or deicing salt is applied. The area to the right shows the results with too much salt, with a resultant non-functional loss of material to the environment. As you can see, additional precipitation and heavy traffic can dilute the brine solution allowing the road to refreeze.

ADDITIONAL PRECIPITATION ALWAYS RESULTS IN A DILUTION OF BRINE AT THE ROAD SURFACE.

Weather information is getting better with everything from air temperature, dew point, optical weather identifiers, to pavement temperature, surface status, and compound information being available. Some agencies utilize remote television cameras to monitor traffic and bridge conditions. This information will help agencies accurately determine the appropriate application of anti-icers.

Do not apply anti-icer under blowing conditions, particularly in areas prone to drifting and anywhere else that might be problematic for salt, such as all areas subject to wind issues.

Don't apply too much or the roadway may become slippery. Always follow application recommendations.

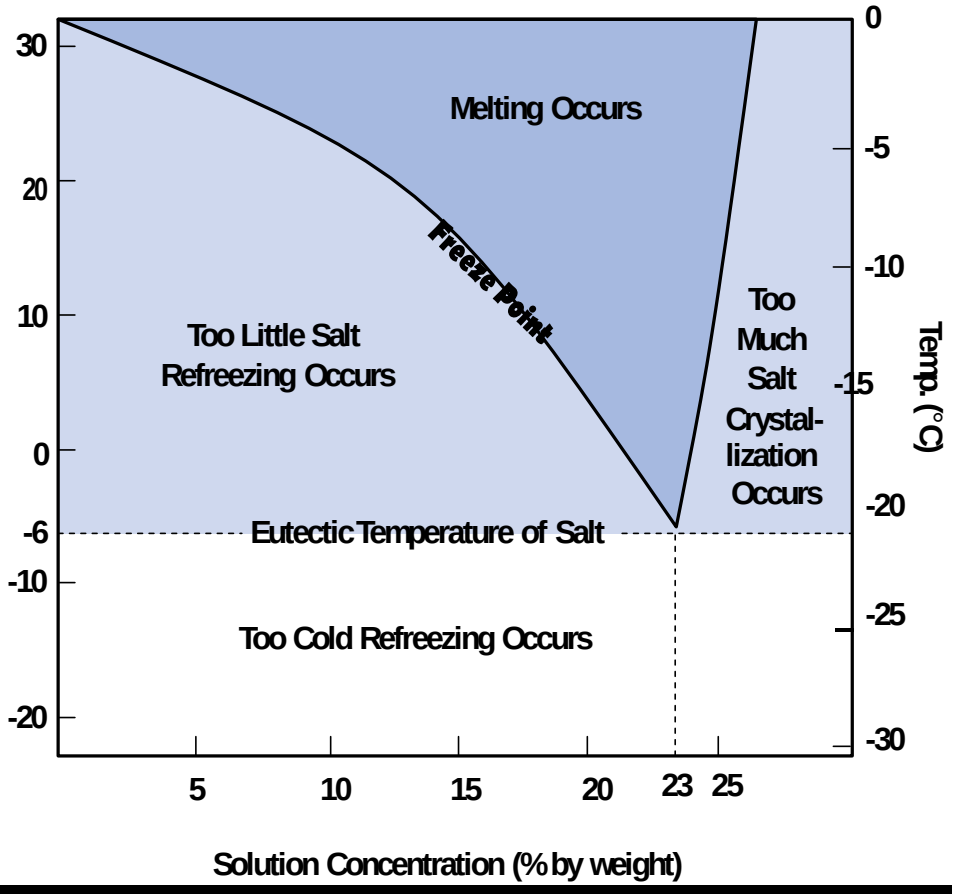
Don't apply CaCl2 or MgCl2 to a warm road (above 28°F pavement temperature). It can become very slippery and cause crashes!

Summary

Anti-icing measures are an important weapon in the snowfighter's arsenal. The appropriate use of anti-icing techniques results in:

- Returning to bare pavement conditions more quickly, saving lives and reducing property damage due to fewer accidents, as well as the reduction of traffic delays and the resulting reduction of losses to local economies;
- Reduction in the quantity of deicer use, resulting in cost savings and less environmental concerns; and
- Reduction in the manpower necessary to maintain safe road conditions, resulting in less overtime costs, less operator fatigue and safer working conditions. ❄

Phase Diagram for Salt



10 DEICING-PREWETTING

Once snow has accumulated and bonded to the road or an ice storm has glazed road surfaces, deicing operations must begin to restore safe driving conditions. The bond between snow and/or ice and the pavement surface must be destroyed by chemical or physical means or a combination of the two.

More than a dozen compounds have been tested for deicing use. The most common products used are sodium chloride, calcium chloride and magnesium chloride. Sodium chloride in the form of rock salt or brine (see previous chapter) is by far the most commonly used chemical in deicing operations due to its lower cost and proven effectiveness. Therefore, in the words of the Transportation Research Board in its 1992 analysis of deicers, salt remains the "deicer of choice."

Abrasives have no melting effect for deicing operations; in fact research by the Strategic Highway Research Program (SHRP) and the University of Wisconsin suggests that sand inhibits the melting process of deicing materials.

Choosing the Proper Application

Salt can be applied in solid, prewetted solid, or liquid form. Application methods are determined by weather and road conditions as well as equipment available. Salt needs moisture to provide melting action. Deicing rock salt or solar salt dissolves in road surface moisture to form a brine which melts snow and ice to form more brine which continues the process. Once salt has penetrated the packed snow and ice to make brine on the pavement surface, the bond will be broken and removal operations can be successful in restoring bare pavement conditions.

Forecasted conditions and road surface temperatures at the time of treatment determine whether winter maintenance materials should be applied in solid, prewetted solid or liquid form. The type of precipitation event, dry snow, wet snow, ice, sleet, freezing rain, etc., must be considered. Keep in mind that changing conditions will affect operations. Falling temperatures can cause refreezing. Additional precipitation can dilute winter maintenance materials, rendering them ineffective. Refer to the Phase Change diagram in the previous chapter for assistance in determining the proper course of action.

If the road surface is wet and temperatures will not cause refreezing, then application of dry salt is appropriate. Necessary moisture is already present so brine will be formed immediately and melting action can begin. The application rate will be determined by the amount of snow and ice coverage. Keep in mind the reduced mobility effect as dilution of deicing salt occurs.

If snow pack and ice is solid, or temperatures will fall to the point that refreezing will take place, then prewetted solid application of deicers may provide more rapid results. Adding moisture to the salt either at loading or at the spinner when applied will jump start the deicing process by providing more moisture to begin the melting process.

Spraying liquids is not recommended for packed snow as the liquid destroys surface friction and the brine may become so diluted before melting action is completed that refreezing could occur. Application of brine is an effective treatment for black ice conditions. Although salt can melt ice at temperatures as low as -6°F, the practical limitation of brine application is considered by the Federal Highway Administration to be around 15°F. Below that temperature, pre-wet with calcium chloride or calcium magnesium chloride mixed with sodium chloride.

Deicers should be applied close to the crown or high point of the road. The resulting brine will run downhill from the crown to the rest of the surface. Spinner speed should be low enough to ensure that deicing materials remain on the road surface. Spinner speed and application rates should be higher at intersections and other high traffic areas to spread deicing material over a larger area or in higher concentrations as required by the conditions. However, use of the BLAST override on automatic controls while stopped at a stop sign or light is not appropriate.

Road conditions, temperature, amount of snow and ice cover, storm progress, and traffic conditions all affect deicing application rates.

The tables in section 5 of this Handbook, will assist in determining appropriate application rates.

Materials Selection

Generally, all deicers work in the same way. They depress the freezing point of water and turn snow and ice into a liquid or a semi-liquid slush. Solid chemical salts infiltrate down through ice and snow, dissolving to form a strong brine solution which spreads out under the ice or hard-packed snow and breaking the bond to the road surface. Once the bond is broken, the ice and snow can be plowed off or removed by other means. By applying material prior to the storm, we can prevent the bond to the road surface and melt the snow and ice as it comes in contact with the brine.

Agricultural byproducts work in a similar fashion. The resulting solutions act by depressing the freezing point of snow and ice. These products are usually used in combination with other materials.

Although all these materials work in much the same way, they vary widely in performance. Several factors are considered in determining performance, such as effective temperature range, speed of action, amount of material required, and duration of melting action.

Other important criteria for material evaluation include: availability, cost, infrastructure and environmental impacts. Each community will place a particular emphasis on each of the criteria to suit their own specific needs. At times, their needs may change depending upon shifting political priorities. The ability to be able to make a rational decision on material selection to closely fit with ongoing needs is of tremendous importance to winter maintenance planners.

In order to come to grips with this issue, a consortium of state DOTs commissioned a study to develop an evidence-based decision tool for materials selection. This was published by the Transportation Research Board (TRB)

of the National Academy of Sciences in May, 2007. The full report can be downloaded from the TRB website.

Now agencies can objectively compare the de-icing compounds they use in terms that each agency defines for itself to be important. The computer program (called the Material Selections Wizard) crunches the data based upon the agency's set of priorities.

This computer program can be downloaded from the TRB website.

Here is an example of how the new Materials Selections Wizard works.

The winter maintenance agency has had budget cuts and decides that the following priorities reflect their particular needs — see Chart 1.

Price is the primary concern (45%), snow- and ice-melting performance is almost but not quite so important (35%), while environmental (11%) and infrastructural (9%) are somewhat lower down on the overall scale of things.

Using the Materials Selection Wizard, the data is inputted and the following results are obtained showing which material will fit the agency's needs for which temperatures — see Chart 2.

The wizard makes an informed choice based on specific priorities. It is a choice that can be defended before City Council. Citizens value their hard-earned dollars and expect them to be spent wisely to keep roads open and safe while safeguarding the environment. The City Council and the citizens determine the policy. This tool turns the policy into a practical and functional choice.

As another example, here is an extreme environment/infrastructure priority model. It disregards deicer costs and weights performance low (25%, with the logic that a lower weighting would be irresponsible since the material must perform its life¬saving deicing mission). Environment and infrastructure together account for three-fourths of the total weighting (split evenly with 37.5% weight for each).

Chart 1

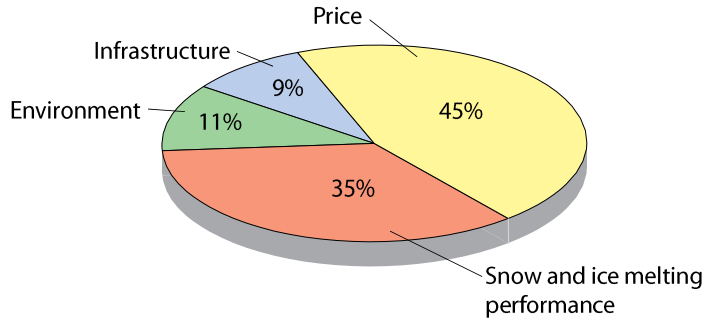


Chart 2

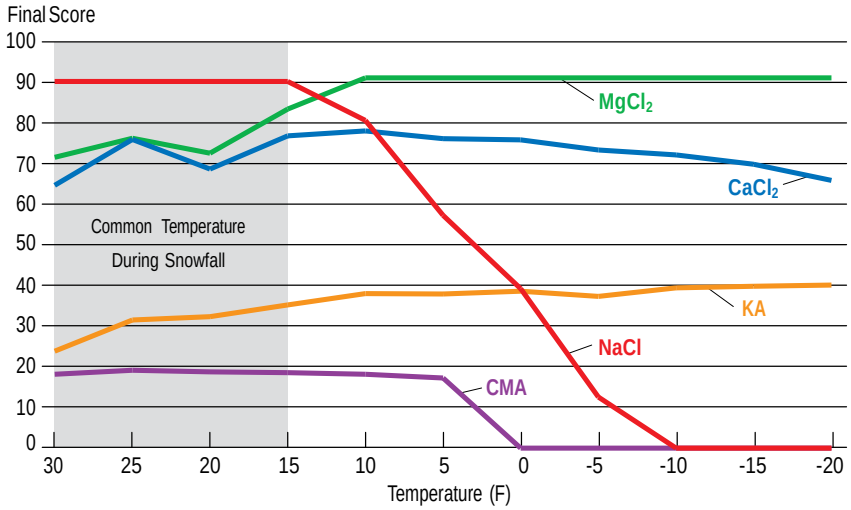
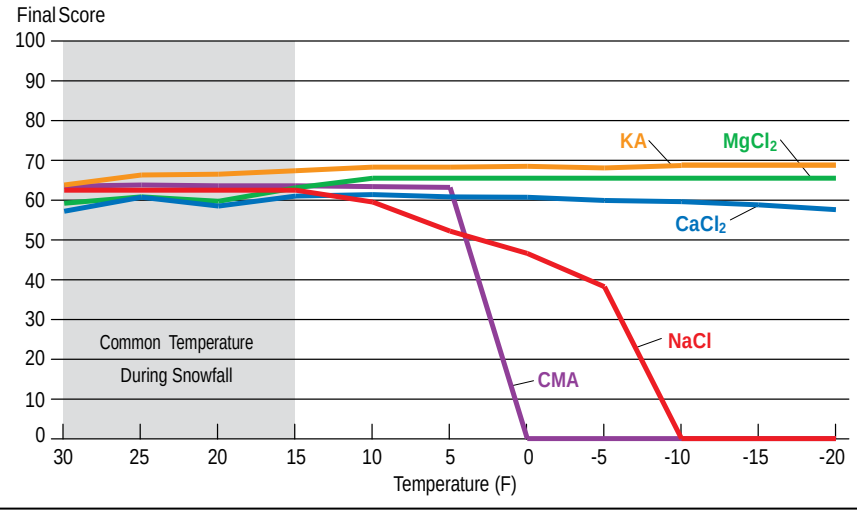


Chart 3



Here is how the various materials stack up with this set of priorities — see Chart 3

So, the choice belongs to the agency that can now be assured that at the temperatures to be encountered, they are choosing materials that comply with their community's particular priorities.

Equipment Used

Solid deicers or prewetted salt is applied with spreader trucks. If the load is wetted, then no additional equipment is necessary. Saddle tanks and a sprayer at the spinner are necessary if brine is applied to the salt at the time of application to the roadway. Brine can be applied with tank trucks or towed equipment using the same equipment discussed in Chapter 9.

Summary

Use of salt is a proven snowfighting technique with many advantages:

- Returns roadway surfaces to bare pavement conditions more quickly, thereby reducing the number of accidents and property damage, and saving lives. Research has shown that deicing pays for itself within the first 25 minutes after the salt is spread;
- Lowers manpower costs by reducing the time necessary to restore dry pavement conditions;
- Eliminates or greatly reduces cleanup costs;
- Compared to alternatives, salt is safer to handle, and kinder to the environment when properly used.

Prewetting may enhance salt use:

- Salt can be spread more uniformly with less waste on shoulders and in ditches because wetted salt sticks to the pavement;
- The amount of dry materials used can be cut by 20-30% (IADOT) because of the dual action of added brine and more materials remain on roadway;
- Works faster because more brine is present;
- Driving/spreading speeds can be increased because salt stays on the roadway. ❄

STORM

Most snowstorms occur at 20°F or above, with the temperature dropping most severely after the snow stops. After the storm, with the pavement clear and dry, is the time to wing back shoulders, clear structures and haul snow away from critical areas to make room for future snow storage or snow removal.

In plowing, a windrow of snow is often left on each side of bridges. These windrows reduce the usable roadway width on the bridge. Moreover, if allowed to remain, they will later melt and form ice. Remove this snow as soon as possible.

Caution. Do not dump material from overhead bridges onto roadway or railroad tracks below. Hand shovel the snow away, if necessary, to ensure all drains in the bridge floor are open and free-draining.

Clear snow from raised medians to prevent drifting. Also clear snow from barrier walls and traffic dividers to reduce later melting and refreezing and to improve driver visibility.

Clear those drains! It is vital that roadway drains and catch basins be kept open to allow melting ice and snow to run off. When water ponds and puddles around drains, falling temperatures may cause it to refreeze. A salt application on frozen drains, catch basins and culverts frees them of snow and ice.

Accurately record all material used. Hazards, such as raised utilities or low hanging branches, and problems encountered such as area-specific snow accumulations should also be recorded.

Discuss opportunities to improve operations.

Carry out interim cleaning and maintenance of equipment.

At end of season, do full cleaning and maintenance of all equipment and ensure all remaining supply piles are securely placed on impervious pads and covered. ❄

12 A WORD ABOUT SAFETY

The main purpose of snow and ice removal is, of course, to provide safe travel for motorists. In doing this, those in maintenance must not overlook their own safety; neither must they overlook the possibility that in trying to provide safe pavement they may be creating another safety hazard.

Become familiar with a few "do's and don'ts" that can make your work far safer:

- Check all equipment before each use. Make sure lights, brakes, windshield wipers, exhaust systems, tires, chains and steering are safe.
- Promptly report all mechanical trouble.
- Remember that speed can kill, especially in a snowstorm and at night.
- Resist the urge to get the job done in a hurry.
- Respect rights of others. Be considerate of motorists who have trouble driving in snow; report stranded motorists when possible.
- Keep first aid kits completely stocked. Check fire extinguishers and flares often.
- Observe traffic laws.
- Watch for signs of fatigue in equipment operators. A limit of twelve continuous hours on duty seems fairly common in public works agencies in the snow belt, although some organizations permit longer work periods. Usually, however, the routine is twelve hours on and twelve off. ❄

13 KEEP THE PUBLIC INFORMED

Publicize snow emergency procedures and regulations. Keep broadcasters and newspapers periodically informed of snow clearing progress and specific problem areas. This way, motorists will know on which routes they will be able to travel with the least difficulty. Advance publicity on snow clearing priorities will reduce time-consuming calls from people demanding to know when their streets or roads will be cleared.

Before storms arrive, pass on information about approaching snow in time for schools, industry and government agencies to decide whether or not to remain open or to close early.

Make contact with other agencies. Long before winter, meet with representatives of other public agencies to discuss means of cooperating in snow and ice removal. Take the initiative to let others know of your plans and to enlist their cooperation.

Consider inviting these people to the pre-winter session: a representative of the top elected public official in your area, the local civil defense director, those in charge of bus transportation for school systems, police and fire officials, emergency road service managers of nearby clubs of the American Automobile Association (AAA), officers from local military units and news media representatives.

Snowfighters are not miracle workers. They are dedicated, hardworking human beings who pit their will against the forces of nature — and usually win!

The real record of their accomplishment is not the tons of snow removed or the miles of pavement kept clear or number of streets plowed. The achievement of open highways that allow business, industry and government to function and people to travel safely and without undue delay is the testament of good snowfighting.

According to a Marquette University study, road salting and plowing can reduce crash frequency by 88%.

A one-day major snowstorm can cost a state $300-700 million in both direct and indirect costs.

Suggested Program Outline For Fall Training Sessions

I. The Importance of Coordination

- Know Your Plowing and Spreading Routes
- Effective Radio Communication
- The Storm Warning System
- Working with Police, other Public Agencies and the Media

II. Equipment—Its Operation and Maintenance

- Plows
- Spreaders, Sprayers and Their Controls
- Loaders
- Emergency Repair and Refueling Stations
- The Importance of Preventive Maintenance

III. Application Procedures

- How Salt Works
- How and when to Salt
- Anti-Icing vs Deicing
- Application Rates
- Special Storm Conditions
- Special Deicing Problems (Bridges, Elevated Curves, Ramps, Intersections
- When to Re-Apply Salt

IV. Review of Winter Maintenance Policy

- Snow Emergency Routes
- Parking Ordinances
- Procedures for Helping Motorists
- Importance of Personal Public Relations by Maintenance Personnel

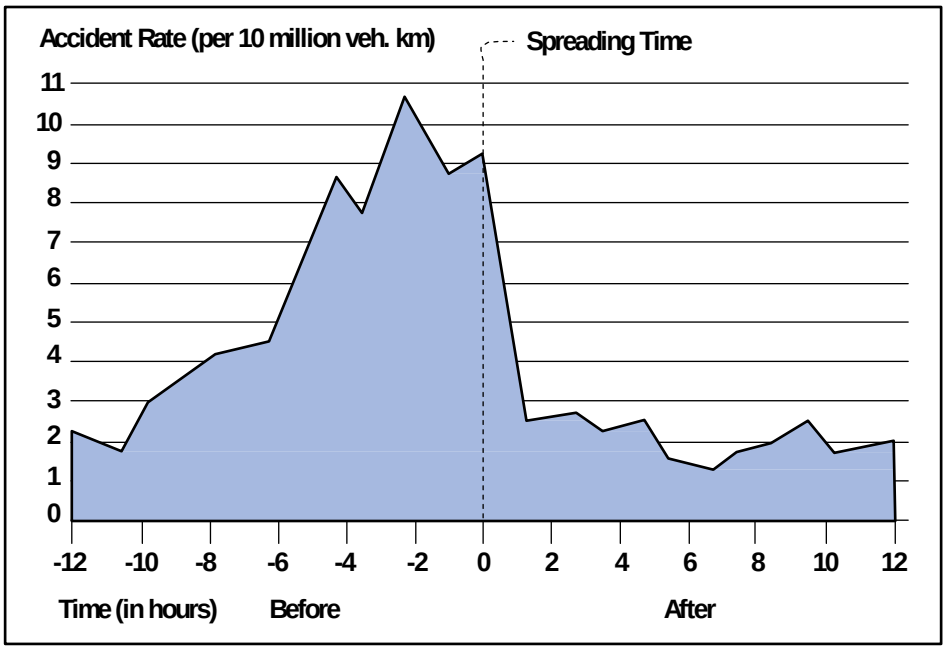
V. On-the-job Safety

- Safety Equipment
- Safety Practices

VI. Discussion, Questions and Answers

To assure yourself that your department is ready for winter, you might have superintendents or foremen complete a checklist showing their progress in pre-winter preparations.

Accident Rate Before and After Salt Spreading



STORM RECORD

Storm No:	Sec:	Div:	Date:

1. Time	AM	PM	Day of Week	2. Location	Miles
Storm Started				From:	
Storm Ended				To:	
Road Cleared					

3. Description

Dry Snow		Temp		Wind		
Wet Snow		Max:	Min:	Direction:	Velocity	MPH
Sleet		Depth of Snow		Visibility		
Freezing Rain		Avg (in)	Drifts (ft)	Good:	Fair:	Poor:

4. Procedures

	No of Apps	Time	
Salt		From:	To:
Plowing		From:	To:
Abrasives		From:	To:

5. Results

	Excellent	Good	Poor
Salt			
Plowing			
Abrasives			

6. Labor, Equipment & Materials

Personnel	Reg Hrs.	O.T. Hrs.	Total	Equip. No.	Type	Hours	Material (TONS)
							Salt
							Abrasives
Total							

Comments:

Completed by: _____

Name, Title

Safe and Sustainable Snowfighting Award Application

The Salt Institute began promoting safe and sustainable snowfighting in 1972, when it began its Sensible Salting Program. Decades later, SI is still leading the way in advancing effective in snowfighting to ensure winter safety, mobility, and protection of the environment.

Partnering with leaders in winter maintenance, SI has expanded its long-standing "Excellence in Storage Award" to include safe and sustainable operations. In 2012, we presented the Salt Institute's "Safe and Sustainable Snowfighting Award," a program that recognizes agencies that demonstrate best practices in salt storage and snowfighting.

Clear winter roads protect lives and commerce. Road salting and effective plowing can reduce injury crashes by up to 88%. And a one-day major snowstorm that shuts down roads can cost a state between $300 and $700 million in direct and indirect costs. Snowfighting is often an underappreciated vocation, but at the Salt Institute we recognize snowfighters as heroes who protect lives and enable our winter economy.

To apply for the "Safe and Sustainable Snowfighting Award" the facility manager should complete the application form and checklist (found as an insert to this handbook, on saltinstitute.org, or on safewinterroads.org), have it signed by an immediate supervisor and returned with all supporting documentation to the Salt Institute by May 1. Please answer all questions.

Applications will be judged by our evaluation committee and in some cases a Salt Institute representative will make an on-site facility visit.

Award recipients will receive a "Safe and Sustainable Snowfighting Award" certificate and will be recognized in a Salt Institute press release.

Publications Available
from the
Salt Institute

Refer to saltinstitute.org for further details and other literature

Salt Storage Handbook

A guide for environmentally sensitive handling and storing deicing salt.

ABOUT THE SALT INSTITUTE: The Salt Institute is a North American based non-profit trade association dedicated to advancing the many benefits of salt, particularly to ensure winter roadway safety, quality water and healthy nutrition. See saltinstitute.org or call 703-549-4648.

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ENVIRONMENTAL Fact Sheet

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

29 Hazen Drive, Concord, New Hampshire 03301 • (603) 271-3503 • www.des.nh.gov

WD-DWGB-22-1 2011

The N.H. Groundwater Protection Act: RSA 485-C
An Overview

Sixty percent of New Hampshire's residents are dependent on groundwater for their drinking water supplies. New Hampshire's Groundwater Protection Act, passed in 1991, authorizes DES to regulate large groundwater withdrawals and commercial discharges of wastewater, establishes best management practices that must be employed by activities that are considered potential contamination sources, creates four classes of groundwater (Table 1), establishes groundwater quality standards, and enables local entities, such as water suppliers and town boards, to play a role in actively managing activities having the potential to contaminate valuable groundwater.

Preventing Contamination of Groundwater

Potential contamination sources (PCSs) are activities that use significant quantities of substances that have the potential to contaminate groundwater and/or affect human health. DES has established best management practices (BMPs), codified in Env-Wq 401, involving the use, transfer or storage of regulated substances in containers having a capacity of five or more gallons. The BMPs must be employed by all PCSs in the state.

The act establishes four classes of groundwater: GAA, GA1, GA2 and GB.

Table 1. CLASSES OF GROUNDWATER

Class	Local Inspection Of PCSs	Description/Comments
GAA	Yes	• Most protected class • Includes groundwater flowing to public water supply wells (wellhead protection areas). • Prohibits six high risk land uses
GA1	Yes	• Local entities identify valuable groundwater resources they want to protect via management of potential contamination sources.
GA2	No	• Includes high-yield stratified drift aquifers mapped by the USGS that are potentially valuable sources of drinking water.
GB	No	• Includes all groundwater not in a higher classification. As in all classes, groundwater must meet drinking water quality standards.

Under the act, all areas were initially classified as GA2 or GB. Wellhead protection areas and other valuable groundwater may be reclassified to Classes GAA or GA1, with both DES and the local entity (typically the municipality or water supplier) taking on specific responsibilities to prevent groundwater contamination in the reclassified areas. (See Table 1.) For guidance

concerning how to reclassify important groundwater resources, download DES's Guide to Groundwater Reclassification at http://des.nh.gov/organization/commissioner/pip/publications/wd/documents/wd-11-24.pdf or contact the groundwater reclassification program manager at (603) 271-0688.

DES's fact sheet WD-DWGB-22-2 Local Reclassification of Groundwater to Implement Protection Programs: A Six Step Process, provides a summary of the process and is available online at http://des.nh.gov/organization/commissioner/pip/factsheets/dwgb/index.htm .

The DES Groundwater Discharge Permitting and Registration Program regulates commercial discharges to groundwater to minimize improper disposal of waste and wastewater containing solvents, petroleum products and other industrial and commercial wastes. All discharges of non-domestic wastewater to the ground must be registered with, and in some cases permitted by, the DES Water Division. In all cases state rules prohibit any discharge of non-domestic wastewater containing regulated contaminants above ambient groundwater quality standards established under the act. For more information visit the program's webpage at http://des.nh.gov/organization/divisions/water/dwgb/dwspp/gw_discharge/index.htm.

Preventing Unacceptable Impacts from Groundwater Withdrawals

To address concerns about the impacts of groundwater withdrawals, the act, along with the N.H. Safe Drinking Water Act, was amended in 1998 to give DES the authority to regulate groundwater withdrawals in excess of 57,600 gallons over a 24-hour period. The act ensures that no adverse impacts to water users or groundwater-dependent natural resources will occur. Adverse impacts as defined under the act include reducing the withdrawal capacity of private and public water supply wells, reducing river flows below acceptable levels established pursuant to the Rivers Management and Protection Act, or altering the flow or movement of any existing groundwater contamination. For more information concerning large groundwater withdrawals, see WD-DWGB-22-15, Large Groundwater Withdrawal Permitting Process for Major Projects at http://des.nh.gov/organization/commissioner/pip/factsheets/dwgb/index.htm .

The New Hampshire Groundwater Protection Act is available online at www.gencourt.state.nh.us/rsa/html/indexes/485-C.html or you may contact the DES Source Water Protection Program, (603) 271-0688.

Note: This fact sheet is accurate as of December 2011. Statutory or regulatory changes or the availability of additional information after this date may render this information inaccurate or incomplete.

ENVIRONMENTAL Fact Sheet

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

29 Hazen Drive, Concord, New Hampshire 03301 • (603) 271-3503 • www.des.nh.gov

WD-DWGB-22-10 2015

Wastewater Discharges from Vehicle Washing

Water used in washing cars, trucks, and other vehicles may contain a wide range of contaminants. These contaminants can include oil, fuels and other hydrocarbons, metals, detergents, road salt and grit. Discharged into surface waters, these contaminants can degrade water quality and harm aquatic life. Discharged into groundwater, they can make water unfit for drinking. To avoid these problems and the legal consequences that may result, the following guidelines apply to facilities where vehicles are washed on a regular basis and the wash water is collected by a conveyance such as a drain, catch basin, ditch or swale and infiltrated to the ground or groundwater*. Owners of facilities that conduct washing activities have four options for their wastewater discharges:

1. Operate a closed system with wastewater recycling (no discharge of wastewater).
2. Discharge to a municipal sanitary sewer.
3. Obtain a groundwater discharge permit.
4. Obtain registration to wash fewer than 30 vehicles per week and discharge to the ground *surface only*.

1. Closed System with No Discharge

This does not require a permit. However, it may require a "Holding Tank Registration" if the treatment system has a grit and oil tank that is pumped out. The water and sludge that are pumped from the tank must be collected and disposed of at an approved disposal facility, i.e., a wastewater treatment plant or hazardous waste disposal facility, depending on the nature of the material.

2. Discharge to Municipal Sanitary Sewer

Connections to your municipal sanitary sewer are controlled by the local sewer authority. Contact the local authority regarding restrictions. Some local sewer authorities do not allow connection of floor drains, while others allow connection only with adequate pretreatment, e.g., an oil/grit separator, or other controls. If you connect an existing floor drain to a municipal sanitary sewer, you still need to notify NHDES.

* These restrictions do not apply to occasional vehicle washing, such as at residences or occasional events such as fundraising car washes. For more information on community car washes and water quality see fact sheet WD-WMB-14 "Community Car Washes and Water Quality" at http://des.nh.gov/organization/commissioner/pip/factsheets/wmb/documents/wmb-14.pdf.

4. Wash Fewer than 30 Vehicles per Week

If you wash fewer than 30 vehicles per week, you may be able to discharge indirectly to groundwater without obtaining a groundwater discharge permit. However, you need to follow Env-Wq 401 Best Management Practices for Groundwater Protection to avoid contamination of your wash water with regulated substances. You also need to register your discharge and floor drain, if any. To avoid having to obtain a groundwater discharge permit, you must meet *all* of the following conditions:

a. Best Management Practices for Groundwater Protection are followed.
b. The floor drain is *not* in an area where regulated contaminants are used or stored.
c. The wastewater:
    - Is *not* from power washing, steam cleaning, engine cleaning or undercarriage cleaning.
    - Does *not* contain soaps or other products that contain regulated contaminants.
    - Does *not* result in a surface water discharge.
    - Discharges to the ground surface.
    - Contains only approved detergents.
    - Leads to an oil-water separator or other pretreatment method prior to infiltration.
    - Is registered with DES in accordance with Env-Wq 402.33.

Owners of facilities with these discharges are responsible for ensuring that regulated contaminants are not discharged and that groundwater is suitable for drinking without treatment.

Surface Water Discharges

In order to adequately protect the quality of surface water in New Hampshire, direct discharges of wastewater derived from car washing into surface water is **prohibited**. For more information about permitting of discharges to surface water, contact the DES Wastewater Engineering Bureau at (603) 271-3908.

For Additional Information

For more information about groundwater discharges, holding tank registration, floor drain registrations, and rules, please visit the DES Drinking Water Source Protection webpage at http://des.nh.gov/organization/divisions/water/dwgb/dwspp/index.htm, or call (603) 271-2858.

For additional information, please contact the Drinking Water and Groundwater Bureau at (603) 271-2513 or dwgbinfo@des.nh.gov, or visit http://des.nh.gov/organization/divisions/water/dwgb/index.htm. All of the bureau's fact sheets are on-line at http://des.nh.gov/organization/commissioner/pip/factsheets/dwgb/index.htm.

Note: This fact sheet is accurate as of June 2010. Statutory or regulatory changes or the availability of additional information after this date may render this information inaccurate or incomplete.

TITLE L: WATER MANAGEMENT AND PROTECTION

485-C:5 Classes of Groundwater:

- **I.** All groundwater shall be classified for the purpose of prescribing protections and management practices. These classifications do not necessarily reflect existing water quality. For purposes of classification, all groundwater shall be assigned to one of 4 classes as follows:
  - **a.** Class GAA groundwater shall be the most protected class. Groundwater in this class is within the wellhead protection area for wells which presently are used or well sites which have been identified for future use as drinking water supply for public water systems. An inventory of potential contamination sources in the wellhead protection area shall be conducted, and a management program shall be implemented as provided under RSA 485-C:8.
  - **b.** Class GA1 shall be assigned to groundwater in a defined zone of high value for present or future drinking water supply. An inventory of potential contamination sources in the contributing area of this class shall be conducted, and a management program shall be implemented as provided under RSA 485-C:8.
  - **c.** Class GA2 shall be assigned to groundwater within aquifers identified as highly productive for potential use as a public water supply by the U.S. Geological Survey regional groundwater studies, or other regional studies. Zones of stratified drift with a saturated thickness greater than 20 feet, and a transmissivity greater than 1,000 feet squared per day shall be designated as class GA2. Zones of bedrock with average well yields greater than 50 gallons per minute shall also be designated as class GA2.
  - **d.** Class GB shall be assigned to all groundwater not assigned to a higher class.
- **II.** The land area vertically above shall be assigned to the highest class of groundwater beneath it, for purposes of managing potential contamination sources.

485-C:12 Prohibited Uses: Within any wellhead protection area classified as GAA, the following new uses are prohibited:

- **I.** The siting or operation of a hazardous waste disposal facility as defined under RSA 147-A.
- **II.** The siting or operation of a solid waste landfill.
- **III.** The outdoor storage of road salt or other deicing chemicals in bulk.
- **IV.** The siting or operation of a junk or salvage yard.
- **V.** The siting or operation of a snow dump.
- **VI.** The siting or operation of a wastewater or septage lagoon.

Source. 1991, 344:1, eff. June 28, 1991.

Source: New Hampshire Statutes CHAPTER 485-C: GROUNDWATER PROTECTION ACT

ENVIRONMENTAL Fact Sheet

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

29 Hazen Drive, Concord, New Hampshire 03301 • (603) 271-3503 • www.des.nh.gov

WD-DWGB-22-13 2010

Groundwater Rights and the Groundwater Protection Act

Several questions often arise when groundwater withdrawals are considered, among them "Who owns groundwater?" and "Which laws govern groundwater withdrawals?" Groundwater is a shared resource in New Hampshire. Therefore the question of "who owns groundwater" may better or more practically be restated as who has the right to use water and how much? New Hampshire's water rights system is based on common law (law that is based on historic court decisions opposed to written codified law). New Hampshire's common law with respect to water use is governed by the doctrine of reasonable use. "Reasonable use" is generally taken to mean that one property owner's water use may not unreasonably interfere with the water use of another property owner, regardless of which use was established first. "Reasonable use" is a mixed question of fact and law, and the standard may change over time – so what was once reasonable may over time become unreasonable.

Because the movement of groundwater does not respect municipal boundaries, it makes sense that the state is the entity that can regulate or restrict groundwater use. New Hampshire's Groundwater Protection Act (RSA 485-C) is intended to ensure that new "large" groundwater withdrawals (those that exceed 57,600 gallons over any 24-hour period) do not adversely impact the quality or quantity of groundwater or water resources such as neighboring wells, wetlands, streams, rivers and lakes. Since August 1998, any proposed "large" groundwater withdrawal must undergo a comprehensive permitting process to demonstrate that other water users or water resources (lakes, rivers and wetlands) would not be adversely impacted. The permitting process includes public notification, two public hearings, extensive field testing and assessment of data, and development of an environmental monitoring, reporting, and mitigation plan.

It is important to note that RSA 485-C does not replace common law with respect to water rights; rather, common law coexists with the statute. This means that landowners developing a groundwater withdrawal of any amount have a right to reasonable use of the water under common law, that large new groundwater withdrawals are regulated under RSA 485-C, and that civil cases may be brought to the courts to resolve conflicts when the water rights of another land owner are unreasonably impacted by any withdrawal.

More information about the DES Large Groundwater Withdrawal Permitting Program may be found at ht t p :/ / des .nh.gov/ organizat ion/ divis ions / wat er/ dwgb / dws p p / lg_ wit hdrawals / index .ht m.

For Additional Information

Please contact the Drinking Water and Groundwater Bureau at (603) 271-2513 or dwgb info@des .nh.gov or visit our website at ht t p :/ / des .nh.gov/ organizat ion/ divis ions / wat er/ dwgb / index .ht m. All of the bureau's fact sheets are on-line at ht t p :/ / des .nh.gov/ organizat ion/ commis s ioner/ p ip / fact s heet s / dwgb / index .ht m. All drinking water and related rules can be accessed at ht t p :/ / des .nh.gov/ organizat ion/ commis s ioner/ legal/ rules / index .ht m# drinking.

Note: This fact sheet is accurate as of June 2010. Statutory or regulatory changes, or the availability of additional information after this date may render this information inaccurate or incomplete.

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NEW HAMPSHIRE DEPARTMENT OF Environmental Services

29 Hazen Drive, Concord, New Hampshire 03301 • (603) 271-3503 • www.des.nh.gov

WD-DWGB 22-4 **2009**

Best Management Practices (BMPs) for Groundwater Protection

Sixty percent of New Hampshire residents rely primarily on groundwater for their drinking water. Recognizing the importance of protecting the natural quality of groundwater, the legislature passed the Groundwater Protection Act (RSA 485-C) in 1991. This legislation recognized that a wide variety of activities involve the use of materials that can, if not properly handled, contaminate groundwater. There have been numerous instances of groundwater contamination in New Hampshire from leaking storage facilities, improper waste disposal, accidental spills, and even from normal use of these materials. Potentially contaminating substances can be more safely managed if certain basic guidelines are followed. The Groundwater Protection Act directed the N.H. Department of Environmental Services to adopt rules specifying best management practices (BMPs) for the Potential Contamination Sources (PCSs) listed below.

DES developed and adopted N.H. Code of Administrative Rules Part Env-Wq 401 Best Management Practices for Groundwater Protection, (formerly Env-Ws 421) which apply to all potential contamination sources in the state. The BMPs within the rules are essentially common-sense operating practices that are simple and economical to implement. The purpose of the BMPs is to help prevent a release of regulated substances. Regulated substances include oil, as defined under RSA 146-A, III, regulated contaminants established pursuant to RSA 485-C:6, and hazardous substances listed under federal regulations at 40 CFR 302. Cleaning up the release of a regulated substance can be very expensive. Following the BMP rules reduces environmental liability and minimizes potential cleanup costs.

Potential Contamination Sources (PCSs)[1]	
• Vehicle service and repair shops • General service and repair shops • Metalworking shops • Manufacturing facilities • Underground and above-ground storage tanks • Waste and scrap processing and storage • Transportation corridors • Septic systems (at commercial and industrial facilities) • Laboratories and certain professional offices (medical, dental, veterinary	• Use of agricultural chemicals[2] • Salt storage and use • Snow dumps • Stormwater infiltration ponds or leaching catch basins • Cleaning services • Food processing plants • Fueling and maintenance of earth moving equipment • Concrete, asphalt, and tar manufacture • Cemeteries • Hazardous waste facilities
[1]As identified in New Hampshire's Groundwater Protection Act (RSA 485-C) [2]Subject to BMPs developed and administered by NH Dept. of Food, Agriculture, and Markets	

Summary of BMP for Groundwater Protection Rules

Storage

- Store regulated substances on an impervious surface.
- Secure storage areas against unauthorized entry.
- Label regulated containers clearly and visibly.
- Inspect storage areas weekly.
- Cover regulated containers[1] in outside storage areas.
- Keep regulated containers that are stored outside more than 50 feet from surface water and storm drains, 75 feet from private wells, and up to 400 feet from public wells.
- Secondary containment is required for regulated containers stored outside, except for on-premise use heating fuel tanks, or aboveground or underground storage tanks otherwise regulated.

Handling

- Keep regulated containers closed and sealed.
- Place drip pans under spigots, valves, and pumps.
- Have spill control and containment equipment readily available in all work areas.
- Use funnels and drip pans when transferring regulated substances; perform transfers over impervious surface.

Release Response Information

- Post information on what to do in the event of a spill.

Floor Drains and Work Sinks

- Cannot discharge into or onto the ground.

[1]Regulated container means any device in which a regulated substance is stored, transported, treated, disposed of, or otherwise handled, with a capacity of five gallons or more. The term does not include fuel tanks attached to and supplying fuel to a motor vehicle.

For more information on best management practices for groundwater protection visit the DES Drinking Water Source Protection webpage at http://des.nh.gov/organization/divisions/water/dwgb/dwspp/index.htm, or contact the NH Department of Environmental Services at (603) 271-2947 or (603) 271-0688.

Disclaimer: Statutory information contained in this fact sheet is current as of February 2, 2007. Statutory or regulatory changes that may occur after February 2, 2007, may cause part or all of the information to be invalid. If there are any questions concerning the status of the information, please contact DES at (603) 271-3644.

ENVIRONMENTAL
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NEW HAMPSHIRE DEPARTMENT OF Environmental Services

29 Hazen Drive, Concord, New Hampshire 03301 • (603) 271-3503 • www.des.nh.gov

WMB-3 2015

Snow Disposal Guidelines

Introduction

Each winter, the Department of Environmental Services receives numerous complaints related to snow disposal into and/or near surface water. There are several different concerns regarding disposal of snow cleared from streets and parking lots ranging from aesthetic concerns, such as minimizing the visibility of debris and huge snow piles, to environmental concerns, such as protection of groundwater quality, drinking water supplies, surface water quality and aquatic life.

The environmental impacts of disposed snow result from high levels of salt, sand, debris and trash, along with contaminants from automobiles including oil and exhaust. The debris and contaminants that inevitably end up in plowed snow make it illegal to dump snow directly into water bodies. RSA 485-A:13,I(a) prohibits discharging wastes to surface waters without a permit. In addition to water quality impacts, snow disposed in open water can cause dangerous ice jams.



Manchester NH sign prohibiting snow dumping. Photo: Robert Robinson, City of Manchester

Groundwater is sensitive to snow dumping due to the high levels of chloride and automotive waste in plowed snow. RSA 485-C:12 prohibits the siting or operation of snow dumps within classified wellhead protection areas.

Refer to the following guidelines for siting legal snow dumps and protecting New Hampshire's water.

Recommended Guidelines for Snow Disposal

These guidelines will assist in identifying snow disposal sites that minimize impact to the environment. Please note that snow dumps are kept out of water bodies due to waste materials, such as litter and debris. Waste does not belong on the land surface either; after the snow melts, all waste must be collected and disposed of properly.

- Disposed snow should be stored near flowing surface waters, but at least 25 feet from the high water mark of the surface water and/or top of stream bank. If a site cannot be found near a flowing surface water, then upland sites further from surface waters are acceptable, provided they do not impact water supply sources as described below.
- A silt fence or equivalent barrier should be securely placed between the snow storage area and the high water mark and/or the top of stream bank with care taken not to exceed the barrier with over-piling. This area should also be accessible for post-melt cleanup. Note: silt fence must be installed prior to the ground freezing.

ENVIRONMENTAL Fact Sheet

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

29 Hazen Drive, Concord, New Hampshire 03301 • (603) 271-3503 • www.des.nh.gov

WD-DWGB-22-30 2011

Storage and Management of Deicing Materials

Storage and management of deicing material can be a source of contamination of surface water and groundwater, causing a violation of state water quality standards. These salt-based products dissolve in precipitation and either infiltrate though the ground surface to groundwater, or run off into surface water. Salt that infiltrates the subsurface at significant concentrations can also react with the soils and release metals into groundwater and surface water at concentrations that exceed water quality standards.

The term "deicing material" used here refers to deicing salts, and may include any of the following in either solid or liquid form: sodium chloride (often called rock salt), potassium chloride, calcium chloride, magnesium chloride, and other mixtures that contain salts (chlorides) including mixtures with abrasives, such as sand, cinder, slag, etc.

Need for Proper Management

Due to their high potential for causing groundwater and surface water pollution, salt storage facilities should not be placed in environmentally sensitive areas. The best strategy to prevent pollution from deicing materials and the associated liability is to use and store these materials responsibly. Facilities should develop good housekeeping practices to minimize loss and waste during the delivery, storage, loading and management of deicing materials.

Existing and new facilities that operate without impermeable surfaces and infiltrate brine to the ground or groundwater need to register with DES under Env-Wq 402 Groundwater Discharge Permit and Registration Rules. This is a free registration and is a method of tracking potential contaminant sources. If there are sensitive receptors nearby, some sites may be required to monitor drinking water wells and/or the groundwater. The registration form can be found at: http://des.nh.gov/organization/divisions/water/dwgb/dwspp/bmps/documents/floor_drain_form.pdf.

Best management practices (BMPs) for locating a new deicing materials storage facility should include the following:

- The facility should be located in an area that is not environmentally sensitive. Avoid areas where there are wells, reservoirs, or within the footprint of stratified-drift aquifers.
- The facility should be located on a flat site away from surface water and wetlands.
- Site drainage should be designed to direct clean stormwater away from the operations and storage areas in order to keep the stockpiles as dry as possible.

- Drainage that is contaminated with salt should be directed to a sewage treatment plant (subject to municipal approval), collected for use in pre-wetting activities or sent for proper disposal.

Structures and Work Areas

Ideally deicing material storage facilities should be completely enclosed, with storage and working areas on impervious surfaces such as asphalt or coated concrete. There should be stormwater drainage controls to prevent runoff water and snow melt from contacting or running through loading and material storage areas. Overhead cover to protect material from exposure to snow and rain should be installed to minimize runoff and inventory loss. A fixed roof is preferred over a tarp, because it is very difficult to keep storage piles completely covered with tarps during winter months and storm events.

Buildings should have concrete foundations and can be designed using dome, barn, or fabric style structures. For more information on constructing salt storage units, calculating how much space is needed for storage, and salting practices, see the Salt Institute's publications at www.saltinstitute.org/. *The Salt Storage Handbook* contains tables that indicate how much space is required to cover different height piles, and provides surface areas of exposed salt piles, to help in calculating number and size of tarps for *temporarily* covering salt piles.

The following BMPs should be considered when storing and managing deicing materials.

Storage Structures

- All salt and sand/salt mixtures should be stored on pads of impermeable asphalt or concrete. Storage and loading areas should have an impermeable floor constructed of asphalt, concrete or other suitable material that extends around the buildings and work area exterior. The area should be sloped away to prevent stormwater from entering the loading areas or structure.
- Concrete pads and walls should be treated to prevent concrete deterioration (spalling).
- Structure hardware should be galvanized and concrete block buildings should be waterproofed inside.
- If using a three-sided building, the exposed salt at the open end should be covered.
- Stormwater and snowmelt runoff should be properly controlled. Building floors and storage pads should be sloped to prevent ponding and allow any water to drain away from the storage piles.

On-Site Management: Delivery/Handling/Loading

- All sand and sand/salt mixtures temporarily out in the open should be covered to prevent salt from being washed or blown from the pile.
- If a permanent under-roof work area is not possible, then storage and handling activities should be conducted on impermeable (bituminous) pads. Any deicing materials left outdoors should be completely covered with waterproof tarpaulins.
- All surplus materials must be removed from the site when winter activity is finished.
- Working areas should be bermed and sloped to allow snow melt and stormwater to drain away from the area. In some cases, it may be necessary to channel water to a collection point, such as a sump, holding tank, or lined basin for collection.
- Storage and distribution should only be conducted during the fall/winter season.

- Spreaders should not be overloaded such that material spills off the vehicle. A plan for loading operations to prevent overfilling vehicles and eliminating material spillage during transportation should be developed and implemented.
- Salt spilled at the storage yard and loading areas should be collected and returned to the storage pile.
- Annual inspection and repairs should be carried out prior to the start of each season. Ongoing inspection of storage structures, work areas, and deicing liquid storage tanks should be carried out during the season.
- Solid bagged materials should be stored securely, indoors if possible.
- Spreaders should only be washed at a location where the wash water is properly managed. (See DES fact sheet WD-DWGB-22-10 Management of Vehicle Wash Water.)
- Liquid storage tanks should be designed such that a plumbing failure will not result in release of the contents. Backflow prevention may be necessary on some plumbing applications.
- Liquid storage tanks should be protected from impact from vehicles moving about the yard and be located such that spilled material can be contained and retrieved in the event of a tank or piping failure. Secondary containment should be provided around large liquid storage tanks.

Brine Storage and Management

In recent years brine has been used on roads prior to storms as an effective ice preventative, reducing the amount of deicing materials needed during a storm event. The water that runs off storage and loading areas can be collected into watertight tanks or lined basin(s) and re-used in pre-storm wetting of roads. Any brine storage should be designed with inert materials that are compatible with salt.

Brine stored using holding tanks must be managed so that there are no releases to drains, groundwater or surface waters. If there is a floor drain in a building where brine is stored, it must be connected to a municipal sewer system (with the approval of the local authority), routed to a registered holding tank or permanently sealed. (see fact sheet WD-DWGB-22-8 Holding Tanks for Floor Drains)

Storage ponds or collection basins used for brine storage must be lined and must not receive runoff from areas other than the storage and operations areas. The basin itself must be impermeable to prevent infiltration of the collected water into the ground. The basin may need a roof or cover to reduce the accumulation of snow and rain water. The collection of this runoff water would only be necessary during the winter maintenance months (November through March). During the remaining seven months of the year, the non-brine stormwater can be redirected from the brine storage to a natural discharge point.

The preferred management option for any brine collected is for use as a pre-wetting agent for roads prior to winter storms. The release of this collected water to the ground, groundwater, or a stormwater system during operation or at season’s end is not permissible and as a consequence, this type of runoff management may require disposal of the brine by one of the following methods: (1) discharge directly to a publicly owned treatment works (POTW) with local approval; (2) pumping and transporting the salt water to a POTW system by tank truck; (3) evaporation; or (4) treatment to remove salt and on-site discharge under a Nondomestic Wastewater Registration.

For Additional Information

For more information, please contact the Drinking Water and Groundwater Bureau at (603) 271-2513 or dwgbinfo@des.nh.gov , or visit our website at http://des.nh.gov/organization/divisions/water/dwgb/index.htm. All of the bureau's fact sheets are online at http://des.nh.gov/organization/commissioner/pip/factsheets/dwgb/index.htm.

References:

Salt Institute (www.saltinstitute.org)

Michigan Department of Environmental Quality (www.michigan.gov/deq/)

Salt and Brine Storage Guidance

Guide to Salt Storage Requirements for Small Commercial Snow Removal Services

Environnent Canada (http://www.ec.gc.ca/nopp/roadsalt/en/index.cfm)

Best Management Practices for Salt Use on Private Roads, Parking Lots & Sidewalks

SIMA (Snow & Ice Management Assoc.) www.sima.org

NH Road Salt Application Rates for Deicing Parking Lots
(Pounds per 1000 sq.ft.)

Pavement Temp. (°F) and Trend (↑ ↓)	Weather Condition	Maintenance Actions	Application Rate (lbs/per 1000 sq.ft.)			
			Salt Prewet/ Pretreated with salt brine	Salt Prewet/ Pretreated with other blends	Dry salt	Winter sand
>30 ↑	Snow	Plow, treat intersections only	4.5	4	4.5	Not recommended
	Frz. Rain	Apply chemical	5.75	5.25	6.5	Not recommended
30 ↓	Snow	Plow and apply chemical	5.75	5.25	6.5	Not recommended
	Frz. Rain	Apply chemical	6.5	5.75	7	Not recommended
25 - 30 ↑	Snow	Plow and apply chemical	5.75	5.25	6.5	Not recommended
	Frz. Rain	Apply chemical	6.5	5.75	7	Not recommended
25 - 30 ↓	Snow	Plow and apply chemical	5.75	5.25	6.5	Not recommended
	Frz. Rain	Apply chemical	7	6.5	8.25	10.5
20 - 25 ↑	Snow or frz. Rain	Plow and Apply chemical	7	6.5	8.25	10.5 for frz. Rain
20 - 25 ↓	Snow	Plow and apply chemical	5.75	7.5	9.5	Not recommended
	Frz. Rain	Apply chemical	7	7.5	10	10.5
15 - 20 ↑	Snow	Plow and apply chemical	7.5	7.5	9.5	Not recommended
	Frz. Rain	Apply chemical	8.75	7.5	10	10.5
15 - 20 ↓	Snow or Frz. Rain	Plow and apply chemical	8.25	7.5	10	10.5 for frz. Rain
0 to 15 ↑↓	Snow	Plow, treat with blends, sand hazardous areas	Not recommended	10	Not recommended	13 and spot-treat as needed
< 0	Snow	Plow, treat with blends, sand hazardous areas	Not recommended	23	Not recommended	13 and spot-treat as needed

Table 19. Application Rates for Deicing

These rates are based on road application guidelines (Mn Snow & Ice Control Field Handbook, Manual 2005-1). Develop your own application rates by adjusting your current rates incrementally downward toward these guidelines. Where temperature categories overlap, select the rate most applicable to your situation.

NH Road Salt Application Rates for Deicing Roads
(Pounds per Lane Mile)

Pavement Temp. (°F) and Trend (↑ ↓)	Weather Condition	Maintenance Actions	Application Rate (lbs/per lane mile)			
			Salt Prewet/ Pretreated with salt brine	Salt Prewet/ Pretreated with other blends	Dry salt	Winter sand
>30 ↑	Snow	Plow, treat intersections only	150	125	150	Not recommended
	Frz. Rain	Apply chemical	175	150	200	Not recommended
30 ↓	Snow	Plow and apply chemical	175	150	200	Not recommended
	Frz. Rain	Apply chemical	200	175	225	Not recommended
25 - 30 ↑	Snow	Plow and apply chemical	200	175	225	Not recommended
	Frz. Rain	Apply chemical	225	200	225-275	Not recommended
25 - 30 ↓	Snow	Plow and apply chemical	250	200	275	Not recommended
	Frz. Rain	Apply chemical	275	250	275-300	450
20 - 25 ↑	Snow or frz. Rain	Plow and Apply chemical	275	275	275-300	450 for frz. Rain
20 - 25 ↓	Snow	Plow and apply chemical	275	250	300-325	Not recommended
	Frz. Rain	Apply chemical	300	275	325-400	450
15 - 20 ↑	Snow	Plow and apply chemical	300	275	325	Not recommended
	Frz. Rain	Apply chemical	300-375	275-350	325-400	450
15 - 20 ↓	Snow or Frz. Rain	Plow and apply chemical	325	300	350	450 for frz. Rain
0 to 15 ↑↓	Snow	Plow, treat with blends, sand hazardous areas	Not recommended	300-350	Not recommended	600 and spot-treat as needed
< 0	Snow	Plow, treat with blends, sand hazardous areas	Not recommended	350-500	Not recommended	600 and spot-treat as needed

Table 19. Application Rates for Deicing

These rates are based on road application guidelines (Mn Snow & Ice Control Field Handbook, Manual 2005-1). Develop your own application rates by adjusting your current rates incrementally downward toward these guidelines. Where temperature categories overlap, select the rate most applicable to your situation.

14.0 CONTAMINATION SCREENING REPORT

Wilcox & Barton INC.

CIVIL • ENVIRONMENTAL • GEOTECHNICAL

CONTAMINATION SCREENING REPORT
for

Banks Chevrolet Parking Lot Reconstruction
234 Airport Road
Concord, NH 03301

Prepared for:
Banks Chevrolet
C/O Fred Booth
137 Manchester Street
Concord, NH 03301

Prepared by:
Wilcox & Barton, Inc.
2 Home Ave.
Concord, New Hampshire 03301
Contact: Erin Lambert, PE, (603) 369-4190 x527



Wilcox & Barton, Inc.
Project No.: BACC0005

February 06, 2026

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Appendices

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Appendix D Supporting Figure with Screening Markup – GMZ, Monitoring Points, Site Plan and Groundwater Contours October 2024 (CMA Engineers, Inc.)

1.0 PROJECT OVERVIEW

The purpose of this report is to Screen the Alteration of Terrain Project Areas for Contaminants for the Purpose of Evaluating the Impacts of Infiltration, in accordance with Env-Wq 1507.02(c). Since this project proposes stormwater management features that rely on infiltration, it is necessary to evaluate whether the site development will encounter areas where the ambient groundwater quality standards (AGQS) or Soil Remediation Standards (SRS) are exceeded.

The project parcel is located at 234 Airport Road in Concord (Tax Map 782Z, Lot 8), consists of approximately 6.95 acres, and is within a designated Groundwater Protection Area and Wellhead Protection Area for the Town of Pembroke. The site provides parking areas to support the existing dealership located across the street at 137 Manchester Street in Concord. The proposed project includes paving an existing gravel parking area and installing a subsurface infiltration gallery with an associated isolator row for stormwater management, providing water quality treatment, volume reduction, and peak flow control to pre-development levels. The project property is located in an area where all abutting properties are serviced by municipal water.

The proposed infiltration gallery and field inlets relies on infiltration, generating groundwater recharge for the property, and the potential for this system to encounter and mobilize contaminants is evaluated in the sections below.

2.0 REMEDIATION SITES

There is a remediation site located on the subject property and abutting Banks Chevrolet dealership property (one remediation site location identification). Both are identified in the NHDES OneStop database as “Automotive Supply Associates” (Site No. 199502046). The NHDES site number is affiliated with the subject property at 234 Airport Road and the abutting Banks Chevrolet property at 137 Manchester Street; 129 Manchester Street was previously merged with 137 Manchester Street. A map showing both these sites is included within this section via Image 1 and a full-sized version of the map and supporting documentation from New Hampshire Department of Environmental Services (NHDES) can be found in Appendix A and B of this report.

The remediation site “Automotive Supply Associates” previously contained a 12,000 gallon underground diesel storage tank (UST Tank #3) and a 4,000 gallon underground gasoline storage tank (UST Tank #6). During UST closure activities on November 10, 1994, petroleum contamination was detected in the vicinity of the diesel dispenser. Soil samples collected from the UST excavation areas showed elevated field screening results for volatile organic compounds (VOCs). Additional soil samples were collected for laboratory analysis of VOCs, semi-volatile organic compounds (SVOCs), and total petroleum hydrocarbons (TPH). Laboratory results indicated that VOC and SVOC concentrations were within acceptable limits; however, TPH concentrations exceeded NHDES standards.

On May 11, 1995, a second round of soil samples was collected at depths of 5 and 6.5 feet below the former diesel dispenser to evaluate VOCs, Polycyclic Aromatic Hydrocarbons (PAHs), and

TPH. Groundwater was not encountered, and laboratory results dated May 30, 1995, indicated that no further investigation or remediation was required.

In 2020, Wilcox & Barton, Inc. was retained by Banks Chevrolet to provide environmental due diligence and UST closure activities at the former "Automotive Supply Associates" property. A Phase I Environmental Site Assessment completed in June 2019 identified limited documentation for previously closed USTs, prompting a ground-penetrating radar (GPR) survey by Radar Solutions International, Inc. UST and drywell closure activities were completed by Andrews Construction Co., Inc. between August 31 and September 3, 2020, in accordance with 2014 NHDES guidance. The work included removal of a 500 gallon UST (containing #2 heating oil), a previously closed-in-place 3,000 gallon UST (numbered Tank #2, containing #2 heating oil), and a drywell. No evidence of petroleum release was observed, groundwater was not encountered, and laboratory analysis of soil samples showed no VOCs, PAHs, or TPH above applicable standards. All UST closure requirements were met, and no further action was required. The full Phase I assessment is enclosed with this Contamination Screening Report.



Image 1: Remediation Sites Screening Map from NHDES OneStop

(Note: Red asterisk denotes Remediation Sites and blue polygon reflects the approximate project parcel)

3.0 PFAS SAMPLING DATA

The site is located near the PFAS Sampling Site known as the Old Suncook Road Landfill (NHDES Site #198406038). The landfill operated from 1968 to 1975 and received municipal solid waste from the City of Concord and the towns of Pembroke and Dunbarton, as well as excess oil fill from the City and NHDOT and septage waste. Prior to its use as a landfill, portions of the site were used for gravel pit activities. Based on available boring data and historical

records, the bottom of waste is estimated to be approximately 25 to 30 feet below ground surface. The site lies within a Groundwater Management Zone (GMZ) that covers a relatively large area in which all properties are served by the public water system. Therefore, there are no concerns regarding drinking water well contamination associated with the site.

According to the NHDES PFAS Sampling Dashboard, there are three PFAS Sampling locations (Stations number #50647, #50650, and #53184) with detectable levels of PFOA and PFOS exceeding current AGQS located within 1,000 feet of the subject property, as shown on Image 2. Additionally, the project is not located within the Consent Decree Boundary for the Saint-Gobain Performance Plastics site. Therefore, a further review of PFAS data is required per Env-Wq 1507.02(c) and is presented in this report.

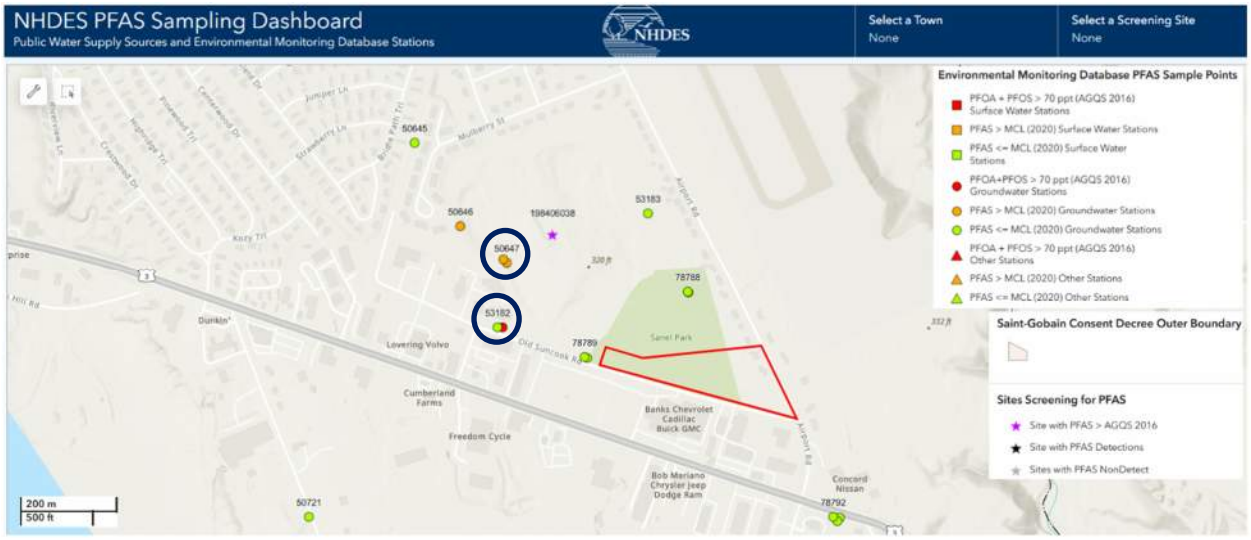


Image 2: NHDES PFAS Sampling Map for Subject Parcel

(Note: Red polygon reflects the approximate project parcel, and the blue circles indicate monitoring wells with PFAS sampling locations exceeding current AGQS within 1,000 ft from the property)

The landfill site has undergone environmental investigations since the early 2000s to evaluate and monitor groundwater quality adjacent to the landfill area, with PFAS specifically monitored between 2018 and 2022. According to the Groundwater Permit Renewal Application Report for the City of Concord, prepared by CMA Engineers, Inc. dated October 9, 2025, groundwater wells located to the southeast of the former landfill site show little to no impact from PFAS or other contaminants (Appendix C).

The report also presents an updated site plan illustrating the GMZ delineation, monitoring locations, and groundwater contours. As shown in Appendix D, the project parcel is located outside the limits of the impacted monitoring well locations from the former landfill (blue polygon marked up in Appendix D Site Plan). In addition, groundwater contour data indicate that wells with elevated PFAS concentrations do not exhibit direct groundwater flow toward the subject parcel. Groundwater flow from the three impacted monitoring well locations (within 1,000 ft of subject property) appears to flow from north to south and towards the northeast as depicted by the groundwater contours. Monitoring wells surrounding the parcel to the north,

west, and south further demonstrate low (below current AGQS) or non-detectable PFAS concentrations. Based on these findings, the project parcel does not appear to be influenced by PFAS contamination originating from the former landfill site.

4.0 LOCATION OF PRACTICES RELY ON INFILTRATION

The project parcel currently has three drywells that provide runoff treatment for the existing gravel parking area, as shown in Image 3. The proposed stormwater practices for the new paved parking lot utilize infiltration and are located near the center of the parking area, as shown in the magenta areas in Image 4. The proposed infiltration systems consist of one infiltration gallery with StormTech MC-3500 chambers and three field inlets with infiltration trenches. The infiltration gallery collects all stormwater runoff from the proposed paved parking area to the maximum extent feasible and replaces three existing dry wells located in the gravel parking lot. The three file inlet/infiltration trench locations collect stormwater runoff from the wooded and landscaped areas north of the project development.

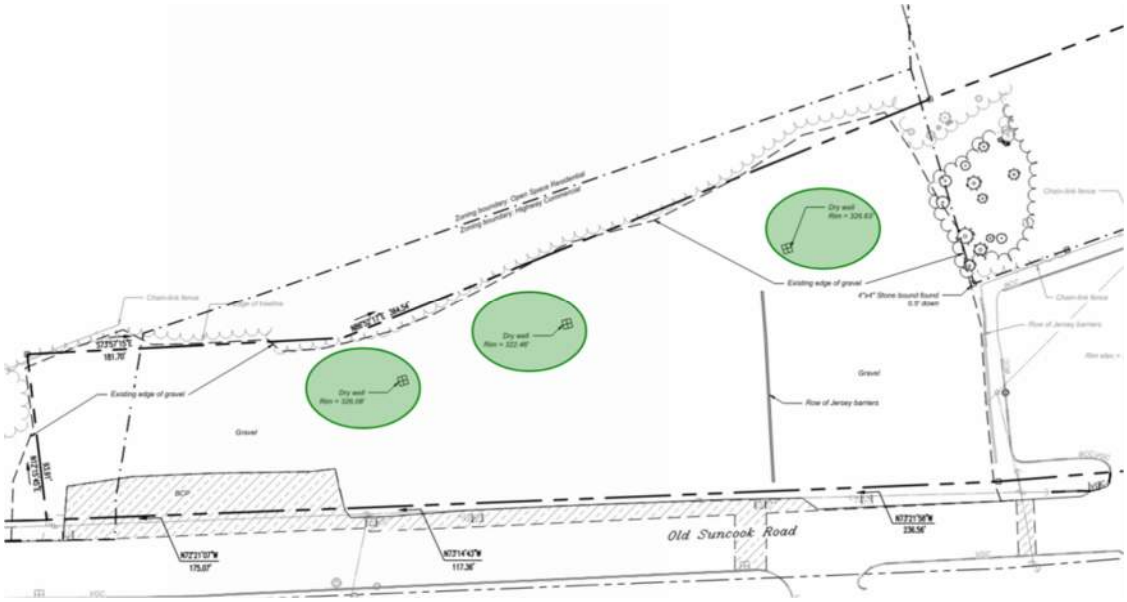


Image 3: Existing Site Plan with Infiltration Areas

Note: Green circles indicate the location of existing infiltration systems. See Existing Conditions Plans for more information.

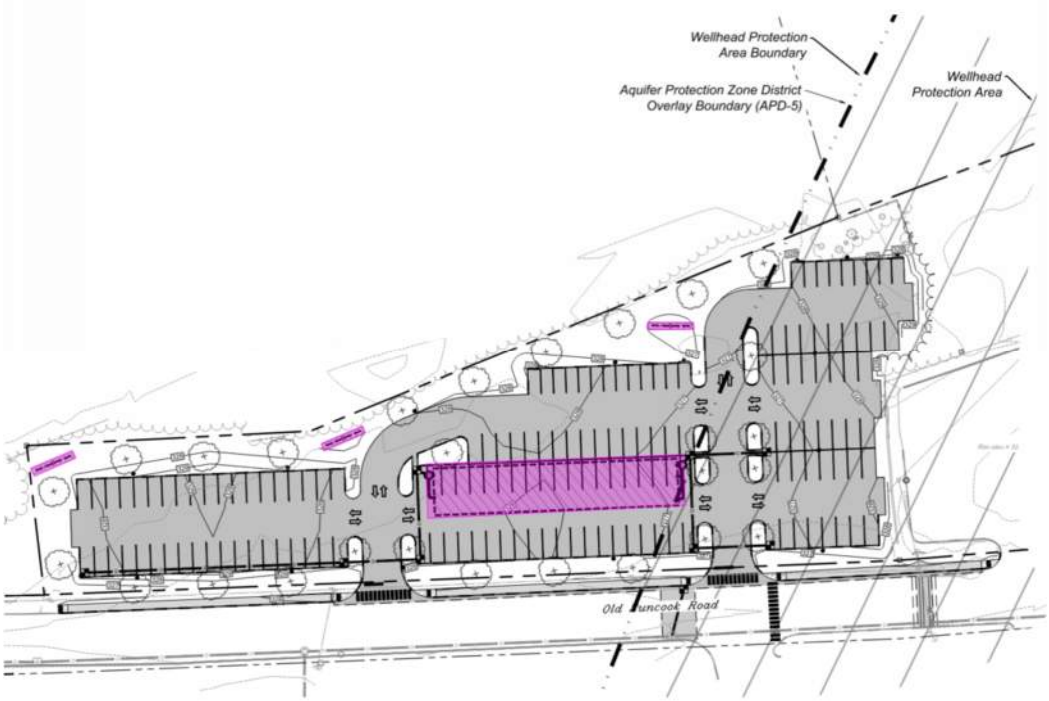


Image 4: Schematic Proposed Site Plan with Infiltration Areas

Note: Magenta areas indicate the location of proposed infiltration systems. See Grading & Drainage Plans for more information.

5.0 POTENTIAL IMPACTS

Evaluations of the remediation sites indicate that no further action is required and that there are no potential impacts to the project area. In addition, the PFAS sampling data presented in Section 4 of this report shows no impacts appear to be located at the project site. The proposed project will improve the existing parking area by replacing the gravel surface with pavement, resulting in an overall decrease of impervious cover; and installing stormwater management systems designed to enhance water quality and control peak runoff to improve pre-development conditions, thereby further reducing potential environmental impacts associated with the project.

