PARTNER

INDUSTRIAL HYGIENE SERVICES

Wall Township Board of Education
1620 18th Avenue
Wall, New Jersey 07719

Date: May 28, 2020
Partner Project No. 20-277423.1

Prepared for:
Wall Township Board of Education
1620 18th Avenue
Wall, NJ 07719

PARTNER
Engineering and Science, Inc.

May 28, 2020

Wall Township Board of Education
1620 18th Avenue
Wall, NJ 07719

Attn: Nicholas Moretta
Facilities Manager

Re: Mercury Investigation Services
Wall Township Board of Education
Wall Township, New Jersey 07719

Dear Mr. Moretta:

Attached is the report of Partner Engineering and Science, Inc.'s (Partner's) Mercury Investigation Services performed at Wall High School, Allenwood Elementary School, and West Belmar Elementary School.

Please feel free to contact me directly with any questions or comments regarding the scope, sequence, or fees as indicated at (732) 380-1700 ext. 1361.

Very truly yours,

Dan Bracey, GSP, CHMM
Project Manager
Industrial Hygiene and Health & Safety Services

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I. INTRODUCTION

At the request of Wall Board of Education (the "Client"), Partner Engineering and Science, Inc. (Partner) conducted a mercury investigation to assess potential mercury content in the rubber-like polyurethane floors in Wall High School, Allenwood Elementary School, and West Belmar Elementary School, Dan Bracey of Partner performed the investigation activities on May 18, 2020.

II. BACKGROUND

Partner conducted an initial walkthrough of the subject building on February 13, 2020, to determine potential sampling locations in the three target areas containing rubber-like polyethylene floors, specifically the gymnasiums at all schools. No safety data sheets (SDSs) for the floors were available at the time of the investigation and the installation date of the floors is unknown. Based upon this information and current guidance from the New Jersey Department of Health (NJDOH), bulk samples of the rubber-like floors were to be collected for analysis of mercury levels by an accredited laboratory using EPA Method 7471B to determine potential mercury content.

III. SAMPLING RESULTS

On May 18, 2020 Partner collected three (3) bulk samples of the rubber floor from the gymnasium at Wall High School, two (2) bulk samples of the rubber floor from the gymnasium at Allenwood Elementary School, and two (2) bulk samples of the rubber floor from the gymnasium at West Belmar Elementary School. Each sample measured approximately 6-inch by 6-inch square. The bulk samples were then cut into approximately 1-inch by 6-inch strips for analysis.

The results of the bulk sampling showed mercury was not detected above the reporting limit of the laboratory for the samples collected from Allenwood Elementary School and West Belmar Elementary School. The results of the bulk samples collected from Wall High School revealed all three samples of the rubber floor contained elevated concentrations of mercury ranging from 0.9 mg/kg to 6.63 mg/kg. Refer to Appendix A for the laboratory results, Appendix B for site photographs of sampling locations, and Appendix C for a sample location map.

Facility	Location	Sample ID	Result (mg/kg)
Wall High School	South Gym – West	HS518-1	3.03
Wall High School	South Gym – North	HS518-2	6.63
Wall High School	South Gym – East	HS518-3	0.91
Allenwood School	Gym – Northeast (Office)	AE518-1	ND
Allenwood School	Gym – Southwest	AE518-2	ND
West Belmar School	Gym – Southwest	WB518-1	ND
West Belmar School	Gym – Northwest	WB518-2	ND

NOTES:
mg/kg = milligrams per kilograms
ND-indicates that the analyte was not detected at the reporting limit of 0.058 mg/kg

IV. CONCLUSIONS AND RECOMMENDATIONS

Laboratory analysis of the bulk samples revealed results below the laboratories minimum detection limits (MDL) at both West Belmar Elementary School and Allenwood Elementary Schools indicating no detectable mercury concentrations were identified in the samples. Based upon these results, no air sampling or additional bulk sampling of the floors is required at this time for these two facilities.

Laboratory analysis of the bulk samples collected from Wall High School revealed elevated mercury concentration ranging from 0.91 mg/kg to 6.63 mg/kg; therefore, as per the NJDOH guidance document titled "*Evaluation and Management of Mercury-Containing Floors in New Jersey Schools: Guidance for School Districts and their Environmental Consultants*" air sampling for mercury is recommended to determine the airborne concentration of mercury vapors in the gym and surrounding areas (Appendix D). Partner can provide a separate proposal for the follow-up air sampling at the request of Wall Board of Education.

APPENDIX A

ALPHA ANALYTICAL

World Class Chemistry

www.alphalab.com

Lab Number: L2020571

Client: Partner Engineering & Science, I

ATTN: Dan Bracey

Project Name: WALL BOE

Project Number: 20-277423.1

ANALYTICAL DATA PACKAGE FOR THE
NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
TRENTON NEW JERSEY 08625

Agency/Division:	**Bureau/Office:**
Project No: 20-277423.1	**Contract No:**
Laboratory: Alpha Analytical	**Laboratory Location:** Westborough, Ma.
	Laboratory Phone Number: (508) 898-9220
SDG No: L2020571	**NJDEP Certification #:** MA015/MA935
Date of First Sample Receipt: 05/19/2020	**Date of Last Sample Receipt:** 05/19/2020

Agency Sample Number	Laboratory Sample Number	Sample Location	Date/Time of Collection
HS518-1	L2020571-01	WALL BOE	05/18/2020 09:12
HS518-2	L2020571-02	WALL BOE	05/18/2020 09:25
HS518-3	L2020571-03	WALL BOE	05/18/2020 10:00
WB518-1	L2020571-04	WALL BOE	05/18/2020 10:33
WB518-2	L2020571-05	WALL BOE	05/18/2020 10:45
AE518-1	L2020571-06	WALL BOE	05/18/2020 11:30
AE518-2	L2020571-07	WALL BOE	05/18/2020 11:40

I certify that this data package is in compliance with the terms and conditions of this contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on disk or electronically has been authorized by the laboratory director or his/her designee, as verified by the following signature.

Technical Director/Representative (Typed)	Melissa Sturgis	05/27/20
Technical Director/Representative (Signature)	Melissa Sturgis	

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Chain of Custody

NEW JERSEY CHAIN OF CUSTODY

ALPHA ANALYTICAL

Westborough, MA 01581
8 Walkup Dr.
TEL: 508-898-9220
FAX: 508-898-9193

Mansfield, MA 02048
320 Forbes Blvd
TEL: 508-822-9300
FAX: 508-822-3288

Service Centers
Mahwah, NJ 07430: 35 Whitney Rd, Suite 5
Albany, NY 12205: 14 Walker Way
Tonawanda, NY 14150: 275 Cooper Ave, Suite 105

Page 1 of 1

Date Rec'd in Lab: 5/19/20

ALPHA Job #: L2020571

Client Information

Client: Partner Engineering
Address: 611 Industrial Way W, Suite A
Phone: 732-380-1700
Fax: 732-380-1701
Email: dbracey@partnersei.com

Project Information

Project Name: Wall BOE
Project Location: Wall, NJ
Project #: 20-277423.2
(Use Project name as Project #) ☐
Project Manager: DRB
ALPHAQuote #:

Turn-Around Time

Standard ☑ Due Date:
Rush (only if pre approved) ☐ # of Days:

Deliverables

☑ NJ Full / Reduced
☐ EQuIS (1 File) ☐ EQuIS (4 File)
☐ Other

Regulatory Requirement

☐ SRS Residential/Non Residential
☐ SRS Impact to Groundwater
☐ NJ Ground Water Quality Standards
☐ NJ IGW SPLP Leachate Criteria
☐ Other

Billing Information

☑ Same as Client Info
PO #

Site Information

Is this site impacted by Petroleum? Yes ☐
Petroleum Product:

These samples have been previously analyzed by Alpha ☐

For EPH, selection is REQUIRED:
☐ Category 1
☐ Category 2

For VOC, selection is REQUIRED:
☐ 1,4-Dioxane
☐ 8011

Other project specific requirements/comments:

Please specify Metals or TAL.

ANALYSIS

Mercury 7471B

Sample Filtration
☐ Done
☐ Lab to do
Preservation
☐ Lab to do
(Please Specify below)

Sample Specific Comments

Total Bottle

ALPHA Lab ID (Lab Use Only)		Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	Mercury 7471B	Total Bottle
20571	1	HS518-1	5/18/20	0912	X1-Floor	DRB	X	
	2	HS518-2	"	0925	"	DRB	"	
	3	HS518-3	"	1000	"	DRB	"	
	4	WB518-1	"	1033	"	DRB	"	
	5	WB518-2	"	1045	"	DRB	"	
	6	AE518-1	"	1130	"	DRB	"	
	7	AE518-2	"	1140	"	DRB	"	

Preservative Code:
A = None
B = HCl
C = HNO_3
D = H_2SO_4
E = NaOH
F = MeOH
G = $NaHSO_4$
H = $Na_2S_2O_3$
K/E = Zn Ac/NaOH
O = Other

Container Code
P = Plastic
A = Amber Glass
V = Vial
G = Glass
B = Bacteria Cup
C = Cube
O = Other
E = Encore
D = BOD Bottle

Westboro: Certification No: MA935
Mansfield: Certification No: MA015

Container Type	A
Preservative	A

Relinquished By:	Date/Time	Received By:	Date/Time
[signature]	5/19/20 1000	[signature]	5/19/20 12:00
[signature]	5/19/20 17:00	[signature]	5/19/20 1110
[signature]	5/19/20 2000	[signature]	5/19/20 2000
[signature]	5/19/20 2200	[signature]	5/19/20 2200

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. BY EXECUTING THIS COC, THE CLIENT HAS READ AND AGREES TO BE BOUND BY ALPHA'S TERMS & CONDITIONS. (See reverse side.)

