LABORATORY REPORTS and RESULTS

of Testing of PET Plastic Bottles and Bottled Beverages

for Antimony, Cobalt, and other Metals and Elements

Commissioned by Defend Our Health

2022

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VANGUARD
LABORATORY

Lab Report for:

Problem Plastic:

How Polyester and PET Plastic Can be Unsafe, Unjust, and Unsustainable Materials

Client:
Defend our Health
565 Congress St, STE 204
Portland, ME 04101
412-889-7684

Vanguard Laboratory
2635 Parkmont Lane SW, Suite A
Olympia, WA 98502
April 26, 2022

Table of Contents

Vanguard Laboratory
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Olympia, WA 98502
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1. Objective

The overall purpose of this project was to (1) determine the amount of heavy metals in PET-bottled beverages, as well as (2) the amount of heavy metals in the plastic bottles. 20 different beverage drinks in unopened containers were supplied to Vanguard Laboratory by the client, Defend Our Health on March 9th, 2022. Data interpretation and risk assessment was not part of this project. The target analytes are show in Table 1.1 and an overview of the samples analysed are shown in table 1.2.

Table 1.1 Target Analytes

Analyte	Chemical Symbol	Analyte	Chemical Symbol
Aluminum	Al	Molybdenum	Mo
Arsenic	As	Nickel	Ni
Barium	Ba	Lead	Pb
Beryllium	Be	Antimony	Sb
Cadmium	Cd	Selenium	Se
Cobalt	Co	Silicon	Si
Chromium	Cr	Tin	Sn
Copper	Cu	Strontium	Sr
Germanium	Ge	Titanium	Ti
Lithium	Li	Thallium	Tl
Manganese	Mn	Vanadium	V

Table 1.2 Samples Analyzed

Sample ID	Product	Sample ID	Product
1- Beverage	COCA COLA	1- Bottle	COCA COLA BOTTLE
2- Beverage	DIET COKE	2- Bottle	DIET COKE BOTTLE

3- Beverage	PEPSI	3- Bottle	PEPSI BOTTLE
4- Beverage	MOUNTAIN DEW	4- Bottle	MOUNTAIN DEW BOTTLE
5- Beverage	PERRIER	5- Bottle	PERRIER BOTTLE
6- Beverage	DR PEPPER	6- Bottle	DR PEPPER BOTTLE
7- Beverage	AQUIFINA	7- Bottle	AQUIFINA BOTTLE
8- Beverage	DASANI	8- Bottle	DASANI BOTTLE
9- Beverage	BLUE RASPBERRY GATORADE	9- Bottle	BLUE RASPBERRY GATORADE BOTTLE
10- Beverage	SIMPLY LEMONADE	10- Bottle	SIMPLY LEMONADE BOTTLE
11- Beverage	7UP	11- Bottle	7UP BOTTLE
12- Beverage	DIET PEPSI	12- Bottle	DIET PEPSI BOTTLE
13- Beverage	MOTTS APPLE JUICE	13- Bottle	MOTTS APPLE JUICE BOTTLE
14- Beverage	OCEAN SPRAY 100% JUICE	14- Bottle	OCEAN SPRAY 100% JUICE BOTTLE
15- Beverage	POWERADE FRUIT PUNCH	15- Bottle	POWERADE FRUIT PUNCH BOTTLE
16- Beverage	TROPICANA ORANGE	16- Bottle	TROPICANA ORANGE BOTTLE
18- Beverage	V8	18- Bottle	V8 BOTTLE
19- Beverage	SNAPPLE PEACH TEA	19- Bottle	SNAPPLE PEACH TEA BOTTLE
20- Beverage	HONEST TEA HALF TEA/HALF LEMONADE	20- Bottle	HONEST TEA HALF TEA/HALF LEMONADE BOTTLE
21- Beverage	DIET DR PEPPER	21- Bottle	DIET DR PEPPER BOTTLE

2. Protocol Overview

The beverage samples were analysed using modified AOAC Official Method 2015.01 with microwave digestion. The pH of each beverage sample was also taken. The bottle samples were analysed using modified EPA Method 200.8 with microwave digestion. All work was performed according to ISO 17025 guidelines in an accredited laboratory. People, methods, equipment are working/operated within an ISO 17025 environment. To ensure good method performance, a quality assurance program is in place. All quality control measures such as

duplicates, matrix spikes, method blanks and check standards were of sufficient quality. See QC Data section 9.2.

3. Instrumentation and Methods

Instrumentation is listed below, if an in-house validated method was used it will be noted here, all external methods will be noted in "Section 6. References".

3.1 Beverage Samples- ICP-MS and MARS 6 Microwave

3.2 Bottle Samples- ICP-MS and MARS 6 Microwave

4. Method LODs

The LODs for the beverage samples are listed in table 4.1 and for the bottle samples in table 4.1. The LODs are also listed on the attached results report for each sample.

Table 4.1 Analyte LODs

Analyte	LOD (ppb)	Analyte	LOD (ppb)
Aluminum	0.5	Molybdenum	0.05
Arsenic	0.05	Nickel	0.1
Barium	0.1	Lead	0.1
Beryllium	0.05	Antimony	0.01
Cadmium	0.01	Selenium	0.1
Cobalt	0.05	Silicon	5
Chromium	0.1	Tin	0.1
Copper	0.1	Strontium	0.1
Germanium	0.1	Titanium	0.1
Lithium	0.1	Thallium	0.05
Manganese	0.1	Vanadium	0.01

5. Results

Results of the analyses are shown in the attached 40 page report, shown in section 10.

6. Possible Interference

6.1. Antimony recovery is negatively affected by the presence of silicates. There was a presence of silicates in the bottle samples, but due to lack of additional sample the laboratory was not able to

re-process the original samples for optimization of antimony recovery. Due to the silicate interference, antimony concentrations in the bottles are likely to be underestimated.

6.2. Chloride in samples can produce low recoveries for antimony and silver. If chloride interference is a concern, 1% HCl can be added during digestion. The lab did process the bottle samples with HCl.

6.3. It is noted that the use of hydrochloric and sulfuric acids should be minimized due to higher incidence of molecular-ion interferences with the presence of these acids. Excessive amounts of nitric acid can also lead to molecular interferences. Analysts were aware of this possible interference.

7. References

7.1. Michelle Briscoe, Determination of Heavy Metals in Food by Inductively Coupled Plasma–Mass Spectrometry: First Action 2015.01, *Journal of AOAC INTERNATIONAL*, Volume 98, Issue 4, 1 July 2015, Pages 1113–1120

7.2. U.S. EPA. 1994. "Method 200.8: Determination of Trace Elements in Waters and Wastes by Inductively Coupled Plasma-Mass Spectrometry," Revision 5.4. Cincinnati, OH

8. Final Report Approval

Samples Tested By: Robert Smalling, Lead Chemist beginning on 3/10/2022

Report Reviewed By: Tori Johnson, Operations Manager on 7/1/2022

Project Sponsored By:

Roopa Krithivasan
Defend our Health
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9. Results-

9.1. Results attached pages 1-40

9.2. QC Reports Beverages & Bottles attached pages 1-8

Vanguard Laboratory
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Report of Laboratory Analysis

Defend our Health
565 Congress St, Ste 204
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Matrix Liquid
Laboratory ID: V220309-3
Date Received: 3/9/2022
Date Reported: 3/23/2022

Sample ID: **1- Beverage**

Analysis	Result	Units	Method	LOD	Date of Analysis	Analyst Initials
pH	2.18	-	pH Probe	-	3/10/2022	RS
Aluminum (Al)	31.774	ug/L	ICP/MS	0.50	3/15/2022	RS
Arsenic (As)	0.361^	ug/L	ICP/MS	0.05	3/15/2022	RS
Barium (Ba)	3.801	ug/L	ICP/MS	0.10	3/15/2022	RS
Beryllium (Be)	nd	ug/L	ICP/MS	0.05	3/15/2022	RS
Cadmium (Cd)	nd	ug/L	ICP/MS	0.01	3/15/2022	RS
Cobalt (Co)	nd	ug/L	ICP/MS	0.05	3/15/2022	RS
Chromium (Cr)	0.871	ug/L	ICP/MS	0.10	3/15/2022	RS
Copper (Cu)	1.614	ug/L	ICP/MS	0.10	3/15/2022	RS
Germanium (Ge)	nd	ug/L	ICP/MS	0.10	3/15/2022	RS
Lithium (Li)	4.484	ug/L	ICP/MS	0.10	3/15/2022	RS
Manganese (Mn)	0.886	ug/L	ICP/MS	0.10	3/15/2022	RS
Molybdenum (Mo)	0.327^	ug/L	ICP/MS	0.05	3/15/2022	RS
Nickel (Ni)	0.436^	ug/L	ICP/MS	0.10	3/15/2022	RS
Lead (Pb)	0.396^	ug/L	ICP/MS	0.10	3/15/2022	RS
Antimony (Sb)	2.198	ug/L	ICP/MS	0.01	3/15/2022	RS
Selenium (Se)	0.228^	ug/L	ICP/MS	0.10	3/15/2022	RS
Silicon (Si)	7.665	ug/L	ICP/MS	5.00	3/15/2022	RS
Tin (Sn)	11.624	ug/L	ICP/MS	0.10	3/15/2022	RS
Strontium (Sr)	22.145	ug/L	ICP/MS	0.10	3/15/2022	RS
Titanium (Ti)	3.535	ug/L	ICP/MS	0.10	3/15/2022	RS
Thallium (Tl)	0.223^	ug/L	ICP/MS	0.05	3/15/2022	RS
Vanadium (V)	0.108^	ug/L	ICP/MS	0.01	3/15/2022	RS

Notes:

^= Result is below LOQ and above LOD

ppm: parts per million

nd: non-detect

n/a: not applicable

ISO 17025:2017 ACCREDITED LABORATORY

Reviewed by Robert Smalling, Chemist on 3/23/2022

Approved by Tori Johnson, Operations Manager on 3/23/2022

Reviewed by Tori Johnson on 3/25/2022

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Matrix Liquid
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Sample ID: **2- Beverage**

Analysis	Result	Units	Method	LOD	Date of Analysis	Analyst Initials
pH	3.28	-	pH Probe	-	3/10/2022	RS
Aluminum (Al)	30.129	ug/L	ICP/MS	0.50	3/15/2022	RS
Arsenic (As)	0.173	ug/L	ICP/MS	0.05	3/15/2022	RS
Barium (Ba)	5.059	ug/L	ICP/MS	0.10	3/15/2022	RS
Beryllium (Be)	nd	ug/L	ICP/MS	0.05	3/15/2022	RS
Cadmium (Cd)	nd	ug/L	ICP/MS	0.01	3/15/2022	RS
Cobalt (Co)	nd	ug/L	ICP/MS	0.05	3/15/2022	RS
Chromium (Cr)	0.539	ug/L	ICP/MS	0.10	3/15/2022	RS
Copper (Cu)	1.275	ug/L	ICP/MS	0.10	3/15/2022	RS
Germanium (Ge)	2.423	ug/L	ICP/MS	0.10	3/15/2022	RS
Lithium (Li)	2.837	ug/L	ICP/MS	0.10	3/15/2022	RS
Manganese (Mn)	1.278	ug/L	ICP/MS	0.10	3/15/2022	RS
Molybdenum (Mo)	0.395^	ug/L	ICP/MS	0.05	3/15/2022	RS
Nickel (Ni)	0.402^	ug/L	ICP/MS	0.10	3/15/2022	RS
Lead (Pb)	0.185^	ug/L	ICP/MS	0.10	3/15/2022	RS
Antimony (Sb)	1.218	ug/L	ICP/MS	0.01	3/15/2022	RS
Selenium (Se)	0.173^	ug/L	ICP/MS	0.10	3/15/2022	RS
Silicon (Si)	156.42	ug/L	ICP/MS	5.00	3/15/2022	RS
Tin (Sn)	3.986	ug/L	ICP/MS	0.10	3/15/2022	RS
Strontium (Sr)	44.616	ug/L	ICP/MS	0.10	3/15/2022	RS
Titanium (Ti)	2.750	ug/L	ICP/MS	0.10	3/15/2022	RS
Thallium (Tl)	0.168^	ug/L	ICP/MS	0.05	3/15/2022	RS
Vanadium (V)	0.324^	ug/L	ICP/MS	0.01	3/15/2022	RS

Notes:

^= Result is below LOQ and above LOD

ppm: parts per million

nd: non-detect

n/a: not applicable

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Reviewed by Robert Smalling, Chemist on 3/23/2022

Approved by Tori Johnson, Operations Manager on 3/23/2022

Reviewed by Tori Johnson on 3/25/2022

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Report of Laboratory Analysis

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Matrix Liquid
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Sample ID: **3- Beverage**

Analysis	Result	Units	Method	LOD	Date of Analysis	Analyst Initials
pH	2.42	-	pH Probe	-	3/10/2022	RS
Aluminum (Al)	19.413	ug/L	ICP/MS	0.50	3/15/2022	RS
Arsenic (As)	0.303^	ug/L	ICP/MS	0.05	3/15/2022	RS
Barium (Ba)	1.134	ug/L	ICP/MS	0.10	3/15/2022	RS
Beryllium (Be)	nd	ug/L	ICP/MS	0.05	3/15/2022	RS
Cadmium (Cd)	nd	ug/L	ICP/MS	0.01	3/15/2022	RS
Cobalt (Co)	nd	ug/L	ICP/MS	0.05	3/15/2022	RS
Chromium (Cr)	1.166	ug/L	ICP/MS	0.10	3/15/2022	RS
Copper (Cu)	0.618	ug/L	ICP/MS	0.10	3/15/2022	RS
Germanium (Ge)	nd	ug/L	ICP/MS	0.10	3/15/2022	RS
Lithium (Li)	2.257	ug/L	ICP/MS	0.10	3/15/2022	RS
Manganese (Mn)	1.106	ug/L	ICP/MS	0.10	3/15/2022	RS
Molybdenum (Mo)	0.901	ug/L	ICP/MS	0.05	3/15/2022	RS
Nickel (Ni)	0.547	ug/L	ICP/MS	0.10	3/15/2022	RS
Lead (Pb)	0.122^	ug/L	ICP/MS	0.10	3/15/2022	RS
Antimony (Sb)	0.984	ug/L	ICP/MS	0.01	3/15/2022	RS
Selenium (Se)	nd	ug/L	ICP/MS	0.10	3/15/2022	RS
Silicon (Si)	14.177	ug/L	ICP/MS	5.00	3/15/2022	RS
Tin (Sn)	0.577	ug/L	ICP/MS	0.10	3/15/2022	RS
Strontium (Sr)	26.185	ug/L	ICP/MS	0.10	3/15/2022	RS
Titanium (Ti)	7.007	ug/L	ICP/MS	0.10	3/15/2022	RS
Thallium (Tl)	0.125^	ug/L	ICP/MS	0.05	3/15/2022	RS
Vanadium (V)	0.679	ug/L	ICP/MS	0.01	3/15/2022	RS

Notes:

^= Result is below LOQ and above LOD

ppm: parts per million

nd: non-detect

n/a: not applicable

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Report of Laboratory Analysis

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Matrix Liquid
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Sample ID: **4- Beverage**