6.0 SUMMARY OF RESULTS

The purpose of the PFAS/Remediation site screening is to ensure stormwater practices are not located on contaminated soils, contaminated groundwater, and are not mobilizing any potential contaminants from the site. Based on the available information collected, the existing and proposed site infiltration practices appear to not impact any receptors negatively, including off-site properties and drinking water wells. No properties abutting the project property have drinking water wells, all are serviced by municipal water. The proposed infiltration system will replace the existing dry well systems and does not appear to pose negative impacts to the environment or human health greater than those posed by current site conditions. This evaluation

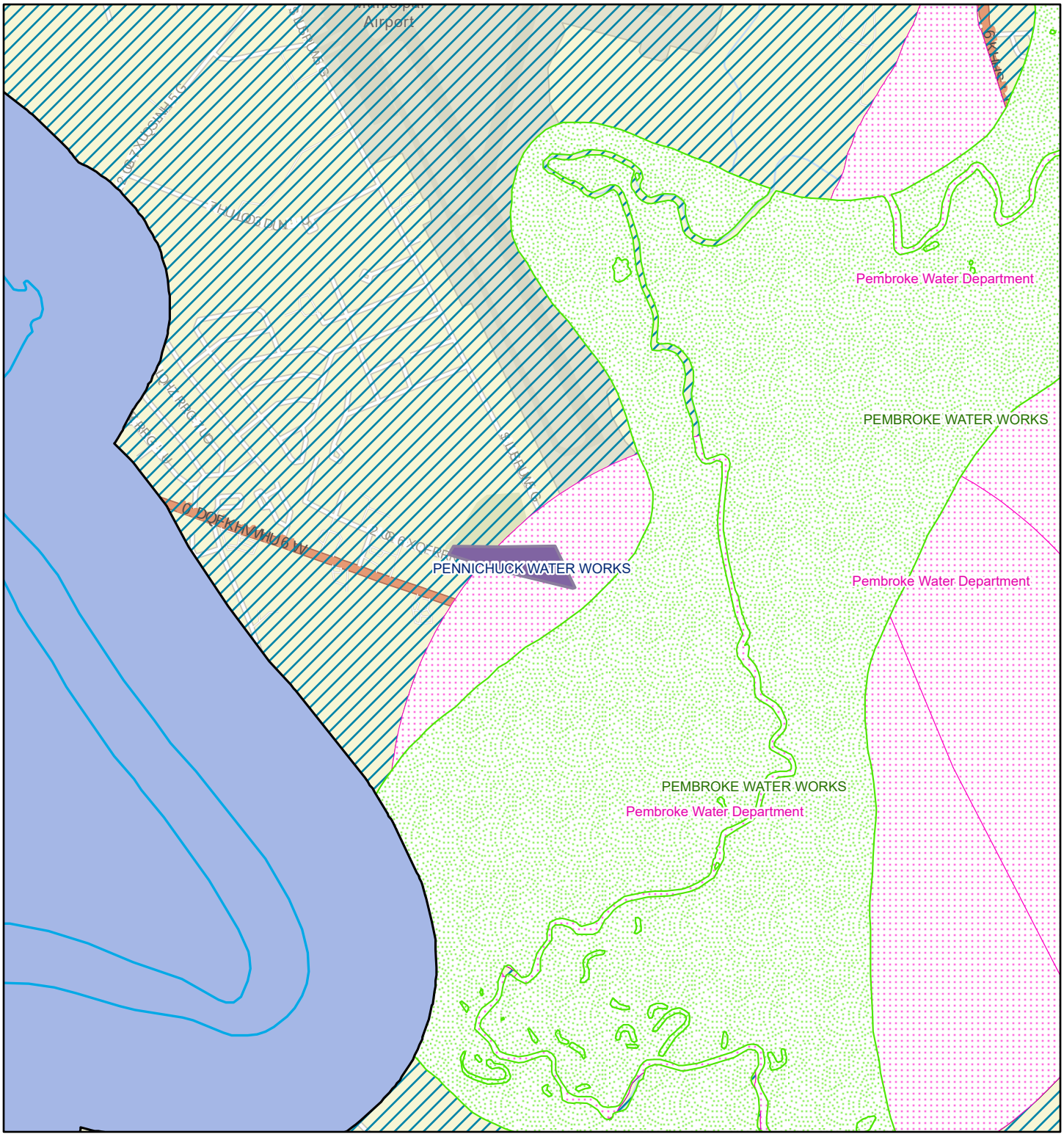
reflects that the available data does not limit the use of the proposed infiltration-based practices on-site.

Supporting documentation is provided in the enclosed appendices, which include Maps, Figures, Reports, and NHDES OneStop Documentation. The NHDES OneStop Documentation reflects historical background on the nearby remediation sites including correspondence regarding tank closures, removals, and recent inspections. Additionally, the Phase I assessment completed for the project property is enclosed in this evaluation package.

APPENDIX A

Supporting Maps

AoT Screening Layers Map



8/18/2025, 10:25:39 AM

1:24,000

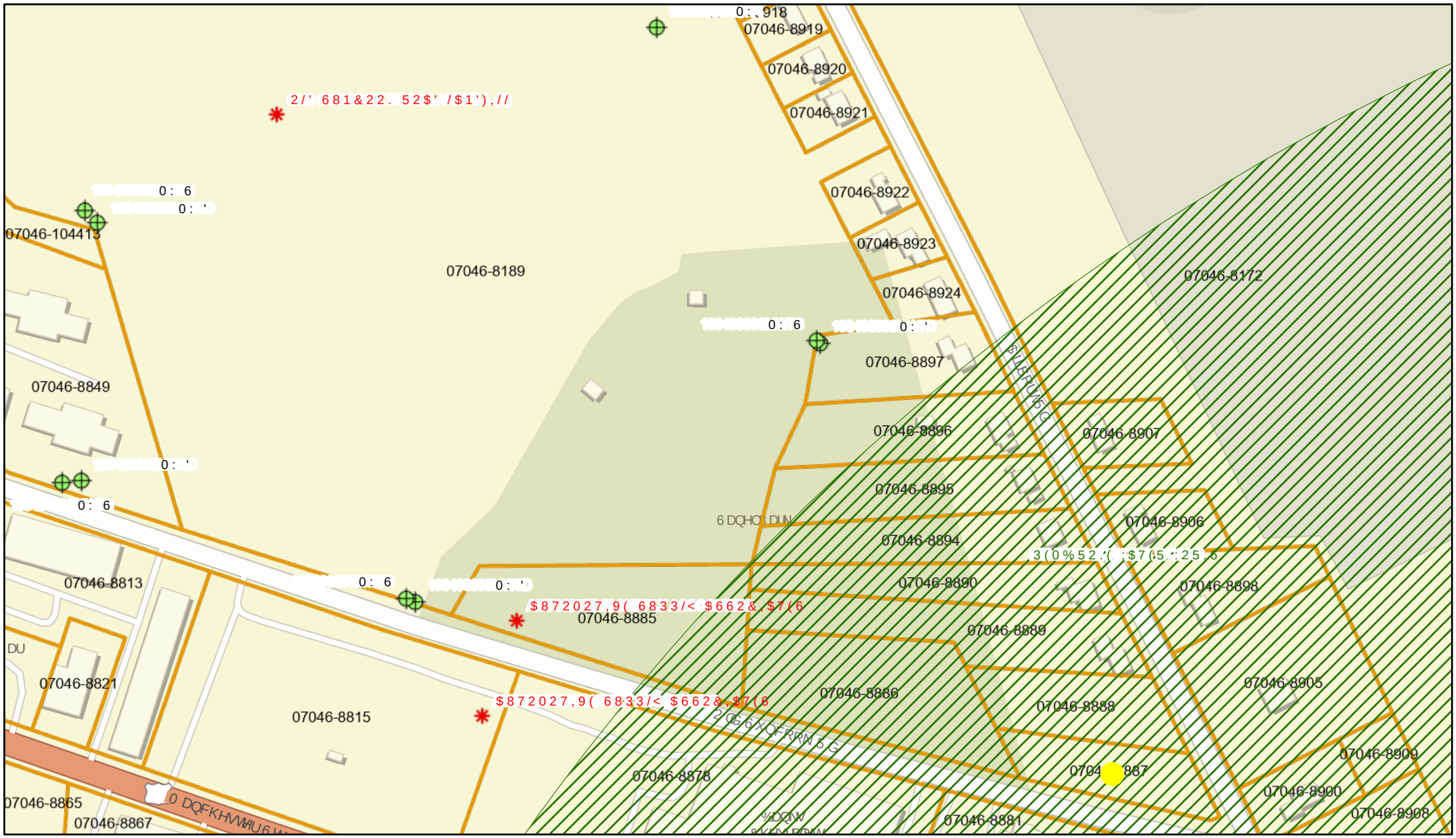
0 0.15 0.3 0.6 mi

0 0.23 0.45 0.9 km

- Designated Rivers
- Designated River Corridor
- Groundwater Classification Areas GA2
- Groundwater Classification Areas GAA
- Source Water Protection Areas
- Wellhead Protection Areas

Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, (c) OpenStreetMap contributors, and the GIS User Community

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PL

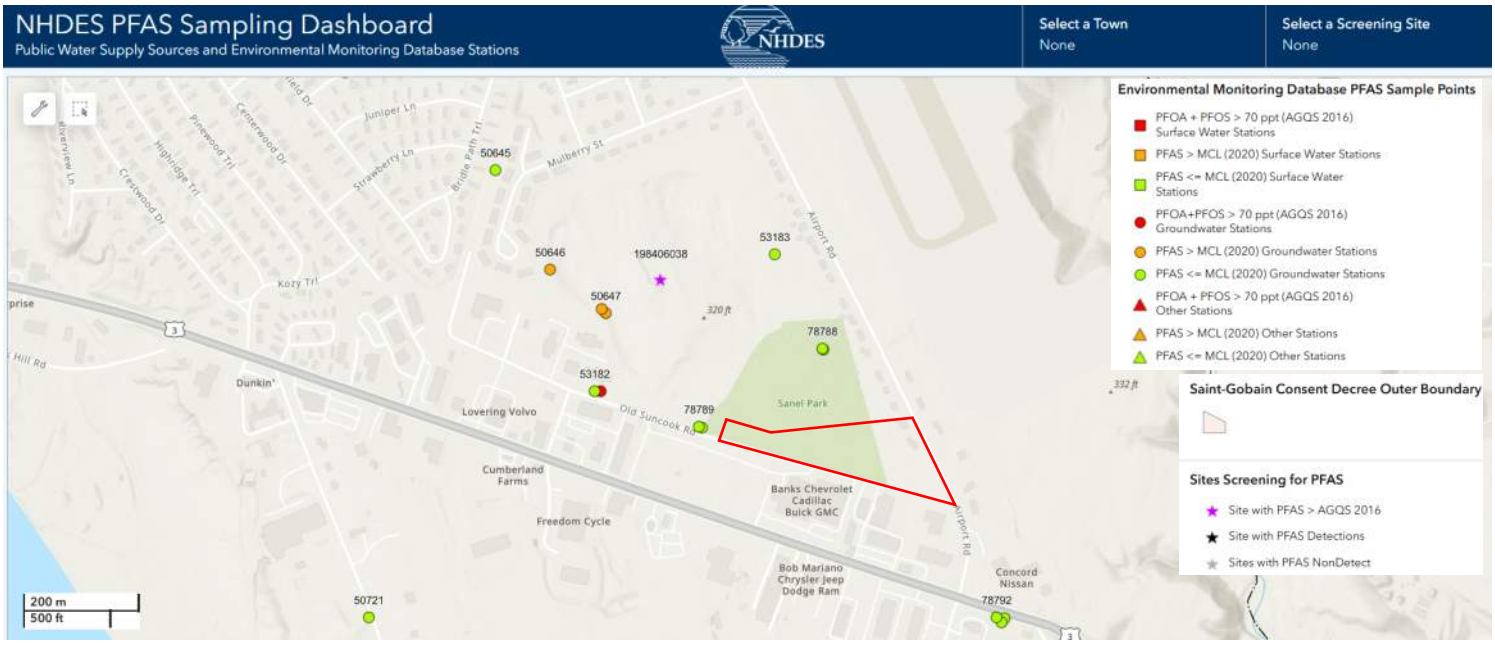
NP

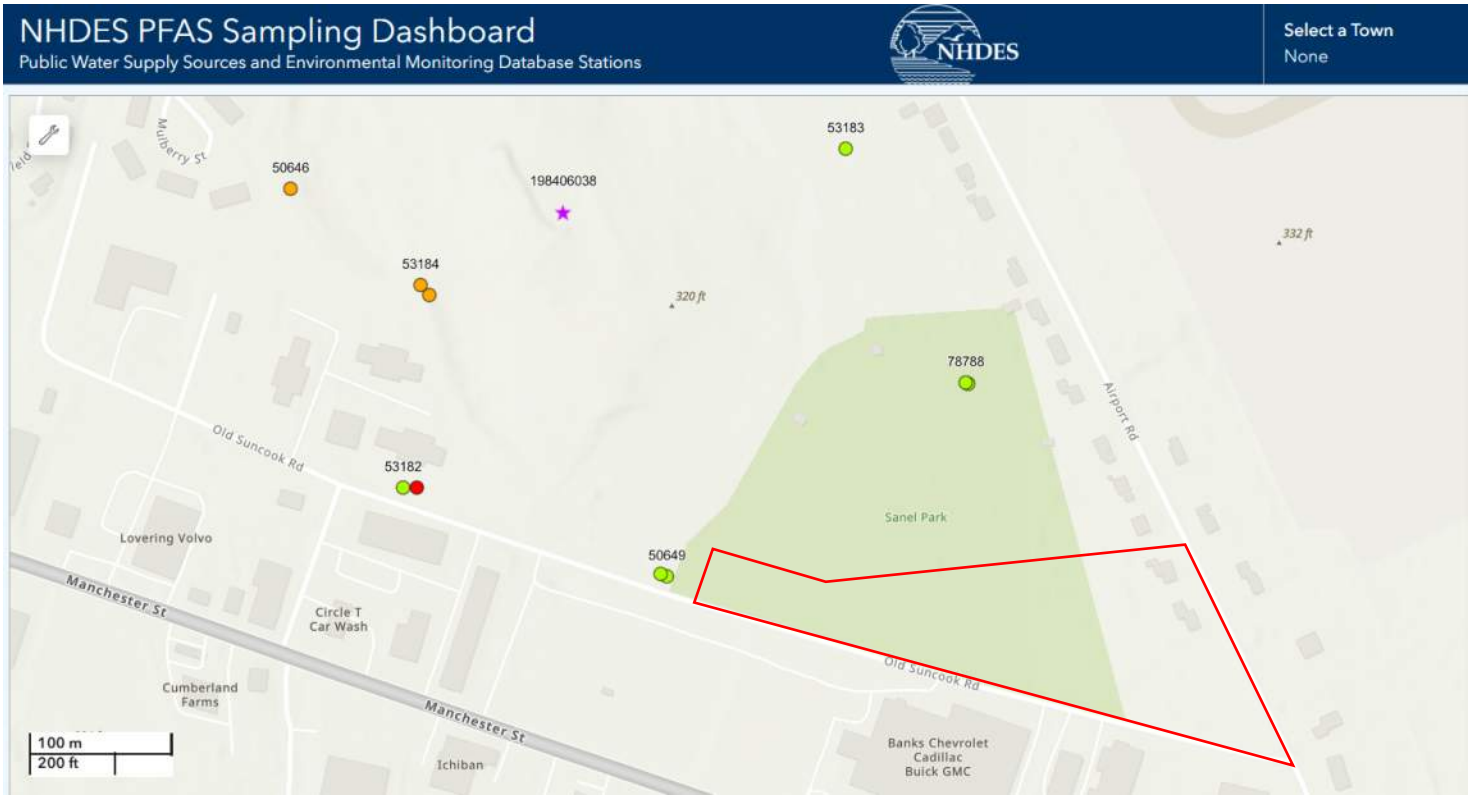
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FRQWULEXWRUV DQG WKH *,6 8VHU &RPPXQLW\ 1+'5

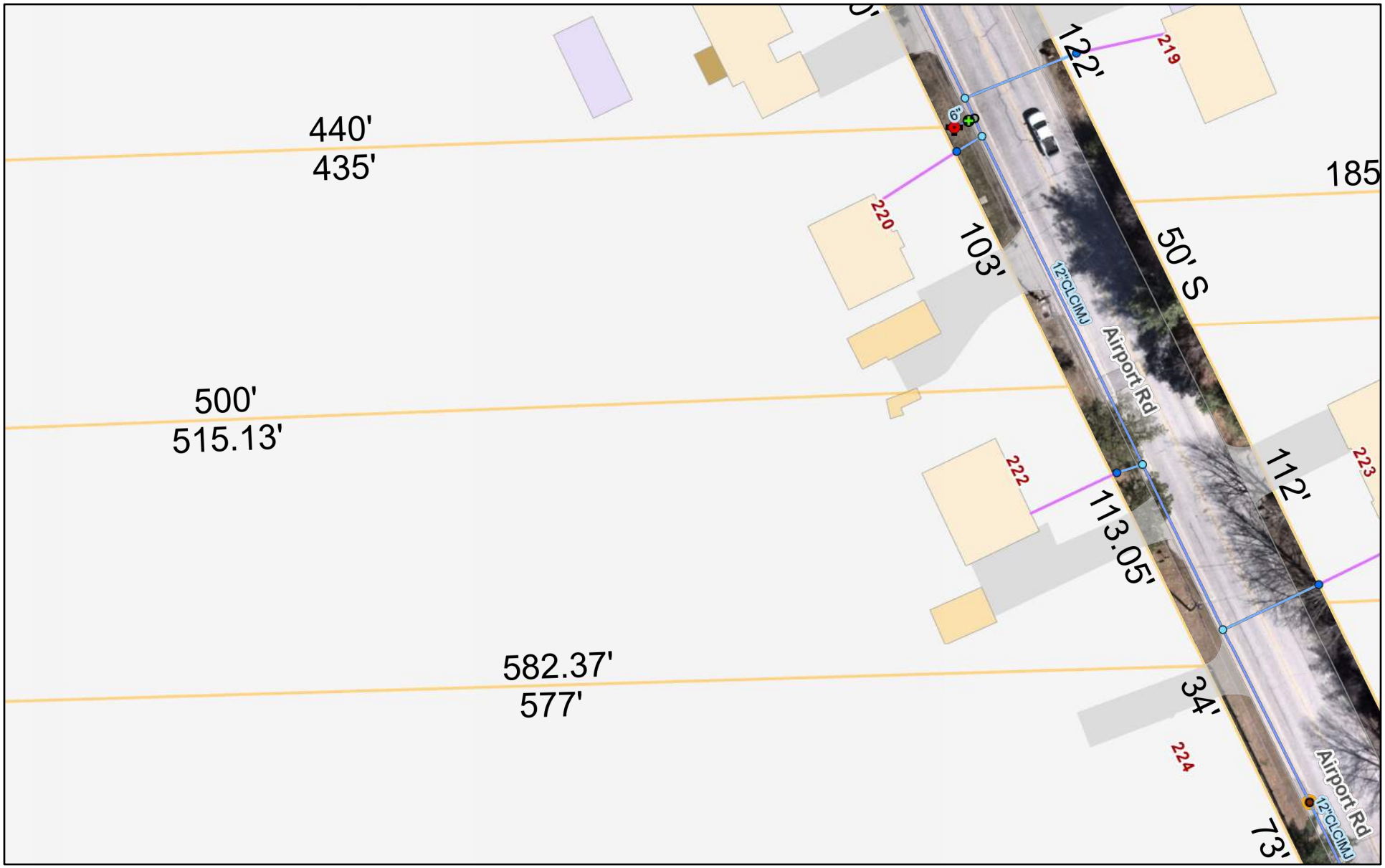
$UF*,6 :RUOG *HRGHVLJQ 6HWWOHPHQW 3URWHFWLRQ $UHDV

5HPHGLDWLRQ 6LWHV 3DUFHOV

(QYLURQPHQWDO 0RQLWRULQJ 6LWHV 6HFXUH


NHDES PFAS Sampling Dashboard
Public Water Supply Sources and Environmental Monitoring Database Stations
NHDES
Select a Town
None
Select a Screening Site
None
Environmental Monitoring Database PFAS Sample Points
PFOA + PFOS > 70 ppt (AGQS 2016) Surface Water Stations
PFAS > MCL (2020) Surface Water Stations
PFAS <= MCL (2020) Surface Water Stations
PFOA+PFOS > 70 ppt (AGQS 2016) Groundwater Stations
PFAS > MCL (2020) Groundwater Stations
PFAS <= MCL (2020) Groundwater Stations
PFOA + PFOS > 70 ppt (AGQS 2016) Other Stations
PFAS > MCL (2020) Other Stations
PFAS <= MCL (2020) Other Stations
Saint-Gobain Consent Decree Outer Boundary
Sites Screening for PFAS
Site with PFAS > AGQS 2016
Site with PFAS Detections
Sites with PFAS NonDetect
50645
50646
198406038
53183
50647
78788
53182
78789
Dunkin'
Lovering Volvo
Old Suncook Rd
Sanel Park
Cumberland Farms
Freedom Cycle
Banks Chevrolet Cadillac Buick GMC
Airport Rd
Bob Mariano Chrysler Jeep Dodge Ram
Concord Nissan
78792
50721
320 ft
332 ft
200 m
500 ft

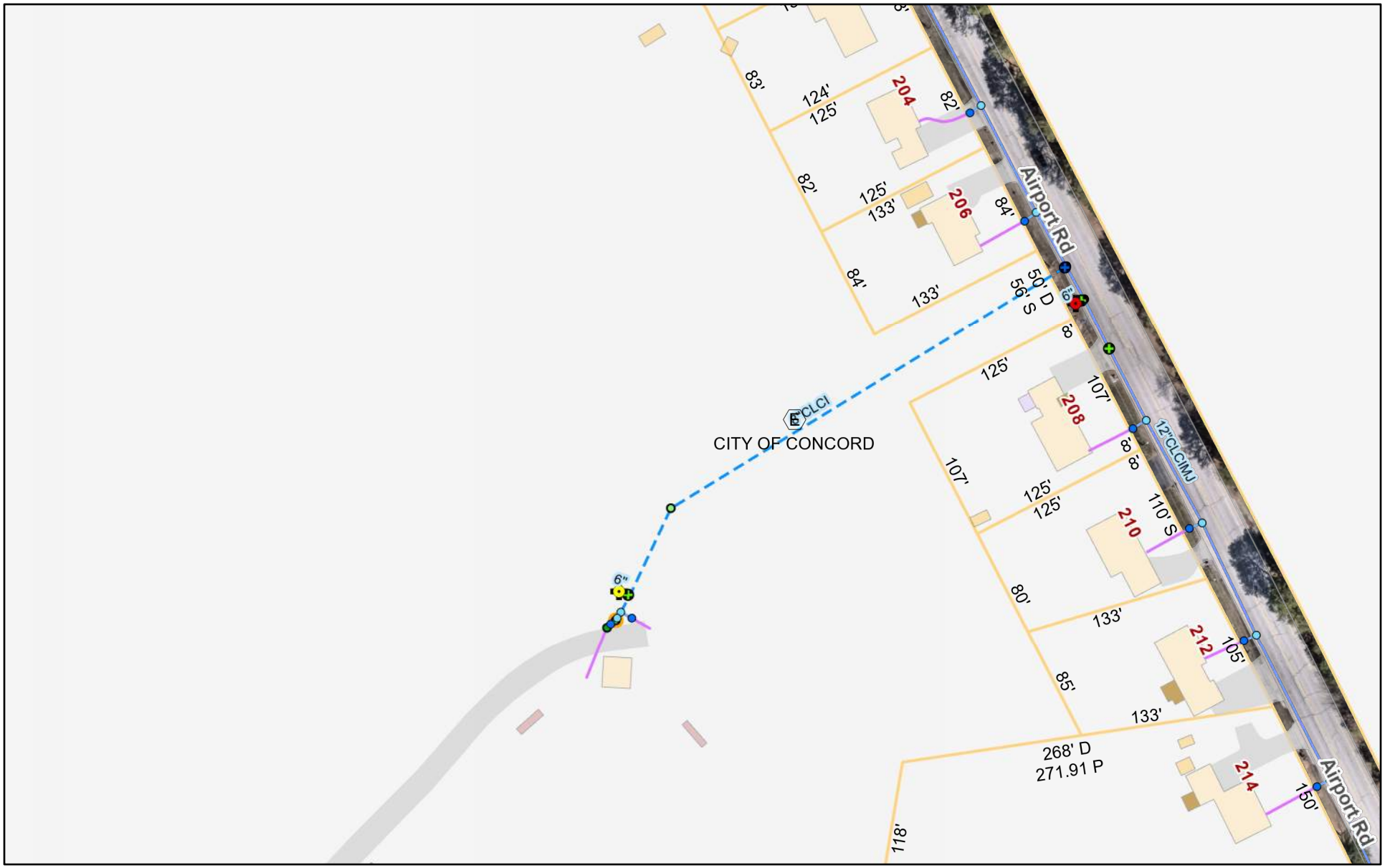

NHDES PFAS Sampling Dashboard
Public Water Supply Sources and Environmental Monitoring Database Stations
NHDES
Select a Town
None
53183
50646
198406038
53184
320 ft
332 ft
78788
Airport Rd
Old Suncook Rd
53182
Sanel Park
Lovering Volvo
50649
Manchester St
Circle T Car Wash
Cumberland Farms
Ichiban
Banks Chevrolet Cadillac Buick GMC
100 m
200 ft



)HEUXDU\

)HHW

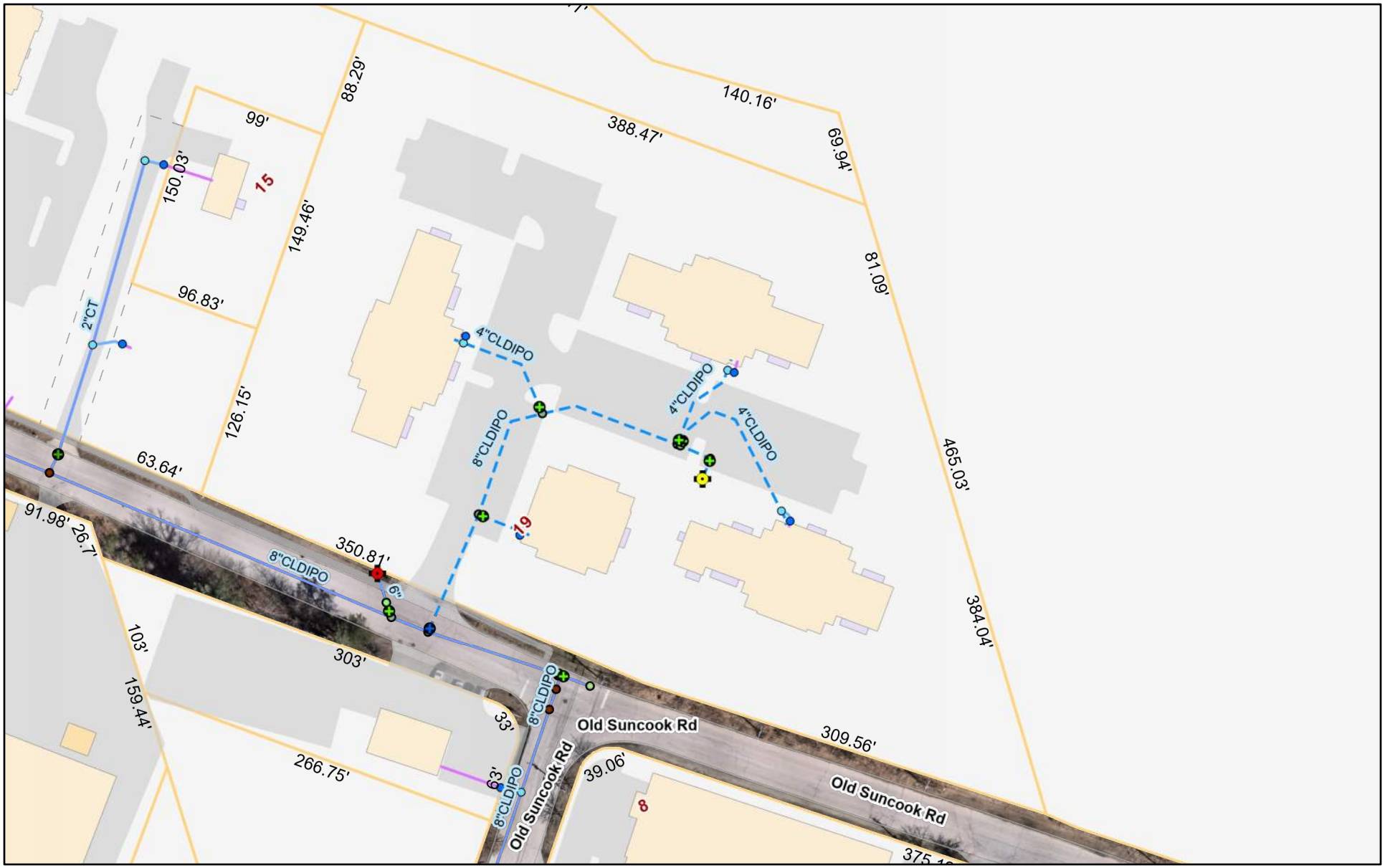
&LW\ RI &RQFRUG 1HZ +DPS



)HEUXDU\

)HHW

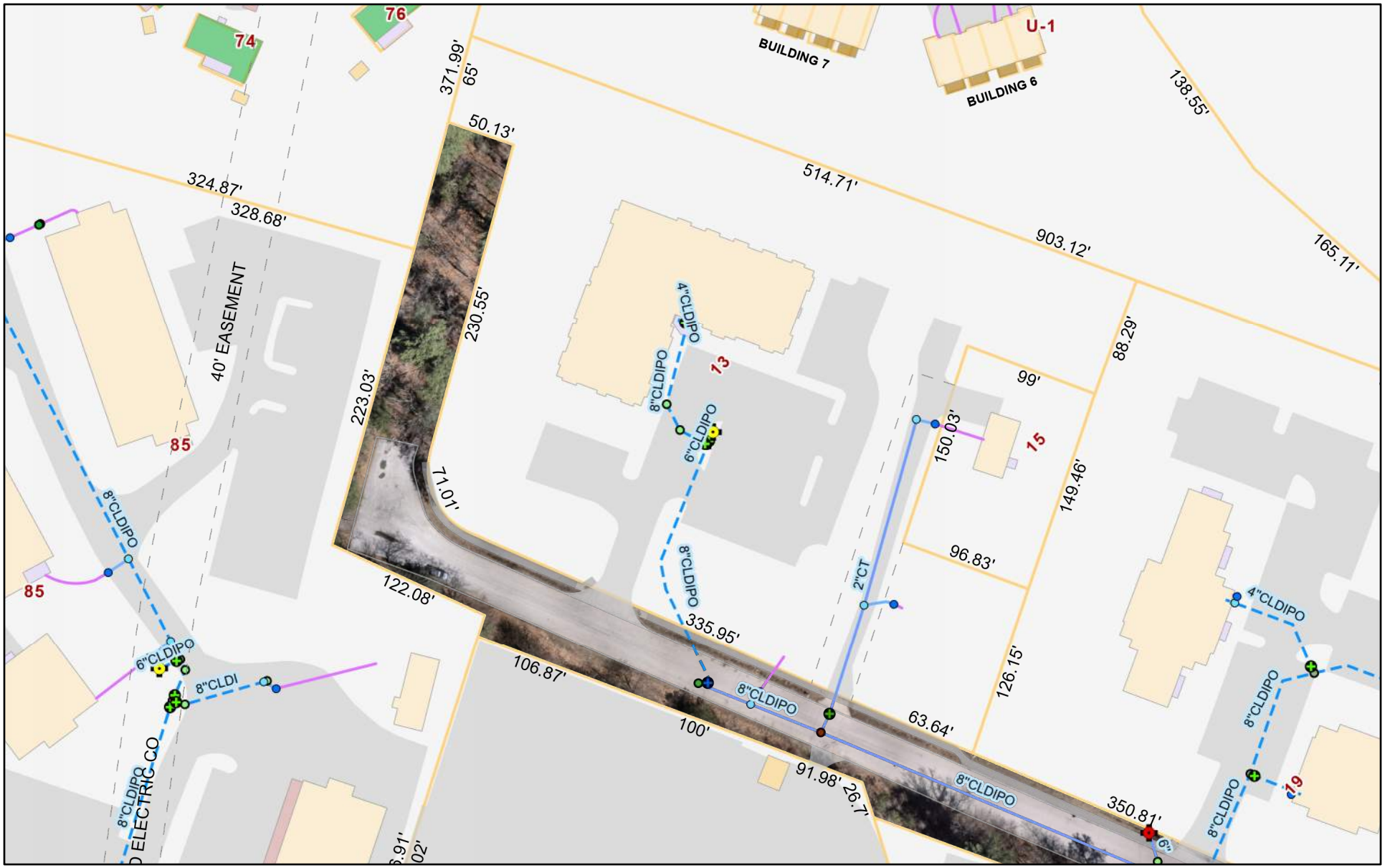
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APPENDIX B

NHDES OneStop Documentation

C.A.B. SERVICES, INC.
POLLUTION CONTROL

RECEIVED
JAN 23 1995
DEPARTMENT OF
ENVIRONMENTAL SERVICES

January 17, 1995

Mr. Thomas Beaulieu
Underground Storage Tank Office
Groundwater Protection Bureau
NH Department of Environmental Services
6 Hazen Drive / P.O. Box 95
Concord, New Hampshire 03302-0095

Re: Underground Storage Tank (UST) Closures at Sanel Realty Co., Inc. Property, (Tax Map #110E Lot #4487-A), Old Suncook Rd., Concord. UST Facility ID#0-112058.

Dear Sir:

On Thursday, November 10, 1994, C.A.B. Services and Scott Coen Construction Company personnel excavated, cleaned, and removed one (1)-12,000 gallon underground diesel storage tank and one (1)-4,000 gallon underground gasoline storage tank (UST) located at the above referenced site. The UST's appeared to be in good condition with minor rust observed along the exterior surfaces of the tanks. New Hampshire Department of Environmental Services (NHDES) personnel were unavailable for inspection of the closure project. UST locations and general site features are shown on the attached UST Closure Site Plan.

In accordance with NHDES/UST Sampling and Reporting Guidelines, C.A.B. Services personnel collected soil samples from the UST excavation areas for field analysis. Soil samples were field analyzed for detection of volatile organic compounds (VOC's) using a Photovac MicroTIP MP-100 organic vapor meter (OVM) equipped with a photoionization detector (PID). Strong petroleum odors were encountered in the soil samples collected from under the pump island in vicinity of the diesel dispenser. Field analysis of soil samples collected from the UST excavation areas, UST piping areas and pump island detected total VOC's ranging from 3.5 to 163 parts per million (ppm). Field sampling locations and field analytical results are described on the attached UST Closure Site Plan.

Groundwater was not encountered in the UST excavation areas. Based on field observations and in accordance with NHDES/UST Closure Guidelines, two composite soil samples were collected from the base of the UST excavation areas and one discrete soil sample was collected from the below the pump island for laboratory analysis.

Samples were delivered to a certified laboratory for analysis by EPA Methods 8015, 8100, and 8260 for detection of volatile organic compounds (VOC's), semi-volatile organic compounds (SVOC's) and total petroleum hydrocarbons (TPH).

Laboratory analyses detected VOC's and SVOC's in only one soil sample at 2.57 micrograms per gram (µg/g). TPH was detected in only one soil sample at 18,000 µg/g. Laboratory results have been enclosed.

Based on laboratory analyses, TPH detected in the soil sample collected from under the diesel dispenser exceeds the acceptable limits of the NHDES "Policy for the Management of Soils Contaminated from Spills/Releases of Virgin Petroleum Products". Additional work would be required to determine the extent of soil contamination.

Please call our office if you have any questions regarding this report. Thank you for your assistance with this project.

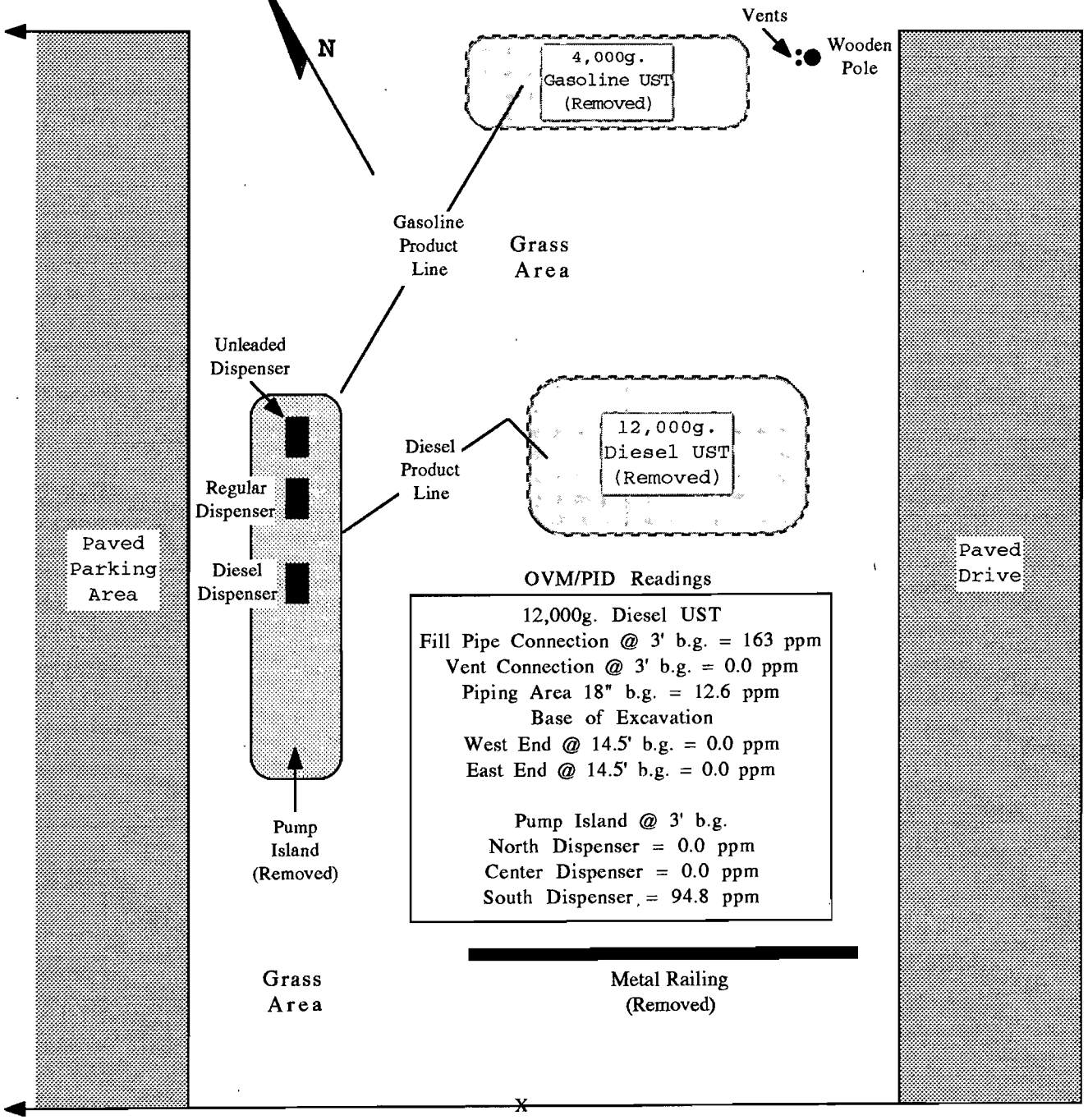
Cordially,

AMB

Alan M. Bryant

Encl: UST Closure Site Plan
Analytical Results

cc: Mr. Scott Coen
Scott Coen Construction, Co.
P.O. Box 435
Contoocook, New Hampshire 03229



OVM/PID Readings

12,000g. Diesel UST
Fill Pipe Connection @ 3' b.g. = 163 ppm
Vent Connection @ 3' b.g. = 0.0 ppm
Piping Area 18" b.g. = 12.6 ppm
Base of Excavation
West End @ 14.5' b.g. = 0.0 ppm
East End @ 14.5' b.g. = 0.0 ppm

Pump Island @ 3' b.g.
North Dispenser = 0.0 ppm
Center Dispenser = 0.0 ppm
South Dispenser = 94.8 ppm

OVM/PID Readings

4,000g. Gasoline UST
Vent Connection @ 3' b.g. = 8.8 ppm
Fill Connection/Manhole Cvr. @ 3' b.g. = 41.2 ppm
Product Line Connection @ 3' b.g. = 6.9 ppm
Piping Area @ 18" b.g. = 3.5 ppm
Base of Excavation
East End @ 10' b.g. = 5.8 ppm
Center @ 10' b.g. = 4.2 ppm
West End @ 10' b.g. = 10.6 ppm

C.A.B. Services, Inc.

Sanel Realty Company, Inc.
Old Suncook Road
Map 110E Lot#4487-A
Concord, New Hampshire
UST Closure Site Plan
UST Facility ID#0-112058
Approximate Scale: 1" = 10'
November 1994

RLI Resource Laboratories, Inc.

230 Maplewood Avenue
Portsmouth, NH 03801

Voice: 603-436-2001
FAX: 603-436-9961

Mr. Bruce Bentham
C.A.B. Services, Inc.
P.O. Box 8
Dover, NH 03820

PO Number: NA
Lab No: 5217
Date Received: 11/10/94
Date Reported: 12/15/94

Project: Sanel-Concord

Attached please find results for volatile organics petroleum hydrocarbons.

Samples were received in acceptable condition and under chain of custody.

Instruments used in analysis were calibrated with the appropriate frequency and to the specifications of the referenced methods.

Analytes in blanks were below levels effecting sample results.

Matrix effects as monitored by matrix spike recovery or unusual physical properties were not apparent.

Accuracy and precision as monitored by laboratory control sample analyses were within acceptance limits.

RESOURCE LABORATORIES

Authorized Signature

Date 12/15/94

Lab Number: 5217-1
Sample Designation: 4000 g Gasoline UST Base of Exc. Comp
Date Sampled: 11/10/94
Date Analyzed: 11/21/94
Matrix: Soil

VOLATILE ORGANICS
Method Reference: EPA SW 846, 3rd Edition. Method 8260.

	Concentration (ug/g dry wt)	Quantitation Limit (ug/g dry wt)		Concentration (ug/g dry wt)	Quantitation Limit (ug/g dry wt)
dichlorodifluoromethane	U	0.1	1,2-dibromomethane	U	0.1
chloromethane	U	0.1	chlorobenzene	U	0.1
vinyl chloride	U	0.1	1,1,1,2-tetrachloroethane	U	0.1
bromomethane	U	0.1	ethylbenzene	U	0.1
chloroethane	U	0.1	m- and p-xylene	U	0.1
trichlorofluoromethane	U	0.1	o-xylene	U	0.1
1,1-dichloroethene	U	0.1	styrene	U	0.1
methylene chloride	U	0.1	bromoform	U	0.1
trans-1,2-dichloroethene	U	0.1	isopropylbenzene	U	0.1
1,1-dichloroethane	U	0.1	bromobenzene	U	0.1
2,2-dichloropropane	U	0.1	1,1,2,2-tetrachloroethane	U	0.1
cis-1,2-dichloroethene	U	0.1	1,2,3-trichloropropane	U	0.1
bromochloromethane	U	0.1	n-propylbenzene	U	0.1
chloroform	U	0.1	2-chlorotoluene	U	0.1
1,1,1-trichloroethane	U	0.1	4-chlorotoluene	U	0.1
carbon tetrachloride	U	0.1	1,3,5-trimethylbenzene	U	0.1
1,1-dichloropropene	U	0.1	tert-butylbenzene	U	0.1
benzene	U	0.1	1,2,4-trimethylbenzene	U	0.1
1,2-dichloroethane	U	0.04	sec-butylbenzene	U	0.1
trichloroethene	U	0.1	1,3-dichlorobenzene	U	0.1
1,2-dichloropropane	U	0.1	4-isopropyltoluene	U	0.1
dibromomethane	U	0.1	1,4-dichlorobenzene	U	0.1
bromodichloromethane	U	0.1	1,2-dichlorobenzene	U	0.1
cis-1,3-dichloropropene	U	0.1	n-butylbenzene	U	0.1
toluene	U	0.1	1,2-dibromo-3-chloropropane	U	0.1
trans-1,3-dichloropropene	U	0.1	1,2,4-trichlorobenzene	U	0.1
1,1,2-trichloroethane	U	0.1	hexachlorobutadiene	U	0.1
tetrachloroethene	U	0.1	naphthalene	U	0.1
1,3-dichloropropane	U	0.1	1,2,3-trichlorobenzene	U	0.1
dibromochloromethane	U	0.1	methyl-t-butyl ether	U	0.2

SURROGATE STANDARDS	Recovery (%)	Acceptance Limits (%)
1,2-dichloroethane-d4	100.1	76 - 114
toluene-d8	95.2	88 - 110
bromofluorobenzene	101.9	86 - 115

U = Below quantitation limit

Lab Number: 5217-2
Sample Designation: 12000 g Diesel UST Base of Exc. Comp
Date Sampled: 11/10/94
Date Analyzed: 11/21/94
Matrix: Soil

VOLATILE ORGANICS
Method Reference: EPA SW 846, 3rd Edition. Method 8260.

	Concentration (ug/g dry wt)	Quantitation Limit (ug/g dry wt)		Concentration (ug/g dry wt)	Quantitation Limit (ug/g dry wt)
dichlorodifluoromethane	U	0.1	1,2-dibromomethane	U	0.1
chloromethane	U	0.1	chlorobenzene	U	0.1
vinyl chloride	U	0.1	1,1,1,2-tetrachloroethane	U	0.1
bromomethane	U	0.1	ethylbenzene	U	0.1
chloroethane	U	0.1	m- and p-xylene	U	0.1
trichlorofluoromethane	U	0.1	o-xylene	U	0.1
1,1-dichloroethene	U	0.1	styrene	U	0.1
methylene chloride	U	0.1	bromoform	U	0.1
trans-1,2-dichloroethene	U	0.1	isopropylbenzene	U	0.1
1,1-dichloroethane	U	0.1	bromobenzene	U	0.1
2,2-dichloropropane	U	0.1	1,1,2,2-tetrachloroethane	U	0.1
cis-1,2-dichloroethene	U	0.1	1,2,3-trichloropropane	U	0.1
bromochloromethane	U	0.1	n-propylbenzene	U	0.1
chloroform	U	0.1	2-chlorotoluene	U	0.1
1,1,1-trichloroethane	U	0.1	4-chlorotoluene	U	0.1
carbon tetrachloride	U	0.1	1,3,5-trimethylbenzene	U	0.1
1,1-dichloropropene	U	0.1	tert-butylbenzene	U	0.1
benzene	U	0.1	1,2,4-trimethylbenzene	U	0.1
1,2-dichloroethane	U	0.04	sec-butylbenzene	U	0.1
trichloroethene	U	0.1	1,3-dichlorobenzene	U	0.1
1,2-dichloropropane	U	0.1	4-isopropyltoluene	U	0.1
dibromomethane	U	0.1	1,4-dichlorobenzene	U	0.1
bromodichloromethane	U	0.1	1,2-dichlorobenzene	U	0.1
cis-1,3-dichloropropene	U	0.1	n-butylbenzene	U	0.1
toluene	U	0.1	1,2-dibromo-3-chloropropane	U	0.1
trans-1,3-dichloropropene	U	0.1	1,2,4-trichlorobenzene	U	0.1
1,1,2-trichloroethane	U	0.1	hexachlorobutadiene	U	0.1
tetrachloroethene	U	0.1	naphthalene	U	0.1
1,3-dichloropropane	U	0.1	1,2,3-trichlorobenzene	U	0.1
dibromochloromethane	U	0.1	methyl-t-butyl ether	U	0.2

SURROGATE STANDARDS	Recovery (%)	Acceptance Limits (%)
1,2-dichloroethane-d4	101.7	76 - 114
toluene-d8	95.1	88 - 110
bromofluorobenzene	101.0	86 - 115

U = Below quantitation limit

Lab Number: 5217-3
Sample Designation: Pump Island Diesel Dispenser
Date Sampled: 11/10/94
Date Analyzed: 11/21/94
Matrix: Soil

VOLATILE ORGANICS
Method Reference: EPA SW 846, 3rd Edition. Method 8260.

	Concentration (ug/g dry wt)	Quantitation Limit (ug/g dry wt)		Concentration (ug/g dry wt)	Quantitation Limit (ug/g dry wt)
dichlorodifluoromethane	U	1	1,2-dibromomethane	U	1
chloromethane	U	1	chlorobenzene	U	1
vinyl chloride	U	1	1,1,1,2-tetrachloroethane	U	1
bromomethane	U	1	ethylbenzene	U	1
chloroethane	U	1	m- and p-xylene	U	1
trichlorofluoromethane	U	1	o-xylene	U	1
1,1-dichloroethene	U	1	styrene	U	1
methylene chloride	U	1	bromoform	U	1
trans-1,2-dichloroethene	U	1	isopropylbenzene	U	1
1,1-dichloroethane	U	1	bromobenzene	U	1
2,2-dichloropropane	U	1	1,1,2,2-tetrachloroethane	U	1
cis-1,2-dichloroethene	U	1	1,2,3-trichloropropane	U	1
bromochloromethane	U	1	n-propylbenzene	U	1
chloroform	U	1	2-chlorotoluene	U	1
1,1,1-trichloroethane	U	1	4-chlorotoluene	U	1
carbon tetrachloride	U	1	1,3,5-trimethylbenzene	U	1
1,1-dichloropropene	U	1	tert-butylbenzene	U	1
benzene	U	1	1,2,4-trimethylbenzene	U	1
1,2-dichloroethane	U	0.4	sec-butylbenzene	U	1
trichloroethene	U	1	1,3-dichlorobenzene	U	1
1,2-dichloropropane	U	1	4-isopropyltoluene	1.6	1
dibromomethane	U	1	1,4-dichlorobenzene	U	1
bromodichloromethane	U	1	1,2-dichlorobenzene	U	1
cis-1,3-dichloropropene	U	1	n-butylbenzene	U	1
toluene	0.97	1	1,2-dibromo-3-chloropropane	U	1
trans-1,3-dichloropropene	U	1	1,2,4-trichlorobenzene	U	1
1,1,2-trichloroethane	U	1	hexachlorobutadiene	U	1
tetrachloroethene	U	1	naphthalene	U	1
1,3-dichloropropane	U	1	1,2,3-trichlorobenzene	U	1
dibromochloromethane	U	1	methyl-t-butyl ether	U	2

Note detection limit elevated by the presence of non-target compounds.

SURROGATE STANDARDS	Recovery (%)	Acceptance Limits (%)
1,2-dichloroethane-d4	104.0	76 - 114
toluene-d8	91.9	88 - 110
bromofluorobenzene	101.6	86 - 115

U = Below quantitation limit

Lab Number:	5217-2	Date Extracted:	11/17/94
Field ID:	12000 g Diesel UST Base of Exc. - Comp	Date Analyzed:	12/10/94
Matrix:	Solid		

TOTAL PETROLEUM HYDROCARBONS
Method Reference: EPA SW 846, 3rd Edition. Method 8100, modified.

Fraction:	Concentration (ug/g dry wt)	Quantitation Limit (ug/g dry wt)
Gasoline range organics	U	20
Diesel range organics	U	50
No. 6/lube oil range organics	U	100

Lab Number:	5174-3	Date Extracted:	11/17/94
Field ID:	Pump island Diesel Dispenser 3' B.G.	Date Analyzed:	11/17/94
Matrix:	Solid		

TOTAL PETROLEUM HYDROCARBONS
Method Reference: EPA SW 846, 3rd Edition. Method 8100, modified.

Fraction:	Concentration (ug/g dry wt)	Quantitation Limit (ug/g dry wt)
Gasoline range organics	U	20
Diesel range organics	18000	50
No. 6/lube oil range organics	U	100

U = Below quantitation limit

Lab Number: 5217-1
Field ID: 4000 g Gasoline UST Base of Exc - Comp
Matrix: Solid

	Concentration (ug/g)	Quantitation Limit (ug/g)	Date Analyzed:
Gasoline range organics	U	10	11/21/94

Method Reference: EPA SW 846, 3rd Edition. Method 8015, modified.

C.A.B. SERVICES, INC.
POLLUTION CONTROL

RECEIVED
APR 17 1995
DEPARTMENT OF
ENVIRONMENTAL SERVICES

April 12, 1995

Mr. Blaise T. Heroux
Emergency Response/Oil Pollution Control Section
New Hampshire Department of Environmental Services
6 Hazen Drive / P.O. Box 95
Concord, New Hampshire 03302-0095

Re: Sanel Realty Property, Old Suncook Road, Workscope and Budget Estimate for Petroleum Contaminated Soil Removal (DES#950246).

Dear Sir:

In response to your letter of February 24, 1995, which requires submitting an Initial Site Characterization (ISC) report for the above referenced site, we request authorization to provide an alternative workscope for the following reasons:

- Petroleum contamination noted in our UST Closure Report (1/17/95) appeared limited to the diesel dispenser area only.
- Laboratory analysis did not detect VOC's or TPH in the soil samples collected from the UST excavation areas.
- Removal of a limited amount of petroleum contaminated soil from under the former diesel dispenser location may be enough to remediate the site without the need for further work.

We would appreciate your review and approval of the enclosed workscope and budget estimate.

Please call our office if you have any questions regarding this information. Thank you for your assistance with this project.

Cordially,

AMB

Alan M. Bryant

Encl: ODDCF Budget Estimate

cc: Mr. George Oberlander
Sanel Realty Company
P.O. Box 1254
Concord, New Hampshire 03301

NEW HAMPSHIRE OIL FUND DISBURSEMENT BOARD

OIL DISCHARGE CLEANUP FUND - WORKSCOPE AND BUDGET ESTIMATE

DES No:	950246	410/412 Phase:	
Facility Name:	Sanel Realty	Fund Applicant:	Sanel Realty
Town:	Concord	Prepared By:	A. M. Bryant
Proposed Budget:	$4,012.50	Owner:	Sanel Realty
Date Prepared:	4/12/95		

TASK	CONTRACTOR	DESCRIPTION	CLASS CODE	OVERALL BREAKDOWN UNITS	TYPE	RATE	COST	BREAKDOWN BY CLASS: ENG-HYDRO SERVICES	LAB SERVICES	SUBSURFACE EXPL.	UST REM./ REST.	SOIL TMT. DISP.	GW TMT. PROD REC	Other
1.0 Workscope Prep.	C.A.B. Services	Pr. Eng. - Office	E	1.50	hrs.	$65.00	$97.50	$97.50	--	--	--	--	--	--
					Task Total:		$97.50	$97.50	--	--	--	--	--	--
2.0 Contaminated Soil Removal and Backfill	C.A.B. Services	Pr. Eng. - Field	E	8.00	hrs.	$65.00	$520.00	$520.00	--	--	--	--	--	--
		Equipment/OVM	E	1.00	LS	$150.00	$150.00	$150.00	--	--	--	--	--	--
		Soil:						--	--	--	--	--	--	--
		VOC's/TPH/FP	L	1.00	ea.	$260.00	$260.00	--	$260.00	--	--	--	--	--
		VOC's/PAH's/TPH	L	2.00	ea.	$325.00	$650.00	--	$650.00	--	--	--	--	--
		Operator	S	8.00	hrs.	$35.00	$280.00	--	--	--	--	$280.00	--	--
		Laborer	S	8.00	hrs.	$30.00	$240.00	--	--	--	--	$240.00	--	--
		Backhoe	S	8.00	hrs.	$45.00	$360.00	--	--	--	--	$360.00	--	--
		Dump Truck	S	8.00	hrs.	$20.00	$160.00	--	--	--	--	$160.00	--	--
		Vehicle	E	8.00	hrs.	$15.00	$120.00	--	--	--	--	$120.00	--	--
		Backfill	S	15.00	tns.	$10.00	$150.00	--	--	--	--	$150.00	--	--
		Polyethylene	S	1.00	rl.	$100.00	$100.00	--	--	--	--	$100.00	--	--
					Task Total:		$2,990.00	$670.00	$910.00	--	--	$1,410.00	--	--
3.0 Load, Transport and Recycle Soil	MTS, Inc.	Loading	S	1.00	LS	$200.00	$200.00	--	--	--	--	$200.00	--	--
		Transportation	S	2.00	hrs.	$35.00	$70.00	--	--	--	--	$70.00	--	--
		Recycling	S	15.00	tns.	$35.00	$525.00	--	--	--		$525.00	--	--
					Task Total:		$795.00	--	--	--	--	$795.00	--	--
4.0 Report Writing	C.A.B. Services	Pr. Eng.	E	2.00	hrs.	$65.00	$130.00	$130.00	--	--	--	--	--	--
					Task Total:		$130.00	$130.00	--	--	--	--	--	--
					SUB-TOTAL:		$4,012.50	$897.50	$910.00	--	--	$2,205.00	--	--

TOTAL
BUDGET ESTIMATE
Task 1, 2, 3, and 4: **$4,012.50**

Phase Codes:
- IRA - Initial Response Action
- FPR - Free Product Removal
- ISC - Initial Site Characterization
- SIR - Site Investigation Report
- RAP - Remedial Action Plan
- RPI - Remedial Plan Implementation
- GMP - GW Monitoring/Permits

Class Codes:
- E = Engineering/Hydrogeologic Services
- L = Laboratory Services
- X = Subsurface Exploration
- U = UST Removals/Restoration
- S = Contaminated Soils Treatment/Disposal
- G = GW Treatment/Product Recovery
- O = Other

State of New Hampshire
DEPARTMENT OF ENVIRONMENTAL SERVICES
6 Hazen Drive, P.O. Box 95, Concord, NH 03302-0095
603-271-3503 FAX 603-271-2867
TDD Access: Relay NH 1-800-735-2964

February 24, 1995

Mr. George Oberlander
Sanel Realty Company Inc.
PO Box 1254
Concord, New Hampshire 03301

RE: CONCORD, 129 MANCHESTER STREET, INITIAL SITE CHARACTERIZATION REQUEST (DES#950246)

Dear Mr. Oberlander:

On January 23, 1995, the New Hampshire Department of Environmental Services (DES) received information from C.A.B Services, Inc., indicating that a discharge of oil as defined in New Hampshire Code of Administrative Rules, Env-Ws 412.02 and Env-Ws 412.03 ("Reporting and Remediation of Oil Discharges"), has occurred at Automotive Supply Associates located at 129 Manchester Street, Concord, New Hampshire.

Based on this information, this office requests that an Initial Site Characterization (ISC) report be completed for this site as required by Env-Ws 412.08. Please refer to Env-Ws 412.08 when conducting the ISC. An ISC is conducted to determine if a site investigation, which defines the nature, extent, and magnitude of contamination at the site and off-site surrounding areas, is warranted. A site investigation is not required if the ISC establishes that no free product, little or no soil contamination, and/or no actual or potential groundwater or surface water impact from the discharge is present at the site. In addition, the ISC identifies receptors and potential receptors to allow DES to assign priority ranking for reviewing reports on the site based on identified risk to the receptors.

The New Hampshire Petroleum Reimbursement Funds (Funds) provide financial assistance to qualified owners of petroleum storage facilities who incur costs for investigation and cleanup of contamination from the release (spill or leak) of petroleum products. To qualify for the state fund coverage, the facility must be in compliance with all applicable state and federal rules for operation and maintenance, and work must be pre-approved for scope and budget. The owner must certify that compliance will be maintained by completing the "Acceptance of Conditions of Fund Eligibility" on the application form. Enclosed is a packet of information on the different reimbursement funds that will guide you through the reimbursement process.

In order to assist in the prompt completion of a DES requested site characterization, a standardized pre-approved work scope along with an example of a quality ISC Report has been enclosed for your use by you and your consultant. If you intend to utilize the Funds, a budget of not to exceed $3,500 for engineering costs and report preparation is hereby approved. Laboratory costs and sub-contractor costs shall be reimbursable at the prevailing market rates. The ISC Report is due to this office no later than thirty (30) days from receipt of this letter. Documentation that the facility is in compliance with all applicable state and federal rules for operation and maintenance, and a signed copy of the "Reimbursement Request Form," must accompany the ISC Report for this work to be eligible for reimbursement.

If special conditions associated with this site require work beyond the standardized workscope, a detailed proposal and budget estimate must be submitted to this office for approval no later than fifteen (15) days after receipt of this letter with the final report due 30 days after approval of said workscope. If you do not intend to utilize the Funds, an ISC Report shall be submitted to this office no later than 30 days following the receipt of this letter.

Enclosed, along with the ISC Packet, is a complete copy of DES rules for "Reporting and Remediation of Oil Discharges" (Env-Ws 412), an information packet on the New Hampshire Petroleum Remediation Funds, and a list of consultants that may perform an ISC.

If you have questions, please contact me at the Water Supply and Pollution Control Division at (603) 271-2872.

Sincerely,

Blaise T. Heroux

Blaise T. Heroux
Groundwater Protection Bureau

BTH/emw:144\2-95
Enc: Env-Ws 412
Engineers List
ODDCF Information Package
Workscope Packet
cc: Harry T. Stewart, P.E., WSPCD
Lynn A. Woodard, P.E., WSPCD
City of Concord

PRE-APPROVED STANDARDIZED INITIAL SITE CHARACTERIZATION WORKSCOPE

SCOPE OF WORK

Task 1 - Background Information Review

A review of local and State records will be performed which is adequate to meet the requirements of Env-Ws 412.08. The objective of the records review is to obtain key site information which shall include:

- Site address and tax map/lot number.
- Site and site area land-use information.
- Identification of receptors and potential receptors, including the locations of wells, basements, and surface waters within the immediate site vicinity.
- Locations of underground utilities, drains and sewers.
- Whether the site is located in a wellhead protection or other sensitive resource area.
- Information on past and present use of oil and hazardous materials at the site and adjacent sites.
- Locations of existing or former petroleum storage facilities such as USTs, floor drains, or other potential sources for the release of oil or hazardous materials at the site and adjacent sites.

Records reviewed may include, as necessary, the available information for the site from the site owner, Fire Department records, and NHDES records pertaining to petroleum storage facilities, contaminated sites, wellhead protection areas, and public water supplies.

Task 2 - Site-Specific Health and Safety Plan

Prior to the initiation of field work, a site-specific health and safety plan will be prepared in accordance with OSHA 29 CFR 1910.120. The Health and Safety Plan will include, at a minimum, descriptions of personal protective clothing and equipment, decontamination procedures, site hazards, environmental and/or personal monitoring, disposal of investigation-derived materials and an emergency response plan. It is noted that the health and safety plan should be adequate for subsequent activities, if any, at the site.

Task 3 - Subsurface Investigations

Test pits will be excavated using a backhoe or excavator, or borings will be advanced in the source area using a drilling rig. Test pit excavations or borings will be observed by the consultant. This work will be performed in one day with observation by consultant field personnel with appropriate field screening and sampling equipment. Backfilling of the test pits or borings will occur immediately after excavation or drilling.

Task 4 - Environmental Sampling

Task 4.1 - Soil Sample Analysis

Soil samples obtained by the consultant during the excavation will be field screened for Volatile Organic Compounds (VOCs) using a photoionization detector (PID), Hanby tests, and/or immunoassay tests and the results recorded for inclusion in the ISC Report. Based on field observations, soil samples will be collected for further laboratory chemical analyses. Soil samples obtained by the consultant during subsurface investigations will be stored on ice for transportation to the laboratory. NHDES and EPA chain-of-custody procedures will be maintained for each sample. A maximum of four (4) samples will be analyzed by an NHDES-certified laboratory for chemical analyses as described below. At the discretion of the consultant, the soil samples analyzed by the laboratory may be either the original field samples or composites of field samples from specific areas of the site. The initial round of soil samples will be analyzed by the laboratory in accordance with NHDES "Recommended Analytical Methods for Petroleum Contaminated Sites" (see Table II enclosed). Testing for additional chemical parameters may be recommended based on a review of the site history and field observations made during subsurface investigations, but require prior approval by the facility owner and verbal approval from NHDES.

Task 4.2 - Groundwater Sample Analysis

If groundwater is encountered during the subsurface investigation, groundwater samples will be collected by the consultant. One groundwater sample per UST excavation may be submitted to a NHDES-certified laboratory for analyses. For the purposes of this Scope of Work, it is assumed that two (2) groundwater samples will require analyses. The initial round of groundwater samples will be analyzed for VOCs in accordance with NHDES "Recommended Analytical Methods for Petroleum Contaminated Sites" (see Table II enclosed). Testing for additional chemical parameters may be recommended based on a review of the site history and field observations made during subsurface investigations, but require prior approval by the facility owner and verbal approval from NHDES.

Task 5 - Initial Site Characterization Report Preparation

An ISC Report will be prepared which presents the results of the investigations described above. The report shall meet the requirements of Env-Ws 412.08 and shall be prepared in accordance with the format described below.

STANDARD ISC REPORT FORMAT GUIDE

The ISC report shall contain the following:

I. COMPLETED STANDARDIZED COVER SHEET

II. INTRODUCTION/SITE DESCRIPTION

A. Briefly outline (one paragraph) the subject of the ISC (e.g., to assess a UST removal area for groundwater contamination). State the nature of the release, if known. Include a description of the "site" or "study area" as appropriate, and include a discussion of site and site area land use and surface (including stormwater) drainage.

B. Present a brief summary of past and present petroleum storage facilities at the site, and other potential site sources in proximity to the study area.

III. FIELD PROCEDURES

A. Briefly describe field procedures including exploration methods (test pits, borings), screening equipment (PID, Immunoassay, Hanby, etc.)

B. Briefly describe work accomplished, exploration depths and limits, excavated soil quantities, and subsurface conditions (soil types, groundwater) encountered.

C. Briefly discuss field screening and laboratory results.

IV. CONCLUSIONS

A. Discuss the contamination identified and make a preliminary assessment of its vertical and lateral extent.

B. Describe the site subsurface conditions placing particular emphasis on a preliminary assessment of groundwater flow direction.

C. Discuss potential receptors, NHDES risk category, and any specific concerns as identified.

D. Render an opinion as to the outcome of the characterization and actions taken. Make recommendations for future actions such as conducting a site investigation, additional soil removal or no further action.

V. TABLES

A. One page (recommended if not feasible to include on site plan) summary of field screening and laboratory data for both soil and groundwater.

VI. FIGURES

A. Locus Map

1. Use USGS map as base, include on one page only.

B. Receptor (site area) Map

1. Need only be a good copy of tax map (recommended);
2. Identify wells and surface waters to within 1,000 feet;
3. Identify basements, underground utilities, drainage structures and stormwater systems to within 250 feet and indicate basement use; and
4. Indicate if the site is in a Wellhead Protection Area. (Information concerning Wellhead Protection Areas is available at NHDES.)

C. Site Plan

1. Drawn to scale and should identify the study area (if not the whole property) and important features;
2. Tabulation of field screening and laboratory data on this figure if feasible;
3. Include former and existing structure (e.g., UST, drywell) areas, buildings (and basements) and subsurface explorations;
4. Show petroleum storage facility removal excavations and soil removal excavations; and
5. Use symbols to identify key topographic features, but topographic contours are not necessary.

VII. APPENDICES

A. Laboratory Data (do <u>not</u> include tank tightness test data, closure forms, etc.);
B. Exploration Logs; and
C. Limitations.

VIII. PROJECT SCHEDULE

The ISC Report will be completed within thirty (30) days of receipt of the NHDES request for the ISC work.

* * *

An example of a quality site characterization report is provided.

NHDES COPY

C.A.B. SERVICES, INC.
POLLUTION CONTROL

RECEIVED
JUL 21 1995
DEPARTMENT OF ENVIRONMENTAL SERVICES

June 7, 1995

Mr. Blaise Heroux
Emergency Response/Pollution Control Section
NH Department of Environmental Services
6 Hazen Drive / P.O. Box 95
Concord, New Hampshire 03302-0095

Re: Soil Sampling and Analysis, Sanel Realty Property, Old Suncook Rd., Concord. DES#950246.

Dear Sir:

On Thursday, November 10, 1994, a 12,000 gallon underground diesel storage tank and one 4,000 gallon underground gasoline storage tank (UST) were removed at the above referenced site. During UST closure, petroleum contamination was detected in vicinity of the diesel dispenser. Laboratory analyses detected TPH at 18,000 µg/g which exceeds the acceptable limit of the NHDES Soils Policy.

In accordance with your authorization letter of April 21, 1995, C.A.B. Services and Scott Coen Construction personnel returned to the above referenced site on Thursday May 11, 1995, to excavate and stockpile petroleum contaminated soil. Soil excavation location has been shown on the attached Excavation Location Plan.

Field analysis of soil samples, collected at 5' and 6'6" below the former location of the diesel dispenser, detected volatile organic compounds (VOC's) which ranged from 17.8 to 40.7 parts per million (ppm). Visual staining and petroleum odors were not observed during field analysis. Soil samples were collected at each depth and delivered to a certified laboratory for analysis.

Analyses were performed by Methods 8100, 8260, and 8270 for detection of volatile organic compounds (VOC's), polyaromatic hydrocarbons (PAH's), and total petroleum hydrocarbons (TPH). Laboratory results were received at our office on May 30, 1995.

Laboratory analysis did not detect VOC's or PAH's above minimum analytical detection limits. TPH was detected in the soil sample collected from 5' below grade at 612 milligrams per kilogram (mg/kg). TPH was not detected in the soil sample collected at 6' below grade. Laboratory results have been enclosed.

Based on field observations and laboratory analysis, no further investigative or remediation efforts appear necessary at this time.

Please call our office if you have any questions regarding this report. Thank you for your assistance with this project.

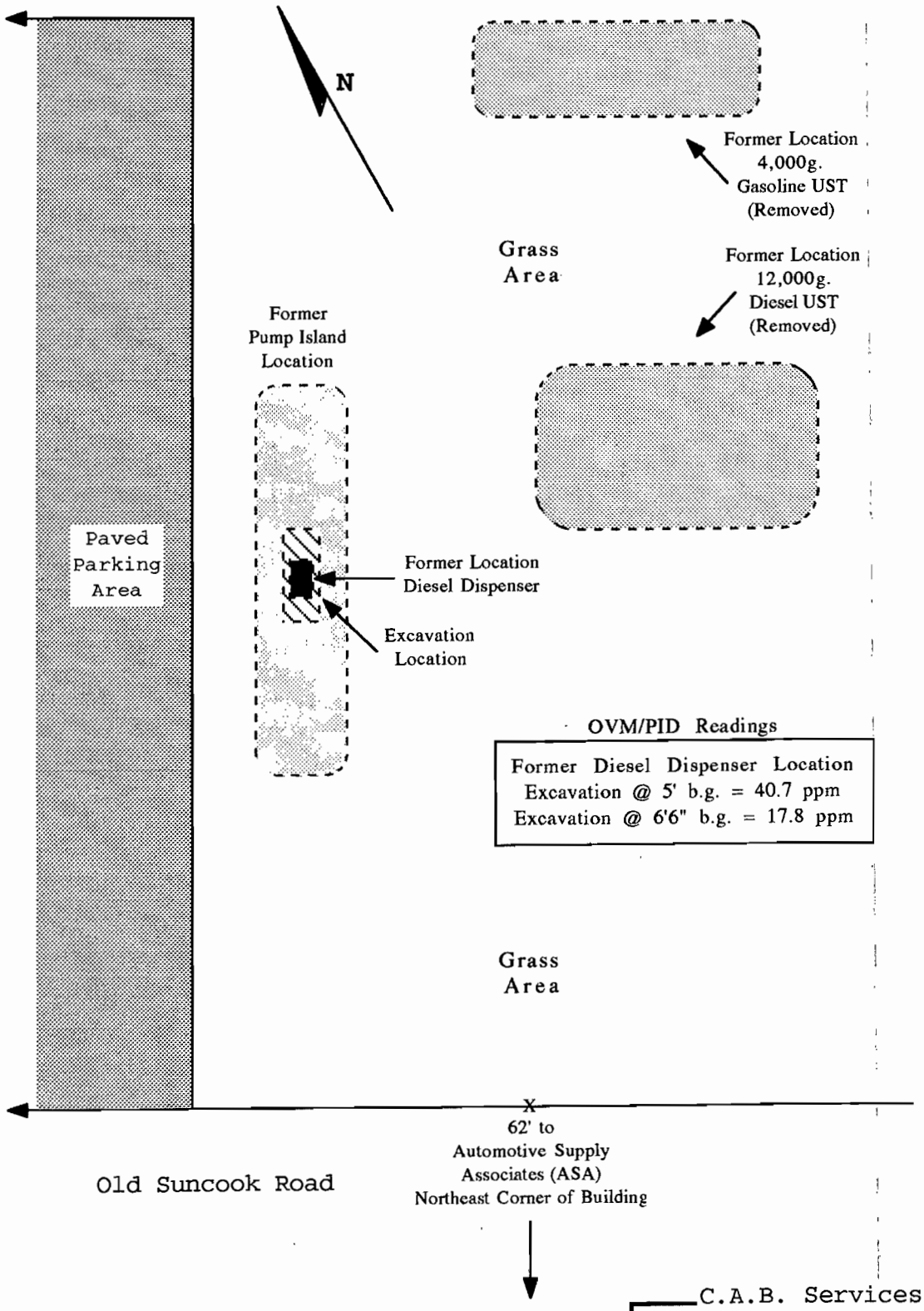
Cordially,

AMB

Alan M. Bryant

Encl: Analytical Results
Excavation Location Plan

cc: Mr. Scott Coen
Scott Coen Construction, Co.
P.O. Box 435
Contoocook, New Hampshire 03229



C.A.B. Services, Inc.

Sanel Realty Company, Inc.
Old Suncook Road
Map 110E Lot#4487-A
Concord, New Hampshire
Excavation Location Plan
Approximate Scale: 1" = 10'
May 1995

analytics environmental laboratory inc.

195 Commerce Way
Portsmouth, New Hampshire 03801
603-436-5111

RECEIVED MAY 30 1995

Mr. Bruce Bentham
C. A. B. Services, Inc.
P. O. Box 8
Dover, NH 03820

May 26, 1995

Re: **Sanel - Concord**

Enclosed are the results of the analyses on your sample(s). Please see individual reports for specific methodologies and references. Samples were received in acceptable condition, with the exceptions noted on the chain of custody.

If you have any further questions on the analytical methods or these results, do not hesitate to call.

Lab Number	Sample Date	Station Location	Analysis	Remarks
34572-1	05/11/95	5' Below Diesel Dispenser	EPA 8260, EPA 8270 (PAH) & Mod. EPA 8100	
34572-2	05/11/95	6'6" Below Diesel Dispenser	EPA 8260, EPA 8270 (PAH) & Mod. EPA 8100	

Analytics Environmental Laboratory is certified by the states of New Hampshire, Maine and Massachusetts. A list of actual certified tests is available upon request.

Authorized signature

analytics environmental laboratory inc.

