



July 31, 2024

Project No. M0624.04.016

Chris DeBoer, LHG

Washington State Department of Ecology

15700 Dayton Ave N

Shoreline, Washington 98133

Re: Quarterly Progress Report—2nd Quarter 2024
Northern State Multi Service Center Site
Facility Site ID: 65415931; Cleanup Site ID: 10048
Agreed Order No. DE 16309
2070 Northern State Road, Sedro-Woolley, Washington

Dear Chris DeBoer:

On behalf of the Port of Skagit, this letter serves as a progress report for the second quarter of 2024 for the former Northern State Multi Service Center Site (the site), located at 2070 Northern State Road in Sedro-Woolley, Washington. The site is also referred to as the Sedro-Woolley Innovation for Tomorrow Center. This report fulfills the progress reporting requirement specified in Section VII of Agreed Order No. DE 16309.

Project Status

The following items were completed in the second quarter of 2024:

- A completion report documenting the interim cleanup action described in the interim action cleanup action plan and engineering design report (IA CAP & EDR) for AOC 1 was finalized on June 18, 2024.
- The second compliance monitoring event associated with the AOC 1 interim remedial action was completed on May 22, 2024. Compliance monitoring activities completed are described in the attached memorandum.
- Grading and seeding associated with AOC 4 were completed the week of May 6, 2024. The area is being observed to monitor seasonal variations in moisture conditions.
- A supplemental investigation work plan was prepared to address data gaps identified by Ecology to complete the remedial investigation. The work plan was finalized following Ecology review on May 29, 2024.

On-Site Field Activities

The following on-site field activities were completed in the reporting period:

- On May 22, 2024, the second compliance monitoring event associated with the AOC 1 interim remedial action was completed. This included the following activities (see attachment):
 - Collection of three indoor and one outdoor air samples.

- Collection of differential pressure measurements at three sub-slab vapor pin locations.

Deviations from Required Tasks

There were no deviations from required tasks.

Deviations from Scope of Work, Schedule, and Cleanup Action Plan

There were no deviations from scope of work, schedule, and cleanup action plan during the reporting period.

Data

Ambient air data were generated from the on-site field activities at AOC, as described above.

All analytical results collected during the second quarter of 2024 will be submitted into the Ecology Electronic Information Management System during the third quarter of 2024.

Upcoming Deliverables and Deadlines

A third compliance monitoring event for AOC 1 is planned for the third quarter of 2024.

A completion report documenting the interim cleanup action described in the interim action cleanup action plan and engineering design report (IA CAP & EDR) for AOC 4 will be prepared by August 8, 2024, within 90 days of the restoration site walk. Current drainage conditions are being observed.

Fieldwork associated with the supplemental investigation work plan is anticipated to be completed during the third quarter of 2024, the week of August 5, 2024.

If you have any questions regarding this letter, please feel free to contact either of us.

Sincerely,

Maul Foster & Alongi, Inc.



Carolyn Wise, LHG
Senior Hydrogeologist



Phil Wiescher, PhD
Principal Environmental Scientist

Attachment

A— May 2024 Compliance Monitoring—AOC 1

cc: Heather Rogerson, Port of Skagit

Attachment A

May 2024 Compliance Monitoring-AOC 1



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Technical Memorandum

To: Chris DeBoer, LHG, Washington State Department of Ecology
Amy Baker, U.S. Environmental Protection Agency

Date: July 15, 2024

From: Carolyn Wise, LHG

Project No.: M0624.04.024

Re: May 2024 Compliance Monitoring--AOC 1
Northern State Multi Service Center, Sedro-Woolley, Washington
Agreed Order No. DE 16309, Cleanup ID: 10048

On behalf of the Port of Skagit (the Port), Maul Foster & Alongi, Inc. (MFA), has prepared this technical memorandum summarizing the second quarterly post-installation compliance monitoring event completed at the former laundry building area of concern (AOC 1) at the Northern State Multi Service Center (former Northern State Hospital site) (the Site). This Site is located at the Sedro-Woolley Innovation for Tomorrow Center property at 2070 Northern State Road in Sedro-Woolley, Washington (the Property) (see Figure 1). The Site is listed with the Washington State Department of Ecology (Ecology) under facility site ID 65415931 and cleanup site ID 10048.

Background

A summary of the interim remedial action, completed at AOC 1 between December 2023 and February 2024, is provided in the final completion report (MFA 2024). Additional information regarding the Property background, site conditions, and interim sub-slab depressurization system (SSDS) construction details are provided in the interim action work plan (IAWP) and completion report (MFA 2024, 2023).

Compliance Monitoring

Indoor and Ambient Air Sampling

On May 22, 2024, MFA collected three indoor air samples (INAI01-052224 through INAI03-052224) and one ambient air sample (OUTAI03-052224) at AOI 1 (see Figure 2). Air samples were collected using 6-liter stainless steel Summa canisters with 8-hour flow controllers and analyzed for chlorinated volatile organic compounds (cVOCs). Sample canisters were placed 3 to 5 feet above the ground to allow for sample collection within the breathing zone. Photographs from the sampling event are provided in Attachment A. Field data were recorded on field sampling data sheets, provided as Attachment B.

Indoor air samples were collected to:

- Confirm that the construction process did not result in preferential pathways for vapor intrusion into the former laundry building, and

- Confirm the effectiveness of the sub-slab depressurization system.

