Hawaii WIIN 2107 Drinking Water Project
Lead Testing in Schools and Child Care Facilities
Stage 1: Final Report

"*Authorized under the Water Infrastructure Improvements for the Nation (WIIN) Act, the Lead Testing in School and Child Care Program Drinking Water Grant creates a voluntary program to assist with testing for lead in drinking water at schools and child care programs.*"
https://www.epa.gov/dwcapacity/wiin-grant-lead-testing-school-and-child-care-program-drinking-water

Prepared for:
State of Hawaii
Department of Health
Environmental Health Administration
Environmental Management Division
Safe Drinking Water Branch &
Hazard Evaluation and Emergency Response Office

Prepared by:
TruePani Inc.
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I. Executive Summary

The Safe Drinking Water Branch (SDWB) of the Hawai'i State Department of Health (HDOH) safeguards public health by protecting Hawai'i's drinking water sources from contamination and assuring that owners and operators of public water systems provide safe drinking water to the community. This mission is accomplished through the administration of the Safe Drinking Water Program, Underground Injection Control Program (UIC), Groundwater Protection Program (GWPP), and the Drinking Water State Revolving Fund (DWSRF).

On November 14, 2018, the HDOH submitted its Notice of Intent to Participate in the Water Infrastructure Improvements for the Nation (WIIN) Act Grant: Lead Testing in School and Child Care Program Drinking Water, for Federal Fiscal Year (FFY) 2019. The HDOH Hazard Evaluation and Emergency Response Office (HEER) is the lead agency. The WIIN 2107 GRANT TEAM is also comprised of HDOH's Environmental Management Division, Safe Drinking Water Branch (SDWB); State Laboratories Division, Environmental Health Analytical Services Branch (EHASB); and Family Health Services Division, Children with Special Health Needs Branch (CSHNB); as well as the Hawai'i Department of Education (HDOE) and the Hawai'i Department of Human Services (HDHS).

In early 2021, the Hawai'i State Department of Health (HDOH) executed a contract (ASO Log No. 21-117) with TruePani Inc., retaining professional services related to executing a state-wide lead in drinking water sampling program at specified Hawai'i Department of Education (HDOE) public schools and Hawai'i Department of Human Services (HDHS) childcare facilities. A full list of responsibilities was outlined in Solicitation No. SDWB 20-01. TruePani, together with the WIIN 2107 Grant Team, successfully enrolled 106 elementary schools and 189 childcare facilities across six Hawai'i islands into the lead testing program. The project was executed in five phases:

Phase 1: Project Kickoff (Completed: December 2020)
Phase 2: Site Investigation (Completed: April 2021[1])
Phase 3: Sample Collection (Completed: October 2021)
Phase 4: Sample Analysis (Completed: October 2021)
Phase 5: Reporting (Completion: November 2021)

The State provided a list of 310 elementary schools (ES) and childcare facilities (CCF) to be included in the program. Before site investigations were completed, TruePani determined that 15 of the facilities were exempt from the program due to permanent closure, previous lead in drinking water testing, or age of the building. Site investigations were conducted at the remaining 295 schools and childcare facilities to complete an inventory of the number, location, and type of drinking water sources eligible for testing. These facilities were loaded into the cloud-based database system and reporting environment. After the completion of the site investigations, an additional 69 facilities were identified as having no sources to be included in the testing phase as they either provided only bottled water or utilized a point-of-use filter that was attached to the fixture. Two childcare facilities closed permanently before samples could be collected and one childcare facility did not allow TruePani personnel to return to collect samples due to medical issues related to COVID-19. In total, 223 facilities (106 elementary schools and 117 childcares) were sampled as part of Phase 3: Sample Collection.

Between the months of May 2021 and October 2021, TruePani collected 6,210 250mL first-draw samples from the 223 facilities located on the islands of Oahu, Hawaii, Maui, Kauai, Molokai, and Lanai. All samples were analyzed by the Hawai'i Division of State Laboratories via EPA method 200.8.

A total of 295 of the 6,210 first-draw samples (4.8%) exceeded the project action level of 15 ppb. 93 of the 223 facilities (42%) had at least one drinking water source with test results above the project action level. When possible, drinking water sources where the initial first-draw result exceeded 15 ppb were re-sampled during a follow-up visit. Both a first draw and 30-second flush sample were collected during follow up visits. Of the 93 facilities that required follow-up sampling, 89 were elementary schools and 4 were childcare facilities.

In total, 282 of the 295 sources that exceeded the project action level were sampled during follow-up sampling, totaling 564 additional samples collected. All sampling was completed following TruePani's Sampling and Analysis Plan, in accordance with the EPA 3T's methodology, which was approved by SDWB on April 30, 2021.

Immediate corrective actions, such as blocking off access to the source and the usage of filters, was communicated to each facility with one or more water sources with initial sample results above 15 ppb. During follow-up sampling, TruePani ensured that sources with exceedances had the appropriate signage. Long term corrective actions for impacted water sources will be determined by the individual school, childcare facility, or HDOE.

Table 1: Facility Overview

Number of Facilities Provided by State	**310**
Number of Exempt Facilities	***87***

[1] Except for six postponed site investigations that were completed during Phase 3: Sample Collection.

Zero-Source Facilities	69
Closed Facilities	11
Drop-Out Facilities	1
Newly Built Facilities	1
Previously Tested Facilities	5
Number of Sampled Facilities	***223***
Elementary Schools (ES)	106
Childcare Facilities (CCF)	117

II. Project Background

Lead is a toxic metal that can be harmful to human health when ingested. Young children are particularly sensitive to the effects of lead as their bodies are still undergoing development. Lead can get into drinking water if it is present in the source water or by interaction between source water and plumbing materials containing lead (through corrosion). Common sources of lead in drinking water include solder, fluxes, pipes and pipe fittings, fixtures, and sediments.

As authorized by the Water Infrastructure Improvements of the Nation (WIIN) Act, EPA has made funds available through the Lead Testing in School and Child Care Program Drinking Water grant to assist states voluntary testing for lead contamination in drinking water. TruePani's sampling method is in accordance with the EPA 3T's for Reducing Lead in Drinking Water in Schools and Child Care Facilities, as required by the EPA for participation in the WIIN assistance.

Aligning with the objective that young children spend much of their time at school, the Hawai'i Department of Health (HDOH) participated in the Water Infrastructure Improvements for the Nation Act (WIIN) to test for lead in drinking water at schools and child care facilities across the state of Hawai'i. These schools and child care facilities were chosen due to their eligibility through the WIIN 2107 Lead Testing in School and Child Care Program Drinking Water grant requirements.

III. Overview of Site Investigation Activities

Site investigations were conducted at 295 facilities (106 schools, 73 residential childcare facilities (RCCFs), and 116 non-residential childcare facilities (NRCCFs)) during Phase 2 of the project to determine the number, location, and type of sources to be tested. All site investigations were completed by April 9, 2021, except for six postponed facilities which were conducted during Phase 3: Sample Collection.

During the site investigation visits, 69 facilities were identified as having no drinking water sources to be tested as they either provided only bottled water or utilized a point-of-use filters attached to fixtures. Two facilities closed permanently before samples could be collected and one facility did not allow TruePani personnel to return to collect samples because of medical concerns related to COVID-19. In total, 223 facilities were included in Phase 3: Sample Collection due to having eligible drinking water sources for testing. A total of 6,527 sample locations across these facilities were identified. An additional 93 sources were identified during first-draw sample collection and represent either newly installed sources or those missed during the site investigation.

Table 2 provides an overview of the 295 facilities included in Phase 2: Site Investigation, organized by total number and type of facility on each island.

Table 2: Summary of Site Investigations by Island

Island	Dates of Site Investigation(s)	ES	RCCF	NRCCF	Total
Hawaii	March 22 – April 9, 2021	22	14	22	**58**
Kauai	March 16 – 19, 2021	6	6	3	**15**

Lanai	March 1, 2021	1	0	0	**1**
Maui	March 3 – 25, 2021	10	18	22	**50**
Molokai	March 2, 2021	3	0	1	**4**
Oahu	March 4 – April 8, 2021	64	35	68	**167**
Total		**106**	**73**	**116**	**295**

At the project onset, TruePani was provided with a list of 310 eligible facilities. 15 facilities were removed from the list due to permanent closure, previous lead in drinking water testing, or build date, for a total of 295 facilities where site investigations were conducted. During site investigations, 71 facilities were determined to be exempt from sampling based on either the lack of eligible drinking water sources or permanent closure of the facility. Only one facility did not want to continue with the project after the Site Investigation. Thus, 223 facilities were sampled during Phase 3: Sample Collection. Table 3 provides an overview of the 87 facilities that were exempted from sampling over the course of the project.