Analysis	Result	Units	Method	LOD	Date of Analysis	Analyst Initials
pH	3.04	-	pH Probe	-	3/10/2022	RS
Aluminum (Al)	21.516	ug/L	ICP/MS	0.50	3/15/2022	RS
Arsenic (As)	0.153^	ug/L	ICP/MS	0.05	3/15/2022	RS
Barium (Ba)	4.132	ug/L	ICP/MS	0.10	3/15/2022	RS
Beryllium (Be)	nd	ug/L	ICP/MS	0.05	3/15/2022	RS
Cadmium (Cd)	nd	ug/L	ICP/MS	0.01	3/15/2022	RS
Cobalt (Co)	nd	ug/L	ICP/MS	0.05	3/15/2022	RS
Chromium (Cr)	0.543	ug/L	ICP/MS	0.10	3/15/2022	RS
Copper (Cu)	4.027	ug/L	ICP/MS	0.10	3/15/2022	RS
Germanium (Ge)	nd	ug/L	ICP/MS	0.10	3/15/2022	RS
Lithium (Li)	1.011	ug/L	ICP/MS	0.10	3/15/2022	RS
Manganese (Mn)	5.151	ug/L	ICP/MS	0.10	3/15/2022	RS
Molybdenum (Mo)	0.120^	ug/L	ICP/MS	0.05	3/15/2022	RS
Nickel (Ni)	0.304^	ug/L	ICP/MS	0.10	3/15/2022	RS
Lead (Pb)	0.170^	ug/L	ICP/MS	0.10	3/15/2022	RS
Antimony (Sb)	1.378	ug/L	ICP/MS	0.01	3/15/2022	RS
Selenium (Se)	nd	ug/L	ICP/MS	0.10	3/15/2022	RS
Silicon (Si)	5.973	ug/L	ICP/MS	5.00	3/15/2022	RS
Tin (Sn)	1.993	ug/L	ICP/MS	0.10	3/15/2022	RS
Strontium (Sr)	7.862	ug/L	ICP/MS	0.10	3/15/2022	RS
Titanium (Ti)	0.846	ug/L	ICP/MS	0.10	3/15/2022	RS
Thallium (Tl)	nd	ug/L	ICP/MS	0.05	3/15/2022	RS
Vanadium (V)	0.210^	ug/L	ICP/MS	0.01	3/15/2022	RS

Notes:

^= Result is below LOQ and above LOD

ppm: parts per million

nd: non-detect

n/a: not applicable

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Reviewed by Tori Johnson on 3/25/2022

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Matrix Liquid
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Sample ID: **5- Beverage**

Analysis	Result	Units	Method	LOD	Date of Analysis	Analyst Initials
pH	5.05	-	pH Probe	-	3/10/2022	RS
Aluminum (Al)	14.605	ug/L	ICP/MS	0.50	3/15/2022	RS
Arsenic (As)	0.194^	ug/L	ICP/MS	0.05	3/15/2022	RS
Barium (Ba)	17.146	ug/L	ICP/MS	0.10	3/15/2022	RS
Beryllium (Be)	nd	ug/L	ICP/MS	0.05	3/15/2022	RS
Cadmium (Cd)	nd	ug/L	ICP/MS	0.01	3/15/2022	RS
Cobalt (Co)	nd	ug/L	ICP/MS	0.05	3/15/2022	RS
Chromium (Cr)	0.654	ug/L	ICP/MS	0.10	3/15/2022	RS
Copper (Cu)	0.819	ug/L	ICP/MS	0.10	3/15/2022	RS
Germanium (Ge)	1.141	ug/L	ICP/MS	0.10	3/15/2022	RS
Lithium (Li)	3.348	ug/L	ICP/MS	0.10	3/15/2022	RS
Manganese (Mn)	0.295^	ug/L	ICP/MS	0.10	3/15/2022	RS
Molybdenum (Mo)	0.448^	ug/L	ICP/MS	0.05	3/15/2022	RS
Nickel (Ni)	0.455^	ug/L	ICP/MS	0.10	3/15/2022	RS
Lead (Pb)	0.298^	ug/L	ICP/MS	0.10	3/15/2022	RS
Antimony (Sb)	1.577	ug/L	ICP/MS	0.01	3/15/2022	RS
Selenium (Se)	0.517	ug/L	ICP/MS	0.10	3/15/2022	RS
Silicon (Si)	14.533	ug/L	ICP/MS	5.00	3/15/2022	RS
Tin (Sn)	2.303	ug/L	ICP/MS	0.10	3/15/2022	RS
Strontium (Sr)	623.04	ug/L	ICP/MS	0.10	3/15/2022	RS
Titanium (Ti)	0.896	ug/L	ICP/MS	0.10	3/15/2022	RS
Thallium (Tl)	nd	ug/L	ICP/MS	0.05	3/15/2022	RS
Vanadium (V)	0.826	ug/L	ICP/MS	0.01	3/15/2022	RS

Notes:

^= Result is below LOQ and above LOD

ppm: parts per million

nd: non-detect

n/a: not applicable

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Matrix Liquid
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Date Received: 3/9/2022
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Sample ID: **6- Beverage**

Analysis	Result	Units	Method	LOD	Date of Analysis	Analyst Initials
pH	3.61	-	pH Probe	-	3/10/2022	RS
Aluminum (Al)	16.416	ug/L	ICP/MS	0.50	3/15/2022	RS
Arsenic (As)	0.300^	ug/L	ICP/MS	0.05	3/15/2022	RS
Barium (Ba)	8.079	ug/L	ICP/MS	0.10	3/15/2022	RS
Beryllium (Be)	nd	ug/L	ICP/MS	0.05	3/15/2022	RS
Cadmium (Cd)	nd	ug/L	ICP/MS	0.01	3/15/2022	RS
Cobalt (Co)	nd	ug/L	ICP/MS	0.05	3/15/2022	RS
Chromium (Cr)	1.501	ug/L	ICP/MS	0.10	3/15/2022	RS
Copper (Cu)	0.709	ug/L	ICP/MS	0.10	3/15/2022	RS
Germanium (Ge)	nd	ug/L	ICP/MS	0.10	3/15/2022	RS
Lithium (Li)	0.578	ug/L	ICP/MS	0.10	3/15/2022	RS
Manganese (Mn)	2.788	ug/L	ICP/MS	0.10	3/15/2022	RS
Molybdenum (Mo)	0.278^	ug/L	ICP/MS	0.05	3/15/2022	RS
Nickel (Ni)	0.796	ug/L	ICP/MS	0.10	3/15/2022	RS
Lead (Pb)	0.229^	ug/L	ICP/MS	0.10	3/15/2022	RS
Antimony (Sb)	0.848	ug/L	ICP/MS	0.01	3/15/2022	RS
Selenium (Se)	nd	ug/L	ICP/MS	0.10	3/15/2022	RS
Silicon (Si)	24.140	ug/L	ICP/MS	5.00	3/15/2022	RS
Tin (Sn)	2.597	ug/L	ICP/MS	0.10	3/15/2022	RS
Strontium (Sr)	64.604	ug/L	ICP/MS	0.10	3/15/2022	RS
Titanium (Ti)	2.124	ug/L	ICP/MS	0.10	3/15/2022	RS
Thallium (Tl)	nd	ug/L	ICP/MS	0.05	3/15/2022	RS
Vanadium (V)	0.644	ug/L	ICP/MS	0.01	3/15/2022	RS

Notes:

^= Result is below LOQ and above LOD

ppm: parts per million

nd: non-detect

n/a: not applicable

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Date Received: 3/9/2022
Date Reported: 3/23/2022

Sample ID: **7- Beverage**

Analysis	Result	Units	Method	LOD	Date of Analysis	Analyst Initials
pH	5.93	-	pH Probe	-	3/10/2022	RS
Aluminum (Al)	12.533	ug/L	ICP/MS	0.50	3/15/2022	RS
Arsenic (As)	nd	ug/L	ICP/MS	0.05	3/15/2022	RS
Barium (Ba)	0.100^	ug/L	ICP/MS	0.10	3/15/2022	RS
Beryllium (Be)	nd	ug/L	ICP/MS	0.05	3/15/2022	RS
Cadmium (Cd)	nd	ug/L	ICP/MS	0.01	3/15/2022	RS
Cobalt (Co)	nd	ug/L	ICP/MS	0.05	3/15/2022	RS
Chromium (Cr)	nd	ug/L	ICP/MS	0.10	3/15/2022	RS
Copper (Cu)	1.460	ug/L	ICP/MS	0.10	3/15/2022	RS
Germanium (Ge)	nd	ug/L	ICP/MS	0.10	3/15/2022	RS
Lithium (Li)	0.138^	ug/L	ICP/MS	0.10	3/15/2022	RS
Manganese (Mn)	nd	ug/L	ICP/MS	0.10	3/15/2022	RS
Molybdenum (Mo)	nd	ug/L	ICP/MS	0.05	3/15/2022	RS
Nickel (Ni)	nd	ug/L	ICP/MS	0.10	3/15/2022	RS
Lead (Pb)	0.155^	ug/L	ICP/MS	0.10	3/15/2022	RS
Antimony (Sb)	0.188^	ug/L	ICP/MS	0.01	3/15/2022	RS
Selenium (Se)	nd	ug/L	ICP/MS	0.10	3/15/2022	RS
Silicon (Si)	105.824	ug/L	ICP/MS	5.00	3/15/2022	RS
Tin (Sn)	1.336	ug/L	ICP/MS	0.10	3/15/2022	RS
Strontium (Sr)	0.117^	ug/L	ICP/MS	0.10	3/15/2022	RS
Titanium (Ti)	0.244^	ug/L	ICP/MS	0.10	3/15/2022	RS
Thallium (Tl)	nd	ug/L	ICP/MS	0.05	3/15/2022	RS
Vanadium (V)	0.113^	ug/L	ICP/MS	0.01	3/15/2022	RS

Notes:

^= Result is below LOQ and above LOD

ppm: parts per million

nd: non-detect

n/a: not applicable

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Reviewed by Robert Smalling, Chemist on 3/23/2022

Approved by Tori Johnson, Operations Manager on 3/23/2022

Reviewed by Tori Johnson on 3/25/2022

Vanguard Laboratory
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Report of Laboratory Analysis

Defend our Health
565 Congress St, Ste 204
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412-889-7684

Matrix Liquid
Laboratory ID: V220309-3
Date Received: 3/9/2022
Date Reported: 3/23/2022

Sample ID: **8- Beverage**

Analysis	Result	Units	Method	LOD	Date of Analysis	Analyst Initials
pH	5.81	-	pH Probe	-	3/10/2022	RS
Aluminum (Al)	nd	ug/L	ICP/MS	0.50	3/15/2022	RS
Arsenic (As)	nd	ug/L	ICP/MS	0.05	3/15/2022	RS
Barium (Ba)	0.150^	ug/L	ICP/MS	0.10	3/15/2022	RS
Beryllium (Be)	nd	ug/L	ICP/MS	0.05	3/15/2022	RS
Cadmium (Cd)	nd	ug/L	ICP/MS	0.01	3/15/2022	RS
Cobalt (Co)	nd	ug/L	ICP/MS	0.05	3/15/2022	RS
Chromium (Cr)	0.205^	ug/L	ICP/MS	0.10	3/15/2022	RS
Copper (Cu)	0.245^	ug/L	ICP/MS	0.10	3/15/2022	RS
Germanium (Ge)	1.508	ug/L	ICP/MS	0.10	3/15/2022	RS
Lithium (Li)	0.215^	ug/L	ICP/MS	0.10	3/15/2022	RS
Manganese (Mn)	0.104^	ug/L	ICP/MS	0.10	3/15/2022	RS
Molybdenum (Mo)	nd	ug/L	ICP/MS	0.05	3/15/2022	RS
Nickel (Ni)	0.101^	ug/L	ICP/MS	0.10	3/15/2022	RS
Lead (Pb)	0.127^	ug/L	ICP/MS	0.10	3/15/2022	RS
Antimony (Sb)	0.171^	ug/L	ICP/MS	0.01	3/15/2022	RS
Selenium (Se)	nd	ug/L	ICP/MS	0.10	3/15/2022	RS
Silicon (Si)	48.287	ug/L	ICP/MS	5.00	3/15/2022	RS
Tin (Sn)	1.185	ug/L	ICP/MS	0.10	3/15/2022	RS
Strontium (Sr)	0.491^	ug/L	ICP/MS	0.10	3/15/2022	RS
Titanium (Ti)	0.419^	ug/L	ICP/MS	0.10	3/15/2022	RS
Thallium (Tl)	nd	ug/L	ICP/MS	0.05	3/15/2022	RS
Vanadium (V)	0.123^	ug/L	ICP/MS	0.01	3/15/2022	RS

Notes:

^= Result is below LOQ and above LOD

ppm: parts per million

nd: non-detect

n/a: not applicable

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Matrix Liquid
Laboratory ID: V220309-3
Date Received: 3/9/2022
Date Reported: 3/23/2022

Sample ID: **9- Beverage**

Analysis	Result	Units	Method	LOD	Date of Analysis	Analyst Initials
pH	2.99	-	pH Probe	-	3/10/2022	RS
Aluminum (Al)	nd	ug/L	ICP/MS	0.50	3/15/2022	RS
Arsenic (As)	0.383^	ug/L	ICP/MS	0.05	3/15/2022	RS
Barium (Ba)	1.741	ug/L	ICP/MS	0.10	3/15/2022	RS
Beryllium (Be)	nd	ug/L	ICP/MS	0.05	3/15/2022	RS
Cadmium (Cd)	nd	ug/L	ICP/MS	0.01	3/15/2022	RS
Cobalt (Co)	nd	ug/L	ICP/MS	0.05	3/15/2022	RS
Chromium (Cr)	0.903	ug/L	ICP/MS	0.10	3/15/2022	RS
Copper (Cu)	6.448	ug/L	ICP/MS	0.10	3/15/2022	RS
Germanium (Ge)	7.158	ug/L	ICP/MS	0.10	3/15/2022	RS
Lithium (Li)	4.602	ug/L	ICP/MS	0.10	3/15/2022	RS
Manganese (Mn)	0.538	ug/L	ICP/MS	0.10	3/15/2022	RS
Molybdenum (Mo)	0.412^	ug/L	ICP/MS	0.05	3/15/2022	RS
Nickel (Ni)	0.972	ug/L	ICP/MS	0.10	3/15/2022	RS
Lead (Pb)	0.146^	ug/L	ICP/MS	0.10	3/15/2022	RS
Antimony (Sb)	1.782	ug/L	ICP/MS	0.01	3/15/2022	RS
Selenium (Se)	nd	ug/L	ICP/MS	0.10	3/15/2022	RS
Silicon (Si)	nd	ug/L	ICP/MS	5.00	3/15/2022	RS
Tin (Sn)	0.777	ug/L	ICP/MS	0.10	3/15/2022	RS
Strontium (Sr)	21.402	ug/L	ICP/MS	0.10	3/15/2022	RS
Titanium (Ti)	3.708	ug/L	ICP/MS	0.10	3/15/2022	RS
Thallium (Tl)	nd	ug/L	ICP/MS	0.05	3/15/2022	RS
Vanadium (V)	0.146^	ug/L	ICP/MS	0.01	3/15/2022	RS

Notes:

^= Result is below LOQ and above LOD

ppm: parts per million

nd: non-detect

n/a: not applicable

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Matrix Liquid
Laboratory ID: V220309-3
Date Received: 3/9/2022
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Sample ID: **10- Beverage**