The outdoor air sample was positioned outside and upwind of the building to capture potential ambient cVOC sources for the 8-hour indoor air sample collection period. Field staff deployed the sampler in a location that was free of discernible ambient sources of cVOCs. Atmospheric data (including wind speed and direction) from the nearest weather station was used to position the sample upwind of the building. Wind was forecasted to blow from the southwest on May 22, 2024; therefore, the ambient air sample was positioned on the southwest corner of the building (see Figure 2). The reported wind directions throughout the day were from the southwest to northwest.

Analytical results are presented in the Table, laboratory analytical reports are provided in Attachment C, and a data validation memorandum is presented in Attachment D.

Indoor and outdoor air sample results were screened to Model Toxics Control Act (MTCA) Method B cleanup levels for indoor air. No indoor or outdoor air results exceeded MTCA Method B cleanup levels. All cVOCs were non-detect, with the exception of 1,2-dichloroethane (1,2-DCA).

Low concentrations of 1,2-DCA were detected in all three indoor air samples, with concentrations ranging from 0.065 to 0.073 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$), as well as in the outdoor air sample at 0.061 $\mu\text{g}/\text{m}^3$. Similarly low and consistent concentrations of 1,2-DCA were detected in indoor and outdoor air during the previous compliance monitoring event on February 14, 2024, and during the remedial investigation vapor sampling on April 6, 2021 (MFA 2024, 2022). 1,2-DCA has not been detected in sub-slab soil gas samples collected within the building (MFA 2022). All concentrations of 1,2-DCA detected to date were below the MTCA Method B cancer cleanup level (0.096 $\mu\text{g}/\text{m}^3$). Given the lack of sub-slab detections and low detections observed in both indoor and outdoor air or sub-slab soil gas, it is likely these detections are associated with an ambient source in the general surrounding area outside of the building.

Sub-Slab Pressure Measurements

On May 22, 2024, MFA measured the differential pressure at the three permanent sub-slab vapor pin locations (SB01 through SB03) to assess whether a vacuum was being generated across the slab of the former laundry building. The differential pressure was measured for approximately 5 minutes at each sub-slab vapor pin location until readings stabilized. The final differential pressure reading, date, time, and location were recorded on the SSDS inspection form (see Attachment E).

The differential pressure measurements from SB01 through SB03 were at or above the vacuum (i.e., negative pressure) goal of 0.001 inches of water column. The negative differential pressure measurements at each measuring point confirm continued effective differential pressure between the sub-slab and the indoor air. It was observed that the differential pressure at location SB03 measured lower than the other two locations. This may have been due to the power being off at the nearest vent riser (VENT02) to SB03 upon initial arrival of field staff. The power for VENT02 was turned on once observed. It is possible that the reduced vacuum from nearby VENT02 resulted in a lower negative pressure reading at SB03, however, the negative pressure goal was met.

Vent Pressure Monitoring

On May 22, 2024, MFA observed the vacuum (pressure differential) from the U-tube manometers at each vent riser pipe (VENT01 through VENT05) to confirm that the fans were functioning and that each vent riser was properly sealed. The differential pressure reading, date, time, and location were recorded on the SSDS inspection form (see Attachment E).

Manometer vacuum (i.e., negative pressure) readings at the five vent locations ranged from 0.6 to 2.8 inches of water column, above the anticipated pressure goal of 0.5 and 1.75 inches of water column. The vent pressure at VENT02 was lower than the pressure readings at the other locations; likely due to the shut off power to the vent upon arrival. Once the power for VENT02 was turned on, the observed pressure was still above the pressure goal of 0.5 inches of water. The observed pressure readings at each of the vent risers indicate that the SSDS is pulling a sufficient vacuum at the vent locations.

Conclusions

The negative differential pressure readings from the sub-slab vapor pins and U-tube manometers on the SSDS vents indicate that the system is operating as anticipated.

All cVOCs were non-detect in indoor and outdoor air samples, with the exception of low detections of 1,2-DCA below the MTCA Method B cancer cleanup level for indoor air. These low detections levels are consistent across indoor and outdoor air samples and are likely associated with an ambient source in the general surrounding area.

The results of the second compliance monitoring indicate the system is functioning within the anticipated operating conditions. In accordance with the schedule provided in the IAWP, the next post-installation compliance monitoring events are scheduled as follows:

- August 2024
- November 2024

Following each compliance monitoring event, data will be provided to Ecology in quarterly progress reports or technical memorandums within 90 days of the completion of each event.

The remedial action described in the completion report is considered an interim remedial action at this time. A final remedial action for this AOC on the Site will be evaluated in the remedial investigation and feasibility study and documented in the forthcoming cleanup action plan.