Table 3: Facilities Exempt from Sampling

Reason for Exemption	Number of Facilities
No Eligible Sources	69
Facility Closure	11
Previously Tested	5
New Build	1
Facility Dropout	1
Total Exempt Facilities	**87**

IV. Overview of Sampling Activities

Between May 2021 and October 2021, TruePani facilitated the drinking water testing and analysis of 223 facilities that were identified to have eligible sources for testing. TruePani collected and tested 6,210 250mL first draw samples from drinking water sources across 106 schools and 117 childcare facilities across six islands. First draw sample collection began on May 24, 2021 and was completed on September 22, 2021. Follow-up sampling of sources with lead results at or above 15 ppb began on July 2, 2021, and was completed on October 14, 2021, with first draw and follow-up sampling carried out concurrently during July, August, and September. All sampling was completed following TruePani's Sampling and Analysis Plan, in accordance with the EPA 3T's methodology and approved by SDWB on April 30, 2021. Table 4 below summarizes the number of facilities sampled, sources collected, facilities with exceedance, and overall exceedance rates.

Table 4: Overview of Sampling Activities

	Schools	CCFs	Total
Number of Facilities Sampled	106	117	**223**
Number of Sources Sampled (First Draw)	5888	322	**6210**
Number of First Draw Exceedances (>=15 ppb)	290	5	**295**
Exceedance Rate	4.9%	1.6%	**4.8%**
Number of Facilities with an Exceedance	89	4	**93**
% Facilities with an Exceedance	84%	6%	**42%**
Number of Sources Sampled During Follow-Up Sampling	277	5	**282**
Maximum Result (ppb)	2054	55	**2054**

A. Initial Sampling Results

All first draw sampling results, organized by school, are publicly available and can be found on the project website located at: https://health.hawaii.gov/heer/environmental-health/highlighted-projects/wiin/. TruePani also maintains a cloud-based database where results are hosted. CSV and .xlsx files containing all source location and lab analysis data are stored in the shared project OneDrive folder and will be provided to HDOH on a flash drive.

Of the 6,120 first draw samples collected, 295 resulted in lead concentrations at or above the project action level of 15 ppb (4.8%). Lead concentrations exceeding the project action level of 15 ppb were found at 93 of the 223 facilities tested (41.2%). There were 89 public elementary schools (84.0%) and 4 childcare facilities (6.0%) with at least 1 exceedance above 15 ppb. Elevated lead concentrations were most often found in classroom faucets (65.8% of the total). Table 5 below includes a breakdown of the number of sources tested by each source type, and the number of sources with results at or above 15 ppb during first draw sample collection. Figure 1 breaks down the prevalence of various lead concentrations of initial first-draw samples.

Table 5: Breakdown of Results by Source Type

Source Type	Abbreviation	Number of Sources	Number of Sources with First Draw Results ≥ 15 ppb	Percentage of Sources ≥ 15 ppb
Bathroom Faucet	BF	30	0	-
Classroom Faucet	CF	3998	194	4.8%
Drinking Fountain	DF	1372	80	5.8%

Ice Machine	IM	78	0	-
Kitchen Faucet	KF	323	8	2.5%
Kitchen Pot Filler	KPF	108	8	7.4%
Nurse Sink	NS	89	3	3.4%
Outdoor Faucet	OF	4	1	25.0%
Refrigerator	R	1	0	-
Water Bottle Filler	WBF	31	0	-
Water Cooler	WC	175	1	0.6%
Other	OTHER	1	0	-
TOTAL		**6210**	**295**	**4.8%**

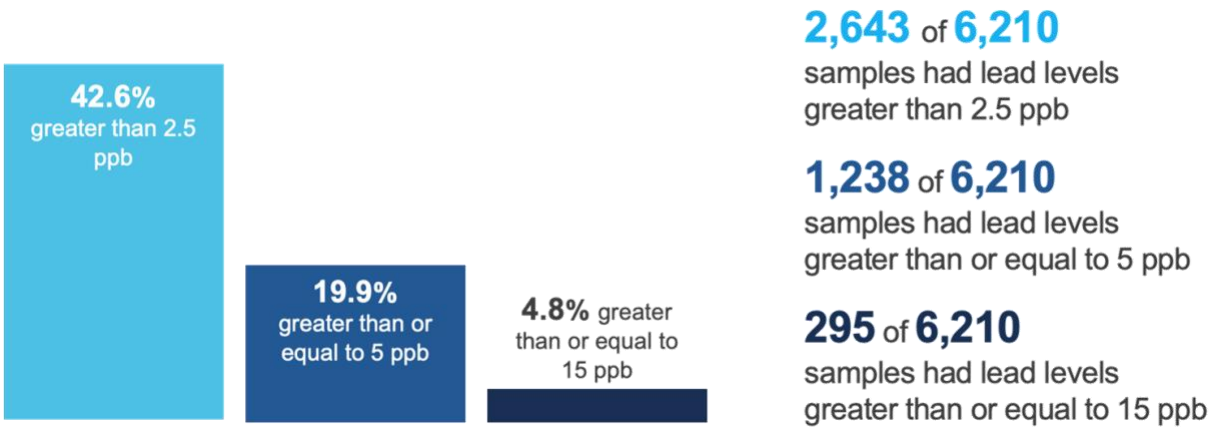

Figure 1: Prevalence of Lead in Initial First Draw Samples

B. Follow-Up Sampling Results

Follow-up sampling was conducted for the sources at or above 15 ppb during initial sampling. Of the 295 sources with an exceedance, 13 were unable to be follow-up sampled as they were taken out of service immediately upon receipt of the initial results. For the remaining 282 sources, the follow-up sampling procedure included the collection of both a first draw and flush sample. The following figures illustrate the prevalence of lead in first draw and flush samples.

