Needham Public Health Division
Prevent. Promote. Protect.

AGENDA
Board of Health Meeting
February 21, 2025
9:00 – 11:00 a.m.
Town Hall – Select Board Chamers

To listen/view this meeting, download the "Zoom Cloud Meeting" app in any app store or at www.zoom.us. At the above date and time, click on "Join a Meeting".

Webinar ID: 865 8542 3343

Passcode: 810825

Or click the link below to register:
https://needham-k12-ma-us.zoom.us/j/86585423343?pwd=B3WXaH8ysC3vV0lazBJ4CkqCGz1kRa.1

	9:00	Welcome & Public Comment Period Attendees are encouraged to inform the Needham Public Health Division of their intent to participate in the public comment period in advance via email (healthdepartment@needhamma.gov), telephone (781) 455-7940, or in person by the end of the business day prior to the meeting. The Chair will first recognize those who have communicated in advance their desire to speak for up to three minutes. If time allows, others wishing to speak will be recognized in an order determined by the Chair for up to three minutes.
1.	**9:03**	Review of Minutes: January 24, 2025
2.	**9:05**	Environmental Testing of Synthetic Turf Fields • Tara Gurge, Assistant Director of Public Health

3.	**9:25**	Enforcement of Zyn Nicotine Chill flavored pouches and other vape products • Tara Gurge, Assistant Public Health Director • Sainath Palani, Environmental Health Agent
4.	**9:40**	Introduction to the Foundational Public Health Services (FPHS) and PHE Data Gathering Initiative • Kerry Dunnell, Shared Services Manager
5.	**10:00**	Customized Permit Fee Calculator • Timothy McDonald, Director of Health & Human Services
6.	**10:05**	December and January Staff Reports • Environmental Health – Sai Palani & Tara Gurge • Accreditation – Lynn Schoeff & Alison Bodenheimer • Traveling Meals – Rebecca Hall • Substance Use Prevention: Regional – Carol Read & Lydia Cunningham • Substance Use Prevention: Needham – Karen Shannon, Karen Mullen, Monica DeWinter, Angi MacDonnell, Vanessa Wronski • Public Health Preparedness –Taleb Abdelrahim • Epidemiology – Julie McCarthy • Nursing – Ginnie Chacon-Lopez, Hanna Burnett & Tiffany Benoit • Shared Public Health Services – Kerry Dunnell & Samantha Menard
7.	**10:55**	Other Items • Next Meeting Date and Time

(Please note that all times are approximate)

Next Meeting – Friday March 21, 2025 at 9:00 a.m.

Needham Public Health Division
Prevent. Promote. Protect

Board of Health
Meeting Minutes
DRAFT

Date: January 24, 2025

Location: via Zoom

Members: Tejal K. Gandhi, MD, MPH Chair, Stephen Epstein, MD, MPP, Member; Robert A. Partridge, MD, MPH, Member, Edward Cosgrove, PhD, Member; Aarti Sawant-Basak, PhD, Member

Staff Present: Timothy Muir McDonald, Director of Health, and Human Services; Tara Gurge, Assistant Director of Public Health; Tiffany (Zike) Benoit, Assistant Director of Public Health; Carol Read; Kerry Dunnell; Sai Palani; Samantha Menard

Welcome & Public Comment Period

Dr. Epstein called the meeting to order at 8:00AM.

According to Chapter 107 of the Acts of 2022, as an act relative to extending certain states of emergency accommodations, as passed by the General Court, and signed into law by Acting Governor Karyn Polito, on July 16, 2022, revised Section 20 of Chapter 20, the Acts of 2021. In so doing, provided modifications to the Massachusetts Open Meeting Law, which allow for flexibility to hold remote only, and hybrid meetings, while preserving public access and, where appropriate, public participation. Currently, that additional flexibility will expire on March 31, 2025, unless additional legislative action occurs.

No public comment at this time.

Review of Minutes: December 13, 2024

Upon motion duly made by Dr. Cosgrove, and seconded by Dr. Sawant-Basak, it was voted to approve the meeting minutes December 13, 2024, as presented. Motion passed unanimously.

Proposed Citizen's Petition to Ban Gas-Powered Leaf Blowers

David Rudolph, Green Needham, made a presentation on his citizen's petition regarding a ban on gas-powered leaf blowers.

Dr. Gandhi asked about enforcement for this proposal. Mr. McDonald explained that complaints may not be able to be responded to in the moment. He will need to review enforcement for a violation not seen by staff with Town Counsel. Enforcement would likely be complaint driven with follow-up at a future date. Dr. Epstein noted that enforcement would require additional funding, and staff may not be available to answer complaints at certain hours of the day.

Ms. Gandhi asked about the fines imposed by other towns. Mr. Rudolph stated that fees usually start at $50-$100 and are on escalating levels.

Dr. Sawant-Basak asked about public outreach on this item in terms of incentives to switch to electric blowers. Mr. Rudolph stated that there will need to be information sessions on this proposal and alternatives.

Dr. Epstein stated that, if this is primarily about noise pollution, there should be decibel levels included in the petition language. Mr. Rudolph stated that this could make enforcement more difficult, as decibel readings would have to be taken at each complaint. Dr. Epstein stated that a seasonal ban is proposed as part of this petition that does not include the times of year when most cleanups occur. Mr. Rudolph explained that this is due to the fact that electric blowers are not yet able to handle large cleanups, and a full ban would place too high a burden on landscapers. The intention is to phase in a complete ban as technology improves. Dr. Epstein explained that gas powered blowers could be used during these seasons, as long as they are quiet.

Community Crisis Intervention Team (CCIT) Presentation

Carol Read reviewed the historical context of the CCIT program. Jess Moss, Assistant Director of Counseling and Volunteers at Needham Aging Services Division, explained that the intention of the program is to discuss high-risk situations in the Town, allowing for interventions with residents before a larger crisis occurs.

The team presented some information and data from the program.

Environmental Testing of Synthetic Turf Fields

Ms. Gurge reviewed the testing reports. She noted that semi-volatile organic compound (SVOC) and volatile organic compound (VOC) concentrations were either consistent or lower than in 2023. Metal concentrations were either consistent or higher than in 2023. Zinc concentrations at Memorial Field were above the MassDEP risk-based level. Arsenic was non-detect but was above the MassDEP risk-based level. After initial testing results were received, the contact asked the lab to re-issue a revised report to the method detection limit, which is the lowest concentration a compound can be measured, without compromising confidence. NPHD received an updated report for the Method Detection Limits (MDL). MDL values are lower and still non-detect, however some values, specifically arsenic and zinc, are still above the MassDEP risk-based levels.

Dr. Cosgrove suggested that the same testing equipment which was used last time should be used for extra testing on the arsenic, to make sure the reporting is consistent. Dr. Epstein agreed that the correct test needs to be carried out. He noted that the zinc test may need to be redone next year, due to the results obtained.

Dr. Partridge suggested collecting samples from other locations on the field.

North Central MetroWest Training Hub

Ms. Menard and Ms. Dunnell presented on the Training Hub. Needham is the host for the NorthCentral MetroWest Local Public Health Training Hub, which is on of ten Training Hubs in MA. The Training Hubs each are assigned a set number of communities. Each local inspector in the local public health workforce will be trained using the same training standards and curriculum.

Dr. Cosgrove stated that he believes this will equalize delivery of public health services across the State.

Staff Reports

Unless otherwise specified, the Board did not directly address the staff reports.

- Public Health Preparedness – Taleb Abdelrahim
- Epidemiology – Julie McCarthy
- Nursing – Ginnie Chacon-Lopez, Hanna Burnett & Tiffany Benoit

- Environmental Health – Sai Palani & Tara Gurge

Mr. Palani stated that a lot of progress has been made at the property on St. Mary's Street. He requested to be allowed discretion to take over the case at this time. He would like to allow another month to continue to make progress on the property. There was agreement on the Board to allow this to occur.

- Accreditation – Lynn Schoeff & Alison Bodenheimer
- Traveling Meals – Rebecca Hall
- Substance Use Prevention: Regional – Carol Read & Lydia Cunningham

- Substance Use Prevention: Needham – Karen Shannon, Karen Mullen, Monica DeWinter, Angi MacDonnell, Vanessa Wronski
- Shared Public Health Services – Kerry Dunnell & Samantha Menard

Other Items

- Needham Public Health Staff Introductions - Updated

The Board reviewed the updated staff introductions. It was noted that Ms. Benoit will be leaving the Town for a position at the State.

- Next Meeting Date and Time

Friday February 21, 2025, at 9:00 a.m.

Adjournment

Upon motion duly made by Dr. Cosgrove, and seconded by Dr. Gandhi, it was voted to adjourn the meeting. Motion passed unanimously.

The meeting was adjourned at 9:30AM.

Attachment:
January 24, 2025, meeting packet

Board of Health
Town of Needham
AGENDA FACT SHEET

MEETING DATE: **February 21, 2025**

Agenda Item	2024 Fuss & O'Neill Synthetic Turf Testing Report – Follow-up
Presenter(s)	Tara Gurge, Assistant Public Health Director Timothy McDonald, Director of Health & Human Services

1.	**BRIEF DESCRIPTION OF TOPIC TO BE DISCUSSED**

To continue our discussion of the Fuss & O'Neill field turf testing results, specifically, the arsenic and zinc results, here is the latest information we received.

After our last Board of Health meeting, we were able to connect with our contact at Fuss & O'Neill about the Boards inquiries, and they said they can provide resampling for arsenic due to the elevated reporting limit, at no additional cost. They also agreed to retest for zinc as well, but did not state that this retesting would be free of charge.

They also agreed to take 6 total grab samples from each field, instead of 3. So, there will still be 3 total samples submitted for laboratory analysis, one from each field.

We would like to receive the Board's feedback on the timing of this field turf retesting.

2.	**VOTE REQUIRED BY BOARD OF HEALTH**

No vote requested.

3.	**BACK UP INFORMATION:**

a) Copy of report.

178 Rosemary Street, Needham, MA 02494 P: (781) 455-7940 E: healthdivision@needhamma.gov

FUSS & O'NEILL
108 Myrtle Street, Suite 502
Quincy, MA 02171
617.282.4675
www.fando.com

Crumb Rubber Monitoring Results
Memorial Park & DeFazio Park
Needham, Massachusetts

Needham Health Department
Needham, Massachusetts

January 2025

FUSS & O'NEILL
108 Myrtle Street, Suite 502
Quincy, MA 02171
617.282.4675
www.fando.com

January 14, 2025

Ms. Tara Gurge, R.S., C.E.H.T., M.S.
Assistant Public Health Director
Needham Public Health Division
Health and Human Services Department
178 Rosemary Street
Needham, MA 02494

RE: **Crumb Rubber Monitoring Results – October 2024**
Memorial and DeFazio Parks
Needham, Massachusetts
Fuss & O'Neill Project No. 20081266.B50

Dear Ms. Gurge:

Enclosed is the summary report for crumb rubber testing performed at the artificial turf athletic fields located at Memorial Park and DeFazio Park in Needham, Massachusetts in October 2024.

If you should have any questions regarding the contents of this report, please do not hesitate to contact the undersigned below. Thank you for this opportunity to have served your environmental needs.

Sincerely,

Evan Koncewicz
Environmental Geologist
(617) 379-5895

Neal Kelly, LSP
Associate
(781) 987-4323

Enclosure

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Memorial Park & DeFazio Park
Needham Health Department

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Appendix A – Laboratory Analytical Reports & Chain-of-Custody Forms
Appendix B – Sampling Equipment
Appendix C – Field Logs
Appendix D – Method Detection Limit Laboratory Analytical Report

1 Introduction and Background

Fuss & O'Neill, Inc. (Fuss & O'Neill) was retained by the Needham Health Department (the "Client") to perform periodic monitoring of the crumb rubber used at the artificial turf athletic fields in Needham, Massachusetts. The study involved the collection of field measurements and crumb rubber samples from Memorial Park (Needham High School Field, 92 Rosemary Street) and DeFazio Park (Brock Field and Founders Field, 380 Dedham Avenue) for laboratory analysis. The laboratory data were compared to toxicity reference data from the Massachusetts Department of Environmental Protection (MassDEP) and/or US Environmental Protection Agency (EPA) to evaluate potential health-related impacts.

On October 2, 2024, Mr. Christopher Juliano of Fuss & O'Neill performed the crumb rubber sampling in accordance with our proposal dated July 1, 2024.

2 Methodology and Scope of Testing

On October 2, 2024, Mr. Juliano of Fuss & O'Neill met Ms. Tara Gurge of the Needham Health Department to access the three athletic fields to perform the sampling and monitoring activities. A three-point composite sample of crumb rubber was collected from each artificial turf athletic field using laboratory provided dedicated glass jars. The composite samples were comprised of crumb rubber collected from three locations (each end and the middle) of each artificial turf athletic field. Approximate discrete locations from which the material was collected to make up the composite samples are indicated on *Figure 1* (Memorial Park) and *Figure 2* (DeFazio Park). Samples were collected from the Needham High School Field in Memorial Park (sample 16431002-04) and from Founders Field (sample 1643241002-01) and Brock Field in DeFazio Park (sample 1643241002-02).

The composite samples were submitted to EMSL Analytical Laboratory in Cinnaminson, New Jersey (EMSL). The crumb rubber was analyzed for trace metals by Environmental Protection Agency (EPA) Methods 6010C/7471B (inductively coupled plasma atomic emission spectrometry [ICP-AES] and mercury by manual cold-vapor technique, respectively); semi-volatile organic compounds (SVOCs) by EPA Method 8270E; and volatile organic compounds (VOCs) by EPA Method TO-15 (analyzed by gas chromatography/mass spectrometry (GC/MS). The VOCs were collected from a "closed container" test, with an air headspace over a sample of the crumb rubber heated to 120°F for one hour. A VOC "tentatively identified compound" (TIC) analysis was also conducted. EMSL subcontracted the analysis of trace metals and SVOCs to ALS Laboratories of Middletown Pennsylvania.

The purpose of the closed container VOC test was to determine what concentrations and types of VOCs could be generated from the crumb rubber in a heated state, e.g. a field with full sun on summer day. Refer to *Appendix A* for the laboratory analytical reports and chain of custody forms. Refer to *Table 1* for a summary of the analytical results.

Real-time ambient conditions were monitored during crumb rubber sampling. TOVs (total organic vapors) were measured using an Ion Science Tiger Photoionization Detector (PID). A TSI Q-Trak Air Quality Monitor was used to record ambient temperature and relative humidity (RH). Refer to *Appendix B* for a list of sampling equipment, and *Table 2* for real-time measurements.

3 Results

Analytical data are summarized in *Table 1*. Multiple VOCs (including TICs) were identified in each sample. The following VOCs were detected in the gas stream samples:

- 2-Butanone (MEK)
- 4-Methyl-2-Pentanone (MIBK)
- Acetone
- Carbon disulfide
- Chloromethane
- Ethanol
- Isopropyl alcohol (2-Propanol)
- Propylene
- Tertiary butyl alcohol (TBA)
- Bromomethane (only identified in Founder's Field sample)

Furthermore, 2-butene, carbonyl sulfide and furan, 2-methyl were identified in all three samples as TICs in the analyses. No concentrations of undefined TIC(s) were identified in any samples.

Iron and zinc were each detected in all three samples. Arsenic, cadmium, chromium, lead, manganese, mercury, and selenium were not detected in any sample. The laboratory detection limits of arsenic were greater than the risk-based level used. Arsenic has historically not been detected above the previous risk based level of 2.2 milligrams per kilogram (mg/kg) during previous sampling events.

Eleven SVOCs were identified in each of the rubber samples. N-nitrosodiphenylamine was additionally identified in the Needham High School and Founder's Field samples. The majority of SVOCs identified were within the class of "polycyclic aromatic hydrocarbons" (PAHs), with the exception of acetophenone, hexachlorobutadiene, hexachloroethane and n-nitrosodiphenylamine.

TOVs were recorded at concentrations at an average or below 0.1 parts per million by volume (ppmv) in ambient air. Readings recorded as less than or equal to 1.0 ppmv likely were a result of moisture in ambient air effecting the PID detector lamp. The ambient relative humidity at the time of sampling was between 41.1 and 57.4 percent, within a 69.8- to 78.5 degree Fahrenheit environment (recorded within a few inches of the surface).

4 Data Evaluation

The Massachusetts Contingency Plan (MCP; 310 CMR 40.0000) establishes soil standards for a variety of uses based on publicly-available toxicity data for a range of compounds, including VOCs, SVOCs, and metals. The numerical standards and their derivations are publicly-available[1]. MassDEP generally establishes these standards based on four criteria:

[1] MassDEP, December 2017, "MCP Numerical Standards." https://www.mass.gov/doc/mcp-numerical-standards-derivation/download, accessed October 2024.

- Publicly-available toxicity data, including EPA and MassDEP Office of Research and Standards (ORS) data, and peer-reviewed industry sources.
- Typical background levels in New England soil.
- Ceiling concentrations (i.e. maximum concentrations set for compounds of limited toxicity).
- Practical quantification limits (PQLs), i.e. levels which analytical laboratories can reliably quantify.

In its toxicity calculations for Method 1 S-1 Soil Standards (applicable to sensitive land uses, including residences, schools and day-care facilities), MassDEP considers inhalation and skin-absorption risks over exposures from infancy to adulthood. Fuss & O'Neill evaluated the crumb rubber analytical results relative to MassDEP's published toxicity levels (i.e. the levels which would be used in the absence of ceiling, background or PQL considerations). For SVOCs and metals, concentrations were compared to MassDEP Residential Receptor Direct Contact Risk-Based Soil Concentration Levels. For VOCs, concentrations were compared to MassDEP Vapor Intrusion Guidance Risk Management Criteria Use to Develop the Threshold Values. These values are included in *Table 1.* Where MassDEP has not published toxicity values, Fuss & O'Neill consulted the EPA "regional screening levels," (RSLs) last updated in November 2024, which consist of similarly derived guidance values for a range of compounds used for screening contaminant concentrations on sites evaluated under the Superfund program[2]. Where RSLs were incorporated into this evaluation, the "non-carcinogenic child screening levels" for resident soil and resident air were generally the most conservative values and were incorporated herein.

The RSL considers the potential for noncancer effects to develop in children and adults via the inhalation route, only. The Resident Air RSL considers that the receptor spends most, if not all, of the day at home and performing home chores as well as outdoor activities. The resident is assumed to be exposed to contaminants via inhalation of ambient air, with no assumption of how contaminants get into the air.

With the exceptions of 2 butene, furan 2-methyl, ethanol, and isopropyl alcohol, MassDEP and/or EPA RSL values were available for all detected compounds.

As noted on *Table 1*, zinc was detected in the sample from Memorial Park at a concentration of 15,200 mg/kg which is greater than the MassDEP threshold value (15,000 mg/kg) and greater than the historically reported range. The zinc concentrations in the other two samples were less than the respective risk-based value. While arsenic was not detected in any of the samples, the laboratory reporting limits were greater than the MassDEP threshold value of 2.5 mg/kg. Arsenic has historically not been detected above the Risk Based Level in our sampling events. The MassDEP exposure levels assume continuous high-contact exposure (five days per week, 30 weeks per year) over a multiple-year duration and are therefore conservative with regard to the actual exposures for users of the field. Except for zinc, all reported metal concentrations were less than the corresponding risk-based levels.

[2] EPA, May 2021. "Regional Screening Levels – Generic Tables." https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables, accessed October 2024.

Three VOC compounds (2-butene, carbonyl sulfide, and furan, 2-methyl) were reported by the laboratory as a TIC, all less than risk-based values. TICs are compounds that are not method target compounds (for which there are calibration standards). The identification of TICs is based on a review of the TIC's mass spectrum against a mass spectral library available in the instrument's software, as TICs are not contained in the calibration standards, the calculation of the concentration of TICs are estimates. As indicated in the laboratory narrative, TIC data is qualified as estimated values which have presumptive evidence of the compound based on the library match. Further, the EPA does not consider the identification as absolute or confirmed until a known standard for the suspect compound can be analyzed on the same instrument which made the tentative identification[3].

All other reported VOC and all SVOC concentrations were less than the associated risk-based levels.

5 Conclusions

Fuss & O'Neill collected field and analytical data to characterize the crumb rubber at three athletic fields in Needham, Massachusetts in October 2024. The analytical results were compared to MassDEP and/or EPA risk-based guidance levels for soil and air, to evaluate potential health risks associated with the use of the crumb rubber media on these athletic fields. The follow conclusions were formed:

- The concentrations of zinc in one of the three samples were greater than the MassDEP threshold value, which is derived from an assumption of high-intensity exposure for a multi-year duration on a consistent basis.
- The laboratory reporting limit of arsenic was greater than the MassDEP threshold value for all three samples, however, arsenic has not been historically detected during crumb rubber sampling at the Site.
- All other reported concentrations of metals, VOCs, and SVOCs were less than the threshold values.

[3] EPA, Feb 2006. "Tentatively Identified Compounds." https://19january2017snapshot.epa.gov/sites/production/files/2015-06/documents/tics.pdf, accessed November 2024.

Tables

Table 1
Summary of Crumb Rubber Monitoring Results – October 2, 2024

Analyte	Analytical Results			Risk-Based Levels
	Memorial Park	DeFazio Park		
	Needham High School 16431002-04	Brock Field 1643241002-02	Founders Field 1643241002-01	
Semivolatile Organic Compounds – dry weight (mg/kg) by method 3546/8270D**				
Acenaphthylene	0.06	0.051	0.054	2,400
Acetophenone	0.152	0.181	0.112	NE [7,800]
Anthracene	0.082	0.08	0.078	24,000
Bis(2-Ethylhexyl)phthalate	5.1	5.17	4.41	110
Chrysene	2.45	1.86	2.11	190
Fluoranthene	3.76	2.68	3.05	3,200
Hexachlorobutadiene	0.426	0.486	0.524	29
Hexachloroethane	0.205	.169	0.221	57
Naphthalene	0.131	0.111	0.172	1,600
N-Nitrosodiphenylamine	0.168	ND < 0.096	0.115	NE [110]
Phenanthrene	0.541	0.453	0.426	2,400
Pyrene	8.32	6.89	7.07	2,400
Volatile organic compounds – vapor (mg/m^3) Closed Container Test by method TO-15				
2-Butene*	0.018	0.019	0.110	NE
Carbonyl Sulfide*	0.0048	0.0055	0.069	NE [0.1]
Furan, 2-Methyl-*	0.044	0.027	0.028	NE
Bromomethane	ND < 0.00088	ND < 0.00078	0.00082	0.005
Carbon Disulfide	0.00078	0.00078	0.00096	NE [0.730]
Chloromethane	0.00054	0.00083	0.001	NE [0.0094]
Propylene	0.0019	0.0032	0.0037	NE [3.1]
Ethanol	0.064	0.099	0.087	NE
Isopropyl alcohol (2-Propanol)	0.019	0.019	0.029	NE
Acetone	0.026	0.093	0.110	0.8
Tertiary butyl alcohol (TBA)	0.0026	0.0029	0.0037	NE
2-Butanone (MEK)	0.013	0.018	0.027	5.00
4-Methyl-2-Pentanone (MIBK)	0.024	0.023	0.025	3.00

* Tentatively-identified compound

**For the SVOC full list, refer to the laboratory analytical report

ND: None Detected; NE: risk threshold not established by MassDEP or EPA.

NE [X]: not established by MassDEP, value is EPA "regional screening level" for risk screening at Superfund sites (Resident Soil/Air).

NR: Not reported

Chromium risk level conservatively assumes hexavalent (Cr-VI) form.
VOCs and TICs were only reported if detected in at least one sample.
Bold and underlined value indicates that the detected value exceeds the Risk Based Level.
Italicized value indicates that the laboratory reporting limit exceeds the Risk Based Level.

Analyte	Analytical Results			Risk-Based Levels
	Memorial Park	**DeFazio Park**		
	Needham High School 16431002-04	Brock Field 1643241002-02	Founders Field 1643241002-01	
Total Metals – dry weight (mg/kg) by method 6010C				
Arsenic	*ND < 39.5 (13.2)*	*ND < 39.7 (13.2)*	*ND < 38.6 (12.9)*	2.5
Cadmium	ND < 9.9	ND < 9.9	ND < 9.7	79
Chromium	ND < 19.8	ND < 19.8	ND < 19.3	150
Iron	640	889	762	NE [55,000]
Lead	ND < 39.5	ND < 39.7	ND < 38.6	130
Manganese	ND < 19.8	ND < 19.8	ND < 19.3	NE [1,800]
Mercury	ND < 0.049	ND < 0.047	ND < 0.047	21
Selenium	ND < 98.8	ND < 99.2	ND < 96.5	430
Zinc	**15,200**	13,200	12,600	15,000

* Tentatively-identified compound
**For the SVOC full list, refer to the laboratory analytical report
ND: None Detected;
NE: risk threshold not established by MassDEP or EPA.
NE [X]: not established by MassDEP, value is EPA "regional screening level" for risk screening at Superfund sites (Resident Soil).
ND < X (X): value in parenthesis is reported method detection limit (MDL), where the analytes were not detected above the MDL.
Chromium risk level conservatively assumes hexavalent (Cr-VI) form.
VOCs and TICs were only reported if detected in at least one sample.
Bold and underlined value indicates that the detected value exceeds the Risk Based Level.
Italicized value indicates that the laboratory reporting limit exceeds the Risk Based Level.

Table 2
Real-Time Measurements, Needham Crumb Rubber Sampling – October 2, 2024

Location	TOVs (ppm)	Temperature (°F)	RH (%)
Needham High School (HS)	0.0	78.5	41.1
Brock Field (D1)	0.1	77.4	45.1
Founders Field (D2)	0.1	69.8	57.4

The highest TOV value from the three sampling locations was recorded. Temperature and relative humidity were averaged amongst the three sampling locations.
°F: degrees Fahrenheit
RH: Relative Humidity

REFERENCES:

1. AERIAL IMAGE WAS TAKEN FROM THE WEBSITE HTTP://WWW.NEARMAP.COM, DATED 2024.
2. FIELD BOUNDIES APPROXIMATE BASED ON SITE OBSERVATIONS.

LEGEND

- FOUNDERS FIELD BOUNDARY
- BROCK FIELD BOUNDARY
- SAMPLE LOCATIONS TO FORM COMPOSITE

SCALE:	
HORZ.: 1" = 200'	
VERT.: -	
DATUM:	
HORZ.: -	
VERT.: -	

0 150' 200'

GRAPHIC SCALE

FUSS & O'NEILL
108 MYRTLE STREET, SUITE 502
QUINCY, MA 02171
617.282.4675
www.fando.com

NEEDHAM HEALTH DEPARTMENT

SITE PLAN

DEFAZIO PARK - 380 DEDHAM ROAD

NEEDHAM MASSACHUSETTS

PROJ. No.: 20081266.B50
DATE: DECEMBER 2024

FIGURE 1

File: j:\DWG\P2008\1266\B50\Environmental\Plan\20081266B50_STP01.dwg Layout: FIGURE 1_DEFAZIO PARK Plotted: 2024-12-11 2:46 PM Saved: 2024-12-11 2:45 PM User: susan.irons
PC3: AUTOCAD PDF (GENERAL DOCUMENTATION).PC3 STB/CTB: FO.STB
MS VIEW: LAYER STATE:

REFERENCES:

1. AERIAL IMAGE WAS TAKEN FROM THE WEBSITE HTTP://WWW.NEARMAP.COM, DATED 2024.
2. FIELD BOUNDIES APPROXIMATE BASED ON SITE OBSERVATIONS.

LEGEND

PARK BOUNDARY

SAMPLE LOCATIONS TO FORM COMPOSITE

SCALE:
HORZ.: 1" = 150'
VERT.: -
DATUM:
HORZ.: -
VERT.: -
0 125' 150'
GRAPHIC SCALE

FUSS & O'NEILL
108 MYRTLE STREET, SUITE 502
QUINCY, MA 02171
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NEEDHAM HEALTH DEPARTMENT

SITE PLAN

MEMORIAL PARK - 92 ROSEMARY ROAD

NEEDHAM MASSACHUSETTS

PROJ. No.: 20081266.B50
DATE: DECEMBER 2024

FIGURE 2

Appendix A

Laboratory Analytical Reports & Chain of Custody Forms

EMSL Analytical, Inc.

200 Route 130, Cinnaminson, NJ, 08077
Telephone: 856-858-4800 Fax:856-786-5974
EMSL-CIN-01

EMSL Order ID: 012433250
LIMS Reference ID: AC33250
EMSL Customer ID: ENVI54

Attention: Results
Fuss & O'Neill, Inc. [ENVI54]
One Financial Plaza, 15th Floor
Hartford, CT 06103
(860) 646-2469
LabResults@fando.com

Project Name: 0000-5465.10E
Customer PO:
EMSL Sales Rep: Jeromy Bish
Received: 10/07/2024 11:40
Reported: 10/21/2024 14:48

Samples in this Report

Lab ID	Sample	Matrix	Date Sampled	Date Received
AC33250-01	1-1643 241002-01	Bulk	10/02/2024	10/07/2024
AC33250-02	2-1643 241002-02	Bulk	10/02/2024	10/07/2024
AC33250-03	4-1643 241002-04	Bulk	10/02/2024	10/07/2024
AC33250-04	Lab Background	Bulk	10/02/2024	10/07/2024

Owen McKenna Laboratory Manager or other approved signatory

Test results meet all NELAP requirements unless otherwise specified. NJDEP Certification #: 03036

EMSL Analytical, Inc.
200 Route 130, Cinnaminson, NJ, 08077
Telephone: 856-858-4800 Fax:856-786-5974
EMSL-CIN-01

EMSL Order ID: 012433250
LIMS Reference ID: AC33250
EMSL Customer ID: ENVI54

Attention: Results
Fuss & O'Neill, Inc. [ENVI54]
One Financial Plaza, 15th Floor
Hartford, CT 06103
(860) 646-2469
LabResults@fando.com

Project Name: 0000-5465.10E
Customer PO:
EMSL Sales Rep: Jeromy Bish
Received: 10/07/2024 11:40
Reported: 10/21/2024 14:48

Analysis Case Narrative

Method Reference
USEPA: Compendium TO-15, "Determination of Volatile Organic Compounds (VOCs) in Air..." Collected in Specially-Prepared Canisters and Analyzed by Gas Chromatography/Mass Spectrometry (GC/MS), January 1999, (EPA/625/R-96/010b).

Column
Restek RTX-502.2, 60m x 0.25mm x 1.4um

Concentrator Traps:
Entech Dual Cold Traps: (1) 1/8" No Packing, (2) 1/8" Tenax.

Gas Standards:
Certified Gas standards were used for all analyses.

Sample Volumes:
Sample volume aliquots for this procedure are 250cc for indoor/ambient air and 50cc for soil gas. Other volumes for sample dilutions are reflected on each result page.

Sampling Pressures:
N/A Bulk samples submitted for off gas analysis.

Holding Times:
All holding times were met.

Sample Dilutions:
Ethanol and Isopropanol are not diluted for and may be reported with an "E" qualifier on the final result.

Initial Calibration:
All acceptance criteria were met.

Initial Calibration Verification Standard (ICVS)- Second Source:
All acceptance criteria were met.

Laboratory Control Samples (LCS):
All acceptance criteria were met.

Continuing Calibration Verification Standard (CCVS):
All acceptance criteria were met.

Method Blanks (MB):
All acceptance criteria were met.

Reporting Limit Laboratory Control Samples (MRL):
All acceptance criteria were met.

Duplicates (DUP):
All acceptance criteria were met.

Sample Internal Standards:
All acceptance criteria were met.

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Ogg Gas Conditions:

35g of each sample were off gassed for 24 hours at 49°c.

EMSL Analytical, Inc. certifies that this data package is in compliance with the terme and conditions of this contract, both technically and for completeness, for other thatn the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer ---readable data submitted on diskette has been authorized by the laboratory manager or his/her designee, as verified by the following signature

Owen McKenna Laboratory Manager or other approved signatory

EMSL Analytical, Inc.

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EMSL Sample ID: AC33250-01
Customer Sample ID: 1-1643 241002-01

Collected: 10/02/2024 11:21
Received: 10/07/2024 11:40

Analysis	Prep Batch	Lab File ID	Canister ID	Sample Vol.	Dil. Factor	Analyst Init.
10/18/24 14:42	BCJ2206	y16718.D	JAR	250 cc	1	TP

Target Compound Results Summary

Target Compounds	Cas#	MW	Result ppbv	RL ppbv	DF	Result ug/m3	RL ug/m3	Analyzed	Q
Acetone	67-64-1	58.1	**48**	0.20	1	**110**	0.48	10/18/24 14:42	E
Acetonitrile	75-05-8	41.0	ND	0.20	1	ND	0.34	10/18/24 14:42	
Acrylonitrile	107-13-1	53.0	ND	0.20	1	ND	0.43	10/18/24 14:42	
Benzene	71-43-2	78.1	ND	0.20	1	ND	0.64	10/18/24 14:42	
Benzyl chloride	100-44-7	126.0	ND	0.20	1	ND	1.0	10/18/24 14:42	
Bromodichloromethane	75-27-4	163.8	ND	0.20	1	ND	1.3	10/18/24 14:42	
Bromoethane(Ethyl bromide)	74-96-4	109.0	ND	0.20	1	ND	0.89	10/18/24 14:42	
Bromoethene(Vinyl bromide)	593-60-2	106.9	ND	0.20	1	ND	0.88	10/18/24 14:42	
Bromoform	75-25-2	252.8	ND	0.20	1	ND	2.1	10/18/24 14:42	
Bromomethane	74-83-9	94.9	**0.21**	0.20	1	**0.82**	0.78	10/18/24 14:42	
1,3-Butadiene	106-99-0	54.1	ND	0.20	1	ND	0.44	10/18/24 14:42	
n-Butane	106-97-8	58.1	ND	0.20	1	ND	0.48	10/18/24 14:42	
2-Butanone(MEK)	78-93-3	72.1	**9.2**	0.20	1	**27**	0.59	10/18/24 14:42	
Carbon disulfide	75-15-0	76.1	**0.31**	0.20	1	**0.96**	0.62	10/18/24 14:42	
Carbon tetrachloride	56-23-5	153.8	ND	0.20	1	ND	1.3	10/18/24 14:42	
Chlorobenzene	108-90-7	112.6	ND	0.20	1	ND	0.92	10/18/24 14:42	
Chloroethane	75-00-3	64.5	ND	0.20	1	ND	0.53	10/18/24 14:42	
Chloroform	67-66-3	119.4	ND	0.20	1	ND	0.98	10/18/24 14:42	
Chloromethane	74-87-3	50.5	**0.50**	0.20	1	**1.0**	0.41	10/18/24 14:42	
3-Chloropropene(Allyl chloride)	107-05-1	76.5	ND	0.20	1	ND	0.63	10/18/24 14:42	
2-Chlorotoluene	95-49-8	126.6	ND	0.20	1	ND	1.0	10/18/24 14:42	
Cyclohexane	110-82-7	84.2	ND	0.20	1	ND	0.69	10/18/24 14:42	
Dibromochloromethane	124-48-1	208.3	ND	0.20	1	ND	1.7	10/18/24 14:42	
1,2-Dibromoethane	106-93-4	187.8	ND	0.20	1	ND	1.5	10/18/24 14:42	
1,2-Dichlorobenzene	95-50-1	147.0	ND	0.20	1	ND	1.2	10/18/24 14:42	
1,3-Dichlorobenzene	541-73-1	147.0	ND	0.20	1	ND	1.2	10/18/24 14:42	
1,4-Dichlorobenzene	106-46-7	147.0	ND	0.20	1	ND	1.2	10/18/24 14:42	
1,1-Dichloroethane	75-34-3	99.0	ND	0.20	1	ND	0.81	10/18/24 14:42	
1,2-Dichloroethane	107-06-2	99.0	ND	0.20	1	ND	0.81	10/18/24 14:42	
1,1-Dichloroethene	75-35-4	96.9	ND	0.20	1	ND	0.79	10/18/24 14:42	
cis-1,2-Dichloroethene	156-59-2	96.9	ND	0.20	1	ND	0.79	10/18/24 14:42	
trans-1,2-Dichloroethene	156-60-5	96.9	ND	0.20	1	ND	0.79	10/18/24 14:42	
1,2-Dichloropropane	78-87-5	113.0	ND	0.20	1	ND	0.92	10/18/24 14:42	
cis-1,3-Dichloropropene	10061-01-5	111.0	ND	0.20	1	ND	0.91	10/18/24 14:42	
trans-1,3-Dichloropropene	10061-02-6	111.0	ND	0.20	1	ND	0.91	10/18/24 14:42	
1,4-Dioxane	123-91-1	88.1	ND	0.20	1	ND	0.72	10/18/24 14:42	
Ethanol	64-17-5	46.1	**46**	1.0	1	**87**	1.9	10/18/24 14:42	E
Ethyl acetate	141-78-6	88.1	ND	0.20	1	ND	0.72	10/18/24 14:42	
Ethylbenzene	100-41-4	106.2	ND	0.20	1	ND	0.87	10/18/24 14:42	
4-Ethyltoluene	622-96-8	120.2	ND	0.20	1	ND	0.98	10/18/24 14:42	
Freon 12(Dichlorodifluoromethane)	75-71-8	120.9	ND	0.20	1	ND	0.99	10/18/24 14:42	
Freon 114(1,2-Dichlorotetrafluoroethane)	76-14-2	170.9	ND	0.20	1	ND	1.4	10/18/24 14:42	
Freon 11(Trichlorofluoromethane)	75-69-4	137.4	ND	0.20	1	ND	1.1	10/18/24 14:42	

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EMSL-CIN-01

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LIMS Reference ID: AC33250
EMSL Customer ID: ENVI54

Attention: Results
Fuss & O'Neill, Inc. [ENVI54]
One Financial Plaza, 15th Floor
Hartford, CT 06103
(860) 646-2469
LabResults@fando.com

Project Name: 0000-5465.10E
Customer PO:
EMSL Sales Rep: Jeromy Bish
Received: 10/07/2024 11:40
Reported: 10/21/2024 14:48

EMSL Sample ID: AC33250-01
Customer Sample ID: 1-1643 241002-01

Collected: 10/02/2024 11:21
Received: 10/07/2024 11:40

Analysis	Prep Batch	Lab File ID	Canister ID	Sample Vol.	Dil. Factor	Analyst Init.
10/18/24 14:42	BCJ2206	y16718.D	JAR	250 cc	1	TP

Target Compound Results Summary

Target Compounds	Cas#	MW	Result ppbv	RL ppbv	DF	Result ug/m3	RL ug/m3	Analyzed	Q
Freon 113(1,1,2-Trichlorotrifluoroethane)	76-13-1	187.4	ND	0.20	1	ND	1.5	10/18/24 14:42	
n-Heptane	142-82-5	100.2	ND	0.20	1	ND	0.82	10/18/24 14:42	
Hexachloro-1,3-butadiene	87-68-3	260.8	ND	0.20	1	ND	2.1	10/18/24 14:42	
n-Hexane	110-54-3	86.2	ND	0.20	1	ND	0.71	10/18/24 14:42	
2-Hexanone(MBK)	591-78-6	100.2	ND	0.20	1	ND	0.82	10/18/24 14:42	
Isopropyl alcohol(2-Propanol)	67-63-0	60.1	**12**	0.20	1	**29**	0.49	10/18/24 14:42	
Isopropylbenzene (cumene)	98-82-8	120.2	ND	0.20	1	ND	0.98	10/18/24 14:42	
Methyl-tert-butyl ether(MTBE)	1634-04-4	88.2	ND	0.20	1	ND	0.72	10/18/24 14:42	
Methylene chloride	75-09-2	84.9	ND	0.20	1	ND	0.69	10/18/24 14:42	
Methyl Methacrylate	80-62-6	100.1	ND	0.20	1	ND	0.82	10/18/24 14:42	
4-Methyl-2-pentanone(MIBK)	108-10-1	100.2	**6.1**	0.20	1	**25**	0.82	10/18/24 14:42	
Naphthalene	91-20-3	128.2	ND	0.20	1	ND	1.0	10/18/24 14:42	
Propylene	115-07-1	42.1	**2.1**	0.20	1	**3.7**	0.34	10/18/24 14:42	
Styrene	100-42-5	104.1	ND	0.20	1	ND	0.85	10/18/24 14:42	
Tertiary butyl alcohol(TBA)	75-65-0	74.1	**1.2**	0.20	1	**3.7**	0.61	10/18/24 14:42	
1,1,2,2-Tetrachloroethane	79-34-5	167.9	ND	0.20	1	ND	1.4	10/18/24 14:42	
Tetrachloroethene	127-18-4	165.8	ND	0.20	1	ND	1.4	10/18/24 14:42	
Tetrahydrofuran	109-99-9	72.1	ND	0.20	1	ND	0.59	10/18/24 14:42	
Toluene	108-88-3	92.1	ND	0.20	1	ND	0.75	10/18/24 14:42	
1,2,4-Trichlorobenzene	120-82-1	181.5	ND	0.20	1	ND	1.5	10/18/24 14:42	
1,1,1-Trichloroethane	71-55-6	133.4	ND	0.20	1	ND	1.1	10/18/24 14:42	
1,1,2-Trichloroethane	79-00-5	133.4	ND	0.20	1	ND	1.1	10/18/24 14:42	
Trichloroethene	79-01-6	131.4	ND	0.20	1	ND	1.1	10/18/24 14:42	
1,3,5-Trimethylbenzene	108-67-8	120.2	ND	0.20	1	ND	0.98	10/18/24 14:42	
1,2,4-Trimethylbenzene	95-63-6	120.2	ND	0.20	1	ND	0.98	10/18/24 14:42	
2,2,4-Trimethylpentane(Isooctane)	540-84-1	114.2	ND	0.20	1	ND	0.93	10/18/24 14:42	
Vinyl acetate	108-05-4	86.0	ND	0.20	1	ND	0.70	10/18/24 14:42	
Vinyl chloride	75-01-4	62.5	ND	0.20	1	ND	0.51	10/18/24 14:42	
Xylene (Ortho)	95-47-6	106.2	ND	0.20	1	ND	0.87	10/18/24 14:42	
Xylene (p,m)	179601-23-1	106.2	ND	0.40	1	ND	1.7	10/18/24 14:42	
Xylenes, Total	1330-20-7	106.2	ND	0.20	1	ND	0.87	10/18/24 14:42	
Total Target Compound Concentrations:			**140**			**340**			

Surrogate	Result	Spike	Recovery
4-Bromofluorobenzene	9.64	10.00	96

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EMSL Sales Rep: Jeromy Bish
Received: 10/07/2024 11:40
Reported: 10/21/2024 14:48

EMSL Sample ID: AC33250-01
Customer Sample ID: 1-1643 241002-01

Collected: 10/02/2024 11:21
Received: 10/07/2024 11:40

Analysis	Prep Batch	Lab File ID	Canister ID	Sample Vol.	Dil. Factor	Analyst Init.
10/18/24 14:42	BCJ2206	y16718.D	JAR	250 cc	1	TP

TICS Compound Results Summary

Target Compounds	Cas#	MW	Result ppbv	RL ppbv	DF	Result ug/m3	RL ug/m3	Analyzed	Q
2-Butene	000107-01-7	56.0	**8.8**		1	**20**		10/18/24 14:42	N
Carbonyl Sulfide	463-58-1	60.1	**2.8**		1	**6.9**		10/18/24 14:42	N
Furan, 2-methyl-	000534-22-5	92.0	**7.4**		1	**28**		10/18/24 14:42	N
Total Target Compound Concentrations:			**140**			**340**			

Qualifier Definitions
(1) = If unknown, MW is assigned as equivalent Toluene (92) for mg/m3 conversion purposes.
B = Compound also found in method blank.
J= Estimated value based on a 1:1 response to internal standard.
N= Presumptive evidence of compound based on library match.

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Analysis	Prep Batch	Lab File ID	Canister ID	Sample Vol.	Dil. Factor	Analyst Init.
10/18/24 14:42	BCJ2206	y16718.D	JAR	250 cc	1	TP

Target Compound Results Summary

Target Compounds	Cas#	MW	Result ppbv	RL ppbv	DF	Result ug/m3	RL ug/m3	Analyzed	Q
Acetone	67-64-1	58.1	**48**	0.20	1	**110**	0.48	10/18/24 14:42	E
Bromomethane	74-83-9	94.9	**0.21**	0.20	1	**0.82**	0.78	10/18/24 14:42	
2-Butanone(MEK)	78-93-3	72.1	**9.2**	0.20	1	**27**	0.59	10/18/24 14:42	
Carbon disulfide	75-15-0	76.1	**0.31**	0.20	1	**0.96**	0.62	10/18/24 14:42	
Chloromethane	74-87-3	50.5	**0.50**	0.20	1	**1.0**	0.41	10/18/24 14:42	
Ethanol	64-17-5	46.1	**46**	1.0	1	**87**	1.9	10/18/24 14:42	E
Isopropyl alcohol(2-Propanol)	67-63-0	60.1	**12**	0.20	1	**29**	0.49	10/18/24 14:42	
4-Methyl-2-pentanone(MIBK)	108-10-1	100.2	**6.1**	0.20	1	**25**	0.82	10/18/24 14:42	
Propylene	115-07-1	42.1	**2.1**	0.20	1	**3.7**	0.34	10/18/24 14:42	
Tertiary butyl alcohol(TBA)	75-65-0	74.1	**1.2**	0.20	1	**3.7**	0.61	10/18/24 14:42	
Total Target Compound Concentrations:			**140**			**340**			

Surrogate	Result	Spike	Recovery
4-Bromofluorobenzene	9.64	10.00	96

TICS Compound Results Summary

Target Compounds	Cas#	MW	Result ppbv	RL ppbv	DF	Result ug/m3	RL ug/m3	Analyzed	Q
2-Butene	000107-01-7	56.0	**8.8**		1	**20**		10/18/24 14:42	N
Carbonyl Sulfide	463-58-1	60.1	**2.8**		1	**6.9**		10/18/24 14:42	N
Furan, 2-methyl-	000534-22-5	92.0	**7.4**		1	**28**		10/18/24 14:42	N
Total Target Compound Concentrations:			**140**			**340**			
Total Volatile Organic Compounds (TVOCs):			**140.00**			**340.00**			

Qualifier Definitions
(1) = If unknown, MW is assigned as equivalent Toluene (92) for mg/m3 conversion purposes.
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J= Estimated value based on a 1:1 response to internal standard.
N= Presumptive evidence of compound based on library match.

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Customer PO:
EMSL Sales Rep: Jeromy Bish
Received: 10/07/2024 11:40
Reported: 10/21/2024 14:48

EMSL Sample ID: AC33250-02
Customer Sample ID: 2-1643 241002-02

Collected: 10/02/2024 11:47
Received: 10/07/2024 11:40

Analysis	Prep Batch	Lab File ID	Canister ID	Sample Vol.	Dil. Factor	Analyst Init.
10/18/24 15:38	BCJ2206	y16719.D	JAR	250 cc	1	TP

Target Compound Results Summary

Target Compounds	Cas#	MW	Result ppbv	RL ppbv	DF	Result ug/m3	RL ug/m3	Analyzed	Q
Acetone	67-64-1	58.1	**39**	0.20	1	**93**	0.48	10/18/24 15:38	
Acetonitrile	75-05-8	41.0	ND	0.20	1	ND	0.34	10/18/24 15:38	
Acrylonitrile	107-13-1	53.0	ND	0.20	1	ND	0.43	10/18/24 15:38	
Benzene	71-43-2	78.1	ND	0.20	1	ND	0.64	10/18/24 15:38	
Benzyl chloride	100-44-7	126.0	ND	0.20	1	ND	1.0	10/18/24 15:38	
Bromodichloromethane	75-27-4	163.8	ND	0.20	1	ND	1.3	10/18/24 15:38	
Bromoethane(Ethyl bromide)	74-96-4	109.0	ND	0.20	1	ND	0.89	10/18/24 15:38	
Bromoethene(Vinyl bromide)	593-60-2	106.9	ND	0.20	1	ND	0.88	10/18/24 15:38	
Bromoform	75-25-2	252.8	ND	0.20	1	ND	2.1	10/18/24 15:38	
Bromomethane	74-83-9	94.9	ND	0.20	1	ND	0.78	10/18/24 15:38	
1,3-Butadiene	106-99-0	54.1	ND	0.20	1	ND	0.44	10/18/24 15:38	
n-Butane	106-97-8	58.1	ND	0.20	1	ND	0.48	10/18/24 15:38	
2-Butanone(MEK)	78-93-3	72.1	**6.0**	0.20	1	**18**	0.59	10/18/24 15:38	
Carbon disulfide	75-15-0	76.1	**0.25**	0.20	1	**0.78**	0.62	10/18/24 15:38	
Carbon tetrachloride	56-23-5	153.8	ND	0.20	1	ND	1.3	10/18/24 15:38	
Chlorobenzene	108-90-7	112.6	ND	0.20	1	ND	0.92	10/18/24 15:38	
Chloroethane	75-00-3	64.5	ND	0.20	1	ND	0.53	10/18/24 15:38	
Chloroform	67-66-3	119.4	ND	0.20	1	ND	0.98	10/18/24 15:38	
Chloromethane	74-87-3	50.5	**0.40**	0.20	1	**0.83**	0.41	10/18/24 15:38	
3-Chloropropene(Allyl chloride)	107-05-1	76.5	ND	0.20	1	ND	0.63	10/18/24 15:38	
2-Chlorotoluene	95-49-8	126.6	ND	0.20	1	ND	1.0	10/18/24 15:38	
Cyclohexane	110-82-7	84.2	ND	0.20	1	ND	0.69	10/18/24 15:38	
Dibromochloromethane	124-48-1	208.3	ND	0.20	1	ND	1.7	10/18/24 15:38	
1,2-Dibromoethane	106-93-4	187.8	ND	0.20	1	ND	1.5	10/18/24 15:38	
1,2-Dichlorobenzene	95-50-1	147.0	ND	0.20	1	ND	1.2	10/18/24 15:38	
1,3-Dichlorobenzene	541-73-1	147.0	ND	0.20	1	ND	1.2	10/18/24 15:38	
1,4-Dichlorobenzene	106-46-7	147.0	ND	0.20	1	ND	1.2	10/18/24 15:38	
1,1-Dichloroethane	75-34-3	99.0	ND	0.20	1	ND	0.81	10/18/24 15:38	
1,2-Dichloroethane	107-06-2	99.0	ND	0.20	1	ND	0.81	10/18/24 15:38	
1,1-Dichloroethene	75-35-4	96.9	ND	0.20	1	ND	0.79	10/18/24 15:38	
cis-1,2-Dichloroethene	156-59-2	96.9	ND	0.20	1	ND	0.79	10/18/24 15:38	
trans-1,2-Dichloroethene	156-60-5	96.9	ND	0.20	1	ND	0.79	10/18/24 15:38	
1,2-Dichloropropane	78-87-5	113.0	ND	0.20	1	ND	0.92	10/18/24 15:38	
cis-1,3-Dichloropropene	10061-01-5	111.0	ND	0.20	1	ND	0.91	10/18/24 15:38	
trans-1,3-Dichloropropene	10061-02-6	111.0	ND	0.20	1	ND	0.91	10/18/24 15:38	
1,4-Dioxane	123-91-1	88.1	ND	0.20	1	ND	0.72	10/18/24 15:38	
Ethanol	64-17-5	46.1	**53**	1.0	1	**99**	1.9	10/18/24 15:38	E
Ethyl acetate	141-78-6	88.1	ND	0.20	1	ND	0.72	10/18/24 15:38	
Ethylbenzene	100-41-4	106.2	ND	0.20	1	ND	0.87	10/18/24 15:38	
4-Ethyltoluene	622-96-8	120.2	ND	0.20	1	ND	0.98	10/18/24 15:38	
Freon 12(Dichlorodifluoromethane)	75-71-8	120.9	ND	0.20	1	ND	0.99	10/18/24 15:38	
Freon 114(1,2-Dichlorotetrafluoroethane)	76-14-2	170.9	ND	0.20	1	ND	1.4	10/18/24 15:38	
Freon 11(Trichlorofluoromethane)	75-69-4	137.4	ND	0.20	1	ND	1.1	10/18/24 15:38	

EMSL Analytical, Inc.

200 Route 130, Cinnaminson, NJ, 08077
Telephone: 856-858-4800 Fax:856-786-5974
EMSL-CIN-01

EMSL Order ID: 012433250
LIMS Reference ID: AC33250
EMSL Customer ID: ENVI54

Attention: Results
Fuss & O'Neill, Inc. [ENVI54]
One Financial Plaza, 15th Floor
Hartford, CT 06103
(860) 646-2469
LabResults@fando.com

Project Name: 0000-5465.10E
Customer PO:
EMSL Sales Rep: Jeromy Bish
Received: 10/07/2024 11:40
Reported: 10/21/2024 14:48

EMSL Sample ID: AC33250-02
Customer Sample ID: 2-1643 241002-02

Collected: 10/02/2024 11:47
Received: 10/07/2024 11:40

Analysis	Prep Batch	Lab File ID	Canister ID	Sample Vol.	Dil. Factor	Analyst Init.
10/18/24 15:38	BCJ2206	y16719.D	JAR	250 cc	1	TP

Target Compound Results Summary

Target Compounds	Cas#	MW	Result ppbv	RL ppbv	DF	Result ug/m3	RL ug/m3	Analyzed	Q
Freon 113(1,1,2-Trichlorotrifluoroethane)	76-13-1	187.4	ND	0.20	1	ND	1.5	10/18/24 15:38	
n-Heptane	142-82-5	100.2	ND	0.20	1	ND	0.82	10/18/24 15:38	
Hexachloro-1,3-butadiene	87-68-3	260.8	ND	0.20	1	ND	2.1	10/18/24 15:38	
n-Hexane	110-54-3	86.2	ND	0.20	1	ND	0.71	10/18/24 15:38	
2-Hexanone(MBK)	591-78-6	100.2	ND	0.20	1	ND	0.82	10/18/24 15:38	
Isopropyl alcohol(2-Propanol)	67-63-0	60.1	**7.6**	0.20	1	**19**	0.49	10/18/24 15:38	
Isopropylbenzene (cumene)	98-82-8	120.2	ND	0.20	1	ND	0.98	10/18/24 15:38	
Methyl-tert-butyl ether(MTBE)	1634-04-4	88.2	ND	0.20	1	ND	0.72	10/18/24 15:38	
Methylene chloride	75-09-2	84.9	ND	0.20	1	ND	0.69	10/18/24 15:38	
Methyl Methacrylate	80-62-6	100.1	ND	0.20	1	ND	0.82	10/18/24 15:38	
4-Methyl-2-pentanone(MIBK)	108-10-1	100.2	**5.7**	0.20	1	**23**	0.82	10/18/24 15:38	
Naphthalene	91-20-3	128.2	ND	0.20	1	ND	1.0	10/18/24 15:38	
Propylene	115-07-1	42.1	**1.9**	0.20	1	**3.2**	0.34	10/18/24 15:38	
Styrene	100-42-5	104.1	ND	0.20	1	ND	0.85	10/18/24 15:38	
Tertiary butyl alcohol(TBA)	75-65-0	74.1	**0.96**	0.20	1	**2.9**	0.61	10/18/24 15:38	
1,1,2,2-Tetrachloroethane	79-34-5	167.9	ND	0.20	1	ND	1.4	10/18/24 15:38	
Tetrachloroethene	127-18-4	165.8	ND	0.20	1	ND	1.4	10/18/24 15:38	
Tetrahydrofuran	109-99-9	72.1	ND	0.20	1	ND	0.59	10/18/24 15:38	
Toluene	108-88-3	92.1	ND	0.20	1	ND	0.75	10/18/24 15:38	
1,2,4-Trichlorobenzene	120-82-1	181.5	ND	0.20	1	ND	1.5	10/18/24 15:38	
1,1,1-Trichloroethane	71-55-6	133.4	ND	0.20	1	ND	1.1	10/18/24 15:38	
1,1,2-Trichloroethane	79-00-5	133.4	ND	0.20	1	ND	1.1	10/18/24 15:38	
Trichloroethene	79-01-6	131.4	ND	0.20	1	ND	1.1	10/18/24 15:38	
1,3,5-Trimethylbenzene	108-67-8	120.2	ND	0.20	1	ND	0.98	10/18/24 15:38	
1,2,4-Trimethylbenzene	95-63-6	120.2	ND	0.20	1	ND	0.98	10/18/24 15:38	
2,2,4-Trimethylpentane(Isooctane)	540-84-1	114.2	ND	0.20	1	ND	0.93	10/18/24 15:38	
Vinyl acetate	108-05-4	86.0	ND	0.20	1	ND	0.70	10/18/24 15:38	
Vinyl chloride	75-01-4	62.5	ND	0.20	1	ND	0.51	10/18/24 15:38	
Xylene (Ortho)	95-47-6	106.2	ND	0.20	1	ND	0.87	10/18/24 15:38	
Xylene (p,m)	179601-23-1	106.2	ND	0.40	1	ND	1.7	10/18/24 15:38	
Xylenes, Total	1330-20-7	106.2	ND	0.20	1	ND	0.87	10/18/24 15:38	
Total Target Compound Concentrations:			**130**			**310**			

Surrogate	Result	Spike	Recovery
4-Bromofluorobenzene	9.66	10.00	97

EMSL Analytical, Inc.

200 Route 130, Cinnaminson, NJ, 08077
Telephone: 856-858-4800 Fax:856-786-5974
EMSL-CIN-01

EMSL Order ID: 012433250
LIMS Reference ID: AC33250
EMSL Customer ID: ENVI54

Attention: Results
Fuss & O'Neill, Inc. [ENVI54]
One Financial Plaza, 15th Floor
Hartford, CT 06103
(860) 646-2469
LabResults@fando.com

Project Name: 0000-5465.10E
Customer PO:
EMSL Sales Rep: Jeromy Bish
Received: 10/07/2024 11:40
Reported: 10/21/2024 14:48

EMSL Sample ID: AC33250-02
Customer Sample ID: 2-1643 241002-02

Collected: 10/02/2024 11:47
Received: 10/07/2024 11:40

Analysis	Prep Batch	Lab File ID	Canister ID	Sample Vol.	Dil. Factor	Analyst Init.
10/18/24 15:38	BCJ2206	y16719.D	JAR	250 cc	1	TP

TICS Compound Results Summary

Target Compounds	Cas#	MW	Result ppbv	RL ppbv	DF	Result ug/m3	RL ug/m3	Analyzed	Q
2-Butene	000107-01-7	56.0	**8.1**		1	**19**		10/18/24 15:38	N
Carbonyl Sulfide	463-58-1	60.1	**2.2**		1	**5.5**		10/18/24 15:38	N
Furan, 2-methyl-	000534-22-5	92.0	**7.1**		1	**27**		10/18/24 15:38	N
Total Target Compound Concentrations:			**130**			**310**			

Qualifier Definitions
(1) = If unknown, MW is assigned as equivalent Toluene (92) for mg/m3 conversion purposes.
B = Compound also found in method blank.
J= Estimated value based on a 1:1 response to internal standard.
N= Presumptive evidence of compound based on library match.

EMSL Analytical, Inc.

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EMSL-CIN-01

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LIMS Reference ID: AC33250
EMSL Customer ID: ENVI54

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Hartford, CT 06103
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Project Name: 0000-5465.10E
Customer PO:
EMSL Sales Rep: Jeromy Bish
Received: 10/07/2024 11:40
Reported: 10/21/2024 14:48

EMSL Sample ID: AC33250-02
Customer Sample ID: 2-1643 241002-02

Collected: 10/02/2024 11:47
Received: 10/07/2024 11:40

Analysis	Prep Batch	Lab File ID	Canister ID	Sample Vol.	Dil. Factor	Analyst Init.
10/18/24 15:38	BCJ2206	y16719.D	JAR	250 cc	1	TP

Target Compound Results Summary

Target Compounds	Cas#	MW	Result ppbv	RL ppbv	DF	Result ug/m3	RL ug/m3	Analyzed	Q
Acetone	67-64-1	58.1	**39**	0.20	1	**93**	0.48	10/18/24 15:38	
2-Butanone(MEK)	78-93-3	72.1	**6.0**	0.20	1	**18**	0.59	10/18/24 15:38	
Carbon disulfide	75-15-0	76.1	**0.25**	0.20	1	**0.78**	0.62	10/18/24 15:38	
Chloromethane	74-87-3	50.5	**0.40**	0.20	1	**0.83**	0.41	10/18/24 15:38	
Ethanol	64-17-5	46.1	**53**	1.0	1	**99**	1.9	10/18/24 15:38	E
Isopropyl alcohol(2-Propanol)	67-63-0	60.1	**7.6**	0.20	1	**19**	0.49	10/18/24 15:38	
4-Methyl-2-pentanone(MIBK)	108-10-1	100.2	**5.7**	0.20	1	**23**	0.82	10/18/24 15:38	
Propylene	115-07-1	42.1	**1.9**	0.20	1	**3.2**	0.34	10/18/24 15:38	
Tertiary butyl alcohol(TBA)	75-65-0	74.1	**0.96**	0.20	1	**2.9**	0.61	10/18/24 15:38	
Total Target Compound Concentrations:			**130**			**310**			

Surrogate	Result	Spike	Recovery
4-Bromofluorobenzene	9.66	10.00	97

TICS Compound Results Summary

Target Compounds	Cas#	MW	Result ppbv	RL ppbv	DF	Result ug/m3	RL ug/m3	Analyzed	Q
2-Butene	000107-01-7	56.0	**8.1**		1	**19**		10/18/24 15:38	N
Carbonyl Sulfide	463-58-1	60.1	**2.2**		1	**5.5**		10/18/24 15:38	N
Furan, 2-methyl-	000534-22-5	92.0	**7.1**		1	**27**		10/18/24 15:38	N
Total Target Compound Concentrations:			**130**			**310**			
Total Volatile Organic Compounds (TVOCs):			**130.00**			**310.00**			

Qualifier Definitions
(1) = If unknown, MW is assigned as equivalent Toluene (92) for mg/m3 conversion purposes.
B = Compound also found in method blank.
J= Estimated value based on a 1:1 response to internal standard.
N= Presumptive evidence of compound based on library match.

EMSL Analytical, Inc.

200 Route 130, Cinnaminson, NJ, 08077
Telephone: 856-858-4800 Fax:856-786-5974
EMSL-CIN-01

EMSL Order ID: 012433250
LIMS Reference ID: AC33250
EMSL Customer ID: ENVI54

Attention: Results
Fuss & O'Neill, Inc. [ENVI54]
One Financial Plaza, 15th Floor
Hartford, CT 06103
(860) 646-2469
LabResults@fando.com

Project Name: 0000-5465.10E
Customer PO:
EMSL Sales Rep: Jeromy Bish
Received: 10/07/2024 11:40
Reported: 10/21/2024 14:48

EMSL Sample ID: AC33250-03
Customer Sample ID: 4-1643 241002-04

Collected: 10/02/2024 12:20
Received: 10/07/2024 11:40

Analysis	Prep Batch	Lab File ID	Canister ID	Sample Vol.	Dil. Factor	Analyst Init.
10/18/24 16:34	BCJ2206	y16720.D	JAR	250 cc	1	TP

Target Compound Results Summary

Target Compounds	Cas#	MW	Result ppbv	RL ppbv	DF	Result ug/m3	RL ug/m3	Analyzed	Q
Acetone	67-64-1	58.1	**33**	0.20	1	**78**	0.48	10/18/24 16:34	
Acetonitrile	75-05-8	41.0	ND	0.20	1	ND	0.34	10/18/24 16:34	
Acrylonitrile	107-13-1	53.0	ND	0.20	1	ND	0.43	10/18/24 16:34	
Benzene	71-43-2	78.1	ND	0.20	1	ND	0.64	10/18/24 16:34	
Benzyl chloride	100-44-7	126.0	ND	0.20	1	ND	1.0	10/18/24 16:34	
Bromodichloromethane	75-27-4	163.8	ND	0.20	1	ND	1.3	10/18/24 16:34	
Bromoethane(Ethyl bromide)	74-96-4	109.0	ND	0.20	1	ND	0.89	10/18/24 16:34	
Bromoethene(Vinyl bromide)	593-60-2	106.9	ND	0.20	1	ND	0.88	10/18/24 16:34	
Bromoform	75-25-2	252.8	ND	0.20	1	ND	2.1	10/18/24 16:34	
Bromomethane	74-83-9	94.9	ND	0.20	1	ND	0.78	10/18/24 16:34	
1,3-Butadiene	106-99-0	54.1	ND	0.20	1	ND	0.44	10/18/24 16:34	
n-Butane	106-97-8	58.1	ND	0.20	1	ND	0.48	10/18/24 16:34	
2-Butanone(MEK)	78-93-3	72.1	**4.5**	0.20	1	**13**	0.59	10/18/24 16:34	
Carbon disulfide	75-15-0	76.1	**0.25**	0.20	1	**0.78**	0.62	10/18/24 16:34	
Carbon tetrachloride	56-23-5	153.8	ND	0.20	1	ND	1.3	10/18/24 16:34	
Chlorobenzene	108-90-7	112.6	ND	0.20	1	ND	0.92	10/18/24 16:34	
Chloroethane	75-00-3	64.5	ND	0.20	1	ND	0.53	10/18/24 16:34	
Chloroform	67-66-3	119.4	ND	0.20	1	ND	0.98	10/18/24 16:34	
Chloromethane	74-87-3	50.5	**0.26**	0.20	1	**0.54**	0.41	10/18/24 16:34	
3-Chloropropene(Allyl chloride)	107-05-1	76.5	ND	0.20	1	ND	0.63	10/18/24 16:34	
2-Chlorotoluene	95-49-8	126.6	ND	0.20	1	ND	1.0	10/18/24 16:34	
Cyclohexane	110-82-7	84.2	ND	0.20	1	ND	0.69	10/18/24 16:34	
Dibromochloromethane	124-48-1	208.3	ND	0.20	1	ND	1.7	10/18/24 16:34	
1,2-Dibromoethane	106-93-4	187.8	ND	0.20	1	ND	1.5	10/18/24 16:34	
1,2-Dichlorobenzene	95-50-1	147.0	ND	0.20	1	ND	1.2	10/18/24 16:34	
1,3-Dichlorobenzene	541-73-1	147.0	ND	0.20	1	ND	1.2	10/18/24 16:34	
1,4-Dichlorobenzene	106-46-7	147.0	ND	0.20	1	ND	1.2	10/18/24 16:34	
1,1-Dichloroethane	75-34-3	99.0	ND	0.20	1	ND	0.81	10/18/24 16:34	
1,2-Dichloroethane	107-06-2	99.0	ND	0.20	1	ND	0.81	10/18/24 16:34	
1,1-Dichloroethene	75-35-4	96.9	ND	0.20	1	ND	0.79	10/18/24 16:34	
cis-1,2-Dichloroethene	156-59-2	96.9	ND	0.20	1	ND	0.79	10/18/24 16:34	
trans-1,2-Dichloroethene	156-60-5	96.9	ND	0.20	1	ND	0.79	10/18/24 16:34	
1,2-Dichloropropane	78-87-5	113.0	ND	0.20	1	ND	0.92	10/18/24 16:34	
cis-1,3-Dichloropropene	10061-01-5	111.0	ND	0.20	1	ND	0.91	10/18/24 16:34	
trans-1,3-Dichloropropene	10061-02-6	111.0	ND	0.20	1	ND	0.91	10/18/24 16:34	
1,4-Dioxane	123-91-1	88.1	ND	0.20	1	ND	0.72	10/18/24 16:34	
Ethanol	64-17-5	46.1	**34**	1.0	1	**64**	1.9	10/18/24 16:34	
Ethyl acetate	141-78-6	88.1	ND	0.20	1	ND	0.72	10/18/24 16:34	
Ethylbenzene	100-41-4	106.2	ND	0.20	1	ND	0.87	10/18/24 16:34	
4-Ethyltoluene	622-96-8	120.2	ND	0.20	1	ND	0.98	10/18/24 16:34	
Freon 12(Dichlorodifluoromethane)	75-71-8	120.9	ND	0.20	1	ND	0.99	10/18/24 16:34	
Freon 114(1,2-Dichlorotetrafluoroethane)	76-14-2	170.9	ND	0.20	1	ND	1.4	10/18/24 16:34	
Freon 11(Trichlorofluoromethane)	75-69-4	137.4	ND	0.20	1	ND	1.1	10/18/24 16:34	

EMSL Analytical, Inc.

200 Route 130, Cinnaminson, NJ, 08077
Telephone: 856-858-4800 Fax:856-786-5974
EMSL-CIN-01

EMSL Order ID: 012433250
LIMS Reference ID: AC33250
EMSL Customer ID: ENVI54

Attention: Results
Fuss & O'Neill, Inc. [ENVI54]
One Financial Plaza, 15th Floor
Hartford, CT 06103
(860) 646-2469
LabResults@fando.com

Project Name: 0000-5465.10E
Customer PO:
EMSL Sales Rep: Jeromy Bish
Received: 10/07/2024 11:40
Reported: 10/21/2024 14:48

EMSL Sample ID: AC33250-03
Customer Sample ID: 4-1643 241002-04

Collected: 10/02/2024 12:20
Received: 10/07/2024 11:40

Analysis	Prep Batch	Lab File ID	Canister ID	Sample Vol.	Dil. Factor	Analyst Init.
10/18/24 16:34	BCJ2206	y16720.D	JAR	250 cc	1	TP

Target Compound Results Summary

Target Compounds	Cas#	MW	Result ppbv	RL ppbv	DF	Result ug/m3	RL ug/m3	Analyzed	Q
Freon 113(1,1,2-Trichlorotrifluoroethane)	76-13-1	187.4	ND	0.20	1	ND	1.5	10/18/24 16:34	
n-Heptane	142-82-5	100.2	ND	0.20	1	ND	0.82	10/18/24 16:34	
Hexachloro-1,3-butadiene	87-68-3	260.8	ND	0.20	1	ND	2.1	10/18/24 16:34	
n-Hexane	110-54-3	86.2	ND	0.20	1	ND	0.71	10/18/24 16:34	
2-Hexanone(MBK)	591-78-6	100.2	ND	0.20	1	ND	0.82	10/18/24 16:34	
Isopropyl alcohol(2-Propanol)	67-63-0	60.1	**7.6**	0.20	1	**19**	0.49	10/18/24 16:34	
Isopropylbenzene (cumene)	98-82-8	120.2	ND	0.20	1	ND	0.98	10/18/24 16:34	
Methyl-tert-butyl ether(MTBE)	1634-04-4	88.2	ND	0.20	1	ND	0.72	10/18/24 16:34	
Methylene chloride	75-09-2	84.9	ND	0.20	1	ND	0.69	10/18/24 16:34	
Methyl Methacrylate	80-62-6	100.1	ND	0.20	1	ND	0.82	10/18/24 16:34	
4-Methyl-2-pentanone(MIBK)	108-10-1	100.2	**5.8**	0.20	1	**24**	0.82	10/18/24 16:34	
Naphthalene	91-20-3	128.2	ND	0.20	1	ND	1.0	10/18/24 16:34	
Propylene	115-07-1	42.1	**1.1**	0.20	1	**1.9**	0.34	10/18/24 16:34	
Styrene	100-42-5	104.1	ND	0.20	1	ND	0.85	10/18/24 16:34	
Tertiary butyl alcohol(TBA)	75-65-0	74.1	**0.87**	0.20	1	**2.6**	0.61	10/18/24 16:34	
1,1,2,2-Tetrachloroethane	79-34-5	167.9	ND	0.20	1	ND	1.4	10/18/24 16:34	
Tetrachloroethene	127-18-4	165.8	ND	0.20	1	ND	1.4	10/18/24 16:34	
Tetrahydrofuran	109-99-9	72.1	ND	0.20	1	ND	0.59	10/18/24 16:34	
Toluene	108-88-3	92.1	ND	0.20	1	ND	0.75	10/18/24 16:34	
1,2,4-Trichlorobenzene	120-82-1	181.5	ND	0.20	1	ND	1.5	10/18/24 16:34	
1,1,1-Trichloroethane	71-55-6	133.4	ND	0.20	1	ND	1.1	10/18/24 16:34	
1,1,2-Trichloroethane	79-00-5	133.4	ND	0.20	1	ND	1.1	10/18/24 16:34	
Trichloroethene	79-01-6	131.4	ND	0.20	1	ND	1.1	10/18/24 16:34	
1,3,5-Trimethylbenzene	108-67-8	120.2	ND	0.20	1	ND	0.98	10/18/24 16:34	
1,2,4-Trimethylbenzene	95-63-6	120.2	ND	0.20	1	ND	0.98	10/18/24 16:34	
2,2,4-Trimethylpentane(Isooctane)	540-84-1	114.2	ND	0.20	1	ND	0.93	10/18/24 16:34	
Vinyl acetate	108-05-4	86.0	ND	0.20	1	ND	0.70	10/18/24 16:34	
Vinyl chloride	75-01-4	62.5	ND	0.20	1	ND	0.51	10/18/24 16:34	
Xylene (Ortho)	95-47-6	106.2	ND	0.20	1	ND	0.87	10/18/24 16:34	
Xylene (p,m)	179601-23-1	106.2	ND	0.40	1	ND	1.7	10/18/24 16:34	
Xylenes, Total	1330-20-7	106.2	ND	0.20	1	ND	0.87	10/18/24 16:34	
Total Target Compound Concentrations:			**100**			**240**			

Surrogate	Result	Spike	Recovery
4-Bromofluorobenzene	9.61	10.00	96

EMSL Analytical, Inc.

200 Route 130, Cinnaminson, NJ, 08077
Telephone: 856-858-4800 Fax:856-786-5974
EMSL-CIN-01

EMSL Order ID: 012433250
LIMS Reference ID: AC33250
EMSL Customer ID: ENVI54

Attention: Results
Fuss & O'Neill, Inc. [ENVI54]
One Financial Plaza, 15th Floor
Hartford, CT 06103
(860) 646-2469
LabResults@fando.com

Project Name: 0000-5465.10E
Customer PO:
EMSL Sales Rep: Jeromy Bish
Received: 10/07/2024 11:40
Reported: 10/21/2024 14:48

EMSL Sample ID: AC33250-03
Customer Sample ID: 4-1643 241002-04

Collected: 10/02/2024 12:20
Received: 10/07/2024 11:40

Analysis	Prep Batch	Lab File ID	Canister ID	Sample Vol.	Dil. Factor	Analyst Init.
10/18/24 16:34	BCJ2206	y16720.D	JAR	250 cc	1	TP

TICS Compound Results Summary

Target Compounds	Cas#	MW	Result ppbv	RL ppbv	DF	Result ug/m3	RL ug/m3	Analyzed	Q
2-Butene	000107-01-7	56.0	**7.7**		1	**18**		10/18/24 16:34	N
Carbonyl Sulfide	463-58-1	60.1	**2.0**		1	**4.8**		10/18/24 16:34	N
Furan, 2-methyl-	000534-22-5	92.0	**4.4**		1	**16**		10/18/24 16:34	N
Total Target Compound Concentrations:			**100**			**240**			

Qualifier Definitions
(1) = If unknown, MW is assigned as equivalent Toluene (92) for mg/m3 conversion purposes.
B = Compound also found in method blank.
J= Estimated value based on a 1:1 response to internal standard.
N= Presumptive evidence of compound based on library match.

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EMSL Customer ID: ENVI54

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EMSL Sample ID: AC33250-03
Customer Sample ID: 4-1643 241002-04

Collected: 10/02/2024 12:20
Received: 10/07/2024 11:40

Analysis	Prep Batch	Lab File ID	Canister ID	Sample Vol.	Dil. Factor	Analyst Init.
10/18/24 16:34	BCJ2206	y16720.D	JAR	250 cc	1	TP

Target Compound Results Summary

Target Compounds	Cas#	MW	Result ppbv	RL ppbv	DF	Result ug/m3	RL ug/m3	Analyzed	Q
Acetone	67-64-1	58.1	**33**	0.20	1	**78**	0.48	10/18/24 16:34	
2-Butanone(MEK)	78-93-3	72.1	**4.5**	0.20	1	**13**	0.59	10/18/24 16:34	
Carbon disulfide	75-15-0	76.1	**0.25**	0.20	1	**0.78**	0.62	10/18/24 16:34	
Chloromethane	74-87-3	50.5	**0.26**	0.20	1	**0.54**	0.41	10/18/24 16:34	
Ethanol	64-17-5	46.1	**34**	1.0	1	**64**	1.9	10/18/24 16:34	
Isopropyl alcohol(2-Propanol)	67-63-0	60.1	**7.6**	0.20	1	**19**	0.49	10/18/24 16:34	
4-Methyl-2-pentanone(MIBK)	108-10-1	100.2	**5.8**	0.20	1	**24**	0.82	10/18/24 16:34	
Propylene	115-07-1	42.1	**1.1**	0.20	1	**1.9**	0.34	10/18/24 16:34	
Tertiary butyl alcohol(TBA)	75-65-0	74.1	**0.87**	0.20	1	**2.6**	0.61	10/18/24 16:34	
Total Target Compound Concentrations:			**100**			**240**			

Surrogate	Result	Spike	Recovery
4-Bromofluorobenzene	9.61	10.00	96

TICS Compound Results Summary

Target Compounds	Cas#	MW	Result ppbv	RL ppbv	DF	Result ug/m3	RL ug/m3	Analyzed	Q
2-Butene	000107-01-7	56.0	**7.7**		1	**18**		10/18/24 16:34	N
Carbonyl Sulfide	463-58-1	60.1	**2.0**		1	**4.8**		10/18/24 16:34	N
Furan, 2-methyl-	000534-22-5	92.0	**4.4**		1	**16**		10/18/24 16:34	N
Total Target Compound Concentrations:			**100**			**240**			
Total Volatile Organic Compounds (TVOCs):			**100.00**			**240.00**			

Qualifier Definitions
(1) = If unknown, MW is assigned as equivalent Toluene (92) for mg/m3 conversion purposes.
B = Compound also found in method blank.
J= Estimated value based on a 1:1 response to internal standard.
N= Presumptive evidence of compound based on library match.