Form No: 01-14 HC (rev. 30-Sept-2013)

ALPHA ANALYTICAL LABORATORIES, INC.
LOGIN CHAIN OF CUSTODY REPORT
May 27 2020, 11:18 am

Login Number: L2020571
Account: PARTNER Partner Engineering & Science, Inc.Project: 20-277423.1
Received: 19MAY20 Due Date: 27MAY20

Sample #	Client ID	Mat	PR	Collected
L2020571-01	HS518-1	4	S0	18MAY20 09:12
| NJ-RED Package Due Date: 05/27/20				
HG-T,NJ-RED,NJDEP,PREPT,TS100				
L2020571-02	HS518-2	4	S0	18MAY20 09:25
| Package Due Date: 05/27/20				
HG-T,PREPT,TS100				
L2020571-03	HS518-3	4	S0	18MAY20 10:00
| Package Due Date: 05/27/20				
HG-T,PREPT,TS100				
L2020571-04	WB518-1	4	S0	18MAY20 10:33
| Package Due Date: 05/27/20				
HG-T,PREPT,TS100				
L2020571-05	WB518-2	4	S0	18MAY20 10:45
| Package Due Date: 05/27/20				
HG-T,PREPT,TS100				
L2020571-06	AE518-1	4	S0	18MAY20 11:30
| Package Due Date: 05/27/20				
HG-T,PREPT,TS100				
L2020571-07	AE518-2	4	S0	18MAY20 11:40
| Package Due Date: 05/27/20				

ALPHA ANALYTICAL LABORATORIES, INC.
LOGIN CHAIN OF CUSTODY REPORT
May 27 2020, 11:18 am

Login Number: L2020571

Account: PARTNER Partner Engineering & Science, Inc.Project: 20-277423.1

Received: 19MAY20 Due Date: 27MAY20

Sample #	Client ID	Mat	PR Collected

HG-T,PREPT,TS100

Logged By: Kyle Provencher

ALPHA ANALYTICAL LABORATORIES
Container Tracking Report

Container ID	Type	Status	Transaction Date	From Response	From Location	From Operator	To Response	To Location	To Operator
L2020571-01A	Glass-A.5	INTACT	21-MAY-20	A2-CUSTODY-REFRIDGE	A2-METALS PREP	Kherna Yoyo	A2-CUSTODY-MET2-S10	A2-CUSTODY-MET2-S10	Kherna Yoyo
L2020571-01A	Glass-A.5	INTACT	21-MAY-20	A2-CUSTODY-REFRIDGE	A2-CUSTODY-MET3-S6	Kherna Yoyo	A2-METALS PREP	A2-METALS PREP	Kherna Yoyo
L2020571-01A	Glass-A.5	INTACT	20-MAY-20	A2-CUSTODY-REFRIDGE	A2-CUSTODY	Andrew Kussmaul	A2-CUSTODY-MET3-S6	A2-CUSTODY-MET3-S6	Andrew Kussmaul
L2020571-01A	Glass-A.5	INTACT	20-MAY-20	TRANSIT COURIER	COOLER4-TRANSFER_TO_MANSFIELD	Wendy Morency	A2-CUSTODY	A2-CUSTODY	Theodore Huddleson
L2020571-01A	Glass-A.5	INTACT	20-MAY-20	COOLER4-TRANSFER_TO_MANSFIELD	COOLER4-TRANSFER_TO_MANSFIELD	Wendy Morency	TRANSIT COURIER	COOLER4-TRANSFER_TO_MANSFIELD	T
L2020571-01A	Glass-A.5	INTACT	20-MAY-20		CUSTODY	Wendy Morency	COOLER4-TRANSFER_TO_MANSFIELD	COOLER4-TRANSFER_TO_MANSFIELD	Wendy Morency
L2020571-01A	Glass-A.5	INTACT	20-MAY-20	LOGIN	LOGIN	Kyle Provencher	CUSTODY	CUSTODY	Kyle Provencher
L2020571-02A	Glass-A.5	INTACT	21-MAY-20	A2-CUSTODY-REFRIDGE	A2-METALS PREP	Kherna Yoyo	A2-CUSTODY-MET2-S10	A2-CUSTODY-MET2-S10	Kherna Yoyo
L2020571-02A	Glass-A.5	INTACT	21-MAY-20	A2-CUSTODY-REFRIDGE	A2-CUSTODY-MET3-S6	Kherna Yoyo	A2-METALS PREP	A2-METALS PREP	Kherna Yoyo
L2020571-02A	Glass-A.5	INTACT	20-MAY-20	A2-CUSTODY-REFRIDGE	A2-CUSTODY	Andrew Kussmaul	A2-CUSTODY-MET3-S6	A2-CUSTODY-MET3-S6	Andrew Kussmaul
L2020571-02A	Glass-A.5	INTACT	20-MAY-20	TRANSIT COURIER	COOLER4-TRANSFER_TO_MANSFIELD	Wendy Morency	A2-CUSTODY	A2-CUSTODY	Theodore Huddleson
L2020571-02A	Glass-A.5	INTACT	20-MAY-20	COOLER4-TRANSFER_TO_MANSFIELD	COOLER4-TRANSFER_TO_MANSFIELD	Wendy Morency	TRANSIT COURIER	COOLER4-TRANSFER_TO_MANSFIELD	T
L2020571-02A	Glass-A.5	INTACT	20-MAY-20		CUSTODY	Wendy Morency	COOLER4-TRANSFER_TO_MANSFIELD	COOLER4-TRANSFER_TO_MANSFIELD	Wendy Morency
L2020571-02A	Glass-A.5	INTACT	20-MAY-20	LOGIN	LOGIN	Kyle Provencher	CUSTODY	CUSTODY	Kyle Provencher
L2020571-03A	Glass-A.5	INTACT	21-MAY-20	A2-CUSTODY-REFRIDGE	A2-METALS PREP	Kherna Yoyo	A2-CUSTODY-MET2-S10	A2-CUSTODY-MET2-S10	Kherna Yoyo
L2020571-03A	Glass-A.5	INTACT	21-MAY-20	A2-CUSTODY-REFRIDGE	A2-CUSTODY-MET3-S6	Kherna Yoyo	A2-METALS PREP	A2-METALS PREP	Kherna Yoyo
L2020571-03A	Glass-A.5	INTACT	20-MAY-20	A2-CUSTODY-REFRIDGE	A2-CUSTODY	Andrew Kussmaul	A2-CUSTODY-MET3-S6	A2-CUSTODY-MET3-S6	Andrew Kussmaul
L2020571-03A	Glass-A.5	INTACT	20-MAY-20	TRANSIT COURIER	COOLER4-TRANSFER_TO_MANSFIELD	Wendy Morency	A2-CUSTODY	A2-CUSTODY	Theodore Huddleson
L2020571-03A	Glass-A.5	INTACT	20-MAY-20	COOLER4-TRANSFER_TO_MANSFIELD	COOLER4-TRANSFER_TO_MANSFIELD	Wendy Morency	TRANSIT COURIER	COOLER4-TRANSFER_TO_MANSFIELD	T
L2020571-03A	Glass-A.5	INTACT	20-MAY-20		CUSTODY	Wendy Morency	COOLER4-TRANSFER_TO_MANSFIELD	COOLER4-TRANSFER_TO_MANSFIELD	Wendy Morency
L2020571-03A	Glass-A.5	INTACT	20-MAY-20	LOGIN	LOGIN	Kyle Provencher	CUSTODY	CUSTODY	Kyle Provencher
L2020571-04A	Glass-A.5	INTACT	21-MAY-20	A2-CUSTODY-REFRIDGE	A2-METALS PREP	Kherna Yoyo	A2-CUSTODY-MET2-S10	A2-CUSTODY-MET2-S10	Kherna Yoyo
L2020571-04A	Glass-A.5	INTACT	21-MAY-20	A2-CUSTODY-REFRIDGE	A2-CUSTODY-MET3-S6	Kherna Yoyo	A2-METALS PREP	A2-METALS PREP	Kherna Yoyo
L2020571-04A	Glass-A.5	INTACT	20-MAY-20	A2-CUSTODY-REFRIDGE	A2-CUSTODY	Andrew Kussmaul	A2-CUSTODY-MET3-S6	A2-CUSTODY-MET3-S6	Andrew Kussmaul
L2020571-04A	Glass-A.5	INTACT	20-MAY-20	TRANSIT COURIER	COOLER4-TRANSFER_TO_MANSFIELD	Wendy Morency	A2-CUSTODY	A2-CUSTODY	Theodore Huddleson

Container ID	Type	Status	Transaction Date	From Response	From Location	From Operator	To Response	To Location	To Operator
L2020571-04A	Glass-A.5	INTACT	20-MAY-20	COOLER4-TRANSFER_TO_MANSFIELD	COOLER4-TRANSFER_TO_MANSFIELD	Wendy Morency	TRANSIT COURIER	COOLER4-TRANSFER_TO_MANSFIELD	
L2020571-04A	Glass-A.5	INTACT	20-MAY-20		CUSTODY	Wendy Morency	COOLER4-TRANSFER_TO_MANSFIELD	COOLER4-TRANSFER_TO_MANSFIELD	Wendy Morency
L2020571-04A	Glass-A.5	INTACT	20-MAY-20	LOGIN	LOGIN	Kyle Provencher	CUSTODY	CUSTODY	Kyle Provencher
L2020571-05A	Glass-A.5	INTACT	21-MAY-20	A2-CUSTODY-REFRIDGE	A2-METALS PREP	Kherna Yoyo	A2-CUSTODY-MET2-S10	A2-CUSTODY-MET2-S10	Kherna Yoyo
L2020571-05A	Glass-A.5	INTACT	21-MAY-20	A2-CUSTODY-REFRIDGE	A2-CUSTODY-MET3-S6	Kherna Yoyo	A2-METALS PREP	A2-METALS PREP	Kherna Yoyo
L2020571-05A	Glass-A.5	INTACT	20-MAY-20	A2-CUSTODY-REFRIDGE	A2-CUSTODY	Andrew Kussmaul	A2-CUSTODY-MET3-S6	A2-CUSTODY-MET3-S6	Andrew Kussmaul
L2020571-05A	Glass-A.5	INTACT	20-MAY-20	TRANSIT COURIER	COOLER4-TRANSFER_TO_MANSFIELD	Wendy Morency	A2-CUSTODY	A2-CUSTODY	Theodore Huddleson
L2020571-05A	Glass-A.5	INTACT	20-MAY-20	COOLER4-TRANSFER_TO_MANSFIELD	COOLER4-TRANSFER_TO_MANSFIELD	Wendy Morency	TRANSIT COURIER	COOLER4-TRANSFER_TO_MANSFIELD	
L2020571-05A	Glass-A.5	INTACT	20-MAY-20		CUSTODY	Wendy Morency	COOLER4-TRANSFER_TO_MANSFIELD	COOLER4-TRANSFER_TO_MANSFIELD	Wendy Morency
L2020571-05A	Glass-A.5	INTACT	20-MAY-20	LOGIN	LOGIN	Kyle Provencher	CUSTODY	CUSTODY	Kyle Provencher
L2020571-06A	Glass-A.5	INTACT	21-MAY-20	A2-CUSTODY-REFRIDGE	A2-METALS PREP	Kherna Yoyo	A2-CUSTODY-MET2-S10	A2-CUSTODY-MET2-S10	Kherna Yoyo
L2020571-06A	Glass-A.5	INTACT	21-MAY-20	A2-CUSTODY-REFRIDGE	A2-CUSTODY-MET3-S6	Kherna Yoyo	A2-METALS PREP	A2-METALS PREP	Kherna Yoyo
L2020571-06A	Glass-A.5	INTACT	20-MAY-20	A2-CUSTODY-REFRIDGE	A2-CUSTODY	Andrew Kussmaul	A2-CUSTODY-MET3-S6	A2-CUSTODY-MET3-S6	Andrew Kussmaul
L2020571-06A	Glass-A.5	INTACT	20-MAY-20	TRANSIT COURIER	COOLER4-TRANSFER_TO_MANSFIELD	Wendy Morency	A2-CUSTODY	A2-CUSTODY	Theodore Huddleson
L2020571-06A	Glass-A.5	INTACT	20-MAY-20	COOLER4-TRANSFER_TO_MANSFIELD	COOLER4-TRANSFER_TO_MANSFIELD	Wendy Morency	TRANSIT COURIER	COOLER4-TRANSFER_TO_MANSFIELD	
L2020571-06A	Glass-A.5	INTACT	20-MAY-20		CUSTODY	Wendy Morency	COOLER4-TRANSFER_TO_MANSFIELD	COOLER4-TRANSFER_TO_MANSFIELD	Wendy Morency
L2020571-06A	Glass-A.5	INTACT	20-MAY-20	LOGIN	LOGIN	Kyle Provencher	CUSTODY	CUSTODY	Kyle Provencher
L2020571-07A	Glass-A.5	INTACT	21-MAY-20	A2-CUSTODY-REFRIDGE	A2-METALS PREP	Kherna Yoyo	A2-CUSTODY-MET2-S10	A2-CUSTODY-MET2-S10	Kherna Yoyo
L2020571-07A	Glass-A.5	INTACT	21-MAY-20	A2-CUSTODY-REFRIDGE	A2-CUSTODY-MET3-S6	Kherna Yoyo	A2-METALS PREP	A2-METALS PREP	Kherna Yoyo
L2020571-07A	Glass-A.5	INTACT	20-MAY-20	A2-CUSTODY-REFRIDGE	A2-CUSTODY	Andrew Kussmaul	A2-CUSTODY-MET3-S6	A2-CUSTODY-MET3-S6	Andrew Kussmaul
L2020571-07A	Glass-A.5	INTACT	20-MAY-20	TRANSIT COURIER	COOLER4-TRANSFER_TO_MANSFIELD	Wendy Morency	A2-CUSTODY	A2-CUSTODY	Theodore Huddleson
L2020571-07A	Glass-A.5	INTACT	20-MAY-20	COOLER4-TRANSFER_TO_MANSFIELD	COOLER4-TRANSFER_TO_MANSFIELD	Wendy Morency	TRANSIT COURIER	COOLER4-TRANSFER_TO_MANSFIELD	
L2020571-07A	Glass-A.5	INTACT	20-MAY-20		CUSTODY	Wendy Morency	COOLER4-TRANSFER_TO_MANSFIELD	COOLER4-TRANSFER_TO_MANSFIELD	Wendy Morency
L2020571-07A	Glass-A.5	INTACT	20-MAY-20	LOGIN	LOGIN	Kyle Provencher	CUSTODY	CUSTODY	Kyle Provencher