195 Commerce Way
Portsmouth, New Hampshire 03801
603-436-5111

Mr. Bruce Bentham
C. A. B. Services, Inc.
P. O. Box 8
Dover, NH 03820

CLIENT SAMPLE ID

Client Project: Sanel - Concord

Project Number:
Station ID: 5' Below Diesel Dispenser

May 26, 1995

SAMPLE DATA

Lab #:	34572-1
Matrix:	Soil
Percent Solid:	96
Dilution Factor:	10
Collection Date:	05/11/95
Lab Receipt Date:	05/12/95
Analysis Date:	05/24/95

ANALYTICAL RESULTS VOLATILE ORGANICS

COMPOUND	Detection Limit: µg/kg	Result: µg/kg	COMPOUND	Detection Limit: µg/kg	Result: µg/kg
Vinyl chloride	20	ND	1,2-Dichloroethane	20	ND
1,1-Dichloroethene	20	ND	1,1,1-Trichloroethane	20	ND
cis-1,2-Dichloroethene	20	ND	1,1,2-Trichloroethane	20	ND
trans-1,2-Dichloroethene	20	ND	1,1,1,2-Tetrachloroethane	20	ND
Trichloroethene	20	ND	1,1,2,2-Tetrachloroethane	20	ND
Tetrachloroethene	20	ND	Chlorobenzene	20	ND
Chloromethane	20	ND	Benzene	20	ND
Methylene chloride	20	ND	Toluene	20	ND
Chloroform	20	ND	Ethylbenzene	20	ND
Carbon tetrachloride	20	ND	o-Xylene	20	ND
Bromodichloromethane	20	ND	m,p-Xylene	20	ND
Dibromochloromethane	20	ND	Methyl t-butyl ether	20	ND
Bromoform	20	ND	o-Dichlorobenzene	20	ND
Chloroethane	20	ND	m-Dichlorobenzene	20	ND
1,1-Dichloroethane	20	ND	p-Dichlorobenzene	20	ND

ND=None Detected <=Less than >=Greater than

METHODOLOGY: Sample analysis was conducted according to "Test Methods for Evaluating Solid Waste, SW-846 Method 8260."

Authorized signature

analytics environmental laboratory inc.

195 Commerce Way
Portsmouth, New Hampshire 03801
603-436-5111

Mr. Bruce Bentham
C. A. B. Services, Inc.
P. O. Box 8
Dover, NH 03820

May 26, 1995

CLIENT SAMPLE ID

Client Project: Sanel - Concord

Project Number:
Station ID: 5' Below Diesel Dispenser

SAMPLE DATA

Lab #:	34572-1
Matrix:	Soil
Percent Solid:	96
Dilution Factor:	10
Collection Date:	05/11/95
Lab Receipt Date:	05/12/95
Analysis Date:	05/24/95

ANALYTICAL RESULTS VOLATILE ORGANICS

COMPOUND	Detection Limit: µg/kg	Result: µg/kg	COMPOUND	Detection Limit: µg/kg	Result: µg/kg
1,2-Dichloropropane	20	ND	Dichlorodifluoromethane	20	ND
cis-1,3-Dichloropropene	20	ND	Trichlorofluoromethane	20	ND
trans-1,3-Dichloropropene	20	ND	Styrene	20	ND
n-Butylbenzene	20	ND	Naphthalene	20	ND
sec-Butylbenzene	20	ND	Bromobenzene	20	ND
tert-Butylbenzene	20	ND	Bromochloromethane	20	ND
2-Chlorotoluene	20	ND	Bromomethane	20	ND
4-Chlorotoluene	20	ND	1,2-Dibromo-3-chloropropane	20	ND
Isopropylbenzene	20	ND	1,2-Dibromoethane	20	ND
4-Isopropyltoluene	20	ND	Dibromomethane	20	ND
n-Propylbenzene	20	ND	1,3-Dichloropropane	20	ND
1,2,3-Trichlorobenzene	20	ND	2,2-Dichloropropane	20	ND
1,2,4-Trichlorobenzene	20	ND	1,1-Dichloropropene	20	ND
1,2,4-Trimethylbenzene	20	ND	Hexachlorobutadiene	20	ND
1,3,5-Trimethylbenzene	20	ND	1,2,3-Trichloropropane	20	ND

Surrogate Standard Recovery

d4-1,2-Dichloroethane	89 %	d8-Toluene	96 %	Bromofluorobenzene	110 %

ND=None Detected <=Less than >=Greater than

METHODOLOGY: Sample analysis was conducted according to "Test Methods for Evaluating Solid Waste, SW-846 Method 8260."

COMMENTS: Results are expressed on a dry weight basis.

Authorized signature

analytics environmental laboratory inc.

195 Commerce Way
Portsmouth, New Hampshire 03801
603-436-5111

Mr. Bruce Bentham
C. A. B. Services, Inc.
P. O. Box 8
Dover, NH 03820

CLIENT SAMPLE ID

Client Project: Sanel - Concord

Project Number:
Station ID: 6'6" Below Diesel Dispenser

May 26, 1995

SAMPLE DATA

Lab #:	34572-2
Matrix:	Soil
Percent Solid:	96
Dilution Factor:	10
Collection Date:	05/11/95
Lab Receipt Date:	05/12/95
Analysis Date:	05/24/95

ANALYTICAL RESULTS VOLATILE ORGANICS

COMPOUND	Detection Limit: µg/kg	Result: µg/kg	COMPOUND	Detection Limit: µg/kg	Result: µg/kg
Vinyl chloride	20	ND	1,2-Dichloroethane	20	ND
1,1-Dichloroethene	20	ND	1,1,1-Trichloroethane	20	ND
cis-1,2-Dichloroethene	20	ND	1,1,2-Trichloroethane	20	ND
trans-1,2-Dichloroethene	20	ND	1,1,1,2-Tetrachloroethane	20	ND
Trichloroethene	20	ND	1,1,2,2-Tetrachloroethane	20	ND
Tetrachloroethene	20	ND	Chlorobenzene	20	ND
Chloromethane	20	ND	Benzene	20	ND
Methylene chloride	20	ND	Toluene	20	ND
Chloroform	20	ND	Ethylbenzene	20	ND
Carbon tetrachloride	20	ND	o-Xylene	20	ND
Bromodichloromethane	20	ND	m,p-Xylene	20	ND
Dibromochloromethane	20	ND	Methyl t-butyl ether	20	ND
Bromoform	20	ND	o-Dichlorobenzene	20	ND
Chloroethane	20	ND	m-Dichlorobenzene	20	ND
1,1-Dichloroethane	20	ND	p-Dichlorobenzene	20	ND

ND=None Detected <=Less than >=Greater than

METHODOLOGY: Sample analysis was conducted according to "Test Methods for Evaluating Solid Waste, SW-846 Method 8260."

Authorized signature

analytics environmental laboratory inc.

195 Commerce Way
Portsmouth, New Hampshire 03801
603-436-5111

Mr. Bruce Bentham
C. A. B. Services, Inc.
P. O. Box 8
Dover, NH 03820

May 26, 1995

CLIENT SAMPLE ID

Client Project: Sanel - Concord

Project Number:
Station ID: 6'6" Below Diesel Dispenser

SAMPLE DATA

Lab #:	34572-2
Matrix:	Soil
Percent Solid:	96
Dilution Factor:	10
Collection Date:	05/11/95
Lab Receipt Date:	05/12/95
Analysis Date:	05/24/95

ANALYTICAL RESULTS VOLATILE ORGANICS

COMPOUND	Detection Limit: µg/kg	Result: µg/kg	COMPOUND	Detection Limit: µg/kg	Result: µg/kg
1,2-Dichloropropane	20	ND	Dichlorodifluoromethane	20	ND
cis-1,3-Dichloropropene	20	ND	Trichlorofluoromethane	20	ND
trans-1,3-Dichloropropene	20	ND	Styrene	20	ND
n-Butylbenzene	20	ND	Naphthalene	20	ND
sec-Butylbenzene	20	ND	Bromobenzene	20	ND
tert-Butylbenzene	20	ND	Bromochloromethane	20	ND
2-Chlorotoluene	20	ND	Bromomethane	20	ND
4-Chlorotoluene	20	ND	1,2-Dibromo-3-chloropropane	20	ND
Isopropylbenzene	20	ND	1,2-Dibromoethane	20	ND
4-Isopropyltoluene	20	ND	Dibromomethane	20	ND
n-Propylbenzene	20	ND	1,3-Dichloropropane	20	ND
1,2,3-Trichlorobenzene	20	ND	2,2-Dichloropropane	20	ND
1,2,4-Trichlorobenzene	20	ND	1,1-Dichloropropene	20	ND
1,2,4-Trimethylbenzene	20	ND	Hexachlorobutadiene	20	ND
1,3,5-Trimethylbenzene	20	ND	1,2,3-Trichloropropane	20	ND

Surrogate Standard Recovery

d4-1,2-Dichloroethane	87 %	d8-Toluene	97 %	Bromofluorobenzene	104 %

ND=None Detected <=Less than >=Greater than

METHODOLOGY: Sample analysis was conducted according to "Test Methods for Evaluating Solid Waste, SW-846 Method 8260."

COMMENTS: Results are expressed on a dry weight basis.

Authorized signature

analytics environmental laboratory inc.

195 Commerce Way
Portsmouth, New Hampshire 03801
603-436-5111

Mr. Bruce Bentham
C. A. B. Services, Inc.
P. O. Box 8
Dover, NH 03820

CLIENT SAMPLE ID

Client Project: Sanel - Concord
Project Number:
Station ID: 5' Below Diesel Dispenser

May 26, 1995
SAMPLE DATA

Lab #:	34572-1
Matrix:	Soil
Percent Solid:	96
Dilution Factor:	1.0
Collection Date:	05/11/95
Lab Receipt Date:	05/12/95
Extraction Date:	05/17/95
Analysis Date:	05/24/95

ANALYTICAL RESULTS SEMI-VOLATILES

COMPOUND	Detection Limit: µg/kg	Result: µg/kg
Polyaromatic Hydrocarbons:		
Acenaphthene	300	ND
Acenaphthylene	300	ND
Anthracene	300	ND
Benz[a]anthracene	300	ND
Benzo[a]pyrene	300	ND
Benzo(b)fluoranthene	300	ND
Benzo[ghi]perylene	300	ND
Benzo(k)fluoranthene	300	ND
Chrysene	300	ND
Dibenz[a,h]anthracene	300	ND
Fluoranthene	300	ND
Fluorene	300	ND
Indeno[1,2,3-cd]pyrene	300	ND
Pyrene	300	ND
2-Chloronaphthalene	300	ND
Naphthalene	300	ND
Phenanthrene	300	**<300**
2-Methylnaphthalene	300	ND

Surrogate Standard Recovery

d5-Nitrobenzene	58 %	2-Fluorobiphenyl	65 %	d14-p-Terphenyl	107 %

ND= None Detected <=Less than >=Greater than

METHODOLOGY: Sample was analyzed according to "Test Methods for Evaluating Solid Waste, SW-846 Method 8270."

COMMENTS: **Results are expressed on a dry weight basis.**

Authorized signature

analytics environmental laboratory inc.

195 Commerce Way
Portsmouth, New Hampshire 03801
603-436-5111

Mr. Bruce Bentham
C. A. B. Services, Inc.
P. O. Box 8
Dover, NH 03820

CLIENT SAMPLE ID

Client Project: Sanel - Concord
Project Number:
Station ID: 6'6" Below Diesel Dispenser

May 26, 1995
SAMPLE DATA

Lab #:	34572-2
Matrix:	Soil
Percent Solid:	96
Dilution Factor:	1.0
Collection Date:	05/11/95
Lab Receipt Date:	05/12/95
Extraction Date:	05/17/95
Analysis Date:	05/24/95

ANALYTICAL RESULTS SEMI-VOLATILES

COMPOUND	Detection Limit: µg/kg	Result: µg/kg
Polyaromatic Hydrocarbons:		
Acenaphthene	300	ND
Acenaphthylene	300	ND
Anthracene	300	ND
Benz[a]anthracene	300	ND
Benzo[a]pyrene	300	ND
Benzo(b)fluoranthene	300	ND
Benzo[ghi]perylene	300	ND
Benzo(k)fluoranthene	300	ND
Chrysene	300	ND
Dibenz[a,h]anthracene	300	ND
Fluoranthene	300	ND
Fluorene	300	ND
Indeno[1,2,3-cd]pyrene	300	ND
Pyrene	300	ND
2-Chloronaphthalene	300	ND
Naphthalene	300	ND
Phenanthrene	300	ND
2-Methylnaphthalene	300	ND

Surrogate Standard Recovery

d5-Nitrobenzene	51 %	2-Fluorobiphenyl	50%	d14-p-Terphenyl	104%

ND= None Detected <=Less than >=Greater than

METHODOLOGY: Sample was analyzed according to "Test Methods for Evaluating Solid Waste, SW-846 Method 8270."

COMMENTS: **Results are expressed on a dry weight basis.**

Authorized signature

analytics environmental laboratory inc.

195 Commerce Way
Portsmouth, New Hampshire 03801
603-436-5111

Mr. Bruce Bentham
C. A. B. Services, Inc.
P. O. Box 8
Dover, NH 03820

May 22, 1995

Client Project: Sanel - Concord

Project Number:

Station ID: 5' Below Diesel Dispenser

Lab #:	34572-1
Matrix:	Soil
Percent Solid:	96
Dilution Factor:	1.0
Collection Date:	05/11/95
Lab Receipt Date:	05/12/95
Extraction Date:	05/15/95
Analysis Date:	05/18/95

TOTAL PETROLEUM HYDROCARBON ANALYSIS

Sample	Result	Units	Detection Limit
34572-1	**612***	mg/kg	1

Surrogate Standard Recovery

m-Terphenyl	** %

Methodology: Water samples prepared by Separatory Funnel Liquid/Liquid Extraction, "Test Methods for Evaluating Solid Waste," Method 3510; other matrices prepared by Sonication Extraction, "Test Methods for Evaluating Solid Waste," Method 3550.

All matrices were analyzed according to "Test Methods for Evaluating Solid Waste, Modified SW-846 Method 8100."

Comments: **Results expressed on a dry weight basis. * The chromatographic fingerprint is indicative of No. 2 Fuel Oil. Quantitation performed based on a No. 2 Fuel Oil standard. **Unable to calculate surrogate recovery due to matrix interferences.**

The sample submitted was compared to the following standards for fingerprinting purposes: Gasoline, Kerosene, Paint Thinner, Mineral Spirits, Jet Fuel, #2, #4, #6 Fuel Oil, and Waste Oil.

Authorized signature 

analytics environmental laboratory inc.

195 Commerce Way
Portsmouth, New Hampshire 03801
603-436-5111

Mr. Bruce Bentham
C. A. B. Services, Inc.
P. O. Box 8
Dover, NH 03820

May 22, 1995

Client Project: Sanel - Concord

Project Number:

Station ID: 6'6" Below Diesel Dispenser

Lab #:	34572-2
Matrix:	Soil
Percent Solid:	96
Dilution Factor:	1.0
Collection Date:	05/11/95
Lab Receipt Date:	05/12/95
Extraction Date:	05/15/95
Analysis Date:	05/18/95

TOTAL PETROLEUM HYDROCARBON ANALYSIS

Sample	Result	Units	Detection Limit
34572-2	ND	mg/kg	1

Surrogate Standard Recovery

m-Terphenyl	89 %

Methodology: Water samples prepared by Separatory Funnel Liquid/Liquid Extraction, "Test Methods for Evaluating Solid Waste," Method 3510; other matrices prepared by Sonication Extraction, "Test Methods for Evaluating Solid Waste," Method 3550.

All matrices were analyzed according to "Test Methods for Evaluating Solid Waste, Modified SW-846 Method 8100."

Comments: **Results are expressed on a dry weight basis.**

Authorized signature

STATE OF NEW HAMPSHIRE

Inter-Department Communication

October 10, 1995

FROM: Blaise T. Heroux BTH
Groundwater Protection Bureau
AT (OFFICE) Water Supply & Pollution Control Division

SUBJECT: Concord, Automotive Supply Associates, File Close-Out (DES# 950246)

TO: File

PROJECT TYPE: X

FILE CLOSE-OUT

I have reviewed the file for subject site, and have determined that no further regulatory action is required. The file is therefore closed out as noted below. (check appropriate option):

X Initial Site Characterization Complete, No Further Action Warranted

The Tank Closure Report and/or Initial Site Characterization has been completed. The conclusion of the consultant or removal contractor is that no source remains on-site. Soil sampling and analysis confirms this conclusion.

_ Site Remediation Complete

All sources of groundwater contamination at the subject site discovered during the site investigation have been removed or remediated. Ambient groundwater quality standards are met throughout the site. Based on information in the Bureau files as of the date of this memo, additional investigation, remedial measures or groundwater monitoring is not required.

_ Site Remediation or Groundwater Monitoring NOT Required

Groundwater contamination at the subject site is a result of a discharge or release from an off-site source. Based on information in the Bureau files as of the date of this memo, additional investigation, remedial measures or groundwater monitoring by the site owner is not required.

* * * * * * * * * * * * * *

LUST TRUST COST RECOVERY CLOSE-OUT

I have reviewed the file for the subject site and have determined that the following cost recovery actions were taken (check appropriate option):

_ No LUST TRUST Monies Expended

Contamination at the subject site was not related to an on-site leaking underground storage tank. No LUST TRUST monies were expended.

_ Total LUST TRUST Cost Recovery

There has been a discharge related to an underground storage tank at the subject site. During the site investigation/remediation process, LUST TRUST monies were expended. All costs incurred by the State have been recovered from responsible parties. Amount recovered $____.

_ Partial LUST TRUST Cost Recovery

There has been a discharge related to an underground storage tank at the subject site. During the site investigation/remediation process, LUST TRUST monies were expended. A settlement was reached by the State and responsible parties and $____ out of a total cost of $___ incurred by the State was recovered.

X No LUST TRUST Cost Recovery

There has been a discharge related to an underground storage tank at the subject site. During the site investigation/remediation process, LUST TRUST monies were expended. Cost recovery was not pursued for the following reason(s) outlined below check appropriate reason(s) and attach supporting data if not already in file):

_ Owner/operator demonstrated lack of financial resources to pay the claim.

_ Project manager determined that the likelihood of success on litigating the claim as small because of the absence of proof of liability or unavailability of required witnesses.

X Cost of judicial collection is disproportionately high.

_ Cost of pursuing the case further will approach or exceed the potential recovery.

_ Bankruptcy of the owner/operator.

_ Statute of Limitations (3 years) has run out.

_ Other reasons (explain)_____

DES Waste Management Division
29 Hazen Drive; PO Box 95
Concord, NH 03302-0095

UNDERGROUND STORAGE TANK AND DRYWELL CLOSURE REPORT

Former Automotive Supply Associates
129 Manchester Street
Concord, New Hampshire

NHDES Site #199502046
UST Facility ID #0112058
UIC Project #0005789

Prepared For:
Banks Chevrolet
137 Manchester Street
Concord, New Hampshire 03301
Phone Number: (603) 229-4004
Contact Name: Mr. Fred Booth
Contact Email: fred.booth@banksautos.com

Prepared By:
Wilcox & Barton, Inc.
#1B Commons Drive, Unit 12B
Londonderry, New Hampshire 03053
Phone Number: (603) 369-4190 x527
Contact Name: Ms. Erin Lambert, P.E.
Contact Email: elambert@wilcoxandbarton.com

November 25, 2020

Wilcox & Barton, Inc. Project #BACC0002

William R. Wilcox, Jr.
Digitally signed by William R. Wilcox, Jr.
Date: 2020.11.25 11:48:20 -05'00'

Wilcox & Barton INC.

CIVIL • ENVIRONMENTAL • GEOTECHNICAL

UNDERGROUND STORAGE TANK AND DRYWELL CLOSURE REPORT

FORMER AUTOMOTIVE SUPPLY ASSOCIATES
129 MANCHESTER STREET
CONCORD, NEW HAMPSHIRE

NHDES SITE #199502046
UST FACILITY ID #0112058
UIC PROJECT #0005789

Prepared for:
Banks Chevrolet
137 Manchester Street
Concord, New Hampshire 03301
Contact: Mr. Fred Booth, (603) 229-4004

Prepared by:
Wilcox & Barton, Inc.
#1B Commons Drive, Unit 12B
Londonderry, New Hampshire 03053
Contact: Ms. Erin Lambert, (603) 369-4190 x527

November 25, 2020

Wilcox & Barton, Inc. Project #BACC0002

CERTIFICATION

The following personnel have prepared and/or reviewed this report for accuracy, content, and quality of presentation.

Document: Underground Storage Tank and Drywell Closure Report
Former Automotive Supply Associates
129 Manchester Street, Concord, New Hampshire
NHDES Site #199502046; UST Facility ID #0112058; UIC Project #0005789

Date/Version: November 25, 2020

Meghan E. Toft
Project Engineer

Chelsea M. Hensley
Project Geologist

Russell Barton
SVP – Principal Geologist

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Appendix A Photographs

Appendix B Wilcox & Barton, Inc. Standard Operating Procedures

Appendix C Laboratory Reports

Appendix D UST Closure Notification and Floor Drain Closure Notification Forms

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1.0 INTRODUCTION

Wilcox & Barton, Inc. was retained by Banks Chevrolet to oversee completion of a ground penetrating radar (GPR) survey, perform closure assessment during removal of two single-walled steel underground storage tanks (USTs) and piping, and closure assessment of a drywell at the former Automotive Supply Associates property at 129 Manchester Street in Concord, New Hampshire.

As part of the environmental due diligence, a Phase I Environmental Assessment, dated June 18, 2019 and revised July 1, 2019, was performed by Wilcox & Barton, Inc. According to The New Hampshire Department of Environmental Services (NHDES) records, Former Automotive Supply Associates is listed as NHDES Site #199502046 and registered as UST Facility #0112058. A total of six USTs are documented as "closed" on the NHDES online database; however, sparse and/or incomplete documentation for closure of the USTs was identified. The possibility of encountering USTs or UST appurtenances during redevelopment was documented in the Phase I report.

The GPR survey was competed by Radar Solutions International, Inc., (RSI) in response to limited documentation of UST closures at the site and after UST system appurtenances were identified during building demolition. Findings of the GPR survey are discussed below.

All tank closure activities were completed by Andrews Construction Co., Inc. (Andrews) of Campton, New Hampshire, in general accordance with the June 2014 NHDES guidance entitled *Requirements for Underground and Aboveground Storage Tank System and System Component Closure Sampling and Reporting* and the New Hampshire Code of Administrative Rules Env-Or 400 *Underground Storage Tank Facilities*. The drywell closure was completed by Andrews in general accordance with the *Code of Federal Regulations §144.89 and §144.82.*

2.0 SITE DESCRIPTION

The subject property, a 4.36-acre parcel identified by the City of Concord Assessor's Office as Map 110, Block D1, Lot 10, is in a residential and commercial area of Concord. The property is currently under construction for future use as a parking lot.

The topography across the site is generally level. The property is bound to the west by a mixed retail and apartment property, to the south by a restaurant and car dealership, to the east by a car dealership, and to the north by a parking lot and a park. The Soucook River is approximately 3,000 feet to the east, and the Merrimack River is approximately 3,300 feet to the southwest.

The USTs and dry well were located on the southern portion of the property within the former building footprint. The location of the site is depicted on Figure 1 – S*ite Location Map* and the site layout is shown on Figure 2 – *Closure Summary Plan*. UST closure photographs are provided in Appendix A.

3.0 GROUND PENETRATING RADAR

On August 31, 2020, RSI conducted a GPR survey on the eastern portion of the subject property and at the adjacent property to the north to evaluate the potential for USTs and/or UST system components. As referenced above, UST piping appurtenances where encountered during building demolition and based on historical site information other USTs where possibly present. Several anomalous zones of buried metal were located; however, no excavation was conducted in the GPR survey area as part of UST closure activities. Results of the GPR survey are presented on Figure 2.

4.0 CLOSURE OF USTS AND DRYWELL

From September 1, 2020 to September 3, 2020, Wilcox & Barton, Inc. oversaw the closure of two USTs, one drywell, and all associated piping. All activities were conducted in accordance with the *Wilcox & Barton Standard Operating Procedure (SOP)* documents included in Appendix B.

4.1 Field Screening

Wilcox & Barton, Inc. collected soil samples during closure of the USTs and dry well. Samples were screened with a Mini-RAE 3000 photoionization detector (PID). The PID was calibrated with isobutylene for the measurement of organic vapors on a part-per-million by volume (ppmv) basis.

4.2 500-Gallon #2 Fuel Oil UST

4.2.1 UST Closure

On September 1, 2020, Andrews removed the 500-gallon #2 heating oil UST. The UST was 500-gallons in capacity, stored heating oil and was of single-walled steel construction. The tank was encountered at approximately 1.5 feet below ground surface (bgs) and was observed to be in poor condition with visible evidence of rust and corrosion. The UST measured approximately 4.5 feet in diameter by 6 feet in length.

PID readings near the UST ranged from 0.0 to 133.1 ppmv, as summarized in Table 1 – *Soil Headspace Screening Results*. The elevated PID reading of 133.1 ppmv was an isolated area and was the result of leaking #2 heating oil from a puncture caused during tank removal.

On September 2, 2020, Clean Harbors/Cyn cut and cleaned the UST. Approximately 25 to 30 gallons of heating oil and cleaning fluids were stored in a 55-gallon drum on site.

4.2.2 Soil Sampling and Analysis

One discrete soil sample (S-1) was collected from the base of the UST excavation at 6 feet bgs. The sample was collected in accordance with the SOP provided in Appendix B and submitted for analysis of volatile organic compounds (VOCs) by Environmental Protection Agency (EPA)

Method 8260, polycyclic aromatic hydrocarbons (PAHs) by EPA Method 8270, and total petroleum hydrocarbons (TPH) by EPA Method 8015 under chain-of-custody to Con-Test Analytical Laboratory (Con-Test) in East Longmeadow, Massachusetts.

Eight petroleum-related VOCs and five PAHs were detected at concentrations or estimated concentrations below NHDES Soil Remediation Standards (SRS). No other VOCs or PAHs were detected above laboratory reporting limits. TPH was detected at a concentration of 130 milligrams per kilogram (mg/kg), well below the SRS of 10,000 mg/kg. Soil analytical results are summarized in Table 2 – *Soil Samples – Summary of Analytical Results* and the laboratory report is provided in Appendix C.

4.3 3,000-Gallon #2 Fuel Oil UST

4.3.1 UST Closure

The UST is identified as Tank #2 on the NHDES online database and is listed as a 3,000-gallon #2 heating oil UST of single-walled steel construction that was closed in place. The installation and closure dates of the UST are undocumented; however, records indicated that the UST had been filled with concrete and closed in place.

PID readings near the UST ranged from 0.0 to 78.0 ppmv, as summarized in Table 1 – *Soil Headspace Screening Results*. The elevated PID reading of 78.0 ppmv was an isolated area encountered along the top of the tank and could not be reproduced.

A UST Closure Notification Form was submitted to the NHDES on September 1, 2020, a copy of which is included in Appendix D. Mr. Cameron Stoddard (ICC No. 8320319) of Dirtworks, LLC provided *International Code Council (ICC) Certification* inspection during the UST removal activities.

On September 3, 2020, Andrews removed the previously closed-in-place UST. Concrete within the UST was broken apart using a hydraulic hammer affixed to an excavator. The UST was found to be in fair condition with limited amounts of rust and corrosion.

4.3.2 Soil Sampling and Analysis

Two discrete soil samples (S-201 and S-202) were collected from the base of the excavation at 12 feet bgs. The samples were submitted for analysis of VOCs by EPA Method 8260, PAHs by EPA Method 8270, and TPH by EPA Method 8015.

Acetone (a common laboratory contaminant), naphthalene (S-202 only), toluene (S-201 only), and phenanthrene (S-202 only) were detected at estimated concentrations below SRS. No other VOCs or PAHs were detected at concentrations above laboratory reporting limits. TPH was detected in both samples at concentrations well below SRS. Soil analytical results are summarized in Table 2 and the laboratory report is provided in Appendix C.

4.4 Drywell

4.4.1 Drywell Closure

On September 3, 2020, Andrews removed the drywell encountered during site redevelopment activities. The entire drywell structure was removed and the area was backfilled.

PID readings near the drywell were less than 1.0 ppmv, as summarized in Table 1 – *Soil Headspace Screening Results*.

The Discharge Well & Floor Drain Pre-Closure Notification Form was submitted to NHDES on September 2, 2020, a copy of which is included in Appendix D.

4.4.2 Soil Sampling and Analysis

One discrete soil sample (S-101) was collected from the base of the drywell excavation at 10 feet bgs. The sample was submitted for analysis of VOCs by EPA Method 8260, PAHs by EPA Method 8270, TPH by EPA Method 8015, TPH as gasoline-range organics (TPH-GRO) and as diesel-range organics (TPH-DRO), and RCRA 8 Metals by EPA Method 6010.

Acetone (a common laboratory contaminant) and methylene chloride were detected at estimated concentrations below SRS. No other VOCs were detected above laboratory reporting limits. No PAHs were detected above laboratory reporting limits. TPH and TPH-DRO were detected well below SRS. TPH-GRO was not detected above laboratory reporting limits. Arsenic, barium, chromium, and lead were detected at concentrations below SRS. Soil analytical results are summarized in Table 2 and the laboratory report is provided in Appendix C.

5.0 WASTE DISPOSAL

The USTs and piping materials were disposed of at Schnitzer Steel Industries, Inc. in Concord, NH.

A total of 30 gallons of oil/water mixture, including several gallons of petroleum removed from fuel piping encountered during building demolition, were transported under a Non-Hazardous Waste Manifest by Cyn Oil Corporation to their facility in Stoughton, Massachusetts. A copy of the waste manifest is included in Appendix E.

6.0 CONCLUSION

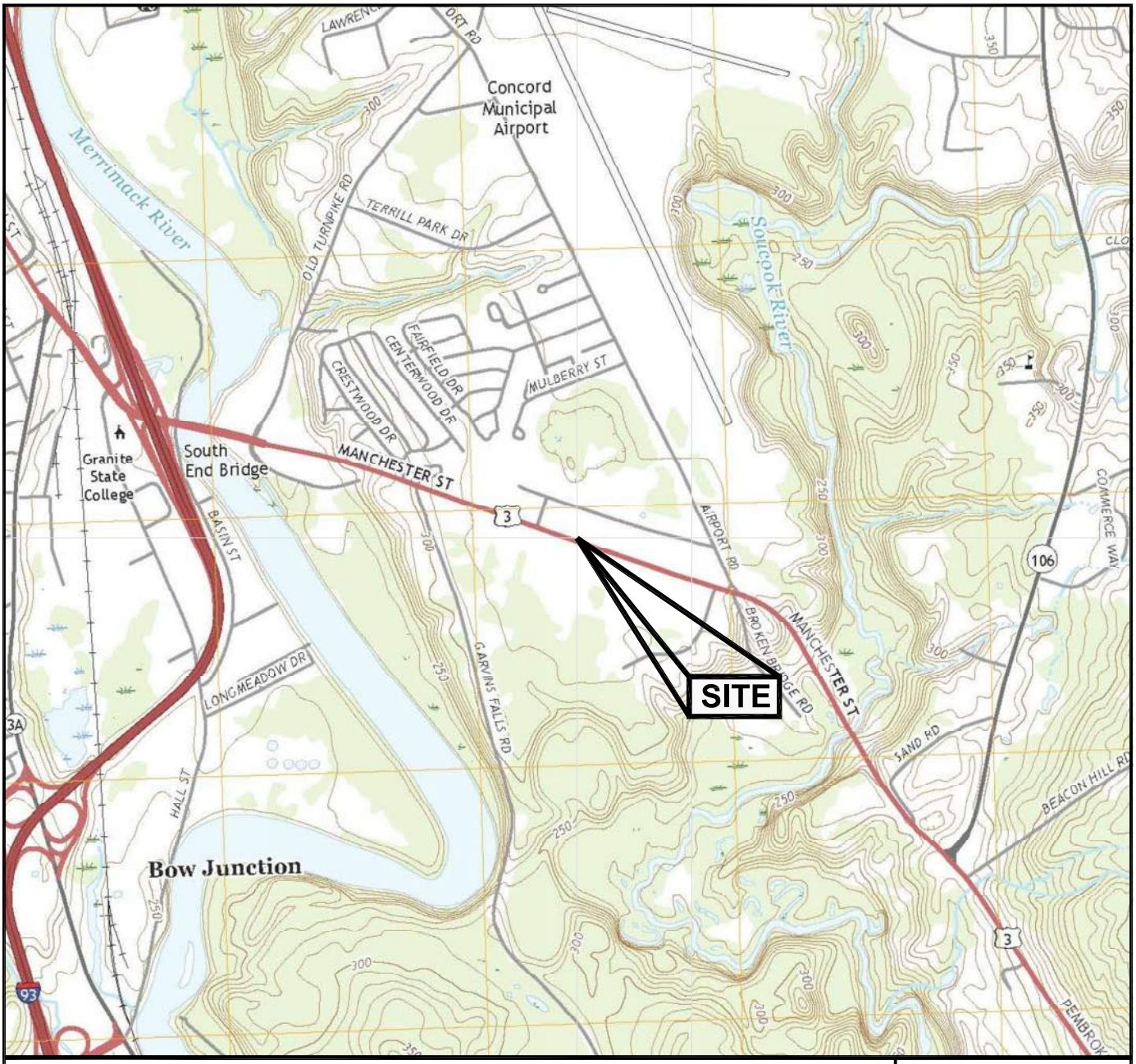
Between August 31, and September 3, 2020, RSI conducted a GPR survey and Andrews removed a 500-gallon single-walled steel UST, a previously closed-in-place 3,000-gallon UST, and a drywell.

During closure of the USTs and drywell, organic vapor readings ranged from 0.0 to 133.1 ppmv and no visual or olfactory evidence of a petroleum release was observed. Reported elevated PID readings were from isolated areas and could not be reproduced. Groundwater was not encountered during UST closure activities.

Laboratory analyses of four discrete soil samples from the limits of the UST and drywell excavations revealed no VOC compounds, PAH compounds, or TPH at concentrations exceeding SRS in the excavation areas.

All UST system closure requirements have been met; therefore, no further action with respect to this UST closure is warranted. Wilcox & Barton, Inc. recommends maintenance of this closure record by the property owner for the operating life of the facility in accordance with the requirements of New Hampshire Code of Administrative Rules Env Or 304.06.

FIGURES



SCALE: 1:24,000

1 1/2 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 .5 0 1 KILOMETER

CONTOUR INTERVAL 20 FEET
NORTH AMERICAN VERTICAL DATUM OF 1988

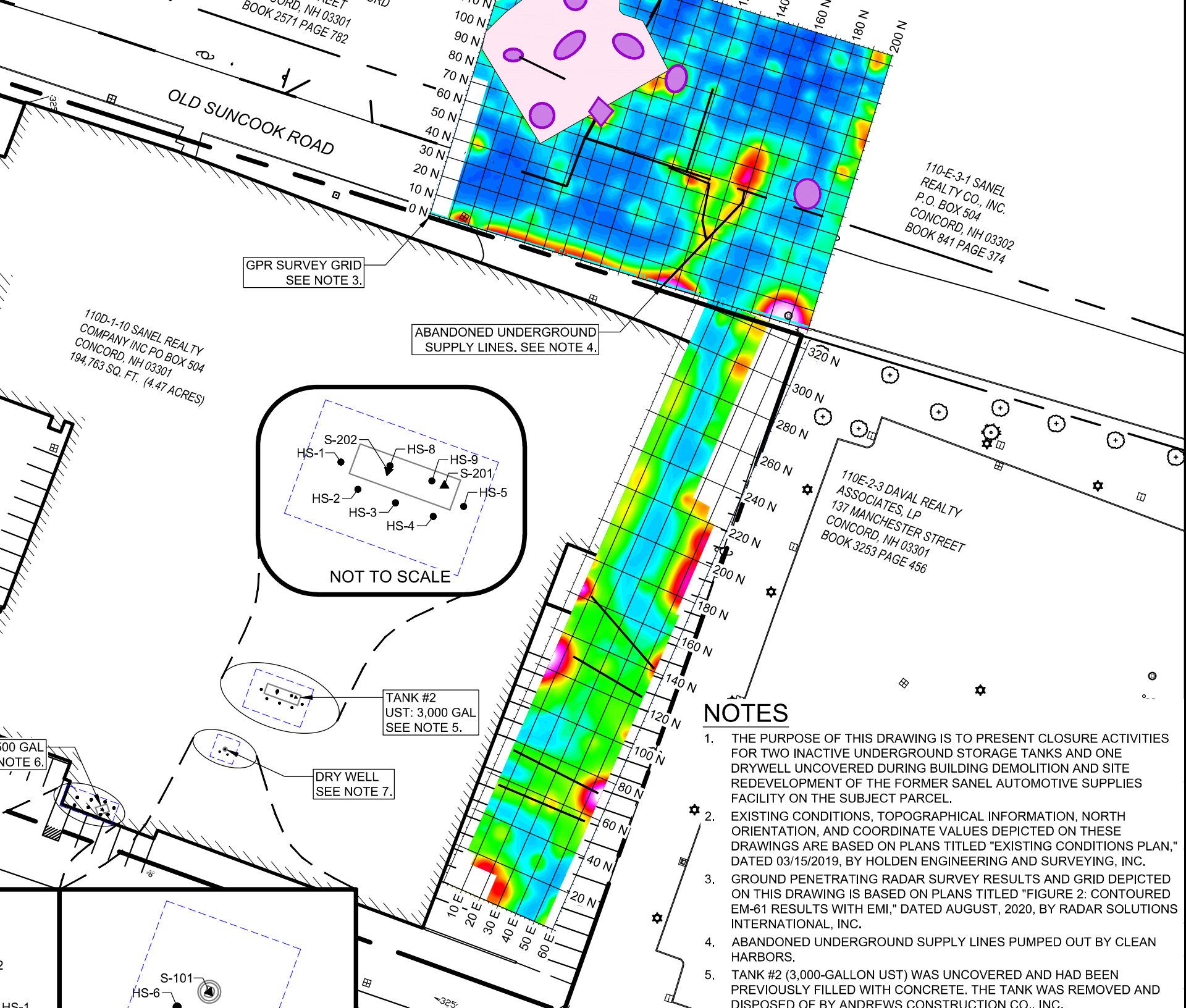
DATE	SCALE	FILE
June 14, 2019	As shown	Site Location Map
APPROVED BY: JPR	DRAWN BY: CMH	REVISED

Wilcox & Barton INC.
CIVIL · ENVIRONMENTAL · GEOTECHNICAL

CLIENT	JOB NUMBER
Banks Chevrolet	BACC0002
LOCATION: Automotive Supply Associates 129 Manchester Street Concord, New Hampshire NHDES Site #199502046	MAP SOURCE: Concord and Suncook, NH USGS QUADs 2018

SITE LOCATION MAP

Figure 1



NOTES

1. THE PURPOSE OF THIS DRAWING IS TO PRESENT CLOSURE ACTIVITIES FOR TWO INACTIVE UNDERGROUND STORAGE TANKS AND ONE DRYWELL UNCOVERED DURING BUILDING DEMOLITION AND SITE REDEVELOPMENT OF THE FORMER SANEL AUTOMOTIVE SUPPLIES FACILITY ON THE SUBJECT PARCEL.
2. EXISTING CONDITIONS, TOPOGRAPHICAL INFORMATION, NORTH ORIENTATION, AND COORDINATE VALUES DEPICTED ON THESE DRAWINGS ARE BASED ON PLANS TITLED "EXISTING CONDITIONS PLAN," DATED 03/15/2019, BY HOLDEN ENGINEERING AND SURVEYING, INC.
3. GROUND PENETRATING RADAR SURVEY RESULTS AND GRID DEPICTED ON THIS DRAWING IS BASED ON PLANS TITLED "FIGURE 2: CONTOURED EM-61 RESULTS WITH EMI," DATED AUGUST, 2020, BY RADAR SOLUTIONS INTERNATIONAL, INC.
4. ABANDONED UNDERGROUND SUPPLY LINES PUMPED OUT BY CLEAN HARBORS.
5. TANK #2 (3,000-GALLON UST) WAS UNCOVERED AND HAD BEEN PREVIOUSLY FILLED WITH CONCRETE. THE TANK WAS REMOVED AND DISPOSED OF BY ANDREWS CONSTRUCTION CO., INC.

DRAWING TITLE
CLOSU
DATE
10/02/2020
APPROVED BY
RWB
OWNER
DAVAL REALTY

TABLES

TABLE 1
Soil Headspace Screening Results
Banks Chevrolet
129 Manchester Street, Concord, New Hampshire
NHDES Site #199502046

Location	Soil Headspace Screening Identification	Laboratory Analytical Soil Sample Identification	Sampling Date	Depth (ft bgs)	PID Reading (ppmv)
500-Gallon UST	HS-1	--	9/1/2020	3.5	0.1
500-Gallon UST	HS-2	--	9/1/2020	3.5	0.7
500-Gallon UST	HS-3	--	9/1/2020	4.0	8.9
500-Gallon UST	HS-4	--	9/1/2020	4.0	133.1
500-Gallon UST	HS-5	--	9/1/2020	3.5	8.1
500-Gallon UST	HS-6	--	9/1/2020	3.5	5.5
500-Gallon UST	HS-7	--	9/1/2020	4.0	0.7
500-Gallon UST	HS-8	--	9/1/2020	4.0	0.7
500-Gallon UST	--	S-1	9/1/2020	6.0	0.9
3,000-Gallon UST	HS-1	--	9/3/2020	4.0	78.0
3,000-Gallon UST	HS-2	--	9/3/2020	4.0	15.1
3,000-Gallon UST	HS-3	--	9/3/2020	4.0	13.1
3,000-Gallon UST	HS-4	--	9/3/2020	4.0	10.5
3,000-Gallon UST	HS-5	--	9/3/2020	4.0	0.7
Dry Well	HS-6	--	9/3/2020	10.0	0.0
Dry Well	HS-7	--	9/3/2020	10.0	0.0
3,000-Gallon UST	HS-8	--	9/3/2020	10.0	18.9
3,000-Gallon UST	HS-9	--	9/3/2020	10.0	7.3
Dry Well	--	S-101	9/3/2020	10.0	0.0
3,000-Gallon UST	--	S-201	9/3/2020	12.0	0.0
3,000-Gallon UST	--	S-202	9/3/2020	12.0	0.0

NOTES:

ft bgs Feet below ground surface.
PID Photoionization detector, measuring organic vapors in parts per million by volume (ppmv).

TABLE 2
Soil Samples - Summary of Analytical Results
Banks Chevrolet
129 Manchester Street, Concord, New Hampshire
NHDES Site #199502046

Sample Identification Sample Date Depth (feet) / PID (ppmv)	NHDES Soil Remediation Standards (SRS) *	S-1 9/1/2020 6 / 0.9		S-101 9/3/2020 10 / 0.0		S-201 9/3/2020 12 / 0.0		S-202 9/3/2020 12 / 0.0	
Polycyclic Aromatic Hydrocarbons (PAHs) by EPA Method 8270									
Acenaphthene	340	0.21	U	0.18	U	0.17	U	0.17	U
Acenaphthylene	490	0.21	U	0.18	U	0.17	U	0.17	U
Anthracene	1,000	0.21	U	0.18	U	0.17	U	0.17	U
Benzo(a)anthracene	1	0.21	U	0.18	U	0.17	U	0.17	U
Benzo(a)pyrene	0.7	0.21	U	0.18	U	0.17	U	0.17	U
Benzo(b)fluoranthene	1	0.15	J	0.18	U	0.17	U	0.17	U
Benzo(g,h,i)perylene	NS	0.21	UJ	0.18	U	0.17	U	0.17	U
Benzo(k)fluoranthene	12	0.21	U	0.18	U	0.17	U	0.17	U
Chrysene	120	0.21	U	0.18	U	0.17	U	0.17	U
Dibenz(a,h)anthracene	0.7	0.21	U	0.18	U	0.17	U	0.17	U
Fluoranthene	960	0.16	J	0.18	U	0.17	U	0.17	U
Fluorene	77	0.21	U	0.18	U	0.17	U	0.17	U
Indeno(1,2,3-cd)pyrene	1	0.21	U	0.18	U	0.17	U	0.17	U
2-Methylnaphthalene	96	0.32		0.18	U	0.17	U	0.17	U
Naphthalene**	28	0.21	U	0.18	U	0.17	U	0.17	U
Phenanthrene	NS	0.15	J	0.18	U	0.17	U	0.15	J
Pyrene	720	0.21	J	0.18	U	0.17	U	0.17	U
Volatile Organic Compounds (VOCs) by EPA Method 8260									
Acetone	75	3.3	U	0.058	J	0.011	J	0.031	J
Benzene	0.3	0.067	U	0.0014	U	0.0016	U	0.0015	U
n-Butylbenzene	110	0.17		0.0014	U	0.0016	U	0.0015	U
sec-Butylbenzene	130	0.057	J	0.0014	U	0.0016	U	0.0015	U
tert-Butylbenzene	100	0.067	U	0.0014	U	0.0016	U	0.0015	U
Ethylbenzene	120	0.11		0.0014	U	0.0016	U	0.0015	U
Isopropylbenzene	330	0.056	J	0.0014	U	0.0016	U	0.0015	U
p-Isopropyltoluene	NS	0.040	J	0.0014	U	0.0016	U	0.0015	U
Methyl tertiary-butyl ether (MTBE)	0.2	0.067	U	0.0029	U	0.0032	U	0.0030	U
Methylene chloride	0.1	***0.33***	***U***	0.0019	J	0.016	U	0.015	U
Naphthalene**	28	0.37		0.0029	U	0.0032	U	0.00062	J
n-Propylbenzene	85	0.14		0.0014	U	0.0016	U	0.0015	U
Toluene	100	0.029	J	0.0014	U	0.00053	J	0.0015	U
1,2,4-Trimethylbenzene	130	0.41		0.0014	U	0.0016	U	0.0015	U
1,3,5-Trimethylbenzene	96	0.14		0.0014	U	0.0016	U	0.0015	U
Total Xylenes	500	0.232		0.0043	U	0.0048	U	0.0045	U
Metals by EPA Method 6010									
Arsenic	11	--		2.7	J	--		--	
Barium	1,000	--		19		--		--	
Cadmium	33	--		0.36	U	--		--	
Chromium	1,000/130 ‡	--		6.4		--		--	
Lead	400	--		3.6		--		--	
Mercury	7	--		0.027	U	--		--	
Selenium	180	--		3.6	U	--		--	
Silver	89	--		0.36	U	--		--	
Total Petroleum Hydrocarbons (TPH) by EPA Method 8015									
TPH (as Gasoline)	10,000	--		0.91	U	--		--	
TPH (as Diesel)	10,000	--		7.3	J	--		--	
TPH (Unknown Hydrocarbons C9-C36)	10,000	130		15		14		390	

All detected and selected other analytes listed; all others were not detected.
Results in milligrams per kilogram (mg/kg) unless otherwise noted.

PID	Photoionization Detector. Results in parts per million by volume (ppmv).
U	Not detected at or above the indicated laboratory reporting limit.
J	Estimated concentration.
NS	No standard established.
‡	Standards for trivalent and hexavalent chromium, respectively.
--	Sample not collected/analyzed for this compound.
bold	Detected concentration exceeds SRS.
bold italics	Not detected; laboratory reporting limit exceeds SRS.
*	Env-Or 606.19, Table 600-2, SRS, effective June 1, 2015.
**	Standard per Risk Characterization and Management Policy Table B-2, revised September 2018.

APPENDIX A

Photographs

Photographs

Banks Chevrolet, 129 Manchester Street, Concord, New Hampshire
NHDES Site #199502046



Photo 1: (8/31/2020) GPR survey of the site.



Photo 2: (9/1/2020) Abandoned 500-gallon UST.



Photo 3: (9/2/2020) Drywell prior to removal.



Photo 4: (9/2/2020) Cut and cleaned 500-gallon UST.

Photographs

Banks Chevrolet, 129 Manchester Street, Concord, New Hampshire

NHDES Site #199502046



Photo 5: (8/31/2020) Abandonded 3,000-gallon UST.



Photo 6: (9/1/2020) Removal of abandoned 3,000-gallon UST.

APPENDIX B

Wilcox & Barton, Inc. Standard Operating Procedures

Wilcox & Barton INC.
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STANDARD OPERATING PROCEDURE

Title:	PID / Jar-Headspace Screening Protocol for Organic Vapors in Soil			**No:**	**FP-01**
Approved:	R. Rooks	**Original Date:**	10/15/13	**Revised:**	3/16/17

Purpose:

To screen environmental media in the field for organic vapors via analysis of headspace.

Introduction:

A photoionization detector (PID) is a portable field meter used to detect the presence of volatile organic compounds in air. The meter responds to compounds that have ionization potentials equal to or less than the energy of the ionization source (lamp). The meter does not differentiate between compounds, and the meter response varies for different compounds. The meter readings are provided in parts-per-million by volume (ppmv) and are quantitative but non-specific.

A PID may be used to assess contamination in environmental media via measurement of organic vapors that volatilize (evaporate) from the sample into the headspace of the container holding the sample. This screening procedure does not provide a true determination of compound concentration. However, the PID is useful for screening to determine the presence or absence and relative degree of contamination by volatile organic compounds. The PID is calibrated to an isobutylene standard (100 ppmv) and a response factor (RF) is applied during calibration to equate the meter response to the contaminant of interest. For petroleum sites, the RF for benzene is used. For non-petroleum sites, the RF for the primary contaminant of concern is used.

Equipment/Materials:

1. Thermo Environmental Instruments, Inc. Model 580B OVM/Datalogger, 10.2 electron-Volt (eV) or 11.8 eV lamp, or
2. Mini Rae 2000 equipped with a 10.6 eV lamp.
3. Other PID as approved by the Project Manager or Technical Lead
4. Isobutylene calibration gas and connecting tubing and valve
5. Glass jars (250 ml to 500 ml)
6. Aluminum foil
7. Polyethylene Whirl-Pak bags (18 oz)

Procedure:

The following procedure is used to screen media for the presence of organic vapors with a PID using the jar-headspace method:

1. The meter is calibrated to an isobutylene standard using the manufacturer's RF for the contaminant of concern prior to screening.
2. A clean glass jar is half filled with the sample to be screened. The top of the jar is covered with a sheet of aluminum foil and the cap is screwed on.
3. Alternatively, a Whirl-Pak™ bag (or equivalent) is half filled with the sample to be screened. The bag is closed and flipped over three times and the closure tabs are twisted together to ensure a tight seal.

4. Headspace gasses over the sample are allowed to equilibrate for approximately 10 minutes at ambient air temperature. If ambient temperature is below freezing, headspace development can be performed inside a heated vehicle or space.
5. The jar or bag is vigorously shaken for 15 seconds at the beginning and the end of the equilibration period.
6. Jars: The screw cap is carefully removed and the probe of the PID meter is inserted through the foil. Bags: The bag is punctured with the probe of the PID meter.
7. The maximum meter reading is recorded. Maximum response should occur between 2 and 5 seconds. Erratic meter response may occur at high organic vapor concentrations or conditions of elevated headspace moisture. Erratic meter response should be noted in the field logs.

Additional Considerations:

For soil screening at sites in Massachusetts, MassDEP Interim Remediation Waste Management Policy for Petroleum Contaminated Sites, #WSC-94-400, specifies the use of jars, but the MCP allows alternate procedures when technically justified (see 310 CMR 40.0017). It is the position of Wilcox & Barton, Inc. that the use of a polyethylene bag is an acceptable alternative to a glass jar. This position is supported by EPA (see EPA 510-B-97-0001 Chapter VI - Field Methods for the Analysis of Petroleum Hydrocarbons) and various other states. Field personnel must consult with both the Project Manager and the LSP before using the bag technique at any Massachusetts site. Further, the user should be aware that alternate techniques may affect data usability and that additional justification for use of a polyethylene bag may be requested by MassDEP. For identifying reportable conditions in Massachusetts, the jar technique must be used.

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STANDARD OPERATING PROCEDURE

Title:	Grab and Composite Soil Sampling			**No:**	**FP-02**
Approved:	R. Rooks	**Original Date:**	3/30/2017	**Revised:**	

Purpose:

To ensure data quality by collecting representative soil samples for laboratory analysis.

Equipment/Materials:

1. Sample containers, preserved and handled as required for the specific media and analyses
2. Analytical chain-of-custody form(s), sample label(s), and sample custody seal
3. Coolers or other containers for transporting samples
4. Packing materials and ice
5. Appropriate clothing/PPE as specified in the health and safety plan
6. Site plan
7. Field log book or field data form
8. Stainless steel or polyethylene scoop/trowel
9. Stainless steel or polyethylene mixing bowl (for composites)
10. Sample collection equipment (hand auger, split-spoon, shovel, etc.)

Procedure:

1. Before sampling, confer with the laboratory performing the analyses to make sure the required data quality objectives and reporting requirements will be met.
2. Obtain appropriate sample containers from the laboratory.
3. Wear dedicated nitrile gloves for each discrete sample collected. Change gloves between sample locations.

Grab Samples – Grab samples are samples collected from a discrete location. Soil samples may be collected using dedicated or reusable equipment. All reusable sample equipment must be decontaminated between sample locations in accordance with ***SOP# FP-06***.

1. Using the appropriate soil collection method and equipment based on site conditions and the contaminants of concern, collect the appropriate volume of soil.
2. Carefully place the appropriate volume of soil into the appropriate sample container in accordance with the laboratory quality systems manual and/or laboratory method SOPs. Clean threads of sample container before placing lid back on sample container to ensure tight seal. Secure lid tightly and complete sample label with ID, date, time, required analysis, etc.
3. Record the location, depth, and characteristics of the grab soil sample in the log book. Soil characteristics should be classified in accordance with ***W&B SOP# FP-14***.
4. Complete the chain-of-custody record in accordance with ***W&B SOP# FP-04***, ensuring that holding time and temperature preservation requirements are maintained.

Composite Samples – Composite samples are grab samples collected from pre-determined locations that are mixed in a container until uniform and placed into containers for submittal to the laboratory. The number of subsamples used to create a composite will be determined during work planning and based upon the volume of soil to be represented and the data quality objectives of the project; values can range from a minimum of 8 for small stockpile characterization up to 50 subsamples when a multi-increment sampling approach is employed.

Due to potential contaminant volatilization during mixing, this method is appropriate ONLY for samples submitted for non-volatile analyses. Soil samples may be collected using dedicated or reusable equipment. All reusable sample equipment must be decontaminated between sample locations in accordance with ***W&B SOP# FP-06***.

1. Using the appropriate soil collection method and equipment based on the contaminants of concern, collect an equal grab sample from each area to be composited. Place each grab sample into a mixing container that is appropriate based on the contaminants of concern.
2. Gently mix the sample using a cone-and-quartering method until thoroughly homogenized. Multiple iterations should be performed until homogeneity can be visualized by grain size, color, moisture content, and cohesiveness.
3. Carefully place the appropriate volume of homogenized soil into the appropriate sample container in accordance with the laboratory quality systems manual and/or laboratory method SOPs. Clean the threads of the sample container before placing lid back on sample container to ensure tight seal. Secure lid tightly and complete sample label with ID, date, time, required analysis, etc.
4. Record the number, locations, and depths of the composited grab samples in the log book. Include a sketch of the sample area and location of the grab samples that comprise the composite.
5. Complete the chain-of-custody record in accordance with ***W&B SOP# FP-04,*** ensuring and that holding time and temperature preservation requirements are maintained.

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STANDARD OPERATING PROCEDURE

Title:	Sampling Groundwater for Volatile Organic Compounds (VOCs), Volatile Petroleum Hydrocarbons (VPH), and Extractable Petroleum Hydrocarbons (EPH)		**No:** **FP-07**
Approved:	R. Rooks	**Original Date:** 7/6/2010	**Revised:** 3/30/2017

Purpose:

To ensure that accurate, legally defensible, and representative data is collected when collecting groundwater samples for VOC, VPH, and EPH analyses.

Equipment/Materials:

1. Water-level indicator or oil/water interface probe
2. Peristaltic pump and power source
3. YSI Multi-Probe System
4. Bailers (based on project and site conditions)
5. Sample tubing (based on project, site conditions, and contaminants of concern)
6. Pre-cleaned, laboratory-supplied sampling containers
7. Coolers/packing materials/wet ice
8. Field log book or project check list

Procedure:

Groundwater samples may be collected using conventional (standard) techniques or via low-flow techniques depending upon project objectives and data needs. Users are responsible for selecting the appropriate technique and adhering to the protocols outlined below.

STANDARD PURGING AND SAMPLE COLLECTION:

1. Measure depth to static water level and depth to bottom of well.
2. Calculate standing water volume in the well.
3. Using a new or decontaminated bailer, purge either: (1) five well volumes of water from the well, (2) until the well is dry, or (3) until pH, specific conductance and temperature readings stabilize.
4. Transfer the sample directly from the bailer into the appropriate sample container(s).
    a) VPH and VOC samples – three pre-cleaned, pre-preserved 40-milliliter VOA vials with Teflon septa caps.
    b) EPH samples - two pre-cleaned 1-liter amber bottles equipped with Teflon-lined screw caps.
5. Pre-preserved sample containers provided by the laboratory are to be used whenever possible. Care must be taken to ensure that the preservative (hydrochloric acid) is not

spilled during filling of containers. Sample pH of <2 must be maintained, and can be accomplished by adding 3 to 4 drops of HCl to a 40-ml VOA vial when needed.

6. After filling vials for VOC or VPH samples, invert each vial and tap to liberate potential air bubbles. Inspect to ensure no air bubbles are in the vial.

7. Place samples on ice immediately. Keep refrigerated until delivery to laboratory under chain-of-custody. Samples must be maintained at a temperature of less than 6°C but not frozen.

LOW FLOW PURGING AND SAMPLE COLLECTION (Less than 25 ft to water):

1. Measure depth to static water level and depth to bottom of well.

2. Determine desired sample intake depth based on well construction log and carefully install decontaminated or new/unused sampling tubing and foot valve assembly, minimizing disturbance of the water column:

    a) Set the intake near the top of the well screen for surficial groundwater monitoring wells; or

    b) Set the intake at the center of the screened interval for vertical delineation groundwater monitoring wells.

3. Attach the sampling tubing to clean, unused peristaltic pump tubing using appropriately sized vacuum fittings (male-male hose barb connection or similar fitting).

4. Attach the discharge of the pump to a calibrated flow-through meter capable of measuring, at a minimum, pH, temperature, and specific conductance, and at least one additional parameter such as oxidation-reduction potential, dissolved oxygen, and/or turbidity.

5. Initiate pumping at the lowest possible flow rate and monitor water level drawdown in the well while gradually increasing flow rate. Set the flow rate at the point just before water level drawdown occurs (generally less than 0.5 liter per minute or 0.12 gallons per minute).

6. Observe and record field parameters and water level drawdown initially at 5 to 15 minute intervals. Once stabilization appears to be approaching, increase the observation frequency to every 3 to 5 minutes. Purging is complete when three successive measurements meet the following minimum criteria:

    - pH ± 0.1
    - Specific Conductivity ± 0.3%
    - Dissolved Oxygen ± 10%

    If additional parameters are considered, recommended stabilized tolerances are:

    - Reduction-Oxidation Potential ± 10 mV
    - Turbidity ± 10%

7. Disconnect the flow-through field parameter meter and collect the sample from the pump discharge tubing.

8. Fill the sample containers directly from the pump discharge tubing, following the same procedures outline in steps 4 through 7 of Standard Purging and Sample Collection above.

DECONTAMINATION:

Use of disposable sampling equipment is preferred. However, if any item of equipment will be introduced into more than one well in a sampling round, the wells should be gauged and/or sampled in order of increasing contamination (*i.e.* wells anticipated to be less contaminated will be sampled first). After use in each well, the equipment will be decontaminated using, at a minimum, the following sequence:

1. Rinse with clean water
2. Wash with Alconox (laboratory detergent) and clean water solution
3. Three rinses with clean water
4. Rinse with distilled water

Similar decontamination procedures should be followed for all equipment introduced into the well, including water level meters, interface probes, and intake tubing. Bailers exposed to free product will not be re-used to sample for dissolved volatile constituents.

APPENDIX C

Laboratory Reports

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

September 14, 2020

Russell Barton
Wilcox & Barton
1115 Route 100B, Suite 200
Moretown, VT 05660

Project Location: 129 Manchester St., Concord, NH
Client Job Number:
Project Number: BACC0003.1
Laboratory Work Order Number: 20I0256

Enclosed are results of analyses for samples received by the laboratory on September 3, 2020. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Raymond J. McCarthy
Project Manager

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con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Wilcox & Barton
1115 Route 100B, Suite 200
Moretown, VT 05660
ATTN: Russell Barton

REPORT DATE: 9/14/2020

PURCHASE ORDER NUMBER:

PROJECT NUMBER: BACC0003.1

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 20I0256

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: 129 Manchester St., Concord, NH

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
S-1 6'	20I0256-01	Soil		SM 2540G SW-846 8100 Modified SW-846 8260C-D SW-846 8270D-E	

con-test® ANALYTICAL LABORATORY

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

CASE NARRATIVE SUMMARY

All reported results are within defined laboratory quality control objectives unless listed below or otherwise qualified in this report.

For method 8270E, only PAHs were requested and reported.

SW-846 8260C-D

Qualifications:

L-07

Either laboratory fortified blank/laboratory control sample or duplicate recovery is outside of control limits, but the other is within limits. RPD between the two LFB/LCS results is within method specified criteria.

Analyte & Samples(s) Qualified:

Chloromethane
B265828-BS1

V-20

Continuing calibration verification (CCV) did not meet method specifications and was biased on the high side. Data validation is not affected since sample result was "not detected" for this compound.

Analyte & Samples(s) Qualified:

Bromomethane
B265828-BS1, B265828-BSD1

Chloromethane
B265828-BS1, B265828-BSD1

SW-846 8270D-E

Qualifications:

V-06

Continuing calibration verification (CCV) did not meet method specifications and was biased on the high side for this compound.

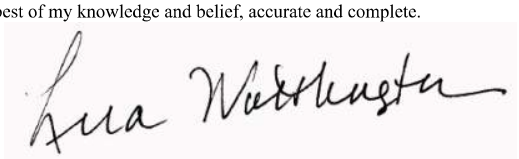
Analyte & Samples(s) Qualified:

Benzo(g,h,i)perylene
20I0256-01[S-1 6']

SW-846 8100 Modified

TPH (C9-C36) is quantitated against a calibration made with a diesel standard.

The results of analyses reported only relate to samples submitted to the Con-Test Analytical Laboratory for testing.
I certify that the analyses listed above, unless specifically listed as subcontracted, if any, were performed under my direction according to the approved methodologies listed in this document, and 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.