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Customer PO:
EMSL Sales Rep: Jeromy Bish
Received: 10/07/2024 11:40
Reported: 10/21/2024 14:48

EMSL Sample ID: AC33250-04
Customer Sample ID: Lab Background

Collected: 10/02/2024 00:00
Received: 10/07/2024 11:40

Analysis	Prep Batch	Lab File ID	Canister ID	Sample Vol.	Dil. Factor	Analyst Init.
10/18/24 17:30	BCJ2206	y16721.D	JAR	250 cc	1	TP

Target Compound Results Summary

Target Compounds	Cas#	MW	Result ppbv	RL ppbv	DF	Result ug/m3	RL ug/m3	Analyzed	Q
Acetone	67-64-1	58.1	**2.8**	0.20	1	**6.7**	0.48	10/18/24 17:30	
Acetonitrile	75-05-8	41.0	ND	0.20	1	ND	0.34	10/18/24 17:30	
Acrylonitrile	107-13-1	53.0	ND	0.20	1	ND	0.43	10/18/24 17:30	
Benzene	71-43-2	78.1	ND	0.20	1	ND	0.64	10/18/24 17:30	
Benzyl chloride	100-44-7	126.0	ND	0.20	1	ND	1.0	10/18/24 17:30	
Bromodichloromethane	75-27-4	163.8	ND	0.20	1	ND	1.3	10/18/24 17:30	
Bromoethane(Ethyl bromide)	74-96-4	109.0	ND	0.20	1	ND	0.89	10/18/24 17:30	
Bromoethene(Vinyl bromide)	593-60-2	106.9	ND	0.20	1	ND	0.88	10/18/24 17:30	
Bromoform	75-25-2	252.8	ND	0.20	1	ND	2.1	10/18/24 17:30	
Bromomethane	74-83-9	94.9	ND	0.20	1	ND	0.78	10/18/24 17:30	
1,3-Butadiene	106-99-0	54.1	ND	0.20	1	ND	0.44	10/18/24 17:30	
n-Butane	106-97-8	58.1	ND	0.20	1	ND	0.48	10/18/24 17:30	
2-Butanone(MEK)	78-93-3	72.1	ND	0.20	1	ND	0.59	10/18/24 17:30	
Carbon disulfide	75-15-0	76.1	ND	0.20	1	ND	0.62	10/18/24 17:30	
Carbon tetrachloride	56-23-5	153.8	ND	0.20	1	ND	1.3	10/18/24 17:30	
Chlorobenzene	108-90-7	112.6	ND	0.20	1	ND	0.92	10/18/24 17:30	
Chloroethane	75-00-3	64.5	ND	0.20	1	ND	0.53	10/18/24 17:30	
Chloroform	67-66-3	119.4	ND	0.20	1	ND	0.98	10/18/24 17:30	
Chloromethane	74-87-3	50.5	ND	0.20	1	ND	0.41	10/18/24 17:30	
3-Chloropropene(Allyl chloride)	107-05-1	76.5	ND	0.20	1	ND	0.63	10/18/24 17:30	
2-Chlorotoluene	95-49-8	126.6	ND	0.20	1	ND	1.0	10/18/24 17:30	
Cyclohexane	110-82-7	84.2	ND	0.20	1	ND	0.69	10/18/24 17:30	
Dibromochloromethane	124-48-1	208.3	ND	0.20	1	ND	1.7	10/18/24 17:30	
1,2-Dibromoethane	106-93-4	187.8	ND	0.20	1	ND	1.5	10/18/24 17:30	
1,2-Dichlorobenzene	95-50-1	147.0	ND	0.20	1	ND	1.2	10/18/24 17:30	
1,3-Dichlorobenzene	541-73-1	147.0	ND	0.20	1	ND	1.2	10/18/24 17:30	
1,4-Dichlorobenzene	106-46-7	147.0	ND	0.20	1	ND	1.2	10/18/24 17:30	
1,1-Dichloroethane	75-34-3	99.0	ND	0.20	1	ND	0.81	10/18/24 17:30	
1,2-Dichloroethane	107-06-2	99.0	ND	0.20	1	ND	0.81	10/18/24 17:30	
1,1-Dichloroethene	75-35-4	96.9	ND	0.20	1	ND	0.79	10/18/24 17:30	
cis-1,2-Dichloroethene	156-59-2	96.9	ND	0.20	1	ND	0.79	10/18/24 17:30	
trans-1,2-Dichloroethene	156-60-5	96.9	ND	0.20	1	ND	0.79	10/18/24 17:30	
1,2-Dichloropropane	78-87-5	113.0	ND	0.20	1	ND	0.92	10/18/24 17:30	
cis-1,3-Dichloropropene	10061-01-5	111.0	ND	0.20	1	ND	0.91	10/18/24 17:30	
trans-1,3-Dichloropropene	10061-02-6	111.0	ND	0.20	1	ND	0.91	10/18/24 17:30	
1,4-Dioxane	123-91-1	88.1	ND	0.20	1	ND	0.72	10/18/24 17:30	
Ethanol	64-17-5	46.1	**27**	1.0	1	**51**	1.9	10/18/24 17:30	
Ethyl acetate	141-78-6	88.1	ND	0.20	1	ND	0.72	10/18/24 17:30	
Ethylbenzene	100-41-4	106.2	ND	0.20	1	ND	0.87	10/18/24 17:30	
4-Ethyltoluene	622-96-8	120.2	ND	0.20	1	ND	0.98	10/18/24 17:30	
Freon 12(Dichlorodifluoromethane)	75-71-8	120.9	ND	0.20	1	ND	0.99	10/18/24 17:30	
Freon 114(1,2-Dichlorotetrafluoroethane)	76-14-2	170.9	ND	0.20	1	ND	1.4	10/18/24 17:30	
Freon 11(Trichlorofluoromethane)	75-69-4	137.4	ND	0.20	1	ND	1.1	10/18/24 17:30	

EMSL Analytical, Inc.

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Telephone: 856-858-4800 Fax:856-786-5974
EMSL-CIN-01

EMSL Order ID: 012433250
LIMS Reference ID: AC33250
EMSL Customer ID: ENVI54

Attention: Results
Fuss & O'Neill, Inc. [ENVI54]
One Financial Plaza, 15th Floor
Hartford, CT 06103
(860) 646-2469
LabResults@fando.com

Project Name: 0000-5465.10E
Customer PO:
EMSL Sales Rep: Jeromy Bish
Received: 10/07/2024 11:40
Reported: 10/21/2024 14:48

EMSL Sample ID: AC33250-04
Customer Sample ID: Lab Background

Collected: 10/02/2024 00:00
Received: 10/07/2024 11:40

Analysis	Prep Batch	Lab File ID	Canister ID	Sample Vol.	Dil. Factor	Analyst Init.
10/18/24 17:30	BCJ2206	y16721.D	JAR	250 cc	1	TP

Target Compound Results Summary

Target Compounds	Cas#	MW	Result ppbv	RL ppbv	DF	Result ug/m3	RL ug/m3	Analyzed	Q
Freon 113(1,1,2-Trichlorotrifluoroethane)	76-13-1	187.4	ND	0.20	1	ND	1.5	10/18/24 17:30	
n-Heptane	142-82-5	100.2	ND	0.20	1	ND	0.82	10/18/24 17:30	
Hexachloro-1,3-butadiene	87-68-3	260.8	ND	0.20	1	ND	2.1	10/18/24 17:30	
n-Hexane	110-54-3	86.2	ND	0.20	1	ND	0.71	10/18/24 17:30	
2-Hexanone(MBK)	591-78-6	100.2	ND	0.20	1	ND	0.82	10/18/24 17:30	
Isopropyl alcohol(2-Propanol)	67-63-0	60.1	**2.3**	0.20	1	**5.8**	0.49	10/18/24 17:30	
Isopropylbenzene (cumene)	98-82-8	120.2	ND	0.20	1	ND	0.98	10/18/24 17:30	
Methyl-tert-butyl ether(MTBE)	1634-04-4	88.2	ND	0.20	1	ND	0.72	10/18/24 17:30	
Methylene chloride	75-09-2	84.9	**0.21**	0.20	1	**0.73**	0.69	10/18/24 17:30	
Methyl Methacrylate	80-62-6	100.1	ND	0.20	1	ND	0.82	10/18/24 17:30	
4-Methyl-2-pentanone(MIBK)	108-10-1	100.2	ND	0.20	1	ND	0.82	10/18/24 17:30	
Naphthalene	91-20-3	128.2	ND	0.20	1	ND	1.0	10/18/24 17:30	
Propylene	115-07-1	42.1	ND	0.20	1	ND	0.34	10/18/24 17:30	
Styrene	100-42-5	104.1	ND	0.20	1	ND	0.85	10/18/24 17:30	
Tertiary butyl alcohol(TBA)	75-65-0	74.1	ND	0.20	1	ND	0.61	10/18/24 17:30	
1,1,2,2-Tetrachloroethane	79-34-5	167.9	ND	0.20	1	ND	1.4	10/18/24 17:30	
Tetrachloroethene	127-18-4	165.8	ND	0.20	1	ND	1.4	10/18/24 17:30	
Tetrahydrofuran	109-99-9	72.1	ND	0.20	1	ND	0.59	10/18/24 17:30	
Toluene	108-88-3	92.1	ND	0.20	1	ND	0.75	10/18/24 17:30	
1,2,4-Trichlorobenzene	120-82-1	181.5	ND	0.20	1	ND	1.5	10/18/24 17:30	
1,1,1-Trichloroethane	71-55-6	133.4	ND	0.20	1	ND	1.1	10/18/24 17:30	
1,1,2-Trichloroethane	79-00-5	133.4	ND	0.20	1	ND	1.1	10/18/24 17:30	
Trichloroethene	79-01-6	131.4	ND	0.20	1	ND	1.1	10/18/24 17:30	
1,3,5-Trimethylbenzene	108-67-8	120.2	ND	0.20	1	ND	0.98	10/18/24 17:30	
1,2,4-Trimethylbenzene	95-63-6	120.2	ND	0.20	1	ND	0.98	10/18/24 17:30	
2,2,4-Trimethylpentane(Isooctane)	540-84-1	114.2	ND	0.20	1	ND	0.93	10/18/24 17:30	
Vinyl acetate	108-05-4	86.0	ND	0.20	1	ND	0.70	10/18/24 17:30	
Vinyl chloride	75-01-4	62.5	ND	0.20	1	ND	0.51	10/18/24 17:30	
Xylene (Ortho)	95-47-6	106.2	ND	0.20	1	ND	0.87	10/18/24 17:30	
Xylene (p,m)	179601-23-1	106.2	ND	0.40	1	ND	1.7	10/18/24 17:30	
Xylenes, Total	1330-20-7	106.2	ND	0.20	1	ND	0.87	10/18/24 17:30	
Total Target Compound Concentrations:			**32**			**64**			

Surrogate	Result	Spike	Recovery
4-Bromofluorobenzene	9.68	10.00	97

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EMSL-CIN-01

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LIMS Reference ID: AC33250
EMSL Customer ID: ENVI54

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Hartford, CT 06103
(860) 646-2469
LabResults@fando.com

Project Name: 0000-5465.10E
Customer PO:
EMSL Sales Rep: Jeromy Bish
Received: 10/07/2024 11:40
Reported: 10/21/2024 14:48

EMSL Sample ID: AC33250-04
Customer Sample ID: Lab Background

Collected: 10/02/2024 00:00
Received: 10/07/2024 11:40

Analysis	Prep Batch	Lab File ID	Canister ID	Sample Vol.	Dil. Factor	Analyst Init.
10/18/24 17:30	BCJ2206	y16721.D	JAR	250 cc	1	TP

TICS Compound Results Summary

Target Compounds	Cas#	MW	Result ppbv	RL ppbv	DF	Result ug/m3	RL ug/m3	Analyzed	Q
Tentatively Identified Compounds		92.0	0.0		1	0		10/18/24 17:30	
Total Target Compound Concentrations:			32			64			

Qualifier Definitions
(1) = If unknown, MW is assigned as equivalent Toluene (92) for mg/m3 conversion purposes.
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Received: 10/07/2024 11:40

Analysis	Prep Batch	Lab File ID	Canister ID	Sample Vol.	Dil. Factor	Analyst Init.
10/18/24 17:30	BCJ2206	y16721.D	JAR	250 cc	1	TP

Target Compound Results Summary

Target Compounds	Cas#	MW	Result ppbv	RL ppbv	DF	Result ug/m3	RL ug/m3	Analyzed	Q
Acetone	67-64-1	58.1	**2.8**	0.20	1	**6.7**	0.48	10/18/24 17:30	
Ethanol	64-17-5	46.1	**27**	1.0	1	**51**	1.9	10/18/24 17:30	
Isopropyl alcohol(2-Propanol)	67-63-0	60.1	**2.3**	0.20	1	**5.8**	0.49	10/18/24 17:30	
Methylene chloride	75-09-2	84.9	**0.21**	0.20	1	**0.73**	0.69	10/18/24 17:30	
Total Target Compound Concentrations:			**32**			**64**			

Surrogate	Result	Spike	Recovery
4-Bromofluorobenzene	9.68	10.00	97

TICS Compound Results Summary

Target Compounds	Cas#	MW	Result ppbv	RL ppbv	DF	Result ug/m3	RL ug/m3	Analyzed	Q
Tentatively Identified Compounds		92.0	**0.0**		1	**0**		10/18/24 17:30	
Total Target Compound Concentrations:			**32**			**64**			
Total Volatile Organic Compounds (TVOCs):			**32.00**			**64.00**			

Qualifier Definitions
(1) = If unknown, MW is assigned as equivalent Toluene (92) for mg/m3 conversion purposes.
B = Compound also found in method blank.
J= Estimated value based on a 1:1 response to internal standard.
N= Presumptive evidence of compound based on library match.

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Reported: 10/21/2024 14:48

Notes and Definitions

Item	Definition
E	Result is beyond calibration range. This value is estimated.
ND	Non Detect. This notation would be used in the results column in lieu of a "U" qualifier.
U	Compound was analyzed for but not detected at a listed and appropriately adjusted reporting level.
J(Target)	Concentration estimated between Reporting Limit and MDL.
J	Estimated value reported below adjusted reporting limit for target compounds or estimating a concentration for TICs where a 1:1 response is assumed
B	Compound found in associated method blank as well as in the sample.
E	Estimated value exceeding upper calibration range of instrument. Ethanol and isopropyl alcohol are not specifically targeted to dilute within calibration range.
D	Compound reported from additional diluted analysis.
N	indicates presumptive evidence of a compound based on library search match.

AC33250

FUSS & O'NEILL ~~ENVIROSCIENCE, LLC~~
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(860) 646-2469 • www.FandO.com

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- ☐ 78 Interstate Drive, West Springfield, MA 01089
- ☑ 108 Myrtle Street, #502, North Quincy, MA 02171
- ☐ 317 Iron Horse Way, Suite 204, Providence, RI 02908
- ☐ 80 Washington Street, Suite 301, Poughkeepsie, NY 12601

CHAIN-OF-CUSTODY RECORD 4517

Turnaround Time
☐ 1 Day* ☐ 3 Days* ☐ Other ____ (days)
☐ 2 Days* ☒ Standard (____ days) *Surcharge Applies

Project Name	Project Location	Project Number	Laboratory
Needham Crumb Rubber	Needham MA	20221266.B50	EMSL (NJ)

Report To: Neal Kelly Neal.Kelly@fando.com
Invoice To:
P.O. No.: —
Sampler's Signature: Date: 10/2/24

Source Codes:
MW=Monitoring Well PW=Potable Water S=Soil W=Waste
SW=Surface Water T=Treatment Facility B=Sediment A=Air
X=Other AQ = Aqueous CR: Crumb Rubber

Item No.	Transfer Check 1	2	3	4	Sample Number	Source Code	Date Sampled	Time Sampled	Analysis Request: Full VOC list 1,1,1 and TICS by TO-15	Full Suite list by 8270	Metals (arsenic, Cadmium, Chromium, Lead, Magnesium, mercury, selenium & zinc) by 6010 / 7470	Containers: Soil VOA Vial, [ ] methanol	Soil VOA Vial, [ ] water	[ ] $Na(SO_4)_2$	Glass Soil Container ( ) oz	Glass Soil Container (4) oz	Other:	Water VOA Vial, [ ] As is ([ ]HCl)	Glass Amber ( ) ml, [ ] As is [ ] H_2SO_4	Plastic 4 As is, [ ] 250 ml [ ] 500 [ ] 1000 ml	Plastic - H_2SO_4, [ ] 250 ml [ ] 500 [ ] 1000 ml	Plastic - HNO_3, 250 ml [ ] Filtered [ ] Unfiltered	Plastic - NaOH, 250 ml	Comments
1					1643241002-01	CR	10/2/24	1121	X		X	X					3							Fenders
2					1643241002-02	CR	10/2/24	1147			X	X					3							~~Brook~~ Brook
3					1643241002-03	AQ	10/2/24	1200											3					~~Brook~~ only VOCs
4					1643241002-04	CR	10/2/24	1220			X	X					3							~~Memorial~~ Memorial

Transfer Number	Relinquished By	Accepted By	Date	Time
1	Chris Juras		10/7/24	11:40
2			10/07/24	11:40am
3				
4				

Reporting and Detection Limit Requirements: MCP CAM Cert.
Additional Comments: Split TO15 | Chem

EMSL Analytical, Inc.

200 Route 130, Cinnaminson, NJ, 08077
Telephone: 856-858-4800 Fax:856-786-5974
EMSL-CIN-01

EMSL Order ID: 012433101
LIMS Reference ID: AC33101
EMSL Customer ID: ENVI54

October 25, 2024

Neal Kelly
Fuss & O'Neill, Inc. [ENVI54]
108 Myrtle St
North Quincy, Massachusetts 02171

The following analytical report covers the analysis performed on samples submitted to EMSL Analytical, Inc. on 10/10/2024. The results are tabulated on the attached pages for the following client designated project:

Needham Crumb Rubber

The reference number for these samples is EMSL Order #: AC33101 . Please use this reference when calling about these samples. If you have any questions, please do not hesitate to contact the lab at 856-858-4800.

Owen McKenna Laboratory Manager or other approved signatory

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EMSL Analytical, Inc.

200 Route 130, Cinnaminson, NJ, 08077
Telephone: 856-858-4800 Fax:856-786-5974
EMSL-CIN-01

EMSL Order ID: 012433101
LIMS Reference ID: AC33101
EMSL Customer ID: ENVI54

Attention: Neal Kelly
Fuss & O'Neill, Inc. [ENVI54]
108 Myrtle St
North Quincy, Massachusetts 02171
(860) 646-2469
Neal.Kelly@fando.com

Project Name: Needham Crumb Rubber

Customer PO: 20081266.B50
EMSL Sales Rep: Jeromy Bish
Received: 10/10/2024 09:00
Reported: 10/25/2024 15:39

Sample Condition on Receipt

Cooler ID: Default Cooler **Temperature:** **°C**

Custody Seals	Y
Containers Intact	Y
COC/Labels Agree	Y
Preservation Confirmed	Y

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Received: 10/10/2024 09:00
Reported: 10/25/2024 15:39

Samples in this Report

Lab ID	Sample	Matrix	Date Sampled	Date Received
AC33101-03	1643241002-03	Waste Water	10/2/24 12:00 pm	10/10/2024

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Customer PO: 20081266.B50
EMSL Sales Rep: Jeromy Bish
Received: 10/10/2024 09:00
Reported: 10/25/2024 15:39

Positive Hits Summary

Lab ID	Client ID				Sampled
AC33101-03	1643241002-03				10/02/24 12:00
Method	Analyte	Result	Qualifier	Unit	Analyzed
EPA 624.1	**No TICs found**	**0.0**		**µg/L**	**10/14/2024 18:26**

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Project Name: Needham Crumb Rubber

Customer PO: 20081266.B50
EMSL Sales Rep: Jeromy Bish
Received: 10/10/2024 09:00
Reported: 10/25/2024 15:39

Sample Results

Sample: 1643241002-03
AC33101-03 (Waste Water)

GCMS-VOA

Analyte	Result	Q	DF	MDL	RL	Units	Prepared Date/Time	Analyzed Date/Time	Prep/Analyst Initials	Prep Method	Analytical Method
No TICs found	0.0		1			µg/L	10/14/24 18:26	10/14/24 18:26	OPM/WRF	EPA 624.1	EPA 624.1
Acetone	ND		1	15		µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
Acrolein	ND	C	1	10		µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
Benzene	ND		1	1.0		µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
Bromobenzene	ND		1	1.0		µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
Bromodichloromethane	ND		1	1.0		µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
Bromoform	ND		1	1.0		µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
Bromomethane	ND		1	5.0		µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
2-Butanone	ND		1	2.0		µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
tert-Butyl Alcohol	ND		1	10		µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
Sec-butylbenzene	ND		1	1.0		µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
Tert-butylbenzene	ND		1	1.0		µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
N-butylbenzene	ND		1	1.0		µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
Carbon Disulfide	ND		1	1.0		µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
Carbon Tetrachloride	ND		1	1.0		µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
Chlorobenzene	ND		1	1.0		µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
Chloroethane	ND		1	5.0		µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
2-Chloroethyl Vinyl Ether	ND		1	2.0		µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
Chloroform	ND		1	1.0		µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
Chloromethane	ND		1	5.0		µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
2-Chlorotoluene	ND		1	1.0		µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
4-Chlorotoluene	ND		1	1.0		µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
1,2-Dibromo-3-chloropropane	ND		1	5.0		µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
Dibromochloromethane	ND		1	1.0		µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
1,2-Dibromoethane	ND		1	1.0		µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
Dibromomethane	ND		1	1.0		µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
Trans-1,4-dichloro-2-butene	ND		1	2.0		µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
1,3-Dichlorobenzene	ND		1	1.0		µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
1,4-Dichlorobenzene	ND		1	1.0		µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
1,2-Dichlorobenzene	ND		1	1.0		µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
Dichlorodifluoromethane	ND		1	5.0		µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
1,1-Dichloroethane	ND		1	1.0		µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
1,2-Dichloroethane	ND		1	1.0		µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
1,1-Dichloroethene	ND		1	1.0		µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
Trans-1,2-dichloroethene	ND		1	1.0		µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
Cis-1,2-dichloroethene	ND		1	1.0		µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
1,2-Dichloropropane	ND		1	1.0		µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
2,2-Dichloropropane	ND		1	1.0		µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
1,3-Dichloropropane	ND		1	1.0		µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
Cis-1,3-dichloropropene	ND		1	1.0		µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
Trans-1,3-dichloropropene	ND		1	1.0		µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
1,1-Dichloropropene	ND		1	1.0		µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
Ethylbenzene	ND		1	1.0		µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
Hexachlorobutadiene	ND		1	1.0		µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
2-Hexanone	ND		1	4.0		µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1

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Project Name: Needham Crumb Rubber

Customer PO: 20081266.B50
EMSL Sales Rep: Jeromy Bish
Received: 10/10/2024 09:00
Reported: 10/25/2024 15:39

Sample Results
(Continued)

Sample: 1643241002-03 (Continued)
AC33101-03 (Waste Water)

Analyte	Result	Q	DF	RL	Units	Prepared Date/Time	Analyzed Date/Time	Prep/Analyst Initials	Prep Method	Analytical Method
GCMS-VOA (Continued)										
Isopropylbenzene	ND		1	1.0	µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
4-Isopropyltoluene	ND		1	1.0	µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
Methylene Chloride	ND		1	1.0	µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
4-Methyl-2-pentanone	ND		1	2.0	µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
Methyl-tert butyl ether	ND		1	1.0	µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
Naphthalene	ND		1	2.0	µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
N-propylbenzene	ND		1	1.0	µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
Styrene	ND		1	1.0	µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
1,1,2,2-Tetrachloroethane	ND		1	1.0	µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
1,1,1,2-Tetrachloroethane	ND		1	1.0	µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
Tetrachloroethene	ND		1	2.0	µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
Toluene	ND		1	1.0	µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
1,2,3-Trichlorobenzene	ND		1	2.0	µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
1,2,4-Trichlorobenzene	ND		1	1.0	µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
1,1,2-Trichloroethane	ND		1	1.0	µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
1,1,1-Trichloroethane	ND		1	1.0	µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
Trichloroethene	ND		1	1.0	µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
Trichlorofluoromethane	ND		1	5.0	µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
1,2,3-Trichloropropane	ND		1	4.0	µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		1	2.0	µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
1,2,4-Trimethylbenzene	ND		1	1.0	µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
1,3,5-Trimethylbenzene	ND		1	1.0	µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
Vinyl Acetate	ND		1	2.0	µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
Vinyl Chloride	ND		1	5.0	µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
o-xylene	ND		1	1.0	µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
m&p-xylenes	ND		1	2.0	µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
Xylenes, Total	ND		1	1.0	µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1

Surrogate(s)	Recovery	Q	Limits					
Surrogate: 4-Bromofluorobenzene	*102%*		*70-130*	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	*EPA 624.1*
Surrogate: Dibromofluoromethane	*115%*		*70-130*	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	*EPA 624.1*
Surrogate: 1,2-Dichloroethane-d4	*104%*		*70-130*	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	*EPA 624.1*
Surrogate: Toluene-d8	*101%*		*70-130*	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	*EPA 624.1*

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Quality Control

GCMS-VOA

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: BCJ1488 - EPA 624.1										
Blank (BCJ1488-BLK1)					Prepared & Analyzed: 10/14/2024					
Acetone	ND		15	µg/L						
Acrolein	ND		10	µg/L						
Benzene	ND		1.0	µg/L						
Bromobenzene	ND		1.0	µg/L						
Bromodichloromethane	ND		1.0	µg/L						
Bromoform	ND		1.0	µg/L						
Bromomethane	ND		5.0	µg/L						
2-Butanone	ND		2.0	µg/L						
tert-Butyl Alcohol	ND		10	µg/L						
Sec-butylbenzene	ND		1.0	µg/L						
Tert-butylbenzene	ND		1.0	µg/L						
N-butylbenzene	ND		1.0	µg/L						
Carbon Disulfide	ND		1.0	µg/L						
Carbon Tetrachloride	ND		1.0	µg/L						
Chlorobenzene	ND		1.0	µg/L						
Chloroethane	ND		5.0	µg/L						
2-Chloroethyl Vinyl Ether	ND		2.0	µg/L						
Chloroform	ND		1.0	µg/L						
Chloromethane	ND		5.0	µg/L						
2-Chlorotoluene	ND		1.0	µg/L						
4-Chlorotoluene	ND		1.0	µg/L						
1,2-Dibromo-3-chloropropane	ND		5.0	µg/L						
Dibromochloromethane	ND		1.0	µg/L						
1,2-Dibromoethane	ND		1.0	µg/L						
Dibromomethane	ND		1.0	µg/L						
Trans-1,4-dichloro-2-butene	ND		2.0	µg/L						
1,3-Dichlorobenzene	ND		1.0	µg/L						
1,4-Dichlorobenzene	ND		1.0	µg/L						
1,2-Dichlorobenzene	ND		1.0	µg/L						
Dichlorodifluoromethane	ND		5.0	µg/L						
1,1-Dichloroethane	ND		1.0	µg/L						
1,2-Dichloroethane	ND		1.0	µg/L						
1,1-Dichloroethene	ND		1.0	µg/L						
Trans-1,2-dichloroethene	ND		1.0	µg/L						
Cis-1,2-dichloroethene	ND		1.0	µg/L						
1,2-Dichloropropane	ND		1.0	µg/L						
2,2-Dichloropropane	ND		1.0	µg/L						
1,3-Dichloropropane	ND		1.0	µg/L						
Cis-1,3-dichloropropene	ND		1.0	µg/L						
Trans-1,3-dichloropropene	ND		1.0	µg/L						
1,1-Dichloropropene	ND		1.0	µg/L						
Ethylbenzene	ND		1.0	µg/L						

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EMSL Order ID: 012433101
LIMS Reference ID: AC33101
EMSL Customer ID: ENVI54

Attention: Neal Kelly
Fuss & O'Neill, Inc. [ENVI54]
108 Myrtle St
North Quincy, Massachusetts 02171
(860) 646-2469
Neal.Kelly@fando.com

Project Name: Needham Crumb Rubber

Customer PO: 20081266.B50
EMSL Sales Rep: Jeromy Bish
Received: 10/10/2024 09:00
Reported: 10/25/2024 15:39

Quality Control
(Continued)

GCMS-VOA (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: BCJ1488 - EPA 624.1 (Continued)										
Blank (BCJ1488-BLK1)					Prepared & Analyzed: 10/14/2024					
Hexachlorobutadiene	ND		1.0	µg/L						
2-Hexanone	ND		4.0	µg/L						
Isopropylbenzene	ND		1.0	µg/L						
4-Isopropyltoluene	ND		1.0	µg/L						
Methylene Chloride	ND		1.0	µg/L						
4-Methyl-2-pentanone	ND		2.0	µg/L						
Methyl-tert butyl ether	ND		1.0	µg/L						
Naphthalene	ND		2.0	µg/L						
N-propylbenzene	ND		1.0	µg/L						
Styrene	ND		1.0	µg/L						
1,1,2,2-Tetrachloroethane	ND		1.0	µg/L						
1,1,1,2-Tetrachloroethane	ND		1.0	µg/L						
Tetrachloroethene	ND		2.0	µg/L						
Toluene	ND		1.0	µg/L						
1,2,3-Trichlorobenzene	ND		2.0	µg/L						
1,2,4-Trichlorobenzene	ND		1.0	µg/L						
1,1,2-Trichloroethane	ND		1.0	µg/L						
1,1,1-Trichloroethane	ND		1.0	µg/L						
Trichloroethene	ND		1.0	µg/L						
Trichlorofluoromethane	ND		5.0	µg/L						
1,2,3-Trichloropropane	ND		4.0	µg/L						
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		2.0	µg/L						
1,2,4-Trimethylbenzene	ND		1.0	µg/L						
1,3,5-Trimethylbenzene	ND		1.0	µg/L						
Vinyl Acetate	ND		2.0	µg/L						
Vinyl Chloride	ND		5.0	µg/L						
o-xylene	ND		1.0	µg/L						
m&p-xylenes	ND		2.0	µg/L						
Xylenes, Total	ND		1.0	µg/L						
Surrogate(s)										
Surrogate: 4-Bromofluorobenzene					*50.00*		*103*	*70-130*		
Surrogate: Dibromofluoromethane					*50.00*		*115*	*70-130*		
Surrogate: 1,2-Dichloroethane-d4					*50.00*		*104*	*70-130*		
Surrogate: Toluene-d8					*50.00*		*100*	*70-130*		

EMSL Analytical, Inc.

200 Route 130, Cinnaminson, NJ, 08077
Telephone: 856-858-4800 Fax:856-786-5974
EMSL-CIN-01

EMSL Order ID: 012433101
LIMS Reference ID: AC33101
EMSL Customer ID: ENVI54

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Fuss & O'Neill, Inc. [ENVI54]
108 Myrtle St
North Quincy, Massachusetts 02171
(860) 646-2469
Neal.Kelly@fando.com

Project Name: Needham Crumb Rubber

Customer PO: 20081266.B50
EMSL Sales Rep: Jeromy Bish
Received: 10/10/2024 09:00
Reported: 10/25/2024 15:39

Quality Control
(Continued)

GCMS-VOA (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: BCJ1488 - EPA 624.1 (Continued)										
LCS (BCJ1488-BS1)					Prepared & Analyzed: 10/14/2024					
Acetone	69.4		15	µg/L	100.0		69	67-134		
Acrolein	181		10	µg/L	200.0		91	60-140		
Benzene	50.3		1.0	µg/L	50.00		101	65-135		
Bromobenzene	46.5		1.0	µg/L	50.00		93	87-121		
Bromodichloromethane	50.8		1.0	µg/L	50.00		102	65-135		
Bromoform	48.0		1.0	µg/L	50.00		96	70-130		
Bromomethane	51.4		5.0	µg/L	50.00		103	15-185		
2-Butanone	90.5		2.0	µg/L	100.0		91	72-129		
tert-Butyl Alcohol	139		10	µg/L	200.0		69	67-143		
Sec-butylbenzene	50.1		1.0	µg/L	50.00		100	86-121		
Tert-butylbenzene	50.0		1.0	µg/L	50.00		100	89-119		
N-butylbenzene	47.9		1.0	µg/L	50.00		96	76-130		
Carbon Disulfide	62.5		1.0	µg/L	50.00		125	82-228		
Carbon Tetrachloride	56.1		1.0	µg/L	50.00		112	70-130		
Chlorobenzene	45.9		1.0	µg/L	50.00		92	65-135		
Chloroethane	51.1		5.0	µg/L	50.00		102	40-160		
2-Chloroethyl Vinyl Ether	93.0		2.0	µg/L	100.0		93	0-225		
Chloroform	50.2		1.0	µg/L	50.00		100	70-135		
Chloromethane	53.1		5.0	µg/L	50.00		106	0-205		
2-Chlorotoluene	47.3		1.0	µg/L	50.00		95	89-116		
4-Chlorotoluene	45.8		1.0	µg/L	50.00		92	78-131		
1,2-Dibromo-3-chloropropane	43.2		5.0	µg/L	50.00		86	56-142		
Dibromochloromethane	52.8		1.0	µg/L	50.00		106	70-135		
1,2-Dibromoethane	48.4		1.0	µg/L	50.00		97	88-121		
Dibromomethane	46.7		1.0	µg/L	50.00		93	85-125		
Trans-1,4-dichloro-2-butene	91.2		2.0	µg/L	100.0		91	10-161		
1,3-Dichlorobenzene	47.8		1.0	µg/L	50.00		96	70-130		
1,4-Dichlorobenzene	46.1		1.0	µg/L	50.00		92	65-135		
1,2-Dichlorobenzene	43.8		1.0	µg/L	50.00		88	65-135		
Dichlorodifluoromethane	65.2	R4	5.0	µg/L	50.00		130	37-119		
1,1-Dichloroethane	50.6		1.0	µg/L	50.00		101	70-130		
1,2-Dichloroethane	46.6		1.0	µg/L	50.00		93	70-130		
1,1-Dichloroethene	54.8		1.0	µg/L	50.00		110	50-150		
Trans-1,2-dichloroethene	52.4		1.0	µg/L	50.00		105	70-130		
Cis-1,2-dichloroethene	50.9		1.0	µg/L	50.00		102	88-142		
1,2-Dichloropropane	49.9		1.0	µg/L	50.00		100	35-165		
2,2-Dichloropropane	60.8		1.0	µg/L	50.00		122	75-134		
1,3-Dichloropropane	48.4		1.0	µg/L	50.00		97	85-116		
Cis-1,3-dichloropropene	55.7		1.0	µg/L	50.00		111	25-175		
Trans-1,3-dichloropropene	56.3		1.0	µg/L	50.00		113	50-150		
1,1-Dichloropropene	52.0		1.0	µg/L	50.00		104	88-116		
Ethylbenzene	47.7		1.0	µg/L	50.00		95	60-140		

EMSL Analytical, Inc.

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EMSL-CIN-01

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LIMS Reference ID: AC33101
EMSL Customer ID: ENVI54

Attention: Neal Kelly
Fuss & O'Neill, Inc. [ENVI54]
108 Myrtle St
North Quincy, Massachusetts 02171
(860) 646-2469
Neal.Kelly@fando.com

Project Name: Needham Crumb Rubber

Customer PO: 20081266.B50
EMSL Sales Rep: Jeromy Bish
Received: 10/10/2024 09:00
Reported: 10/25/2024 15:39

Quality Control
(Continued)

GCMS-VOA (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: BCJ1488 - EPA 624.1 (Continued)										
LCS (BCJ1488-BS1)					Prepared & Analyzed: 10/14/2024					
Hexachlorobutadiene	48.0		1.0	µg/L	50.00		96	76-114		
2-Hexanone	96.8		4.0	µg/L	100.0		97	72-131		
Isopropylbenzene	49.6		1.0	µg/L	50.00		99	89-136		
4-Isopropyltoluene	51.0		1.0	µg/L	50.00		102	85-125		
Methylene Chloride	49.3		1.0	µg/L	50.00		99	60-140		
4-Methyl-2-pentanone	97.5		2.0	µg/L	100.0		98	72-126		
Methyl-tert butyl ether	51.9		1.0	µg/L				79-120		
Naphthalene	48.6		2.0	µg/L	50.00		97	73-133		
N-propylbenzene	48.8		1.0	µg/L	50.00		98	77-131		
Styrene	48.3		1.0	µg/L	50.00		97	90-122		
1,1,2,2-Tetrachloroethane	43.0		1.0	µg/L	50.00		86	60-140		
1,1,1,2-Tetrachloroethane	49.7		1.0	µg/L	50.00		99	89-118		
Tetrachloroethene	50.8		2.0	µg/L	50.00		102	70-130		
Toluene	49.7		1.0	µg/L	50.00		99	70-130		
1,2,3-Trichlorobenzene	47.8		2.0	µg/L	50.00		96	79-128		
1,2,4-Trichlorobenzene	49.7		1.0	µg/L	50.00		99	70-130		
1,1,2-Trichloroethane	46.7		1.0	µg/L	50.00		93	70-130		
1,1,1-Trichloroethane	54.3		1.0	µg/L	50.00		109	70-130		
Trichloroethene	49.7		1.0	µg/L	50.00		99	65-135		
Trichlorofluoromethane	55.0		5.0	µg/L	50.00		110	50-150		
1,2,3-Trichloropropane	42.9		4.0	µg/L	50.00		86	70-130		
1,1,2-Trichloro-1,2,2-trifluoroethane	54.0		2.0	µg/L	50.00		108	70-130		
1,2,4-Trimethylbenzene	48.8		1.0	µg/L	50.00		98	86-122		
1,3,5-Trimethylbenzene	49.2		1.0	µg/L	50.00		98	88-121		
Vinyl Acetate	49.4		2.0	µg/L	50.00		99	70-130		
Vinyl Chloride	56.5		5.0	µg/L	50.00		113	5-195		
o-xylene	48.3		1.0	µg/L	50.00		97	89-118		
m&p-xylenes	95.6		2.0	µg/L	100.0		96	70-130		
Xylenes, Total	144		1.0	µg/L	150.0		96	70-130		
Surrogate(s)										
Surrogate: 4-Bromofluorobenzene					*50.00*		*105*	*70-130*		
Surrogate: Dibromofluoromethane					*50.00*		*114*	*70-130*		
Surrogate: 1,2-Dichloroethane-d4					*50.00*		*103*	*70-130*		
Surrogate: Toluene-d8					*50.00*		*102*	*70-130*		

EMSL Analytical, Inc.

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EMSL-CIN-01

EMSL Order ID: 012433101
LIMS Reference ID: AC33101
EMSL Customer ID: ENVI54

Attention: Neal Kelly
Fuss & O'Neill, Inc. [ENVI54]
108 Myrtle St
North Quincy, Massachusetts 02171
(860) 646-2469
Neal.Kelly@fando.com

Project Name: Needham Crumb Rubber

Customer PO: 20081266.B50
EMSL Sales Rep: Jeromy Bish
Received: 10/10/2024 09:00
Reported: 10/25/2024 15:39

Quality Control
(Continued)

GCMS-VOA (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: BCJ1488 - EPA 624.1 (Continued)										
Matrix Spike (BCJ1488-MS1)	**Source: AC32432-01**				Prepared & Analyzed: 10/14/2024					
Acetone	128		15	µg/L	100.0	54.5	73	56-168		
Acrolein	230		10	µg/L	200.0	ND	115	40-160		
Benzene	50.7		1.0	µg/L	50.00	ND	101	37-151		
Bromobenzene	46.2		1.0	µg/L	50.00	ND	92	85-114		
Bromodichloromethane	50.9		1.0	µg/L	50.00	ND	102	35-155		
Bromoform	46.8		1.0	µg/L	50.00	ND	94	45-169		
Bromomethane	51.1		5.0	µg/L	50.00	ND	102	10-242		
2-Butanone	93.9		2.0	µg/L	100.0	ND	94	60-155		
tert-Butyl Alcohol	166		10	µg/L	200.0	ND	83	57-181		
Sec-butylbenzene	49.7		1.0	µg/L	50.00	ND	99	84-113		
Tert-butylbenzene	49.6		1.0	µg/L	50.00	ND	99	85-114		
N-butylbenzene	46.8		1.0	µg/L	50.00	ND	94	79-117		
Carbon Disulfide	61.9	R4	1.0	µg/L	50.00	ND	124	72-122		
Carbon Tetrachloride	56.0		1.0	µg/L	50.00	ND	112	70-140		
Chlorobenzene	45.4		1.0	µg/L	50.00	ND	91	37-160		
Chloroethane	52.9		5.0	µg/L	50.00	ND	106	14-230		
2-Chloroethyl Vinyl Ether	ND		2.0	µg/L	100.0	ND		0-305		
Chloroform	49.3		1.0	µg/L	50.00	ND	99	51-138		
Chloromethane	55.9		5.0	µg/L	50.00	ND	112	0-273		
2-Chlorotoluene	47.5		1.0	µg/L	50.00	ND	95	82-112		
4-Chlorotoluene	46.2		1.0	µg/L	50.00	ND	92	78-114		
1,2-Dibromo-3-chloropropane	43.8		5.0	µg/L	50.00	ND	88	57-166		
Dibromochloromethane	52.8		1.0	µg/L	50.00	ND	106	53-149		
1,2-Dibromoethane	48.3		1.0	µg/L	50.00	ND	97	86-125		
Dibromomethane	47.7		1.0	µg/L	50.00	ND	95	76-136		
Trans-1,4-dichloro-2-butene	89.7		2.0	µg/L	100.0	ND	90	74-136		
1,3-Dichlorobenzene	47.3		1.0	µg/L	50.00	ND	95	59-156		
1,4-Dichlorobenzene	46.1		1.0	µg/L	50.00	ND	92	18-190		
1,2-Dichlorobenzene	43.4		1.0	µg/L	50.00	ND	87	18-190		
Dichlorodifluoromethane	68.1		5.0	µg/L	50.00	ND	136	65-145		
1,1-Dichloroethane	51.2		1.0	µg/L	50.00	ND	102	59-155		
1,2-Dichloroethane	48.1		1.0	µg/L	50.00	ND	96	49-155		
1,1-Dichloroethene	54.5		1.0	µg/L	50.00	ND	109	0-234		
Trans-1,2-dichloroethene	52.1		1.0	µg/L	50.00	ND	104	54-156		
Cis-1,2-dichloroethene	50.8		1.0	µg/L	50.00	ND	102	91-116		
1,2-Dichloropropane	49.6		1.0	µg/L	50.00	ND	99	0-210		
2,2-Dichloropropane	54.2		1.0	µg/L	50.00	ND	108	73-126		
1,3-Dichloropropane	48.6		1.0	µg/L	50.00	ND	97	85-121		
Cis-1,3-dichloropropene	52.9		1.0	µg/L	50.00	ND	106	0-227		
Trans-1,3-dichloropropene	53.8		1.0	µg/L	50.00	ND	108	17-183		
1,1-Dichloropropene	53.2		1.0	µg/L	50.00	ND	106	85-112		
Ethylbenzene	47.6		1.0	µg/L	50.00	ND	95	37-162		

EMSL Analytical, Inc.

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EMSL Sales Rep: Jeromy Bish
Received: 10/10/2024 09:00
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Quality Control
(Continued)

GCMS-VOA (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: BCJ1488 - EPA 624.1 (Continued)										
Matrix Spike (BCJ1488-MS1)	**Source: AC32432-01**				Prepared & Analyzed: 10/14/2024					
Hexachlorobutadiene	43.8		1.0	µg/L	50.00	ND	88	78-118		
2-Hexanone	102		4.0	µg/L	100.0	ND	102	31-155		
Isopropylbenzene	49.2		1.0	µg/L	50.00	ND	98	78-114		
4-Isopropyltoluene	50.5		1.0	µg/L	50.00	ND	101	81-112		
Methylene Chloride	49.6		1.0	µg/L	50.00	ND	99	10-221		
4-Methyl-2-pentanone	104		2.0	µg/L	100.0	ND	104	78-138		
Methyl-tert butyl ether	50.3		1.0	µg/L		ND		84-127		
Naphthalene	51.1		2.0	µg/L	50.00	ND	102	40-140		
N-propylbenzene	49.0		1.0	µg/L	50.00	ND	98	74-123		
Styrene	47.4		1.0	µg/L	50.00	ND	95	87-112		
1,1,2,2-Tetrachloroethane	43.7		1.0	µg/L	50.00	ND	87	46-157		
1,1,1,2-Tetrachloroethane	49.0		1.0	µg/L	50.00	ND	98	81-125		
Tetrachloroethene	50.9		2.0	µg/L	50.00	ND	102	64-148		
Toluene	50.6		1.0	µg/L	50.00	ND	101	47-150		
1,2,3-Trichlorobenzene	49.5		2.0	µg/L	50.00	ND	99	80-118		
1,2,4-Trichlorobenzene	49.0		1.0	µg/L	50.00	ND	98	70-130		
1,1,2-Trichloroethane	47.2		1.0	µg/L	50.00	ND	94	52-150		
1,1,1-Trichloroethane	54.6		1.0	µg/L	50.00	ND	109	52-162		
Trichloroethene	49.8		1.0	µg/L	50.00	ND	100	70-157		
Trichlorofluoromethane	58.0		5.0	µg/L	50.00	ND	116	17-181		
1,2,3-Trichloropropane	43.7		4.0	µg/L	50.00	ND	87	70-130		
1,1,2-Trichloro-1,2,2-trifluoroethane	55.6		2.0	µg/L	50.00	ND	111	70-130		
1,2,4-Trimethylbenzene	53.5		1.0	µg/L	50.00	4.03	99	67-129		
1,3,5-Trimethylbenzene	50.2		1.0	µg/L	50.00	1.20	98	79-115		
Vinyl Acetate	48.5		2.0	µg/L	50.00	ND	97	70-130		
Vinyl Chloride	58.0		5.0	µg/L	50.00	ND	116	0-251		
o-xylene	49.3		1.0	µg/L	50.00	1.13	96	85-112		
m&p-xylenes	94.4		2.0	µg/L	100.0	ND	94	70-130		
Xylenes, Total	144		1.0	µg/L		1.13		70-130		
Surrogate(s)										
Surrogate: 4-Bromofluorobenzene					*50.00*		*104*	*70-130*		
Surrogate: Dibromofluoromethane					*50.00*		*114*	*70-130*		
Surrogate: 1,2-Dichloroethane-d4					*50.00*		*105*	*70-130*		
Surrogate: Toluene-d8					*50.00*		*106*	*70-130*		

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EMSL Sales Rep: Jeromy Bish
Received: 10/10/2024 09:00
Reported: 10/25/2024 15:39

Quality Control
(Continued)

GCMS-VOA (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: BCJ1488 - EPA 624.1 (Continued)										
Matrix Spike Dup (BCJ1488-MSD1)	**Source: AC32432-01**				Prepared & Analyzed: 10/14/2024					
Acetone	152		15	µg/L	100.0	54.5	98	56-168	18	24
Acrolein	267		10	µg/L	200.0	ND	134	40-160	15	60
Benzene	53.1		1.0	µg/L	50.00	ND	106	37-151	5	61
Bromobenzene	47.9		1.0	µg/L	50.00	ND	96	85-114	4	7
Bromodichloromethane	52.2		1.0	µg/L	50.00	ND	104	35-155	3	56
Bromoform	50.6		1.0	µg/L	50.00	ND	101	45-169	8	42
Bromomethane	54.4		5.0	µg/L	50.00	ND	109	10-242	6	61
2-Butanone	109		2.0	µg/L	100.0	ND	109	60-155	15	20
tert-Butyl Alcohol	248	R4	10	µg/L	200.0	ND	124	57-181	40	21
Sec-butylbenzene	52.4		1.0	µg/L	50.00	ND	105	84-113	5	11
Tert-butylbenzene	51.9		1.0	µg/L	50.00	ND	104	85-114	4	10
N-butylbenzene	51.0		1.0	µg/L	50.00	ND	102	79-117	9	12
Carbon Disulfide	67.2	R4	1.0	µg/L	50.00	ND	134	72-122	8	17
Carbon Tetrachloride	59.3		1.0	µg/L	50.00	ND	119	70-140	6	41
Chlorobenzene	47.7		1.0	µg/L	50.00	ND	95	37-160	5	53
Chloroethane	54.8		5.0	µg/L	50.00	ND	110	14-230	3	78
2-Chloroethyl Vinyl Ether	ND		2.0	µg/L	100.0	ND		0-305		71
Chloroform	50.8		1.0	µg/L	50.00	ND	102	51-138	3	54
Chloromethane	60.1		5.0	µg/L	50.00	ND	120	0-273	7	60
2-Chlorotoluene	49.4		1.0	µg/L	50.00	ND	99	82-112	4	10
4-Chlorotoluene	48.5		1.0	µg/L	50.00	ND	97	78-114	5	11
1,2-Dibromo-3-chloropropane	52.0		5.0	µg/L	50.00	ND	104	57-166	17	19
Dibromochloromethane	55.9		1.0	µg/L	50.00	ND	112	53-149	6	50
1,2-Dibromoethane	51.5		1.0	µg/L	50.00	ND	103	86-125	6	13
Dibromomethane	50.1		1.0	µg/L	50.00	ND	100	76-136	5	15
Trans-1,4-dichloro-2-butene	100		2.0	µg/L	100.0	ND	100	74-136	11	15
1,3-Dichlorobenzene	49.7		1.0	µg/L	50.00	ND	99	59-156	5	43
1,4-Dichlorobenzene	48.5		1.0	µg/L	50.00	ND	97	18-190	5	57
1,2-Dichlorobenzene	47.3		1.0	µg/L	50.00	ND	95	18-190	9	57
Dichlorodifluoromethane	72.5		5.0	µg/L	50.00	ND	145	65-145	6	15
1,1-Dichloroethane	53.2		1.0	µg/L	50.00	ND	106	59-155	4	40
1,2-Dichloroethane	49.3		1.0	µg/L	50.00	ND	99	49-155	2	49
1,1-Dichloroethene	58.6		1.0	µg/L	50.00	ND	117	0-234	7	32
Trans-1,2-dichloroethene	55.5		1.0	µg/L	50.00	ND	111	54-156	6	45
Cis-1,2-dichloroethene	52.9		1.0	µg/L	50.00	ND	106	91-116	4	9
1,2-Dichloropropane	52.5		1.0	µg/L	50.00	ND	105	0-210	6	55
2,2-Dichloropropane	59.4		1.0	µg/L	50.00	ND	119	73-126	9	12
1,3-Dichloropropane	51.5		1.0	µg/L	50.00	ND	103	85-121	6	13
Cis-1,3-dichloropropene	56.1		1.0	µg/L	50.00	ND	112	0-227	6	58
Trans-1,3-dichloropropene	58.1		1.0	µg/L	50.00	ND	116	17-183	8	86
1,1-Dichloropropene	55.8		1.0	µg/L	50.00	ND	112	85-112	5	8
Ethylbenzene	50.2		1.0	µg/L	50.00	ND	100	37-162	5	63

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Neal.Kelly@fando.com

Project Name: Needham Crumb Rubber

Customer PO: 20081266.B50
EMSL Sales Rep: Jeromy Bish
Received: 10/10/2024 09:00
Reported: 10/25/2024 15:39

Quality Control
(Continued)

GCMS-VOA (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: BCJ1488 - EPA 624.1 (Continued)										
Matrix Spike Dup (BCJ1488-MSD1)	**Source: AC32432-01**				Prepared & Analyzed: 10/14/2024					
Hexachlorobutadiene	50.9		1.0	µg/L	50.00	ND	102	78-118	15	17
2-Hexanone	115		4.0	µg/L	100.0	ND	115	31-155	12	19
Isopropylbenzene	51.8		1.0	µg/L	50.00	ND	104	78-114	5	10
4-Isopropyltoluene	52.6		1.0	µg/L	50.00	ND	105	81-112	4	12
Methylene Chloride	51.6		1.0	µg/L	50.00	ND	103	10-221	4	28
4-Methyl-2-pentanone	116		2.0	µg/L	100.0	ND	116	78-138	10	16
Methyl-tert butyl ether	55.1		1.0	µg/L		ND		84-127	9	13
Naphthalene	63.3		2.0	µg/L	50.00	ND	127	40-140	21	25
N-propylbenzene	51.4		1.0	µg/L	50.00	ND	103	74-123	5	11
Styrene	49.4		1.0	µg/L	50.00	ND	99	87-112	4	9
1,1,2,2-Tetrachloroethane	47.4		1.0	µg/L	50.00	ND	95	46-157	8	61
1,1,1,2-Tetrachloroethane	51.2		1.0	µg/L	50.00	ND	102	81-125	4	11
Tetrachloroethene	54.5		2.0	µg/L	50.00	ND	109	64-148	7	39
Toluene	53.4		1.0	µg/L	50.00	ND	107	47-150	5	41
1,2,3-Trichlorobenzene	60.5	R4	2.0	µg/L	50.00	ND	121	80-118	20	11
1,2,4-Trichlorobenzene	56.3		1.0	µg/L	50.00	ND	113	70-130	14	25
1,1,2-Trichloroethane	49.8		1.0	µg/L	50.00	ND	100	52-150	5	45
1,1,1-Trichloroethane	57.2		1.0	µg/L	50.00	ND	114	52-162	5	36
Trichloroethene	52.4		1.0	µg/L	50.00	ND	105	70-157	5	48
Trichlorofluoromethane	59.7		5.0	µg/L	50.00	ND	119	17-181	3	84
1,2,3-Trichloropropane	47.6		4.0	µg/L	50.00	ND	95	70-130	9	11
1,1,2-Trichloro-1,2,2-trifluoroethane	58.4		2.0	µg/L	50.00	ND	117	70-130	5	25
1,2,4-Trimethylbenzene	55.6		1.0	µg/L	50.00	4.03	103	67-129	4	13
1,3,5-Trimethylbenzene	52.6		1.0	µg/L	50.00	1.20	103	79-115	5	10
Vinyl Acetate	54.5		2.0	µg/L	50.00	ND	109	70-130	12	25
Vinyl Chloride	62.7		5.0	µg/L	50.00	ND	125	0-251	8	66
o-xylene	51.6		1.0	µg/L	50.00	1.13	101	85-112	4	7
m&p-xylenes	99.7		2.0	µg/L	100.0	ND	100	70-130	5	25
Xylenes, Total	151		1.0	µg/L		1.13		70-130	5	25
Surrogate(s)										
Surrogate: 4-Bromofluorobenzene					*50.00*		*100*	*70-130*		
Surrogate: Dibromofluoromethane					*50.00*		*111*	*70-130*		
Surrogate: 1,2-Dichloroethane-d4					*50.00*		*99*	*70-130*		
Surrogate: Toluene-d8					*50.00*		*106*	*70-130*		

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Project Name: Needham Crumb Rubber

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EMSL Sales Rep: Jeromy Bish
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Reported: 10/25/2024 15:39

Certified Analyses included in this Report

Analyte	CAS #	Certifications
EPA 624.1 in Waste Water		
Acetone	67-64-1	NJDEP,PADEP
Acrolein	107-02-8	NJDEP,PADEP
Benzene	71-43-2	NJDEP,PADEP
Bromobenzene	108-86-1	NJDEP,PADEP
Bromodichloromethane	75-27-4	NJDEP,PADEP
Bromoform	75-25-2	NJDEP,PADEP
Bromomethane	74-83-9	NJDEP,PADEP
2-Butanone	78-93-3	NJDEP,PADEP
tert-Butyl Alcohol	75-65-0	NJDEP,PADEP
Sec-butylbenzene	135-98-8	NJDEP,PADEP
Tert-butylbenzene	98-06-6	NJDEP,PADEP
N-butylbenzene	104-51-8	NJDEP,PADEP
Carbon Disulfide	75-15-0	NJDEP,PADEP
Carbon Tetrachloride	56-23-5	NJDEP,PADEP
Chlorobenzene	108-90-7	NJDEP,PADEP
Chloroethane	75-00-3	NJDEP,PADEP
2-Chloroethyl Vinyl Ether	110-75-8	NJDEP,PADEP
Chloroform	67-66-3	NJDEP,PADEP
Chloromethane	74-87-3	NJDEP,PADEP
2-Chlorotoluene	95-49-8	NJDEP,PADEP
4-Chlorotoluene	106-43-4	NJDEP,PADEP
1,2-Dibromo-3-chloropropane	96-12-8	NJDEP,PADEP
Dibromochloromethane	124-48-1	NJDEP,PADEP
1,2-Dibromoethane	106-93-4	NJDEP,PADEP
Dibromomethane	74-95-3	NJDEP,PADEP
Trans-1,4-dichloro-2-butene	110-57-6	NJDEP,PADEP
1,3-Dichlorobenzene	541-73-1	NJDEP,PADEP
1,4-Dichlorobenzene	106-46-7	NJDEP,PADEP
1,2-Dichlorobenzene	95-50-1	NJDEP,PADEP
Dichlorodifluoromethane	75-71-8	NJDEP,PADEP
1,1-Dichloroethane	75-34-3	NJDEP,PADEP
1,2-Dichloroethane	107-06-2	NJDEP,PADEP
1,1-Dichloroethene	75-35-4	NJDEP,PADEP
Trans-1,2-dichloroethene	156-60-5	NJDEP,PADEP
Cis-1,2-dichloroethene	156-59-2	NJDEP,PADEP
1,2-Dichloropropane	78-87-5	NJDEP,PADEP
2,2-Dichloropropane	594-20-7	NJDEP,PADEP
1,3-Dichloropropane	142-28-9	NJDEP,PADEP
Cis-1,3-dichloropropene	10061-01-5	NJDEP,PADEP

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Certified Analyses included in this Report
(Continued)

Analyte	CAS #	Certifications
EPA 624.1 in Waste Water (Continued)		
Trans-1,3-dichloropropene	10061-02-6	NJDEP,PADEP
1,1-Dichloropropene	563-58-6	NJDEP,PADEP
Ethylbenzene	100-41-4	NJDEP,PADEP
Hexachlorobutadiene	87-68-3	NJDEP,PADEP
2-Hexanone	591-78-6	NJDEP,PADEP
Isopropylbenzene	98-82-8	NJDEP,PADEP
4-Isopropyltoluene	99-87-6	NJDEP,PADEP
Methylene Chloride	75-09-2	NJDEP,PADEP
4-Methyl-2-pentanone	108-10-1	NJDEP,PADEP
Methyl-tert butyl ether	1634-04-4	NJDEP,PADEP
Naphthalene	91-20-3	NJDEP,PADEP
N-propylbenzene	103-65-1	NJDEP,PADEP
Styrene	100-42-5	NJDEP,PADEP
1,1,2,2-Tetrachloroethane	79-34-5	NJDEP,PADEP
1,1,1,2-Tetrachloroethane	630-20-6	NJDEP,PADEP
Tetrachloroethene	127-18-4	NJDEP,PADEP
Toluene	108-88-3	NJDEP,PADEP
1,2,3-Trichlorobenzene	87-61-6	NJDEP,PADEP
1,2,4-Trichlorobenzene	120-82-1	NJDEP,PADEP
1,1,2-Trichloroethane	79-00-5	NJDEP,PADEP
1,1,1-Trichloroethane	71-55-6	NJDEP,PADEP
Trichloroethene	79-01-6	NJDEP,PADEP
Trichlorofluoromethane	75-69-4	NJDEP,PADEP
1,2,3-Trichloropropane	96-18-4	NJDEP,PADEP
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	NJDEP,PADEP
1,2,4-Trimethylbenzene	95-63-6	NJDEP,PADEP
1,3,5-Trimethylbenzene	108-67-8	NJDEP,PADEP
Vinyl Acetate	108-05-4	NJDEP,PADEP
Vinyl Chloride	75-01-4	NJDEP,PADEP
o-xylene	95-47-6	NJDEP,PADEP
m&p-xylenes	179601-23-1	NJDEP,PADEP
Xylenes, Total	1330-20-7	NJDEP,PADEP

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List of Certifications

Code	Description	Number	Expires
PADEP	Pennsylvania Department of Environmental Protection	68-00367	11/30/2024
NYSDOH	New York State Department of Health	10872	04/01/2025
NJDEP	New Jersey Department of Environmental Protection	03036	06/30/2025
MADEP	Massachusetts Department of Environmental Protection	M-NJ337	06/30/2025
CTDPH	Connecticut Department of Public Health	PH-0270	06/23/2026
California ELAP	California Water Boards	1877	06/30/2025
AIHA LAP	EMSL Analytical, Inc. Cinnaminson, NJ AIHA-LAP, LLC-ELLAP Accredited	100194	01/01/2025
A2LA	A2LA Environmental Certificate	2845.01	07/31/2026

Please see the specific Field of Testing (FOT) on www.emsl.com <http://www.emsl.com> for a complete listing of parameters for which EMSL is certified.

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Notes and Definitions

Item	Definition
C	The sample was preserved to a PH of less than 2. Acrolein requires an unpreserved aliquot. Results for Acrolein may be biased.
R4	High percent recovery and no associated postive found in the batch.
(Dig)	For metals analysis, sample was digested.
[2C]	Reported from the second channel in dual column analysis.
DF	Dilution Factor
MDL	Method Detection Limit.
ND	Analyte was NOT DETECTED at or above the detection limit.
NR	Spike/Surrogate showed no recovery.
Q	Qualifier
RL	Reporting Limit
Wet	Sample is not dry weight corrected.
%REC	Percent Recovery
RPD	Relative Percent Difference
Source	Sample that was matrix spiked or duplicated

Measurement of uncertainty and any applicable definitions of method modifications are available upon request. Per EPA NLLAP policy, sample results are not blank corrected.

AC33101

FUSS & O'NEILL ~~ENVIROSCIENCE, LLC~~
Disciplines to Deliver
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- ☐ 56 Quarry Road, Trumbull, CT 06611
- ☐ 1419 Richland Street, Columbia, SC 29201
- ☐ 78 Interstate Drive, West Springfield, MA 01089
- ☑ 108 Myrtle Street, #502, North Quincy, MA 02171
- ☐ 317 Iron Horse Way, Suite 204, Providence, RI 02908
- ☐ 80 Washington Street, Suite 301, Poughkeepsie, NY 12601

CHAIN-OF-CUSTODY RECORD 4517

Turnaround
☐ 1 Day* ☐ 3 Days* ☐ Other _____ (days)
☐ 2 Days* ☒ Standard (____ days) *Surcharge Applies

PROJECT NAME	PROJECT LOCATION	PROJECT NUMBER	LABORATORY
Needham Crumb Rubber	Needham MA	2ae1266.B50	EMSL (NJ)

REPORT TO: Neal Kelly Neal.Kelly@fando.com
INVOICE TO:
P.O. NO.:
Sampler's Signature: Date: 10/2/24

Source Codes:
MW=Monitoring Well PW=Potable Water S=Soil W=Waste
SW=Surface Water T=Treatment Facility B=Sediment A=Air
X=Other AQ = Aqueous CR: Crumb Rubber

Analysis Request / Containers

Item No.	Transfer Check 1 2 3 4	Sample Number	Source Code	Date Sampled	Time Sampled	Full VOC list and TICs	8270 TO-15 Full SVOC list by	Methods (arsenic, cadmium, chromium, lead, iron, manganese, mercury, selenium & zinc) by 6010/7470	Soil VOA Vial, [ ] methanol	Soil VOA Vial, [ ] water	Glass Soil Container [ ] $Na(SO_4)_2$	Glass Soil Container ( ) oz	Other:	Water VOA Vial, [ ] As is ([ ]HCl	Glass Amber ( ) ml, [ ] As is	Plastic - As is, [ ] 250 ml [ ] H_2SO_4	Plastic - H_2SO_4, [ ] 250 ml [ ] 500 [ ] 1000 ml	Plastic - HNO_3, 250 ml [ ] 500 ml	Plastic - NaOH, 250 ml [ ] Filtered [ ] Unfiltered	Comments
1		164324 1002 -01	CR	10/2/24	1121	X	X	X				3							Founders
2		164324 1002 - 02	CR	10/2/24	1147	↓	X	X				3							~~Brook~~ Brook
3		164324 1002 - 03	AQ	10/2/24	1200		~~X~~	~~X~~				~~3~~		3					~~Memorial~~ Brook only VOCs
4		164324 1002 - 04	CR	10/2/24	1220		X	X				3							Memorial

Transfer Number	Relinquished By	Accepted By	Date	Time
1	Chris Juran	FX	10/7/24	1140
2			10/07/24	11:40am
3				
4				

Reporting and Detection Limit Requirements: MCP CAM Cert.
Additional Comments:

Main Site: 301 Fulling Mill Road | Middletown, PA 17057 | Phone: 717-944-5541 | Fax: 717-944-1430 | www.alsglobal.com
Associated Site: 20 Riverside Drive | Spring City, PA 19475 | Phone: 610-948-4903 | Fax: 717-944-1430 |

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343, NJ PA101

Analytical Results Report For **EMSL Inc.**

Project AC33101
Workorder 3382844
Report ID 362618 on 10/24/2024

Certificate of Analysis

Enclosed are the analytical results for samples received by the laboratory on Oct 11, 2024.

The ALS Environmental laboratory in Middletown, Pennsylvania is a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory and as such, certifies that all applicable test results meet the requirements of NELAP.

If you have any questions regarding this certificate of analysis, please contact Kaleb Brown (Project Coordinator) at (717) 944-5541.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications section of the ALS website at www.alsglobal.com/en/Our-Services/Life-Sciences/Environmental/Downloads.

ALS Middletown: 301 Fulling Mill Road, Middletown, PA 17057 : 717-944-5541.

Recipient(s):
Reports - EMSL Inc.
Travis Albert - EMSL Analytical Inc.

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.

Kaleb Brown

Kaleb Brown *(ALS Digital Signature)*
Project Coordinator

Sample Summary

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collector	Collection Company
3382844001	AC33101-01	Oil/Other	10/02/2024 11:21	10/11/2024 09:24	CBC	Collected By Client
3382844002	AC33101-02	Oil/Other	10/02/2024 11:47	10/11/2024 09:24	CBC	Collected By Client
3382844003	AC33101-04	Oil/Other	10/02/2024 00:20	10/11/2024 09:24	CBC	Collected By Client

Reference

Notes

- Samples collected by ALS personnel are done so in accordance with the procedures set forth in the ALS Field Sampling Plan (20 - Field Services Sampling Plan).
- Except as qualified, Clean Water Act sample analyses are consistent with methodology requirements in 40 CFR Part 136, including but not limited to the following EPA Method reference revisions:
  EPA 300.1 Rev. 1.0-1997
  EPA 300.0 Rev. 2.1-1993
  EPA 353.2 Rev. 2.0-1993
  EPA 410.4 Rev. 1.0-1993
  EPA 420.4 Rev. 1.0-1993
  EPA 365.1 Rev. 2.0-1993
  EPA 200.7 Rev. 4.4-1994
  EPA 200.8 Rev. 5.4-1994
  EPA 245.1 Rev. 3.0-1994
- Except as qualified, Safe Drinking Water Act sample analyses are consistent with methodology requirements in 40 CFR Part 141.
- The Chain of Custody document is included as part of this report.
- All Library Search analytes should be regarded as tentative identifications based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.
- Parameters identified as "analyze immediately" require analysis within 15 minutes of collection. Any "analyze immediately" parameters not listed under the header "Field Parameters" are preformed in the laboratory and are therefore analyzed out of hold time.
- Method references listed on this report beginning with the prefix “S” followed by a method number (such as S2310B-97) refer to methods from “Standard Methods for the Examination of Water and Wastewater”.
- For microbiological analyses, the "Prepared" value is the date/time into the incubator and the "Analyzed" value is the date/time out the incubator.
- An Analysis-Prep Method Cross Reference Table is included after Analytical Results & Qualifiers section in this report.
- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.

Standard Acronyms/Flags

J	Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte
U	Indicates that the analyte was Not Detected (ND) above the MDL
N	Indicates presumptive evidence of the presence of a compound
MDL	Method Detection Limit
PQL	Practical Quantitation Limit
RDL	Practical Quantitation Limit for this Project
ND	Not Detected - indicates that the analyte was Not Detected
Cntr	Analysis was performed using this container
RegLmt	Regulatory Limit
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
%Rec	Percent Recovery
RPD	Relative Percent Difference
LOD	DoD Limit of Detection
LOQ	DoD Limit of Quantitation
DL	DoD Detection Limit
I	Indicates reported value is greater than or equal to the Method Detection Limit (MDL) but less than the Report Detection Limit (RDL)
(S)	Surrogate Compound
NC	Not Calculated
*	Result outside of QC limits
#	Please reference the result in the Results Section for analyte-level flags.

Project Notations

P1 Project was received at a temperature greater than six degrees Celsius.

Sample Notations

Lab ID	Sample ID		
3382844001	AC33101-01	**S1**	Sample was re-extracted past the holding time for EPA method 8270E.
3382844002	AC33101-02	**S2**	Sample was re-extracted past the holding time for EPA method 8270E.
3382844003	AC33101-04	**S3**	Sample was re-extracted past the holding time for EPA method 8270E.

Result Notations

Notation Ref.

Detected Results Summary

Client Sample ID	AC33101-01	Collected	10/02/2024 11:21
Lab Sample ID	3382844001	Lab Receipt	10/11/2024 09:24

Compound	Result	Units	RDL	Method	Flag
METALS					
Iron, Total	762	mg/kg	193	SW846 6010C	#
Zinc, Total	12600	mg/kg	38.6	SW846 6010C	#
SEMIVOLATILES					
Acenaphthylene	54.5	ug/kg	44.6	SW846 8270E	#
Acetophenone	112	ug/kg	89.3	SW846 8270E	#
Anthracene	78.4	ug/kg	44.6	SW846 8270E	#
bis(2-Ethylhexyl)phthalate	4410	ug/kg	89.3	SW846 8270E	#
Chrysene	2110	ug/kg	44.6	SW846 8270E	#
Fluoranthene	3050	ug/kg	44.6	SW846 8270E	#
Hexachlorobutadiene	524	ug/kg	89.3	SW846 8270E	#
Hexachloroethane	221	ug/kg	89.3	SW846 8270E	#
Naphthalene	172	ug/kg	44.6	SW846 8270E	#
N-Nitrosodiphenylamine	115	ug/kg	89.3	SW846 8270E	#
Phenanthrene	426	ug/kg	44.6	SW846 8270E	#
Pyrene	7070	ug/kg	223	SW846 8270E	#

Detected Results Summary

Client Sample ID	AC33101-02	Collected	10/02/2024 11:47
Lab Sample ID	3382844002	Lab Receipt	10/11/2024 09:24

Compound	Result	Units	RDL	Method	Flag
METALS					
Iron, Total	889	mg/kg	198	SW846 6010C	#
Zinc, Total	13200	mg/kg	39.7	SW846 6010C	#
SEMIVOLATILES					
Acenaphthylene	50.8	ug/kg	48.1	SW846 8270E	#
Acetophenone	181	ug/kg	96.2	SW846 8270E	#
Anthracene	79.6	ug/kg	48.1	SW846 8270E	#
bis(2-Ethylhexyl)phthalate	5170	ug/kg	96.2	SW846 8270E	#
Chrysene	1860	ug/kg	48.1	SW846 8270E	#
Fluoranthene	2680	ug/kg	48.1	SW846 8270E	#
Hexachlorobutadiene	486	ug/kg	96.2	SW846 8270E	#
Hexachloroethane	169	ug/kg	96.2	SW846 8270E	#
Naphthalene	111	ug/kg	48.1	SW846 8270E	#
Phenanthrene	453	ug/kg	48.1	SW846 8270E	#
Pyrene	6890	ug/kg	48.1	SW846 8270E	#

Detected Results Summary

Client Sample ID	AC33101-04	Collected	10/02/2024 00:20
Lab Sample ID	3382844003	Lab Receipt	10/11/2024 09:24

Compound	Result	Units	RDL	Method	Flag
METALS					
Iron, Total	640	mg/kg	198	SW846 6010C	#
Zinc, Total	15200	mg/kg	39.5	SW846 6010C	#
SEMIVOLATILES					
Acenaphthylene	59.8	ug/kg	44.6	SW846 8270E	#
Acetophenone	152	ug/kg	89.3	SW846 8270E	#
Anthracene	82.3	ug/kg	44.6	SW846 8270E	#
bis(2-Ethylhexyl)phthalate	5100	ug/kg	89.3	SW846 8270E	#
Chrysene	2450	ug/kg	44.6	SW846 8270E	#
Fluoranthene	3760	ug/kg	44.6	SW846 8270E	#
Hexachlorobutadiene	426	ug/kg	89.3	SW846 8270E	#
Hexachloroethane	205	ug/kg	89.3	SW846 8270E	#
Naphthalene	131	ug/kg	44.6	SW846 8270E	#
N-Nitrosodiphenylamine	168	ug/kg	89.3	SW846 8270E	#
Phenanthrene	541	ug/kg	44.6	SW846 8270E	#
Pyrene	8320	ug/kg	223	SW846 8270E	#

Results

Client Sample ID	AC33101-01	Collected	10/02/2024 11:21
Lab Sample ID	3382844001	Lab Receipt	10/11/2024 09:24

METALS

Compound	Result	Flag	Units	RDL	Method	Dilution	Analysis Date/Time	By	Cntr
Arsenic, Total	ND	ND,P1,S1	mg/kg	38.6	SW846 6010C	10	10/18/2024 10:21	MSY	A1
Cadmium, Total	ND	ND,P1,S1	mg/kg	9.7	SW846 6010C	10	10/18/2024 10:21	MSY	A1
Chromium, Total	ND	ND,P1,S1	mg/kg	19.3	SW846 6010C	10	10/18/2024 10:21	MSY	A1
Iron, Total	762	P1,S1	mg/kg	193	SW846 6010C	10	10/18/2024 10:21	MSY	A1
Lead, Total	ND	ND,P1,S1	mg/kg	38.6	SW846 6010C	10	10/18/2024 10:21	MSY	A1
Manganese, Total	ND	ND,P1,S1	mg/kg	19.3	SW846 6010C	10	10/18/2024 10:21	MSY	A1
Mercury, Total	ND	ND,P1,S1	mg/kg	0.047	SW846 7471B	1	10/24/2024 11:12	JMS	A
Selenium, Total	ND	ND,P1,S1	mg/kg	96.5	SW846 6010C	10	10/18/2024 10:21	MSY	A1
Zinc, Total	12600	P1,S1	mg/kg	38.6	SW846 6010C	10	10/18/2024 10:21	MSY	A1

SEMIVOLATILES

Compound	Result	Flag	Units	RDL	Method	Dilution	Analysis Date/Time	By	Cntr
1,2,4,5-Tetrachlorobenzene	ND	ND,P1,S1	ug/kg	89.3	SW846 8270E	1	10/21/2024 19:49	S7M	A
1,4-Dioxane	ND	ND,P1,S1	ug/kg	89.3	SW846 8270E	1	10/21/2024 19:49	S7M	A
2,3,4,6-Tetrachlorophenol	ND	ND,P1,S1	ug/kg	179	SW846 8270E	1	10/21/2024 19:49	S7M	A
2,4,5-Trichlorophenol	ND	ND,P1,S1	ug/kg	179	SW846 8270E	1	10/21/2024 19:49	S7M	A
2,4,6-Trichlorophenol	ND	ND,P1,S1	ug/kg	179	SW846 8270E	1	10/21/2024 19:49	S7M	A
2,4-Dichlorophenol	ND	ND,P1,S1	ug/kg	179	SW846 8270E	1	10/21/2024 19:49	S7M	A
2,4-Dimethylphenol	ND	ND,P1,S1	ug/kg	179	SW846 8270E	1	10/21/2024 19:49	S7M	A
2,4-Dinitrophenol	ND	ND,P1,S1	ug/kg	357	SW846 8270E	1	10/21/2024 19:49	S7M	A
2,4-Dinitrotoluene	ND	ND,P1,S1	ug/kg	89.3	SW846 8270E	1	10/21/2024 19:49	S7M	A
2,6-Dinitrotoluene	ND	ND,P1,S1	ug/kg	89.3	SW846 8270E	1	10/21/2024 19:49	S7M	A
2-Chloronaphthalene	ND	ND,P1,S1	ug/kg	89.3	SW846 8270E	1	10/21/2024 19:49	S7M	A
2-Chlorophenol	ND	ND,P1,S1	ug/kg	179	SW846 8270E	1	10/21/2024 19:49	S7M	A
2-Methyl-4,6-dinitrophenol	ND	ND,P1,S1	ug/kg	179	SW846 8270E	1	10/21/2024 19:49	S7M	A
2-Methylnaphthalene	ND	ND,P1,S1	ug/kg	89.3	SW846 8270E	1	10/21/2024 19:49	S7M	A
2-Nitroaniline	ND	ND,P1,S1	ug/kg	179	SW846 8270E	1	10/21/2024 19:49	S7M	A
2-Nitrophenol	ND	ND,P1,S1	ug/kg	179	SW846 8270E	1	10/21/2024 19:49	S7M	A
3,3-Dichlorobenzidine	ND	ND,P1,S1	ug/kg	179	SW846 8270E	1	10/21/2024 19:49	S7M	A
3-Nitroaniline	ND	ND,P1,S1	ug/kg	179	SW846 8270E	1	10/21/2024 19:49	S7M	A
4-Bromophenyl-phenylether	ND	ND,P1,S1	ug/kg	89.3	SW846 8270E	1	10/21/2024 19:49	S7M	A
4-Chloro-3-methylphenol	ND	ND,P1,S1	ug/kg	179	SW846 8270E	1	10/21/2024 19:49	S7M	A
4-Chloroaniline	ND	ND,P1,S1	ug/kg	179	SW846 8270E	1	10/21/2024 19:49	S7M	A
4-Chlorophenyl-phenylether	ND	ND,P1,S1	ug/kg	89.3	SW846 8270E	1	10/21/2024 19:49	S7M	A
4-Nitroaniline	ND	ND,P1,S1	ug/kg	179	SW846 8270E	1	10/21/2024 19:49	S7M	A
4-Nitrophenol	ND	ND,P1,S1	ug/kg	179	SW846 8270E	1	10/21/2024 19:49	S7M	A

Results

Client Sample ID	AC33101-01	Collected	10/02/2024 11:21
Lab Sample ID	3382844001	Lab Receipt	10/11/2024 09:24

SEMIVOLATILES (cont.)