Methodology Review

REFERENCES

1 Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Third Edition. Updates I - IV, 2007.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.

Laboratory Chronicle

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information

Cooler	Custody Seal
A	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2020571-01A	Glass 500ml/16oz unpreserved	A	NA		4.7	Y	Absent		HG-T(28)
L2020571-02A	Glass 500ml/16oz unpreserved	A	NA		4.7	Y	Absent		HG-T(28)
L2020571-03A	Glass 500ml/16oz unpreserved	A	NA		4.7	Y	Absent		HG-T(28)
L2020571-04A	Glass 500ml/16oz unpreserved	A	NA		4.7	Y	Absent		HG-T(28)
L2020571-05A	Glass 500ml/16oz unpreserved	A	NA		4.7	Y	Absent		HG-T(28)
L2020571-06A	Glass 500ml/16oz unpreserved	A	NA		4.7	Y	Absent		HG-T(28)
L2020571-07A	Glass 500ml/16oz unpreserved	A	NA		4.7	Y	Absent		HG-T(28)

*Values in parentheses indicate holding time in days

NJ DEP
Data of Known Quality Protocols
Conformance/Non-Conformance
Summary Questionnaire

NJ DEP Data of Known Quality Protocols
Conformance/Non-Conformance
Summary Questionnaire

1	For each analytical method referenced in this laboratory report package, were all specified QA/QC performance criteria followed, including the requirement to explain any criteria falling outside of acceptable guidelines, as specified in the NJDEP Data of Known Quality performance standards?	YES
1a	Were the method specified handling, preservation, and holding time requirements met?	YES
1b	EPH Method: Was the EPH Method conducted without significant modifications (see Section 11.3 of respective DKQ methods)?	N/A
2	Were all samples received by the laboratory in a condition consistent with that described on the associated chain-of-custody document(s)?	YES
3	Were all samples received at an appropriate temperature (4 ± 2° C)?	YES
4	Were all QA/QC performance criteria specified in the NJDEP DKQP standards achieved?	YES
5a	Were reporting limits specified or referenced on the chain-of-custody or communicated to the laboratory prior to sample receipt?	YES
5b	Were these reporting limits met?	YES
6	For each analytical method referenced in this laboratory report package, were results reported for all constituents identified in the method-specific analyte lists presented in the DKQP documents and/or site-specific QAPP?	YES
7	Are project-specific matrix spikes and/or laboratory duplicates included in this data set?	NO

Note: For all questions to which the response was "No" (with the exception of question #7), additional information must be provided in an attached narrative. If the answer to question #1, #1a or #1b is "No", the data package does not meet the requirements for "Data of Known Quality".

Conformance/Non-Conformance Summary

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively. When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. All specific QC information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications. Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances the specific failure is not narrated but noted in the associated QC table. The information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications.

Please see the associated ADEx data file for a comparison of laboratory reporting limits that were achieved with the regulatory Numerical Standards requested on the Chain of Custody.

HOLD POLICY
For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Client Service Representative and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Client Services at 800-624-9220 with any questions.

Case Narrative (continued)

Report Submission

All non-detect (ND) or estimated concentrations (J-qualified) have been quantitated to the limit noted in the MDL column.

DKQP Related Narratives

Report Submission

All DKQP required questions were answered with affirmative responses; therefore, there are no relevant data issues to discuss.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature: Melissa Sturgis Report Date: 05/27/20

Title: Technical Director/Representative

Glossary

GLOSSARY

Acronyms

DL - Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

EDL - Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).

EMPC - Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.

EPA - Environmental Protection Agency.

LCS - Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.

LCSD - Laboratory Control Sample Duplicate: Refer to LCS.

LFB - Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.

LOD - Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

LOQ - Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

MDL - Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.

MS - Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.

MSD - Matrix Spike Sample Duplicate: Refer to MS.

NA - Not Applicable.

NC - Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.

NDPA/DPA - N-Nitrosodiphenylamine/Diphenylamine.

NI - Not Ignitable.

NP - Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.

RL - Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.

RPD - Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.

SRM - Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.

STLP - Semi-dynamic Tank Leaching Procedure per EPA Method 1315.

TEF - Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.

TEQ - Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.

TIC - Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Footnotes

Report Format: DU Report with 'J' Qualifiers

1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Difference: With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

PAH Total: With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)+(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

PFAS Total: With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. If a 'Total' result is requested, the results of its individual components will also be reported.

The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA,this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

A - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.

B - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).

C - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.

D - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.

E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.

G - The concentration may be biased high due to matrix interferences (i.e, co-elution) with non-target compound(s). The result should be considered estimated.

H - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.

I - The lower value for the two columns has been reported due to obvious interference.

M - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.

NJ - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.

P - The RPD between the results for the two columns exceeds the method-specified criteria.

Q - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)

R - Analytical results are from sample re-analysis.

Report Format: DU Report with 'J' Qualifiers

Data Qualifiers

RE - Analytical results are from sample re-extraction.

S - Analytical results are from modified screening analysis.

J - Estimated value. The Target analyte concentration is below the quantitation limit (RL), but above the Method Detection Limit (MDL) or Estimated Detection Limit (EDL) for SPME-related analyses. This represents an estimated concentration for Tentatively Identified Compounds (TICs).

ND - Not detected at the method detection limit (MDL) for the sample, or estimated detection limit (EDL) for SPME-related analyses.

Report Format: DU Report with 'J' Qualifiers

Metals

Inorganic Data
(Mercury Analysis)

Sample Results Summary

Form 1
METALS

Client	: Partner Engineering & Science, Inc.	**Lab Number**	: L2020571
Project Name	: WALL BOE	**Project Number**	: 20-277423.1
Lab ID	: L2020571-01	**Date Collected**	: 05/18/20 09:12
Client ID	: HS518-1	**Date Received**	: 05/19/20
Sample Location	: WALL, NJ	**Date Analyzed**	: 05/22/20 01:55
Sample Matrix	: SOLID	**Dilution Factor**	: 2
Analytical Method	: 1,7471B	**Analyst**	: AL
Lab File ID	: WG1373359.csv	**Instrument ID**	: NIC1
Sample Amount	: 0.342g	**%Solids**	: 100
Digestion Method	: EPA 7471B	**Date Digested**	: 05/21/20

		mg/kg			
CAS NO.	**Parameter**	**Results**	**RL**	**MDL**	**Qualifier**
7439-97-6	Mercury, Total	3.03	0.146	0.095	

Form 1
METALS

Client	: Partner Engineering & Science, Inc.	**Lab Number**	: L2020571
Project Name	: WALL BOE	**Project Number**	: 20-277423.1
Lab ID	: L2020571-02	**Date Collected**	: 05/18/20 09:25
Client ID	: HS518-2	**Date Received**	: 05/19/20
Sample Location	: WALL, NJ	**Date Analyzed**	: 05/22/20 01:58
Sample Matrix	: SOLID	**Dilution Factor**	: 20
Analytical Method	: 1,7471B	**Analyst**	: AL
Lab File ID	: WG1373359.csv	**Instrument ID**	: NIC1
Sample Amount	: 0.338g	**%Solids**	: 100
Digestion Method	: EPA 7471B	**Date Digested**	: 05/21/20

		mg/kg			
CAS NO.	**Parameter**	**Results**	**RL**	**MDL**	**Qualifier**
7439-97-6	Mercury, Total	6.63	1.48	0.964	

Form 1
METALS

Client	: Partner Engineering & Science, Inc.	**Lab Number**	: L2020571
Project Name	: WALL BOE	**Project Number**	: 20-277423.1
Lab ID	: L2020571-03	**Date Collected**	: 05/18/20 10:00
Client ID	: HS518-3	**Date Received**	: 05/19/20
Sample Location	: WALL, NJ	**Date Analyzed**	: 05/21/20 19:55
Sample Matrix	: SOLID	**Dilution Factor**	: 1
Analytical Method	: 1,7471B	**Analyst**	: AL
Lab File ID	: WG1373359.csv	**Instrument ID**	: NIC1
Sample Amount	: 0.399g	**%Solids**	: 100
Digestion Method	: EPA 7471B	**Date Digested**	: 05/21/20

		mg/kg			
CAS NO.	**Parameter**	**Results**	**RL**	**MDL**	**Qualifier**
7439-97-6	Mercury, Total	0.910	0.063	0.041	