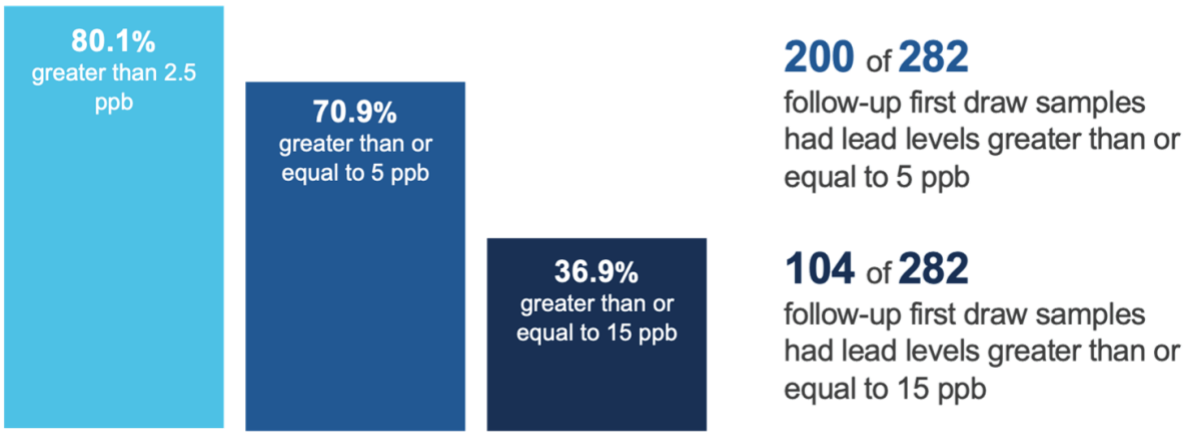

Figure 2: Prevalence of Lead in Follow-Up First Draw Samples

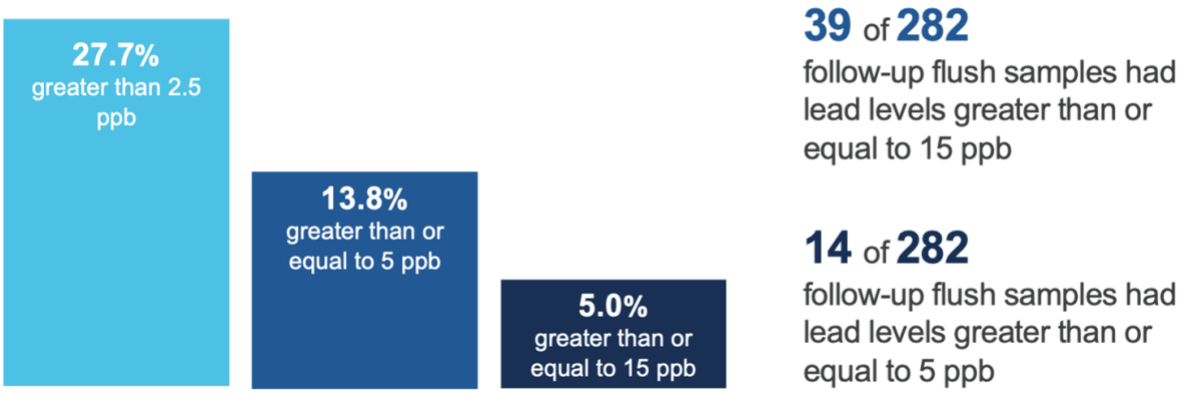

Figure 3: Prevalence of Lead in Follow-Up Flush Samples

Table 6 lists each source with an initial sample result above 15 ppb, the follow-up testing results for each exceedance, and the location of the source within the facility.

Table 6: Initial Sampling Exceedances

Source ID	Source Type	Facility Name	Room Number	Initial Lead Result	Follow-Up First Draw Result	Follow-Up Flush Result
1-9	DF	Kaunakakai Elementary	B108	125 ppb	<2.5 ppb	<2.5 ppb
2-13	DF	Kilohana Elementary	A5	569 ppb	55 ppb	15 ppb
2-20	CF	Kilohana Elementary	P1	22 ppb	<2.5 ppb	<2.5 ppb
6-26	DF	Kapaa Elementary	A23	18 ppb	Unable to Sample	Unable to Sample

Source ID	Source Type	Facility Name	Room Number	Initial Lead Result	Follow-Up First Draw Result	Follow-Up Flush Result
6-44	CF	Kapaa Elementary	P9	74 ppb	5 ppb	<2.5 ppb
7-18	KF	Kilauea Elementary	KIT	22 ppb	<5 ppb	<2.5 ppb
18-97	KPF	Wilcox Elementary	KIT	33 ppb	10 ppb	<5 ppb
18-104	DF	Wilcox Elementary	J11	49 ppb	Unable to Sample	Unable to Sample
18-124	DF	Wilcox Elementary	A25	68 ppb	Unable to Sample	Unable to Sample
18-135	DF	Wilcox Elementary	C40	17 ppb	Unable to Sample	Unable to Sample
19-10	KPF	Eleele Elementary	KIT	49 ppb	<2.5 ppb	<2.5 ppb
22-1	DF	Kekaha Elementary	CAF	20 ppb	12 ppb	<5 ppb
23-5	CF	Lanai High & Elementary	D5	23 ppb	10 ppb	13 ppb
23-27	CF	Lanai High & Elementary	H29	17 ppb	57 ppb	<2.5 ppb
23-40	CF	Lanai High & Elementary	T103B	34 ppb	435 ppb	<5 ppb
23-41	CF	Lanai High & Elementary	T103B	72 ppb	Unable to Sample	Unable to Sample
24-27	CF	Haleiwa Elementary	J5	15 ppb	6 ppb	<2.5 ppb
24-51	CF	Haleiwa Elementary	A1	25 ppb	19 ppb	6 ppb
27-44	CF	Waialua Elementary	D202	20 ppb	<5 ppb	<2.5 ppb
28-2	NS	Helemano Elementary	NURSE	59 ppb	8 ppb	<2.5 ppb
29-27	CF	Iliahi Elementary	ALOUNGE	16 ppb	9 ppb	<2.5 ppb
29-44	CF	Iliahi Elementary	D2	19 ppb	<5 ppb	<2.5 ppb
30-7	CF	Wahiawa Elementary	B1	43 ppb	14 ppb	<2.5 ppb
30-14	CF	Wahiawa Elementary	F2	18 ppb	<5 ppb	<2.5 ppb
30-22	CF	Wahiawa Elementary	P4	22 ppb	17 ppb	<2.5 ppb
30-38	CF	Wahiawa Elementary	C3	15 ppb	<5 ppb	<2.5 ppb
30-46	KF	Wahiawa Elementary	KIT	21 ppb	6 ppb	<2.5 ppb
30-47	KF	Wahiawa Elementary	KIT	15 ppb	<2.5 ppb	<2.5 ppb
34-54	CF	Ka'ala Elementary	TP3	30 ppb	26 ppb	<2.5 ppb

Source ID	Source Type	Facility Name	Room Number	Initial Lead Result	Follow-Up First Draw Result	Follow-Up Flush Result
35-44	CF	Wheeler Elementary	A5	28 ppb	10 ppb	<2.5 ppb
35-54	CF	Wheeler Elementary	A1	19 ppb	<5 ppb	<2.5 ppb
35-55	CF	Wheeler Elementary	A6	17 ppb	13 ppb	<5 ppb
35-57	CF	Wheeler Elementary	A7	27 ppb	12 ppb	<2.5 ppb
35-74	CF	Wheeler Elementary	G102	21 ppb	18 ppb	<2.5 ppb
38-55	CF	Kipapa Elementary	L2	27 ppb	<5 ppb	<2.5 ppb
38-60	CF	Kipapa Elementary	L7	799 ppb	<5 ppb	<2.5 ppb
48-38	CF	Leihoku Elementary	J204	55 ppb	5 ppb	<2.5 ppb
49-34	CF	Makaha Elementary	P05	20 ppb	10 ppb	<2.5 ppb
50-7	CF	Waianae Elementary	A111	28 ppb	22 ppb	<2.5 ppb
50-51	CF	Waianae Elementary	F1	45 ppb	13 ppb	<2.5 ppb
55-22	CF	Maili Elementary	D2	20 ppb	<5 ppb	<2.5 ppb
61-14	CF	Nanakuli Elementary	P7	19 ppb	<2.5 ppb	<2.5 ppb
61-61	CF	Nanakuli Elementary	F102	19 ppb	<5 ppb	<2.5 ppb
61-62	CF	Nanakuli Elementary	F101	20 ppb	<2.5 ppb	<2.5 ppb
62-7	CF	Barbers Point Elementary	C3	141 ppb	<2.5 ppb	<2.5 ppb
62-8	CF	Barbers Point Elementary	C4	101 ppb	<5 ppb	<2.5 ppb
62-9	CF	Barbers Point Elementary	C5	29 ppb	<2.5 ppb	<2.5 ppb
62-10	CF	Barbers Point Elementary	C6	36 ppb	<5 ppb	<2.5 ppb
62-22	CF	Barbers Point Elementary	D18	109 ppb	<2.5 ppb	<2.5 ppb
62-30	CF	Barbers Point Elementary	D13	26 ppb	Unable to Sample	Unable to Sample
62-34	CF	Barbers Point Elementary	F7	16 ppb	20 ppb	<2.5 ppb
62-40	CF	Barbers Point Elementary	F12	120 ppb	25 ppb	<2.5 ppb
62-42	CF	Barbers Point Elementary	G20	17 ppb	Unable to Sample	Unable to Sample
62-53	CF	Barbers Point Elementary	E25	34 ppb	17 ppb	<2.5 ppb