Compound	Result	Flag	Units	RDL	Method	Dilution	Analysis Date/Time	By	Cntr
Acenaphthene	ND	ND,P1,S1	ug/kg	44.6	SW846 8270E	1	10/21/2024 19:49	S7M	A
Acenaphthylene	54.5	P1,S1	ug/kg	44.6	SW846 8270E	1	10/21/2024 19:49	S7M	A
Acetophenone	112	P1,S1	ug/kg	89.3	SW846 8270E	1	10/21/2024 19:49	S7M	A
Anthracene	78.4	P1,S1	ug/kg	44.6	SW846 8270E	1	10/21/2024 19:49	S7M	A
Atrazine	ND	ND,P1,S1	ug/kg	89.3	SW846 8270E	1	10/21/2024 19:49	S7M	A
Benzaldehyde	ND	ND,P1,S1	ug/kg	179	SW846 8270E	1	10/21/2024 19:49	S7M	A
Benzo(a)anthracene	ND	ND,P1,S1	ug/kg	44.6	SW846 8270E	1	10/21/2024 19:49	S7M	A
Benzo(a)pyrene	ND	ND,P1,S1	ug/kg	44.6	SW846 8270E	1	10/21/2024 19:49	S7M	A
Benzo(b)fluoranthene	ND	ND,P1,S1	ug/kg	44.6	SW846 8270E	1	10/21/2024 19:49	S7M	A
Benzo(g,h,i)perylene	ND	ND,P1,S1	ug/kg	44.6	SW846 8270E	1	10/21/2024 19:49	S7M	A
Benzo(k)fluoranthene	ND	ND,P1,S1	ug/kg	44.6	SW846 8270E	1	10/21/2024 19:49	S7M	A
Biphenyl	ND	ND,P1,S1	ug/kg	89.3	SW846 8270E	1	10/21/2024 19:49	S7M	A
bis(2-Chloroethoxy)methane	ND	ND,P1,S1	ug/kg	89.3	SW846 8270E	1	10/21/2024 19:49	S7M	A
bis(2-Chloroethyl)ether	ND	ND,P1,S1	ug/kg	89.3	SW846 8270E	1	10/21/2024 19:49	S7M	A
bis(2-Chloroisopropyl)ether	ND	ND,P1,S1	ug/kg	89.3	SW846 8270E	1	10/21/2024 19:49	S7M	A
bis(2-Ethylhexyl)phthalate	4410	P1,S1	ug/kg	89.3	SW846 8270E	1	10/21/2024 19:49	S7M	A
Butylbenzylphthalate	ND	ND,P1,S1	ug/kg	89.3	SW846 8270E	1	10/21/2024 19:49	S7M	A
Caprolactam	ND	ND,P1,S1	ug/kg	179	SW846 8270E	1	10/21/2024 19:49	S7M	A
Carbazole	ND	ND,P1,S1	ug/kg	89.3	SW846 8270E	1	10/21/2024 19:49	S7M	A
Chrysene	2110	P1,S1	ug/kg	44.6	SW846 8270E	1	10/21/2024 19:49	S7M	A
Dibenzo(a,h)anthracene	ND	ND,P1,S1	ug/kg	44.6	SW846 8270E	1	10/21/2024 19:49	S7M	A
Dibenzofuran	ND	ND,P1,S1	ug/kg	89.3	SW846 8270E	1	10/21/2024 19:49	S7M	A
Diethylphthalate	ND	ND,P1,S1	ug/kg	89.3	SW846 8270E	1	10/21/2024 19:49	S7M	A
Dimethylphthalate	ND	ND,P1,S1	ug/kg	89.3	SW846 8270E	1	10/21/2024 19:49	S7M	A
Di-n-Butylphthalate	ND	ND,P1,S1	ug/kg	89.3	SW846 8270E	1	10/21/2024 19:49	S7M	A
Di-n-Octylphthalate	ND	ND,P1,S1	ug/kg	89.3	SW846 8270E	1	10/21/2024 19:49	S7M	A
Fluoranthene	3050	P1,S1	ug/kg	44.6	SW846 8270E	1	10/21/2024 19:49	S7M	A
Fluorene	ND	ND,P1,S1	ug/kg	44.6	SW846 8270E	1	10/21/2024 19:49	S7M	A
Hexachlorobenzene	ND	ND,P1,S1	ug/kg	89.3	SW846 8270E	1	10/21/2024 19:49	S7M	A
Hexachlorobutadiene	524	P1,S1	ug/kg	89.3	SW846 8270E	1	10/21/2024 19:49	S7M	A
Hexachlorocyclopentadiene	ND	ND,P1,S1	ug/kg	179	SW846 8270E	1	10/21/2024 19:49	S7M	A
Hexachloroethane	221	P1,S1	ug/kg	89.3	SW846 8270E	1	10/21/2024 19:49	S7M	A
Indeno(1,2,3-cd)pyrene	ND	ND,P1,S1	ug/kg	44.6	SW846 8270E	1	10/21/2024 19:49	S7M	A
Isophorone	ND	ND,P1,S1	ug/kg	89.3	SW846 8270E	1	10/21/2024 19:49	S7M	A
mp-Cresol	ND	ND,P1,S1	ug/kg	179	SW846 8270E	1	10/21/2024 19:49	S7M	A
Naphthalene	172	P1,S1	ug/kg	44.6	SW846 8270E	1	10/21/2024 19:49	S7M	A
Nitrobenzene	ND	ND,P1,S1	ug/kg	89.3	SW846 8270E	1	10/21/2024 19:49	S7M	A
N-Nitroso-di-n-propylamine	ND	ND,P1,S1	ug/kg	89.3	SW846 8270E	1	10/21/2024 19:49	S7M	A

Results

Client Sample ID	AC33101-01	Collected	10/02/2024 11:21
Lab Sample ID	3382844001	Lab Receipt	10/11/2024 09:24

SEMIVOLATILES (cont.)

Compound	Result	Flag	Units	RDL	Method	Dilution	Analysis Date/Time	By	Cntr
N-Nitrosodiphenylamine	115	P1,S1	ug/kg	89.3	SW846 8270E	1	10/21/2024 19:49	S7M	A
o-Cresol	ND	ND,P1,S1	ug/kg	179	SW846 8270E	1	10/21/2024 19:49	S7M	A
Pentachlorophenol	ND	ND,P1,S1	ug/kg	179	SW846 8270E	1	10/21/2024 19:49	S7M	A
Phenanthrene	426	P1,S1	ug/kg	44.6	SW846 8270E	1	10/21/2024 19:49	S7M	A
Phenol	ND	ND,P1,S1	ug/kg	179	SW846 8270E	1	10/21/2024 19:49	S7M	A
Pyrene	7070	P1,S1	ug/kg	223	SW846 8270E	5	10/22/2024 20:36	CGS	A

SURROGATES

Compound	CAS No	Recovery	Limits(%)	Analysis Date/Time	Qualifiers
2,4,6-Tribromophenol	118-79-6	60.5%	19 – 132	10/21/2024 19:49	
2-Fluorobiphenyl	321-60-8	67.8%	40 – 110	10/21/2024 19:49	
2-Fluorophenol	367-12-4	40.3%	26 – 116	10/21/2024 19:49	
Nitrobenzene-d5	4165-60-0	66%	38 – 112	10/21/2024 19:49	
Phenol-d5	4165-62-2	55.6%	35 – 111	10/21/2024 19:49	
Terphenyl-d14	98904-43-9	93.3%	45 – 126	10/21/2024 19:49	

Results

Client Sample ID	AC33101-02	Collected	10/02/2024 11:47
Lab Sample ID	3382844002	Lab Receipt	10/11/2024 09:24

METALS

Compound	Result	Flag	Units	RDL	Method	Dilution	Analysis Date/Time	By	Cntr
Arsenic, Total	ND	ND,P1,S2	mg/kg	39.7	SW846 6010C	10	10/18/2024 10:22	MSY	A1
Cadmium, Total	ND	ND,P1,S2	mg/kg	9.9	SW846 6010C	10	10/18/2024 10:22	MSY	A1
Chromium, Total	ND	ND,P1,S2	mg/kg	19.8	SW846 6010C	10	10/18/2024 10:22	MSY	A1
Iron, Total	889	P1,S2	mg/kg	198	SW846 6010C	10	10/18/2024 10:22	MSY	A1
Lead, Total	ND	ND,P1,S2	mg/kg	39.7	SW846 6010C	10	10/18/2024 10:22	MSY	A1
Manganese, Total	ND	ND,P1,S2	mg/kg	19.8	SW846 6010C	10	10/18/2024 10:22	MSY	A1
Mercury, Total	ND	ND,P1,S2	mg/kg	0.047	SW846 7471B	1	10/24/2024 11:13	JMS	A
Selenium, Total	ND	ND,P1,S2	mg/kg	99.2	SW846 6010C	10	10/18/2024 10:22	MSY	A1
Zinc, Total	13200	P1,S2	mg/kg	39.7	SW846 6010C	10	10/18/2024 10:22	MSY	A1

SEMIVOLATILES

Compound	Result	Flag	Units	RDL	Method	Dilution	Analysis Date/Time	By	Cntr
1,2,4,5-Tetrachlorobenzene	ND	ND,P1,S2	ug/kg	96.2	SW846 8270E	1	10/21/2024 20:14	S7M	A
1,4-Dioxane	ND	ND,P1,S2	ug/kg	96.2	SW846 8270E	1	10/21/2024 20:14	S7M	A
2,3,4,6-Tetrachlorophenol	ND	ND,P1,S2	ug/kg	192	SW846 8270E	1	10/21/2024 20:14	S7M	A
2,4,5-Trichlorophenol	ND	ND,P1,S2	ug/kg	192	SW846 8270E	1	10/21/2024 20:14	S7M	A
2,4,6-Trichlorophenol	ND	ND,P1,S2	ug/kg	192	SW846 8270E	1	10/21/2024 20:14	S7M	A
2,4-Dichlorophenol	ND	ND,P1,S2	ug/kg	192	SW846 8270E	1	10/21/2024 20:14	S7M	A
2,4-Dimethylphenol	ND	ND,P1,S2	ug/kg	192	SW846 8270E	1	10/21/2024 20:14	S7M	A
2,4-Dinitrophenol	ND	ND,P1,S2	ug/kg	385	SW846 8270E	1	10/21/2024 20:14	S7M	A
2,4-Dinitrotoluene	ND	ND,P1,S2	ug/kg	96.2	SW846 8270E	1	10/21/2024 20:14	S7M	A
2,6-Dinitrotoluene	ND	ND,P1,S2	ug/kg	96.2	SW846 8270E	1	10/21/2024 20:14	S7M	A
2-Chloronaphthalene	ND	ND,P1,S2	ug/kg	96.2	SW846 8270E	1	10/21/2024 20:14	S7M	A
2-Chlorophenol	ND	ND,P1,S2	ug/kg	192	SW846 8270E	1	10/21/2024 20:14	S7M	A
2-Methyl-4,6-dinitrophenol	ND	ND,P1,S2	ug/kg	192	SW846 8270E	1	10/21/2024 20:14	S7M	A
2-Methylnaphthalene	ND	ND,P1,S2	ug/kg	96.2	SW846 8270E	1	10/21/2024 20:14	S7M	A
2-Nitroaniline	ND	ND,P1,S2	ug/kg	192	SW846 8270E	1	10/21/2024 20:14	S7M	A
2-Nitrophenol	ND	ND,P1,S2	ug/kg	192	SW846 8270E	1	10/21/2024 20:14	S7M	A
3,3-Dichlorobenzidine	ND	ND,P1,S2	ug/kg	192	SW846 8270E	1	10/21/2024 20:14	S7M	A
3-Nitroaniline	ND	ND,P1,S2	ug/kg	192	SW846 8270E	1	10/21/2024 20:14	S7M	A
4-Bromophenyl-phenylether	ND	ND,P1,S2	ug/kg	96.2	SW846 8270E	1	10/21/2024 20:14	S7M	A
4-Chloro-3-methylphenol	ND	ND,P1,S2	ug/kg	192	SW846 8270E	1	10/21/2024 20:14	S7M	A
4-Chloroaniline	ND	ND,P1,S2	ug/kg	192	SW846 8270E	1	10/21/2024 20:14	S7M	A
4-Chlorophenyl-phenylether	ND	ND,P1,S2	ug/kg	96.2	SW846 8270E	1	10/21/2024 20:14	S7M	A
4-Nitroaniline	ND	ND,P1,S2	ug/kg	192	SW846 8270E	1	10/21/2024 20:14	S7M	A
4-Nitrophenol	ND	ND,P1,S2	ug/kg	192	SW846 8270E	1	10/21/2024 20:14	S7M	A

Results

Client Sample ID	AC33101-02	Collected	10/02/2024 11:47
Lab Sample ID	3382844002	Lab Receipt	10/11/2024 09:24

SEMIVOLATILES (cont.)

Compound	Result	Flag	Units	RDL	Method	Dilution	Analysis Date/Time	By	Cntr
Acenaphthene	ND	ND,P1,S2	ug/kg	48.1	SW846 8270E	1	10/21/2024 20:14	S7M	A
Acenaphthylene	50.8	P1,S2	ug/kg	48.1	SW846 8270E	1	10/21/2024 20:14	S7M	A
Acetophenone	181	P1,S2	ug/kg	96.2	SW846 8270E	1	10/21/2024 20:14	S7M	A
Anthracene	79.6	P1,S2	ug/kg	48.1	SW846 8270E	1	10/21/2024 20:14	S7M	A
Atrazine	ND	ND,P1,S2	ug/kg	96.2	SW846 8270E	1	10/21/2024 20:14	S7M	A
Benzaldehyde	ND	ND,P1,S2	ug/kg	192	SW846 8270E	1	10/21/2024 20:14	S7M	A
Benzo(a)anthracene	ND	ND,P1,S2	ug/kg	48.1	SW846 8270E	1	10/21/2024 20:14	S7M	A
Benzo(a)pyrene	ND	ND,P1,S2	ug/kg	48.1	SW846 8270E	1	10/21/2024 20:14	S7M	A
Benzo(b)fluoranthene	ND	ND,P1,S2	ug/kg	48.1	SW846 8270E	1	10/21/2024 20:14	S7M	A
Benzo(g,h,i)perylene	ND	ND,P1,S2	ug/kg	48.1	SW846 8270E	1	10/21/2024 20:14	S7M	A
Benzo(k)fluoranthene	ND	ND,P1,S2	ug/kg	48.1	SW846 8270E	1	10/21/2024 20:14	S7M	A
Biphenyl	ND	ND,P1,S2	ug/kg	96.2	SW846 8270E	1	10/21/2024 20:14	S7M	A
bis(2-Chloroethoxy)methane	ND	ND,P1,S2	ug/kg	96.2	SW846 8270E	1	10/21/2024 20:14	S7M	A
bis(2-Chloroethyl)ether	ND	ND,P1,S2	ug/kg	96.2	SW846 8270E	1	10/21/2024 20:14	S7M	A
bis(2-Chloroisopropyl)ether	ND	ND,P1,S2	ug/kg	96.2	SW846 8270E	1	10/21/2024 20:14	S7M	A
bis(2-Ethylhexyl)phthalate	5170	P1,S2	ug/kg	96.2	SW846 8270E	1	10/21/2024 20:14	S7M	A
Butylbenzylphthalate	ND	ND,P1,S2	ug/kg	96.2	SW846 8270E	1	10/21/2024 20:14	S7M	A
Caprolactam	ND	ND,P1,S2	ug/kg	192	SW846 8270E	1	10/21/2024 20:14	S7M	A
Carbazole	ND	ND,P1,S2	ug/kg	96.2	SW846 8270E	1	10/21/2024 20:14	S7M	A
Chrysene	1860	P1,S2	ug/kg	48.1	SW846 8270E	1	10/21/2024 20:14	S7M	A
Dibenzo(a,h)anthracene	ND	ND,P1,S2	ug/kg	48.1	SW846 8270E	1	10/21/2024 20:14	S7M	A
Dibenzofuran	ND	ND,P1,S2	ug/kg	96.2	SW846 8270E	1	10/21/2024 20:14	S7M	A
Diethylphthalate	ND	ND,P1,S2	ug/kg	96.2	SW846 8270E	1	10/21/2024 20:14	S7M	A
Dimethylphthalate	ND	ND,P1,S2	ug/kg	96.2	SW846 8270E	1	10/21/2024 20:14	S7M	A
Di-n-Butylphthalate	ND	ND,P1,S2	ug/kg	96.2	SW846 8270E	1	10/21/2024 20:14	S7M	A
Di-n-Octylphthalate	ND	ND,P1,S2	ug/kg	96.2	SW846 8270E	1	10/21/2024 20:14	S7M	A
Fluoranthene	2680	P1,S2	ug/kg	48.1	SW846 8270E	1	10/21/2024 20:14	S7M	A
Fluorene	ND	ND,P1,S2	ug/kg	48.1	SW846 8270E	1	10/21/2024 20:14	S7M	A
Hexachlorobenzene	ND	ND,P1,S2	ug/kg	96.2	SW846 8270E	1	10/21/2024 20:14	S7M	A
Hexachlorobutadiene	486	P1,S2	ug/kg	96.2	SW846 8270E	1	10/21/2024 20:14	S7M	A
Hexachlorocyclopentadiene	ND	ND,P1,S2	ug/kg	192	SW846 8270E	1	10/21/2024 20:14	S7M	A
Hexachloroethane	169	P1,S2	ug/kg	96.2	SW846 8270E	1	10/21/2024 20:14	S7M	A
Indeno(1,2,3-cd)pyrene	ND	ND,P1,S2	ug/kg	48.1	SW846 8270E	1	10/21/2024 20:14	S7M	A
Isophorone	ND	ND,P1,S2	ug/kg	96.2	SW846 8270E	1	10/21/2024 20:14	S7M	A
mp-Cresol	ND	ND,P1,S2	ug/kg	192	SW846 8270E	1	10/21/2024 20:14	S7M	A
Naphthalene	111	P1,S2	ug/kg	48.1	SW846 8270E	1	10/21/2024 20:14	S7M	A
Nitrobenzene	ND	ND,P1,S2	ug/kg	96.2	SW846 8270E	1	10/21/2024 20:14	S7M	A
N-Nitroso-di-n-propylamine	ND	ND,P1,S2	ug/kg	96.2	SW846 8270E	1	10/21/2024 20:14	S7M	A

Results

Client Sample ID	AC33101-02	Collected	10/02/2024 11:47
Lab Sample ID	3382844002	Lab Receipt	10/11/2024 09:24

SEMIVOLATILES (cont.)

Compound	Result	Flag	Units	RDL	Method	Dilution	Analysis Date/Time	By	Cntr
N-Nitrosodiphenylamine	ND	ND,P1,S2	ug/kg	96.2	SW846 8270E	1	10/21/2024 20:14	S7M	A
o-Cresol	ND	ND,P1,S2	ug/kg	192	SW846 8270E	1	10/21/2024 20:14	S7M	A
Pentachlorophenol	ND	ND,P1,S2	ug/kg	192	SW846 8270E	1	10/21/2024 20:14	S7M	A
Phenanthrene	453	P1,S2	ug/kg	48.1	SW846 8270E	1	10/21/2024 20:14	S7M	A
Phenol	ND	ND,P1,S2	ug/kg	192	SW846 8270E	1	10/21/2024 20:14	S7M	A
Pyrene	6890	P1,S2	ug/kg	48.1	SW846 8270E	1	10/21/2024 20:14	S7M	A

SURROGATES

Compound	CAS No	Recovery	Limits(%)	Analysis Date/Time	Qualifiers
2,4,6-Tribromophenol	118-79-6	59%	19 – 132	10/21/2024 20:14	
2-Fluorobiphenyl	321-60-8	65%	40 – 110	10/21/2024 20:14	
2-Fluorophenol	367-12-4	46.6%	26 – 116	10/21/2024 20:14	
Nitrobenzene-d5	4165-60-0	66.3%	38 – 112	10/21/2024 20:14	
Phenol-d5	4165-62-2	60.9%	35 – 111	10/21/2024 20:14	
Terphenyl-d14	98904-43-9	88.4%	45 – 126	10/21/2024 20:14	

Results

Client Sample ID	AC33101-04	Collected	10/02/2024 00:20
Lab Sample ID	3382844003	Lab Receipt	10/11/2024 09:24

METALS

Compound	Result	Flag	Units	RDL	Method	Dilution	Analysis Date/Time	By	Cntr
Arsenic, Total	ND	ND,P1,S3	mg/kg	39.5	SW846 6010C	10	10/18/2024 10:23	MSY	A1
Cadmium, Total	ND	ND,P1,S3	mg/kg	9.9	SW846 6010C	10	10/18/2024 10:23	MSY	A1
Chromium, Total	ND	ND,P1,S3	mg/kg	19.8	SW846 6010C	10	10/18/2024 10:23	MSY	A1
Iron, Total	640	P1,S3	mg/kg	198	SW846 6010C	10	10/18/2024 10:23	MSY	A1
Lead, Total	ND	ND,P1,S3	mg/kg	39.5	SW846 6010C	10	10/18/2024 10:23	MSY	A1
Manganese, Total	ND	ND,P1,S3	mg/kg	19.8	SW846 6010C	10	10/18/2024 10:23	MSY	A1
Mercury, Total	ND	ND,P1,S3	mg/kg	0.049	SW846 7471B	1	10/24/2024 11:08	JMS	A
Selenium, Total	ND	ND,P1,S3	mg/kg	98.8	SW846 6010C	10	10/18/2024 10:23	MSY	A1
Zinc, Total	15200	P1,S3	mg/kg	39.5	SW846 6010C	10	10/18/2024 10:23	MSY	A1

SEMIVOLATILES

Compound	Result	Flag	Units	RDL	Method	Dilution	Analysis Date/Time	By	Cntr
1,2,4,5-Tetrachlorobenzene	ND	ND,P1,S3	ug/kg	89.3	SW846 8270E	1	10/21/2024 19:25	S7M	A
1,4-Dioxane	ND	ND,P1,S3	ug/kg	89.3	SW846 8270E	1	10/21/2024 19:25	S7M	A
2,3,4,6-Tetrachlorophenol	ND	ND,P1,S3	ug/kg	179	SW846 8270E	1	10/21/2024 19:25	S7M	A
2,4,5-Trichlorophenol	ND	ND,P1,S3	ug/kg	179	SW846 8270E	1	10/21/2024 19:25	S7M	A
2,4,6-Trichlorophenol	ND	ND,P1,S3	ug/kg	179	SW846 8270E	1	10/21/2024 19:25	S7M	A
2,4-Dichlorophenol	ND	ND,P1,S3	ug/kg	179	SW846 8270E	1	10/21/2024 19:25	S7M	A
2,4-Dimethylphenol	ND	ND,P1,S3	ug/kg	179	SW846 8270E	1	10/21/2024 19:25	S7M	A
2,4-Dinitrophenol	ND	ND,P1,S3	ug/kg	357	SW846 8270E	1	10/21/2024 19:25	S7M	A
2,4-Dinitrotoluene	ND	ND,P1,S3	ug/kg	89.3	SW846 8270E	1	10/21/2024 19:25	S7M	A
2,6-Dinitrotoluene	ND	ND,P1,S3	ug/kg	89.3	SW846 8270E	1	10/21/2024 19:25	S7M	A
2-Chloronaphthalene	ND	ND,P1,S3	ug/kg	89.3	SW846 8270E	1	10/21/2024 19:25	S7M	A
2-Chlorophenol	ND	ND,P1,S3	ug/kg	179	SW846 8270E	1	10/21/2024 19:25	S7M	A
2-Methyl-4,6-dinitrophenol	ND	ND,P1,S3	ug/kg	179	SW846 8270E	1	10/21/2024 19:25	S7M	A
2-Methylnaphthalene	ND	ND,P1,S3	ug/kg	89.3	SW846 8270E	1	10/21/2024 19:25	S7M	A
2-Nitroaniline	ND	ND,P1,S3	ug/kg	179	SW846 8270E	1	10/21/2024 19:25	S7M	A
2-Nitrophenol	ND	ND,P1,S3	ug/kg	179	SW846 8270E	1	10/21/2024 19:25	S7M	A
3,3-Dichlorobenzidine	ND	ND,P1,S3	ug/kg	179	SW846 8270E	1	10/21/2024 19:25	S7M	A
3-Nitroaniline	ND	ND,P1,S3	ug/kg	179	SW846 8270E	1	10/21/2024 19:25	S7M	A
4-Bromophenyl-phenylether	ND	ND,P1,S3	ug/kg	89.3	SW846 8270E	1	10/21/2024 19:25	S7M	A
4-Chloro-3-methylphenol	ND	ND,P1,S3	ug/kg	179	SW846 8270E	1	10/21/2024 19:25	S7M	A
4-Chloroaniline	ND	ND,P1,S3	ug/kg	179	SW846 8270E	1	10/21/2024 19:25	S7M	A
4-Chlorophenyl-phenylether	ND	ND,P1,S3	ug/kg	89.3	SW846 8270E	1	10/21/2024 19:25	S7M	A
4-Nitroaniline	ND	ND,P1,S3	ug/kg	179	SW846 8270E	1	10/21/2024 19:25	S7M	A
4-Nitrophenol	ND	ND,P1,S3	ug/kg	179	SW846 8270E	1	10/21/2024 19:25	S7M	A

Results

Client Sample ID	AC33101-04	Collected	10/02/2024 00:20
Lab Sample ID	3382844003	Lab Receipt	10/11/2024 09:24

SEMIVOLATILES (cont.)

Compound	Result	Flag	Units	RDL	Method	Dilution	Analysis Date/Time	By	Cntr
Acenaphthene	ND	ND,P1,S3	ug/kg	44.6	SW846 8270E	1	10/21/2024 19:25	S7M	A
Acenaphthylene	59.8	P1,S3	ug/kg	44.6	SW846 8270E	1	10/21/2024 19:25	S7M	A
Acetophenone	152	P1,S3	ug/kg	89.3	SW846 8270E	1	10/21/2024 19:25	S7M	A
Anthracene	82.3	P1,S3	ug/kg	44.6	SW846 8270E	1	10/21/2024 19:25	S7M	A
Atrazine	ND	ND,P1,S3	ug/kg	89.3	SW846 8270E	1	10/21/2024 19:25	S7M	A
Benzaldehyde	ND	ND,P1,S3	ug/kg	179	SW846 8270E	1	10/21/2024 19:25	S7M	A
Benzo(a)anthracene	ND	ND,P1,S3	ug/kg	44.6	SW846 8270E	1	10/21/2024 19:25	S7M	A
Benzo(a)pyrene	ND	ND,P1,S3	ug/kg	44.6	SW846 8270E	1	10/21/2024 19:25	S7M	A
Benzo(b)fluoranthene	ND	ND,P1,S3	ug/kg	44.6	SW846 8270E	1	10/21/2024 19:25	S7M	A
Benzo(g,h,i)perylene	ND	ND,P1,S3	ug/kg	44.6	SW846 8270E	1	10/21/2024 19:25	S7M	A
Benzo(k)fluoranthene	ND	ND,P1,S3	ug/kg	44.6	SW846 8270E	1	10/21/2024 19:25	S7M	A
Biphenyl	ND	ND,P1,S3	ug/kg	89.3	SW846 8270E	1	10/21/2024 19:25	S7M	A
bis(2-Chloroethoxy)methane	ND	ND,P1,S3	ug/kg	89.3	SW846 8270E	1	10/21/2024 19:25	S7M	A
bis(2-Chloroethyl)ether	ND	ND,P1,S3	ug/kg	89.3	SW846 8270E	1	10/21/2024 19:25	S7M	A
bis(2-Chloroisopropyl)ether	ND	ND,P1,S3	ug/kg	89.3	SW846 8270E	1	10/21/2024 19:25	S7M	A
bis(2-Ethylhexyl)phthalate	5100	P1,S3	ug/kg	89.3	SW846 8270E	1	10/21/2024 19:25	S7M	A
Butylbenzylphthalate	ND	ND,P1,S3	ug/kg	89.3	SW846 8270E	1	10/21/2024 19:25	S7M	A
Caprolactam	ND	ND,P1,S3	ug/kg	179	SW846 8270E	1	10/21/2024 19:25	S7M	A
Carbazole	ND	ND,P1,S3	ug/kg	89.3	SW846 8270E	1	10/21/2024 19:25	S7M	A
Chrysene	2450	P1,S3	ug/kg	44.6	SW846 8270E	1	10/21/2024 19:25	S7M	A
Dibenzo(a,h)anthracene	ND	ND,P1,S3	ug/kg	44.6	SW846 8270E	1	10/21/2024 19:25	S7M	A
Dibenzofuran	ND	ND,P1,S3	ug/kg	89.3	SW846 8270E	1	10/21/2024 19:25	S7M	A
Diethylphthalate	ND	ND,P1,S3	ug/kg	89.3	SW846 8270E	1	10/21/2024 19:25	S7M	A
Dimethylphthalate	ND	ND,P1,S3	ug/kg	89.3	SW846 8270E	1	10/21/2024 19:25	S7M	A
Di-n-Butylphthalate	ND	ND,P1,S3	ug/kg	89.3	SW846 8270E	1	10/21/2024 19:25	S7M	A
Di-n-Octylphthalate	ND	ND,P1,S3	ug/kg	89.3	SW846 8270E	1	10/21/2024 19:25	S7M	A
Fluoranthene	3760	P1,S3	ug/kg	44.6	SW846 8270E	1	10/21/2024 19:25	S7M	A
Fluorene	ND	ND,P1,S3	ug/kg	44.6	SW846 8270E	1	10/21/2024 19:25	S7M	A
Hexachlorobenzene	ND	ND,P1,S3	ug/kg	89.3	SW846 8270E	1	10/21/2024 19:25	S7M	A
Hexachlorobutadiene	426	P1,S3	ug/kg	89.3	SW846 8270E	1	10/21/2024 19:25	S7M	A
Hexachlorocyclopentadiene	ND	ND,P1,S3	ug/kg	179	SW846 8270E	1	10/21/2024 19:25	S7M	A
Hexachloroethane	205	P1,S3	ug/kg	89.3	SW846 8270E	1	10/21/2024 19:25	S7M	A
Indeno(1,2,3-cd)pyrene	ND	ND,P1,S3	ug/kg	44.6	SW846 8270E	1	10/21/2024 19:25	S7M	A
Isophorone	ND	ND,P1,S3	ug/kg	89.3	SW846 8270E	1	10/21/2024 19:25	S7M	A
mp-Cresol	ND	ND,P1,S3	ug/kg	179	SW846 8270E	1	10/21/2024 19:25	S7M	A
Naphthalene	131	P1,S3	ug/kg	44.6	SW846 8270E	1	10/21/2024 19:25	S7M	A
Nitrobenzene	ND	ND,P1,S3	ug/kg	89.3	SW846 8270E	1	10/21/2024 19:25	S7M	A
N-Nitroso-di-n-propylamine	ND	ND,P1,S3	ug/kg	89.3	SW846 8270E	1	10/21/2024 19:25	S7M	A

Results

Client Sample ID	AC33101-04	Collected	10/02/2024 00:20
Lab Sample ID	3382844003	Lab Receipt	10/11/2024 09:24

SEMIVOLATILES (cont.)

Compound	Result	Flag	Units	RDL	Method	Dilution	Analysis Date/Time	By	Cntr
N-Nitrosodiphenylamine	168	P1,S3	ug/kg	89.3	SW846 8270E	1	10/21/2024 19:25	S7M	A
o-Cresol	ND	ND,P1,S3	ug/kg	179	SW846 8270E	1	10/21/2024 19:25	S7M	A
Pentachlorophenol	ND	ND,P1,S3	ug/kg	179	SW846 8270E	1	10/21/2024 19:25	S7M	A
Phenanthrene	541	P1,S3	ug/kg	44.6	SW846 8270E	1	10/21/2024 19:25	S7M	A
Phenol	ND	ND,P1,S3	ug/kg	179	SW846 8270E	1	10/21/2024 19:25	S7M	A
Pyrene	8320	P1,S3	ug/kg	223	SW846 8270E	5	10/22/2024 20:12	CGS	A

SURROGATES

Compound	CAS No	Recovery	Limits(%)	Analysis Date/Time	Qualifiers
2,4,6-Tribromophenol	118-79-6	62.9%	19 – 132	10/21/2024 19:25	
2-Fluorobiphenyl	321-60-8	70.7%	40 – 110	10/21/2024 19:25	
2-Fluorophenol	367-12-4	42.5%	26 – 116	10/21/2024 19:25	
Nitrobenzene-d5	4165-60-0	60.3%	38 – 112	10/21/2024 19:25	
Phenol-d5	4165-62-2	58.2%	35 – 111	10/21/2024 19:25	
Terphenyl-d14	98904-43-9	80.7%	45 – 126	10/21/2024 19:25	

Sample - Method Cross Reference Table

Lab ID	Sample ID	Analysis Method	Preparation Method	Leachate Method
3382844001	AC33101-01	SW846 6010C	SW846 3051A	
		SW846 7471B	SW846 7471B	
		SW846 8270E	SW846 3546	
3382844002	AC33101-02	SW846 6010C	SW846 3051A	
		SW846 7471B	SW846 7471B	
		SW846 8270E	SW846 3546	
3382844003	AC33101-04	SW846 6010C	SW846 3051A	
		SW846 7471B	SW846 7471B	
		SW846 8270E	SW846 3546	

QUALITY CONTROL SAMPLES

METALS

QC Batch

QC Batch	1317128	Prep Method	SW846 3051A
Date	10/17/2024 10:05	Analysis Method	SW846 6010C
Tech.	MEM		

Associated Samples

3382844001 3382844002 3382844003

Matrix Spike 3893223 (MS1) 3383018001 (non-Project Sample) For QC Batch 1317128

****NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Matrix Spike Duplicate 3893224 (MSD1) 3383018001 (non-Project Sample) For QC Batch 1317128

Method Blank 3893221 (MB) Created on 10/17/2024 09:37 For QC Batch 1317128

RESULTS

Compound	CAS No		Result	Units	RDL	Qualifiers
Arsenic, Total	7440-38-2	BLK	ND	mg/kg	2.0	ND
Cadmium, Total	7440-43-9	BLK	ND	mg/kg	0.50	ND
Chromium, Total	7440-47-3	BLK	ND	mg/kg	1.0	ND
Iron, Total	7439-89-6	BLK	ND	mg/kg	10.0	ND
Lead, Total	7439-92-1	BLK	ND	mg/kg	2.0	ND
Manganese, Total	7439-96-5	BLK	ND	mg/kg	1.0	ND
Selenium, Total	7782-49-2	BLK	ND	mg/kg	5.0	ND
Zinc, Total	7440-66-6	BLK	ND	mg/kg	2.0	ND

Lab Control Standard 3893222 (LCS1) Created on 10/17/2024 09:37 For QC Batch 1317128

RESULTS

Compound	CAS No		Result (mg/kg)	Orig. Result (mg/kg)	Spk Added (mg/kg)	Rec. (%)	Limits (%)	RPD Limit (%)	Qualifiers
Arsenic, Total	7440-38-2	LCS	40.60		40	102	80 - 120		
Cadmium, Total	7440-43-9	LCS	21		20	105	80 - 120		
Chromium, Total	7440-47-3	LCS	21.10		20	106	80 - 120		
Iron, Total	7439-89-6	LCS	1080		1000	108	80 - 120		
Lead, Total	7439-92-1	LCS	108		100	108	80 - 120		
Manganese, Total	7439-96-5	LCS	22.40		20	112	80 - 120		
Selenium, Total	7782-49-2	LCS	103		100	103	80 - 120		
Zinc, Total	7440-66-6	LCS	106		100	106	80 - 120		

QC Batch

QC Batch	1320490	Prep Method	SW846 7471B
Date	10/24/2024 08:01	Analysis Method	SW846 7471B
Tech.	JMS		

Associated Samples

3382844001 3382844002 3382844003

QUALITY CONTROL SAMPLES

METALS (cont.)

Matrix Spike 3895659 (MS) 3383382001 (non-Project Sample) For QC Batch 1320490

****NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Matrix Spike Duplicate 3895660 (MSD) 3383382001 (non-Project Sample) For QC Batch 1320490

RESULTS

Compound	CAS No		Result (mg/kg)	Orig. Result (mg/kg)	Spk Added (mg/kg)	Rec. (%)	Limits (%)	RPD Limit (%)	Qualifiers
Mercury, Total	7439-97-6	MS	0.92	0.0037	0.95	96.4	80 - 120		
Mercury, Total	7439-97-6	MSD	0.80	0.0037	0.84	95.6	80 - 120	RPD 13.10 (Max-20)	

Matrix Spike 3895661 (MS) 3383385001 (non-Project Sample) For QC Batch 1320490

****NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Matrix Spike Duplicate 3895662 (MSD) 3383385001 (non-Project Sample) For QC Batch 1320490

RESULTS

Compound	CAS No		Result (mg/kg)	Orig. Result (mg/kg)	Spk Added (mg/kg)	Rec. (%)	Limits (%)	RPD Limit (%)	Qualifiers
Mercury, Total	7439-97-6	MS	1.10	0.0011	0.95	121*	80 - 120		
Mercury, Total	7439-97-6	MSD	0.83	0.0011	0.89	92.7	80 - 120	RPD 32.30* (Max-20)	

Method Blank 3895657 (MB) Created on 10/23/2024 09:48 For QC Batch 1320490

RESULTS

Compound	CAS No		Result	Units	RDL	Qualifiers
Mercury, Total	7439-97-6	BLK	ND	mg/kg	0.050	ND

Lab Control Standard 3895658 (LCS) Created on 10/23/2024 09:48 For QC Batch 1320490

RESULTS

Compound	CAS No		Result (mg/kg)	Orig. Result (mg/kg)	Spk Added (mg/kg)	Rec. (%)	Limits (%)	RPD Limit (%)	Qualifiers
Mercury, Total	7439-97-6	LCS	0.39		0.40	98.5	80 - 120		

QUALITY CONTROL SAMPLES

SEMIVOLATILES

QC Batch

QC Batch	1318932	Prep Method	SW846 3546
Date	10/20/2024 13:30	Analysis Method	SW846 8270E
Tech.	GED		

Associated Samples

3382844001 3382844002 3382844003

Matrix Spike 3894048 (MS) 3382843001 (non-Project Sample) For QC Batch 1318932

****NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Matrix Spike Duplicate 3894049 (MSD) 3382843001 (non-Project Sample) For QC Batch 1318932

RESULTS

Compound	CAS No		Result (ug/kg)	Orig. Result (ug/kg)	Spk Added (ug/kg)	Rec. (%)	Limits (%)	RPD Limit (%)	Qualifiers
2-Methylnaphthalene	91-57-6	MS	1600	0	2160	74.1	59 - 108		
2-Methylnaphthalene	91-57-6	MSD	1830	0	2360	77.8	59 - 108	RPD 13.80 (Max-21)	
Acenaphthene	83-32-9	MS	1690	0	2160	78.4	61 - 105		
Acenaphthene	83-32-9	MSD	1900	0	2360	80.5	61 - 105	RPD 11.70 (Max-17)	
Acenaphthylene	208-96-8	MS	1440	0	2160	66.6	63 - 106		
Acenaphthylene	208-96-8	MSD	1650	0	2360	70.1	63 - 106	RPD 14.20 (Max-17)	
Anthracene	120-12-7	MS	1790	0	2160	83.3	60 - 107		
Anthracene	120-12-7	MSD	1870	0	2360	79.3	60 - 107	RPD 4.12 (Max-20)	
Benzo(a)anthracene	56-55-3	MS	1870	0	2160	86.8	61 - 113		
Benzo(a)anthracene	56-55-3	MSD	2060	0	2360	87.5	61 - 113	RPD 9.89 (Max-22)	
Benzo(a)pyrene	50-32-8	MS	1880	0	2160	87.2	68 - 121		
Benzo(a)pyrene	50-32-8	MSD	2060	0	2360	87.2	68 - 121	RPD 9.08 (Max-24)	
Benzo(b)fluoranthene	205-99-2	MS	1840	0	2160	85.3	64 - 115		
Benzo(b)fluoranthene	205-99-2	MSD	2080	0	2360	88	64 - 115	RPD 12.20 (Max-28)	
Benzo(g,h,i)perylene	191-24-2	MS	1980	0	2160	91.7	57 - 119		
Benzo(g,h,i)perylene	191-24-2	MSD	2230	0	2360	94.4	57 - 119	RPD 12 (Max-30)	
Benzo(k)fluoranthene	207-08-9	MS	1890	0	2160	87.8	63 - 116		
Benzo(k)fluoranthene	207-08-9	MSD	2020	0	2360	85.7	63 - 116	RPD 6.53 (Max-22)	
Chrysene	218-01-9	MS	1930	0	2160	89.7	65 - 113		
Chrysene	218-01-9	MSD	2100	0	2360	88.9	65 - 113	RPD 8.17 (Max-20)	
Dibenzo(a,h)anthracene	53-70-3	MS	1980	0	2160	91.7	59 - 116		
Dibenzo(a,h)anthracene	53-70-3	MSD	2190	0	2360	93	59 - 116	RPD 10.40 (Max-28)	
Fluoranthene	206-44-0	MS	2000	0	2160	92.7	61 - 114		
Fluoranthene	206-44-0	MSD	1990	0	2360	84.5	61 - 114	RPD 0.19 (Max-21)	
Fluorene	86-73-7	MS	1670	0	2160	77.6	62 - 107		
Fluorene	86-73-7	MSD	1890	0	2360	80	62 - 107	RPD 12 (Max-16)	
Indeno(1,2,3-cd)pyrene	193-39-5	MS	1900	0	2160	88	53 - 118		
Indeno(1,2,3-cd)pyrene	193-39-5	MSD	2140	0	2360	90.8	53 - 118	RPD 12.10 (Max-30)	
Naphthalene	91-20-3	MS	1650	0	2160	76.6	60 - 102		
Naphthalene	91-20-3	MSD	1900	0	2360	80.6	60 - 102	RPD 14.10 (Max-21)	
Phenanthrene	85-01-8	MS	1780	0	2160	82.7	61 - 106		
Phenanthrene	85-01-8	MSD	1770	0	2360	74.9	61 - 106	RPD 0.90 (Max-20)	
Pyrene	129-00-0	MS	1810	0	2160	83.8	62 - 117		
Pyrene	129-00-0	MSD	1940	0	2360	82.3	62 - 117	RPD 7.12 (Max-20)	

QUALITY CONTROL SAMPLES

SEMIVOLATILES (cont.)

SURROGATES

Compound	CAS No		Result (ug/L)	Expected (ug/L)	Rec. (%)	Limits (%)	Qualifiers
2-Fluorobiphenyl	321-60-8	MS	1920	2160	89.1	40 - 110	
2-Fluorobiphenyl	321-60-8	MSD	2140	2360	90.9	40 - 110	
Nitrobenzene-d5	4165-60-0	MS	2060	2160	95.4	38 - 112	
Nitrobenzene-d5	4165-60-0	MSD	2170	2360	91.8	38 - 112	
Terphenyl-d14	98904-43-9	MS	2340	2160	109	45 - 126	
Terphenyl-d14	98904-43-9	MSD	2520	2360	107	45 - 126	

Method Blank 3894046 (MB) Created on 10/19/2024 08:06 For QC Batch 1318932

RESULTS

Compound	CAS No		Result	Units	RDL	Qualifiers
1,2,4,5-Tetrachlorobenzene	95-94-3	BLK	ND	ug/kg	100	ND
1,4-Dioxane	123-91-1	BLK	ND	ug/kg	100	ND
2,3,4,6-Tetrachlorophenol	58-90-2	BLK	ND	ug/kg	200	ND
2,4,5-Trichlorophenol	95-95-4	BLK	ND	ug/kg	200	ND
2,4,6-Trichlorophenol	88-06-2	BLK	ND	ug/kg	200	ND
2,4-Dichlorophenol	120-83-2	BLK	ND	ug/kg	200	ND
2,4-Dimethylphenol	105-67-9	BLK	ND	ug/kg	200	ND
2,4-Dinitrophenol	51-28-5	BLK	ND	ug/kg	400	ND
2,4-Dinitrotoluene	121-14-2	BLK	ND	ug/kg	100	ND
2,6-Dinitrotoluene	606-20-2	BLK	ND	ug/kg	100	ND
2-Chloronaphthalene	91-58-7	BLK	ND	ug/kg	100	ND
2-Chlorophenol	95-57-8	BLK	ND	ug/kg	200	ND
2-Methyl-4,6-dinitrophenol	534-52-1	BLK	ND	ug/kg	200	ND
2-Methylnaphthalene	91-57-6	BLK	ND	ug/kg	100	ND
2-Nitroaniline	88-74-4	BLK	ND	ug/kg	200	ND
2-Nitrophenol	88-75-5	BLK	ND	ug/kg	200	ND
3,3-Dichlorobenzidine	91-94-1	BLK	ND	ug/kg	200	ND
3-Nitroaniline	99-09-2	BLK	ND	ug/kg	200	ND
4-Bromophenyl-phenylether	101-55-3	BLK	ND	ug/kg	100	ND
4-Chloro-3-methylphenol	59-50-7	BLK	ND	ug/kg	200	ND
4-Chloroaniline	106-47-8	BLK	ND	ug/kg	200	ND
4-Chlorophenyl-phenylether	7005-72-3	BLK	ND	ug/kg	100	ND
4-Nitroaniline	100-01-6	BLK	ND	ug/kg	200	ND
4-Nitrophenol	100-02-7	BLK	ND	ug/kg	200	ND
Acenaphthene	83-32-9	BLK	ND	ug/kg	50.0	ND
Acenaphthylene	208-96-8	BLK	ND	ug/kg	50.0	ND
Acetophenone	98-86-2	BLK	ND	ug/kg	100	ND
Anthracene	120-12-7	BLK	ND	ug/kg	50.0	ND
Atrazine	1912-24-9	BLK	ND	ug/kg	100	ND
Benzaldehyde	100-52-7	BLK	ND	ug/kg	200	ND
Benzo(a)anthracene	56-55-3	BLK	ND	ug/kg	50.0	ND
Benzo(a)pyrene	50-32-8	BLK	ND	ug/kg	50.0	ND
Benzo(b)fluoranthene	205-99-2	BLK	ND	ug/kg	50.0	ND
Benzo(g,h,i)perylene	191-24-2	BLK	ND	ug/kg	50.0	ND

QUALITY CONTROL SAMPLES

SEMIVOLATILES (cont.)

RESULTS

Compound	CAS No		Result	Units	RDL	Qualifiers
Benzo(k)fluoranthene	207-08-9	BLK	ND	ug/kg	50.0	ND
Biphenyl	92-52-4	BLK	ND	ug/kg	100	ND
bis(2-Chloroethoxy)methane	111-91-1	BLK	ND	ug/kg	100	ND
bis(2-Chloroethyl)ether	111-44-4	BLK	ND	ug/kg	100	ND
bis(2-Chloroisopropyl)ether	108-60-1	BLK	ND	ug/kg	100	ND
bis(2-Ethylhexyl)phthalate	117-81-7	BLK	ND	ug/kg	100	ND
Butylbenzylphthalate	85-68-7	BLK	ND	ug/kg	100	ND
Caprolactam	105-60-2	BLK	ND	ug/kg	200	ND
Carbazole	86-74-8	BLK	ND	ug/kg	100	ND
Chrysene	218-01-9	BLK	ND	ug/kg	50.0	ND
Dibenzo(a,h)anthracene	53-70-3	BLK	ND	ug/kg	50.0	ND
Dibenzofuran	132-64-9	BLK	ND	ug/kg	100	ND
Diethylphthalate	84-66-2	BLK	ND	ug/kg	100	ND
Dimethylphthalate	131-11-3	BLK	ND	ug/kg	100	ND
Di-n-Butylphthalate	84-74-2	BLK	ND	ug/kg	100	ND
Di-n-Octylphthalate	117-84-0	BLK	ND	ug/kg	100	ND
Fluoranthene	206-44-0	BLK	ND	ug/kg	50.0	ND
Fluorene	86-73-7	BLK	ND	ug/kg	50.0	ND
Hexachlorobenzene	118-74-1	BLK	ND	ug/kg	100	ND
Hexachlorobutadiene	87-68-3	BLK	ND	ug/kg	100	ND
Hexachlorocyclopentadiene	77-47-4	BLK	ND	ug/kg	200	ND
Hexachloroethane	67-72-1	BLK	ND	ug/kg	100	ND
Indeno(1,2,3-cd)pyrene	193-39-5	BLK	ND	ug/kg	50.0	ND
Isophorone	78-59-1	BLK	ND	ug/kg	100	ND
mp-Cresol	108394/106445	BLK	ND	ug/kg	200	ND
Naphthalene	91-20-3	BLK	ND	ug/kg	50.0	ND
Nitrobenzene	98-95-3	BLK	ND	ug/kg	100	ND
N-Nitroso-di-n-propylamine	621-64-7	BLK	ND	ug/kg	100	ND
N-Nitrosodiphenylamine	86-30-6	BLK	ND	ug/kg	100	ND
o-Cresol	95-48-7	BLK	ND	ug/kg	200	ND
Pentachlorophenol	87-86-5	BLK	ND	ug/kg	200	ND
Phenanthrene	85-01-8	BLK	ND	ug/kg	50.0	ND
Phenol	108-95-2	BLK	ND	ug/kg	200	ND
Pyrene	129-00-0	BLK	ND	ug/kg	50.0	ND

SURROGATES

Compound	CAS No		Result (ug/kg)	Expected (ug/kg)	Rec. (%)	Limits (%)	Qualifiers
2,4,6-Tribromophenol	118-79-6	BLK	4460	5000	89.2	19 - 132	
2-Fluorobiphenyl	321-60-8	BLK	2230	2500	89.1	40 - 110	
2-Fluorophenol	367-12-4	BLK	4470	5000	89.3	26 - 116	
Nitrobenzene-d5	4165-60-0	BLK	2310	2500	92.2	38 - 112	
Phenol-d5	4165-62-2	BLK	5190	5000	104	35 - 111	
Terphenyl-d14	98904-43-9	BLK	3060	2500	122	45 - 126	

QUALITY CONTROL SAMPLES

SEMIVOLATILES (cont.)

Lab Control Standard 3894047 (LCS) Created on 10/19/2024 08:06 For QC Batch 1318932

RESULTS

Compound	CAS No		Result (ug/kg)	Orig. Result (ug/kg)	Spk Added (ug/kg)	Rec. (%)	Limits (%)	RPD Limit (%)	Qualifiers
1,2,4,5-Tetrachlorobenzene	95-94-3	LCS	1930		2500	77.1	51 - 102		
1,4-Dioxane	123-91-1	LCS	1610		2500	64.6	24 - 104		
2,3,4,6-Tetrachlorophenol	58-90-2	LCS	4430		5000	88.5	55 - 111		
2,4,5-Trichlorophenol	95-95-4	LCS	4760		5000	95.2	60 - 108		
2,4,6-Trichlorophenol	88-06-2	LCS	4540		5000	90.8	59 - 111		
2,4-Dichlorophenol	120-83-2	LCS	4860		5000	97.1	61 - 109		
2,4-Dimethylphenol	105-67-9	LCS	5270		5000	105	59 - 133		
2,4-Dinitrophenol	51-28-5	LCS	5060		5000	101	28 - 135		
2,4-Dinitrotoluene	121-14-2	LCS	1870		2500	74.7	62 - 115		
2,6-Dinitrotoluene	606-20-2	LCS	1910		2500	76.3	61 - 114		
2-Chloronaphthalene	91-58-7	LCS	1810		2500	72.5	59 - 104		
2-Chlorophenol	95-57-8	LCS	5070		5000	101	61 - 106		
2-Methyl-4,6-dinitrophenol	534-52-1	LCS	5530		5000	111	39 - 113		
2-Methylnaphthalene	91-57-6	LCS	1930		2500	77.2	59 - 108		
2-Nitroaniline	88-74-4	LCS	1900		2500	76.2	60 - 115		
2-Nitrophenol	88-75-5	LCS	4820		5000	96.5	60 - 114		
3,3-Dichlorobenzidine	91-94-1	LCS	2960		5000	59.3	25 - 104		
3-Nitroaniline	99-09-2	LCS	2010		2500	80.5	52 - 119		
4-Bromophenyl-phenylether	101-55-3	LCS	1860		2500	74.5	60 - 110		
4-Chloro-3-methylphenol	59-50-7	LCS	5090		5000	102	59 - 115		
4-Chloroaniline	106-47-8	LCS	1910		2500	76.4	42 - 111		
4-Chlorophenyl-phenylether	7005-72-3	LCS	2010		2500	80.4	59 - 107		
4-Nitroaniline	100-01-6	LCS	1820		2500	72.9	49 - 121		
4-Nitrophenol	100-02-7	LCS	5120		5000	102	53 - 124		
Acenaphthene	83-32-9	LCS	1940		2500	77.7	61 - 105		
Acenaphthylene	208-96-8	LCS	1610		2500	64.6	63 - 106		
Acetophenone	98-86-2	LCS	1890		2500	75.5	33 - 98		
Anthracene	120-12-7	LCS	1960		2500	78.5	60 - 107		
Atrazine	1912-24-9	LCS	1920		2500	76.7	62 - 116		
Benzaldehyde	100-52-7	LCS	2140		2500	85.4	46 - 115		
Benzo(a)anthracene	56-55-3	LCS	1970		2500	78.7	61 - 113		
Benzo(a)pyrene	50-32-8	LCS	1950		2500	77.9	68 - 121		
Benzo(b)fluoranthene	205-99-2	LCS	2010		2500	80.2	64 - 115		
Benzo(g,h,i)perylene	191-24-2	LCS	2000		2500	80.1	57 - 119		
Benzo(k)fluoranthene	207-08-9	LCS	2100		2500	83.8	63 - 116		
Biphenyl	92-52-4	LCS	1940		2500	77.5	56 - 100		
bis(2-Chloroethoxy)methane	111-91-1	LCS	2250		2500	89.9	56 - 112		
bis(2-Chloroethyl)ether	111-44-4	LCS	2030		2500	81.3	51 - 109		
bis(2-Chloroisopropyl)ether	108-60-1	LCS	2150		2500	86	38 - 120		
bis(2-Ethylhexyl)phthalate	117-81-7	LCS	2140		2500	85.4	51 - 130		
Butylbenzylphthalate	85-68-7	LCS	2180		2500	87.2	58 - 125		
Caprolactam	105-60-2	LCS	2070		2500	82.7	51 - 119		
Carbazole	86-74-8	LCS	1850		2500	73.9	66 - 117		
Chrysene	218-01-9	LCS	2060		2500	82.3	65 - 113		

QUALITY CONTROL SAMPLES

SEMIVOLATILES (cont.)

RESULTS

Compound	CAS No		Result (ug/kg)	Orig. Result (ug/kg)	Spk Added (ug/kg)	Rec. (%)	Limits (%)	RPD Limit (%)	Qualifiers
Dibenzo(a,h)anthracene	53-70-3	LCS	1900		2500	75.9	59 - 116		
Dibenzofuran	132-64-9	LCS	1820		2500	72.9	62 - 106		
Diethylphthalate	84-66-2	LCS	2010		2500	80.4	59 - 112		
Dimethylphthalate	131-11-3	LCS	1990		2500	79.5	60 - 111		
Di-n-Butylphthalate	84-74-2	LCS	2100		2500	83.9	62 - 125		
Di-n-Octylphthalate	117-84-0	LCS	2210		2500	88.3	47 - 134		
Fluoranthene	206-44-0	LCS	1890		2500	75.7	61 - 114		
Fluorene	86-73-7	LCS	1900		2500	76.2	62 - 107		
Hexachlorobenzene	118-74-1	LCS	1860		2500	74.2	56 - 111		
Hexachlorobutadiene	87-68-3	LCS	2210		2500	88.2	56 - 127		
Hexachlorocyclopentadiene	77-47-4	LCS	1480		2500	59	20 - 124		
Hexachloroethane	67-72-1	LCS	2010		2500	80.3	57 - 101		
Indeno(1,2,3-cd)pyrene	193-39-5	LCS	1810		2500	72.2	53 - 118		
Isophorone	78-59-1	LCS	2070		2500	83	41 - 101		
mp-Cresol	108394/106445	LCS	5460		5000	109	60 - 109		
Naphthalene	91-20-3	LCS	1920		2500	76.6	60 - 102		
Nitrobenzene	98-95-3	LCS	2040		2500	81.4	52 - 113		
N-Nitroso-di-n-propylamine	621-64-7	LCS	2210		2500	88.3	50 - 121		
N-Nitrosodiphenylamine	86-30-6	LCS	2380		2500	95.1	73 - 129		
o-Cresol	95-48-7	LCS	5030		5000	101	61 - 108		
Pentachlorophenol	87-86-5	LCS	5770		5000	115	46 - 138		
Phenanthrene	85-01-8	LCS	1920		2500	76.9	61 - 106		
Phenol	108-95-2	LCS	5010		5000	100	57 - 110		
Pyrene	129-00-0	LCS	2100		2500	83.8	62 - 117		

SURROGATES

Compound	CAS No		Result (ug/kg)	Expected (ug/kg)	Rec. (%)	Limits (%)	Qualifiers
2,4,6-Tribromophenol	118-79-6	LCS	4260	5000	85.2	19 - 132	
2-Fluorobiphenyl	321-60-8	LCS	2110	2500	84.2	40 - 110	
2-Fluorophenol	367-12-4	LCS	4190	5000	83.8	26 - 116	
Nitrobenzene-d5	4165-60-0	LCS	2210	2500	88.3	38 - 112	
Phenol-d5	4165-62-2	LCS	4730	5000	94.7	35 - 111	
Terphenyl-d14	98904-43-9	LCS	2760	2500	110	45 - 126	

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Lab ID	Sample ID	Preparation Method	Prep Batch	Prep Date/Time	By	Analysis Method	Anly Batch
3382844001	AC33101-01	SW846 3051A	1317128	10/17/2024 10:05	MEM	SW846 6010C	1318062
		SW846 7471B	1320490	10/24/2024 08:01	JMS	SW846 7471B	1321252
		SW846 3546	1318932	10/20/2024 13:30	GED	SW846 8270E	1319871
		SW846 3546	1318932	10/20/2024 13:30	GED	SW846 8270E	1320102
3382844002	AC33101-02	SW846 3051A	1317128	10/17/2024 10:05	MEM	SW846 6010C	1318062
		SW846 7471B	1320490	10/24/2024 08:01	JMS	SW846 7471B	1321252
		SW846 3546	1318932	10/20/2024 13:30	GED	SW846 8270E	1319871
3382844003	AC33101-04	SW846 3051A	1317128	10/17/2024 10:05	MEM	SW846 6010C	1318062
		SW846 7471B	1320490	10/24/2024 08:01	JMS	SW846 7471B	1321252
		SW846 3546	1318932	10/20/2024 13:30	GED	SW846 8270E	1319871
		SW846 3546	1318932	10/20/2024 13:30	GED	SW846 8270E	1320102

Environmental Chemistry Lab Service
200 Route 130 North, Cinnaminson, NJ 08077
TEL: (856) 858-4800 FAX: (856) 786-5974

Chain of Custody / Analysis Request Form

Print ALL Information. Incomplete chain of custody could result in the delay of analysis.

EMSL Project # AC33101
Account Rep: ENVI54
Indicate State where samples were collected: MA

3382844
Logged By: CXW
PM: KSB

REPORT RESULTS TO:
Name: Travis Albert PO#:
Company
EMSL Analytical, Inc.
Address: 200 Route 130 North
City: Cinnaminson
State: NJ Zip: 08077
Tel: 856-303-2548 ext. 2548 Fax: 856-854-2362
Email: sublab@emsl.com
Sampled by: (Signature)

SEND INVOICE TO:
Name: PO#:
Company
EMSL Analytical, Inc.
Address: 200 Route 130 North
City: Cinnaminson
State: NJ Zip: 08077
Tel: 800-220-3675 Fax: 856-854-2362
# of Samples in Shipment: 3

Turnaround Time
Due 1
Analytical Laboratory
301 Fulling Mill Rd
Middletown, PA 17057
717-944-5541
PROJECT NAME:
Date of Sample Shipment: 10/10/24

	Lab Sample Number	Client Sample ID	Comp	Grab	Matrix: Waste WATER	SOIL	AIR	SLUDGE	OTHER	Preservative: HCl	HNO3	$Na_2S_2O_3$	ICE	Sampling: DATE	TIME	List Method and Test Needed: SVOC	Metals 6010/7470
1.	AC33101-01								X					10/02	11:21am	2X	X
2.	AC33101-02								X					10/02	11:47am	2X	X
3.	AC33101-04								X					10/02	12:20m	2X	X
4.																	
5.																	
6.																	

MJE 10/11/24

Released By Signature: [signature]
Date & Time Released: 10/10/24
Delivery Method: FedEx
Received By Signature: Fedex
Agency:
Date & Time Received:

Please indicate reporting requirements: ☐1. Results Only ☒2. Results and QC ☐3. Reduced Deliverables ☐4. Disk Deliverable ☐5. Other

Comments: **Please analyze for metals (As, Cd, Cr, Pb, Fe, Mn, Hg, Se, Zn) and SVOC 8270**

17° 280508572397

Temp By: MJE | WO Temp (°C): 17° | Therm ID: 569

Receipt Info Completed By: MJE
Cooler Custody Seal Intact: Y N NA
Sample Custody Seal Intact: Y N NA
Received on Ice: Y N NA
Cooler & Samples Intact: Y N
Correct Containers Provided: Y N
Sample Label/COC Agree: Y N
Adequate Sample Volumes: Y N
CR6 Samples Filtered: Y N NA
OP Samples Filtered: Y N NA
VOA Trip Blank: Y N NA
NJ≤ 4 Days? Y N NA
Rad Screen (uCi): Y N
Courier/Tracking #: 280508572397

Appendix B

Sampling Equipment

Sampling Equipment

Analyte	Description	Calibration
Volatile Organic Compounds (VOCs)	Ion Science Tiger Photoionization Detector	Calibrated by Rental Company Verified Prior to Use
Surface Temperature & Relative Humidity	TSI Q-Trak Air Quality Monitor	Verified Prior to Use

Appendix C

Field Logs

edham Rubber Crumb Sampling
12/24
0B | 266 B50
CJuliano
r: 60s Overcast

Description:
CJuliano ~~[illegible]~~ meets Tam from the Town of Needham at Needham memorial field at Needham High School.
Class is on the field So CJuliano/Tam go to Defazio Park collects Samples from Founders and Brooks Field.
CJuliano and Tam return to memorial field. Samples are Collected
CJuliano offsite.

Samples Collected by Scraping Jars against turf. FB Collected in Center of Brooks field. ~~Turf extracted to be composited by lab.~~

10/3/2024- CJuliano composites jars by their field (not seperate sections of each field within each jar). Samples delivered to FedEX for shipment to ESML NJ

Sample ID	Time	Location	Location ID
164324002-01	1121	Founders Field	G-04
164324002-02	1147	Brooks Field	G-05
164324002-03	1200	Field blank	G-06
164324002-04	1220	Memorial Field	G-01
			G-02
			G-03
			G-02
			G-07
			G-08
			G-09

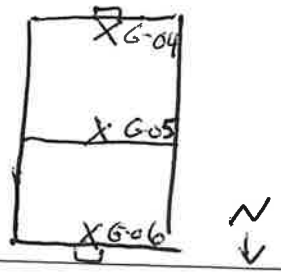
CAS

Crumb Rubber Sampling Field Data

Client/Project Name: Needham Crumb Rubber	
Project Location: Needham, MA	**PROJECT #: 20081266.B50**
Sample#: 1643241002- 01	Sample Location ID G-04 G-05, G-06 Founder' field

FUSS & O'NEILL

Sample Location Description (include sketch map with location of sample)



Sample Data

Date: 10/02/2024 Time: 1121

Sampler: CJ

Weather: Ambient Temperature: 69.8

Relative Humidity: 57 4

Barometric Pressure: NA

Sampling Device: Auger / Core Sampler / Shovel / Trowel / Other Destroke Spoon Jars

Field decon: Yes / No / Dedicated

Type of Sample: Grab / Composite / Other

PID Reading (ppm): 0.1

Container	Quantity	Preservative
4oz Amber	3	---

Description Data

Generic Sample Description: Crumb rubber

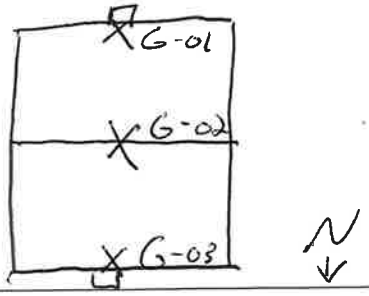
Comments:

Crumb Rubber Sampling Field Data

Client/Project Name: Needham Crumb Rubber	
Project Location: Needham, MA	**PROJECT #: 20081266.B50**
Sample#: 1643241002-02	Sample Location ID Brook Field G-01, G-02, G-03

FUSS & O'NEILL

Sample Location Description (include sketch map with location of sample)



Sample Data

Date: 10/02/2024 Time: 1147

Sampler: CJ

Weather: Ambient Temperature: 77.4

Relative Humidity: 45.1

Barometric Pressure: NA

Sampling Device: Auger / Core Sampler / Shovel / Trowel / Other Deltrator Jar

Field decon: Yes / No / Dedicated

Type of Sample: Grab / Composite / Other

PID Reading (ppm): 0.1

Container	Quantity	Preservative
4oz Amber	3	---

Description Data

Generic Sample Description: Crumb rubber

Comments:

Field Blank Field Data

Client/Project Name: Needham Rubber Crumb Project Location: Needham MA	**PROJECT #: 20081622.B50**	FUSS & O'NEILL
Sample#: 1643241002-03	Sample ID Field Blank	

Sample Data

Date: 10/2/2024 Time: 1200

Sampler: CJ Weather: Overcast 60's

Blank Water Supplied By: Lab / F&O / Other _____

Comments: Collected in Center of Brook's Field (G-02)

Container	Quantity	Preservative
VOA	3	HCl

* - Organic-free DI water used in these containers.

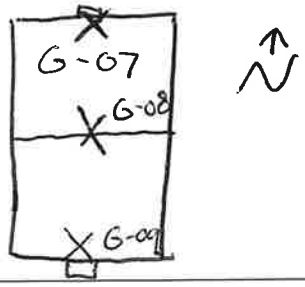
Comments:

Crumb Rubber Sampling Field Data

Client/Project Name: Needham Crumb Rubber	
Project Location: Needham, MA	**PROJECT #: 20081266.B50**
Sample#: 1643241002- 04	Sample Location ID Memorial Field G7, G08, G09

FUSS & O'NEILL

Sample Location Description (include sketch map with location of sample)



Sample Data

Date: 10/02/2024 Time: 1220

Sampler: CJ

Weather: Ambient Temperature: 78.5

Relative Humidity: 41.1

Barometric Pressure:

Sampling Device: Auger / Core Sampler / Shovel / Trowel / Other Dedicated Jar

Field decon: Yes / No / Dedicated

Type of Sample: Grab / Composite / Other

PID Reading (ppm): 0.0

Container	Quantity	Preservative
4oz Amber	3	---

Description Data

Generic Sample Description: Crumb rubber

Comments:

MAP REFERENCE

THIS MAP WAS PREPARED FROM USGS ORTHOPHOTOGRAPHY, (c) 2013 MASSGIS.

SOURCE: OFFICE OF GEOGRAPHIC AND ENVIRONMENTAL INFORMATION (MASSGIS), COMMOMWEALTH OF MASSACHUSETTS EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS.

FIELD BOUNDARIES APPROXIMATE BASED ON SITE OBSERVATIONS

LEGEND

- FOUNDERS FIELD BOUNDARY
- BROCK FIELD BOUNDARY
- SAMPLE LOCATIONS TO FORM COMPOSITE

SCALE:
HORZ : 1" = 150'
VERT.:
DATUM:
HORZ.:
VERT.:
0 75' 150'
GRAPHIC SCALE

FUSS & O'NEILL
108 MYRTLE STREET, SUITE 502
QUINCY, MA 02171
617.282.4675
www.fando.com

NEEDHAM HEALTH DEPARTMENT

SITE PLAN

DEFAZIO PARK
380 DEDHAM ROAD

NEEDHAM MASSACHUSETTS

PROJ. No.: 20081266.B10
DATE: JUNE 2020

FIGURE 2

File Path: J:\DWG\P2008\1266\A9E\Environmental\Plan\20081266A9E_STP01.dwg Layout: DEFAZIO PARK Plotted: Tue, June 23, 2020 - 2:54 PM User: sdevincentis
Plotter: DWG TO PDF.PC3 CTB File: FO HALF.STB
MS VIEW: LAYER STATE:

MAP REFERENCE

THIS MAP WAS PREPARED FROM USGS ORTHOPHOTOGRAPHY, (c) 2013 MASSGIS.

SOURCE: OFFICE OF GEOGRAPHIC AND ENVIRONMENTAL INFORMATION (MASSGIS), COMMOMWEALTH OF MASSACHUSETTS EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS.

MEMORIAL FIELD BOUNDARIES APPROXIMATE BASED ON SITE OBSERVATIONS

LEGEND

PARK BOUNDARY

SAMPLE LOCATIONS TO FORM COMPOSITE

SCALE:
HORZ.: 1" = 150'
VERT.:
DATUM:
HORZ.:
VERT.:
0 75' 150'
GRAPHIC SCALE

FUSS & O'NEILL
108 MYRTLE STREET, SUITE 502
QUINCY, MA 02171
617.282.4675
www.fando.com

NEEDHAM HEALTH DEPARTMENT

SITE PLAN

MEMORIAL PARK
92 ROSEMARY ROAD

NEEDHAM MASSACHUSETTS

PROJ. No.: 20081266.B10
DATE: JUNE 2020

FIGURE 1

File Path: J:\DWG\P2008\1266\A9E\Environmental\Plan\20081266A9E_STP01.dwg Layout: MEMORIAL PARK Plotted: Tue, June 23, 2020 - 2:55 PM User: sdevincenlis
Plotter: DWG TO PDF.PC3 CTB File: FO HALF.STB
LAYER STATE:
MS VIEW:

FUSS & O'NEILL ~~ENVIROSCIENCE, LLC~~
Disciplines to Deliver
(860) 646-2469 • www.FandO.com

- ☐ 146 Hartford Road, Manchester, CT 06040
- ☐ 56 Quarry Road, Trumbull, CT 06611
- ☐ 1419 Richland Street, Columbia, SC 29201
- ☐ 78 Interstate Drive, West Springfield, MA 01089
- ☑ 108 Myrtle Street, #502, North Quincy, MA 02171
- ☐ 317 Iron Horse Way, Suite 204, Providence, RI 02908
- ☐ 80 Washington Street, Suite 301, Poughkeepsie, NY 12601

CHAIN-OF-CUSTODY RECORD

4517

Turnaround
☐ 1 Day* ☐ 3 Days* ☐ Other _____ (days)
☐ 2 Days* ☒ Standard (____ days) *Surcharge Applies

PROJECT NAME	PROJECT LOCATION	PROJECT NUMBER	LABORATORY
Needham Crumb Rubber	Needham MA	2018266.B50	EMSL (NJ)

REPORT TO: Neal Kelly neal.kelly@fando.com
INVOICE TO:
P.O. No.:
Sampler's Signature: Date: 10/2/24

Source Codes:
MW=Monitoring Well PW=Potable Water S=Soil W=Waste
SW=Surface Water T=Treatment Facility B=Sediment A=Air
X=Other AQ = Aqueous CR: Crumb Rubber

Analysis Request / Containers

Item No.	Transfer Check 1	2	3	4	Sample Number	Source Code	Date Sampled	Time Sampled	Full VOC list and TICS	Full SVOC list by 8270	Metals (arsenic, cadmium, chromium, lead, iron, manganese, mercury, selenium & zinc) by 6010/7470	Soil VOA Vial, [ ] methanol	Soil VOA Vial, [ ] water	Glass Soil Container ( ) oz	Glass Soil Container (4) oz	Other:	Water VOA Vial, [ ] As is [ ] HCl	Glass Amber ( ) ml, [ ] As is	Plastic - As is, [ ] 250 ml	Plastic - H_2SO_4, [ ] 250 ml	Plastic - HNO_3, 250 ml	Plastic - NaOH, 250 ml	Comments
1					1643241002-01	CR	10/2/24	1121	X	X	X				3								Founders
2					1643241002-02	CR	10/2/24	1147	↓	X	X				3								~~Brook~~ Brook
3					1643241002-03	AQ	10/2/24	1200									3						~~Memorial~~ Brook only VOCs
4					1643241002-04	CR	10/2/24	1220	↓	X	X				3								Memorial

Transfer Number	Relinquished By	Accepted By	Date	Time
1	Chris Julian			
2				
3				
4				

Reporting and Detection Limit Requirements: MCP CAM Cert.

Additional Comments:

Appendix D

Method Detection Limit Laboratory Analytical Report

EMSL Analytical, Inc.

200 Route 130, Cinnaminson, NJ, 08077
Telephone: 856-858-4800 Fax:856-786-5974
EMSL-CIN-01

EMSL Order ID: 012433101
LIMS Reference ID: AC33101
EMSL Customer ID: ENVI54

December 12, 2024

Neal Kelly
Fuss & O'Neill, Inc. [ENVI54]
108 Myrtle St
North Quincy, Massachusetts 02171

The following analytical report covers the analysis performed on samples submitted to EMSL Analytical, Inc. on 10/10/2024. The results are tabulated on the attached pages for the following client designated project:

Needham Crumb Rubber

The reference number for these samples is EMSL Order #: AC33101 . Please use this reference when calling about these samples. If you have any questions, please do not hesitate to contact the lab at 856-858-4800.

Owen McKenna Laboratory Manager or other approved signatory

Table of Contents

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EMSL Analytical, Inc.

200 Route 130, Cinnaminson, NJ, 08077
Telephone: 856-858-4800 Fax:856-786-5974
EMSL-CIN-01

EMSL Order ID: 012433101
LIMS Reference ID: AC33101
EMSL Customer ID: ENVI54

Attention: Neal Kelly
Fuss & O'Neill, Inc. [ENVI54]
108 Myrtle St
North Quincy, Massachusetts 02171
(860) 646-2469
Neal.Kelly@fando.com

Project Name: Needham Crumb Rubber

Customer PO: 20081266.B50
EMSL Sales Rep: Jeromy Bish
Received: 10/10/2024 09:00
Reported: 12/12/2024 13:03

Sample Condition on Receipt

Cooler ID: Default Cooler **Temperature:** **°C**

Custody Seals	Y
Containers Intact	Y
COC/Labels Agree	Y
Preservation Confirmed	Y

EMSL Analytical, Inc.

200 Route 130, Cinnaminson, NJ, 08077
Telephone: 856-858-4800 Fax:856-786-5974
EMSL-CIN-01

EMSL Order ID: 012433101
LIMS Reference ID: AC33101
EMSL Customer ID: ENVI54

Attention: Neal Kelly
Fuss & O'Neill, Inc. [ENVI54]
108 Myrtle St
North Quincy, Massachusetts 02171
(860) 646-2469
Neal.Kelly@fando.com

Project Name: Needham Crumb Rubber

Customer PO: 20081266.B50
EMSL Sales Rep: Jeromy Bish
Received: 10/10/2024 09:00
Reported: 12/12/2024 13:03

Samples in this Report

Lab ID	Sample	Matrix	Date Sampled	Date Received
AC33101-03	1643241002-03	Waste Water	10/2/24 12:00 pm	10/10/2024

EMSL Analytical, Inc.

200 Route 130, Cinnaminson, NJ, 08077
Telephone: 856-858-4800 Fax:856-786-5974
EMSL-CIN-01

EMSL Order ID: 012433101
LIMS Reference ID: AC33101
EMSL Customer ID: ENVI54

Attention: Neal Kelly
Fuss & O'Neill, Inc. [ENVI54]
108 Myrtle St
North Quincy, Massachusetts 02171
(860) 646-2469
Neal.Kelly@fando.com

Project Name: Needham Crumb Rubber

Customer PO: 20081266.B50
EMSL Sales Rep: Jeromy Bish
Received: 10/10/2024 09:00
Reported: 12/12/2024 13:03

Positive Hits Summary

Lab ID	Client ID				Sampled
AC33101-03	1643241002-03				10/02/24 12:00
Method	Analyte	Result	Qualifier	Unit	Analyzed
EPA 624.1	**No TICs found**	**0.0**		**µg/L**	**10/14/2024 18:26**

EMSL Analytical, Inc.

200 Route 130, Cinnaminson, NJ, 08077
Telephone: 856-858-4800 Fax:856-786-5974
EMSL-CIN-01

EMSL Order ID: 012433101
LIMS Reference ID: AC33101
EMSL Customer ID: ENVI54

Attention: Neal Kelly
Fuss & O'Neill, Inc. [ENVI54]
108 Myrtle St
North Quincy, Massachusetts 02171
(860) 646-2469
Neal.Kelly@fando.com

Project Name: Needham Crumb Rubber

Customer PO: 20081266.B50
EMSL Sales Rep: Jeromy Bish
Received: 10/10/2024 09:00
Reported: 12/12/2024 13:03

Work Order Case Narrative

Revised - MDL request change

EMSL Analytical, Inc.