Analysis	Result	Units	Method	LOD	Date of Analysis	Analyst Initials
pH	2.58	-	pH Probe	-	3/10/2022	RS
Aluminum (Al)	nd	ug/L	ICP/MS	0.50	3/15/2022	RS
Arsenic (As)	0.325^	ug/L	ICP/MS	0.05	3/15/2022	RS
Barium (Ba)	12.240	ug/L	ICP/MS	0.10	3/15/2022	RS
Beryllium (Be)	nd	ug/L	ICP/MS	0.05	3/15/2022	RS
Cadmium (Cd)	nd	ug/L	ICP/MS	0.01	3/15/2022	RS
Cobalt (Co)	0.291^	ug/L	ICP/MS	0.05	3/15/2022	RS
Chromium (Cr)	0.849	ug/L	ICP/MS	0.10	3/15/2022	RS
Copper (Cu)	31.189	ug/L	ICP/MS	0.10	3/15/2022	RS
Germanium (Ge)	0.267^	ug/L	ICP/MS	0.10	3/15/2022	RS
Lithium (Li)	1.836	ug/L	ICP/MS	0.10	3/15/2022	RS
Manganese (Mn)	27.324	ug/L	ICP/MS	0.10	3/15/2022	RS
Molybdenum (Mo)	0.569	ug/L	ICP/MS	0.05	3/15/2022	RS
Nickel (Ni)	1.776	ug/L	ICP/MS	0.10	3/15/2022	RS
Lead (Pb)	0.410^	ug/L	ICP/MS	0.10	3/15/2022	RS
Antimony (Sb)	0.955	ug/L	ICP/MS	0.01	3/15/2022	RS
Selenium (Se)	nd	ug/L	ICP/MS	0.10	3/15/2022	RS
Silicon (Si)	25.082	ug/L	ICP/MS	5.00	3/15/2022	RS
Tin (Sn)	2.191	ug/L	ICP/MS	0.10	3/15/2022	RS
Strontium (Sr)	130.721	ug/L	ICP/MS	0.10	3/15/2022	RS
Titanium (Ti)	1.044	ug/L	ICP/MS	0.10	3/15/2022	RS
Thallium (Tl)	nd	ug/L	ICP/MS	0.05	3/15/2022	RS
Vanadium (V)	0.303^	ug/L	ICP/MS	0.01	3/15/2022	RS

Notes:

^= Result is below LOQ and above LOD

ppm: parts per million

nd: non-detect

n/a: not applicable

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Matrix Liquid
Laboratory ID: V220309-3
Date Received: 3/9/2022
Date Reported: 3/23/2022

Sample ID: **11- Beverage**

Analysis	Result	Units	Method	LOD	Date of Analysis	Analyst Initials
pH	3.33	-	pH Probe	-	3/10/2022	RS
Aluminum (Al)	7.711	ug/L	ICP/MS	0.50	3/15/2022	RS
Arsenic (As)	0.243^	ug/L	ICP/MS	0.05	3/15/2022	RS
Barium (Ba)	11.571	ug/L	ICP/MS	0.10	3/15/2022	RS
Beryllium (Be)	nd	ug/L	ICP/MS	0.05	3/15/2022	RS
Cadmium (Cd)	nd	ug/L	ICP/MS	0.01	3/15/2022	RS
Cobalt (Co)	nd	ug/L	ICP/MS	0.05	3/15/2022	RS
Chromium (Cr)	2.752	ug/L	ICP/MS	0.10	3/15/2022	RS
Copper (Cu)	0.277^	ug/L	ICP/MS	0.10	3/15/2022	RS
Germanium (Ge)	nd	ug/L	ICP/MS	0.10	3/15/2022	RS
Lithium (Li)	5.867	ug/L	ICP/MS	0.10	3/15/2022	RS
Manganese (Mn)	0.159^	ug/L	ICP/MS	0.10	3/15/2022	RS
Molybdenum (Mo)	6.524	ug/L	ICP/MS	0.05	3/15/2022	RS
Nickel (Ni)	0.112^	ug/L	ICP/MS	0.10	3/15/2022	RS
Lead (Pb)	0.162^	ug/L	ICP/MS	0.10	3/15/2022	RS
Antimony (Sb)	0.816	ug/L	ICP/MS	0.01	3/15/2022	RS
Selenium (Se)	0.775	ug/L	ICP/MS	0.10	3/15/2022	RS
Silicon (Si)	77.593	ug/L	ICP/MS	5.00	3/15/2022	RS
Tin (Sn)	2.322	ug/L	ICP/MS	0.10	3/15/2022	RS
Strontium (Sr)	196.125	ug/L	ICP/MS	0.10	3/15/2022	RS
Titanium (Ti)	0.614	ug/L	ICP/MS	0.10	3/15/2022	RS
Thallium (Tl)	nd	ug/L	ICP/MS	0.05	3/15/2022	RS
Vanadium (V)	2.407	ug/L	ICP/MS	0.01	3/15/2022	RS

Notes:

^= Result is below LOQ and above LOD

ppm: parts per million

nd: non-detect

n/a: not applicable

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Matrix Liquid
Laboratory ID: V220309-3
Date Received: 3/9/2022
Date Reported: 3/23/2022

Sample ID: **12- Beverage**

Analysis	Result	Units	Method	LOD	Date of Analysis	Analyst Initials
pH	3.17	-	pH Probe	-	3/10/2022	RS
Aluminum (Al)	nd	ug/L	ICP/MS	0.50	3/15/2022	RS
Arsenic (As)	0.119^	ug/L	ICP/MS	0.05	3/15/2022	RS
Barium (Ba)	0.222^	ug/L	ICP/MS	0.10	3/15/2022	RS
Beryllium (Be)	nd	ug/L	ICP/MS	0.05	3/15/2022	RS
Cadmium (Cd)	nd	ug/L	ICP/MS	0.01	3/15/2022	RS
Cobalt (Co)	nd	ug/L	ICP/MS	0.05	3/15/2022	RS
Chromium (Cr)	1.053	ug/L	ICP/MS	0.10	3/15/2022	RS
Copper (Cu)	0.191^	ug/L	ICP/MS	0.10	3/15/2022	RS
Germanium (Ge)	3.429	ug/L	ICP/MS	0.10	3/15/2022	RS
Lithium (Li)	1.641	ug/L	ICP/MS	0.10	3/15/2022	RS
Manganese (Mn)	0.345^	ug/L	ICP/MS	0.10	3/15/2022	RS
Molybdenum (Mo)	0.958	ug/L	ICP/MS	0.05	3/15/2022	RS
Nickel (Ni)	0.417^	ug/L	ICP/MS	0.10	3/15/2022	RS
Lead (Pb)	0.182^	ug/L	ICP/MS	0.10	3/15/2022	RS
Antimony (Sb)	1.102	ug/L	ICP/MS	0.01	3/15/2022	RS
Selenium (Se)	nd	ug/L	ICP/MS	0.10	3/15/2022	RS
Silicon (Si)	63.907	ug/L	ICP/MS	5.00	3/15/2022	RS
Tin (Sn)	1.018	ug/L	ICP/MS	0.10	3/15/2022	RS
Strontium (Sr)	1.249	ug/L	ICP/MS	0.10	3/15/2022	RS
Titanium (Ti)	3.917	ug/L	ICP/MS	0.10	3/15/2022	RS
Thallium (Tl)	nd	ug/L	ICP/MS	0.05	3/15/2022	RS
Vanadium (V)	0.197^	ug/L	ICP/MS	0.01	3/15/2022	RS

Notes:

^= Result is below LOQ and above LOD

ppm: parts per million

nd: non-detect

n/a: not applicable

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Matrix Liquid
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Date Received: 3/9/2022
Date Reported: 3/23/2022

Sample ID: **13- Beverage**

Analysis	Result	Units	Method	LOD	Date of Analysis	Analyst Initials
pH	3.45	-	pH Probe	-	3/10/2022	RS
Aluminum (Al)	288.155	ug/L	ICP/MS	0.50	3/15/2022	RS
Arsenic (As)	2.080	ug/L	ICP/MS	0.05	3/15/2022	RS
Barium (Ba)	62.764	ug/L	ICP/MS	0.10	3/15/2022	RS
Beryllium (Be)	nd	ug/L	ICP/MS	0.05	3/15/2022	RS
Cadmium (Cd)	nd	ug/L	ICP/MS	0.01	3/15/2022	RS
Cobalt (Co)	0.848	ug/L	ICP/MS	0.05	3/15/2022	RS
Chromium (Cr)	2.356	ug/L	ICP/MS	0.10	3/15/2022	RS
Copper (Cu)	23.332	ug/L	ICP/MS	0.10	3/15/2022	RS
Germanium (Ge)	7.899	ug/L	ICP/MS	0.10	3/15/2022	RS
Lithium (Li)	2.237	ug/L	ICP/MS	0.10	3/15/2022	RS
Manganese (Mn)	166.958	ug/L	ICP/MS	0.10	3/15/2022	RS
Molybdenum (Mo)	0.236^	ug/L	ICP/MS	0.05	3/15/2022	RS
Nickel (Ni)	3.725	ug/L	ICP/MS	0.10	3/15/2022	RS
Lead (Pb)	0.616	ug/L	ICP/MS	0.10	3/15/2022	RS
Antimony (Sb)	0.975	ug/L	ICP/MS	0.01	3/15/2022	RS
Selenium (Se)	nd	ug/L	ICP/MS	0.10	3/15/2022	RS
Silicon (Si)	0.859	ug/L	ICP/MS	5.00	3/15/2022	RS
Tin (Sn)	1.937	ug/L	ICP/MS	0.10	3/15/2022	RS
Strontium (Sr)	69.811	ug/L	ICP/MS	0.10	3/15/2022	RS
Titanium (Ti)	2.067	ug/L	ICP/MS	0.10	3/15/2022	RS
Thallium (Tl)	0.843	ug/L	ICP/MS	0.05	3/15/2022	RS
Vanadium (V)	0.142^	ug/L	ICP/MS	0.01	3/15/2022	RS

Notes:

^= Result is below LOQ and above LOD

ppm: parts per million

nd: non-detect

n/a: not applicable

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Matrix Liquid
Laboratory ID: V220309-3
Date Received: 3/9/2022
Date Reported: 3/23/2022

Sample ID: **14- Beverage**

Analysis	Result	Units	Method	LOD	Date of Analysis	Analyst Initials
pH	2.89	-	pH Probe	-	3/10/2022	RS
Aluminum (Al)	173.449	ug/L	ICP/MS	0.50	3/15/2022	RS
Arsenic (As)	5.826	ug/L	ICP/MS	0.05	3/15/2022	RS
Barium (Ba)	220.080	ug/L	ICP/MS	0.10	3/15/2022	RS
Beryllium (Be)	nd	ug/L	ICP/MS	0.05	3/15/2022	RS
Cadmium (Cd)	1.176	ug/L	ICP/MS	0.01	3/15/2022	RS
Cobalt (Co)	3.738	ug/L	ICP/MS	0.05	3/15/2022	RS
Chromium (Cr)	3.796	ug/L	ICP/MS	0.10	3/15/2022	RS
Copper (Cu)	16.593	ug/L	ICP/MS	0.10	3/15/2022	RS
Germanium (Ge)	8.039	ug/L	ICP/MS	0.10	3/15/2022	RS
Lithium (Li)	24.461	ug/L	ICP/MS	0.10	3/15/2022	RS
Manganese (Mn)	639.139	ug/L	ICP/MS	0.10	3/15/2022	RS
Molybdenum (Mo)	0.254^	ug/L	ICP/MS	0.05	3/15/2022	RS
Nickel (Ni)	18.236	ug/L	ICP/MS	0.10	3/15/2022	RS
Lead (Pb)	1.092	ug/L	ICP/MS	0.10	3/15/2022	RS
Antimony (Sb)	0.464^	ug/L	ICP/MS	0.01	3/15/2022	RS
Selenium (Se)	0.517	ug/L	ICP/MS	0.10	3/15/2022	RS
Silicon (Si)	168.592	ug/L	ICP/MS	5.00	3/15/2022	RS
Tin (Sn)	1.604	ug/L	ICP/MS	0.10	3/15/2022	RS
Strontium (Sr)	421.593	ug/L	ICP/MS	0.10	3/15/2022	RS
Titanium (Ti)	2.678	ug/L	ICP/MS	0.10	3/15/2022	RS
Thallium (Tl)	0.172^	ug/L	ICP/MS	0.05	3/15/2022	RS
Vanadium (V)	0.525	ug/L	ICP/MS	0.01	3/15/2022	RS

Notes:

^= Result is below LOQ and above LOD

ppm: parts per million

nd: non-detect

n/a: not applicable

Reviewed by Robert Smalling, Chemist on 3/23/2022

Approved by Tori Johnson, Operations Manager on 3/23/2022

Reviewed by Tori Johnson on 3/25/2022

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Matrix Liquid
Laboratory ID: V220309-3
Date Received: 3/9/2022
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Sample ID: **15- Beverage**

Analysis	Result	Units	Method	LOD	Date of Analysis	Analyst Initials
pH	2.35	-	pH Probe	-	3/10/2022	RS
Aluminum (Al)	nd	ug/L	ICP/MS	0.50	3/15/2022	RS
Arsenic (As)	0.175^	ug/L	ICP/MS	0.05	3/15/2022	RS
Barium (Ba)	1.883	ug/L	ICP/MS	0.10	3/15/2022	RS
Beryllium (Be)	nd	ug/L	ICP/MS	0.05	3/15/2022	RS
Cadmium (Cd)	nd	ug/L	ICP/MS	0.01	3/15/2022	RS
Cobalt (Co)	0.357^	ug/L	ICP/MS	0.05	3/15/2022	RS
Chromium (Cr)	0.540	ug/L	ICP/MS	0.10	3/15/2022	RS
Copper (Cu)	0.547	ug/L	ICP/MS	0.10	3/15/2022	RS
Germanium (Ge)	3.223	ug/L	ICP/MS	0.10	3/15/2022	RS
Lithium (Li)	1.318	ug/L	ICP/MS	0.10	3/15/2022	RS
Manganese (Mn)	0.895	ug/L	ICP/MS	0.10	3/15/2022	RS
Molybdenum (Mo)	0.615	ug/L	ICP/MS	0.05	3/15/2022	RS
Nickel (Ni)	0.185^	ug/L	ICP/MS	0.10	3/15/2022	RS
Lead (Pb)	0.432^	ug/L	ICP/MS	0.10	3/15/2022	RS
Antimony (Sb)	0.878	ug/L	ICP/MS	0.01	3/15/2022	RS
Selenium (Se)	nd	ug/L	ICP/MS	0.10	3/15/2022	RS
Silicon (Si)	73.330	ug/L	ICP/MS	5.00	3/15/2022	RS
Tin (Sn)	0.698	ug/L	ICP/MS	0.10	3/15/2022	RS
Strontium (Sr)	16.611	ug/L	ICP/MS	0.10	3/15/2022	RS
Titanium (Ti)	3.012	ug/L	ICP/MS	0.10	3/15/2022	RS
Thallium (Tl)	nd	ug/L	ICP/MS	0.05	3/15/2022	RS
Vanadium (V)	0.290^	ug/L	ICP/MS	0.01	3/15/2022	RS

Notes:

^= Result is below LOQ and above LOD

ppm: parts per million

nd: non-detect

n/a: not applicable

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Reviewed by Robert Smalling, Chemist on 3/23/2022

Approved by Tori Johnson, Operations Manager on 3/23/2022

Reviewed by Tori Johnson on 3/25/2022

Vanguard Laboratory
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360.967.7010

Report of Laboratory Analysis

Defend our Health
565 Congress St, Ste 204
Portland, ME 4101
412-889-7684

Matrix Liquid
Laboratory ID: V220309-3
Date Received: 3/9/2022
Date Reported: 3/23/2022