Source ID	Source Type	Facility Name	Room Number	Initial Lead Result	Follow-Up First Draw Result	Follow-Up Flush Result
62-56	CF	Barbers Point Elementary	E28	47 ppb	<2.5 ppb	<2.5 ppb
62-62	CF	Barbers Point Elementary	I39	17 ppb	<5 ppb	<2.5 ppb
62-63	CF	Barbers Point Elementary	I39	34 ppb	9 ppb	<2.5 ppb
62-64	CF	Barbers Point Elementary	I38	16 ppb	7 ppb	<2.5 ppb
62-66	CF	Barbers Point Elementary	I37	17 ppb	<2.5 ppb	<2.5 ppb
62-78	CF	Barbers Point Elementary	I40	23 ppb	7 ppb	<2.5 ppb
62-79	CF	Barbers Point Elementary	I40	63 ppb	25 ppb	<2.5 ppb
62-80	CF	Barbers Point Elementary	I41	19 ppb	6 ppb	<2.5 ppb
65-47	CF	Mauka Lani Elementary	A104	27 ppb	5 ppb	<2.5 ppb
67-10	DF	Ewa Elementary	J102	15 ppb	11 ppb	<2.5 ppb
67-12	CF	Ewa Elementary	JWORKROOM	93 ppb	34 ppb	<2.5 ppb
67-18	CF	Ewa Elementary	JLOUNGE	33 ppb	14 ppb	<2.5 ppb
67-54	DF	Ewa Elementary	I1	22 ppb	9 ppb	<2.5 ppb
73-52	CF	Kaimiloa Elementary	ADMIN	29 ppb	16 ppb	<2.5 ppb
76-52	CF	Honowai Elementary	J2	87 ppb	<5 ppb	<2.5 ppb
76-56	CF	Honowai Elementary	G4	22 ppb	<5 ppb	<2.5 ppb
78-7	DF	Waipahu Elementary	J	18 ppb	6 ppb	<2.5 ppb
78-10	CF	Waipahu Elementary	P23	16 ppb	<2.5 ppb	<2.5 ppb
78-21	DF	Waipahu Elementary	P14	16 ppb	25 ppb	8 ppb
78-38	DF	Waipahu Elementary	DOFFICE	30 ppb	10 ppb	<5 ppb
78-40	DF	Waipahu Elementary	D1	21 ppb	7 ppb	<5 ppb
78-45	DF	Waipahu Elementary	D4	19 ppb	10 ppb	<2.5 ppb
78-48	CF	Waipahu Elementary	D8	24 ppb	<5 ppb	<2.5 ppb
78-51	DF	Waipahu Elementary	D6	97 ppb	14 ppb	16 ppb
78-54	DF	Waipahu Elementary	E7	19 ppb	Unable to Sample	Unable to Sample

Source ID	Source Type	Facility Name	Room Number	Initial Lead Result	Follow-Up First Draw Result	Follow-Up Flush Result
78-58	DF	Waipahu Elementary	E11	41 ppb	119 ppb	16 ppb
78-66	DF	Waipahu Elementary	E3	21 ppb	29 ppb	15 ppb
78-73	DF	Waipahu Elementary	I7	60 ppb	56 ppb	27 ppb
81-14	CF	Kailua Elementary	C31	149 ppb	35 ppb	<2.5 ppb
81-23	CF	Kailua Elementary	JWORKROOM	39 ppb	<2.5 ppb	<2.5 ppb
81-31	CF	Kailua Elementary	I12	16 ppb	<5 ppb	<2.5 ppb
81-32	CF	Kailua Elementary	I13	99 ppb	62 ppb	<2.5 ppb
81-34	CF	Kailua Elementary	I15	68 ppb	26 ppb	8 ppb
81-39	CF	Kailua Elementary	I23	47 ppb	132 ppb	<5 ppb
81-40	CF	Kailua Elementary	I22	16 ppb	<5 ppb	<2.5 ppb
81-41	CF	Kailua Elementary	I21	16 ppb	<2.5 ppb	<2.5 ppb
81-42	CF	Kailua Elementary	I20	23 ppb	<2.5 ppb	<2.5 ppb
88-28	DF	Keolu Elementary	C104	31 ppb	17 ppb	<2.5 ppb
88-30	CF	Keolu Elementary	C103	15 ppb	12 ppb	<5 ppb
88-35	DF	Keolu Elementary	C201	40 ppb	13 ppb	<5 ppb
88-36	CF	Keolu Elementary	C201	17 ppb	16 ppb	<5 ppb
88-37	CF	Keolu Elementary	C202	19 ppb	10 ppb	<2.5 ppb
88-38	CF	Keolu Elementary	C203	16 ppb	7 ppb	<2.5 ppb
88-45	KPF	Keolu Elementary	KIT	68 ppb	<2.5 ppb	<2.5 ppb
89-37	CF	Pope Elementary	A104	434 ppb	18 ppb	<2.5 ppb
89-40	CF	Pope Elementary	A102	24 ppb	9 ppb	<2.5 ppb
95-32	CF	Hauula Elementary	B8	18 ppb	10 ppb	<2.5 ppb
95-34	CF	Hauula Elementary	B8	27 ppb	19 ppb	<2.5 ppb
95-38	CF	Hauula Elementary	C14	15 ppb	<5 ppb	<2.5 ppb
95-43	CF	Hauula Elementary	C13	48 ppb	<2.5 ppb	<2.5 ppb

Source ID	Source Type	Facility Name	Room Number	Initial Lead Result	Follow-Up First Draw Result	Follow-Up Flush Result
95-44	CF	Hauula Elementary	C13	22 ppb	<5 ppb	<2.5 ppb
95-46	CF	Hauula Elementary	C12	22 ppb	7 ppb	<2.5 ppb
98-9	DF	Waiahole Elementary	KIT	22 ppb	<5 ppb	<2.5 ppb
98-10	DF	Waiahole Elementary	CAF	58 ppb	35 ppb	29 ppb
99-10	CF	Heeia Elementary	B106	15 ppb	8 ppb	<2.5 ppb
99-16	CF	Heeia Elementary	B101	30 ppb	7 ppb	<2.5 ppb
100-11	DF	Kahaluu Elementary	D2	23 ppb	13 ppb	8 ppb
100-28	CF	Kahaluu Elementary	B3	17 ppb	17 ppb	<2.5 ppb
100-40	NS	Kahaluu Elementary	NURSE	25 ppb	5 ppb	<2.5 ppb
100-41	KPF	Kahaluu Elementary	KIT	164 ppb	24 ppb	6 ppb
104-6	DF	Kalihi Elementary	B1	19 ppb	20 ppb	<2.5 ppb
104-36	DF	Kalihi Elementary	A13	15 ppb	15 ppb	7 ppb
104-37	DF	Kalihi Elementary	A13	21 ppb	21 ppb	7 ppb
104-45	CF	Kalihi Elementary	A16	18 ppb	20 ppb	<2.5 ppb
104-68	DF	Kalihi Elementary	A19	17 ppb	23 ppb	<2.5 ppb
108-2	CF	Kamaaina Kids Calvary Preschool	A	15 ppb	<5 ppb	<2.5 ppb
111-35	CF	Pu'ohala Elementary	A5	25 ppb	<2.5 ppb	<2.5 ppb
111-42	CF	Pu'ohala Elementary	A7	18 ppb	<2.5 ppb	<2.5 ppb
113-71	CF	August Ahrens Elementary	LOUNGE	32 ppb	59 ppb	<2.5 ppb
113-144	DF	August Ahrens Elementary	Admin	16 ppb	6 ppb	5 ppb
116-3	DF	Pearl City Elementary	C10	20 ppb	7 ppb	6 ppb
125-23	CF	Kalihi Uka Elementary	ALOUNGE	50 ppb	20 ppb	<2.5 ppb