200 Route 130, Cinnaminson, NJ, 08077
Telephone: 856-858-4800 Fax:856-786-5974
EMSL-CIN-01

EMSL Order ID: 012433101
LIMS Reference ID: AC33101
EMSL Customer ID: ENVI54

Attention: Neal Kelly
Fuss & O'Neill, Inc. [ENVI54]
108 Myrtle St
North Quincy, Massachusetts 02171
(860) 646-2469
Neal.Kelly@fando.com

Project Name: Needham Crumb Rubber

Customer PO: 20081266.B50
EMSL Sales Rep: Jeromy Bish
Received: 10/10/2024 09:00
Reported: 12/12/2024 13:03

Sample Results

Sample: 1643241002-03
AC33101-03 (Waste Water)

GCMS-VOA

Analyte	Result	Q	DF	MDL	RL	Units	Prepared Date/Time	Analyzed Date/Time	Prep/Analyst Initials	Prep Method	Analytical Method
No TICs found	0.0		1			µg/L	10/14/24 18:26	10/14/24 18:26	OPM/WRF	EPA 624.1	EPA 624.1
Acetone	ND		1	15		µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
Acrolein	ND	C	1	10		µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
Benzene	ND		1	1.0		µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
Bromobenzene	ND		1	1.0		µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
Bromodichloromethane	ND		1	1.0		µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
Bromoform	ND		1	1.0		µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
Bromomethane	ND		1	5.0		µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
2-Butanone	ND		1	2.0		µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
tert-Butyl Alcohol	ND		1	10		µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
Sec-butylbenzene	ND		1	1.0		µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
Tert-butylbenzene	ND		1	1.0		µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
N-butylbenzene	ND		1	1.0		µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
Carbon Disulfide	ND		1	1.0		µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
Carbon Tetrachloride	ND		1	1.0		µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
Chlorobenzene	ND		1	1.0		µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
Chloroethane	ND		1	5.0		µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
2-Chloroethyl Vinyl Ether	ND		1	2.0		µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
Chloroform	ND		1	1.0		µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
Chloromethane	ND		1	5.0		µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
2-Chlorotoluene	ND		1	1.0		µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
4-Chlorotoluene	ND		1	1.0		µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
1,2-Dibromo-3-chloropropane	ND		1	5.0		µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
Dibromochloromethane	ND		1	1.0		µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
1,2-Dibromoethane	ND		1	1.0		µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
Dibromomethane	ND		1	1.0		µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
Trans-1,4-dichloro-2-butene	ND		1	2.0		µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
1,3-Dichlorobenzene	ND		1	1.0		µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
1,4-Dichlorobenzene	ND		1	1.0		µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
1,2-Dichlorobenzene	ND		1	1.0		µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
Dichlorodifluoromethane	ND		1	5.0		µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
1,1-Dichloroethane	ND		1	1.0		µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
1,2-Dichloroethane	ND		1	1.0		µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
1,1-Dichloroethene	ND		1	1.0		µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
Trans-1,2-dichloroethene	ND		1	1.0		µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
Cis-1,2-dichloroethene	ND		1	1.0		µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
1,2-Dichloropropane	ND		1	1.0		µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
2,2-Dichloropropane	ND		1	1.0		µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
1,3-Dichloropropane	ND		1	1.0		µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
Cis-1,3-dichloropropene	ND		1	1.0		µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
Trans-1,3-dichloropropene	ND		1	1.0		µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
1,1-Dichloropropene	ND		1	1.0		µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
Ethylbenzene	ND		1	1.0		µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
Hexachlorobutadiene	ND		1	1.0		µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
2-Hexanone	ND		1	4.0		µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1

EMSL Analytical, Inc.

200 Route 130, Cinnaminson, NJ, 08077
Telephone: 856-858-4800 Fax:856-786-5974
EMSL-CIN-01

EMSL Order ID: 012433101
LIMS Reference ID: AC33101
EMSL Customer ID: ENVI54

Attention: Neal Kelly
Fuss & O'Neill, Inc. [ENVI54]
108 Myrtle St
North Quincy, Massachusetts 02171
(860) 646-2469
Neal.Kelly@fando.com

Project Name: Needham Crumb Rubber

Customer PO: 20081266.B50
EMSL Sales Rep: Jeromy Bish
Received: 10/10/2024 09:00
Reported: 12/12/2024 13:03

Sample Results
(Continued)

Sample: 1643241002-03 (Continued)
AC33101-03 (Waste Water)

Analyte	Result	Q	DF	RL	Units	Prepared Date/Time	Analyzed Date/Time	Prep/Analyst Initials	Prep Method	Analytical Method
GCMS-VOA (Continued)										
Isopropylbenzene	ND		1	1.0	µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
4-Isopropyltoluene	ND		1	1.0	µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
Methylene Chloride	ND		1	1.0	µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
4-Methyl-2-pentanone	ND		1	2.0	µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
Methyl-tert butyl ether	ND		1	1.0	µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
Naphthalene	ND		1	2.0	µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
N-propylbenzene	ND		1	1.0	µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
Styrene	ND		1	1.0	µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
1,1,2,2-Tetrachloroethane	ND		1	1.0	µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
1,1,1,2-Tetrachloroethane	ND		1	1.0	µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
Tetrachloroethene	ND		1	2.0	µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
Toluene	ND		1	1.0	µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
1,2,3-Trichlorobenzene	ND		1	2.0	µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
1,2,4-Trichlorobenzene	ND		1	1.0	µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
1,1,2-Trichloroethane	ND		1	1.0	µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
1,1,1-Trichloroethane	ND		1	1.0	µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
Trichloroethene	ND		1	1.0	µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
Trichlorofluoromethane	ND		1	5.0	µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
1,2,3-Trichloropropane	ND		1	4.0	µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		1	2.0	µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
1,2,4-Trimethylbenzene	ND		1	1.0	µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
1,3,5-Trimethylbenzene	ND		1	1.0	µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
Vinyl Acetate	ND		1	2.0	µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
Vinyl Chloride	ND		1	5.0	µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
o-xylene	ND		1	1.0	µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
m&p-xylenes	ND		1	2.0	µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1
Xylenes, Total	ND		1	1.0	µg/L	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	EPA 624.1

Surrogate(s)	Recovery	Q	Limits					
Surrogate: 4-Bromofluorobenzene	*102%*		*70-130*	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	*EPA 624.1*
Surrogate: Dibromofluoromethane	*115%*		*70-130*	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	*EPA 624.1*
Surrogate: 1,2-Dichloroethane-d4	*104%*		*70-130*	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	*EPA 624.1*
Surrogate: Toluene-d8	*101%*		*70-130*	10/14/24 18:26	10/14/24 18:26	WF/WRF	EPA 624.1	*EPA 624.1*

EMSL Analytical, Inc.

200 Route 130, Cinnaminson, NJ, 08077
Telephone: 856-858-4800 Fax:856-786-5974
EMSL-CIN-01

EMSL Order ID: 012433101
LIMS Reference ID: AC33101
EMSL Customer ID: ENVI54

Attention: Neal Kelly
Fuss & O'Neill, Inc. [ENVI54]
108 Myrtle St
North Quincy, Massachusetts 02171
(860) 646-2469
Neal.Kelly@fando.com

Project Name: Needham Crumb Rubber

Customer PO: 20081266.B50
EMSL Sales Rep: Jeromy Bish
Received: 10/10/2024 09:00
Reported: 12/12/2024 13:03

Quality Control

GCMS-VOA

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: BCJ1488 - EPA 624.1										
Blank (BCJ1488-BLK1)					Prepared & Analyzed: 10/14/2024					
Acetone	ND		15	µg/L						
Acrolein	ND		10	µg/L						
Benzene	ND		1.0	µg/L						
Bromobenzene	ND		1.0	µg/L						
Bromodichloromethane	ND		1.0	µg/L						
Bromoform	ND		1.0	µg/L						
Bromomethane	ND		5.0	µg/L						
2-Butanone	ND		2.0	µg/L						
tert-Butyl Alcohol	ND		10	µg/L						
Sec-butylbenzene	ND		1.0	µg/L						
Tert-butylbenzene	ND		1.0	µg/L						
N-butylbenzene	ND		1.0	µg/L						
Carbon Disulfide	ND		1.0	µg/L						
Carbon Tetrachloride	ND		1.0	µg/L						
Chlorobenzene	ND		1.0	µg/L						
Chloroethane	ND		5.0	µg/L						
2-Chloroethyl Vinyl Ether	ND		2.0	µg/L						
Chloroform	ND		1.0	µg/L						
Chloromethane	ND		5.0	µg/L						
2-Chlorotoluene	ND		1.0	µg/L						
4-Chlorotoluene	ND		1.0	µg/L						
1,2-Dibromo-3-chloropropane	ND		5.0	µg/L						
Dibromochloromethane	ND		1.0	µg/L						
1,2-Dibromoethane	ND		1.0	µg/L						
Dibromomethane	ND		1.0	µg/L						
Trans-1,4-dichloro-2-butene	ND		2.0	µg/L						
1,3-Dichlorobenzene	ND		1.0	µg/L						
1,4-Dichlorobenzene	ND		1.0	µg/L						
1,2-Dichlorobenzene	ND		1.0	µg/L						
Dichlorodifluoromethane	ND		5.0	µg/L						
1,1-Dichloroethane	ND		1.0	µg/L						
1,2-Dichloroethane	ND		1.0	µg/L						
1,1-Dichloroethene	ND		1.0	µg/L						
Trans-1,2-dichloroethene	ND		1.0	µg/L						
Cis-1,2-dichloroethene	ND		1.0	µg/L						
1,2-Dichloropropane	ND		1.0	µg/L						
2,2-Dichloropropane	ND		1.0	µg/L						
1,3-Dichloropropane	ND		1.0	µg/L						
Cis-1,3-dichloropropene	ND		1.0	µg/L						
Trans-1,3-dichloropropene	ND		1.0	µg/L						
1,1-Dichloropropene	ND		1.0	µg/L						
Ethylbenzene	ND		1.0	µg/L						

EMSL Analytical, Inc.

200 Route 130, Cinnaminson, NJ, 08077
Telephone: 856-858-4800 Fax:856-786-5974
EMSL-CIN-01

EMSL Order ID: 012433101
LIMS Reference ID: AC33101
EMSL Customer ID: ENVI54

Attention: Neal Kelly
Fuss & O'Neill, Inc. [ENVI54]
108 Myrtle St
North Quincy, Massachusetts 02171
(860) 646-2469
Neal.Kelly@fando.com

Project Name: Needham Crumb Rubber

Customer PO: 20081266.B50
EMSL Sales Rep: Jeromy Bish
Received: 10/10/2024 09:00
Reported: 12/12/2024 13:03

Quality Control
(Continued)

GCMS-VOA (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: BCJ1488 - EPA 624.1 (Continued)										
Blank (BCJ1488-BLK1)					Prepared & Analyzed: 10/14/2024					
Hexachlorobutadiene	ND		1.0	µg/L						
2-Hexanone	ND		4.0	µg/L						
Isopropylbenzene	ND		1.0	µg/L						
4-Isopropyltoluene	ND		1.0	µg/L						
Methylene Chloride	ND		1.0	µg/L						
4-Methyl-2-pentanone	ND		2.0	µg/L						
Methyl-tert butyl ether	ND		1.0	µg/L						
Naphthalene	ND		2.0	µg/L						
N-propylbenzene	ND		1.0	µg/L						
Styrene	ND		1.0	µg/L						
1,1,2,2-Tetrachloroethane	ND		1.0	µg/L						
1,1,1,2-Tetrachloroethane	ND		1.0	µg/L						
Tetrachloroethene	ND		2.0	µg/L						
Toluene	ND		1.0	µg/L						
1,2,3-Trichlorobenzene	ND		2.0	µg/L						
1,2,4-Trichlorobenzene	ND		1.0	µg/L						
1,1,2-Trichloroethane	ND		1.0	µg/L						
1,1,1-Trichloroethane	ND		1.0	µg/L						
Trichloroethene	ND		1.0	µg/L						
Trichlorofluoromethane	ND		5.0	µg/L						
1,2,3-Trichloropropane	ND		4.0	µg/L						
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		2.0	µg/L						
1,2,4-Trimethylbenzene	ND		1.0	µg/L						
1,3,5-Trimethylbenzene	ND		1.0	µg/L						
Vinyl Acetate	ND		2.0	µg/L						
Vinyl Chloride	ND		5.0	µg/L						
o-xylene	ND		1.0	µg/L						
m&p-xylenes	ND		2.0	µg/L						
Xylenes, Total	ND		1.0	µg/L						
Surrogate(s)										
Surrogate: 4-Bromofluorobenzene					*50.00*		*103*	*70-130*		
Surrogate: Dibromofluoromethane					*50.00*		*115*	*70-130*		
Surrogate: 1,2-Dichloroethane-d4					*50.00*		*104*	*70-130*		
Surrogate: Toluene-d8					*50.00*		*100*	*70-130*		

EMSL Analytical, Inc.

200 Route 130, Cinnaminson, NJ, 08077
Telephone: 856-858-4800 Fax:856-786-5974
EMSL-CIN-01

EMSL Order ID: 012433101
LIMS Reference ID: AC33101
EMSL Customer ID: ENVI54

Attention: Neal Kelly
Fuss & O'Neill, Inc. [ENVI54]
108 Myrtle St
North Quincy, Massachusetts 02171
(860) 646-2469
Neal.Kelly@fando.com

Project Name: Needham Crumb Rubber

Customer PO: 20081266.B50
EMSL Sales Rep: Jeromy Bish
Received: 10/10/2024 09:00
Reported: 12/12/2024 13:03

Quality Control
(Continued)

GCMS-VOA (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: BCJ1488 - EPA 624.1 (Continued)										
LCS (BCJ1488-BS1)					Prepared & Analyzed: 10/14/2024					
Acetone	69.4		15	µg/L	100.0		69	67-134		
Acrolein	181		10	µg/L	200.0		91	60-140		
Benzene	50.3		1.0	µg/L	50.00		101	65-135		
Bromobenzene	46.5		1.0	µg/L	50.00		93	87-121		
Bromodichloromethane	50.8		1.0	µg/L	50.00		102	65-135		
Bromoform	48.0		1.0	µg/L	50.00		96	70-130		
Bromomethane	51.4		5.0	µg/L	50.00		103	15-185		
2-Butanone	90.5		2.0	µg/L	100.0		91	72-129		
tert-Butyl Alcohol	139		10	µg/L	200.0		69	67-143		
Sec-butylbenzene	50.1		1.0	µg/L	50.00		100	86-121		
Tert-butylbenzene	50.0		1.0	µg/L	50.00		100	89-119		
N-butylbenzene	47.9		1.0	µg/L	50.00		96	76-130		
Carbon Disulfide	62.5		1.0	µg/L	50.00		125	82-228		
Carbon Tetrachloride	56.1		1.0	µg/L	50.00		112	70-130		
Chlorobenzene	45.9		1.0	µg/L	50.00		92	65-135		
Chloroethane	51.1		5.0	µg/L	50.00		102	40-160		
2-Chloroethyl Vinyl Ether	93.0		2.0	µg/L	100.0		93	0-225		
Chloroform	50.2		1.0	µg/L	50.00		100	70-135		
Chloromethane	53.1		5.0	µg/L	50.00		106	0-205		
2-Chlorotoluene	47.3		1.0	µg/L	50.00		95	89-116		
4-Chlorotoluene	45.8		1.0	µg/L	50.00		92	78-131		
1,2-Dibromo-3-chloropropane	43.2		5.0	µg/L	50.00		86	56-142		
Dibromochloromethane	52.8		1.0	µg/L	50.00		106	70-135		
1,2-Dibromoethane	48.4		1.0	µg/L	50.00		97	88-121		
Dibromomethane	46.7		1.0	µg/L	50.00		93	85-125		
Trans-1,4-dichloro-2-butene	91.2		2.0	µg/L	100.0		91	10-161		
1,3-Dichlorobenzene	47.8		1.0	µg/L	50.00		96	70-130		
1,4-Dichlorobenzene	46.1		1.0	µg/L	50.00		92	65-135		
1,2-Dichlorobenzene	43.8		1.0	µg/L	50.00		88	65-135		
Dichlorodifluoromethane	65.2	R4	5.0	µg/L	50.00		130	37-119		
1,1-Dichloroethane	50.6		1.0	µg/L	50.00		101	70-130		
1,2-Dichloroethane	46.6		1.0	µg/L	50.00		93	70-130		
1,1-Dichloroethene	54.8		1.0	µg/L	50.00		110	50-150		
Trans-1,2-dichloroethene	52.4		1.0	µg/L	50.00		105	70-130		
Cis-1,2-dichloroethene	50.9		1.0	µg/L	50.00		102	88-142		
1,2-Dichloropropane	49.9		1.0	µg/L	50.00		100	35-165		
2,2-Dichloropropane	60.8		1.0	µg/L	50.00		122	75-134		
1,3-Dichloropropane	48.4		1.0	µg/L	50.00		97	85-116		
Cis-1,3-dichloropropene	55.7		1.0	µg/L	50.00		111	25-175		
Trans-1,3-dichloropropene	56.3		1.0	µg/L	50.00		113	50-150		
1,1-Dichloropropene	52.0		1.0	µg/L	50.00		104	88-116		
Ethylbenzene	47.7		1.0	µg/L	50.00		95	60-140		

EMSL Analytical, Inc.

200 Route 130, Cinnaminson, NJ, 08077
Telephone: 856-858-4800 Fax:856-786-5974
EMSL-CIN-01

EMSL Order ID: 012433101
LIMS Reference ID: AC33101
EMSL Customer ID: ENVI54

Attention: Neal Kelly
Fuss & O'Neill, Inc. [ENVI54]
108 Myrtle St
North Quincy, Massachusetts 02171
(860) 646-2469
Neal.Kelly@fando.com

Project Name: Needham Crumb Rubber

Customer PO: 20081266.B50
EMSL Sales Rep: Jeromy Bish
Received: 10/10/2024 09:00
Reported: 12/12/2024 13:03

Quality Control
(Continued)

GCMS-VOA (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: BCJ1488 - EPA 624.1 (Continued)										
LCS (BCJ1488-BS1)					Prepared & Analyzed: 10/14/2024					
Hexachlorobutadiene	48.0		1.0	µg/L	50.00		96	76-114		
2-Hexanone	96.8		4.0	µg/L	100.0		97	72-131		
Isopropylbenzene	49.6		1.0	µg/L	50.00		99	89-136		
4-Isopropyltoluene	51.0		1.0	µg/L	50.00		102	85-125		
Methylene Chloride	49.3		1.0	µg/L	50.00		99	60-140		
4-Methyl-2-pentanone	97.5		2.0	µg/L	100.0		98	72-126		
Methyl-tert butyl ether	51.9		1.0	µg/L	50.00		104	79-120		
Naphthalene	48.6		2.0	µg/L	50.00		97	73-133		
N-propylbenzene	48.8		1.0	µg/L	50.00		98	77-131		
Styrene	48.3		1.0	µg/L	50.00		97	90-122		
1,1,2,2-Tetrachloroethane	43.0		1.0	µg/L	50.00		86	60-140		
1,1,1,2-Tetrachloroethane	49.7		1.0	µg/L	50.00		99	89-118		
Tetrachloroethene	50.8		2.0	µg/L	50.00		102	70-130		
Toluene	49.7		1.0	µg/L	50.00		99	70-130		
1,2,3-Trichlorobenzene	47.8		2.0	µg/L	50.00		96	79-128		
1,2,4-Trichlorobenzene	49.7		1.0	µg/L	50.00		99	70-130		
1,1,2-Trichloroethane	46.7		1.0	µg/L	50.00		93	70-130		
1,1,1-Trichloroethane	54.3		1.0	µg/L	50.00		109	70-130		
Trichloroethene	49.7		1.0	µg/L	50.00		99	65-135		
Trichlorofluoromethane	55.0		5.0	µg/L	50.00		110	50-150		
1,2,3-Trichloropropane	42.9		4.0	µg/L	50.00		86	70-130		
1,1,2-Trichloro-1,2,2-trifluoroethane	54.0		2.0	µg/L	50.00		108	70-130		
1,2,4-Trimethylbenzene	48.8		1.0	µg/L	50.00		98	86-122		
1,3,5-Trimethylbenzene	49.2		1.0	µg/L	50.00		98	88-121		
Vinyl Acetate	49.4		2.0	µg/L	50.00		99	70-130		
Vinyl Chloride	56.5		5.0	µg/L	50.00		113	5-195		
o-xylene	48.3		1.0	µg/L	50.00		97	89-118		
m&p-xylenes	95.6		2.0	µg/L	100.0		96	70-130		
Xylenes, Total	144		1.0	µg/L	150.0		96	70-130		
Surrogate(s)										
Surrogate: 4-Bromofluorobenzene					*50.00*		*105*	*70-130*		
Surrogate: Dibromofluoromethane					*50.00*		*114*	*70-130*		
Surrogate: 1,2-Dichloroethane-d4					*50.00*		*103*	*70-130*		
Surrogate: Toluene-d8					*50.00*		*102*	*70-130*		

EMSL Analytical, Inc.

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Telephone: 856-858-4800 Fax:856-786-5974
EMSL-CIN-01

EMSL Order ID: 012433101
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EMSL Customer ID: ENVI54

Attention: Neal Kelly
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108 Myrtle St
North Quincy, Massachusetts 02171
(860) 646-2469
Neal.Kelly@fando.com

Project Name: Needham Crumb Rubber

Customer PO: 20081266.B50
EMSL Sales Rep: Jeromy Bish
Received: 10/10/2024 09:00
Reported: 12/12/2024 13:03

Quality Control
(Continued)

GCMS-VOA (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: BCJ1488 - EPA 624.1 (Continued)										
Matrix Spike (BCJ1488-MS1)	**Source: AC32432-01**				Prepared & Analyzed: 10/14/2024					
Acetone	128		15	µg/L	100.0	54.5	73	56-168		
Acrolein	230		10	µg/L	200.0	ND	115	40-160		
Benzene	50.7		1.0	µg/L	50.00	ND	101	37-151		
Bromobenzene	46.2		1.0	µg/L	50.00	ND	92	85-114		
Bromodichloromethane	50.9		1.0	µg/L	50.00	ND	102	35-155		
Bromoform	46.8		1.0	µg/L	50.00	ND	94	45-169		
Bromomethane	51.1		5.0	µg/L	50.00	ND	102	10-242		
2-Butanone	93.9		2.0	µg/L	100.0	ND	94	60-155		
tert-Butyl Alcohol	166		10	µg/L	200.0	ND	83	57-181		
Sec-butylbenzene	49.7		1.0	µg/L	50.00	ND	99	84-113		
Tert-butylbenzene	49.6		1.0	µg/L	50.00	ND	99	85-114		
N-butylbenzene	46.8		1.0	µg/L	50.00	ND	94	79-117		
Carbon Disulfide	61.9	R4	1.0	µg/L	50.00	ND	124	72-122		
Carbon Tetrachloride	56.0		1.0	µg/L	50.00	ND	112	70-140		
Chlorobenzene	45.4		1.0	µg/L	50.00	ND	91	37-160		
Chloroethane	52.9		5.0	µg/L	50.00	ND	106	14-230		
2-Chloroethyl Vinyl Ether	ND		2.0	µg/L	100.0	ND		0-305		
Chloroform	49.3		1.0	µg/L	50.00	ND	99	51-138		
Chloromethane	55.9		5.0	µg/L	50.00	ND	112	0-273		
2-Chlorotoluene	47.5		1.0	µg/L	50.00	ND	95	82-112		
4-Chlorotoluene	46.2		1.0	µg/L	50.00	ND	92	78-114		
1,2-Dibromo-3-chloropropane	43.8		5.0	µg/L	50.00	ND	88	57-166		
Dibromochloromethane	52.8		1.0	µg/L	50.00	ND	106	53-149		
1,2-Dibromoethane	48.3		1.0	µg/L	50.00	ND	97	86-125		
Dibromomethane	47.7		1.0	µg/L	50.00	ND	95	76-136		
Trans-1,4-dichloro-2-butene	89.7		2.0	µg/L	100.0	ND	90	74-136		
1,3-Dichlorobenzene	47.3		1.0	µg/L	50.00	ND	95	59-156		
1,4-Dichlorobenzene	46.1		1.0	µg/L	50.00	ND	92	18-190		
1,2-Dichlorobenzene	43.4		1.0	µg/L	50.00	ND	87	18-190		
Dichlorodifluoromethane	68.1		5.0	µg/L	50.00	ND	136	65-145		
1,1-Dichloroethane	51.2		1.0	µg/L	50.00	ND	102	59-155		
1,2-Dichloroethane	48.1		1.0	µg/L	50.00	ND	96	49-155		
1,1-Dichloroethene	54.5		1.0	µg/L	50.00	ND	109	0-234		
Trans-1,2-dichloroethene	52.1		1.0	µg/L	50.00	ND	104	54-156		
Cis-1,2-dichloroethene	50.8		1.0	µg/L	50.00	ND	102	91-116		
1,2-Dichloropropane	49.6		1.0	µg/L	50.00	ND	99	0-210		
2,2-Dichloropropane	54.2		1.0	µg/L	50.00	ND	108	73-126		
1,3-Dichloropropane	48.6		1.0	µg/L	50.00	ND	97	85-121		
Cis-1,3-dichloropropene	52.9		1.0	µg/L	50.00	ND	106	0-227		
Trans-1,3-dichloropropene	53.8		1.0	µg/L	50.00	ND	108	17-183		
1,1-Dichloropropene	53.2		1.0	µg/L	50.00	ND	106	85-112		
Ethylbenzene	47.6		1.0	µg/L	50.00	ND	95	37-162		

EMSL Analytical, Inc.

200 Route 130, Cinnaminson, NJ, 08077
Telephone: 856-858-4800 Fax:856-786-5974
EMSL-CIN-01

EMSL Order ID: 012433101
LIMS Reference ID: AC33101
EMSL Customer ID: ENVI54

Attention: Neal Kelly
Fuss & O'Neill, Inc. [ENVI54]
108 Myrtle St
North Quincy, Massachusetts 02171
(860) 646-2469
Neal.Kelly@fando.com

Project Name: Needham Crumb Rubber

Customer PO: 20081266.B50
EMSL Sales Rep: Jeromy Bish
Received: 10/10/2024 09:00
Reported: 12/12/2024 13:03

Quality Control
(Continued)

GCMS-VOA (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: BCJ1488 - EPA 624.1 (Continued)										
Matrix Spike (BCJ1488-MS1)	**Source: AC32432-01**				Prepared & Analyzed: 10/14/2024					
Hexachlorobutadiene	43.8		1.0	µg/L	50.00	ND	88	78-118		
2-Hexanone	102		4.0	µg/L	100.0	ND	102	31-155		
Isopropylbenzene	49.2		1.0	µg/L	50.00	ND	98	78-114		
4-Isopropyltoluene	50.5		1.0	µg/L	50.00	ND	101	81-112		
Methylene Chloride	49.6		1.0	µg/L	50.00	ND	99	10-221		
4-Methyl-2-pentanone	104		2.0	µg/L	100.0	ND	104	78-138		
Methyl-tert butyl ether	50.3		1.0	µg/L		ND		84-127		
Naphthalene	51.1		2.0	µg/L	50.00	ND	102	40-140		
N-propylbenzene	49.0		1.0	µg/L	50.00	ND	98	74-123		
Styrene	47.4		1.0	µg/L	50.00	ND	95	87-112		
1,1,2,2-Tetrachloroethane	43.7		1.0	µg/L	50.00	ND	87	46-157		
1,1,1,2-Tetrachloroethane	49.0		1.0	µg/L	50.00	ND	98	81-125		
Tetrachloroethene	50.9		2.0	µg/L	50.00	ND	102	64-148		
Toluene	50.6		1.0	µg/L	50.00	ND	101	47-150		
1,2,3-Trichlorobenzene	49.5		2.0	µg/L	50.00	ND	99	80-118		
1,2,4-Trichlorobenzene	49.0		1.0	µg/L	50.00	ND	98	70-130		
1,1,2-Trichloroethane	47.2		1.0	µg/L	50.00	ND	94	52-150		
1,1,1-Trichloroethane	54.6		1.0	µg/L	50.00	ND	109	52-162		
Trichloroethene	49.8		1.0	µg/L	50.00	ND	100	70-157		
Trichlorofluoromethane	58.0		5.0	µg/L	50.00	ND	116	17-181		
1,2,3-Trichloropropane	43.7		4.0	µg/L	50.00	ND	87	70-130		
1,1,2-Trichloro-1,2,2-trifluoroethane	55.6		2.0	µg/L	50.00	ND	111	70-130		
1,2,4-Trimethylbenzene	53.5		1.0	µg/L	50.00	4.03	99	67-129		
1,3,5-Trimethylbenzene	50.2		1.0	µg/L	50.00	1.20	98	79-115		
Vinyl Acetate	48.5		2.0	µg/L	50.00	ND	97	70-130		
Vinyl Chloride	58.0		5.0	µg/L	50.00	ND	116	0-251		
o-xylene	49.3		1.0	µg/L	50.00	1.13	96	85-112		
m&p-xylenes	94.4		2.0	µg/L	100.0	ND	94	70-130		
Xylenes, Total	144		1.0	µg/L		1.13		70-130		
Surrogate(s)										
Surrogate: 4-Bromofluorobenzene					*50.00*		*104*	*70-130*		
Surrogate: Dibromofluoromethane					*50.00*		*114*	*70-130*		
Surrogate: 1,2-Dichloroethane-d4					*50.00*		*105*	*70-130*		
Surrogate: Toluene-d8					*50.00*		*106*	*70-130*		

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LIMS Reference ID: AC33101
EMSL Customer ID: ENVI54

Attention: Neal Kelly
Fuss & O'Neill, Inc. [ENVI54]
108 Myrtle St
North Quincy, Massachusetts 02171
(860) 646-2469
Neal.Kelly@fando.com

Project Name: Needham Crumb Rubber

Customer PO: 20081266.B50
EMSL Sales Rep: Jeromy Bish
Received: 10/10/2024 09:00
Reported: 12/12/2024 13:03

Quality Control
(Continued)

GCMS-VOA (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: BCJ1488 - EPA 624.1 (Continued)										
Matrix Spike Dup (BCJ1488-MSD1)	**Source: AC32432-01**				Prepared & Analyzed: 10/14/2024					
Acetone	152		15	µg/L	100.0	54.5	98	56-168	18	24
Acrolein	267		10	µg/L	200.0	ND	134	40-160	15	60
Benzene	53.1		1.0	µg/L	50.00	ND	106	37-151	5	61
Bromobenzene	47.9		1.0	µg/L	50.00	ND	96	85-114	4	7
Bromodichloromethane	52.2		1.0	µg/L	50.00	ND	104	35-155	3	56
Bromoform	50.6		1.0	µg/L	50.00	ND	101	45-169	8	42
Bromomethane	54.4		5.0	µg/L	50.00	ND	109	10-242	6	61
2-Butanone	109		2.0	µg/L	100.0	ND	109	60-155	15	20
tert-Butyl Alcohol	248	R4	10	µg/L	200.0	ND	124	57-181	40	21
Sec-butylbenzene	52.4		1.0	µg/L	50.00	ND	105	84-113	5	11
Tert-butylbenzene	51.9		1.0	µg/L	50.00	ND	104	85-114	4	10
N-butylbenzene	51.0		1.0	µg/L	50.00	ND	102	79-117	9	12
Carbon Disulfide	67.2	R4	1.0	µg/L	50.00	ND	134	72-122	8	17
Carbon Tetrachloride	59.3		1.0	µg/L	50.00	ND	119	70-140	6	41
Chlorobenzene	47.7		1.0	µg/L	50.00	ND	95	37-160	5	53
Chloroethane	54.8		5.0	µg/L	50.00	ND	110	14-230	3	78
2-Chloroethyl Vinyl Ether	ND		2.0	µg/L	100.0	ND		0-305		71
Chloroform	50.8		1.0	µg/L	50.00	ND	102	51-138	3	54
Chloromethane	60.1		5.0	µg/L	50.00	ND	120	0-273	7	60
2-Chlorotoluene	49.4		1.0	µg/L	50.00	ND	99	82-112	4	10
4-Chlorotoluene	48.5		1.0	µg/L	50.00	ND	97	78-114	5	11
1,2-Dibromo-3-chloropropane	52.0		5.0	µg/L	50.00	ND	104	57-166	17	19
Dibromochloromethane	55.9		1.0	µg/L	50.00	ND	112	53-149	6	50
1,2-Dibromoethane	51.5		1.0	µg/L	50.00	ND	103	86-125	6	13
Dibromomethane	50.1		1.0	µg/L	50.00	ND	100	76-136	5	15
Trans-1,4-dichloro-2-butene	100		2.0	µg/L	100.0	ND	100	74-136	11	15
1,3-Dichlorobenzene	49.7		1.0	µg/L	50.00	ND	99	59-156	5	43
1,4-Dichlorobenzene	48.5		1.0	µg/L	50.00	ND	97	18-190	5	57
1,2-Dichlorobenzene	47.3		1.0	µg/L	50.00	ND	95	18-190	9	57
Dichlorodifluoromethane	72.5		5.0	µg/L	50.00	ND	145	65-145	6	15
1,1-Dichloroethane	53.2		1.0	µg/L	50.00	ND	106	59-155	4	40
1,2-Dichloroethane	49.3		1.0	µg/L	50.00	ND	99	49-155	2	49
1,1-Dichloroethene	58.6		1.0	µg/L	50.00	ND	117	0-234	7	32
Trans-1,2-dichloroethene	55.5		1.0	µg/L	50.00	ND	111	54-156	6	45
Cis-1,2-dichloroethene	52.9		1.0	µg/L	50.00	ND	106	91-116	4	9
1,2-Dichloropropane	52.5		1.0	µg/L	50.00	ND	105	0-210	6	55
2,2-Dichloropropane	59.4		1.0	µg/L	50.00	ND	119	73-126	9	12
1,3-Dichloropropane	51.5		1.0	µg/L	50.00	ND	103	85-121	6	13
Cis-1,3-dichloropropene	56.1		1.0	µg/L	50.00	ND	112	0-227	6	58
Trans-1,3-dichloropropene	58.1		1.0	µg/L	50.00	ND	116	17-183	8	86
1,1-Dichloropropene	55.8		1.0	µg/L	50.00	ND	112	85-112	5	8
Ethylbenzene	50.2		1.0	µg/L	50.00	ND	100	37-162	5	63

EMSL Analytical, Inc.

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EMSL-CIN-01

EMSL Order ID: 012433101
LIMS Reference ID: AC33101
EMSL Customer ID: ENVI54

Attention: Neal Kelly
Fuss & O'Neill, Inc. [ENVI54]
108 Myrtle St
North Quincy, Massachusetts 02171
(860) 646-2469
Neal.Kelly@fando.com

Project Name: Needham Crumb Rubber

Customer PO: 20081266.B50
EMSL Sales Rep: Jeromy Bish
Received: 10/10/2024 09:00
Reported: 12/12/2024 13:03

Quality Control
(Continued)

GCMS-VOA (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: BCJ1488 - EPA 624.1 (Continued)										
Matrix Spike Dup (BCJ1488-MSD1)	**Source: AC32432-01**				Prepared & Analyzed: 10/14/2024					
Hexachlorobutadiene	50.9		1.0	µg/L	50.00	ND	102	78-118	15	17
2-Hexanone	115		4.0	µg/L	100.0	ND	115	31-155	12	19
Isopropylbenzene	51.8		1.0	µg/L	50.00	ND	104	78-114	5	10
4-Isopropyltoluene	52.6		1.0	µg/L	50.00	ND	105	81-112	4	12
Methylene Chloride	51.6		1.0	µg/L	50.00	ND	103	10-221	4	28
4-Methyl-2-pentanone	116		2.0	µg/L	100.0	ND	116	78-138	10	16
Methyl-tert butyl ether	55.1		1.0	µg/L		ND		84-127	9	13
Naphthalene	63.3		2.0	µg/L	50.00	ND	127	40-140	21	25
N-propylbenzene	51.4		1.0	µg/L	50.00	ND	103	74-123	5	11
Styrene	49.4		1.0	µg/L	50.00	ND	99	87-112	4	9
1,1,2,2-Tetrachloroethane	47.4		1.0	µg/L	50.00	ND	95	46-157	8	61
1,1,1,2-Tetrachloroethane	51.2		1.0	µg/L	50.00	ND	102	81-125	4	11
Tetrachloroethene	54.5		2.0	µg/L	50.00	ND	109	64-148	7	39
Toluene	53.4		1.0	µg/L	50.00	ND	107	47-150	5	41
1,2,3-Trichlorobenzene	60.5	R4	2.0	µg/L	50.00	ND	121	80-118	20	11
1,2,4-Trichlorobenzene	56.3		1.0	µg/L	50.00	ND	113	70-130	14	25
1,1,2-Trichloroethane	49.8		1.0	µg/L	50.00	ND	100	52-150	5	45
1,1,1-Trichloroethane	57.2		1.0	µg/L	50.00	ND	114	52-162	5	36
Trichloroethene	52.4		1.0	µg/L	50.00	ND	105	70-157	5	48
Trichlorofluoromethane	59.7		5.0	µg/L	50.00	ND	119	17-181	3	84
1,2,3-Trichloropropane	47.6		4.0	µg/L	50.00	ND	95	70-130	9	11
1,1,2-Trichloro-1,2,2-trifluoroethane	58.4		2.0	µg/L	50.00	ND	117	70-130	5	25
1,2,4-Trimethylbenzene	55.6		1.0	µg/L	50.00	4.03	103	67-129	4	13
1,3,5-Trimethylbenzene	52.6		1.0	µg/L	50.00	1.20	103	79-115	5	10
Vinyl Acetate	54.5		2.0	µg/L	50.00	ND	109	70-130	12	25
Vinyl Chloride	62.7		5.0	µg/L	50.00	ND	125	0-251	8	66
o-xylene	51.6		1.0	µg/L	50.00	1.13	101	85-112	4	7
m&p-xylenes	99.7		2.0	µg/L	100.0	ND	100	70-130	5	25
Xylenes, Total	151		1.0	µg/L		1.13		70-130	5	25
Surrogate(s)										
Surrogate: 4-Bromofluorobenzene					*50.00*		*100*	*70-130*		
Surrogate: Dibromofluoromethane					*50.00*		*111*	*70-130*		
Surrogate: 1,2-Dichloroethane-d4					*50.00*		*99*	*70-130*		
Surrogate: Toluene-d8					*50.00*		*106*	*70-130*		

EMSL Analytical, Inc.

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Neal.Kelly@fando.com

Project Name: Needham Crumb Rubber

Customer PO: 20081266.B50
EMSL Sales Rep: Jeromy Bish
Received: 10/10/2024 09:00
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Certified Analyses included in this Report

Analyte	CAS #	Certifications
EPA 624.1 in Waste Water		
Acetone	67-64-1	NJDEP,PADEP
Acrolein	107-02-8	NJDEP,PADEP
Benzene	71-43-2	NJDEP,PADEP
Bromobenzene	108-86-1	NJDEP,PADEP
Bromodichloromethane	75-27-4	NJDEP,PADEP
Bromoform	75-25-2	NJDEP,PADEP
Bromomethane	74-83-9	NJDEP,PADEP
2-Butanone	78-93-3	NJDEP,PADEP
tert-Butyl Alcohol	75-65-0	NJDEP,PADEP
Sec-butylbenzene	135-98-8	NJDEP,PADEP
Tert-butylbenzene	98-06-6	NJDEP,PADEP
N-butylbenzene	104-51-8	NJDEP,PADEP
Carbon Disulfide	75-15-0	NJDEP,PADEP
Carbon Tetrachloride	56-23-5	NJDEP,PADEP
Chlorobenzene	108-90-7	NJDEP,PADEP
Chloroethane	75-00-3	NJDEP,PADEP
2-Chloroethyl Vinyl Ether	110-75-8	NJDEP,PADEP
Chloroform	67-66-3	NJDEP,PADEP
Chloromethane	74-87-3	NJDEP,PADEP
2-Chlorotoluene	95-49-8	NJDEP,PADEP
4-Chlorotoluene	106-43-4	NJDEP,PADEP
1,2-Dibromo-3-chloropropane	96-12-8	NJDEP,PADEP
Dibromochloromethane	124-48-1	NJDEP,PADEP
1,2-Dibromoethane	106-93-4	NJDEP,PADEP
Dibromomethane	74-95-3	NJDEP,PADEP
Trans-1,4-dichloro-2-butene	110-57-6	NJDEP,PADEP
1,3-Dichlorobenzene	541-73-1	NJDEP,PADEP
1,4-Dichlorobenzene	106-46-7	NJDEP,PADEP
1,2-Dichlorobenzene	95-50-1	NJDEP,PADEP
Dichlorodifluoromethane	75-71-8	NJDEP,PADEP
1,1-Dichloroethane	75-34-3	NJDEP,PADEP
1,2-Dichloroethane	107-06-2	NJDEP,PADEP
1,1-Dichloroethene	75-35-4	NJDEP,PADEP
Trans-1,2-dichloroethene	156-60-5	NJDEP,PADEP
Cis-1,2-dichloroethene	156-59-2	NJDEP,PADEP
1,2-Dichloropropane	78-87-5	NJDEP,PADEP
2,2-Dichloropropane	594-20-7	NJDEP,PADEP
1,3-Dichloropropane	142-28-9	NJDEP,PADEP
Cis-1,3-dichloropropene	10061-01-5	NJDEP,PADEP

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Received: 10/10/2024 09:00
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Certified Analyses included in this Report
(Continued)

Analyte	CAS #	Certifications
EPA 624.1 in Waste Water (Continued)		
Trans-1,3-dichloropropene	10061-02-6	NJDEP,PADEP
1,1-Dichloropropene	563-58-6	NJDEP,PADEP
Ethylbenzene	100-41-4	NJDEP,PADEP
Hexachlorobutadiene	87-68-3	NJDEP,PADEP
2-Hexanone	591-78-6	NJDEP,PADEP
Isopropylbenzene	98-82-8	NJDEP,PADEP
4-Isopropyltoluene	99-87-6	NJDEP,PADEP
Methylene Chloride	75-09-2	NJDEP,PADEP
4-Methyl-2-pentanone	108-10-1	NJDEP,PADEP
Methyl-tert butyl ether	1634-04-4	NJDEP,PADEP
Naphthalene	91-20-3	NJDEP,PADEP
N-propylbenzene	103-65-1	NJDEP,PADEP
Styrene	100-42-5	NJDEP,PADEP
1,1,2,2-Tetrachloroethane	79-34-5	NJDEP,PADEP
1,1,1,2-Tetrachloroethane	630-20-6	NJDEP,PADEP
Tetrachloroethene	127-18-4	NJDEP,PADEP
Toluene	108-88-3	NJDEP,PADEP
1,2,3-Trichlorobenzene	87-61-6	NJDEP,PADEP
1,2,4-Trichlorobenzene	120-82-1	NJDEP,PADEP
1,1,2-Trichloroethane	79-00-5	NJDEP,PADEP
1,1,1-Trichloroethane	71-55-6	NJDEP,PADEP
Trichloroethene	79-01-6	NJDEP,PADEP
Trichlorofluoromethane	75-69-4	NJDEP,PADEP
1,2,3-Trichloropropane	96-18-4	NJDEP,PADEP
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	NJDEP,PADEP
1,2,4-Trimethylbenzene	95-63-6	NJDEP,PADEP
1,3,5-Trimethylbenzene	108-67-8	NJDEP,PADEP
Vinyl Acetate	108-05-4	NJDEP,PADEP
Vinyl Chloride	75-01-4	NJDEP,PADEP
o-xylene	95-47-6	NJDEP,PADEP
m&p-xylenes	179601-23-1	NJDEP,PADEP
Xylenes, Total	1330-20-7	NJDEP,PADEP

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List of Certifications

Code	Description	Number	Expires
PADEP	Pennsylvania Department of Environmental Protection	68-00367	11/30/2025
NYSDOH	New York State Department of Health	10872	04/01/2025
NJDEP	New Jersey Department of Environmental Protection	03036	06/30/2025
MADEP	Massachusetts Department of Environmental Protection	M-NJ337	06/30/2025
CTDPH	Connecticut Department of Public Health	PH-0270	06/23/2026
California ELAP	California Water Boards	1877	06/30/2025
AIHA LAP	EMSL Analytical, Inc. Cinnaminson, NJ AIHA-LAP, LLC-ELLAP Accredited	100194	01/01/2025
A2LA	A2LA Environmental Certificate	2845.01	07/31/2026

Please see the specific Field of Testing (FOT) on www.emsl.com <http://www.emsl.com> for a complete listing of parameters for which EMSL is certified.

EMSL Analytical, Inc.

200 Route 130, Cinnaminson, NJ, 08077
Telephone: 856-858-4800 Fax:856-786-5974
EMSL-CIN-01

EMSL Order ID: 012433101
LIMS Reference ID: AC33101
EMSL Customer ID: ENVI54

Attention: Neal Kelly
Fuss & O'Neill, Inc. [ENVI54]
108 Myrtle St
North Quincy, Massachusetts 02171
(860) 646-2469
Neal.Kelly@fando.com

Project Name: Needham Crumb Rubber

Customer PO: 20081266.B50
EMSL Sales Rep: Jeromy Bish
Received: 10/10/2024 09:00
Reported: 12/12/2024 13:03

Notes and Definitions

Item	Definition
C	The sample was preserved to a PH of less than 2. Acrolein requires an unpreserved aliquot. Results for Acrolein may be biased.
R4	High percent recovery and no associated postive found in the batch.
(Dig)	For metals analysis, sample was digested.
[2C]	Reported from the second channel in dual column analysis.
DF	Dilution Factor
MDL	Method Detection Limit.
ND	Analyte was NOT DETECTED at or above the detection limit.
NR	Spike/Surrogate showed no recovery.
Q	Qualifier
RL	Reporting Limit
Wet	Sample is not dry weight corrected.
%REC	Percent Recovery
RPD	Relative Percent Difference
Source	Sample that was matrix spiked or duplicated

Measurement of uncertainty and any applicable definitions of method modifications are available upon request. Per EPA NLLAP policy, sample results are not blank corrected.

AC33101

FUSS & O'NEILL ~~ENVIROSCIENCE, LLC~~
Disciplines to Deliver
(860) 646-2469 • www.FandO.com

- ☐ 146 Hartford Road, Manchester, CT 06040
- ☐ 56 Quarry Road, Trumbull, CT 06611
- ☐ 1419 Richland Street, Columbia, SC 29201
- ☐ 78 Interstate Drive, West Springfield, MA 01089
- ☑ 108 Myrtle Street, #502, North Quincy, MA 02171
- ☐ 317 Iron Horse Way, Suite 204, Providence, RI 02908
- ☐ 80 Washington Street, Suite 301, Poughkeepsie, NY 12601

CHAIN-OF-CUSTODY RECORD 4517

Turnaround
☐ 1 Day* ☐ 3 Days* ☐ Other _____ (days)
☐ 2 Days* ☒ Standard (____ days) *Surcharge Applies

PROJECT NAME	PROJECT LOCATION	PROJECT NUMBER	LABORATORY
Needham Crumb Rubber	Needham MA	2ae1266.B50	EMSL (NJ)

REPORT TO: Neal Kelly Neal.Kelly@fando.com
INVOICE TO:
P.O. NO.:
Sampler's Signature: Date: 10/2/24

Source Codes:
MW=Monitoring Well PW=Potable Water S=Soil W=Waste
SW=Surface Water T=Treatment Facility B=Sediment A=Air
X=Other AQ = Aqueous CR: Crumb Rubber

Analysis Request / Containers

Item No.	Transfer Check 1 2 3 4	Sample Number	Source Code	Date Sampled	Time Sampled	Full VOC list and TICs	8270 TO-15 Full SVOC list by Methods (arsenic, cadmium, chromium, lead, iron, manganese, mercury, selenium & zinc) by 6010/7470	Soil VOA Vial, [ ] methanol	Soil VOA Vial, [ ] water	Glass Soil Container [ ] $Na(SO_4)_2$	Glass Soil Container ( ) oz	Other:	Water VOA Vial, [ ] As is [ ] HCl	Glass Amber ( ) ml, [ ] As is	Plastic - As is, [ ] 250 ml [ ] H_2SO_4	Plastic - H_2SO_4, [ ] 250 ml [ ] 500 [ ] 1000 ml	Plastic - HNO_3, 250 ml [ ] 500 ml	Plastic - NaOH, 250 ml [ ] Filtered [ ] Unfiltered	Comments
1		643241002-01	CR	10/2/24	1121	X	X	X						3						Founders
2		643241002-02	CR	10/2/24	1147	↓	X	X						3		3				~~Brook~~ Brook
3		643241002-03	AQ	10/2/24	1200		~~X~~	~~X~~						~~3~~		3				~~Memorial~~ Brook only VOCs
4		643241002-04	CR	10/2/24	1220		X	X						3						Memorial

Transfer Number	Relinquished By	Accepted By	Date	Time
1	Chris Juran	FX	10/7/24	1140
2			10/07/24	11:40am
3				
4				

Reporting and Detection Limit Requirements: MCP CAM Cert.
Additional Comments:

Main Site: 301 Fulling Mill Road | Middletown, PA 17057 | Phone: 717-944-5541 | www.alsglobal.com
Associated Site: 20 Riverside Drive | Spring City, PA 19475 | Phone: 610-948-4903 |

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343, NJ PA101

Analytical Results Report For **EMSL Inc.**

Project AC33101
Workorder 3382844
Report ID 373722 on 12/12/2024 (Revised report. See Project Notations Section.)

Certificate of Analysis

Enclosed are the analytical results for samples received by the laboratory on Oct 11, 2024.

The ALS Environmental laboratory in Middletown, Pennsylvania is a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory and as such, certifies that all applicable test results meet the requirements of NELAP.

If you have any questions regarding this certificate of analysis, please contact Kaleb Brown (Project Coordinator) at (717) 944-5541.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications section of the ALS website at www.alsglobal.com/en/Our-Services/Life-Sciences/Environmental/Downloads.

ALS Middletown: 301 Fulling Mill Road, Middletown, PA 17057 : 717-944-5541.

Recipient(s):
Reports - EMSL Inc.
Travis Albert - EMSL Analytical Inc.

Kaleb Brown

Kaleb Brown *(ALS Digital Signature)*
Project Coordinator

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.

Sample Summary

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collector	Collection Company
3382844001	AC33101-01	Oil/Other	10/02/2024 11:21	10/11/2024 09:24	CBC	Collected By Client
3382844002	AC33101-02	Oil/Other	10/02/2024 11:47	10/11/2024 09:24	CBC	Collected By Client
3382844003	AC33101-04	Oil/Other	10/02/2024 00:20	10/11/2024 09:24	CBC	Collected By Client

Reference

Notes

- Samples collected by ALS personnel are done so in accordance with the procedures set forth in the ALS Field Sampling Plan (20 - Field Services Sampling Plan).
- Except as qualified, Clean Water Act sample analyses are consistent with methodology requirements in 40 CFR Part 136, including but not limited to the following EPA Method reference revisions:
  EPA 300.1 Rev. 1.0-1997
  EPA 300.0 Rev. 2.1-1993
  EPA 353.2 Rev. 2.0-1993
  EPA 410.4 Rev. 1.0-1993
  EPA 420.4 Rev. 1.0-1993
  EPA 365.1 Rev. 2.0-1993
  EPA 200.7 Rev. 4.4-1994
  EPA 200.8 Rev. 5.4-1994
  EPA 245.1 Rev. 3.0-1994
- Except as qualified, Safe Drinking Water Act sample analyses are consistent with methodology requirements in 40 CFR Part 141.
- The Chain of Custody document is included as part of this report.
- All Library Search analytes should be regarded as tentative identifications based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.
- Parameters identified as "analyze immediately" require analysis within 15 minutes of collection. Any "analyze immediately" parameters not listed under the header "Field Parameters" are preformed in the laboratory and are therefore analyzed out of hold time.
- Method references listed on this report beginning with the prefix “S” followed by a method number (such as S2310B-97) refer to methods from “Standard Methods for the Examination of Water and Wastewater”.
- For microbiological analyses, the "Prepared" value is the date/time into the incubator and the "Analyzed" value is the date/time out the incubator.
- An Analysis-Prep Method Cross Reference Table is included after Analytical Results & Qualifiers section in this report.
- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.

Standard Acronyms/Flags

J	Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte
U	Indicates that the analyte was Not Detected (ND) above the MDL
N	Indicates presumptive evidence of the presence of a compound
MDL	Method Detection Limit
PQL	Practical Quantitation Limit
RDL	Practical Quantitation Limit for this Project
ND	Not Detected - indicates that the analyte was Not Detected
Cntr	Analysis was performed using this container
RegLmt	Regulatory Limit
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
%Rec	Percent Recovery
RPD	Relative Percent Difference
LOD	DoD Limit of Detection
LOQ	DoD Limit of Quantitation
DL	DoD Detection Limit
I	Indicates reported value is greater than or equal to the Method Detection Limit (MDL) but less than the Report Detection Limit (RDL)
(S)	Surrogate Compound
NC	Not Calculated
*	Result outside of QC limits
#	Please reference the result in the Results Section for analyte-level flags.

Project Notations

P1	Project was received at a temperature greater than six degrees Celsius.
P2	This Certificate of Analysis has been revised to report to the MDL, data has not been changed. LLB 12/12/24

Sample Notations

Lab ID	Sample ID		
3382844001	AC33101-01	**S1**	Sample was re-extracted past the holding time for EPA method 8270E.
3382844002	AC33101-02	**S2**	Sample was re-extracted past the holding time for EPA method 8270E.
3382844003	AC33101-04	**S3**	Sample was re-extracted past the holding time for EPA method 8270E.

Result Notations

Notation Ref.

Detected Results Summary

Client Sample ID	AC33101-01	Collected	10/02/2024 11:21
Lab Sample ID	3382844001	Lab Receipt	10/11/2024 09:24

Compound	Result	Units	RDL	MDL	Method	Flag
METALS						
Iron, Total	762	mg/kg	193	64.3	SW846 6010C	#
Manganese, Total	6.6J	mg/kg	19.3	6.4	SW846 6010C	#
Zinc, Total	12600	mg/kg	38.6	12.9	SW846 6010C	#
SEMIVOLATILES						
2-Methylnaphthalene	46.2J	ug/kg	89.3	15.2	SW846 8270E	#
Acenaphthylene	54.5	ug/kg	44.6	15.2	SW846 8270E	#
Acetophenone	112	ug/kg	89.3	15.2	SW846 8270E	#
Anthracene	78.4	ug/kg	44.6	15.2	SW846 8270E	#
Benzaldehyde	151J	ug/kg	179	17.9	SW846 8270E	#
bis(2-Ethylhexyl)phthalate	4410	ug/kg	89.3	19.6	SW846 8270E	#
Chrysene	2110	ug/kg	44.6	15.2	SW846 8270E	#
Fluoranthene	3050	ug/kg	44.6	15.2	SW846 8270E	#
Hexachlorobutadiene	524	ug/kg	89.3	15.2	SW846 8270E	#
Hexachloroethane	221	ug/kg	89.3	20.5	SW846 8270E	#
Naphthalene	172	ug/kg	44.6	15.2	SW846 8270E	#
N-Nitrosodiphenylamine	115	ug/kg	89.3	15.2	SW846 8270E	#
Phenanthrene	426	ug/kg	44.6	15.2	SW846 8270E	#
Pyrene	7070	ug/kg	223	75.9	SW846 8270E	#

Detected Results Summary

Client Sample ID	AC33101-02	Collected	10/02/2024 11:47
Lab Sample ID	3382844002	Lab Receipt	10/11/2024 09:24

Compound	Result	Units	RDL	MDL	Method	Flag
METALS						
Iron, Total	889	mg/kg	198	66.1	SW846 6010C	#
Manganese, Total	6.7J	mg/kg	19.8	6.6	SW846 6010C	#
Zinc, Total	13200	mg/kg	39.7	13.2	SW846 6010C	#
SEMIVOLATILES						
2-Methylnaphthalene	38.8J	ug/kg	96.2	16.3	SW846 8270E	#
Acenaphthylene	50.8	ug/kg	48.1	16.3	SW846 8270E	#
Acetophenone	181	ug/kg	96.2	16.3	SW846 8270E	#
Anthracene	79.6	ug/kg	48.1	16.3	SW846 8270E	#
bis(2-Ethylhexyl)phthalate	5170	ug/kg	96.2	21.2	SW846 8270E	#
Chrysene	1860	ug/kg	48.1	16.3	SW846 8270E	#
Fluoranthene	2680	ug/kg	48.1	16.3	SW846 8270E	#
Hexachlorobutadiene	486	ug/kg	96.2	16.3	SW846 8270E	#
Hexachloroethane	169	ug/kg	96.2	22.1	SW846 8270E	#
Naphthalene	111	ug/kg	48.1	16.3	SW846 8270E	#
Phenanthrene	453	ug/kg	48.1	16.3	SW846 8270E	#
Pyrene	6890	ug/kg	48.1	16.3	SW846 8270E	#

Detected Results Summary

Client Sample ID	AC33101-04	Collected	10/02/2024 00:20
Lab Sample ID	3382844003	Lab Receipt	10/11/2024 09:24

Compound	Result	Units	RDL	MDL	Method	Flag
METALS						
Iron, Total	640	mg/kg	198	65.8	SW846 6010C	#
Manganese, Total	7.5J	mg/kg	19.8	6.6	SW846 6010C	#
Zinc, Total	15200	mg/kg	39.5	13.2	SW846 6010C	#
SEMIVOLATILES						
2-Methylnaphthalene	40.9J	ug/kg	89.3	15.2	SW846 8270E	#
Acenaphthylene	59.8	ug/kg	44.6	15.2	SW846 8270E	#
Acetophenone	152	ug/kg	89.3	15.2	SW846 8270E	#
Anthracene	82.3	ug/kg	44.6	15.2	SW846 8270E	#
bis(2-Ethylhexyl)phthalate	5100	ug/kg	89.3	19.6	SW846 8270E	#
Chrysene	2450	ug/kg	44.6	15.2	SW846 8270E	#
Fluoranthene	3760	ug/kg	44.6	15.2	SW846 8270E	#
Hexachlorobutadiene	426	ug/kg	89.3	15.2	SW846 8270E	#
Hexachloroethane	205	ug/kg	89.3	20.5	SW846 8270E	#
Naphthalene	131	ug/kg	44.6	15.2	SW846 8270E	#
N-Nitrosodiphenylamine	168	ug/kg	89.3	15.2	SW846 8270E	#
Phenanthrene	541	ug/kg	44.6	15.2	SW846 8270E	#
Pyrene	8320	ug/kg	223	75.9	SW846 8270E	#

Results

Client Sample ID	AC33101-01	Collected	10/02/2024 11:21
Lab Sample ID	3382844001	Lab Receipt	10/11/2024 09:24

METALS

Compound	Result	Flag	Units	RDL	MDL	Method	Dilution	Analysis Date/Time	By	Cntr
Arsenic, Total	12.9U	U,P1,P2,S1	mg/kg	38.6	12.9	SW846 6010C	10	10/18/2024 10:21	MSY	A1
Cadmium, Total	3.2U	U,P1,P2,S1	mg/kg	9.7	3.2	SW846 6010C	10	10/18/2024 10:21	MSY	A1
Chromium, Total	6.4U	U,P1,P2,S1	mg/kg	19.3	6.4	SW846 6010C	10	10/18/2024 10:21	MSY	A1
Iron, Total	762	P1,P2,S1	mg/kg	193	64.3	SW846 6010C	10	10/18/2024 10:21	MSY	A1
Lead, Total	12.9U	U,P1,P2,S1	mg/kg	38.6	12.9	SW846 6010C	10	10/18/2024 10:21	MSY	A1
Manganese, Total	6.6J	J,P1,P2,S1	mg/kg	19.3	6.4	SW846 6010C	10	10/18/2024 10:21	MSY	A1
Mercury, Total	0.015U	U,P1,P2,S1	mg/kg	0.047	0.015	SW846 7471B	1	10/24/2024 11:12	JMS	A
Selenium, Total	32.2U	U,P1,P2,S1	mg/kg	96.5	32.2	SW846 6010C	10	10/18/2024 10:21	MSY	A1
Zinc, Total	12600	P1,P2,S1	mg/kg	38.6	12.9	SW846 6010C	10	10/18/2024 10:21	MSY	A1

SEMIVOLATILES

Compound	Result	Flag	Units	RDL	MDL	Method	Dilution	Analysis Date/Time	By	Cntr
1,2,4,5-Tetrachlorobenzene	15.2U	U,P1,P2,S1	ug/kg	89.3	15.2	SW846 8270E	1	10/21/2024 19:49	S7M	A
1,4-Dioxane	15.2U	U,P1,P2,S1	ug/kg	89.3	15.2	SW846 8270E	1	10/21/2024 19:49	S7M	A
2,3,4,6-Tetrachlorophenol	30.4U	U,P1,P2,S1	ug/kg	179	30.4	SW846 8270E	1	10/21/2024 19:49	S7M	A
2,4,5-Trichlorophenol	30.4U	U,P1,P2,S1	ug/kg	179	30.4	SW846 8270E	1	10/21/2024 19:49	S7M	A
2,4,6-Trichlorophenol	30.4U	U,P1,P2,S1	ug/kg	179	30.4	SW846 8270E	1	10/21/2024 19:49	S7M	A
2,4-Dichlorophenol	30.4U	U,P1,P2,S1	ug/kg	179	30.4	SW846 8270E	1	10/21/2024 19:49	S7M	A
2,4-Dimethylphenol	30.4U	U,P1,P2,S1	ug/kg	179	30.4	SW846 8270E	1	10/21/2024 19:49	S7M	A
2,4-Dinitrophenol	177U	U,P1,P2,S1	ug/kg	357	177	SW846 8270E	1	10/21/2024 19:49	S7M	A
2,4-Dinitrotoluene	17.9U	U,P1,P2,S1	ug/kg	89.3	17.9	SW846 8270E	1	10/21/2024 19:49	S7M	A
2,6-Dinitrotoluene	30.4U	U,P1,P2,S1	ug/kg	89.3	30.4	SW846 8270E	1	10/21/2024 19:49	S7M	A
2-Chloronaphthalene	15.2U	U,P1,P2,S1	ug/kg	89.3	15.2	SW846 8270E	1	10/21/2024 19:49	S7M	A
2-Chlorophenol	30.4U	U,P1,P2,S1	ug/kg	179	30.4	SW846 8270E	1	10/21/2024 19:49	S7M	A
2-Methyl-4,6-dinitrophenol	44.6U	U,P1,P2,S1	ug/kg	179	44.6	SW846 8270E	1	10/21/2024 19:49	S7M	A
2-Methylnaphthalene	46.2J	J,P1,P2,S1	ug/kg	89.3	15.2	SW846 8270E	1	10/21/2024 19:49	S7M	A
2-Nitroaniline	20.5U	U,P1,P2,S1	ug/kg	179	20.5	SW846 8270E	1	10/21/2024 19:49	S7M	A
2-Nitrophenol	30.4U	U,P1,P2,S1	ug/kg	179	30.4	SW846 8270E	1	10/21/2024 19:49	S7M	A
3,3-Dichlorobenzidine	27.7U	U,P1,P2,S1	ug/kg	179	27.7	SW846 8270E	1	10/21/2024 19:49	S7M	A
3-Nitroaniline	15.2U	U,P1,P2,S1	ug/kg	179	15.2	SW846 8270E	1	10/21/2024 19:49	S7M	A
4-Bromophenyl-phenylether	15.2U	U,P1,P2,S1	ug/kg	89.3	15.2	SW846 8270E	1	10/21/2024 19:49	S7M	A
4-Chloro-3-methylphenol	30.4U	U,P1,P2,S1	ug/kg	179	30.4	SW846 8270E	1	10/21/2024 19:49	S7M	A
4-Chloroaniline	15.2U	U,P1,P2,S1	ug/kg	179	15.2	SW846 8270E	1	10/21/2024 19:49	S7M	A
4-Chlorophenyl-phenylether	15.2U	U,P1,P2,S1	ug/kg	89.3	15.2	SW846 8270E	1	10/21/2024 19:49	S7M	A
4-Nitroaniline	25.9U	U,P1,P2,S1	ug/kg	179	25.9	SW846 8270E	1	10/21/2024 19:49	S7M	A
4-Nitrophenol	30.4U	U,P1,P2,S1	ug/kg	179	30.4	SW846 8270E	1	10/21/2024 19:49	S7M	A

Results

Client Sample ID	AC33101-01	Collected	10/02/2024 11:21
Lab Sample ID	3382844001	Lab Receipt	10/11/2024 09:24

SEMIVOLATILES (cont.)

Compound	Result	Flag	Units	RDL	MDL	Method	Dilution	Analysis Date/Time	By	Cntr
Acenaphthene	15.2U	U,P1,P2,S1	ug/kg	44.6	15.2	SW846 8270E	1	10/21/2024 19:49	S7M	A
Acenaphthylene	54.5	P1,P2,S1	ug/kg	44.6	15.2	SW846 8270E	1	10/21/2024 19:49	S7M	A
Acetophenone	112	P1,P2,S1	ug/kg	89.3	15.2	SW846 8270E	1	10/21/2024 19:49	S7M	A
Anthracene	78.4	P1,P2,S1	ug/kg	44.6	15.2	SW846 8270E	1	10/21/2024 19:49	S7M	A
Atrazine	15.2U	U,P1,P2,S1	ug/kg	89.3	15.2	SW846 8270E	1	10/21/2024 19:49	S7M	A
Benzaldehyde	151J	J,P1,P2,S1	ug/kg	179	17.9	SW846 8270E	1	10/21/2024 19:49	S7M	A
Benzo(a)anthracene	15.2U	U,P1,P2,S1	ug/kg	44.6	15.2	SW846 8270E	1	10/21/2024 19:49	S7M	A
Benzo(a)pyrene	15.2U	U,P1,P2,S1	ug/kg	44.6	15.2	SW846 8270E	1	10/21/2024 19:49	S7M	A
Benzo(b)fluoranthene	15.2U	U,P1,P2,S1	ug/kg	44.6	15.2	SW846 8270E	1	10/21/2024 19:49	S7M	A
Benzo(g,h,i)perylene	15.2U	U,P1,P2,S1	ug/kg	44.6	15.2	SW846 8270E	1	10/21/2024 19:49	S7M	A
Benzo(k)fluoranthene	15.2U	U,P1,P2,S1	ug/kg	44.6	15.2	SW846 8270E	1	10/21/2024 19:49	S7M	A
Biphenyl	15.2U	U,P1,P2,S1	ug/kg	89.3	15.2	SW846 8270E	1	10/21/2024 19:49	S7M	A
bis(2-Chloroethoxy)methane	15.2U	U,P1,P2,S1	ug/kg	89.3	15.2	SW846 8270E	1	10/21/2024 19:49	S7M	A
bis(2-Chloroethyl)ether	15.2U	U,P1,P2,S1	ug/kg	89.3	15.2	SW846 8270E	1	10/21/2024 19:49	S7M	A
bis(2-Chloroisopropyl)ether	15.2U	U,P1,P2,S1	ug/kg	89.3	15.2	SW846 8270E	1	10/21/2024 19:49	S7M	A
bis(2-Ethylhexyl)phthalate	4410	P1,P2,S1	ug/kg	89.3	19.6	SW846 8270E	1	10/21/2024 19:49	S7M	A
Butylbenzylphthalate	15.2U	U,P1,P2,S1	ug/kg	89.3	15.2	SW846 8270E	1	10/21/2024 19:49	S7M	A
Caprolactam	34.8U	U,P1,P2,S1	ug/kg	179	34.8	SW846 8270E	1	10/21/2024 19:49	S7M	A
Carbazole	15.2U	U,P1,P2,S1	ug/kg	89.3	15.2	SW846 8270E	1	10/21/2024 19:49	S7M	A
Chrysene	2110	P1,P2,S1	ug/kg	44.6	15.2	SW846 8270E	1	10/21/2024 19:49	S7M	A
Dibenzo(a,h)anthracene	15.2U	U,P1,P2,S1	ug/kg	44.6	15.2	SW846 8270E	1	10/21/2024 19:49	S7M	A
Dibenzofuran	15.2U	U,P1,P2,S1	ug/kg	89.3	15.2	SW846 8270E	1	10/21/2024 19:49	S7M	A
Diethylphthalate	15.2U	U,P1,P2,S1	ug/kg	89.3	15.2	SW846 8270E	1	10/21/2024 19:49	S7M	A
Dimethylphthalate	15.2U	U,P1,P2,S1	ug/kg	89.3	15.2	SW846 8270E	1	10/21/2024 19:49	S7M	A
Di-n-Butylphthalate	31.3U	U,P1,P2,S1	ug/kg	89.3	31.3	SW846 8270E	1	10/21/2024 19:49	S7M	A
Di-n-Octylphthalate	15.2U	U,P1,P2,S1	ug/kg	89.3	15.2	SW846 8270E	1	10/21/2024 19:49	S7M	A
Fluoranthene	3050	P1,P2,S1	ug/kg	44.6	15.2	SW846 8270E	1	10/21/2024 19:49	S7M	A
Fluorene	15.2U	U,P1,P2,S1	ug/kg	44.6	15.2	SW846 8270E	1	10/21/2024 19:49	S7M	A
Hexachlorobenzene	15.2U	U,P1,P2,S1	ug/kg	89.3	15.2	SW846 8270E	1	10/21/2024 19:49	S7M	A
Hexachlorobutadiene	524	P1,P2,S1	ug/kg	89.3	15.2	SW846 8270E	1	10/21/2024 19:49	S7M	A
Hexachlorocyclopentadiene	26.8U	U,P1,P2,S1	ug/kg	179	26.8	SW846 8270E	1	10/21/2024 19:49	S7M	A
Hexachloroethane	221	P1,P2,S1	ug/kg	89.3	20.5	SW846 8270E	1	10/21/2024 19:49	S7M	A
Indeno(1,2,3-cd)pyrene	15.2U	U,P1,P2,S1	ug/kg	44.6	15.2	SW846 8270E	1	10/21/2024 19:49	S7M	A
Isophorone	15.2U	U,P1,P2,S1	ug/kg	89.3	15.2	SW846 8270E	1	10/21/2024 19:49	S7M	A
mp-Cresol	30.4U	U,P1,P2,S1	ug/kg	179	30.4	SW846 8270E	1	10/21/2024 19:49	S7M	A
Naphthalene	172	P1,P2,S1	ug/kg	44.6	15.2	SW846 8270E	1	10/21/2024 19:49	S7M	A

Results

Client Sample ID	AC33101-01	Collected	10/02/2024 11:21
Lab Sample ID	3382844001	Lab Receipt	10/11/2024 09:24

SEMIVOLATILES (cont.)

Compound	Result	Flag	Units	RDL	MDL	Method	Dilution	Analysis Date/Time	By	Cntr
Nitrobenzene	30.4U	U,P1,P2,S1	ug/kg	89.3	30.4	SW846 8270E	1	10/21/2024 19:49	S7M	A
N-Nitroso-di-n-propylamine	15.2U	U,P1,P2,S1	ug/kg	89.3	15.2	SW846 8270E	1	10/21/2024 19:49	S7M	A
N-Nitrosodiphenylamine	115	P1,P2,S1	ug/kg	89.3	15.2	SW846 8270E	1	10/21/2024 19:49	S7M	A
o-Cresol	30.4U	U,P1,P2,S1	ug/kg	179	30.4	SW846 8270E	1	10/21/2024 19:49	S7M	A
Pentachlorophenol	43.8U	U,P1,P2,S1	ug/kg	179	43.8	SW846 8270E	1	10/21/2024 19:49	S7M	A
Phenanthrene	426	P1,P2,S1	ug/kg	44.6	15.2	SW846 8270E	1	10/21/2024 19:49	S7M	A
Phenol	30.4U	U,P1,P2,S1	ug/kg	179	30.4	SW846 8270E	1	10/21/2024 19:49	S7M	A
Pyrene	7070	P1,P2,S1	ug/kg	223	75.9	SW846 8270E	5	10/22/2024 20:36	CGS	A

SURROGATES

Compound	CAS No	Recovery	Limits(%)	Analysis Date/Time	Qualifiers
2,4,6-Tribromophenol	118-79-6	60.5%	19 – 132	10/21/2024 19:49	
2-Fluorobiphenyl	321-60-8	67.8%	40 – 110	10/21/2024 19:49	
2-Fluorophenol	367-12-4	40.3%	26 – 116	10/21/2024 19:49	
Nitrobenzene-d5	4165-60-0	66%	38 – 112	10/21/2024 19:49	
Phenol-d5	4165-62-2	55.6%	35 – 111	10/21/2024 19:49	
Terphenyl-d14	98904-43-9	93.3%	45 – 126	10/21/2024 19:49	

Results

Client Sample ID	AC33101-02	Collected	10/02/2024 11:47
Lab Sample ID	3382844002	Lab Receipt	10/11/2024 09:24

METALS

Compound	Result	Flag	Units	RDL	MDL	Method	Dilution	Analysis Date/Time	By	Cntr
Arsenic, Total	13.2U	U,P1,P2,S2	mg/kg	39.7	13.2	SW846 6010C	10	10/18/2024 10:22	MSY	A1
Cadmium, Total	3.3U	U,P1,P2,S2	mg/kg	9.9	3.3	SW846 6010C	10	10/18/2024 10:22	MSY	A1
Chromium, Total	6.6U	U,P1,P2,S2	mg/kg	19.8	6.6	SW846 6010C	10	10/18/2024 10:22	MSY	A1
Iron, Total	889	P1,P2,S2	mg/kg	198	66.1	SW846 6010C	10	10/18/2024 10:22	MSY	A1
Lead, Total	13.2U	U,P1,P2,S2	mg/kg	39.7	13.2	SW846 6010C	10	10/18/2024 10:22	MSY	A1
Manganese, Total	6.7J	J,P1,P2,S2	mg/kg	19.8	6.6	SW846 6010C	10	10/18/2024 10:22	MSY	A1
Mercury, Total	0.015U	U,P1,P2,S2	mg/kg	0.047	0.015	SW846 7471B	1	10/24/2024 11:13	JMS	A
Selenium, Total	33.1U	U,P1,P2,S2	mg/kg	99.2	33.1	SW846 6010C	10	10/18/2024 10:22	MSY	A1
Zinc, Total	13200	P1,P2,S2	mg/kg	39.7	13.2	SW846 6010C	10	10/18/2024 10:22	MSY	A1

SEMIVOLATILES

Compound	Result	Flag	Units	RDL	MDL	Method	Dilution	Analysis Date/Time	By	Cntr
1,2,4,5-Tetrachlorobenzene	16.3U	U,P1,P2,S2	ug/kg	96.2	16.3	SW846 8270E	1	10/21/2024 20:14	S7M	A
1,4-Dioxane	16.3U	U,P1,P2,S2	ug/kg	96.2	16.3	SW846 8270E	1	10/21/2024 20:14	S7M	A
2,3,4,6-Tetrachlorophenol	32.7U	U,P1,P2,S2	ug/kg	192	32.7	SW846 8270E	1	10/21/2024 20:14	S7M	A
2,4,5-Trichlorophenol	32.7U	U,P1,P2,S2	ug/kg	192	32.7	SW846 8270E	1	10/21/2024 20:14	S7M	A
2,4,6-Trichlorophenol	32.7U	U,P1,P2,S2	ug/kg	192	32.7	SW846 8270E	1	10/21/2024 20:14	S7M	A
2,4-Dichlorophenol	32.7U	U,P1,P2,S2	ug/kg	192	32.7	SW846 8270E	1	10/21/2024 20:14	S7M	A
2,4-Dimethylphenol	32.7U	U,P1,P2,S2	ug/kg	192	32.7	SW846 8270E	1	10/21/2024 20:14	S7M	A
2,4-Dinitrophenol	190U	U,P1,P2,S2	ug/kg	385	190	SW846 8270E	1	10/21/2024 20:14	S7M	A
2,4-Dinitrotoluene	19.2U	U,P1,P2,S2	ug/kg	96.2	19.2	SW846 8270E	1	10/21/2024 20:14	S7M	A
2,6-Dinitrotoluene	32.7U	U,P1,P2,S2	ug/kg	96.2	32.7	SW846 8270E	1	10/21/2024 20:14	S7M	A
2-Chloronaphthalene	16.3U	U,P1,P2,S2	ug/kg	96.2	16.3	SW846 8270E	1	10/21/2024 20:14	S7M	A
2-Chlorophenol	32.7U	U,P1,P2,S2	ug/kg	192	32.7	SW846 8270E	1	10/21/2024 20:14	S7M	A
2-Methyl-4,6-dinitrophenol	48.1U	U,P1,P2,S2	ug/kg	192	48.1	SW846 8270E	1	10/21/2024 20:14	S7M	A
2-Methylnaphthalene	38.8J	J,P1,P2,S2	ug/kg	96.2	16.3	SW846 8270E	1	10/21/2024 20:14	S7M	A
2-Nitroaniline	22.1U	U,P1,P2,S2	ug/kg	192	22.1	SW846 8270E	1	10/21/2024 20:14	S7M	A
2-Nitrophenol	32.7U	U,P1,P2,S2	ug/kg	192	32.7	SW846 8270E	1	10/21/2024 20:14	S7M	A
3,3-Dichlorobenzidine	29.8U	U,P1,P2,S2	ug/kg	192	29.8	SW846 8270E	1	10/21/2024 20:14	S7M	A
3-Nitroaniline	16.3U	U,P1,P2,S2	ug/kg	192	16.3	SW846 8270E	1	10/21/2024 20:14	S7M	A
4-Bromophenyl-phenylether	16.3U	U,P1,P2,S2	ug/kg	96.2	16.3	SW846 8270E	1	10/21/2024 20:14	S7M	A
4-Chloro-3-methylphenol	32.7U	U,P1,P2,S2	ug/kg	192	32.7	SW846 8270E	1	10/21/2024 20:14	S7M	A
4-Chloroaniline	16.3U	U,P1,P2,S2	ug/kg	192	16.3	SW846 8270E	1	10/21/2024 20:14	S7M	A
4-Chlorophenyl-phenylether	16.3U	U,P1,P2,S2	ug/kg	96.2	16.3	SW846 8270E	1	10/21/2024 20:14	S7M	A
4-Nitroaniline	27.9U	U,P1,P2,S2	ug/kg	192	27.9	SW846 8270E	1	10/21/2024 20:14	S7M	A
4-Nitrophenol	32.7U	U,P1,P2,S2	ug/kg	192	32.7	SW846 8270E	1	10/21/2024 20:14	S7M	A

Results

Client Sample ID	AC33101-02	Collected	10/02/2024 11:47
Lab Sample ID	3382844002	Lab Receipt	10/11/2024 09:24

SEMIVOLATILES (cont.)