Lisa A. Worthington
Technical Representative

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: 129 Manchester St., Concord, NH Sample Description: Work Order: 20I0256

Date Received: 9/3/2020

Field Sample #: S-1 6' Sampled: 9/1/2020 11:45

Sample ID: 20I0256-01

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	DF	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	3.3	0.25	mg/Kg dry	1	U	SW-846 8260C-D	9/4/20	9/4/20 16:46	MFF
Acrylonitrile	ND	0.33	0.035	mg/Kg dry	1	U	SW-846 8260C-D	9/4/20	9/4/20 16:46	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.033	0.0094	mg/Kg dry	1	U	SW-846 8260C-D	9/4/20	9/4/20 16:46	MFF
Benzene	ND	0.067	0.012	mg/Kg dry	1	U	SW-846 8260C-D	9/4/20	9/4/20 16:46	MFF
Bromobenzene	ND	0.067	0.010	mg/Kg dry	1	U	SW-846 8260C-D	9/4/20	9/4/20 16:46	MFF
Bromochloromethane	ND	0.067	0.021	mg/Kg dry	1	U	SW-846 8260C-D	9/4/20	9/4/20 16:46	MFF
Bromodichloromethane	ND	0.067	0.011	mg/Kg dry	1	U	SW-846 8260C-D	9/4/20	9/4/20 16:46	MFF
Bromoform	ND	0.067	0.031	mg/Kg dry	1	U	SW-846 8260C-D	9/4/20	9/4/20 16:46	MFF
Bromomethane	ND	0.13	0.092	mg/Kg dry	1	U	SW-846 8260C-D	9/4/20	9/4/20 16:46	MFF
2-Butanone (MEK)	ND	1.3	0.13	mg/Kg dry	1	U	SW-846 8260C-D	9/4/20	9/4/20 16:46	MFF
tert-Butyl Alcohol (TBA)	ND	1.3	0.28	mg/Kg dry	1	U	SW-846 8260C-D	9/4/20	9/4/20 16:46	MFF
n-Butylbenzene	0.17	0.067	0.014	mg/Kg dry	1		SW-846 8260C-D	9/4/20	9/4/20 16:46	MFF
sec-Butylbenzene	0.057	0.067	0.011	mg/Kg dry	1	J	SW-846 8260C-D	9/4/20	9/4/20 16:46	MFF
tert-Butylbenzene	ND	0.067	0.011	mg/Kg dry	1	U	SW-846 8260C-D	9/4/20	9/4/20 16:46	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.033	0.011	mg/Kg dry	1	U	SW-846 8260C-D	9/4/20	9/4/20 16:46	MFF
Carbon Disulfide	ND	0.33	0.30	mg/Kg dry	1	U	SW-846 8260C-D	9/4/20	9/4/20 16:46	MFF
Carbon Tetrachloride	ND	0.067	0.0074	mg/Kg dry	1	U	SW-846 8260C-D	9/4/20	9/4/20 16:46	MFF
Chlorobenzene	ND	0.067	0.010	mg/Kg dry	1	U	SW-846 8260C-D	9/4/20	9/4/20 16:46	MFF
Chlorodibromomethane	ND	0.033	0.014	mg/Kg dry	1	U	SW-846 8260C-D	9/4/20	9/4/20 16:46	MFF
Chloroethane	ND	0.13	0.024	mg/Kg dry	1	U	SW-846 8260C-D	9/4/20	9/4/20 16:46	MFF
Chloroform	ND	0.13	0.011	mg/Kg dry	1	U	SW-846 8260C-D	9/4/20	9/4/20 16:46	MFF
Chloromethane	ND	0.13	0.030	mg/Kg dry	1	U	SW-846 8260C-D	9/4/20	9/4/20 16:46	MFF
2-Chlorotoluene	ND	0.067	0.0080	mg/Kg dry	1	U	SW-846 8260C-D	9/4/20	9/4/20 16:46	MFF
4-Chlorotoluene	ND	0.067	0.0094	mg/Kg dry	1	U	SW-846 8260C-D	9/4/20	9/4/20 16:46	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.33	0.035	mg/Kg dry	1	U	SW-846 8260C-D	9/4/20	9/4/20 16:46	MFF
1,2-Dibromoethane (EDB)	ND	0.033	0.013	mg/Kg dry	1	U	SW-846 8260C-D	9/4/20	9/4/20 16:46	MFF
Dibromomethane	ND	0.067	0.025	mg/Kg dry	1	U	SW-846 8260C-D	9/4/20	9/4/20 16:46	MFF
1,2-Dichlorobenzene	ND	0.067	0.011	mg/Kg dry	1	U	SW-846 8260C-D	9/4/20	9/4/20 16:46	MFF
1,3-Dichlorobenzene	ND	0.067	0.0080	mg/Kg dry	1	U	SW-846 8260C-D	9/4/20	9/4/20 16:46	MFF
1,4-Dichlorobenzene	ND	0.067	0.0087	mg/Kg dry	1	U	SW-846 8260C-D	9/4/20	9/4/20 16:46	MFF
trans-1,4-Dichloro-2-butene	ND	0.13	0.021	mg/Kg dry	1	U	SW-846 8260C-D	9/4/20	9/4/20 16:46	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.13	0.017	mg/Kg dry	1	U	SW-846 8260C-D	9/4/20	9/4/20 16:46	MFF
1,1-Dichloroethane	ND	0.067	0.011	mg/Kg dry	1	U	SW-846 8260C-D	9/4/20	9/4/20 16:46	MFF
1,2-Dichloroethane	ND	0.067	0.027	mg/Kg dry	1	U	SW-846 8260C-D	9/4/20	9/4/20 16:46	MFF
1,1-Dichloroethylene	ND	0.067	0.021	mg/Kg dry	1	U	SW-846 8260C-D	9/4/20	9/4/20 16:46	MFF
cis-1,2-Dichloroethylene	ND	0.067	0.0087	mg/Kg dry	1	U	SW-846 8260C-D	9/4/20	9/4/20 16:46	MFF
trans-1,2-Dichloroethylene	ND	0.067	0.021	mg/Kg dry	1	U	SW-846 8260C-D	9/4/20	9/4/20 16:46	MFF
1,2-Dichloropropane	ND	0.067	0.013	mg/Kg dry	1	U	SW-846 8260C-D	9/4/20	9/4/20 16:46	MFF
1,3-Dichloropropane	ND	0.033	0.0074	mg/Kg dry	1	U	SW-846 8260C-D	9/4/20	9/4/20 16:46	MFF
2,2-Dichloropropane	ND	0.067	0.013	mg/Kg dry	1	U	SW-846 8260C-D	9/4/20	9/4/20 16:46	MFF
1,1-Dichloropropene	ND	0.13	0.011	mg/Kg dry	1	U	SW-846 8260C-D	9/4/20	9/4/20 16:46	MFF
cis-1,3-Dichloropropene	ND	0.033	0.0087	mg/Kg dry	1	U	SW-846 8260C-D	9/4/20	9/4/20 16:46	MFF
trans-1,3-Dichloropropene	ND	0.033	0.015	mg/Kg dry	1	U	SW-846 8260C-D	9/4/20	9/4/20 16:46	MFF
Diethyl Ether	ND	0.13	0.023	mg/Kg dry	1	U	SW-846 8260C-D	9/4/20	9/4/20 16:46	MFF

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: 129 Manchester St., Concord, NH Sample Description: Work Order: 20I0256

Date Received: 9/3/2020

Field Sample #: S-1 6' Sampled: 9/1/2020 11:45

Sample ID: 20I0256-01

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	DF	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.033	0.011	mg/Kg dry	1	U	SW-846 8260C-D	9/4/20	9/4/20 16:46	MFF
1,4-Dioxane	ND	3.3	1.5	mg/Kg dry	1	U	SW-846 8260C-D	9/4/20	9/4/20 16:46	MFF
Ethylbenzene	0.11	0.067	0.0087	mg/Kg dry	1		SW-846 8260C-D	9/4/20	9/4/20 16:46	MFF
Hexachlorobutadiene	ND	0.067	0.031	mg/Kg dry	1	U	SW-846 8260C-D	9/4/20	9/4/20 16:46	MFF
2-Hexanone (MBK)	ND	0.67	0.10	mg/Kg dry	1	U	SW-846 8260C-D	9/4/20	9/4/20 16:46	MFF
Isopropylbenzene (Cumene)	0.056	0.067	0.011	mg/Kg dry	1	J	SW-846 8260C-D	9/4/20	9/4/20 16:46	MFF
p-Isopropyltoluene (p-Cymene)	0.040	0.067	0.013	mg/Kg dry	1	J	SW-846 8260C-D	9/4/20	9/4/20 16:46	MFF
Methyl Acetate	ND	0.67	0.028	mg/Kg dry	1	U	SW-846 8260C-D	9/4/20	9/4/20 16:46	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.067	0.017	mg/Kg dry	1	U	SW-846 8260C-D	9/4/20	9/4/20 16:46	MFF
Methyl Cyclohexane	ND	0.067	0.013	mg/Kg dry	1	U	SW-846 8260C-D	9/4/20	9/4/20 16:46	MFF
Methylene Chloride	ND	0.33	0.023	mg/Kg dry	1	U	SW-846 8260C-D	9/4/20	9/4/20 16:46	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.67	0.11	mg/Kg dry	1	U	SW-846 8260C-D	9/4/20	9/4/20 16:46	MFF
Naphthalene	0.37	0.13	0.021	mg/Kg dry	1		SW-846 8260C-D	9/4/20	9/4/20 16:46	MFF
n-Propylbenzene	0.14	0.067	0.0087	mg/Kg dry	1		SW-846 8260C-D	9/4/20	9/4/20 16:46	MFF
Styrene	ND	0.067	0.0074	mg/Kg dry	1	U	SW-846 8260C-D	9/4/20	9/4/20 16:46	MFF
1,1,1,2-Tetrachloroethane	ND	0.067	0.018	mg/Kg dry	1	U	SW-846 8260C-D	9/4/20	9/4/20 16:46	MFF
1,1,2,2-Tetrachloroethane	ND	0.033	0.015	mg/Kg dry	1	U	SW-846 8260C-D	9/4/20	9/4/20 16:46	MFF
Tetrachloroethylene	ND	0.067	0.012	mg/Kg dry	1	U	SW-846 8260C-D	9/4/20	9/4/20 16:46	MFF
Tetrahydrofuran	ND	0.67	0.034	mg/Kg dry	1	U	SW-846 8260C-D	9/4/20	9/4/20 16:46	MFF
Toluene	0.029	0.067	0.0094	mg/Kg dry	1	J	SW-846 8260C-D	9/4/20	9/4/20 16:46	MFF
1,2,3-Trichlorobenzene	ND	0.33	0.038	mg/Kg dry	1	U	SW-846 8260C-D	9/4/20	9/4/20 16:46	MFF
1,2,4-Trichlorobenzene	ND	0.067	0.027	mg/Kg dry	1	U	SW-846 8260C-D	9/4/20	9/4/20 16:46	MFF
1,3,5-Trichlorobenzene	ND	0.067	0.020	mg/Kg dry	1	U	SW-846 8260C-D	9/4/20	9/4/20 16:46	MFF
1,1,1-Trichloroethane	ND	0.067	0.013	mg/Kg dry	1	U	SW-846 8260C-D	9/4/20	9/4/20 16:46	MFF
1,1,2-Trichloroethane	ND	0.067	0.011	mg/Kg dry	1	U	SW-846 8260C-D	9/4/20	9/4/20 16:46	MFF
Trichloroethylene	ND	0.067	0.016	mg/Kg dry	1	U	SW-846 8260C-D	9/4/20	9/4/20 16:46	MFF
Trichlorofluoromethane (Freon 11)	ND	0.13	0.022	mg/Kg dry	1	U	SW-846 8260C-D	9/4/20	9/4/20 16:46	MFF
1,2,3-Trichloropropane	ND	0.13	0.017	mg/Kg dry	1	U	SW-846 8260C-D	9/4/20	9/4/20 16:46	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.067	0.021	mg/Kg dry	1	U	SW-846 8260C-D	9/4/20	9/4/20 16:46	MFF
1,2,4-Trimethylbenzene	0.41	0.067	0.012	mg/Kg dry	1		SW-846 8260C-D	9/4/20	9/4/20 16:46	MFF
1,3,5-Trimethylbenzene	0.14	0.067	0.0094	mg/Kg dry	1		SW-846 8260C-D	9/4/20	9/4/20 16:46	MFF
Vinyl Chloride	ND	0.13	0.030	mg/Kg dry	1	U	SW-846 8260C-D	9/4/20	9/4/20 16:46	MFF
m+p Xylene	0.14	0.13	0.020	mg/Kg dry	1		SW-846 8260C-D	9/4/20	9/4/20 16:46	MFF
o-Xylene	0.092	0.067	0.011	mg/Kg dry	1		SW-846 8260C-D	9/4/20	9/4/20 16:46	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	101	70-130		9/4/20 16:46
Toluene-d8	99.9	70-130		9/4/20 16:46
4-Bromofluorobenzene	104	70-130		9/4/20 16:46

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: 129 Manchester St., Concord, NH Sample Description: Work Order: 20I0256

Date Received: 9/3/2020

Field Sample #: S-1 6' Sampled: 9/1/2020 11:45

Sample ID: 20I0256-01

Sample Matrix: Soil

Semivolatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	DF	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acenaphthene	ND	0.21	0.11	mg/Kg dry	1	U	SW-846 8270D-E	9/9/20	9/11/20 10:36	IMR
Acenaphthylene	ND	0.21	0.14	mg/Kg dry	1	U	SW-846 8270D-E	9/9/20	9/11/20 10:36	IMR
Anthracene	ND	0.21	0.11	mg/Kg dry	1	U	SW-846 8270D-E	9/9/20	9/11/20 10:36	IMR
Benzo(a)anthracene	ND	0.21	0.14	mg/Kg dry	1	U	SW-846 8270D-E	9/9/20	9/11/20 10:36	IMR
Benzo(a)pyrene	ND	0.21	0.14	mg/Kg dry	1	U	SW-846 8270D-E	9/9/20	9/11/20 10:36	IMR
Benzo(b)fluoranthene	0.15	0.21	0.14	mg/Kg dry	1	J	SW-846 8270D-E	9/9/20	9/11/20 10:36	IMR
Benzo(g,h,i)perylene	ND	0.21	0.12	mg/Kg dry	1	V-06, U	SW-846 8270D-E	9/9/20	9/11/20 10:36	IMR
Benzo(k)fluoranthene	ND	0.21	0.14	mg/Kg dry	1	U	SW-846 8270D-E	9/9/20	9/11/20 10:36	IMR
Chrysene	ND	0.21	0.14	mg/Kg dry	1	U	SW-846 8270D-E	9/9/20	9/11/20 10:36	IMR
Dibenz(a,h)anthracene	ND	0.21	0.12	mg/Kg dry	1	U	SW-846 8270D-E	9/9/20	9/11/20 10:36	IMR
Fluoranthene	0.16	0.21	0.12	mg/Kg dry	1	J	SW-846 8270D-E	9/9/20	9/11/20 10:36	IMR
Fluorene	ND	0.21	0.15	mg/Kg dry	1	U	SW-846 8270D-E	9/9/20	9/11/20 10:36	IMR
Indeno(1,2,3-cd)pyrene	ND	0.21	0.15	mg/Kg dry	1	U	SW-846 8270D-E	9/9/20	9/11/20 10:36	IMR
2-Methylnaphthalene	0.32	0.21	0.14	mg/Kg dry	1		SW-846 8270D-E	9/9/20	9/11/20 10:36	IMR
Naphthalene	ND	0.21	0.14	mg/Kg dry	1	U	SW-846 8270D-E	9/9/20	9/11/20 10:36	IMR
Phenanthrene	0.15	0.21	0.11	mg/Kg dry	1	J	SW-846 8270D-E	9/9/20	9/11/20 10:36	IMR
Pyrene	0.21	0.21	0.14	mg/Kg dry	1	J	SW-846 8270D-E	9/9/20	9/11/20 10:36	IMR

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Nitrobenzene-d5	72.4	30-130		9/11/20 10:36
2-Fluorobiphenyl	70.3	30-130		9/11/20 10:36
p-Terphenyl-d14	80.6	30-130		9/11/20 10:36

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Project Location: 129 Manchester St., Concord, NH Sample Description: Work Order: 20I0256

Date Received: 9/3/2020

Field Sample #: S-1 6' Sampled: 9/1/2020 11:45

Sample ID: 20I0256-01

Sample Matrix: Soil

Petroleum Hydrocarbons Analyses

Analyte	Results	RL	DL	Units	DF	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
TPH (C9-C36)	130	10	4.6	mg/Kg dry	1		SW-846 8100 Modified	9/9/20	9/11/20 21:42	RDD

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
2-Fluorobiphenyl	66.7	40-140		9/11/20 21:42

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Project Location: 129 Manchester St., Concord, NH Sample Description: Work Order: 20I0256

Date Received: 9/3/2020

Field Sample #: S-1 6' Sampled: 9/1/2020 11:45

Sample ID: 20I0256-01

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	DF	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	78.8		% Wt	1		SM 2540G	9/10/20	9/10/20 21:39	CJT+JE

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Sample Extraction Data

Prep Method: % Solids-SM 2540G

Lab Number [Field ID]	Batch	Date
20I0256-01 [S-1 6']	B266181	09/10/20

Prep Method: SW-846 3546-SW-846 8100 Modified

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
20I0256-01 [S-1 6']	B266056	30.7	1.00	09/09/20

Prep Method: SW-846 5035-SW-846 8260C-D

Lab Number [Field ID]	Batch	Sample Amount(g)	Methanol Volume(mL)	Methanol Aliquot(mL)	Final Volume(mL)	Date
20I0256-01 [S-1 6']	B265828	5.93	6.26	1	50	09/04/20

Prep Method: SW-846 3546-SW-846 8270D-E

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
20I0256-01 [S-1 6']	B266055	30.7	1.00	09/09/20

con-test® ANALYTICAL LABORATORY
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QUALITY CONTROL

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B265828 - SW-846 5035										
Blank (B265828-BLK1)				Prepared & Analyzed: 09/04/20						
Acetone	ND	2.5	mg/Kg wet							U
Acrylonitrile	ND	0.25	mg/Kg wet							U
tert-Amyl Methyl Ether (TAME)	ND	0.025	mg/Kg wet							U
Benzene	ND	0.050	mg/Kg wet							U
Bromobenzene	ND	0.050	mg/Kg wet							U
Bromochloromethane	ND	0.050	mg/Kg wet							U
Bromodichloromethane	ND	0.050	mg/Kg wet							U
Bromoform	ND	0.050	mg/Kg wet							U
Bromomethane	ND	0.10	mg/Kg wet							U
2-Butanone (MEK)	ND	1.0	mg/Kg wet							U
tert-Butyl Alcohol (TBA)	ND	1.0	mg/Kg wet							U
n-Butylbenzene	ND	0.050	mg/Kg wet							U
sec-Butylbenzene	ND	0.050	mg/Kg wet							U
tert-Butylbenzene	ND	0.050	mg/Kg wet							U
tert-Butyl Ethyl Ether (TBEE)	ND	0.025	mg/Kg wet							U
Carbon Disulfide	ND	0.25	mg/Kg wet							U
Carbon Tetrachloride	ND	0.050	mg/Kg wet							U
Chlorobenzene	ND	0.050	mg/Kg wet							U
Chlorodibromomethane	ND	0.025	mg/Kg wet							U
Chloroethane	ND	0.10	mg/Kg wet							U
Chloroform	ND	0.10	mg/Kg wet							U
Chloromethane	ND	0.10	mg/Kg wet							U
2-Chlorotoluene	ND	0.050	mg/Kg wet							U
4-Chlorotoluene	ND	0.050	mg/Kg wet							U
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.25	mg/Kg wet							U
1,2-Dibromoethane (EDB)	ND	0.025	mg/Kg wet							U
Dibromomethane	ND	0.050	mg/Kg wet							U
1,2-Dichlorobenzene	ND	0.050	mg/Kg wet							U
1,3-Dichlorobenzene	ND	0.050	mg/Kg wet							U
1,4-Dichlorobenzene	ND	0.050	mg/Kg wet							U
trans-1,4-Dichloro-2-butene	ND	0.10	mg/Kg wet							U
Dichlorodifluoromethane (Freon 12)	ND	0.10	mg/Kg wet							U
1,1-Dichloroethane	ND	0.050	mg/Kg wet							U
1,2-Dichloroethane	ND	0.050	mg/Kg wet							U
1,1-Dichloroethylene	ND	0.050	mg/Kg wet							U
cis-1,2-Dichloroethylene	ND	0.050	mg/Kg wet							U
trans-1,2-Dichloroethylene	ND	0.050	mg/Kg wet							U
Dichlorofluoromethane (Freon 21)	ND	0.050	mg/Kg wet							U
1,2-Dichloropropane	ND	0.050	mg/Kg wet							U
1,3-Dichloropropane	ND	0.025	mg/Kg wet							U
2,2-Dichloropropane	ND	0.050	mg/Kg wet							U
1,1-Dichloropropene	ND	0.10	mg/Kg wet							U
cis-1,3-Dichloropropene	ND	0.025	mg/Kg wet							U
trans-1,3-Dichloropropene	ND	0.025	mg/Kg wet							U
Diethyl Ether	ND	0.10	mg/Kg wet							U
Difluorochloromethane (Freon 22)	ND	0.050	mg/Kg wet							U
Diisopropyl Ether (DIPE)	ND	0.025	mg/Kg wet							U
1,4-Dioxane	ND	2.5	mg/Kg wet							U
Ethylbenzene	ND	0.050	mg/Kg wet							U
Hexachlorobutadiene	ND	0.050	mg/Kg wet							U
2-Hexanone (MBK)	ND	0.50	mg/Kg wet							U
Isopropylbenzene (Cumene)	ND	0.050	mg/Kg wet							U

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QUALITY CONTROL

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes	
Batch B265828 - SW-846 5035											
Blank (B265828-BLK1)				Prepared & Analyzed: 09/04/20							
p-Isopropyltoluene (p-Cymene)	ND	0.050	mg/Kg wet							U	
Methyl Acetate	ND	0.50	mg/Kg wet							U	
Methyl tert-Butyl Ether (MTBE)	ND	0.050	mg/Kg wet							U	
Methyl Cyclohexane	ND	0.050	mg/Kg wet							U	
Methylene Chloride	ND	0.25	mg/Kg wet							U	
4-Methyl-2-pentanone (MIBK)	ND	0.50	mg/Kg wet							U	
Naphthalene	ND	0.10	mg/Kg wet							U	
n-Propylbenzene	ND	0.050	mg/Kg wet							U	
Styrene	ND	0.050	mg/Kg wet							U	
1,1,1,2-Tetrachloroethane	ND	0.050	mg/Kg wet							U	
1,1,2,2-Tetrachloroethane	ND	0.025	mg/Kg wet							U	
Tetrachloroethylene	ND	0.050	mg/Kg wet							U	
Tetrahydrofuran	ND	0.50	mg/Kg wet							U	
Toluene	ND	0.050	mg/Kg wet							U	
1,2,3-Trichlorobenzene	ND	0.25	mg/Kg wet							U	
1,2,4-Trichlorobenzene	ND	0.050	mg/Kg wet							U	
1,3,5-Trichlorobenzene	ND	0.050	mg/Kg wet							U	
1,1,1-Trichloroethane	ND	0.050	mg/Kg wet							U	
1,1,2-Trichloroethane	ND	0.050	mg/Kg wet							U	
Trichloroethylene	ND	0.050	mg/Kg wet							U	
Trichlorofluoromethane (Freon 11)	ND	0.10	mg/Kg wet							U	
1,2,3-Trichloropropane	ND	0.10	mg/Kg wet							U	
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.050	mg/Kg wet							U	
1,2,4-Trimethylbenzene	ND	0.050	mg/Kg wet							U	
1,3,5-Trimethylbenzene	ND	0.050	mg/Kg wet							U	
Vinyl Chloride	ND	0.10	mg/Kg wet							U	
m+p Xylene	ND	0.10	mg/Kg wet							U	
o-Xylene	ND	0.050	mg/Kg wet							U	
Surrogate: 1,2-Dichloroethane-d4	*0.0250*		mg/Kg wet	0.0250		99.8	70-130				
Surrogate: Toluene-d8	*0.0245*		mg/Kg wet	0.0250		98.2	70-130				
Surrogate: 4-Bromofluorobenzene	*0.0241*		mg/Kg wet	0.0250		96.4	70-130				
LCS (B265828-BS1)				Prepared & Analyzed: 09/04/20							
Acetone	0.114	0.057	mg/Kg wet	0.113		101	70-160				†
Acrylonitrile	0.0111	0.0057	mg/Kg wet	0.0113		97.8	70-130				
tert-Amyl Methyl Ether (TAME)	0.0101	0.00057	mg/Kg wet	0.0113		89.1	70-130				
Benzene	0.0106	0.0011	mg/Kg wet	0.0113		93.8	70-130				
Bromobenzene	0.0113	0.0011	mg/Kg wet	0.0113		99.9	70-130				
Bromochloromethane	0.0102	0.0011	mg/Kg wet	0.0113		90.4	70-130				
Bromodichloromethane	0.0111	0.0011	mg/Kg wet	0.0113		97.7	70-130				
Bromoform	0.0119	0.0011	mg/Kg wet	0.0113		105	70-130				
Bromomethane	0.00573	0.0023	mg/Kg wet	0.0113		50.6	40-130			V-20	†
2-Butanone (MEK)	0.100	0.023	mg/Kg wet	0.113		88.6	70-160				†
tert-Butyl Alcohol (TBA)	0.0981	0.023	mg/Kg wet	0.113		86.6	40-130				†
n-Butylbenzene	0.0105	0.0011	mg/Kg wet	0.0113		92.3	70-130				
sec-Butylbenzene	0.0114	0.0011	mg/Kg wet	0.0113		100	70-130				
tert-Butylbenzene	0.0111	0.0011	mg/Kg wet	0.0113		97.6	70-160				†
tert-Butyl Ethyl Ether (TBEE)	0.00958	0.00057	mg/Kg wet	0.0113		84.5	70-130				
Carbon Disulfide	0.0114	0.0057	mg/Kg wet	0.0113		100	70-130				
Carbon Tetrachloride	0.0107	0.0011	mg/Kg wet	0.0113		94.0	70-130				
Chlorobenzene	0.0120	0.0011	mg/Kg wet	0.0113		106	70-130				
Chlorodibromomethane	0.0112	0.00057	mg/Kg wet	0.0113		98.4	70-130				

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QUALITY CONTROL

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC		%REC Limits	RPD	RPD Limit	Notes
Batch B265828 - SW-846 5035											
LCS (B265828-BS1)				Prepared & Analyzed: 09/04/20							
Chloroethane	0.0112	0.0023	mg/Kg wet	0.0113		98.4		70-130			
Chloroform	0.0110	0.0023	mg/Kg wet	0.0113		96.8		70-130			
Chloromethane	0.0150	0.0023	mg/Kg wet	0.0113		**132**	*	70-130			L-07, V-20
2-Chlorotoluene	0.0114	0.0011	mg/Kg wet	0.0113		101		70-130			
4-Chlorotoluene	0.0119	0.0011	mg/Kg wet	0.0113		105		70-130			
1,2-Dibromo-3-chloropropane (DBCP)	0.0106	0.0057	mg/Kg wet	0.0113		93.2		70-130			
1,2-Dibromoethane (EDB)	0.0114	0.00057	mg/Kg wet	0.0113		101		70-130			
Dibromomethane	0.0108	0.0011	mg/Kg wet	0.0113		95.0		70-130			
1,2-Dichlorobenzene	0.0119	0.0011	mg/Kg wet	0.0113		105		70-130			
1,3-Dichlorobenzene	0.0120	0.0011	mg/Kg wet	0.0113		106		70-130			
1,4-Dichlorobenzene	0.0111	0.0011	mg/Kg wet	0.0113		98.2		70-130			
trans-1,4-Dichloro-2-butene	0.0125	0.0023	mg/Kg wet	0.0113		110		70-130			
Dichlorodifluoromethane (Freon 12)	0.00974	0.0023	mg/Kg wet	0.0113		85.9		40-160			†
1,1-Dichloroethane	0.0108	0.0011	mg/Kg wet	0.0113		95.1		70-130			
1,2-Dichloroethane	0.0110	0.0011	mg/Kg wet	0.0113		97.4		70-130			
1,1-Dichloroethylene	0.0111	0.0011	mg/Kg wet	0.0113		97.9		70-130			
cis-1,2-Dichloroethylene	0.0106	0.0011	mg/Kg wet	0.0113		93.8		70-130			
trans-1,2-Dichloroethylene	0.0103	0.0011	mg/Kg wet	0.0113		90.9		70-130			
Dichlorofluoromethane (Freon 21)	0.0116	0.0011	mg/Kg wet	0.0113		103		70-130			
1,2-Dichloropropane	0.0109	0.0011	mg/Kg wet	0.0113		96.2		70-130			
1,3-Dichloropropane	0.0108	0.00057	mg/Kg wet	0.0113		95.7		70-130			
2,2-Dichloropropane	0.0105	0.0011	mg/Kg wet	0.0113		92.4		70-130			
1,1-Dichloropropene	0.00968	0.0023	mg/Kg wet	0.0113		85.4		70-130			
cis-1,3-Dichloropropene	0.0105	0.00057	mg/Kg wet	0.0113		92.4		70-130			
trans-1,3-Dichloropropene	0.0106	0.00057	mg/Kg wet	0.0113		93.6		70-130			
Diethyl Ether	0.0119	0.0023	mg/Kg wet	0.0113		105		70-130			
Difluorochloromethane (Freon 22)	0.0104	0.0011	mg/Kg wet	0.0113		92.0		70-130			
Diisopropyl Ether (DIPE)	0.0106	0.00057	mg/Kg wet	0.0113		93.8		70-130			
1,4-Dioxane	0.101	0.057	mg/Kg wet	0.113		89.0		40-160			†
Ethylbenzene	0.0114	0.0011	mg/Kg wet	0.0113		100		70-130			
Hexachlorobutadiene	0.0120	0.0011	mg/Kg wet	0.0113		106		70-160			
2-Hexanone (MBK)	0.0986	0.011	mg/Kg wet	0.113		87.0		70-160			†
Isopropylbenzene (Cumene)	0.0115	0.0011	mg/Kg wet	0.0113		102		70-130			
p-Isopropyltoluene (p-Cymene)	0.0110	0.0011	mg/Kg wet	0.0113		97.3		70-130			
Methyl Acetate	0.0117	0.011	mg/Kg wet	0.0113		103		70-130			
Methyl tert-Butyl Ether (MTBE)	0.0109	0.0011	mg/Kg wet	0.0113		96.4		70-130			
Methyl Cyclohexane	0.0106	0.0011	mg/Kg wet	0.0113		93.4		70-130			
Methylene Chloride	0.0118	0.0057	mg/Kg wet	0.0113		104		40-160			†
4-Methyl-2-pentanone (MIBK)	0.100	0.011	mg/Kg wet	0.113		88.5		70-160			†
Naphthalene	0.00970	0.0023	mg/Kg wet	0.0113		85.6		40-130			†
n-Propylbenzene	0.0113	0.0011	mg/Kg wet	0.0113		99.8		70-130			
Styrene	0.0114	0.0011	mg/Kg wet	0.0113		101		70-130			
1,1,1,2-Tetrachloroethane	0.0122	0.0011	mg/Kg wet	0.0113		108		70-130			
1,1,2,2-Tetrachloroethane	0.0124	0.00057	mg/Kg wet	0.0113		109		70-130			
Tetrachloroethylene	0.0118	0.0011	mg/Kg wet	0.0113		104		70-130			
Tetrahydrofuran	0.0108	0.011	mg/Kg wet	0.0113		95.5		70-130			J
Toluene	0.0111	0.0011	mg/Kg wet	0.0113		97.7		70-130			
1,2,3-Trichlorobenzene	0.0108	0.0057	mg/Kg wet	0.0113		95.0		70-130			
1,2,4-Trichlorobenzene	0.0111	0.0011	mg/Kg wet	0.0113		97.7		70-130			
1,3,5-Trichlorobenzene	0.0116	0.0011	mg/Kg wet	0.0113		102		70-130			
1,1,1-Trichloroethane	0.0108	0.0011	mg/Kg wet	0.0113		95.3		70-130			
1,1,2-Trichloroethane	0.0118	0.0011	mg/Kg wet	0.0113		104		70-130			

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QUALITY CONTROL

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes	
Batch B265828 - SW-846 5035											
LCS (B265828-BS1)				Prepared & Analyzed: 09/04/20							
Trichloroethylene	0.0111	0.0011	mg/Kg wet	0.0113		97.9	70-130				
Trichlorofluoromethane (Freon 11)	0.0103	0.0023	mg/Kg wet	0.0113		90.9	70-130				
1,2,3-Trichloropropane	0.0110	0.0023	mg/Kg wet	0.0113		97.1	70-130				
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	0.0125	0.0011	mg/Kg wet	0.0113		110	70-130				
1,2,4-Trimethylbenzene	0.0106	0.0011	mg/Kg wet	0.0113		93.8	70-130				
1,3,5-Trimethylbenzene	0.0113	0.0011	mg/Kg wet	0.0113		99.6	70-130				
Vinyl Chloride	0.00963	0.0023	mg/Kg wet	0.0113		85.0	40-130				†
m+p Xylene	0.0226	0.0023	mg/Kg wet	0.0227		99.5	70-130				
o-Xylene	0.0116	0.0011	mg/Kg wet	0.0113		102	70-130				
Surrogate: 1,2-Dichloroethane-d4	*0.0279*		mg/Kg wet	0.0283		98.3	70-130				
Surrogate: Toluene-d8	*0.0284*		mg/Kg wet	0.0283		100	70-130				
Surrogate: 4-Bromofluorobenzene	*0.0285*		mg/Kg wet	0.0283		100	70-130				
LCS Dup (B265828-BSD1)				Prepared & Analyzed: 09/04/20							
Acetone	0.114	0.057	mg/Kg wet	0.113		100	70-160	0.159	25		†
Acrylonitrile	0.00981	0.0057	mg/Kg wet	0.0113		86.6	70-130	12.1	25		
tert-Amyl Methyl Ether (TAME)	0.00930	0.00057	mg/Kg wet	0.0113		82.1	70-130	8.18	25		
Benzene	0.00967	0.0011	mg/Kg wet	0.0113		85.3	70-130	9.49	25		
Bromobenzene	0.0107	0.0011	mg/Kg wet	0.0113		94.4	70-130	5.66	25		
Bromochloromethane	0.00951	0.0011	mg/Kg wet	0.0113		83.9	70-130	7.46	25		
Bromodichloromethane	0.0108	0.0011	mg/Kg wet	0.0113		95.4	70-130	2.38	25		
Bromoform	0.0112	0.0011	mg/Kg wet	0.0113		98.7	70-130	6.28	25		
Bromomethane	0.00631	0.0023	mg/Kg wet	0.0113		55.7	40-130	9.60	25	V-20	†
2-Butanone (MEK)	0.0934	0.023	mg/Kg wet	0.113		82.4	70-160	7.24	25		†
tert-Butyl Alcohol (TBA)	0.0955	0.023	mg/Kg wet	0.113		84.3	40-130	2.67	25		†
n-Butylbenzene	0.00987	0.0011	mg/Kg wet	0.0113		87.1	70-130	5.80	25		
sec-Butylbenzene	0.0107	0.0011	mg/Kg wet	0.0113		94.1	70-130	6.48	25		
tert-Butylbenzene	0.0104	0.0011	mg/Kg wet	0.0113		91.5	70-160	6.45	25		†
tert-Butyl Ethyl Ether (TBEE)	0.00904	0.00057	mg/Kg wet	0.0113		79.8	70-130	5.72	25		
Carbon Disulfide	0.00996	0.0057	mg/Kg wet	0.0113		87.9	70-130	13.1	25		
Carbon Tetrachloride	0.00980	0.0011	mg/Kg wet	0.0113		86.5	70-130	8.31	25		
Chlorobenzene	0.0115	0.0011	mg/Kg wet	0.0113		101	70-130	4.73	25		
Chlorodibromomethane	0.0108	0.00057	mg/Kg wet	0.0113		95.7	70-130	2.78	25		
Chloroethane	0.0106	0.0023	mg/Kg wet	0.0113		93.4	70-130	5.21	25		
Chloroform	0.0102	0.0023	mg/Kg wet	0.0113		89.6	70-130	7.73	25		
Chloromethane	0.0132	0.0023	mg/Kg wet	0.0113		116	70-130	12.6	25	V-20	
2-Chlorotoluene	0.0105	0.0011	mg/Kg wet	0.0113		92.7	70-130	8.57	25		
4-Chlorotoluene	0.0109	0.0011	mg/Kg wet	0.0113		95.9	70-130	8.87	25		
1,2-Dibromo-3-chloropropane (DBCP)	0.0103	0.0057	mg/Kg wet	0.0113		91.2	70-130	2.17	25		
1,2-Dibromoethane (EDB)	0.0108	0.00057	mg/Kg wet	0.0113		95.1	70-130	5.82	25		
Dibromomethane	0.0105	0.0011	mg/Kg wet	0.0113		92.8	70-130	2.34	25		
1,2-Dichlorobenzene	0.0108	0.0011	mg/Kg wet	0.0113		95.3	70-130	9.78	25		
1,3-Dichlorobenzene	0.0115	0.0011	mg/Kg wet	0.0113		101	70-130	4.83	25		
1,4-Dichlorobenzene	0.0111	0.0011	mg/Kg wet	0.0113		97.7	70-130	0.510	25		
trans-1,4-Dichloro-2-butene	0.0113	0.0023	mg/Kg wet	0.0113		99.4	70-130	10.2	25		
Dichlorodifluoromethane (Freon 12)	0.00870	0.0023	mg/Kg wet	0.0113		76.8	40-160	11.2	25		†
1,1-Dichloroethane	0.00993	0.0011	mg/Kg wet	0.0113		87.6	70-130	8.21	25		
1,2-Dichloroethane	0.0105	0.0011	mg/Kg wet	0.0113		92.6	70-130	5.05	25		
1,1-Dichloroethylene	0.0102	0.0011	mg/Kg wet	0.0113		90.0	70-130	8.41	25		
cis-1,2-Dichloroethylene	0.00993	0.0011	mg/Kg wet	0.0113		87.6	70-130	6.84	25		
trans-1,2-Dichloroethylene	0.00980	0.0011	mg/Kg wet	0.0113		86.5	70-130	4.96	25		
Dichlorofluoromethane (Freon 21)	0.0108	0.0011	mg/Kg wet	0.0113		94.9	70-130	7.70	25		

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QUALITY CONTROL

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes	
Batch B265828 - SW-846 5035											
LCS Dup (B265828-BSD1)				Prepared & Analyzed: 09/04/20							
1,2-Dichloropropane	0.0102	0.0011	mg/Kg wet	0.0113		90.0	70-130	6.66	25		
1,3-Dichloropropane	0.0104	0.00057	mg/Kg wet	0.0113		92.0	70-130	3.94	25		
2,2-Dichloropropane	0.00962	0.0011	mg/Kg wet	0.0113		84.9	70-130	8.46	25		
1,1-Dichloropropene	0.00879	0.0023	mg/Kg wet	0.0113		77.6	70-130	9.57	25		
cis-1,3-Dichloropropene	0.0101	0.00057	mg/Kg wet	0.0113		89.5	70-130	3.19	25		
trans-1,3-Dichloropropene	0.0102	0.00057	mg/Kg wet	0.0113		89.8	70-130	4.14	25		
Diethyl Ether	0.0109	0.0023	mg/Kg wet	0.0113		96.0	70-130	8.86	25		
Difluorochloromethane (Freon 22)	0.00962	0.0011	mg/Kg wet	0.0113		84.9	70-130	8.03	25		
Diisopropyl Ether (DIPE)	0.00991	0.00057	mg/Kg wet	0.0113		87.4	70-130	7.06	25		
1,4-Dioxane	0.0886	0.057	mg/Kg wet	0.113		78.2	40-160	12.9	50		† ‡
Ethylbenzene	0.0108	0.0011	mg/Kg wet	0.0113		95.2	70-130	5.22	25		
Hexachlorobutadiene	0.0113	0.0011	mg/Kg wet	0.0113		99.6	70-160	6.51	25		
2-Hexanone (MBK)	0.0930	0.011	mg/Kg wet	0.113		82.1	70-160	5.82	25		†
Isopropylbenzene (Cumene)	0.0107	0.0011	mg/Kg wet	0.0113		94.5	70-130	7.14	25		
p-Isopropyltoluene (p-Cymene)	0.0102	0.0011	mg/Kg wet	0.0113		90.0	70-130	7.79	25		
Methyl Acetate	0.0108	0.011	mg/Kg wet	0.0113		95.0	70-130	7.89	25	J	
Methyl tert-Butyl Ether (MTBE)	0.0104	0.0011	mg/Kg wet	0.0113		91.4	70-130	5.32	25		
Methyl Cyclohexane	0.00986	0.0011	mg/Kg wet	0.0113		87.0	70-130	7.10	25		
Methylene Chloride	0.0110	0.0057	mg/Kg wet	0.0113		97.1	40-160	6.67	25		†
4-Methyl-2-pentanone (MIBK)	0.0953	0.011	mg/Kg wet	0.113		84.1	70-160	5.15	25		†
Naphthalene	0.00946	0.0023	mg/Kg wet	0.0113		83.5	40-130	2.48	25		†
n-Propylbenzene	0.0105	0.0011	mg/Kg wet	0.0113		93.0	70-130	7.05	25		
Styrene	0.0110	0.0011	mg/Kg wet	0.0113		96.8	70-130	3.95	25		
1,1,1,2-Tetrachloroethane	0.0119	0.0011	mg/Kg wet	0.0113		105	70-130	3.01	25		
1,1,2,2-Tetrachloroethane	0.0118	0.00057	mg/Kg wet	0.0113		104	70-130	4.69	25		
Tetrachloroethylene	0.0112	0.0011	mg/Kg wet	0.0113		99.1	70-130	5.11	25		
Tetrahydrofuran	0.0102	0.011	mg/Kg wet	0.0113		89.7	70-130	6.26	25	J	
Toluene	0.0104	0.0011	mg/Kg wet	0.0113		92.1	70-130	5.90	25		
1,2,3-Trichlorobenzene	0.0101	0.0057	mg/Kg wet	0.0113		89.2	70-130	6.30	25		
1,2,4-Trichlorobenzene	0.0103	0.0011	mg/Kg wet	0.0113		91.0	70-130	7.10	25		
1,3,5-Trichlorobenzene	0.0107	0.0011	mg/Kg wet	0.0113		94.7	70-130	7.52	25		
1,1,1-Trichloroethane	0.0100	0.0011	mg/Kg wet	0.0113		88.3	70-130	7.63	25		
1,1,2-Trichloroethane	0.0112	0.0011	mg/Kg wet	0.0113		98.6	70-130	5.52	25		
Trichloroethylene	0.0105	0.0011	mg/Kg wet	0.0113		92.4	70-130	5.78	25		
Trichlorofluoromethane (Freon 11)	0.00953	0.0023	mg/Kg wet	0.0113		84.1	70-130	7.77	25		
1,2,3-Trichloropropane	0.0107	0.0023	mg/Kg wet	0.0113		94.1	70-130	3.14	25		
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	0.0109	0.0011	mg/Kg wet	0.0113		96.2	70-130	13.8	25		
1,2,4-Trimethylbenzene	0.0101	0.0011	mg/Kg wet	0.0113		89.3	70-130	4.92	25		
1,3,5-Trimethylbenzene	0.0105	0.0011	mg/Kg wet	0.0113		92.6	70-130	7.28	25		
Vinyl Chloride	0.00866	0.0023	mg/Kg wet	0.0113		76.4	40-130	10.7	25		†
m+p Xylene	0.0216	0.0023	mg/Kg wet	0.0227		95.5	70-130	4.10	25		
o-Xylene	0.0109	0.0011	mg/Kg wet	0.0113		96.4	70-130	5.74	25		
Surrogate: 1,2-Dichloroethane-d4	*0.0273*		mg/Kg wet	0.0283		96.4	70-130				
Surrogate: Toluene-d8	*0.0285*		mg/Kg wet	0.0283		101	70-130				
Surrogate: 4-Bromofluorobenzene	*0.0281*		mg/Kg wet	0.0283		99.3	70-130				

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QUALITY CONTROL

Semivolatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B266055 - SW-846 3546										
Blank (B266055-BLK1)				Prepared: 09/09/20 Analyzed: 09/10/20						
Acenaphthene	ND	0.17	mg/Kg wet							U
Acenaphthylene	ND	0.17	mg/Kg wet							U
Anthracene	ND	0.17	mg/Kg wet							U
Benzo(a)anthracene	ND	0.17	mg/Kg wet							U
Benzo(a)pyrene	ND	0.17	mg/Kg wet							U
Benzo(b)fluoranthene	ND	0.17	mg/Kg wet							U
Benzo(g,h,i)perylene	ND	0.17	mg/Kg wet							U
Benzo(k)fluoranthene	ND	0.17	mg/Kg wet							U
Chrysene	ND	0.17	mg/Kg wet							U
Dibenz(a,h)anthracene	ND	0.17	mg/Kg wet							U
Fluoranthene	ND	0.17	mg/Kg wet							U
Fluorene	ND	0.17	mg/Kg wet							U
Indeno(1,2,3-cd)pyrene	ND	0.17	mg/Kg wet							U
2-Methylnaphthalene	ND	0.17	mg/Kg wet							U
Naphthalene	ND	0.17	mg/Kg wet							U
Phenanthrene	ND	0.17	mg/Kg wet							U
Pyrene	ND	0.17	mg/Kg wet							U
Surrogate: Nitrobenzene-d5	*2.31*		mg/Kg wet	3.33		69.4	30-130			
Surrogate: 2-Fluorobiphenyl	*2.25*		mg/Kg wet	3.33		67.4	30-130			
Surrogate: p-Terphenyl-d14	*2.75*		mg/Kg wet	3.33		82.5	30-130			
LCS (B266055-BS1)				Prepared: 09/09/20 Analyzed: 09/10/20						
Acenaphthene	1.11	0.17	mg/Kg wet	1.67		66.7	40-140			
Acenaphthylene	1.14	0.17	mg/Kg wet	1.67		68.7	40-140			
Anthracene	1.22	0.17	mg/Kg wet	1.67		73.1	40-140			
Benzo(a)anthracene	1.15	0.17	mg/Kg wet	1.67		69.2	40-140			
Benzo(a)pyrene	1.14	0.17	mg/Kg wet	1.67		68.5	40-140			
Benzo(b)fluoranthene	1.14	0.17	mg/Kg wet	1.67		68.6	40-140			
Benzo(g,h,i)perylene	1.38	0.17	mg/Kg wet	1.67		82.6	40-140			
Benzo(k)fluoranthene	1.14	0.17	mg/Kg wet	1.67		68.4	40-140			
Chrysene	1.16	0.17	mg/Kg wet	1.67		69.4	40-140			
Dibenz(a,h)anthracene	1.31	0.17	mg/Kg wet	1.67		78.7	40-140			
Fluoranthene	1.11	0.17	mg/Kg wet	1.67		66.8	40-140			
Fluorene	1.16	0.17	mg/Kg wet	1.67		69.3	40-140			
Indeno(1,2,3-cd)pyrene	1.45	0.17	mg/Kg wet	1.67		86.8	40-140			
2-Methylnaphthalene	1.15	0.17	mg/Kg wet	1.67		68.7	40-140			
Naphthalene	1.04	0.17	mg/Kg wet	1.67		62.1	40-140			
Phenanthrene	1.20	0.17	mg/Kg wet	1.67		72.1	40-140			
Pyrene	1.13	0.17	mg/Kg wet	1.67		68.1	40-140			
Surrogate: Nitrobenzene-d5	*2.27*		mg/Kg wet	3.33		68.0	30-130			
Surrogate: 2-Fluorobiphenyl	*2.36*		mg/Kg wet	3.33		70.8	30-130			
Surrogate: p-Terphenyl-d14	*2.58*		mg/Kg wet	3.33		77.5	30-130			

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QUALITY CONTROL

Semivolatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B266055 - SW-846 3546										
LCS Dup (B266055-BSD1)				Prepared: 09/09/20 Analyzed: 09/10/20						
Acenaphthene	1.14	0.17	mg/Kg wet	1.67		68.7	40-140	3.01	30	
Acenaphthylene	1.16	0.17	mg/Kg wet	1.67		69.5	40-140	1.24	30	
Anthracene	1.26	0.17	mg/Kg wet	1.67		75.7	40-140	3.52	30	
Benzo(a)anthracene	1.20	0.17	mg/Kg wet	1.67		72.3	40-140	4.38	30	
Benzo(a)pyrene	1.21	0.17	mg/Kg wet	1.67		72.5	40-140	5.68	30	
Benzo(b)fluoranthene	1.20	0.17	mg/Kg wet	1.67		72.3	40-140	5.19	30	
Benzo(g,h,i)perylene	1.46	0.17	mg/Kg wet	1.67		87.5	40-140	5.81	30	
Benzo(k)fluoranthene	1.21	0.17	mg/Kg wet	1.67		72.6	40-140	5.87	30	
Chrysene	1.22	0.17	mg/Kg wet	1.67		73.0	40-140	5.08	30	
Dibenz(a,h)anthracene	1.39	0.17	mg/Kg wet	1.67		83.4	40-140	5.80	30	
Fluoranthene	1.17	0.17	mg/Kg wet	1.67		70.3	40-140	5.05	30	
Fluorene	1.19	0.17	mg/Kg wet	1.67		71.2	40-140	2.65	30	
Indeno(1,2,3-cd)pyrene	1.49	0.17	mg/Kg wet	1.67		89.5	40-140	3.06	30	
2-Methylnaphthalene	1.11	0.17	mg/Kg wet	1.67		66.4	40-140	3.49	30	
Naphthalene	1.01	0.17	mg/Kg wet	1.67		60.8	40-140	2.21	30	
Phenanthrene	1.25	0.17	mg/Kg wet	1.67		74.7	40-140	3.54	30	
Pyrene	1.20	0.17	mg/Kg wet	1.67		72.2	40-140	5.88	30	
Surrogate: Nitrobenzene-d5	*2.18*		mg/Kg wet	3.33		65.3	30-130			
Surrogate: 2-Fluorobiphenyl	*2.32*		mg/Kg wet	3.33		69.7	30-130			
Surrogate: p-Terphenyl-d14	*2.68*		mg/Kg wet	3.33		80.5	30-130			

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QUALITY CONTROL

Petroleum Hydrocarbons Analyses - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B266056 - SW-846 3546										
Blank (B266056-BLK1)				Prepared: 09/09/20 Analyzed: 09/10/20						
TPH (C9-C36)	ND	8.3	mg/Kg wet							U
Surrogate: 2-Fluorobiphenyl	*2.19*		mg/Kg wet	3.33		65.8	40-140			
LCS (B266056-BS1)				Prepared: 09/09/20 Analyzed: 09/10/20						
TPH (C9-C36)	24.2	8.3	mg/Kg wet	33.3		72.7	40-140			
Surrogate: 2-Fluorobiphenyl	*2.13*		mg/Kg wet	3.33		63.9	40-140			
LCS Dup (B266056-BSD1)				Prepared: 09/09/20 Analyzed: 09/10/20						
TPH (C9-C36)	24.4	8.3	mg/Kg wet	33.3		73.1	40-140	0.586	30	
Surrogate: 2-Fluorobiphenyl	*2.03*		mg/Kg wet	3.33		60.8	40-140			

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FLAG/QUALIFIER SUMMARY

*	QC result is outside of established limits.
†	Wide recovery limits established for difficult compound.
‡	Wide RPD limits established for difficult compound.
#	Data exceeded client recommended or regulatory level
ND	Not Detected
RL	Reporting Limit
DL	Method Detection Limit
MCL	Maximum Contaminant Level
	Percent recoveries and relative percent differences (RPDs) are determined by the software using values in the calculation which have not been rounded.
	No results have been blank subtracted unless specified in the case narrative section.
J	Detected but below the Reporting Limit (lowest calibration standard); therefore, result is an estimated concentration (CLP J-Flag).
L-07	Either laboratory fortified blank/laboratory control sample or duplicate recovery is outside of control limits, but the other is within limits. RPD between the two LFB/LCS results is within method specified criteria.
U	Analyte included in the analysis, but not detected
V-06	Continuing calibration verification (CCV) did not meet method specifications and was biased on the high side for this compound.
V-20	Continuing calibration verification (CCV) did not meet method specifications and was biased on the high side. Data validation is not affected since sample result was "not detected" for this compound.

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CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
SW-846 8260C-D in Soil	
Acetone	CT,NH,NY,ME,VA
Acrylonitrile	CT,NH,NY,ME,VA
Benzene	CT,NH,NY,ME,VA
Bromobenzene	NH,NY,ME,VA
Bromochloromethane	NH,NY,ME,VA
Bromodichloromethane	CT,NH,NY,ME,VA
Bromoform	CT,NH,NY,ME,VA
Bromomethane	CT,NH,NY,ME,VA
2-Butanone (MEK)	CT,NH,NY,ME,VA
n-Butylbenzene	CT,NH,NY,ME,VA
sec-Butylbenzene	CT,NH,NY,ME,VA
tert-Butylbenzene	CT,NH,NY,ME,VA
Carbon Disulfide	CT,NH,NY,ME,VA
Carbon Tetrachloride	CT,NH,NY,ME,VA
Chlorobenzene	CT,NH,NY,ME,VA
Chlorodibromomethane	CT,NH,NY,ME,VA
Chloroethane	CT,NH,NY,ME,VA
Chloroform	CT,NH,NY,ME,VA
Chloromethane	CT,NH,NY,ME,VA
2-Chlorotoluene	CT,NH,NY,ME,VA
4-Chlorotoluene	CT,NH,NY,ME,VA
1,2-Dibromo-3-chloropropane (DBCP)	NY
1,2-Dibromoethane (EDB)	NH,NY
Dibromomethane	NH,NY,ME,VA
1,2-Dichlorobenzene	CT,NH,NY,ME,VA
1,3-Dichlorobenzene	CT,NH,NY,ME,VA
1,4-Dichlorobenzene	CT,NH,NY,ME,VA
Dichlorodifluoromethane (Freon 12)	NY,ME,VA
1,1-Dichloroethane	CT,NH,NY,ME,VA
1,2-Dichloroethane	CT,NH,NY,ME,VA
1,1-Dichloroethylene	CT,NH,NY,ME,VA
cis-1,2-Dichloroethylene	CT,NH,NY,ME,VA
trans-1,2-Dichloroethylene	CT,NH,NY,ME,VA
1,2-Dichloropropane	CT,NH,NY,ME,VA
1,3-Dichloropropane	NH,NY,ME,VA
2,2-Dichloropropane	NH,NY,ME,VA
1,1-Dichloropropene	NH,NY,ME,VA
cis-1,3-Dichloropropene	CT,NH,NY,ME,VA
trans-1,3-Dichloropropene	CT,NH,NY,ME,VA
Ethylbenzene	CT,NH,NY,ME,VA
Hexachlorobutadiene	NH,NY,ME,VA
2-Hexanone (MBK)	CT,NH,NY,ME,VA
Isopropylbenzene (Cumene)	CT,NH,NY,ME,VA
p-Isopropyltoluene (p-Cymene)	NH,NY
Methyl tert-Butyl Ether (MTBE)	NY,VA
Methylene Chloride	CT,NH,NY,ME,VA
4-Methyl-2-pentanone (MIBK)	CT,NH,NY,VA

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CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
SW-846 8260C-D in Soil	
Naphthalene	NH,NY,ME,VA
n-Propylbenzene	NH,NY
Styrene	CT,NH,NY,ME,VA
1,1,1,2-Tetrachloroethane	CT,NH,NY,ME,VA
1,1,2,2-Tetrachloroethane	CT,NH,NY,ME,VA
Tetrachloroethylene	CT,NH,NY,ME,VA
Toluene	CT,NH,NY,ME,VA
1,2,4-Trichlorobenzene	NH,NY,ME,VA
1,1,1-Trichloroethane	CT,NH,NY,ME,VA
1,1,2-Trichloroethane	CT,NH,NY,ME,VA
Trichloroethylene	CT,NH,NY,ME,VA
Trichlorofluoromethane (Freon 11)	CT,NH,NY,VA
1,2,3-Trichloropropane	NH,NY,ME,VA
1,2,4-Trimethylbenzene	CT,NH,NY,ME,VA
1,3,5-Trimethylbenzene	CT,NH,NY,ME,VA
Vinyl Chloride	CT,NH,NY,ME,VA
m+p Xylene	CT,NH,NY,ME,VA
o-Xylene	CT,NH,NY,ME,VA
SW-846 8270D-E in Soil	
Acenaphthene	CT,NY,NH,ME,NC,VA
Acenaphthylene	CT,NY,NH,ME,NC,VA
Anthracene	CT,NY,NH,ME,NC,VA
Benzo(a)anthracene	CT,NY,NH,ME,NC,VA
Benzo(a)pyrene	CT,NY,NH,ME,NC,VA
Benzo(b)fluoranthene	CT,NY,NH,ME,NC,VA
Benzo(g,h,i)perylene	CT,NY,NH,ME,NC,VA
Benzo(k)fluoranthene	CT,NY,NH,ME,NC,VA
Chrysene	CT,NY,NH,ME,NC,VA
Dibenz(a,h)anthracene	CT,NY,NH,ME,NC,VA
Fluoranthene	CT,NY,NH,ME,NC,VA
Fluorene	CT,NY,NH,ME,NC,VA
Indeno(1,2,3-cd)pyrene	CT,NY,NH,ME,NC,VA
2-Methylnaphthalene	CT,NY,NH,ME,NC,VA
Naphthalene	CT,NY,NH,ME,NC,VA
Phenanthrene	CT,NY,NH,ME,NC,VA
Pyrene	CT,NY,NH,ME,NC,VA

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The CON-TEST Environmental Laboratory operates under the following certifications and accreditations:

Code	Description	Number	Expires
AIHA	AIHA-LAP, LLC - ISO17025:2017	100033	03/1/2022
MA	Massachusetts DEP	M-MA100	06/30/2021
CT	Connecticut Department of Publilc Health	PH-0567	09/30/2021
NY	New York State Department of Health	10899 NELAP	04/1/2021
NH-S	New Hampshire Environmental Lab	2516 NELAP	02/5/2021
RI	Rhode Island Department of Health	LAO00112	12/30/2020
NC	North Carolina Div. of Water Quality	652	12/31/2020
NJ	New Jersey DEP	MA007 NELAP	06/30/2021
FL	Florida Department of Health	E871027 NELAP	06/30/2021
VT	Vermont Department of Health Lead Laboratory	LL015036	07/30/2021
ME	State of Maine	2011028	06/9/2021
VA	Commonwealth of Virginia	460217	12/14/2020
NH-P	New Hampshire Environmental Lab	2557 NELAP	09/6/2021
VT-DW	Vermont Department of Health Drinking Water	VT-255716	06/12/2021
NC-DW	North Carolina Department of Health	25703	07/31/2021
PA	Commonwealth of Pennsylvania DEP	68-05812	06/30/2021
MI	Dept. of Env, Great Lakes, and Energy	9100	10/1/2020

20I0256

con-test ANALYTICAL LABORATORY

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http://www.contestlabs.com

CHAIN OF CUSTODY RECORD

39 Spruce Street
East Longmeadow, MA 01028

Doc # 381 Rev 2_06262019

Page 1 of 1

Company Name: Wilcox & Barton Inc
Address: 1B Commons Dr. Unit 12B Londonderry NH
Phone: 603) 369-4190
Project Name: BACL0003.1
Project Location: 129 Manchester St. Concord, NH
Project Number: BACL0003.1
Project Manager: R. Barton
Con-Test Quote Name/Number:
Invoice Recipient:
Sampled By: M. Miraglia

Requested Turnaround Time
7-Day ☐ 10-Day ☐
PFAS 10-Day (std) ☐ Due Date: 5 Day

NELAC Approval Required
1-Day ☐ 3-Day ☐
2-Day ☐ 4-Day ☐

Data Delivery
Format: PDF ☒ EXCEL ☒
Other:
CLP Like Data Pkg Required: ☐
Email To: RBarton@wilcoxandbarton.com
Fax To #:

Dissolved Metals Samples
○ Field Filtered
○ Lab to Filter

Orthophosphate Samples
○ Field Filtered
○ Lab to Filter

ANALYSIS REQUESTED

Con-Test Work Order#	Client Sample ID / Description	Beginning Date/Time	Ending Date/Time	COMP/GRAB	Matrix Code	Conc Code	VIALS	GLASS	PLASTIC	BACTERIA	ENCORE	VOL 8260	PAH 8270	TPH 8100	% Solids
1	S-1 6'	09/1/20	1145	Grab	S	U	3	2				X	X	X	X

[2] Preservation Code

Courier Use Only
Total Number Of:
VIALS
GLASS
PLASTIC
BACTERIA
ENCORE

Glassware in the fridge? Y / N
Glassware in freezer? Y / N
Prepackaged Cooler? Y / N
*Contest is not responsible for missing samples from prepacked coolers

[1] Matrix Codes:
GW = Ground Water
WW = Waste Water
DW = Drinking Water
A = Air
S = Soil
SL = Sludge
SOL = Solid
O = Other (please define)

[2] Preservation Codes:
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium Bisulfate
X = Sodium Hydroxide
T = Sodium Thiosulfate
O = Other (please define)

	Date/Time
Relinquished by: (signature)	9/2/20 1600
Received by: (signature)	9/2/2016:00
Relinquished by: (signature)	9/3/2016:10
Received by: (signature)	9/3/20 1615
Relinquished by: (signature)	9/2/20 1838
Received by: (signature)	1838
Relinquished by: (signature)	
Received by: (signature)	

Client Comments:
A pricing

Detection Limit Requirements
MA
GW

Special Requirements
☐ MA MCP Required
MCP Certification Form Required
☐ CT RCP Required
RCP Certification Form Required
MA State DW Required
PWSID #

Please use the following codes to indicate possible sample concentration within the Conc Code column above:
H - High; M - Medium; L - Low; C - Clean; U - Unknown

Other: NHDES SRS

NELAC and AIHA-LAP, LLC Accredited

Project Entity
Government ☐ Municipality ☐ MWRA ☐ WRTA ☐
Federal ☐ 21 J ☐ School ☐
City ☐ Brownfield ☐ MBTA ☐

Other
☐ Chromatogram
☐ AIHA-LAP,LLC

PCB ONLY
☐ Soxhlet
☐ Non Soxhlet

Comments:

Disclaimer: Con-Test Labs is not responsible for any omitted information on the Chain of Custody. The Chain of Custody is a legal document that must be complete and accurate and is used to determine wha analyses the laboratory will perform. Any missing information is not the laboratory's responsibility. Con Test values your partnership on each project and will try to assist with missing information, but will not b held accountable.

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I Have Not Confirmed Sample Container Numbers With Lab Staff Before Relinquishing Over Samples_____

con-test® ANALYTICAL LABORATORY

Doc# 277 Rev 5 2017

Login Sample Receipt Checklist - (Rejection Criteria Listing - Using Acceptance Policy) Any False Statement will be brought to the attention of the Client - State True or False

Client Wilcox & Barton

Received By SA Date 9/3 Time 1838

How were the samples received? In Cooler T No Cooler _____ On Ice T No Ice _____

Direct from Sampling _____ Ambient _____ Melted Ice _____

By Gun # 4 Actual Temp - 2.0

Were samples within Temperature? 2-6°C T By Blank # _____ Actual Temp - _____

Was Custody Seal Intact? NA Were Samples Tampered with? NA

Was COC Relinquished ? T Does Chain Agree With Samples? T

Are there broken/leaking/loose caps on any samples? F

Is COC in ink/ Legible? T Were samples received within holding time? T

Did COC include all pertinent Information? Client T Project T Analysis T ID's T Sampler Name T Collection Dates/Times T

Are Sample labels filled out and legible? T

Are there Lab to Filters? F Who was notified? _____

Are there Rushes? F Who was notified? _____

Are there Short Holds? F Who was notified? _____

Is there enough Volume? T

Is there Headspace where applicable? F MS/MSD? F

Proper Media/Containers Used? T Is splitting samples required? F

Were trip blanks received? F On COC? F

Do all samples have the proper pH? Acid N+ Base NA

Vials	#	Containers:	#		#		#
Unp-		1 Liter Amb.		1 Liter Plastic		16 oz Amb.	
HCL-		500 mL Amb.		500 mL Plastic		8oz Amb/Clear	8
Meoh-	1	250 mL Amb.		250 mL Plastic		4oz Amb/Clear	
Bisulfate-	2	Flashpoint		Col./Bacteria		2oz Amb/Clear	
DI-		Other Glass		Other Plastic		Encore	
Thiosulfate-		SOC Kit		Plastic Bag		Frozen:	
Sulfuric-		Perchlorate		Ziplock			

Unused Media

Vials	#	Containers:	#		#		#
Unp-		1 Liter Amb.		1 Liter Plastic		16 oz Amb.	
HCL-		500 mL Amb.		500 mL Plastic		8oz Amb/Clear	
Meoh-		250 mL Amb.		250 mL Plastic		4oz Amb/Clear	
Bisulfate-		Col./Bacteria		Flashpoint		2oz Amb/Clear	
DI-		Other Plastic		Other Glass		Encore	
Thiosulfate-		SOC Kit		Plastic Bag		Frozen:	
Sulfuric-		Perchlorate		Ziplock			

Comments:

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September 14, 2020

Russell Barton
Wilcox & Barton
1115 Route 100B, Suite 200
Moretown, VT 05660

Project Location: 129 Manchester St., Concord, NH
Client Job Number:
Project Number: RACC0003.1
Laboratory Work Order Number: 20I0311

Enclosed are results of analyses for samples received by the laboratory on September 4, 2020. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Raymond J. McCarthy
Project Manager

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Semivolatile Organic Compounds by GC/MS 17

B266291 17

Petroleum Hydrocarbons Analyses 19

B266118 19

B266172 19

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B265989 20

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con-test® ANALYTICAL LABORATORY

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Wilcox & Barton
1115 Route 100B, Suite 200
Moretown, VT 05660
ATTN: Russell Barton

REPORT DATE: 9/14/2020

PURCHASE ORDER NUMBER:

PROJECT NUMBER: RACC0003.1

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 20I0311

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: 129 Manchester St., Concord, NH

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
S-101	20I0311-01	Soil		SM 2540G	
				SW-846 6010D	
				SW-846 7471B	
				SW-846 8015C	
				SW-846 8100 Modified	
				SW-846 8260C-D	
				SW-846 8270D-E	

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CASE NARRATIVE SUMMARY

All reported results are within defined laboratory quality control objectives unless listed below or otherwise qualified in this report.

For method 8270E ,only PAHs were reqiested amd reported.

SW-846 8260C-D

Qualifications:

L-02

Laboratory fortified blank/laboratory control sample recovery and duplicate recoveries outside of control limits. Data validation is not affected since all results are "not detected" for associated samples in this batch and bias is on the high side.

Analyte & Samples(s) Qualified:

Methyl Acetate
B266044-BS1, B266044-BSD1

L-07

Either laboratory fortified blank/laboratory control sample or duplicate recovery is outside of control limits, but the other is within limits. RPD between the two LFB/LCS results is within method specified criteria.

Analyte & Samples(s) Qualified:

tert-Butyl Alcohol (TBA)
B266044-BS1

V-20

Continuing calibration verification (CCV) did not meet method specifications and was biased on the high side. Data validation is not affected since sample result was "not detected" for this compound.

Analyte & Samples(s) Qualified:

Methyl Acetate
B266044-BS1, B266044-BSD1

V-34

Initial calibration verification (ICV) did not meet method specifications and was biased on the low side for this compound. Reported result is estimated.

Analyte & Samples(s) Qualified:

Bromomethane
20I0311-01[S-101], B266044-BLK1, B266044-BS1, B266044-BSD1

SW-846 8015C

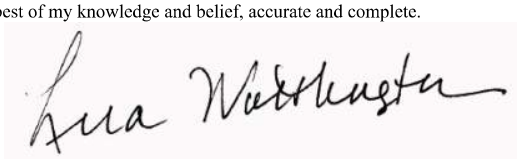
Gasoline Range Organics (2-Methylpentane through 1,2,4-Trimethylbenzene) is quantitated against a calibration made with an unleaded gasoline composite standard.

Diesel Range Organics (C10-C28) is quantitated against a calibration made with a #2 fuel oil standard.

SW-846 8100 Modified

TPH (C9-C36) is quantitated against a calibration made with a diesel standard.

The results of analyses reported only relate to samples submitted to the Con-Test Analytical Laboratory for testing.
I certify that the analyses listed above, unless specifically listed as subcontracted, if any, were performed under my direction according to the approved methodologies listed in this document, and 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.



Lisa A. Worthington
Technical Representative

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: 129 Manchester St., Concord, NH Sample Description: Work Order: 20I0311

Date Received: 9/4/2020

Field Sample #: S-101 Sampled: 9/3/2020 09:40

Sample ID: 20I0311-01

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	DF	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	0.058	0.071	0.0060	mg/Kg dry	1	J	SW-846 8260C-D	9/9/20	9/9/20 6:18	MFF
Acrylonitrile	ND	0.0043	0.00071	mg/Kg dry	1	U	SW-846 8260C-D	9/9/20	9/9/20 6:18	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.00071	0.00021	mg/Kg dry	1	U	SW-846 8260C-D	9/9/20	9/9/20 6:18	MFF
Benzene	ND	0.0014	0.00043	mg/Kg dry	1	U	SW-846 8260C-D	9/9/20	9/9/20 6:18	MFF
Bromobenzene	ND	0.0014	0.00029	mg/Kg dry	1	U	SW-846 8260C-D	9/9/20	9/9/20 6:18	MFF
Bromochloromethane	ND	0.0014	0.00057	mg/Kg dry	1	U	SW-846 8260C-D	9/9/20	9/9/20 6:18	MFF
Bromodichloromethane	ND	0.0014	0.00036	mg/Kg dry	1	U	SW-846 8260C-D	9/9/20	9/9/20 6:18	MFF
Bromoform	ND	0.0014	0.00050	mg/Kg dry	1	U	SW-846 8260C-D	9/9/20	9/9/20 6:18	MFF
Bromomethane	ND	0.0071	0.00079	mg/Kg dry	1	V-34, U	SW-846 8260C-D	9/9/20	9/9/20 6:18	MFF
2-Butanone (MEK)	ND	0.029	0.0039	mg/Kg dry	1	U	SW-846 8260C-D	9/9/20	9/9/20 6:18	MFF
tert-Butyl Alcohol (TBA)	ND	0.029	0.0032	mg/Kg dry	1	U	SW-846 8260C-D	9/9/20	9/9/20 6:18	MFF
n-Butylbenzene	ND	0.0014	0.00036	mg/Kg dry	1	U	SW-846 8260C-D	9/9/20	9/9/20 6:18	MFF
sec-Butylbenzene	ND	0.0014	0.00057	mg/Kg dry	1	U	SW-846 8260C-D	9/9/20	9/9/20 6:18	MFF
tert-Butylbenzene	ND	0.0014	0.00043	mg/Kg dry	1	U	SW-846 8260C-D	9/9/20	9/9/20 6:18	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.00071	0.00014	mg/Kg dry	1	U	SW-846 8260C-D	9/9/20	9/9/20 6:18	MFF
Carbon Disulfide	ND	0.0043	0.0039	mg/Kg dry	1	U	SW-846 8260C-D	9/9/20	9/9/20 6:18	MFF
Carbon Tetrachloride	ND	0.0014	0.00050	mg/Kg dry	1	U	SW-846 8260C-D	9/9/20	9/9/20 6:18	MFF
Chlorobenzene	ND	0.0014	0.00036	mg/Kg dry	1	U	SW-846 8260C-D	9/9/20	9/9/20 6:18	MFF
Chlorodibromomethane	ND	0.00071	0.00029	mg/Kg dry	1	U	SW-846 8260C-D	9/9/20	9/9/20 6:18	MFF
Chloroethane	ND	0.014	0.00057	mg/Kg dry	1	U	SW-846 8260C-D	9/9/20	9/9/20 6:18	MFF
Chloroform	ND	0.0029	0.00036	mg/Kg dry	1	U	SW-846 8260C-D	9/9/20	9/9/20 6:18	MFF
Chloromethane	ND	0.0071	0.00050	mg/Kg dry	1	U	SW-846 8260C-D	9/9/20	9/9/20 6:18	MFF
2-Chlorotoluene	ND	0.0014	0.00021	mg/Kg dry	1	U	SW-846 8260C-D	9/9/20	9/9/20 6:18	MFF
4-Chlorotoluene	ND	0.0014	0.00029	mg/Kg dry	1	U	SW-846 8260C-D	9/9/20	9/9/20 6:18	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0014	0.00071	mg/Kg dry	1	U	SW-846 8260C-D	9/9/20	9/9/20 6:18	MFF
1,2-Dibromoethane (EDB)	ND	0.00071	0.00050	mg/Kg dry	1	U	SW-846 8260C-D	9/9/20	9/9/20 6:18	MFF
Dibromomethane	ND	0.0014	0.00057	mg/Kg dry	1	U	SW-846 8260C-D	9/9/20	9/9/20 6:18	MFF
1,2-Dichlorobenzene	ND	0.0014	0.00029	mg/Kg dry	1	U	SW-846 8260C-D	9/9/20	9/9/20 6:18	MFF
1,3-Dichlorobenzene	ND	0.0014	0.00029	mg/Kg dry	1	U	SW-846 8260C-D	9/9/20	9/9/20 6:18	MFF
1,4-Dichlorobenzene	ND	0.0014	0.00057	mg/Kg dry	1	U	SW-846 8260C-D	9/9/20	9/9/20 6:18	MFF
trans-1,4-Dichloro-2-butene	ND	0.0029	0.00043	mg/Kg dry	1	U	SW-846 8260C-D	9/9/20	9/9/20 6:18	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.014	0.00079	mg/Kg dry	1	U	SW-846 8260C-D	9/9/20	9/9/20 6:18	MFF
1,1-Dichloroethane	ND	0.0014	0.00029	mg/Kg dry	1	U	SW-846 8260C-D	9/9/20	9/9/20 6:18	MFF
1,2-Dichloroethane	ND	0.0014	0.00036	mg/Kg dry	1	U	SW-846 8260C-D	9/9/20	9/9/20 6:18	MFF
1,1-Dichloroethylene	ND	0.0029	0.00050	mg/Kg dry	1	U	SW-846 8260C-D	9/9/20	9/9/20 6:18	MFF
cis-1,2-Dichloroethylene	ND	0.0014	0.00050	mg/Kg dry	1	U	SW-846 8260C-D	9/9/20	9/9/20 6:18	MFF
trans-1,2-Dichloroethylene	ND	0.0014	0.00043	mg/Kg dry	1	U	SW-846 8260C-D	9/9/20	9/9/20 6:18	MFF
1,2-Dichloropropane	ND	0.0014	0.00057	mg/Kg dry	1	U	SW-846 8260C-D	9/9/20	9/9/20 6:18	MFF
1,3-Dichloropropane	ND	0.00071	0.00036	mg/Kg dry	1	U	SW-846 8260C-D	9/9/20	9/9/20 6:18	MFF
2,2-Dichloropropane	ND	0.0014	0.00057	mg/Kg dry	1	U	SW-846 8260C-D	9/9/20	9/9/20 6:18	MFF
1,1-Dichloropropene	ND	0.0014	0.00057	mg/Kg dry	1	U	SW-846 8260C-D	9/9/20	9/9/20 6:18	MFF
cis-1,3-Dichloropropene	ND	0.00071	0.00029	mg/Kg dry	1	U	SW-846 8260C-D	9/9/20	9/9/20 6:18	MFF
trans-1,3-Dichloropropene	ND	0.00071	0.00029	mg/Kg dry	1	U	SW-846 8260C-D	9/9/20	9/9/20 6:18	MFF
Diethyl Ether	ND	0.014	0.00050	mg/Kg dry	1	U	SW-846 8260C-D	9/9/20	9/9/20 6:18	MFF

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Project Location: 129 Manchester St., Concord, NH Sample Description: Work Order: 20I0311

Date Received: 9/4/2020

Field Sample #: S-101 Sampled: 9/3/2020 09:40

Sample ID: 20I0311-01

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	DF	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.00071	0.00014	mg/Kg dry	1	U	SW-846 8260C-D	9/9/20	9/9/20 6:18	MFF
1,4-Dioxane	ND	0.071	0.0038	mg/Kg dry	1	U	SW-846 8260C-D	9/9/20	9/9/20 6:18	MFF
Ethylbenzene	ND	0.0014	0.00043	mg/Kg dry	1	U	SW-846 8260C-D	9/9/20	9/9/20 6:18	MFF
Hexachlorobutadiene	ND	0.0014	0.00050	mg/Kg dry	1	U	SW-846 8260C-D	9/9/20	9/9/20 6:18	MFF
2-Hexanone (MBK)	ND	0.014	0.0014	mg/Kg dry	1	U	SW-846 8260C-D	9/9/20	9/9/20 6:18	MFF
Isopropylbenzene (Cumene)	ND	0.0014	0.00043	mg/Kg dry	1	U	SW-846 8260C-D	9/9/20	9/9/20 6:18	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.0014	0.00036	mg/Kg dry	1	U	SW-846 8260C-D	9/9/20	9/9/20 6:18	MFF
Methyl Acetate	ND	0.0014	0.00050	mg/Kg dry	1	U	SW-846 8260C-D	9/9/20	9/9/20 6:18	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.0029	0.00021	mg/Kg dry	1	U	SW-846 8260C-D	9/9/20	9/9/20 6:18	MFF
Methyl Cyclohexane	ND	0.0014	0.00050	mg/Kg dry	1	U	SW-846 8260C-D	9/9/20	9/9/20 6:18	MFF
Methylene Chloride	0.0019	0.014	0.00071	mg/Kg dry	1	J	SW-846 8260C-D	9/9/20	9/9/20 6:18	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.014	0.0018	mg/Kg dry	1	U	SW-846 8260C-D	9/9/20	9/9/20 6:18	MFF
Naphthalene	ND	0.0029	0.00029	mg/Kg dry	1	U	SW-846 8260C-D	9/9/20	9/9/20 6:18	MFF
n-Propylbenzene	ND	0.0014	0.00043	mg/Kg dry	1	U	SW-846 8260C-D	9/9/20	9/9/20 6:18	MFF
Styrene	ND	0.0014	0.00029	mg/Kg dry	1	U	SW-846 8260C-D	9/9/20	9/9/20 6:18	MFF
1,1,1,2-Tetrachloroethane	ND	0.0014	0.00071	mg/Kg dry	1	U	SW-846 8260C-D	9/9/20	9/9/20 6:18	MFF
1,1,2,2-Tetrachloroethane	ND	0.00071	0.00029	mg/Kg dry	1	U	SW-846 8260C-D	9/9/20	9/9/20 6:18	MFF
Tetrachloroethylene	ND	0.0014	0.00086	mg/Kg dry	1	U	SW-846 8260C-D	9/9/20	9/9/20 6:18	MFF
Tetrahydrofuran	ND	0.0071	0.00079	mg/Kg dry	1	U	SW-846 8260C-D	9/9/20	9/9/20 6:18	MFF
Toluene	ND	0.0014	0.00043	mg/Kg dry	1	U	SW-846 8260C-D	9/9/20	9/9/20 6:18	MFF
1,2,3-Trichlorobenzene	ND	0.0014	0.00071	mg/Kg dry	1	U	SW-846 8260C-D	9/9/20	9/9/20 6:18	MFF
1,2,4-Trichlorobenzene	ND	0.0014	0.00029	mg/Kg dry	1	U	SW-846 8260C-D	9/9/20	9/9/20 6:18	MFF
1,3,5-Trichlorobenzene	ND	0.0014	0.00021	mg/Kg dry	1	U	SW-846 8260C-D	9/9/20	9/9/20 6:18	MFF
1,1,1-Trichloroethane	ND	0.0014	0.00036	mg/Kg dry	1	U	SW-846 8260C-D	9/9/20	9/9/20 6:18	MFF
1,1,2-Trichloroethane	ND	0.0014	0.00029	mg/Kg dry	1	U	SW-846 8260C-D	9/9/20	9/9/20 6:18	MFF
Trichloroethylene	ND	0.0014	0.00057	mg/Kg dry	1	U	SW-846 8260C-D	9/9/20	9/9/20 6:18	MFF
Trichlorofluoromethane (Freon 11)	ND	0.0071	0.00050	mg/Kg dry	1	U	SW-846 8260C-D	9/9/20	9/9/20 6:18	MFF
1,2,3-Trichloropropane	ND	0.0014	0.00057	mg/Kg dry	1	U	SW-846 8260C-D	9/9/20	9/9/20 6:18	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.0071	0.00057	mg/Kg dry	1	U	SW-846 8260C-D	9/9/20	9/9/20 6:18	MFF
1,2,4-Trimethylbenzene	ND	0.0014	0.00021	mg/Kg dry	1	U	SW-846 8260C-D	9/9/20	9/9/20 6:18	MFF
1,3,5-Trimethylbenzene	ND	0.0014	0.00036	mg/Kg dry	1	U	SW-846 8260C-D	9/9/20	9/9/20 6:18	MFF
Vinyl Chloride	ND	0.0071	0.00064	mg/Kg dry	1	U	SW-846 8260C-D	9/9/20	9/9/20 6:18	MFF
m+p Xylene	ND	0.0029	0.00071	mg/Kg dry	1	U	SW-846 8260C-D	9/9/20	9/9/20 6:18	MFF
o-Xylene	ND	0.0014	0.00043	mg/Kg dry	1	U	SW-846 8260C-D	9/9/20	9/9/20 6:18	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	108	70-130		9/9/20 6:18
Toluene-d8	97.4	70-130		9/9/20 6:18
4-Bromofluorobenzene	104	70-130		9/9/20 6:18

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Project Location: 129 Manchester St., Concord, NH Sample Description: Work Order: 20I0311

Date Received: 9/4/2020

Field Sample #: S-101 Sampled: 9/3/2020 09:40

Sample ID: 20I0311-01

Sample Matrix: Soil

Semivolatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	DF	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acenaphthene	ND	0.18	0.097	mg/Kg dry	1	U	SW-846 8270D-E	9/11/20	9/12/20 18:13	BGL
Acenaphthylene	ND	0.18	0.12	mg/Kg dry	1	U	SW-846 8270D-E	9/11/20	9/12/20 18:13	BGL
Anthracene	ND	0.18	0.097	mg/Kg dry	1	U	SW-846 8270D-E	9/11/20	9/12/20 18:13	BGL
Benzo(a)anthracene	ND	0.18	0.12	mg/Kg dry	1	U	SW-846 8270D-E	9/11/20	9/12/20 18:13	BGL
Benzo(a)pyrene	ND	0.18	0.12	mg/Kg dry	1	U	SW-846 8270D-E	9/11/20	9/12/20 18:13	BGL
Benzo(b)fluoranthene	ND	0.18	0.12	mg/Kg dry	1	U	SW-846 8270D-E	9/11/20	9/12/20 18:13	BGL
Benzo(g,h,i)perylene	ND	0.18	0.11	mg/Kg dry	1	U	SW-846 8270D-E	9/11/20	9/12/20 18:13	BGL
Benzo(k)fluoranthene	ND	0.18	0.12	mg/Kg dry	1	U	SW-846 8270D-E	9/11/20	9/12/20 18:13	BGL
Chrysene	ND	0.18	0.12	mg/Kg dry	1	U	SW-846 8270D-E	9/11/20	9/12/20 18:13	BGL
Dibenz(a,h)anthracene	ND	0.18	0.11	mg/Kg dry	1	U	SW-846 8270D-E	9/11/20	9/12/20 18:13	BGL
Fluoranthene	ND	0.18	0.11	mg/Kg dry	1	U	SW-846 8270D-E	9/11/20	9/12/20 18:13	BGL
Fluorene	ND	0.18	0.13	mg/Kg dry	1	U	SW-846 8270D-E	9/11/20	9/12/20 18:13	BGL
Indeno(1,2,3-cd)pyrene	ND	0.18	0.13	mg/Kg dry	1	U	SW-846 8270D-E	9/11/20	9/12/20 18:13	BGL
2-Methylnaphthalene	ND	0.18	0.12	mg/Kg dry	1	U	SW-846 8270D-E	9/11/20	9/12/20 18:13	BGL
Naphthalene	ND	0.18	0.12	mg/Kg dry	1	U	SW-846 8270D-E	9/11/20	9/12/20 18:13	BGL
Phenanthrene	ND	0.18	0.097	mg/Kg dry	1	U	SW-846 8270D-E	9/11/20	9/12/20 18:13	BGL
Pyrene	ND	0.18	0.12	mg/Kg dry	1	U	SW-846 8270D-E	9/11/20	9/12/20 18:13	BGL