Form 1
METALS

Client	: Partner Engineering & Science, Inc.	**Lab Number**	: L2020571
Project Name	: WALL BOE	**Project Number**	: 20-277423.1
Lab ID	: L2020571-04	**Date Collected**	: 05/18/20 10:33
Client ID	: WB518-1	**Date Received**	: 05/19/20
Sample Location	: WALL, NJ	**Date Analyzed**	: 05/21/20 19:59
Sample Matrix	: SOLID	**Dilution Factor**	: 1
Analytical Method	: 1,7471B	**Analyst**	: AL
Lab File ID	: WG1373359.csv	**Instrument ID**	: NIC1
Sample Amount	: 0.339g	**%Solids**	: 100
Digestion Method	: EPA 7471B	**Date Digested**	: 05/21/20

		mg/kg			
CAS NO.	**Parameter**	**Results**	**RL**	**MDL**	**Qualifier**
7439-97-6	Mercury, Total	ND	0.074	0.048	U

Form 1
METALS

Client	: Partner Engineering & Science, Inc.	**Lab Number**	: L2020571
Project Name	: WALL BOE	**Project Number**	: 20-277423.1
Lab ID	: L2020571-05	**Date Collected**	: 05/18/20 10:45
Client ID	: WB518-2	**Date Received**	: 05/19/20
Sample Location	: WALL, NJ	**Date Analyzed**	: 05/21/20 20:02
Sample Matrix	: SOLID	**Dilution Factor**	: 1
Analytical Method	: 1,7471B	**Analyst**	: AL
Lab File ID	: WG1373359.csv	**Instrument ID**	: NIC1
Sample Amount	: 0.302g	**%Solids**	: 100
Digestion Method	: EPA 7471B	**Date Digested**	: 05/21/20

		mg/kg			
CAS NO.	**Parameter**	**Results**	**RL**	**MDL**	**Qualifier**
7439-97-6	Mercury, Total	ND	0.083	0.054	U

Form 1
METALS

Client	: Partner Engineering & Science, Inc.	**Lab Number**	: L2020571
Project Name	: WALL BOE	**Project Number**	: 20-277423.1
Lab ID	: L2020571-06	**Date Collected**	: 05/18/20 11:30
Client ID	: AE518-1	**Date Received**	: 05/19/20
Sample Location	: WALL, NJ	**Date Analyzed**	: 05/21/20 20:05
Sample Matrix	: SOLID	**Dilution Factor**	: 1
Analytical Method	: 1,7471B	**Analyst**	: AL
Lab File ID	: WG1373359.csv	**Instrument ID**	: NIC1
Sample Amount	: 0.303g	**%Solids**	: 100
Digestion Method	: EPA 7471B	**Date Digested**	: 05/21/20

		mg/kg			
CAS NO.	**Parameter**	**Results**	**RL**	**MDL**	**Qualifier**
7439-97-6	Mercury, Total	ND	0.083	0.054	U

Form 1
METALS

Client	: Partner Engineering & Science, Inc.	**Lab Number**	: L2020571
Project Name	: WALL BOE	**Project Number**	: 20-277423.1
Lab ID	: L2020571-07	**Date Collected**	: 05/18/20 11:40
Client ID	: AE518-2	**Date Received**	: 05/19/20
Sample Location	: WALL, NJ	**Date Analyzed**	: 05/21/20 20:09
Sample Matrix	: SOLID	**Dilution Factor**	: 1
Analytical Method	: 1,7471B	**Analyst**	: AL
Lab File ID	: WG1373359.csv	**Instrument ID**	: NIC1
Sample Amount	: 0.381g	**%Solids**	: 100
Digestion Method	: EPA 7471B	**Date Digested**	: 05/21/20

		mg/kg			
CAS NO.	**Parameter**	**Results**	**RL**	**MDL**	**Qualifier**
7439-97-6	Mercury, Total	ND	0.066	0.043	U

Form 1
METALS

Client	: Partner Engineering & Science, Inc.	**Lab Number**	: L2020571
Project Name	: WALL BOE	**Project Number**	: 20-277423.1
Lab ID	: WG1373197-1	**Date Collected**	: NA
Client ID	: WG1373197-1BLANK	**Date Received**	: NA
Sample Location	:	**Date Analyzed**	: 05/21/20 19:02
Sample Matrix	: SOIL	**Dilution Factor**	: 1
Analytical Method	: 1,7471B	**Analyst**	: AL
Lab File ID	: WG1373359.csv	**Instrument ID**	: NIC1
Sample Amount	: 0.3g	**%Solids**	: NA
Digestion Method	: EPA 7471B	**Date Digested**	: 05/21/20

		mg/kg			
CAS NO.	**Parameter**	**Results**	**RL**	**MDL**	**Qualifier**
7439-97-6	Mercury, Total	ND	0.083	0.054	U

Blank Results Summary

Form 3
Blanks

Client	: Partner Engineering & Science, Inc.	**Lab Number**	: L2020571
Project Name	: WALL BOE	**Project Number**	: 20-277423.1
Instrument ID	: NIC1		

	Initial Calibration Blank		Continuing Calibration Blank(s)						Preparation Blank	
Lab ID :	R1315479-2		R1315479-4		R1315479-6		R1315479-8		WG1373197-1	
Date Analyzed :	05/21/20 18:49		05/21/20 18:59		05/21/20 19:43		05/21/20 20:25		05/21/20 19:02	
Parameter	mg/l	Q	mg/l	Q	mg/l	Q	mg/l	Q	mg/kg	Q
Mercury	0.000326	U	0.000326	U	0.000326	U	0.000326	U	0.054	U

Form 3
Blanks

Client	: Partner Engineering & Science, Inc.	**Lab Number**	: L2020571
Project Name	: WALL BOE	**Project Number**	: 20-277423.1
Instrument ID	: NIC1		

	Initial Calibration Blank		Continuing Calibration Blank(s)						Preparation Blank	
Lab ID :			R1315479-10		R1315479-12		R1315479-14			
Date Analyzed :			05/21/20 21:05		05/21/20 21:44		05/21/20 22:24			
Parameter	mg/l	Q	mg/l	Q	mg/l	Q	mg/l	Q		Q
Mercury			0.000326	U	0.000326	U	0.000326	U		

Form 3
Blanks

Client	: Partner Engineering & Science, Inc.	**Lab Number**	: L2020571
Project Name	: WALL BOE	**Project Number**	: 20-277423.1
Instrument ID	: NIC1		

	Initial Calibration Blank		Continuing Calibration Blank(s)						Preparation Blank	
Lab ID :			R1315479-16		R1315479-18		R1315479-20			
Date Analyzed :			05/21/20 23:03		05/21/20 23:43		05/22/20 00:23			
Parameter	mg/l	Q	mg/l	Q	mg/l	Q	mg/l	Q		Q
Mercury			0.000326	U	0.000326	U	0.000326	U		

Form 3
Blanks

Client	: Partner Engineering & Science, Inc.	**Lab Number**	: L2020571
Project Name	: WALL BOE	**Project Number**	: 20-277423.1
Instrument ID	: NIC1		

	Initial Calibration Blank		Continuing Calibration Blank(s)						Preparation Blank	
Lab ID :			R1315479-22		R1315479-24		R1315479-26			
Date Analyzed :			05/22/20 01:09		05/22/20 01:48		05/22/20 02:05			
Parameter	mg/l	Q	mg/l	Q	mg/l	Q	mg/l	Q		Q
Mercury			0.000326	U	0.000326	U	0.000326	U		

Calibration Summary

Form 2A
Initial and Continuing Calibration Verification

Client	: Partner Engineering & Science, Inc.	**Lab Number**	: L2020571
Project Name	: WALL BOE	**Project Number**	: 20-277423.1
Instrument ID	: NIC1	**Units**	: mg/l

		Initial Calibration			Continuing Calibration(s)						
Lab ID	:	R1315479-1			R1315479-3			R1315479-5		R1315479-7	
Date Analyzed	:	05/21/20 18:44			05/21/20 18:55			05/21/20 19:39		05/21/20 20:22	
Parameter		**True**	**Found**	**%R**	**True**	**Found**	**%R**	**Found**	**%R**	**Found**	**%R**
Mercury		0.00300	0.0032	106	0.0100	0.0101	101	0.00990	99	0.0100	100

Acceptance Criteria:

ICV:	95-105%	(Methods 200.7, 245.1)
	90-110%	(Methods 200.8, 6010, 6020, 7470, 7471, 7474)
	85-115%	(Method 1631)
CCV:	90-110%	(Methods 200.7, 245.1, 6010, 6020, 7474)
	85-115%	(Methods 200.8, 1631)
	80-120%	(Methods 7470, 7471)

Form 2A
Initial and Continuing Calibration Verification

Client	: Partner Engineering & Science, Inc.	**Lab Number**	: L2020571
Project Name	: WALL BOE	**Project Number**	: 20-277423.1
Instrument ID	: NIC1	**Units**	: mg/l

	Initial Calibration			Continuing Calibration(s)						
Lab ID :				R1315479-9			R1315479-11		R1315479-13	
Date Analyzed :				05/21/20 21:01			05/21/20 21:41		05/21/20 22:20	
Parameter	**True**	**Found**	**%R**	**True**	**Found**	**%R**	**Found**	**%R**	**Found**	**%R**
Mercury				0.0100	0.00990	99	0.00990	99	0.00990	99

Acceptance Criteria:

ICV:	**95-105%**	**(Methods 200.7, 245.1)**
	90-110%	**(Methods 200.8, 6010, 6020, 7470, 7471, 7474)**
	85-115%	**(Method 1631)**
CCV:	**90-110%**	**(Methods 200.7, 245.1, 6010, 6020, 7474)**
	85-115%	**(Methods 200.8, 1631)**
	80-120%	**(Methods 7470, 7471)**

Form 2A
Initial and Continuing Calibration Verification

Client	: Partner Engineering & Science, Inc.	**Lab Number**	: L2020571
Project Name	: WALL BOE	**Project Number**	: 20-277423.1
Instrument ID	: NIC1	**Units**	: mg/l

	Initial Calibration			Continuing Calibration(s)						
Lab ID :				R1315479-15			R1315479-17		R1315479-19	
Date Analyzed :				05/21/20 23:00			05/21/20 23:40		05/22/20 00:19	
Parameter	**True**	**Found**	**%R**	**True**	**Found**	**%R**	**Found**	**%R**	**Found**	**%R**
Mercury				0.0100	0.00990	99	0.00990	99	0.0100	100

Acceptance Criteria:

ICV:	95-105%	(Methods 200.7, 245.1)
	90-110%	(Methods 200.8, 6010, 6020, 7470, 7471, 7474)
	85-115%	(Method 1631)
CCV:	90-110%	(Methods 200.7, 245.1, 6010, 6020, 7474)
	85-115%	(Methods 200.8, 1631)
	80-120%	(Methods 7470, 7471)

Form 2A
Initial and Continuing Calibration Verification

Client	: Partner Engineering & Science, Inc.	**Lab Number**	: L2020571
Project Name	: WALL BOE	**Project Number**	: 20-277423.1
Instrument ID	: NIC1	**Units**	: mg/l

	Initial Calibration			Continuing Calibration(s)						
Lab ID :				R1315479-21			R1315479-23		R1315479-25	
Date Analyzed :				05/22/20 01:06			05/22/20 01:45		05/22/20 02:02	
Parameter	**True**	**Found**	**%R**	**True**	**Found**	**%R**	**Found**	**%R**	**Found**	**%R**
Mercury				0.0100	0.00990	99	0.0100	100	0.0100	100