Attachments

References

Limitations

Figures

Table

A—Field Photographs

B—Field Sampling Data Sheets

C—Analytical Laboratory Reports

D—Data Validation Memorandum

E—Sub-slab Depressurization Inspection Form

References

- Ecology. 2024. Chris DeBoer, Washington State Department of Ecology. *Response to Northern State Multi Service Center - AOC 1 Vent Location Adjustment*. Email to Carolyn Wise, Maul Foster & Alongi, Inc. January 5.
- EPA. 1993. *Radon Reduction Techniques for Existing Detached Houses, Technical Guidance (Third Edition) for Active Soil Depressurization Systems*. October.
- EPA. 2024. Amy Baker, U.S. Environmental Protection Agency. *Response to Northern State Multi Service Center - AOC 1 Vent Location Adjustment*. Email to Carolyn Wise, Maul Foster & Alongi, Inc. January 10.
- MFA. 2014. *Final Focused Site Assessment Work Plan for Northern State Hospital Property, Sedro-Woolley, Washington*. Maul Foster & Alongi, Inc. Bellingham, Washington. September 9.
- MFA. 2015. *Preliminary Remedial Investigation and Feasibility Study for Northern State Hospital Property, Sedro-Woolley, Washington*. Maul Foster & Alongi, Inc. Bellingham, Washington. June 30.
- MFA. 2018. *Phase II Environmental Site Assessment, Former Northern State Hospital, Sedro-Woolley, Washington*. Maul Foster & Alongi, Inc. Bellingham, Washington. October 29.
- MFA. 2022. *Draft Remedial Investigation Report, Former Northern State Hospital, Sedro-Woolley, Washington*. Maul Foster & Alongi, Inc. Bellingham, Washington. June 9.
- MFA. 2023. *Interim Action Work Plan—AOC 1, Northern State Multi Service Center, Sedro-Woolley, Washington*. Maul Foster & Alongi, Inc. Bellingham, Washington. August 24.
- MFA. 2024. *Completion Report—AOC 1, Northern State Multi Service Center, Sedro-Woolley, Washington*. Maul Foster & Alongi, Inc. Bellingham, Washington. June 18.

Limitations

The services undertaken in completing this technical memorandum were performed consistent with generally accepted professional consulting principles and practices. No other warranty, express or implied, is made. These services were performed consistent with our agreement with our client. This technical memorandum is solely for the use and information of our client unless otherwise noted. Any reliance on this report by a third party is at such party's sole risk.

Opinions and recommendations contained in this technical memorandum apply to conditions existing when services were performed and are intended only for the client, purposes, locations, time frames, and project parameters indicated. We are not responsible for the impacts of any changes in environmental standards, practices, or regulations subsequent to performance of services. We do not warrant the accuracy of information supplied by others, or the use of segregated portions of this technical memorandum.

Figures



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Source: Aerial photograph obtained from Esri ArcGIS Online; parcels and roads and streams data sets obtained from Skagit County; city limits data set obtained from City of Sedro-Woolley.

- Legend**
- Property Parcel and Parcel Name
 - Northern State Recreational Area
 - Sedro-Woolley City Limits (Post Annexation)
 - Stream

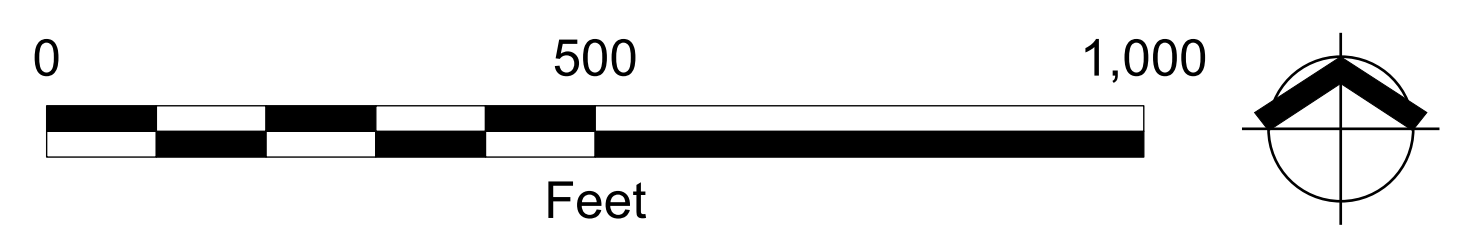
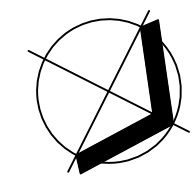
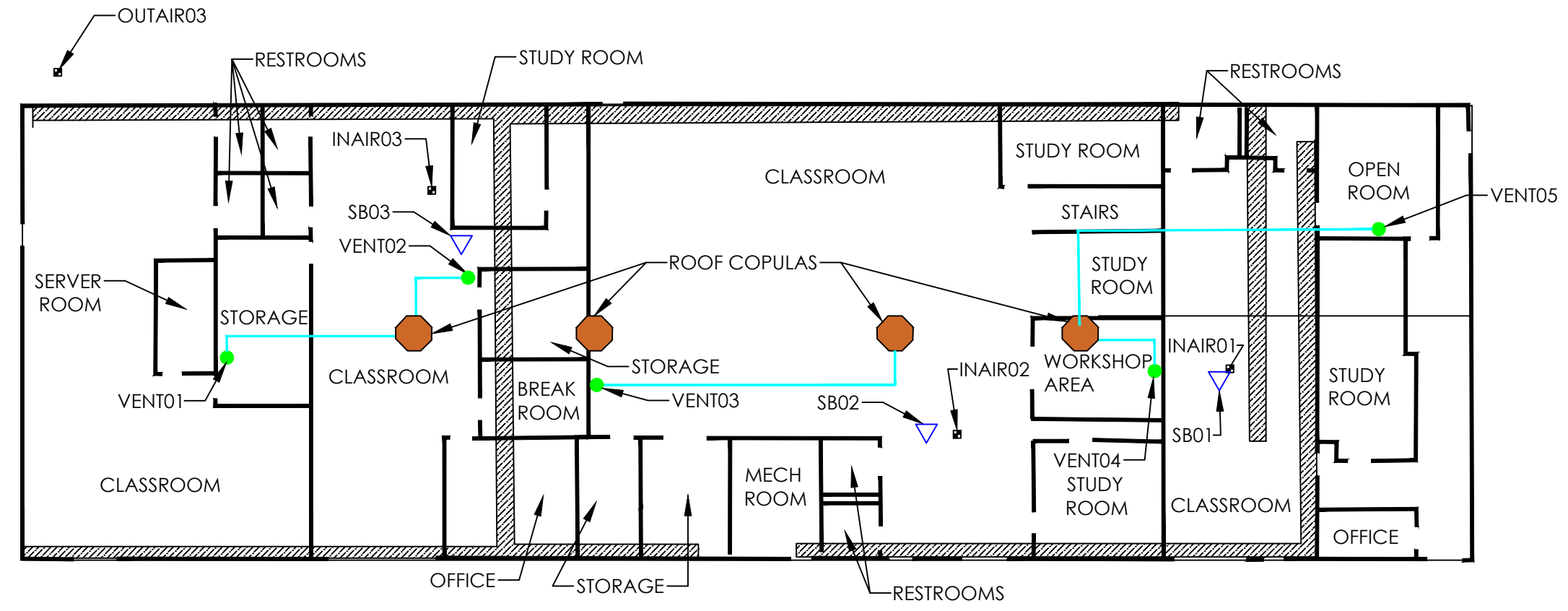