Compound	Result	Flag	Units	RDL	MDL	Method	Dilution	Analysis Date/Time	By	Cntr
Acenaphthene	16.3U	U,P1,P2,S2	ug/kg	48.1	16.3	SW846 8270E	1	10/21/2024 20:14	S7M	A
Acenaphthylene	50.8	P1,P2,S2	ug/kg	48.1	16.3	SW846 8270E	1	10/21/2024 20:14	S7M	A
Acetophenone	181	P1,P2,S2	ug/kg	96.2	16.3	SW846 8270E	1	10/21/2024 20:14	S7M	A
Anthracene	79.6	P1,P2,S2	ug/kg	48.1	16.3	SW846 8270E	1	10/21/2024 20:14	S7M	A
Atrazine	16.3U	U,P1,P2,S2	ug/kg	96.2	16.3	SW846 8270E	1	10/21/2024 20:14	S7M	A
Benzaldehyde	19.2U	U,P1,P2,S2	ug/kg	192	19.2	SW846 8270E	1	10/21/2024 20:14	S7M	A
Benzo(a)anthracene	16.3U	U,P1,P2,S2	ug/kg	48.1	16.3	SW846 8270E	1	10/21/2024 20:14	S7M	A
Benzo(a)pyrene	16.3U	U,P1,P2,S2	ug/kg	48.1	16.3	SW846 8270E	1	10/21/2024 20:14	S7M	A
Benzo(b)fluoranthene	16.3U	U,P1,P2,S2	ug/kg	48.1	16.3	SW846 8270E	1	10/21/2024 20:14	S7M	A
Benzo(g,h,i)perylene	16.3U	U,P1,P2,S2	ug/kg	48.1	16.3	SW846 8270E	1	10/21/2024 20:14	S7M	A
Benzo(k)fluoranthene	16.3U	U,P1,P2,S2	ug/kg	48.1	16.3	SW846 8270E	1	10/21/2024 20:14	S7M	A
Biphenyl	16.3U	U,P1,P2,S2	ug/kg	96.2	16.3	SW846 8270E	1	10/21/2024 20:14	S7M	A
bis(2-Chloroethoxy)methane	16.3U	U,P1,P2,S2	ug/kg	96.2	16.3	SW846 8270E	1	10/21/2024 20:14	S7M	A
bis(2-Chloroethyl)ether	16.3U	U,P1,P2,S2	ug/kg	96.2	16.3	SW846 8270E	1	10/21/2024 20:14	S7M	A
bis(2-Chloroisopropyl)ether	16.3U	U,P1,P2,S2	ug/kg	96.2	16.3	SW846 8270E	1	10/21/2024 20:14	S7M	A
bis(2-Ethylhexyl)phthalate	5170	P1,P2,S2	ug/kg	96.2	21.2	SW846 8270E	1	10/21/2024 20:14	S7M	A
Butylbenzylphthalate	16.3U	U,P1,P2,S2	ug/kg	96.2	16.3	SW846 8270E	1	10/21/2024 20:14	S7M	A
Caprolactam	37.5U	U,P1,P2,S2	ug/kg	192	37.5	SW846 8270E	1	10/21/2024 20:14	S7M	A
Carbazole	16.3U	U,P1,P2,S2	ug/kg	96.2	16.3	SW846 8270E	1	10/21/2024 20:14	S7M	A
Chrysene	1860	P1,P2,S2	ug/kg	48.1	16.3	SW846 8270E	1	10/21/2024 20:14	S7M	A
Dibenzo(a,h)anthracene	16.3U	U,P1,P2,S2	ug/kg	48.1	16.3	SW846 8270E	1	10/21/2024 20:14	S7M	A
Dibenzofuran	16.3U	U,P1,P2,S2	ug/kg	96.2	16.3	SW846 8270E	1	10/21/2024 20:14	S7M	A
Diethylphthalate	16.3U	U,P1,P2,S2	ug/kg	96.2	16.3	SW846 8270E	1	10/21/2024 20:14	S7M	A
Dimethylphthalate	16.3U	U,P1,P2,S2	ug/kg	96.2	16.3	SW846 8270E	1	10/21/2024 20:14	S7M	A
Di-n-Butylphthalate	33.7U	U,P1,P2,S2	ug/kg	96.2	33.7	SW846 8270E	1	10/21/2024 20:14	S7M	A
Di-n-Octylphthalate	16.3U	U,P1,P2,S2	ug/kg	96.2	16.3	SW846 8270E	1	10/21/2024 20:14	S7M	A
Fluoranthene	2680	P1,P2,S2	ug/kg	48.1	16.3	SW846 8270E	1	10/21/2024 20:14	S7M	A
Fluorene	16.3U	U,P1,P2,S2	ug/kg	48.1	16.3	SW846 8270E	1	10/21/2024 20:14	S7M	A
Hexachlorobenzene	16.3U	U,P1,P2,S2	ug/kg	96.2	16.3	SW846 8270E	1	10/21/2024 20:14	S7M	A
Hexachlorobutadiene	486	P1,P2,S2	ug/kg	96.2	16.3	SW846 8270E	1	10/21/2024 20:14	S7M	A
Hexachlorocyclopentadiene	28.8U	U,P1,P2,S2	ug/kg	192	28.8	SW846 8270E	1	10/21/2024 20:14	S7M	A
Hexachloroethane	169	P1,P2,S2	ug/kg	96.2	22.1	SW846 8270E	1	10/21/2024 20:14	S7M	A
Indeno(1,2,3-cd)pyrene	16.3U	U,P1,P2,S2	ug/kg	48.1	16.3	SW846 8270E	1	10/21/2024 20:14	S7M	A
Isophorone	16.3U	U,P1,P2,S2	ug/kg	96.2	16.3	SW846 8270E	1	10/21/2024 20:14	S7M	A
mp-Cresol	32.7U	U,P1,P2,S2	ug/kg	192	32.7	SW846 8270E	1	10/21/2024 20:14	S7M	A
Naphthalene	111	P1,P2,S2	ug/kg	48.1	16.3	SW846 8270E	1	10/21/2024 20:14	S7M	A

Results

Client Sample ID	AC33101-02	Collected	10/02/2024 11:47
Lab Sample ID	3382844002	Lab Receipt	10/11/2024 09:24

SEMIVOLATILES (cont.)

Compound	Result	Flag	Units	RDL	MDL	Method	Dilution	Analysis Date/Time	By	Cntr
Nitrobenzene	32.7U	U,P1,P2,S2	ug/kg	96.2	32.7	SW846 8270E	1	10/21/2024 20:14	S7M	A
N-Nitroso-di-n-propylamine	16.3U	U,P1,P2,S2	ug/kg	96.2	16.3	SW846 8270E	1	10/21/2024 20:14	S7M	A
N-Nitrosodiphenylamine	16.3U	U,P1,P2,S2	ug/kg	96.2	16.3	SW846 8270E	1	10/21/2024 20:14	S7M	A
o-Cresol	32.7U	U,P1,P2,S2	ug/kg	192	32.7	SW846 8270E	1	10/21/2024 20:14	S7M	A
Pentachlorophenol	47.1U	U,P1,P2,S2	ug/kg	192	47.1	SW846 8270E	1	10/21/2024 20:14	S7M	A
Phenanthrene	453	P1,P2,S2	ug/kg	48.1	16.3	SW846 8270E	1	10/21/2024 20:14	S7M	A
Phenol	32.7U	U,P1,P2,S2	ug/kg	192	32.7	SW846 8270E	1	10/21/2024 20:14	S7M	A
Pyrene	6890	P1,P2,S2	ug/kg	48.1	16.3	SW846 8270E	1	10/21/2024 20:14	S7M	A

SURROGATES

Compound	CAS No	Recovery	Limits(%)	Analysis Date/Time	Qualifiers
2,4,6-Tribromophenol	118-79-6	59%	19 – 132	10/21/2024 20:14	
2-Fluorobiphenyl	321-60-8	65%	40 – 110	10/21/2024 20:14	
2-Fluorophenol	367-12-4	46.6%	26 – 116	10/21/2024 20:14	
Nitrobenzene-d5	4165-60-0	66.3%	38 – 112	10/21/2024 20:14	
Phenol-d5	4165-62-2	60.9%	35 – 111	10/21/2024 20:14	
Terphenyl-d14	98904-43-9	88.4%	45 – 126	10/21/2024 20:14	

Results

Client Sample ID	AC33101-04	Collected	10/02/2024 00:20
Lab Sample ID	3382844003	Lab Receipt	10/11/2024 09:24

METALS

Compound	Result	Flag	Units	RDL	MDL	Method	Dilution	Analysis Date/Time	By	Cntr
Arsenic, Total	13.2U	U,P1,P2,S3	mg/kg	39.5	13.2	SW846 6010C	10	10/18/2024 10:23	MSY	A1
Cadmium, Total	3.3U	U,P1,P2,S3	mg/kg	9.9	3.3	SW846 6010C	10	10/18/2024 10:23	MSY	A1
Chromium, Total	6.6U	U,P1,P2,S3	mg/kg	19.8	6.6	SW846 6010C	10	10/18/2024 10:23	MSY	A1
Iron, Total	640	P1,P2,S3	mg/kg	198	65.8	SW846 6010C	10	10/18/2024 10:23	MSY	A1
Lead, Total	13.2U	U,P1,P2,S3	mg/kg	39.5	13.2	SW846 6010C	10	10/18/2024 10:23	MSY	A1
Manganese, Total	7.5J	J,P1,P2,S3	mg/kg	19.8	6.6	SW846 6010C	10	10/18/2024 10:23	MSY	A1
Mercury, Total	0.016U	U,P1,P2,S3	mg/kg	0.049	0.016	SW846 7471B	1	10/24/2024 11:08	JMS	A
Selenium, Total	33.0U	U,P1,P2,S3	mg/kg	98.8	33.0	SW846 6010C	10	10/18/2024 10:23	MSY	A1
Zinc, Total	15200	P1,P2,S3	mg/kg	39.5	13.2	SW846 6010C	10	10/18/2024 10:23	MSY	A1

SEMIVOLATILES

Compound	Result	Flag	Units	RDL	MDL	Method	Dilution	Analysis Date/Time	By	Cntr
1,2,4,5-Tetrachlorobenzene	15.2U	U,P1,P2,S3	ug/kg	89.3	15.2	SW846 8270E	1	10/21/2024 19:25	S7M	A
1,4-Dioxane	15.2U	U,P1,P2,S3	ug/kg	89.3	15.2	SW846 8270E	1	10/21/2024 19:25	S7M	A
2,3,4,6-Tetrachlorophenol	30.4U	U,P1,P2,S3	ug/kg	179	30.4	SW846 8270E	1	10/21/2024 19:25	S7M	A
2,4,5-Trichlorophenol	30.4U	U,P1,P2,S3	ug/kg	179	30.4	SW846 8270E	1	10/21/2024 19:25	S7M	A
2,4,6-Trichlorophenol	30.4U	U,P1,P2,S3	ug/kg	179	30.4	SW846 8270E	1	10/21/2024 19:25	S7M	A
2,4-Dichlorophenol	30.4U	U,P1,P2,S3	ug/kg	179	30.4	SW846 8270E	1	10/21/2024 19:25	S7M	A
2,4-Dimethylphenol	30.4U	U,P1,P2,S3	ug/kg	179	30.4	SW846 8270E	1	10/21/2024 19:25	S7M	A
2,4-Dinitrophenol	177U	U,P1,P2,S3	ug/kg	357	177	SW846 8270E	1	10/21/2024 19:25	S7M	A
2,4-Dinitrotoluene	17.9U	U,P1,P2,S3	ug/kg	89.3	17.9	SW846 8270E	1	10/21/2024 19:25	S7M	A
2,6-Dinitrotoluene	30.4U	U,P1,P2,S3	ug/kg	89.3	30.4	SW846 8270E	1	10/21/2024 19:25	S7M	A
2-Chloronaphthalene	15.2U	U,P1,P2,S3	ug/kg	89.3	15.2	SW846 8270E	1	10/21/2024 19:25	S7M	A
2-Chlorophenol	30.4U	U,P1,P2,S3	ug/kg	179	30.4	SW846 8270E	1	10/21/2024 19:25	S7M	A
2-Methyl-4,6-dinitrophenol	44.6U	U,P1,P2,S3	ug/kg	179	44.6	SW846 8270E	1	10/21/2024 19:25	S7M	A
2-Methylnaphthalene	40.9J	J,P1,P2,S3	ug/kg	89.3	15.2	SW846 8270E	1	10/21/2024 19:25	S7M	A
2-Nitroaniline	20.5U	U,P1,P2,S3	ug/kg	179	20.5	SW846 8270E	1	10/21/2024 19:25	S7M	A
2-Nitrophenol	30.4U	U,P1,P2,S3	ug/kg	179	30.4	SW846 8270E	1	10/21/2024 19:25	S7M	A
3,3-Dichlorobenzidine	27.7U	U,P1,P2,S3	ug/kg	179	27.7	SW846 8270E	1	10/21/2024 19:25	S7M	A
3-Nitroaniline	15.2U	U,P1,P2,S3	ug/kg	179	15.2	SW846 8270E	1	10/21/2024 19:25	S7M	A
4-Bromophenyl-phenylether	15.2U	U,P1,P2,S3	ug/kg	89.3	15.2	SW846 8270E	1	10/21/2024 19:25	S7M	A
4-Chloro-3-methylphenol	30.4U	U,P1,P2,S3	ug/kg	179	30.4	SW846 8270E	1	10/21/2024 19:25	S7M	A
4-Chloroaniline	15.2U	U,P1,P2,S3	ug/kg	179	15.2	SW846 8270E	1	10/21/2024 19:25	S7M	A
4-Chlorophenyl-phenylether	15.2U	U,P1,P2,S3	ug/kg	89.3	15.2	SW846 8270E	1	10/21/2024 19:25	S7M	A
4-Nitroaniline	25.9U	U,P1,P2,S3	ug/kg	179	25.9	SW846 8270E	1	10/21/2024 19:25	S7M	A
4-Nitrophenol	30.4U	U,P1,P2,S3	ug/kg	179	30.4	SW846 8270E	1	10/21/2024 19:25	S7M	A

Results

Client Sample ID	AC33101-04	Collected	10/02/2024 00:20
Lab Sample ID	3382844003	Lab Receipt	10/11/2024 09:24

SEMIVOLATILES (cont.)

Compound	Result	Flag	Units	RDL	MDL	Method	Dilution	Analysis Date/Time	By	Cntr
Acenaphthene	15.2U	U,P1,P2,S3	ug/kg	44.6	15.2	SW846 8270E	1	10/21/2024 19:25	S7M	A
Acenaphthylene	59.8	P1,P2,S3	ug/kg	44.6	15.2	SW846 8270E	1	10/21/2024 19:25	S7M	A
Acetophenone	152	P1,P2,S3	ug/kg	89.3	15.2	SW846 8270E	1	10/21/2024 19:25	S7M	A
Anthracene	82.3	P1,P2,S3	ug/kg	44.6	15.2	SW846 8270E	1	10/21/2024 19:25	S7M	A
Atrazine	15.2U	U,P1,P2,S3	ug/kg	89.3	15.2	SW846 8270E	1	10/21/2024 19:25	S7M	A
Benzaldehyde	17.9U	U,P1,P2,S3	ug/kg	179	17.9	SW846 8270E	1	10/21/2024 19:25	S7M	A
Benzo(a)anthracene	15.2U	U,P1,P2,S3	ug/kg	44.6	15.2	SW846 8270E	1	10/21/2024 19:25	S7M	A
Benzo(a)pyrene	15.2U	U,P1,P2,S3	ug/kg	44.6	15.2	SW846 8270E	1	10/21/2024 19:25	S7M	A
Benzo(b)fluoranthene	15.2U	U,P1,P2,S3	ug/kg	44.6	15.2	SW846 8270E	1	10/21/2024 19:25	S7M	A
Benzo(g,h,i)perylene	15.2U	U,P1,P2,S3	ug/kg	44.6	15.2	SW846 8270E	1	10/21/2024 19:25	S7M	A
Benzo(k)fluoranthene	15.2U	U,P1,P2,S3	ug/kg	44.6	15.2	SW846 8270E	1	10/21/2024 19:25	S7M	A
Biphenyl	15.2U	U,P1,P2,S3	ug/kg	89.3	15.2	SW846 8270E	1	10/21/2024 19:25	S7M	A
bis(2-Chloroethoxy)methane	15.2U	U,P1,P2,S3	ug/kg	89.3	15.2	SW846 8270E	1	10/21/2024 19:25	S7M	A
bis(2-Chloroethyl)ether	15.2U	U,P1,P2,S3	ug/kg	89.3	15.2	SW846 8270E	1	10/21/2024 19:25	S7M	A
bis(2-Chloroisopropyl)ether	15.2U	U,P1,P2,S3	ug/kg	89.3	15.2	SW846 8270E	1	10/21/2024 19:25	S7M	A
bis(2-Ethylhexyl)phthalate	5100	P1,P2,S3	ug/kg	89.3	19.6	SW846 8270E	1	10/21/2024 19:25	S7M	A
Butylbenzylphthalate	15.2U	U,P1,P2,S3	ug/kg	89.3	15.2	SW846 8270E	1	10/21/2024 19:25	S7M	A
Caprolactam	34.8U	U,P1,P2,S3	ug/kg	179	34.8	SW846 8270E	1	10/21/2024 19:25	S7M	A
Carbazole	15.2U	U,P1,P2,S3	ug/kg	89.3	15.2	SW846 8270E	1	10/21/2024 19:25	S7M	A
Chrysene	2450	P1,P2,S3	ug/kg	44.6	15.2	SW846 8270E	1	10/21/2024 19:25	S7M	A
Dibenzo(a,h)anthracene	15.2U	U,P1,P2,S3	ug/kg	44.6	15.2	SW846 8270E	1	10/21/2024 19:25	S7M	A
Dibenzofuran	15.2U	U,P1,P2,S3	ug/kg	89.3	15.2	SW846 8270E	1	10/21/2024 19:25	S7M	A
Diethylphthalate	15.2U	U,P1,P2,S3	ug/kg	89.3	15.2	SW846 8270E	1	10/21/2024 19:25	S7M	A
Dimethylphthalate	15.2U	U,P1,P2,S3	ug/kg	89.3	15.2	SW846 8270E	1	10/21/2024 19:25	S7M	A
Di-n-Butylphthalate	31.3U	U,P1,P2,S3	ug/kg	89.3	31.3	SW846 8270E	1	10/21/2024 19:25	S7M	A
Di-n-Octylphthalate	15.2U	U,P1,P2,S3	ug/kg	89.3	15.2	SW846 8270E	1	10/21/2024 19:25	S7M	A
Fluoranthene	3760	P1,P2,S3	ug/kg	44.6	15.2	SW846 8270E	1	10/21/2024 19:25	S7M	A
Fluorene	15.2U	U,P1,P2,S3	ug/kg	44.6	15.2	SW846 8270E	1	10/21/2024 19:25	S7M	A
Hexachlorobenzene	15.2U	U,P1,P2,S3	ug/kg	89.3	15.2	SW846 8270E	1	10/21/2024 19:25	S7M	A
Hexachlorobutadiene	426	P1,P2,S3	ug/kg	89.3	15.2	SW846 8270E	1	10/21/2024 19:25	S7M	A
Hexachlorocyclopentadiene	26.8U	U,P1,P2,S3	ug/kg	179	26.8	SW846 8270E	1	10/21/2024 19:25	S7M	A
Hexachloroethane	205	P1,P2,S3	ug/kg	89.3	20.5	SW846 8270E	1	10/21/2024 19:25	S7M	A
Indeno(1,2,3-cd)pyrene	15.2U	U,P1,P2,S3	ug/kg	44.6	15.2	SW846 8270E	1	10/21/2024 19:25	S7M	A
Isophorone	15.2U	U,P1,P2,S3	ug/kg	89.3	15.2	SW846 8270E	1	10/21/2024 19:25	S7M	A
mp-Cresol	30.4U	U,P1,P2,S3	ug/kg	179	30.4	SW846 8270E	1	10/21/2024 19:25	S7M	A
Naphthalene	131	P1,P2,S3	ug/kg	44.6	15.2	SW846 8270E	1	10/21/2024 19:25	S7M	A

Results

Client Sample ID	AC33101-04	Collected	10/02/2024 00:20
Lab Sample ID	3382844003	Lab Receipt	10/11/2024 09:24

SEMIVOLATILES (cont.)

Compound	Result	Flag	Units	RDL	MDL	Method	Dilution	Analysis Date/Time	By	Cntr
Nitrobenzene	30.4U	U,P1,P2,S3	ug/kg	89.3	30.4	SW846 8270E	1	10/21/2024 19:25	S7M	A
N-Nitroso-di-n-propylamine	15.2U	U,P1,P2,S3	ug/kg	89.3	15.2	SW846 8270E	1	10/21/2024 19:25	S7M	A
N-Nitrosodiphenylamine	168	P1,P2,S3	ug/kg	89.3	15.2	SW846 8270E	1	10/21/2024 19:25	S7M	A
o-Cresol	30.4U	U,P1,P2,S3	ug/kg	179	30.4	SW846 8270E	1	10/21/2024 19:25	S7M	A
Pentachlorophenol	43.8U	U,P1,P2,S3	ug/kg	179	43.8	SW846 8270E	1	10/21/2024 19:25	S7M	A
Phenanthrene	541	P1,P2,S3	ug/kg	44.6	15.2	SW846 8270E	1	10/21/2024 19:25	S7M	A
Phenol	30.4U	U,P1,P2,S3	ug/kg	179	30.4	SW846 8270E	1	10/21/2024 19:25	S7M	A
Pyrene	8320	P1,P2,S3	ug/kg	223	75.9	SW846 8270E	5	10/22/2024 20:12	CGS	A

SURROGATES

Compound	CAS No	Recovery	Limits(%)	Analysis Date/Time	Qualifiers
2,4,6-Tribromophenol	118-79-6	62.9%	19 – 132	10/21/2024 19:25	
2-Fluorobiphenyl	321-60-8	70.7%	40 – 110	10/21/2024 19:25	
2-Fluorophenol	367-12-4	42.5%	26 – 116	10/21/2024 19:25	
Nitrobenzene-d5	4165-60-0	60.3%	38 – 112	10/21/2024 19:25	
Phenol-d5	4165-62-2	58.2%	35 – 111	10/21/2024 19:25	
Terphenyl-d14	98904-43-9	80.7%	45 – 126	10/21/2024 19:25	

Sample - Method Cross Reference Table

Lab ID	Sample ID	Analysis Method	Preparation Method	Leachate Method
3382844001	AC33101-01	SW846 6010C	SW846 3051A	
		SW846 7471B	SW846 7471B	
		SW846 8270E	SW846 3546	
3382844002	AC33101-02	SW846 6010C	SW846 3051A	
		SW846 7471B	SW846 7471B	
		SW846 8270E	SW846 3546	
3382844003	AC33101-04	SW846 6010C	SW846 3051A	
		SW846 7471B	SW846 7471B	
		SW846 8270E	SW846 3546	

QUALITY CONTROL SAMPLES

METALS

QC Batch

QC Batch	1317128	Prep Method	SW846 3051A
Date	10/17/2024 10:05	Analysis Method	SW846 6010C
Tech.	MEM		

Associated Samples

3382844001 3382844002 3382844003

Matrix Spike 3893223 (MS1) 3383018001 (non-Project Sample) For QC Batch 1317128

****NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Matrix Spike Duplicate 3893224 (MSD1) 3383018001 (non-Project Sample) For QC Batch 1317128

Method Blank 3893221 (MB) Created on 10/17/2024 09:37 For QC Batch 1317128

RESULTS

Compound	CAS No		Result	Units	RDL	Qualifiers
Arsenic, Total	7440-38-2	BLK	0.67U	mg/kg	2.0	U
Cadmium, Total	7440-43-9	BLK	0.17U	mg/kg	0.50	U
Chromium, Total	7440-47-3	BLK	0.33U	mg/kg	1.0	U
Iron, Total	7439-89-6	BLK	3.3U	mg/kg	10.0	U
Lead, Total	7439-92-1	BLK	0.67U	mg/kg	2.0	U
Manganese, Total	7439-96-5	BLK	0.33U	mg/kg	1.0	U
Selenium, Total	7782-49-2	BLK	1.7U	mg/kg	5.0	U
Zinc, Total	7440-66-6	BLK	0.67U	mg/kg	2.0	U

Lab Control Standard 3893222 (LCS1) Created on 10/17/2024 09:37 For QC Batch 1317128

RESULTS

Compound	CAS No		Result (mg/kg)	Orig. Result (mg/kg)	Spk Added (mg/kg)	Rec. (%)	Limits (%)	RPD Limit (%)	Qualifiers
Arsenic, Total	7440-38-2	LCS	40.6		40	102	80 - 120		
Cadmium, Total	7440-43-9	LCS	21		20	105	80 - 120		
Chromium, Total	7440-47-3	LCS	21.1		20	106	80 - 120		
Iron, Total	7439-89-6	LCS	1080		1000	108	80 - 120		
Lead, Total	7439-92-1	LCS	108		100	108	80 - 120		
Manganese, Total	7439-96-5	LCS	22.4		20	112	80 - 120		
Selenium, Total	7782-49-2	LCS	103		100	103	80 - 120		
Zinc, Total	7440-66-6	LCS	106		100	106	80 - 120		

QC Batch

QC Batch	1320490	Prep Method	SW846 7471B
Date	10/24/2024 08:01	Analysis Method	SW846 7471B
Tech.	JMS		

Associated Samples

3382844001 3382844002 3382844003

QUALITY CONTROL SAMPLES

METALS (cont.)

Matrix Spike 3895659 (MS) 3383382001 (non-Project Sample) For QC Batch 1320490

****NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Matrix Spike Duplicate 3895660 (MSD) 3383382001 (non-Project Sample) For QC Batch 1320490

RESULTS

Compound	CAS No		Result (mg/kg)	Orig. Result (mg/kg)	Spk Added (mg/kg)	Rec. (%)	Limits (%)	RPD Limit (%)	Qualifiers
Mercury, Total	7439-97-6	MS	0.92	0.0037	0.95	96.4	80 - 120		
Mercury, Total	7439-97-6	MSD	0.8	0.0037	0.84	95.6	80 - 120	RPD 13.10 (Max-20)	

Matrix Spike 3895661 (MS) 3383385001 (non-Project Sample) For QC Batch 1320490

****NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Matrix Spike Duplicate 3895662 (MSD) 3383385001 (non-Project Sample) For QC Batch 1320490

RESULTS

Compound	CAS No		Result (mg/kg)	Orig. Result (mg/kg)	Spk Added (mg/kg)	Rec. (%)	Limits (%)	RPD Limit (%)	Qualifiers
Mercury, Total	7439-97-6	MS	1.1	0.0011	0.95	121*	80 - 120		
Mercury, Total	7439-97-6	MSD	0.83	0.0011	0.89	92.7	80 - 120	RPD 32.30* (Max-20)	

Method Blank 3895657 (MB) Created on 10/23/2024 09:48 For QC Batch 1320490

RESULTS

Compound	CAS No		Result	Units	RDL	Qualifiers
Mercury, Total	7439-97-6	BLK	0.016U	mg/kg	0.050	U

Lab Control Standard 3895658 (LCS) Created on 10/23/2024 09:48 For QC Batch 1320490

RESULTS

Compound	CAS No		Result (mg/kg)	Orig. Result (mg/kg)	Spk Added (mg/kg)	Rec. (%)	Limits (%)	RPD Limit (%)	Qualifiers
Mercury, Total	7439-97-6	LCS	0.39		0.40	98.5	80 - 120		

QUALITY CONTROL SAMPLES

SEMIVOLATILES

QC Batch

QC Batch	1318932	Prep Method	SW846 3546
Date	10/20/2024 13:30	Analysis Method	SW846 8270E
Tech.	GED		

Associated Samples

3382844002 3382844003 3382844001

Matrix Spike 3894048 (MS) 3382843001 (non-Project Sample) For QC Batch 1318932

****NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Matrix Spike Duplicate 3894049 (MSD) 3382843001 (non-Project Sample) For QC Batch 1318932

RESULTS

Compound	CAS No		Result (ug/kg)	Orig. Result (ug/kg)	Spk Added (ug/kg)	Rec. (%)	Limits (%)	RPD Limit (%)	Qualifiers
2-Methylnaphthalene	91-57-6	MS	1600	0	2160	74.1	59 - 108		
2-Methylnaphthalene	91-57-6	MSD	1830	0	2360	77.8	59 - 108	RPD 13.80 (Max-21)	
Acenaphthene	83-32-9	MS	1690	0	2160	78.4	61 - 105		
Acenaphthene	83-32-9	MSD	1900	0	2360	80.5	61 - 105	RPD 11.70 (Max-17)	
Acenaphthylene	208-96-8	MS	1440	0	2160	66.6	63 - 106		
Acenaphthylene	208-96-8	MSD	1650	0	2360	70.1	63 - 106	RPD 14.20 (Max-17)	
Anthracene	120-12-7	MS	1790	0	2160	83.3	60 - 107		
Anthracene	120-12-7	MSD	1870	0	2360	79.3	60 - 107	RPD 4.12 (Max-20)	
Benzo(a)anthracene	56-55-3	MS	1870	0	2160	86.8	61 - 113		
Benzo(a)anthracene	56-55-3	MSD	2060	0	2360	87.5	61 - 113	RPD 9.89 (Max-22)	
Benzo(a)pyrene	50-32-8	MS	1880	0	2160	87.2	68 - 121		
Benzo(a)pyrene	50-32-8	MSD	2060	0	2360	87.2	68 - 121	RPD 9.08 (Max-24)	
Benzo(b)fluoranthene	205-99-2	MS	1840	0	2160	85.3	64 - 115		
Benzo(b)fluoranthene	205-99-2	MSD	2080	0	2360	88	64 - 115	RPD 12.20 (Max-28)	
Benzo(g,h,i)perylene	191-24-2	MS	1980	0	2160	91.7	57 - 119		
Benzo(g,h,i)perylene	191-24-2	MSD	2230	0	2360	94.4	57 - 119	RPD 12 (Max-30)	
Benzo(k)fluoranthene	207-08-9	MS	1890	0	2160	87.8	63 - 116		
Benzo(k)fluoranthene	207-08-9	MSD	2020	0	2360	85.7	63 - 116	RPD 6.53 (Max-22)	
Chrysene	218-01-9	MS	1930	0	2160	89.7	65 - 113		
Chrysene	218-01-9	MSD	2100	0	2360	88.9	65 - 113	RPD 8.17 (Max-20)	
Dibenzo(a,h)anthracene	53-70-3	MS	1980	0	2160	91.7	59 - 116		
Dibenzo(a,h)anthracene	53-70-3	MSD	2190	0	2360	93	59 - 116	RPD 10.40 (Max-28)	
Fluoranthene	206-44-0	MS	2000	0	2160	92.7	61 - 114		
Fluoranthene	206-44-0	MSD	1990	0	2360	84.5	61 - 114	RPD 0.19 (Max-21)	
Fluorene	86-73-7	MS	1670	0	2160	77.6	62 - 107		
Fluorene	86-73-7	MSD	1890	0	2360	80	62 - 107	RPD 12 (Max-16)	
Indeno(1,2,3-cd)pyrene	193-39-5	MS	1900	0	2160	88	53 - 118		
Indeno(1,2,3-cd)pyrene	193-39-5	MSD	2140	0	2360	90.8	53 - 118	RPD 12.10 (Max-30)	
Naphthalene	91-20-3	MS	1650	0	2160	76.6	60 - 102		
Naphthalene	91-20-3	MSD	1900	0	2360	80.6	60 - 102	RPD 14.10 (Max-21)	
Phenanthrene	85-01-8	MS	1780	0	2160	82.7	61 - 106		
Phenanthrene	85-01-8	MSD	1770	0	2360	74.9	61 - 106	RPD 0.90 (Max-20)	
Pyrene	129-00-0	MS	1810	0	2160	83.8	62 - 117		
Pyrene	129-00-0	MSD	1940	0	2360	82.3	62 - 117	RPD 7.12 (Max-20)	

QUALITY CONTROL SAMPLES

SEMIVOLATILES (cont.)

SURROGATES

Compound	CAS No		Result (ug/L)	Expected (ug/L)	Rec. (%)	Limits (%)	Qualifiers
2-Fluorobiphenyl	321-60-8	MS	1920	2160	89.1	40 - 110	
2-Fluorobiphenyl	321-60-8	MSD	2140	2360	90.9	40 - 110	
Nitrobenzene-d5	4165-60-0	MS	2060	2160	95.4	38 - 112	
Nitrobenzene-d5	4165-60-0	MSD	2170	2360	91.8	38 - 112	
Terphenyl-d14	98904-43-9	MS	2340	2160	109	45 - 126	
Terphenyl-d14	98904-43-9	MSD	2520	2360	107	45 - 126	

Method Blank 3894046 (MB) Created on 10/19/2024 08:06 For QC Batch 1318932

RESULTS

Compound	CAS No		Result	Units	RDL	Qualifiers
1,2,4,5-Tetrachlorobenzene	95-94-3	BLK	17.0U	ug/kg	100	U
1,4-Dioxane	123-91-1	BLK	17.0U	ug/kg	100	U
2,3,4,6-Tetrachlorophenol	58-90-2	BLK	34.0U	ug/kg	200	U
2,4,5-Trichlorophenol	95-95-4	BLK	34.0U	ug/kg	200	U
2,4,6-Trichlorophenol	88-06-2	BLK	34.0U	ug/kg	200	U
2,4-Dichlorophenol	120-83-2	BLK	34.0U	ug/kg	200	U
2,4-Dimethylphenol	105-67-9	BLK	34.0U	ug/kg	200	U
2,4-Dinitrophenol	51-28-5	BLK	198U	ug/kg	400	U
2,4-Dinitrotoluene	121-14-2	BLK	20.0U	ug/kg	100	U
2,6-Dinitrotoluene	606-20-2	BLK	34.0U	ug/kg	100	U
2-Chloronaphthalene	91-58-7	BLK	17.0U	ug/kg	100	U
2-Chlorophenol	95-57-8	BLK	34.0U	ug/kg	200	U
2-Methyl-4,6-dinitrophenol	534-52-1	BLK	50.0U	ug/kg	200	U
2-Methylnaphthalene	91-57-6	BLK	17.0U	ug/kg	100	U
2-Nitroaniline	88-74-4	BLK	23.0U	ug/kg	200	U
2-Nitrophenol	88-75-5	BLK	34.0U	ug/kg	200	U
3,3-Dichlorobenzidine	91-94-1	BLK	31.0U	ug/kg	200	U
3-Nitroaniline	99-09-2	BLK	17.0U	ug/kg	200	U
4-Bromophenyl-phenylether	101-55-3	BLK	17.0U	ug/kg	100	U
4-Chloro-3-methylphenol	59-50-7	BLK	34.0U	ug/kg	200	U
4-Chloroaniline	106-47-8	BLK	17.0U	ug/kg	200	U
4-Chlorophenyl-phenylether	7005-72-3	BLK	17.0U	ug/kg	100	U
4-Nitroaniline	100-01-6	BLK	29.0U	ug/kg	200	U
4-Nitrophenol	100-02-7	BLK	34.0U	ug/kg	200	U
Acenaphthene	83-32-9	BLK	17.0U	ug/kg	50.0	U
Acenaphthylene	208-96-8	BLK	17.0U	ug/kg	50.0	U
Acetophenone	98-86-2	BLK	17.0U	ug/kg	100	U
Anthracene	120-12-7	BLK	17.0U	ug/kg	50.0	U
Atrazine	1912-24-9	BLK	17.0U	ug/kg	100	U
Benzaldehyde	100-52-7	BLK	20.0U	ug/kg	200	U
Benzo(a)anthracene	56-55-3	BLK	17.0U	ug/kg	50.0	U
Benzo(a)pyrene	50-32-8	BLK	17.0U	ug/kg	50.0	U
Benzo(b)fluoranthene	205-99-2	BLK	17.0U	ug/kg	50.0	U
Benzo(g,h,i)perylene	191-24-2	BLK	17.0U	ug/kg	50.0	U

QUALITY CONTROL SAMPLES

SEMIVOLATILES (cont.)

RESULTS

Compound	CAS No		Result	Units	RDL	Qualifiers
Benzo(k)fluoranthene	207-08-9	BLK	17.0U	ug/kg	50.0	U
Biphenyl	92-52-4	BLK	17.0U	ug/kg	100	U
bis(2-Chloroethoxy)methane	111-91-1	BLK	17.0U	ug/kg	100	U
bis(2-Chloroethyl)ether	111-44-4	BLK	17.0U	ug/kg	100	U
bis(2-Chloroisopropyl)ether	108-60-1	BLK	17.0U	ug/kg	100	U
bis(2-Ethylhexyl)phthalate	117-81-7	BLK	22.0U	ug/kg	100	U
Butylbenzylphthalate	85-68-7	BLK	17.0U	ug/kg	100	U
Caprolactam	105-60-2	BLK	39.0U	ug/kg	200	U
Carbazole	86-74-8	BLK	17.0U	ug/kg	100	U
Chrysene	218-01-9	BLK	17.0U	ug/kg	50.0	U
Dibenzo(a,h)anthracene	53-70-3	BLK	17.0U	ug/kg	50.0	U
Dibenzofuran	132-64-9	BLK	17.0U	ug/kg	100	U
Diethylphthalate	84-66-2	BLK	17.0U	ug/kg	100	U
Dimethylphthalate	131-11-3	BLK	17.0U	ug/kg	100	U
Di-n-Butylphthalate	84-74-2	BLK	35.0U	ug/kg	100	U
Di-n-Octylphthalate	117-84-0	BLK	17.0U	ug/kg	100	U
Fluoranthene	206-44-0	BLK	17.0U	ug/kg	50.0	U
Fluorene	86-73-7	BLK	17.0U	ug/kg	50.0	U
Hexachlorobenzene	118-74-1	BLK	17.0U	ug/kg	100	U
Hexachlorobutadiene	87-68-3	BLK	17.0U	ug/kg	100	U
Hexachlorocyclopentadiene	77-47-4	BLK	30.0U	ug/kg	200	U
Hexachloroethane	67-72-1	BLK	23.0U	ug/kg	100	U
Indeno(1,2,3-cd)pyrene	193-39-5	BLK	17.0U	ug/kg	50.0	U
Isophorone	78-59-1	BLK	17.0U	ug/kg	100	U
mp-Cresol	108394/106445	BLK	34.0U	ug/kg	200	U
Naphthalene	91-20-3	BLK	17.0U	ug/kg	50.0	U
Nitrobenzene	98-95-3	BLK	34.0U	ug/kg	100	U
N-Nitroso-di-n-propylamine	621-64-7	BLK	17.0U	ug/kg	100	U
N-Nitrosodiphenylamine	86-30-6	BLK	17.0U	ug/kg	100	U
o-Cresol	95-48-7	BLK	34.0U	ug/kg	200	U
Pentachlorophenol	87-86-5	BLK	49.0U	ug/kg	200	U
Phenanthrene	85-01-8	BLK	17.0U	ug/kg	50.0	U
Phenol	108-95-2	BLK	34.0U	ug/kg	200	U
Pyrene	129-00-0	BLK	17.0U	ug/kg	50.0	U

SURROGATES

Compound	CAS No		Result (ug/kg)	Expected (ug/kg)	Rec. (%)	Limits (%)	Qualifiers
2,4,6-Tribromophenol	118-79-6	BLK	4460	5000	89.2	19 - 132	
2-Fluorobiphenyl	321-60-8	BLK	2230	2500	89.1	40 - 110	
2-Fluorophenol	367-12-4	BLK	4470	5000	89.3	26 - 116	
Nitrobenzene-d5	4165-60-0	BLK	2310	2500	92.2	38 - 112	
Phenol-d5	4165-62-2	BLK	5190	5000	104	35 - 111	
Terphenyl-d14	98904-43-9	BLK	3060	2500	122	45 - 126	

QUALITY CONTROL SAMPLES

SEMIVOLATILES (cont.)

Lab Control Standard 3894047 (LCS) Created on 10/19/2024 08:06 For QC Batch 1318932

RESULTS

Compound	CAS No		Result (ug/kg)	Orig. Result (ug/kg)	Spk Added (ug/kg)	Rec. (%)	Limits (%)	RPD Limit (%)	Qualifiers
1,2,4,5-Tetrachlorobenzene	95-94-3	LCS	1930		2500	77.1	51 - 102		
1,4-Dioxane	123-91-1	LCS	1610		2500	64.6	24 - 104		
2,3,4,6-Tetrachlorophenol	58-90-2	LCS	4430		5000	88.5	55 - 111		
2,4,5-Trichlorophenol	95-95-4	LCS	4760		5000	95.2	60 - 108		
2,4,6-Trichlorophenol	88-06-2	LCS	4540		5000	90.8	59 - 111		
2,4-Dichlorophenol	120-83-2	LCS	4860		5000	97.1	61 - 109		
2,4-Dimethylphenol	105-67-9	LCS	5270		5000	105	59 - 133		
2,4-Dinitrophenol	51-28-5	LCS	5060		5000	101	28 - 135		
2,4-Dinitrotoluene	121-14-2	LCS	1870		2500	74.7	62 - 115		
2,6-Dinitrotoluene	606-20-2	LCS	1910		2500	76.3	61 - 114		
2-Chloronaphthalene	91-58-7	LCS	1810		2500	72.5	59 - 104		
2-Chlorophenol	95-57-8	LCS	5070		5000	101	61 - 106		
2-Methyl-4,6-dinitrophenol	534-52-1	LCS	5530		5000	111	39 - 113		
2-Methylnaphthalene	91-57-6	LCS	1930		2500	77.2	59 - 108		
2-Nitroaniline	88-74-4	LCS	1900		2500	76.2	60 - 115		
2-Nitrophenol	88-75-5	LCS	4820		5000	96.5	60 - 114		
3,3-Dichlorobenzidine	91-94-1	LCS	2960		5000	59.3	25 - 104		
3-Nitroaniline	99-09-2	LCS	2010		2500	80.5	52 - 119		
4-Bromophenyl-phenylether	101-55-3	LCS	1860		2500	74.5	60 - 110		
4-Chloro-3-methylphenol	59-50-7	LCS	5090		5000	102	59 - 115		
4-Chloroaniline	106-47-8	LCS	1910		2500	76.4	42 - 111		
4-Chlorophenyl-phenylether	7005-72-3	LCS	2010		2500	80.4	59 - 107		
4-Nitroaniline	100-01-6	LCS	1820		2500	72.9	49 - 121		
4-Nitrophenol	100-02-7	LCS	5120		5000	102	53 - 124		
Acenaphthene	83-32-9	LCS	1940		2500	77.7	61 - 105		
Acenaphthylene	208-96-8	LCS	1610		2500	64.6	63 - 106		
Acetophenone	98-86-2	LCS	1890		2500	75.5	33 - 98		
Anthracene	120-12-7	LCS	1960		2500	78.5	60 - 107		
Atrazine	1912-24-9	LCS	1920		2500	76.7	62 - 116		
Benzaldehyde	100-52-7	LCS	2140		2500	85.4	46 - 115		
Benzo(a)anthracene	56-55-3	LCS	1970		2500	78.7	61 - 113		
Benzo(a)pyrene	50-32-8	LCS	1950		2500	77.9	68 - 121		
Benzo(b)fluoranthene	205-99-2	LCS	2010		2500	80.2	64 - 115		
Benzo(g,h,i)perylene	191-24-2	LCS	2000		2500	80.1	57 - 119		
Benzo(k)fluoranthene	207-08-9	LCS	2100		2500	83.8	63 - 116		
Biphenyl	92-52-4	LCS	1940		2500	77.5	56 - 100		
bis(2-Chloroethoxy)methane	111-91-1	LCS	2250		2500	89.9	56 - 112		
bis(2-Chloroethyl)ether	111-44-4	LCS	2030		2500	81.3	51 - 109		
bis(2-Chloroisopropyl)ether	108-60-1	LCS	2150		2500	86	38 - 120		
bis(2-Ethylhexyl)phthalate	117-81-7	LCS	2140		2500	85.4	51 - 130		
Butylbenzylphthalate	85-68-7	LCS	2180		2500	87.2	58 - 125		
Caprolactam	105-60-2	LCS	2070		2500	82.7	51 - 119		
Carbazole	86-74-8	LCS	1850		2500	73.9	66 - 117		
Chrysene	218-01-9	LCS	2060		2500	82.3	65 - 113		

QUALITY CONTROL SAMPLES

SEMIVOLATILES (cont.)

RESULTS

Compound	CAS No		Result (ug/kg)	Orig. Result (ug/kg)	Spk Added (ug/kg)	Rec. (%)	Limits (%)	RPD Limit (%)	Qualifiers
Dibenzo(a,h)anthracene	53-70-3	LCS	1900		2500	75.9	59 - 116		
Dibenzofuran	132-64-9	LCS	1820		2500	72.9	62 - 106		
Diethylphthalate	84-66-2	LCS	2010		2500	80.4	59 - 112		
Dimethylphthalate	131-11-3	LCS	1990		2500	79.5	60 - 111		
Di-n-Butylphthalate	84-74-2	LCS	2100		2500	83.9	62 - 125		
Di-n-Octylphthalate	117-84-0	LCS	2210		2500	88.3	47 - 134		
Fluoranthene	206-44-0	LCS	1890		2500	75.7	61 - 114		
Fluorene	86-73-7	LCS	1900		2500	76.2	62 - 107		
Hexachlorobenzene	118-74-1	LCS	1860		2500	74.2	56 - 111		
Hexachlorobutadiene	87-68-3	LCS	2210		2500	88.2	56 - 127		
Hexachlorocyclopentadiene	77-47-4	LCS	1480		2500	59	20 - 124		
Hexachloroethane	67-72-1	LCS	2010		2500	80.3	57 - 101		
Indeno(1,2,3-cd)pyrene	193-39-5	LCS	1810		2500	72.2	53 - 118		
Isophorone	78-59-1	LCS	2070		2500	83	41 - 101		
mp-Cresol	108394/106445	LCS	5460		5000	109	60 - 109		
Naphthalene	91-20-3	LCS	1920		2500	76.6	60 - 102		
Nitrobenzene	98-95-3	LCS	2040		2500	81.4	52 - 113		
N-Nitroso-di-n-propylamine	621-64-7	LCS	2210		2500	88.3	50 - 121		
N-Nitrosodiphenylamine	86-30-6	LCS	2380		2500	95.1	73 - 129		
o-Cresol	95-48-7	LCS	5030		5000	101	61 - 108		
Pentachlorophenol	87-86-5	LCS	5770		5000	115	46 - 138		
Phenanthrene	85-01-8	LCS	1920		2500	76.9	61 - 106		
Phenol	108-95-2	LCS	5010		5000	100	57 - 110		
Pyrene	129-00-0	LCS	2100		2500	83.8	62 - 117		

SURROGATES

Compound	CAS No		Result (ug/kg)	Expected (ug/kg)	Rec. (%)	Limits (%)	Qualifiers
2,4,6-Tribromophenol	118-79-6	LCS	4260	5000	85.2	19 - 132	
2-Fluorobiphenyl	321-60-8	LCS	2110	2500	84.2	40 - 110	
2-Fluorophenol	367-12-4	LCS	4190	5000	83.8	26 - 116	
Nitrobenzene-d5	4165-60-0	LCS	2210	2500	88.3	38 - 112	
Phenol-d5	4165-62-2	LCS	4730	5000	94.7	35 - 111	
Terphenyl-d14	98904-43-9	LCS	2760	2500	110	45 - 126	

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Lab ID	Sample ID	Preparation Method	Prep Batch	Prep Date/Time	By	Analysis Method	Anly Batch
3382844001	AC33101-01	SW846 3051A	1317128	10/17/2024 10:05	MEM	SW846 6010C	1318062
		SW846 7471B	1320490	10/24/2024 08:01	JMS	SW846 7471B	1321252
		SW846 3546	1318932	10/20/2024 13:30	GED	SW846 8270E	1320102
		SW846 3546	1318932	10/20/2024 13:30	GED	SW846 8270E	1319871
3382844002	AC33101-02	SW846 3051A	1317128	10/17/2024 10:05	MEM	SW846 6010C	1318062
		SW846 7471B	1320490	10/24/2024 08:01	JMS	SW846 7471B	1321252
		SW846 3546	1318932	10/20/2024 13:30	GED	SW846 8270E	1319871
3382844003	AC33101-04	SW846 3051A	1317128	10/17/2024 10:05	MEM	SW846 6010C	1318062
		SW846 7471B	1320490	10/24/2024 08:01	JMS	SW846 7471B	1321252
		SW846 3546	1318932	10/20/2024 13:30	GED	SW846 8270E	1319871
		SW846 3546	1318932	10/20/2024 13:30	GED	SW846 8270E	1320102

Environmental Chemistry Lab Service
200 Route 130 North, Cinnaminson, NJ 08077
TEL: (856) 858-4800 FAX: (856) 786-5974

Chain of Custody / Analysis Request Form

Print ALL Information. Incomplete chain of custody could result in the delay of analysis.

EMSL Project # AC33101
Account Rep: ENVI54
Indicate State where samples were collected: MA

3382844
Logged By: CXW
PM: KSB

REPORT RESULTS TO:
Name: Travis Albert PO#:
Company
EMSL Analytical, Inc.
Address: 200 Route 130 North
City: Cinnaminson
State: NJ Zip: 08077
Tel: 856-303-2548 ext. 2548 Fax: 856-854-2362
Email: sublab@emsl.com
Sampled by: (Signature)

SEND INVOICE TO:
Name: PO#:
Company
EMSL Analytical, Inc.
Address: 200 Route 130 North
City: Cinnaminson
State: NJ Zip: 08077
Tel: 800-220-3675 Fax: 856-854-2362
# of Samples in Shipment: 3

Turnaround Time
Due 1
Analytical Laboratory
301 Fulling Mill Rd
Middletown, PA 17057
717-944-5541
PROJECT NAME:
Date of Sample Shipment: 10/10/24

	Lab Sample Number	Client Sample ID	Comp	Grab	Matrix: Waste WATER	SOIL	AIR	SLUDGE	OTHER	Preservative: HCl	HNO3	$Na_2S_2O_3$	ICE	Sampling: DATE	TIME	List Method and Test Needed: SVOC	Metals 6010/7470
1.	AC33101-01								X					10/02	11:21am	2X	X
2.	AC33101-02								X					10/02	11:47am	2X	X
3.	AC33101-04								X					10/02	12:20m	2X	X
4.																	
5.																	
6.																	

MJE 10/11/24

Temp By: MJE | WO Temp (°C): 17° | Therm ID: 569

Receipt Info Completed By: MJE
Cooler Custody Seal Intact: Y N NA
Sample Custody Seal Intact: Y N NA
Received on Ice: Y N
Cooler & Samples Intact: Y N
Correct Containers Provided: Y N
Sample Label/COC Agree: Y N
Adequate Sample Volumes: Y N
CR6 Samples Filtered: Y N NA
OP Samples Filtered: Y N NA
VOA Trip Blank: Y N NA
NJ≤ 4 Days?: Y N NA
Rad Screen (uCi): —
Courier/Tracking #: 280508572397

Released By Signature	Date & Time Released	Delivery Method	Received By Signature	Agency	Date & Time Received
	10/10/24	FedEx	Fedex		

Please indicate reporting requirements: ☐1. Results Only ☒2. Results and QC ☐3. Reduced Deliverables ☐4. Disk Deliverable ☐5. Other

Comments: **Please analyze for metals (As, Cd, Cr, Pb, Fe, Mn, Hg, Se, Zn) and SVOC 8270**

Fedex 10/11/24 924

17° 280508572397

Board of Health
Town of Needham
AGENDA FACT SHEET

MEETING DATE: **February 21, 2025**

Agenda Item	Enforcement of Zyn Nicotine Chill flavored pouches and other vape products.
Presenter(s)	Tara Gurge, Assistant Public Health Director Sainath Palani, Environmental Health Agent

1.	**BRIEF DESCRIPTION OF TOPIC TO BE DISCUSSED**

Public Health staff had a follow-up virtual meeting with Cheryl Sbarra and her staff. They gave us some helpful guidance on the next steps for enforcement of Zyn nicotine pouches. They also provided us with some resource articles, which we have also included for your review.

The enforcement guidance we received is noted below:

- We can continue our plan to enforce Zyn Chill, since the basis for prohibiting its sale is that it is considered a flavored product, which is prohibited.
- If the Board is interested in restricting the nicotine content, we can now limit it to the 3mg or 6mg amounts, due to the recent FDA authorization.
- Advertising and displays cannot be restricted per First Amendment.
- We can also restrict the scanning of the QR coupon code on the base of the Zyn containers, since coupons and discounts are not allowed.

We are open to receiving feedback from the Board. We would also like to receive feedback on some other vape products that may have a characterizing flavor.

2.	**VOTE REQUIRED BY BOARD OF HEALTH**

No vote requested.

3.	**BACK UP INFORMATION:**

a) FDA Authorizes Marketing of 20 ZYN Nicotine Pouch Products After Extensive Scientific Review (Jan. 16, 2025)
b) How Safe Are Nicotine Pouches? (June 24, 2024)
c) The Potential Impact of Oral Nicotine Pouches on Public Health: A Scoping Review (June 17, 2024)
d) Nicotine Pouches (Jan. 22, 2021)

178 Rosemary Street, Needham, MA 02494 P: (781) 455-7940 E: healthdivision@needhamma.gov

FDA NEWS RELEASE

FDA Authorizes Marketing of 20 ZYN Nicotine Pouch Products after Extensive Scientific Review

Agency Will Closely Monitor Youth Use and Company's Compliance with Marketing Restrictions

For Immediate Release:

January 16, 2025

Today, the U.S. Food and Drug Administration authorized the marketing of 20 ZYN nicotine pouch products through the premarket tobacco product application (PMTA) (/tobacco-products/market-and-distribute-tobacco-product/premarket-tobacco-product-applications) pathway following an extensive scientific review. This is the first time the agency has authorized products commonly referred to as nicotine pouches (https://www.fda.gov/tobacco-products/products-ingredients-components/other-tobacco-products#Nicotine%20Pouches), which are small synthetic fiber pouches containing nicotine designed to be placed between a person's gum and lip.

The FDA determined that the specific products receiving marketing authorization met the public health standard (https://www.fda.gov/tobacco-products/market-and-distribute-tobacco-product/premarket-tobacco-product-applications) legally required by the 2009 Family Smoking Prevention and Tobacco Control Act. This standard considers the risks and benefits of products to the population as a whole.

Among several key considerations, the agency's evaluation showed that, due to substantially lower amounts of harmful constituents than cigarettes and most smokeless tobacco products, such as moist snuff and snus, the authorized products pose lower risk of cancer and other serious health conditions than such products. The applicant also provided evidence from a study showing that a substantial proportion of adults who use cigarette and/or smokeless tobacco products completely switched to the newly authorized nicotine pouch products.

"To receive marketing authorizations, the FDA must have sufficient evidence that the new products offer greater benefits to population health than risks," said Matthew Farrelly, Ph.D., director of the Office of Science in the FDA's Center for Tobacco Products. "In this

case, the data show that these nicotine pouch products meet that bar by benefiting adults who use cigarettes and/or smokeless tobacco products and completely switch to these products."

Additionally, the FDA found that the applicant showed these nicotine pouch products have the potential to provide a benefit to adults who smoke cigarettes and/or use other smokeless tobacco products that is sufficient to outweigh the risks of the products, including to youth. As part of its evaluation, the FDA reviewed data regarding youth risk and found that youth use of nicotine pouches remains low despite growing sales in recent years. For example, the 2024 National Youth Tobacco Survey (/tobacco-products/youth-and-tobacco/results-annual-national-youth-tobacco-survey) showed that 1.8% of U.S. middle and high school students reported currently using nicotine pouches.

"It's critical that the manufacturer market these products responsibly to prevent youth use," said Brian King, Ph.D., M.P.H., director of the FDA's Center for Tobacco Products. "While current data show that youth use remains low, the FDA is closely monitoring the marketplace and is committed to taking action, as appropriate, to best protect public health."

While today's actions permit these specific tobacco products to be legally marketed in the U.S. to adults 21 and older, it does not mean these tobacco products are safe, nor are they "FDA approved." There is no safe tobacco product; youth should not use tobacco products and adults who do not use tobacco products should not start.

The FDA will closely monitor the marketing and use of these products. To reduce the potential for youth exposure to advertising of these products, the authorizations impose stringent marketing restrictions for digital, TV and radio, including measures to ensure ads are carefully targeted to adults ages 21 and older and the demographics of the audiences reached by the ads are tracked and measured by the manufacturer. The company also stated that they intend to implement additional measures to restrict youth access, reduce youth appeal and limit youth exposure to their labeling and advertising, such as: not using mass-market advertising on radio and TV; employing actors/models for marketing that are no younger than 35 years old, or styled to appear under 35; and avoiding any content designed to target youth, including characters, images or themes. The agency may suspend or withdraw a marketing granted order issued under the PMTA pathway for a variety of reasons if the agency determines the continued marketing of a product no longer meets the necessary public health standard, such as if there is a notable increase in youth initiation.

The products for which the FDA issued marketing granted orders are the following, each with two nicotine strengths (3 milligram and 6 milligram): ZYN Chill, ZYN Cinnamon, ZYN Citrus, ZYN Coffee, ZYN Cool Mint, ZYN Menthol, ZYN Peppermint, ZYN Smooth, ZYN Spearmint and ZYN Wintergreen. Importantly, today's actions are specific to these products only; the authorizations do not apply to any other nicotine pouch or other ZYN products. Additionally, the authorization does not allow the company to make reduced risk claims about the authorized products, which would require a modified risk tobacco product application.

Today's actions are the latest of many the FDA has taken to ensure all new tobacco products marketed in the U.S. undergo science-based review and have received marketing authorizations by the agency. To date, the FDA has received applications for nearly 27 million products and has made determinations on more than 26 million of those applications. This includes authorization of other flavored oral tobacco products, including nicotine mints and chews in 2021 and mint smokeless tobacco in 2015. To find a list of tobacco products that may be legally marketed and sold in the U.S., visit the FDA's Searchable Tobacco Products Database (https://www.accessdata.fda.gov/scripts/searchtobacco/).

Related Information

- ZYN: Order Letters (https://www.accessdata.fda.gov/static/searchtobacco/ZYN/MGO_Ltr_SMUSA_PM593-PM612_Zyn_MM_DD_2024_Redacted.pdf) and Decision Summaries (https://www.accessdata.fda.gov/static/searchtobacco/ZYN/PMTA_TPL_PM593-PM612_Zyn_01_13_2025_Redacted.pdf)
- Other Tobacco Products: What Are Nicotine Pouches? (https://www.fda.gov/tobacco-products/products-ingredients-components/other-tobacco-products#Nicotine%20Pouches)
- Searchable Tobacco Products Database (https://www.accessdata.fda.gov/scripts/searchtobacco/)
- Quitting Smoking and Other Tobacco Public Health Resources (/tobacco-products/health-effects-tobacco-use/quitting-smoking-and-other-tobacco-public-health-resources)
- The Relative Risks of Tobacco Products (/tobacco-products/health-effects-tobacco-use/relative-risks-tobacco-products)

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The FDA, an agency within the U.S. Department of Health and Human Services, protects the public health by assuring the safety, effectiveness, and security of human and veterinary drugs, vaccines and other biological products for human use, and medical devices. The agency also is

responsible for the safety and security of our nation's food supply, cosmetics, dietary supplements, radiation-emitting electronic products, and for regulating tobacco products.

Inquiries

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How safe are nicotine pouches? 'Tobacco-free' does not mean 'risk-free,' VCU expert says

Alexandra Howell, DMD, of the VCU School of Dentistry, urges nicotine pouch users to prioritize dental screenings for health problems.

June 24, 2024

While the pouches are marketed as a way to help smokers quit, researchers note that the amount of nicotine in these products is often higher than nicotine replacement therapies. (Getty Images)

By Sara McCloskey

A nicotine product marketed as an alternative to smoking - and a potential way to quit - is gaining popularity, but experts say there are still concerns when it comes to your health.

Nicotine pouches are dissolvable pouches with a nicotine powder mix that doesn't have tobacco leaves. One of the popular brands is ZYN, of which 350 million cans were sold the United States in 2023 - an increase of 62% compared to the previous year.

The amount of nicotine in oral pouches, like ZYN, is similar to smokeless tobacco products, such as snus and snuff which are placed in the lip to be absorbed through the gums.

"Nicotine pouches are marketed as a nicotine product that provides a buzz without the harmful effects of tobacco or smoking. However, people using these products should be aware that 'tobacco-free' does not mean 'risk-free,'" said Alexandra Howell, DMD, oral medicine specialist and assistant professor in the Department of Oral Diagnostic Sciences at Virginia Commonwealth University's School of Dentistry.

As researchers are still studying the health impacts of these newer nicotine products, federal health experts note smokeless tobacco products are still causing serious health problems, including nicotine addiction and diseases of the mouth.

"While these pouches may seem like a convenient way to consume nicotine, people should be aware of the potential oral health risks," Howell added.

Howell spoke with VCU Health News about the impact nicotine pouches have on your teeth, gums and mouth as well as other health considerations for people using smokeless tobacco or oral nicotine products.

What is in smokeless tobacco products and nicotine pouches that could be harmful?

When considering smokeless tobacco, individuals who dip or chew get about the same amount of nicotine as regular smokers. Additionally, they are subjected to at least 28 carcinogenic chemicals. Among these, tobacco-specific nitrosamines (TSNAs) pose the most significant cancer risk. The concentration of TSNAs differs among products, with higher levels correlating to increased cancer risks.

The U.S. Food and Drug Administration has established a list of chemicals that are called HPHCs - Harmful and Potentially Harmful Constituents - that are in tobacco products that cause or could cause harm to smokers or nonsmokers. While these oral nicotine products don't seem to contain TSNAs, they still have been found to have low levels of several of these HPHCs.

The cancer risk associated with newer variants of smokeless tobacco or oral nicotine products remains somewhat uncertain, primarily due to limited research compared to traditional chewing tobacco and snuff. Nevertheless, these newer products still harbor potentially detrimental chemicals that could elevate cancer risk.

What other health problems are associated with nicotine pouches and smokeless tobacco products?

Nicotine pouches present several cardiovascular risks due to the nicotine content. The use of these products can lead to increased heart rate and blood pressure, which may increase the risk of developing cardiovascular diseases such as hypertension, heart disease, and potential heart attacks.

As far as the potential oral side effects are concerned, many users report significant mouth sores and gum irritation, particularly in the area where the pouch is placed. The continuous exposure to nicotine and other ingredients, like artificial flavorings and sweeteners, can lead to inflammation, redness, ulcers and swelling. Over time, this can contribute to gum recession, exposing the roots of the teeth and increasing sensitivity and risk of cavities.

Nicotine has also been shown to reduce saliva production, leading to dry mouth. Saliva is crucial for neutralizing acids produced by bacteria in the mouth, washing away food particles and helping digestion. A lack of saliva can result in an increased risk of tooth decay, mouth irritation, bad breath and other dental problems.

Traditional smokeless tobacco is still known to cause gum disease, dental decay, and tooth loss. In addition, it can also cause white or gray patches inside the mouth, called leukoplakia, that can lead to cancer.

Are nicotine pouches safer than vaping?

According to the Centers for Disease Control and Prevention, no tobacco products, including vapes or e-cigarettes, are safe. Nicotine, which is found in tobacco products, is addictive. In general, tobacco-free nicotine products, like ZYN pouches or vapes, were originally developed as tools to help people quit smoking, and they are not intended for those who do not already use tobacco or nicotine products.

Some research shows that the oral pouches' nicotine levels are higher than medications prescribed by a doctor to help smokers quit, called nicotine replacement therapy.

The dental and medical communities are urging for more comprehensive research to fully understand the long-term effects that these increasingly popular nicotine products have on oral health.

It is crucial that people who use these products prioritize regular dental check-ups to screen for these potential issues and maintain good oral hygiene daily.

More health and wellness news

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Review

The Potential Impact of Oral Nicotine Pouches on Public Health: A Scoping Review

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Abstract

Introduction: Oral nicotine pouches (ONPs) are a new class of nicotine products. This scoping review summarizes evidence on ONPs and explores their potential public health impact.

Aims and Methods: We conducted a structured literature search for empirical studies across three electronic databases through January 10, 2024. Outcomes included ONP product characteristics, use patterns, beliefs and perceptions, toxicity, and marketing and sales.

Results: Sixty-two studies were included, 17 were industry-funded. Most studies were from the United States. While large variations across studies were observed in ONP youth prevalence estimates, nationally representative U.S. studies find current use at 1.5% and lifetime use below 2.5% through 2023. Between 35% and 42% of U.S. adolescents and young adults have heard of ONPs, and 9-21% of tobacco-naïve youth were susceptible to trying them. U.S. adult-use estimates varied widely (0.8%–3% current; 3%–16% lifetime use) and were limited to populations with a history of tobacco use. The chemical composition of ONPs suggests fewer harmful/potentially harmful compounds at lower levels than cigarettes and smokeless tobacco (SLT), except formaldehyde. Industry-funded studies find substantially less cytotoxicity compared to cigarettes and suggest that higher nicotine-strength ONPs can deliver nicotine at levels comparable to or higher than SLT or cigarettes, although with slower nicotine release than cigarettes. Evidence on the cytotoxicity of ONPs relative to SLT is mixed.

Conclusions: ONPs appear to be less toxic than cigarettes and deliver comparable nicotine, presenting an alternative for combustible product users, although key data are mainly available from industry-funded studies. Data from independent research is critically needed. Industry marketing of ONPs may encourage initiation in youth and situational and dual use in adults.

Implications: The review provides an initial assessment of the potential role of ONPs in harm reduction and aims to determine unintended consequences of their use (youth uptake and dual-use) and identify populations that disproportionately use the product. This information is essential for tobacco regulatory bodies in determining the net public health impact of nicotine pouches.

Introduction

Over the last decade, noncombustible nicotine-containing products that are potentially less harmful than combustible tobacco products have entered the global tobacco market. Harm reduction literature has since mainly focused on electronic nicotine delivery systems (ENDS)[1–4] and heated tobacco products (HTPs).[5–8] Recently, a new class of noncombustible nicotine products, known as oral nicotine pouches (ONPs), has emerged. ONPs are pre-portioned pouches similar in appearance and use to traditional snus (a form of smokeless tobacco [SLT] placed between gum and lip) and are sold in various flavors and nicotine strengths. Unlike SLT products that contain processed tobacco leaf, ONPs contain synthetic or tobacco-derived nicotine formulated into a white granular powder or a plant fiber-based substrate version[9] and are often marketed as "tobacco-free."[10]

Since their introduction to the global market after 2016, ONPs have become widely available, with the majority of sales concentrated in the United States, Sweden, and Denmark.[11,12] Particularly in the United States, sales of ONPs continue to grow rapidly.[13] Leading brands of ONPs are currently owned by the major tobacco companies (Table 1). With Altria buying an 80% stake in ON! in 2019 and Philip Morris International acquiring Swedish Match (ZYN) in 2022, the sales of ONPs in the United States are expected to further increase.[14] A substantial investment in the marketing of ONPs[15] suggests that ONPs are becoming increasingly important to the tobacco industry.

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Table 1. Leading ONP Brands Available in the United States Between 2016 and 2022

ONP brand	Manufacturer	Nicotine strengths	Flavors	Other oral nicotine products
ZYN	Philip Morris International (Swedish Match)	3 mg; 6 mg	Cool mint, peppermint, wintergreen, spearmint, cinnamon, coffee, citrus, unflavored smooth (unflavored), menthol (unflavored), and chill (unflavored).	n/a
On!	Altria	1.5 mg; 2 mg; 3.5 mg; 4 mg; 8 mg	Mint, berry, cinnamon, citrus, coffee, wintergreen, and original (unflavored)	n/a
VELO (formerly LYFT)	British American Tobacco (BAT)	2 mg; 4 mg; 7 mg	Mint, citrus, spearmint, wintergreen, cinnamon, citrus burst, dragon fruit, coffee, peppermint, and black cherry	VELO nicotine lozenge (berry, mint, dark mint, and crema flavors; 4 mg nicotine strength)
Rogue	Swisher International	3 mg; 6 mg	Wintergreen, peppermint, apple, berry, spearmint, cinnamon, mango, honey lemon, and tabac, original.	Rogue nicotine lozenge (wintergreen, peppermint, menthol, and citrus; 2 and 4 mg nicotine strength) Rogue nicotine gum (wintergreen, peppermint, fruit; 2 and 4 mg nicotine strength) Rogue nicotine tablet (wintergreen, peppermint, berry; 2 and 4 mg nicotine strength)

In the United States, the potential public health impact of ONPs is especially relevant because of steadily rising trends in awareness and use, particularly among young adults.[16,17] As with ENDS,[18,19] the wide variety of ONP flavors and aggressive marketing campaigns (eg, advertising ONPs as "flavor-ban approved," using social media campaigns)[20–22] have the potential to appeal to youth and young adults, providing another pathway to nicotine dependence. However, because ONPs do not involve combustion or contain tobacco leaves, they may be a lower-risk product if used as a substitute to replace more harmful types of tobacco, especially combustibles.[23]

Classification and regulation of ONPs vary substantially across countries. Some classify ONPs as nicotine replacement therapies regulated as medicinal products (eg, Finland, Spain, and Australia [for synthetic nicotine ONPs]), and others classify them as tobacco products (eg, Brazil and United States).[11] In other countries, ONP sales are banned or proposed to be banned (eg, Netherlands, Belgium, and Singapore) or are unregulated (eg, Germany, Sweden, and United Kingdom).[11,24,25] In the United States, the Food and Drug Administration (FDA) has asserted jurisdiction over ONPs, but no ONP product has yet received premarketing authorization. Hence, ONPs do not neatly fit into pre-established product categories and present a new challenge to regulators seeking to shape markets and protect public health.

Conceptual frameworks and regulatory agendas have been proposed to help inform regulatory actions.[23,26] However, due to the product's novelty, empirical evidence is needed to assess the potential role of ONPs in harm reduction and to identify unintended consequences of their use (eg, concurrent use with other tobacco products and youth uptake).

This scoping review summarizes the literature on ONP product characteristics, toxicity, use prevalence estimates, product appeal, risk perceptions, sales trends, and industry marketing tactics. We aim to provide direction for future research on ONPs useful to tobacco regulatory bodies.

Materials and Methods

We used a scoping review methodology to answer a broad research question of what is known about ONPs and to summarize findings from existing research, which we judged likely to be heterogeneous in study designs, methods, and outcomes. We adhered to guidelines for the Preferred Reporting Items for Scoping Reviews (PRISMA-ScR).[27]

Search Strategy

Following the review protocol, two reviewers (NT, HO) carried out a structured literature search in PubMed (MEDLINE), Web of Science, and Embase databases through January 10, 2024. We limited the searches to 2016 onwards, when ONPs first emerged in the U.S. market. The complete search strategy employed for PubMed is presented in File S1.

Two reviewers (NT and HO) independently extracted and screened titles and abstracts using the Distiller SR Literature Review Software (Version 2.35; DistillerSR Inc.; 2023). Reviewers were blinded to author names, affiliations, and publication journals. Two reviewers (NT and HO) independently screened full-text articles for eligibility criteria. Finally, two reviewers (NT and RR) searched reference lists in the bibliographies of eligible papers for additional sources. Disagreements between reviewers were resolved by consensus.

Eligibility

Eligible articles had to investigate ONPs in relation to any of five outcome categories: (1) Use Patterns (prevalence estimates, sociodemographic characteristics of users, and reasons for use); (2) Beliefs and Perceptions (product awareness, appeal, satisfaction, and risk perception); (3) Product Characteristics (nicotine content and pharmacokinetics); (4) Toxicity (toxicant content, in vitro/in vivo toxicity, and human health outcomes); and (5) Marketing and Sales (sales analysis, industry marketing strategies, advertising expenditures, and retail availability).

We included empirical studies of any design published in English and excluded reviews, editorials, commentaries, and conference proceedings. Studies that investigated oral nicotine products (eg, nicotine pouches, lozenges, and gum) as a category, without reporting nicotine pouch-specific findings, were excluded.

Data Extraction

Two reviewers (NT and HO) independently extracted data from eligible studies using an a priori-developed standardized data extraction tool in Microsoft Excel (Version 2310; Microsoft Corporation; 2019). Information was extracted for citation, funding, author financial disclosures, study design, data collection period, country of investigation, product definition, product characteristics (flavor, nicotine strength, and brand), comparator product, population characteristics (age, socioeconomic status, ethnicity/race, and history of tobacco or nicotine product use), description of intervention/exposure, cell-type (for in vitro studies), main results, authors' conclusions, and study limitations.

Data Synthesis

Our primary analysis consists of a detailed narrative and tabular presentation of the findings grouped by outcome category. The secondary analyses stratify findings by population, document differences in findings between industry versus non-industry-funded studies, and identify gaps and limitations of current research.

Results

A database search identified 277 unique records, of which 113 were further assessed for eligibility in full text. A total of 62 studies were eligible for inclusion, with 17 funded by industry (Figure 1). Most studies were from the United States (43), with some from Sweden (6), United Kingdom (4), Canada (4), Germany (3), the Netherlands (1), and Australia (1). Table S1 summarizes the characteristics of all included studies. The age ranges of the surveyed populations varied across studies and are presented in Tables S1–S3.

Use Patterns of ONPs

Prevalence Estimates of ONP Use

Estimates of current (mostly past 30 days) and lifetime (ever) use among youth, young adults, and adults in the United States and other countries are presented in Table S2.

United States.

Data from nationally representative and population-based youth surveys show lifetime ONP use among adolescents at 3.5%–4.1 % between 2019 and 2021,[28] at 1.9% in 2021[29,30] and at 2.3% in 2022[31] and 2023.[32] Current use was reported by 1.5%–2.0% of adolescents between 2019 and 2021,[28,33] 0.8% in 2021,[29,30] 1.1% in 2022,[31] and 1.5% in 2023.[32] Non-representative surveys report from 0.6%[34] lifetime use in adolescents to 16%–18%[35,36] lifetime and 11%–12% current use[35,36] in youth and young adults in 2021–2022, with higher estimates of lifetime (11%) and current (29%) ONP use among ENDS users.[37]

Adult prevalence estimates from two 2021 nationally representative surveys are limited to those with a history of tobacco use and estimate current use at 3% among current and former tobacco users,[38] and lifetime use at 5.6% among current smokers[16] and 16.4% among current and former tobacco users.[38] Various non-representative surveys estimated current use below 1% among current and former tobacco users in 2020[17,39] and at 2.2% among young adult cigarette and ENDS users in 2022.[40] Lifetime ONP use was reported

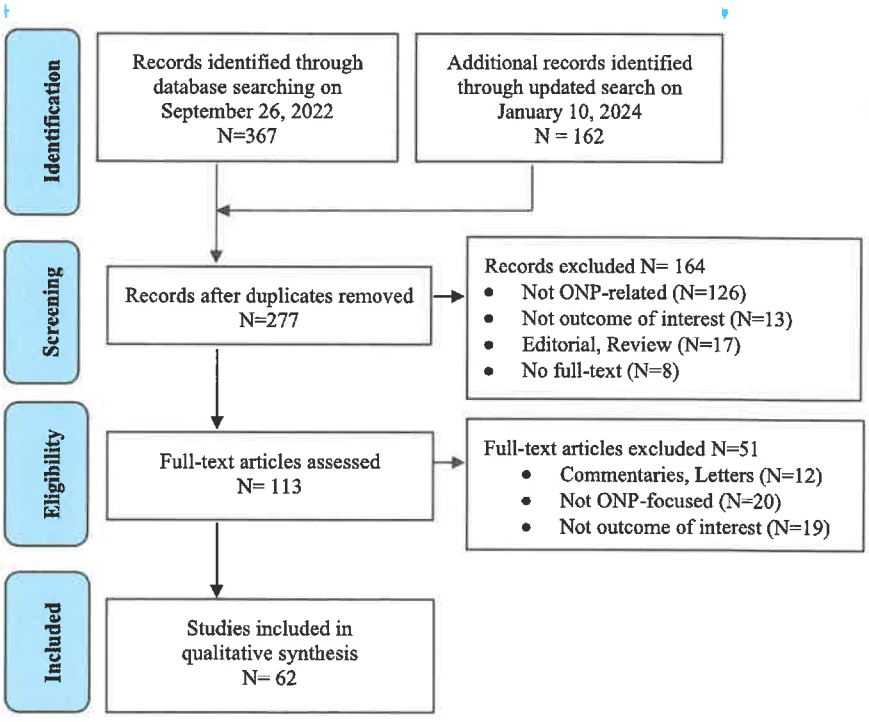

Figure 1. PRISMA Flow-chart of eligibility screening.

at 3% in a sample of current and former adult smokers and ENDS users in 2020[17] and at 10% among young adult current tobacco users in 2021–2022.[40–42]

Other Countries.

Lifetime ONP use among adolescents was reported at 0.3% and current use at 0% in the Netherlands,[43] while current use in Canada[33] and England[33] was below 1.5% in 2019–2020 nationally representative surveys. Among adults, current ONP use was below 0.5% in the Netherlands[43] and Great Britain[44] in 2020–2021, while nearly 3% of current and former smokers reported current ONP use in the United Kingdom in 2019.[45]

Demographic Characteristics of ONP Users

Studies investigating demographic characteristics of lifetime ONP users were largely heterogeneous in their samples and focused mainly on adult current and/or former tobacco product users (Table S3). Except for two UK studies,[44,45] all were from the United States. The majority of studies found a higher likelihood of lifetime ONP use for younger adults[17,35,41] or those ages 18–45,[16,38,45] males,[17,35,42,45] current[17,38] and lifetime[16,41,42] SLT users, and current cigarette and ENDS users.[45] Lifetime cigarette, cigar, and ENDS use were not associated with lifetime ONP use,[16,42] except in one survey.[41] The findings for lifetime ONP use and ethnicity, education, and income were inconsistent across studies: Positively associated with being white and higher education levels,[17,42,45] not associated with ethnicity and income,[16,17] and positively associated with lower levels of education[16] and lower income.[35] Among U.S. adolescents, higher lifetime ONP use was observed in male and non-Hispanic white populations,[28–32] and those reporting past 30-day SLT, ENDS, and cigarette use.[28]

Demographic characteristics of current ONP users were less studied due to small sample sizes. Studies suggest that current ONP users are likely to be young adults[35,38] and ages 35–44,[38,44] males,[35,44,46] and current SLT,[38,46] cigarette,[38,44] and ENDS[38,44] users as well as former smokers.[44,46]

Reasons for ONP Use

Non-Industry-Funded Studies.