Sample ID: **16- Beverage**

Analysis	Result	Units	Method	LOD	Date of Analysis	Analyst Initials
pH	3.71	-	pH Probe	-	3/10/2022	RS
Aluminum (Al)	64.396	ug/L	ICP/MS	0.50	3/15/2022	RS
Arsenic (As)	0.360^	ug/L	ICP/MS	0.05	3/15/2022	RS
Barium (Ba)	98.023	ug/L	ICP/MS	0.10	3/15/2022	RS
Beryllium (Be)	nd	ug/L	ICP/MS	0.05	3/15/2022	RS
Cadmium (Cd)	nd	ug/L	ICP/MS	0.01	3/15/2022	RS
Cobalt (Co)	1.176	ug/L	ICP/MS	0.05	3/15/2022	RS
Chromium (Cr)	6.790	ug/L	ICP/MS	0.10	3/15/2022	RS
Copper (Cu)	286.043	ug/L	ICP/MS	0.10	3/15/2022	RS
Germanium (Ge)	0.255^	ug/L	ICP/MS	0.10	3/15/2022	RS
Lithium (Li)	1.888	ug/L	ICP/MS	0.10	3/15/2022	RS
Manganese (Mn)	324.432	ug/L	ICP/MS	0.10	3/15/2022	RS
Molybdenum (Mo)	3.461	ug/L	ICP/MS	0.05	3/15/2022	RS
Nickel (Ni)	9.106	ug/L	ICP/MS	0.10	3/15/2022	RS
Lead (Pb)	0.359^	ug/L	ICP/MS	0.10	3/15/2022	RS
Antimony (Sb)	0.564	ug/L	ICP/MS	0.01	3/15/2022	RS
Selenium (Se)	0.332^	ug/L	ICP/MS	0.10	3/15/2022	RS
Silicon (Si)	64.431	ug/L	ICP/MS	5.00	3/15/2022	RS
Tin (Sn)	1.061	ug/L	ICP/MS	0.10	3/15/2022	RS
Strontium (Sr)	15259.896	ug/L	ICP/MS	0.10	3/15/2022	RS
Titanium (Ti)	5.753	ug/L	ICP/MS	0.10	3/15/2022	RS
Thallium (Tl)	0.213^	ug/L	ICP/MS	0.05	3/15/2022	RS
Vanadium (V)	0.196^	ug/L	ICP/MS	0.01	3/15/2022	RS

Notes:

^= Result is below LOQ and above LOD

ppm: parts per million

nd: non-detect

n/a: not applicable

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Report of Laboratory Analysis

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412-889-7684

Matrix Liquid
Laboratory ID: V220309-3
Date Received: 3/9/2022
Date Reported: 3/23/2022

Sample ID: **18- Beverage**

Analysis	Result	Units	Method	LOD	Date of Analysis	Analyst Initials
pH	4.11	-	pH Probe	-	3/10/2022	RS
Aluminum (Al)	1673.112	ug/L	ICP/MS	0.50	3/15/2022	RS
Arsenic (As)	2.172	ug/L	ICP/MS	0.05	3/15/2022	RS
Barium (Ba)	198.045	ug/L	ICP/MS	0.10	3/15/2022	RS
Beryllium (Be)	nd	ug/L	ICP/MS	0.05	3/15/2022	RS
Cadmium (Cd)	11.096	ug/L	ICP/MS	0.01	3/15/2022	RS
Cobalt (Co)	4.890	ug/L	ICP/MS	0.05	3/15/2022	RS
Chromium (Cr)	5.932	ug/L	ICP/MS	0.10	3/15/2022	RS
Copper (Cu)	428.549	ug/L	ICP/MS	0.10	3/15/2022	RS
Germanium (Ge)	4.812	ug/L	ICP/MS	0.10	3/15/2022	RS
Lithium (Li)	30.949	ug/L	ICP/MS	0.10	3/15/2022	RS
Manganese (Mn)	641.487	ug/L	ICP/MS	0.10	3/15/2022	RS
Molybdenum (Mo)	17.890	ug/L	ICP/MS	0.05	3/15/2022	RS
Nickel (Ni)	56.770	ug/L	ICP/MS	0.10	3/15/2022	RS
Lead (Pb)	2.543	ug/L	ICP/MS	0.10	3/15/2022	RS
Antimony (Sb)	3.447	ug/L	ICP/MS	0.01	3/15/2022	RS
Selenium (Se)	5.093	ug/L	ICP/MS	0.10	3/15/2022	RS
Silicon (Si)	125.141	ug/L	ICP/MS	5.00	3/15/2022	RS
Tin (Sn)	1.212	ug/L	ICP/MS	0.10	3/15/2022	RS
Strontium (Sr)	718.442	ug/L	ICP/MS	0.10	3/15/2022	RS
Titanium (Ti)	21.239	ug/L	ICP/MS	0.10	3/15/2022	RS
Thallium (Tl)	0.235^	ug/L	ICP/MS	0.05	3/15/2022	RS
Vanadium (V)	4.027	ug/L	ICP/MS	0.01	3/15/2022	RS

Notes:

^= Result is below LOQ and above LOD

ppm: parts per million

nd: non-detect

n/a: not applicable

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Matrix Liquid
Laboratory ID: V220309-3
Date Received: 3/9/2022
Date Reported: 3/23/2022

Sample ID: **19- Beverage**

Analysis	Result	Units	Method	LOD	Date of Analysis	Analyst Initials
pH	2.92	-	pH Probe	-	3/10/2022	RS
Aluminum (Al)	1094.372	ug/L	ICP/MS	0.50	3/15/2022	RS
Arsenic (As)	0.192^	ug/L	ICP/MS	0.05	3/15/2022	RS
Barium (Ba)	15.851	ug/L	ICP/MS	0.10	3/15/2022	RS
Beryllium (Be)	nd	ug/L	ICP/MS	0.05	3/15/2022	RS
Cadmium (Cd)	nd	ug/L	ICP/MS	0.01	3/15/2022	RS
Cobalt (Co)	0.387^	ug/L	ICP/MS	0.05	3/15/2022	RS
Chromium (Cr)	1.912	ug/L	ICP/MS	0.10	3/15/2022	RS
Copper (Cu)	8.947	ug/L	ICP/MS	0.10	3/15/2022	RS
Germanium (Ge)	3.610	ug/L	ICP/MS	0.10	3/15/2022	RS
Lithium (Li)	1.491	ug/L	ICP/MS	0.10	3/15/2022	RS
Manganese (Mn)	589.848	ug/L	ICP/MS	0.10	3/15/2022	RS
Molybdenum (Mo)	0.139^	ug/L	ICP/MS	0.05	3/15/2022	RS
Nickel (Ni)	27.627	ug/L	ICP/MS	0.10	3/15/2022	RS
Lead (Pb)	0.202^	ug/L	ICP/MS	0.10	3/15/2022	RS
Antimony (Sb)	0.504	ug/L	ICP/MS	0.01	3/15/2022	RS
Selenium (Se)	nd	ug/L	ICP/MS	0.10	3/15/2022	RS
Silicon (Si)	41.638	ug/L	ICP/MS	5.00	3/15/2022	RS
Tin (Sn)	0.442^	ug/L	ICP/MS	0.10	3/15/2022	RS
Strontium (Sr)	18.177	ug/L	ICP/MS	0.10	3/15/2022	RS
Titanium (Ti)	0.515	ug/L	ICP/MS	0.10	3/15/2022	RS
Thallium (Tl)	nd	ug/L	ICP/MS	0.05	3/15/2022	RS
Vanadium (V)	nd	ug/L	ICP/MS	0.01	3/15/2022	RS

Notes:

^= Result is below LOQ and above LOD

ppm: parts per million

nd: non-detect

n/a: not applicable

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Report of Laboratory Analysis

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Matrix Liquid
Laboratory ID: V220309-3
Date Received: 3/9/2022
Date Reported: 3/23/2022

Sample ID: **20- Beverage**

Analysis	Result	Units	Method	LOD	Date of Analysis	Analyst Initials
pH	2.89	-	pH Probe	-	3/10/2022	RS
Aluminum (Al)	1763.416	ug/L	ICP/MS	0.50	3/15/2022	RS
Arsenic (As)	0.149^	ug/L	ICP/MS	0.05	3/15/2022	RS
Barium (Ba)	14.334	ug/L	ICP/MS	0.10	3/15/2022	RS
Beryllium (Be)	nd	ug/L	ICP/MS	0.05	3/15/2022	RS
Cadmium (Cd)	nd	ug/L	ICP/MS	0.01	3/15/2022	RS
Cobalt (Co)	0.532	ug/L	ICP/MS	0.05	3/15/2022	RS
Chromium (Cr)	3.237	ug/L	ICP/MS	0.10	3/15/2022	RS
Copper (Cu)	22.634	ug/L	ICP/MS	0.10	3/15/2022	RS
Germanium (Ge)	1.331	ug/L	ICP/MS	0.10	3/15/2022	RS
Lithium (Li)	2.080	ug/L	ICP/MS	0.10	3/15/2022	RS
Manganese (Mn)	771.715	ug/L	ICP/MS	0.10	3/15/2022	RS
Molybdenum (Mo)	0.219^	ug/L	ICP/MS	0.05	3/15/2022	RS
Nickel (Ni)	22.704	ug/L	ICP/MS	0.10	3/15/2022	RS
Lead (Pb)	0.243^	ug/L	ICP/MS	0.10	3/15/2022	RS
Antimony (Sb)	1.069	ug/L	ICP/MS	0.01	3/15/2022	RS
Selenium (Se)	nd	ug/L	ICP/MS	0.10	3/15/2022	RS
Silicon (Si)	39.013	ug/L	ICP/MS	5.00	3/15/2022	RS
Tin (Sn)	0.364^	ug/L	ICP/MS	0.10	3/15/2022	RS
Strontium (Sr)	21.842	ug/L	ICP/MS	0.10	3/15/2022	RS
Titanium (Ti)	1.451	ug/L	ICP/MS	0.10	3/15/2022	RS
Thallium (Tl)	0.130^	ug/L	ICP/MS	0.05	3/15/2022	RS
Vanadium (V)	0.291^	ug/L	ICP/MS	0.01	3/15/2022	RS

Notes:

^= Result is below LOQ and above LOD

ppm: parts per million

nd: non-detect

n/a: not applicable

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Matrix Liquid
Laboratory ID: V220309-3
Date Received: 3/9/2022
Date Reported: 3/23/2022

Sample ID: **21- Beverage**

Analysis	Result	Units	Method	LOD	Date of Analysis	Analyst Initials
pH	2.9	-	pH Probe	-	3/10/2022	RS
Aluminum (Al)	nd	ug/L	ICP/MS	0.50	3/15/2022	RS
Arsenic (As)	0.173^	ug/L	ICP/MS	0.05	3/15/2022	RS
Barium (Ba)	1.878	ug/L	ICP/MS	0.10	3/15/2022	RS
Beryllium (Be)	nd	ug/L	ICP/MS	0.05	3/15/2022	RS
Cadmium (Cd)	nd	ug/L	ICP/MS	0.01	3/15/2022	RS
Cobalt (Co)	nd	ug/L	ICP/MS	0.05	3/15/2022	RS
Chromium (Cr)	1.661	ug/L	ICP/MS	0.10	3/15/2022	RS
Copper (Cu)	0.375^	ug/L	ICP/MS	0.10	3/15/2022	RS
Germanium (Ge)	0.457^	ug/L	ICP/MS	0.10	3/15/2022	RS
Lithium (Li)	3.666	ug/L	ICP/MS	0.10	3/15/2022	RS
Manganese (Mn)	4.763	ug/L	ICP/MS	0.10	3/15/2022	RS
Molybdenum (Mo)	0.857	ug/L	ICP/MS	0.05	3/15/2022	RS
Nickel (Ni)	0.675	ug/L	ICP/MS	0.10	3/15/2022	RS
Lead (Pb)	0.198^	ug/L	ICP/MS	0.10	3/15/2022	RS
Antimony (Sb)	0.785	ug/L	ICP/MS	0.01	3/15/2022	RS
Selenium (Se)	nd	ug/L	ICP/MS	0.10	3/15/2022	RS
Silicon (Si)	63.627	ug/L	ICP/MS	5.00	3/15/2022	RS
Tin (Sn)	nd	ug/L	ICP/MS	0.10	3/15/2022	RS
Strontium (Sr)	17.412	ug/L	ICP/MS	0.10	3/15/2022	RS
Titanium (Ti)	4.117	ug/L	ICP/MS	0.10	3/15/2022	RS
Thallium (Tl)	nd	ug/L	ICP/MS	0.05	3/15/2022	RS
Vanadium (V)	0.168^	ug/L	ICP/MS	0.01	3/15/2022	RS

Notes:

^= Result is below LOQ and above LOD

ppm: parts per million

nd: non-detect

n/a: not applicable

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Matrix Plastic
Laboratory ID: V220309-3
Date Received: 3/9/2022
Date Reported: 3/25/2022

Sample ID: **1- Bottle**

Analysis	Result	Units	Method	LOD (ug/L)	Date of Analysis	Analyst Initials
Aluminum (Al)	285.721	ug/L	ICP/MS	0.50	3/23/2022	RS
Arsenic (As)	2.238	ug/L	ICP/MS	0.05	3/21/2022	RS
Barium (Ba)	105.200	ug/L	ICP/MS	0.10	3/21/2022	RS
Beryllium (Be)	0.708	ug/L	ICP/MS	0.05	3/21/2022	RS
Cadmium (Cd)	0.641	ug/L	ICP/MS	0.01	3/21/2022	RS
Cobalt (Co)	676.361	ug/L	ICP/MS	0.05	3/21/2022	RS
Chromium (Cr)	45.383	ug/L	ICP/MS	0.10	3/21/2022	RS
Copper (Cu)	nd	ug/L	ICP/MS	0.10	3/21/2022	RS
Germanium (Ge)	nd	ug/L	ICP/MS	0.10	3/21/2022	RS
Lithium (Li)	121.113	ug/L	ICP/MS	0.10	3/21/2022	RS
Manganese (Mn)	73.267	ug/L	ICP/MS	0.10	3/21/2022	RS
Molybdenum (Mo)	4.911	ug/L	ICP/MS	0.05	3/21/2022	RS
Nickel (Ni)	17.880	ug/L	ICP/MS	0.10	3/21/2022	RS
Lead (Pb)	7.890	ug/L	ICP/MS	0.10	3/21/2022	RS
Antimony (Sb)	12331.640	ug/L	ICP/MS	0.01	3/22/2022	RS
Selenium (Se)	1.802	ug/L	ICP/MS	0.10	3/21/2022	RS
Silicon (Si)	nd	ug/L	ICP/MS	5.00	3/25/2022	RS
Tin (Sn)	nd	ug/L	ICP/MS	0.10	3/21/2022	RS
Strontium (Sr)	26.146	ug/L	ICP/MS	0.10	3/21/2022	RS
Titanium (Ti)	79.304	ug/L	ICP/MS	0.10	3/21/2022	RS
Thallium (Tl)	4.668	ug/L	ICP/MS	0.05	3/21/2022	RS
Vanadium (V)	1.783	ug/L	ICP/MS	0.01	3/21/2022	RS

Notes:

^= Result is below LOQ and above LOD

ppm: parts per million

nd: non-detect

n/a: not applicable

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Matrix Plastic
Laboratory ID: V220309-3
Date Received: 3/9/2022
Date Reported: 3/25/2022

Sample ID: **2- Bottle**

Analysis	Result	Units	Method	LOD (ug/L)	Date of Analysis	Analyst Initials
Aluminum (Al)	151.102	ug/L	ICP/MS	0.50	3/23/2022	RS
Arsenic (As)	3.564	ug/L	ICP/MS	0.05	3/21/2022	RS
Barium (Ba)	73.735	ug/L	ICP/MS	0.10	3/21/2022	RS
Beryllium (Be)	0.686	ug/L	ICP/MS	0.05	3/21/2022	RS
Cadmium (Cd)	0.590	ug/L	ICP/MS	0.01	3/21/2022	RS
Cobalt (Co)	608.863	ug/L	ICP/MS	0.05	3/21/2022	RS
Chromium (Cr)	40.983	ug/L	ICP/MS	0.10	3/21/2022	RS
Copper (Cu)	6.149	ug/L	ICP/MS	0.10	3/21/2022	RS
Germanium (Ge)	29.343	ug/L	ICP/MS	0.10	3/21/2022	RS
Lithium (Li)	96.335	ug/L	ICP/MS	0.10	3/21/2022	RS
Manganese (Mn)	122.281	ug/L	ICP/MS	0.10	3/21/2022	RS
Molybdenum (Mo)	4.297	ug/L	ICP/MS	0.05	3/21/2022	RS
Nickel (Ni)	14.983	ug/L	ICP/MS	0.10	3/21/2022	RS
Lead (Pb)	26.050	ug/L	ICP/MS	0.10	3/21/2022	RS
Antimony (Sb)	14237.314	ug/L	ICP/MS	0.01	3/22/2022	RS
Selenium (Se)	2.823	ug/L	ICP/MS	0.10	3/21/2022	RS
Silicon (Si)	nd	ug/L	ICP/MS	5.00	3/25/2022	RS
Tin (Sn)	nd	ug/L	ICP/MS	0.10	3/21/2022	RS
Strontium (Sr)	11.385	ug/L	ICP/MS	0.10	3/21/2022	RS
Titanium (Ti)	84.397	ug/L	ICP/MS	0.10	3/21/2022	RS
Thallium (Tl)	3.697	ug/L	ICP/MS	0.05	3/21/2022	RS
Vanadium (V)	9.549	ug/L	ICP/MS	0.01	3/21/2022	RS