Figure 1
Property Vicinity
 Northern State Multi Service Center
 Port of Skagit
 Sedro-Woolley, Washington

This figure prepared as supplemental visual information only and should not be used for construction purposes. Only plan sheets approved, stamped and signed by a registered professional engineer in the state of governing jurisdiction shall be used for construction. Additionally, only plans approved by the applicable governing jurisdiction(s) shall be used for final construction unless otherwise expressly noted in writing by the engineer of record.

Filepath: G:\00_MFA\Civil\3D\00_PROJECTS\0624\04 Port of Skagitj\16_AOC\1\PLANS\Vapor Points.dwg
 Printed by: Julia Fudge
 Date: 7/2/2024 4:52:55 PM



DRAWING NOT TO SCALE

LEGEND:

- BUILDING FOOTPRINT
- VENT LOCATION/ FLOOR PENETRATION
- PIPE ROUTE
- INDOOR OR OUTDOOR AIR SAMPLE LOCATION
- SUB-SLAB VAPOR PIN
- PIPE TRENCH

NOTE:

1. INDOOR AND OUTDOOR AIR SAMPLE LOCATIONS AND PIPE TRENCH LOCATIONS ARE APPROXIMATE.

Figure 2
Sub-Slab
Depressurization
System As-Built

Northern State Multi Service
 Center
 Sedro-Woolley, WA

Table



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Table
AOC 1: Indoor and Ambient (Outdoor) Air Analytical Results
Northern State Multi Service Center
Sedro-Woolley, Washington

Location Type:	MTCA Method B, Vapor Intrusion, Indoor Air ⁽¹⁾		Indoor Air						Ambient Air ^(a)	
			INAIRO1		INAIRO2		INAIRO3		OUTAIRO2	OUTAIRO3
Location:			INAIRO1-021424	INAIRO1-052224	INAIRO2-021424	INAIRO2-052224	INAIRO3-021424	INAIRO3-052224	OUTAIRO2-021424	OUTAIRO3-052224
Sample Name:										
Collection Date:	Cancer	Noncancer	02/14/2024	05/22/2024	02/14/2024	05/22/2024	02/14/2024	05/22/2024	02/14/2024	05/22/2024
VOCs (ug/m³)										
1,1,1-Trichloroethane	NV	2,300	0.55 U	0.55 U	0.55 U	0.55 U	0.55 U	0.55 U	0.55 U	0.55 U
1,1,2-Trichloroethane	0.16	0.091	0.055 U	0.055 U	0.055 U	0.055 U	0.055 U	0.055 U	0.055 U	0.055 U
1,1-Dichloroethane	1.6	NV	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
1,1-Dichloroethene	NV	91	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
1,2-Dichloroethane	0.096	3.2	0.073	0.065	0.069	0.069	0.073	0.073	0.057	0.061
Chloroethane	NV	4,600	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U
cis-1,2-Dichloroethene	NV	18	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
Tetrachloroethene	9.6	18	6.8 U	6.8 U	6.8 U	6.8 U	6.8 U	6.8 U	6.8 U	6.8 U
trans-1,2-Dichloroethene	NV	18	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
Trichloroethene	0.33	0.91	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U
Vinyl chloride	0.28	46	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U
Notes										
<p>Detections were compared to screening criteria and no exceedances were identified; non-detects (U) were not compared with screening criteria.</p> <p>AOC = area of concern.</p> <p>MTCA = Model Toxics Control Act.</p> <p>NV = no value.</p> <p>U = result is non-detect at the method reporting limit.</p> <p>ug/m³ = micrograms per cubic meter.</p> <p>VOC = volatile organic compound.</p> <p>^(a) Ambient air locations are positioned upwind of the building, and may vary between sampling events based on the wind direction the day of collection.</p>										
Reference										
⁽¹⁾ Ecology. 2024. <i>Cleanup Levels and Risk Calculation (CLARC) table</i> . Washington State Department of Ecology, Toxics Cleanup Program. February.										

Attachment A

Field Photographs



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Photographs

Project Name: Northern State Multi Service Center—
AOC 1 Interim Action Completion Report
Project Number: M0624.04.024
Location: Sedro-Woolley, Washington

Photo No. 1.

Description

Outdoor air sample
OUTAIRO3 on the
southwest side of the
building, collected on
May 22, 2024.



Photo No. 2.

Description

Indoor air sample
INAIRO1 in the northern
portion of the building,
collected on May 22,
2024.





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Photographs

Project Name: Northern State Multi Service Center—
AOC 1 Interim Action Completion Report
Project Number: M0624.04.024
Location: Sedro-Woolley, Washington

Photo No. 3.

Description

Indoor air sample
INAIRO2 in the central
portion of the building,
collected on May 22,
2024.