A U.S. survey[40] of youth and young adults ages 18–34, many of whom used cigarettes and ENDS, found curiosity about the product (28%) and flavors (26%), use where other tobacco products are prohibited (26%), and discreet use (29%) to be the strongest motives for ever ONP use. In a Dutch survey[43] of adolescents and adults ages ≥13 most common reasons for ever ONP use were curiosity about the product (over 70%), and perceived reduced harm compared to cigarettes (over 20%). The availability of flavors (31%) was the main motive for use in a U.S. sample of ONP-experienced adults.[47]

Industry-Funded Studies.

A Swedish Match-funded U.S. study[46] found that less perceived harm compared to cigarettes was the most common reason for ZYN use among current cigarette smokers (73% of respondents) and dual cigarette and SLT users (60%) who started using ZYN. The less perceived harm compared to other tobacco products was the predominant reason for using ZYN among current SLT users (65%), current other tobacco product users (71%), former tobacco users (63%), and never-tobacco users (51%). Ease of pouch use (53%) and helping to reduce (46%) or quit (52%) other tobacco use were among other common reasons.

Beliefs and Perceptions

Product Awareness

US Youth and Young Adults.

Nearly 36% of middle and high school students had heard of ONPs in a 2021 representative survey.[29] Awareness was especially prevalent among ever and current users of SLT, ENDS, cigarettes, cigars, and HTPs. A 2021 Southern California survey[48] of young adult never-ONP users ages 19–23 found that nearly 11% were aware of ONP products, with greater awareness in current noncombustible product users (19%) and dual (combustible and noncombustible) users (20%). A 2021 survey[41] of young adults ages 18–25 (with current tobacco users oversampled) found nearly 42% awareness of ONPs. In another 2021 survey, 37% of young adults ages 18–25 were aware of synthetic nicotine ONPs, in particular.[42] Higher odds of awareness were associated with younger age and lifetime cigarette and cigar/cigarillo use. A 2022 survey[40] of young adults ages 18–34 (with oversampled cigarette and ENDS users) found 35% ONP awareness, with higher odds among males, nonwhite participants, and those using cigarettes, ENDS, and SLT.

US Adults.

A 2020 survey[17] found that nearly 20% of adults with a history of smoking and/or vaping had heard of ONPs, with increased awareness among younger ages 18–24 and those ages 40–54 compared to ≥55, and among current exclusive ENDS users, dual (ENDS and cigarette) users, and SLT users compared to non-current users. Representative surveys found that in 2021, nearly 29% of adult current established smokers[16] and nearly 47% of current and former adult tobacco users[38] were aware of ONPs. Higher awareness was observed for ages 18–29 and 30–44 compared to ages >60, and by ever SLT user.[16]

Other Countries.

In a 2019 UK representative survey,[45] 16% of adults with a smoking and/or vaping history had heard of ONPs. In a 2020 representative survey[43] of Dutch adolescents and adults, 7% were aware of ONPs, with higher awareness among adolescents (9%) and young adults ages 18–24 (10%) and 25–44 (9%) compared to ages > 44.

Product Interest/Susceptibility

US Youth and Young Adults.

Measures of product susceptibility varied, but generally included not being opposed to trying ONPs. Among Southern California adolescent never-tobacco users in 2021, between 9%[49] and 21%[50] were susceptible to trying ONPs after viewing product images. A 2021 Southern California survey[48] of young adult never users of ONPs ages 19–23 found 19% susceptible to trying ONPs after viewing ONP product images and advertising. Susceptibility was lower among non-users of any tobacco products (15%) compared to combustible product users (29%), exclusive noncombustible product (snus, ENDS, or HTP) users (34%), and multi-product users (44%). In a 2021 survey[42] of young adults ages 18–25, 29% were susceptible to trying synthetic nicotine ONPs in the

next year, with higher odds in males, and in lifetime cigarette, ENDS, and SLT users compared to non-users. Nearly 24% of young adults ages 18–25 were susceptible to ONP use in a 2021 survey,[41] with current tobacco users oversampled.

US Adults.

In a 2021 representative survey,[38] 43% of adult current and recent former tobacco users were susceptible to ONP use. Another 2021 representative survey[16] had nearly 17% of adult current established smokers expressing interest in using ONPs in the next 6 months, with greater interest observed in those who planned to quit smoking in the next 6 months or who previously tried quitting smoking, and those who ever used ONPs.

Industry-Funded Studies.

In a Swedish Match-funded adult consumer panel,[46] 75% of dual SLT and cigarette users found ZYN appealing after viewing its packaging and product description, followed by 52% of current SLT users, 36% of current smokers, 12% of former tobacco users and 11% of never-tobacco/nicotine users.

Risk Perception

In a Southern California survey[48] of young adult never users of ONPs nearly half were uncertain whether ONPs posed less harm to health than cigarettes (49%) and ENDS (52%). Uncertainty about the harm of ONPs relative to traditional SLT was also reported in a U.S. sample[41] of young adults (with current tobacco users oversampled). In a U.S. representative sample[38] of adult current and former tobacco users, 23% agreed that ONPs were less harmful than SLT, while 40% disagreed and 37% were unsure. ONPs were generally rated less harmful compared to cigarettes, cigarillos, and HTPs in a representative sample of Dutch adolescents and adults.[43] Susceptibility to ONP use and current and lifetime ONP use were associated with favorable harm perceptions of ONPs compared to SLT and other tobacco products.[38,40,41] In particular, awareness of and susceptibility to synthetic nicotine ONP use in young adults was associated with their less perceived harm than tobacco-derived ONPs.[42]

Experimental studies show that ONP product packaging influences risk perception. Viewing ONP packaging with a "tobacco-free" warning label was associated with reduced harm perception in young adult men[51] and with reduced risk perceptions and increased use intentions among youth, non-tobacco users, and racially minoritized groups[52] compared to viewing a standard FDA nicotine warning label. Risk perceptions also varied by tobacco use behavior. Viewing ONP packaging with a modified-risk tobacco product warning label was associated with reduced harm perception compared to cigarettes, but not ENDS in young adult cigarette/ENDS users.[53] Adult current smokers perceived ONPs to have similar overall health risks to cigarettes (less respiratory, but more oral and gastrointestinal), while SLT users viewed ONPs as similarly or less risky than SLT.[54] ONPs were perceived as less harmful by adult tobacco users versus non-tobacco users after viewing ONP pack images, regardless of the warning label presence.[55]

Subjective Ratings

Five industry-funded and one non-industry-funded randomized crossover studies examined subjective ratings of ONP use in established adult tobacco users, including product likability, satisfaction, intent to use again, changes in urges to smoke, and cravings for a cigarette.

Non-Industry Funded Studies.

In one study,[56] smokers found ONPs to be moderately appealing, but less appealing than usual brand cigarettes. Initial withdrawal relief was greater post-cigarette use, but remained comparable for both products during a 90-minute follow-up.

Industry-Funded Studies.

In a BAT-funded study,[57] satisfaction with different brand ONPs was assessed in current dual snus and cigarette users after a single cigarette or ONP product use. Higher scores for product likability were observed for combustible cigarettes (60%), followed by ZYN 10 mg (Swedish Match, 54%), and lowest for the lowest strength nicotine ONP (Altria's ON! 6 mg, 29%). Higher scores for intent to continue to use the product were received for combustible cigarettes (57%) than all ONPs (14% for ON! 6 mg- 37% for ZYN 10 mg). In an Altria-funded study[58] of smokers randomly assigned to ONP or own-brand cigarette use, the desire to use the product again was highest for cigarettes (86%), with ratings also high for six favors of ON! 4 mg pouches (71%–79%). Reduction in urges to smoke, cigarette craving, and positive subjective ratings (eg, pleasant, satisfying, and calming effects) were lower after ONP use of all flavors compared to cigarette use. In another Altria-funded study,[59] subjective ratings of ON! were similar between 1.5 and 8.0 mg nicotine strengths, but lower compared to participants' own-brand cigarettes and moist SLT in dual cigarette and moist SLT users. The reduction in cigarette craving and urges to smoke post-product use was comparable between ON! 8 mg and cigarettes and moist SLT. The desire to use the product again was highest for moist SLT (93%) and cigarettes (77%) compared to ONPs (46% for 8.0 mg—66% for 1.5 mg). In an Imperial Brands study,[60] product likability among tobacco users was similar for cigarettes compared to 5.8 and 10.1 mg ZoneX pouches. In an Imperial Tobacco Canada-funded study[61] of cigarette smokers, a 4 mg ONP showed greater product likability with 55% of responses compared to a 4 mg nicotine lozenge (19%) and 4 mg nicotine gum (9%). Product satisfaction was highest for nicotine gum (50% of responses), followed by ONP (40%) and lozenge (16%).

Overall findings indicate greater product likability, satisfaction, and desire for repeat use of combustible cigarettes and SLT than ONPs in adult smokers and dual cigarette and SLT users.

Product Characteristics

Nicotine Content and Release From Pouches

Four studies analyzed the nicotine content in ONPs, with two funded by industry

Non-Industry-Funded Studies.

An analysis[62] of 37 ONPs of different brands, nicotine strengths, and flavors yielded a range of total nicotine content from 0.89 mg/pouch (Velo 2 mg) to 6.73 mg/pouch (White Fox). ON! and White Fox exhibited the highest alkalinity levels (pH of 9.36), corresponding to 95.8% free-base nicotine in ON! 3 mg, 97.3% in ON! 6 mg, and 99.2% in White Fox pouches. Higher alkalinity (pH > 6) increased the amount of bioavailable free-base nicotine (the form most

easily absorbed), suggesting nicotine delivery properties of ONPs comparable to snus. In another study,[63] the nicotine content of 44 ONPs from 20 brands available in Germany ranged from 1.79 to 47.5 mg/pouch, with a median value of 9.48 mg/pouch. The pH levels ranged from 5.5 to 10.5, with a median of 8.8, while the median proportion of free-base nicotine was 86%.

Industry-Funded Studies.

In a Swedish Match study,[64] the amount of in vivo extracted nicotine from ZYN 6 mg (3.51 mg/pouch) after a 60-minute application by a sample of snus users was higher than from their General Snus 8 mg (2.41 mg/sachet). ZYN 8 mg yielded a higher amount of extracted nicotine (3.79 mg/pouch) than Longhorn 18 mg moist snus (2.99 mg/sachet) but lower than two 8mg General Snus sachets (5.04 mg). The extracted fraction of nicotine was higher from 3 mg (56%) and 6 mg (59%) ZYN than from General Snus 8 mg (32%) and higher from ZYN 8 mg (50%) than from both reference products (19% for Longhorn snus and 33% for two 8 mg General Snus sachets). A study[61] by Imperial Tobacco Canada found that the fraction of extracted nicotine from a pouch after a 60-minute application varied substantially within a sample of smokers, with mean values higher for the 4 mg ONP (62%) than the 4 mg nicotine gum (33%), but lower than the 4 mg nicotine lozenge (100%).

In summary, both industry and non-industry studies indicate levels of total and free-base nicotine in ONPs comparable to conventional SLT, suggesting the ability to deliver nicotine at a similar concentration as SLT. However, studies also indicate a high degree of variability in nicotine content between ONP brands.

Pharmacokinetics

All but one randomized crossover study analyzing the pharmacokinetic properties of ONPs were funded by industry (Table S4).

Non-Industry Funded Study.

In adult smokers, using ZYN 6 mg was associated with greater plasma nicotine delivery at 30 minutes than ZYN 3 mg or cigarettes.[56]

Industry-Funded Studies.

The nicotine plasma concentration after using a ZYN 6 mg pouch was higher than General Snus 8 mg in snus users, while for ZYN 8 mg the concentration was comparable to Longhorn 18 mg moist snuff.[64] An analysis of six flavors of ON! 4 mg suggested slower nicotine release and lower nicotine plasma concentration compared to smokers' own cigarette brands.[58] A subsequent analysis[59] of various nicotine strength ON! pouches found lower plasma concentrations for lower strength ONPs (<4 mg) compared to own-brand cigarette and moist SLT in dual cigarette and moist SLT users, while the pharmacokinetic profile of ON! 4 mg was comparable to moist SLT, and the profile of ON! 8 mg substantially exceeded that of cigarettes and moist SLT. Nicotine release was slower for all ONPs than for cigarettes, and comparable to moist SLT.

The nicotine plasma concentration of LYFT 10 mg was substantially greater than for a cigarette and other ONPs (ZYN 10 mg and Skruf 8 mg) in dual snus and cigarette users, while nicotine release was slower for all ONPs than for a cigarette.[57] Nicotine delivery was lower and slower for both 5.8 and 10.1 mg ZoneX ONPs compared to cigarette in cigarette smokers or snus users.[60] Nicotine plasma concentration of BAT-manufactured 4 mg ONPs in smokers were similar to those of the same strength nicotine lozenge, but much higher than those of nicotine gum.[61]

Overall, studies suggest a lower plasma nicotine concentration for lower-strength ONPs (<4 mg) compared to cigarettes and SLT, while higher-strength ONPs (≥6 mg) may deliver comparable or higher nicotine than conventional SLT products and cigarettes.

Toxicity

Toxicant Content

Evidence on ONP constituents was obtained from five chemical studies, two were industry-funded.

Non-Industry-Funded Studies.

A screening[65] of 48 ONPs from 22 manufacturers showed 186 different chemical components present besides nicotine, with an average of 17 constituents in each ONP. Eight were classified as hazardous according to the European Classification Labeling and Packaging regulation, and methyl eugenol, benzophenone, and β-myrcene were classified as possibly carcinogenic to humans by the International Agency for Research on Cancer. Among other carcinogens, tobacco-specific nitrosamines (TSNAs) were detected in 26 of the 44 ONP samples from 20 manufacturers,[63] although often below quantification levels. The authors report that the highest detected levels were much lower than those typically found in cigarettes and snus.

In an analysis[9] of 21 white granular powder-based or plant fiber-based ONPs, levels of benzo[a]pyrene, nitrite, acetaldehyde, and metals were generally found to be either below quantification levels or at far lower levels compared to snus products, with some notable variations between samples. For example, in some plant-based ONP samples, levels of acetaldehyde, nitrite, and nickel were substantially higher than in snus products. Quantifiable TSNA levels were observed in two plant-based ONP samples, but at much lower levels than in snus. Formaldehyde was consistently found in all ONPs at levels comparable to snus, except in two white granular powder ONPs with concentrations three-to-four times higher than in snus products.

Industry-Funded Studies.

A Swedish Match-funded analysis[66] quantified the fewest non-nicotine compounds in the NRT lozenge (nickel), followed by ZYN moist (formaldehyde, chromium, ammonia), ZYN dry (formaldehyde, chromium, ammonia, and nickel), and NRT gum (cadmium, chromium, lead, nickel, acetaldehyde, ammonia, and the uranium isotopes). Both ZYN and NRT products contained the lowest levels of detected compounds. Snus and moist snuff contained the highest number of compounds (19 and 26, respectively), with the highest levels observed for moist snuff. While ZYN moist and snus products contained comparable levels of formaldehyde, ZYN dry exceeded those levels by five times. Notably, the study detected no TSNAs in ZYN products.

Apart from moisture and nicotine, only chromium and formaldehyde were detected in some LYFT ONP samples in a BAT-funded study.[67] TSNA levels were below quantification. Chromium and nickel were detected in one of the three

Table 2. In Vitro Toxicity of Oral Nicotine Pouches Compared to Other Tobacco Products

Author, year	Funding	Test product	Toxicity: ONP	Toxicity: Reference product 1	Toxicity: Reference product 2
Bishop et al., 2020[68]	BAT	LYFT, Berry Frost 4 mg	Minimal cytotoxicity in all assays	*Snus* Minimal to moderate cytotoxicity in all assays	*Cigarette* Consistent toxicological effects in most assays
East et al., 2021[69]	BAT	LYFT, 4–11 mg, various flavors	All deemed non-cytotoxic (below the 30% toxicity threshold)	*Competitor ONP* (Nordic Spirit) 86% toxicity	*Snus* 91% toxicity
Yu et al., 2022[70]	Imperial Brands	Skruf Superwhite (mint, 5.8 and 10.1 mg)	Minimal cytotoxicity (above the 20% toxicity threshold)	*Snus* Minimal to moderate cytotoxicity (above the 20% toxicity threshold)	*Cigarette* Substantially more cytotoxic
Alizadehgharib et al., 2022[71]	Swedish Match	ZYN (cinnamon, smooth, peppermint, 3 or 6 mg)	No inflammatory response	*Competitor ONP* (LYFT Ice Cool) Significant increase in the production of proinflammatory cytokines	*Four snus products* Significant increase in the production of proinflammatory cytokines
Shaikh et al., 2022[72]	U.S. National Institutes of Health	Multiple nicotine strengths of different flavor ONPs (ZYN, ON!, VELO, and Rogue)	Increased cytotoxicity and inflammatory response compared to non-treated cells	*Snus* Cytotoxic effects of ZYN spearmint were comparable to those of identically flavored reference snus product.	
Shaikh et al., 2022[73]	U.S. National Institutes of Health	ZYN Smooth 6 mg, Lucy Spearmint 8 mg, ON! 8 mg Citrus	Increased cytotoxic response for ON! (20%–34%) and Lucy (13%–19%) at all concentrations, and ZYN (15%–30%) at higher concentrations.	*Snus* Increased cytotoxic response of 13%–16% at higher concentrations for snus #1, and 21%–27% at all concentrations for snus #2.	
Miller-Holt et al., 2022[74]	JTI	Nordic spirit spearmint and mint of multiple strengths	non-mutagenic, non-genotoxic and non-cytotoxic	*Snus* non-mutagenic, non-genotoxic and non-cytotoxic	*Cigarettes* mutagenic, genotoxic, and cytotoxic
Rinaldi et al., 2023[75]	Federal	Five ONPs of various flavors and nicotine strengths	Cytotoxicity was observed in two of the five ONPs.	*Snus* No cytotoxicity	

BAT = British American Tobacco; JTI = Japan Tobacco International.

replicates of the comparator nicotine lozenge. Cadmium, chromium, nickel, and lead were present at low levels in the nicotine gum. In contrast, Swedish snus products contained 11 chemical compounds. Notably, levels of formaldehyde in ONPs were higher than in both NRT products and comparable to Swedish snus. Table S5 shows how highest detected levels of common toxicants found in ONPs compared to reference products.

Overall, both industry and non-industry-funded studies consistently found formaldehyde in ONPs, sometimes at levels much higher than in reference snus. Chromium, ammonia, and nickel were also detected in many ONP samples. TSNAs were quantifiable in some samples in two non-industry-funded studies, but not in industry-funded studies.

In Vitro *Toxicity*

Five out of eight studies assessing the in vitro toxicity of ONPs were industry-funded (Table 2).

Non-Industry-Funded Studies.

Comparative analyses[72,73] of inflammatory response, reactive oxygen species (ROS) production, and cytotoxicity between identical flavors of four various nicotine strengths of major ONP brands found increased cytotoxicity, differential ROS, and proinflammatory cytokine release in human bronchial epithelial cells compared to untreated cells at lowest concentration treatments at 4–24 hours. In particular, cytotoxic effects of ZYN 6 mg spearmint were comparable to those of identically flavored reference snus products.[72] In human oral gingival epithelial cells, increased cytotoxicity, differential ROS, and cytokine release were observed in ONPs at the highest nicotine concentration, particularly for tobacco-, citrus-, and cool cider-flavored pouches.[73] ONPs were found to induce an oxidative stress response rather than an inflammatory response in human gingival fibroblasts after 24 hours of exposure, compared to snus that induced both.[75] While the referenced snus product did not exhibit any cytotoxicity, two of the five ONP samples did. The authors concluded that flavorings likely contributed to the toxicity of ONPs.[75]

Industry-Funded Studies.

A BAT-funded study found LYFT 4 mg to be minimally toxic in all cytotoxicity assays, whereas snus showed minimal to moderate, and cigarettes showed consistent toxicological

effects in most assays of human oral fibroblasts and human lung epithelial cells.[68] In a subsequent BAT study,[69] all LYFT ONPs (4–11 mg) were deemed non-cytotoxic in a short-term assay using human bronchial epithelial and human gingival fibroblast cells. In contrast, the competitor ONP (Nordic Spirit, JTI) and the reference snus induced up to 86%–91% cytotoxicity. Flavor and nicotine strength did not affect the overall toxicity of the ONPs.

In a JTI-funded study, Nordic Spirit ONPs of various nicotine strengths and the reference Swedish snus were found non-mutagenic, non-genotoxic, and non-cytotoxic in Chinese hamster ovary cells compared to the reference cigarette.[74] A study by Swedish Match showed that exposure of human peripheral blood mononuclear cells to ZYN (3 and 6 mg) did not elicit an in vitro inflammatory response, while four Swedish snus products and the competitor ONP (LYFT and BAT) exhibited a significant increase in proinflammatory cytokine release compared to unstimulated cells.[71] An Imperial Brands-funded study showed that their Skruf Superwhite ONPs (5.8 and 10.1 mg) and a Swedish snus reference product of identical flavor were deemed cytotoxic in human lung epithelial and liver cancer cell lines, although substantially less cytotoxic than the reference cigarette.[70] Compared to a cigarette, neither ONPs nor the reference snus were found to be mutagenetic or genotoxic.

Overall, non-industry-funded studies are scarce and suggest cytotoxic effects of ONPs comparable to or exceeding those of SLT in some samples. Industry-funded findings suggest that ONPs are minimally cytotoxic, likely less cytotoxic than SLT, and substantially less cytotoxic than cigarettes. Variations in findings were observed between ONP brands. While own-brand products were typically reported as non-cytotoxic or minimally cytotoxic, the same brand products were found to be substantially more cytotoxic and comparable to snus when used as a reference product in another study, often funded by a competitor brand.

Human Studies

All four studies examining the human health effects of ONPs were industry-funded. The almost complete substitution of Swedish snus with 3 or 6 mg ZYN during a 6-week period resulted in the gradual resolution of preexisting oral mucosal lesions in healthy snus users.[71] Exposure to LYFT 10 mg for 86 days resulted in minimal tooth enamel staining compared to cigarette smoke and snus.[76] Compared to smokers, urine and blood samples of exclusive VELO users showed lower levels of biomarkers of exposure and potential harm, except for one biomarker of oxidative damage and two biomarkers related to cardiovascular disease incidence that were not significantly different from those of smokers.[77] Completely switching from smoking to either 2, 4, or 8 mg ON! use for 7 days reduced levels of biomarkers of exposure to tobacco-related toxicants (comparable to stopping all tobacco use) in urine and blood samples of smokers relative to those who continued smoking.[78]

Marketing and Sales

Market Share and Sales Data

Sales data from the 2011–2019 Nielsen Convenience Track system[79] indicate that oral nicotine product sales steadily increased to constitute 4% of the overall U.S. SLT market by 2019, with the vast majority of sales attributed to ONPs. The most sold ONP flavors were spearmint/mint (55%) and wintergreen (23%). By 2019, the U.S. ONP market leader was ZYN, capturing 86% of the ONP market.[79] An analysis[80] of U.S. Nielsen sales data showed that ONP sales increased from 163 178 units in 2016 to 45.97 million units in 2020, with ZYN comprising nearly 79% of ONP market share in 2020, followed by ON! (10.0%), VELO (7.6%) and Rogue (2.4%). A subsequent Nielsen sales data analysis[13] showed a further sales increase to 808.14 million units by 2022, with ZYN leading the overall unit share (58.8%), followed by ON! (24.6%), VELO (12.1%), and Rogue (4.8%).

Advertising Expenditures and Industry Marketing Strategies

While conventional SLT products accounted for 63% of total US smokeless tobacco advertising expenditures between 2018 and 2020, ONP advertising exceeded those expenditures by August 2020.[15] The vast majority of conventional SLT advertising expenditures were through print media (96%), whereas most ONP promotion spending was through TV (61%) and radio (23%). Between 2019 and 2021 VELO spent the most on advertising ($23.45 million), vastly exceeding the expenditures of the U.S. ONP market leader ZYN ($1.17 million).[11,81] Ad occurrences and characteristics analyses showed that VELO was predominantly promoted through television (17%) and radio (79%), referring to "freedom," "health claims," "flavor," and "innovation" in headlines, targeting designated geographic market areas. ON! was commonly promoted through online displays (98.5%), with ads focusing on "flavor," prioritizing national distribution. ZYN was also commonly promoted through online displays (78%), with ad headlines emphasizing "freedom," "health claims," and "brand," focusing on national distribution.[11] The most common claims in direct-mail advertising for ON! and VELO (including lozenges) were that the product could be used anywhere (84%), was an alternative to other tobacco products (69%), and was tobacco-leaf free (55%).[82]

Retail Availability

An audit of tobacco retailers in four U.S. states in 2021 found that ONPs were available in nearly half of stores, but were more common in chain convenience stores and neighborhoods with more non-Hispanic White residents.[83] An analysis of 2016–2020 Nielsen data (excluding e-commerce and tobacco specialty stores) found that convenience stores accounted for 97.7% of U.S. ONP sales.[80]

Discussion

ONPs, mainly produced by major combustible tobacco manufacturers, have become widely available in the United States. While large variations in use prevalence estimates were observed across studies, nationally representative U.S. studies suggest current youth ONP use below 1.5% and lifetime use below 2.5% through 2023. Adult use estimates were largely limited to populations with a history of tobacco use and varied widely by age and tobacco/nicotine product use status. In view of recent sales trends, estimates may have increased in the past year.[84,85] Industry advertising expenditures for ONPs have grown, exceeding those of traditional SLTs, suggesting increasing interest by tobacco companies in promoting ONPs.

The public health impact of ONPs will depend on the extent to which they replace or supplement the use of more harmful tobacco products, and contribute to the initiation of ONPs

or other nicotine or tobacco product use among nicotine/tobacco-naïve populations. Thus, it will be essential to understand the demographics of ONP users and the patterns and timing of use and co-use with other products. While longitudinal data on ONP use patterns and transitions are missing due to the novelty of the product, our review of cross-sectional studies found that in populations with a history of tobacco/nicotine product use, higher lifetime ONP use was observed for younger adult males, current and lifetime SLT users, current smokers, and dual cigarette and ENDS users. Among U.S. adolescents, higher lifetime ONP use was observed in male and non-Hispanic White populations. Thus, ONPs seem to attract youth with characteristics similar to the lifetime adolescent SLT users.[32] Studies of current ONP use commonly reported small sample sizes and limited predictive power of observed sociodemographic associations. In addition, measures of current use in the reviewed literature have been mainly limited to past 30-day use, and thus may not represent regular use. More accurate and consistent measurements of ONP use have been recommended.[86] Continued monitoring is needed to understand the likelihood of supplemental ONP use, use as a replacement for combustibles and other tobacco products, and use in otherwise nicotine-naïve populations.

ONP products have the potential to help smokers and SLT users transition to a less harmful alternative. While scarce, non-industry-funded studies of the chemical composition of ONPs report a total of 180 chemicals and indicate the presence of some harmful and potentially harmful compounds, including TSNAs. Such compounds were found at much lower levels compared to cigarettes and SLT, with the exception of formaldehyde levels, comparable to or higher than SLT. We note the high variability of identified compounds and their levels across different ONP products. More generally, tobacco smoke contains over 7000 chemicals, including 69 identified as carcinogens,[87] while SLTs contain nearly 4000 chemicals with 28 known carcinogens.[88,89] However, comparing constituents per unit does not provide a meaningful conclusion about the toxicant levels to which the user is exposed. To compare levels of exposure between ONPs and other products, factors like nicotine content and user behavior need to be considered. For example, considering smokers who switch to ONPs, comparing the toxicant exposure from the amount of the ONP product with nicotine content equivalent to the cigarettes they smoked per day could provide more accurate estimates of differences in potential exposure. Since ONPs are not purported for inhalation, their potentially harmful constituents may be expected to impact oral, gastrointestinal, and cardiovascular health, rather than respiratory health.

Short-term in vitro toxicology studies, funded predominantly by industry, suggest substantially less ONP cytotoxicity than cigarettes. Wide variations were observed within industry studies and compared to non-industry-funded findings regarding cytotoxicity levels of ONPs relative to SLT. Industry-funded human studies suggest beneficial effects of ONPs in oral health after switching from SLT, and in levels of biomarkers of exposure and potential harm after short-term switching from cigarette to ONP use. Thus, findings suggest that ONPs may be substantially less toxic than cigarettes. Yet, given the past track record of tobacco-funded research bias,[90] independent studies are urgently needed to confirm these findings. In particular, more independent chemical, toxicological, preclinical, and human studies are needed to determine the harm of ONPs relative to SLT; which in turn are less harmful than cigarettes.[91,92] Also, toxicity will likely vary between ONP products. More research is needed to determine whether results from existing studies generalize to other products.

Another factor in the acceptance of ONPs as a potential alternative to cigarettes and SLT is the nicotine delivery and subjective rating of ONPs compared to cigarettes and other forms of smokeless. Pharmacokinetic studies by industry find that higher nicotine strength ONPs can deliver comparable or higher nicotine to the user than SLT or cigarettes, although with slower nicotine release than cigarettes. While ONPs generally demonstrated the ability to relieve nicotine withdrawal symptoms in smokers, consistently lower positive subjective ratings compared to cigarettes and SLT call into question their suitability as an effective substitute.

There is considerable concern in the tobacco control community about ONPs becoming a new form of nicotine dependence in the tobacco-naïve population, especially youth. While ONP use among U.S. adolescents remains relatively low, we found nearly 35%–42% ONP product awareness by adolescents and young adults, and 9%–21% of tobacco-naïve youth were susceptible to trying them. These findings suggest that ONP product appeal may reach others besides established tobacco users. Higher odds of ONP awareness and susceptibility to use were observed in ever and current combustible tobacco users, noncombustible tobacco users, and users of multiple tobacco products. In particular, higher awareness and susceptibility to use among dual cigarette and noncombustible product users may suggest a greater likelihood of situational than substitutional use of ONPs. Indeed, ONPs are often marketed as more discrete alternatives to combustibles, ENDS, or HTPs and cross-promoted to smokers as a "product that could be used anywhere."[82] Since they may be used where indoor smoking and ENDS/HTP use is prohibited, ONPs may encourage dual-use.[23,47,54,82]

Industry marketing strategies of ONPs include diverse demographic groups previously excluded from traditional smokeless product marketing (eg, females, people of color, and LGBTQ+).[93] The wide range of ONP flavors may be particularly attractive to youth.[40,72,94] Although tobacco companies claim to target smokers, they have also claimed that ONPs may increase the size of the nicotine product market, presumably by attracting youth and young adults who would not have otherwise smoked.[95,96] By using ad headlines focusing on freedom, innovation, and flavor, and emphasizing that ONPs are "tobacco-free," prominent ONP brands disassociate the product from more established tobacco products and may attract new tobacco-naïve users. In particular, the "tobacco-free" descriptor may confuse understanding of the source of nicotine: 17% of U.S. young adults wrongfully believed that tobacco-free ONPs contained neither tobacco nor nicotine.[97] The present review found that a "tobacco-free" modified warning label was associated with reduced harm perceptions among young adults, which in turn were related to higher susceptibility to ONP use, particularly among non-tobacco users.

In addition to the potential implicit reduced harm claims used by the industry to market ONPs, and their similarity in appearance to NRT products,[98] some tobacco companies manufacture both ONPs and other nicotine products, such as lozenges and gums, under the same brand name (eg, VELO and Rogue).[99,100] These marketing tactics may confuse users,

contributing to a blurring of the lines between cessation and recreational nicotine products.[98] Moreover, misleading marketing claims of "flavor-ban approved," while many U.S. states and localities have enacted restrictions on sales of flavored tobacco products, may further contribute to confusion about ONP regulation.[20,101]

In the United States, ONPs are currently neither authorized by the FDA for marketing as a modified-risk product, nor approved as a cessation product. If granted marketing authorization, industry marketing will need to be regulated. Standards for ONP content should be promulgated, particularly regarding nicotine levels, levels of toxic substances, and flavoring additives. FDA-mandated nicotine addiction warning labels should be enforced on product packaging without modifications. Globally, countries where ONPs are currently not regulated need to update their classification and regulatory policies to include ONPs, particularly those containing synthetic nicotine, which often fall outside of any regulatory purview.[11]

The results of this review should be interpreted in light of its limitations. Our literature search did not include gray literature databases and excluded articles published in languages other than English. This may have prevented us from identifying relevant studies, particularly from Scandinavian countries, where ONP use is particularly high.[102] Furthermore, as a scoping review we did not set out to statistically synthesize data or critically appraise the included studies. As more ONP studies become available, focused systematic reviews will be needed to provide pooled estimates and judge the quality and certainty of the evidence. We did not pre-register our review protocol in any publicly available databases.

We identified several limitations of current ONP research. The U.S. adult prevalence data from the included surveys are not representative of the general population due to oversampling of current and former smokers and other tobacco users. The low prevalence of ONP users precluded some studies from conducting stratified analysis by race/ethnicity and socioeconomic status. The cross-sectional design of the surveys further limits the ability to analyze transitions from smoking and other tobacco product use to ONP use to estimate their net public health benefit. Longitudinal data on transitions to and from ONP use is needed to inform independent simulation modeling studies to adequately estimate public health impacts. At present, the only such study is by industry.[103] Nationally representative surveys should incorporate consistent measurements of ONP use. Given the novelty of ONPs and their resemblance to other oral tobacco/nicotine products, surveys need to employ clear definitions of ONPs to avoid product misclassification and ensure accurate estimates.

Conclusions

Our scoping review provides an initial summary of the current evidence on ONP use and the potential impact of ONPs on public health. Based in part on the evidence from industry-funded studies, ONPs appear to be less toxic than cigarettes, and may deliver comparable nicotine to smokers, providing a potentially less harmful alternative to combustible products. More studies are needed to determine the harm of ONPs relative to SLT. Rather than, or in addition to, increased cessation from more harmful products, industry marketing might encourage the initiation of ONPs by youth and situational and dual-use by adults. Future studies should assess the awareness of, susceptibility to, and initiation of ONPs in a population with no history of tobacco/nicotine use, and better understand patterns of regular use among users of other nicotine and tobacco products, including transition patterns. As ONPs evolve, independently funded research is needed to understand and update use patterns as well as toxicology and health effects of ONPs compared to combustible and noncombustible products and to nonuse.

Supplementary material

Supplementary material is available at *Nicotine and Tobacco Research* online.

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Author Contributions

Nargiz Travis (Conceptualization [lead], Data curation [lead], Formal analysis [lead], Investigation [lead], Methodology [lead], Project administration [lead], Supervision [lead], Validation [lead], Visualization [lead], Writing—original draft [lead], Writing—review & editing [lead]), Kenneth Warner (Formal analysis [supporting], Writing—review & editing [supporting]), Maciej Goniewicz (Formal analysis [supporting], Writing—review & editing [supporting]), Hayoung Oh (Data curation [equal], Investigation [supporting], Methodology [supporting]), Radhika Ranganathan (Data curation [supporting], Investigation [supporting]), Rafael Meza (Writing—review & editing [supporting]), Jamie Hartmann-Boyce (Writing—review & editing [supporting]), and David Levy (Conceptualization [equal], Funding acquisition [lead], Methodology [supporting], Writing—original draft [supporting], Writing—review & editing [supporting])

References

1. Dai H, Leventhal AM. Prevalence of e-cigarette use among adults in the United States, 2014-2018. *JAMA*. 2019;322(18):1824.
2. Beard E, West R, Michie S, Brown J. Association of prevalence of electronic cigarette use with smoking cessation and cigarette consumption in England: a time-series analysis between 2006 and 2017. *Addiction*. 2019;115(5):961–974.
3. Filippidis FT, Laverty AA, Gerovasili V, Vardavas CI. Two-year trends and predictors of e-cigarette use in 27 European Union member states. *Tob Control*. 2017;26(1):98–104.
4. Gravely S, Driezen P, Ouimet J, *et al*. Prevalence of awareness, ever-use and current use of nicotine vaping products (NVPs) among adult current smokers and ex-smokers in 14 countries with differing regulations on sales and marketing of NVPs: cross-sectional findings from the ITC Project. *Addiction*. 2019;114(6):1060–1073.

5. Igarashi A, Aida J, Kusama T, *et al*. Heated tobacco products have reached younger or more affluent people in Japan. *J Epidemiol*. 2021;31(3):187–193.
6. Stoklosa M, Cahn Z, Liber A, Nargis N, Drope J. Effect of IQOS introduction on cigarette sales: evidence of decline and replacement. *Tob Control*. 2020;29(4):381–387.
7. Hwang JH, Ryu DH, Park SW. Heated tobacco products: cigarette complements, not substitutes. *Drug Alcohol Depend*. 2019;204:107576.
8. Kang SY, Lee S, Cho HJ. Prevalence and predictors of heated tobacco product use and its relationship with attempts to quit cigarette smoking among Korean adolescents. *Tob Control*. 2020;30(2):192–198.
9. Jablonski JJ, Cheetham AG, Martin AM. Market survey of modern oral nicotine products: determination of select HPHCs and comparison to traditional smokeless tobacco products. *SEPARATIONS*. 2022;9(3):65.
10. Robichaud MO, Seidenberg AB, Byron MJ. Tobacco companies introduce 'tobacco-. free' Nicotine Pouches. *Tob Control*. 2020;29(e1):e145–e146.
11. Duren M, Atella L, Welding K, Kennedy RD. Nicotine pouches: a summary of regulatory approaches across 67 countries. *Tob Control*. 2023;33:e32–e40.
12. European Parliament Committee on the Environment, Public Health and Food Safety (ENVI). Novel tobacco and nicotine products and their effects on health. https://www.europarl.europa.eu/RegData/etudes/IDAN/2022/740068/IPOL_IDA(2022)740068_EN.pdf. 2023. Accessed April 25, 2024.
13. Majmundar A, Okitondo C, Xue A, *et al*. Nicotine pouch sales trends in the US by volume and nicotine concentration levels from 2019 to 2022. *JAMA Netw Open*. 2022;5(11):e2242235.
14. Levy DT, Warner KE, Liber AC, *et al*. Potential implications for tobacco industry transformation of the acquisition of Swedish match by Philip Morris International. *Nicotine Tob Res*. 2023;25(12):1899–1903.
15. Emery SL, Binns S, Carter CC, Rose SW, Kostygina G. Characterising advertising strategies and expenditures for conventional and newer smokeless tobacco products. *Tob Control*. 2022;32:795–798.
16. Hrywna M, Gonsalves NJ, Delnevo CD, Wackowski OA. Nicotine pouch product awareness, interest and ever use among US adults who smoke, 2021. *Tob Control*. 2022;32:782–785.
17. Felicione NJ, Schneller LM, Goniewicz ML, *et al*. Oral nicotine product awareness and use among people who smoke and vape in the U.S. *Am J Prev Med*. 2022;63(4):611–618.
18. Walley SC, Wilson KM, Winickoff JP, Groner J. A public health crisis: electronic cigarettes, vape, and JUUL. *Pediatrics*. 2019;143(6):e20182741.
19. Collins L, Glasser AM, Abudayyeh H, Pearson JL, Villanti AC. E-cigarette marketing and communication: how E-Cigarette Companies Market E-Cigarettes and the public engages with E-cigarette Information. *Nicotine & Tobacco Research*. 2019;21(1):14–24.
20. Tackett AP, Barrington-Trimis JL, Leventhal AM. 'Flavour ban approved': new marketing strategies from tobacco-free nicotine pouch maker Zyn. *Tob Control*. 2022;32:e134–e135.
21. Talbot EM, Giovenco DP, Grana R, Hrywna M, Ganz O. Cross-promotion of nicotine pouches by leading cigarette brands. *Tob Control*. 2021;32:528–529.
22. Sun T, Tattan-Birch H. Sports, gigs, and tiktoks: multi-channel advertising of oral nicotine pouches. *Qeios* 2024.
23. Patwardhan S, Fagerstrom K. The new nicotine pouch category- a tobacco harm reduction tool? *Nicotine Tob Res*. 2021;24(4):623–625.
24. Salokannel M, Ollila E. Snus and snus-like nicotine products moving across Nordic borders: Can laws protect young people? *Nordisk Alkohol Nark*. 2021;38(6):540–554.
25. Linnansaari A, Ollila H, Pisinger C, *et al*. Towards Tobacco-Free Generation: implementation of preventive tobacco policies in the Nordic countries. *Scand J Public Health*. 2022;51(8):1108–1121.
26. Lund KE, Vedoy TF. A conceptual framework for assessing the public health effects from snus and novel non-combustible nicotine products. *Nordisk Alkohol Nark*. 2021;38(6):586–604.
27. Tricco AC, Lillie E, Zarin W, *et al*. PRISMA Extension for Scoping Reviews (PRISMA-ScR): checklist and Explanation. *Ann Intern Med*. 2018;169(7):467–473.
28. Schneller LM, Felicione NJ, Hammond D, Goniewicz ML, O'Connor RJ. Tobacco-free oral nicotine product use among youth in the U.S., 2019-2021. *AJPM Focus*. 2023;2(1):100061.
29. Kramer RD, Park-Lee E, Marynak KL, *et al*. Nicotine pouch awareness and use among youth, National Youth Tobacco Survey, 2021. *Nicotine Tob Res*. 2023;25(9):1610–1613.
30. Gentzke AS, Wang TW, Cornelius M, *et al*. Tobacco product use and associated factors among middle and high school students - national youth tobacco survey, United States, 2021. *MMWR Surveill Summ*. 2022;71(5):1–29.
31. Park-Lee E, Ren C, Cooper M, *et al*. Tobacco product use among middle and high school students - United States, 2022. *MMWR Morb Mortal Wkly Rep*. 2022;71(45):1429–1435.
32. Birdsey J, Cornelius M, Jamal A, *et al*. Tobacco product use among U.S. middle and high school students - National Youth Tobacco Survey, 2023. *MMWR Morb Mortal Wkly Rep*. 2023;72(44):1173–1182.
33. East KA, Reid JL, Rynard VL, Hammond D. Trends and patterns of tobacco and nicotine product use among youth in Canada, England, and the United States from 2017 to 2019. *J Adolesc Health*. 2021;69(3):447–456.
34. Harlow AF, Vogel EA, Tackett AP, *et al*. Adolescent use of flavored non-tobacco oral nicotine products. *Pediatrics*. 2022;150(3):e2022056586.
35. Patel M, Kierstead EC, Kreslake J, Schillo BA. Patterns of oral nicotine pouch use among U.S. adolescents and young adults. *Prev Med Rep*. 2023;34:102239.
36. Gaiha SM, Lin C, Lempert LK, Halpern-Felsher B. Use, marketing, and appeal of oral nicotine products among adolescents, young adults, and adults. *Addict Behav*. 2023;140:107632.
37. Couch ET, Halpern-Felsher B, Werts M, Chaffee BW. Use of emerging and conventional oral tobacco among Adolescent and Young Adult E-Cigarette Users. *Subst Use Misuse*. 2023;58(2):283–288.
38. Sparrock LS, Phan L, Chen-Sankey J, *et al*. Nicotine pouch: awareness, beliefs, use, and susceptibility among current tobacco users in the United States, 2021. *Int J Environ Res Public Health*. 2023;20(3):2050.
39. Li L, Borland R, Cummings KM, *et al*. Patterns of non-cigarette tobacco and nicotine use among current cigarette smokers and recent quitters: findings from the 2020 ITC four country smoking and vaping survey. *Nicotine Tob Res*. 2021;23(9):1611–1616.
40. Tosakoon S, Romm KF, Berg CJ. Nicotine pouch awareness, use and perceptions among young adults from six metropolitan statistical areas in the United States. *Tob Prev Cessat*. 2023;9:19.
41. Morean ME, Bold KW, Davis DR, *et al*. Awareness, susceptibility, and use of oral nicotine pouches and comparative risk perceptions with smokeless tobacco among young adults in the United States. *PLoS One*. 2023;18(1):e0281235.
42. Morean ME, Bold KW, Davis DR, *et al*. "Tobacco-free" nicotine pouches: risk perceptions, awareness, susceptibility, and use among young adults in the United States. *Nicotine Tob Res*. 2022;25(1):143–150.
43. Havermans A, Pennings JLA, Hegger I, *et al*. Awareness, use and perceptions of cigarillos, heated tobacco products and nicotine pouches: a survey among Dutch adolescents and adults. *Drug Alcohol Depend*. 2021;229(Pt B):109136.
44. Tattan-Birch H, Jackson SE, Dockrell M, Brown J. Tobacco-free nicotine pouch use in Great Britain: a representative population survey 2020-2021. *Nicotine Tob Res*. 2022;24(9):1509–1512.
45. Brose LS, McDermott MS, McNeill A. Heated tobacco products and nicotine pouches: a survey of people with experience of smoking and/or vaping in the UK. *Int J Environ Res Public Health*. 2021;18(16):8852.

46. Plurphanswat N, Hughes JR, Fagerstrom K, Rodu B. Initial information on a novel nicotine product. *Am J Addict.* 2020;29(4):279–286.
47. Dowd AN, Thrul J, Czaplicki L, *et al.* A cross-sectional survey on oral nicotine pouches: characterizing use-motives, topography, dependence levels, and adverse events. *Nicotine Tob Res.* 2024;26(2):245–249.
48. Vogel EA, Barrington-Trimis JL, Kechter A, *et al.* Differences in young adults' perceptions of and willingness to use nicotine pouches by tobacco use Status. *Int J Environ Res Public Health.* 2022;19(5):2685.
49. Vogel EA, Barrington-Trimis JL, Harlow AF, *et al.* Prevalence of and disparities in adolescents' susceptibility to novel oral nicotine products marketed as "tobacco-free.". *Prev Med.* 2023;166:107387.
50. Tackett AP, Wong M, Cho J, *et al.* Willingness to use commercial nicotine gums, lozenges, and gummies among nontobacco using adolescents in Southern California. *J Adolesc Health.* 2023;72(2):277–286.
51. Keller-Hamilton B, Curran H, Stevens EM, *et al.* Effects of "Tobacco Free" language in warning labels on perceptions of electronic cigarettes and nicotine pouches among young adult men: a randomized trial. *Subst Use Misuse.* 2023;58(10):1302–1306.
52. Morean ME, Gueorguieva R, O'Malley S, Krishnan-Sarin S. Including the term 'tobacco-free nicotine' in the nicotine addiction warning label mandated by the US Food and Drug Administration alters risk perceptions and use intentions. *Tob Control.* 2023:tc–2023.
53. Vogel EA, Tackett AP, Unger JB, *et al.* Effects of flavour and modified risk claims on nicotine pouch perceptions and use intentions among young adults who use inhalable nicotine and tobacco products: a randomised controlled trial. *Tob Control.* 2023:tc–2023.
54. Long L, Alalwan MA, Keller-Hamilton B, *et al.* Perceptions of oral nicotine pouches & their marketing among Ohio Appalachia smokers and smokeless tobacco users. *PLoS One.* 2023;18(10):e0293597.
55. Mays D, Long L, Alalwan MA, *et al.* The effects of oral nicotine pouch packaging features on adult tobacco users' and nonusers' product perceptions. *Int J Environ Res Public Health.* 2023;20(4):3383.
56. Keller-Hamilton B, Alalwan MA, Curran H, *et al.* Evaluating the effects of nicotine concentration on the appeal and nicotine delivery of oral nicotine pouches among rural and Appalachian adults who smoke cigarettes: a randomized cross-over study. *Addiction.* 2023;119(3):464–475.
57. McEwan M, Azzopardi D, Gale N, *et al.* A randomised study to investigate the nicotine pharmacokinetics of oral nicotine pouches and a combustible cigarette. *Eur J Drug Metab Pharmacokinet.* 2022;47(2):211–221.
58. Rensch J, Liu J, Wang J, *et al.* Nicotine pharmacokinetics and subjective response among adult smokers using different flavors of on! nicotine pouches compared to combustible cigarettes. *Psychopharmacology (Berl).* 2021;238(11):3325–3334.
59. Liu J, Rensch J, Wang J, *et al.* Nicotine pharmacokinetics and subjective responses after using nicotine pouches with different nicotine levels compared to combustible cigarettes and moist smokeless tobacco in adult tobacco users. *Psychopharmacology (Berl).* 2022;239(9):2863–2873.
60. Chapman F, McDermott S, Rudd K, *et al.* A randomised, open-label, cross-over clinical study to evaluate the pharmacokinetic, pharmacodynamic and safety and tolerability profiles of tobacco-free oral nicotine pouches relative to cigarettes. *Psychopharmacology (Berl).* 2022;239(9):2931–2943.
61. Azzopardi D, Ebajemito J, McEwan M, *et al.* A randomised study to assess the nicotine pharmacokinetics of an oral nicotine pouch and two nicotine replacement therapy products. *Sci Rep.* 2022;12(1):6949.
62. Stanfill S, Tran H, Tyx R, *et al.* Characterization of total and unprotonated (free) nicotine content of nicotine pouch products. *Nicotine Tob Res.* 2021;23(9):1590–1596.
63. Mallock N, Schulz T, Malke S, *et al.* Levels of nicotine and tobacco-specific nitrosamines in oral nicotine pouches. *Tob Control.* 2024;33:193–199.
64. Lunell E, Fagerstrom K, Hughes J, Pendrill R. Pharmacokinetic comparison of a novel non-tobacco-based nicotine pouch (ZYN) with conventional, tobacco-based swedish snus and american moist snuff. *Nicotine Tob Res.* 2020;22(10):1757–1763.
65. Mallock-Ohnesorg N, Rinaldi S, Malke S, *et al.* Oral nicotine pouches with an aftertaste? Part 1: screening and initial toxicological assessment of flavorings and other ingredients. *Arch Toxicol.* 2023;97(9):2357–2369.
66. Back S, Masser AE, Rutqvist LE, Lindholm J. Harmful and potentially harmful constituents (HPHCs) in two novel nicotine pouch products in comparison with regular smokeless tobacco products and pharmaceutical nicotine replacement therapy products (NRTs). *BMC Chem.* 2023;17(1):9.
67. Azzopardi D, Liu C, Murphy J. Chemical characterization of tobacco-free "modern" oral nicotine pouches and their position on the toxicant and risk continuums. *Drug Chem Toxicol.* 2022;45(5):2246–2254.
68. Bishop E, East N, Bozhilova S, *et al.* An approach for the extract generation and toxicological assessment of tobacco-free 'modern' oral nicotine pouches. *Food Chem Toxicol.* 2020;145:111713.
69. East N, Bishop E, Breheny D, Gaca M, Thorne D. A screening approach for the evaluation of tobacco-free 'modern oral' nicotine products using Real Time Cell Analysis. *Toxicol Rep.* 2021;8:481–488.
70. Yu F, Rudd K, Pour SJ, *et al.* Preclinical assessment of tobacco-free nicotine pouches demonstrates reduced in vitro toxicity compared with tobacco snus and combustible cigarette smoke. *Applied In Vitro Toxicology.* 2022;8(1):24–35.
71. Alizadehgharib S, Lehrkinder A, Alshabeeb A, Ostberg AK, Lingstrom P. The effect of a non-tobacco-based nicotine pouch on mucosal lesions caused by Swedish smokeless tobacco (snus). *Eur J Oral Sci.* 2022;130(4):e12885.
72. Shaikh S, Tung WC, Lucas J, *et al.* Flavor classification/categorization and differential toxicity of oral nicotine pouches (ONPs) in lung epithelial cells. *bioRxiv.* 2022.
73. Shaikh SB, Tung WC, Pang C, *et al.* Flavor classification/categorization and differential toxicity of Oral Nicotine Pouches (ONPs) in oral gingival epithelial cells and bronchial epithelial cells. *Toxics.* 2022;10(11):660.
74. Miller-Holt J, Baskerville-Abraham I, Sakimura M, *et al.* In vitro evaluation of mutagenic, cytotoxic, genotoxic and oral irritation potential of nicotine pouch products. *Toxicol Rep.* 2022;9:1316–1324.
75. Rinaldi S, Pieper E, Schulz T, *et al.* Oral nicotine pouches with an aftertaste? Part 2: in vitro toxicity in human gingival fibroblasts. *Arch Toxicol.* 2023;97(9):2343–2356.
76. Dalrymple A, Bean EJ, Badrock TC, *et al.* Enamel staining with e-cigarettes, tobacco heating products and modern oral nicotine products compared with cigarettes and snus: an in vitro study. *Am J Dent.* 2021;34(1):3–9.
77. Azzopardi D, Haswell LE, Frosina J, *et al.* Assessment of biomarkers of exposure and potential harm, and physiological and subjective health measures in exclusive users of nicotine pouches and current, former and never smokers. *Biomarkers.* 2023;28(1):118–129.
78. Rensch J, Edmiston J, Wang J, Jin X, Sarkar M. A randomized, controlled study to assess changes in biomarkers of exposures among adults who smoke that switch to oral nicotine pouch products relative to continuing smoking or stopping all tobacco use. *J Clin Pharmacol.* 2023;63(10):1108–1118.
79. Delnevo CD, Hrywna M, Miller Lo EJ, Wackowski OA. Examining market trends in smokeless tobacco sales in the United States: 2011-2019. *Nicotine Tob Res.* 2021;23(8):1420–1424.
80. Marynak KL, Wang X, Borowiecki M, *et al.* Nicotine Pouch Unit Sales in the US, 2016-2020. *JAMA.* 2021;326(6):566–568.
81. Ling PM, Hrywna M, Talbot EM, Lewis MJ. Tobacco-derived nicotine pouch brands and marketing messages on internet and traditional media: content analysis. *JMIR Form Res.* 2023;7:e39146.

82. Czaplicki L, Patel M, Rahman B, *et al.* Oral nicotine marketing claims in direct-mail advertising. *Tob Control.* 2022;31(5):663–666.
83. Rose SW, Annabathula A, Westneat S, *et al.* Neighborhood distribution of availability of newer tobacco products: a four-site study, 2021. *medRxiv.* 2022;30:102028.
84. Phillip Morris International. Philip Morris International Reports 2023 Third-Quarter and Nine-Month Year-to-Date Results. https://www.pmi.com/media-center/press-releases/press-details?newsId=26881. 2023. Accessed February 11, 2023.
85. Altria. Altria Reports 2023 Second-quarter and First-half Results; Reaffirms 2023 Full-Year Earnings Guidance. https://www.altria.com/-/media/Project/Altria/Altria/Investors/events-and-presentations/2023/2023-Q2/Press-Release.pdf. Accessed February 11, 2023.
86. Hrywna M, Ozga JE, Stanton CA, *et al.* Prioritizing common terminology and measures to advance research on oral nicotine product use. *Nicotine Tob Res.* 2023;26(5):645–648.
87. National Center for Chronic Disease Prevention and Health Promotion (US) Office on Smoking and Health. *The Health Consequences of Smoking—50 Years of Progress: A Report of the Surgeon General.* Atlanta, GA: Centers for Disease Control and Prevention (US); 2014. https://www.ncbi.nlm.nih.gov/books/NBK179276/
88. IARC Working Group on the Evaluation of Carcinogenic Risks to Humans. Smokeless tobacco and some tobacco-specific N-nitrosamines. *IARC Monogr Eval Carcinog Risks Hum.* 2007;89:1–592.
89. National Cancer Institute and Centers for Disease Control and Prevention. *Smokeless Tobacco and Public Health: A Global Perspective*. Bethesda, MD: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Institutes of Health, National Cancer Institute. NIH Publication No. 14-7983; 2014.
90. Bero LA. Tobacco industry manipulation of research. *Public Health Rep.* 2005;120(2):200–208.
91. Food and Drug Administration. FDA Grants First-Ever Modified Risk Orders to Eight Smokeless Tobacco Products. https://www.fda.gov/news-events/press-announcements/fda-grants-first-ever-modified-risk-orders-eight-smokeless-tobacco-products. Accessed June 12, 2023.
92. Inoue-Choi M, Shiels MS, McNeel TS, *et al.* Contemporary associations of exclusive cigarette, cigar, pipe, and smokeless tobacco use with overall and cause-specific mortality in the United States. *JNCI Cancer Spectr.* 2019;3(3):pkz036.
93. Hendlin YH, Small S, Ling PM. 'No-Barriers' tobacco product? Selling smokeless tobacco to women, people of colour and the LGBTQ+ community in the USA. *Tob Control.* 2021;32:330–337.
94. Truth Initiative. What is Zyn and What are Oral Nicotine Pouches? https://truthinitiative.org/research-resources/emerging-tobacco-products/what-zyn-and-what-are-oral-nicotine-pouches. 2021. Accessed December 28, 2021.
95. The Bureau of Investigative Journalism. New products, old tricks? Concerns big tobacco is targeting youngsters. https://www.thebureauinvestigates.com/stories/2021-02-21/new-products-old-tricks-concerns-big-tobacco-is-targeting-youngsters. 2021. Accessed December 30, 2021.
96. The Guardian. Tobacco giant bets £1bn on influencers to boost "more lung-friendly" sales. https://www.theguardian.com/business/2021/feb/20/tobacco-giant-bets-1bn-on-social-media-influencers-to-boost-lung-friendlier-sales. 2021. Accessed January 28, 2021.
97. Morean ME, Bold KW, Davis DR, *et al.* Does it come from tobacco? Young adults' interpretations of the term "tobacco-free nicotine" in a cross-sectional national survey sample. *PLoS One.* 2022;17(5):e0268464.
98. Kostygina G, England L, Ling P. New product marketing blurs the line between nicotine replacement therapy and smokeless tobacco products. *Am J Public Health.* 2016;106(7):1219–1222.
99. Ling PM, Kim M, Egbe CO, *et al.* Moving targets: how the rapidly changing tobacco and nicotine landscape creates advertising and promotion policy challenges. *Tob Control.* 2022;31(2):222–228.
100. Roque Nicotine Products. https://www.roguenicotine.com/. Accessed November 1, 2023.
101. Jabba SV, Erythropel HC, Woodrow JG, *et al.* Synthetic cooling agent in oral nicotine pouch products marketed as 'Flavour-Ban Approved'. *Tob Control.* 2023:tc–2023.
102. Phillip Morris International. Championing a Smoke-Free World. https://philipmorrisinternational.gcs-web.com/static-files/a86c6d92-8e5b-4e8e-ae88-3914c1f92c03. Accessed November 29, 2023
103. Lee PN, Fry JS, Ljung T. Estimating the public health impact had tobacco-free nicotine pouches been introduced into the US in 2000. *BMC Public Health.* 2022;22(1):1025.

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Letter | Published: 22 January 2021

Oral health

Nicotine pouches

A. Keogh

British Dental Journal **230**, 61–62 (2021)

Sir, nicotine pouches, also referred to as non-medicinal nicotine pouches or tobacco-free snus, are small receptacles that contain white nicotine powder which a user places in the anterior maxillary vestibule.[1] They originated in Scandinavia and their distribution is rapidly widening to other countries, with five tobacco manufacturers currently selling their products in the UK.[1] Currently unregulated in the European Union, their packaging carries no health warnings and are widely advertised online, on billboards and buses as 'harmless tobacco-free alternatives'.[2]

The evidence behind the correlation of nicotine and cancer development is inconclusive, although several studies have illustrated that nicotine can facilitate a tumour-supporting environment and has proven genotoxic effects.[3] Oral mucosal changes (for example, hyperkeratotic changes) behind habitual oral nicotine use have been documented.[4]

These nicotine pouches are being marketed as a vogue and safe way to get a 'nicotine hit' without the associated negative health consequences of traditional tobacco or snus

use. They are available in a wide variety of flavours and packaged in fashionable tins with coloured logos which have great visual appeal.[1,2]

As a hospital clinician, I had no prior knowledge of these products despite distributing smoking cessation advice on a daily basis. With such a paucity of information available regarding these products and their associated potential harmful consequences, how is a layperson supposed to make an informed decision regarding their use?

I am deeply concerned that these pouches provide a gateway to traditional tobacco smoking via nicotine addiction. Even if they may offer a harm-reduction means for established tobacco users to get their 'nicotine hit', we must not take tobacco companies at their word; rigorous independent research is imperative. We have seen an uptake of new-generation smokers with vaping and smokeless tobacco and now know of the established detrimental health effects.[5] We must act urgently and in unison, lest we repeat our mistakes.

References

1. Robichaud M O, Seidenberg A B, Byron M J. Tobacco companies introduce 'tobacco-free' nicotine pouches. *Tob Control* 2020; **29:** e145-e146. DOI: 10.1136/tobaccocontrol-2019-055321.

2. Rossel S. Out of the bag. *Tobacco Reporter* 1 September 2020. Available at: https://tobaccoreporter.com/2020/09/01/out-of-the-bag/ (accessed January 2021).

3. Grando S A. Connections of nicotine to cancer. *Nat Rev Cancer* 2014; **14:** 419-429.

4. Tebbutt J, Khan Z, Ariyaratnam R. A case report of oral nicotine-associated keratosis and a review of oral mucosal changes in tobacco and similar products. *Br Dent J* 2020; **228:** 757-760.

5. Public Health England. Research and analysis: e-cigarettes and heated tobacco products: evidence review. Last updated 2 March 2018. Available at: https://www.gov.uk/government/publications/e-cigarettes-and-heated-tobacco-products-evidence-review (accessed January 2021).

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Needham Public Health Division
Prevent. Promote. Protect.

Board of Health
Town of Needham
AGENDA FACT SHEET

MEETING DATE: February 21, 2025

Agenda Item	Foundational Public Health Services (FPHS) and the Assessment Process
Presenter(s)	Kerry Dunnell, Shared Services Manager

1.	**BRIEF DESCRIPTION OF TOPIC TO BE DISCUSSED**
Ms. Dunnell will present to the Board information about the upcoming Foundational Public Health Services Assessment Process, along with how the initiative will impact the Charles River Public Health District and the Needham Public Health Division.	
2.	**VOTE REQUIRED BY BOARD OF HEALTH**
Discussion Only.	
3.	**BACK UP INFORMATION:**
Powerpoint presentation attached.	

178 Rosemary Street, Needham, MA 02494 P: (781) 455-7940 E: healthdivision@needhamma.gov

Foundational Public Health Services & the Assessment Process

Kerry C. Dunnell
Manager, Shared Services & Training Hub
Needham Public Health Division

Foundational Public Health Services
Foundational Areas

5 Foundational Areas
28 associated Headline Responsibilities

*Public Health programs, or **Foundational Areas**, are basic public health, topic-specific programs and services aimed at improving the health of the community. These 5 Foundational Areas reflect the minimum level of services that should be available in all communities.*

Communicable Disease Control

Chronic Disease & Injury Prevention

Environmental Public Health

Maternal, Child, & Family Health

Access to & Linkage with Clinical Care

Source: MA Department of Public Health retrieved February 19, 2025

Foundational Public Health Services
Foundational Capabilities

8 Foundational Capabilities
28 associated headline responsibilities

*Public health infrastructure consists of **Foundational Capabilities** that are the cross-cutting skills and capacities needed to support basic public health protections, programs, and activities key to ensuring community health, well-being, and achieving equitable outcomes.*

Assessment & Surveillance	Community Partnership Development	Equity	Organizational Competencies
Policy Development & Support	Accountability & Performance Management	Emergency Preparedness & Response	Communications

Source: MA Department of Public Health retrieved February 19, 2025

How will the assessment benefit public health?

Data-Driven Decision Making to inform strategies, allowing for evidence-based decisions and demonstrating the effectiveness of public health interventions.

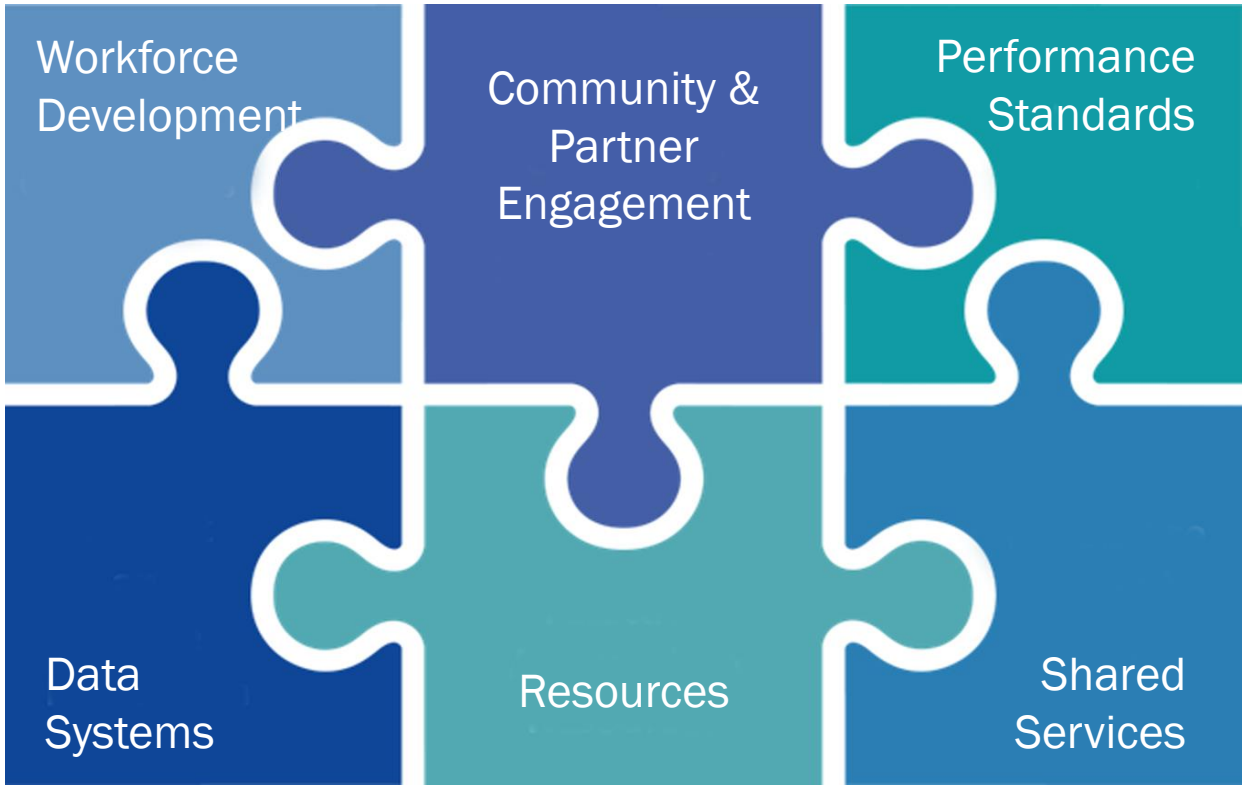
Increased Accountability through a structured approach to track progress and outcomes, facilitating transparency and accountability to stakeholders and the community.

Capacity Building through the development of a skilled workforce, enhancing the capacity of local health departments to address current and emerging public health challenges.

Securing Funding Opportunities fueled by a commitment to FPHS to strengthen public health funding and support from government and private entities.

Why Foundational Public Health Services for Massachusetts Local Public Health?

In 2019, the Special Commission on Local and Regional Public Health released the **Blueprint for Public Health Excellence**: Recommendations for Improved Effectiveness and Efficiency of Local Public Health Protections.



"To improve, the local public health system must first have clear, comprehensive, uniform, and quantifiable goals. **The nationally accepted FPHS**, a set of cross-cutting capabilities and program areas that all health department should have, **is best suited to elevate standards in Massachusetts**."

So What is the Assessment Process?

Cost Tool

- The Cost Tool collects information on the resources (e.g., labor, revenue, contracts, etc.) each local public health entity is spending on FPHS-related activities.

Service Delivery Tool

- The Service Delivery Tool captures current services provided, services shared, and overall capacity and staff expertise to fulfill FPHS across SSAs and their participating municipalities.

***ISD Tool (If applicable)**

- The ISD Tool is a condensed, streamlined tool that captures both cost (labor, revenue, contracts, etc.) and service delivery (services shared, and overall capacity and staff expertise) data in one tool for ISDs that provide public health services to complete.

Source: MA Department of Public Health retrieved February 19, 2025

Cost Tool - FY24 Financial Reporting

FY24 Revenue	• Report funding/revenue for public health services
FY24 Labor FTE and Costs	• Report each staff, seasonal worker, paid intern, hourly rate contractors who provides public health services
FY24 Contracts and Subawards	• Report spending on contracted services and subawards
FY24 Operational Costs	• Report operational costs on public health services

Source: MA Department of Public Health retrieved February 19, 2025

Service Delivery Tool

Massachusetts FPHS Service Delivery Tool

Municipality Information

Municipality:	Needham
Population:	32091
Tool status:	Not Started

Capacity Staff and/or other resources, materials, and supplies		Expertise Education, training, skills, credentials, and experience
Absent: Staff time and resources are largely unavailable.	1	**Absent:** Staff lack expertise or are unable to apply it.
Limited: Partial staff time and resources available to provide some functions.	2	**Limited:** Partial expertise and some ability to apply it.
Moderate: Almost sufficient staff time and resources available for most functions.	3	**Moderate:** Almost sufficient expertise and can apply it effectively for most functions.
Comprehensive (Full): Sufficient staff time and resources to fully implement all functions.	4	**Comprehensive (Full):** Sufficient expertise and can apply it effectively for all functions.

	Sharing			Capacity and Expertise		Delivery
For each of the Headline Responsibilities, we are asking how services were delivered to your community in Fiscal Year 2024. Please also review the capacity and expertise available in your LPH Entity for each Headline Responsibility in Fiscal Year 2024. Complete this tool in its entirety to the best of your ability. *You do not need to enter responses for the Foundational Areas and Foundational Capabilities (darker blue rows).* *Headline Responsibilities highlighted in grey are typically **not** the responsibility of LPH in Massachusetts. While some information in these rows has been pre-populated, please complete the remaining details to the best of your ability.*	*Which organizations contributed to the delivery of this Headline Responsibility in your community? Select "Yes" for all that apply.* ***Note:** Column E ("My SSA") is not a data entry column for LPH. Data in this column will automatically update based on data entered by the Shared Services Coordinator.*	***Optional**: If you selected "Yes" for Column F ("Another org"), identify with whom you share this Headline Responsibility or who delivered it.*	*For this Headline Responsibility, what was the responsibility attributable to your LPH entity? (i.e., provide the % share of your LPH entity).* *For example, if you indicated that **only** your LPH Entity delivered this Headline Responsibility, then your share was "All: Complete involvement or contribution (100%)".*	*Indicate your LPH Entity's capacity for each Headline Responsibility, according to the rubric above.*	*Indicate the expertise among your LPH Entity's staff for each Headline Responsibility, according to the rubric above.*	*To what extent did the organizations responsible for delivering this Headline Responsibility fulfill the services required to meet the needs of your community?*

Number	FPHS Headline Responsibility	My LPH Entity	My SSA	Another org	Partners	My LPH Entity's Share	LPH Capacity	LPH Expertise	Service Delivery Fulfillment

1. Overview | 2. FPHS Examples | Dover | Medfield | Needham | Sherborn | Charles River PH District | 4. SSA Summary

Source: MA Department of Public Health retrieved February 19, 2025

Cost Tool – Time spent on each Foundational Public Health Services Foundational Areas and Capabilities

Foundational Areas (FA)					Foundational Capabilities (FC)								
Access to & Linkage with Clinical Care	Chronic Disease & Injury Prevention	Communicable Disease Control	Environmental Public Health	Maternal, Child, & Family Health	Accountability & Performance Management	Assessment & Surveillance	Communications	Community Partnership Development	Emergency Preparedness & Response	Equity	Organizational Competencies	Policy Development & Support	Community-Specific Services
		5%	5%		10%	5%		15%	15%	10%	25%	10%	

Source: MA Department of Public Health retrieved February 19, 2025

Considerations and Tips for Responding to Questions in the Service Delivery Tool

Gather Diverse Perspectives

Engage LPH staff who work across the Headline Responsibility to gather diverse perspectives

Use best judgement when responding to questions

Any combination of capacity & expertise is acceptable

No expectations around LPH % share or service delivery fulfillment

Review relevant technical assistance (TA) resources

FPHS Activities & Massachusetts Specific Examples

Service Delivery Tool Cheat Sheet

Source: MA Department of Public Health retrieved February 19, 2025

How will the assessment benefit public health?

Data-Driven Decision Making to inform strategies, allowing for evidence-based decisions and demonstrating the effectiveness of public health interventions.

Increased Accountability through a structured approach to track progress and outcomes, facilitating transparency and accountability to stakeholders and the community.

Capacity Building through the development of a skilled workforce, enhancing the capacity of local health departments to address current and emerging public health challenges.

Securing Funding Opportunities fueled by a commitment to FPHS to strengthen public health funding and support from government and private entities.

Example: Use of the Data from Wisconsin

- Example aggregate estimate of the gap in spending needed to fully implement FPHS in Wisconsin.

Figure 25: Estimated FPHS Spending and Gap for Full Implementation (in Millions)

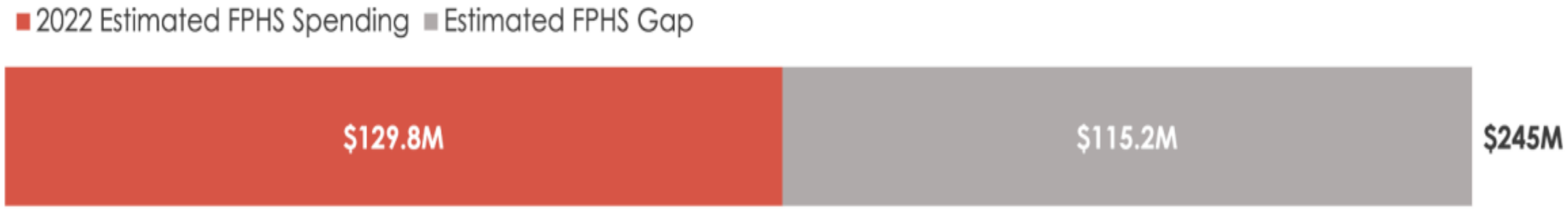
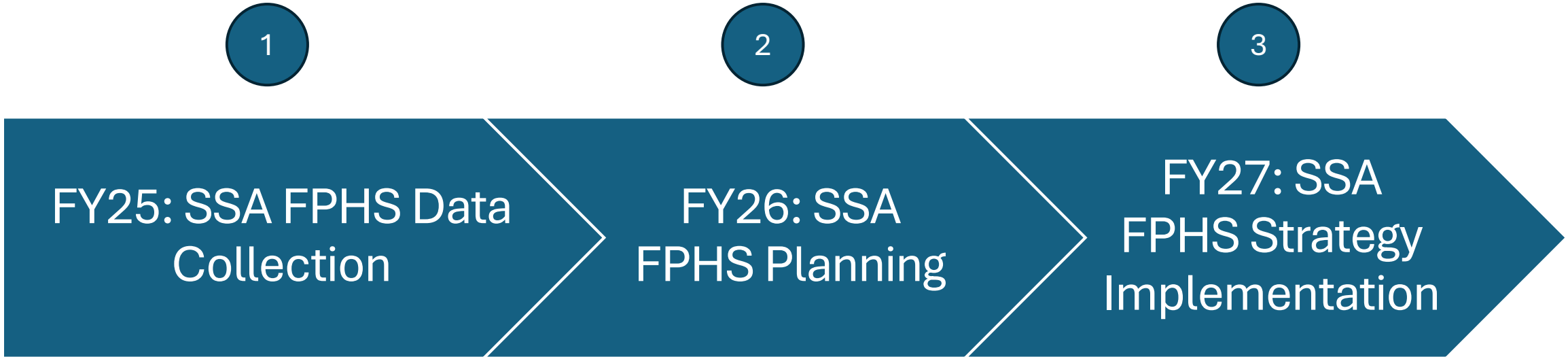


Figure from Wisconsin Foundational Public Health Services: Costing & Capacity Assessment Report

Timeframe for using the results

Part of the FY26 PHE workplan will include continuing to look at the results as a Shared Service Arrangement and developing a plan to enhance work towards achieving the FPHS over time.



Source: MA Department of Public Health retrieved February 19, 2025

Any Questions?

Needham Public Health Division
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AGENDA FACT SHEET

MEETING DATE: February 21, 2025

Agenda Item	Customized Permit Fee Calculator
Presenter(s)	Timothy McDonald, Director of Health & Human Services

1.	**BRIEF DESCRIPTION OF TOPIC TO BE DISCUSSED**

Mr. McDonald will briefly preview the Customized Permit Fee Calculator that was developed with significant staff and contractor effort. The dynamic model attempts to capture the true cost to the Public Health Division to accept and process various applications and plan reviews, and to conduct the appropriate inspections and follow-ups.

It will be discussed in greater depth at the Board's March Meeting (3/21/25), but the current calculations show that the Public Health Division may overcharge for some types of permits and licenses and also undercharges (in some cases dramatically) for various food service licenses.

In March, the Board will debate the appropriate level at which to set permit fees for FY2026, including how to best balance the desire to have the cost charged accurately reflect the time and effort devoted to that permit versus the goal of not dramatically increasing costs to permit holders without sufficient notice (and a potential phase-in period).

2.	**VOTE REQUIRED BY BOARD OF HEALTH**

Discussion Only.