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Nitrobenzene-d5	84.7	30-130		9/12/20 18:13
2-Fluorobiphenyl	83.1	30-130		9/12/20 18:13
p-Terphenyl-d14	103	30-130		9/12/20 18:13

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Project Location: 129 Manchester St., Concord, NH Sample Description: Work Order: 20I0311

Date Received: 9/4/2020

Field Sample #: S-101 Sampled: 9/3/2020 09:40

Sample ID: 20I0311-01

Sample Matrix: Soil

Petroleum Hydrocarbons Analyses

Analyte	Results	RL	DL	Units	DF	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Gasoline Range Organics (GRO)	ND	0.91	0.88	mg/Kg dry	1	U	SW-846 8015C	9/9/20	9/9/20 17:08	KMB
Diesel Range Organics	7.3	9.0	3.3	mg/Kg dry	1	J	SW-846 8015C	9/10/20	9/14/20 4:36	RDD
TPH (C9-C36)	15	9.0	4.0	mg/Kg dry	1		SW-846 8100 Modified	9/10/20	9/14/20 4:36	RDD

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1-Chloro-3-fluorobenzene	90.8	70-130		9/9/20 17:08
2-Fluorobiphenyl	68.9	40-140		9/14/20 4:36
2-Fluorobiphenyl	68.9	40-140		9/14/20 4:36

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Project Location: 129 Manchester St., Concord, NH Sample Description: Work Order: 20I0311

Date Received: 9/4/2020

Field Sample #: S-101 Sampled: 9/3/2020 09:40

Sample ID: 20I0311-01

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	DF	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Arsenic	2.7	3.6	0.58	mg/Kg dry	1	J	SW-846 6010D	9/10/20	9/11/20 19:39	MJH
Barium	19	1.8	0.24	mg/Kg dry	1		SW-846 6010D	9/10/20	9/11/20 19:39	MJH
Cadmium	ND	0.36	0.10	mg/Kg dry	1	U	SW-846 6010D	9/10/20	9/11/20 19:39	MJH
Chromium	6.4	0.72	0.43	mg/Kg dry	1		SW-846 6010D	9/10/20	9/11/20 19:39	MJH
Lead	3.6	0.54	0.35	mg/Kg dry	1		SW-846 6010D	9/10/20	9/11/20 19:39	MJH
Mercury	ND	0.027	0.0080	mg/Kg dry	1	U	SW-846 7471B	9/8/20	9/9/20 12:34	CJV
Selenium	ND	3.6	0.80	mg/Kg dry	1	U	SW-846 6010D	9/10/20	9/11/20 19:39	MJH
Silver	ND	0.36	0.22	mg/Kg dry	1	U	SW-846 6010D	9/10/20	9/13/20 18:30	TBC

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Project Location: 129 Manchester St., Concord, NH Sample Description: Work Order: 20I0311

Date Received: 9/4/2020

Field Sample #: S-101 Sampled: 9/3/2020 09:40

Sample ID: 20I0311-01

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	DF	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	92.1		% Wt	1		SM 2540G	9/11/20	9/11/20 16:34	jje

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Sample Extraction Data

Prep Method: % Solids-SM 2540G

Lab Number [Field ID]	Batch	Date
20I0311-01 [S-101]	B266281	09/11/20

Prep Method: SW-846 3050B-SW-846 6010D

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
20I0311-01 [S-101]	B266232	1.52	50.0	09/10/20

Prep Method: SW-846 7471-SW-846 7471B

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
20I0311-01 [S-101]	B265989	0.608	50.0	09/08/20

Prep Method: SW-846 5030B-SW-846 8015C

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
20I0311-01 [S-101]	B266118	6.60	5.50	09/09/20

Prep Method: SW-846 3546-SW-846 8015C

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
20I0311-01 [S-101]	B266172	30.0	1.00	09/10/20

Prep Method: SW-846 3546-SW-846 8100 Modified

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
20I0311-01 [S-101]	B266172	30.0	1.00	09/10/20

Prep Method: SW-846 5035-SW-846 8260C-D

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
20I0311-01 [S-101]	B266044	7.61	10.0	09/09/20

Prep Method: SW-846 3546-SW-846 8270D-E

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
20I0311-01 [S-101]	B266291	30.1	1.00	09/11/20

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QUALITY CONTROL

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B266044 - SW-846 5035										
Blank (B266044-BLK1)				Prepared & Analyzed: 09/09/20						
Acetone	ND	0.10	mg/Kg wet							U
Acrylonitrile	ND	0.0060	mg/Kg wet							U
tert-Amyl Methyl Ether (TAME)	ND	0.0010	mg/Kg wet							U
Benzene	ND	0.0020	mg/Kg wet							U
Bromobenzene	ND	0.0020	mg/Kg wet							U
Bromochloromethane	ND	0.0020	mg/Kg wet							U
Bromodichloromethane	ND	0.0020	mg/Kg wet							U
Bromoform	ND	0.0020	mg/Kg wet							U
Bromomethane	ND	0.010	mg/Kg wet							V-34, U
2-Butanone (MEK)	ND	0.040	mg/Kg wet							U
tert-Butyl Alcohol (TBA)	ND	0.040	mg/Kg wet							U
n-Butylbenzene	ND	0.0020	mg/Kg wet							U
sec-Butylbenzene	ND	0.0020	mg/Kg wet							U
tert-Butylbenzene	ND	0.0020	mg/Kg wet							U
tert-Butyl Ethyl Ether (TBEE)	ND	0.0010	mg/Kg wet							U
Carbon Disulfide	ND	0.0060	mg/Kg wet							U
Carbon Tetrachloride	ND	0.0020	mg/Kg wet							U
Chlorobenzene	ND	0.0020	mg/Kg wet							U
Chlorodibromomethane	ND	0.0010	mg/Kg wet							U
Chloroethane	ND	0.020	mg/Kg wet							U
Chloroform	ND	0.0040	mg/Kg wet							U
Chloromethane	ND	0.010	mg/Kg wet							U
2-Chlorotoluene	ND	0.0020	mg/Kg wet							U
4-Chlorotoluene	ND	0.0020	mg/Kg wet							U
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0020	mg/Kg wet							U
1,2-Dibromoethane (EDB)	ND	0.0010	mg/Kg wet							U
Dibromomethane	ND	0.0020	mg/Kg wet							U
1,2-Dichlorobenzene	ND	0.0020	mg/Kg wet							U
1,3-Dichlorobenzene	ND	0.0020	mg/Kg wet							U
1,4-Dichlorobenzene	ND	0.0020	mg/Kg wet							U
trans-1,4-Dichloro-2-butene	ND	0.0040	mg/Kg wet							U
Dichlorodifluoromethane (Freon 12)	ND	0.020	mg/Kg wet							U
1,1-Dichloroethane	ND	0.0020	mg/Kg wet							U
1,2-Dichloroethane	ND	0.0020	mg/Kg wet							U
1,1-Dichloroethylene	ND	0.0040	mg/Kg wet							U
cis-1,2-Dichloroethylene	ND	0.0020	mg/Kg wet							U
trans-1,2-Dichloroethylene	ND	0.0020	mg/Kg wet							U
1,2-Dichloropropane	ND	0.0020	mg/Kg wet							U
1,3-Dichloropropane	ND	0.0010	mg/Kg wet							U
2,2-Dichloropropane	ND	0.0020	mg/Kg wet							U
1,1-Dichloropropene	ND	0.0020	mg/Kg wet							U
cis-1,3-Dichloropropene	ND	0.0010	mg/Kg wet							U
trans-1,3-Dichloropropene	ND	0.0010	mg/Kg wet							U
Diethyl Ether	ND	0.020	mg/Kg wet							U
Diisopropyl Ether (DIPE)	ND	0.0010	mg/Kg wet							U
1,4-Dioxane	ND	0.10	mg/Kg wet							U
Ethylbenzene	ND	0.0020	mg/Kg wet							U
Hexachlorobutadiene	ND	0.0020	mg/Kg wet							U
2-Hexanone (MBK)	ND	0.020	mg/Kg wet							U
Isopropylbenzene (Cumene)	ND	0.0020	mg/Kg wet							U
p-Isopropyltoluene (p-Cymene)	ND	0.0020	mg/Kg wet							U
Methyl Acetate	ND	0.0020	mg/Kg wet							U

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QUALITY CONTROL

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC		%REC Limits	RPD	RPD Limit	Notes	
Batch B266044 - SW-846 5035												
Blank (B266044-BLK1)				Prepared & Analyzed: 09/09/20								
Methyl tert-Butyl Ether (MTBE)	ND	0.0040	mg/Kg wet								U	
Methyl Cyclohexane	ND	0.0020	mg/Kg wet								U	
Methylene Chloride	ND	0.020	mg/Kg wet								U	
4-Methyl-2-pentanone (MIBK)	ND	0.020	mg/Kg wet								U	
Naphthalene	ND	0.0040	mg/Kg wet								U	
n-Propylbenzene	ND	0.0020	mg/Kg wet								U	
Styrene	ND	0.0020	mg/Kg wet								U	
1,1,1,2-Tetrachloroethane	ND	0.0020	mg/Kg wet								U	
1,1,2,2-Tetrachloroethane	ND	0.0010	mg/Kg wet								U	
Tetrachloroethylene	ND	0.0020	mg/Kg wet								U	
Tetrahydrofuran	ND	0.010	mg/Kg wet								U	
Toluene	ND	0.0020	mg/Kg wet								U	
1,2,3-Trichlorobenzene	ND	0.0020	mg/Kg wet								U	
1,2,4-Trichlorobenzene	ND	0.0020	mg/Kg wet								U	
1,3,5-Trichlorobenzene	ND	0.0020	mg/Kg wet								U	
1,1,1-Trichloroethane	ND	0.0020	mg/Kg wet								U	
1,1,2-Trichloroethane	ND	0.0020	mg/Kg wet								U	
Trichloroethylene	ND	0.0020	mg/Kg wet								U	
Trichlorofluoromethane (Freon 11)	ND	0.010	mg/Kg wet								U	
1,2,3-Trichloropropane	ND	0.0020	mg/Kg wet								U	
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.010	mg/Kg wet								U	
1,2,4-Trimethylbenzene	ND	0.0020	mg/Kg wet								U	
1,3,5-Trimethylbenzene	ND	0.0020	mg/Kg wet								U	
Vinyl Chloride	ND	0.010	mg/Kg wet								U	
m+p Xylene	ND	0.0040	mg/Kg wet								U	
o-Xylene	ND	0.0020	mg/Kg wet								U	
Surrogate: 1,2-Dichloroethane-d4	*0.0510*		mg/Kg wet	0.0500		102		70-130				
Surrogate: Toluene-d8	*0.0498*		mg/Kg wet	0.0500		99.6		70-130				
Surrogate: 4-Bromofluorobenzene	*0.0499*		mg/Kg wet	0.0500		99.8		70-130				
LCS (B266044-BS1)				Prepared & Analyzed: 09/09/20								
Acetone	0.242	0.10	mg/Kg wet	0.200		121		70-160				†
Acrylonitrile	0.0228	0.0060	mg/Kg wet	0.0200		114		70-130				
tert-Amyl Methyl Ether (TAME)	0.0208	0.0010	mg/Kg wet	0.0200		104		70-130				
Benzene	0.0182	0.0020	mg/Kg wet	0.0200		91.1		70-130				
Bromobenzene	0.0193	0.0020	mg/Kg wet	0.0200		96.4		70-130				
Bromochloromethane	0.0225	0.0020	mg/Kg wet	0.0200		112		70-130				
Bromodichloromethane	0.0175	0.0020	mg/Kg wet	0.0200		87.4		70-130				
Bromoform	0.0181	0.0020	mg/Kg wet	0.0200		90.4		70-130				
Bromomethane	0.0174	0.010	mg/Kg wet	0.0200		87.1		40-130			V-34	†
2-Butanone (MEK)	0.248	0.040	mg/Kg wet	0.200		124		70-160				†
tert-Butyl Alcohol (TBA)	0.267	0.040	mg/Kg wet	0.200		**134**	*	40-130			L-07	†
n-Butylbenzene	0.0174	0.0020	mg/Kg wet	0.0200		87.0		70-130				
sec-Butylbenzene	0.0199	0.0020	mg/Kg wet	0.0200		99.4		70-130				
tert-Butylbenzene	0.0195	0.0020	mg/Kg wet	0.0200		97.6		70-160				†
tert-Butyl Ethyl Ether (TBEE)	0.0215	0.0010	mg/Kg wet	0.0200		108		70-130				
Carbon Disulfide	0.168	0.0060	mg/Kg wet	0.200		84.2		70-130				
Carbon Tetrachloride	0.0199	0.0020	mg/Kg wet	0.0200		99.6		70-130				
Chlorobenzene	0.0209	0.0020	mg/Kg wet	0.0200		105		70-130				
Chlorodibromomethane	0.0191	0.0010	mg/Kg wet	0.0200		95.7		70-130				
Chloroethane	0.0203	0.020	mg/Kg wet	0.0200		102		70-130				
Chloroform	0.0177	0.0040	mg/Kg wet	0.0200		88.4		70-130				

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QUALITY CONTROL

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC		%REC Limits	RPD	RPD Limit	Notes	
Batch B266044 - SW-846 5035												
LCS (B266044-BS1)				Prepared & Analyzed: 09/09/20								
Chloromethane	0.0211	0.010	mg/Kg wet	0.0200		106		70-130				
2-Chlorotoluene	0.0186	0.0020	mg/Kg wet	0.0200		92.8		70-130				
4-Chlorotoluene	0.0183	0.0020	mg/Kg wet	0.0200		91.4		70-130				
1,2-Dibromo-3-chloropropane (DBCP)	0.0191	0.0020	mg/Kg wet	0.0200		95.5		70-130				
1,2-Dibromoethane (EDB)	0.0195	0.0010	mg/Kg wet	0.0200		97.7		70-130				
Dibromomethane	0.0194	0.0020	mg/Kg wet	0.0200		96.8		70-130				
1,2-Dichlorobenzene	0.0196	0.0020	mg/Kg wet	0.0200		97.8		70-130				
1,3-Dichlorobenzene	0.0197	0.0020	mg/Kg wet	0.0200		98.7		70-130				
1,4-Dichlorobenzene	0.0194	0.0020	mg/Kg wet	0.0200		96.8		70-130				
trans-1,4-Dichloro-2-butene	0.0205	0.0040	mg/Kg wet	0.0200		102		70-130				
Dichlorodifluoromethane (Freon 12)	0.0195	0.020	mg/Kg wet	0.0200		97.7		40-160			J	†
1,1-Dichloroethane	0.0203	0.0020	mg/Kg wet	0.0200		102		70-130				
1,2-Dichloroethane	0.0193	0.0020	mg/Kg wet	0.0200		96.6		70-130				
1,1-Dichloroethylene	0.0189	0.0040	mg/Kg wet	0.0200		94.5		70-130				
cis-1,2-Dichloroethylene	0.0197	0.0020	mg/Kg wet	0.0200		98.5		70-130				
trans-1,2-Dichloroethylene	0.0200	0.0020	mg/Kg wet	0.0200		100		70-130				
1,2-Dichloropropane	0.0193	0.0020	mg/Kg wet	0.0200		96.3		70-130				
1,3-Dichloropropane	0.0189	0.0010	mg/Kg wet	0.0200		94.6		70-130				
2,2-Dichloropropane	0.0180	0.0020	mg/Kg wet	0.0200		89.9		70-130				
1,1-Dichloropropene	0.0187	0.0020	mg/Kg wet	0.0200		93.4		70-130				
cis-1,3-Dichloropropene	0.0193	0.0010	mg/Kg wet	0.0200		96.7		70-130				
trans-1,3-Dichloropropene	0.0186	0.0010	mg/Kg wet	0.0200		93.0		70-130				
Diethyl Ether	0.0190	0.020	mg/Kg wet	0.0200		94.8		70-130			J	
Diisopropyl Ether (DIPE)	0.0233	0.0010	mg/Kg wet	0.0200		116		70-130				
1,4-Dioxane	0.208	0.10	mg/Kg wet	0.200		104		40-160				†
Ethylbenzene	0.0176	0.0020	mg/Kg wet	0.0200		87.9		70-130				
Hexachlorobutadiene	0.0177	0.0020	mg/Kg wet	0.0200		88.6		70-160				
2-Hexanone (MBK)	0.223	0.020	mg/Kg wet	0.200		111		70-160				†
Isopropylbenzene (Cumene)	0.0194	0.0020	mg/Kg wet	0.0200		97.2		70-130				
p-Isopropyltoluene (p-Cymene)	0.0185	0.0020	mg/Kg wet	0.0200		92.7		70-130				
Methyl Acetate	0.0309	0.0020	mg/Kg wet	0.0200		**154**	*	70-130			L-02, V-20	
Methyl tert-Butyl Ether (MTBE)	0.0196	0.0040	mg/Kg wet	0.0200		97.9		70-130				
Methyl Cyclohexane	0.0184	0.0020	mg/Kg wet	0.0200		92.2		70-130				
Methylene Chloride	0.0251	0.020	mg/Kg wet	0.0200		125		40-160				†
4-Methyl-2-pentanone (MIBK)	0.217	0.020	mg/Kg wet	0.200		108		70-160				†
Naphthalene	0.0192	0.0040	mg/Kg wet	0.0200		96.0		40-130				†
n-Propylbenzene	0.0184	0.0020	mg/Kg wet	0.0200		92.2		70-130				
Styrene	0.0193	0.0020	mg/Kg wet	0.0200		96.7		70-130				
1,1,1,2-Tetrachloroethane	0.0203	0.0020	mg/Kg wet	0.0200		102		70-130				
1,1,2,2-Tetrachloroethane	0.0202	0.0010	mg/Kg wet	0.0200		101		70-130				
Tetrachloroethylene	0.0185	0.0020	mg/Kg wet	0.0200		92.6		70-130				
Tetrahydrofuran	0.0206	0.010	mg/Kg wet	0.0200		103		70-130				
Toluene	0.0180	0.0020	mg/Kg wet	0.0200		90.1		70-130				
1,2,3-Trichlorobenzene	0.0177	0.0020	mg/Kg wet	0.0200		88.4		70-130				
1,2,4-Trichlorobenzene	0.0184	0.0020	mg/Kg wet	0.0200		91.9		70-130				
1,3,5-Trichlorobenzene	0.0184	0.0020	mg/Kg wet	0.0200		92.2		70-130				
1,1,1-Trichloroethane	0.0175	0.0020	mg/Kg wet	0.0200		87.5		70-130				
1,1,2-Trichloroethane	0.0180	0.0020	mg/Kg wet	0.0200		90.1		70-130				
Trichloroethylene	0.0177	0.0020	mg/Kg wet	0.0200		88.5		70-130				
Trichlorofluoromethane (Freon 11)	0.0192	0.010	mg/Kg wet	0.0200		96.0		70-130				
1,2,3-Trichloropropane	0.0209	0.0020	mg/Kg wet	0.0200		104		70-130				

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QUALITY CONTROL

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes	
Batch B266044 - SW-846 5035											
LCS (B266044-BS1)				Prepared & Analyzed: 09/09/20							
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	0.0188	0.010	mg/Kg wet	0.0200		94.2	70-130				
1,2,4-Trimethylbenzene	0.0179	0.0020	mg/Kg wet	0.0200		89.5	70-130				
1,3,5-Trimethylbenzene	0.0182	0.0020	mg/Kg wet	0.0200		91.0	70-130				
Vinyl Chloride	0.0194	0.010	mg/Kg wet	0.0200		97.2	40-130				†
m+p Xylene	0.0368	0.0040	mg/Kg wet	0.0400		92.0	70-130				
o-Xylene	0.0183	0.0020	mg/Kg wet	0.0200		91.7	70-130				
Surrogate: 1,2-Dichloroethane-d4	*0.0511*		mg/Kg wet	0.0500		102	70-130				
Surrogate: Toluene-d8	*0.0505*		mg/Kg wet	0.0500		101	70-130				
Surrogate: 4-Bromofluorobenzene	*0.0491*		mg/Kg wet	0.0500		98.1	70-130				
LCS Dup (B266044-BSD1)				Prepared & Analyzed: 09/09/20							
Acetone	0.236	0.10	mg/Kg wet	0.200		118	70-160	2.41	25		†
Acrylonitrile	0.0217	0.0060	mg/Kg wet	0.0200		109	70-130	4.67	25		
tert-Amyl Methyl Ether (TAME)	0.0208	0.0010	mg/Kg wet	0.0200		104	70-130	0.0963	25		
Benzene	0.0186	0.0020	mg/Kg wet	0.0200		93.0	70-130	2.06	25		
Bromobenzene	0.0186	0.0020	mg/Kg wet	0.0200		93.0	70-130	3.59	25		
Bromochloromethane	0.0217	0.0020	mg/Kg wet	0.0200		108	70-130	3.62	25		
Bromodichloromethane	0.0174	0.0020	mg/Kg wet	0.0200		86.9	70-130	0.574	25		
Bromoform	0.0180	0.0020	mg/Kg wet	0.0200		89.9	70-130	0.555	25		
Bromomethane	0.0177	0.010	mg/Kg wet	0.0200		88.6	40-130	1.71	25	V-34	†
2-Butanone (MEK)	0.250	0.040	mg/Kg wet	0.200		125	70-160	0.964	25		†
tert-Butyl Alcohol (TBA)	0.232	0.040	mg/Kg wet	0.200		116	40-130	14.0	25		†
n-Butylbenzene	0.0176	0.0020	mg/Kg wet	0.0200		88.0	70-130	1.14	25		
sec-Butylbenzene	0.0203	0.0020	mg/Kg wet	0.0200		102	70-130	2.19	25		
tert-Butylbenzene	0.0199	0.0020	mg/Kg wet	0.0200		99.7	70-160	2.13	25		†
tert-Butyl Ethyl Ether (TBEE)	0.0215	0.0010	mg/Kg wet	0.0200		107	70-130	0.279	25		
Carbon Disulfide	0.170	0.0060	mg/Kg wet	0.200		84.8	70-130	0.675	25		
Carbon Tetrachloride	0.0207	0.0020	mg/Kg wet	0.0200		104	70-130	3.84	25		
Chlorobenzene	0.0206	0.0020	mg/Kg wet	0.0200		103	70-130	1.64	25		
Chlorodibromomethane	0.0200	0.0010	mg/Kg wet	0.0200		100	70-130	4.39	25		
Chloroethane	0.0204	0.020	mg/Kg wet	0.0200		102	70-130	0.295	25		
Chloroform	0.0181	0.0040	mg/Kg wet	0.0200		90.4	70-130	2.24	25		
Chloromethane	0.0220	0.010	mg/Kg wet	0.0200		110	70-130	3.90	25		
2-Chlorotoluene	0.0181	0.0020	mg/Kg wet	0.0200		90.4	70-130	2.62	25		
4-Chlorotoluene	0.0186	0.0020	mg/Kg wet	0.0200		92.9	70-130	1.63	25		
1,2-Dibromo-3-chloropropane (DBCP)	0.0192	0.0020	mg/Kg wet	0.0200		95.9	70-130	0.418	25		
1,2-Dibromoethane (EDB)	0.0194	0.0010	mg/Kg wet	0.0200		96.9	70-130	0.822	25		
Dibromomethane	0.0203	0.0020	mg/Kg wet	0.0200		101	70-130	4.54	25		
1,2-Dichlorobenzene	0.0205	0.0020	mg/Kg wet	0.0200		102	70-130	4.50	25		
1,3-Dichlorobenzene	0.0191	0.0020	mg/Kg wet	0.0200		95.7	70-130	3.09	25		
1,4-Dichlorobenzene	0.0195	0.0020	mg/Kg wet	0.0200		97.4	70-130	0.618	25		
trans-1,4-Dichloro-2-butene	0.0225	0.0040	mg/Kg wet	0.0200		112	70-130	9.40	25		
Dichlorodifluoromethane (Freon 12)	0.0203	0.020	mg/Kg wet	0.0200		102	40-160	3.82	25		†
1,1-Dichloroethane	0.0210	0.0020	mg/Kg wet	0.0200		105	70-130	3.29	25		
1,2-Dichloroethane	0.0190	0.0020	mg/Kg wet	0.0200		94.8	70-130	1.88	25		
1,1-Dichloroethylene	0.0178	0.0040	mg/Kg wet	0.0200		88.9	70-130	6.11	25		
cis-1,2-Dichloroethylene	0.0199	0.0020	mg/Kg wet	0.0200		99.6	70-130	1.11	25		
trans-1,2-Dichloroethylene	0.0202	0.0020	mg/Kg wet	0.0200		101	70-130	0.995	25		
1,2-Dichloropropane	0.0209	0.0020	mg/Kg wet	0.0200		104	70-130	7.98	25		
1,3-Dichloropropane	0.0193	0.0010	mg/Kg wet	0.0200		96.3	70-130	1.78	25		
2,2-Dichloropropane	0.0178	0.0020	mg/Kg wet	0.0200		89.2	70-130	0.782	25		
1,1-Dichloropropene	0.0174	0.0020	mg/Kg wet	0.0200		86.8	70-130	7.33	25		

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QUALITY CONTROL

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC		%REC Limits	RPD	RPD Limit	Notes	
Batch B266044 - SW-846 5035												
LCS Dup (B266044-BSD1)				Prepared & Analyzed: 09/09/20								
cis-1,3-Dichloropropene	0.0179	0.0010	mg/Kg wet	0.0200		89.6		70-130	7.62	25		
trans-1,3-Dichloropropene	0.0197	0.0010	mg/Kg wet	0.0200		98.6		70-130	5.85	25		
Diethyl Ether	0.0190	0.020	mg/Kg wet	0.0200		95.1		70-130	0.316	25	J	
Diisopropyl Ether (DIPE)	0.0241	0.0010	mg/Kg wet	0.0200		120		70-130	3.30	25		
1,4-Dioxane	0.208	0.10	mg/Kg wet	0.200		104		40-160	0.00961	50		† ‡
Ethylbenzene	0.0174	0.0020	mg/Kg wet	0.0200		86.9		70-130	1.14	25		
Hexachlorobutadiene	0.0176	0.0020	mg/Kg wet	0.0200		87.9		70-160	0.793	25		
2-Hexanone (MBK)	0.221	0.020	mg/Kg wet	0.200		111		70-160	0.693	25		†
Isopropylbenzene (Cumene)	0.0198	0.0020	mg/Kg wet	0.0200		98.8		70-130	1.63	25		
p-Isopropyltoluene (p-Cymene)	0.0196	0.0020	mg/Kg wet	0.0200		98.1		70-130	5.66	25		
Methyl Acetate	0.0311	0.0020	mg/Kg wet	0.0200		**156**	*	70-130	0.709	25	L-02, V-20	
Methyl tert-Butyl Ether (MTBE)	0.0208	0.0040	mg/Kg wet	0.0200		104		70-130	5.95	25		
Methyl Cyclohexane	0.0186	0.0020	mg/Kg wet	0.0200		92.9		70-130	0.756	25		
Methylene Chloride	0.0236	0.020	mg/Kg wet	0.0200		118		40-160	5.91	25		†
4-Methyl-2-pentanone (MIBK)	0.215	0.020	mg/Kg wet	0.200		108		70-160	0.769	25		†
Naphthalene	0.0205	0.0040	mg/Kg wet	0.0200		102		40-130	6.35	25		†
n-Propylbenzene	0.0177	0.0020	mg/Kg wet	0.0200		88.7		70-130	3.87	25		
Styrene	0.0197	0.0020	mg/Kg wet	0.0200		98.4		70-130	1.74	25		
1,1,1,2-Tetrachloroethane	0.0201	0.0020	mg/Kg wet	0.0200		100		70-130	1.29	25		
1,1,2,2-Tetrachloroethane	0.0192	0.0010	mg/Kg wet	0.0200		95.8		70-130	5.19	25		
Tetrachloroethylene	0.0181	0.0020	mg/Kg wet	0.0200		90.4		70-130	2.40	25		
Tetrahydrofuran	0.0219	0.010	mg/Kg wet	0.0200		109		70-130	6.13	25		
Toluene	0.0179	0.0020	mg/Kg wet	0.0200		89.3		70-130	0.892	25		
1,2,3-Trichlorobenzene	0.0197	0.0020	mg/Kg wet	0.0200		98.4		70-130	10.7	25		
1,2,4-Trichlorobenzene	0.0178	0.0020	mg/Kg wet	0.0200		89.1		70-130	3.09	25		
1,3,5-Trichlorobenzene	0.0187	0.0020	mg/Kg wet	0.0200		93.5		70-130	1.40	25		
1,1,1-Trichloroethane	0.0182	0.0020	mg/Kg wet	0.0200		90.8		70-130	3.70	25		
1,1,2-Trichloroethane	0.0184	0.0020	mg/Kg wet	0.0200		91.9		70-130	1.98	25		
Trichloroethylene	0.0177	0.0020	mg/Kg wet	0.0200		88.3		70-130	0.226	25		
Trichlorofluoromethane (Freon 11)	0.0189	0.010	mg/Kg wet	0.0200		94.3		70-130	1.79	25		
1,2,3-Trichloropropane	0.0208	0.0020	mg/Kg wet	0.0200		104		70-130	0.384	25		
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	0.0194	0.010	mg/Kg wet	0.0200		97.0		70-130	2.93	25		
1,2,4-Trimethylbenzene	0.0181	0.0020	mg/Kg wet	0.0200		90.5		70-130	1.11	25		
1,3,5-Trimethylbenzene	0.0178	0.0020	mg/Kg wet	0.0200		89.1		70-130	2.11	25		
Vinyl Chloride	0.0192	0.010	mg/Kg wet	0.0200		95.8		40-130	1.45	25		†
m+p Xylene	0.0359	0.0040	mg/Kg wet	0.0400		89.6		70-130	2.53	25		
o-Xylene	0.0180	0.0020	mg/Kg wet	0.0200		90.0		70-130	1.87	25		
Surrogate: 1,2-Dichloroethane-d4	*0.0526*		mg/Kg wet	0.0500		105		70-130				
Surrogate: Toluene-d8	*0.0495*		mg/Kg wet	0.0500		99.0		70-130				
Surrogate: 4-Bromofluorobenzene	*0.0496*		mg/Kg wet	0.0500		99.2		70-130				

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QUALITY CONTROL

Semivolatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B266291 - SW-846 3546										
Blank (B266291-BLK1)				Prepared: 09/11/20 Analyzed: 09/12/20						
Acenaphthene	ND	0.17	mg/Kg wet							U
Acenaphthylene	ND	0.17	mg/Kg wet							U
Anthracene	ND	0.17	mg/Kg wet							U
Benzo(a)anthracene	ND	0.17	mg/Kg wet							U
Benzo(a)pyrene	ND	0.17	mg/Kg wet							U
Benzo(b)fluoranthene	ND	0.17	mg/Kg wet							U
Benzo(g,h,i)perylene	ND	0.17	mg/Kg wet							U
Benzo(k)fluoranthene	ND	0.17	mg/Kg wet							U
Chrysene	ND	0.17	mg/Kg wet							U
Dibenz(a,h)anthracene	ND	0.17	mg/Kg wet							U
Fluoranthene	ND	0.17	mg/Kg wet							U
Fluorene	ND	0.17	mg/Kg wet							U
Indeno(1,2,3-cd)pyrene	ND	0.17	mg/Kg wet							U
2-Methylnaphthalene	ND	0.17	mg/Kg wet							U
Naphthalene	ND	0.17	mg/Kg wet							U
Phenanthrene	ND	0.17	mg/Kg wet							U
Pyrene	ND	0.17	mg/Kg wet							U
Surrogate: Nitrobenzene-d5	*2.66*		mg/Kg wet	3.33		79.8	30-130			
Surrogate: 2-Fluorobiphenyl	*3.02*		mg/Kg wet	3.33		90.7	30-130			
Surrogate: p-Terphenyl-d14	*3.75*		mg/Kg wet	3.33		113	30-130			
LCS (B266291-BS1)				Prepared: 09/11/20 Analyzed: 09/12/20						
Acenaphthene	1.39	0.17	mg/Kg wet	1.67		83.7	40-140			
Acenaphthylene	1.40	0.17	mg/Kg wet	1.67		83.9	40-140			
Anthracene	1.43	0.17	mg/Kg wet	1.67		86.1	40-140			
Benzo(a)anthracene	1.41	0.17	mg/Kg wet	1.67		84.8	40-140			
Benzo(a)pyrene	1.38	0.17	mg/Kg wet	1.67		82.6	40-140			
Benzo(b)fluoranthene	1.41	0.17	mg/Kg wet	1.67		84.7	40-140			
Benzo(g,h,i)perylene	1.59	0.17	mg/Kg wet	1.67		95.3	40-140			
Benzo(k)fluoranthene	1.37	0.17	mg/Kg wet	1.67		82.4	40-140			
Chrysene	1.40	0.17	mg/Kg wet	1.67		83.7	40-140			
Dibenz(a,h)anthracene	1.58	0.17	mg/Kg wet	1.67		94.8	40-140			
Fluoranthene	1.37	0.17	mg/Kg wet	1.67		82.3	40-140			
Fluorene	1.43	0.17	mg/Kg wet	1.67		85.7	40-140			
Indeno(1,2,3-cd)pyrene	1.71	0.17	mg/Kg wet	1.67		103	40-140			
2-Methylnaphthalene	1.43	0.17	mg/Kg wet	1.67		85.6	40-140			
Naphthalene	1.30	0.17	mg/Kg wet	1.67		78.3	40-140			
Phenanthrene	1.44	0.17	mg/Kg wet	1.67		86.5	40-140			
Pyrene	1.49	0.17	mg/Kg wet	1.67		89.3	40-140			
Surrogate: Nitrobenzene-d5	*2.95*		mg/Kg wet	3.33		88.4	30-130			
Surrogate: 2-Fluorobiphenyl	*3.46*		mg/Kg wet	3.33		104	30-130			
Surrogate: p-Terphenyl-d14	*3.68*		mg/Kg wet	3.33		111	30-130			

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QUALITY CONTROL

Semivolatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B266291 - SW-846 3546										
LCS Dup (B266291-BSD1)				Prepared: 09/11/20 Analyzed: 09/12/20						
Acenaphthene	1.45	0.17	mg/Kg wet	1.67		87.1	40-140	4.05	30	
Acenaphthylene	1.46	0.17	mg/Kg wet	1.67		87.5	40-140	4.29	30	
Anthracene	1.50	0.17	mg/Kg wet	1.67		90.2	40-140	4.65	30	
Benzo(a)anthracene	1.47	0.17	mg/Kg wet	1.67		88.0	40-140	3.61	30	
Benzo(a)pyrene	1.47	0.17	mg/Kg wet	1.67		88.3	40-140	6.74	30	
Benzo(b)fluoranthene	1.50	0.17	mg/Kg wet	1.67		90.3	40-140	6.45	30	
Benzo(g,h,i)perylene	1.69	0.17	mg/Kg wet	1.67		101	40-140	6.17	30	
Benzo(k)fluoranthene	1.48	0.17	mg/Kg wet	1.67		88.9	40-140	7.54	30	
Chrysene	1.45	0.17	mg/Kg wet	1.67		87.2	40-140	4.07	30	
Dibenz(a,h)anthracene	1.68	0.17	mg/Kg wet	1.67		101	40-140	6.33	30	
Fluoranthene	1.43	0.17	mg/Kg wet	1.67		85.6	40-140	3.98	30	
Fluorene	1.48	0.17	mg/Kg wet	1.67		89.0	40-140	3.76	30	
Indeno(1,2,3-cd)pyrene	1.82	0.17	mg/Kg wet	1.67		109	40-140	6.36	30	
2-Methylnaphthalene	1.36	0.17	mg/Kg wet	1.67		81.7	40-140	4.73	30	
Naphthalene	1.33	0.17	mg/Kg wet	1.67		79.6	40-140	1.65	30	
Phenanthrene	1.48	0.17	mg/Kg wet	1.67		88.8	40-140	2.63	30	
Pyrene	1.54	0.17	mg/Kg wet	1.67		92.4	40-140	3.43	30	
Surrogate: Nitrobenzene-d5	*2.92*		mg/Kg wet	3.33		87.5	30-130			
Surrogate: 2-Fluorobiphenyl	*3.31*		mg/Kg wet	3.33		99.3	30-130			
Surrogate: p-Terphenyl-d14	*3.75*		mg/Kg wet	3.33		112	30-130			

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QUALITY CONTROL

Petroleum Hydrocarbons Analyses - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B266118 - SW-846 5030B										
Blank (B266118-BLK1)				Prepared & Analyzed: 09/09/20						
Gasoline Range Organics (GRO)	ND	1.0	mg/Kg wet							U
Surrogate: 1-Chloro-3-fluorobenzene	*15.2*		µg/L	15.0		101	70-130			
LCS (B266118-BS1)				Prepared & Analyzed: 09/09/20						
Gasoline Range Organics (GRO)	0.235	0.010	mg/Kg wet	0.250		93.8	80-120			
Surrogate: 1-Chloro-3-fluorobenzene	*14.5*		µg/L	15.0		96.7	70-130			
LCS Dup (B266118-BSD1)				Prepared & Analyzed: 09/09/20						
Gasoline Range Organics (GRO)	0.229	0.010	mg/Kg wet	0.250		91.6	80-120	2.43	30	
Surrogate: 1-Chloro-3-fluorobenzene	*14.4*		µg/L	15.0		96.2	70-130			
Matrix Spike (B266118-MS1)	**Source: 20I0311-01**			Prepared & Analyzed: 09/09/20						
Gasoline Range Organics (GRO)	25.6	0.91	mg/Kg dry	22.6	ND	113	80-120			
Surrogate: 1-Chloro-3-fluorobenzene	*13.4*		µg/L	15.0		89.5	70-130			
Batch B266172 - SW-846 3546										
Blank (B266172-BLK1)				Prepared: 09/10/20 Analyzed: 09/11/20						
Diesel Range Organics	ND	8.3	mg/Kg wet							U
TPH (C9-C36)	ND	8.3	mg/Kg wet							U
Surrogate: 2-Fluorobiphenyl	*2.17*		mg/Kg wet	3.33		65.1	40-140			
Surrogate: 2-Fluorobiphenyl	*2.17*		mg/Kg wet	3.33		65.1	40-140			
LCS (B266172-BS1)				Prepared: 09/10/20 Analyzed: 09/11/20						
Diesel Range Organics	24.4	8.3	mg/Kg wet	33.3		73.2	40-140			
TPH (C9-C36)	25.6	8.3	mg/Kg wet	33.3		76.7	40-140			
Surrogate: 2-Fluorobiphenyl	*2.32*		mg/Kg wet	3.33		69.6	40-140			
Surrogate: 2-Fluorobiphenyl	*2.32*		mg/Kg wet	3.33		69.6	40-140			
LCS Dup (B266172-BSD1)				Prepared: 09/10/20 Analyzed: 09/11/20						
Diesel Range Organics	24.2	8.3	mg/Kg wet	33.3		72.6	40-140	0.765		
TPH (C9-C36)	25.4	8.3	mg/Kg wet	33.3		76.3	40-140	0.467	30	
Surrogate: 2-Fluorobiphenyl	*2.22*		mg/Kg wet	3.33		66.5	40-140			
Surrogate: 2-Fluorobiphenyl	*2.22*		mg/Kg wet	3.33		66.5	40-140			

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B265989 - SW-846 7471										
Blank (B265989-BLK1)				Prepared: 09/08/20 Analyzed: 09/09/20						
Mercury	ND	0.025	mg/Kg wet							U
LCS (B265989-BS1)				Prepared: 09/08/20 Analyzed: 09/09/20						
Mercury	6.28	0.38	mg/Kg wet	5.99		105	74.1-126			
LCS Dup (B265989-BSD1)				Prepared: 09/08/20 Analyzed: 09/09/20						
Mercury	6.67	0.38	mg/Kg wet	5.99		111	74.1-126	5.95	20	
Duplicate (B265989-DUP1)	**Source: 20I0311-01**			Prepared: 09/08/20 Analyzed: 09/09/20						
Mercury	ND	0.027	mg/Kg dry		ND			NC	20	U
Matrix Spike (B265989-MS1)	**Source: 20I0311-01**			Prepared: 09/08/20 Analyzed: 09/09/20						
Mercury	0.342	0.026	mg/Kg dry	0.347	ND	98.8	80-120			
Batch B266232 - SW-846 3050B										
Blank (B266232-BLK1)				Prepared: 09/10/20 Analyzed: 09/11/20						
Arsenic	ND	3.3	mg/Kg wet							U
Barium	ND	1.7	mg/Kg wet							U
Cadmium	ND	0.33	mg/Kg wet							U
Chromium	ND	0.67	mg/Kg wet							U
Lead	ND	0.50	mg/Kg wet							U
Selenium	ND	3.3	mg/Kg wet							U
Silver	ND	0.33	mg/Kg wet							U
LCS (B266232-BS1)				Prepared: 09/10/20 Analyzed: 09/11/20						
Arsenic	89.6	10	mg/Kg wet	97.6		91.8	82.8-116.8			
Barium	310	5.0	mg/Kg wet	320		96.9	82.5-117.5			
Cadmium	109	1.0	mg/Kg wet	114		96.0	82.8-117.5			
Chromium	138	2.0	mg/Kg wet	147		93.5	81.6-117.7			
Lead	99.9	1.5	mg/Kg wet	105		95.2	82.6-117.1			
Selenium	83.4	10	mg/Kg wet	93.1		89.5	78.9-121.4			
Silver	31.9	1.0	mg/Kg wet	32.0		99.8	79.7-120			
LCS Dup (B266232-BSD1)				Prepared: 09/10/20 Analyzed: 09/11/20						
Arsenic	90.1	10	mg/Kg wet	97.6		92.4	82.8-116.8	0.616	30	
Barium	320	5.0	mg/Kg wet	320		100	82.5-117.5	3.31	20	
Cadmium	113	1.0	mg/Kg wet	114		98.8	82.8-117.5	2.88	20	
Chromium	146	2.0	mg/Kg wet	147		99.1	81.6-117.7	5.74	30	
Lead	99.0	1.5	mg/Kg wet	105		94.3	82.6-117.1	0.971	30	
Selenium	84.6	10	mg/Kg wet	93.1		90.8	78.9-121.4	1.43	30	
Silver	31.3	1.0	mg/Kg wet	32.0		97.9	79.7-120	1.90	30	

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B266232 - SW-846 3050B										
Duplicate (B266232-DUP1)	**Source: 20I0311-01**			Prepared: 09/10/20 Analyzed: 09/11/20						
Arsenic	2.63	3.6	mg/Kg dry		2.69			2.21	35	J
Barium	17.7	1.8	mg/Kg dry		18.5			4.81	35	
Cadmium	ND	0.36	mg/Kg dry		ND			NC	35	U
Chromium	6.50	0.72	mg/Kg dry		6.40			1.62	35	
Lead	3.52	0.54	mg/Kg dry		3.55			1.02	35	
Selenium	ND	3.6	mg/Kg dry		ND			NC	35	U
Silver	ND	0.36	mg/Kg dry		ND			NC	35	U
Matrix Spike (B266232-MS1)	**Source: 20I0311-01**			Prepared: 09/10/20 Analyzed: 09/11/20						
Arsenic	18.6	3.6	mg/Kg dry	18.2	2.69	87.5	75-125			
Barium	34.1	1.8	mg/Kg dry	18.2	18.5	85.4	75-125			
Cadmium	17.2	0.36	mg/Kg dry	18.2	ND	94.3	75-125			
Chromium	23.4	0.73	mg/Kg dry	18.2	6.40	93.2	75-125			
Lead	20.1	0.55	mg/Kg dry	18.2	3.55	90.8	75-125			
Selenium	15.6	3.6	mg/Kg dry	18.2	ND	85.4	75-125			
Silver	18.8	0.36	mg/Kg dry	18.2	ND	103	75-125			
Reference (B266232-SRM1)				Prepared: 09/10/20 Analyzed: 09/11/20						
Lead	0.496	0.49	mg/Kg wet	0.493		101	80-120			

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FLAG/QUALIFIER SUMMARY

*	QC result is outside of established limits.
†	Wide recovery limits established for difficult compound.
‡	Wide RPD limits established for difficult compound.
#	Data exceeded client recommended or regulatory level
ND	Not Detected
RL	Reporting Limit
DL	Method Detection Limit
MCL	Maximum Contaminant Level
	Percent recoveries and relative percent differences (RPDs) are determined by the software using values in the calculation which have not been rounded.
	No results have been blank subtracted unless specified in the case narrative section.
J	Detected but below the Reporting Limit (lowest calibration standard); therefore, result is an estimated concentration (CLP J-Flag).
L-02	Laboratory fortified blank/laboratory control sample recovery and duplicate recoveries outside of control limits. Data validation is not affected since all results are "not detected" for associated samples in this batch and bias is on the high side.
L-07	Either laboratory fortified blank/laboratory control sample or duplicate recovery is outside of control limits, but the other is within limits. RPD between the two LFB/LCS results is within method specified criteria.
U	Analyte included in the analysis, but not detected
V-20	Continuing calibration verification (CCV) did not meet method specifications and was biased on the high side. Data validation is not affected since sample result was "not detected" for this compound.
V-34	Initial calibration verification (ICV) did not meet method specifications and was biased on the low side for this compound. Reported result is estimated.

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CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
SW-846 6010D in Soil	
Arsenic	CT,NH,NY,ME,VA,NC
Barium	CT,NH,NY,ME,VA,NC
Cadmium	CT,NH,NY,ME,VA,NC
Chromium	CT,NH,NY,ME,VA,NC
Lead	CT,NH,NY,AIHA,ME,VA,NC
Selenium	CT,NH,NY,ME,VA,NC
Silver	CT,NH,NY,ME,VA,NC
SW-846 7471B in Soil	
Mercury	CT,NH,NY,NC,ME,VA
SW-846 8015C in Soil	
Gasoline Range Organics (GRO)	NY,VA,NH,NC
Diesel Range Organics	NY,VA,NH,NC
SW-846 8260C-D in Soil	
Acetone	CT,NH,NY,ME,VA
Acrylonitrile	CT,NH,NY,ME,VA
Benzene	CT,NH,NY,ME,VA
Bromobenzene	NH,NY,ME,VA
Bromochloromethane	NH,NY,ME,VA
Bromodichloromethane	CT,NH,NY,ME,VA
Bromoform	CT,NH,NY,ME,VA
Bromomethane	CT,NH,NY,ME,VA
2-Butanone (MEK)	CT,NH,NY,ME,VA
tert-Butyl Alcohol (TBA)	NY,ME
n-Butylbenzene	CT,NH,NY,ME,VA
sec-Butylbenzene	CT,NH,NY,ME,VA
tert-Butylbenzene	CT,NH,NY,ME,VA
Carbon Disulfide	CT,NH,NY,ME,VA
Carbon Tetrachloride	CT,NH,NY,ME,VA
Chlorobenzene	CT,NH,NY,ME,VA
Chlorodibromomethane	CT,NH,NY,ME,VA
Chloroethane	CT,NH,NY,ME,VA
Chloroform	CT,NH,NY,ME,VA
Chloromethane	CT,NH,NY,ME,VA
2-Chlorotoluene	CT,NH,NY,ME,VA
4-Chlorotoluene	CT,NH,NY,ME,VA
1,2-Dibromo-3-chloropropane (DBCP)	NY,ME
1,2-Dibromoethane (EDB)	NH,NY
Dibromomethane	NH,NY,ME,VA
1,2-Dichlorobenzene	CT,NH,NY,ME,VA
1,3-Dichlorobenzene	CT,NH,NY,ME,VA
1,4-Dichlorobenzene	CT,NH,NY,ME,VA
trans-1,4-Dichloro-2-butene	NY,ME
Dichlorodifluoromethane (Freon 12)	NH,NY,ME,VA
1,1-Dichloroethane	CT,NH,NY,ME,VA
1,2-Dichloroethane	CT,NH,NY,ME,VA
1,1-Dichloroethylene	CT,NH,NY,ME,VA

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CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
SW-846 8260C-D in Soil	
cis-1,2-Dichloroethylene	CT,NH,NY,ME,VA
trans-1,2-Dichloroethylene	CT,NH,NY,ME,VA
1,2-Dichloropropane	CT,NH,NY,ME,VA
1,3-Dichloropropane	NH,NY,ME,VA
2,2-Dichloropropane	NH,NY,ME,VA
1,1-Dichloropropene	NH,NY,ME,VA
cis-1,3-Dichloropropene	CT,NH,NY,ME,VA
trans-1,3-Dichloropropene	CT,NH,NY,ME,VA
Diethyl Ether	ME
1,4-Dioxane	NY,ME
Ethylbenzene	CT,NH,NY,ME,VA
Hexachlorobutadiene	NH,NY,ME,VA
2-Hexanone (MBK)	CT,NH,NY,ME,VA
Isopropylbenzene (Cumene)	CT,NH,NY,ME,VA
p-Isopropyltoluene (p-Cymene)	NH,NY
Methyl Acetate	NY,ME
Methyl tert-Butyl Ether (MTBE)	NY,ME,VA
Methyl Cyclohexane	NY
Methylene Chloride	CT,NH,NY,ME,VA
4-Methyl-2-pentanone (MIBK)	CT,NH,NY,ME,VA
Naphthalene	NH,NY,ME,VA
n-Propylbenzene	NH,NY,ME
Styrene	CT,NH,NY,ME,VA
1,1,1,2-Tetrachloroethane	CT,NH,NY,ME,VA
1,1,2,2-Tetrachloroethane	CT,NH,NY,ME,VA
Tetrachloroethylene	CT,NH,NY,ME,VA
Toluene	CT,NH,NY,ME,VA
1,2,3-Trichlorobenzene	NY,ME
1,2,4-Trichlorobenzene	NH,NY,ME,VA
1,3,5-Trichlorobenzene	ME
1,1,1-Trichloroethane	CT,NH,NY,ME,VA
1,1,2-Trichloroethane	CT,NH,NY,ME,VA
Trichloroethylene	CT,NH,NY,ME,VA
Trichlorofluoromethane (Freon 11)	CT,NH,NY,ME,VA
1,2,3-Trichloropropane	NH,NY,ME,VA
1,2,4-Trimethylbenzene	CT,NH,NY,ME,VA
1,3,5-Trimethylbenzene	CT,NH,NY,ME,VA
Vinyl Chloride	CT,NH,NY,ME,VA
m+p Xylene	CT,NH,NY,ME,VA
o-Xylene	CT,NH,NY,ME,VA
SW-846 8270D-E in Soil	
Acenaphthene	CT,NY,NH,ME,NC,VA
Acenaphthylene	CT,NY,NH,ME,NC,VA
Anthracene	CT,NY,NH,ME,NC,VA
Benzo(a)anthracene	CT,NY,NH,ME,NC,VA
Benzo(a)pyrene	CT,NY,NH,ME,NC,VA

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CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
SW-846 8270D-E in Soil	
Benzo(b)fluoranthene	CT,NY,NH,ME,NC,VA
Benzo(g,h,i)perylene	CT,NY,NH,ME,NC,VA
Benzo(k)fluoranthene	CT,NY,NH,ME,NC,VA
Chrysene	CT,NY,NH,ME,NC,VA
Dibenz(a,h)anthracene	CT,NY,NH,ME,NC,VA
Fluoranthene	CT,NY,NH,ME,NC,VA
Fluorene	CT,NY,NH,ME,NC,VA
Indeno(1,2,3-cd)pyrene	CT,NY,NH,ME,NC,VA
2-Methylnaphthalene	CT,NY,NH,ME,NC,VA
Naphthalene	CT,NY,NH,ME,NC,VA
Phenanthrene	CT,NY,NH,ME,NC,VA
Pyrene	CT,NY,NH,ME,NC,VA

The CON-TEST Environmental Laboratory operates under the following certifications and accreditations:

Code	Description	Number	Expires
AIHA	AIHA-LAP, LLC - ISO17025:2017	100033	03/1/2022
MA	Massachusetts DEP	M-MA100	06/30/2021
CT	Connecticut Department of Publilc Health	PH-0567	09/30/2021
NY	New York State Department of Health	10899 NELAP	04/1/2021
NH-S	New Hampshire Environmental Lab	2516 NELAP	02/5/2021
RI	Rhode Island Department of Health	LAO00112	12/30/2020
NC	North Carolina Div. of Water Quality	652	12/31/2020
NJ	New Jersey DEP	MA007 NELAP	06/30/2021
FL	Florida Department of Health	E871027 NELAP	06/30/2021
VT	Vermont Department of Health Lead Laboratory	LL015036	07/30/2021
ME	State of Maine	2011028	06/9/2021
VA	Commonwealth of Virginia	460217	12/14/2020
NH-P	New Hampshire Environmental Lab	2557 NELAP	09/6/2021
VT-DW	Vermont Department of Health Drinking Water	VT-255716	06/12/2021
NC-DW	North Carolina Department of Health	25703	07/31/2021
PA	Commonwealth of Pennsylvania DEP	68-05812	06/30/2021
MI	Dept. of Env, Great Lakes, and Energy	9100	10/1/2020

20I0311

con-test ANALYTICAL LABORATORY

Phone: 413-525-2332
Fax: 413-525-6405
Email: info@contestlabs.com

http://www.contestlabs.com

CHAIN OF CUSTODY RECORD

39 Spruce Street
East Longmeadow, MA 01028

Doc # 381 Rev 2_06262019

Page 1 of 1

Company Name: Wilcox & Barton Inc.
Address: 18 Commerce Dr. Unit 12B Londonderry NH
Phone: 603-364-4190
Project Name: BACC0003.1
Project Location: 129 Manchester St Concord
Project Number: BACC0003.1
Project Manager: R. Barton
Con-Test Quote Name/Number:
Invoice Recipient:
Sampled By: M. Micalcian

Requested Turnaround Time
7-Day ☐ 10-Day ☐
PFAS 10-Day (std) ☐ Due Date: 5 Day

Rush Approval Required
1-Day ☐ 3-Day ☐
2-Day ☐ 4-Day ☐

Dissolved Metals Samples
○ Field Filtered
○ Lab to Filter

Orthophosphate Samples
○ Field Filtered
○ Lab to Filter

Data Delivery
Format: PDF ☒ EXCEL ☒
Other:
CLP Like Data Pkg Required: ☐
Email To: RBarton@wilcoxandbarton.com
Fax To #:

ANALYSIS REQUESTED

Con-Test Work Order#	Client Sample ID / Description	Beginning Date/Time	Ending Date/Time	COMP/GRAB	[1]Matrix Code	Conc Code	VIALS	GLASS	PLASTIC	BACTERIA	ENCORE	VOC 8260B	PAH 8270C	TPH 8100	DRO 8015B	RCRA	GRO	% Solid	m/B
1	S-101	9/3/20	0940	Grab	S	U	3	2				X	X	X	X	X	X	X	

[2] Preservation Code

Container Type

Total Number Of:
VIALS
GLASS
PLASTIC
BACTERIA
ENCORE

Glassware in the fridge? Y / N
Glassware in freezer? Y / N
Prepackaged Cooler? Y / N
*Contest is not responsible for missing samples from prepacked coolers

[1] Matrix Codes:
GW = Ground Water
WW = Waste Water
DW = Drinking Water
A = Air
S = Soil
SL = Sludge
SOL = Solid
O = Other (please define)

[2] Preservation Codes:
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium Bisulfate
X = Sodium Hydroxide
T = Sodium Thiosulfate
O = Other (please define)

	Date/Time:
Relinquished by: (signature)	9/4/20 1510
Received by: (signature)	9/4/20 1510
Relinquished by: (signature)	9/4/20 1805
Received by: (signature)	9/4/20 1805
Relinquished by: (signature)	Date/Time:
Received by: (signature)	Date/Time:
Relinquished by: (signature)	Date/Time:
Received by: (signature)	Date/Time:

Client Comments:
5 Day A pricing

Detection Limit Requirements
MA
GW1
Other: NHDES SRS

Special Requirements
☐ MA MCP Required
☐ MCP Certification Form Required
☐ CT RCP Required
☐ RCP Certification Form Required
☐ MA State DW Required
PWSID #

Please use the following codes to indicate possible sample concentration within the Conc Code column above:
H - High; M - Medium; L - Low; C - Clean; U - Unknown

NELAC and AIHA-LAP, LLC Accredited

Project Entity
Government ☐ Municipality ☐ MWRA ☐ WRTA ☐
Federal ☐ 21 J ☐ School ☐
City ☐ Brownfield ☐ MBTA ☐

Other
☐ Chromatogram
☐ AIHA-LAP,LLC

PCB ONLY
☐ Soxhlet
☐ Non Soxhlet

Comments:

Disclaimer: Con-Test Labs is not responsible for any omitted information on the Chain of Custody. The Chain of Custody is a legal document that must be complete and accurate and is used to determine what analyses the laboratory will perform. Any missing information is not the laboratory's responsibility. Con Test values your partnership on each project and will try to assist with missing information, but will not b held accountable.

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I Have Not Confirmed Sample Container Numbers With Lab Staff Before Relinquishing Over Samples_____

con-test® ANALYTICAL LABORATORY

Doc# 277 Rev 5 2017

Login Sample Receipt Checklist - (Rejection Criteria Listing - Using Acceptance Policy) Any False Statement will be brought to the attention of the Client - State True or False

Client Wilcox & Barton

Received By SA Date 9/4 Time 1805

How were the samples received? In Cooler T No Cooler ____ On Ice T No Ice ____ Direct from Sampling ____ Ambient ____ Melted Ice ____

By Gun # 4 Actual Temp - 3.2

Were samples within Temperature? 2-6°C T By Blank # ____ Actual Temp - ____

Was Custody Seal Intact? NA Were Samples Tampered with? NA

Was COC Relinquished ? T Does Chain Agree With Samples? T

Are there broken/leaking/loose caps on any samples? F

Is COC in ink/ Legible? T Were samples received within holding time? T

Did COC include all pertinent Information? Client T Project T Analysis T ID's T Sampler Name T Collection Dates/Times F

Are Sample labels filled out and legible? T

Are there Lab to Filters? F Who was notified? ____

Are there Rushes? F Who was notified? ____

Are there Short Holds? F Who was notified? ____

Is there enough Volume? T

Is there Headspace where applicable? F MS/MSD? F

Proper Media/Containers Used? T Is splitting samples required? F

Were trip blanks received? F On COC? F

Do all samples have the proper pH? Acid NA Base NA

Vials	#	Containers:			#		#
Unp-		1 Liter Amb.		1 Liter Plastic		16 oz Amb.	
HCL-		500 mL Amb.		500 mL Plastic		8oz Amb/Clear	2
Meoh-	1	250 mL Amb.		250 mL Plastic		4oz Amb/Clear	
Bisulfate-	2	Flashpoint		Col./Bacteria		2oz Amb/Clear	
DI-		Other Glass		Other Plastic		Encore	
Thiosulfate-		SOC Kit		Plastic Bag		Frozen:	
Sulfuric-		Perchlorate		Ziplock			

Unused Media

Vials	#	Containers:	#		#		#
Unp-		1 Liter Amb.		1 Liter Plastic		16 oz Amb.	
HCL-		500 mL Amb.		500 mL Plastic		8oz Amb/Clear	
Meoh-		250 mL Amb.		250 mL Plastic		4oz Amb/Clear	
Bisulfate-		Col./Bacteria		Flashpoint		2oz Amb/Clear	
DI-		Other Plastic		Other Glass		Encore	
Thiosulfate-		SOC Kit		Plastic Bag		Frozen:	
Sulfuric-		Perchlorate		Ziplock			

Comments:

con-test® ANALYTICAL LABORATORY
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September 14, 2020

Russell Barton
Wilcox & Barton
1115 Route 100B, Suite 200
Moretown, VT 05660

Project Location: 129 Manchester St., Concord, NH
Client Job Number:
Project Number: RACC0003.1
Laboratory Work Order Number: 20I0334

Enclosed are results of analyses for samples received by the laboratory on September 4, 2020. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Raymond J. McCarthy
Project Manager

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Wilcox & Barton
1115 Route 100B, Suite 200
Moretown, VT 05660
ATTN: Russell Barton

REPORT DATE: 9/14/2020

PURCHASE ORDER NUMBER:

PROJECT NUMBER: RACC0003.1

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 20I0334

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: 129 Manchester St., Concord, NH

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
S-201	20I0334-01	Soil		SM 2540G	
				SW-846 8100 Modified	
				SW-846 8260C-D	
				SW-846 8270D-E	
S-202	20I0334-02	Soil		SM 2540G	
				SW-846 8100 Modified	
				SW-846 8260C-D	
				SW-846 8270D-E	

con-test® ANALYTICAL LABORATORY

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CASE NARRATIVE SUMMARY

All reported results are within defined laboratory quality control objectives unless listed below or otherwise qualified in this report.

For method 8270E ,only PAHs were reqiested amd reported.

SW-846 8260C-D

Qualifications:

L-02

Laboratory fortified blank/laboratory control sample recovery and duplicate recoveries outside of control limits. Data validation is not affected since all results are "not detected" for associated samples in this batch and bias is on the high side.

Analyte & Samples(s) Qualified:

Acrylonitrile
B265979-BS1, B265979-BSD1

Methyl Acetate
B265979-BS1, B265979-BSD1

L-07

Either laboratory fortified blank/laboratory control sample or duplicate recovery is outside of control limits, but the other is within limits. RPD between the two LFB/LCS results is within method specified criteria.

Analyte & Samples(s) Qualified:

Diisopropyl Ether (DIPE)
B265979-BS1

Tetrahydrofuran
B265979-BS1

V-20

Continuing calibration verification (CCV) did not meet method specifications and was biased on the high side. Data validation is not affected since sample result was "not detected" for this compound.

Analyte & Samples(s) Qualified:

Diisopropyl Ether (DIPE)
B265979-BS1, B265979-BSD1

Methyl Acetate
B265979-BS1, B265979-BSD1

Tetrahydrofuran
B265979-BS1, B265979-BSD1

V-34

Initial calibration verification (ICV) did not meet method specifications and was biased on the low side for this compound. Reported result is estimated.

Analyte & Samples(s) Qualified:

Bromomethane
20I0334-01[S-201], 20I0334-02[S-202], B265979-BLK1, B265979-BS1, B265979-BSD1

V-36

Initial calibration verification (ICV) did not meet method specifications and was biased on the high side. Data validation is not affected since sample result was "not detected" for this compound.

Analyte & Samples(s) Qualified:

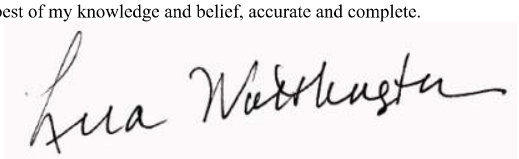
Dichlorodifluoromethane (Freon 1
B265979-BS1, B265979-BSD1

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SW-846 8100 Modified

TPH (C9-C36) is quantitated against a calibration made with a diesel standard.

The results of analyses reported only relate to samples submitted to the Con-Test Analytical Laboratory for testing.
I certify that the analyses listed above, unless specifically listed as subcontracted, if any, were performed under my direction according to the approved methodologies listed in this document, and 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.