Source ID	Source Type	Facility Name	Room Number	Initial Lead Result	Follow-Up First Draw Result	Follow-Up Flush Result
127-18	CF	Kapalama Elementary	CWORK ROOM	66 ppb	<2.5 ppb	<2.5 ppb
127-78	CF	Kapalama Elementary	1-CWORK ROOM	19 ppb	13 ppb	<2.5 ppb
131-34	CF	Pearl Harbor Elementary	C9	19 ppb	6 ppb	<2.5 ppb
132-12	CF	Salt Lake Elementary	E1A	18 ppb	<5 ppb	<2.5 ppb
132-15	CF	Salt Lake Elementary	E1C	35 ppb	<2.5 ppb	<2.5 ppb
132-48	CF	Salt Lake Elementary	C3	156 ppb	25 ppb	<2.5 ppb
134-14	CF	Fern Elementary	I201	24 ppb	<5 ppb	<2.5 ppb
134-46	DF	Fern Elementary	F7	21 ppb	18 ppb	<5 ppb
135-16	CF	Kalihi Waena Elementary	A5	39 ppb	<2.5 ppb	<2.5 ppb
135-37	CF	Kalihi Waena Elementary	HCOM	15 ppb	7 ppb	<2.5 ppb
136-10	DF	Linapuni Elementary	A7	18 ppb	16 ppb	<2.5 ppb
138-52	KPF	Kaiulani Elementary	KIT	72 ppb	26 ppb	9 ppb
139-57	CF	Kalihi Kai Elementary	K47	70 ppb	<2.5 ppb	<2.5 ppb
141-19	DF	Puuhale Elementary	A103	25 ppb	20 ppb	<2.5 ppb
142-32	DF	Kauluwela Elementary	D9	31 ppb	13 ppb	<5 ppb
143-14	CF	Lanakila Elementary	IWORKR OOM	38 ppb	22 ppb	<2.5 ppb
143-47	DF	Lanakila Elementary	D6	50 ppb	<5 ppb	<2.5 ppb
143-58	KPF	Lanakila Elementary	Kit	49 ppb	57 ppb	<5 ppb
144-18	CF	Likelike Elementary	B10	18 ppb	10 ppb	<2.5 ppb
144-21	CF	Likelike Elementary	B8	34 ppb	6 ppb	<2.5 ppb
144-40	DF	Likelike Elementary	A6	18 ppb	22 ppb	<5 ppb

Source ID	Source Type	Facility Name	Room Number	Initial Lead Result	Follow-Up First Draw Result	Follow-Up Flush Result
144-50	KPF	Likelike Elementary	KIT	20 ppb	8 ppb	<2.5 ppb
149-30	CF	Royal Elementary	A12	17 ppb	12 ppb	<5 ppb
149-32	CF	Royal Elementary	AWORK ROOM	17 ppb	6 ppb	<2.5 ppb
162-18	CF	Lunalilo Elementary	D17	26 ppb	94 ppb	<2.5 ppb
162-20	CF	Lunalilo Elementary	D19	329 ppb	41 ppb	<5 ppb
162-21	CF	Lunalilo Elementary	B1	21 ppb	5 ppb	<2.5 ppb
162-31	CF	Lunalilo Elementary	B6	203 ppb	48 ppb	7 ppb
162-39	DF	Lunalilo Elementary	C5	34 ppb	<5 ppb	<2.5 ppb
166-1	CF	Lehua Elementary	C101	16 ppb	9 ppb	<2.5 ppb
166-6	CF	Lehua Elementary	COFFICE	15 ppb	<5 ppb	<2.5 ppb
166-14	CF	Lehua Elementary	A4	15 ppb	7 ppb	<2.5 ppb
166-15	CF	Lehua Elementary	A5	17 ppb	9 ppb	<2.5 ppb
166-16	CF	Lehua Elementary	A25	17 ppb	9 ppb	<2.5 ppb
166-21	DF	Lehua Elementary	A24	21 ppb	32 ppb	6 ppb
166-25	CF	Lehua Elementary	B2	41 ppb	<5 ppb	<2.5 ppb
166-29	CF	Lehua Elementary	B5	19 ppb	25 ppb	<2.5 ppb
166-30	CF	Lehua Elementary	B25	15 ppb	16 ppb	<2.5 ppb
166-33	CF	Lehua Elementary	B23	35 ppb	51 ppb	11 ppb
166-40	CF	Lehua Elementary	D23	24 ppb	17 ppb	<5 ppb
166-41	CF	Lehua Elementary	D22	15 ppb	15 ppb	<2.5 ppb
166-42	DF	Lehua Elementary	D22	16 ppb	49 ppb	<2.5 ppb
166-43	CF	Lehua Elementary	D21	17 ppb	14 ppb	<2.5 ppb
166-45	NS	Lehua Elementary	NURSE	17 ppb	11 ppb	<2.5 ppb
166-48	CF	Lehua Elementary	LIB	19 ppb	25 ppb	<2.5 ppb
166-49	DF	Lehua Elementary	ADMIN	21 ppb	32 ppb	5 ppb
166-50	DF	Lehua Elementary	C1	38 ppb	15 ppb	5 ppb

Source ID	Source Type	Facility Name	Room Number	Initial Lead Result	Follow-Up First Draw Result	Follow-Up Flush Result
166-51	DF	Lehua Elementary	C105	27 ppb	17 ppb	<5 ppb
169-9	CF	Waimalu Elementary	P9	19 ppb	16 ppb	<2.5 ppb
169-39	CF	Waimalu Elementary	D6	23 ppb	<5 ppb	<2.5 ppb
169-63	CF	Waimalu Elementary	E8	17 ppb	23 ppb	<2.5 ppb
173-35	CF	Waiau Elementary	D202A	19 ppb	<5 ppb	<2.5 ppb
175-17	CF	Lincoln Elementary	B11	65 ppb	<2.5 ppb	<2.5 ppb
175-29	DF	Lincoln Elementary	D18	23 ppb	202 ppb	39 ppb
175-30	DF	Lincoln Elementary	D18	41 ppb	<5 ppb	<5 ppb
175-59	KF	Lincoln Elementary	KIT	48 ppb	<5 ppb	<2.5 ppb
176-8	CF	Pauoa Elementary	C1	16 ppb	11 ppb	<2.5 ppb
176-13	CF	Pauoa Elementary	CWORK ROOM	347 ppb	40 ppb	269 ppb
176-18	CF	Pauoa Elementary	C4	17 ppb	<2.5 ppb	<2.5 ppb
176-26	CF	Pauoa Elementary	C6	19 ppb	<5 ppb	<2.5 ppb
176-27	CF	Pauoa Elementary	B1	17 ppb	6 ppb	<2.5 ppb
176-28	CF	Pauoa Elementary	B1	15 ppb	5 ppb	<2.5 ppb
176-68	CF	Pauoa Elementary	DWORK ROOM	121 ppb	<5 ppb	<2.5 ppb
176-69	CF	Pauoa Elementary	DWORK ROOM	119 ppb	23 ppb	<2.5 ppb
178-24	DF	Ali'iolani Elementary	F202	19 ppb	18 ppb	<2.5 ppb
178-31	DF	Ali'iolani Elementary	KIT	25 ppb	19 ppb	<2.5 ppb
179-47	CF	Anuenue	B110	18 ppb	10 ppb	<2.5 ppb
182-41	DF	Palolo Elementary	C2	18 ppb	14 ppb	<5 ppb
182-44	DF	Palolo Elementary	C5	17 ppb	<5 ppb	<2.5 ppb
182-47	DF	Palolo Elementary	B7	31 ppb	93 ppb	<5 ppb
183-1	CF	Ala Wai Elementary	NURSE	178 ppb	23 ppb	<5 ppb
183-21	CF	Ala Wai Elementary	C14	17 ppb	15 ppb	<2.5 ppb
183-49	KF	Ala Wai Elementary	KIT	16 ppb	6 ppb	<2.5 ppb