Acceptance Criteria:

ICV:	**95-105%**	**(Methods 200.7, 245.1)**
	90-110%	**(Methods 200.8, 6010, 6020, 7470, 7471, 7474)**
	85-115%	**(Method 1631)**
CCV:	**90-110%**	**(Methods 200.7, 245.1, 6010, 6020, 7474)**
	85-115%	**(Methods 200.8, 1631)**
	80-120%	**(Methods 7470, 7471)**

LCS Sample Results Summary

Form 7
Laboratory Control Sample

Client	: Partner Engineering & Science, Inc.	**Lab Number**	: L2020571
Project Name	: WALL BOE	**Project Number**	: 20-277423.1
Client Sample ID	: NA	**Matrix**	: SOIL
Lab Sample ID	: WG1373197-2	**LCS Analysis Date**	: 05/21/20 19:05
Dup Sample ID	:	**LCSD Analysis Date**	:

	Laboratory Control Sample			Laboratory Control Duplicate					
Parameter	**True (mg/kg)**	**Found (mg/kg)**	**%R**	**True (mg/kg)**	**Found (mg/kg)**	**%R**	**RPD**	**Recovery Limits**	**RPD Limit**
Mercury, Total	**7.61**	**6.62**	**87.**					**60-141**	**20**

Run Logs

Form 13
Analysis Run Log

Client	: Partner Engineering & Science, Inc.	**Lab Number**	: L2020571
Project Name	: WALL BOE	**Project Number**	: 20-277423.1
Instrument ID	: NIC1	**Analysis Method**	: 1,7471B
Start Date	: 05/21/20 18:44	**End Date**	: 05/22/20 02:05

Sample Number	Dilution Factor	Analysis Time	Mercury, Total
R1315479-1 ICV	1	18:44:29	X
R1315479-2 ICB	1	18:49:18	X
R1315479-3 CCV	1	18:55:54	X
R1315479-4 CCB	1	18:59:12	X
WG1373197-1 BLANK	1	19:02:31	X
WG1373197-2 LCS	2	19:05:49	X
R1315479-5 CCV	1	19:39:46	X
R1315479-6 CCB	1	19:43:04	X
L2020571-03	1	19:55:54	X
L2020571-04	1	19:59:12	X
L2020571-05	1	20:02:30	X
L2020571-06	1	20:05:48	X
L2020571-07	1	20:09:06	X
R1315479-7 CCV	1	20:22:18	X
R1315479-8 CCB	1	20:25:35	X
R1315479-9 CCV	1	21:01:54	X
R1315479-10 CCB	1	21:05:12	X
R1315479-11 CCV	1	21:41:27	X
R1315479-12 CCB	1	21:44:44	X
R1315479-13 CCV	1	22:20:56	X
R1315479-14 CCB	1	22:24:14	X
R1315479-15 CCV	1	23:00:31	X
R1315479-16 CCB	1	23:03:49	X
R1315479-17 CCV	1	23:40:12	X
R1315479-18 CCB	1	23:43:29	X
R1315479-19 CCV	1	00:19:48	X
R1315479-20 CCB	1	00:23:05	X

Form 13
Analysis Run Log

Client	: Partner Engineering & Science, Inc.	**Lab Number**	: L2020571
Project Name	: WALL BOE	**Project Number**	: 20-277423.1
Instrument ID	: NIC1	**Analysis Method**	: 1,7471B
Start Date	: 05/21/20 18:44	**End Date**	: 05/22/20 02:05

Sample Number	Dilution Factor	Analysis Time	Mercury, Total
R1315479-21 CCV	1	01:06:04	X
R1315479-22 CCB	1	01:09:22	X
R1315479-23 CCV	1	01:45:38	X
R1315479-24 CCB	1	01:48:56	X
L2020571-01	2	01:55:30	X
L2020571-02	20	01:58:48	X
R1315479-25 CCV	1	02:02:05	X
R1315479-26 CCB	1	02:05:23	X

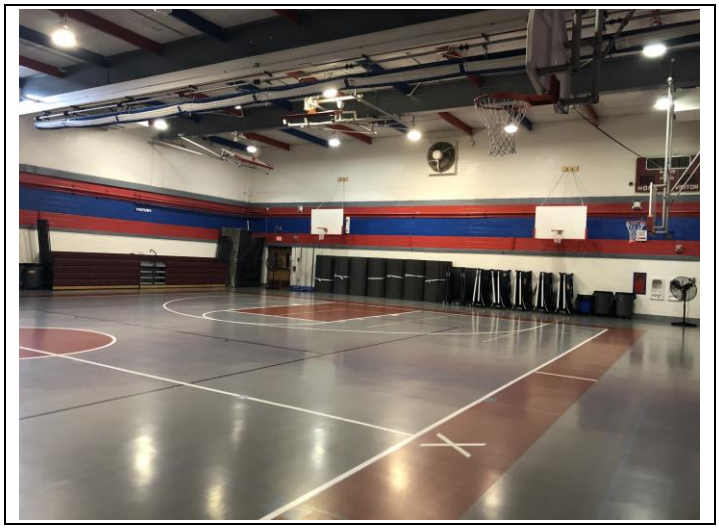
Digestion Logs
Mercury

Form 12
Preparation Log

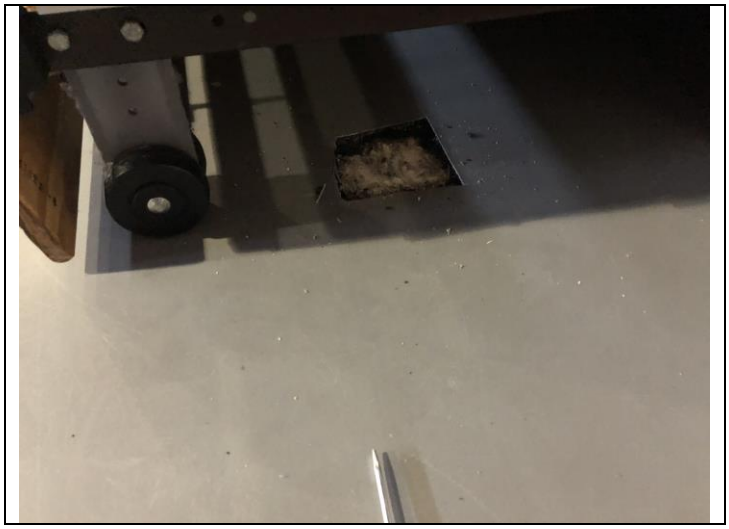
Client	: Partner Engineering & Science, Inc.	**Lab Number**	: L2020571
Project Name	: WALL BOE	**Project Number**	: 20-277423.1
Matrix	: SOLID	**Prep Method**	: EPA 7471B

Sample Number	Preparation Date	Weight (gram)	Volume (mL)
L2020571-01	05/21/20 16:50	0.34	-
L2020571-02	05/21/20 16:50	0.34	-
L2020571-03	05/21/20 16:50	0.40	-
L2020571-04	05/21/20 16:50	0.34	-
L2020571-05	05/21/20 16:50	0.30	-
L2020571-06	05/21/20 16:50	0.30	-
L2020571-07	05/21/20 16:50	0.38	-
WG1373197-1	05/21/20 16:50	0.30	-
WG1373197-2	05/21/20 16:50	0.16	-