Lisa A. Worthington
Technical Representative

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: 129 Manchester St., Concord, NH Sample Description: Work Order: 20I0334

Date Received: 9/4/2020

Field Sample #: S-201 Sampled: 9/3/2020 10:50

Sample ID: 20I0334-01

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	DF	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	0.011	0.080	0.0068	mg/Kg dry	1	J	SW-846 8260C-D	9/8/20	9/8/20 11:19	MFF
Acrylonitrile	ND	0.0048	0.00080	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:19	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.00080	0.00024	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:19	MFF
Benzene	ND	0.0016	0.00048	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:19	MFF
Bromobenzene	ND	0.0016	0.00032	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:19	MFF
Bromochloromethane	ND	0.0016	0.00064	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:19	MFF
Bromodichloromethane	ND	0.0016	0.00040	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:19	MFF
Bromoform	ND	0.0016	0.00056	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:19	MFF
Bromomethane	ND	0.0080	0.00089	mg/Kg dry	1	V-34, U	SW-846 8260C-D	9/8/20	9/8/20 11:19	MFF
2-Butanone (MEK)	ND	0.032	0.0044	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:19	MFF
tert-Butyl Alcohol (TBA)	ND	0.032	0.0036	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:19	MFF
n-Butylbenzene	ND	0.0016	0.00040	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:19	MFF
sec-Butylbenzene	ND	0.0016	0.00064	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:19	MFF
tert-Butylbenzene	ND	0.0016	0.00048	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:19	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.00080	0.00016	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:19	MFF
Carbon Disulfide	ND	0.0048	0.0043	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:19	MFF
Carbon Tetrachloride	ND	0.0016	0.00056	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:19	MFF
Chlorobenzene	ND	0.0016	0.00040	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:19	MFF
Chlorodibromomethane	ND	0.00080	0.00032	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:19	MFF
Chloroethane	ND	0.016	0.00064	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:19	MFF
Chloroform	ND	0.0032	0.00040	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:19	MFF
Chloromethane	ND	0.0080	0.00056	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:19	MFF
2-Chlorotoluene	ND	0.0016	0.00024	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:19	MFF
4-Chlorotoluene	ND	0.0016	0.00032	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:19	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0016	0.00080	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:19	MFF
1,2-Dibromoethane (EDB)	ND	0.00080	0.00056	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:19	MFF
Dibromomethane	ND	0.0016	0.00064	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:19	MFF
1,2-Dichlorobenzene	ND	0.0016	0.00032	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:19	MFF
1,3-Dichlorobenzene	ND	0.0016	0.00032	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:19	MFF
1,4-Dichlorobenzene	ND	0.0016	0.00064	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:19	MFF
trans-1,4-Dichloro-2-butene	ND	0.0032	0.00048	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:19	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.016	0.00089	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:19	MFF
1,1-Dichloroethane	ND	0.0016	0.00032	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:19	MFF
1,2-Dichloroethane	ND	0.0016	0.00040	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:19	MFF
1,1-Dichloroethylene	ND	0.0032	0.00056	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:19	MFF
cis-1,2-Dichloroethylene	ND	0.0016	0.00056	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:19	MFF
trans-1,2-Dichloroethylene	ND	0.0016	0.00048	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:19	MFF
1,2-Dichloropropane	ND	0.0016	0.00064	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:19	MFF
1,3-Dichloropropane	ND	0.00080	0.00040	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:19	MFF
2,2-Dichloropropane	ND	0.0016	0.00064	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:19	MFF
1,1-Dichloropropene	ND	0.0016	0.00064	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:19	MFF
cis-1,3-Dichloropropene	ND	0.00080	0.00032	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:19	MFF
trans-1,3-Dichloropropene	ND	0.00080	0.00032	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:19	MFF
Diethyl Ether	ND	0.016	0.00056	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:19	MFF

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: 129 Manchester St., Concord, NH Sample Description: Work Order: 20I0334

Date Received: 9/4/2020

Field Sample #: S-201 Sampled: 9/3/2020 10:50

Sample ID: 20I0334-01

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	DF	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.00080	0.00016	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:19	MFF
1,4-Dioxane	ND	0.080	0.0043	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:19	MFF
Ethylbenzene	ND	0.0016	0.00048	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:19	MFF
Hexachlorobutadiene	ND	0.0016	0.00056	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:19	MFF
2-Hexanone (MBK)	ND	0.016	0.0016	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:19	MFF
Isopropylbenzene (Cumene)	ND	0.0016	0.00048	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:19	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.0016	0.00040	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:19	MFF
Methyl Acetate	ND	0.0016	0.00056	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:19	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.0032	0.00024	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:19	MFF
Methyl Cyclohexane	ND	0.0016	0.00056	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:19	MFF
Methylene Chloride	ND	0.016	0.00080	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:19	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.016	0.0020	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:19	MFF
Naphthalene	ND	0.0032	0.00032	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:19	MFF
n-Propylbenzene	ND	0.0016	0.00048	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:19	MFF
Styrene	ND	0.0016	0.00032	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:19	MFF
1,1,1,2-Tetrachloroethane	ND	0.0016	0.00080	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:19	MFF
1,1,2,2-Tetrachloroethane	ND	0.00080	0.00032	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:19	MFF
Tetrachloroethylene	ND	0.0016	0.00097	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:19	MFF
Tetrahydrofuran	ND	0.0080	0.00089	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:19	MFF
Toluene	0.00053	0.0016	0.00048	mg/Kg dry	1	J	SW-846 8260C-D	9/8/20	9/8/20 11:19	MFF
1,2,3-Trichlorobenzene	ND	0.0016	0.00080	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:19	MFF
1,2,4-Trichlorobenzene	ND	0.0016	0.00032	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:19	MFF
1,3,5-Trichlorobenzene	ND	0.0016	0.00024	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:19	MFF
1,1,1-Trichloroethane	ND	0.0016	0.00040	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:19	MFF
1,1,2-Trichloroethane	ND	0.0016	0.00032	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:19	MFF
Trichloroethylene	ND	0.0016	0.00064	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:19	MFF
Trichlorofluoromethane (Freon 11)	ND	0.0080	0.00056	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:19	MFF
1,2,3-Trichloropropane	ND	0.0016	0.00064	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:19	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.0080	0.00064	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:19	MFF
1,2,4-Trimethylbenzene	ND	0.0016	0.00024	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:19	MFF
1,3,5-Trimethylbenzene	ND	0.0016	0.00040	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:19	MFF
Vinyl Chloride	ND	0.0080	0.00072	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:19	MFF
m+p Xylene	ND	0.0032	0.00080	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:19	MFF
o-Xylene	ND	0.0016	0.00048	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:19	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	101	70-130		9/8/20 11:19
Toluene-d8	98.9	70-130		9/8/20 11:19
4-Bromofluorobenzene	104	70-130		9/8/20 11:19

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: 129 Manchester St., Concord, NH Sample Description: Work Order: 20I0334

Date Received: 9/4/2020

Field Sample #: S-201 Sampled: 9/3/2020 10:50

Sample ID: 20I0334-01

Sample Matrix: Soil

Semivolatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	DF	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acenaphthene	ND	0.17	0.091	mg/Kg dry	1	U	SW-846 8270D-E	9/11/20	9/12/20 18:37	BGL
Acenaphthylene	ND	0.17	0.11	mg/Kg dry	1	U	SW-846 8270D-E	9/11/20	9/12/20 18:37	BGL
Anthracene	ND	0.17	0.091	mg/Kg dry	1	U	SW-846 8270D-E	9/11/20	9/12/20 18:37	BGL
Benzo(a)anthracene	ND	0.17	0.11	mg/Kg dry	1	U	SW-846 8270D-E	9/11/20	9/12/20 18:37	BGL
Benzo(a)pyrene	ND	0.17	0.11	mg/Kg dry	1	U	SW-846 8270D-E	9/11/20	9/12/20 18:37	BGL
Benzo(b)fluoranthene	ND	0.17	0.11	mg/Kg dry	1	U	SW-846 8270D-E	9/11/20	9/12/20 18:37	BGL
Benzo(g,h,i)perylene	ND	0.17	0.10	mg/Kg dry	1	U	SW-846 8270D-E	9/11/20	9/12/20 18:37	BGL
Benzo(k)fluoranthene	ND	0.17	0.11	mg/Kg dry	1	U	SW-846 8270D-E	9/11/20	9/12/20 18:37	BGL
Chrysene	ND	0.17	0.11	mg/Kg dry	1	U	SW-846 8270D-E	9/11/20	9/12/20 18:37	BGL
Dibenz(a,h)anthracene	ND	0.17	0.10	mg/Kg dry	1	U	SW-846 8270D-E	9/11/20	9/12/20 18:37	BGL
Fluoranthene	ND	0.17	0.10	mg/Kg dry	1	U	SW-846 8270D-E	9/11/20	9/12/20 18:37	BGL
Fluorene	ND	0.17	0.12	mg/Kg dry	1	U	SW-846 8270D-E	9/11/20	9/12/20 18:37	BGL
Indeno(1,2,3-cd)pyrene	ND	0.17	0.12	mg/Kg dry	1	U	SW-846 8270D-E	9/11/20	9/12/20 18:37	BGL
2-Methylnaphthalene	ND	0.17	0.11	mg/Kg dry	1	U	SW-846 8270D-E	9/11/20	9/12/20 18:37	BGL
Naphthalene	ND	0.17	0.11	mg/Kg dry	1	U	SW-846 8270D-E	9/11/20	9/12/20 18:37	BGL
Phenanthrene	ND	0.17	0.091	mg/Kg dry	1	U	SW-846 8270D-E	9/11/20	9/12/20 18:37	BGL
Pyrene	ND	0.17	0.11	mg/Kg dry	1	U	SW-846 8270D-E	9/11/20	9/12/20 18:37	BGL

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Nitrobenzene-d5	85.0	30-130		9/12/20 18:37
2-Fluorobiphenyl	82.9	30-130		9/12/20 18:37
p-Terphenyl-d14	106	30-130		9/12/20 18:37

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Project Location: 129 Manchester St., Concord, NH Sample Description: Work Order: 20I0334

Date Received: 9/4/2020

Field Sample #: S-201 Sampled: 9/3/2020 10:50

Sample ID: 20I0334-01

Sample Matrix: Soil

Petroleum Hydrocarbons Analyses

Analyte	Results	RL	DL	Units	DF	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
TPH (C9-C36)	14	8.4	3.7	mg/Kg dry	1		SW-846 8100 Modified	9/11/20	9/14/20 4:57	RDD

Surrogates	% Recovery	Recovery Limits	Flag/Qual		
2-Fluorobiphenyl	72.0	40-140			9/14/20 4:57

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Project Location: 129 Manchester St., Concord, NH Sample Description: Work Order: 20I0334

Date Received: 9/4/2020

Field Sample #: S-201 Sampled: 9/3/2020 10:50

Sample ID: 20I0334-01

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	DF	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	98.9		% Wt	1		SM 2540G	9/11/20	9/11/20 16:34	jje

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Project Location: 129 Manchester St., Concord, NH Sample Description: Work Order: 20I0334

Date Received: 9/4/2020

Field Sample #: S-202 Sampled: 9/3/2020 10:55

Sample ID: 20I0334-02

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	DF	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	0.031	0.076	0.0064	mg/Kg dry	1	J	SW-846 8260C-D	9/8/20	9/8/20 11:44	MFF
Acrylonitrile	ND	0.0046	0.00076	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:44	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.00076	0.00023	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:44	MFF
Benzene	ND	0.0015	0.00046	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:44	MFF
Bromobenzene	ND	0.0015	0.00030	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:44	MFF
Bromochloromethane	ND	0.0015	0.00061	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:44	MFF
Bromodichloromethane	ND	0.0015	0.00038	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:44	MFF
Bromoform	ND	0.0015	0.00053	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:44	MFF
Bromomethane	ND	0.0076	0.00083	mg/Kg dry	1	V-34, U	SW-846 8260C-D	9/8/20	9/8/20 11:44	MFF
2-Butanone (MEK)	ND	0.030	0.0042	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:44	MFF
tert-Butyl Alcohol (TBA)	ND	0.030	0.0034	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:44	MFF
n-Butylbenzene	ND	0.0015	0.00038	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:44	MFF
sec-Butylbenzene	ND	0.0015	0.00061	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:44	MFF
tert-Butylbenzene	ND	0.0015	0.00046	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:44	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.00076	0.00015	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:44	MFF
Carbon Disulfide	ND	0.0046	0.0041	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:44	MFF
Carbon Tetrachloride	ND	0.0015	0.00053	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:44	MFF
Chlorobenzene	ND	0.0015	0.00038	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:44	MFF
Chlorodibromomethane	ND	0.00076	0.00030	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:44	MFF
Chloroethane	ND	0.015	0.00061	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:44	MFF
Chloroform	ND	0.0030	0.00038	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:44	MFF
Chloromethane	ND	0.0076	0.00053	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:44	MFF
2-Chlorotoluene	ND	0.0015	0.00023	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:44	MFF
4-Chlorotoluene	ND	0.0015	0.00030	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:44	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0015	0.00076	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:44	MFF
1,2-Dibromoethane (EDB)	ND	0.00076	0.00053	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:44	MFF
Dibromomethane	ND	0.0015	0.00061	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:44	MFF
1,2-Dichlorobenzene	ND	0.0015	0.00030	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:44	MFF
1,3-Dichlorobenzene	ND	0.0015	0.00030	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:44	MFF
1,4-Dichlorobenzene	ND	0.0015	0.00061	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:44	MFF
trans-1,4-Dichloro-2-butene	ND	0.0030	0.00046	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:44	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.015	0.00083	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:44	MFF
1,1-Dichloroethane	ND	0.0015	0.00030	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:44	MFF
1,2-Dichloroethane	ND	0.0015	0.00038	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:44	MFF
1,1-Dichloroethylene	ND	0.0030	0.00053	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:44	MFF
cis-1,2-Dichloroethylene	ND	0.0015	0.00053	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:44	MFF
trans-1,2-Dichloroethylene	ND	0.0015	0.00046	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:44	MFF
1,2-Dichloropropane	ND	0.0015	0.00061	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:44	MFF
1,3-Dichloropropane	ND	0.00076	0.00038	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:44	MFF
2,2-Dichloropropane	ND	0.0015	0.00061	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:44	MFF
1,1-Dichloropropene	ND	0.0015	0.00061	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:44	MFF
cis-1,3-Dichloropropene	ND	0.00076	0.00030	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:44	MFF
trans-1,3-Dichloropropene	ND	0.00076	0.00030	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:44	MFF
Diethyl Ether	ND	0.015	0.00053	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:44	MFF

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: 129 Manchester St., Concord, NH Sample Description: Work Order: 20I0334

Date Received: 9/4/2020

Field Sample #: S-202 Sampled: 9/3/2020 10:55

Sample ID: 20I0334-02

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	DF	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.00076	0.00015	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:44	MFF
1,4-Dioxane	ND	0.076	0.0040	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:44	MFF
Ethylbenzene	ND	0.0015	0.00046	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:44	MFF
Hexachlorobutadiene	ND	0.0015	0.00053	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:44	MFF
2-Hexanone (MBK)	ND	0.015	0.0015	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:44	MFF
Isopropylbenzene (Cumene)	ND	0.0015	0.00046	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:44	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.0015	0.00038	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:44	MFF
Methyl Acetate	ND	0.0015	0.00053	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:44	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.0030	0.00023	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:44	MFF
Methyl Cyclohexane	ND	0.0015	0.00053	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:44	MFF
Methylene Chloride	ND	0.015	0.00076	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:44	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.015	0.0019	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:44	MFF
Naphthalene	0.00062	0.0030	0.00030	mg/Kg dry	1	J	SW-846 8260C-D	9/8/20	9/8/20 11:44	MFF
n-Propylbenzene	ND	0.0015	0.00046	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:44	MFF
Styrene	ND	0.0015	0.00030	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:44	MFF
1,1,1,2-Tetrachloroethane	ND	0.0015	0.00076	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:44	MFF
1,1,2,2-Tetrachloroethane	ND	0.00076	0.00030	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:44	MFF
Tetrachloroethylene	ND	0.0015	0.00091	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:44	MFF
Tetrahydrofuran	ND	0.0076	0.00083	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:44	MFF
Toluene	ND	0.0015	0.00046	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:44	MFF
1,2,3-Trichlorobenzene	ND	0.0015	0.00076	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:44	MFF
1,2,4-Trichlorobenzene	ND	0.0015	0.00030	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:44	MFF
1,3,5-Trichlorobenzene	ND	0.0015	0.00023	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:44	MFF
1,1,1-Trichloroethane	ND	0.0015	0.00038	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:44	MFF
1,1,2-Trichloroethane	ND	0.0015	0.00030	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:44	MFF
Trichloroethylene	ND	0.0015	0.00061	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:44	MFF
Trichlorofluoromethane (Freon 11)	ND	0.0076	0.00053	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:44	MFF
1,2,3-Trichloropropane	ND	0.0015	0.00061	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:44	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.0076	0.00061	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:44	MFF
1,2,4-Trimethylbenzene	ND	0.0015	0.00023	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:44	MFF
1,3,5-Trimethylbenzene	ND	0.0015	0.00038	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:44	MFF
Vinyl Chloride	ND	0.0076	0.00068	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:44	MFF
m+p Xylene	ND	0.0030	0.00076	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:44	MFF
o-Xylene	ND	0.0015	0.00046	mg/Kg dry	1	U	SW-846 8260C-D	9/8/20	9/8/20 11:44	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	104	70-130		9/8/20 11:44
Toluene-d8	98.5	70-130		9/8/20 11:44
4-Bromofluorobenzene	99.9	70-130		9/8/20 11:44

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Project Location: 129 Manchester St., Concord, NH Sample Description: Work Order: 20I0334

Date Received: 9/4/2020

Field Sample #: S-202 Sampled: 9/3/2020 10:55

Sample ID: 20I0334-02

Sample Matrix: Soil

Semivolatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	DF	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acenaphthene	ND	0.17	0.092	mg/Kg dry	1	U	SW-846 8270D-E	9/11/20	9/12/20 19:01	BGL
Acenaphthylene	ND	0.17	0.11	mg/Kg dry	1	U	SW-846 8270D-E	9/11/20	9/12/20 19:01	BGL
Anthracene	ND	0.17	0.092	mg/Kg dry	1	U	SW-846 8270D-E	9/11/20	9/12/20 19:01	BGL
Benzo(a)anthracene	ND	0.17	0.11	mg/Kg dry	1	U	SW-846 8270D-E	9/11/20	9/12/20 19:01	BGL
Benzo(a)pyrene	ND	0.17	0.11	mg/Kg dry	1	U	SW-846 8270D-E	9/11/20	9/12/20 19:01	BGL
Benzo(b)fluoranthene	ND	0.17	0.11	mg/Kg dry	1	U	SW-846 8270D-E	9/11/20	9/12/20 19:01	BGL
Benzo(g,h,i)perylene	ND	0.17	0.10	mg/Kg dry	1	U	SW-846 8270D-E	9/11/20	9/12/20 19:01	BGL
Benzo(k)fluoranthene	ND	0.17	0.11	mg/Kg dry	1	U	SW-846 8270D-E	9/11/20	9/12/20 19:01	BGL
Chrysene	ND	0.17	0.11	mg/Kg dry	1	U	SW-846 8270D-E	9/11/20	9/12/20 19:01	BGL
Dibenz(a,h)anthracene	ND	0.17	0.10	mg/Kg dry	1	U	SW-846 8270D-E	9/11/20	9/12/20 19:01	BGL
Fluoranthene	ND	0.17	0.10	mg/Kg dry	1	U	SW-846 8270D-E	9/11/20	9/12/20 19:01	BGL
Fluorene	ND	0.17	0.12	mg/Kg dry	1	U	SW-846 8270D-E	9/11/20	9/12/20 19:01	BGL
Indeno(1,2,3-cd)pyrene	ND	0.17	0.12	mg/Kg dry	1	U	SW-846 8270D-E	9/11/20	9/12/20 19:01	BGL
2-Methylnaphthalene	ND	0.17	0.11	mg/Kg dry	1	U	SW-846 8270D-E	9/11/20	9/12/20 19:01	BGL
Naphthalene	ND	0.17	0.11	mg/Kg dry	1	U	SW-846 8270D-E	9/11/20	9/12/20 19:01	BGL
Phenanthrene	0.15	0.17	0.092	mg/Kg dry	1	J	SW-846 8270D-E	9/11/20	9/12/20 19:01	BGL
Pyrene	ND	0.17	0.11	mg/Kg dry	1	U	SW-846 8270D-E	9/11/20	9/12/20 19:01	BGL

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Nitrobenzene-d5	89.8	30-130		9/12/20 19:01
2-Fluorobiphenyl	87.0	30-130		9/12/20 19:01
p-Terphenyl-d14	110	30-130		9/12/20 19:01

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Date Received: 9/4/2020

Field Sample #: S-202 Sampled: 9/3/2020 10:55

Sample ID: 20I0334-02

Sample Matrix: Soil

Petroleum Hydrocarbons Analyses

Analyte	Results	RL	DL	Units	DF	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
TPH (C9-C36)	390	86	38	mg/Kg dry	10		SW-846 8100 Modified	9/11/20	9/14/20 9:56	RDD

Surrogates	% Recovery	Recovery Limits	Flag/Qual		
2-Fluorobiphenyl	66.8	40-140		9/14/20 9:56	

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Sample ID: 20I0334-02

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	DF	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	97.1		% Wt	1		SM 2540G	9/11/20	9/11/20 16:34	jje

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Sample Extraction Data

Prep Method: % Solids-SM 2540G

Lab Number [Field ID]	Batch	Date
20I0334-01 [S-201]	B266281	09/11/20
20I0334-02 [S-202]	B266281	09/11/20

Prep Method: SW-846 3546-SW-846 8100 Modified

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
20I0334-01 [S-201]	B266273	30.1	1.00	09/11/20
20I0334-02 [S-202]	B266273	30.1	1.00	09/11/20

Prep Method: SW-846 5035-SW-846 8260C-D

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
20I0334-01 [S-201]	B265979	6.28	10.0	09/08/20
20I0334-02 [S-202]	B265979	6.79	10.0	09/08/20

Prep Method: SW-846 3546-SW-846 8270D-E

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
20I0334-01 [S-201]	B266291	30.1	1.00	09/11/20
20I0334-02 [S-202]	B266291	30.1	1.00	09/11/20

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QUALITY CONTROL

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B265979 - SW-846 5035										
Blank (B265979-BLK1)				Prepared & Analyzed: 09/08/20						
Acetone	ND	0.10	mg/Kg wet							U
Acrylonitrile	ND	0.0060	mg/Kg wet							U
tert-Amyl Methyl Ether (TAME)	ND	0.0010	mg/Kg wet							U
Benzene	ND	0.0020	mg/Kg wet							U
Bromobenzene	ND	0.0020	mg/Kg wet							U
Bromochloromethane	ND	0.0020	mg/Kg wet							U
Bromodichloromethane	ND	0.0020	mg/Kg wet							U
Bromoform	ND	0.0020	mg/Kg wet							U
Bromomethane	ND	0.010	mg/Kg wet							V-34, U
2-Butanone (MEK)	ND	0.040	mg/Kg wet							U
tert-Butyl Alcohol (TBA)	ND	0.040	mg/Kg wet							U
n-Butylbenzene	ND	0.0020	mg/Kg wet							U
sec-Butylbenzene	ND	0.0020	mg/Kg wet							U
tert-Butylbenzene	ND	0.0020	mg/Kg wet							U
tert-Butyl Ethyl Ether (TBEE)	ND	0.0010	mg/Kg wet							U
Carbon Disulfide	ND	0.0060	mg/Kg wet							U
Carbon Tetrachloride	ND	0.0020	mg/Kg wet							U
Chlorobenzene	ND	0.0020	mg/Kg wet							U
Chlorodibromomethane	ND	0.0010	mg/Kg wet							U
Chloroethane	ND	0.020	mg/Kg wet							U
Chloroform	ND	0.0040	mg/Kg wet							U
Chloromethane	ND	0.010	mg/Kg wet							U
2-Chlorotoluene	ND	0.0020	mg/Kg wet							U
4-Chlorotoluene	ND	0.0020	mg/Kg wet							U
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0020	mg/Kg wet							U
1,2-Dibromoethane (EDB)	ND	0.0010	mg/Kg wet							U
Dibromomethane	ND	0.0020	mg/Kg wet							U
1,2-Dichlorobenzene	ND	0.0020	mg/Kg wet							U
1,3-Dichlorobenzene	ND	0.0020	mg/Kg wet							U
1,4-Dichlorobenzene	ND	0.0020	mg/Kg wet							U
trans-1,4-Dichloro-2-butene	ND	0.0040	mg/Kg wet							U
Dichlorodifluoromethane (Freon 12)	ND	0.020	mg/Kg wet							U
1,1-Dichloroethane	ND	0.0020	mg/Kg wet							U
1,2-Dichloroethane	ND	0.0020	mg/Kg wet							U
1,1-Dichloroethylene	ND	0.0040	mg/Kg wet							U
cis-1,2-Dichloroethylene	ND	0.0020	mg/Kg wet							U
trans-1,2-Dichloroethylene	ND	0.0020	mg/Kg wet							U
1,2-Dichloropropane	ND	0.0020	mg/Kg wet							U
1,3-Dichloropropane	ND	0.0010	mg/Kg wet							U
2,2-Dichloropropane	ND	0.0020	mg/Kg wet							U
1,1-Dichloropropene	ND	0.0020	mg/Kg wet							U
cis-1,3-Dichloropropene	ND	0.0010	mg/Kg wet							U
trans-1,3-Dichloropropene	ND	0.0010	mg/Kg wet							U
Diethyl Ether	ND	0.020	mg/Kg wet							U
Diisopropyl Ether (DIPE)	ND	0.0010	mg/Kg wet							U
1,4-Dioxane	ND	0.10	mg/Kg wet							U
Ethylbenzene	ND	0.0020	mg/Kg wet							U
Hexachlorobutadiene	ND	0.0020	mg/Kg wet							U
2-Hexanone (MBK)	ND	0.020	mg/Kg wet							U
Isopropylbenzene (Cumene)	ND	0.0020	mg/Kg wet							U
p-Isopropyltoluene (p-Cymene)	ND	0.0020	mg/Kg wet							U
Methyl Acetate	ND	0.0020	mg/Kg wet							U

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QUALITY CONTROL

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC		%REC Limits	RPD	RPD Limit	Notes	
Batch B265979 - SW-846 5035												
Blank (B265979-BLK1)				Prepared & Analyzed: 09/08/20								
Methyl tert-Butyl Ether (MTBE)	ND	0.0040	mg/Kg wet								U	
Methyl Cyclohexane	ND	0.0020	mg/Kg wet								U	
Methylene Chloride	ND	0.020	mg/Kg wet								U	
4-Methyl-2-pentanone (MIBK)	ND	0.020	mg/Kg wet								U	
Naphthalene	ND	0.0040	mg/Kg wet								U	
n-Propylbenzene	ND	0.0020	mg/Kg wet								U	
Styrene	ND	0.0020	mg/Kg wet								U	
1,1,1,2-Tetrachloroethane	ND	0.0020	mg/Kg wet								U	
1,1,2,2-Tetrachloroethane	ND	0.0010	mg/Kg wet								U	
Tetrachloroethylene	ND	0.0020	mg/Kg wet								U	
Tetrahydrofuran	ND	0.010	mg/Kg wet								U	
Toluene	ND	0.0020	mg/Kg wet								U	
1,2,3-Trichlorobenzene	ND	0.0020	mg/Kg wet								U	
1,2,4-Trichlorobenzene	ND	0.0020	mg/Kg wet								U	
1,3,5-Trichlorobenzene	ND	0.0020	mg/Kg wet								U	
1,1,1-Trichloroethane	ND	0.0020	mg/Kg wet								U	
1,1,2-Trichloroethane	ND	0.0020	mg/Kg wet								U	
Trichloroethylene	ND	0.0020	mg/Kg wet								U	
Trichlorofluoromethane (Freon 11)	ND	0.010	mg/Kg wet								U	
1,2,3-Trichloropropane	ND	0.0020	mg/Kg wet								U	
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.010	mg/Kg wet								U	
1,2,4-Trimethylbenzene	ND	0.0020	mg/Kg wet								U	
1,3,5-Trimethylbenzene	ND	0.0020	mg/Kg wet								U	
Vinyl Chloride	ND	0.010	mg/Kg wet								U	
m+p Xylene	ND	0.0040	mg/Kg wet								U	
o-Xylene	ND	0.0020	mg/Kg wet								U	
Surrogate: 1,2-Dichloroethane-d4	*0.0519*		mg/Kg wet	0.0500		104		70-130				
Surrogate: Toluene-d8	*0.0494*		mg/Kg wet	0.0500		98.9		70-130				
Surrogate: 4-Bromofluorobenzene	*0.0509*		mg/Kg wet	0.0500		102		70-130				
LCS (B265979-BS1)				Prepared & Analyzed: 09/08/20								
Acetone	0.206	0.10	mg/Kg wet	0.200		103		70-160				†
Acrylonitrile	0.0266	0.0060	mg/Kg wet	0.0200		**133**	*	70-130			L-02	
tert-Amyl Methyl Ether (TAME)	0.0230	0.0010	mg/Kg wet	0.0200		115		70-130				
Benzene	0.0235	0.0020	mg/Kg wet	0.0200		117		70-130				
Bromobenzene	0.0203	0.0020	mg/Kg wet	0.0200		101		70-130				
Bromochloromethane	0.0252	0.0020	mg/Kg wet	0.0200		126		70-130				
Bromodichloromethane	0.0224	0.0020	mg/Kg wet	0.0200		112		70-130				
Bromoform	0.0216	0.0020	mg/Kg wet	0.0200		108		70-130				
Bromomethane	0.0199	0.010	mg/Kg wet	0.0200		99.7		40-130			V-34	†
2-Butanone (MEK)	0.266	0.040	mg/Kg wet	0.200		133		70-160				†
tert-Butyl Alcohol (TBA)	0.242	0.040	mg/Kg wet	0.200		121		40-130				†
n-Butylbenzene	0.0185	0.0020	mg/Kg wet	0.0200		92.4		70-130				
sec-Butylbenzene	0.0191	0.0020	mg/Kg wet	0.0200		95.5		70-130				
tert-Butylbenzene	0.0199	0.0020	mg/Kg wet	0.0200		99.7		70-160				†
tert-Butyl Ethyl Ether (TBEE)	0.0239	0.0010	mg/Kg wet	0.0200		119		70-130				
Carbon Disulfide	0.200	0.0060	mg/Kg wet	0.200		100		70-130				
Carbon Tetrachloride	0.0237	0.0020	mg/Kg wet	0.0200		119		70-130				
Chlorobenzene	0.0213	0.0020	mg/Kg wet	0.0200		106		70-130				
Chlorodibromomethane	0.0240	0.0010	mg/Kg wet	0.0200		120		70-130				
Chloroethane	0.0206	0.020	mg/Kg wet	0.0200		103		70-130				
Chloroform	0.0234	0.0040	mg/Kg wet	0.0200		117		70-130				

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QUALITY CONTROL

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC		%REC Limits	RPD	RPD Limit	Notes	
Batch B265979 - SW-846 5035												
LCS (B265979-BS1)				Prepared & Analyzed: 09/08/20								
Chloromethane	0.0253	0.010	mg/Kg wet	0.0200		127		70-130				
2-Chlorotoluene	0.0204	0.0020	mg/Kg wet	0.0200		102		70-130				
4-Chlorotoluene	0.0208	0.0020	mg/Kg wet	0.0200		104		70-130				
1,2-Dibromo-3-chloropropane (DBCP)	0.0177	0.0020	mg/Kg wet	0.0200		88.3		70-130				
1,2-Dibromoethane (EDB)	0.0224	0.0010	mg/Kg wet	0.0200		112		70-130				
Dibromomethane	0.0207	0.0020	mg/Kg wet	0.0200		104		70-130				
1,2-Dichlorobenzene	0.0201	0.0020	mg/Kg wet	0.0200		100		70-130				
1,3-Dichlorobenzene	0.0203	0.0020	mg/Kg wet	0.0200		101		70-130				
1,4-Dichlorobenzene	0.0198	0.0020	mg/Kg wet	0.0200		99.2		70-130				
trans-1,4-Dichloro-2-butene	0.0195	0.0040	mg/Kg wet	0.0200		97.6		70-130				
Dichlorodifluoromethane (Freon 12)	0.0216	0.020	mg/Kg wet	0.0200		108		40-160			V-36	†
1,1-Dichloroethane	0.0237	0.0020	mg/Kg wet	0.0200		119		70-130				
1,2-Dichloroethane	0.0229	0.0020	mg/Kg wet	0.0200		115		70-130				
1,1-Dichloroethylene	0.0207	0.0040	mg/Kg wet	0.0200		103		70-130				
cis-1,2-Dichloroethylene	0.0243	0.0020	mg/Kg wet	0.0200		121		70-130				
trans-1,2-Dichloroethylene	0.0235	0.0020	mg/Kg wet	0.0200		117		70-130				
1,2-Dichloropropane	0.0220	0.0020	mg/Kg wet	0.0200		110		70-130				
1,3-Dichloropropane	0.0226	0.0010	mg/Kg wet	0.0200		113		70-130				
2,2-Dichloropropane	0.0210	0.0020	mg/Kg wet	0.0200		105		70-130				
1,1-Dichloropropene	0.0234	0.0020	mg/Kg wet	0.0200		117		70-130				
cis-1,3-Dichloropropene	0.0214	0.0010	mg/Kg wet	0.0200		107		70-130				
trans-1,3-Dichloropropene	0.0218	0.0010	mg/Kg wet	0.0200		109		70-130				
Diethyl Ether	0.0232	0.020	mg/Kg wet	0.0200		116		70-130				
Diisopropyl Ether (DIPE)	0.0274	0.0010	mg/Kg wet	0.0200		**137**	*	70-130			L-07, V-20	
1,4-Dioxane	0.223	0.10	mg/Kg wet	0.200		111		40-160				†
Ethylbenzene	0.0204	0.0020	mg/Kg wet	0.0200		102		70-130				
Hexachlorobutadiene	0.0202	0.0020	mg/Kg wet	0.0200		101		70-160				
2-Hexanone (MBK)	0.239	0.020	mg/Kg wet	0.200		119		70-160				†
Isopropylbenzene (Cumene)	0.0213	0.0020	mg/Kg wet	0.0200		106		70-130				
p-Isopropyltoluene (p-Cymene)	0.0195	0.0020	mg/Kg wet	0.0200		97.7		70-130				
Methyl Acetate	0.0355	0.0020	mg/Kg wet	0.0200		**177**	*	70-130			L-02, V-20	
Methyl tert-Butyl Ether (MTBE)	0.0235	0.0040	mg/Kg wet	0.0200		118		70-130				
Methyl Cyclohexane	0.0215	0.0020	mg/Kg wet	0.0200		108		70-130				
Methylene Chloride	0.0258	0.020	mg/Kg wet	0.0200		129		40-160				†
4-Methyl-2-pentanone (MIBK)	0.245	0.020	mg/Kg wet	0.200		123		70-160				†
Naphthalene	0.0197	0.0040	mg/Kg wet	0.0200		98.7		40-130				†
n-Propylbenzene	0.0202	0.0020	mg/Kg wet	0.0200		101		70-130				
Styrene	0.0206	0.0020	mg/Kg wet	0.0200		103		70-130				
1,1,1,2-Tetrachloroethane	0.0212	0.0020	mg/Kg wet	0.0200		106		70-130				
1,1,2,2-Tetrachloroethane	0.0210	0.0010	mg/Kg wet	0.0200		105		70-130				
Tetrachloroethylene	0.0241	0.0020	mg/Kg wet	0.0200		120		70-130				
Tetrahydrofuran	0.0290	0.010	mg/Kg wet	0.0200		**145**	*	70-130			L-07, V-20	
Toluene	0.0212	0.0020	mg/Kg wet	0.0200		106		70-130				
1,2,3-Trichlorobenzene	0.0211	0.0020	mg/Kg wet	0.0200		105		70-130				
1,2,4-Trichlorobenzene	0.0200	0.0020	mg/Kg wet	0.0200		100		70-130				
1,3,5-Trichlorobenzene	0.0203	0.0020	mg/Kg wet	0.0200		102		70-130				
1,1,1-Trichloroethane	0.0242	0.0020	mg/Kg wet	0.0200		121		70-130				
1,1,2-Trichloroethane	0.0224	0.0020	mg/Kg wet	0.0200		112		70-130				
Trichloroethylene	0.0219	0.0020	mg/Kg wet	0.0200		109		70-130				
Trichlorofluoromethane (Freon 11)	0.0193	0.010	mg/Kg wet	0.0200		96.6		70-130				
1,2,3-Trichloropropane	0.0216	0.0020	mg/Kg wet	0.0200		108		70-130				

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QUALITY CONTROL

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC		%REC Limits	RPD	RPD Limit	Notes	
Batch B265979 - SW-846 5035												
LCS (B265979-BS1)				Prepared & Analyzed: 09/08/20								
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	0.0209	0.010	mg/Kg wet	0.0200		105		70-130				
1,2,4-Trimethylbenzene	0.0192	0.0020	mg/Kg wet	0.0200		95.8		70-130				
1,3,5-Trimethylbenzene	0.0210	0.0020	mg/Kg wet	0.0200		105		70-130				
Vinyl Chloride	0.0208	0.010	mg/Kg wet	0.0200		104		40-130				†
m+p Xylene	0.0408	0.0040	mg/Kg wet	0.0400		102		70-130				
o-Xylene	0.0201	0.0020	mg/Kg wet	0.0200		100		70-130				
Surrogate: 1,2-Dichloroethane-d4	*0.0510*		mg/Kg wet	0.0500		102		70-130				
Surrogate: Toluene-d8	*0.0486*		mg/Kg wet	0.0500		97.2		70-130				
Surrogate: 4-Bromofluorobenzene	*0.0522*		mg/Kg wet	0.0500		104		70-130				
LCS Dup (B265979-BSD1)				Prepared & Analyzed: 09/08/20								
Acetone	0.189	0.10	mg/Kg wet	0.200		94.4		70-160	8.78	25		†
Acrylonitrile	0.0263	0.0060	mg/Kg wet	0.0200		**132**	*	70-130	0.908	25	L-02	
tert-Amyl Methyl Ether (TAME)	0.0217	0.0010	mg/Kg wet	0.0200		109		70-130	5.60	25		
Benzene	0.0215	0.0020	mg/Kg wet	0.0200		107		70-130	8.89	25		
Bromobenzene	0.0187	0.0020	mg/Kg wet	0.0200		93.4		70-130	8.21	25		
Bromochloromethane	0.0235	0.0020	mg/Kg wet	0.0200		117		70-130	7.08	25		
Bromodichloromethane	0.0216	0.0020	mg/Kg wet	0.0200		108		70-130	3.46	25		
Bromoform	0.0204	0.0020	mg/Kg wet	0.0200		102		70-130	5.92	25		
Bromomethane	0.0180	0.010	mg/Kg wet	0.0200		90.2		40-130	10.0	25	V-34	†
2-Butanone (MEK)	0.244	0.040	mg/Kg wet	0.200		122		70-160	8.60	25		†
tert-Butyl Alcohol (TBA)	0.231	0.040	mg/Kg wet	0.200		116		40-130	4.64	25		†
n-Butylbenzene	0.0171	0.0020	mg/Kg wet	0.0200		85.4		70-130	7.79	25		
sec-Butylbenzene	0.0179	0.0020	mg/Kg wet	0.0200		89.5		70-130	6.58	25		
tert-Butylbenzene	0.0183	0.0020	mg/Kg wet	0.0200		91.5		70-160	8.55	25		†
tert-Butyl Ethyl Ether (TBEE)	0.0221	0.0010	mg/Kg wet	0.0200		111		70-130	7.43	25		
Carbon Disulfide	0.183	0.0060	mg/Kg wet	0.200		91.6		70-130	8.95	25		
Carbon Tetrachloride	0.0224	0.0020	mg/Kg wet	0.0200		112		70-130	5.65	25		
Chlorobenzene	0.0195	0.0020	mg/Kg wet	0.0200		97.4		70-130	8.95	25		
Chlorodibromomethane	0.0227	0.0010	mg/Kg wet	0.0200		114		70-130	5.39	25		
Chloroethane	0.0191	0.020	mg/Kg wet	0.0200		95.6		70-130	7.35	25	J	
Chloroform	0.0216	0.0040	mg/Kg wet	0.0200		108		70-130	7.85	25		
Chloromethane	0.0228	0.010	mg/Kg wet	0.0200		114		70-130	10.5	25		
2-Chlorotoluene	0.0188	0.0020	mg/Kg wet	0.0200		94.1		70-130	7.87	25		
4-Chlorotoluene	0.0190	0.0020	mg/Kg wet	0.0200		94.8		70-130	9.47	25		
1,2-Dibromo-3-chloropropane (DBCP)	0.0182	0.0020	mg/Kg wet	0.0200		91.0		70-130	2.99	25		
1,2-Dibromoethane (EDB)	0.0207	0.0010	mg/Kg wet	0.0200		104		70-130	7.89	25		
Dibromomethane	0.0201	0.0020	mg/Kg wet	0.0200		101		70-130	2.91	25		
1,2-Dichlorobenzene	0.0192	0.0020	mg/Kg wet	0.0200		96.2		70-130	4.30	25		
1,3-Dichlorobenzene	0.0190	0.0020	mg/Kg wet	0.0200		95.2		70-130	6.35	25		
1,4-Dichlorobenzene	0.0190	0.0020	mg/Kg wet	0.0200		94.9		70-130	4.47	25		
trans-1,4-Dichloro-2-butene	0.0188	0.0040	mg/Kg wet	0.0200		94.0		70-130	3.70	25		
Dichlorodifluoromethane (Freon 12)	0.0200	0.020	mg/Kg wet	0.0200		100		40-160	7.62	25	V-36	†
1,1-Dichloroethane	0.0216	0.0020	mg/Kg wet	0.0200		108		70-130	9.24	25		
1,2-Dichloroethane	0.0223	0.0020	mg/Kg wet	0.0200		111		70-130	2.97	25		
1,1-Dichloroethylene	0.0193	0.0040	mg/Kg wet	0.0200		96.7		70-130	6.74	25		
cis-1,2-Dichloroethylene	0.0227	0.0020	mg/Kg wet	0.0200		114		70-130	6.47	25		
trans-1,2-Dichloroethylene	0.0220	0.0020	mg/Kg wet	0.0200		110		70-130	6.59	25		
1,2-Dichloropropane	0.0211	0.0020	mg/Kg wet	0.0200		106		70-130	4.17	25		
1,3-Dichloropropane	0.0210	0.0010	mg/Kg wet	0.0200		105		70-130	7.34	25		
2,2-Dichloropropane	0.0198	0.0020	mg/Kg wet	0.0200		98.9		70-130	5.90	25		
1,1-Dichloropropene	0.0216	0.0020	mg/Kg wet	0.0200		108		70-130	8.15	25		

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QUALITY CONTROL

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC		%REC Limits	RPD	RPD Limit	Notes	
Batch B265979 - SW-846 5035												
LCS Dup (B265979-BSD1)				Prepared & Analyzed: 09/08/20								
cis-1,3-Dichloropropene	0.0206	0.0010	mg/Kg wet	0.0200		103		70-130	3.59	25		
trans-1,3-Dichloropropene	0.0201	0.0010	mg/Kg wet	0.0200		101		70-130	7.94	25		
Diethyl Ether	0.0220	0.020	mg/Kg wet	0.0200		110		70-130	5.48	25		
Diisopropyl Ether (DIPE)	0.0254	0.0010	mg/Kg wet	0.0200		127		70-130	7.42	25	V-20	
1,4-Dioxane	0.216	0.10	mg/Kg wet	0.200		108		40-160	2.90	50		† ‡
Ethylbenzene	0.0186	0.0020	mg/Kg wet	0.0200		93.0		70-130	9.35	25		
Hexachlorobutadiene	0.0185	0.0020	mg/Kg wet	0.0200		92.3		70-160	8.97	25		
2-Hexanone (MBK)	0.228	0.020	mg/Kg wet	0.200		114		70-160	4.31	25		†
Isopropylbenzene (Cumene)	0.0194	0.0020	mg/Kg wet	0.0200		96.8		70-130	9.32	25		
p-Isopropyltoluene (p-Cymene)	0.0181	0.0020	mg/Kg wet	0.0200		90.7		70-130	7.44	25		
Methyl Acetate	0.0307	0.0020	mg/Kg wet	0.0200		**153**	*	70-130	14.5	25	L-02, V-20	
Methyl tert-Butyl Ether (MTBE)	0.0223	0.0040	mg/Kg wet	0.0200		111		70-130	5.46	25		
Methyl Cyclohexane	0.0203	0.0020	mg/Kg wet	0.0200		101		70-130	6.12	25		
Methylene Chloride	0.0247	0.020	mg/Kg wet	0.0200		123		40-160	4.37	25		†
4-Methyl-2-pentanone (MIBK)	0.232	0.020	mg/Kg wet	0.200		116		70-160	5.47	25		†
Naphthalene	0.0191	0.0040	mg/Kg wet	0.0200		95.3		40-130	3.50	25		†
n-Propylbenzene	0.0183	0.0020	mg/Kg wet	0.0200		91.7		70-130	9.43	25		
Styrene	0.0191	0.0020	mg/Kg wet	0.0200		95.6		70-130	7.25	25		
1,1,1,2-Tetrachloroethane	0.0200	0.0020	mg/Kg wet	0.0200		99.8		70-130	6.08	25		
1,1,2,2-Tetrachloroethane	0.0191	0.0010	mg/Kg wet	0.0200		95.7		70-130	9.08	25		
Tetrachloroethylene	0.0224	0.0020	mg/Kg wet	0.0200		112		70-130	7.29	25		
Tetrahydrofuran	0.0255	0.010	mg/Kg wet	0.0200		128		70-130	12.8	25	V-20	
Toluene	0.0200	0.0020	mg/Kg wet	0.0200		99.8		70-130	5.84	25		
1,2,3-Trichlorobenzene	0.0196	0.0020	mg/Kg wet	0.0200		97.8		70-130	7.37	25		
1,2,4-Trichlorobenzene	0.0190	0.0020	mg/Kg wet	0.0200		95.2		70-130	5.06	25		
1,3,5-Trichlorobenzene	0.0189	0.0020	mg/Kg wet	0.0200		94.5		70-130	7.26	25		
1,1,1-Trichloroethane	0.0221	0.0020	mg/Kg wet	0.0200		111		70-130	8.78	25		
1,1,2-Trichloroethane	0.0207	0.0020	mg/Kg wet	0.0200		104		70-130	7.85	25		
Trichloroethylene	0.0208	0.0020	mg/Kg wet	0.0200		104		70-130	5.29	25		
Trichlorofluoromethane (Freon 11)	0.0179	0.010	mg/Kg wet	0.0200		89.6		70-130	7.54	25		
1,2,3-Trichloropropane	0.0192	0.0020	mg/Kg wet	0.0200		96.2		70-130	11.7	25		
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	0.0189	0.010	mg/Kg wet	0.0200		94.7		70-130	9.99	25		
1,2,4-Trimethylbenzene	0.0180	0.0020	mg/Kg wet	0.0200		89.8		70-130	6.46	25		
1,3,5-Trimethylbenzene	0.0192	0.0020	mg/Kg wet	0.0200		95.8		70-130	9.29	25		
Vinyl Chloride	0.0193	0.010	mg/Kg wet	0.0200		96.6		40-130	7.31	25		†
m+p Xylene	0.0376	0.0040	mg/Kg wet	0.0400		94.0		70-130	8.08	25		
o-Xylene	0.0183	0.0020	mg/Kg wet	0.0200		91.6		70-130	9.10	25		
Surrogate: 1,2-Dichloroethane-d4	*0.0507*		mg/Kg wet	0.0500		101		70-130				
Surrogate: Toluene-d8	*0.0496*		mg/Kg wet	0.0500		99.3		70-130				
Surrogate: 4-Bromofluorobenzene	*0.0516*		mg/Kg wet	0.0500		103		70-130				

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QUALITY CONTROL

Semivolatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B266291 - SW-846 3546										
Blank (B266291-BLK1)				Prepared: 09/11/20 Analyzed: 09/12/20						
Acenaphthene	ND	0.17	mg/Kg wet							U
Acenaphthylene	ND	0.17	mg/Kg wet							U
Anthracene	ND	0.17	mg/Kg wet							U
Benzo(a)anthracene	ND	0.17	mg/Kg wet							U
Benzo(a)pyrene	ND	0.17	mg/Kg wet							U
Benzo(b)fluoranthene	ND	0.17	mg/Kg wet							U
Benzo(g,h,i)perylene	ND	0.17	mg/Kg wet							U
Benzo(k)fluoranthene	ND	0.17	mg/Kg wet							U
Chrysene	ND	0.17	mg/Kg wet							U
Dibenz(a,h)anthracene	ND	0.17	mg/Kg wet							U
Fluoranthene	ND	0.17	mg/Kg wet							U
Fluorene	ND	0.17	mg/Kg wet							U
Indeno(1,2,3-cd)pyrene	ND	0.17	mg/Kg wet							U
2-Methylnaphthalene	ND	0.17	mg/Kg wet							U
Naphthalene	ND	0.17	mg/Kg wet							U
Phenanthrene	ND	0.17	mg/Kg wet							U
Pyrene	ND	0.17	mg/Kg wet							U
Surrogate: Nitrobenzene-d5	*2.66*		mg/Kg wet	3.33		79.8	30-130			
Surrogate: 2-Fluorobiphenyl	*3.02*		mg/Kg wet	3.33		90.7	30-130			
Surrogate: p-Terphenyl-d14	*3.75*		mg/Kg wet	3.33		113	30-130			
LCS (B266291-BS1)				Prepared: 09/11/20 Analyzed: 09/12/20						
Acenaphthene	1.39	0.17	mg/Kg wet	1.67		83.7	40-140			
Acenaphthylene	1.40	0.17	mg/Kg wet	1.67		83.9	40-140			
Anthracene	1.43	0.17	mg/Kg wet	1.67		86.1	40-140			
Benzo(a)anthracene	1.41	0.17	mg/Kg wet	1.67		84.8	40-140			
Benzo(a)pyrene	1.38	0.17	mg/Kg wet	1.67		82.6	40-140			
Benzo(b)fluoranthene	1.41	0.17	mg/Kg wet	1.67		84.7	40-140			
Benzo(g,h,i)perylene	1.59	0.17	mg/Kg wet	1.67		95.3	40-140			
Benzo(k)fluoranthene	1.37	0.17	mg/Kg wet	1.67		82.4	40-140			
Chrysene	1.40	0.17	mg/Kg wet	1.67		83.7	40-140			
Dibenz(a,h)anthracene	1.58	0.17	mg/Kg wet	1.67		94.8	40-140			
Fluoranthene	1.37	0.17	mg/Kg wet	1.67		82.3	40-140			
Fluorene	1.43	0.17	mg/Kg wet	1.67		85.7	40-140			
Indeno(1,2,3-cd)pyrene	1.71	0.17	mg/Kg wet	1.67		103	40-140			
2-Methylnaphthalene	1.43	0.17	mg/Kg wet	1.67		85.6	40-140			
Naphthalene	1.30	0.17	mg/Kg wet	1.67		78.3	40-140			
Phenanthrene	1.44	0.17	mg/Kg wet	1.67		86.5	40-140			
Pyrene	1.49	0.17	mg/Kg wet	1.67		89.3	40-140			
Surrogate: Nitrobenzene-d5	*2.95*		mg/Kg wet	3.33		88.4	30-130			
Surrogate: 2-Fluorobiphenyl	*3.46*		mg/Kg wet	3.33		104	30-130			
Surrogate: p-Terphenyl-d14	*3.68*		mg/Kg wet	3.33		111	30-130			

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QUALITY CONTROL

Semivolatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B266291 - SW-846 3546										
LCS Dup (B266291-BSD1)				Prepared: 09/11/20 Analyzed: 09/12/20						
Acenaphthene	1.45	0.17	mg/Kg wet	1.67		87.1	40-140	4.05	30	
Acenaphthylene	1.46	0.17	mg/Kg wet	1.67		87.5	40-140	4.29	30	
Anthracene	1.50	0.17	mg/Kg wet	1.67		90.2	40-140	4.65	30	
Benzo(a)anthracene	1.47	0.17	mg/Kg wet	1.67		88.0	40-140	3.61	30	
Benzo(a)pyrene	1.47	0.17	mg/Kg wet	1.67		88.3	40-140	6.74	30	
Benzo(b)fluoranthene	1.50	0.17	mg/Kg wet	1.67		90.3	40-140	6.45	30	
Benzo(g,h,i)perylene	1.69	0.17	mg/Kg wet	1.67		101	40-140	6.17	30	
Benzo(k)fluoranthene	1.48	0.17	mg/Kg wet	1.67		88.9	40-140	7.54	30	
Chrysene	1.45	0.17	mg/Kg wet	1.67		87.2	40-140	4.07	30	
Dibenz(a,h)anthracene	1.68	0.17	mg/Kg wet	1.67		101	40-140	6.33	30	
Fluoranthene	1.43	0.17	mg/Kg wet	1.67		85.6	40-140	3.98	30	
Fluorene	1.48	0.17	mg/Kg wet	1.67		89.0	40-140	3.76	30	
Indeno(1,2,3-cd)pyrene	1.82	0.17	mg/Kg wet	1.67		109	40-140	6.36	30	
2-Methylnaphthalene	1.36	0.17	mg/Kg wet	1.67		81.7	40-140	4.73	30	
Naphthalene	1.33	0.17	mg/Kg wet	1.67		79.6	40-140	1.65	30	
Phenanthrene	1.48	0.17	mg/Kg wet	1.67		88.8	40-140	2.63	30	
Pyrene	1.54	0.17	mg/Kg wet	1.67		92.4	40-140	3.43	30	
Surrogate: Nitrobenzene-d5	*2.92*		mg/Kg wet	3.33		87.5	30-130			
Surrogate: 2-Fluorobiphenyl	*3.31*		mg/Kg wet	3.33		99.3	30-130			
Surrogate: p-Terphenyl-d14	*3.75*		mg/Kg wet	3.33		112	30-130			

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QUALITY CONTROL

Petroleum Hydrocarbons Analyses - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B266273 - SW-846 3546										
Blank (B266273-BLK1)				Prepared: 09/11/20 Analyzed: 09/13/20						
TPH (C9-C36)	ND	8.3	mg/Kg wet							U
Surrogate: 2-Fluorobiphenyl	*2.41*		mg/Kg wet	3.33		72.4	40-140			
LCS (B266273-BS1)				Prepared: 09/11/20 Analyzed: 09/13/20						
TPH (C9-C36)	31.5	8.3	mg/Kg wet	33.3		94.5	40-140			
Surrogate: 2-Fluorobiphenyl	*2.44*		mg/Kg wet	3.33		73.2	40-140			
LCS Dup (B266273-BSD1)				Prepared: 09/11/20 Analyzed: 09/13/20						
TPH (C9-C36)	33.2	8.3	mg/Kg wet	33.3		99.7	40-140	5.31	30	
Surrogate: 2-Fluorobiphenyl	*2.53*		mg/Kg wet	3.33		75.9	40-140			

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FLAG/QUALIFIER SUMMARY

*	QC result is outside of established limits.
†	Wide recovery limits established for difficult compound.
‡	Wide RPD limits established for difficult compound.
#	Data exceeded client recommended or regulatory level
ND	Not Detected
RL	Reporting Limit
DL	Method Detection Limit
MCL	Maximum Contaminant Level
	Percent recoveries and relative percent differences (RPDs) are determined by the software using values in the calculation which have not been rounded.
	No results have been blank subtracted unless specified in the case narrative section.
J	Detected but below the Reporting Limit (lowest calibration standard); therefore, result is an estimated concentration (CLP J-Flag).
L-02	Laboratory fortified blank/laboratory control sample recovery and duplicate recoveries outside of control limits. Data validation is not affected since all results are "not detected" for associated samples in this batch and bias is on the high side.
L-07	Either laboratory fortified blank/laboratory control sample or duplicate recovery is outside of control limits, but the other is within limits. RPD between the two LFB/LCS results is within method specified criteria.
U	Analyte included in the analysis, but not detected
V-20	Continuing calibration verification (CCV) did not meet method specifications and was biased on the high side. Data validation is not affected since sample result was "not detected" for this compound.
V-34	Initial calibration verification (ICV) did not meet method specifications and was biased on the low side for this compound. Reported result is estimated.
V-36	Initial calibration verification (ICV) did not meet method specifications and was biased on the high side. Data validation is not affected since sample result was "not detected" for this compound.

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CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
SW-846 8260C-D in Soil	
Acetone	CT,NH,NY,ME,VA
Acrylonitrile	CT,NH,NY,ME,VA
Benzene	CT,NH,NY,ME,VA
Bromobenzene	NH,NY,ME,VA
Bromochloromethane	NH,NY,ME,VA
Bromodichloromethane	CT,NH,NY,ME,VA
Bromoform	CT,NH,NY,ME,VA
Bromomethane	CT,NH,NY,ME,VA
2-Butanone (MEK)	CT,NH,NY,ME,VA
tert-Butyl Alcohol (TBA)	NY,ME
n-Butylbenzene	CT,NH,NY,ME,VA
sec-Butylbenzene	CT,NH,NY,ME,VA
tert-Butylbenzene	CT,NH,NY,ME,VA
Carbon Disulfide	CT,NH,NY,ME,VA
Carbon Tetrachloride	CT,NH,NY,ME,VA
Chlorobenzene	CT,NH,NY,ME,VA
Chlorodibromomethane	CT,NH,NY,ME,VA
Chloroethane	CT,NH,NY,ME,VA
Chloroform	CT,NH,NY,ME,VA
Chloromethane	CT,NH,NY,ME,VA
2-Chlorotoluene	CT,NH,NY,ME,VA
4-Chlorotoluene	CT,NH,NY,ME,VA
1,2-Dibromo-3-chloropropane (DBCP)	NY,ME
1,2-Dibromoethane (EDB)	NH,NY
Dibromomethane	NH,NY,ME,VA
1,2-Dichlorobenzene	CT,NH,NY,ME,VA
1,3-Dichlorobenzene	CT,NH,NY,ME,VA
1,4-Dichlorobenzene	CT,NH,NY,ME,VA
trans-1,4-Dichloro-2-butene	NY,ME
Dichlorodifluoromethane (Freon 12)	NH,NY,ME,VA
1,1-Dichloroethane	CT,NH,NY,ME,VA
1,2-Dichloroethane	CT,NH,NY,ME,VA
1,1-Dichloroethylene	CT,NH,NY,ME,VA
cis-1,2-Dichloroethylene	CT,NH,NY,ME,VA
trans-1,2-Dichloroethylene	CT,NH,NY,ME,VA
1,2-Dichloropropane	CT,NH,NY,ME,VA
1,3-Dichloropropane	NH,NY,ME,VA
2,2-Dichloropropane	NH,NY,ME,VA
1,1-Dichloropropene	NH,NY,ME,VA
cis-1,3-Dichloropropene	CT,NH,NY,ME,VA
trans-1,3-Dichloropropene	CT,NH,NY,ME,VA
Diethyl Ether	ME
1,4-Dioxane	NY,ME
Ethylbenzene	CT,NH,NY,ME,VA
Hexachlorobutadiene	NH,NY,ME,VA
2-Hexanone (MBK)	CT,NH,NY,ME,VA
Isopropylbenzene (Cumene)	CT,NH,NY,ME,VA

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CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
SW-846 8260C-D in Soil	
p-Isopropyltoluene (p-Cymene)	NH,NY
Methyl Acetate	NY,ME
Methyl tert-Butyl Ether (MTBE)	NY,ME,VA
Methyl Cyclohexane	NY
Methylene Chloride	CT,NH,NY,ME,VA
4-Methyl-2-pentanone (MIBK)	CT,NH,NY,ME,VA
Naphthalene	NH,NY,ME,VA
n-Propylbenzene	NH,NY,ME
Styrene	CT,NH,NY,ME,VA
1,1,1,2-Tetrachloroethane	CT,NH,NY,ME,VA
1,1,2,2-Tetrachloroethane	CT,NH,NY,ME,VA
Tetrachloroethylene	CT,NH,NY,ME,VA
Toluene	CT,NH,NY,ME,VA
1,2,3-Trichlorobenzene	NY,ME
1,2,4-Trichlorobenzene	NH,NY,ME,VA
1,3,5-Trichlorobenzene	ME
1,1,1-Trichloroethane	CT,NH,NY,ME,VA
1,1,2-Trichloroethane	CT,NH,NY,ME,VA
Trichloroethylene	CT,NH,NY,ME,VA
Trichlorofluoromethane (Freon 11)	CT,NH,NY,ME,VA
1,2,3-Trichloropropane	NH,NY,ME,VA
1,2,4-Trimethylbenzene	CT,NH,NY,ME,VA
1,3,5-Trimethylbenzene	CT,NH,NY,ME,VA
Vinyl Chloride	CT,NH,NY,ME,VA
m+p Xylene	CT,NH,NY,ME,VA
o-Xylene	CT,NH,NY,ME,VA
SW-846 8270D-E in Soil	
Acenaphthene	CT,NY,NH,ME,NC,VA
Acenaphthylene	CT,NY,NH,ME,NC,VA
Anthracene	CT,NY,NH,ME,NC,VA
Benzo(a)anthracene	CT,NY,NH,ME,NC,VA
Benzo(a)pyrene	CT,NY,NH,ME,NC,VA
Benzo(b)fluoranthene	CT,NY,NH,ME,NC,VA
Benzo(g,h,i)perylene	CT,NY,NH,ME,NC,VA
Benzo(k)fluoranthene	CT,NY,NH,ME,NC,VA
Chrysene	CT,NY,NH,ME,NC,VA
Dibenz(a,h)anthracene	CT,NY,NH,ME,NC,VA
Fluoranthene	CT,NY,NH,ME,NC,VA
Fluorene	CT,NY,NH,ME,NC,VA
Indeno(1,2,3-cd)pyrene	CT,NY,NH,ME,NC,VA
2-Methylnaphthalene	CT,NY,NH,ME,NC,VA
Naphthalene	CT,NY,NH,ME,NC,VA
Phenanthrene	CT,NY,NH,ME,NC,VA
Pyrene	CT,NY,NH,ME,NC,VA

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

The CON-TEST Environmental Laboratory operates under the following certifications and accreditations:

Code	Description	Number	Expires
AIHA	AIHA-LAP, LLC - ISO17025:2017	100033	03/1/2022
MA	Massachusetts DEP	M-MA100	06/30/2021
CT	Connecticut Department of Publilc Health	PH-0567	09/30/2021
NY	New York State Department of Health	10899 NELAP	04/1/2021
NH-S	New Hampshire Environmental Lab	2516 NELAP	02/5/2021
RI	Rhode Island Department of Health	LAO00112	12/30/2020
NC	North Carolina Div. of Water Quality	652	12/31/2020
NJ	New Jersey DEP	MA007 NELAP	06/30/2021
FL	Florida Department of Health	E871027 NELAP	06/30/2021
VT	Vermont Department of Health Lead Laboratory	LL015036	07/30/2021
ME	State of Maine	2011028	06/9/2021
VA	Commonwealth of Virginia	460217	12/14/2020
NH-P	New Hampshire Environmental Lab	2557 NELAP	09/6/2021
VT-DW	Vermont Department of Health Drinking Water	VT-255716	06/12/2021
NC-DW	North Carolina Department of Health	25703	07/31/2021
PA	Commonwealth of Pennsylvania DEP	68-05812	06/30/2021
MI	Dept. of Env, Great Lakes, and Energy	9100	10/1/2020

~~20I0334~~ SA 20I0334

con-test ANALYTICAL LABORATORY

Phone: 413-525-2332
Fax: 413-525-6405
Email: info@contestlabs.com

http://www.contestlabs.com

CHAIN OF CUSTODY RECORD

39 Spruce Street
East Longmeadow, MA 01028

Doc # 381 Rev 2_06262019

Page 1 of 1

Company Name:	Wilcox & Barton Inc
Address:	1B Commerce Dr. Unit 12B Londonderry NH
Phone:	603-369-4190
Project Name:	PMCC00031
Project Location:	129 Manchester St Concord NH
Project Number:	PMCC00031
Project Manager:	R. Barton
Con-Test Quote Name/Number:	
Invoice Recipient:	
Sampled By:	M. Miraglia

Requested Turnaround Time
7-Day ☐ 10-Day ☐
PFAS 10-Day (std) ☐ Due Date: 5 Day

Rush-Approval Required
1-Day ☐ 3-Day ☐
2-Day ☐ 4-Day ☐

Dissolved Metals Samples
○ Field Filtered
○ Lab to Filter

Orthophosphate Samples
○ Field Filtered
○ Lab to Filter

Data Delivery
Format: PDF ☑ EXCEL ☑
Other:
CLP Like Data Pkg Required: ☐
Email To: R Barton @ wilcoxandbarton.com
Fax To #:

ANALYSIS REQUESTED

Con-Test Work Order#	Client Sample ID / Description	Beginning Date/Time	Ending Date/Time	COMP/GRAB	[1]Matrix Code	Conc Code	VIALS	GLASS	PLASTIC	BACTERIA	ENCORE	M/B VOC 8260B	PAH 8270C	TPH 8100	% Solid
1	S-201	9/3/20	1050	Grab	S	U	3	2				X	X	X	X
2	S-202	9/3/20	1055	Grab	S	U	3	2				X	X	X	X

[2] Preservation Code

Courier Use Only
Total Number Of:
VIALS
GLASS
PLASTIC
BACTERIA
ENCORE

Glassware in the fridge? Y / N
Glassware in freezer? Y / N
Prepackaged Cooler? Y / N
*Contest is not responsible for missing samples from prepacked coolers

[1] Matrix Codes:
GW = Ground Water
WW = Waste Water
DW = Drinking Water
A = Air
S = Soil
SL = Sludge
SOL = Solid
O = Other (please define)

[2] Preservation Codes:
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium Bisulfate
X = Sodium Hydroxide
T = Sodium Thiosulfate
O = Other (please define)

Relinquished by: (signature)	Date/Time: 9/4/20 1500
Received by: (signature)	Date/Time: 9/4/20 1510
Relinquished by: (signature)	Date/Time: 9/4/20 1805
Received by: (signature)	Date/Time: 9/4/20 1805
Relinquished by: (signature)	Date/Time:
Received by: (signature)	Date/Time:
Relinquished by: (signature)	Date/Time:
Received by: (signature)	Date/Time:

Client Comments: A pricing

Detection Limit Requirements
MA
CT
Other: NHDES SRS

Special Requirements
☐ MA MCP Required
☐ MCP Certification Form Required
☐ CT RCP Required
☐ RCP Certification Form Required
☐ MA State DW Required
PWSID #

Please use the following codes to indicate possible sample concentration within the Conc Code column above:
H - High; M - Medium; L - Low; C - Clean; U - Unknown

NELAC and AIHA-LAP, LLC Accredited

Project Entity
Government ☐ Municipality ☐ MWRA ☐ WRTA ☐
Federal ☐ 21 J ☐ School ☐
City ☐ Brownfield ☐ MBTA ☐

Other
☐ Chromatogram
☐ *AIHA-LAP,LLC*

PCB ONLY
☐ Soxhlet
☐ Non Soxhlet

Comments:

Disclaimer: Con-Test Labs is not responsible for any omitted information on the Chain of Custody. The Chain of Custody is a legal document that must be complete and accurate and is used to determine what analyses the laboratory will perform. Any missing information 's not the laboratory's responsibility. Con Test values your partnership on each project and will try to assist with missing information, but will not b held accountable.

Table of Contents

I Have Not Confirmed Sample Container Numbers With Lab Staff Before Relinquishing Over Samples_____

con-test® ANALYTICAL LABORATORY

Doc# 277 Rev 5 2017

Login Sample Receipt Checklist - (Rejection Criteria Listing - Using Acceptance Policy) Any False Statement will be brought to the attention of the Client - State True or False

Client Wilcox & Barton **Received By** SA Date 9/4 Time 1805

How were the samples received? In Cooler T No Cooler _____ On Ice T No Ice _____ Direct from Sampling _____ Ambient _____ Melted Ice _____

Were samples within Temperature? 2-6°C T By Gun # 4 Actual Temp - 3.2 By Blank # _____ Actual Temp - _____

Was Custody Seal Intact? NA Were Samples Tampered with? NA

Was COC Relinquished ? T Does Chain Agree With Samples? T

Are there broken/leaking/loose caps on any samples? F

Is COC in ink/ Legible? T Were samples received within holding time? T

Did COC include all pertinent Information? Client T Analysis T Sampler Name T Project T ID's T Collection Dates/Times T

Are Sample labels filled out and legible? T

Are there Lab to Filters? F Who was notified? _____

Are there Rushes? F Who was notified? _____

Are there Short Holds? F Who was notified? _____

Is there enough Volume? T

Is there Headspace where applicable? F MS/MSD? F

Proper Media/Containers Used? T Is splitting samples required? F

Were trip blanks received? F On COC? F

Do all samples have the proper pH? Acid NA Base NA

Vials	#	Containers:			#		#
Unp-		1 Liter Amb.		1 Liter Plastic		16 oz Amb.	
HCL-		500 mL Amb.		500 mL Plastic		8oz Amb/Clear	4
Meoh-	2	250 mL Amb.		250 mL Plastic		4oz Amb/Clear	
Bisulfate-	4	Flashpoint		Col./Bacteria		2oz Amb/Clear	
DI-		Other Glass		Other Plastic		Encore	
Thiosulfate-		SOC Kit		Plastic Bag		Frozen:	
Sulfuric-		Perchlorate		Ziplock			

Unused Media

Vials	#	Containers:	#		#		#
Unp-		1 Liter Amb.		1 Liter Plastic		16 oz Amb.	
HCL-		500 mL Amb.		500 mL Plastic		8oz Amb/Clear	
Meoh-		250 mL Amb.		250 mL Plastic		4oz Amb/Clear	
Bisulfate-		Col./Bacteria		Flashpoint		2oz Amb/Clear	
DI-		Other Plastic		Other Glass		Encore	
Thiosulfate-		SOC Kit		Plastic Bag		Frozen:	
Sulfuric-		Perchlorate		Ziplock			

Comments:

APPENDIX D

UST Closure Notification and Floor Drain Closure Notification Forms

Underground Storage Tank Closure Notification Form

Oil Remediation and Compliance Bureau

RSA 146-C; Env-Or 408.06

ATTENTION: This form is a document used to facilitate the submission of information required under Env-Or 400. Nothing in this form is required to be submitted to the Department unless such a requirement is expressly stated in the rules. If there is any inconsistency between this document and the adopted rules, only those requirements specified in the rules are applicable and enforceable. Use of this form to submit information required under the rules is OPTIONAL.

The owner shall notify NHDES at least 14 days prior to any UST system or piping system permanent closure.

1. Person Reporting Notification	
Name: Wilcox & Barton, Inc. - Russel Rucker	Date: 9/1/20
Address: 2 Capital Plaza, Suite 305, Concord, NH 03301	Initial: RSR
Phone: (603) 369-4190	Email: rrucker@wilcoxandbarton.com

2. Facility Information	
NHDES Site # 199502046	Facility ID # 0112058
Name: Former Automotive Supply Associates	
Address: 129 Manchester Street, Concord, NH 03301	

3. Owner Information	
Name: Daval Realty Associates, LP	
Address: 137 Manchester Street	
Phone: (603) 229-4004	Email: fbooth@banksautos.com

4. Tank Removal Information - Select all that apply: **L** – Leaker Suspected **R** – Removed **F** – Filled In Place **P** – Piping Only Closed			
L ☐ R ☒ F ☐ P ☐	L ☐ R ☐ F ☐ P ☐	L ☐ R ☐ F ☐ P ☐	L ☐ R ☐ F ☐ P ☐
Tank #2	Tank #	Tank #	Tank #
Size: 3,000 gal	Size:	Size:	Size:
Product: #2 Fuel	Product:	Product:	Product:
Will tank/piping be replaced underground? ☐ YES ☒ NO	Will tank/piping be replaced underground? ☐ YES ☐ NO	Will tank/piping be replaced underground? ☐ YES ☐ NO	Will tank/piping be replaced underground? ☐ YES ☐ NO

5. Certified Tank Remover Present: TBD ICC-U2 Certification #: TBD

6. Local Fire Dept. Notified: _____ Date Notified: 9/2/20

7. Scheduled Closure Date: ASAP Mailed: _____

The State of New Hampshire
Department of Environmental Services
Robert R. Scott, Commissioner

(E-Mail Only)

September 3, 2020

MR. RUSSELL RUCKER
WILCOX & BARTON INC.
2 CAPITAL PLAZA – SUITE 305
CONCORD, NH 03301

SUBJECT: CONCORD – Sanel (fmly: Automotive Supply Associates), 129 Manchester Street, Floor Drain Closure
Site# 199502046 / Project# 5798 / Activity# 284065

Dear Mr. Rucker:

The NH Department of Environmental Services (NHDES) has received a floor drain pre-closure notification form for the existing floor drain and drywell closure at the subject location. Provided the drywell and/or drains are not contaminated, NHDES supports and approves the permanent closure of the existing floor drains and discharge structure. Please forward confirmation and photos when the work has been completed.

Please note that this closure status is specific to the identified floor drain(s) and disposal structure only. This status does not remove any liability for existing contamination or any future investigations and/or clean up action(s) that may be required by NHDES. NHDES understands that with this closure there are no other nondomestic discharges from the facility to the environment (e.g., vehicle or equipment wash water, boiler blow down, parts sink, etc.). If this is not the case, please contact this office.

If there is information regarding your facility that the NHDES is unaware of or you have any questions regarding nondomestic wastewater discharges in NH, please contact me at (603) 271-2858 or by e-mail at *mitchell.locker@des.nh.gov*.

Sincerely,

Mitchell D. Locker, P.G.
Drinking Water & Groundwater Bureau

MDL/ml/S:\ ..\...\uic\2019mdl\closed\199502046 5K ok_to_close

e-copy: Stephen Roy, DWGB Stephen.roy@des.nh.gov
Fred Booth, Duval Realty Assoc LP fbooth@bankauto.com

NHDES-W-03-050

DISCHARGE WELL & FLOOR DRAIN PRE-CLOSURE NOTIFICATION FORM

Drinking Water and Groundwater Bureau
Groundwater Discharge Program

RSA/Rule: RSA 485-A:6, VII; 485:3, X; Env-Wq 402 and Env-Wq 404

THIS FORM SHOULD BE SUBMITTED TO NHDES 30 DAYS PRIOR TO FLOOR DRAIN CLOSURE

Facility Information

Facility Name: Former Automotive Supply Associates
Address: 129 Manchester Street, Concord, NH 03301
City/Town: Concord State: NH Zip: 03301
Property Location: Latitude 43.188293 N Longitude 71.51685 W Tax Map: 782Z Lot #: 32

Applicant/Facility Owner Information

(if you represent the owner or owner's company check this box ☐)

Name: Daval Realty Associates, LP Daytime Phone Number: (603) 229 - 4004
Address: 137 Manchester Street
City/Town: Concord State: NH Zip: 03301

Property Owner Information (complete only if different from facility owner)

Owner Name:_____ Daytime Phone Number: (____)_____-_____
Address:_____
City/Town:_____ State:_____Zip:_____
Email:_____ Fax: (_____)_____-_____

Contact Person Information (complete only if different from facility owner)

Contact Person Name: Wilcox & Barton, Inc. - Russel Rucker Email: rrucker@wilcoxandbarton.com
Contact Person Phone: (603) 369 - 4190 Fax: (_____)_____-_____

Type of Discharge Well(s): _X_Drywell ____Septic Tank ____Cesspool
____Leachfield ____Other_____

Type of Wastewater Discharge: General automotive parts warehouse floor rinse
Total No. of Discharge Wells: 1 **Years in Existence:** Unknown
Average Flow (gallons per day: < 1 gpd **Proposed Closure Date:** ASAP
Describe Closure Method:
Excavate soil and remove drywell then backfill with clean granular fill material.

Note: Discharge wells must be closed in a manner that will NOT allow the movement of fluids containing any contaminant into the groundwater. Additionally, you must dispose of or otherwise manage any soil, gravel, sludge, etc., or other materials removed from, and/or adjacent to, your discharge well in accordance with all federal, state and local regulations and requirements.

dwgbinfo@des.nh.gov or phone (603) 271-2858
PO Box 95, Concord, NH 03302-0095
www.des.nh.gov

Discharge Well and Floor Drain Pre-Closure Notification Form

version 2.1

(Submission #: HP2-FE2M-2YEPX, version 1)

Details

Form Alias	Discharge Well and Floor Drain Pre-Closure Notification Form
Form Started	9/2/2020 2:47 PM by Russel Steven Rucker
Form Submitted	9/2/2020 3:40 PM by Russel Steven Rucker
Submission #	HP2-FE2M-2YEPX
Submission Reason	new
Status	Submitted
Active Steps	Form Processing

Form Input

Facility Information

Facility Name
Former Automotive Supply Associates

Facility Location
43.1896836,-71.5043264

129 Manchester St, Concord, NH 03301, USA

Tax Map and Lot Number
782Z/32

Applicant/Facility Owner Information

Applicant or Facility Owner Information

Contact

Prefix
Mr.

First Name	Last Name
Fred	*Booth*

Title
NONE PROVIDED

Organization Name
Daval Realty Associates, LP

Phone Type	Number	Extension
Business	6032294004	

Email
fbooth@banksautos.com

Fax
NONE PROVIDED

Address

137 MANCHESTER ST

CONCORD, NH 03301

USA

Choose one of the selections below:
I Represent the Owner

Property Owner Information

Complete only if different than facility owner

Prefix
NONE PROVIDED

First Name	Last Name
NONE PROVIDED	*NONE PROVIDED*

Title
NONE PROVIDED

Organization Name
NONE PROVIDED

Phone Type	Number	Extension
NONE PROVIDED		

Email
NONE PROVIDED

Fax
NONE PROVIDED

Address

137 MANCHESTER ST

CONCORD, NH 03301

USA

Contact Person Information

Complete only if different than facility owner

Prefix
Mr.

First Name	Last Name
Russel	*Rucker*

Title
Staff Engineer

Organization Name
Wilcox & Barton, Inc.

Phone Type	Number	Extension
Business	6033694190	510

Email
rrucker@wilcoxandbarton.com

Fax
NONE PROVIDED

Address

2 Capital Plaza, Suite 305

Concord, NH 03301

USA

Well Information

Type of Discharge Wells
Drywell

Total Number of Discharge Wells
1

Type of Wastewater Discharge
General automotive parts warehouse floor rinse

Average Flow in gallons per day
less than 1 gpd

Years in Existence
Unknown

Proposed Closure Date
9/3/2020

Describe Closure Method
Excavate soil and remove drywell then backfill with clean granular fill material.

Total Number of Floor Drains
1

Status History

	User	Processing Status
9/2/2020 2:47:35 PM	Russel Steven Rucker	Draft
9/2/2020 3:40:25 PM	Russel Steven Rucker	Submitted

Processing Steps

Step Name	Assigned To/Completed By	Date Completed
Form Submitted	Russel Steven Rucker	9/2/2020 3:40:25 PM
Form Processing	Mitchell Locker	

APPENDIX E

Waste Disposal Document

Generator acknowledges that no material change has occurred either in the characteristics or in the process generating the material.

Please print or type. Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator ID Number	2. Page 1 of	3. Emergency Response Phone	4. Manifest Tracking Number
NHD999999998	1	(800) 483-3718	006093500 GBF

GENERATOR

5. Generator's Name and Mailing Address
Former Automotive Supply Associates ATTN: FRED BOOTH
Daval Realty Associates, LP 137 Manchester Street
Concord, NH 03301
Generator's Phone: 603-229-4004

Generator's Site Address (if different than mailing address)
129 Manchester Street
Concord, NH 03301

6. Transporter 1 Company Name
Cyn Oil Corporation
U.S. EPA ID Number
MAD082303777

7. Transporter 2 Company Name
U.S. EPA ID Number

8. Designated Facility Name and Site Address
Cyn Oil Corporation
1771 Washington St
Stoughton, MA 02072
Facility's Phone: (781) 341-5108
U.S. EPA ID Number
MAD082303777

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes		
	1. NON DOT REGULATED MATERIAL, (STATE REGULATED OIL)	1	DM	300	P	MA01		
	2.							
	3.							
	4.							

14. Special Handling Instructions and Additional Information
1. CH1751420-SOF

Contract retained by generator confers agency authority on initial transporter to add or substitute additional transporters on generator's behalf for purposes of transportation efficiency, convenience or safety

15. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name: X AGENT FOR GENERATOR CARLOS MARCAL
Signature: X Agent For Generator Carlos Marcal
Month: 09 Day: 23 Year: 20

INTL

16. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter signature (for exports only): Date leaving U.S.:

TRANSPORTER

17. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name: CARLOS MARCAL
Signature: Carlos Marcal
Month: 09 Day: 23 Year: 20

Transporter 2 Printed/Typed Name
Signature
Month Day Year

DESIGNATED FACILITY

18. Discrepancy

18a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection

Manifest Reference Number:

18b. Alternate Facility (or Generator)
U.S. EPA ID Number
Facility's Phone:

18c. Signature of Alternate Facility (or Generator)
Month Day Year

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

1.	2.	3.	4.
H141			

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a

Printed/Typed Name
Signature
Month Day Year

EPA Form 8700-22 (Rev. 12-17) Previous editions are obsolete.

Clean Harbors has the appropriate permits for and will accept the waste the generator is shipping.

DESIGNATED FACILITY TO EPA's e-MANIFEST SYSTEM

ESD 204743157-002 PPW

APPENDIX C

Groundwater Permit Renewal Application Report (CMA Engineers, Inc.)

Clear Form

Report Cover
Waste Management Division

Groundwater Permit Renewal Application

Old Suncoook Road Landfill

Old Suncook Road

Concord, NH 03301

NHDES Site #: 198406038

Project Type: LAND/UNLN

Project #: 115

PREPARED FOR

City of Concord

311 N State Street

Concord, NH 03301

(603) 228-2737

Jeff Hoadley

jhoadley@concordnh.gov

STATE OF NEW HAMPSHIRE
JODIE BRAY STRICKLAND
No. 12874
LICENSED PROFESSIONAL ENGINEER

PREPARED BY

CMA Engineers, Inc.