3.	**BACK UP INFORMATION:**

- Sample Screenshot from Customized Permit Fee Calculator
- Draft Permit Fee list for FY2026 with calculated values

178 Rosemary Street, Needham, MA 02494 P: (781) 455-7940 E: healthdivision@needhamma.gov

Permit Type	Total Number of Permits *	Current Permit Fees *	Calculated Permit Application Fees	Permit Fee Difference	Current Revenue *	Projected Revenue Based on Calculated Fees	Revenue Difference
This sheet tracks what the projected revenue is based on calculated permit fees and the total number of permits issued. The table has been customized to Needham's permit fees. Please fill in Column B with number of permits for analysis. You are also able to compare Needham's current permit fees (Column C) against the calculated permit fees (Column E).							
~~~ FOOD ~~~				**(Plan Review Fees Not Included)**			
Farmers Market Seasonal Permit		$ 50.00	$ 80.00	$ (30.00)	$ -	$ -	$ -
Food Service – less than 50 seats		$ 250.00	$ 660.00	$ (410.00)	$ -	$ -	$ -
Food Service – 50 to 149 seats		$ 450.00	$ 660.00	$ (210.00)	$ -	$ -	$ -
Food Service – 150 to 250 seats		$ 550.00	$ 660.00	$ (110.00)	$ -	$ -	$ -
Food Service – more than 250 seats		$ 650.00	$ 660.00	$ (10.00)	$ -	$ -	$ -
Food Service – Catered Feeding Location		$ 175.00	$ 300.00	$ (125.00)	$ -	$ -	$ -
Food Service – Residential Kitchen		$ 125.00	$ 120.00	$ 5.00	$ -	$ -	$ -
Food Service - Risk Level 1			$ 180.00	$ (180.00)	$ -	$ -	$ -
Food Service - Risk Level 2			$ 500.00	$ (500.00)	$ -	$ -	$ -
Food Service - Risk Level 3			$ 850.00	$ (850.00)	$ -	$ -	$ -
Food Service - Risk Level 4			$ 1,180.00	$ (1,180.00)	$ -	$ -	$ -
Food Service - 2nd Reinspection			$ 90.00	$ (90.00)	$ -	$ -	$ -
Mobile Food Service Vendors Non-Selectboard approved vendors		$ 125.00	$ 120.00	$ 5.00	$ -	$ -	$ -
Retail Food Establishment – Prepackaged foods, Refrigeration		$ 125.00	$ 150.00	$ (25.00)	$ -	$ -	$ -
Retail Food Establishment less than 1,500 square feet		$ 150.00	$ 180.00	$ (30.00)	$ -	$ -	$ -
Retail Food Establishment between 1,500 and 3,000 square feet		$ 250.00	$ 360.00	$ (110.00)	$ -	$ -	$ -
Retail Food Establishment between 3,000 and 6,000 square feet		$ 450.00	$ 120.00	$ 330.00	$ -	$ -	$ -
Retail Food Establishment between 6,000 & 10,000 square feet		$ 550.00	$ 300.00	$ 250.00	$ -	$ -	$ -
Retail Food Establishment more than 10,000 square feet		$ 750.00	$ 360.00	$ 390.00	$ -	$ -	$ -
Temporary/One Day Event Permit		$ 50.00	$ 120.00	$ (70.00)	$ -	$ -	$ -
~~~ TITLE V/SEPTIC ~~~							
Installer's Annual Permit (new- including exam)		$ 250.00	$ 150.00	$ 100.00	$ -	$ -	$ -
Installer's Renewal (no exam)		$ 125.00	$ 60.00	$ 65.00	$ -	$ -	$ -
Installer's Recertification Test (biennial)		$ 50.00	$ 90.00	$ (40.00)	$ -	$ -	$ -
Soil Application Inspection (less than 2 hours)		$ 425.00	$ 300.00	$ 125.00	$ -	$ -	$ -
Soil Application (each additional hour over 2 initial hours)		$ 75.00	$ 130.00	$ (55.00)	$ -	$ -	$ -
Septic Construction Permit (Major)		$ 400.00	$ 480.00	$ (80.00)	$ -	$ -	$ -
Septic Construction Permit (Minor)		$ 125.00	$ 120.00	$ 5.00	$ -	$ -	$ -
Septic System Excavation & Trench Permit		$ 50.00	$ 30.00	$ 20.00	$ -	$ -	$ -
Septic System Variance Request		$ 150.00	$ 60.00	$ 90.00	$ -	$ -	$ -
~~~ WELL ~~~							
Well Application – Geothermal, Irrigation		$ 250.00	$ 160.00	$ 90.00	$ -	$ -	$ -
~~~ SWIMMING POOLS ~~~							
Public/Semi-Public Pool – Permit (Annual)		$ 300.00	$ 420.00	$ (120.00)	$ -	$ -	$ -
Public/Semi-Public Pool – Permit (Seasonal)		$ 200.00	$ 420.00	$ (220.00)	$ -	$ -	$ -
Public/Semi-Public Pool – Re-Inspection		$ 125.00	$ 150.00	$ (25.00)	$ -	$ -	$ -
Public/Semi-Public Pool – Variance Initial Application		$ 150.00	$ 120.00	$ 30.00	$ -	$ -	$ -
Public/Semi-Public Pool – Variance Renewal		$ 75.00	$ 30.00	$ 45.00	$ -	$ -	$ -
~~~ CAMPS ~~~							
Camp License (For Profit Groups)		$ 250.00	$ -	$ 250.00	$ -	$ -	$ -
Camp License (Non-Profit Groups)		$ 125.00	$ -	$ 125.00	$ -	$ -	$ -
~~~ MARIJUANA ~~~							
Marijuana Treatment Center (MTC) Initial Permit Application		$ 2,500.00	$ 1,200.00	$ 1,300.00	$ -	$ -	$ -
Marijuana Treatment Center (MTC) Annual Permit Renewal		$ 1,250.00	$ 720.00	$ 530.00	$ -	$ -	$ -
Marijuana Home Cultivation Permit (Home Permit)		$ 150.00	$ -	$ 150.00	$ -	$ -	$ -
~~~ TANNING ~~~							
Initial Permit Application		$ 500.00	$ -	$ 500.00	$ -	$ -	$ -
Permit Renewal (per Tanning Bed/Booth)		$ 125.00	$ -	$ 125.00	$ -	$ -	$ -
~~~ MISCELLANEOUS ~~~							
Tobacco Permit		$ 700.00	$ 360.00	$ 340.00	$ -	$ -	$ -
Animal Permit		$ 100.00	$ 60.00	$ 40.00	$ -	$ -	$ -
- Additional per species for laboratory animals		$ 50.00	$ 50.00	$ -	$ -	$ -	$ -
Beaver Removal Permit		$ 75.00	$ 360.00	$ (285.00)	$ -	$ -	$ -
Biosafety Laboratory Initial Registration and Annual Renewal		$ 500.00	$ 1,020.00	$ (520.00)	$ -	$ -	$ -
- Plan Modification and Reinspection		$ 250.00	$ 180.00	$ 70.00	$ -	$ -	$ -
Body Art Establishment		$ 700.00	$ 180.00	$ 520.00	$ -	$ -	$ -
Body Art Practitioner Permit		$ 575.00	$ 80.00	$ 495.00	$ -	$ -	$ -
Bodyworks Establishment Permit		$ 125.00	$ 280.00	$ (155.00)	$ -	$ -	$ -
Bodyworks Practitioner Permit		$ 25.00	$ 80.00	$ (55.00)	$ -	$ -	$ -
Demolition Permit		$ 100.00	$ 40.00	$ 60.00	$ -	$ -	$ -
Hauler Company (Grease, Medical, Rubbish, Septic)		$ 150.00	$ 40.00	$ 110.00	$ -	$ -	$ -
Hotel/Motel		$ 250.00	$ 160.00	$ 90.00	$ -	$ -	$ -
Pre-Residency Housing Inspection		$ 80.00	$ 180.00	$ (100.00)	$ -	$ -	$ -
Sharps Permit		$ 100.00	$ 100.00	$ -	$ -	$ -	$ -
TOTAL	**0**	**$ 16,130.00**	**$ 15,460.00**		**$ -**	**$ -**	**$ -**

Needham Public Health Division
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Board of Health

PERMIT & LICENSE FEE SCHEDULE

Permit/License	FY25 Fee	FY26 Fee?
Animal Permit	$100.00	**$40.00**
• Additional per species for laboratory animals	$50.00	$50.00
Beaver Removal Permit *(not subject to Late Renewal Surcharges)*	$75.00	**$360.00**
Biosafety Laboratory Initial Registration and Annual Renewal	$500.00	**$1,020.00**
• Plan Modification and Reinspection	$250.00	**$180.00**
Body Art Establishment	$700.00	**$180.00**
Body Art Practitioner Permit	$575.00	**$80.00**
Bodyworks Establishment Plan Review	$200.00	$200.00
Bodyworks Establishment Permit	$125.00	**$280.00**
Bodyworks Practitioner Permit	$25.00	**$80.00**
Camp License (For Profit Groups)	$250.00	$250.00
Camp License (Non-Profit Groups)	$125.00	$125.00
Demolition Permit *(not subject to Late Renewal Surcharges)*	$100.00	**$40.00**
Food: • Farmers Market Seasonal Permit	$50.00	**$80.00**
• Food Service – less than 50 seats	$250.00	**$660.00**
• Food Service – 50 to 149 seats	$450.00	**$660.00**
• Food Service – 150 to 250 seats	$550.00	**$660.00**
• Food Service – more than 250 seats	$650.00	**$660.00**
• Food Service – Catered Feeding Location	$175.00	**$300.00**
• Food Service – Residential Kitchen	$125.00	**$125.00**
• Mobile Food Service Vendors (non-Selectboard approved vendors)	$125.00	**$120.00**
• Plan Reviews for New Mobile Food Trucks (Seasonal)	$50.00	$50.00
• Plan Reviews for All Food Service or Retail Establishments	$225.00	$225.00
• Retail Food Establishment – Prepackaged foods, Refrigeration	$125.00	**$150.00**
• Retail Food Establishment less than 1,500 square feet	$150.00	**$180.00**
• Retail Food Establishment between 1,500 and 3,000 square feet	$250.00	**$360.00**
• Retail Food Establishment between 3,000 and 6,000 square feet	$450.00	**$120.00**
• Retail Food Establishment between 6,000 & 10,000 square feet	$550.00	**$300.00**
• Retail Food Establishment more than 10,000 square feet	$750.00	**$360.00**
• Temporary/One Day Event Permit	$50.00	**$120.00**

Proposed May 12, 2023. Adopted by unanimous vote of the Board of Health on June 9, 2023. Effective July 1, 2023.

Permit/License	**FY25 Fee**	**FY26 Fee?**
Hauler Company (Grease, Medical, Rubbish, Septic)	$150.00	**$40.00**
Hotel/Motel	$250.00	**$160.00**
Marijuana: • Plan Review (Treatment Center or Cultivation/Processing Site)	$1,000.00	$1,000.00
• Plan Review (Storage/Disposal)	$1,000.00	$1,000.00
• Plan Review (Continuity of Business/Continuity of Operations)	NO FEE	NO FEE
• Plan Review (Security)	NO FEE	NO FEE
• Marijuana Treatment Center (MTC) Initial Permit Application	$2,500.00	**$1,200.00**
• Marijuana Treatment Center (MTC) Annual Permit Renewal	$1,250.00	**$720.00**
• Marijuana Home Cultivation Permit (Home Permit)	$150.00	**NO FEE**
Pre-Residency Housing Inspection[1] *(not subject to Late Renewal Surcharges)*	$80.00	**$180.00**
Sharps Permit	$100.00	$100.00
Swimming Pool: • Public/Semi-Public Pool – Permit (Annual)	$300.00	**$420.00**
• Public/Semi-Public Pool – Permit (Seasonal)	$200.00	**$420.00**
• Public/Semi-Public Pool – Plan Review (includes 2 free revisions)	$250.00	$250.00
• Public/Semi-Public Pool – Plan Revisions	$50.00	$50.00
• Public/Semi-Public Pool – Re-Inspection	$125.00	**$150.00**
• Public/Semi-Public Pool – Variance Initial Application	$150.00	**$120.00**
• Public/Semi-Public Pool – Variance Renewal	$75.00	**$30.00**
Tanning (Indoor Tanning): • Initial Permit Application	$500.00	$500.00
• Permit Renewal (per Tanning Bed/Booth)	$125.00	$125.00
Title V/Septic: *(not subject to Late Renewal Surcharges)* • Installer's Annual Permit (new- including exam)	$250.00	**$150.00**
• Installer's Renewal (no exam)	$125.00	**$60.00**
• Installer's Recertification Test (biennial)	$50.00	**$90.00**
• Soil Application Inspection (less than 2 hours)	$425.00	**$300.00**
• Soil Application (each additional hour over 2 initial hours)	$75.00	**$130.00**
• Septic Construction Permit (Major)	$400.00	**$480.00**
• Septic Construction Permit (Minor)	$125.00	**$120.00**
• Septic Plan Review (includes one free revision)	$275.00	$275.00
○ Addition to home with Septic	$75.00	$75.00
○ Deed Restriction	$125.00	$125.00
○ Additional Plan Reviews for Septic Design	$50.00	$50.00
• Septic System Excavation & Trench Permit	$50.00	**$30.00**
• Septic System Local Upgrade Approval Request	$150.00	$150.00
Tobacco Permit	$700.00	**$360.00**
Well Application – Geothermal, Irrigation *(not subject to Late Renewal) Surcharges)*	$250.00	**$160.00**

[1] Pre-Residency Housing Inspections as required by state and federal housing assistance programs only, unless specifically approved by the Director of Health & Human Services.

Notes

- In order for a permit or license renewal to be considered by the Needham Public Health Division, it must be:
    - submitted with all required documentation and attachments;
    - complete and accurate; and
    - inclusive of payment in full.
- Permit and license renewals (which are accurate and complete and which include payment) will be reviewed and approved promptly. The processing time for applications is at least 15 business days, but every effort will be made to review applications promptly and those which are complete and accurate and inclusive of full payment may be processed in less time (potentially substantially less time).
    - **Delayed License/Permit Renewals** are those submitted within 15 business days of permit/license expiration.
    - **Late License/Permit Renewals** are those submitted within 10 business days of permit/license expiration.
    - **Last-Minute License/Permit Renewals** are those submitted within 5 business days of permit/license expiration.
- Expedited reviews of permit and license renewals may be ordered at the applicant's discretion to avoid a possible gap in licensure, but that is not required.
- Non-profit organizations may, upon request and when approved by the Director of Health & Human Services, receive a discount of up to 50% on the applicable fees.
- In extraordinary circumstances, the Director of Health & Human Services or the Board of Health's designated agent may modify or reduce the fees noted above if, in that person's opinion, it is in the best interests of the Town of Needham. The Director or the designated agent will inform the Board of any modifications and the rationale for such actions at the Board's next meeting.
- Mobile Food Vendor permits and permits for the Farmers Market are the subjects of an extended cooperative program with other Town Departments and community partners that includes a bundled or simplified fee, and thus any fees may by waived if approved by the Director of Health & Human Services.

Surcharges	**New**
• Delayed License/Permit Renewal	$75.00
• Late License/Permit Renewal	$150.00
• Last-Minute License/Permit Renewal	DOUBLE FEE
• Noncompliance Re-inspection *(unless otherwise specified)*	$150.00
• Inspection following Noncompliance for Operating without a Permit	DOUBLE FEE

Needham Public Health Division
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December 2024

Monthly Staff Reports

www.needhamma.gov/health

178 Rosemary Street, Needham, MA 02494 P: (781) 455-7940 E: healthdivision@needhamma.gov

Needham Public Health Division
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Board of Health

AGENDA FACT SHEET

February 21, 2025

Agenda Item	December 2024 Staff Reports
Presenter(s)	Public Health Division staff members

1.	**BRIEF DESCRIPTION OF TOPIC TO BE DISCUSSED**

Each program area within the Public Health Division will give a brief update on current topics, projects, events, accomplishments, and more.

2.	**VOTE REQUIRED BY BOARD OF HEALTH**

Discussion only.

3.	**BACK UP INFORMATION:**

a) Environmental Health – Sai Palani & Tara Gurge
b) Accreditation – Lynn Schoeff & Alison Bodenheimer
c) Public Health Preparedness –Taleb Abdelrahim
d) Traveling Meals – Rebecca Hall
e) Substance Use Prevention: Regional – Carol Read & Lydia Cunningham
f) Substance Use Prevention: Needham – Karen Shannon, Karen Mullen, Monica DeWinter, Angi MacDonnell, Vanessa Wronski
g) Epidemiology – Julie McCarthy
h) Nursing – Ginnie Chacon-Lopez, Hanna Burnett & Tiffany Benoit
i) Public Health Excellence – Kerry Dunnell & Samantha Menard

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December 2024

Assist. Health Director - Tara Gurge
Full-time Health Agent – Sainath Palani
Part-time Health Agents – Monica Pancare and Pamela Ross-Kung

Unit: Environmental Health
Date: January 24, 2025
Staff members: Tara Gurge, Sainath Palani, Monica Pancare and Pamela Ross-Kung

Activities and Accomplishments

Activity	Notes
Rice Barn Update	Property owner confirmed that settlement is being finalized between them and the former Rice Barn owner. There is already interest from prospective tenants to occupy the space to be used for a new restaurant.
Nicotine Free Generation Outreach	Environmental Health staff created new signage for new Nicotine Free Generation policy. Signage was posted at each retailer the week of December 23rd at all tobacco retailers and health agent described the policies to each store owner or another representative of the store. An additional visit was performed to provide each retailer with smaller versions of signage and to confirm that blunt wraps were no longer sold at each retailer. Retailers with scanners are actively working on changing their systems so that scanners can flag id's of persons born on or after January 1st, 2004, and restrict the sale. All retailers understood the regulation changes and our office has not received any questions or complaints from the retail store owners or the public. (Attached at the end of this report)
Dumpster Regulation Update	Environmental Health staff has created initial draft of the online application for the dumpster permit and hope to have it go live in the month of January. The inspectional services departments from the Fire Department and Building Departments are interested in being involved with the review process of the application. Once the application is finalized and live, outreach will be done via email and physical mail by public health staff and the town's Office of Economic Development to inform businesses about the requirement to get their existing and/or new dumpsters permitted and the process to apply online.
Town Regulation Banning Polystyrene (non-orientated), Plastic Stirrers, and Splash	An email was sent out to all food establishments about the restrictions and bans that were to begin on January 1, 2025 related to a citizen petition for Article 45 that was passed in the May 2024 Town Meeting. Health agent answered any questions about the ban and granted some extensions to those that needed additional time to comply with the regulation. Enforcement of the regulation will mainly be done based on complaints

Guards and Restricting Plastic Straws Update	received or if a violation of this regulation is witnessed in an obvious manner at the time of a routine inspection.
Additional Enforcement Actions for Food Establishments by Staff	The Farmhouse has hired a reputable food safety consultant to train staff and get their processes done so that food is being prepared in a safe manner consistently. Reports detailing the trainings and their observations from their audits are being sent to our office for review. Inspectional team met with consultant to discuss progress made what their next steps are as issues appear to continue based on their own audits. Consultant has recommended to temporarily stop doing audits and to focus more on training and process development with the establishment and their staff.
Issuance of end of year permits	Environmental health staff worked to review, and issue permits for all health permits that expired at the end of the year.

Other Public Health Division activities this month: (See report below.)

Activities

Activity	*Notes*
Body Art	**0** – Staff are waiting for applicant to reach back out for a reinspection and to review missing materials.
Demo Reviews/ Approvals	**6 - Demolition signoffs:** -#26 Carol Rd. -#60 Whiting Way -#32 Fremont St. -#345 Central Ave. -#173 Fairfield St. -#34 Pershing Rd.
Disposal of Sharps Permits	**8 – Disposal of Sharps Permits issued to:** - Acupuncture Herbs and Beyond - Boston Acupuncture - Chinese Accupuncture and Herbal Medicine - Karla Barbieri - Evolved by Nature (Biotech) - Zdorovie ADH (Adult daycare center) - MLan Biosciences (Biotech) - Invicro (Biotech) Inspections performed for all acupuncturist facilities.

Septage/Grease/ Medical Waste Hauler Permits Issued	**16 – Septage/Grease & Medical Waste Hauler Permits Issued to:** - B&D Associates (Medical) - Advowaste Medical Services (Medical) - United Medical Waste Management (Medical) - Liquid Environmental Solutions (Grease) - Regan Septic Pumping (Septage) - Podgurski Corp. (Grease/Septage) - Bakers Commodities (Grease) - A Best (septage) - A & K Waste (Grease/septage) - Agri-Cycle Energy (Grease/Septage) - United Site Services Northeast (Septage/Grease) - BNV Enterprises, Inc./Rooterman (Septage/Grease) - Mahoney Environmental (Septage/Grease) - Rodenhiser Excavating (septage) - Wind River Environmental, LLC (septage/Grease) - Clear Choice Drains (septage/grease)
Trash/Recycling Waste Hauler Permit issued	**0 - Trash and Recycling Waste Hauler Permit issued.**
Food - Plan reviews/Follow-ups/Pre-operation inspections	**1 - Initial Pre-operation inspections conducted.** - Monsoon Kitchen (Takeout Indian Restaurant)
Food – Temporary Food Event Permits issued	**0 – Temporary Food event online permit application reviews and permits issued to:**
Food Complaints/ Follow-ups	**3 – Food Complaints received.** - **Starbucks**: Complaint about public bathrooms for customers being out of order again. Store manager was contacted to remove any indoor seating from establishment and only field takeout orders. Private bathrooms for employees were still operational. - **Little Spoon:** Fire inspector witnessed open snap traps on food preparation surfaces upon his inspection of the facility. Owner of establishment was contacted, and traps were removed and owner agreed to not put them out again. Establishment switched pest control companies to match the one contracted with other tenants in building and owner was instructed not to leave back doors to the kitchen open due to concerns of pests but also due to these doors being fire doors. - **Roche Brothers:** Water line broke from street in front of Rocher Bros. Store was closed for operations on December 11th. Once town got water up and running, a health agent performed a site visit and allowed the reopening of the store.
Housing - Complaints/Follow-ups, etc.	**(2/4) - New Housing Complaints/Follow-ups conducted at:** – **Saint Mary's St. (0/1)**: Health agent visited site and met with occupants on 12/30/24. One of the cars was removed and the rear of the property looked much

	cleaner. The other two cars were set to be removed on 12/31/24. The health agent requested owner to remove other inoperable unregistered car parked in driveway and to remove any rusted auto parts/tools and any of the large plastic bins filled with miscellaneous things. Mosquitoes were observed at time of inspection and health agent got permission to turn over any buckets or lids filled with water on site. Owner will continue to clean and organize. **Board of Health should advise staff on what they want next steps to be, since the deadline has passed.** – **Chambers St. (Needham Housing Authority/NHA) (0/0) - Update:** No update at this time. Will follow up in month of January. U-Haul truck was observed to be parked in front of building and occupant was previously using it to help haul waste out of the unit. – **Gage St. (0/0) - Update:** No update at this time. Health agent will be following up with owner-occupant in month of January. – **Chambers St. (NHA) (0/1)** – **Update:** After a lengthy conversation with occupant of the unit, they did not want to allow access into the unit and wanted to drop the housing case. A letter describing events that occurred and stating that the case would be administratively closed was sent to the landlord and occupant. The occupant was informed that they can contact our office and file a new complaint, and we can open a new case at that time. Occupant still does not have a working fridge due to refusing to accept the one being provided by landlord. – **Chambers St. (NHA) (1/1)** – Complaint of musty smells in apartment and possibility of mold in the unit. Inspection was performed and no signs of mold were observed within unit and ventilation fan in the bathroom was working. Recommendations for occupants were provided. No follow up required. – **Rosemary St. (1/1)** – Complaint of mold and excess moistures in a unit. Occupants requested a comprehensive inspection where violations were found and orders to correct have been sent to the responsibly party.
Housing Pre-occupancy inspections	**0 – Housing pre-occupancy inspections conducted.**
Nuisance complaints/Follow-ups	**(2/2) – New Nuisance Complaints/Follow-ups:** - **Central Ave. (0/0)** - Autobody paint shop was caught again painting cars and allowed the migration of volatile fumes (VOCs) to migrate offsite and into an adjacent occupied building. Environmental health staff worked with MADEP, OTA and other town departments to investigate this concern. Legal representation for paint shop has indicated they have had a consultation visit from the Office of Technical Assistance (OTA) and were going to follow those recommendations. Neighbors have been told to call our office if they observe fumes again during normal office hours, otherwise they should call the fire department to come out and witness it and test for volatile organic in the air. Update: In November, we received a follow-up from the owner that the air filtration booth was fixed, and all other matters were being addressed with OTA. MADEP in process of drafting a letter to be mailed to the shop in the next few weeks. No updates in the month of December or January. Will reach back out to DEP on latest updates towards the end of January and to request a copy of their letter for our file.

	- **Chestnut St. (0/0) -** Health agent had meeting with property owners to address site conditions that are conducive to rats. Property owner added plugs to the drain holes in retaining wall and took other steps to improve site conditions. Area will continue to be monitored, and treatment continues. **Update:** Property owner has continued to send pest control reports showing how active this site is and captures and activity appear to be decreasing. - **Highland Terrace (0/1**) - Reports of dumpsters and waste haulers making noise as early at 4 or 5am while serving dumpsters on abutting commercial properties. Waste haulers for those dumpsters were contacted and they will inform dispatch to remind drivers to wait until 7am to service dumpsters in that area. Homeowner will take a video with a time stamp if this continues to occur. **Update:** Homeowner sent videos with timestamps showing dumpsters being serviced prior to 6am. Footage was sent to waste hauler in question and to stop the servicing of this dumpster that early. Further follow-up with occur if homeowner continues to witness the occurrence of this. - **Pickering St. (1/0) –** Complaint received about smoking inside the residential complex. Agent requested caller to request an inspection the next time it is witnessed so we can start to document it. They were advised to continue to work with the property manager about this matter. - **Warren St. (1/1**) – Complaint about witnessing a dead rat on their driveway. Agent went out and met with complainant and did education and canvassing of adjacent properties. One of the adjacent properties had a large unenclosed composting pile but no signs of nesting were observed.
Indoor/Outdoor Pool spot checks and annual permit renewal inspections	**6 – Indoor/Outdoor pool spot checks/meetings conducted at:** - North Hill - Sheraton (4x)- Pool ordered to be closed on November 25 and remained closed up until December 25. Pool testing logs are mandated to be sent for health agent review for at least the next month. - YMCA - Met with YMCA director and Y risk management and additional pool staff on site to review pool variance requirements to allow the use of temporary stairs in the pool. Reviewed required signage and letter of request. (Uploaded to online permit.)
Planning Board Special Permit / Off-street drainage bond release reviews	**3 – Planning Board reviews conducted.** - **Belle Lane Subdivision** – Follow-up letter sent to developer RE: the BOH approved release 5 off-street drainage bonds for the five lots. - **Reservoir Ave. Subdivision** – Received off-street drainage bond release request for lot 3. Letter sent to developer with next steps. - **DPW Complex Phase I Fleet Building addition proposal –** Attended Planning Board meeting and issued Public Health Division comments.
Septic Certificate of Compliance (COC)	**0 – Septic Certificate of Compliance final signoff issued.**
Septic – Construction	**3 – Septic Construction Repair Permits issued.** - 120 Stratford Rd. (Minor: D-box replacement)

Repair permit issued	- 869 Charles River St. (Minor: D-box replacement) - 111 Windsor Rd.
Septic Failure Letters	**0 – Septic system failure letters sent.**
Septic Installation inspections	**5 – Septic installation inspections conducted at:** - 120 Stratford Rd. - 869 Charles River St. - 111 Windsor Rd. (3x)
Septic Deed Restrictions	**0 – Septic Deed Restrictions received.**
Septic Installer Exam/Permit Issued	**6 - Septic System Installer exam and permits issued.** - DL Atkinson - Scott Septic - J. Hockman Inc. - R. P. Luttazi - Jack Malone Company, Inc. - J Derenzo Properties LLC
Septic Addition/Reno. to a Home on a Septic reviews	**0 – Addition/Reno. to a Home on a Septic reviews conducted.**
Septic Plan Reviews/Approvals issued	**0 – Septic Plan reviews conducted/approvals issued**
Septic – Soil/Perc Tests	**0– Septic Soil/Perc Tests conducted.**
Septic Trench permits issued	**3 – Septic Trench permits issued.** - **120 Stratford Rd.** - **869 Charles River St.** - **111 Windsor Rd**
Septic – Abandonment Forms	**0 – Septic abandonment/connection to sewer forms received.**
Tobacco Compliance Checks/Hearing Scheduled	**0 – Tobacco retail routine compliance checks conducted at all permitted establishments.**
Well Permit online plan reviews	**2 – Well permit online application follow-up plan reviews conducted:** - #18 Plymouth Rd. - #97 Highgate Street

Zoning Board of Appeals plan reviews	**2 – Zoning Board of Appeals plan reviews conducted for:** - #282 Warren St. - #51 Fremont St.

FY 25 Priority FBI Risk Violations of Interest

Establishment	Date	Violation(s)	Corrective Action/Follow-up
Rainbow ADHC	December 2, 2024	-Proper hand washing was not observed when required such as after handling raw meat, taking out trash, washing dirty dishes, cleaning surfaces and then preparing and handling food. - No sanitizing step was taking place when staff were ware washing utensils and food contact surfaces.	Health agent attempted to educate and have as many violations correct onsite but there was a language barrier. After discussions with their in-house food consultant, the consultant needed at least a week to retrain kitchen staff and manager. An extensive meeting was held with kitchen managers and their food consultants the following week about their plan of action to handle the situation in house. A reinspection was performed and the managers were able to demonstrate improvement. Progress will be monitored at next routine inspection.
Briarwood	December 3, 2024	-Multiple items including but not limited to leftover soups from the day prior did not cool to a safe temperature overnight. -Gravy that was cooked the morning of the inspection was not hot held at a safe temperature prior to lunch service.	-All foods that were out of temperature were discarded. - Gravy was reheated once again before service.
The James	December 6, 2024	-Sanitizer in buckets was depleted and being used to attempt to clean and sanitize food contact surface. -Sausages and mayonnaise made in house were out of temperature and in temperature danger zone.	-Sanitizer in buckets and wiping clothes were replenished and surfaces were sanitized properly. -Out of temperature products were discarded.

Kosta's	December 7, 2024	-Staff were using latex powdered gloves while handling food.	Health agent informed PIC that latex gloves are not recommend to be used while handling ready to eat food and may be used for other purposely such as during cleaning certain areas.
Dominos	December 7, 2024	-Employees failed to wash their hands after leaving to go outside and then began to start prepping food.	-Health agent discussed this matter with the person in charge.
El Mariachi	December 12, 2024	-Employees were observed handling raw meat with gloves on and then touch multiple surfaces without taking gloves off and washing hands afterwards. -Raw meats were stored above ready-to-eat foods in the walk-in refrigerator.	-Employee that was present was educated about this and manager who was not present said he will retrain staff. Translated educational materials and posters were also provided to the store manager.
Restaurant Depot	December 14, 2024	-Raw and exposed squid and shrimp were not protected from contamination with use of a display case or sneeze guards.	-Exposed items were removed from display.
Sweet Boba	December 16, 2024	-The sole employee and PIC at the time of inspection were observed cleaning kitchen and then failed to wash their hands prior to taking orders and making drinks.	- PIC was educated about when it is required to wash their hands and PIC demonstrated this for the remainder of the inspection.
Zdorovie ADH	December 17, 2024	-Employees failed to ware wash dishes correctly. They were observed just rinsing with hot water and no wash or sanitizing step was taking place.	-New staff member who was just hired was working in the kitchen and had yet to be trained on the process. PIC who was not monitoring was informed and they took over and demonstrated the proper procedure. They would make sure to train all new staff prior to having them work on their own.

Dragon Chef	December 20, 2024	-Raw meat was stored above ready to eat product in the walk-in coolers.	-Health agent had PIC reorganize walk in fridge to allow for the raw chicken to be stored appropriately even during busier times.
St. Joseph Elementary	December 20, 2024	-Pizza on site were not at proper hold holding temperatures. It was later observed that being received from another local pizza establishment might be delivered out of temperature.	-Establishment is in the process of applying to use time as a public health control versus using temperature for the pizza on Fridays.
Sweet Tomatoes	December 21, 2024	-Meatballs on steamtable were in the temperature danger zone. -Logs were not being filled out for Time as a Public Health Control for the pizza slices.	- Health agent allowed meatballs to be reheated and staff were educated that all hot held products must be reheated to 165f before hot holding starts. -Slices were discarded and a new log was started.
Comella's	December 23, 2024	-Raw ground veal and calamari was stored above ready to eat products in the walk-in fridge. -Several containers to food located in a fridge were missing use-by dates or had date marking indicating the product was over a week old.	-Raw products were moved to appropriate areas. -All out of date foods or foods that were missing date marking were discarded.
Masala Art	December 27, 2024	-Chicken tikka on buffet line was in the temperature danger zone and not hot held safely. -Green salad on buffet line was not cold held at safe temperatures.	-Chicken was discarded. -Salad was discarded and more ice will be added.
Blue on Highland	December 27, 2024	-The dishwasher in the bar was not dispensing sanitizer and thus was not sanitizing glassware. -Onion soup and marinara sauce were not reheated properly for hot holding and were also in the temperature danger zone.	-Dishwasher was ordered to not be used until it was serviced and confirmed to be dispensing sanitizer. -Soup and sauce were reheated on stove and then placed into the hot holding wells. Health agent educated staff on this.

Needham Public Health Division

ENFORCEMENT DATE OF NEEDHAM BOARD OF HEALTH REGULATION ARTICLE 1, SECTION D: JANUARY 1, 2025

THE SALE OF TOBACCO PRODUCTS, INCLUDING E-CIGARETTES, TO A PERSON BORN ON OR AFTER 1/1/2004 IS PROHIBITED.

NICOTINE-FREE GENERATION POLICY

PLEASE SCAN QR TO ACCESS ARTICLE 1

FOR MORE INFORMATION, PLEASE CONTACT THE NEEDHAM PUBLIC HEALH DIVISION AT (781) 455-7940 x504

Category	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	FY'25	FY'24	FY'23	FY'22	FY'21	FY '20	FY' 19	FY' 18
Biotech registrations/Plan rev./Insp.	0	0	0	0	0	0							0	15	3	3	0	1	1	1
Bodywork Estab. Insp.	0	0	0	0	0	6							6	8	5	5	6	7	14	11
Bodywork Estab. Permits	0	0	0	0	0	5							5	5	6	5	13	9	9	6
Bodywork Pract. Permits	0	0	0	0	0	7							7	10	5	8	12	23	21	22
Demo reviews	6	4	6	7	3	8							34	96	53	89	76	73	104	105
Domestic Animal permits	0	0	0	0	0	0							0	17	17	15	29	1	21	19
Domestic Animal Inspections	0	0	0	0	0	0							0	2	1	10	8	3	22	3
Food Service Routine insp.	17	24	17	10	26	27							121	224	214	194	134	149	200	225
Food Service Pre-oper. Insp.	0	2	5	0	1	2							10	23	22	22	16	48	12	32
Retail Food Routine insp. Or 6 month check in	0	0	0	0	0	0							0	4	13	11	12	33	46	60
Residential Kitchen Routine insp.	1	2	0	3	1	2							9	5	8	5	5	3	6	8
Mobile Routine insp.	0	0	0	0	0	0							0	5	10	10	10	4	17	13
Food Service Re-insp.	17	19	19	7	2	9							73	114	37	27	7	21	28	53
Food Establishment Annual/Seasonal Permits	0	1	1	0	44	71							117	128	130	138	134	155	140	171
Temp. food permits	2	4	6	2	5	1							20	51	33	37	9	67	134	163
Temp. food inspections	7	2	0	1	1	0							11	24	16	9	3	10	37	29
Farmers Market permits	1	1	1	0	0	0							3	15	11	16	15	14	14	14
Farmers Market insp.	10	0	3	0	0	0							13	65	73	149	124	158	229	127
Food Complaints	3	3	1	0	1	3							11	25	11	13	7	49	18	20
Follow-up food complaints	3	2	1	0	1	3							10	18	12	15	8	48	21	21
Food Service Plan Reviews	1	1	2	0	1	1							6	21	75	13	12	14	20	42
Food Service Admin. Hearings	0	0	0	0	0	0							0	0	0	2	1	3	0	0
Grease/ Septage Hauler Permits	0	0	0	3	9	16							28	25	29	22	13	20	21	24
Housing (Chap II Housing) Annual routine inspection	0	0	0	0	0	0							0	13	9	10	7	7	0	14
Housing Follow-up insp.	0	1	1	2	1	2							7	26	13	3	2	0	0	5
Housing New Complaint	2	2	2	0	0	2							8	38	26	41	40	41	22	22
Housing Follow-ups	5	3	5	3	2	4							22	81	69	65	63	56	28	24

Category	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	FY'25	FY'24	FY'23	FY'22	FY'21	FY '20	FY' 19	FY' 18
Hotel Annual inspection	0	0	0	0	2	1							3	3	3	3	3	3	3	3
Hotel Follow-ups	0	0	0	0	0	1							1	2	2	0	1	15	0	0
Nuisance Complaints	5	3	4	8	2	2							24	53	36	35	45	34	55	42
Nuisance Follow-ups	7	4	9	11	8	2							41	89	58	41	60	55	69	42
Pool inspections	1	6	0	1	5	1							14	30	14	15	15	13	20	12
Pool Follow up inspections	0	4	0	0	1	5							10	6	5	4	5	3	12	7
Pool permits	0	0	0	0	0	6							6	14	14	15	17	11	19	12
Pool plan reviews	0	0	0	0	0	0							0	0	5	0	5	0	3	44
Pool variances	0	0	0	0	0	5							5	5	7	6	5	6	5	7
Septic Abandonment	0	0	0	0	0	0							0	4	4	9	17	21	9	5
Addition to a home on a septic plan rev/approval	0	0	0	0	1	0							1	1	2	15	5	5	2	2
Septic Install. Insp.	0	4	0	3	0	6							13	26	22	19	11	13	21	28
Septic COC for Component	0	0	0	0	0	2							2	1	2	3	2	5	3	1
Septic COC for complete septic system	0	0	1	1	0	0							2	6	3	4	1	3	4	3
Septic Info. requests	3	4	3	6	5	7							28	60	62	64	86	61	62	51
Septic Soil/Perc Test.	1	1	0	0	0	0							2	6	6	5	8	1	1	2
Septic Const. permits	0	0	1	0	0	3							4	4	5	6	6	6	6	5
Septic Installer permits	1	0	1	0	0	6							8	7	16	11	8	6	8	9
Septic Installer Tests	1	0	0	0	0	0							1	5	9	4	3	2	5	3
Septic Deed Restrict.	0	0	0	1	1	0							2	3	0	0	4	1	1	3
Septic Plan reviews	0	0	0	1	2	0							3	13	29	21	14	8	9	23
Septic Trench permits	1	1	0	0	0	3							5	9	11	12	-	-	-	-
Disposal of Sharps permits	0	0	0	1	0	8							9	10	10	7	8	7	7	9
Disposal of Sharps Inspections	0	0	0	1	1	4							6	8	12	8	8	7	7	7
Rat Nuisance Complaints	1	2	3	10	1	1							18	20	5	6	2	2	1	-
RMD	0	0	0	0	0	0							0	3	2	-	-	-	-	-
Planning Board Subdivision Sp Permit Plan reviews/Insp. of lots	0	2	2	0	6	3							13	10	19	21	20	4	1	1
Subdivision Bond Releases	0	0	0	0	5	0							5	2	1	0	1	0	1	0
Special Permit/Zoning	2	1	1	3	4	2							13	16	19	21	18	17	34	15
Tobacco permits	0	0	0	0	1	6							7	6	7	6	7	10	10	11
Tobacco Routine insp	0	0	0	0	3	3							6	12	7	12	7	8	14	18
Tobacco Follow-up insp.	0	0	0	0	0	6							6	3	0	0	1	8	3	3

Category	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	FY'25	FY'24	FY'23	FY'22	FY'21	FY '20	FY' 19	FY' 18
Tobacco Compliance checks	6	0	0	0	6	0							12	12	6	6	6	30	30	41
Tobacco complaints	0	0	0	0	0	0							0	0	6	0	0	2	3	4
Tobacco Compl. follow-ups	1	0	2	0	0	0							3	0	6	0	0	1	3	4
Trash Hauler permits	0	0	0	0	0	0							0	16	20	23	16	15	17	14
Medical Waste Hauler permits	0	0	0	2	2	3							7	6	6	2	2	2	2	1
Well - Plan Reviews, Permission to drill letters, Insp.	0	1	0	0	0	2							3	11	14	10	11	2	6	2
Well Permits	0	0	0	0	0	0							0	0	1	4	1	1	1	0
Monthly Totals	**105**	**104**	**97**	**87**	**154**	**257**							**804**	1540	1357	1355	1195	1405	1642	1668

Needham Public Health Division
Prevent. Promote. Protect.

Unit: Accreditation

Date: January 7, 2024

Staff: Alison Bodenheimer, Lynn Schoeff

Activity	Notes
PHAB documents	All required documents were uploaded to the PHAB website and "sent" to PHAB on December 11, 2024.
Quality Improvement	Quality Improvement Plan finalized
Performance Management	Ongoing progress updates made to performance management dashboard with staff
Policies	Hotel Inspections Testing Public Water Fountains Public Health Surveillance

Needham Public Health Division
Prevent. Promote. Protect.

Unit: Traveling Meals Program

Date: December 2024

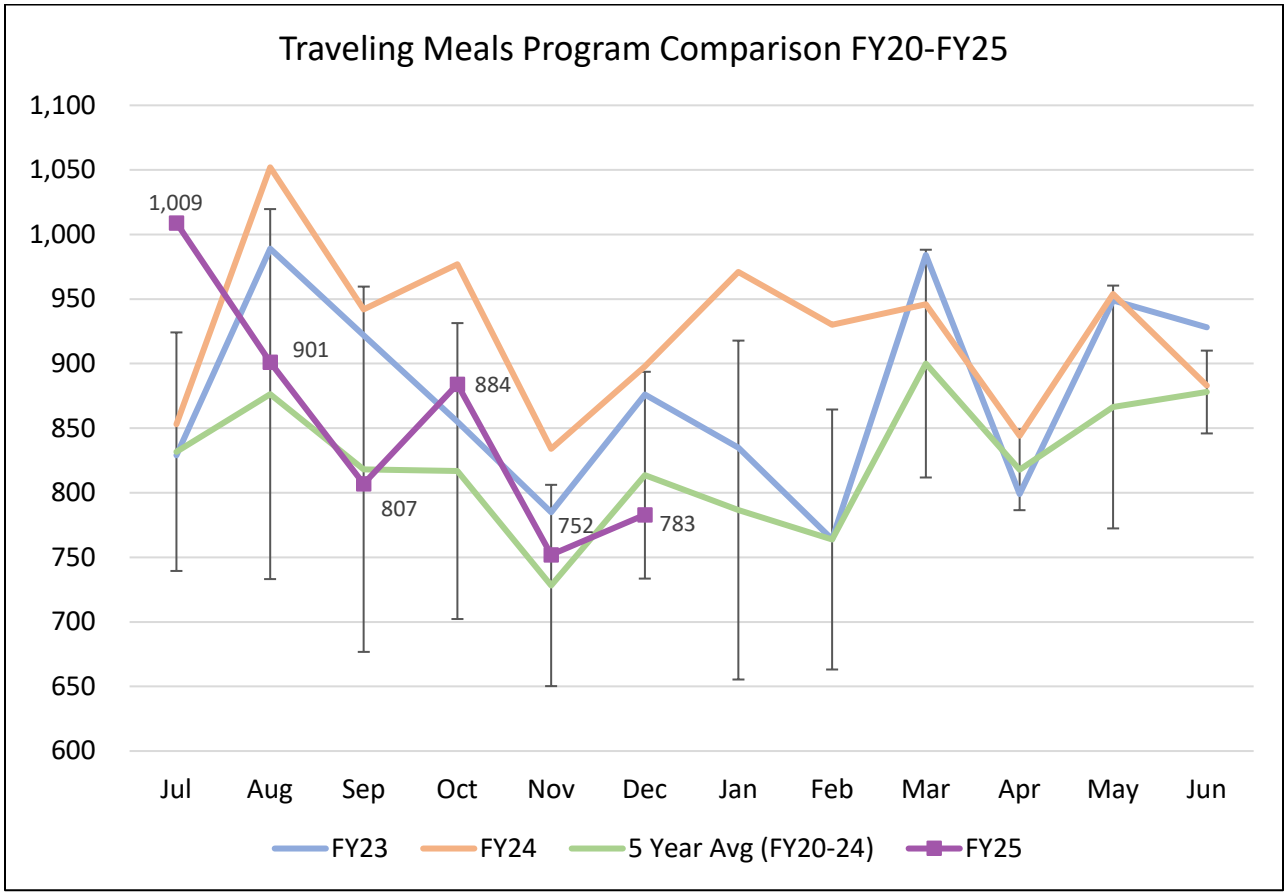
Staff: Rebecca Hall

Activities and Accomplishments

Activity	Notes
Volunteers and Seasonal Drivers delivered meals to homebound Needham residents in need of food.	***Meal delivery for month by 29 Volunteer Drivers and Community Partners***
783 Meals delivered in December 2024 ***45 Clients at end of December:*** ***41 Springwell Consumers*** ***4 Private Pay Consumers*** ***1 New Client (1 Springwell)*** ***2 Cancelled Program (1 Springwell, 1 Private)***	***No 911 calls initiated***
Included flyers about Christmas Day Meal Sign-Up in meal bags	***Christmas Day Meals organized by Needham Community Council and prepared/distributed by Temple Beth Shalom on 12/25/24***
Included flyers for Community Council Focus Group "Seeking Needham Caregivers of a Loved One with Dementia or Alzheimer's"	***Included in appropriate client meal bags***

Other Public Health Division activities this month:

Summary overview for the month: **Graph of Meal Deliveries for the month December 2024**



Unit: Substance Use Prevention MassCALL3 grant: Dedham, Needham, Walpole, Westwood
Date: December 2024
Staff members: Carol Read, M.Ed., CAGS, CPS & Lydia Cunningham, MPH, CHES®

Activity	Notes
Ariana Tornatore, Director of Wellness & Donna Tobin, PhD., Social Emotional Learning Coordinator, Westwood Public Schools- 12/2 In person	• History and overview of MassCALL3 grant and previous substance use prevention grants. • MetroWest Adolescent Health Survey: funding options, data sharing, data dashboard. • Westwood Cares coalition re-start and Drug-Free Communities grant application process.
MassCALL3 Connections Monthly Meeting- 12/3 Regional prevention staff, public health nurses, public health directors and assistant directors, human services staff.	Presentation by Leah Arteaga, Community Relations Representative, Massachusetts Behavioral Health Helpline. Overview of service offered, connection to care, referral process, insurance considerations/cost. Next meeting: January 7th 9:00am
Needham Community Crisis Intervention Core Team, Deputy Chief Chris Baker, Needham Police Department - 12/3 Jonathan Steeves, EMS Supervisor, Jessica Moss, LICSW, Assistant Director Aging Services, Sara Shine, LICSW, Director Youth & Family Services. Emily Turnbull, LICSW, Jail Diversion Clinician and Kelsey Cournoyer, NPD Crime Analyst.	Monthly service provider meeting: Confidential case management review of response and support for all age residents navigating acute and chronic substance use disorders and/or mental health conditions. Resource sharing – local and state – counseling, assessment, detox, treatment. Needham crisis response data review- crisis response planning including housing insecurity.
MDPH- Office of Local & Regional Health OLRH monthly webinar 12/3	Agenda: Local Public Health Survey Findings | Local Public Health Data Solution Update | Foundational Public Health Services Update
Massachusetts Alcohol Policy Coalition- 12/4 Elizabeth Parsons, Volunteer Chair & David Jernigan, PhD, Boston University School of Public Health. Youth coordinators: Stormy Leung, MPH Braintree Community Partnership - Mary Cole, MPH, CHES MassCALL3 BUY Bay State Community Services, Quincy.	Agenda: Alcohol Delivery and Digital Advertising research project recruitment: volunteers who live in MA, ages 21-26 needed. | Alcohol Policy Day Training Series for youth: Next training 12/14 at Boston University. Legislative visit January 15th including DPH meeting | Alcohol excise tax: seeking resolution signatures, including from Boards of Health and Health Departments. Next meeting: January 29th 9:00am.
Walpole Community Crisis Intervention Team- Walpole Police Sergeant Tom	Agenda: Town service provider confidential case management review of response and support for

Hart 12/5 Jillian Nauman, Outreach Coordinator, Aging Services, Dylan Jones, LSCW, WPD Emergency Services Jail Diversion Program (JDP) coordinator- Riverside Community Care	all age residents navigating acute and chronic substance use disorders and/or mental health conditions. Resource sharing, crisis response and non- acute care support. Rebel, WPD service dog.
CARE Massachusetts Opioid Abatement Partnership 12/5 and 12/12 JSI Research & Training Institute, Inc., 2023 contract by the Massachusetts Department of Public Health's (MDPH) Bureau of Substance Addiction Services (BSAS). Training and Technical Assistance to municipalities receiving opioid settlement funds- capacity building, strategic planning and reporting in compliance with the state subdivision agreement. Cheryl Sbarra, JD, municipal consultant.	December 5th: Words Matter: Stigma and Language. Recovery Month project DPH Leadership and DPH Staff pledge review. Goals: Describe the impact of language in framing what the public thinks about substance use and recovery | Give examples of alternatives to stigmatizing language | Get answers to questions about how to discuss substance use with your community using an affirming and strengths-based approach. December 12th: Expenditure Report Correction Required reporting – data quality assurance activities implemented aligned with expenditures. Goals: Review the data quality assurance process for expenditure reports | Review feedback rubric on municipality-reported data | Review process and timeline for municipalities to respond to rubric.
Charles River Health District- Dover-Needham- Medfield- Sherborn. Public Health Excellence (PHE) site visit meeting 12/6 Kerry Dunnell, MPH, Manager Shared Services -Training Hub Samantha Menard, MPH Assist. Manager.	Agenda: Jess Ferland, Project Coordinator, Office of Local & Regional Health- Shared Services regions manager. Overview and discussion of OLRH goals, fiscal year budget parameters and implementation structures.
Jessica Goldberg, MPH, MSW, Prevention Solutions@ EDC- 12/5 MassCALL3 Strategic Planning and 12/23 Mentoring discussion.	Agenda 12/5: Discussion: MGH team iDECIDE meeting, implementation next steps | Community capacity building planning. | Next steps for curriculum implementation Everfi: Alcohol Education: Safe and Smart (grades 9-12) and Stanford Smart Talk: Cannabis Prevention & Awareness Curriculum. (grades 6-8)
Substance Prevention Alliance of Needham (SPAN) Winter Meeting- 12/10 Karen Shannon, CPS, Substance Use Prevention Coordinator, Town of Needham	Agenda: 2024 Parent Survey data presentation by Scott Formica, PhD, Senior Research Scientist, SSRE. | Survey of approx. 200 parents/caregivers students in grades 6-12 | Domains: health and wellness, home/community life, communication with child and other parents, parental attitudes and beliefs, parenting behaviors, prevention and supports.

Needham Public Health Division Staff Meeting- 12/10 Timothy McDonald, Director of Health and Human Services, Tiffany Benoit and Tara Gurge, Assistant Public Health Directors	Agenda: Mental health and Youth and Family Services Division program presentation by Kristina Kozak, MSW, BCBA. December Board of Health meeting agenda: Revised health regulations, final vote scheduled, Article 1 tobacco including NFG language, Article 22 synthetics, and dumpster regulation.
Amal Marks, Contract Manager, MA Department of Public Health, Bureau of Substance Addiction Services- 12/11 MassCALL3 Prevention Partners (PP) supervision meeting.	Agenda: Strategic planning updates on two curriculums and iDECIDE program scope, current readiness status and implementation plans | Monthly PP meeting progress and topic review, resource sharing - MA Behavioral Health Helpline. Town updates: Needham Board of Health approval tobacco/nicotine regulations (NFG) and synthetic cannabinoids | | Dedham Beth Israel Deaconess Needham grants– Mental Health & Substance Use: Grant #1: $345,000 (3 years) Dedham Public Schools – Building Equity and Access, tracking every student and teacher every year to identify needs. Grant #2: $171,000 (3 years) Dedham Care Cab, Transportation program for mental health and substance use appointments and programs.
Needham Homelessness Prevention Coalition- 12/11 Jessica Moss, Assistant Director of Counseling and Volunteers, Needham Council on Aging	Agenda: Tracking interactions with those in need. | Data review (various service providers) | School update on families with housing concerns | Crisis fund updates and planning to grow funds.
Needham Accounting- 12/12 Michelle Vaillancourt, Town Accountant & Lisa McDonough, Administrative Analyst	MassCALL3 grant November expense reimbursement submission. EIM- Virtual Gateway FY25 budget line item review.
Middlesex County District Attorney Marian Ryan Anti-Hate Anti-Bias Taskforce- 12/12	Presentation: Immigration policy anxiety and election fatigue: Community Action Agency of Somerville & Costas Panagopoulos, PhD, Northeastern University. Local updates: ransomware attacks, three-year grant to evaluate the Anti Hate Anti Bias task force and update on violence towards Cambodian Americans.
Webinar: Potential Changes in Federal Cannabis Policy and the Anticipated Public Health Impacts- 12/12 Mathew Swinburne, J.D., and George Townsend, JD, Legal Resource Center for Public Health Policy-Cannabis.	Agenda: How the Controlled Substances Act regulates cannabis, current rescheduling process underway at the DEA, and what rescheduling would mean for federal and state law. | How federal law has created a market for intoxicating hemp-derived products; potential changes in federal law aimed at addressing this.

Community prevention, education and advocacy- Underage marijuana use (risk and protective factors) State Representative Marcus Vaughn, 9th Norfolk- 12/12 Amy Turncliff, PhD, Neuroscientist Rockfern Scientific, Annmarie Galvin, Scituate FACTS Coalition.	Agenda: Presentation on prevention of adolescent cannabis use, rising THC potency in commercial products, general public health regulations and strategies. Policy recommendations including (H113) prohibit billboard advertising of cannabis businesses/products | (H154) limit potency and products appealing to young people | (H155) improve warning labels on cannabis products to add risk of psychosis and CHS. | (H156) improve data collection on cannabis use and harms.
Teagan Seeley, Manager, District Relationships, EVERFI- Alcohol Education: Safe and Smart program (grades 9-12) 12/12	Agenda: Overview of Alcohol Education: Safe and Smart program (formerly AlcoholEdu) | Best practices for implementation: facilitator training and support, student monitoring and data collection, no cost for implementation.
Norfolk County Sheriff's Office Youth Task Force- 12/16 Kathryn Hubley, Community Affairs Coordinator. Nora Quinn, M.Ed., Youth Outreach Coordinator	Guest speaker: Laura B. Rosenthal, Suicide Prevention Program Coordinator, Baystate Community Service. Overview of state and local resources, programs available for youth, review of data.
Dedham Organization for Substance Awareness (DOSA) - 12/17 Tae Averett, Program Coordinator, Drug-Free Communities Grant	In person outreach: Tabling at Dedham High School lunch period. Resources provided for impaired driving awareness month.

*NPHD November Report- monthly activities
*Time dedicated to in-person collaboration and capacity building in cluster communities
This report is part of a larger quarterly report to BSAS and is not considered finalized for purposes of the BSAS report. A later version will be available.

END

Unit: Substance Use Prevention

Date: December 2024

Staff: Karen Shannon, Karen Mullen, Monica De Winter, Angi MacDonnell, Vanessa Wronski

Activities and Accomplishments

Activity	Notes
SPAN Projects & Events	**SPAN in the community:** SPAN hosted the Winter coalition meeting on December 10 with a presentation of the 2024 SPAN Parent Survey data by Dr. Scott Formica of Social Science Research & Evaluation. Sixteen people attended the meeting. **Coming up:** A three-part parent education series, **"Conversations with Your Middle Schooler: Why You Shouldn't Wait to Talk About Substance Use."(**see details below under Educ. Action Team**)** **SPAN Newsletter, December issue:** **https://www.spanneedham.org/newsletter/2024/12/19/2024-issue-13** **SPAN social media:** https://www.facebook.com/SPANNeedham/ **SPAN Action Teams-** **Education Action Team** met on December 6 to finalize the action plan for **"Conversations with Your Middle Schooler: Why You Shouldn't Wait to Talk About Substance Use,"** parent education series, geared for parents of 5th through 8th graders. Each session will provide tips, techniques and tangible strategies for talking with their children about underage drinking and other substances**.** The sessions are scheduled for January 14, February 11 and March 11 at the Rosemary Recreation Complex. Karen Shannon and Angi MacDonnel will be facilitating the presentations and Tony Serio and Kristina Kozak of Needham Youth & Family Services will facilitate the breakout sessions. **Mental Health Action Team** met on December 4 to plan next steps for their work. The team will continue writing posts for the Rethinking Success newsletter, https://www.spanneedham.org/rethinking-success. Angi installed the interactive display, *"What does success mean to you,"* at the Needham Library Youth Room to raise awareness about the team's attention to values about the meaning of success. **Nicotine Free Generation:** Prevention Team staff continued outreach and education about NFG policy and researched health harms of nicotine.

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Needham Public Health Peer Recovery Coach	During December, Angi MacDonnell, Peer Recovery Coach engaged in the following: Worked with 6 people (phone, in person, and text contacts) Average Age: 57 Majority: Female Substance of choice: Alcohol Peer Recovery Service work also included: Dual Recovery Anonymous weekly meeting at Center at the Heights, Needham. • DRA is a 12-step self-help program for individuals who experience both an addiction and a psychiatric challenge. This mutual support community uses a harm reduction approach towards wellness. Meeting attendance during December averaged 4 people per week.
STOP Act grant	SAMHSA grant: STOPing Underage Access and Use of Alcohol: Codifying Youth, Parent and Retailer Education and Compliance in Needham, MA: **Alcohol compliance** – On December, 16 sixteen employees of Needham alcohol licensed businesses attended ServSafe Alcohol training. Officers Austin Broderick and Sarah Timmerman of the Needham Police facilitated their first session, having become certified instructors in November at the train-the-trainer hosted by the STOP Act Grant prevention team staff. This course replaces the TIPS training course. See summary below. **WeCard calendars** were purchased by STOP Act grant funds and the grant staff hand delivered them to the 29 Needham alcohol licensed businesses. WeCard calendars provide a visual tool for retailers to determine if a customer is old enough to purchase alcohol. **MA Alcohol Policy Coalition** – Vanessa Wronski worked with two SALSA students to prepare them for legislative visits at the State House in January. The students will meet with their House Representative Joshua Tarsky to share a prepared statement about the need for an increase to the sales tax on alcohol on January 15.
SALSA	During the month of December 25 SALSA members contributed 114 hours of service in Needham. This month's highlights include: 2 SALSA members participated in Alcohol Policy Training (preparing for 1/15/25 trip to the MA State House). 2 SALSA members co-sponsored the NHS Ping Pong Club Tournament w/SALSA prize wheel to increase awareness. 2 SALSA members participated in the SPAN Winter Meeting on 12/10/24 to hear the Parent Survey Presentation.

Summary for December 2024: Focus this month included STOP Act grant deliverables for hosting responsible beverage server instructor training, hosting the SPAN Winter meeting, preparation for the SPAN middle school parent education series, and final submission of documentation for the NPHD Accreditation Application.

Alcohol Compliance Summary

Business	licens	12/2022 (	4/2023 (	5/2023 TI	9/2023 (	10/2023 T	12/2023 (	2/2024 TIF	05/2024 C	06/2024 T	10/2024	12/2024 R
Bertucci's	12	Fail	Closed	Closed	Closed	Closed	Closed	closed	Closed	closed	closed	closed
Bin Ends	15	Pass	Pass	1	Fail	1	Pass		Pass	2	Pass	1
Blue on Highland	12	Pass	Pass	1	Pass	0	Pass		Pass		Pass	
Cappella	12	Fail	Pass	0	Pass	7	Pass		Pass		Pass	
The Common Room	12	N/a	N/a	0	N/a	0	N/a	7	Pass	2	Pass	
Cook Needham	12	Fail	Fail	3	Pass	0	Pass	2	Pass		Pass	1
French Press Bakery	12	Fail	Pass	0	Pass	0	Pass		N/a		Pass	
Fuji Steakhouse	12	Pass	Pass	0	Pass	0	Pass	1	Pass		Pass	3
Gari	12	Pass	Pass	0	Pass	1	Pass		Pass		Pass	
Gordons Fine Wines	15	N/a	N/a	0	N/a	0	N/a	1	N/a		Fail	
Hearth Pizzeria	12	Pass	Pass	1	Pass	0	Pass	1	Pass		Pass	
Hungry Coyote	12	N/a	Pass	0	N/a	0	N/a		N/a		N/a	
Latina Kitchen and Bar	12	Pass	Pass	0	Pass	1	Pass		Closed		Closed	
Little Spoon	12	Fail	Pass	0	Pass	0	Pass	5	Pass	5	Pass	
Mandarin Cuisine	12	Pass	Pass	0	Pass	0	Pass	1	Pass		Pass	
Masala Art	12	Pass	Pass	0	Pass	0	Pass		Pass		Pass	
Needham Fine Wines	15	Fail	Pass	0	Pass	0	Fail	3	Pass		Pass	1
Needham Golf Club	12	N/a	N/a	0	Pass	0	N/a	1	Pass		Pass	
Needham Wine & Spirits	15	Pass	Pass	0	Pass	0	Fail	2	Pass		Pass	
Ray's New Garden	12	Pass	Pass	0	Pass	0	Pass		Pass		Pass	
Pancho's Taqueria	12	Fail	Fail	0	Pass	0	Closed		Closed		Closed	
Residence Inn	12	Pass	N/a	0	N/a	0	N/a	1	N/a		N/a	
Reveler Beverage	15	Fail	Pass	0	Pass	0	Pass		Pass	2	Pass	
Rice Barn	12	Pass	Closed	0	Closed	0	Closed		Closed		Closed	
Sheraton Needham	12	Fail	N/a	6	Pass	4	Pass	1	Pass	1	Pass	3
Spiga	12	Pass	Pass	3	Pass	0	Pass		Pass		Pass	
The Farmhouse	12	Pass	N/a	0	Pass	0	Pass	3	Pass	1	N/a	
Homewood Suites	12	N/a	N/a	2	N/a	0	Fail	1	Pass		Pass	1
The James	12	Pass	Pass	0	Pass	0	Pass	3	Pass		Fail	6
Needham General Store	15	Pass	Pass	0	Pass	0	Fail		N/a		N/a	
V.F.W.	12	Pass	Pass	1	Pass	1	Pass		Pass		N/a	
Village Club	12	N/a	N/a	0	N/a	0	N/a		N/a		Pass	
Vinodivino	15	Fail	Pass	0	Pass	0	Pass	2	Pass		Pass	
Volante Farms	12	Pass	Pass	6	Pass	0	Pass		Pass		Pass	

Business	license	12/2022 CC	4/2023 CC	5/2023 TIPS	9/2023 CC	10/2023 TIPS	12/2023 CC	2/2024 TIPS	05/2024 CC	06/2024 TIPS	10/2024CC	12/2024 RBS
Total TIPS attendees				24		15		35		13		16
Total PASSES		18	22		25		21		24		23	
Total FAILS		10	2		1		4		0		2	
Total establishments checked		28	24		26		25		24		25	
Percent failure		36%	8%		4%		16%		0%		8%	

Definitions for spreadsheet:
CC: compliance check
TIP: TIPS training for alcohol licensees
License type 15: Off-premise liquor license
License type 12: On-premise liquor license
Closed: A business which has closed permanently
N/a: A business which was not checked due to a liquor license suspension, compliance check during non-business hours, has not opened yet, or other reason

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Unit: Emergency Preparedness

Date: December 2024

Staff: Taleb Abdelrahim

Activities and Accomplishments

Activity	Notes
Medical Reserve Corps (MRC)	NACCHO awarded the Norfolk County-8 (NC-8) MRC unit the full $10,000 Operational Readiness Award (ORA). This funding will support exciting initiatives and opportunities for the unit this year.
Extreme Temperature Health Impacts Planning	Working on Health Action Plan to document our action to take before and during an extreme temperature event to mitigate health impacts.
Training	Completed Intermediate Emergency Operations Center Functions - a three-day course as part of the Massachusetts Professional Emergency Manager (MPEM) program, fulfilling a key professional development requirement by MEMA.

Unit: Epidemiology

Date: December 2024

Staff: Julie McCarthy

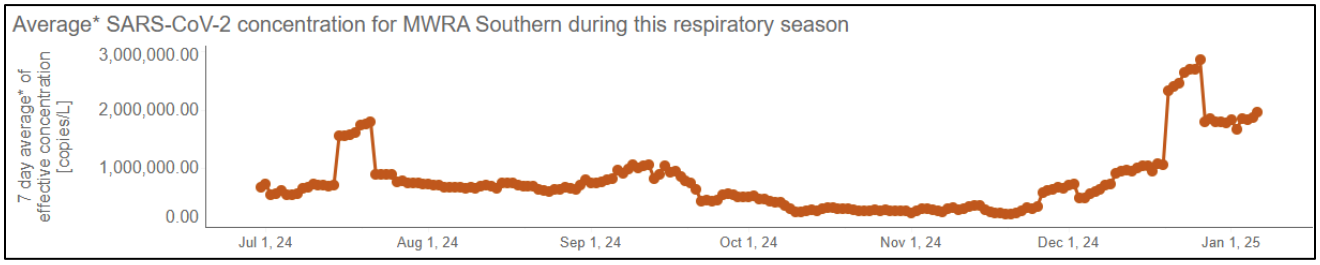
Activities and Accomplishments

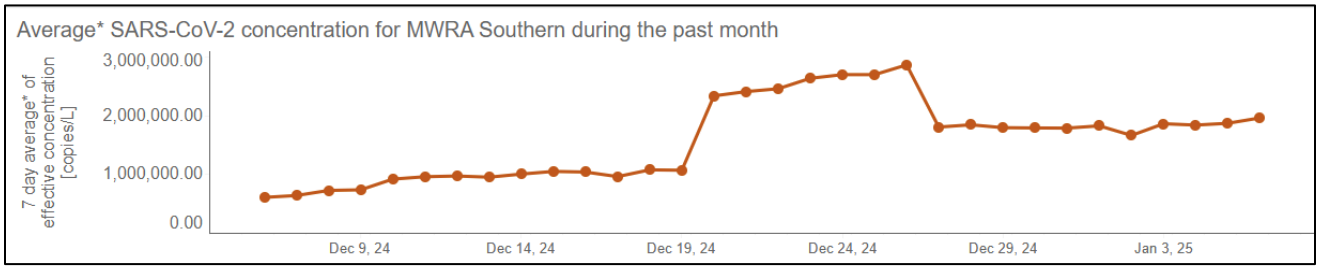
Age	Needham- Influenza	MA- Influenza	Needham- Covid-19	MA- Covid-19
Total	56%	35%	35%	18%
Under 5 years	51%	40%	24%	10%
5-19 years	56%	31%	26%	10%
20-34 years	43%	22%	24%	10%
35-49 years	50%	28%	28%	14%
50-64 years	52%	33%	35%	18%
65-79 years	77%	66%	63%	45%
80+ years	77%	68%	62%	47%

RSV-Cumulative	Needham	MA
60-74 years	35%	18%
75+ years	43%	33%

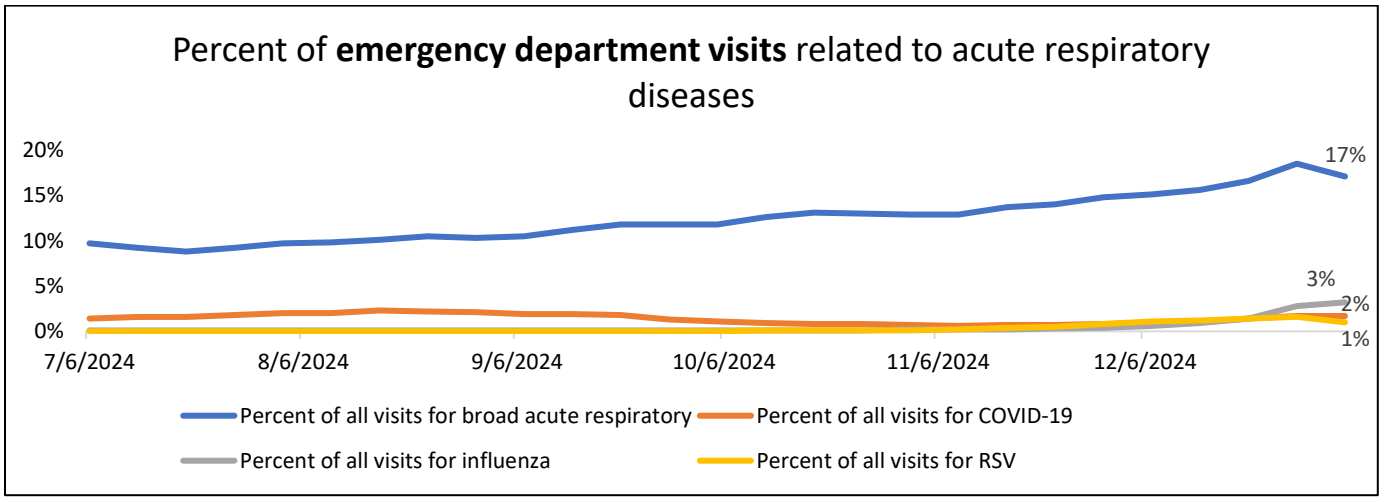
Source: https://www.mass.gov/info-details/immunizations-for-respiratory-diseases

NOTE: A single dose of RSV vaccine is recommended for all adults ages 75 and older and for adults aged 60-74 who are at increased risk of RSV infection. Annual doses are not recommended for those who have already received a previous dose, so I have only included the cumulative number, not those who have received vaccine this season. Additional patient populations may be eligible for the vaccine based on clinical information.

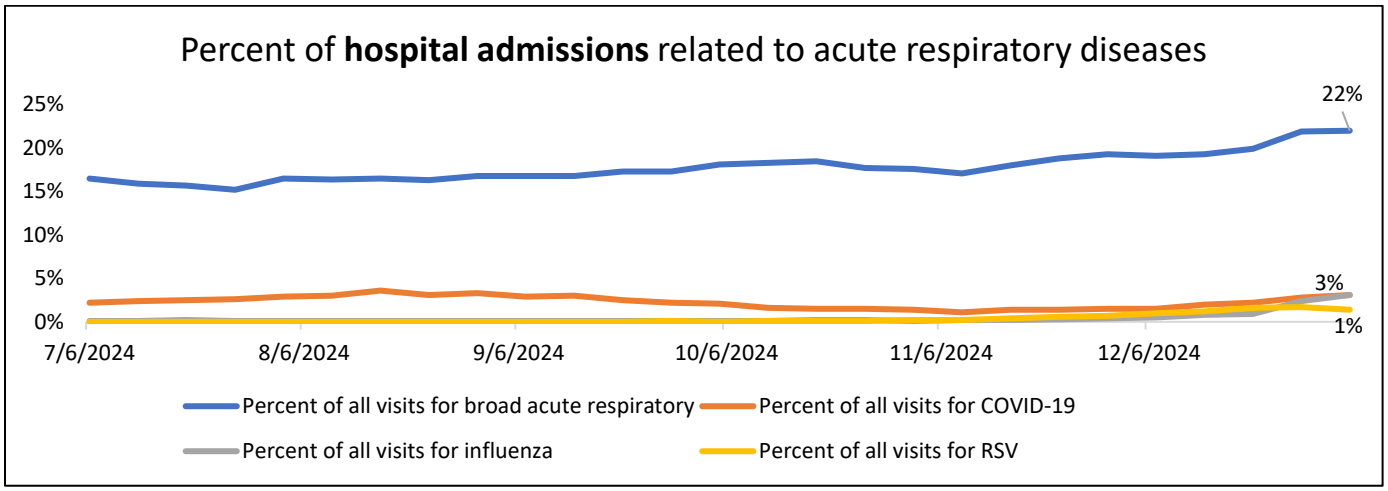




Source: https://www.mass.gov/info-details/wastewater-surveillance-reporting



Source: https://www.mass.gov/info-details/respiratory-illness-reporting



Source: https://www.mass.gov/info-details/respiratory-illness-reporting

Mass General Brigham clinics and hospitals introduced new masking procedures at the beginning of January due to escalated levels of respiratory virus activity.

Activity	Notes
Biosafety Committee	Scheduling meeting for end of Jan/beginning of Feb to discuss 2025 permitting process including modifying questions asked in annual permit renewal, timeline of document submission and review, and inspections.
MetroWest Adolescent Health Survey	Worked with Karen S to address follow up on questions from BOH at the November meeting.

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Unit: Public Health Nursing

Date: December 2024

Staff: Hanna Burnett and Ginnie Chacon-Lopez

Activities and Accomplishments

Activity	Notes
Community Outreach	3 CPR classes offered in December. New classes were added for January. BP clinic at the CATH weekly, well attended.
Education	Hanna: MPHA 2024 Annual Conference: Rising in resistance. Ginnie: Various webinars; started a Legal Epidemiology online course through Temple University; and attended the 2024 Merrimack Valley Substance Use Disorder Summit in Westford, MA.
DVAC	Officer Denneno presented on Police Investigations on Domestic Violence Calls in Needham. Created episode 4 for cable series, recording that in February.
Additional Notes	FRIENDS of the Needham Board of Health and Traveling Meals Program donated 30 gift cards to distribute to residents as needed. Efforts to sustain the Gift of Warmth program are continuing.

Potential Foodborne Illnesses	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	2025	2024	2023
Calicivirus/Norovirus						<5							<5	5	5
Campylobacteriosis Confirmed/Probable	<5	<5	<5										<5	10	9
Cryptosporidiosis													0	<5	0
Cyclosporiasis													0	<5	<5
Enterovirus	<5				<5								<5	0	0
Giardiasis													0	0	<5
Salmonellosis		<5											<5	<5	5
Shiga Toxin Producing Organism	<5												<5	<5	<5
Shigellosis		<5											<5	0	0
Vibrio spp													0	<5	<5
Arbovirus	**JUL**	**AUG**	**SEP**	**OCT**	**NOV**	**DEC**	**JAN**	**FEB**	**MAR**	**APR**	**MAY**	**JUN**	**2025**	**2024**	**2023**
Babesiosis													0	<5	<5
HGA/Anaplasmosis			<5	<5									<5	<5	<5
Lyme Disease Suspect	6			<5	<5								9	45	58
Lyme Disease Probable		<5	<5	<5		<5							6	35	19
Other Communicable Illnesses	**JUL**	**AUG**	**SEP**	**OCT**	**NOV**	**DEC**	**JAN**	**FEB**	**MAR**	**APR**	**MAY**	**JUN**	**2025**	**2024**	**2023**
Group A streptococcus						<5							<5	0	0
Group B streptococcus													0	<5	<5
Haemophilus influenzae		<5											<5	<5	0
Hepatitis B Confirmed/Probable				<5		<5							<5	5	<5
Hepatitis C Confirmed/Probable	<5	<5											<5	<5	0
Influenza Confirmed			<5	<5	7	25							34	155	193
Malaria													0	<5	-
Legionellosis													0	<5	<5
Novel Coronavirus Confirmed	24	34	27	13	<5	14							115	308	980
Novel Coronavirus Probable	14	7	8	7	<5	8							48	54	188
Pertussis (Bordetella spp.)		<5	<5										<5	0	<5
TB Infection Confirmed	<5	5	<5		<5								12	45	44
TB Infection Contact	<5												<5	<5	-
Varicella					<5								<5	6	<5
Totals	55	55	45	26	19	51	0	0	0	0	0	0	251	690	1519

Immunizations/Injections	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	2024	2024	2023
B12	2	1	1	1	2	2							9	8	3
Influenza			332	115	76	8							531	771	719
Tdap						1							1	0	1
Covid-19				30	31	15							76	208	461
VFC						3							3	0	0
Other						5							5	3	0
Total	2	1	333	146	109	34	0	0	0	0	0	0	2	990	1184

Animal-to-Human Bites	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	2024	2024	2023
Dog													0	3	3
Cat													0	1	0
Bat					1								1	0	0
Total Bites	0	0	0	0	1	0	0	0	0	0	0	0	1	4	3

Assistance Programs	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	2024	2024	2023
Food Pantry						2							2	0	4
Friends	1												1	0	0
Gift of Warmth	0	2	1	5	4	0							12	29	51
GoW Amount	0	1400	300	2394	1877	0							5971	16843	25921
Parks & Rec													0	0	0
Self Help													0	2	6

Education	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	2024	2024	2023
CPR Education			88	17	11	14							130	243	197
Matter of Balance Graduates					5								5	15	34
Narcan	3	69	13	8	9	0							102	174	25

Donations:	$750
Gift Cards Distributed:	0

December 2024 Report

Unit: Shared Services Grants – Public Health Excellence and Contact Tracing

Date: 1/15/24

Staff members: Kerry Dunnell, Samantha Menard, Jennifer Casey, Amy McInerney, Jennifer Gangadharan

Activities and Accomplishments

Activity	Notes
Shared Services-Charles River Public Health District (Towns of Dover, Medfield, Needham, and Sherborn)	<u>Continuing Education and Training</u> Jenn Gangadharan enrolled in MIIS and completed the 5-day email trainings. Sam and Amy attend a webinar titled Public Health Power Hour- Reduced Oxygen Packaging on 12/10 hosted by the FRCOG training hub. <u>Community Support & Engagement</u> Jenn G. coordinated a meeting with Regional PHNs from Foxboro and Seekonk on December 2. The group discussed programming and shared ideas from each jurisdiction and agreed to meet again in January. One long term goal of the group is to expand their network and collaborate with other Regional PHNs. Amy is finalizing the webpage for the Charles River Public Health District Collaborative. The page will go live in January. <u>Strategic Planning</u> After a competitive procurement process BME Consulting awarded a contract to conduct strategic planning with the Charles River PHD Advisory Board. Kerry & Jen Casey met with BME to discuss timetable and deliverables. BME will begin meeting with the Advisory Board in January and continue monthly through the end of the fiscal year. <u>Fee Cost Study</u> BME Consulting prepared a final presentation for the Advisory Board about their work on the fee comparisons and fee cost calculator for use by all CRPHD communities. Amy McInerney will be trained by BME to be the CRPHD point of contact regarding use of the fee cost calculator. <u>Environmental Health Activity</u> *Regional environmental health agents support environmental health activities and conduct inspections in all member communities as requested*

	In December Sam Menard, Assistant Manager, and Amy McInerney, Regional Environmental Health Agent conducted food establishment, Title V and Tobacco inspections in Needham. The Environmental Health Working Group, including representatives from all communities met on December 17. There were three outcomes from this meeting. 1) A final draft of a common variance application form was accepted and will be presented to the CRPHD collaborative Advisory Board for consideration., 2) Participants agreed to research tobacco enforcement options and report to the group at an upcoming working group meeting. 3) The next working group meeting will include collaborative review of the self-assessment tool to ensure accuracy and consistency of responses among the four communities. <u>Regional Public Health Nursing</u> Jenn G. began monitoring all MAVEN cases for the town of Medfield on December 3, 2024. Jenn will be continuing to do so while the Medfield public health nurse position is vacant to ensure that the requirement for continuous MAVEN coverage is being met. In preparation for the arrival in early February 2025 of a public health nurse in Dover, Jenn and Kerry met with Kay Peterson MD, Dover Board of Health Chair and Jason Belmonte, Dover Health Director. Topics included onboarding plans, equipment needs, and desired programming in Dover. <u>Grant Administration & Finance</u> Staff hosted a quarterly check in meeting with MA DPH Program Coordinator, Jessica Ferland on December 6. The meeting included review of successes and challenges in the most recent reporting period as well as question and answers with Advisory Board members.