Notes:

^= Result is below LOQ and above LOD

ppm: parts per million

nd: non-detect

n/a: not applicable

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Matrix Plastic
Laboratory ID: V220309-3
Date Received: 3/9/2022
Date Reported: 3/25/2022

Sample ID: **3- Bottle**

Analysis	Result	Units	Method	LOD (ug/L)	Date of Analysis	Analyst Initials
Aluminum (Al)	nd	ug/L	ICP/MS	0.50	3/23/2022	RS
Arsenic (As)	6.687	ug/L	ICP/MS	0.05	3/21/2022	RS
Barium (Ba)	187.754	ug/L	ICP/MS	0.10	3/21/2022	RS
Beryllium (Be)	0.104^	ug/L	ICP/MS	0.05	3/21/2022	RS
Cadmium (Cd)	0.384^	ug/L	ICP/MS	0.01	3/21/2022	RS
Cobalt (Co)	21.321	ug/L	ICP/MS	0.05	3/21/2022	RS
Chromium (Cr)	28.341	ug/L	ICP/MS	0.10	3/21/2022	RS
Copper (Cu)	nd	ug/L	ICP/MS	0.10	3/21/2022	RS
Germanium (Ge)	100.425	ug/L	ICP/MS	0.10	3/21/2022	RS
Lithium (Li)	nd	ug/L	ICP/MS	0.10	3/21/2022	RS
Manganese (Mn)	81.487	ug/L	ICP/MS	0.10	3/21/2022	RS
Molybdenum (Mo)	2.840	ug/L	ICP/MS	0.05	3/21/2022	RS
Nickel (Ni)	0.899	ug/L	ICP/MS	0.10	3/21/2022	RS
Lead (Pb)	80.010	ug/L	ICP/MS	0.10	3/21/2022	RS
Antimony (Sb)	19431.852	ug/L	ICP/MS	0.01	3/22/2022	RS
Selenium (Se)	nd	ug/L	ICP/MS	0.10	3/21/2022	RS
Silicon (Si)	nd	ug/L	ICP/MS	5.00	3/25/2022	RS
Tin (Sn)	nd	ug/L	ICP/MS	0.10	3/21/2022	RS
Strontium (Sr)	nd	ug/L	ICP/MS	0.10	3/21/2022	RS
Titanium (Ti)	8.432	ug/L	ICP/MS	0.10	3/21/2022	RS
Thallium (Tl)	2.858	ug/L	ICP/MS	0.05	3/21/2022	RS
Vanadium (V)	nd	ug/L	ICP/MS	0.01	3/21/2022	RS

Notes:

^= Result is below LOQ and above LOD

ppm: parts per million

nd: non-detect

n/a: not applicable

Reviewed by Robert Smalling, Chemist on 3/25/2022

Approved by Tori Johnson, Operations Manager on 3/25/2022

Vanguard Laboratory
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Report of Laboratory Analysis

Defend our Health
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412-889-7684

Matrix Plastic
Laboratory ID: V220309-3
Date Received: 3/9/2022
Date Reported: 3/25/2022

Sample ID: **4- Bottle**

Analysis	Result	Units	Method	LOD (ug/L)	Date of Analysis	Analyst Initials
Aluminum (Al)	45.724	ug/L	ICP/MS	0.50	3/23/2022	RS
Arsenic (As)	nd	ug/L	ICP/MS	0.05	3/21/2022	RS
Barium (Ba)	62.406	ug/L	ICP/MS	0.10	3/21/2022	RS
Beryllium (Be)	0.336^	ug/L	ICP/MS	0.05	3/21/2022	RS
Cadmium (Cd)	0.251^	ug/L	ICP/MS	0.01	3/21/2022	RS
Cobalt (Co)	949.575	ug/L	ICP/MS	0.05	3/21/2022	RS
Chromium (Cr)	5.140	ug/L	ICP/MS	0.10	3/21/2022	RS
Copper (Cu)	690.032	ug/L	ICP/MS	0.10	3/21/2022	RS
Germanium (Ge)	2.443	ug/L	ICP/MS	0.10	3/21/2022	RS
Lithium (Li)	1501.783	ug/L	ICP/MS	0.10	3/21/2022	RS
Manganese (Mn)	60.607	ug/L	ICP/MS	0.10	3/21/2022	RS
Molybdenum (Mo)	2.698	ug/L	ICP/MS	0.05	3/21/2022	RS
Nickel (Ni)	2.498	ug/L	ICP/MS	0.10	3/21/2022	RS
Lead (Pb)	14.736	ug/L	ICP/MS	0.10	3/21/2022	RS
Antimony (Sb)	16.201	ug/L	ICP/MS	0.01	3/22/2022	RS
Selenium (Se)	nd	ug/L	ICP/MS	0.10	3/21/2022	RS
Silicon (Si)	nd	ug/L	ICP/MS	5.00	3/25/2022	RS
Tin (Sn)	nd	ug/L	ICP/MS	0.10	3/21/2022	RS
Strontium (Sr)	nd	ug/L	ICP/MS	0.10	3/21/2022	RS
Titanium (Ti)	748.566	ug/L	ICP/MS	0.10	3/21/2022	RS
Thallium (Tl)	2.253	ug/L	ICP/MS	0.05	3/21/2022	RS
Vanadium (V)	nd	ug/L	ICP/MS	0.01	3/21/2022	RS

Notes:

^= Result is below LOQ and above LOD

ppm: parts per million

nd: non-detect

n/a: not applicable

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Matrix Plastic
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Sample ID: **5- Bottle**

Analysis	Result	Units	Method	LOD (ug/L)	Date of Analysis	Analyst Initials
Aluminum (Al)	nd	ug/L	ICP/MS	0.50	3/23/2022	RS
Arsenic (As)	0.171^	ug/L	ICP/MS	0.05	3/21/2022	RS
Barium (Ba)	13.455	ug/L	ICP/MS	0.10	3/21/2022	RS
Beryllium (Be)	0.354^	ug/L	ICP/MS	0.05	3/21/2022	RS
Cadmium (Cd)	0.453^	ug/L	ICP/MS	0.01	3/21/2022	RS
Cobalt (Co)	87.024	ug/L	ICP/MS	0.05	3/21/2022	RS
Chromium (Cr)	25.323	ug/L	ICP/MS	0.10	3/21/2022	RS
Copper (Cu)	1922.863	ug/L	ICP/MS	0.10	3/21/2022	RS
Germanium (Ge)	nd	ug/L	ICP/MS	0.10	3/21/2022	RS
Lithium (Li)	nd	ug/L	ICP/MS	0.10	3/21/2022	RS
Manganese (Mn)	14.747	ug/L	ICP/MS	0.10	3/21/2022	RS
Molybdenum (Mo)	15.301	ug/L	ICP/MS	0.05	3/21/2022	RS
Nickel (Ni)	5.592	ug/L	ICP/MS	0.10	3/21/2022	RS
Lead (Pb)	5.136	ug/L	ICP/MS	0.10	3/21/2022	RS
Antimony (Sb)	36564.549	ug/L	ICP/MS	0.01	3/22/2022	RS
Selenium (Se)	nd	ug/L	ICP/MS	0.10	3/21/2022	RS
Silicon (Si)	nd	ug/L	ICP/MS	5.00	3/25/2022	RS
Tin (Sn)	nd	ug/L	ICP/MS	0.10	3/21/2022	RS
Strontium (Sr)	nd	ug/L	ICP/MS	0.10	3/21/2022	RS
Titanium (Ti)	7.167	ug/L	ICP/MS	0.10	3/21/2022	RS
Thallium (Tl)	8.852	ug/L	ICP/MS	0.05	3/21/2022	RS
Vanadium (V)	nd	ug/L	ICP/MS	0.01	3/21/2022	RS

Notes:

^= Result is below LOQ and above LOD

ppm: parts per million

nd: non-detect

n/a: not applicable

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Sample ID: **6- Bottle**

Analysis	Result	Units	Method	LOD (ug/L)	Date of Analysis	Analyst Initials
Aluminum (Al)	nd	ug/L	ICP/MS	0.50	3/23/2022	RS
Arsenic (As)	5.806	ug/L	ICP/MS	0.05	3/21/2022	RS
Barium (Ba)	6.435	ug/L	ICP/MS	0.10	3/21/2022	RS
Beryllium (Be)	0.247^	ug/L	ICP/MS	0.05	3/21/2022	RS
Cadmium (Cd)	0.342^	ug/L	ICP/MS	0.01	3/21/2022	RS
Cobalt (Co)	104.176	ug/L	ICP/MS	0.05	3/21/2022	RS
Chromium (Cr)	45.531	ug/L	ICP/MS	0.10	3/21/2022	RS
Copper (Cu)	nd	ug/L	ICP/MS	0.10	3/21/2022	RS
Germanium (Ge)	nd	ug/L	ICP/MS	0.10	3/21/2022	RS
Lithium (Li)	2.823	ug/L	ICP/MS	0.10	3/21/2022	RS
Manganese (Mn)	249.525	ug/L	ICP/MS	0.10	3/21/2022	RS
Molybdenum (Mo)	4.321	ug/L	ICP/MS	0.05	3/21/2022	RS
Nickel (Ni)	16.872	ug/L	ICP/MS	0.10	3/21/2022	RS
Lead (Pb)	14.182	ug/L	ICP/MS	0.10	3/21/2022	RS
Antimony (Sb)	4324.772	ug/L	ICP/MS	0.01	3/22/2022	RS
Selenium (Se)	nd	ug/L	ICP/MS	0.10	3/21/2022	RS
Silicon (Si)	nd	ug/L	ICP/MS	5.00	3/25/2022	RS
Tin (Sn)	nd	ug/L	ICP/MS	0.10	3/21/2022	RS
Strontium (Sr)	nd	ug/L	ICP/MS	0.10	3/21/2022	RS
Titanium (Ti)	33.520	ug/L	ICP/MS	0.10	3/21/2022	RS
Thallium (Tl)	4.143	ug/L	ICP/MS	0.05	3/21/2022	RS
Vanadium (V)	41.133	ug/L	ICP/MS	0.01	3/21/2022	RS

Notes:

^= Result is below LOQ and above LOD

ppm: parts per million

nd: non-detect

n/a: not applicable

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Sample ID: **7- Bottle**

Analysis	Result	Units	Method	LOD (ug/L)	Date of Analysis	Analyst Initials
Aluminum (Al)	nd	ug/L	ICP/MS	0.50	3/23/2022	RS
Arsenic (As)	3.666	ug/L	ICP/MS	0.05	3/21/2022	RS
Barium (Ba)	10.328	ug/L	ICP/MS	0.10	3/21/2022	RS
Beryllium (Be)	0.121^	ug/L	ICP/MS	0.05	3/21/2022	RS
Cadmium (Cd)	0.281^	ug/L	ICP/MS	0.01	3/21/2022	RS
Cobalt (Co)	15.439	ug/L	ICP/MS	0.05	3/21/2022	RS
Chromium (Cr)	17.417	ug/L	ICP/MS	0.10	3/21/2022	RS
Copper (Cu)	nd	ug/L	ICP/MS	0.10	3/21/2022	RS
Germanium (Ge)	nd	ug/L	ICP/MS	0.10	3/21/2022	RS
Lithium (Li)	nd	ug/L	ICP/MS	0.10	3/21/2022	RS
Manganese (Mn)	15.650	ug/L	ICP/MS	0.10	3/21/2022	RS
Molybdenum (Mo)	1.727	ug/L	ICP/MS	0.05	3/21/2022	RS
Nickel (Ni)	nd	ug/L	ICP/MS	0.10	3/21/2022	RS
Lead (Pb)	9.395	ug/L	ICP/MS	0.10	3/21/2022	RS
Antimony (Sb)	12495.787	ug/L	ICP/MS	0.01	3/22/2022	RS
Selenium (Se)	nd	ug/L	ICP/MS	0.10	3/21/2022	RS
Silicon (Si)	nd	ug/L	ICP/MS	5.00	3/25/2022	RS
Tin (Sn)	nd	ug/L	ICP/MS	0.10	3/21/2022	RS
Strontium (Sr)	9.107	ug/L	ICP/MS	0.10	3/21/2022	RS
Titanium (Ti)	0.484^	ug/L	ICP/MS	0.10	3/21/2022	RS
Thallium (Tl)	2.390	ug/L	ICP/MS	0.05	3/21/2022	RS
Vanadium (V)	nd	ug/L	ICP/MS	0.01	3/21/2022	RS

Notes:

^= Result is below LOQ and above LOD

ppm: parts per million

nd: non-detect

n/a: not applicable

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Sample ID: **8- Bottle**

Analysis	Result	Units	Method	LOD (ug/L)	Date of Analysis	Analyst Initials
Aluminum (Al)	14.262	ug/L	ICP/MS	0.50	3/23/2022	RS
Arsenic (As)	1.566	ug/L	ICP/MS	0.05	3/21/2022	RS
Barium (Ba)	30.396	ug/L	ICP/MS	0.10	3/21/2022	RS
Beryllium (Be)	0.251^	ug/L	ICP/MS	0.05	3/21/2022	RS
Cadmium (Cd)	0.884	ug/L	ICP/MS	0.01	3/21/2022	RS
Cobalt (Co)	194.863	ug/L	ICP/MS	0.05	3/21/2022	RS
Chromium (Cr)	34.160	ug/L	ICP/MS	0.10	3/21/2022	RS
Copper (Cu)	nd	ug/L	ICP/MS	0.10	3/21/2022	RS
Germanium (Ge)	nd	ug/L	ICP/MS	0.10	3/21/2022	RS
Lithium (Li)	2.185	ug/L	ICP/MS	0.10	3/21/2022	RS
Manganese (Mn)	269.069	ug/L	ICP/MS	0.10	3/21/2022	RS
Molybdenum (Mo)	2.333	ug/L	ICP/MS	0.05	3/21/2022	RS
Nickel (Ni)	7.776	ug/L	ICP/MS	0.10	3/21/2022	RS
Lead (Pb)	15.871	ug/L	ICP/MS	0.10	3/21/2022	RS
Antimony (Sb)	12579.792	ug/L	ICP/MS	0.01	3/22/2022	RS
Selenium (Se)	nd	ug/L	ICP/MS	0.10	3/21/2022	RS
Silicon (Si)	nd	ug/L	ICP/MS	5.00	3/25/2022	RS
Tin (Sn)	nd	ug/L	ICP/MS	0.10	3/21/2022	RS
Strontium (Sr)	4.116	ug/L	ICP/MS	0.10	3/21/2022	RS
Titanium (Ti)	12.308	ug/L	ICP/MS	0.10	3/21/2022	RS
Thallium (Tl)	2.025	ug/L	ICP/MS	0.05	3/21/2022	RS
Vanadium (V)	2.805	ug/L	ICP/MS	0.01	3/21/2022	RS

Notes:

^= Result is below LOQ and above LOD

ppm: parts per million

nd: non-detect

n/a: not applicable

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Sample ID: **9- Bottle**

Analysis	Result	Units	Method	LOD (ug/L)	Date of Analysis	Analyst Initials
Aluminum (Al)	nd	ug/L	ICP/MS	0.50	3/23/2022	RS
Arsenic (As)	2.883	ug/L	ICP/MS	0.05	3/21/2022	RS
Barium (Ba)	227.019	ug/L	ICP/MS	0.10	3/21/2022	RS
Beryllium (Be)	nd	ug/L	ICP/MS	0.05	3/21/2022	RS
Cadmium (Cd)	0.072^	ug/L	ICP/MS	0.01	3/21/2022	RS
Cobalt (Co)	1298.915	ug/L	ICP/MS	0.05	3/21/2022	RS
Chromium (Cr)	18.340	ug/L	ICP/MS	0.10	3/21/2022	RS
Copper (Cu)	nd	ug/L	ICP/MS	0.10	3/21/2022	RS
Germanium (Ge)	5.320	ug/L	ICP/MS	0.10	3/21/2022	RS
Lithium (Li)	33.246	ug/L	ICP/MS	0.10	3/21/2022	RS
Manganese (Mn)	36.534	ug/L	ICP/MS	0.10	3/21/2022	RS
Molybdenum (Mo)	2.696	ug/L	ICP/MS	0.05	3/21/2022	RS
Nickel (Ni)	3.112	ug/L	ICP/MS	0.10	3/21/2022	RS
Lead (Pb)	4.591	ug/L	ICP/MS	0.10	3/21/2022	RS
Antimony (Sb)	34742.292	ug/L	ICP/MS	0.01	3/22/2022	RS
Selenium (Se)	nd	ug/L	ICP/MS	0.10	3/21/2022	RS
Silicon (Si)	nd	ug/L	ICP/MS	5.00	3/25/2022	RS
Tin (Sn)	nd	ug/L	ICP/MS	0.10	3/21/2022	RS
Strontium (Sr)	4.656	ug/L	ICP/MS	0.10	3/21/2022	RS
Titanium (Ti)	18.955	ug/L	ICP/MS	0.10	3/21/2022	RS
Thallium (Tl)	1.440	ug/L	ICP/MS	0.05	3/21/2022	RS
Vanadium (V)	nd	ug/L	ICP/MS	0.01	3/21/2022	RS

Notes:

^= Result is below LOQ and above LOD

ppm: parts per million

nd: non-detect

n/a: not applicable

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Sample ID: **10- Bottle**

Analysis	Result	Units	Method	LOD (ug/L)	Date of Analysis	Analyst Initials
Aluminum (Al)	450.095	ug/L	ICP/MS	0.50	3/23/2022	RS
Arsenic (As)	nd	ug/L	ICP/MS	0.05	3/21/2022	RS
Barium (Ba)	nd	ug/L	ICP/MS	0.10	3/21/2022	RS
Beryllium (Be)	nd	ug/L	ICP/MS	0.05	3/21/2022	RS
Cadmium (Cd)	0.016^	ug/L	ICP/MS	0.01	3/21/2022	RS
Cobalt (Co)	872.077	ug/L	ICP/MS	0.05	3/21/2022	RS
Chromium (Cr)	1.373	ug/L	ICP/MS	0.10	3/21/2022	RS
Copper (Cu)	nd	ug/L	ICP/MS	0.10	3/21/2022	RS
Germanium (Ge)	5.222	ug/L	ICP/MS	0.10	3/21/2022	RS
Lithium (Li)	1555.572	ug/L	ICP/MS	0.10	3/21/2022	RS
Manganese (Mn)	52.360	ug/L	ICP/MS	0.10	3/21/2022	RS
Molybdenum (Mo)	1.373	ug/L	ICP/MS	0.05	3/21/2022	RS
Nickel (Ni)	1.457	ug/L	ICP/MS	0.10	3/21/2022	RS
Lead (Pb)	1.837	ug/L	ICP/MS	0.10	3/21/2022	RS
Antimony (Sb)	22.631	ug/L	ICP/MS	0.01	3/22/2022	RS
Selenium (Se)	nd	ug/L	ICP/MS	0.10	3/21/2022	RS
Silicon (Si)	nd	ug/L	ICP/MS	5.00	3/25/2022	RS
Tin (Sn)	nd	ug/L	ICP/MS	0.10	3/21/2022	RS
Strontium (Sr)	nd	ug/L	ICP/MS	0.10	3/21/2022	RS
Titanium (Ti)	823.495	ug/L	ICP/MS	0.10	3/21/2022	RS
Thallium (Tl)	1.117	ug/L	ICP/MS	0.05	3/21/2022	RS
Vanadium (V)	nd	ug/L	ICP/MS	0.01	3/21/2022	RS

Notes:

^= Result is below LOQ and above LOD

ppm: parts per million

nd: non-detect

n/a: not applicable

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Sample ID: **11- Bottle**

Analysis	Result	Units	Method	LOD (ug/L)	Date of Analysis	Analyst Initials
Aluminum (Al)	513.517	ug/L	ICP/MS	0.50	3/23/2022	RS
Arsenic (As)	nd	ug/L	ICP/MS	0.05	3/21/2022	RS
Barium (Ba)	129.408	ug/L	ICP/MS	0.10	3/21/2022	RS
Beryllium (Be)	0.137^	ug/L	ICP/MS	0.05	3/21/2022	RS
Cadmium (Cd)	0.087^	ug/L	ICP/MS	0.01	3/21/2022	RS
Cobalt (Co)	1488.338	ug/L	ICP/MS	0.05	3/21/2022	RS
Chromium (Cr)	11.901	ug/L	ICP/MS	0.10	3/21/2022	RS
Copper (Cu)	554.208	ug/L	ICP/MS	0.10	3/21/2022	RS
Germanium (Ge)	nd	ug/L	ICP/MS	0.10	3/21/2022	RS
Lithium (Li)	1634.709	ug/L	ICP/MS	0.10	3/21/2022	RS
Manganese (Mn)	107.947	ug/L	ICP/MS	0.10	3/21/2022	RS
Molybdenum (Mo)	2.299	ug/L	ICP/MS	0.05	3/21/2022	RS
Nickel (Ni)	5.844	ug/L	ICP/MS	0.10	3/21/2022	RS
Lead (Pb)	32.299	ug/L	ICP/MS	0.10	3/21/2022	RS
Antimony (Sb)	359.951	ug/L	ICP/MS	0.01	3/22/2022	RS
Selenium (Se)	nd	ug/L	ICP/MS	0.10	3/21/2022	RS
Silicon (Si)	nd	ug/L	ICP/MS	5.00	3/25/2022	RS
Tin (Sn)	nd	ug/L	ICP/MS	0.10	3/21/2022	RS
Strontium (Sr)	29.010	ug/L	ICP/MS	0.10	3/21/2022	RS
Titanium (Ti)	825.837	ug/L	ICP/MS	0.10	3/21/2022	RS
Thallium (Tl)	0.885	ug/L	ICP/MS	0.05	3/21/2022	RS
Vanadium (V)	nd	ug/L	ICP/MS	0.01	3/21/2022	RS

Notes:

^= Result is below LOQ and above LOD

ppm: parts per million

nd: non-detect

n/a: not applicable

Reviewed by Robert Smalling, Chemist on 3/25/2022

Approved by Tori Johnson, Operations Manager on 3/25/2022

Vanguard Laboratory
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Report of Laboratory Analysis

Defend our Health
565 Congress St, Ste 204
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412-889-7684

Matrix Plastic
Laboratory ID: V220309-3
Date Received: 3/9/2022
Date Reported: 3/25/2022

Sample ID: **12- Bottle**

Analysis	Result	Units	Method	LOD (ug/L)	Date of Analysis	Analyst Initials
Aluminum (Al)	nd	ug/L	ICP/MS	0.50	3/23/2022	RS
Arsenic (As)	5.175	ug/L	ICP/MS	0.05	3/21/2022	RS
Barium (Ba)	1.911	ug/L	ICP/MS	0.10	3/21/2022	RS
Beryllium (Be)	0.122^	ug/L	ICP/MS	0.05	3/21/2022	RS
Cadmium (Cd)	0.037^	ug/L	ICP/MS	0.01	3/21/2022	RS
Cobalt (Co)	65.123	ug/L	ICP/MS	0.05	3/21/2022	RS
Chromium (Cr)	48.795	ug/L	ICP/MS	0.10	3/21/2022	RS
Copper (Cu)	nd	ug/L	ICP/MS	0.10	3/21/2022	RS
Germanium (Ge)	11.629	ug/L	ICP/MS	0.10	3/21/2022	RS
Lithium (Li)	19.328	ug/L	ICP/MS	0.10	3/21/2022	RS
Manganese (Mn)	218.143	ug/L	ICP/MS	0.10	3/21/2022	RS
Molybdenum (Mo)	4.962	ug/L	ICP/MS	0.05	3/21/2022	RS
Nickel (Ni)	18.318	ug/L	ICP/MS	0.10	3/21/2022	RS
Lead (Pb)	13.137	ug/L	ICP/MS	0.10	3/21/2022	RS
Antimony (Sb)	11882.719	ug/L	ICP/MS	0.01	3/22/2022	RS
Selenium (Se)	nd	ug/L	ICP/MS	0.10	3/21/2022	RS
Silicon (Si)	nd	ug/L	ICP/MS	5.00	3/25/2022	RS
Tin (Sn)	nd	ug/L	ICP/MS	0.10	3/21/2022	RS
Strontium (Sr)	8.312	ug/L	ICP/MS	0.10	3/21/2022	RS
Titanium (Ti)	25.195	ug/L	ICP/MS	0.10	3/21/2022	RS
Thallium (Tl)	1.499	ug/L	ICP/MS	0.05	3/21/2022	RS
Vanadium (V)	49.904	ug/L	ICP/MS	0.01	3/21/2022	RS

Notes:

^= Result is below LOQ and above LOD

ppm: parts per million

nd: non-detect

n/a: not applicable

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Approved by Tori Johnson, Operations Manager on 3/25/2022

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Matrix Plastic
Laboratory ID: V220309-3
Date Received: 3/9/2022
Date Reported: 3/25/2022

Sample ID: **13- Bottle**

Analysis	Result	Units	Method	LOD (ug/L)	Date of Analysis	Analyst Initials
Aluminum (Al)	nd	ug/L	ICP/MS	0.50	3/23/2022	RS
Arsenic (As)	1.691	ug/L	ICP/MS	0.05	3/21/2022	RS
Barium (Ba)	1.281	ug/L	ICP/MS	0.10	3/21/2022	RS
Beryllium (Be)	nd	ug/L	ICP/MS	0.05	3/21/2022	RS
Cadmium (Cd)	0.180^	ug/L	ICP/MS	0.01	3/21/2022	RS
Cobalt (Co)	9497.654	ug/L	ICP/MS	0.05	3/21/2022	RS
Chromium (Cr)	15.153	ug/L	ICP/MS	0.10	3/21/2022	RS
Copper (Cu)	nd	ug/L	ICP/MS	0.10	3/21/2022	RS
Germanium (Ge)	nd	ug/L	ICP/MS	0.10	3/21/2022	RS
Lithium (Li)	nd	ug/L	ICP/MS	0.10	3/21/2022	RS
Manganese (Mn)	200.218	ug/L	ICP/MS	0.10	3/21/2022	RS
Molybdenum (Mo)	1.144	ug/L	ICP/MS	0.05	3/21/2022	RS
Nickel (Ni)	2.156	ug/L	ICP/MS	0.10	3/21/2022	RS
Lead (Pb)	2.624	ug/L	ICP/MS	0.10	3/21/2022	RS
Antimony (Sb)	8322.769	ug/L	ICP/MS	0.01	3/22/2022	RS
Selenium (Se)	nd	ug/L	ICP/MS	0.10	3/21/2022	RS
Silicon (Si)	nd	ug/L	ICP/MS	5.00	3/25/2022	RS
Tin (Sn)	nd	ug/L	ICP/MS	0.10	3/21/2022	RS
Strontium (Sr)	2.085	ug/L	ICP/MS	0.10	3/21/2022	RS
Titanium (Ti)	1.837	ug/L	ICP/MS	0.10	3/21/2022	RS
Thallium (Tl)	0.823	ug/L	ICP/MS	0.05	3/21/2022	RS
Vanadium (V)	nd	ug/L	ICP/MS	0.01	3/21/2022	RS

Notes:

^= Result is below LOQ and above LOD

ppm: parts per million

nd: non-detect

n/a: not applicable

Reviewed by Robert Smalling, Chemist on 3/25/2022

Approved by Tori Johnson, Operations Manager on 3/25/2022

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Matrix Plastic
Laboratory ID: V220309-3
Date Received: 3/9/2022
Date Reported: 3/25/2022

Sample ID: **14- Bottle**

Analysis	Result	Units	Method	LOD (ug/L)	Date of Analysis	Analyst Initials
Aluminum (Al)	nd	ug/L	ICP/MS	0.50	3/23/2022	RS
Arsenic (As)	5.649	ug/L	ICP/MS	0.05	3/21/2022	RS
Barium (Ba)	8.890	ug/L	ICP/MS	0.10	3/21/2022	RS
Beryllium (Be)	0.137^	ug/L	ICP/MS	0.05	3/21/2022	RS
Cadmium (Cd)	0.302^	ug/L	ICP/MS	0.01	3/21/2022	RS
Cobalt (Co)	1048.438	ug/L	ICP/MS	0.05	3/21/2022	RS
Chromium (Cr)	33.130	ug/L	ICP/MS	0.10	3/21/2022	RS
Copper (Cu)	nd	ug/L	ICP/MS	0.10	3/21/2022	RS
Germanium (Ge)	nd	ug/L	ICP/MS	0.10	3/21/2022	RS
Lithium (Li)	nd	ug/L	ICP/MS	0.10	3/21/2022	RS
Manganese (Mn)	171.694	ug/L	ICP/MS	0.10	3/21/2022	RS
Molybdenum (Mo)	2.045	ug/L	ICP/MS	0.05	3/21/2022	RS
Nickel (Ni)	13.630	ug/L	ICP/MS	0.10	3/21/2022	RS
Lead (Pb)	14.845	ug/L	ICP/MS	0.10	3/21/2022	RS
Antimony (Sb)	10183.851	ug/L	ICP/MS	0.01	3/22/2022	RS
Selenium (Se)	nd	ug/L	ICP/MS	0.10	3/21/2022	RS
Silicon (Si)	nd	ug/L	ICP/MS	5.00	3/25/2022	RS
Tin (Sn)	nd	ug/L	ICP/MS	0.10	3/21/2022	RS
Strontium (Sr)	1.625	ug/L	ICP/MS	0.10	3/21/2022	RS
Titanium (Ti)	19.511	ug/L	ICP/MS	0.10	3/21/2022	RS
Thallium (Tl)	1.419	ug/L	ICP/MS	0.05	3/21/2022	RS
Vanadium (V)	30.316	ug/L	ICP/MS	0.01	3/21/2022	RS

Notes:

^= Result is below LOQ and above LOD

ppm: parts per million

nd: non-detect

n/a: not applicable

Reviewed by Robert Smalling, Chemist on 3/25/2022

Approved by Tori Johnson, Operations Manager on 3/25/2022

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Report of Laboratory Analysis

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Matrix Plastic
Laboratory ID: V220309-3
Date Received: 3/9/2022
Date Reported: 3/25/2022