35 Bow Street

Portsmouth, NH 03801

(603) 431-6196

Jodie Bray Strickland, P.E.

Jstrickland@cmaengineers.com

Date of Report: October 9, 2025

Groundwater Monitoring Report Cover Sheet

Waste Management Bureau

Clear Form

Site Name: Old Suncoook Road Landfill

NHDES Site ID#: 198406038 **Project number:** 115

Municipality: Concord

Type of Permit and Submittal (*Check all that apply*)

Permit Type	Year
☐ Non-Permit Monitoring Data Submittal	
☒ Groundwater Management Permit (GMP)	2020
☐ Groundwater Release Detection Permit (GRDP)	
☐ Groundwater Discharge Permit (GDP)	

Submittal Type

☐ Annual/Periodic Summary Report (Year) _____

☐ Data Transmittal* (Mo./Year) _____

*for GMP Data Transmittals month/year per Condition #7 and/or any other Conditions that require reporting per Permit

Check each box where the answer to any of the following questions is "YES."

Sampling Results

☐ During the most recent monitoring event, were any ***new*** compounds detected at any sampling point?
Well/Compound:

☐ During the most recent monitoring event, did any compounds exceed the Ambient Groundwater Quality Standards (AGQS) included in Env-Or 606.03, Table 600-1 ***for the first time*** at any sampling point?
Well/Compound:

☐ Are there any detections of contamination in drinking water that is untreated prior to use?
Well/Compound:

☐ Do compounds detected exceed AGQS?

☐ Was free product detected for the ***first time*** in any monitoring point?

☐ Surface Water (*visible sheen*)

☐ Groundwater (*1/8" or greater thickness*)
Location/Thickness:

Contaminant Trends

☐ Do sampling results show an increasing concentration trend in any source area monitoring well?
Well/Compound:

☒ Do sampling results indicate an AGQS violation in any of the Groundwater Management Zone (GMZ) boundary wells?
Well/Compound: MW-4/manganese, MW-7D/manganese, MW-11D/manganese

Recommendations

(For Petroleum Fund eligible sites, contact NHDES directly, and on discovery, to recommend well/road box repairs.)

☒ Does the submittal include any recommendations requiring NHDES action? (*Do not check this box if the only recommendation is to continue monitoring under the conditions set forth in the existing Permit*).

Tina.A.Clark@des.nh.gov or phone (603) 271-7379
PO Box 95, Concord, NH 03302-0095
www.des.nh.gov

Application for *Renewal* of Groundwater Management Permit

Waste Management Division
Site Remediation Programs

RSA 485-C:4, VIII and Env-Or 607

A GROUNDWATER MANAGEMENT PERMIT is issued under RSA 485-C:4, VIII and Env-Or 607 to a responsible party to remedy contamination associated with the past discharge of regulated contaminants, and to manage the use of the contaminated groundwater. (Examples include sites contaminated from leaking underground storage tanks, unlined landfills regulated pursuant to RSA 14-M, hazardous waste disposal, etc.)

SUBMIT:

- ONE SIGNED AND COMPLETED APPLICATION (Application shall be dated, signed and sealed by the professional of record licensed under RSA 310-A.)
- SUPPORTING INFORMATION
- $2,000 APPLICATION FEE (In the form of a check payable to the "Treasurer – State of New Hampshire." State and local government, including counties and political subdivisions, are exempt unless eligible for funding under the Petroleum Reimbursement Fund Program.)

TO: NHDES/Waste Management Division
Site Remediation Programs
Groundwater Management Permit Coordinator
P.O. Box 95, 29 Hazen Drive
Concord, NH 03302-0095

CERTIFICATION OF NOTICE TO LOCAL TOWN/CITY CLERK

In order to meet the requirements of Env-Or 607.02 (b)(3), the applicant certifies that on 10/9, 20 25 a copy of this completed permit application was given to the Town/City Clerk of Concord (the town in which the facility requesting a permit is located).

Date: 10/9/25 **Applicant Signature:** Jeff K. Hoadley

Applicant Name (print or type): Jeff Hoadley, Acting Director of General Services

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CERTIFICATION OF NOTICE TO OWNERS OF LOTS PROPOSED FOR INCLUSION IN THE GMZ
(As Applicable)

In order to meet the requirements of Env-Or 607.02 (b)(2), the applicant certifies that notification has been provided (via certified mail – return receipt requested) to all owners of lots proposed for inclusion in the Groundwater Management Zone (GMZ).

Date: _____ **Applicant Signature:** _____

Applicant Name (print or type): _____

I. SITE INFORMATION

Site Name: Old Suncook Road Landfill DES Site #: 198406038
Address: Old Suncook Road
City: Concord State: NH Zip: 03301
Tax Map: 782 Lot Number: 19
Deed Reference: County: Merrimack Book and Page: 2571/782

II. SITE OWNER INFORMATION

Site Owner Name: City of Concord Attn: Jeff Hoadley Phone: (603) 228-2737
Mailing Address: 311 N State Street
City: Concord State: NH Zip: 03301
Email: jhoadley@concordnh.gov Fax:

III. PERMIT APPLICANT INFORMATION (complete only if different than site owner)

Permit Applicant Name: Phone:
Mailing Address:
City: State: Zip:
Email: Fax:

IV. CONTACT PERSON INFORMATION (complete only if different than site owner)

Contact Person Name: Phone:
Mailing Address:
City: State: Zip:
Email: Fax:

V. SUPPORTING INFORMATION (required)

a) Tabular summary of all monitoring results for the 5 years immediately preceding the renewal application from existing monitoring points with an assessment of trends in the data.

b) Narrative summary of the status of remedial measures performed (e.g., landfills: active, inactive w/no closure plan submitted, closed (as per approved closure plan); petroleum release and hazardous waste release sites: active remediation on-going, remedial action plan (RAP) completed w/on-going monitoring or monitoring–only RAP) and an update on the performance of measures conducted.

c) Recommendations for any revisions to the existing Groundwater Management Permit, including an outline of proposed modifications to the monitoring program. Any proposed modifications to the monitoring program must be specific in terms of individual monitoring locations, sampling frequency and analytical parameters, and should be supported by reference to the monitoring summary.

d) Updated site plan(s) scaled to fit onto an 8-1/2 inches by 11 inches or 11 inches by 17 inches sheet, using a tax map as a base, that identifies and locates the following:
   1. Proposed groundwater management zone boundary.
   2. Any properties, including tax map and lot numbers, within and abutting the lots on which the proposed groundwater management zone is located.
   3. All proposed sampling locations.

4. Current groundwater contours referenced to a table of current water level measurements obtained from piezometers and monitoring wells used to develop the contours.
5. Water supply wells, including type of use, within 500 feet of the GMZ per Env-Or 607.03 (a) (7) f..

e) A list of properties located within the groundwater management zone including owner's name, mailing address, telephone number, property address, and deed reference including county book and page and tax map and lot number.

VI. CERTIFICATION

To the best of my knowledge, the data and information that I have submitted to renew the Groundwater Management Permit from the New Hampshire Department of Environmental Services, are true and correct.

The undersigned certifies that application has been made for all required local, state, or federal permits. If an officer of the owner, I affirm that I have been duly authorized by the corporation, LLC, LLP, or other corporate entity to bind the corporation, LLC, LLP, or other corporate entity, and to make the above declarations. I also affirm that the corporation, LLC, LLP, or other corporate entity has made all filings and paid all fees required by the New Hampshire Secretary of State.

Date: 10/9/25 **Signature:** Jeff K. Hoadley
Permit Applicant

Name (print or type): Jeff Hoadley, Acting Director of General Services

VII. PROFESSIONAL CERTIFICATION

Date: 10/9/2025 **Signature:** Jodie Bray Strickland
Professional Engineer or Geologist

Name (print or type): Jodie Bray Strickland, P.E.

The New Hampshire licensed professional of record who prepared this permit application is required to apply their professional seal in the space provided below.



No liability is incurred by the State by reason of any approval for Groundwater Management Permits. Approval by the New Hampshire Department of Environmental Services is based on the information supplied by the applicant. No guarantee is intended or implied by reason of any advice given by NHDES or its staff.

City of Concord, New Hampshire

Old Suncook Road Landfill

Groundwater Management Permit Renewal

Application Form

&

Supporting Information

V. Supporting Information

(a) Tabular Summary of Monitoring Results and Assessment of Trends

Overall Site Water Quality Monitoring

Groundwater quality at the Old Suncook Road Landfill on Old Suncook Road in Concord, NH is monitored annually in October and includes leachate indicator and inorganic parameters, and volatile organic compounds (VOCs). Drinking water metals were monitored in October of 2021. Per- and polyfluoroalkyl substances (PFAS) testing was conducted at various wells on site in 2018-2022. There are currently 21 groundwater monitoring wells in the sampling program.

A site plan with the current groundwater management zone (GMZ), monitoring locations, and the groundwater contours for October 2024 are depicted on Figure 1. Summary tables for the past five years of monitoring data for inorganic parameters, VOCs, water level measurements, and PFAS, are attached.

Site Sampling Protocols

Summary: Wells are 2-inch diameter with either standpipes with locking caps or flush mount road boxes and are in good overall condition unless otherwise noted below. Wells are purged and sampled using dedicated tubing or bailers, and either inertial pumps (Waterra©) or submersible pumps. Samples collected for dissolved metals are field filtered and preserved with Nitric Acid.

MW-1 – well MW-1 is purged three well volumes using dedicated tubing and check valve assembly (i.e inertial pump) prior to collection.

MW-2 – well MW-2 is purged three well volumes using dedicated tubing and check valve assembly (i.e. inertial pump) prior to collection.

MW-3 – Well MW-3 is purged three well volumes using dedicated tubing and check valve assembly (i.e. inertial pump) prior to collection.

MW-4 – Well MW-4 is purged three well volumes using dedicated tubing and check valve assembly (i.e. inertial pump) prior to collection.

MW-5D – Well MW-5D is purged three well volumes using dedicated tubing and a submersible pump prior to collection.

MW-5S – Well MW-5S is purged three well volumes using dedicated tubing and a check valve assembly (i.e. inertial pump) prior to collection.

MW-6 – Well MW-6 is purged 1.5 well volumes using dedicated tubing and a check valve assembly (i.e. inertial pump). Well is allowed to sufficiently recharge prior to collection.

MW-7D – Well MW-7D is purged three well volumes using dedicated tubing and a submersible pump prior to collection.

MW-7S – Well MW-7S is purged 3 well volumes using a dedicated bailer prior to collection.

MW-8D – Well MW-8D is purged three well volumes using dedicated tubing and a submersible pump prior to collection.

MW-8S – Well MW-8S is purged 3 well volumes using a dedicated bailer prior to collection.

MW-9D – Well MW-9D is purged three well volumes using dedicated tubing and a check valve assembly (i.e. inertial pump) prior to collection.

MW-9S – Well MW-9S is purged three well volumes using dedicated tubing and a check valve assembly (i.e. inertial pump) prior to collection.

MW-10D – Well MW-10D is purged three well volumes using dedicated tubing and a submersible pump prior to collection.

MW-10I – Well MW-10I is purged three well volumes using dedicated tubing and a check valve assembly (i.e. inertial pump) prior to collection.

MW-11D – Well MW-11D is purged three well volumes using dedicated tubing and a submersible pump prior to collection. This well was damaged by a plow during winter of 2016. The concrete pad was broken in half and ripped out of the ground with the road box (found in woods about 10' away from well location). The remaining half of the concrete pad protected the PVC well and the plug was still present preventing the debris that had accumulated in the hole from entering the well. Repair recommended.

MW-11I – Well MW-11I is purged three well volumes using dedicated tubing and a check valve assembly (i.e. inertial pump) prior to collection. This well is in poor condition, similar to MW-11D. Repair recommended.

MW-11S – Well MW-11S is purged three well volumes using dedicated tubing and a check valve assembly (i.e. inertial pump) prior to collection. This well is in poor condition, similar to MW-11D. Repair recommended.

MW-12D – Well MW-12D is purged three well volumes using dedicated tubing and a submersible pump prior to collection.

MW-12I – Well MW-12I is purged three well volumes using dedicated tubing and a submersible pump prior to collection. Road box cover does not sit flush.

MW-12S – Well MW-12S is purged three well volumes using dedicated tubing and a check valve assembly (i.e. inertial pump) prior to collection. Road box cover does not sit flush.

Static Water Elevations

The sampling program includes static water elevations at monitoring wells at the site. There is some variability from year to year with respect to precipitation amounts and the previous decreasing trend in

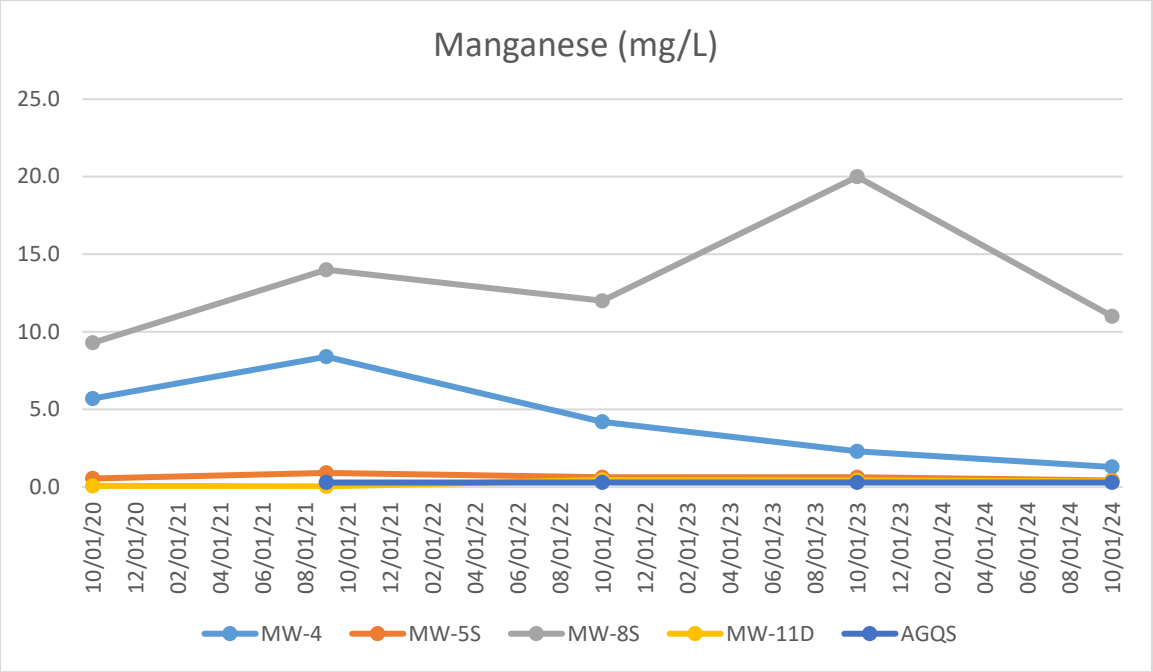
water elevations at the site has stabilized. Water elevations site wide were above the five-year average in 2023 and 2024.

A groundwater contour plan for October 2024 water levels is provided as Figure 1, and a summary of static water elevations for the past five years is also attached. The plan depicts both shallow overburden and bedrock contours. Groundwater flows from north to south towards the Merrimack River, which is approximately 3,000 feet from the site. A relatively small component of flow from the northeast portion of the site is to the east toward the Soucook River.

Inorganic Compounds and Indicator Parameters

Inorganic groundwater quality results under the current permit are similar to previous results.

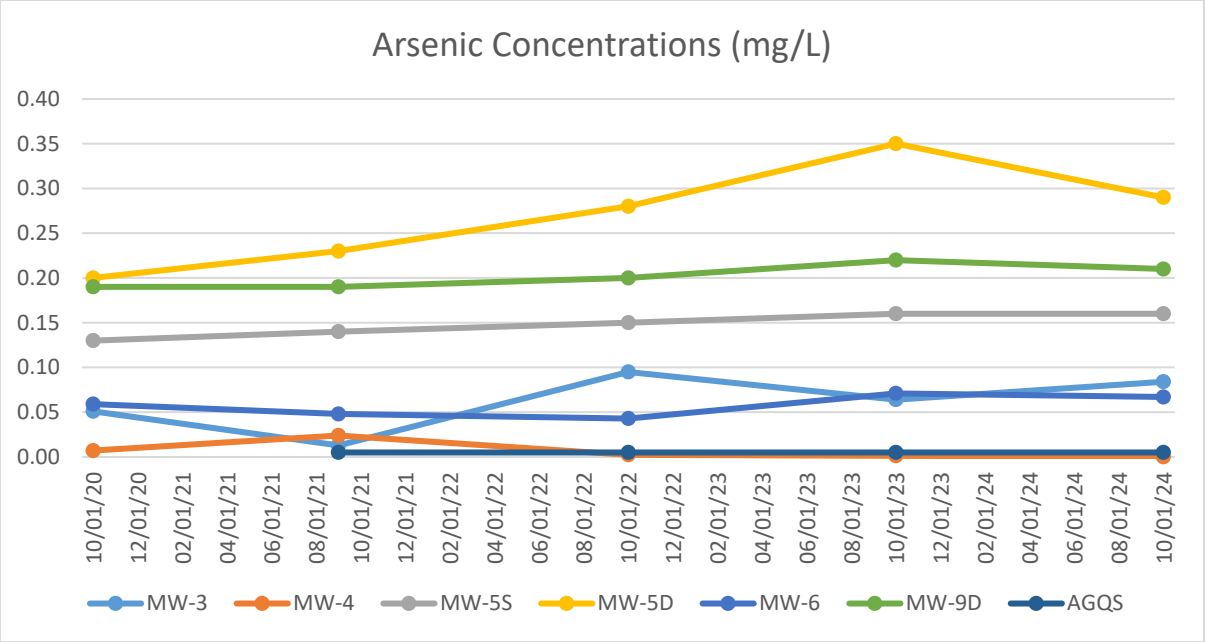
Manganese exceeds the ambient groundwater quality standard (AGQS) of 0.3 mg/L at locations MW-4, MW-5S, MW-8S, and MW-11D. The previous increasing trend at MW-4 is no longer apparent and concentrations have trended downward since 2021. The manganese concentrations at MW-8S continue to fluctuate with one detection of 20 mg/L om 2023.



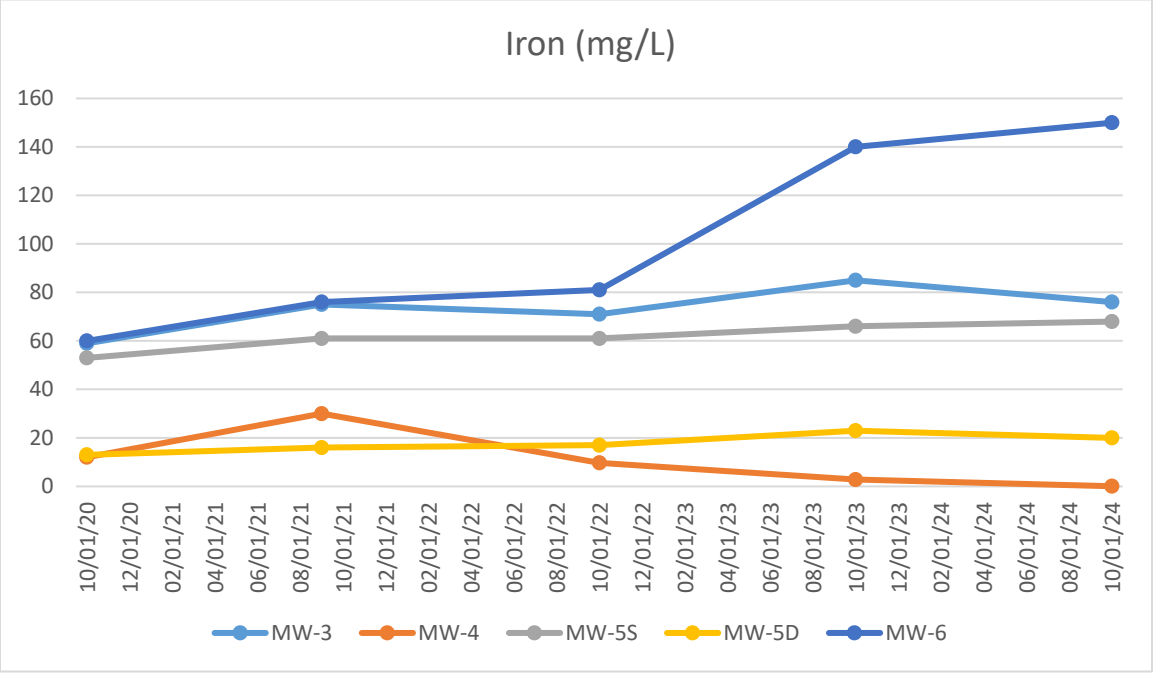
Nitrate is detected at multiple locations but at or below the AGQS of 10 mg/L. There are no apparent trends.

TKN is detected at several wells. Concentrations are relatively stable with no apparent trends.

Arsenic remains above the NH Ambient Groundwater Quality Standard (AGQS) of 0.005 mg/L at wells MW-3, MW-5S, MW-5D, MW-6, and MW-9D. Concentrations at MW-4 previously exceeded the AQGS on a regular basis but have done so only once under the current permit (0.0240 mg/L in 2021).

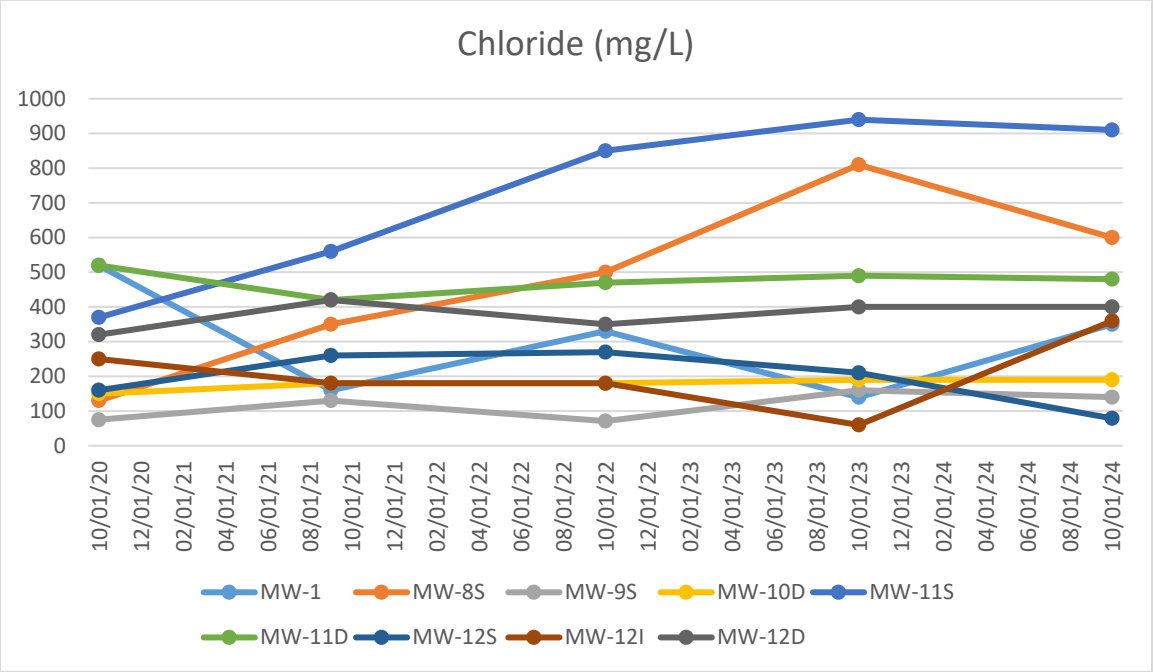


Iron is elevated at several wells on site. There is a strong increasing trend at MW-6 with minor increasing trends at MW-3, MW-5S and MW-5D. MW-4 shows a strong decreasing trend since 2021.

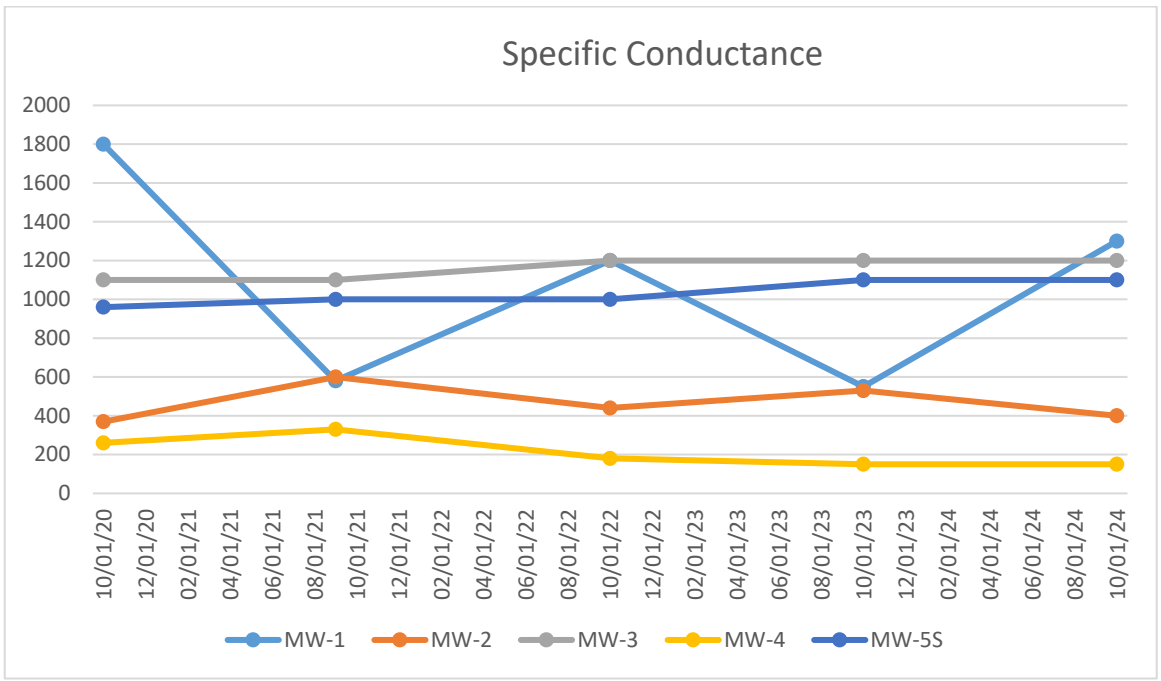


Chloride concentrations are elevated at most wells. There is evidence of potential increasing trends, at wells MW-8S and MW-11S, which may be attributed to road salting given their locations. Most wells show

fluctuations.



Specific conductance readings are also elevated at several wells. Readings vary without evident trends.



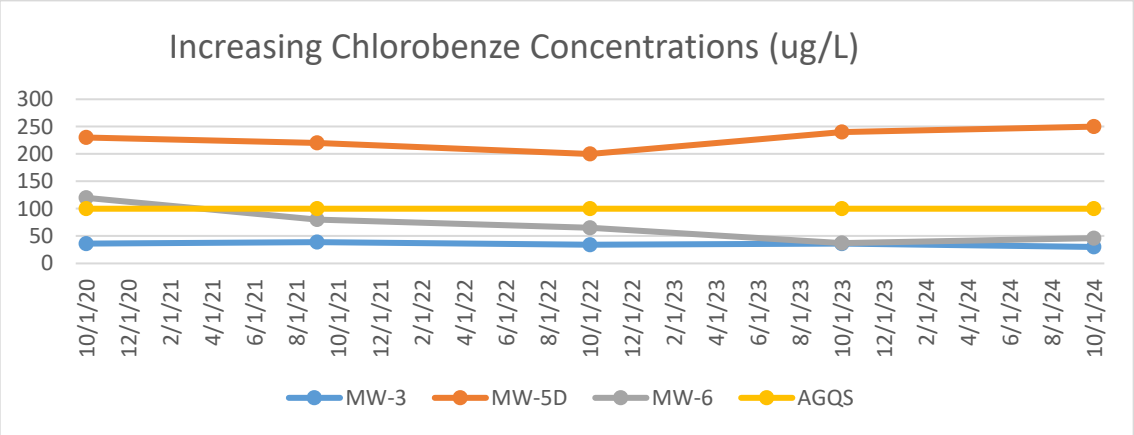
Overall, inorganic analyte concentrations continue to fluctuate on site. A summary of inorganic compounds and indicator parameters is included.

Volatile Organic Compounds (VOCs)

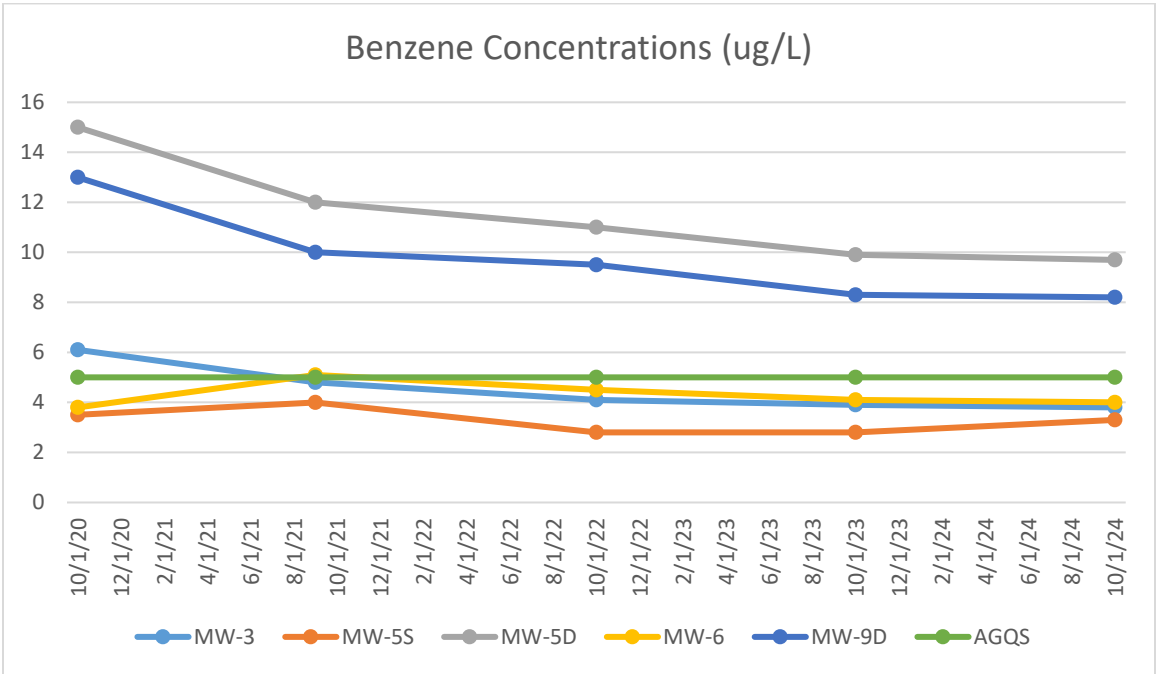
In general, VOC detections are decreasing and there is evidence of improving groundwater quality with respect to several compounds.

At wells MW-2, MW-8S, and MW-9S, all VOCs were below detection under the current permit sampling period.

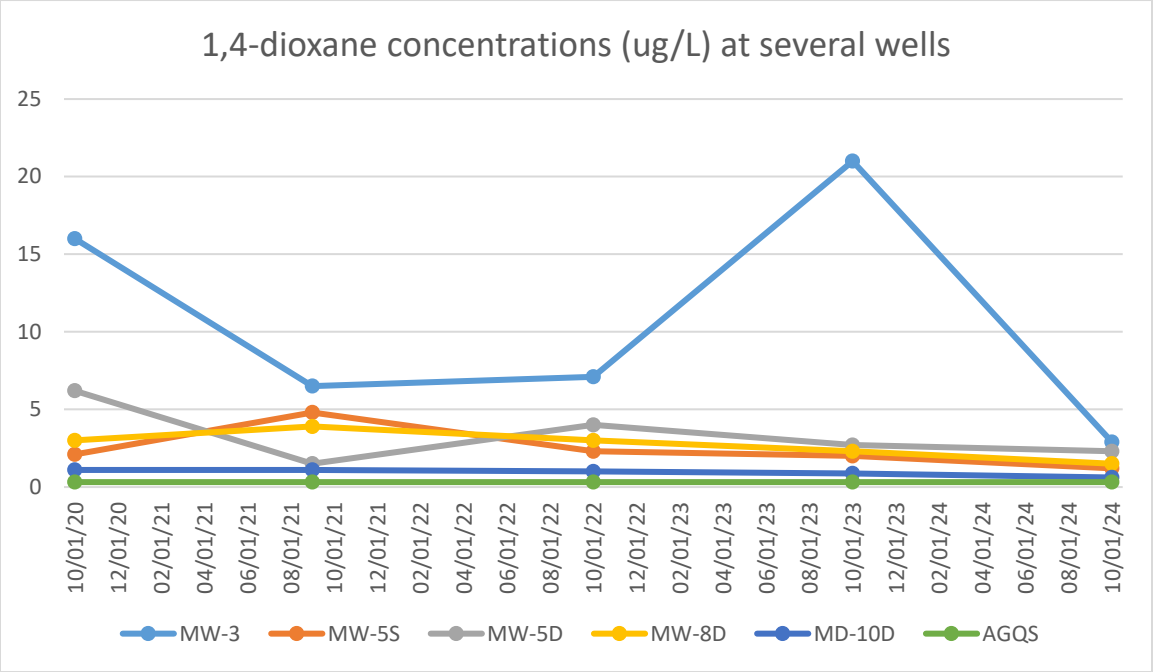
The increasing chlorobenzene trend at well MW-5D has somewhat stabilized. Wells MW-3 and MW-6 increasing trends are now decreasing, most notably at MW-6 which has been below the AGQS since 2020.

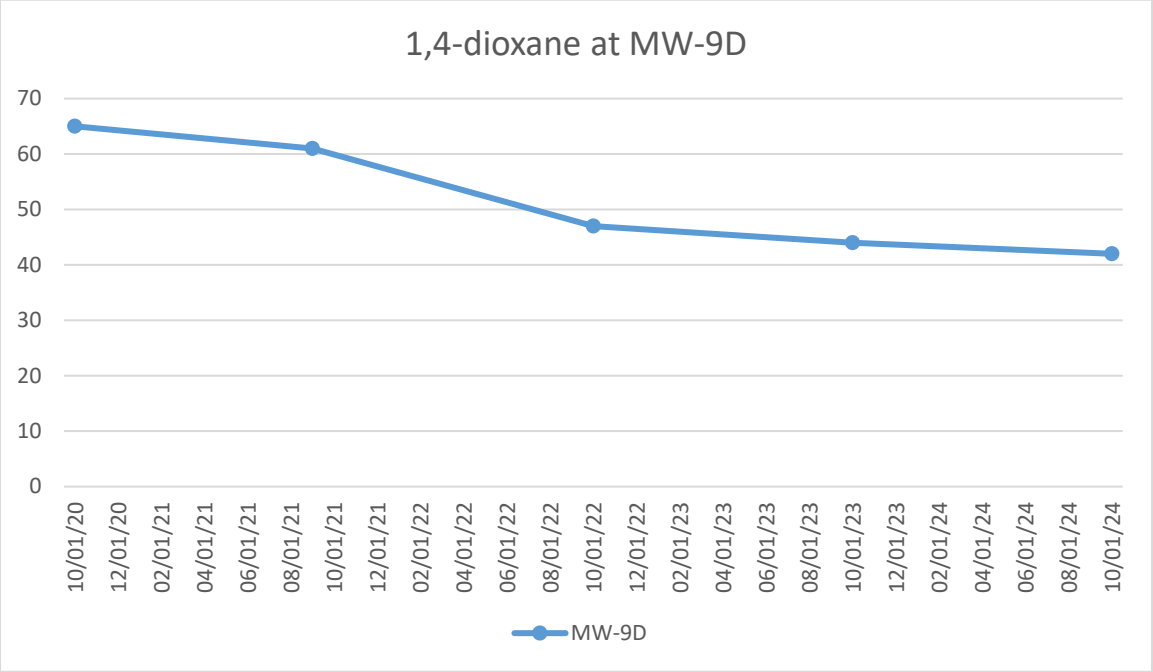


Benzene is still detected at MW-3, MW-5S, MW-5D, MW-6 and MW-9D, but AGQS exceedances are fewer, and all locations show a general decreasing trend.



There are consistent AGQS exceedances of 1,4-dioxane (0.32 ug/L) at wells MW-3, MW-5S, MW-5D, MW-6, MW-8D, MW-9D and MW-10D and intermittent exceedances at MW-6. Decreasing trends are evident at multiple wells, most notably MW-9D.





The only other VOC AGQS exceedance not discussed above was vinyl chloride at MW-9D in 2021 and 2022.

We will continue to monitor VOCs and their concentrations for trend assessment moving forward. A summary table of VOCs is included.

Drinking Water Metals

Drinking water metals were last analyzed in 2021. Other than arsenic, manganese, and iron as described above, other detected metals included barium, chromium and cadmium at trace concentrations. They appear to have had negligible impact on groundwater quality on site.

Per- and Polyfluoroalkyl Substances (PFAS)

Sampling of PFAS has been conducted at various wells on site between 2018 and 2022. There have been exceedances of the AGQS of PFHxS, PFOA and PFOS. In addition, multiple other PFAS compounds without currently established AGQS levels have been detected. A summary of PFAS exceedances is presented below:

Well	Date	PFHxS	PFOA	PFOS
AGQS		18	12	15
MW-3	10/02/2019	29.1	**148**	<4.38
	10/20/2020	14.3	**186**	8.49
	10/25/2022	6.63	**57.0**	7.44
MW-5D	10/02/2019	**24.5**	**48.0**	<4.35
	10/20/2020	17.0	**52.5**	<4.40
	10/25/2022	**24.9**	**65.8**	<2.01
MW-5S	10/02/2019	<4.51	**41.2**	<4.51
MW-9D	10/25/2018	21.7	**119**	22.9
	10/02/2019	14.0	**90.8**	**19.3**
	10/20/2020	12.7	**101**	13.1
	10/25/2022	16.8	**124**	**18.9**

- **BOLD** indicates an AGQS exceedance

(b) Summary of Site Remediation and Landfill Management Actions

The landfill was operated from approximately 1968 to 1975 and accepted municipal solid waste from the City of Concord and the Towns of Pembroke and Dunbarton. The City had utilized the landfill area for deposition of excess soil fill from City and NHDOT construction activities, reportedly including materials from Exit 13 construction of Interstate 93, which is in the vicinity of a known contaminated site. The landfill also accepted septage waste for a period of time. Prior to use as a landfill, portions of the site were used for gravel pit operations. Soil cover material thicknesses over waste vary over the site from several inches to over 8 feet in some areas. The bottom of waste is approximately 25 to 30 feet below ground surface based on test borings and historical information.

In 2001, a developer on an adjacent parcel completed a site assessment and site investigation and determined that the landfill extended onto their property, and that the groundwater quality adjacent to the landfill was impacted. Their investigation also determined that the water quality in a well installed adjacent to the landfill was impacted and that contaminants were present in the soils within the landfill waste mass. Monitoring wells MW-1, MW-2 and MW-3 were installed off-site as part of this investigation.

In 2003, the portion of the property containing the landfill was deeded to the City and the developer commenced with their plans for construction of single family and multi-family residences.

In November 2003, the City submitted a registration form for the pre-1981 landfill site with a proposed scope of work to complete additional investigations. In 2004, NHDES accepted the registration and approved the work scope for a site investigation with some requested additions and CMA Engineers was retained by the City of Concord to complete a series of test pit excavations and install four new groundwater monitoring wells (MW-4, MW-5S, MW-5D, and MW-6) at the site. The test pit excavations and soil sampling were completed to determine the quantity and quality of the cover materials and investigate whether there was a connection between the cover soil materials and the impacted groundwater quality. The groundwater monitoring wells were installed and sampled in May and June 2004. In February 2005, the City submitted the Site Investigation Report and the draft groundwater management permit application. In February 2006, six additional groundwater quality monitoring wells (MW-7S&D, MW-8S&D, MW-9S&D) were installed at three locations as proposed in the Site Investigation Report. The results of the first two rounds of water quality monitoring and an updated Site Plan depicting the well locations, groundwater contours and contaminant concentrations were submitted to NHDES in July 2006.

A supplemental hydrogeological investigation report was submitted to NHDES in June 2009. (prepared by Exeter Environmental Associates with the coordination of CMA Engineers). An additional 9 wells (MW-10I,S &D, MW-11I, S&D, MW-12I, S&D) were installed at three locations well downgradient of the site, southwest, south, and southeast; all on the south side of Manchester Street from the landfill. The supplemental report supported a revised Groundwater Management Zone (GMZ), and an associated revised Groundwater Management Permit. The GMZ and Permit were approved by NHDES in May 2010. The GMZ includes a greatly expanded area, with all properties having public water available assuring that property owners have access to potable water. The GMZ on these properties was recorded in the Merrimack County Registry of Deeds in 2010.

A soil vapor extraction (SVE) system was installed initially in the early 2000s and subsequently expanded. The City continues to operate this system to prevent migration of landfill gas off-site to abutting properties. The system is regularly inspected and maintained. Landfill gas has not been detected in off-site structures.

The site was secured with a chain link fence in 2012. In 2013, a significant stockpile of topsoil was regraded to establish a minimum thickness of cover soil over the entire limit of waste, then seeded and stabilized.

In early 2019, in response to NHDES comments regarding water quality at MW-10D, the City investigated potential water supply wells in the GMZ along Garvins Falls Road, and water quality at a well 10 Garvins Falls Road. It was concluded that no other wells exist within 500 feet of MW-10D and that City water is being used at 10 Garvins Falls Road (the on-site well is inactive). These issues were resolved in a letter from NHDES dated May 16, 2019.

In response to ongoing discussions between the City and NHDES regarding additional potential remedial actions, the City prepared a letter dated December 28, 2018 which summarized the unique characteristics of the landfill with respect to groundwater and other environmental impacts; impacts of these conditions relative to the feasibility of conventional landfill closure; actions taken by the City to actively manage the environmental impacts of the landfill; and a plan to further evaluate site management options during this Groundwater Permit renewal including plume interception.

As previously discussed in the 2018 letter, the landfill's unique characteristics include vertical or steeply sloped walls from the former gravel pit, flat land surrounding the landfill, significant depth between the bottom of waste and the water table. Additionally, as previously noted, the landfill is located near the upper areas of the watershed above a groundwater divide. Water quality impacts are more pronounced in the deep wells as opposed to shallow wells and the time for contaminant migration from the bottom of the waste to the water table and then to the property boundary is very long (decades).

Also noted in the 2018 letter, the impacts of these conditions on conventional landfill closure include:

- Difficulties with stormwater management because a gravity outlet is not possible due to the flat grades of the landfill, so 100% infiltration of stormwater would be necessary,
- Settlement of the waste along the gravel pit vertical walls would result in the cap settling below the top of the walls resulting in a depression that would need to be monitored and filled with clean soil as needed,
- Achieving closure slopes requires hundreds of thousands of cubic yards of fill to achieve appropriate stormwater drainage off the cap which would add weight and exacerbate the settlement problem,
- Positive effects of a capping system on groundwater quality would be delayed significantly, probably by decades, if they are realized at all.

With these factors and limitations in mind, we maintain that a conventional landfill closure is not a reasonable option for this site, particularly when considering the overall significant declines in VOCs and other contaminants over time (since monitoring began in the early 2000s) .

The water quality monitoring completed to date has indicated that the shallow groundwater has had minor impact from the landfill. Deep overburden water quality downgradient from the site has been impacted. There is not an upgradient source of unimpacted groundwater flowing under the site to dilute or naturally attenuate contaminates, due to the groundwater divide across the center of the site.

Water quality at the limits of the expanded GMZ is monitored by the MW-10s, MW-11s, and MW-12s to the west and south of the landfill. The eastern portion of the GMZ extends beyond the airport to the Soucook River and is monitored by MW-4 and MW-7 west of Airport Road. Groundwater quality at the GMZ perimeter wells discussed above shows little to no impact from VOCs, inorganics, or PFAS. AGQS exceedances are limited to manganese at two wells and 1,4-dioxane at one well. Other VOCs and PFAS detected are below AGQS.

AGQS exceedances at the GMZ perimeter wells:

	Date	Manganese	1,4-dioxane
AGQS		0.30 mg/L	0.32 ug/L
MW-4	10/17/2024	1.3 mg/L	<0.2 ug/L
MW-7D	10/17/2024	0.31 mg/L	<0.2 ug/L
MW-10D	10/17/2024	0.0079 mg/L	0.62 ug/L

All properties within the GMZ and within 1000' of the GMZ are served by public water, and use of groundwater within the GMZ is limited by the GMZ. It is ours and the City's position that active interception of the plume within the GMZ is not warranted or appropriate.

With respect to management of other environmental impacts, the City and their landfill gas subcontractor complete periodic inspections of the landfill and the landfill gas extraction system.

Maintenance and repairs to the perimeter fencing as noted by the City, are ongoing.

CMA Engineers will conduct a comprehensive inspection of the landfill 2026. Our inspection will include:

- Assessment of the site and the landfill to identify any areas of settlement,
- Review of any areas of erosion and of the fencing and site access, and any other issues that require attention.

A summary of any deficiencies will be prepared and reviewed with the City and NHDES.

The groundwater sampling contractor has identified issues with the MW-11 wells and stated the road box covers for MW-12I and MW-12S do not sit flush. We will evaluate the need for any necessary repairs during our 2026 inspection.

Additional confirmatory groundwater sampling is suggested to verify groundwater quality at the GMZ, as discussed below.

In summary of our evaluation of the site and its constraints and in consideration of improving water quality, we propose to maintain the current water quality monitoring program for the site, with minor modifications suggested below.

(c) Recommendations for revisions to the existing Groundwater Management Permit

PFAS sampling has not occurred since 2022. Several wells showed PFAS exceedances during earlier sampling events, including wells MW-3, MW-5D, MW-5S, and MW-9D. We recommend biennial sampling for PFAS at these locations.

Several of the GMZ perimeter well sampling frequencies are reduced from previous permits for VOCs and have had minimal PFAS testing. We recommend one confirmatory round of PFAS and VOC sampling at MW-4, and at the MW-7, 10, 11 and 12 wells to verify that higher frequency testing at these locations is not needed. We recommend biennial sampling of VOCs at wells that are currently tested annually.

We recommend removing testing for non-standard drinking water metals from the permit, which were last sampled in 2021 with trace amounts of barium, cadmium and chromium detected. These metals have had little to no impact on groundwater quality at the site.

With the above recommendations, the monitoring program would be as follows:

Monitoring Locations	Sampling Frequency	Parameters
MW-1, MW-2, MW-3, MW-4, MW-5S, MW-5D, MW-6, MW-7S, MW-7D, MW-8S, MW-8D, MW-9S, MW-9D, MW-10I, MW-10D, MW-11S, MW-11I, MW-11D, MW-12S, MW-12I, and MW-12D	October of each year	Specific conductance @25°C, pH, chloride, nitrate, TKN, arsenic, iron, manganese, and static water level elevation
MW-2, MW-3, MW-4, MW-5S, MW-5D, MW-6, MW-7D,	October of every other year	NHDES Waste Management Division Full List of analytes for volatile organics

MW-8S, MW-8D, MW-9S, MW-9D, MW-10I, and MW-10D		and 1,4-dioxane (using a < 0.25 ug/L reporting limit)
MW-3, MW-5D, MW-5S, and MW-9D	October of every other year	Per- and polyfluoroalkyl substances (PFAS)
MW-4, MW-7D, MW-7S, MW-10I, MW-10D, MW-11S, MW-11I, MW-11D, MW-12S, MW-12I, and MW-12D	October 2026	NHDES Waste Management Division Full List of analytes for volatile organics and 1,4-dioxane (using a < 0.25 ug/L reporting limit), Per- and polyfluoroalkyl substances (PFAS)

We recommend that biennial groundwater summary reporting (in odd numbered years) continue.

(d) Updated Site Plan and Groundwater Contours

Please see the attached plan that depicts the Groundwater Management Zone, all monitoring locations and the approximate groundwater contours based on the October 2024 monitoring data.

(e) List of Properties Within the Groundwater Management Zone

An updated list of all properties located within the GMZ is attached. We note that there are several new units in the condominium development off Mulberry street that have not been included in the GMZ under previous permits. We have added these properties in the attached spreadsheet.

Water Quality Summary Tables

Table 1: Summary of Static Water Elevations
Old Suncook Road Landfill - Concord, NH

Well ID#	Sampling Date	Top of PVC (ft)	Water Depth (ft)	Static H_2O elevation (MSL)
MW-1		327.94		
	10/20/20		44.61	283.33
	09/28/21		45.39	282.55
	10/25/22		45.78	282.16
	10/31/23		44.33	283.61
	10/17/24		43.35	284.59
MW-2		330.60		
	10/20/20		47.10	283.50
	09/28/21		46.69	283.91
	10/25/22		46.89	283.71
	10/31/23		45.28	285.32
	10/17/24		44.30	286.30
MW-3		330.38		
	10/20/20		47.70	282.68
	09/28/21		46.94	283.44
	10/25/22		47.38	283.00
	10/31/23		45.98	284.40
	10/17/24		45.02	285.36
MW-4		333.02		
	10/20/20		57.21	275.81
	09/28/21		57.85	275.17
	10/25/22		57.36	275.66
	10/31/23		56.09	276.93
	10/17/24		54.40	278.62
MW-5S		332.03		
	10/20/20		52.81	279.22
	09/28/21		53.21	278.82
	10/25/22		52.84	279.19
	10/31/23		51.76	280.27
	10/17/24		44.20	287.83
MW-5D		331.67		
	10/20/20		52.54	279.13
	09/28/21		52.86	278.81
	10/25/22		52.15	279.52
	10/31/23		51.51	280.16
	10/17/24		49.95	281.72
MW-6		330.72		
	10/20/20		51.36	279.36
	09/28/21		54.23	276.49
	10/25/22		48.63	282.09
	10/31/23		48.06	282.66
	10/17/24		46.93	283.79

Table 1: Summary of Static Water Elevations
Old Suncook Road Landfill - Concord, NH

Well ID#	Sampling Date	Top of PVC (ft)	Water Depth (ft)	Static H_2O elevation (MSL)
MW-7S		331.26		
	10/20/20		54.68	276.58
	09/28/21		55.23	276.03
	10/25/22		54.71	276.55
	10/30/23		53.56	277.70
	10/17/24		52.02	279.24
MW-7D		331.57		
	10/20/20		56.50	274.76
	09/28/21		56.88	274.38
	10/25/22		56.58	274.68
	10/30/23		55.15	276.11
	10/17/24		53.83	277.43
MW-8S		330.43		
	10/20/20		52.31	278.12
	09/28/21		52.25	278.18
	10/25/22		52.12	278.31
	10/30/23		50.75	279.68
	10/17/24		49.49	280.94
MW-8D		330.38		
	10/20/20		52.28	278.10
	09/28/21		52.40	277.98
	10/25/22		52.12	278.26
	10/30/23		50.76	279.62
	10/17/24		49.45	280.93
MW-9S		330.07		
	10/20/20		49.72	280.35
	09/28/21		48.63	281.44
	10/25/22		49.11	280.96
	10/31/23		47.76	282.31
	10/17/24		46.77	283.30
MW-9D		330.24		
	10/20/20		51.85	278.39
	09/28/21		51.94	278.30
	10/25/22		52.77	277.47
	10/31/23		50.64	279.60
	10/17/24		49.23	281.01
MW-10I		308.85		
	10/20/20		43.03	265.82
	09/28/21		40.97	267.88
	10/25/22		42.41	266.44
	10/30/23		38.59	270.26
	10/17/24		37.36	271.49
MW-10D		309.01		

Table 1: Summary of Static Water Elevations
Old Suncook Road Landfill - Concord, NH

Well ID#	Sampling Date	Top of PVC (ft)	Water Depth (ft)	Static H_2O elevation (MSL)
	10/20/20		37.11	271.90
	09/28/21		36.45	272.56
	10/25/22		36.65	272.36
	10/30/23		35.47	273.54
	10/17/24		34.85	274.16
MW-11S		323.13		
	10/20/20		50.74	272.39
	09/28/21		50.55	272.58
	10/25/22		50.92	272.21
	10/30/23		49.75	273.38
	10/17/24		49.40	273.73
MW-11I		322.75		
	10/20/20		51.03	271.72
	09/28/21		50.28	272.47
	10/25/22		50.71	272.04
	10/30/23		49.51	273.24
	10/17/24		49.16	273.59
MW-11D		322.69		
	10/20/20		51.30	271.39
	09/28/21		50.19	272.50
	10/25/22		53.70	268.99
	10/30/23		49.42	273.27
	10/17/24		49.17	273.52
MW-12S		318.93		
	10/20/20		47.32	274.61
	09/28/21		47.09	274.84
	10/25/22		47.04	274.89
	10/31/23		45.75	276.18
	10/17/24		44.77	277.16
MW-12I		319.05		
	10/20/20		47.80	274.25
	09/28/21		57.58	264.47
	10/25/22		58.39	263.66
	10/31/23		46.13	275.92
	10/17/24		45.15	276.9
MW-12D		319.2		
	10/20/20		47.28	274.92
	09/28/21		47.27	274.93
	10/25/22		46.83	275.37
	10/31/23		45.45	276.75
	10/17/24		44.91	277.29

Table 1: Summary of Static Water Elevations
Old Suncook Road Landfill - Concord, NH

Well ID#	Sampling Date	Top of PVC (ft)	Water Depth (ft)	Static H_2O elevation (MSL)
MW-1		327.94		
	10/20/20		44.61	283.33
	09/28/21		45.39	282.55
	10/25/22		45.78	282.16
	10/31/23		44.33	283.61
	10/17/24		43.35	284.59
MW-2		330.60		
	10/20/20		47.10	283.50
	09/28/21		46.69	283.91
	10/25/22		46.89	283.71
	10/31/23		45.28	285.32
	10/17/24		44.30	286.30
MW-3		330.38		
	10/20/20		47.70	282.68
	09/28/21		46.94	283.44
	10/25/22		47.38	283.00
	10/31/23		45.98	284.40
	10/17/24		45.02	285.36
MW-4		333.02		
	10/20/20		57.21	275.81
	09/28/21		57.85	275.17
	10/25/22		57.36	275.66
	10/31/23		56.09	276.93
	10/17/24		54.40	278.62
MW-5S		332.03		
	10/20/20		52.81	279.22
	09/28/21		53.21	278.82
	10/25/22		52.84	279.19
	10/31/23		51.76	280.27
	10/17/24		44.20	287.83
MW-5D		331.67		
	10/20/20		52.54	279.13
	09/28/21		52.86	278.81
	10/25/22		52.15	279.52
	10/31/23		51.51	280.16
	10/17/24		49.95	281.72
MW-6		330.72		
	10/20/20		51.36	279.36
	09/28/21		54.23	276.49
	10/25/22		48.63	282.09
	10/31/23		48.06	282.66
	10/17/24		46.93	283.79

Table 1: Summary of Static Water Elevations
Old Suncook Road Landfill - Concord, NH

Well ID#	Sampling Date	Top of PVC (ft)	Water Depth (ft)	Static H_2O elevation (MSL)
MW-7S		331.26		
	10/20/20		54.68	276.58
	09/28/21		55.23	276.03
	10/25/22		54.71	276.55
	10/30/23		53.56	277.70
	10/17/24		52.02	279.24
MW-7D		331.57		
	10/20/20		56.50	274.76
	09/28/21		56.88	274.38
	10/25/22		56.58	274.68
	10/30/23		55.15	276.11
	10/17/24		53.83	277.43
MW-8S		330.43		
	10/20/20		52.31	278.12
	09/28/21		52.25	278.18
	10/25/22		52.12	278.31
	10/30/23		50.75	279.68
	10/17/24		49.49	280.94
MW-8D		330.38		
	10/20/20		52.28	278.10
	09/28/21		52.40	277.98
	10/25/22		52.12	278.26
	10/30/23		50.76	279.62
	10/17/24		49.45	280.93
MW-9S		330.07		
	10/20/20		49.72	280.35
	09/28/21		48.63	281.44
	10/25/22		49.11	280.96
	10/31/23		47.76	282.31
	10/17/24		46.77	283.30
MW-9D		330.24		
	10/20/20		51.85	278.39
	09/28/21		51.94	278.30
	10/25/22		52.77	277.47
	10/31/23		50.64	279.60
	10/17/24		49.23	281.01
MW-10I		308.85		
	10/20/20		43.03	265.82
	09/28/21		40.97	267.88
	10/25/22		42.41	266.44
	10/30/23		38.59	270.26
	10/17/24		37.36	271.49
MW-10D		309.01		

Table 1: Summary of Static Water Elevations
Old Suncook Road Landfill - Concord, NH

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	09/28/21		36.45	272.56
	10/25/22		36.65	272.36
	10/30/23		35.47	273.54
	10/17/24		34.85	274.16
MW-11S		323.13		
	10/20/20		50.74	272.39
	09/28/21		50.55	272.58
	10/25/22		50.92	272.21
	10/30/23		49.75	273.38
	10/17/24		49.40	273.73
MW-11I		322.75		
	10/20/20		51.03	271.72
	09/28/21		50.28	272.47
	10/25/22		50.71	272.04
	10/30/23		49.51	273.24
	10/17/24		49.16	273.59
MW-11D		322.69		
	10/20/20		51.30	271.39
	09/28/21		50.19	272.50
	10/25/22		53.70	268.99
	10/30/23		49.42	273.27
	10/17/24		49.17	273.52
MW-12S		318.93		
	10/20/20		47.32	274.61
	09/28/21		47.09	274.84
	10/25/22		47.04	274.89
	10/31/23		45.75	276.18
	10/17/24		44.77	277.16
MW-12I		319.05		
	10/20/20		47.80	274.25
	09/28/21		57.58	264.47
	10/25/22		58.39	263.66
	10/31/23		46.13	275.92
	10/17/24		45.15	276.9
MW-12D		319.2		
	10/20/20		47.28	274.92
	09/28/21		47.27	274.93
	10/25/22		46.83	275.37
	10/31/23		45.45	276.75
	10/17/24		44.91	277.29

Table 2: Summary of Inorganic Compounds and Indicator Parameters
Old Suncook Road Landfill - Concord, NH

-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Sampling Location	Sampling Date	Specific Conductance (uS)	pH (SU)	Chloride (mg/L)	Nitrate (mg/L)	TKN (mg/L)	As (mg/L)	Ba (mg/L)	Cd (mg/L)	Cr (mg/L)	Fe (mg/L)	Pb (mg/L)	Mn (mg/L)	Hg (mg/L)	Se (mg/L)	Ag (mg/L)
	NH AGQS:			**NS**	**10**	**NS**	**0.05**	**2.0**	**0.005**	**0.1**	**NS**	**0.015**	**0.3**	**0.002**	**0.05**	**0.01**
MW-1																
	10/20/20	**1800**	**5.54**	**520**	**1.7**	<0.5	<0.001	-	-	-	<0.05	-	**0.086**	-	-	-
	09/28/21	**580**	**5.76**	**160**	**1.8**	<0.5	<0.0005	**0.041**	<0.001	<0.001	<0.05	<0.001	**0.027**	<0.0001	<0.001	<0.001
	10/25/22	**1200**	**5.51**	**330**	**1.6**	<0.5	<0.0005	-	-	-	<0.05	-	**0.025**	-	-	-
	10/31/23	**550**	**6.09**	**140**	**1.6**	<0.5	<0.0005	-	-	-	<0.05	-	**0.016**	-	-	-
	10/17/24	**1300**	**5.68**	**350**	**0.94**	<0.5	<0.0005	-	-	-	<0.05	-	**0.039**	-	-	-
MW-2																
	10/20/20	**370**	**5.60**	**76**	**4.2**	<0.5	<0.001	-	-	-	<0.05	-	**0.0055**	-	-	-
	09/28/21	**600**	**5.49**	**160**	**3.5**	<0.5	<0.0005	**0.020**	<0.001	<0.001	<0.05	<0.001	**0.0086**	<0.0001	<0.001	<0.001
	10/25/22	**440**	**5.36**	**96**	**4.3**	<0.5	<0.0005	-	-	-	<0.05	-	**0.0064**	-	-	-
	10/31/23	**530**	**5.68**	**100**	**4.4**	<0.5	<0.0005	-	-	-	<0.05	-	**0.010**	-	-	-
	10/17/24	**400**	**5.52**	**73**	**6.6**	<0.5	<0.0005	-	-	-	<0.05	-	**0.012**	-	-	-
MW-3																
	10/20/20	**1100**	**5.91**	**16**	<0.5	**35**	**0.05**	-	-	-	**59**	-	**0.23**	-	-	-
	09/28/21	**1100**	**6.22**	**11**	<0.5	**36**	**0.01**	**0.059**	<0.001	**0.0014**	**75**	<0.001	**0.37**	<0.0001	<0.001	<0.001
	10/25/22	**1200**	**6.20**	**11**	<0.5	**41**	**0.10**	-	-	-	**71**	-	**0.25**	-	-	-
	10/31/23	**1200**	**6.34**	**20**	<0.5	**39**	**0.064**	-	-	-	**85**	-	**0.27**	-	-	-
	10/17/24	**1200**	**6.22**	**7.8**	<0.5	**38**	**0.084**	-	-	-	**76**	-	**0.27**	-	-	-
MW-4																
	10/20/20	**260**	**5.73**	**16**	<0.5	**2.0**	**0.0071**	-	-	-	**12**	-	**5.7**	-	-	-
	09/28/21	**330**	**5.88**	**5**	<0.5	**5.5**	**0.0240**	**0.030**	<0.001	<0.001	**30**	<0.001	**8.4**	<0.0001	<0.001	<0.001
	10/25/22	**180**	**5.48**	**3**	**2.5**	**3.9**	**0.0023**	-	-	-	**9.7**	-	**4.2**	-	-	-
	10/31/23	**150**	**5.62**	**3.7**	**2.7**	**2.0**	**0.0013**	-	-	-	**2.8**	-	**2.3**	-	-	-
	10/17/24	**150**	**5.04**	**2.7**	**7.0**	<0.5	<0.0005	-	-	-	**0.091**	-	**1.3**	-	-	-
MW-5S																
	10/20/20	**960**	**5.96**	**31**	<0.5	**23**	**0.13**	-	-	-	**53**	-	**0.55**	-	-	-
	09/28/21	**1000**	**6.14**	**17**	<0.5	**19**	**0.14**	**0.19**	<0.001	<0.001	**61**	<0.001	**0.92**	<0.0001	<0.001	<0.001
	10/25/22	**1000**	**6.17**	**14**	<0.5	**25**	**0.15**	-	-	-	**61**	-	**0.63**	-	-	-
	10/31/23	**1100**	**6.32**	**13**	<0.5	**43**	**0.16**	-	-	-	**66**	-	**0.63**	-	-	-
	10/17/24	**1100**	**6.07**	**14**	<0.5	**33**	**0.16**	-	-	-	**68**	-	**0.43**	-	-	-
MW-5D																
	10/20/20	**1100**	**6.86**	**4.3**	**2.3**	**17**	**0.20**	-	-	-	**13**	-	**0.021**	-	-	-
	09/28/21	**1100**	**6.81**	**27**	<0.5	**20**	**0.23**	**0.19**	<0.001	<0.001	**16**	<0.001	**0.023**	<0.0001	<0.001	<0.001
	10/25/22	**1000**	**6.72**	**22**	<0.5	**21**	**0.28**	-	-	-	**17**	-	**0.024**	-	-	-
	10/31/23	**1000**	**6.77**	**21**	<0.5	**21**	**0.35**	-	-	-	**23**	-	**0.032**	-	-	-
	10/17/24	**1000**	**6.49**	**18**	<0.5	**20**	**0.29**	-	-	-	**20**	-	**0.027**	-	-	-
MW-6																
	10/20/20	**960**	**6.27**	**12**	<0.5	**36**	**0.059**	-	-	-	**60**	-	**0.10**	-	-	-
	09/28/21	**930**	**6.27**	**6.5**	<0.5	**40**	**0.048**	**0.090**	<0.001	**0.0023**	**76**	<0.001	**0.31**	<0.0001	<0.001	<0.001
	10/25/22	**950**	**5.91**	**5.7**	<0.5	**41**	**0.043**	-	-	-	**81**	-	**0.29**	-	-	-

Table 2: Summary of Inorganic Compounds and Indicator Parameters
Old Suncook Road Landfill - Concord, NH

-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Sampling Location	Sampling Date	Specific Conductance (uS)	pH (SU)	Chloride (mg/L)	Nitrate (mg/L)	TKN (mg/L)	As (mg/L)	Ba (mg/L)	Cd (mg/L)	Cr (mg/L)	Fe (mg/L)	Pb (mg/L)	Mn (mg/L)	Hg (mg/L)	Se (mg/L)	Ag (mg/L)
	NH AGQS:			**NS**	**10**	**NS**	**0.05**	**2.0**	**0.005**	**0.1**	**NS**	**0.015**	**0.3**	**0.002**	**0.05**	**0.01**
	10/31/23	**910**	**6.52**	**3.7**	<0.5	**35**	**0.071**	-	-	-	**140**	-	**0.68**	-	-	-
	10/17/24	**480**	**6.26**	**3.7**	<0.5	**43**	**0.067**	-	-	-	**150**	-	**0.027**	-	-	-
MW-7S																
	10/20/20	**34**	**5.98**	**9.6**	<0.5	<0.5	<0.001	-	-	-	<0.05	-	<0.005	-	-	-
	09/28/21	**35**	**5.79**	**1.8**	<0.5	<0.5	<0.0005	<0.001	<0.001	<0.001	<0.05	<0.001	<0.005	<0.001	<0.001	<0.001
	10/25/22	**34**	**5.50**	**1.8**	<0.5	<0.5	<0.0005	<0.001	<0.001	<0.001	<0.05	<0.001	<0.005	<0.001	<0.001	<0.001
	10/30/23	**42**	**5.34**	**2.1**	<0.5	**0.93**	<0.0005	-	-	-	<0.05	-	**0.010**	-	-	-
	10/17/24	**39**	**5.60**	**2.2**	<0.5	<0.5	<0.0005	-	-	-	**0.071**	-	<0.005	-	-	-
MW-7D																
	10/20/20	**270**	**6.35**	**9.6**	<0.5	<0.5	**0.0066**	-	-	-	**39**	-	**0.32**	-	-	-
	09/28/21	**280**	**6.33**	**8.1**	<0.5	<0.5	**0.0064**	**0.035**	<0.001	<0.001	**37**	<0.001	**0.30**	<0.0001	<0.001	<0.001
	10/25/22	**270**	**6.23**	**8.2**	<0.5	<0.5	**0.0061**	-	-	-	**33**	-	**0.26**	-	-	-
	10/30/23	**270**	**5.91**	**8.9**	<0.5	<0.5	**0.0071**	-	-	-	**36**	-	**0.30**	-	-	-
	10/17/24	**300**	**5.82**	**7.8**	<0.5	<0.5	**0.0069**	-	-	-	**35**	-	**0.31**	-	-	-
MW-8S																
	10/20/20	**360**	**5.05**	**130**	**3.4**	<0.5	<0.001	-	-	-	<0.05	-	**9.3**	-	-	-
	09/28/21	**1200**	**5.40**	**350**	**3.9**	**1.3**	<0.0005	**0.031**	**0.0016**	<0.001	<0.05	<0.001	**14**	<0.0001	<0.001	<0.001
	10/25/22	**1700**	**5.30**	**500**	**2.2**	<0.5	<0.0005	-	-	-	<0.05	-	**12**	-	-	-
	10/30/23	**3000**	**5.14**	**810**	**3.4**	<0.5	<0.0005	-	-	-	<0.05	-	**20**	-	-	-
	10/17/24	**2200**	**5.41**	**600**	**3.3**	<0.5	<0.0005	-	-	-	<0.05	-	**11**	-	-	-
MW-8D																
	10/20/20	**280**	**5.79**	**13**	**10**	<0.5	<0.001	-	-	-	**0.75**	-	**0.24**	-	-	-
	09/28/21	**280**	**5.80**	**13**	**9.3**	<0.5	<0.0005	**0.024**	<0.001	<0.001	**0.81**	<0.001	**0.23**	<0.0001	<0.001	<0.001
	10/25/22	**280**	**5.73**	**13**	**9.5**	<0.5	<0.0005	-	-	-	**0.86**	-	**0.23**	-	-	-
	10/30/23	**270**	**5.47**	**13**	**9.2**	<0.5	<0.0005	-	-	-	**0.93**	-	**0.24**	-	-	-
	10/17/24	**270**	**5.73**	**11**	**8.8**	<0.5	<0.0005	-	-	-	**0.86**	-	**0.23**	-	-	-
MW-9S																
	10/20/20	**360**	**5.05**	**75**	**4.0**	<0.5	<0.001	-	-	-	<0.05	-	**0.073**	-	-	-
	09/28/21	**560**	**5.46**	**130**	**3.6**	**0.86**	<0.0005	**0.040**	<0.001	<0.001	<0.05	<0.001	**0.23**	<0.0001	<0.001	<0.001
	10/25/22	**340**	**5.34**	**71**	**1.9**	<0.5	<0.0005	-	-	-	<0.05	-	**0.12**	-	-	-
	10/31/23	**640**	**5.38**	**160**	**1.9**	<0.5	<0.0005	-	-	-	<0.05	-	**0.28**	-	-	-
	10/17/24	**620**	**5.24**	**140**	**2.7**	<0.5	<0.0005	-	-	-	<0.05	-	**0.20**	-	-	-
MW-9D																
	10/20/20	**1300**	**6.57**	**130**	<0.5	**4.7**	**0.19**	-	-	-	**14**	-	**0.030**	-	-	-
	09/28/21	**1300**	**6.74**	**110**	<0.5	**3.8**	**0.19**	**0.20**	<0.001	<0.001	**14**	<0.001	**0.031**	<0.0001	<0.001	<0.001
	10/25/22	**1400**	**6.51**	**94**	<0.5	**4.8**	**0.20**	-	-	-	**14**	-	**0.031**	-	-	-
	10/31/23	**1400**	**6.72**	**83**	<0.5	**5.0**	**0.22**	-	-	-	**16**	-	**0.035**	-	-	-
	10/17/24	**660**	**6.62**	**60**	<0.5	**5.7**	**0.21**	-	-	-	**14**	-	**0.028**	-	-	-
MW-10I																

Table 2: Summary of Inorganic Compounds and Indicator Parameters
Old Suncook Road Landfill - Concord, NH