Photo No. 4.

Description

Indoor air sample
INAIRO3 in the southern
portion of the building,
collected on May 22,
2024.



Attachment B

Field Sampling Data Sheets



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Sampler(s): B. Murphy

Vapor Field Sampling Data Sheet
Project: Former Northern State Hospital
Location: 2070 Northern State Road, Sedro-Woolley, Washington



Sample ID	Sample Type	Date	Summa Canister ID	Manifold ID	Canister Size (L)	Collection Duration	Sample			
							Begin Time	End Time	Initial Vacuum ("Hg) ^(a)	Final Vacuum ("Hg)
INAI01-052224	Indoor Air	5/22/2024	37210	05354	6	8 hour	8:10	16:10	-29	-2
INAI02-052224 ^(b)	Indoor Air	5/22/2024	35332	06603	6	8 hour	8:02	22:02	-30	-5
INAI03-052224	Indoor Air	5/22/2024	21442	87871	6	8 hour	8:18	16:18	-29	-7
OUTAI03-052224	Ambient Air	5/22/2024	20541	13966	6	8 hour	6:51	14:51	-30+	-9
Notes "Hg = inches of mercury. ID = identification. L = liter. ppm = parts per million. ^(a) -30+ indicates that the vacuum gauge was above the maximum pressure value of 30"Hg. ^(b) Interim sample collection stopped at an unknown time. Sample collection restarted at 16:02.										

Attachment C

Analytical Laboratory Reports



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FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Vineta Mills, M.S.
Eric Young, B.S.

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May 30, 2024

Carolyn Wise, Project Manager
Maul Foster Alongi
1329 N State St, Suite 301
Bellingham, WA 98225

Dear Ms Wise:

Included are the results from the testing of material submitted on May 24, 2024 from the Former Northern State Hospital M0624.04.024, F&BI 405432 project. There are 8 pages included in this report.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl
Project Manager

Enclosures
MFA0530R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on May 24, 2024 by Friedman & Bruya, Inc. from the Maul Foster Alongi Former Northern State Hospital M0624.04.024, F&BI 405432 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>Maul Foster Alongi</u>
405432 -01	INAIR01-052224
405432 -02	INAIR02-052224
405432 -03	INAIR03-052224
405432 -04	OUTAIR03-052224

All quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	INAIR01-052224	Client:	Maul Foster Alongi
Date Received:	05/24/24	Project:	Former Northern State Hospital
Date Collected:	05/22/24	Lab ID:	405432-01
Date Analyzed:	05/24/24	Data File:	052421.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	bat

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
4-Bromofluorobenzene	90	70	130

Compounds:	Concentration	
	ug/m3	ppbv
Vinyl chloride	<0.26	<0.1
Chloroethane	<2.6	<1
1,1-Dichloroethene	<0.4	<0.1
trans-1,2-Dichloroethene	<0.4	<0.1
1,1-Dichloroethane	<0.4	<0.1
cis-1,2-Dichloroethene	<0.4	<0.1
1,2-Dichloroethane (EDC)	0.065	0.016
1,1,1-Trichloroethane	<0.55	<0.1
Trichloroethene	<0.11	<0.02
1,1,2-Trichloroethane	<0.055	<0.01
Tetrachloroethene	<6.8	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	INAIR02-052224	Client:	Maul Foster Alongi
Date Received:	05/24/24	Project:	Former Northern State Hospital
Date Collected:	05/22/24	Lab ID:	405432-02
Date Analyzed:	05/24/24	Data File:	052420.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	bat

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
4-Bromofluorobenzene	94	70	130

Compounds:	Concentration	
	ug/m3	ppbv
Vinyl chloride	<0.26	<0.1
Chloroethane	<2.6	<1
1,1-Dichloroethene	<0.4	<0.1
trans-1,2-Dichloroethene	<0.4	<0.1
1,1-Dichloroethane	<0.4	<0.1
cis-1,2-Dichloroethene	<0.4	<0.1
1,2-Dichloroethane (EDC)	0.069	0.017
1,1,1-Trichloroethane	<0.55	<0.1
Trichloroethene	<0.11	<0.02
1,1,2-Trichloroethane	<0.055	<0.01
Tetrachloroethene	<6.8	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	INAIR03-052224	Client:	Maul Foster Alongi
Date Received:	05/24/24	Project:	Former Northern State Hospital
Date Collected:	05/22/24	Lab ID:	405432-03
Date Analyzed:	05/24/24	Data File:	052419.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	bat

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
4-Bromofluorobenzene	93	70	130

Compounds:	Concentration	
	ug/m3	ppbv
Vinyl chloride	<0.26	<0.1
Chloroethane	<2.6	<1
1,1-Dichloroethene	<0.4	<0.1
trans-1,2-Dichloroethene	<0.4	<0.1
1,1-Dichloroethane	<0.4	<0.1
cis-1,2-Dichloroethene	<0.4	<0.1
1,2-Dichloroethane (EDC)	0.073	0.018
1,1,1-Trichloroethane	<0.55	<0.1
Trichloroethene	<0.11	<0.02
1,1,2-Trichloroethane	<0.055	<0.01
Tetrachloroethene	<6.8	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	OUTAIR03-052224	Client:	Maul Foster Alongi
Date Received:	05/24/24	Project:	Former Northern State Hospital
Date Collected:	05/22/24	Lab ID:	405432-04
Date Analyzed:	05/24/24	Data File:	052418.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	bat

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
4-Bromofluorobenzene	91	70	130