Sample ID: **15- Bottle**

Analysis	Result	Units	Method	LOD (ug/L)	Date of Analysis	Analyst Initials
Aluminum (Al)	nd	ug/L	ICP/MS	0.50	3/23/2022	RS
Arsenic (As)	0.759	ug/L	ICP/MS	0.05	3/21/2022	RS
Barium (Ba)	32.371	ug/L	ICP/MS	0.10	3/21/2022	RS
Beryllium (Be)	nd	ug/L	ICP/MS	0.05	3/21/2022	RS
Cadmium (Cd)	0.197^	ug/L	ICP/MS	0.01	3/21/2022	RS
Cobalt (Co)	23.321	ug/L	ICP/MS	0.05	3/21/2022	RS
Chromium (Cr)	16.460	ug/L	ICP/MS	0.10	3/21/2022	RS
Copper (Cu)	nd	ug/L	ICP/MS	0.10	3/21/2022	RS
Germanium (Ge)	nd	ug/L	ICP/MS	0.10	3/21/2022	RS
Lithium (Li)	nd	ug/L	ICP/MS	0.10	3/21/2022	RS
Manganese (Mn)	33.206	ug/L	ICP/MS	0.10	3/21/2022	RS
Molybdenum (Mo)	2.581	ug/L	ICP/MS	0.05	3/21/2022	RS
Nickel (Ni)	nd	ug/L	ICP/MS	0.10	3/21/2022	RS
Lead (Pb)	2.496	ug/L	ICP/MS	0.10	3/21/2022	RS
Antimony (Sb)	11851.770	ug/L	ICP/MS	0.01	3/22/2022	RS
Selenium (Se)	nd	ug/L	ICP/MS	0.10	3/21/2022	RS
Silicon (Si)	nd	ug/L	ICP/MS	5.00	3/25/2022	RS
Tin (Sn)	nd	ug/L	ICP/MS	0.10	3/21/2022	RS
Strontium (Sr)	14.288	ug/L	ICP/MS	0.10	3/21/2022	RS
Titanium (Ti)	nd	ug/L	ICP/MS	0.10	3/21/2022	RS
Thallium (Tl)	6.428	ug/L	ICP/MS	0.05	3/21/2022	RS
Vanadium (V)	nd	ug/L	ICP/MS	0.01	3/21/2022	RS

Notes:

^= Result is below LOQ and above LOD

ppm: parts per million

nd: non-detect

n/a: not applicable

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Matrix Plastic
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Date Received: 3/9/2022
Date Reported: 3/25/2022

Sample ID: **16- Bottle**

Analysis	Result	Units	Method	LOD (ug/L)	Date of Analysis	Analyst Initials
Aluminum (Al)	nd	ug/L	ICP/MS	0.50	3/23/2022	RS
Arsenic (As)	1.590	ug/L	ICP/MS	0.05	3/21/2022	RS
Barium (Ba)	27.416	ug/L	ICP/MS	0.10	3/21/2022	RS
Beryllium (Be)	0.255^	ug/L	ICP/MS	0.05	3/21/2022	RS
Cadmium (Cd)	0.409^	ug/L	ICP/MS	0.01	3/21/2022	RS
Cobalt (Co)	633.016	ug/L	ICP/MS	0.05	3/21/2022	RS
Chromium (Cr)	31.254	ug/L	ICP/MS	0.10	3/21/2022	RS
Copper (Cu)	nd	ug/L	ICP/MS	0.10	3/21/2022	RS
Germanium (Ge)	nd	ug/L	ICP/MS	0.10	3/21/2022	RS
Lithium (Li)	236.608	ug/L	ICP/MS	0.10	3/21/2022	RS
Manganese (Mn)	126.953	ug/L	ICP/MS	0.10	3/21/2022	RS
Molybdenum (Mo)	2.805	ug/L	ICP/MS	0.05	3/21/2022	RS
Nickel (Ni)	8.765	ug/L	ICP/MS	0.10	3/21/2022	RS
Lead (Pb)	32.629	ug/L	ICP/MS	0.10	3/21/2022	RS
Antimony (Sb)	17139.458	ug/L	ICP/MS	0.01	3/22/2022	RS
Selenium (Se)	nd	ug/L	ICP/MS	0.10	3/21/2022	RS
Silicon (Si)	nd	ug/L	ICP/MS	5.00	3/25/2022	RS
Tin (Sn)	nd	ug/L	ICP/MS	0.10	3/21/2022	RS
Strontium (Sr)	5.827	ug/L	ICP/MS	0.10	3/21/2022	RS
Titanium (Ti)	122.437	ug/L	ICP/MS	0.10	3/21/2022	RS
Thallium (Tl)	3.283	ug/L	ICP/MS	0.05	3/21/2022	RS
Vanadium (V)	3.090	ug/L	ICP/MS	0.01	3/21/2022	RS

Notes:

^= Result is below LOQ and above LOD

ppm: parts per million

nd: non-detect

n/a: not applicable

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Matrix Plastic
Laboratory ID: V220309-3
Date Received: 3/9/2022
Date Reported: 3/25/2022

Sample ID: **18- Bottle**

Analysis	Result	Units	Method	LOD (ug/L)	Date of Analysis	Analyst Initials
Aluminum (Al)	nd	ug/L	ICP/MS	0.50	3/23/2022	RS
Arsenic (As)	5.750	ug/L	ICP/MS	0.05	3/21/2022	RS
Barium (Ba)	3.816	ug/L	ICP/MS	0.10	3/21/2022	RS
Beryllium (Be)	nd	ug/L	ICP/MS	0.05	3/21/2022	RS
Cadmium (Cd)	0.077^	ug/L	ICP/MS	0.01	3/21/2022	RS
Cobalt (Co)	82.453	ug/L	ICP/MS	0.05	3/21/2022	RS
Chromium (Cr)	36.190	ug/L	ICP/MS	0.10	3/21/2022	RS
Copper (Cu)	nd	ug/L	ICP/MS	0.10	3/21/2022	RS
Germanium (Ge)	nd	ug/L	ICP/MS	0.10	3/21/2022	RS
Lithium (Li)	9.046	ug/L	ICP/MS	0.10	3/21/2022	RS
Manganese (Mn)	163.095	ug/L	ICP/MS	0.10	3/21/2022	RS
Molybdenum (Mo)	3.409	ug/L	ICP/MS	0.05	3/21/2022	RS
Nickel (Ni)	10.936	ug/L	ICP/MS	0.10	3/21/2022	RS
Lead (Pb)	9.964	ug/L	ICP/MS	0.10	3/21/2022	RS
Antimony (Sb)	15379.437	ug/L	ICP/MS	0.01	3/22/2022	RS
Selenium (Se)	nd	ug/L	ICP/MS	0.10	3/21/2022	RS
Silicon (Si)	nd	ug/L	ICP/MS	5.00	3/25/2022	RS
Tin (Sn)	nd	ug/L	ICP/MS	0.10	3/21/2022	RS
Strontium (Sr)	10.355	ug/L	ICP/MS	0.10	3/21/2022	RS
Titanium (Ti)	11.278	ug/L	ICP/MS	0.10	3/21/2022	RS
Thallium (Tl)	2.939	ug/L	ICP/MS	0.05	3/21/2022	RS
Vanadium (V)	29.238	ug/L	ICP/MS	0.01	3/21/2022	RS

Notes:

^= Result is below LOQ and above LOD

ppm: parts per million

nd: non-detect

n/a: not applicable

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Approved by Tori Johnson, Operations Manager on 3/25/2022

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Matrix Plastic
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Date Received: 3/9/2022
Date Reported: 3/25/2022

Sample ID: **19- Bottle**

Analysis	Result	Units	Method	LOD (ug/L)	Date of Analysis	Analyst Initials
Aluminum (Al)	nd	ug/L	ICP/MS	0.50	3/23/2022	RS
Arsenic (As)	1.728	ug/L	ICP/MS	0.05	3/21/2022	RS
Barium (Ba)	31.101	ug/L	ICP/MS	0.10	3/21/2022	RS
Beryllium (Be)	0.371^	ug/L	ICP/MS	0.05	3/21/2022	RS
Cadmium (Cd)	0.103^	ug/L	ICP/MS	0.01	3/21/2022	RS
Cobalt (Co)	715.810	ug/L	ICP/MS	0.05	3/21/2022	RS
Chromium (Cr)	22.918	ug/L	ICP/MS	0.10	3/21/2022	RS
Copper (Cu)	nd	ug/L	ICP/MS	0.10	3/21/2022	RS
Germanium (Ge)	54.059	ug/L	ICP/MS	0.10	3/21/2022	RS
Lithium (Li)	94.399	ug/L	ICP/MS	0.10	3/21/2022	RS
Manganese (Mn)	61.043	ug/L	ICP/MS	0.10	3/21/2022	RS
Molybdenum (Mo)	9.095	ug/L	ICP/MS	0.05	3/21/2022	RS
Nickel (Ni)	5.431	ug/L	ICP/MS	0.10	3/21/2022	RS
Lead (Pb)	5.604	ug/L	ICP/MS	0.10	3/21/2022	RS
Antimony (Sb)	9410.808	ug/L	ICP/MS	0.01	3/22/2022	RS
Selenium (Se)	nd	ug/L	ICP/MS	0.10	3/21/2022	RS
Silicon (Si)	nd	ug/L	ICP/MS	5.00	3/25/2022	RS
Tin (Sn)	nd	ug/L	ICP/MS	0.10	3/21/2022	RS
Strontium (Sr)	6.858	ug/L	ICP/MS	0.10	3/21/2022	RS
Titanium (Ti)	63.592	ug/L	ICP/MS	0.10	3/21/2022	RS
Thallium (Tl)	1.372	ug/L	ICP/MS	0.05	3/21/2022	RS
Vanadium (V)	nd	ug/L	ICP/MS	0.01	3/21/2022	RS

Notes:

^= Result is below LOQ and above LOD

ppm: parts per million

nd: non-detect

n/a: not applicable

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Matrix Plastic
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Date Reported: 3/25/2022

Sample ID: **20- Bottle**

Analysis	Result	Units	Method	LOD (ug/L)	Date of Analysis	Analyst Initials
Aluminum (Al)	nd	ug/L	ICP/MS	0.50	3/23/2022	RS
Arsenic (As)	1.626	ug/L	ICP/MS	0.05	3/21/2022	RS
Barium (Ba)	4.527	ug/L	ICP/MS	0.10	3/21/2022	RS
Beryllium (Be)	0.123^	ug/L	ICP/MS	0.05	3/21/2022	RS
Cadmium (Cd)	nd	ug/L	ICP/MS	0.01	3/21/2022	RS
Cobalt (Co)	40.690	ug/L	ICP/MS	0.05	3/21/2022	RS
Chromium (Cr)	14.302	ug/L	ICP/MS	0.10	3/21/2022	RS
Copper (Cu)	nd	ug/L	ICP/MS	0.10	3/21/2022	RS
Germanium (Ge)	nd	ug/L	ICP/MS	0.10	3/21/2022	RS
Lithium (Li)	8.332	ug/L	ICP/MS	0.10	3/21/2022	RS
Manganese (Mn)	26.981	ug/L	ICP/MS	0.10	3/21/2022	RS
Molybdenum (Mo)	3.480	ug/L	ICP/MS	0.05	3/21/2022	RS
Nickel (Ni)	0.879	ug/L	ICP/MS	0.10	3/21/2022	RS
Lead (Pb)	3.615	ug/L	ICP/MS	0.10	3/21/2022	RS
Antimony (Sb)	13211.811	ug/L	ICP/MS	0.01	3/22/2022	RS
Selenium (Se)	nd	ug/L	ICP/MS	0.10	3/21/2022	RS
Silicon (Si)	nd	ug/L	ICP/MS	5.00	3/25/2022	RS
Tin (Sn)	nd	ug/L	ICP/MS	0.10	3/21/2022	RS
Strontium (Sr)	2.562	ug/L	ICP/MS	0.10	3/21/2022	RS
Titanium (Ti)	80.065	ug/L	ICP/MS	0.10	3/21/2022	RS
Thallium (Tl)	1.031	ug/L	ICP/MS	0.05	3/21/2022	RS
Vanadium (V)	nd	ug/L	ICP/MS	0.01	3/21/2022	RS

Notes:

^= Result is below LOQ and above LOD

ppm: parts per million

nd: non-detect

n/a: not applicable

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Matrix Plastic
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Date Received: 3/9/2022
Date Reported: 3/25/2022

Sample ID: **21- Bottle**

Analysis	Result	Units	Method	LOD (ug/L)	Date of Analysis	Analyst Initials
Aluminum (Al)	nd	ug/L	ICP/MS	0.50	3/23/2022	RS
Arsenic (As)	4.344	ug/L	ICP/MS	0.05	3/21/2022	RS
Barium (Ba)	7.999	ug/L	ICP/MS	0.10	3/21/2022	RS
Beryllium (Be)	0.257^	ug/L	ICP/MS	0.05	3/21/2022	RS
Cadmium (Cd)	0.277^	ug/L	ICP/MS	0.01	3/21/2022	RS
Cobalt (Co)	182.868	ug/L	ICP/MS	0.05	3/21/2022	RS
Chromium (Cr)	43.997	ug/L	ICP/MS	0.10	3/21/2022	RS
Copper (Cu)	nd	ug/L	ICP/MS	0.10	3/21/2022	RS
Germanium (Ge)	nd	ug/L	ICP/MS	0.10	3/21/2022	RS
Lithium (Li)	nd	ug/L	ICP/MS	0.10	3/21/2022	RS
Manganese (Mn)	316.255	ug/L	ICP/MS	0.10	3/21/2022	RS
Molybdenum (Mo)	4.151	ug/L	ICP/MS	0.05	3/21/2022	RS
Nickel (Ni)	14.456	ug/L	ICP/MS	0.10	3/21/2022	RS
Lead (Pb)	10.197	ug/L	ICP/MS	0.10	3/21/2022	RS
Antimony (Sb)	13350.139	ug/L	ICP/MS	0.01	3/22/2022	RS
Selenium (Se)	nd	ug/L	ICP/MS	0.10	3/21/2022	RS
Silicon (Si)	nd	ug/L	ICP/MS	5.00	3/25/2022	RS
Tin (Sn)	nd	ug/L	ICP/MS	0.10	3/21/2022	RS
Strontium (Sr)	3.052	ug/L	ICP/MS	0.10	3/21/2022	RS
Titanium (Ti)	34.535	ug/L	ICP/MS	0.10	3/21/2022	RS
Thallium (Tl)	1.168	ug/L	ICP/MS	0.05	3/21/2022	RS
Vanadium (V)	28.765	ug/L	ICP/MS	0.01	3/21/2022	RS

Notes:

^= Result is below LOQ and above LOD

ppm: parts per million

nd: non-detect

n/a: not applicable

ISO 17025:2017 ACCREDITED LABORATORY

Reviewed by Robert Smalling, Chemist on 3/25/2022

Approved by Tori Johnson, Operations Manager on 3/25/2022

Vanguard Laboratory
2635 Parkmont Lane SW
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QC Summary Report

Defend Our Health
565 Congress St, Ste 204
Portland, ME 04101
412-889-7684

Matrix: Beverages
Collection Date: 3/10/22 - 3/17/22
Laboratory ID: V220309-3
Date Received: 3/9/2022
Date Reported: 3/25/2022

Method: Total Metals by EPA Method 200.8

Sample ID: V220309-3 Sample Type: MBLK Units: µg/L Prep Date: 3/10/2022 Run No: 3
Client ID: Defend Our Health Batch ID: V220309-3 Analysis Date: 3/10/22 - 3/17/22 220310, 220316, 220317