Source ID	Source Type	Facility Name	Room Number	Initial Lead Result	Follow-Up First Draw Result	Follow-Up Flush Result
184-19	CF	Kuhio Elementary	H104	680 ppb	17 ppb	<2.5 ppb
190-3	CF	Jefferson Elementary	ADMIN	139 ppb	16 ppb	74 ppb
190-20	CF	Jefferson Elementary	R11&12	27 ppb	6 ppb	<2.5 ppb
190-34	CF	Jefferson Elementary	C18	22 ppb	5 ppb	<2.5 ppb
190-49	CF	Jefferson Elementary	KB	47 ppb	12 ppb	5 ppb
193-32	CF	Hawaii School for Deaf and Blind	C203	72 ppb	76 ppb	8 ppb
193-41	CF	Hawaii School for Deaf and Blind	D6	57 ppb	20 ppb	<5 ppb
193-43	CF	Hawaii School for Deaf and Blind	D13	47 ppb	54 ppb	<2.5 ppb
193-50	CF	Hawaii School for Deaf and Blind	D1	16 ppb	7 ppb	<2.5 ppb
193-51	CF	Hawaii School for Deaf and Blind	D9	18 ppb	8 ppb	<2.5 ppb
193-53	DF	Hawaii School for Deaf and Blind	DDAYROOM	20 ppb	14 ppb	30 ppb
193-76	KF	Hawaii School for Deaf and Blind	HKIT	2054 ppb	176 ppb	38 ppb
202-12	CF	Pukalani Elementary School	P6	30 ppb	<2.5 ppb	<2.5 ppb
202-17	DF	Pukalani Elementary School	CAF	34 ppb	Unable to Sample	Unable to Sample
202-22	CF	Pukalani Elementary School	LIB	77 ppb	48 ppb	<5 ppb
208-9	DF	Kamehameha Preschool Paukukalo	IV	38 ppb	6 ppb	<2.5 ppb
208-10	DF	Kamehameha Preschool Paukukalo	V	55 ppb	11 ppb	<2.5 ppb
214-13	CF	Kihei Elementary	A101	60 ppb	<2.5 ppb	<2.5 ppb
214-19	CF	Kihei Elementary	A105	21 ppb	6 ppb	<2.5 ppb
214-41	CF	Kihei Elementary	B102	21 ppb	34 ppb	<2.5 ppb
214-46	CF	Kihei Elementary	D103	18 ppb	24 ppb	6 ppb
217-24	CF	Kahului Elementary	M3	16 ppb	11 ppb	<2.5 ppb
217-28	CF	Kahului Elementary	M1	23 ppb	17 ppb	<2.5 ppb
217-29	DF	Kahului Elementary	M1	21 ppb	15 ppb	<2.5 ppb
217-90	CF	Kahului Elementary	JSTORAGE	74 ppb	10 ppb	<2.5 ppb
225-13	CF	Wailuku Elementary	P2	67 ppb	14 ppb	<2.5 ppb

Source ID	Source Type	Facility Name	Room Number	Initial Lead Result	Follow-Up First Draw Result	Follow-Up Flush Result
225-34	KPF	Wailuku Elementary	KIT	17 ppb	<5 ppb	<2.5 ppb
225-39	CF	Wailuku Elementary	G20	16 ppb	9 ppb	<5 ppb
226-17	CF	Hana High & Elementary	I101	31 ppb	6 ppb	<2.5 ppb
226-18	CF	Hana High & Elementary	I102	20 ppb	<2.5 ppb	<2.5 ppb
226-22	DF	Hana High & Elementary	I104	15 ppb	12 ppb	<5 ppb
226-43	CF	Hana High & Elementary	E101	16 ppb	<2.5 ppb	<2.5 ppb
226-49	CF	Hana High & Elementary	CONCESSION	120 ppb	135 ppb	10 ppb
226-52	CF	Hana High & Elementary	L101	19 ppb	9 ppb	<2.5 ppb
226-56	CF	Hana High & Elementary	L103	20 ppb	6 ppb	<2.5 ppb
235-21	CF	Haiku Elementary	C2	19 ppb	<2.5 ppb	<2.5 ppb
235-40	DF	Haiku Elementary	E104	301 ppb	340 ppb	125 ppb
237-25	DF	Makawao Elementary	A6	26 ppb	<5 ppb	<2.5 ppb
237-26	DF	Makawao Elementary	A4	25 ppb	18 ppb	15 ppb
238-13	CF	Kalanianaole Elementary & Inter	D78	59 ppb	42 ppb	6 ppb
238-14	CF	Kalanianaole Elementary & Inter	D78	18 ppb	6 ppb	<2.5 ppb
238-15	CF	Kalanianaole Elementary & Inter	D78	16 ppb	6 ppb	<2.5 ppb
238-16	CF	Kalanianaole Elementary & Inter	D78	50 ppb	34 ppb	<2.5 ppb
238-17	CF	Kalanianaole Elementary & Inter	D74	17 ppb	10 ppb	<2.5 ppb
238-18	CF	Kalanianaole Elementary & Inter	D82	398 ppb	Unable to Sample	Unable to Sample
238-30	DF	Kalanianaole Elementary & Inter	B50	47 ppb	<2.5 ppb	<2.5 ppb
242-10	CF	Pa'ia Elementary	D2	20 ppb	17 ppb	<2.5 ppb
247-41	CF	Lihikai Elementary	E19	16 ppb	<2.5 ppb	<2.5 ppb
247-61	CF	Lihikai Elementary	C1	15 ppb	<2.5 ppb	<2.5 ppb
247-65	CF	Lihikai Elementary	P12	32 ppb	5 ppb	<2.5 ppb
247-86	DF	Lihikai Elementary	P11	50 ppb	36 ppb	<2.5 ppb
249-14	DF	Mountain View Elementary	CAF	22 ppb	16 ppb	<2.5 ppb

Source ID	Source Type	Facility Name	Room Number	Initial Lead Result	Follow-Up First Draw Result	Follow-Up Flush Result
253-17	CF	Kau High & Pahala Elementary	B12	30 ppb	77 ppb	7 ppb
253-38	DF	Kau High & Pahala Elementary	NOUTDOOREQUIPMENT	15 ppb	16 ppb	<2.5 ppb
253-47	DF	Kau High & Pahala Elementary	DGYM	21 ppb	27 ppb	<5 ppb
258-6	OF	Malamalama Waldorf School Kinderhale	LILIKOI	24 ppb	23 ppb	<2.5 ppb
266-12	CF	Waiakeawaena Elementary	G24	15 ppb	11 ppb	<2.5 ppb
266-13	DF	Waiakeawaena Elementary	G24	24 ppb	25 ppb	<5 ppb
266-15	DF	Waiakeawaena Elementary	G23	16 ppb	9 ppb	<5 ppb
270-32	DF	Waiakea Elementary	AK2	33 ppb	32 ppb	<5 ppb
270-33	DF	Waiakea Elementary	AK1	16 ppb	21 ppb	25 ppb
270-36	CF	Waiakea Elementary	P5	32 ppb	27 ppb	<5 ppb
270-38	CF	Waiakea Elementary	P4	15 ppb	12 ppb	<2.5 ppb
270-45	DF	Waiakea Elementary	P3	15 ppb	Unable to Sample	Unable to Sample
274-2	CF	Kapiolani Elementary	B12	28 ppb	<5 ppb	<2.5 ppb
274-3	DF	Kapiolani Elementary	B12	19 ppb	11 ppb	<5 ppb
274-4	CF	Kapiolani Elementary	B13	17 ppb	<2.5 ppb	<2.5 ppb
274-33	CF	Kapiolani Elementary	G34	18 ppb	<2.5 ppb	<2.5 ppb
274-34	DF	Kapiolani Elementary	G34	19 ppb	7 ppb	<5 ppb
274-35	CF	Kapiolani Elementary	G35	23 ppb	<2.5 ppb	<2.5 ppb
274-36	DF	Kapiolani Elementary	G35	15 ppb	<2.5 ppb	<2.5 ppb
274-37	CF	Kapiolani Elementary	G36	29 ppb	<2.5 ppb	<2.5 ppb
274-38	DF	Kapiolani Elementary	G36	36 ppb	13 ppb	<2.5 ppb
275-10	CF	Keaukaha Elementary	C7	19 ppb	6 ppb	<2.5 ppb
275-12	CF	Keaukaha Elementary	C6	33 ppb	10 ppb	<2.5 ppb
275-42	CF	Keaukaha Elementary	AWRITING	16 ppb	33 ppb	<2.5 ppb
285-2	DF	Honoka'a Elementary	ADMIN	16 ppb	19 ppb	<5 ppb