APPENDIX B

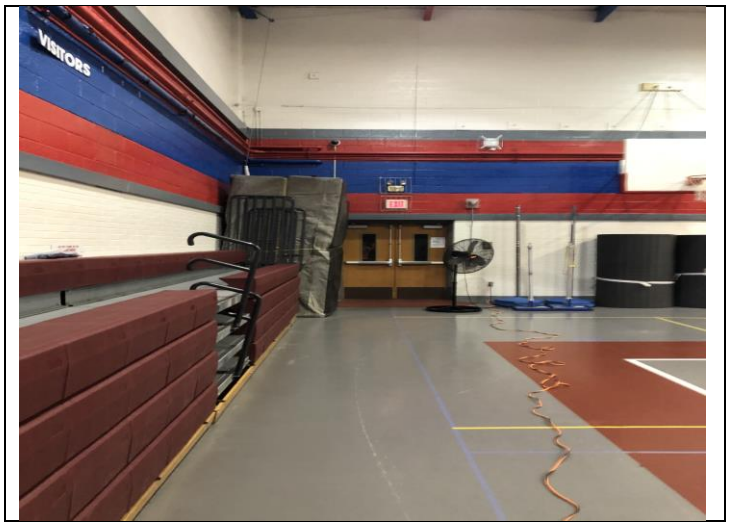


1. View of Wall High School – South Gym



2. View of HS518-1 sample area.

3. View of HS518-2 sample area

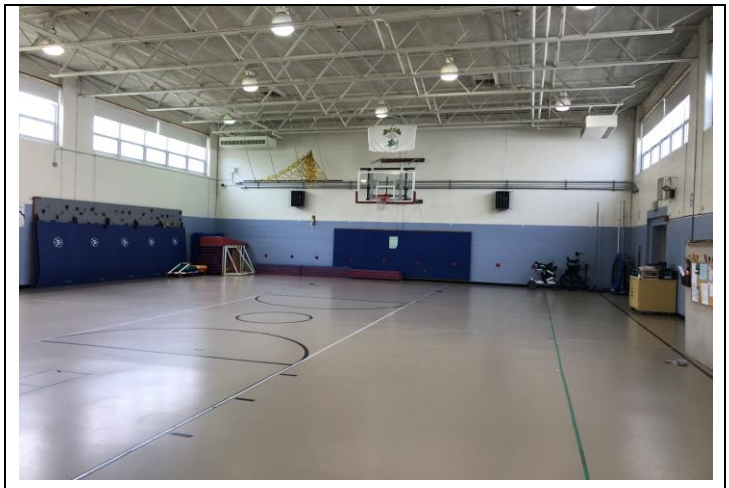


4. View of HS518-3 sample area

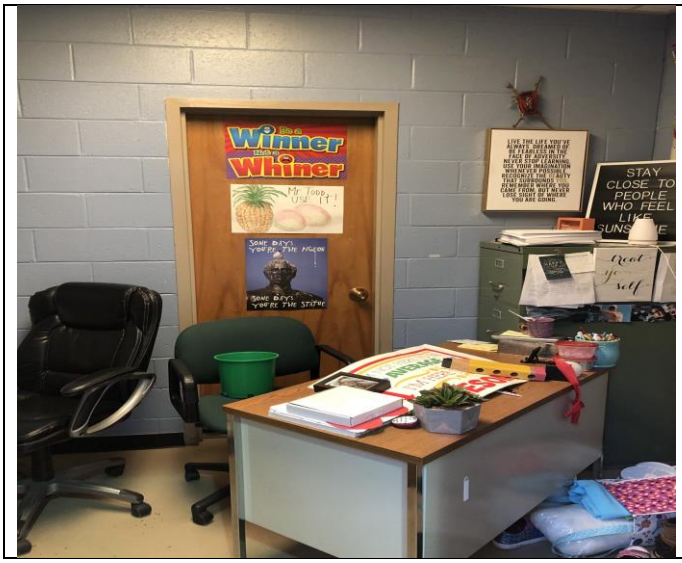
5. View of West Belmar School Gym

5. View of WB518-1 sample area.

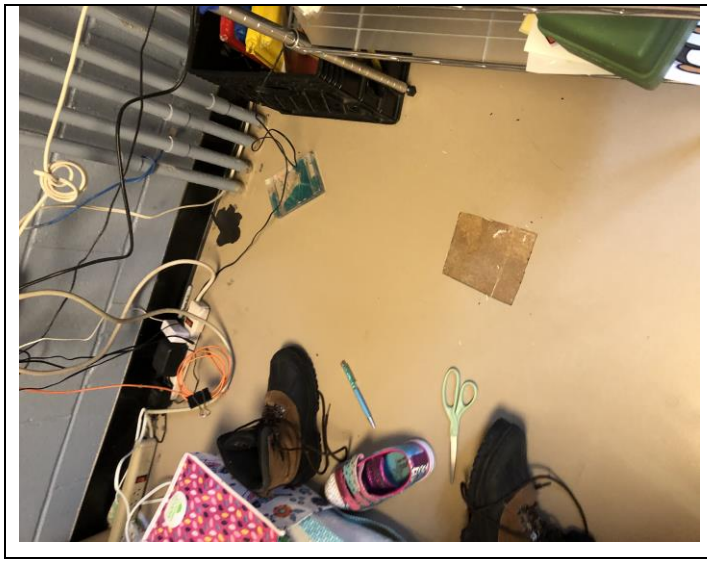
6. View of WB518-2 sample area.



7. View of Allenwood School gym.



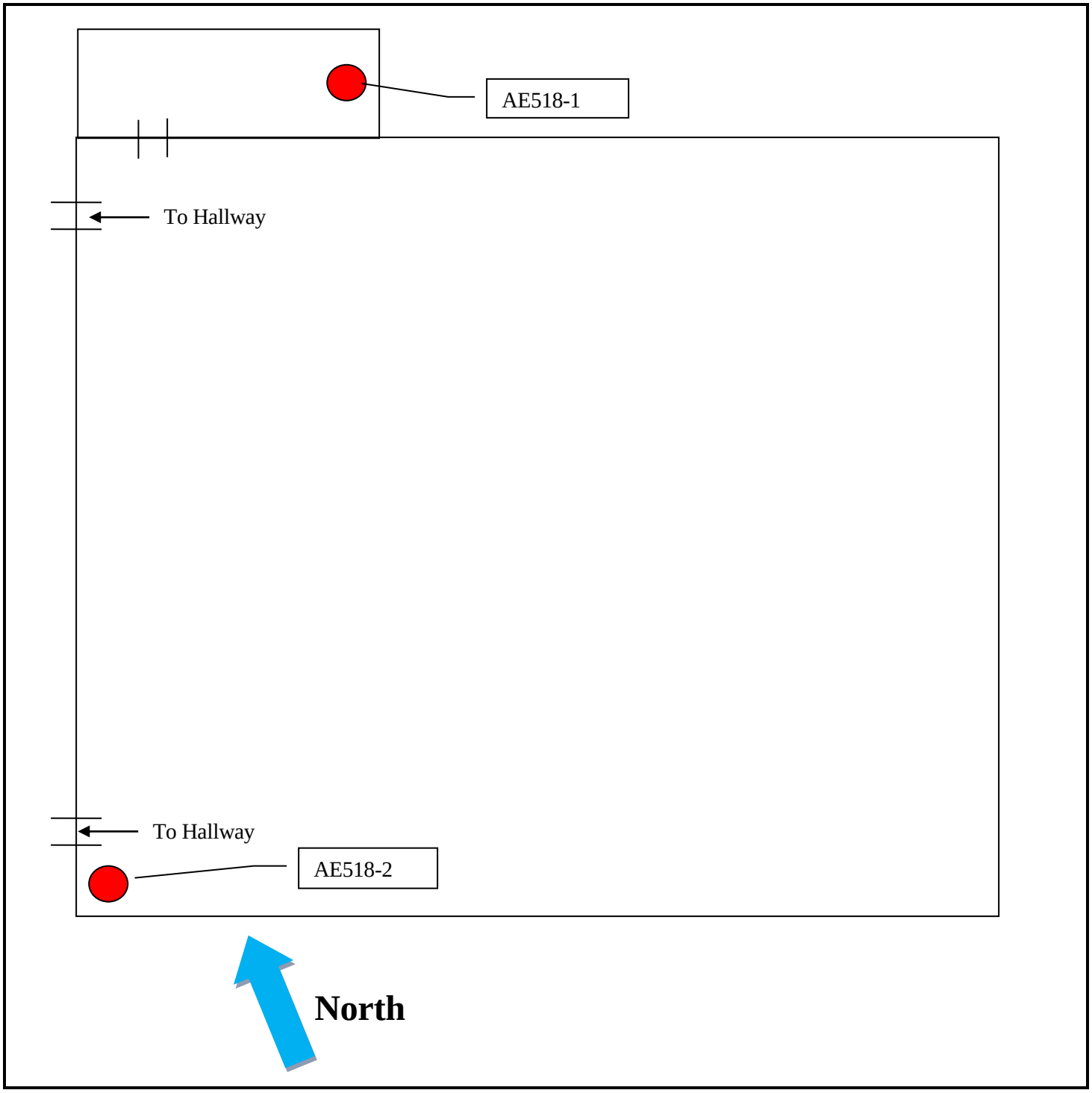
8. View of gym office.