Compounds:	Concentration	
	ug/m3	ppbv
Vinyl chloride	<0.26	<0.1
Chloroethane	<2.6	<1
1,1-Dichloroethene	<0.4	<0.1
trans-1,2-Dichloroethene	<0.4	<0.1
1,1-Dichloroethane	<0.4	<0.1
cis-1,2-Dichloroethene	<0.4	<0.1
1,2-Dichloroethane (EDC)	0.061	0.015
1,1,1-Trichloroethane	<0.55	<0.1
Trichloroethene	<0.11	<0.02
1,1,2-Trichloroethane	<0.055	<0.01
Tetrachloroethene	<6.8	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	Method Blank	Client:	Maul Foster Alongi
Date Received:	Not Applicable	Project:	Former Northern State Hospital
Date Collected:	Not Applicable	Lab ID:	04-1210 MB
Date Analyzed:	05/24/24	Data File:	052412.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	bat

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
4-Bromofluorobenzene	91	70	130

Compounds:	Concentration	
	ug/m3	ppbv
Vinyl chloride	<0.26	<0.1
Chloroethane	<2.6	<1
1,1-Dichloroethene	<0.4	<0.1
trans-1,2-Dichloroethene	<0.4	<0.1
1,1-Dichloroethane	<0.4	<0.1
cis-1,2-Dichloroethene	<0.4	<0.1
1,2-Dichloroethane (EDC)	<0.04	<0.01
1,1,1-Trichloroethane	<0.55	<0.1
Trichloroethene	<0.11	<0.02
1,1,2-Trichloroethane	<0.055	<0.01
Tetrachloroethene	<6.8	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 05/30/24

Date Received: 05/24/24

Project: Former Northern State Hospital M0624.04.024, F&BI 405432

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF AIR SAMPLES
FOR VOLATILES BY METHOD TO-15**

Laboratory Code: 405402-01 1/7.5 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 30)
Vinyl chloride	ug/m3	<1.9	<1.9	nm
Chloroethane	ug/m3	<20	<20	nm
1,1-Dichloroethene	ug/m3	<3	<3	nm
trans-1,2-Dichloroethene	ug/m3	<3	<3	nm
1,1-Dichloroethane	ug/m3	<3	<3	nm
cis-1,2-Dichloroethene	ug/m3	<3	<3	nm
1,2-Dichloroethane (EDC)	ug/m3	<0.3	<0.3	nm
1,1,1-Trichloroethane	ug/m3	<4.1	<4.1	nm
Trichloroethene	ug/m3	<0.81	<0.81	nm
1,1,2-Trichloroethane	ug/m3	<0.41	<0.41	nm
Tetrachloroethene	ug/m3	<51	<51	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Vinyl chloride	ug/m3	35	104	70-130
Chloroethane	ug/m3	36	105	70-130
1,1-Dichloroethene	ug/m3	54	104	70-130
trans-1,2-Dichloroethene	ug/m3	54	99	70-130
1,1-Dichloroethane	ug/m3	55	109	70-130
cis-1,2-Dichloroethene	ug/m3	54	98	70-130
1,2-Dichloroethane (EDC)	ug/m3	55	115	70-130
1,1,1-Trichloroethane	ug/m3	74	111	70-130
Trichloroethene	ug/m3	73	120	70-130
1,1,2-Trichloroethane	ug/m3	74	130	70-130
Tetrachloroethene	ug/m3	92	127	70-130

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Data Qualifiers & Definitions

- a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.
- b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.
- ca - The calibration results for the analyte were outside of acceptance criteria, biased low; or, the calibration results for the analyte were outside of acceptance criteria, biased high, with a detection for the analyte in the sample. The value reported is an estimate.
- c - The presence of the analyte may be due to carryover from previous sample injections.
- cf - The sample was centrifuged prior to analysis.
- d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.
- dv - Insufficient sample volume was available to achieve normal reporting limits.
- f - The sample was laboratory filtered prior to analysis.
- fb - The analyte was detected in the method blank.
- fc - The analyte is a common laboratory and field contaminant.
- hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.
- hs - Headspace was present in the container used for analysis.
- ht - The analysis was performed outside the method or client-specified holding time requirement.
- ip - Recovery fell outside of control limits due to sample matrix effects.
- j - The analyte concentration is reported below the standard reporting limit. The value reported is an estimate.
- J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.
- jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.
- js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.
- k - The calibration results for the analyte were outside of acceptance criteria, biased high, and the analyte was not detected in the sample.
- lc - The presence of the analyte is likely due to laboratory contamination.
- L - The reported concentration was generated from a library search.
- nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.
- pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.
- ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.
- vo - The value reported fell outside the control limits established for this analyte.
- x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

405432

SAMPLE CHAIN OF CUSTODY

05/24/24

Page # 1 of 1

Report To Carolyn Wise

Company Maul Foster & Alongi, Inc

Address 1329 N State St Ste. 301

City, State, ZIP Bellingham, WA 98225

Phone 360-690-5982 Email cwise@maulfoster.com

SAMPLERS (signature) Brendan Murphy

PROJECT NAME & ADDRESS
Former Northern State Hospital

PO #

NOTES:

MO624.04.024

INVOICE TO

accounting@maulfoster.com

TURNAROUND TIME

Standard RUSH
Rush charges authorized by:

SAMPLE INFORMATION

ANALYSIS REQUESTED

Sample Name	Lab ID	Canister ID	Flow Cont. ID	Reporting Level: IA=Indoor Air SG=Soil Gas (Circle One)	Date Sampled	Initial Vac. ("Hg)	Field Initial Time	Final Vac. ("Hg)	Field Final Time	TO15 Full Scan	TO15 BTEXN	TO15 cVOCs	APH	Helium	Notes
INAIR01-052224	01	37210	05354	IA / SG	5/22/24	-29	8:10	-2	16:10	X					
INAIR02-052224	02	35332 34	06003	IA / SG	5/22/24	-30	8:02	-5	22:02	X					*Interim sample collection stopped at an unknown time. Collection restarted at 16:02.
INAIR03-052224	03	21442	87871	IA / SG	5/22/24	-29	8:18	-7	16:18	X					
OUTAIR03-052224	04	20541	13966	IA / SG	5/22/24	-30+	6:51	-9	14:51	X					
				IA / SG											
				IA / SG											
				IA / SG											
				IA / SG											

Samples received at 21 °C

Friedman & Bruya, Inc.