Source ID	Source Type	Facility Name	Room Number	Initial Lead Result	Follow-Up First Draw Result	Follow-Up Flush Result
285-4	DF	Honoka'a Elementary	MLOUNGE	23 ppb	20 ppb	8 ppb
285-18	DF	Honoka'a Elementary	J6	16 ppb	13 ppb	<2.5 ppb
288-16	CF	Pa'Auilo Elementary & Int	C8	35 ppb	57 ppb	<5 ppb
288-35	CF	Pa'Auilo Elementary & Int	A3	15 ppb	<5 ppb	<2.5 ppb
288-36	DF	Pa'Auilo Elementary & Int	A3	15 ppb	Unable to Sample	Unable to Sample
288-40	DF	Pa'Auilo Elementary & Int	A1	16 ppb	175 ppb	<5 ppb
290-5	WC	Kohala Elementary	A11	34 ppb	<5 ppb	<2.5 ppb
294-2	DF	Waimea Elementary	F9	103 ppb	Unable to Sample	Unable to Sample
294-19	DF	Waimea Elementary	J3	19 ppb	7 ppb	<5 ppb
294-38	CF	Waimea Elementary	P10	35 ppb	<5 ppb	<5 ppb
294-65	CF	Waimea Elementary	V102	17 ppb	21 ppb	<2.5 ppb
295-29	CF	Honaunau Elementary	B6	15 ppb	<5 ppb	<5 ppb
295-34	DF	Honaunau Elementary	ECONFERENCE	40 ppb	22 ppb	5 ppb
296-23	CF	Hookena Elementary	P2	22 ppb	<5 ppb	<2.5 ppb
299-6	CF	Ke Kula O Ehunuikaimalino	6B	24 ppb	11 ppb	6 ppb
299-16	KF	Ke Kula O Ehunuikaimalino	KIT	24 ppb	<2.5 ppb	<2.5 ppb
300-1	KF	Pact Keauhou Head Start	KIT	17 ppb	82 ppb	<2.5 ppb
308-53	CF	Kahakai Elementary	TB2	17 ppb	15 ppb	<2.5 ppb
308-79	CF	Kahakai Elementary	A107	75 ppb	10 ppb	<2.5 ppb

C. Actions Taken for Exceedances

1. Immediate Actions Taken

When initial sampling results were received from the lab, facilities were contacted via email regarding results. For those sources with results above 15 ppb, Facility Coordinators were instructed to immediately block off access to the fixture by either disconnecting the water flow or covering the source.

Following the release of results to the public page, each facility was provided a customized email outlining the sources with elevated lead results, immediate corrective actions, signage to post near affected sources, and further information on lead exposure. Corrective action communications were sent to the designated Facility Coordinator, and in the case of schools, the principal was also included. The following corrective action recommendations were included:

- Flushing the water before use until a uniform temperature is reached (no less than 30 seconds)
- Using a filter to remove lead and periodically replacing filter cartridges
- Frequent cleaning of aerators
- Using the identified fixture for handwashing only and using bottled water for drinking/cooking
- Replacing the faucet or plumbing with certified lead-free materials

2. Long-Term Actions Taken

The long-term corrective actions for sources with lead results above 15 ppb will ultimately be determined by the individual school, childcare facility, or HDOE. Several facilities chose to permanently disconnect or remove one or more of their affected sources from service due to lack of usage or availability of other drinking water sources nearby. Although removal of an affected source is an immediate and cost-effective solution to eliminate lead exposure, permanent removal of a source is likely only an option for facilities with alternative drinking water sources.

For facilities with a water bottle filler (WBF) or water cooler (WC), a potential long-term solution is to retrofit the existing unit with a filter attachment. This approach is often less expensive than purchasing and installing a new unit, however not all models of water coolers can be retrofitted with a filter attachment. Because water coolers have an attached electric chiller unit, they represent locations with both an existing water pipe and an electric outlet. These locations represent a possible opportunity to add a new filtered unit in a building. Facilities can encourage the use of these centrally located WCs and WBFs that have been affixed with a filter, especially for those classrooms or locations with affected drinking water sources. Of the 89 schools with exceedances, 84 schools have at least one WC or WBF. The locations of all sampled water coolers and water bottle fillers, as well as exempted water coolers and water bottle fillers, are available in Section VII. Appendix.

V. Financial Summary

In May 2020 the “Lead Testing in School and Child Care Program Drinking Water Grant Workplan for the State of Hawai’i”, a total project budget of $918,000 was established and comprised of both federal funds ($222,000) and voluntary funds ($696,000). Line Item 6.F. estimated Contractual services totaling $628,800.

TruePani submitted a best and final offer (BAFO) for $580,527.00 for the work outlined in Solicitation No. SDWB 20-01. This is the contract total, as outlined by ASO Log No. 21-117, executed on January 8, 2021. As of February 2, 2022, all work outlined in the contract was completed, invoiced, and paid for, totaling $580,519

Table 7: Contract Total and Remaining Balance

ASO Log No. 21-117 Contract Total	**$**	**580,527**
Final Amount Paid for Stage 2	**$**	**580,518**

Throughout the project, TruePani tracked labor, travel and direct expense costs, and tax estimates by county, for reporting and general excise tax (GET) purposes. Table 8 displays a breakdown of costs by county and category.

Table 88: Project Costs by County and Category

County	Labor, Travel & Direct Expenses	
Honolulu County	$	399,436
Maui County	$	70,887
Hawaii County	$	90,280
Kauai County	$	19,916
Total	**$**	**580,519**
GET Paid	**$**	**25,769**

TruePani segmented the labor, travel expenses, direct costs, and tax estimates by facility type. Using time tracking software, it was determined that on average, child care facilities took 1/4th of the time to complete site investigations and sampling as elementary schools. This was represented by the equation:

4*(Labor Cost/CCF) = Labor Cost/ES

Using the distribution of schools (ES) and child care facilities (NRCCF and RCCF) shown in Table 9, a system of equations approach was used for each county to determine the portion of the labor expense associated with each facility type. For example, in Oahu County:

64 (Labor Cost/ES) + 71(Labor Cost/CCF) = $399,436

The result allocated labor costs across county and facility type, as shown in Table 10.

Table 99: Distribution of Facility Type Sampled by Island

Island	ES	NRCCF	RCCF	Total
Hawaii	22	17	9	**48**
Kauai	6	1	3	**10**
Lanai	1	0	0	**1**
Maui	10	8	8	**26**
Molokai	3	0	0	**3**
Oahu	64	44	27	**135**
Total	**106**	**70**	**47**	**223**

Travel expenses, direct costs, and estimated taxes were weighted equally between schools and child care facilities. They were then distributed by facility type, based on the number of facilities. General Excise Tax (GET) payments were made to the Hawai'i Department of Taxation through the Hawai'i Tax Online website.

A distribution of project costs by facility type and county are displayed in Table 14. These costs are also compared to the percent of facilities sampled. For example, 68% of project costs were spent on Oahu, and 61% of facilities sampled were located on Oahu. 69% of project costs were spent on elementary schools, and elementary schools accounted for 48% of the facilities sampled.

Table 1410: Percent of Costs Compared to Percent of Facilities Sampled by County and Facility Type

	ES	NRCCF	RCCF	Percent of Cost	Percent of Facilities Sampled
Honolulu County	48%	13%	8%	**68%**	**61%**
Maui County	8%	2%	2%	**12%**	**13%**
Hawaii County	10%	4%	2%	**16%**	**22%**
Kauai County	3%	0%	1%	**4%**	**4%**
Percent of Cost	**69%**	**19%**	**12%**	**100%**	**100%**
Percent of Facilities Sampled	**48%**	**31%**	**21%**	**100%**	

VI. Key Takeaways & Best Practices

A. Key Takeaways

1. Low Lead Levels in Water Bottle Fillers & Water Coolers

During the project, TruePani sampled 31 water bottle fillers (WBFs), none of which had results above the laboratory reporting limit of 2.5 ppb. Of the 175 water coolers (WCs) that were sampled, only one had lead levels above the action level with a result of 34 ppb. Furthermore, six water coolers had any level of quantifiable lead below the action level (5 ppb -14 ppb). Overall, the exceedance rate for water coolers was 0.6%, as opposed to the overall exceedance rate of 4.75% for all sources sampled during the project.

2. Consistency of Resampling Results

During the initial sampling, first draw samples were collected from all sources identified during the site investigations. Upon receipt of results, any source with a lead concentration above 15 ppb was scheduled for follow-up sampling, in which a first draw and flush sample were

collected. Except for the flush sample, the sample collection procedure was the same between initial and follow-up sampling, in that sources were flushed the day before to ensure an 8-to-18-hour stagnation period before sampling. However, as evidenced by the large variation in first draw results between initial and follow-up sampling, it is apparent that lead concentrations can be incredibly transient, even at a single source. This suggests that a first draw sample is indicative of the presence of lead only at a specific point in time and that a single non-detect is not necessarily an indication of the absence of lead.