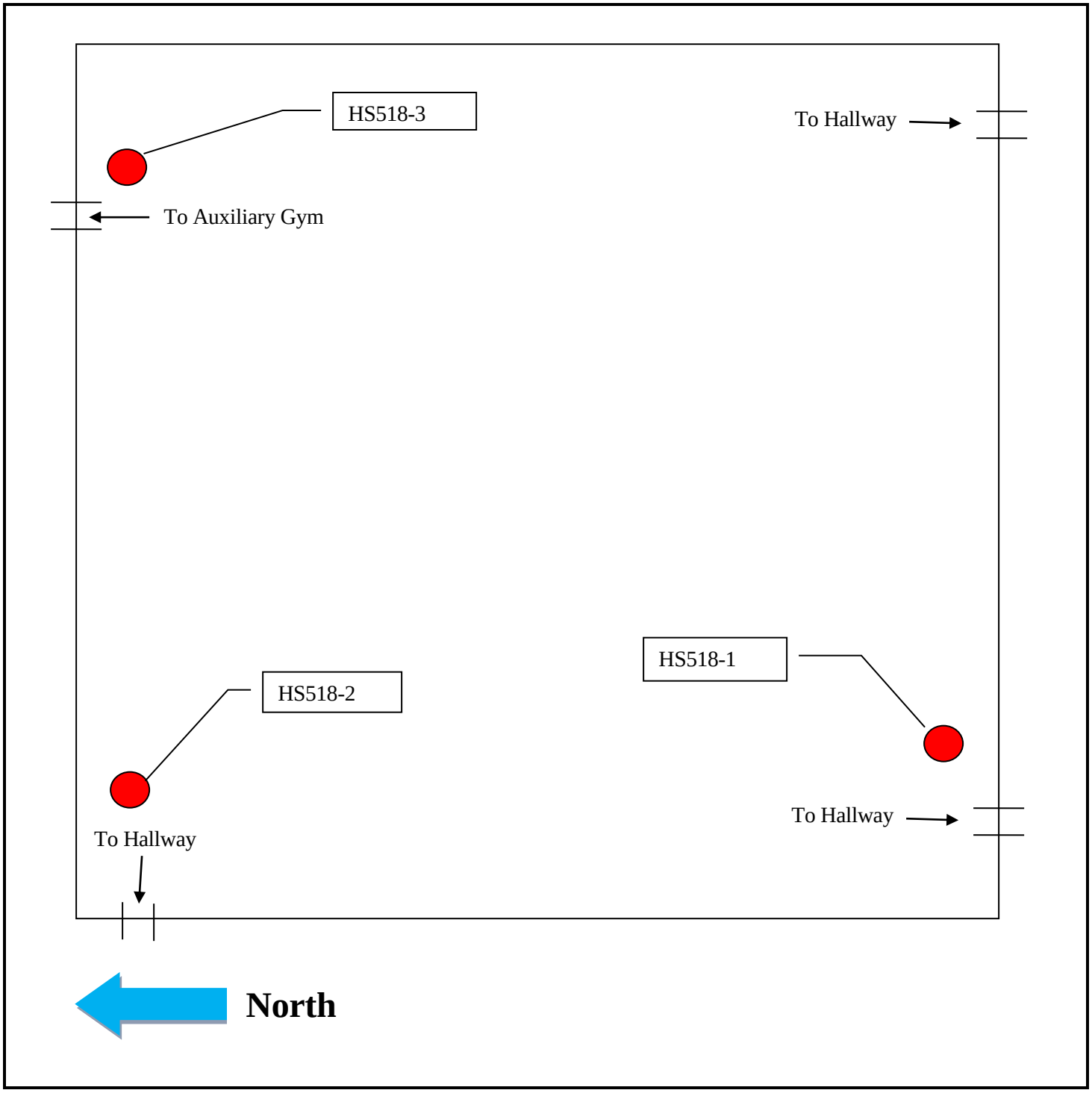


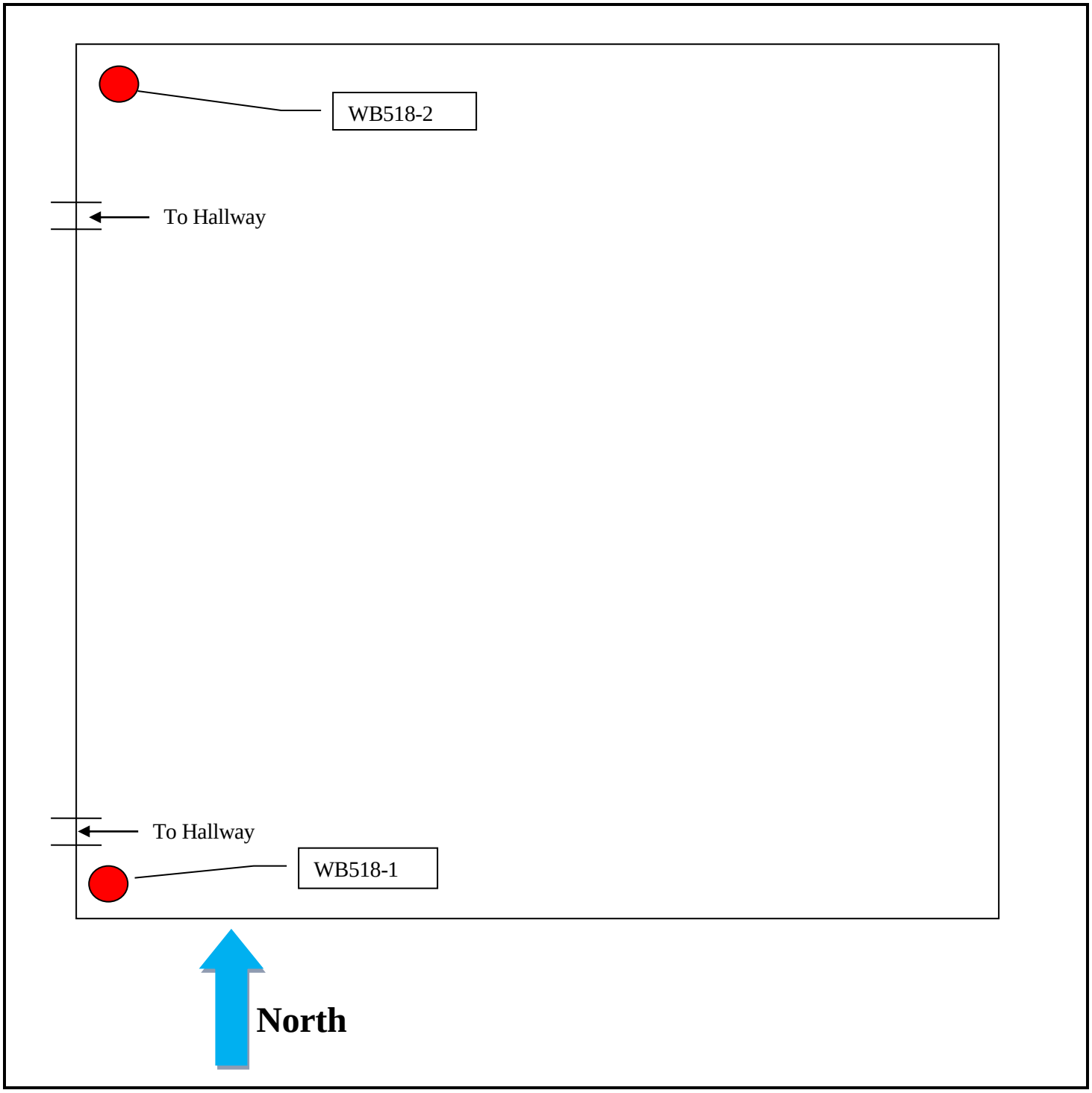
9. View of AE518-1 sample area

10. View of AE518-2 sample area.

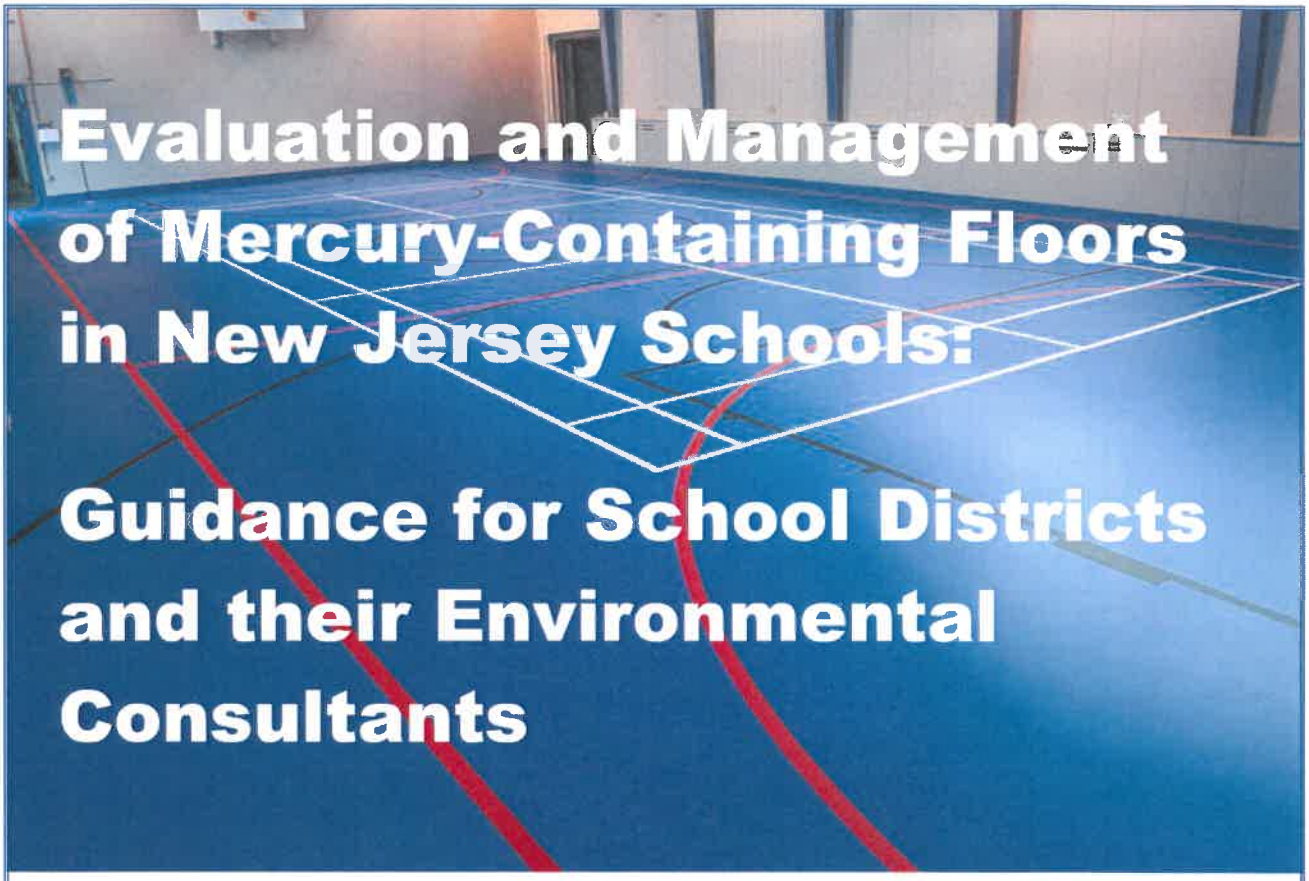
APPENDIX C


AE518-1
To Hallway
To Hallway
AE518-2
North


HS518-3
To Hallway
To Auxiliary Gym
HS518-1
HS518-2
To Hallway
To Hallway
North


WB518-2
To Hallway
To Hallway
WB518-1
North

APPENDIX D



Evaluation and Management of Mercury-Containing Floors in New Jersey Schools:

Guidance for School Districts and their Environmental Consultants

February 6, 2020

Health Consultation
prepared by:

New Jersey Department of Health
Environmental and Occupational Health Surveillance Program

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Purpose

This guidance document provides a systematic approach for school districts and their environmental consultants to evaluate whether installed mercury-containing flooring systems emit mercury vapors in excess of New Jersey Department of Health's (NJDOH) recommended maximum contaminant level of 0.8 micrograms per cubic meter ($\mu g/m^3$) of air.

Introduction

In the 1960s, a number of companies began manufacturing and installing a thin layer of synthetic, polyurethane flooring on top of concrete sub-floors, to provide a resilient and rubberlike surface (ATSDR 2010; ATSDR 2006a; ATSDR 2006b). Typically, liquid polyurethane was poured directly over concrete sub-floors, and in some cases over a rubberized shock-absorbing cushion material. Certain formulations of polyurethane incorporated mercury catalysts, such as phenylmercuric acetate (PMA), to produce a solid, seamless rubber-like floor. Depending on the required thickness of the floor, multiple pours of polyurethane were often employed. The concentration of mercury in such polyurethane flooring systems are reported to contain between 0.1 and 0.2 percent total mercury (Bush 2011; ATSDR 2006a; Reiner 2005).

Mercury-containing polyurethane floors were widely installed in school gymnasiums across the United States until being reportedly discontinued amid concerns over their emissions of elemental mercury vapor (NEWMOA 2010). It is to be noted that depending on the type and brand of polyurethane flooring, these floors may have been installed even as late as in 2005 or 2006 (Washington Township, New Jersey 2019; Bush 2011).

The following list of manufacturers are consistently referenced as having produced polyurethane products known to contain PMA in their formulation (Garrison, 2019). It is important to recognize this list is not an all-inclusive list. It is believed other manufacturers may also have included mercury catalysts in their polyurethane flooring systems.

- 3M under the name of Tartan® floors and Tartan® track
- American Biltrite Rubber Co. Inc.
- Amtico Rubber Flooring
- Athletic Polymer Systems (APS)
- Chemothane
- Crossfields Products (DexOTex)
- Mondo Rubber
- Pitzer Inc.
- Pulastic Systems
- Robbins Sport Surfaces - Chemturf
- Selby Battersby & Company Surfacing Systems

- Sportan Surfaces, Inc.
- Whittaker Synthetic Surfaces

Studies have shown that some of these flooring systems emit mercury vapor into the indoor air, leading to a concern about mercury exposures in schools. It is not known how many of these floors currently exist, whether they are still being installed, or what schools have them (ATSDR 2004; ATSDR 2006a; ATSDR 2006b; ATSDR 2010; Bush 2011; Garrison 2019).

This document provides guidance to school districts investigating the potential mercury vapors being emitted from these floors.

Steps for Assessment of Flooring

1. School districts should conduct a visual inspection to determine if poured-polyurethane floors (soft material in one contiguous piece that is clearly not wood or tile) have been installed in the school. If this type of flooring is identified in the school, a licensed indoor environmental consultant should be hired. A list of these consultants can be found on the Department's website at: https://www.nj.gov/health/ceohs/documents/childcare/conslt.pdf

2. Check if the manufacturer is noted in the list above and/or review the floor's Safety Data Sheet (SDS) for PMA. If the presence of PMA is confirmed, then skip step 3 below (as bulk sampling is not necessary to confirm the presence of mercury). It is not possible to rule out the potential presence of mercury based on the list above as other flooring system manufacturers and installers may have incorporated PMA in their polyurethane formulations. Further, the SDS may not be conclusive as the company might list the PMA ingredient as proprietary information.

3. If the record review was inconclusive, the district and its consultant may choose to collect a bulk sample of the flooring material to test for the presence of mercury. A bulk sampling plan overview is outlined below for the consultant to follow. The consultant will determine the timing between the bulk sampling and any indoor air sampling as these should not occur concurrently. The bulk sampling test may be informative in confirming there is no mercury present. The bulk sample must be analyzed by an American Industrial Hygiene Association (AIHA) accredited laboratory available at: https://www.aihaaccreditedlabs.org/

4. If the record review or bulk sampling confirmed the presence of mercury in the flooring, an appropriate air testing and monitoring program is warranted. A sampling plan overview is outlined below for your consultant to follow.

Sampling Plan Overview

A sampling plan that includes specific sampling and analytical methods is critical for evaluating mercury levels contained in synthetic flooring and the mercury levels in the indoor air. The district should hire and work with a licensed environmental consultant to understand the sampling plan before the plan is implemented. The consultant must provide sampling protocols, procedures, and an understanding of how to interpret the results to the district. The details for these procedures are provided in the sections below.