Shared Services- North Central & MetroWest Local Public Health Training Hub Serving the 40 communities in the Charles River Health District, Greater Boroughs, MetroWest Public Health Coalition, Nashoba Associated Boards of Health, Norfolk County-8 Public Health shared services arrangements, along with the communities of Bellingham, Holliston and Marlborough.	<u>Staffing</u> An offer was extended to a qualified preferred candidate for the Environmental Health Agent Trainer position. Padraig Martin is scheduled to begin work on January 6, 2025. <u>Continuing Education & Training</u> Housing Training – Sam participated in the final three training days (two in-person and one remote) for Tier 3 Housing trainings for trainers hosted by the Office of Local & Regional Health (OLRH). OLRH will issue approval to provide training in early January 2025. Additionally, OLRH will issue final documents for trainer use with individuals who are ready for Tier 3 training. The first segment of Tier 3 training will focus on how to prepare proper and complete documentation for housing cases Jenn Ganghadaran completed the Tier 2 Housing Training and passed the exam. She will be participating in the next Tier 3 Housing for Trainers. <u>Training Hub groups engagement & support</u> Amy is finalizing the webpage for the North Central MetroWest Local Public Health Training Hub. The page will go live in January. Staff assembled 75 environmental health equipment starter kits for distribution to Tier 3 trainees. The kit includes various essential items needed for food and housing inspections, including a head covering, and a list of the items so that trainees can replenish their supplies with similar items. The equipment is provided in a sturdy work bag. The bag, head covering, and list all are branded with the NCMW Local Public Health Training Hub logo. <u>Training Delivery</u> Sam held a kick-off meeting for three new Food Inspection Tier 3 trainees. OLRH provides a list of individual eligible for Tier 3 training monthly. Individuals are eligible for Tier 3 once they have completed all Tier 1 online trainings and Tier 2 classroom trainings. <u>Funder Communication & Collaboration</u> Kerry and Sam participate each month in work groups as well as two monthly meetings of the ten training hubs led by the Office of Local and Regional Health (OLRH). Workgroups include Evaluation and satisfaction surveys and Assessment tool development. Monthly meetings include discussion of curriculum development and coordination with the Tier 1 and Tier 2 trainings, as well as efforts to align the ten training hubs on job descriptions and communication with Hub communities.

Needham Public Health Division
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January 2025

Monthly Staff Reports

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Board of Health

AGENDA FACT SHEET

February 21, 2025

Agenda Item	January 2025 Staff Reports
Presenter(s)	Public Health Division staff members

1.	**BRIEF DESCRIPTION OF TOPIC TO BE DISCUSSED**

Each program area within the Public Health Division will give a brief update on current topics, projects, events, accomplishments, and more.

2.	**VOTE REQUIRED BY BOARD OF HEALTH**

Discussion only.

3.	**BACK UP INFORMATION:**

a) Environmental Health – Sai Palani & Tara Gurge
b) Accreditation – Lynn Schoeff & Alison Bodenheimer
c) Public Health Preparedness –Taleb Abdelrahim
d) Traveling Meals – Rebecca Hall
e) Substance Use Prevention: Regional – Carol Read & Lydia Cunningham
f) Substance Use Prevention: Needham – Karen Shannon, Karen Mullen, Monica DeWinter, Angi MacDonnell, Vanessa Wronski
g) Epidemiology – Julie McCarthy
h) Nursing – Ginnie Chacon-Lopez, Hanna Burnett & Tiffany Benoit
i) Public Health Excellence – Kerry Dunnell & Samantha Menard

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January 2025

Assist. Health Director - Tara Gurge
Full-time Health Agent – Sainath Palani
Part-time Health Agents – Monica Pancare and Pamela Ross-Kung

Unit: Environmental Health
Date: February 21, 2025
Staff members: Tara Gurge, Sainath Palani, Monica Pancare and Pamela Ross-Kung

Activities and Accomplishments

Activity	Notes
Staff Updates	The Environmental Team recently conducted interviews and hired a temporary part-time Environmental Health Student Intern that will be starting with us on Monday, February 24th. Her name is Alexandra Diener, and she will be working 15 hours per week in assisting us with some ongoing Env. Health projects for the next six months.
Dumpster Regulation Update	Staff created a new online dumpster permit from scratch and made it live at the end of January. Notices will be sent out in February to have businesses, property managers and landlords apply for dumpster permits with assistance from the town economic development manager. Once dumpsters are registered with our office, we can look to create a map showing where dumpsters are located in town and log data in a layer on the Town GIS system. It can be used for potentially different applications.
Fuss & O'Neill Turf Testing Follow-up	After our last Board of Health meeting, we were able to connect with our contact at Fuss & O'Neill about the Boards inquiries, and they said they can provide resampling for Arsenic due to the mistake with the analysis and elevated reporting limit. They also stated that they will retest for that metal at no additional cost. They also agreed to retest for Zinc as well, but did not state that this retesting would be free of charge. They also agreed to take 6 total grab samples from each field, instead of 3. So, there will still be 3 total samples submitted for laboratory analysis, one from each field. We would like to receive the Board's feedback on the timing of this field turf retesting.

Follow-up on Enforcement of Zyn Nicotine Pouches/Other Vape Products	Public Health staff had a follow-up virtual meeting with Cheryl Sbarra and her staff. She and her team gave us some helpful guidance on the next steps for enforcement of Zyn nicotine pouches, specifically, the Zyn Chill flavored version. Her staff provided us with some recent articles that we also included in this meeting packet for you to review. One recent document entitled, 'FDA Authorizes Marketing of 20 Zyn Nicotine Pouch Products After Scientific Review,' is the latest information regarding Zyn pouches. The enforcement guidance we received is noted below: - They stated that we should be fine continuing to enforce the Zyn Chill, since the basis for prohibiting its sale is that it is considered a flavored product, which is prohibited under state law. The FDA (federal) authorization has no impact on that. - They also stated that if the Board is interested in restricting the nicotine content, restricting it to the 3mg or 6mg amounts would now have a stronger basis, since those are the only two authorized by the FDA. - Cheryl and her team also stated that we cannot restrict the advertising or display cases, since that is protected by the First Amendment. - The other item we can enforce is restricting the scanning of the QR coupon code on the base of the Zyn containers, since coupons and discounts are not allowed. We are open to receiving feedback from the Board on the above-mentioned enforcement options for this product. We would also like to receive feedback on some other vape products that our retailers have on their shelves with a "clear" flavoring that other towns have found to be flavored after completing smell tests. The chill version of Zyn is still being sold in retailers and enforcement of product will begin at time of next routine inspections of those stores.
MBTA/Keolis Pest Control Treatment	Sai and Tara met with A1 Pest Control and witnessed the second CO gas pest control treatment being conducted in the burrows by the MBTA Right-of-Way, along the tracks on January 8, 2025. This treatment was conducted behind the Sudbury Farms, Hungry Coyote, Subway and Dunkin Donuts, by Highland Ave.
Additional Enforcement Actions for Food Establishments by Staff	A routine inspection was performed at New Garden and conditions appeared to have improved. There was new management present, and they were more understanding of what we were asking from them. Staff decided that New Garden does not need to continue to work with a food consultant but made it clear to them that if they were to fall backwards that things would escalate once again. Farmhouse has hired a reputable food safety consultant to train staff and get their processes done so that food is being prepared in safe a manner consistently. Reports detailing the training courses and their observations from their unannounced audits, along with weekly Cooling, Cleaning and sanitizer logs, are being sent to our office for review. Environmental staff

	are planning on completing a routine inspection soon to check the progress that was made and whether they are ready to be released with their contract with their food consultant. French Press was failing to follow the provisions of their approval to use Time instead of Temperature for some of their time and temperature controlled for safety foods that they leave out on display, such as their ham & cheese croissants. The approval was allowing them to use up to 4 hours, but they have been using up to 6 hours instead, which is not approved by the food code and the FDA deems this as an unsafe practice. Due to continued non-compliance with these provisions after being given ample time to determine how to address this, staff are again meeting with them to determine whether are willing to follow the 4 hours the code allows to keep product out or whether they will need to take those products off their menu or handle them in a different manner that the FDA and our food codes deem is safe for the public.

Other Public Health Division activities this month: (See report below.)

Activities

Activity	*Notes*
Body Art	**1** – Reinspection performed and permit was issued to Premium Skin on Oak St. to be able to perform microblading.
Demo Reviews/ Approvals	**5 - Demolition signoffs:** -#626 South St. -#74 Gary Rd. -#19 Mason -#107 Valley Rd. -#211 High Rock Rd.
Disposal of Sharps Permits	**0 – Disposal of Sharps Permits issued to:**
Septage/Grease/ Medical Waste Hauler Permits Issued	**0 – Septage/Grease & Medical Waste Hauler Permits Issued to:**
Trash/Recycling Waste Hauler Permit issued	**0 - Trash and Recycling Waste Hauler Permit issued.**

Food - Plan reviews/Follow-ups/Pre-operation inspections	**4 – Plan Review Meetings/Initial Pre-operation inspections conducted.** **-** Abbott's Frozen Custard (Permit issued) - Conrad's (Previous Bertucci's site) – Environmental Team brought owner and his staff in for a plan review meeting to discuss the requirements. Initial pre-operation inspection conducted. Final pre-opening inspections were done in early February and soft-opening is planned for February 10th, 2025. - Katie Eats Boston (Residential kitchen) - Knights of Columbus: Kitchen is in the process of being redone after the sudden flood back in late 2023. Plan review documentation was submitted and staff met with Knights and contractor about the requirements needed.
Food – Temporary Food Event Permits issued	**4 – Temporary Food event online permit application reviews and permits issued to:** - Eversource Informational Session at Powers Hall (January 29th) - Sunita Williams PTC-Family Movie Night (March 7th) - Plugged-In Band at Power Hall (April 5th) - Needham Community Theatre (February 2nd)
Food Complaint/ Follow-up	**3 – Food Complaints received.** - **Capella**: Witnessed mouse droppings on top of seating booth. - **Dragon Chef**: Complainant saw food handler cut their finger while preparing food in the kitchen. Complainant believed they were not following proper protocols afterwards. - **McDonalds**: Confirmed food borne illness complaint. McDonalds in Needham was part of food history.
Housing - Complaints/Follow-ups, etc.	**(2/4) - New Housing Complaints/Follow-ups conducted at:** – **Saint. Mary's St. (0/1)**: Follow up inspection performed and an inspection report was sent out, and letter will be sent out to responsible parties describing next steps. – **Chambers St. (Needham Housing Authority/NHA) (0/1) - Update:** Another reinspection was performed in the month of January and an inspection report was sent out. Housing court judge made decision to evict occupant after providing over a year of extensions with the case. Once constable deliveries eviction papers, NHA will change locks and begin to clean out the unit. An inspection will be requested from our office after that point. – **Gage St. (0/0) - Update:** Occupant requested another month to continue to clean out the unit. Next inspection is scheduled in mid-February. - **Central Ave. (1/1) –** Our office received a complaint about repeating flooding issues into their bathroom, presumably coming from the toilet the upstairs unit clogging and overflowing. Scheduled inspection was canceled by complainant. No further action is needed. – **Seabed's Way (1/1) –** Mold was appearing in the closet again for occupant (repeating issue from year prior). A mold abatement professional was hired and their recommendations included removal of the closet doors and moving things away from the walls inside the closet. – **Rosemary St. (0/0) –** Update: An agent of the property owner contacted our office and said that the occupants agreed to move out of the unit on their own. The violations noted would be corrected and a reinspection would be performed prior to renting out the unit to new tenants.

Housing Pre-occupancy inspections	**0 – Housing pre-occupancy inspections conducted.**
Nuisance complaints/Follow-ups	**(4/2) – New Nuisance Complaints/Follow-ups:** - **Central Ave. (0/0)** - Autobody paint shop case. **Update:** No update in the month of January. - **Central Ave. (1/1) –** Complaint about bright lights from new daycare center and Temple across the street where it was reported that lights were on all night long. Adjacent properties were requested to turn off lights at night to be respectful of residential neighbors. - **Yurick Rd. (1/0) –** Received complaint about a strange odor that smells like laundry being observed outside their residence in the middle of the unit a few times a week. Fire department had already responded and were not concerned with smell. - **Fourth Ave. (1/0)** – Heater in the pool room was broken. Complaint was received stating that instructors and swimmers might be getting sick due the cooler than normal air temperatures. Pool owners were contacted and they stated it was to be fixed within a week. - **Gould St. (1/1)** – Mercury thermometer had broken inside a unit inside one a residence. State and local fire departments responded to start clean up of the spill. Unit was then professionally cleaned and once it was confirmed that concentration of mercury in the air inside the unit was at safe level, health agent gave confirmation that unit could be reoccupied. No further action is needed.
Indoor/Outdoor Pool spot check and annual permit renewal inspections	**1 – Indoor/Outdoor pool spot check conducted.** - **Residence Inn (Failed to renew their 2025 annual permit, pool is closed due to water heater failure and inspection and new permit will be needed to reopen the pool)**
Planning Board Special Permit reviews	**1 - Planning Board review conducted for:** - **#63 Kendrick St. – Comments sent.**
Septic Certificate of Compliance (COC)	**3 – Septic Certificate of Compliance final signoff issued.** - **#18 Brookside Rd.** - **#120 Stratford Rd. (D-box replacement only)** - **#896 Charles River St. (D-box replacement only)**
Septic – Construction Repair permit issued	**0 – Septic Construction Repair Permits issued.**
Septic Failure Letters	**0 – Septic system failure letters sent.**
Septic Installation inspections	**2 – Septic installation inspections conducted at:** - **#365 Charles River St.**

Septic Deed Restrictions	**0 – Septic Deed Restrictions received.**
Septic Installer Exam/Permit Issued	**0 - Septic System Installer exam and permits issued.**
Septic Addition/Reno. to a Home on a Septic reviews	**0 – Addition/Reno. to a Home on a Septic reviews conducted.**
Septic Plan Reviews/Approvals issued	**1 – Septic Plan reviews conducted/approvals issued.** - **#1266 South St.**
Septic – Soil/Perc Tests	**0– Septic Soil/Perc Tests conducted.**
Septic Trench permit issued	**1 – Septic Trench permit issued.** - **#365 Charles River St. (DP & Sons/Pettis)**
Septic – Abandonment Forms	**0 – Septic abandonment/connection to sewer forms received.**
Tobacco Compliance Checks/Hearing Scheduled	**0 – Tobacco retail routine compliance checks conducted at all permitted establishments.**
Well Permit online plan review	**0 – Well permit online application plan reviews conducted.**
Zoning Board of Appeals plan reviews	**2 – Zoning Board of Appeals plan reviews conducted for:** - **#0 Colgate Rd.** - **#378 Manning St.**

FY 25 Priority FBI Risk Violations of Interest

Establishment	Date	Violation(s)	Corrective Action/Follow-up
Ray's New Garden	January 2, 2025	-Raw pork was observed to be stored above cooked products in the walk-in fridge. On cook line, raw chicken was stored above ready-to-eat products -There was visible mold inside the ice machine where ice gets made for bar drinks.	-Improper storage of raw products were addressed on-site. Newer PIC added this item as something to add to their daily walk around and check of the kitchen. - Ice machine was turned off and any ice in the machine and recently made and located in the bar were ordered to not be used. Ice made else where was purchased, until which time the ice machine could be professionally cleaned. PIC was looking into replacing the ice machine with a newer unit that easier to clean.
BID-Needham	January 4, 2025	-Baited unenclosed snap traps were observed on a shelf and by the grill and fry station.	-All open traps were removed and pest control company was contacted about use those these pest control products in the kitchen.
Little Spoon	January 11, 2025	-A mop wringer was observed being used to remove excess water from washed cabbage for spring rolls. The mop wringer not an approved tool to be used for this purpose. -Raw chicken was stored above ready to eat product in a small refrigerator on cookline.	-Reinspection performed and staff are no long using the mop wringer and have gone back to using a strainer with a mesh cloth. -Chicken was moved to appropriate location and this was rechecked at the reinspection.
Residence Inn	January 11, 2025	-Multiple butane canisters were stored on a shelf above food.	-Butane containers were moved to a separate dry storage room and stored correctly.

Starbucks	January 14, 2025	-There was excess mold inside of the ice machine that was making ice for all the drinks at the store. -One of the fridges storing ham sandwiches and cream cheese was too warm and products themselves were warm.	-Ice machine was ordered to cease being used, staff purchased ice from a neighboring establishment. Ice machine was cleaned prior to being used again. -All food in warm fridge were moved to a working fridge and warm fridge was serviced.
Hazel's Bakery	January 15, 2025	-Multiple foods, such as the corn beef and pastrami, were held at unsafe temperatures. Unit itself was running too warm. .	-Health agent had all foods in the fridge removed placed into fridges that were working. PIC would work on adjusting temperature of the unit or service the unit prior to using again. Note: Owner is still working on installing a proper ventilation in their system in their kitchen.
Sweet Basil	January 21, 2025	-Establishment a year ago was mandated to keep cooling logs. Logs the day of the inspections were not filled out even though there were multiple items that were cooling. When questioned, the Bolognese sauce was not close to cooling fast enough inside of their blast chiller making the food potentially unsafe.	-PIC chose to reheat the Bolognese sauce and would restart the cooling process.
Capella	January 28, 2025	-Multiple cooked/prepared foods were at temperatures that were too warm on cookline.	- Since products were just recently prepared, PIC asked staff to take these products and put them on sheet pans and place them in the walk-in fridge to cool down quicker. Agent suggested that products are prepared cold and in batches and that if they are too warm to cool down quickly using approved

			methods to minimize time the products is held at improper temperatures.
Bagel's Best	January 29, 2025	-PIC was unaware of the requirements for the exclusion and restriction of sick employees. -Food in one of the sandwich units was too warm and at unsafe temperatures.	-Guidance was left with PIC about exclusion and restriction. -Any food that was over 45f was discarded and the remainder were brought to the walkin fridge to cool down. Unit was ordered to not be used until serviced or unit could hold below 41f.
Just Salads	January 29, 2025	-Hot held chicken were in the temperature danger zone. Products were prepared over 4 hours ago and hold holding unit was not working. -Sanitizer at sink and being held in the wiping cloth buckets were too weak. Dispenser at 3-bay sink was not auto-dispensing at right concentration.	-Chicken was voluntarily discarded. Hot holding unit will not be used and chicken will be held in the back of house in units that are working. Unit will not be used until agent verifies it is working. - Sanitizer was manually made. Health agent order they keep a daily log for the sanitizer as this was a repeating violation. Reinspection scheduled.
Cook	January 31, 2025	- Multiple TCS foods were at unsafe temperatures in a cold holding unit in the basement and in a unit by the pizza station.	-TCS foods (shrimp, risotto and cooked onions, meatballs, chicken, sausage) were voluntarily discarded. Physical temperature logs were mandated to be kept and then sent to the health department until the reinspection date.

Trader Joe's	January 31, 2025	- Chemicals were stored above scale used for food.	-Chemicals were moved.
Founders Café at Shark Ninja	January 31, 2025	-Dishwasher was observed not washing their hands between handling dirty dishes and clean dishes. - Hot held TCS foods (hamburgers and fries) were at unsafe temperatures. -Cold sandwiches and their ingredients were held at unsafe temperatures.	-Person in charge was notified of dishwasher not washing their hands when needed and additional training would take place. -Food products were out for 2 hours or less and were to be discarded after lunch. However, kitchen is not permitted to use Time as a public health control. Kitchen will apply with office if they choose to use Time moving forward.

Category	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	FY'25	FY'24	FY'23	FY'22	FY'21	FY '20	FY' 19	FY' 18
Biotech registrations/Plan rev./Insp.	0	0	0	0	0	0	0						0	15	3	3	0	1	1	1
Bodywork Estab. Insp.	0	0	0	0	0	6	0						6	8	5	5	6	7	14	11
Bodywork Estab. Permits	0	0	0	0	0	5	0						5	5	6	5	13	9	9	6
Bodywork Pract. Permits	0	0	0	0	0	7	0						7	10	5	8	12	23	21	22
Demo reviews	6	4	6	7	3	8	5						39	96	53	89	76	73	104	105
Domestic Animal permits	0	0	0	0	0	0	0						0	17	17	15	29	1	21	19
Domestic Animal Inspections	0	0	0	0	0	0	0						0	2	1	10	8	3	22	3
Food Service Routine insp.	17	24	17	10	26	27	20						141	224	214	194	134	149	200	225
Food Service Pre-oper. Insp.	0	2	5	0	1	2	3						13	23	22	22	16	48	12	32
Retail Food Routine insp. Or 6 month check in	0	0	0	0	0	0	0						0	4	13	11	12	33	46	60
Residential Kitchen Routine insp.	1	2	0	3	1	2	1						10	5	8	5	5	3	6	8
Mobile Routine insp.	0	0	0	0	0	0	1						1	5	10	10	10	4	17	13
Food Service Re-insp.	17	19	19	7	2	9	22						95	114	37	27	7	21	28	53
Food Establishment Annual/Seasonal Permits	0	1	1	0	44	71	5						122	128	130	138	134	155	140	171
Temp. food permits	2	4	6	2	5	1	4						24	51	33	37	9	67	134	163
Temp. food inspections	7	2	0	1	1	0	0						11	24	16	9	3	10	37	29
Farmers Market permits	1	1	1	0	0	0	0						3	15	11	16	15	14	14	14
Farmers Market insp.	10	0	3	0	0	0	0						13	65	73	149	124	158	229	127
Food Complaints	3	3	1	0	1	3	3						14	25	11	13	7	49	18	20
Follow-up food complaints	3	2	1	0	1	3	1						11	18	12	15	8	48	21	21
Food Service Plan Reviews	1	1	2	0	1	1	4						10	21	75	13	12	14	20	42
Food Service Admin. Hearings	0	0	0	0	0	0	0						0	0	0	2	1	3	0	0
Grease/ Septage Hauler Permits	0	0	0	3	9	16	0						28	25	29	22	13	20	21	24
Housing (Chap II Housing) Annual routine inspection	0	0	0	0	0	0	0						0	13	9	10	7	7	0	14
Housing Follow-up insp.	0	1	1	2	1	2	3						10	26	13	3	2	0	0	5
Housing New Complaint	2	2	2	0	0	2	2						10	38	26	41	40	41	22	22
Housing Follow-ups	5	3	5	3	2	4	4						26	81	69	65	63	56	28	24
Hotel Annual inspection	0	0	0	0	2	1	0						3	3	3	3	3	3	3	3
Hotel Follow-ups	0	0	0	0	0	1	0						1	2	2	0	1	15	0	0
Nuisance Complaints	5	3	4	8	2	2	4						28	53	36	35	45	34	55	42
Nuisance Follow-ups	7	4	9	11	8	2	2						43	89	58	41	60	55	69	42
Pool inspections	1	6	0	1	5	1	0						14	30	14	15	15	13	20	12
Pool Follow up inspections	0	4	0	0	1	5	1						11	6	5	4	5	3	12	7
Pool permits	0	0	0	0	0	6	0						6	14	14	15	17	11	19	12
Pool plan reviews	0	0	0	0	0	0	0						0	0	5	0	5	0	3	44
Pool variances	0	0	0	0	0	5	0						5	5	7	6	5	6	5	7
Septic Abandonment	0	0	0	0	0	0	0						0	4	4	9	17	21	9	5
Addition to a home on a septic plan rev/approval	0	0	0	0	1	0	0						1	1	2	15	5	5	2	2
Septic Install. Insp.	0	4	0	3	0	6	2						15	26	22	19	11	13	21	28
Septic COC for Component	0	0	0	0	0	2	2						4	1	2	3	2	5	3	1
Septic COC for complete septic system	0	0	1	1	0	0	1						3	6	3	4	1	3	4	3
Septic Info. requests	3	4	3	6	5	7	3						31	60	62	64	86	61	62	51
Septic Soil/Perc Test.	1	1	0	0	0	0	0						2	6	6	5	8	1	1	2
Septic Const. permits	0	0	1	0	0	3	0						4	4	5	6	6	6	6	5
Septic Installer permits	1	0	1	0	0	6	0						8	7	16	11	8	6	8	9
Septic Installer Tests	1	0	0	0	0	0	0						1	5	9	4	3	2	5	3
Septic Deed Restrict.	0	0	0	1	1	0	0						2	3	0	0	4	1	1	3
Septic Plan reviews	0	0	0	1	2	0	1						4	13	29	21	14	8	9	23
Septic Trench permits	1	1	0	0	0	3	1						6	9	11	12	-	-	-	-
Disposal of Sharps permits	0	0	0	1	0	8	0						9	10	10	7	8	7	7	9
Disposal of Sharps Inspections	0	0	0	1	1	4	0						6	8	12	8	8	7	7	7
Rat Nuisance Complaints	1	2	3	10	1	1	0						18	20	5	6	2	2	1	-
RMD	0	0	0	0	0	0	0						0	3	2	-	-	-	-	-
Planning Board Subdivision Sp Permit Plan reviews/Insp. of lots	0	2	2	0	6	3	1						14	10	19	21	20	4	1	1
Subdivision Bond Releases	0	0	0	0	5	0	0						5	2	1	0	1	0	1	0
Special Permit/Zoning	2	1	1	3	4	2	2						15	16	19	21	18	17	34	15
Tobacco permits	0	0	0	0	1	6	0						7	6	7	6	7	10	10	11

Tobacco Routine insp	0	0	0	0	3	3	0						**6**	12	7	12	7	8	14	18
Tobacco Follow-up insp.	0	0	0	0	0	6	0						**6**	3	0	0	1	8	3	3
Tobacco Compliance checks	6	0	0	0	6	0	0						**12**	12	6	6	6	30	30	41
Tobacco complaints	0	0	0	0	0	0	0						**0**	0	6	0	0	2	3	4
Tobacco Compl. follow-ups	1	0	2	0	0	0	0						**3**	0	6	0	0	1	3	4
Trash Hauler permits	0	0	0	0	0	0	0						**0**	16	20	23	16	15	17	14
Medical Waste Hauler permits	0	0	0	2	2	3	0						**7**	6	6	2	2	2	2	1
Well - Plan Reviews, Permission to drill letters, Insp.	0	1	0	0	0	2	0						**3**	11	14	10	11	2	6	2
Well Permits	0	0	0	0	0	0	0						**0**	0	1	4	1	1	1	0
Monthly Totals	**105**	**104**	**97**	**87**	**154**	257	**98**						**902**	1540	1357	1355	1195	1405	1642	1668

Needham Public Health Division
Prevent. Promote. Protect.

Unit: Accreditation

Date: January 2025

Staff: Alison Bodenheimer and Lynn Schoeff

Activities and Accomplishments

Activity	Notes
Review PHAB submission	Identified strengths and weaknesses of submitted documents in anticipation of PHAB feedback
Policy review	Conducted gap analysis of policies and procedures. Identified missing policies and policies due for review
Policies	Demolition review Septic plan review and approval Grease trap inspections Septic system abandonment Sharps disposal permits

Other Public Health Division activities this month:

Needham Public Health Division
Prevent. Promote. Protect.

Unit: Traveling Meals Program

Date: January 2025

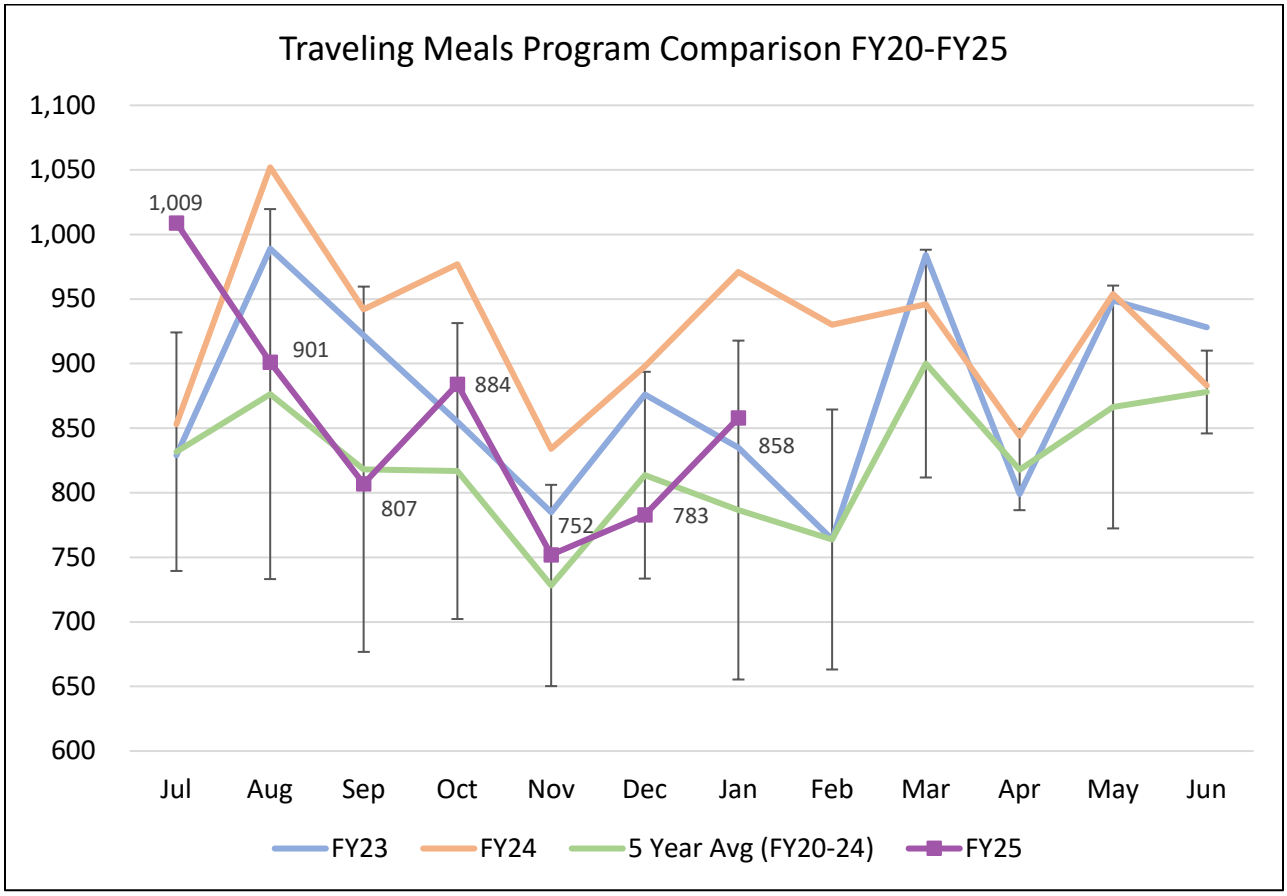
Staff: Rebecca Hall

Activities and Accomplishments

Activity	Notes
Volunteers and Seasonal Drivers delivered meals to homebound Needham residents in need of food.	***Meal delivery for month by 29 Volunteer Drivers and Community Partners***
858 Meals delivered in January 2025 ***49 Clients at end of January:*** ***42 Springwell Consumers*** ***7 Private Pay Consumers*** ***4 New Clients (1 Springwell. 3 Private)*** ***0 Cancelled Program***	***No 911 calls initiated***

Other Public Health Division activities this month:

Summary overview for the month: **Graph of Meal Deliveries for the month January 2025**



Needham Public Health Division
Prevent. Promote. Protect.

Unit: Substance Use Prevention MassCALL3 grant: Dedham, Needham, Walpole, Westwood
Date: January 2025
Staff members: Carol Read, M.Ed., CAGS, CPS & Lydia Cunningham, MPH, CHES®

Activity	Notes
Jessica Goldberg, MPH, MSW, Prevention Solutions @EDC- 1/2	Discussion: review of MassCALL3 brochure, request to update existing data displays with 2023 MetroWest Adolescent Health Survey data, discussion of meeting with EVERFI staff related to Alcohol Education: Safe and Smart curriculum.
MassCALL3 Grant Supervision- 1/6 Tiffany Benoit, MPH, RN, CHO, Assistant Director of Public Health Lydia Cunningham Annual Review- 1/9	Review and discussion: funding options for NPHD prevention staff (hospital community benefits, short term funding through Town operating budget, STOP Act grant). MassCALL3 brochure printing options, upcoming annual review and goal setting. Review and revision of 2024 goals and creation and discussion of goals for 2025.
MassCALL3 Connections Monthly Meeting- 1/7 Regional prevention staff, public health nurses, public health directors and assistant directors, human services staff.	-Strategic planning progress: two curriculum programs EVERFI's Alcohol Education Safe and Smart for high schoolers and Stanford University's Smart Talk Cannabis Prevention & Awareness curriculum for middle schoolers. Overview of both programs, best practices, current participation in region if known, and support for facilitators. -Needham Public Health regulations: Article 1: Regulation Affecting Smoking and the Sale and Distribution of Tobacco Products in Needham and Article 22: Regulation for Prohibiting the Manufacturing, Sale, and Distribution of Synthetically Derived Cannabinoids and Other Drugs.
BSAS The Montana Institute Session 2: Coalition Building through Coalescing, Communication Planning, and Core Principles- 1/8 Ben Tanzer & Becky Franks, the Montana Institute	-Review of the Montana Institute's "Core Principles" and how they apply to our work: be positive, present, perceptive, purposeful, perfected, proactive, passionate, and paradoxical. -Capacity building exercise: identifying who has influence on youth and parents in the community,

	who are trusted messengers, who has special knowledge and skills, who is most impacted.
Continuation of Funding for NPHD Substance Use Prevention Staff- 1/9 Tiffany Benoit, Assistant Director of Public Health & Karen Shannon, Substance Use Prevention Coordinator	Discussion of funding options available to sustain NPHD prevention staff and activities, including: -Beth Israel Deaconess Needham community benefits grants -NPHD operating funds -reapplication for STOP Act grant -cost sharing for prevention programs with Needham Police Dept.
Certified Prevention Specialist (CPS) Certification with interested MassCALL3 grantees- 1/9	Review of CPS application process and materials available online. Discussion of courses available for continuing education credits. Sharing of notes, resources/trainings, supervisory letter, and other required application materials.
Needham Public Health Division Staff Meeting- 1/14 Timothy McDonald, Director of Health and Human Services, Tiffany Benoit and Tara Gurge, Assistant Public Health Directors	Agenda: Introductions- new staff member Padraig Martin, Environmental Health Trainer. -Upcoming BOH meeting topics: CCIT data presentation, training hub presentation. -Staff updates: SPAN parent/caregiver education session held, two Needham high school students visiting the State House to discuss alcohol policy, plastic ban, housing vote.
Town of Brookline Health & Human Services 1/15 Public Health- Prevention Laila McGeorge, MPH	Agenda: Capacity assessment overview including federal funding opportunities, opioid abatement funds spending parameters, scope of MassCALL3 regional grant (Wayside collaborative member) youth survey options MetroWest Health Foundation.
Michelle Vaillancourt, Town Accountant & Lisa McDonough, Administrative Analyst, Town of Needham- 1/15	MassCALL3 grant December expense reimbursement submission. EIM- Virtual Gateway FY25 budget line-item review.
SAMHSA "Talk. They Hear You." Screen4Success: Early Intervention Through Screening- 1/15	In-depth review of Screen4Success tool in Talk They Hear You mobile app. Professional and personal screening questionnaire available as part of a larger suite of free resources. Screening provides resources based on specific responses.
Scott Gerbert, Director of Outreach and Strategic Partnerships, Division of Adolescent Medicine | Department of	Overview of Stanford REACH Lab's "Smart Talk" Cannabis Prevention & Awareness Curriculum, cannabis toolkit, and tobacco toolkit. Program includes free slide decks with lesson plans,

Pediatrics, Stanford University School of Medicine- 1/21	discussion questions, quiz games, pre and post-evaluation, teacher/facilitator training.
County Health Rankings and Roadmaps: The Land Back movement and health- 1/21 Ericka Burroughs Girardi, Research Program Coordinator, Colleen Wick, Communications Specialist, & Joanne Lee, Collaborative Learning Director	-Discussion of the relationship between reclaiming ancestral land and health and well-being. -How Indigenous land acknowledgements can help repair generational trauma rooted in forced relocation and intentional erasure of native language and cultural traditions. - Call for the return of Indigenous lands to strengthen social and economic opportunity. -Building relationships across groups experiencing oppression, shifting power and transforming systems.
Westwood Connected- Local Government 101, Westwood Public Library 1/22	Meeting and open question and answer session with Assistant Town Administrator and Human Resources Director, Molly Fitzpatrick and Assistant Town Administrator and Finance Director, Stephanie McManus. MassCALL3 staff provided grant overview and MassCALL3/Talk They Hear You resources.
Dedham Organization for Substance Awareness (DOSA)- 1/22 Rachel Smith, Drug Free Communities Program Director & Tae Averett, Program Coordinator	Agenda: Welcome, review of recent newsletter, update on opioid settlement fund- “mini grants” available to local non-profits, coalition partnership updates from youth, MassCALL3 Prevention Partners, faith sector.
Scott Formica, Senior Research Scientist, Social Science Research & Evaluation, Inc. -1/23	Discussion: MassCALL3 strategy- alternative to suspension program. Review of Mass. General Hospital’s iDECIDE program- best practices, ease of implementation, evidence base.
Middlesex County District Attorney Marian Ryan Anti-Hate Anti-Bias Taskforce- 1/23	Presentation by Attorney Ogor Okoye, BOS Legal group on immigration law, changes, and what to expect. Sanctuary cities and towns in Massachusetts, steps for family preparedness, additional resources.
Artificial Intelligence (AI) and Substance Misuse Prevention: Ethical Implications- 1/23	Session 1: Overview of AI basic programs that are assessable to the workforce -Comparison of potential benefits and pitfalls of using AI in substance misuse prevention work -Ethical decision-making process for making choices about AI use in work

Needham Board of Health- 1/24 Timothy McDonald, Director, Needham Department of Health and Human Services, Tiffany Benoit & Tara Gurge, Assistant Directors, Needham Public Health Division	Agenda: Welcome and public comment, review of December meeting minutes, propose citizen's petition to ban gas-powered leaf blowers, Community Crisis Intervention Team (CCIT) presentation, environmental testing of synthetic turf fields, North Central MetroWest Training Hub presentation.
Kristin French MSW, LCSW Director of Prevention & Human Services and Eliza Dodge Usen, MSW, Youth & Community Coordinator, Town of Ashland- 1/27	Discussion: prevention communication efforts- specifically Talk They Hear You campaign and MassCALL3 website and social media communication. Ability to modify TTHY content and tailor messaging to communities.
Norfolk County DA: Substance Use and Medical Review- 1/27 Dr. Dan Muse, Emergency Medicine Physician, Signature Health Care, Brockton and EMS medical director.	-Local data discussion: overdose and death by overdose data from BSAS dashboard -Local increase in connections to care prior to EMS involvement -Emerging and continuing trends: fentanyl and xylazine. -Comparison between overdose reversal drugs naloxone and nalmefene.
Boston Children's Hospital Virtual Conversation on Youth Health and Prevention Policy- 1/27 Ben Thomas, Director of State Government Relations & Shantel Gooden, Director of Behavioral Health Policy	-Discussion with MA prevention specialists to discuss pressing youth health and prevention policy needs. -Overview of BCH policy efforts focused on social determinants of health, increasing protective factors, and mitigating risk.
Charles River Shared Services Advisory Board - Kerry Dunnell, MPH Manager – Sam Menard Assistant Manager 1/28 Monthly meeting – 1/30 Strategic Planning. Town of Needham in collaboration with Dover, Medfield and Sherborn	Monthly meeting agenda: Foundational Public Health Services overview | CRPHD staffing updates | Public Health Nursing overview, Jen Gangadharan, Regional PH nurse. Strategic Planning meeting agenda: Program goals, timeline and outcomes for collaborative work facilitated by Arissa Ruano, MPH & Meghan Russell, MPH, BME Strategy Associates.
MetroWest Substance Awareness and Prevention Alliance- 1/28 Amy Turncliff, PhD, Rockfern Scientific	Agenda: Welcome and introductions -Policy Updates: Cannabis Policy: -Rep. Marcus Vaughn has filed and sponsored HD315, HD316, HD318, HD320, HD2985, HD2986, HD2992 (no advertising of out of state dispensaries, requiring CCC to review each billboard request, CCC to study fine structure,

	THC potency limit, data collection, warning labels) -Senator O'Connor filed counterparts (SD2434, SD2436, SD2433, SD2399, and SD2431) -Rep. Patrick Kearney has filed and sponsored HD229 cannabis billboard ban -Psychedelics policy: several bills filed to loosen restrictions in wake of failed ballot question -Alcohol policy: Senator Jason Lewis filed bill to increase alcohol excise tax.
Needham Community Crisis Intervention Team Quarterly Meeting- 1/28 Deputy Chief Chris Baker, Emily Turnbull, LCSW, Jail Diversion Clinician, Victoria Denneno, Community Outreach Officer and Kelsey Cournoyer, Crime Analyst - Needham Police Department. Jonathan Steeves, EMS Supervisor. Town service providers: EMS, Aging Services, Public Health, Youth & Family Services.	Agenda: Community partner information sharing De-Identified Statistical Data and trends- BID Needham Hospital- Newton Wellesley Hospital- Needham EMS- Needham Police incidents- Jail Diversion clinician activity | Resident support programs Recovery Coach, Youth & Family Services – Aging Services. | Homelessness Task Force Update | Core Team meeting, review acute and chronic resident mental health and substance use dependence support needs.
HealthBegins: Advancing Health Equity Effectively with the Social Needs Investment Lab- 1/28 Rishi Manchanda, MD, MPH, CEO of HealthBegins, Shantanu Agrawal, MD, MPhil, Chief Health Officer, Elevance Health, & Kofi Essel, MD, MPH, Food as Medicine Director, Elevance	Demonstration of the Social Needs Investment Lab's "evidence assessment library" tool: online repository of evidence assessments, each dedicated to a specific health-related social needs intervention. Examples of use cases: interventions to improve food security and maternal health.
Equipping Professionals to Tackle Synthetic Drug Challenges in Prevention- 1/28 Derrick Newby, South-Southwest Prevention Technology Transfer Center & Dr. Fernando Montero	-Overview of synthetic drugs (cannabinoids, cathinones, phenethlyamines, tryptamines, piperazines, fentanyl, xylazine, methamphetamine) and their unique risks. -Recent history of U.S. street opioid supply -Discussion of prevention strategies.
Massachusetts Alcohol Policy Coalition- 1/29 Elizabeth Parsons, Chair, David Jernigan, PhD, Boston University School of Public Health	-Youth Alcohol Policy Day Training Series and legislative visit recap: 52 youth from 12 communities met with legislators about increasing alcohol excise tax -Local guide for municipal leaders and training for prevention leaders: available for use and modification -Updates on home delivery research project. Next meeting: February 26th

Dedham Public Schools (DPS)- Mark Carney, Director of K-12 Wellness- 1/30	-Review of DPS K-12 wellness curriculum and time in learning for health and physical education. -Updates related to 2023 Massachusetts Comprehensive Health and Physical Education Framework. Health education staff working with Lighthouse Consulting on adopting this framework. -Current curriculum programs used in DPS for alcohol and marijuana education. Health education staff use homegrown curriculum model. -Feasibility of implementing two programs identified in MassCALL3 strategic plan: Alcohol Education Safe and Smart & Smart Talk: Cannabis Prevention and Awareness Curriculum.

*NPHD November Report- monthly activities
*BSAS Quarterly Report- October through December 2024
*Time dedicated to in-person collaboration and capacity building in cluster communities
This report is part of a larger quarterly report to BSAS and is not considered finalized for purposes of the BSAS report. A later version will be available.

END

Needham Public Health Division
Prevent. Promote. Protect.

Unit: Substance Use Prevention

Date: January 2025

Staff: Karen Shannon, Karen Mullen, Monica De Winter, Angi MacDonnell, Vanessa Wronski

Activities and Accomplishments

Activity	Notes
SPAN Projects & Events	**SPAN in the community:** **"Conversations with Your Middle Schooler: Why You Shouldn't Wait to Talk About Substance Use."** A three-part education series, geared for parents and caregivers of 5th through 8th graders. Each session will provide tips, techniques and tangible strategies for talking with their children about underage drinking and other substances. Ten parents/caregivers attended the first session held on January 14. Sessions 2 and 3 are scheduled for February 11 and March 11 at the Rosemary Recreation Complex. Karen Shannon and Angi MacDonnell are facilitating the presentations and Tony Serio and Kristina Kozak of Needham Youth & Family Services are facilitating the breakout sessions. **SPAN social media:** https://www.facebook.com/SPANNeedham/ **SPAN Action Teams-** **Education Action Team** met on January 21 to debrief the first session of Conversations with Your Middle Schooler and plan a social host law event for parents and caregivers on April 8. **Mental Health Action Team** met on January 22 to plan next steps for their work. They are using the SPAN Strategic Plan as their guide to addressing youth mental health. The team will continue writing posts for the Rethinking Success newsletter, https://www.spanneedham.org/rethinking-success. **Steering Committee** met on January 7 to review the Coalition Action Plan which was created from the 2023 Strategic Plan. **Nicotine Pouches:** Prevention Team staff worked with other Public Health staff to research nicotine pouches. Karen Shannon participated in a meeting organized by Tara Gurge with MHOA colleagues Cheryl Sbarra, Sarah McColgan and Lisa Stevens Goodnight to discuss health harms of nicotine pouches.
Needham Public Health Peer Recovery Coach	During January, Angi MacDonnell, Peer Recovery Coach engaged in the following: Worked with 6 people (phone, in person, and text contacts) Average Age: 57 Majority: Female

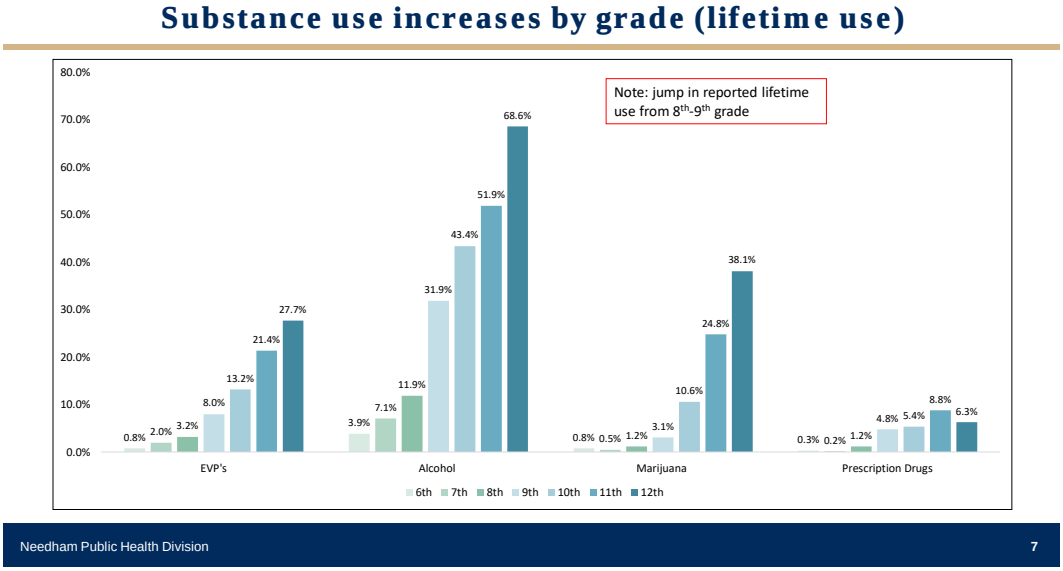
	Substance of choice: Alcohol Peer Recovery Service work also included: Dual Recovery Anonymous weekly meeting at Center at the Heights, Needham. • DRA is a 12-step self-help program for individuals who experience both an addiction and a psychiatric challenge. This mutual support community uses a harm reduction approach towards wellness. Meeting attendance during January averaged 4 people per week.
STOP Act grant	SAMHSA grant: STOPing Underage Access and Use of Alcohol: Codifying Youth, Parent and Retailer Education and Compliance in Needham, MA: **Alcohol compliance** – With the end of the STOP Act Grant on April 29, 2025, grant staff have approached Public Health leadership to identify a sustainability plan for continuing alcohol compliance checks and responsible beverage service training. **MA Alcohol Policy Coalition** (MAPC) – On January 15, Vanessa Wronski accompanied 2 Needham High SALSA students to the MA State House to participate with other students from area communities in a MAPC-led advocacy effort for raising the alcohol excise tax in MA. This event was the culmination of a months-long youth training program led by Dr. David Jernigan of Boston University School of Public Health and leader of MAPC. The Needham students met with House Representative Joshua Tarsky and Senator Becca Rausch's staff liaison to share a prepared statement about the need for an increase to the excise tax.
SALSA	During the month of January, 51 SALSA members contributed 248 hours of service in Needham. January highlights include: - 21 SALSA members taught refusal skills to 80 Pollard 8th graders during 4 Pollard MS health classes. - 2 SALSA members participated in Alcohol Policy Day at the MA State House meeting w/Representative Tarksy and Senator Rauch's office to discuss alcohol policy in Needham and in MA. - 14 SALSA members attended the Youth Power Summit in Worcester hosted by The 84 Movement and the MA Department of Public Health to meet with youth from across MA to discuss youth mental health and social justice issues.
Other programs	On January 30, Karen Shannon and Sara Shine facilitated part 1 of the Youth Mental Health First Aid course to 15 members of the Needham Resiliency Network. Angi is participating in the Metro West Health Foundation Leadership Program that runs from January to June 2025.

Summary for January 2025: Focus this month included delivery of session one of the SPAN middle school parent education series, preparation of the Annual Programmatic Report for the STOP Act grant, alcohol compliance sustainability, and review of the SPAN Strategic Plan.

Follow up to questions about the 2023 Needham MetroWest Adolescent Health Survey Data during the November 2024 presentation to Board of Health

1) **Prescription drug misuse rate for grade 12: why is it lower?**

It is difficult to know why the rate for prescription drug misuse reported by Needham High School 12th grade students (6.3%) is lower than the rate reported by 11th grade students (8.8%). The MWAHS does not ask students specific questions to get qualitative information about their use. We cannot make too many assumptions about why, and while we could make some guesses, it may be that the 11th grade cohort is different from others. Comparatively, the rate of cigarette use by Needham 11th grade students is higher than in other grades.

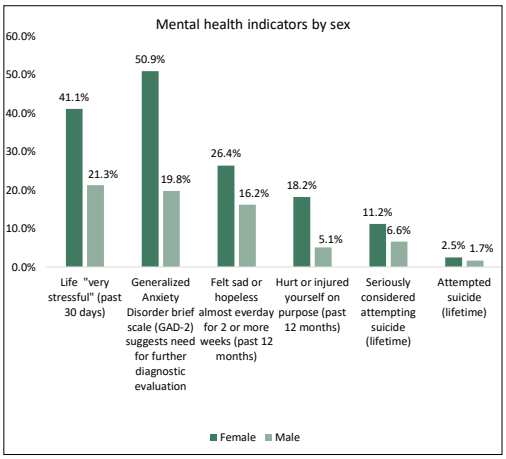


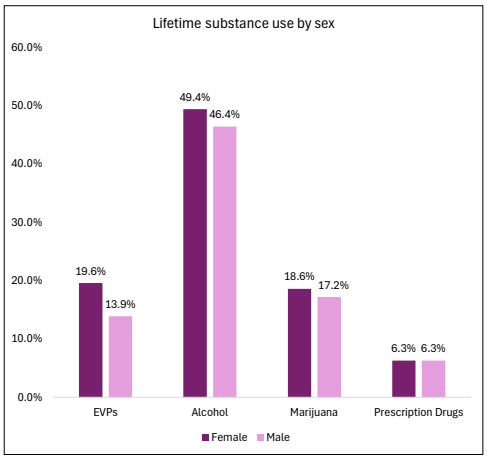
2) **Disparity between males and females for mental health indicators: is mental health is driving substance use?**

Female students are reporting substance use at higher or similar rates to male students. Current and lifetime use rates show the difference in alcohol and electronic vapor products but less so for cannabis and prescription drug misuse. Yet, their mental health indicators show a huge disparity.

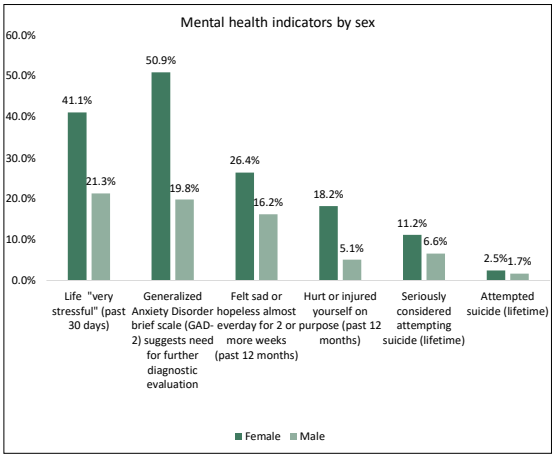
Is student mental health driving their substance use? The question about which drives the other is a bit like asking if the chicken or the egg comes first. Without diagnostic criteria, it is difficult to know whether one is driving the other. We do know that substance use and mental health are intricately linked and we cannot address one without the other.

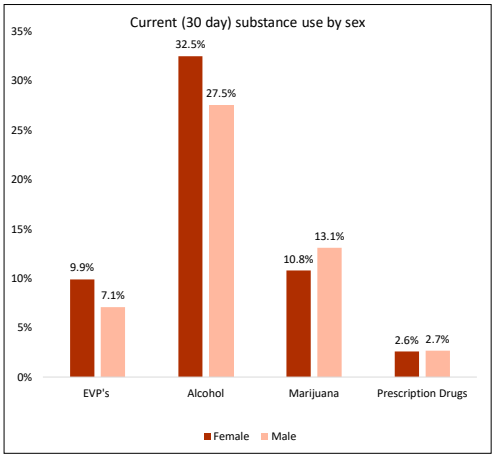
Mental health and lifetime substance use by sex (HS)





Mental health and current substance use by sex (HS)





3) Comparison of alcohol use rates before and after Needham began issuing alcohol licenses

Needham began issuing alcohol licenses in 2013. For the 2016, 2018 and 2021 MetroWest Adolescent Health Surveys, the Needham optional questions included several questions about alcohol access specific by location. 97-98% of students responded they did not purchase alcohol from a store. Of those that did, an average of .43% purchased from a store in Needham, and slightly more purchased from a store outside of Needham (avg. 1.5%).

During the past 30 days, did you purchase alcohol from a store?	**2016**	**2018**	**2021**
No, I did not purchase alcohol from a store	97.10%	98.30%	97%
Yes, I purchased from a store in Needham	0.50%	0.40%	0.40%
Yes, I purchased from a store outside of Needham	1.40%	1.10%	2.10%
Yes, I purchased from stores both in and outside of Needham	1%	0.20%	0.40%

The core survey includes questions that ask students where they obtain alcohol (see below). The majority of Needham high school students who report using alcohol do not purchase alcohol from an alcohol-licensed establishment. Trends over time show that most students access alcohol from a party, from a friend (not at a party), from home with and without parent knowledge and from someone 21+. The Needham alcohol access data resembles closely to the Metro West regional data.

Access to Alcohol among Current Drinkers (9-12)	**2012**	**2014**	**2016**	**2018**	**2021**	**2023**
At a party	80%	67%	70%	66%	74%	76%
from a friend (not at a party)	61%	62%	64%	45%	45%	50%
from home with parent/guardian knowledge	16%	16%	19%	23%	28%	26%
from home without parent/guardian knowledge	35%	33%	30%	23%	29%	27%
I bought it with a fake ID	6%	10%	9%	7%	7%	6%
I bought it without fake ID	6%	10%	4%	3%	4%	4%
someone I know 21+ gave it to me/purchased for me	36%	35%	42%	27%	22%	15%
asked a stranger to buy it for me	8%	8%	7%	3%	3%	4%
bought it from a delivery service	n/a	n/a	3%	3%	4%	6%

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Needham Public Health Division
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Unit: Emergency Preparedness

Date: January 2025

Staff: Taleb Abdelrahim

Activities and Accomplishments

Activity	Notes
Medical Reserve Corps (MRC)	• Coordinated with the Norfolk County-8 (NC-8) MRC coordinator to host in-person volunteer meeting on Tuesday, February 11th at Rosemary. • Attended the NC-8 MRC finance meeting and discussed financial and communication matters due to the Assistant Director's departure. • Attended the NC-8 MRC advisory group monthly meeting. • New policy requires CORI updates every two years. Volunteers have until September to complete the process. • Incident Command System-100 Virtual Training hosted by MRC Region 4AB Coordinator on January 28th
Pocketalk Translator Trial for Community Outreach	Provided training to Community Outreach Clinician Team from Youth & Family Services on using Pocketalk translators for ESL families.
Extreme Temperature Health Impacts Planning	Continued work on Health Action Plan to document our action to take before and during an extreme temperature event to mitigate health impacts.
Emergency Preparedness Supplies Walkthrough	Reviewed supplies with the Assistant Director of Public Health and Emergency Management Administrator.

Unit: Epidemiology

Date: January 2025

Staff: Julie McCarthy

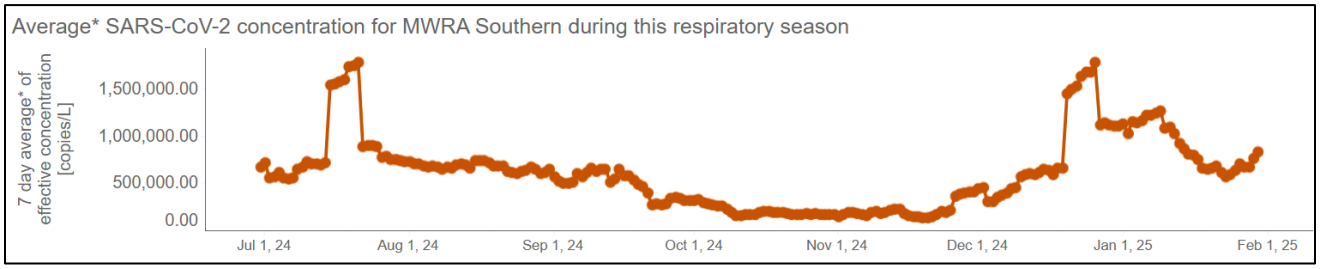
Vaccination rates: Influenza, Covid-19, RSV:

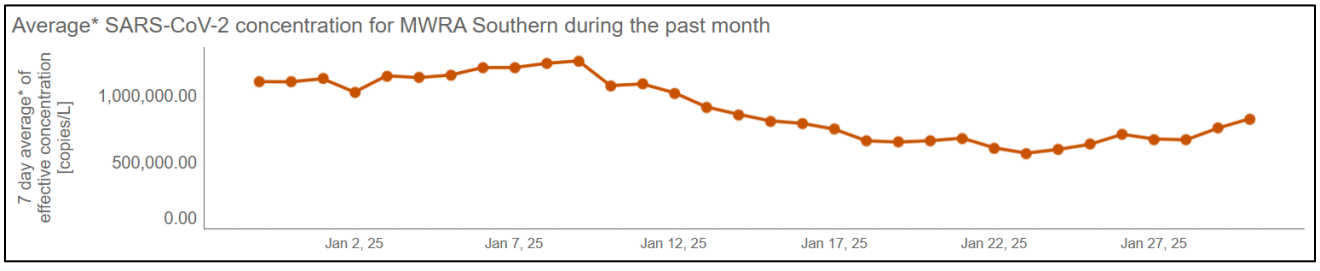
Age	Needham- Influenza	MA- Influenza	Needham- Covid-19	MA- Covid-19
Total	59%	38%	37%	19%
Under 5 years	53%	44%	25%	11%
5-19 years	59%	34%	27%	11%
20-34 years	48%	24%	26%	10%
35-49 years	53%	30%	29%	14%
50-64 years	54%	35%	37%	19%
65-79 years	79%	69%	65%	47%
80+ years	79%	70%	64%	49%

RSV-Cumulative	Needham	MA
60-74 years	36%	19.1%
75+ years	44.4%	34.1%

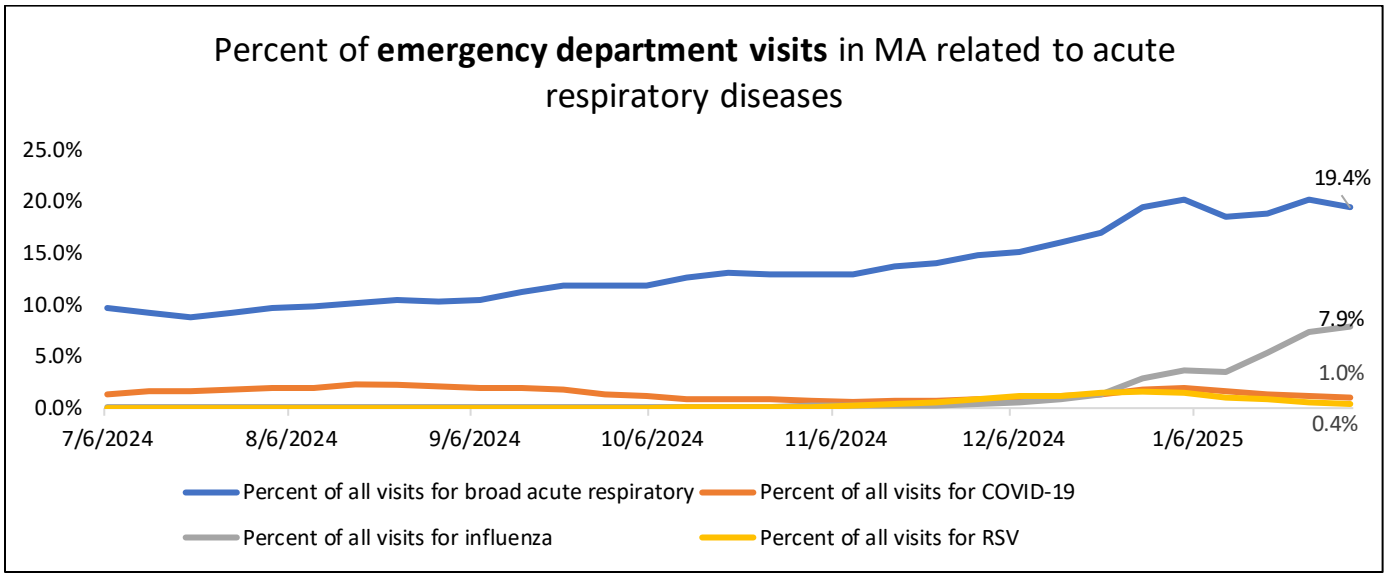
Source: https://www.mass.gov/info-details/immunizations-for-respiratory-diseases

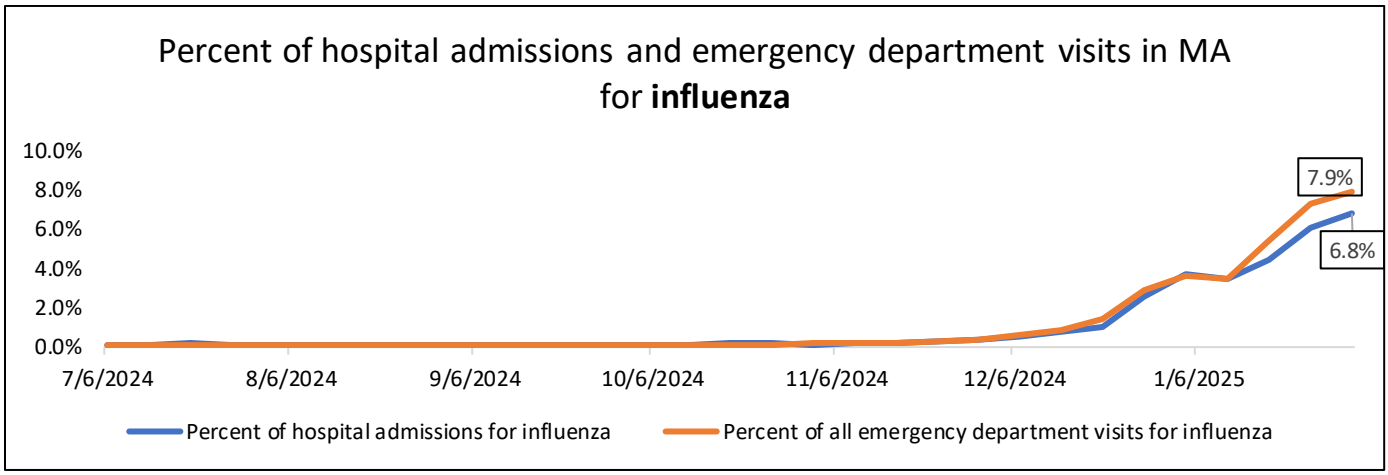
NOTE: A single dose of RSV vaccine is recommended for all adults ages 75 and older and for adults aged 60-74 who are at increased risk of RSV infection. Annual doses are not recommended for those who have already received a previous dose, so I have only included the cumulative number, not those who have received vaccine this season. Additional patient populations may be eligible for the vaccine based on clinical information.





Source: https://www.mass.gov/info-details/wastewater-surveillance-reporting





Source: https://www.mass.gov/info-details/respiratory-illness-reporting

Needham historical influenza cases and vaccination rates

Fiscal Year	FY25	FY24	FY23	FY22	FY21	FY20	FY19
Fiscal Year detail	Jul 2024- Jun 2025	Jul 2023- Jun 2024	Jul 2022- Jun 2023	Jul 2021- Jun 2022	Jul 2020- Jun 2021	Jul 2019- Jun 2020	Jul 2018- Jun 2019
Confirmed influenza #s	226*	160	175	46	0	127	101
Flu vax rate (Feb)- Needham	59%	61.00%	-	-	-	-	-
Flu vax rate (Feb)- MA	38%	40.10%	43.90%	44.50%	45.60%	36.60%	-

*Data as of 2/12/25

Source: MAVEN, https://www.mass.gov/info-details/respiratory-illness-reporting

Needham Public Health Division
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Unit: Public Health Nursing

Date: January 2025

Staff: Hanna Burnett and Ginnie Chacon-Lopez

Activities and Accomplishments

Activity	Notes
Community Outreach	• 3 CPR classes offered in January for the community, all fully attended. CPR training was offered at town offices for staff during workdays. • BP clinic at the CATH weekly, well attended. • BP clinics to start monthly at NHA.
Education	• Ginnie: Various webinars; attended MAPHN monthly meeting with a presentation about hoarding.
DVAC	• Social media posts on Facebook, X, and Instagram about National Stalking Awareness Month. • DVAC *Conversations* held for Rotary Club. • Meeting with the Commissioners of Trust.
Additional Notes	• Needham Community Council donated $10,000 towards Gift of Warmth. • $500 donation from Christ Episcopal Church towards Gift of Warmth. • $500 donation for DVAC.

Potential Foodborne Illnesses	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	2025	2024	2023
Calicivirus/Norovirus						<5	6						7	5	5
Campylobacteriosis Confirmed/Probable	<5	<5	<5				<5						5	10	9
Cryptosporidiosis													0	<5	0
Cyclosporiasis													0	<5	<5
Enterovirus	<5				<5								<5	0	0
Giardiasis													0	0	<5
Salmonellosis		<5											<5	<5	5
Shiga Toxin Producing Organism	<5												<5	<5	<5
Shigellosis		<5											<5	0	0
Vibrio spp													0	<5	<5
Arbovirus	**JUL**	**AUG**	**SEP**	**OCT**	**NOV**	**DEC**	**JAN**	**FEB**	**MAR**	**APR**	**MAY**	**JUN**	**2025**	**2024**	**2023**
Babesiosis													0	<5	<5
HGA/Anaplasmosis			<5	<5									<5	<5	<5
Lyme Disease Suspect	6			<5	<5								9	45	58
Lyme Disease Probable		<5	<5	<5		<5	<5						7	35	19
Other Communicable Illnesses	**JUL**	**AUG**	**SEP**	**OCT**	**NOV**	**DEC**	**JAN**	**FEB**	**MAR**	**APR**	**MAY**	**JUN**	**2025**	**2024**	**2023**
Group A streptococcus						<5							<5	0	0
Group B streptococcus													0	<5	<5
Haemophilus influenzae		<5											<5	<5	0
Hepatitis B Confirmed/Probable				<5		<5	<5						<5	5	<5
Hepatitis C Confirmed/Probable	<5	<5											<5	<5	0

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Influenza Confirmed			<5	<5	7	25	106						140	155	193
Malaria													0	<5	-
Legionellosis													0	<5	<5
Novel Coronavirus Confirmed	24	34	27	13	<5	14	32						147	308	980
Novel Coronavirus Probable	14	7	8	7	<5	8	10						58	54	188
Pertussis (Bordetella spp.)		<5	<5										<5	0	<5
Streptococcus pneumoniae							<5						<5	0	<5
TB Infection Confirmed	<5	5	<5		<5								12	45	44
TB Infection Contact	<5												<5	<5	-
Varicella					<5								<5	6	<5
Totals	55	55	45	26	19	53	158	0	0	0	0	0	411	690	1520

Immunizations/Injections	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	2024	2024	2023
B12	2	1	1	1	2	2	1						10	8	3
Influenza			332	115	76	8	2						533	771	719
Tdap						1							1	0	1
Covid-19				30	31	15							76	208	461
VFC						3							3	0	0
Other						5							5	3	0
Total	2	1	333	146	109	34	3	0	0	0	0	0	2	990	1184

Animal-to-Human Bites	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	2024	2024	2023
Dog													0	3	3
Cat													0	1	0
Bat					1								1	0	0
Total Bites	0	0	0	0	1	0	0	0	0	0	0	0	1	4	3

Assistance Programs	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	2024	2024	2023
Food Pantry													0	0	4
Friends	1												1	0	0
Gift of Warmth	0	2	1	5	4	0	2						14	29	51
GoW Amount	0	1400	300	2394	1877	0	1404						7375	16843	25921
Parks & Rec													0	0	0
Self Help													0	2	6

Education	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	2024	2024	2023
CPR Education			88	17	11	14	22						152	243	197
Matter of Balance Graduates					5								5	15	34
Narcan	3	69	13	8	9	0	5						107	174	25

Donations:	$11,000
Gift Cards Distributed:	0

January 2025 Report

Unit: Public Health Excellence - Shared Services, Contact Tracing & Local Public Health Training Hub

Date: 2/7/25

Staff members: Kerry Dunnell, Samantha Menard, Jennifer Casey, Amy McInerney, Jennifer Gangadharan

Activities and Accomplishments

Activity	Notes
Shared Services-Charles River Public Health District (Towns of Dover, Medfield, Needham, and Sherborn)	<u>Continuing Education and Training</u> • Jenn Gangadharan completed a Vaccines for Children (VFC) Compliance/Vaccine Storage and Handling training. • Jenn G. also completed the Local Public Health Intensive Training online course Recreational Camps for Children Program for Regulators. • Amy McInerney completed the Tier 2 Local Public Health Housing Training. The program included 1 in-person day in Salem and 3 virtual half-days of learning. Next step will include completing Tier 3 of the program when available. • Sam Menard and Amy attended a lunch and learn 1-hr webinar hosted by MA Environmental Health Association (MEHA) on the topic of Accessory Dwelling Units. <u>Community Support & Engagement</u> *Regional Public Health Nursing -- Disease Control & Prevention including MA Virtual Epidemiological Network (MAVEN)* • Responded to disease surveillance questions that arose in Dover and in Medfield. • Prepared a pre/on-boarding public health nurse checklist and a document entitled Considerations for launching a public health nursing Program for use by Dover & Sherborn to welcome their new public health nurse who starts February 10. • Continued to provide MAVEN coverage for Medfield (effective December 3, 2024). • Due to a lack of available resources in Dover and Sherborn via their Visting Nurses Association (VNA) contract, Jenn G began providing MAVEN coverage for those communities effective January 28, 2025. A new public health nurse begins work in Dover on February 10 and will begin training on MAVEN promptly. • Provided a review of MAVEN and reporting examples at the January 28 Advisory Board meeting.

- Developing staffing charts to plan for the requirement of having two people per jurisdiction trained in MAVEN (primary, secondary and back up).
- Collaborated with other Regional Public Health nurses regarding professional organizations and upcoming conferences.

Communications & Outreach

- The Charles River Public Health District Collaborative webpage is now live at https://www.needhamma.gov/5474/Charles-River-Public-Health-District

Environmental Health -- Regional environmental health agents support environmental health activities and conduct inspections in all member communities as requested

- In January Sam Menard, and Amy McInerney, conducted food establishment and Title V inspections in Needham, Dover and Sherborn
- The Environmental Health Working Group (EHWG) met on January 21. Representatives from Dover, Needham and Sherborn were present.
- A final draft of a common variance application form was prepared to be presented to the Advisory Board.
- Amy McInerney compiled results of the Self-Assessment responses
- The EHWG reviewed self-assessment tool responses to ensure common understanding of questions and requirements.
- Amy has developed a food establishment permit application for review by the EHWG and possible recommendation to the Advisory Board.

Strategic Planning

- Met with Arissa Ruano and Meghan Russell from BME Strategies prepare for the strategic planning process.
- Provided requested documents including Capacity Assessment (CART) results, current workplan, progress on self-assessments.
- Held first monthly meeting on Thursday January 30. These meetings of the full advisory board and membership will occur monthly through June.
- At the January 30 meeting, consultants introduced the strategic planning process and led the group in discussions about why communities and staff are engaged in the work, what people identify as important about the work, and opportunities for future collaboration.
- Consultants will be conducting interviews with representatives during February and March.

Fee Cost Study

- Janice Chen and Rebecca Han of BME Consulting provided a final presentation to the Advisory Board at their January 28, 2025, meeting.
- The Town of Dover has used the tool and shared information with the Dover Board of Health. The tool was helpful for a fee review discussion in that community.

Training Hub-North Central & MetroWest Local Public Health Training Hub Serving the 40 communities in the Charles River Health District, Greater Boroughs, MetroWest Public Health Coalition, Nashoba Associated Boards of Health, Norfolk County-8 Public Health shared services arrangements, and the communities of Bellingham, Holliston and Marlborough.	**Staff members:** Kerry Dunnell, Samantha Menard, Jennifer Casey, Amy McInerney, Jennifer Gangadharan, Padraig Martin Padraig Martin began work on January 6th as the Environmental Health Trainer. Staff are working closely with him while he completes his onboarding work. The North Central MetroWest Local Public Health Training Hub is now fully staffed. <u>Continuing Education & Training</u> *Local Public Health Intensive Training (LPHIT) Housing.* • Pat completed Tier 1 (online) and Tier 2 (classroom) training. Tier 2 included one in-person day in Salem and three virtual half-days of learning. • Sam provided facilitation for break-out groups during the in-person Tier 2 Housing Training day. • OLRH will offer the Tier 3 Step 1 Housing Train the Trainers in late February or early March 2025. Both Pat and Jenn Gangadharan will attend. • When all three trainers have completed Tier 3 Step 1, the Training Hub will begin conducting training for eligible housing inspectors in each of our forty-three assigned communities. • Jenn Ganghadaran attended a meeting of the MA Public Health Nursing Association Southeast chapter which included a presentation on Hoarding. *Local Public Health Intensive Training (LPHIT) Food Inspection Training* • Pat has scheduled his Tier 3 food inspections with the Central Trainers for the month of February. Once complete Pat will be eligible to begin conducting training and Tier 3 Food Assessment Inspections. <u>Training Hub outreach, communication & support activities</u> • The Training Hub staff met with the new Greater Boroughs Shared Services Coordinator and regional inspector on January 9th to introduce the Training Hub program. • Amy finalized the webpage for the North Central MetroWest Local Public Health Training Hub. It is now live and viewable at https://www.needhamma.gov/5595/North-Central-MetroWest-Local-Public-Hea • Staff are gathering information about community characteristics, demand for specific kinds of training, and inspectional needs of each of the forty-three communities assigned to the North Central MetroWest Training Hub. In support

	of this effort and in preparation for camp season, Jenn G. obtained a list from MA DPH of all camps licensed by a Board of Health within the Hub. <u>Training Delivery</u> Sam continues to work with multiple Tier 3 Food Inspection trainees. In January, there are three trainees actively working through the training requirements with Sam. Additionally, one trainee completed all the requirements for Tier 3 Food Inspection and one new candidate began the training process. <u>Funder Communication & Collaboration</u> Kerry and Sam participate each month in work groups as well as two monthly meetings of the ten training hubs led by the Office of Local and Regional Health (OLRH). Workgroups include Evaluation and satisfaction surveys and Assessment tool development. Monthly meetings include discussion of curriculum development and coordination with the Tier 1 and Tier 2 trainings, as well as efforts to align the ten training hubs on job descriptions and communication with Hub communities.