5500 4th Avenue South

Seattle, WA 98108

Ph. (206) 285-8282

Fax (206) 283-5044

FORMS\OOC\COCTO-15.DOC

SIGNATURE

PRINT NAME

COMPANY

DATE

TIME

Relinquished by: Brendan Murphy

Received by: Anna W

Relinquished by: Anna W

Received by: Anna W Bruya

Brendan Murphy

Anna W Bruya

MFA

F&B

5/23/24 12:30

5/24/24 13:45

SAMPLE CONDITION UPON RECEIPT CHECKLIST

PROJECT # 405432 CLIENT MFA INITIALS/DATE: AMB 5/24

If custody seals are present on cooler, are they intact? NA YES NO

Cooler/Sample temperature 21 °C
Thermometer ID: Fluke 96312917

Were samples received on ice/cold packs? YES NO

How did samples arrive?
 Over the Counter Picked up by F&BI FedEx/UPS/GSO

Is there a Chain-of-Custody* (COC)? YES NO Initials/Date: AP 05/24/24
*or other representative documents, letters, and/or shipping memos

Number of days samples have been sitting prior to receipt at laboratory 2 days

Are the samples clearly identified? (explain "no" answer below) YES NO

Were all sample containers received intact (i.e. not broken, leaking etc.)? (explain "no" answer below) YES NO

Were appropriate sample containers used? YES NO Unknown

If custody seals are present on samples, are they intact? NA YES NO

Are samples requiring no headspace, headspace free? NA YES NO

Is the following information provided on the COC, and does it match the sample label? (explain "no" answer below)

- Sample ID's Yes No _____ Not on COC/label
- Date Sampled Yes No _____ Not on COC/label
- Time Sampled Yes No _____ Not on COC/label
- # of Containers Yes No _____
- Relinquished Yes No _____
- Requested analysis Yes On Hold _____

Other comments (use a separate page if needed)

Air Samples: Were any additional canisters/tubes received? NA YES NO

Number of unused TO15 canisters _____ Number of unused TO17 tubes _____

Attachment D

Data Validation Memorandum



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Data Validation Memorandum

Project No. M0624.04.024 | June 11, 2024 | Port of Skagit

Maul Foster & Alongi, Inc. (MFA), conducted an independent Stage 2A review of the quality of analytical results for indoor air and outdoor air samples collected on May 22, 2024, at the Northern State Multi Service Center site in Sedro-Woolley, Washington.

Friedman & Bruya, Inc. (F&B), performed the analyses. MFA reviewed F&B report number 405432. The analyses performed and the samples analyzed are listed in the following tables.

Analysis	Reference
Volatile organic compounds	EPA TO-15

Notes

EPA = U.S. Environmental Protection Agency.
TO = toxic organics.

Samples Analyzed
Report 405432
INAIRO1-052224
INAIRO2-052224
INAIRO3-052224
OUTAIRO3-052224

Data Validation Procedures

Analytical results were evaluated according to applicable sections of U.S. Environmental Protection Agency (EPA) guidelines for data review (EPA 2020) and appropriate laboratory- and method-specific guidelines (EPA 1986, F&B 2022).

Based on the data quality assurance/quality control review described herein, the data, with the appropriate final data qualifiers assigned, are considered acceptable for their intended use. Final data qualifiers represent qualifiers originating from the laboratory and accepted by the reviewer, and data qualifiers assigned by the reviewer during validation.

Final data qualifier:

- U = result is non-detect at the method reporting limit (MRL).

General Qualifications

According to a note on the chain-of-custody (COC) form accompanying report 405432, sample INAIRO2-052224 had interim sample collection stopped at an unknown time and restarted at 4:02 pm. The reviewer confirmed with the laboratory that sample pressure, and not sample collection time, is used for analytical calculation. The reviewer also confirmed with the sampler that the sampling train was not disrupted. Qualification of EPA Method TO-15 results was not required.

Sample Conditions

Sample Custody

Sample custody was appropriately documented on the COC form accompanying the report.

The reviewer confirmed that the gap in custody on the COC form accompanying report 405432 is due to shipment via a third-party service.

Holding Times

Extractions and analyses were performed within the recommended holding times.

Preservation and Sample Storage

The samples were preserved and stored appropriately.

Reporting Limits

The laboratory evaluated results to MRLs.

Blank Results

Method Blanks

Laboratory method blanks are used to evaluate whether laboratory contamination was introduced during sample preparation and analysis. Laboratory method blank analyses were performed at the required frequencies, in accordance with laboratory- and method-specific requirements.

All laboratory method blank results were non-detect to MRLs.

Laboratory Control Sample and Laboratory Control Sample Duplicate Results

Laboratory control sample (LCS) and laboratory control sample duplicate (LCSD) results are used to evaluate laboratory precision and accuracy. F&B did not report LCSD results; laboratory precision was evaluated using laboratory duplicate results. The LCS were prepared and analyzed at the required frequency.