Bulk Sampling

The purpose of the bulk sampling is to determine if mercury is present in the flooring material and if indoor air monitoring is necessary. A sampling plan must be developed to ensure that the bulk samples are representative of the floor area(s) being evaluated. As noted above, the consultant will determine the timing between the bulk sampling and any indoor air sampling as these should not occur concurrently. The plan must include a diagram of the floor(s) showing the sampling locations and the laboratory results of the bulk samples. The environmental consultant should identify the rooms that contain the suspect flooring, coordinate the collection of bulk samples with school facilities staff, and execute the bulk sampling plan. The environmental consultant must ensure that all floor sampling locations are sealed and repaired after the bulk samples are collected.

Sampling Methods and Procedures

1. An appropriate size sample of the flooring material needs to be collected for analysis. The thickness of most poured polyurethane floors typically ranges from ¼-inch to 1-inch. Bulk samples of rubberized floor must represent the entire thickness/depth of the floor material. Sampling of only the surface or partial thickness of the floor must be avoided. Coring tools are commonly used to collect the bulk sample of the floor material. The environmental consultant must provide information on the bulk sample collection tools as well as the procedure to collect the sample from the entire thickness of the floor.

2. The recommended number of samples is: one floor sample from rooms that are less than 1,000 square feet, two samples from rooms 1,000 to 5,000 square feet, and three samples from rooms greater than 5,000 square feet. The sample locations should be selected, to the extent possible, in areas where the sample extraction is less likely to present a visual blemish (such as in room corners, in closets, behind doors, etc.)

Bulk samples of floor material must be analyzed using USEPA Method 7471B to determine the mercury content. An accredited laboratory should be contacted to ensure the proper amount of floor material is being collected. Typically, laboratories require 10 grams of floor material to analyze for mercury content.

If the floor contains mercury at any concentration, the NJDOH recommends sampling of the indoor air to evaluate the mercury vapor levels.

Indoor Air Sampling

The primary route of exposure to mercury vapor is through inhalation. Therefore, it is important to conduct air sampling to provide data which characterizes the mercury vapor levels in the indoor air.

General Requirements

- An indoor air sampling plan must be developed before any samples are collected. The sampling plan should ensure that air samples are taken from several locations to be representative of the floor area or room being evaluated. Samples should be collected at the breathing zone level, which is typically between three to five feet above the floor. Your consultant should include procedures for using a direct read instrument, the NIOSH 6009 method or both in the plan. See below for general sampling requirements using these methods. For all sampling plans, a diagram of the floor area or room showing the locations of the air samples must be developed. Sampling adjacent hallways and rooms should be included in the sampling plan. Ambient readings should be collected outside the facility to establish background levels.

Airborne mercury levels are affected by the operation of the Heating, Ventilation and Air Conditioning (HVAC) system. Given this relationship, the indoor air samples should be collected under typical HVAC operational conditions. Sampling under these conditions will represent the typical ventilation and temperature conditions under which the building is being maintained and occupied. The room temperature and typical operational settings of the HVAC system should be documented prior to collecting any air samples.

Field notes should include a visual inspection of the condition of the floor at locations where samples are collected, specifically noting if the floor surface is compromised in any manner.

Sampling Methods and Procedures

The following two widely used sampling and analytical methods are available for quantifying mercury levels in the indoor air.

1. Direct Reading Instruments:

- The Lumex RA-915M Mercury Vapor Analyzer (OhioLumex Co., Inc.,) or the Jerome J505 (AMETEK Arizona Instrument) can be used to measure mercury vapor concentrations in air. These direct read instruments are portable mercury

vapor analyzers that have very little cross-sensitivity to chemicals other than elemental mercury. These instruments have low detection limits (ranging from 0.002 micrograms per cubic meter ($\mu g/m^3$) to 0.05 $\mu g/m^3$) and can measure mercury vapor levels under a variety of sample collection protocols.

Sample Collection Procedures

- Ensure that the instrument has been properly calibrated according to the manufacture's recommended procedures. Calibration records must be retained to document that the instrument is functioning correctly.
- Temperature, humidity, and air pressure measurements must be collected during the sampling events.
- Direct read measurements should be taken in a predetermined pattern throughout the gym/room where the flooring material is located.
- Direct reading measurements should be taken at various heights above the floor.
- Readings collected at locations where the floor surface is compromised should be noted.

2. Industrial Hygiene Sampling:

- NIOSH Method 6009 - Analysis of Mercury in Air, is a common method for collecting airborne mercury vapors for laboratory analysis. Using this method, samples may be collected over customized periods of time to represent typical occupied conditions. The sample collection method includes a solid sorbent tube (Hopcalite sample collection media) which is connected to a properly calibrated sampling pump. Sampling pumps must be calibrated using a recognized primary standard to document the sampling flowrate. The NIOSH 6009 method should be consulted for the sample collection flowrates and detection limits.

Sample Collection Procedure

- To be representative of the gym/room, three to five samples should be collected. The number of samples within the gym/room may vary depending on the size of the room being evaluated. When determining the number of samples to be collected, the consultant should ensure that there are a sufficient number of samples to represent the gym/room and adjacent areas being evaluated.
- Temperature, humidity, and air pressure measurements must be collected during the sampling events.
- Samples should be collected at a height between three and five feet above the floor.
- The sampling time should be between six to eight hours to represent a typical day within the gym/room.
- Samples should be collected at a flowrate between 0.20 – 0.25 liters per minute (LPM)
- Collect between 90 and 100 liters of air to ensure that the lowest limit of detection (LOD) for the method is reached.

- Record the sampling information on a chain of custody form for submission to the accredited laboratory.
- Follow the quality control procedures outlined in the method for the submission of blank samples to the laboratory.
- Submit the samples to an accredited laboratory for analysis.

Risk Assessment

The primary exposure to mercury vapor is by inhalation. The NJDOH has adopted Standards for Indoor Environment Certification and for Licensure of Indoor Environmental Consultants (N.J.A.C. 8:50[1]). These regulations provide a risk assessment model that can be used to evaluate indoor air contaminants for school children and staff. This model is very conservative and adjusts for body weight, inhalation rate, and the amount of time spent in school for both children and staff. Based on the toxicological information and this regulated risk assessment model, the NJDOH has issued a guidance maximum contaminant level of 0.8 µg/m^3 for evaluating mercury in flooring. **This level is protective for children as young as three years old and is based on an exposure frequency of 8-hours per day for 180 days (NJDOH 2017).** The NJDOH acknowledges that there are other guidance levels for mercury vapors established by ATSDR, USEPA and other states, but there is no national standard (ATSDR 2004; 2006a; 2006b; 2010; Bush 2011; OEHHA; USEPA). The NJDOH guidance value is based on the exposure scenario in the risk model that is protective of preschool-aged children and a level at which adverse health effects are not likely to occur.

Evaluate and Mitigate Exposures

Based on the air sampling results, school districts may encounter the following scenarios:

Airborne mercury levels lower or equal to 0.8 µg/m^3

- Continue to use the gym/room under the occupied conditions that the samples were collected.
- Quarterly, seasonal sampling is recommended to ensure that the seasonal variability's impact on mercury concentrations is captured. Assessing the seasonal mercury level variation will ensure that the mercury indoor air level is always lower than 0.8 µg/m^3. Mercury vapor levels are related to temperature, so it is important to test during all seasons, especially during the heat of the summer.
- Maintain the room temperature and ventilation system to remain consistent with the operations at the time of sampling.

[1] https://www.nj.gov/health/ceohs/documents/eohap/njac_850_adoption.pdf

- If conditions of the flooring change, i.e., if there are cracks or other signs of deterioration or damage, resampling of mercury vapors in indoor air is necessary.
- Mercury vapor levels can be managed by active ventilation and temperature control of the room.

Airborne mercury levels above 0.8 µg/m³

- Work with the environmental consultant to develop a feasible plan to reduce the mercury vapor levels below 0.8 µg/m³. Mercury vapor levels can be reduced by active ventilation and temperature control of the room.
- Make adjustments to the HVAC system including increasing the ventilation/fresh air intake and/or lowering the temperature in the room. Verify (by retesting) that these adjustments have reduced mercury vapor levels to equal to or less than 0.8 µg/m³.
- If these adjustments are inadequate to maintain the levels to 0.8 µg/m³ or below, reduce the amount of time spent in the room to less than 8 hours per day or do not allow use of the room.
- If ventilation adjustments sufficiently reduce the levels to less than or equal to 0.8 µg/m³, monitor the indoor air at least quarterly to evaluate the mercury levels during other seasons.
- If ventilation adjustments do not sufficiently reduce the levels to less than or equal to 0.8 µg/m³, additional actions including removal of the flooring should be considered. Discussions with the environmental consultant will be needed to determine the appropriate course of action.

In addition, the gym floor should be cleaned using non-abrasive cleaning methods to avoid damaging the floor which could result in an increase in mercury emissions into the air.

Disposal of Floor Materials

If the flooring contains mercury and a decision is made to remove it, a determination needs to be made whether the material would be regulated as a hazardous waste for disposal. Contact the NJDEP's Bureau of Solid and Hazardous Waste[2] for information on the proper disposal of the flooring material. The Bureau of Solid and Hazardous Waste can be reached at (609) 633-1418 or (609) 984-0565.

For general questions, please contact the NJDOH - Consumer, Environmental, & Occupational Health Services at 609-826-4920.

[2] https://www.nj.gov/dep/enforcement/hw.html; https://www.nj.gov/dep/easyaccess/compenf.htm#hazwastecompenf

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Washington Township Public Schools, Gloucester County, New Jersey March 2019. Rubberized Flooring Mercury Investigation – Occupied Air Sampling Report. March 26, 2019.

Technical Resources

Analytical Methods for Mercury

- EPA 7471B Mercury in solid or semisolid waste (manual cold-vapor technique) https://www.epa.gov/sites/production/files/2015-07/documents/epa-7471b.pdf
- EPA TCLP Method 1311 SW-846 Test Method 1311: Toxicity Characteristic Leaching Procedure https://www.epa.gov/sites/production/files/2015-12/documents/1311.pdf
- NIOSH Method 6009 https://www.cdc.gov/niosh/docs/2003-154/pdfs/6009.pdf
- TCLP test https://www.epa.gov/sites/production/files/2015-12/documents/1311.pdf

Sources for Direct Reading Instruments for Mercury

- Lumex of Ohio, https://www.ohiolumex.com/mercury-analyzer-915m
- Arizona Instruments/Jerome, https://www.azic.com/jerome/j505/

REPORT PREPARATION

This health consultation providing guidance for evaluation of mercury in flooring was prepared by the New Jersey Department of Health.

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This publication was made possible by Grant Number NU61TS000288-02-00 from the Agency for Toxic Substances and Disease Registry. Its contents are solely the responsibility of the authors and do not necessarily represent the official views of the Agency for Toxic Substances and Disease Registry, or the Department of Health and Human Services.