-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Sampling Location	Sampling Date	Specific Conductance (uS)	pH (SU)	Chloride (mg/L)	Nitrate (mg/L)	TKN (mg/L)	As (mg/L)	Ba (mg/L)	Cd (mg/L)	Cr (mg/L)	Fe (mg/L)	Pb (mg/L)	Mn (mg/L)	Hg (mg/L)	Se (mg/L)	Ag (mg/L)
	NH AGQS:			**NS**	**10**	**NS**	**0.05**	**2.0**	**0.005**	**0.1**	**NS**	**0.015**	**0.3**	**0.002**	**0.05**	**0.01**
	10/20/20	**310**	**5.93**	**120**	**2.6**	<0.5	<0.001	-	-	-	<0.05	-	<0.005	-	-	-
	09/28/21	**400**	**5.82**	**150**	**3.9**	**0.5**	<0.0005	**0.016**	<0.001	<0.001	<0.05	<0.001	<0.005	<0.0001	<0.001	<0.001
	10/25/22	**620**	**5.65**	**180**	**4.2**	<0.5	<0.0005	-	-	-	<0.05	-	**0.0076**	-	-	-
	10/30/23	**630**	**5.73**	**170**	**4.3**	<0.5	<0.0005	-	-	-	**0.054**	-	**0.0054**	-	-	-
	10/17/24	**700**	**5.68**	**180**	**3.3**	<0.5	<0.0005	-	-	-	<0.05	-	<0.005	-	-	-
MW-10D																
	10/20/20	**590**	**5.90**	**150**	**2.6**	<0.5	<0.001	-	-	-	<0.05	-	**0.075**	-	-	-
	09/28/21	**680**	**5.78**	**180**	**3.9**	<0.5	<0.0005	**0.023**	<0.001	<0.001	<0.05	<0.001	**0.006**	<0.0001	<0.001	<0.001
	10/25/22	**700**	**5.72**	**180**	**3.7**	<0.5	<0.0005	-	-	-	<0.05	-	**0.0077**	-	-	-
	10/30/23	**730**	**5.91**	**190**	**3.6**	<0.5	<0.0005	-	-	-	<0.05	-	**0.0086**	-	-	-
	10/17/24	**770**	**5.56**	**190**	**2.8**	<0.5	<0.0005	-	-	-	<0.05	-	**0.0079**	-	-	-
MW-11S																
	10/20/20	**1300**	**6.60**	**370**	<0.5	<0.5	**0.0035**	-	-	-	**37**	-	**0.50**	-	-	-
	09/28/21	**2000**	**5.66**	**560**	**1.6**	<0.5	<0.0005	**0.065**	<0.001	<0.001	<0.05	<0.001	**0.049**	<0.0001	<0.001	<0.001
	10/25/22	**2900**	**5.38**	**850**	**1.6**	<0.5	<0.0005	-	-	-	<0.05	-	**0.094**	-	-	-
	10/30/23	**3000**	**5.53**	**940**	**1.9**	<0.5	<0.0005	-	-	-	<0.05	-	**0.091**	-	-	-
	10/17/24	**3200**	**5.54**	**910**	**2.0**	<0.5	<0.0005	-	-	-	<0.05	-	**0.081**	-	-	-
MW-11I																
	10/20/20	**930**	**5.62**	**260**	**2.0**	<0.5	<0.001	-	-	-	<0.05	-	**0.0072**	-	-	-
	09/28/21	**500**	**5.66**	**140**	**2.2**	<0.5	<0.0005	**0.012**	<0.001	<0.001	<0.05	<0.001	<0.005	<0.0001	<0.001	<0.001
	10/25/22	**350**	**5.62**	**76**	**1.8**	<0.5	<0.0005	-	-	-	<0.05	-	<0.005	-	-	-
	10/30/23	**430**	**5.88**	**94**	**1.8**	<0.5	<0.0005	-	-	-	<0.05	-	<0.005	-	-	-
	10/17/24	**400**	**5.80**	**80**	**1.3**	<0.5	<0.0005	-	-	-	**0.065**	-	<0.005	-	-	-
MW-11D																
	10/20/20	**1800**	**5.64**	**520**	**1.3**	<0.5	<0.001	-	-	-	<0.05	-	**0.075**	-	-	-
	09/28/21	**1400**	**6.48**	**420**	<0.5	<0.5	**0.0027**	**0.22**	<0.001	<0.001	**44**	<0.001	**0.044**	<0.0001	<0.001	<0.001
	10/25/22	**1700**	**5.98**	**470**	<0.5	**0.60**	**0.0027**	-	-	-	**46**	-	**0.46**	-	-	-
	10/30/23	**1700**	**6.41**	**490**	<0.5	<0.5	**0.0028**	-	-	-	**48**	-	**0.43**	-	-	-
	10/17/24	**1900**	**6.19**	**480**	<0.5	<0.5	**0.0024**	-	-	-	**41**	-	**0.37**	-	-	-
MW-12S																
	10/20/20	**640**	**5.99**	**160**	**0.76**	<0.5	<0.001	-	-	-	<0.05	-	**0.014**	-	-	-
	09/28/21	**900**	**5.83**	**260**	**0.67**	<0.5	<0.0005	**0.016**	<0.001	<0.001	<0.05	<0.001	**0.020**	<0.0001	<0.001	<0.001
	10/25/22	**1000**	**5.54**	**270**	**0.60**	**0.60**	<0.0005	-	-	-	<0.05	-	**0.0055**	-	-	-
	10/31/23	**810**	**5.96**	**210**	**1.3**	<0.5	<0.0005	-	-	-	<0.05	-	**0.063**	-	-	-
	10/17/24	**380**	**6.14**	**79**	<0.5	<0.5	<0.0005	-	-	-	<0.05	-	<0.005	-	-	-
MW-12I																
	10/20/20	**1000**	**6.20**	**250**	**1.2**	<0.5	<0.001	-	-	-	<0.05	-	<0.005	-	-	-
	09/28/21	**660**	**6.07**	**180**	**1.4**	<0.5	<0.0005	**0.015**	<0.001	<0.001	<0.05	<0.001	<0.005	<0.0001	<0.001	<0.001
	10/25/22	**870**	**5.92**	**180**	**0.64**	**1.1**	0.0014	-	-	-	**1.7**	-	**0.080**	-	-	
	10/31/23	**270**	**6.28**	**60**	<0.5	<0.5	<0.0005	-	-	-	**0.066**	-	**<0.005**	-	-	-

Table 2: Summary of Inorganic Compounds and Indicator Parameters
Old Suncook Road Landfill - Concord, NH

-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Sampling Location	Sampling Date	Specific Conductance (uS)	pH (SU)	Chloride (mg/L)	Nitrate (mg/L)	TKN (mg/L)	As (mg/L)	Ba (mg/L)	Cd (mg/L)	Cr (mg/L)	Fe (mg/L)	Pb (mg/L)	Mn (mg/L)	Hg (mg/L)	Se (mg/L)	Ag (mg/L)
	NH AGQS:			**NS**	**10**	**NS**	**0.05**	**2.0**	**0.005**	**0.1**	**NS**	**0.015**	**0.3**	**0.002**	**0.05**	**0.01**
	10/17/24	**1400**	**5.94**	**360**	**1.4**	<0.5	<0.0005	-	-	-	<0.05	-	<0.005	-	-	-
MW-12D																
	10/20/20	**1200**	**5.73**	**320**	**3.3**	<0.5	<0.001	-	-	-	<0.05	-	**0.011**	-	-	-
	09/28/21	**1400**	**5.64**	**420**	**2.0**	<0.5	<0.0005	**0.13**	<0.001	<0.001	<0.05	<0.001	**0.017**	<0.0001	<0.001	<0.001
	10/25/22	**1300**	**5.52**	**350**	**1.8**	<0.5	<0.0005	-	-	-	<0.05	-	**0.20**	-	-	-
	10/31/23	**1400**	**5.67**	**400**	**2.2**	<0.5	<0.0005	-	-	-	<0.05	-	**0.046**	-	-	-
	10/17/24	**1500**	**5.62**	**400**	**1.9**	<0.5	**0.00051**	-	-	-	**0.067**	-	**0.017**	-	-	-

Notes:

	Denotes concentration exceeds NH AGQS
< 0.001	Denotes parameter not detected at the indicated laboratory detection limit
NS	Indicates No Standard Established
-	Denotes parameter was not sampled

Table 3: Summary of Volatile Organic Compounds
Old Suncook Road Landfill - Concord, NH
All concentrations given in micrograms per liter (µg/L) unless otherwise noted

Sampling Location	Sampling Date	Dichlorodifluoro methane	Vinyl chloride	Chloro ethane	Diethyl ether	Acetone	1,1,-Dichloro ethene	MtBE	1,1-Dichloro ethane	cis-1,2-Dichloro ethene	THF	1,1,1-Trichloro ethane	Benzene	1,2-Dichloro ethane	Trichloro ethene	1,2-Dichloro propane	Toluene	Chloro benzene
	NH AGQS	**1000**	**2**	**NS**	**1400**	**6000**	**7**	**13**	**81**	**70**	**600****	**200**	**5**	**5**	**5**	**5**	**1000**	**100**
MW-2																		
	10/20/20	<2	<1	<2	<2	<10	<0.5	<1	<1	<1	<10	<1	<1	<1	<1	<1	<1	<1
	9/28/21	<2	<1	<2	<2	<10	<0.5	<1	<1	<1	<10	<1	<1	<1	<1	<1	<1	<1
	10/25/22	<2	<1	<2	<2	<10	<0.5	<1	<1	<1	<10	<1	<1	<1	<1	<1	<1	<1
	10/31/23	<2	<1	<2	<2	<10	<0.5	<1	<1	<1	<10	<1	<1	<1	<1	<1	<1	<1
	10/17/24	<2	<1	<2	<2	<10	<0.5	<1	<1	<1	<10	<1	<1	<1	<1	<1	<1	<1
MW-3																		
	10/20/20	<2	<1	**15**	**22**	<10	<0.5	<1	**2**	<1	**140**	<1	**6.1**	<1	<1	<1	<1	**36**
	9/28/21	<2	<1	**6**	**11**	<10	<0.5	<1	**1**	<1	**20**	<1	**4.8**	<1	<1	<1	<1	**39**
	10/25/22	<2	<1	**6.1**	**10**	<10	<0.5	<1	**1.5**	<1	**10**	<1	**4.1**	<1	<1	<1	<1	**34**
	10/31/23	<2	<1	**5.7**	**10**	<10	<0.5	<1	**2.1**	<1	**140**	<1	**3.9**	<1	<1	<1	<1	**36**
	10/17/24	<2	<1	**3.4**	**5.4**	<10	<0.5	<1	**1.5**	<1	<10	<1	**3.8**	<1	<1	<1	<1	**30**
MW-4																		
	10/20/20	<2	<1	**8.2**	<2	<10	<0.5	<1	<1	<1	<10	<1	<1	<1	<1	<1	<1	**7.1**
	9/28/21	<2	<1	**8.2**	<2	<10	<0.5	<1	<1	<1	<10	<1	<1	<1	<1	<1	<1	**13**
	10/25/22	<2	<1	**2.2**	<2	<10	<0.5	<1	<1	<1	<10	<1	<1	<1	<1	<1	<1	**9.9**
	10/31/23	<2	<1	<2	<2	<10	<0.5	<1	<1	<1	<10	<1	<1	<1	<1	<1	<1	**5.2**
	10/17/24	<2	<1	<2	<2	<10	<0.5	<1	<1	<1	<10	<1	<1	<1	<1	<1	<1	<1
MW-5S																		
	10/20/20	<2	<1	**4**	**2.5**	<10	<0.5	<1	**1.8**	<1	<10	<1	**3.5**	<1	<1	<1	<1	**40**
	9/28/21	<2	<1	<2	**3.7**	**14**	<0.5	<1	**1.3**	<1	<10	<1	**4**	<1	<1	<1	**4.4**	**40**
	10/25/22	<2	<1	<2	**2.4**	<10	<0.5	<1	**1.6**	<1	<10	<1	**2.8**	<1	<1	<1	<1	**34**
	10/31/23	<2	<1	<2	**2.4**	<10	<0.5	<1	**1.5**	<1	<10	<1	**2.8**	<1	<1	<1	<1	**34**
	10/17/24	<2	<1	<2	**2.7**	<10	<0.5	<1	**1.1**	<1	<10	<1	**3.3**	<1	<1	<1	<1	**42**
MW-5D															<1			
	10/20/20	<2	<1	<2	**21**	<10	<0.5	<1	**3.2**	<1	<10	<1	**15**	<1	<1	<1	<1	**230**
	9/28/21	<2	<1	<2	**16**	<10	<0.5	<1	**2.7**	<1	<10	<1	**12**	<1	<1	<1	<1	**220**
	10/25/22	**3.1**	<1	<2	**13**	<10	<0.5	<1	**2.7**	<1	<10	<1	**11**	<1	<1	<1	**1**	**200**
	10/31/23	**2.3**	<1	<2	**11**	<10	<0.5	<1	**2.9**	<1	<10	<1	**9.9**	<1	<1	<1	<1	**240**
	10/17/24	**4.2**	<1	<2	**9.8**	<10	<0.5	<1	**2.8**	<1	<10	<1	**9.7**	<1	<1	<1	<1	**250**
MW-6																		
	10/20/20	<2	<1	<2	**4**	<10	<0.5	<1	<1	<1	<10	<1	**3.8**	<1	<1	<1	<1	**120**
	9/28/21	<2	<1	<2	**2.3**	<10	<0.5	<1	<1	<1	<10	<1	**5.1**	<1	<1	<1	<1	**80**
	10/25/22	<2	<1	<2	<2	<10	<0.5	<1	<1	<1	<10	<1	**4.5**	<1	<1	<1	<1	**65**
	10/31/23	<2	<1	<2	<2	<10	<0.5	<1	<1	<1	<10	<1	**4.1**	<1	<1	<1	**1.8**	**37**
	10/17/24	<2	<1	<2	<2	<10	<0.5	<1	<1	<1	<10	<1	**4**	<1	<1	<1	<1	**46**
MW-7D																		
	10/20/20	<2	<1	<2	<2	<10	<0.5	<1	<1	**6.9**	<10	<1	<1	<1	<1	<1	<1	<1
	9/28/21	<2	<1	<2	<2	<10	<0.5	<1	<1	**5.8**	<10	<1	<1	<1	<1	<1	<1	<1
	10/25/22	<2	<1	<2	<2	<10	<0.5	<1	<1	**1.7**	<10	<1	<1	<1	<1	<1	<1	<1
	10/30/23	<2	<1	<2	<2	<10	<0.5	<1	<1	**1.7**	<10	<1	<1	<1	<1	<1	<1	<1
	10/17/24	<2	<1	<2	<2	<10	<0.5	<1	<1	**2.5**	<10	<1	<1	<1	<1	<1	<1	<1
MW-8S																		
	10/20/20	<2	<1	<2	<2	<10	<0.5	<1	<1	<1	<10	<1	<1	<1	<1	<1	<1	<1
	9/28/21	<2	<1	<2	<2	<10	<0.5	<1	<1	<1	<10	<1	<1	<1	<1	<1	<1	<1
	10/25/22	<2	<1	<2	<2	<10	<0.5	<1	<1	<1	<10	<1	<1	<1	<1	<1	<1	<1
	10/30/23	<2	<1	<2	<2	<10	<0.5	<1	<1	<1	<10	<1	<1	<1	<1	<1	<1	<1
	10/17/24	<2	<1	<2	<2	<10	<0.5	<1	<1	<1	<10	<1	<1	<1	<1	<1	<1	<1
MW-8D																		
	10/20/20	<2	<1	<2	<2	<10	<0.5	<1	**4.5**	<1	<10	<1	<1	<1	<1	<1	<1	<1
	9/28/21	<2	<1	<2	<2	<10	<0.5	<1	**4.8**	<1	<10	<1	<1	<1	<1	<1	<1	<1
	10/25/22	<2	<1	<2	<2	<10	<0.5	<1	**3.6**	<1	<10	<1	<1	<1	<1	<1	<1	<1
	10/30/23	<2	<1	<2	<2	<10	<0.5	<1	**3.7**	<1	<10	<1	<1	<1	<1	<1	<1	<1
	10/17/24	<2	<1	<2	<2	<10	<0.5	<1	**2.4**	<1	<10	<1	<1	<1	<1	<1	<1	<1
MW-9S																		
	10/20/20	<2	<1	<2	<2	<10	<0.5	<1	<1	<1	<10	<1	<1	<1	<1	<1	<1	<1
	9/28/21	<2	<1	<2	<2	<10	<0.5	<1	<1	<1	<10	<1	<1	<1	<1	<1	<1	<1
	10/25/22	<2	<1	<2	<2	<10	<0.5	<1	<1	<1	<10	<1	<1	<1	<1	<1	<1	<1
	10/31/23	<2	<1	<2	<2	<10	<0.5	<1	<1	<1	<10	<1	<1	<1	<1	<1	<1	<1
	10/17/24	<2	<1	<2	<2	<10	<0.5	<1	<1	<1	<10	<1	<1	<1	<1	<1	<1	<1
MW-10S																		
	10/20/20	<2	**2.6**	**2.2**	**47**	<10	<0.5	<1	**21**	<1	**44**	<1	**13**	**1.3**	<1	<1	**6.6**	**26**
	9/28/21	<2	<1	<2	**35**	<10	<0.5	<1	**17**	<1	**29**	<1	**10**	<1	<1	<1	**3.6**	**27**
	10/25/22	**2.5**	**2.1**	<2	**34**	<10	<0.5	<1	**17**	<1	**30**	<1	**9.5**	<1	<1	<1	**3.2**	**29**
	10/31/23	<2	**1.6**	<2	**29**	<10	<0.5	<1	**17**	<1	**26**	<1	**8.3**	<1	<1	<1	**2.2**	**30**
	10/17/24	3.2	**1.5**	<2	**28**	<10	<0.5	<1	**17**	<1	**26**	<1	**8.2**	<1	<1	<1	**2.3**	**33**
MW-10I																		
	10/20/20	<2	<1	<2	<2	<10	<0.5	<1	<1	<1	<10	<1	<1	<1	<1	<1	<1	<1
	9/28/21	<2	<1	<2	<2	<10	<0.5	<1	<1	<1	<10	<1	<1	<2	<2	<2	<1	<1
	10/25/22	<2	<1	<2	<2	<10	<0.5	<1	<1	<1	<10	<1	<1	<1	<1	<1	<1	<1
	10/30/23	<2	<1	<2	<2	<10	<0.5	<1	<1	<1	<10	<1	<1	<1	<1	<1	<1	<1
	10/17/24	<2	<1	<2	<2	<10	<0.5	<1	<1	<1	<10	<1	<1	<1	<1	<1	<1	<1
MW-10D																		
	10/20/20	<2	<1	<2	<2	<10	<0.5	<1	<1	<1	<10	<1	<1	<2	<2	<2	<1	<1
	9/28/21	<2	<1	<2	<2	<10	<0.5	<1	<1	<1	<10	<1	<1	<2	<2	<2	<1	<1
	10/25/22	<2	<1	<2	<2	<10	<0.5	<1	<1	<1	<10	<1	<1	<2	<2	<2	<1	<1
	10/30/23	<2	<1	<2	<2	<10	<0.5	<1	<1	<1	<10	<1	<1	<2	<2	<2	<1	<1
	10/17/24	<2	<1	<2	<2	<10	<0.5	<1	<1	<1	<10	<1	<1	<1	<1	<1	<1	<1

Notes:

	Denotes concentration exceeds NH AGQS or GW-2
< 2	Denotes parameter not detected at the indicated laboratory detection limit
NS	Indicates no standard established

Table 3 (continued): Summary of Volatile Organic Compounds
Old Suncook Road Landfill - Concord, NH
All concentrations given in micrograms per liter (µg/L) unless otherwise noted.

Sampling Location	Sampling Date	Ethyl benzene	Xylenes	IsoPropyl benzene	n-Propyl benzene	1,3,5-Trimethyl benzene	1,2,4-Trimethyl benzene	sec-Butyl benzene	p-Isopropyl toluene	n-Butyl benzene	1,3-Dichloro benzene	1,4-Dichloro benzene	1,2-Dichloro benzene	1,2,4-Trichloro benzene	Naphthalene	Tertrachloroethene	Chloroform	Bromodichloro-methane	1,4-Dioxane
	NH AGQS	**700**	**10000**	**800**	**260**	**330**	**330**	**260**	**260**	**260**	**600**	**75**	**600**	**70**	**100**	**5**	**70**	**80+**	**0.32**
MW-2																			
	10/20/20	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<2	<1	<1	<0.5	<0.2
	09/29/21	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<2	<1	<1	<0.5	<0.2
	10/25/22	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<2	<1	<1	<0.5	<0.2
	10/31/23	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<2	<1	<1	<0.5	<0.2
	10/17/24	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<2	<1	<1	<0.5	<0.2
MW-3																			
	10/20/20	<1	**36**	**5.1**	**3.9**	**1.6**	**56**	<1	<1	<1	<1	**14**	**2.7**	<1	**36**	<1	<1	<0.5	**16**
	09/29/21	<1	**3.7**	**4.3**	**3.3**	<1	**9.4**	**1.1**	<1	<1	<1	**18**	**2.9**	<1	**20**	<1	<1	<0.5	**6.5**
	10/25/22	<1	**5.6**	**3**	**1.2**	<1	**16**	<1	<1	<1	<1	**14**	**2.6**	<1	**38**	<1	<1	<0.5	**7.1**
	10/31/23	<1	**70.2**	**2.9**	**2.1**	**2**	**26**	<1	<1	<1	<1	**13**	**3**	<1	**26**	<1	<1	<0.5	**21**
	10/17/24	<1	**1.2**	**2.5**	**1.1**	<1	**5.2**	<1	<1	<1	<1	**14**	**1.9**	<1	**4**	<1	<1	<0.5	**2.9**
MW-4																			
	10/20/20	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	**51**	**1.7**	<1	<2	<1	<1	<0.5	<0.2
	09/29/21	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	**51**	**1.7**	<1	<2	<1	<1	<0.5	<0.2
	10/25/22	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	**22**	<1	<1	<2	<1	<1	<0.5	<0.2
	10/31/23	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	**13**	<1	<1	<2	<1	<1	<0.5	<0.2
	10/17/24	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<2	<1	<1	<0.5	<0.2
MW-5S																			
	10/20/20	**1.2**	**3.1**	**1.9**	<1	<1	**5.9**	<1	<1	<1	<1	**21**	**2**	<1	**8.6**	<1	<1	<0.5	**2.1**
	09/29/21	<1	**1.2**	**1.6**	<1	<1	**1.8**	<1	<1	<1	<1	**21**	**2.2**	<1	**8.6**	<1	<1	<0.5	**4.8**
	10/25/22	<1	**1.1**	**1.5**	<1	<1	<1	<1	<1	<1	<1	**14**	**1.6**	<1	**2.9**	<1	<1	<0.5	**2.3**
	10/31/23	<1	<1	**1.3**	<1	<1	<1	<1	<1	<1	<1	**18**	**2**	<1	**4.9**	<1	<1	<0.5	**2**
	10/17/24	<1	<1	**1.7**	<1	<1	<1	<1	<1	<1	<1	**18**	**1.9**	<1	<2	<1	<1	<0.5	**1.2**
MW-5D																			
	10/20/20	**11**	**189**	**13**	**9.3**	**53**	**110**	**2.4**	<1	<1	**3.7**	**32**	**5.4**	**1.7**	**54**	<1	<1	<0.5	**6.2**
	09/29/21	<1	**101**	**9.9**	**8.2**	**56**	**89**	**2.5**	<1	<1	**3.9**	**31**	**5**	**1.3**	**52**	<1	<1	<0.5	**1.5**
	10/25/22	<1	**83.9**	**9.6**	**6.9**	**42**	**2.4**	**4.5**	<1	<1	<1	**31**	**4.9**	**1.2**	**44**	<1	<1	<0.5	**4.0**
	10/31/23	<1	**72.1**	**7.7**	**4.9**	**35**	**49**	**2**	<1	<1	**4.3**	**30**	**4.6**	**1.9**	**35**	<1	<1	<0.5	**2.7**
	10/17/24	<1	**58.3**	**8.1**	**5.3**	**38**	**44**	**2.1**	<1	<1	<1	**31**	**4.8**	**1.1**	**25**	<1	<1	<0.5	**2.3**
MW-6																			
	10/20/20	<1	<1	**1.5**	<1	<1	**2**	<1	<1	<1	<1	**19**	**4**	<1	<2	<1	<1	<0.5	**1.0**
	09/29/21	<1	**1.2**	**1.5**	<1	<1	**14**	**1.2**	<1	<1	**1.2**	**23**	**4.8**	<1	<2	<1	<1	<0.5	**0.4**
	10/25/22	<1	<1	**1.3**	<1	<1	**13**	<1	<1	<1	<1	**16**	**3.5**	<1	<1	<1	<1	<0.5	**0.26**
	10/31/23	<1	**3.3**	<1	<1	<1	**13**	<1	<1	<1	<1	**20**	**3.3**	<1	<1	<1	<1	<0.5	<0.2
	10/17/24	<1	**1.6**	<1	<1	<1	**18**	<1	<1	<1	<1	**17**	**2.7**	<1	<1	<1	<1	<0.5	<0.2
MW-7D																			
	10/20/20	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<2	<2	<1	<0.5	<0.2
	09/29/21	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<2	<2	<1	<0.5	<0.2
	10/25/22	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<2	<2	<1	<0.5	<0.2
	10/30/23	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<2	<2	<1	<0.5	<0.2
	10/17/24	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<2	<2	<1	<0.5	<0.2
MW-8S																			
	10/20/20	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<2	<2	<1	<0.5	<0.2
	09/29/21	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<2	<2	<1	<0.5	<0.2
	10/25/22	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<2	<2	<1	<0.5	<0.2
	10/30/23	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<2	<2	<1	<0.5	<0.2
	10/17/24	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<2	<2	<1	<0.5	<0.2
MW-8D																			
	10/20/20	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<2	<2	<1	<0.5	**3.0**
	09/29/21	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<2	<2	<1	<0.5	**3.9**
	10/25/22	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<2	<2	<1	<0.5	**3.0**
	10/30/23	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<2	<2	<1	<0.5	**2.3**
	10/17/24	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<2	<2	<1	<0.5	**1.5**
MW-9S																			
	10/20/20	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<2	<2	<1	<0.5	<0.2
	09/29/21	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<5	<1	<1	<0.5	<0.2
	10/25/22	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<2	<2	<1	<0.5	<0.2
	10/31/23	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<2	<2	<1	<0.5	<0.2
	10/17/24	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<2	<2	<1	<0.5	<0.2

Table 3 (continued): Summary of Volatile Organic Compounds
Old Suncook Road Landfill - Concord, NH
All concentrations given in micrograms per liter (µg/L) unless otherwise noted.

Sampling Location	Sampling Date	Ethyl benzene	Xylenes	IsoPropyl benzene	n-Propyl benzene	1,3,5-Trimethyl benzene	1,2,4-Trimethyl benzene	sec-Butyl benzene	p-Isopropyl toluene	n-Butyl benzene	1,3-Dichloro benzene	1,4-Dichloro benzene	1,2-Dichloro benzene	1,2,4-Trichloro benzene	Naphthalene	Tertrachloroethene	Chloroform	Bromodichloro-methane	1,4-Dioxane
	NH AGQS	**700**	**10000**	**800**	**260**	**330**	**330**	**260**	**260**	**260**	**600**	**75**	**600**	**70**	**100**	**5**	**70**	**80+**	**0.32**
MW-9D																			
	10/20/20	**120**	**169**	**10**	**3.6**	**14**	**39**	<1	**2.6**	<1	<1	**15**	**1.8**	<1	**39**	<1	<1	<0.5	**65**
	09/29/21	**71**	**81.5**	**6.6**	**2.5**	**14**	**29**	<1	**2.5**	<1	<1	**14**	**1.7**	<1	**38**	<1	<1	<0.5	**61**
	10/25/22	**45**	**73.8**	**7.4**	**2**	**12**	**27**	<1	<1	<1	<1	**15**	**1.9**	<1	**43**	<1	<1	<0.5	**47**
	10/31/23	**31**	**61.3**	**5**	**1.2**	**9.1**	**23**	<1	<1	<1	<1	**15**	**2**	<1	**37**	<1	<1	<0.5	**44**
	10/17/24	**32**	**56**	**5.8**	**1.4**	**12**	**26**	<1	<1	<1	<1	**16**	**2.2**	<1	**32**	<1	<1	<0.5	**42**
MW-10I																			
	10/20/20	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<2	<2	**5.7**	**0.98**	<0.2
	09/29/21	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<2	<1	**3**	<0.5	<0.2
	10/25/22	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<2	<2	<1	<0.5	<0.2
	10/30/23	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<2	<2	<1	<0.5	<0.2
	10/17/24	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<2	<2	<1	<0.5	<0.2
MW-10D																			
	10/20/20	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	**2**	<2	**4.7**	**0.71**	**1.1**
	09/29/21	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<2	<1	**2.5**	<0.5	**1.1**
	10/25/22	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<2	<2	**1.3**	<0.5	**1.0**
	10/30/23	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<2	<2	**1.2**	<0.5	**0.87**
	10/17/24	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<2	<2	<1	<0.5	**0.62**

Notes:

	Denotes concentration exceeds NH AGQS or GW-2
< 2	Denotes parameter not detected at the indicated laboratory detection limit
NS	Indicates no standard established

Table 4: Summary of Per- and Polyfluoroalkyl Substances Detected in Water Samples
Old Suncook Road Landfill Concord, NH

All concentrations given in nanograms per liter (ng/L) unless otherwise noted

DATE	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorobutanesulfonic acid (PFBS)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorohexanesulfonic acid (PFHxS)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorooctane sulfonic acid (PFOS)	TOTAL (PFOA & PFOS)	Hexafluoropropylene oxide-dimer acid (HFPO)	ADONA	9Cl-PF3ONS	Perfluorodecanoic Acid (PFDA)	MeFOSAA	EtFOSAA	PFUnA	11Cl-PF3OUdS	PFDoA	PFTrDA	PFTeDA
CAS #	**375-22-4**	**2706-90-3**	**375-73-5**	**307-24-4**	**375-85-9**	**355-46-4**	**335-67-1**	**375-95-1**	**1763-23-1**	**-**	**13252-13-6**	**919005-14-4**	**756426-58-1**	**335-76-2**	**2355-31-9**	**2991-50-6**	**2058-94-8**	**763051-92-9**	**307-55-1**	**7262994-8**	**376-06-7**
Previous NH AGQS	NS	NS	NS	NS	NS	NS	70	NS	70	70	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Current NH AGQS	NS	NS	NS	NS	NS	18 [1]	12 [1]	11 [1]	15 [1]	*	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
MW-2																					
10/25/18	<4.31	**4.85**	<4.31	<4.31	<4.31	<4.31	<4.31	<4.31	<4.31	<4.31	-	-	-	-	-	-	-	-	-	-	-
MW-3																					
10/25/18	**13.7**	**10.1**	<4.24	**19.4**	**16.3**	**8.31**	**59.0**	<4.24	<4.24	**59.0**	-	-	-	-	-	-	-	-	-	-	-
10/02/19	<4.38	<4.38	<4.38	**22**	**34.2**	**29.1**	**148**	<4.38	<4.38	*	-	-	-	-	-	-	-	-	-	-	-
10/20/20	**16.5**	**9.91**	<4.48	**18.5**	**20.5**	**14.3**	**186**	<4.48	**8.49**	*	-	-	-	-	-	-	-	-	-	-	-
10/25/22	**-**	**-**	<2.01	**21.2**	**20.7**	**6.63**	**57.0**	<2.01	**7.44**	*	<2.01	<2.01	<2.01	<2.01	<2.01	<2.01	<2.01	<2.01	<2.01	<2.01	<2.01
MW-4																					
10/02/19	<4.62	<4.62	<4.62	<4.62	<4.62	<4.62	<4.62	<4.62	<4.62	<4.62	-	-	-	-	-	-	-	-	-	-	-
09/29/21	<2.10	<2.10	<2.10	**2.22**	<2.10	<2.10	**2.44**	<2.10	<2.10	<2.10	<2.10	<2.10	<2.10	<2.10	<2.10	<2.75	<2.10	<2.10	<2.10	<2.10	<2.10
MW-5D																					
10/25/18	**14.0**	**13.5**	<4.38	**37.7**	**26.3**	**25.3**	**59.0**	<4.38	<4.38	**59.0**	-	-	-	-	-	-	-	-	-	-	-
10/02/19	<4.35	<4.35	<4.35	**24.3**	**23.4**	**24.5**	**48.0**	<4.35	<4.35	*	-	-	-	-	-	-	-	-	-	-	-
10/20/20	<4.40	**16.8**	<4.40	**24.9**	**33.3**	**17.0**	**52.5**	<4.40	<4.40	*	-	-	-	-	-	-	-	-	-	-	-
10/25/22	-	**-**	**5.06**	**25.1**	**31.2**	**24.9**	**65.8**	<2.01	<2.01	*											
MW-5S																					
10/02/19	<4.51	<4.51	<4.51	**22.8**	**10.7**	<4.51	**41.2**	<4.51	<4.51	*	-	-	-	-	-	-	-	-	-	-	-
MW-7D																					
10/25/18	<4.32	<4.32	<4.32	<4.32	<4.32	<4.32	<4.32	<4.32	<4.32	<4.32	-	-	-	-	-	-	-	-	-	-	-
09/29/21	<2.01	<2.01	<2.01	<2.01	<2.01	<2.01	<2.01	<2.01	<2.01	*	<2.01	<2.01	<2.01	<2.01	<2.01	<2.64	<2.01	<2.01	<2.01	<2.01	<2.01
MW-8D																					
10/25/18	<4.22	**11.9**	<4.22	**11.0**	<4.22	<4.22	<4.22	<4.22	<4.22	<4.22	-	-	-	-	-	-	-	-	-	-	-
09/29/21	<2.00	<2.00	<2.00	**31.7**	**18.8**	<2.00	<2.00	<2.00	<2.00	*	<2.00	<2.00	<2.00	<2.00	<2.00	<2.63	<2.00	<2.00	<2.00	<2.00	<2.00
MW-9D																					
10/25/18	**17.7**	**14.6**	<4.22	**38.8**	**27.4**	**21.7**	**119**	<4.22	**22.9**	**141.9**	-	-	-	-	-	-	-	-	-	-	-
10/02/19	<4.41	<4.41	<4.41	**26.7**	**17.6**	**14.0**	**90.8**	<4.41	**19.3**	*	-	-	-	-	-	-	-	-	-	-	-
10/20/20	**13.9**	**13.2**	<4.40	**42.4**	**26.5**	**12.7**	**101**	<4.40	**13.1**	*	-	-	-	-	-	-	-	-	-	-	-
10/25/22	**-**	**-**	<1.99	**30.4**	**24.0**	**16.8**	**124**	<1.99	**18.9**	*	<1.99	<1.99	<1.99	<1.99	<1.99	<1.99	<1.99	<1.99	<1.99	<1.99	<1.99
MW-9S																					
10/02/19	<4.34	<4.34	<4.34	<4.34	<4.34	<4.34	**8.70**	<4.34	<4.34	*	-	-	-	-	-	-	-	-	-	-	-
MW-10D																					
02/12/19	**4.90**	**7.93**	<4.00	**7.37**	**4.15**	<4.00	**9.80**	<4.00	<4.00	**9.80**	-	-	-	-	-	-	-	-	-	-	-
10/02/19	<4.36	**9.69**	<4.36	**6.10**	<4.36	<4.36	**6.86**	<4.36	<4.36	*	-	-	-	-	-	-	-	-	-	-	-
MW-7S																					
09/29/21	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	*	<2.00	<2.00	<2.00	<2.00	<2.00	<2.63	<2.00	<2.00	<2.00	<2.00	<2.00

Table 4: Summary of Per- and Polyfluoroalkyl Substances Detected in Water Samples
Old Suncook Road Landfill Concord, NH

All concentrations given in nanograms per liter (ng/L) unless otherwise noted

DATE	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorobutanesulfonic acid (PFBS)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorohexanesulfonic acid (PFHxS)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorooctane sulfonic acid (PFOS)	TOTAL (PFOA & PFOS)	Hexafluoropropylene oxide-dimer acid (HFPO)	ADONA	9Cl-PF3ONS	Perfluorodecanoic Acid (PFDA)	MeFOSAA	EtFOSAA	PFUnA	11Cl-PF3OUdS	PFDoA	PFTrDA	PFTeDA
CAS #	**375-22-4**	**2706-90-3**	**375-73-5**	**307-24-4**	**375-85-9**	**355-46-4**	**335-67-1**	**375-95-1**	**1763-23-1**	**-**	**13252-13-6**	**919005-14-4**	**756426-58-1**	**335-76-2**	**2355-31-9**	**2991-50-6**	**2058-94-8**	**763051-92-9**	**307-55-1**	**7262994-8**	**376-06-7**
Previous NH AGQS	NS	NS	NS	NS	NS	NS	70	NS	70	70	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Current NH AGQS	NS	NS	NS	NS	NS	18 [1]	12 [1]	11 [1]	15 [1]	*	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
MW-8S																					
09/29/21	<2.07	<2.07	**3.93**	<2.07	<2.07	<2.07	<2.07	<2.07	<2.07	*	<2.07	<2.07	<2.07	<2.07	<2.07	<2.72	<2.07	<2.07	<2.07	<2.07	<2.07
MW-12D																					
09/29/21	<2.08	<2.08	<2.08	<2.08	<2.08	<2.08	<2.08	<2.08	<2.08	*	<2.08	<2.08	<2.08	<2.08	<2.08	<2.74	<2.08	<2.08	<2.08	<2.08	<2.08
MW-12I																					
09/29/21	<2.05	<2.05	<2.05	<2.05	<2.05	<2.05	**4.33**	<2.05	<2.05	*	<2.05	<2.05	<2.05	<2.05	<2.05	<2.69	<2.05	<2.05	<2.05	<2.05	<2.05
MW-12S																					
09/29/21	<2.07	<2.07	**2.80**	<2.07	<2.07	**10.5**	**5.97**	<2.07	**10.6**	*	<2.07	<2.07	<2.07	<2.07	<2.07	<2.72	<2.07	<2.07	<2.07	<2.07	<2.07
Ranges at Pembroke wells						**ND - 6.69**	**ND - 5.88**		**ND - 19.2**												

NOTE:

ND - Not detected

NS - No standard

- AGQS exceedance

* no longer regulated

Figure 1

Updated Site Plan with GMZ, Monitoring Locations and October 2024 Contours

Notes:

1. Topography by City of Concord, Community Development Department, GIS Plans dated April 2000. Reference elevation NGVD.
2. Locations of groundwater monitoring wells, test borings, test pits and soil gas survey SG–1 through SG–8 were survey located by T.F. Bernier, Inc. Concord, NH in June, 2004 and March 2006. Locations of soil gas survey SG–9 through SG–14 and gas monitoring wells GMW–1 through GMW–6 are approximate and are based on field measurements and observations by CMA Engineers, Inc.
3. Approximate property lines shown are based on City of Concord Tax Maps. Surveyed property lines are from Sanford Surveying & Engineering Road Concept Plan prepared for Robert V. and Richard E. Aranosian, July 26, 2004.
4. Test Borings and Monitoring wells TB1–2, and MW–4, 5S, 5D and 6 were installed by Great Works Test Boring in May 2004. The borings were observed and logged by Exeter Environmental Associates. Monitoring wells MW–1, 2, & 3 were installed by ARC Environmental Consultants for REI Development, July 2001. Groundwater monitoring wells MW–7S, 7D, 8S, 8D, 9S and 9D were installed by Great Works Test Boring in February 2004. The borings were observed and logged by Exeter Environmental Associates.
5. Gas Migration Monitoring Wells GMW–1 and 2 were installed by Great Works Test Boring in June 2004 and were observed and logged by Exeter Environmental Associates. GMW–3 through GMW–6 were installed by Great Works Test Boring in April 2007 and were observed and logged by CMA Engineers.
6. Monitoring wells MW–10 S,I,D, MW–11 S,I,D, and MW–12 S,I,D were installed by Expedition Drilling and field surveyed by T.F. Bernier in December 2008.

Legend:

- Tax Map Lines
- GMW–2 — Gas Monitoring Well
- MW–4 — Groundwater Monitoring Well
- 275 — Approximate Shallow GW Contours (October 2024)
- 275 — Approximate Deep GW Contours (October 2024)
- Approximate Limit of Waste
- 753-15 — Tax Map & Lot Number
- GMZ Boundary
- Approximate Location of Landfill Gas Management System

MW–4
PFOA 2.44 ng/L*
PFOS <2.10 ng/L*
PFHxS <2.10 ng/L*
ARSENIC <0.0005 mg/L
MANGANESE 1.3 mg/L
*2021

MW–4 278.62
GMW–1S,I,D

MW–7S
PFOA <2.00 ng/L*
PFOS <2.00 ng/L*
PFHxS <2.00 ng/L*
ARSENIC <0.0005 mg/L
MANGANESE <0.005 mg/L
*2021

MW–7S 279.24
MW–7D 277.43
GMW–6S,I,D

MW–7D
PFOA <2.01 ng/L*
PFOS <2.01 ng/L*
PFHxS <2.01 ng/L*
ARSENIC 0.0069 mg/L
MANGANESE 0.31 mg/L
cis-1,2-DCE 2.5 ug/L
*2021

MW–3 285.36
MW–5 284.59
MW–5S 287.51
MW–5D 281.72
MW–6 283.79
MW–9D 280.58
MW–9S 283.30
MW–8S 280.94
MW–8D 280.91
GMW–3S,I,D
GMW–4S,I,D
GMW–2S,I,D
GMW–5S,I,D

MW–10 S,I,D
271.49
274.16

MW–10S
PFAS N/A
ARSENIC <0.0005 mg/L
MANGANESE <0.005 mg/L
1,4-dioxane <0.2 ug/L

MW–10D
PFOA 6.86 ng/L*
PFOS <4.36 ng/L*
PFHxS <4.36 ng/L*
ARSENIC <0.0005mg/L
MANGANESE 0.0079 mg/L
1,4-dioxane 0.62 ug/L
*2019

MW–11 S,I,D
273.73
273.59
273.52

MW–11I
PFAS N/A
ARSENIC <0.0005 mg/L
MANGANESE <0.005 mg/L
MIBE <5 ug/L*
*2019

MW–11S
PFAS N/A
ARSENIC <0.0005 mg/L
MANGANESE 0.081 mg/L
MIBE <5 ug/L*
*2019

MW–11D
PFAS N/A
ARSENIC 0.0024 mg/L
MANGANESE 0.37 mg/L
MIBE 2.9 ug/L*
*2019

MW–12I
PFOA 4.33 ng/L*
PFOS <2.05 ng/L*
PFHxS <2.05 ng/L*
ARSENIC <0.0005 mg/L
MANGANESE <0.005 mg/L
*2021

MW–12S
PFOA 10.5 ng/L*
PFOS 5.97 ng/L*
PFHxS 10.6 ng/L*
ARSENIC <0.0005 mg/L
MANGANESE <0.005 mg/L
*2021

MW–12 S,I,D
277.16
276.9
277.29

MW–12D
PFOA <2.08 ng/L*
PFOS <2.08 ng/L*
PFHxS <2.08 ng/L*
ARSENIC <0.0005 mg/L
MANGANESE <0.005 mg/L
*2021

MULBERRY STREET
AIRPORT ROAD
OLD SUNCOOK ROAD
MANCHESTER STREET
GARVINS FALLS ROAD
INTEGRA DRIVE
To Soucook River
To Soucook River

by	date	revision	no.

CMA ENGINEERS
Civil/Environmental/Structural
Portsmouth NH • Manchester NH • Portland ME
603/431-6196 • 603/627-0708 • 207/541-4223
cmaengineers.com

designed by:
drawn by: JBS
approved by: WAS
date: September 2025
project no: 531
file name: 531\dwg\s-p-contours-2024.dwg
scale: 120' 60' 0 Scale: 1" = 60'

Old Suncook Road Landfill
City of Concord, NH
Groundwater Management Permit
Renewal Application
GMZ, Monitoring Points, Site Plan and Groundwater Contours October 2024

drawing no. 1
sheet: 1 of 1

F:\CADD\PROJECTS\531\dwg\engineer\GWPermit\531egwsp-contours-2024.dwg Date Plotted: Sep 12, 2025 – 2:00pm Plotted By: JSTRICKLAND

GMZ Property Listing

New Tax Map/ Lot/Unit	Old Tax Map/ Block - Lot No.	Property Address	Owner Name and Address	Deed Reference (Book / Page)
782Z/ 19	110/ 2/ 5	Airport Road	City of Concord 41 Green Street Concord, NH 03301-4255	2571/0782
783Z/ 13	110K/ 1-13	8 Integra Drive	Metzer/McGuire Inc P.O. Box 2217 Concord, NH 03302-2217	3839/0710
783Z/ 11	110K/1-15	12 Integra Drive	Mark Plefebvre Recovable Trust of 1997 7119 Hacienda Drive Grant , FL 32949-3417	3788/1899
783Z/ 10	109/ 6-26	14 Integra Drive	NH State 14 Integra Dr Concord, NH 03301-5102	3618/1539
633Z/ 3	110/ 1-6	65 Airport Road	City of Concord 41 Green Street Concord, NH 03301-4255	2693/1655
784Z/ 6	110/ 3-1	59 Garvins Falls Road	Daniel & Kristen Curren 59 Garvins Falls Road Concord, NH 03301-5175	3362/0902
753Z/ 15	110B/ 1-3	3 Mulberry Street	Charleston & Kyle Cushman 3 Mulberry Street Concord, NH 03301-5239	3771-0886
753Z/ 16	110B/ 1-4	9 Mulberry Street	Romi Banerjee 9 Mulberry Street Concord, NH 03301-5239	0/0
753Z/ 17	110B/ 1-5	11 Mulberry Street	Marc & Kristine Nailor 11 Mulberry Street Concord, NH 03301-5239	3199/0586
753Z/ 18	110B/ 1-6	15 Mulberry Street	Shireen Meskoob 15 Mulberry Street Concord, NH 03301-5239	3855/2490
753Z/ 19	110B/ 1-7	19 Mulberry Street	Nevzat & Ayse Eser 19 Mulberry Street Concord, NH 03301-5239	2730/1060
753Z/ 20	110B/ 1-8	23 Mulberry Street	Angela Shepa & Biraj Gurung 23 Mulberry Street Concord, NH 03301-5239	3857/2994
753Z/ 21	110B/ 1-9	27 Mulberry Street	Bill A. & Ma Leah G. Bernardo 27 Mulberry Street Concord, NH 03301-5239	2727/1511
781Z/ 11	110D/ 1-7	93-95 Manchester Street	93-95 Manchester Street LLC 95 Manchester Street Concord, NH 03301-5111	2488/1983
782Z/ 34	110D/ 1-9	101 Manchester Street	95 Manchester Street LLC 95 Manchester Street Concord, NH 03301-5501	3017/0066
782Z/ 35	110D/ 1-14	105 Manchester Street	Rupert S. Dance, LLC 105 Kennard Road Nottingham, NH 03290-5806	3426/0793
782Z/ 36	110D/ 1-13	109 Manchester Street	November 25 2009, LLC 65 Post Road Hooksett, NH 03106-1725	3250/1377
782Z/ 37	110D/ 1-16	113 Manchester Street	Marlene JD Real Estate Holdings, LLC c/o Robert Dabrowski P.O. Box 616 Marlborough, NH 03445-0616	3141/1240
782Z/ 38	110D/ 1-8	117 Manchester Street	117 Manchester Street LLC P.O. Box 10483 Bedford, NH 03110-0483	3530/0849

New Tax Map/ Lot/Unit	Old Tax Map/ Block - Lot No.	Property Address	Owner Name and Address	Deed Reference (Book / Page)
782Z/ 40	110K/ 1-2	134 Manchester Street	Amanda Training Center LLC 594 Route 3A Bow, NH 03304-3217	3804/2387
782Z/ 31	110E/ 2-3	137 Manchester Street	Daval Realty Associates 137 Manchester Street Concord, NH 03301-5118	3712/2589
782Z/ 39	110K/ 1-3	142 Manchester Street	Blue Penny Realty 137 Manchester St Concord, NH 03301-5112	3706/0836
783Z/ 17	110K/ 1-4	146 Manchester Street	Brian Duval Realty LLC 146 Manchester St Concord, NH 03301-5112	3810/1623
783Z/ 16	110K/ 1-16	150 Manchester Street	Manchester Street Concord Auto LLC 300 Trade Ctr Ste 7700 Woburn, MA 01801-7419	3836/2445
783Z/ 15	110K/ 1-5	158 Manchester Street	PRM Auo/Concord II LLC 300 Trade Ctr Ste 7700 Woburn, MA 01801-7419	32844/0127
783Z/ 14	110K/ 1-12	162 Manchester Street	New England Industrial Properties Inc. 24 Harriman Dr Auburn, ME 04210-8300	3263/0620
782Z/ 33	110D/ 1-15	7 Old Suncook Road	Seven Old Suncook Road LLC 7 Old Suncook Road Concord, NH 03301-7318	3143/1716
781Z/ 10	110D/ 2-3	13 Old Suncook Road	Friedman Court II LP 105 Loudon Road Suite 1 Concord, NH 03301-5601	3021/1724
782Z/ 26	110D/ 2-7	15 Old Suncook Road	Darlene A. & Bruce A. Labrie 15 Old Suncook Road Concord, NH 03301-7318	3016/1988
782Z/ 27	110D/ 2-10	19 Old Suncook Road	Friedman Court I LP 105 Loudon Road Suite 1 Concord, NH 03301-5601	3021/1698
781Z/ 17	110D/ 3-6	5 Garvins Falls Road	SARP Realty, LLC 72 Manchester Street Concord, NH 03301-5129	3756/1990
781Z/ 18	110D/ 3-5	7 Garvins Falls Road	Gail R. Matson 7 Garvins Falls Road Concord, NH 03301-5175	3350/0949
781Z/ 19	110D/ 3-4	9 Garvins Falls Road	Aranosian/Blais Family Real Estate Trust 5 Shore View Dr Bow, NH 03304-4417	3875/0297
781Z/ 20	110D/ 3-3	11 Garvins Falls Road	Aranosian/Blais Family Real Estate Trust 5 Shore View Dr Bow, NH 03304-4417	3548/0323
784Z/ 1	110D/ 3-1	15 Garvins Falls Road	Pam Sampadian Revocable Trust 308 South Street Concord, NH 03301-2600	3414/1867
781Z/ 16	110D/ 3-7	72 Manchester Street	Sarp Realty LLC 72 Manchester Street Concord, NH 03301-5129	2404/0820
781Z/ 15	110D/ 3-8	84 Manchester Street	84 Manchester St Realty Trust 84 Manchester Street Concord, NH 03301-5129	1943/1368
781Z/ 15	110D/ 3-23	92 Manchester Street	JCLB Properties LLC 92 Manchester Street Concord, NH 03301-5129	3878/0188

New Tax Map/ Lot/Unit	Old Tax Map/ Block - Lot No.	Property Address	Owner Name and Address	Deed Reference (Book / Page)
781Z/ 13	110D/ 3-9	88 – 92 Manchester Street	JCLB Properties LLC 92 Manchester Street Concord, NH 03301-5129	3878/0186
781Z/ 12	110D/ 3-10	94 Manchester Street	94 Manchester Street, LLC 549 US Rte 1-Bypass Portsmouth, NH 03801-4131	3629/0787
781Z/ 12-1	110D/ 3-10	98 Manchester Street	94 Manchester Street, LLC 549 US Rte 1-Bypass Portsmouth, NH 03801-4131	3629/0787
782Z/ 46	110D/ 3-2	102 Manchester Street	Obsidian ML 7 LLC Store #14267 11995 El Camino Real San Diego, CA 92130-2539	3831/2545
782Z/ 45	110D/ 3-12	106 Manchester Street	Taylor-Corliss Holdings LLC 106 Manchester Street Concord, NH 03301-5151	3661/0067
782Z/ 44	110D/ 3-13	110 Manchester Street	Two Wheeler Holdings LLC 98 Willow Street Manchester, NH 03103-6322	3816/0436
782Z/ 43	110D/ 3-15	118 Manchester Street	118 Summit Property LLC 33 Dominique Dr Concord, NH 03301-5947	3618/2804
782Z/ 42	110D/ 3-16	124 Manchester Street	David & Jennifer Albert 2021 Trust 37 Ferrin Road Concord, NH 03303-4139	3760/1929
782Z/ 41	110D/ 3-17	126 Manchester Street	David & Jennifer Albert 2021 Trust 37 Ferrin Road Concord, NH 03303-4139	3800/2469
782Z/ 30	110E/ 2-9	151-163 Manchester Street	Pasquale F. Alosa Revocable Trust PO Box 1182 Concord, NH 03302-1182	3509/1341
783Z/ 1	110E/ 2-10	169 Manchester Street	Forget & Boucher LLC 175 Manchester Street Concord, NH 03301-5131	3270/1268
782Z/ 8	110E/ 3-1 - 3-6	234 Airport Road	Daval Realty Associates LLC Attn: Banks Chevrolet 137 Manchester Street Concord, NH 03301-5118	3743/0515
782Z/ 12	110E/ 3-7	222 Airport Road	Shawn Palmer & Jane Chloe 222 Airport Road Concord, NH 03301-5203	3771/1685
782Z/ 13	110E/ 3-8	220 Airport Road	Joe & Lindsey Maccini Ramsay 220 Airport Road Concord, NH 03301-5203	3486/2958
782Z/ 14	110E/ 3-9	216 Airport Road	Eva M. Burnham & Edward F Tomsic 216 Airport Road Concord, NH 03301-5203	3085/0420
782Z/ 15	110E/ 3-10	214 Airport Road	Anthony & Alberta Oliveira 214 Airport Road Concord, NH 03301-5203	3786/0467
782Z/ 3	110E/ 4-1	227 Airport Road	Madeline E. White Revocable Trust 227 Airport Road Concord, NH 03301-7307	2504/0547
782Z/ 4	110E/ 4-8	237 Airport Road	Jake T. Curtin 237 Airport Road Concord, NH 03301-7307	3485/2950

New Tax Map/ Lot/Unit	Old Tax Map/ Block - Lot No.	Property Address	Owner Name and Address	Deed Reference (Book / Page)
782Z/ 2	110E/ 4-9	223 Airport Road	Michael & Lindsey Haberland 223 Airport Road Concord, NH 03301-7307	3639/1308
782Z/ 1	110E/ 4-10	219 Airport Road	Susan A. Chuvala 219 Airport Road Concord, NH 03301-7307	2040/1470
753Z/ 12	110F/ 1-1	178 Airport Road	Michael J. Quinn 178 Airport Road Concord, NH 03301-5203	2179/1751
753Z/ 11	110F/ 1-2	180 Airport Road	Dana D'Esopo 180 Airport Road Concord, NH 03301-5203	3877/2787
753Z/ 10	110F/ 1-3	182 Airport Road	John Swenson 38 Hutchins Street Concord, NH 03301-3208	3667/1928
782Z/ 27	110F/ 1-4	184 Airport Road	Penny A. Letourneau Revocable Trust 184 Airport Road Concord, NH 03301-5203	3750/2586
782Z/ 26	110F/ 1-5	186 Airport Road	Ronald D. & Sally A. Paul 186 Airport Road Concord, NH 03301-5203	1282/0398
782Z/ 25	110F/ 1-6	188 Airport Road	Donald Noel 188 Airport Road Concord, NH 03301-5203	3744/2949
782Z/ 24	110F/ 1-7	190 Airport Road	David G. & Roberta Thompson 190 Airport Road Concord, NH 03301-5203	3195/1226
782Z/ 23	110F/ 1-8	192 Airport Road	David R. & Sharon L. Levesque 192 Airport Road Concord, NH 03301-5203	2157/1104
782Z/ 22	110F/ 1-9	202 Airport Road	Monica Dresser Trust 202 Airport Road Concord, NH 03301-5203	3642/1683
782Z/ 21	110F/ 1-10	204 Airport Road	Kayla Zupokfska & Timothy McMeniman 204 Airport Road Concord, NH 03301-5203	3891/0038
782Z/ 20	110F/ 1-11	206 Airport Road	Devin Hedderig 206 Airport Road Concord, NH 03301-5203	3402/1768
782Z/ 18	110F/ 1-12	208 Airport Road	Ferris Family Revocable Trust 208 Airport Road Concord, NH 03301-5203	3278/0661
782Z/17	110F/ 1-13	210 Airport Road	Mark Fanny & Donna Drew-Fanny 210 Airport Road Concord, NH 03301-5203	2172/1684
782Z/ 16	110F/ 1-14	212 Airport Road	William M. & Tracey A. Biron 212 Airport Road Concord, NH 03301-5203	2475/0536
784Z/ 4	110I/ 1-1	53 Garvins Falls Road	Steven H. Foley 53 Garvins Falls Road Concord, NH 03301-5175	2559/1003
784Z/ 3	110I/ 1-4	47 Garvins Falls Road	Marcel J. Nadeau 47 Garvins Falls Road Concord, NH 03301-5175	3171/0331

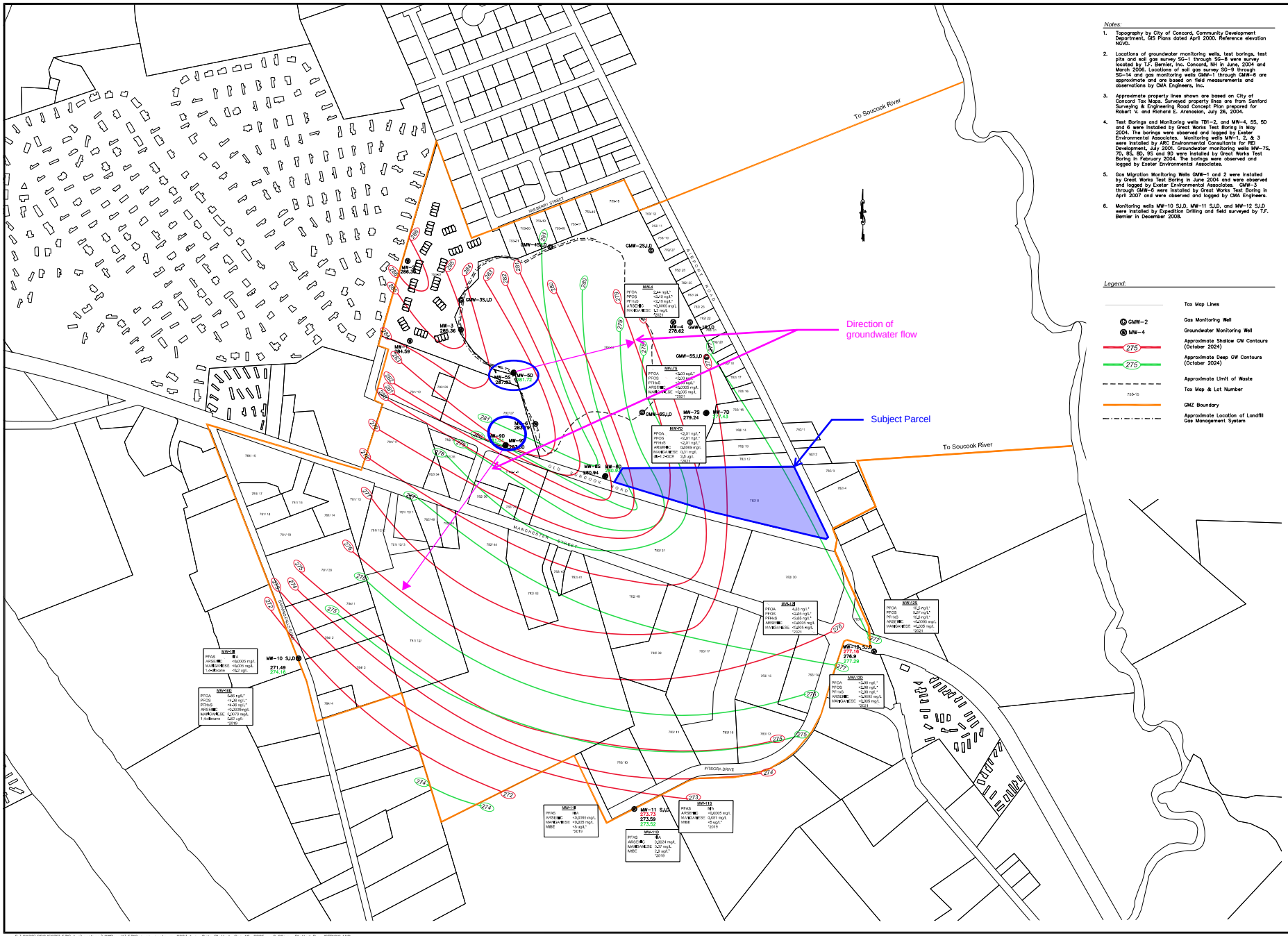
New Tax Map/ Lot/Unit	Old Tax Map/ Block - Lot No.	Property Address	Owner Name and Address	Deed Reference (Book / Page)
784Z/ 2	110I/ 1-5	45 Garvins Falls Road	Cyprian & Marie Mugenga 45 Garvins Falls RoadC oncord, NH 03301-5175	3694/0122
781Z/ 21	110I/ 2-4	10 Garvins Falls Road	Capital City Real Estate & Holdings LLC 16 Pine Woods Road East Kingston, NH 03827-2131	3831/0937
753Z/ 22/ 1/ 1	110L/ 1-1	33 Mulberry Street Apt 1	Ben Gelernter 33 Mulberry Street, Apt 1 Concord, NH 03301-5289	3866/0009
753Z/ 22/ 1/ 2	110L/ 1-2	33 Mulberry Street Apt 2	William E. Grennon, Jr. 33 Mulberry Street, Apt 2 Concord, NH 03301-5289	3588/0782
753Z/ 22/ 1/ 3	110L/ 1-3	33 Mulberry Street Apt 3	Maureen A. Juliano 33 Mulberry Street, Apt 3 Concord, NH 03301-5289	3589/0069
753Z/ 22/ 1/ 4	110L/ 1-4	33 Mulberry Street Apt 4	Timothy & Carol Hoyt 33 Mulberry Street, Apt 4 Concord, NH 03301-5289	3626/2121
753Z/ 22/ 2/ 1	110L/ 1-5	39 Mulberry Street Unit 1	Tracey J. Caron 39 Mulberry St Unit 1 Concord, NH 03301-5290	2683/1144
753Z/ 22/ 2/ 2	110L/ 1-6	39 Mulberry Street Unit 2	Kenneth D. Cassidy 12 Adams Ave Merrimack, NH 03054-7020	2684/0978
753Z/ 22/ 2/ 3	110L/ 1-7	39 Mulberry Street Unit 3	Sharon Kelly-Corson Revocable Trust 39 Mulberry St Unit-3 Concord, NH 03301-5290	3887/0087
753Z/ 22/ 2/ 4	110L/ 1-8	39 Mulberry Street Unit 4	Catherine McGuire Revocable Trust 20 Beachside Drive Apt 201Vero Beach, FL 32963-9566	3585/1905
753Z/ 22/ 3/ 1		47 Mulberry Street Unit 1	Stefanos Papanikolau 47 Mulberry St Unit 1 Concord, NH 03301-5295	3499/1264
753Z/ 22/ 3/ 2		47 Mulberry Street Unit 2	Raymond & Alvina Hemond 47 Mulberry St Unit 2 Concord, NH 03301-5295	3437/0858
753Z/ 22/ 3/ 3		47 Mulberry Street Unit 3	Peter Gakumo 47 Mulberry St Unit 3 Concord, NH 03301-5295	3872/2439
753Z/ 22/ 3/ 4		47 Mulberry Street Unit 4	Cory Breakstone Revocable Trust 47 Mulberry St Unit 4 Concord, NH 03301-5295	3835/2289
753Z/ 22/ 4/ 1		53 Mulberry Street Unit 1	Mehrdad & Rogheyeh Meskoob 53 Mulberry St Unit 1 Concord, NH 03301-5295	3873/0592
753Z/ 22/ 4/ 2		53 Mulberry Street Unit 2	Janet Tucker 53 Mulberry St Unit 2 Concord, NH 03301-5295	3644/1378
753Z/ 22/ 4/ 3		53 Mulberry Street Unit 3	Sandra & Charles Pace 53 Mulberry St Unit 3 Concord, NH 03301-5295	3838/2588
753Z/ 22/ 4/ 4		53 Mulberry Street Unit 4	Jeffrey Baines 53 Mulberry St Unit 4 Concord, NH 03301-5295	3631/0995
753Z/ 22/ 5/ 1		61 Mulberry Street Unit 1	Diane Chadwick 61 Mulberry St Unit 1 Concord, NH 03301-5295	2796/1045
753Z/ 22/ 5/ 2		61 Mulberry Street Unit 2	Mary Hamilton 61 Mulberry St Unit 2 Concord, NH 03301-5295	3865/2181

New Tax Map/ Lot/Unit	Old Tax Map/ Block - Lot No.	Property Address	Owner Name and Address	Deed Reference (Book / Page)
753Z/ 22/ 5/ 3		61 Mulberry Street Unit 3	Patrick Curley 61 Mulberry St Unit 3 Concord, NH 03301-5295	3860/1592
753Z/ 22/ 5/ 4		61 Mulberry Street Unit 4	Amie Pariseau Revocable Trust 61 Mulberry St Unit 4 Concord, NH 03301-5295	3767/0482
753Z/ 22/ 6/ 1		65 Mulberry Street Unit 1	Thomas Benner 8 Edgewood Circle Plymouth, NH 02360-8214	3655/1140
753Z/ 22/ 6/ 2		65 Mulberry Street Unit 2	Brian Eddy 65 Mulberry St Unit 2 Concord, NH 03301-5295	3349/1857
753Z/ 22/ 6/ 3		65 Mulberry Street Unit 3	Katherine Dibble 65 Mulberry St Unit 3 Concord, NH 03301-5295	3713/0337
753Z/ 22/ 6/ 4		65 Mulberry Street Unit 4	Danielle Latta 65 Mulberry St Unit 4 Concord, NH 03301-5295	3887/2324
753Z/ 22/ 7/ 1		69 Mulberry Street Unit 1	Helen Smith 69 Mulberry St Unit 1 Concord, NH 03301-5295	3887/1224
753Z/ 22/ 7/ 2		69 Mulberry Street Unit 2	Linda & William Darby 69 Mulberry St Unit Concord, NH 03301-5295	3832/2708
753Z/ 22/ 7/ 3		69 Mulberry Street Unit 3	Helaina Sacco 69 Mulberry St Unit 3 Concord, NH 03301-5295	3898/2675
753Z/ 22/ 7/ 4		69 Mulberry Street Unit 4	Denise Tarquinio Living Trust 69 Mulberry St Unit 4 Concord, NH 03301-5295	3818/2359
753Z/ 22/ 8/ 1		60 Mulberry Street Unit 1	Michael & Amy Nikitas 60 Mulberry St Unit 1 Concord, NH 03301-5295	3752/2041
753Z/ 22/ 8/ 2		60 Mulberry Street Unit 2	Kenneth Stitt 60 Mulberry St Unit 2 Concord, NH 03301-5295	3830/0238
753Z/ 22/ 8/ 3		60 Mulberry Street Unit 3	Christopher & Lisa Saturley 60 Mulberry St Unit 3 Concord, NH 03301-5295	3855/0467
753Z/ 22/ 8/ 4		60 Mulberry Street Unit 4	Susan Clogston 60 Mulberry St Unit 4 Concord, NH 03301-5295	2791/0929
753Z/ 22/ 9/ 1		56 Mulberry Street Unit 1	Barbara Sanborn-Valenti 56 Mulberry St Unit 1 Concord, NH 03301-5295	3813/1228
753Z/ 22/ 9/ 2		56 Mulberry Street Unit 2	John Fitgerald Revocable Trust 56 Mulberry St Unit 2 Concord, NH 03301-5295	3893/0722
753Z/ 22/ 9/ 3		56 Mulberry Street Unit 3	Andre Soucy, Jr. 56 Mulberry St Unit 3 Concord, NH 03301-5295	3701/2142
753Z/ 22/ 9/ 4		56 Mulberry Street Unit 4	Lauri & David Lacourse 56 Mulberry St Unit 4 Concord, NH 03301-5295	3421/1698
753Z/ 22/ 10/ 1		52 Mulberry Street Unit 1	Yuan Ming & Wenyi Hsiao 52 Mulberry St Unit 1 Concord, NH 03301-5295	2740/0093
753Z/ 22/ 10/ 2		52 Mulberry Street Unit 2	Diane Delisle 52 Mulberry St Unit 2 Concord, NH 03301-5295	2743/0230
753Z/ 22/ 10/ 3		52 Mulberry Street Unit 3	Randall & Megan Shaw 52 Mulberry St Unit 3 Concord, NH 03301-5295	3818/0824

New Tax Map/ Lot/Unit	Old Tax Map/ Block - Lot No.	Property Address	Owner Name and Address	Deed Reference (Book / Page)
753Z/ 22/ 10/ 4		52 Mulberry Street Unit 4	Shawn Collins 52 Mulberry St Unit 4 Concord, NH 03301-5295	3329/0642
753Z/ 22/ 11/ 1		48 Mulberry Street Unit 1	Frank Emiro 48 Mulberry St Unit 1 Concord, NH 03301-5298	3878/2727
753ZZ/ 22/ 11/ 2		48 Mulberry Street Unit 2	True Way New Hampshire, LLC 48 Mulberry St Unit 2 Raymond, NH 03077-1612	3799/0425
753Z/ 22/ 11/ 3		48 Mulberry Street Unit 3	Shannon Fica 48 Mulberry St Unit 3 Concord, NH 03301-5298	3681/1532
753Z/ 22/ 11/ 4		48 Mulberry Street Unit 4	Steven Burbank 48 Mulberry St Unit 4 Concord, NH 03301-5298	3601/2110
753Z/ 22/ 12/ 1		44 Mulberry Street Unit 1	Bevan Timm 44 Mulberry St Unit 1 Concord, NH 03301-5294	3543/2506
753Z/ 22/ 12/ 2		44 Mulberry Street Unit 2	Gerald Slaughter 44 Mulberry St Unit 2 Concord, NH 03301-5294	2887/1646
753Z/ 22/ 12/ 3		44 Mulberry Street Unit 3	Eric & Nathan Larson 44 Mulberry St Unit 3 Concord, NH 03301-5294	3357/1313
753Z/ 22/ 12/ 4		44 Mulberry Street Unit 4	Claire Gruenfelder 44 Mulberry St Unit 4 Concord, NH 03301-5294	3598/0614
753Z/ 22/ 13/ 1		1 Peach Street Unit 1	Christopher & Janel McCabe 1 Peach St Unit 1 Concord, NH 03301-5288	2751/1318
753Z/ 22/ 13/ 2		1 Peach Street Unit 2	Tina Dubois 1 Peach St Unit 2 Concord, NH 03301-5288	3453/2494
753Z/ 22/ 13/ 3		1 Peach Street Unit 3	Elizabeth & Edwin Mignault 1 Peach St Unit 3 Concord, NH 03301-5288	3180/1745
753Z/ 22/ 13/ 4		1 Peach Street Unit 4	Ourania Georgopoulos 1 Peach St Unit 4 Concord, NH 03301-5288	2847/0915
753Z/ 22/ 14/ 1		5 Peach Street Unit 1	Steven Daniels & Mary & Thomas Lucas 5 Peach St Unit 1 Concord, NH 03301-5299	3314/1700
753Z/ 22/ 14/ 2		5 Peach Street Unit 2	Shaun Brennan 5 Peach St Unit 2 Concord, NH 03301-5299	3393/1881
753Z/ 22/ 14/ 3		5 Peach Street Unit 3	Katherine Draus 5 Peach St Unit 3 Concord, NH 03301-5299	3461/0586
753Z/ 22/ 14/ 4		5 Peach Street Unit 4	Chris Bottrill 5 Peach St Unit 4 Concord, NH 03301-5299	3757/0485
753Z/ 22/ 15/ 1		40 Mulberry Street Unit 1	Diane Fontaine 40 Mulberry St Unit 1 Concord, NH 03301-5292	3487/2328
753Z/ 22/ 15/ 2		40 Mulberry Street Unit 2	Carrie Gugliotta 40 Mulberry St Unit 2 Concord, NH 03301-5292	2694/1899
753Z/ 22/ 15/ 3		40 Mulberry Street Unit 3	Patricia Sullivan 40 Mulberry St Unit 3 Concord, NH 03301-5292	2691/0537
753Z/ 22/ 15/ 4		40 Mulberry Street Unit 4	Gregg Keniston 14 Washington St Apt 18 Stoneham, MA 02180-3800	2691/0570

APPENDIX D

Supporting Figure with Screening Markup – GMZ, Monitoring Points, Site Plan and Groundwater Contours October 2024 (CMA Engineers, Inc.)


Notes:
1. Topography by City of Concord, Community Development Department, GIS Plans dated April 2000. Reference elevation NGVD.
2. Locations of groundwater monitoring wells, test borings, test pits and soil gas survey SG-1 through SG-8 were surveyed located by T.F. Bernier, Inc. Concord, NH in June, 2004 and March 2006. Locations of soil gas survey SG-9 through SG-14 and gas monitoring wells GMW-1 through GMW-6 are approximate and are based on field measurements and observations by CMA Engineers, Inc.
3. Approximate property lines shown are based on City of Concord Tax Maps. Surveyed property lines are from Sanford Surveying & Engineering Road Concept Plan prepared for Robert V. and Richard E. Aranosian, July 26, 2004.
4. Test Borings and Monitoring wells TB1-2, and MW-4, 5S, 5D and 6 were installed by Great Works Test Boring in May 2004. The borings were observed and logged by Exeter Environmental Associates. Monitoring wells MW-1, 2, & 3 were installed by ARC Environmental Consultants for RES Development, July 2001. Groundwater monitoring wells MW-7S, 7D, 8S, 8D, 9S and 9D were installed by Great Works Test Boring in February 2004. The borings were observed and logged by Exeter Environmental Associates.
5. Gas Migration Monitoring Wells GMW-1 and 2 were installed by Great Works Test Boring in June 2004 and were observed and logged by Exeter Environmental Associates. GMW-3 through GMW-6 were installed by Great Works Test Boring in April 2007 and were observed and logged by CMA Engineers.
6. Monitoring wells MW-10 SJD, MW-11 SJD, and MW-12 SJD were installed by Expedition Drilling and field surveyed by T.F. Bernier in December 2008.
Legend:
Tax Map Lines
GMW-2 Gas Monitoring Well
MW-4 Groundwater Monitoring Well
275 Approximate Shallow GW Contours (October 2024)
275 Approximate Deep GW Contours (October 2024)
Approximate Limit of Waste
Tax Map & Lot Number
GMZ Boundary
Approximate Location of Landfill Gas Management System
Direction of groundwater flow
Subject Parcel
To Soucook River
To Soucook River
HALEWOOD STREET
OLD SUNCOOK ROAD
MANCHESTER STREET
INTEGRA DRIVE
GMW-4S,D
GMW-2S,D
GMW-1S,D
GMW-3S,D
GMW-5S,D
GMW-6S,D
MW-1 279.62
MW-2 286.36
MW-3 280.36
MW-4 278.62
MW-5S 284.59
MW-5D 287.82
MW-5D 287.72
MW-6S 283.59
MW-6D 284.00
MW-7S 279.24
MW-7D 279.43
MW-8S 280.94
MW-8D 280.94
MW-9S 282.94
MW-9D 282.94
MW-10 SJD 271.49 271.13
MW-11 SJD 273.33 273.59 273.52
MW-12 SJD 276.79 277.16 277.29
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