3. Effectiveness of Flushing

During the follow-up visit for confirmatory testing of the sources with levels above the action level, TruePani collected 282 follow-up and first draw samples. Based only on the data collected from follow-up flush samples, flushing reduced the lead levels below 15 ppb at 268 of the 282 sources. Flushing is often effective in reducing lead levels but cannot be considered a permanent solution and only a best practice.

4. High Participation Rates

Of the 295 eligible facilities in the state, 100% were contacted successfully during the initial communications. 100% of schools and 99.1% of eligible childcare facilities completed the program from site investigation through follow-up sampling (or completion of the project). This high participation rate is likely the result of multi-agency collaboration at the beginning of the project to ensure that participants were aware of the project before TruePani's initial communications.

5. Increased Engagement Following Press Release

A press release created by the Hawai'i Department of Health was shared with the public on July 21,2021, providing a progress update of the 58 schools and 70 childcare facilities sampled at that time. Various news outlets pulled information from the State's press release to inform their own articles. Following the press release and reporting by various news outlets, TruePani saw an increase in schools' willingness to cooperate with follow-up sampling. Facilities seemed more willing to allow TruePani personnel into the schools to sample during the school day, along with an increase in involvement from principals or vice principals during follow-up sample collection.

B. Best Practices

1. Direct and Personal Interaction with Facility Coordinators

TruePani's user-centered approach to interacting with Facility Coordinators allowed for the development of a personal connection to each facility. Each facility was contacted by a TruePani individual, given information about the project, and invited to call or email with any questions or concerns. A rigorous and direct communications strategy showed willingness in Facility Coordinators to supply information about the facility. If a Facility Coordinator could not be contacted by email, they would be contacted by phone at the appropriate number. Additionally, TruePani's willingness to play a direct support role increased a facilities participation in follow up sampling. For example, there was a 100% participation rate for facilities requiring one or more follow-up samples. Understanding that the time of a Facility

Coordinator is valuable, TruePani's continuous but flexible outreach took as much burden from facility personnel as possible. Instead of having to remember dates and set reminders, the Facility Coordinator was contacted directly by a familiar name, given the information they needed, and invited once again to reach out in a way convenient to them for any questions or concerns. The flexibility of the most convenient mode of communication to the Facility Coordinator allowed TruePani to operate based on the individual needs of the facility.

2. Immediate and Automated Communications

Oftentimes when TruePani would enter occupied classrooms for follow-up sampling (usually during late Summer when students were not yet on campus), educators would show concern that their classroom water source had elevated lead levels and would be curious about the status of nearby drinking water sources. As TruePani would immediately post results to the user-friendly public page once received, TruePani would be able to direct curious individuals to the results page whenever questions would arise regarding sample results. This practice ensured that information was accessible to all individuals, beyond just facility managers and administration. By updating the public webpage as results were received, rather than in rounds or by geography, TruePani was able to immediately address the interest of the public and provide results in real time.

3. Inter-Departmental Approach

The Hawai'i WIIN 2107 Drinking Water Project team took an inter-departmental approach by including relevant departments in meetings from the onset of the contract. The team was comprised of individuals from the Hawai'i Department of Health, Safe Drinking Water Branch, Hazard Evaluation and Emergency Response Office, Environmental Management Division, Department of Human Services, Department of Education, Laboratories Division, and TruePani. This approach ensured that all parties were aligned with major milestones, events affecting progress, results communication, and remediation. Additionally, by hosting a bi-weekly team meeting, project updates were always communicated in a timely manner and respective departments-maintained engagement with the project.

4. Flushing for All Kitchen Sources

During sample collection activities, TruePani encouraged flushing sources in kitchens, even if the drinking water sources had results below the project action level. As sources in kitchens are directly used for consumption, this is an important practice to relay to staff when visiting kitchens for sampling. Although fixtures with lead results above the action level were to be discontinued from use, replaced, or affixed with a filter, flushing all sources, regardless of lead concentration, can be an effective method to decrease the lead in drinking water. This reasoning resonated with many kitchen staff, who either expressed that they already implement daily flushing or plan to do so in the future.

C. Future Considerations

The State of Hawai'i has contracted with TruePani to complete lead testing at the remaining 72 public elementary schools that were not tested as part of Stage 1 of the 2021 WIIN 2107 Drinking Water Project. In the upcoming Stage 2 of the 2107 WIIN Drinking Water Project, TruePani plans to implement the following considerations.

1. Overlap Site Investigations and Sample Collection

In Stage 1, the site investigation and sample collection phases were conducted separately over the course of a total of seven months. TruePani's approach for Stage 2 features completion of site investigation and flush visit for sample collection on the same day, with sample collection scheduled for the morning following the site investigation/flush visit. This approach will reduce travel costs and time spent visiting facilities, as well as decrease the time between the facilities first interaction with the program and receipt of their results. Additionally, with schools returning to in-person learning, this overlapped approach reduces the time spent visiting classrooms during the academic year.

2. Communications Directed to Principals

Throughout the course of the project, a Facility Coordinator was designated as a point of contact for all scheduling, updates, and results communication. Facility Coordinators were generally custodial or maintenance staff that were familiar with the facility, had access to all buildings, and could shut off/turn on water sources. However, these Facility Coordinators may not be in a position where they can inform and encourage all teachers to implement best practices in their classrooms. Because the Facility Coordinator was the recipient of all TruePani communications, administrative staff did not always receive these communications. In most cases, Principals were unfamiliar with the project until the results email was released or the TruePani team arrived for follow-up sampling. By directing milestone communications such as early program information and initial scheduling to both Facility Coordinators and Principals, TruePani aims to encourage greater involvement from school administrative staff in correcting and informing reduction of lead exposure in drinking water. This is to better align the facility staff that has the time and expertise to assist in sampling with those who have the power to institute corrective actions at the school.

3. Readily Available Resources on Various Lead Exposures

TruePani had the opportunity to speak with many parents, educators, and administrative staff who expressed concern over possible lead exposures in their facilities. TruePani offered information on best practices, accessible filter options, project partner contacts, and directed individuals to the resources available on the Hawai'i Department of Health WIIN website. If an individual was curious about completing lead testing at their home or other lead exposures such as paint and soil, TruePani guided individuals to the Department of Health website. However, for all questions encountered while in the field, TruePani did not have a standardized method for sharing information. For Stage 2, TruePani will prepare a document to answer frequently asked about other lead exposures with specific Hawai'i Department of Health resources, websites, and contacts.

4. Information on WCs and WBFs

During Phase 2: Site Investigations, TruePani annotated floorplans with all water sources, including those that were exempt from testing. This included the locations of all water coolers and water bottle fillers that were exempt due to an existing filter, broken fixtures, or inaccessible location. However, TruePani did not record the reason for exempting each fixture. The locations

of WCs and WBFs could be later used to inform remediation opportunities; specifically retrofitting existing water coolers with filter attachments or guiding students to existing filtered units. During Stage 2, TruePani will collect information on exempt water coolers and water bottle fillers in the same manner as information for eligible sources was collected. This will include location, filter status, make, model, and reason for exemption. Data collected in the field will be uploaded to the database in real time to allow for tracking of exempt fixtures. This information will make it easier to organize information on water bottle fillers and water coolers that will be helpful for possible remediation opportunities.

VII. Appendix

A. Monthly and Quarterly Reports

1. Monthly Reports

https://1drv.ms/u/s!AqmUvfgjsW1DzXEi92RsKk3nSnyF?e=rGlthP

2. Quarterly Reports

https://1drv.ms/u/s!AqmUvfgjsW1DzXJIoLNvpX2vZUhk?e=3CionC

B. Public Results Website

https://health.hawaii.gov/heer/environmental-health/highlighted-projects/wiin/results/

C. Locations of Water Coolers

1. Sampled Water Bottle Fillers and Water Coolers

https://1drv.ms/x/s!AqmUvfgjsW1DgYJxUo_UmKM99XsLZQ

2. Exempt Water Bottle Fillers

https://1drv.ms/x/s!AqmUvfgjsW1DgYJxUo_UmKM99XsLZQ