All LCS results were within acceptance limits for percent recovery.

Laboratory Duplicate Results

Laboratory duplicate results are used to evaluate laboratory precision and sample homogeneity. All laboratory duplicate samples were prepared and analyzed at the required frequency, in accordance with laboratory- and method-specific requirements.

Laboratory duplicate results greater than five times the MRL were evaluated using laboratory relative percent difference (RPD) control limits. A secondary criterion was used when laboratory duplicate results were non-detect or less than five times the MRL. Results meet the secondary criterion if the absolute difference of the laboratory duplicate sample result and the parent sample result, or the MRL for non-detects, is equal to or less than the MRL value of the parent sample.

All laboratory duplicate results met the acceptance criteria.

Matrix Spike and Matrix Spike Duplicate Results

Matrix spike (MS) and matrix spike duplicate (MSD) results are used to evaluate laboratory precision, accuracy, and the effect of the sample matrix on sample preparation and target analyte recovery. F&B did not report MS or MSD results, in accordance with the method.

Surrogate Results

Surrogate results are used to evaluate laboratory performance of target organic compounds for individual samples.

When surrogate results were outside percent recovery acceptance limits because of dilutions necessary to quantify high concentrations of target analytes, qualification by the reviewer was not required because surrogate concentrations could not be accurately quantified.

When batch quality control samples had surrogate percent recovery exceedances, qualification by the reviewer was not required when batch quality control target analyte results were within percent recovery acceptance limits.

All surrogate results were within percent recovery acceptance limits.

Field Duplicate Results

Field duplicate results are used to evaluate field precision and sample homogeneity. No field duplicate samples were submitted for analysis.

Data Package

The data package was reviewed for transcription errors, omissions, and anomalies.

None were found.

References

- EPA. 1986. *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*. EPA publication SW-846. 3rd ed. U.S. Environmental Protection Agency. Final updates I (1993), II (1995), IIA (1994), IIB (1995), III (1997), IIIA (1999), IIIB (2005), IV (2008), V (2015), VI phase I (2017), VI phase II (2018), VI phase III (2019), VII phase I (2019), and VII phase II (2020).
- EPA. 2020. *National Functional Guidelines for Organic Superfund Methods Data Review*. EPA 540-R-20-005. U.S. Environmental Protection Agency, Office of Superfund Remediation and Technology Innovation: Washington, DC. November.
- F&B. 2022. *Quality Assurance Manual*. Rev. 18. Friedman & Bruya, Inc.: Seattle, WA. December 9.

Attachment E

Sub-slab Depressurization Inspection Form



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Name: Brenden Murphy Date: 5/22/24 Outdoor temp.: 57° F

1. Power Supply

- 1.1 Is the power switch in "On" Position upon arrival? Yes No
 1.2 If No, explain why power was off (if known) and steps taken to correct: VENTOZ power was off upon arrival (unknown reason). Power was turned back on and allowed to equilibrate before recording measurements.

2. Manometer Gauge Reading

Table 2.1 Manometer Gauge Readings

(Make sure lower side of manometer gauge is at 0)

Location	Time	Manometer Condition Good?	Pressure (" WC)	Pressure Goal (" WC)	Measurement Above Goal?
VENT01	22:02	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.8	0.5 – 1.75	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
VENT02	22:05	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	0.6	0.5 – 1.75	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
VENT03	17:50	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.6	0.5 – 1.75	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
VENT04	17:45	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.5	0.5 – 1.75	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
VENT05	17:00	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.5	0.5 – 1.75	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

Notes:

If **No** is selected and blower operational, notify PM to identify corrective actions.
 " WC = inches of water column.

3. Additional System Documentation

Table 3.1 System Checklist

Is the SSDS operating upon arrival?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Is the SSDS visually intact and undamaged?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Conduct a visual inspection of accessible system piping and pipe seals, connections, etc. Are the components free of any cracks, gaps, or changes?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Is the floor in generally good condition, with no cracks or penetrations observed?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Is the caulking on floor penetrations in good condition?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <u>NA - no caulk; sealant in good condition</u>

If the answer was **No** to any of the above, describe below and document corrective actions. Please describe any issues with the SSDS, if applicable:

4. Structural Changes

Table 4.1 System Checklist

Have there been any significant changes to the building's HVAC system?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are any new buildings present near the subject structure that have emissions that could impact indoor air?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Has the building changed in use since last inspection?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Has the building undergone any physical modifications (additions, wall changes, new drains, etc.)	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

If the answer was **Yes** to any of the above, describe the changes below and photo document them:



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5. Differential Pressure Readings

Existing sub-slab vapor pins are located on the floor of the building as shown on Figure 5-1 of Interim Action Work Plan.

Table 5.1 Final Differential Pressure Readings

Location	Time	Cap and Seal Secure Before Readings?	Final Pressure (" WC)	Pressure Goal (" WC)	Pressure Above Goal?	Weather	
						Wind Velocity/ Direction	Barometric Pressure (" Hg)
SB01	16:59	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	-0.020	-0.001	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	4 mph nw	29.99
SB02	17:49	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	-0.058	-0.001	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3 mph wnw	30.00
SB03	22:12	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	-0.001	-0.001	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	6 mph sse	30.04

Notes:

Measurements will be taken manually at each monitoring port using micromanometer with capability to measure as low as 0.001 " of WC).

" Hg = inches of mercury.

" WC = inches of water column.

Were all sub-slab vapor pins sealed/capped after differential pressure readings were measured?

Yes No