Analyte:	Result	RL	SPK Value	% Rec	Low Limit	High Limit	RPD Ref Value	% RPD	RPD Limit	Qual
Arsenic (As)	0.018	0.50	-	-	-	-	-	-	-	-
Barium (Ba)	0.073	0.50	-	-	-	-	-	-	-	-
Beryllium (Be)	0.004	0.50	-	-	-	-	-	-	-	-
Cadmium (Cd)	0.005	0.50	-	-	-	-	-	-	-	-
Cobalt (Co)	0.002	0.50	-	-	-	-	-	-	-	-
Chromium (Cr)	0.012	0.50	-	-	-	-	-	-	-	-
Copper (Cu)	0	0.50	-	-	-	-	-	-	-	-
Germanium (Ge)	0.34	0.50	-	-	-	-	-	-	-	-
Lithium (Li)	0.437	0.50	-	-	-	-	-	-	-	-
Manganese (Mn)	0.065	0.50	-	-	-	-	-	-	-	-
Molybdenum (Mo)	0.046	0.50	-	-	-	-	-	-	-	-
Nickel (Ni)	0.013	0.50	-	-	-	-	-	-	-	-
Lead (Pb)	0.028	0.50	-	-	-	-	-	-	-	-
Antimony (Sb)	0.003	0.50	-	-	-	-	-	-	-	-
Selenium (Se)	0.017	0.50	-	-	-	-	-	-	-	-
Silicon (Si)	0	5.00	-	-	-	-	-	-	-	-
Tin (Sn)	0.069	0.50	-	-	-	-	-	-	-	-
Strontium (Sr)	0.099	0.50	-	-	-	-	-	-	-	-
Titanium (Ti)	0.04	0.50	-	-	-	-	-	-	-	-
Thallium (Tl)	0.178	0.50	-	-	-	-	-	-	-	-
Vanadium (V)	0.025	0.50	-	-	-	-	-	-	-	-
Aluminum (Al)	0	1.00	-	-	-	-	-	-	-	-

Sample ID: V220309-3	Sample Type: LCS		Units: µg/L		Prep Date: 3/10/2022		Run No: 3		
Client ID: Defend Our Health	Batch ID: V220309-3				Analysis Date: 3/10/22 - 3/17/22		220310, 220316, 220317		
Analyte:	Result	RL	SPK Value	% Rec	Low Limit	High Limit	RPD Ref Value	% RPD RPD Limit	Qual
Arsenic (As)	2006.257	0.50	2000	100.31285	85	115	-	-	-
Barium (Ba)	1941.045	0.50	2000	97.05225	85	115	-	-	-
Beryllium (Be)	2017.829	0.50	2000	100.89145	85	115	-	-	-
Cadmium (Cd)	1929.965	0.50	2000	96.49825	85	115	-	-	-
Cobalt (Co)	1976.24	0.50	2000	98.812	85	115	-	-	-
Chromium (Cr)	1993.282	0.50	2000	99.6641	85	115	-	-	-
Copper (Cu)	1961.156	0.50	2000	98.0578	85	115	-	-	-
Germanium (Ge)	1887.452	0.50	2000	94.3726	85	115	-	-	-
Lithium (Li)	2017.829	0.50	2000	100.89145	85	115	-	-	-
Manganese (Mn)	1977.572	0.50	2000	98.8786	85	115	-	-	-
Molybdenum (Mo)	1997.082	0.50	2000	99.8541	85	115	-	-	-
Nickel (Ni)	1938.178	0.50	2000	96.9089	85	115	-	-	-
Lead (Pb)	2023.489	0.50	2000	101.17445	85	115	-	-	-
Antimony (Sb)	1907.176	0.50	2000	95.3588	85	115	-	-	-
Selenium (Se)	2140.426	0.50	2000	107.0213	85	115	-	-	-
Silicon (Si)	9375.012	5.00	10000	93.75012	85	115	-	-	-
Tin (Sn)	2127.607	0.50	2000	106.38035	85	115	-	-	-
Strontium (Sr)	1978.919	0.50	2000	98.94595	85	115	-	-	-
Titanium (Ti)	1935.353	0.50	2000	96.76765	85	115	-	-	-
Thallium (Tl)	1908.242	0.50	2000	95.4121	85	115	-	-	-
Vanadium (V)	1975.636	0.50	2000	98.7818	85	115	-	-	-
Aluminum (Al)	2091.385	1.00	2000	104.56925	85	115	-	-	-

Sample ID: V220309-3	Sample Type: MS			Units: µg/L		Prep Date: 3/10/2022		Run No: 3		
Client ID: Defend Our Health	Batch ID: V220309-3					Analysis Date: 3/10/22 - 3/17/22		220310, 220316, 220317		
Analyte:	Result	RL	SPK Value	% Rec	Low Limit	High Limit	RPD Ref Value	% RPD	RPD Limit	Qual
Arsenic (As)	1971.582	0.50	2000	98.5791	70	130	-	0.98	30	-
Barium (Ba)	1949.273	0.50	2000	97.46365	70	130	-	0.34	30	-
Beryllium (Be)	2019.742	0.50	2000	100.9871	70	130	-	0.17	30	-
Cadmium (Cd)	1916.642	0.50	2000	95.8321	70	130	-	0.56	30	-
Cobalt (Co)	1925.203	0.50	2000	96.26015	70	130	-	2.04	30	-
Chromium (Cr)	1973.141	0.50	2000	98.65705	70	130	-	0.59	30	-
Copper (Cu)	1940.225	0.50	2000	97.01125	70	130	-	0.56	30	-
Germanium (Ge)	1750.012	0.50	2000	87.5006	70	130	-	4.56	30	-
Lithium (Li)	2066.544	0.50	2000	103.3272	70	130	-	2.04	30	-
Manganese (Mn)	1945.819	0.50	2000	97.29095	70	130	-	0.51	30	-
Molybdenum (Mo)	1986.625	0.50	2000	99.33125	70	130	-	1.21	30	-
Nickel (Ni)	1920.550	0.50	2000	96.0275	70	130	-	1.57	30	-
Lead (Pb)	2054.301	0.50	2000	102.71505	70	130	-	0.56	30	-
Antimony (Sb)	1786.768	0.50	2000	89.3384	70	130	-	2.03	30	-
Selenium (Se)	2140.426	0.50	2000	107.0213	70	130	-	1.48	30	-
Silicon (Si)	9183.342	5.00	10000	91.83342	70	130	-	2.17	30	-
Tin (Sn)	2071.348	0.50	2000	103.5674	70	130	-	0.57	30	-
Strontium (Sr)	1966.989	0.50	2000	98.34945	70	130	-	1.24	30	-
Titanium (Ti)	1921.979	0.50	2000	96.09895	70	130	-	2.38	30	-
Thallium (Tl)	2020.004	0.50	2000	101.0002	70	130	-	0.80	30	-
Vanadium (V)	1971.687	0.50	2000	98.58435	70	130	-	0.26	30	-
Aluminum (Al)	2082.432	1.00	2000	104.1216	70	130	-	1.78	30	-

Sample ID: V220309-3	Sample Type: MSDUP	Units: µg/L	Prep Date: 3/10/2022	Run No: 3
Client ID: Defend Our Health	Batch ID: V220309-3		Analysis Date: 3/10/22 - 3/17/22	220310, 220316, 220317

Analyte:	Result	RL	SPK Value	% Rec	Low Limit	High Limit	RPD Ref Value	% RPD	RPD Limit	Qual
Arsenic (As)	1990.922	0.50	2000	99.5461	70	130	-	0.98	30	-
Barium (Ba)	1955.853	0.50	2000	97.79265	70	130	-	0.34	30	-
Beryllium (Be)	2023.135	0.50	2000	101.15675	70	130	-	0.17	30	-
Cadmium (Cd)	1905.963	0.50	2000	95.29815	70	130	-	0.56	30	-
Cobalt (Co)	1964.930	0.50	2000	98.2465	70	130	-	2.04	30	-
Chromium (Cr)	1984.781	0.50	2000	99.23905	70	130	-	0.59	30	-
Copper (Cu)	1951.167	0.50	2000	97.55835	70	130	-	0.56	30	-
Germanium (Ge)	1831.773	0.50	2000	91.58865	70	130	-	4.56	30	-
Lithium (Li)	2109.200	0.50	2000	105.46	70	130	-	2.04	30	-
Manganese (Mn)	1955.745	0.50	2000	97.78725	70	130	-	0.51	30	-
Molybdenum (Mo)	2010.775	0.50	2000	100.53875	70	130	-	1.21	30	-
Nickel (Ni)	1950.882	0.50	2000	97.5441	70	130	-	1.57	30	-
Lead (Pb)	2042.823	0.50	2000	102.14115	70	130	-	0.56	30	-
Antimony (Sb)	1823.357	0.50	2000	91.16785	70	130	-	2.03	30	-
Selenium (Se)	2172.226	0.50	2000	108.6113	70	130	-	1.48	30	-
Silicon (Si)	8986.096	5.00	10000	89.86096	70	130	-	2.17	30	-
Tin (Sn)	2083.123	0.50	2000	104.15615	70	130	-	0.57	30	-
Strontium (Sr)	1991.525	0.50	2000	99.57625	70	130	-	1.24	30	-
Titanium (Ti)	1968.238	0.50	2000	98.4119	70	130	-	2.38	30	-
Thallium (Tl)	2003.978	0.50	2000	100.1989	70	130	-	0.80	30	-
Vanadium (V)	1976.896	0.50	2000	98.8448	70	130	-	0.26	30	-
Aluminum (Al)	2119.841	1.00	2000	105.99205	70	130	-	1.78	30	-

Notes:

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QC Summary Report

Defend our Health
565 Congress St, Ste 204
Portland, ME 04101
412-889-7684

Matrix: Plastic Bottles
Collection Date: 3/21/22 - 3/25/22
Laboratory ID: V220309-3
Date Received: 3/9/2022
Date Reported: 3/25/2022

Method: Total Metals by EPA Method 200.8

Client ID: V220309-3 | Sample Type: MBLK | Units: µg/L | Prep Date: 3/18/2022 | Run No: 4
Batch ID: V220309-3 | Analysis Date: 3/21/22-3/25/22 | 220321, 220322Sb, 220324Al, 220324Si

Analyte:	Result	RL	SPK Value	% Rec	Low Limit	High Limit	RPD Ref Value	% RPD	RPD Limit	Qual
Arsenic (As)	ND	0.50	-	-	-	-	-	-		-
Barium (Ba)	ND	0.50	-	-	-	-	-	-		-
Beryllium (Be)	ND	0.50	-	-	-	-	-	-		-
Cadmium (Cd)	ND	0.50	-	-	-	-	-	-		-
Cobalt (Co)	ND	0.50	-	-	-	-	-	-		-
Chromium (Cr)	ND	0.50	-	-	-	-	-	-		-
Copper (Cu)	ND	0.50	-	-	-	-	-	-		-
Germanium (Ge)	13.07	0.50	-	-	-	-	-	-		-
Lithium (Li)	ND	0.50	-	-	-	-	-	-		-
Manganese (Mn)	ND	0.50	-	-	-	-	-	-		-
Molybdenum (Mo)	5.886	0.50	-	-	-	-	-	-		-
Nickel (Ni)	13.781	0.50	-	-	-	-	-	-		-
Lead (Pb)	6.602	0.50	-	-	-	-	-	-		-
Antimony (Sb)	ND	0.50	-	-	-	-	-	-		-
Selenium (Se)	ND	0.50	-	-	-	-	-	-		-
Silicon (Si)	ND	5.00	-	-	-	-	-	-		-
Tin (Sn)	ND	0.50	-	-	-	-	-	-		-
Strontium (Sr)	ND	0.50	-	-	-	-	-	-		-
Titanium (Ti)	ND	0.50	-	-	-	-	-	-		-
Thallium (Tl)	ND	0.50	-	-	-	-	-	-		-
Vanadium (V)	ND	0.50	-	-	-	-	-	-		-
Aluminum (Al)	2.556	1.00	-	-	-	-	-	-		-

Notes:

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QC Summary Report

Defend our Health
565 Congress St, Ste 204
Portland, ME 04101
412-889-7684

Matrix: Plastic Bottles
Collection Date: 3/21/22 - 3/25/22
Laboratory ID: V220309-3
Date Received: 3/9/2022
Date Reported: 3/25/2022

Method: Total Metals by EPA Method 200.8

Client ID: V220309-3	Sample Type: LCS	Units: µg/L	Prep Date: 3/18/2022	Run No: 4
	Batch ID: V220309-3		Analysis Date: 3/21/22-3/25/22	220321, 220322Sb, 220324Al, 220324Si

Analyte:	Result	RL	SPK Value	% Rec	Low Limit	High Limit	RPD Ref Value	% RPD	RPD Limit	Qual
Arsenic (As)	1014.725	0.50	1000	101.4725	85	115	-	-		-
Barium (Ba)	1005.487	0.50	1000	100.5487	85	115	-	-		-
Beryllium (Be)	968.258	0.50	1000	96.8258	85	115	-	-		-
Cadmium (Cd)	1020.425	0.50	1000	102.0425	85	115	-	-		-
Cobalt (Co)	1013.311	0.50	1000	101.3311	85	115	-	-		-
Chromium (Cr)	1010.235	0.50	1000	101.0235	85	115	-	-		-
Copper (Cu)	917.918	0.50	1000	91.7918	85	115	-	-		-
Germanium (Ge)	966.361	0.50	1000	96.6361	85	115	-	-		-
Lithium (Li)	1016.072	0.50	1000	101.6072	85	115	-	-		-
Manganese (Mn)	1016.555	0.50	1000	101.6555	85	115	-	-		-
Molybdenum (Mo)	1015.308	0.50	1000	101.5308	85	115	-	-		-
Nickel (Ni)	1063.393	0.50	1000	106.3393	85	115	-	-		-
Lead (Pb)	1025.177	0.50	1000	102.5177	85	115	-	-		-
Antimony (Sb)	1022.23	0.50	1000	102.223	85	115	-	-		-
Selenium (Se)	1040.449	0.50	1000	104.0449	85	115	-	-		-
Silicon (Si)	10893.44	5.00	10000	108.9344	85	115	-	-		-
Tin (Sn)	917.735	0.50	1000	91.7735	85	115	-	-		-
Strontium (Sr)	997.641	0.50	1000	99.7641	85	115	-	-		-
Titanium (Ti)	1018.987	0.50	1000	101.8987	85	115	-	-		-
Thallium (Tl)	1039.933	0.50	1000	103.9933	85	115	-	-		-
Vanadium (V)	1007.856	0.50	1000	100.7856	85	115	-	-		-
Aluminum (Al)	2061.792	1.00	2000	103.0896	85	115	-	-		-

Notes:

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QC Summary Report

Defend our Health
565 Congress St, Ste 204
Portland, ME 04101
412-889-7684

Matrix: Plastic Bottles
Collection Date: 3/21/22 - 3/25/22
Laboratory ID: V220309-3
Date Received: 3/9/2022
Date Reported: 3/25/2022

Method: Total Metals by EPA Method 200.8

Client ID: V220309-3	Sample Type: MS	Units: µg/L	Prep Date: 3/18/2022	Run No: 4
	Batch ID: V220309-3		Analysis Date: 3/21/22-3/25/22	220321, 220322Sb, 220324Al, 220324Si

Analyte:	Result	RL	SPK Value	% Rec	Low Limit	High Limit	RPD Ref Value	% RPD	RPD Limit	Qual
Arsenic (As)	1011.871	0.50	1000	101.1871	70	130	-	0.39	30	-
Barium (Ba)	999.683	0.50	1000	99.9683	70	130	-	2.61	30	-
Beryllium (Be)	1039.078	0.50	1000	103.9078	70	130	-	2.33	30	-
Cadmium (Cd)	1019.040	0.50	1000	101.904	70	130	-	0.17	30	-
Cobalt (Co)	1007.379	0.50	1000	100.7379	70	130	-	0.25	30	-
Chromium (Cr)	1002.578	0.50	1000	100.2578	70	130	-	0.40	30	-
Copper (Cu)	914.876	0.50	1000	91.4876	70	130	-	0.08	30	-
Germanium (Ge)	868.539	0.50	1000	86.8539	70	130	-	20.03	30	-
Lithium (Li)	922.687	0.50	1000	92.2687	70	130	-	7.01	30	-
Manganese (Mn)	1014.058	0.50	1000	101.4058	70	130	-	1.03	30	-
Molybdenum (Mo)	1019.771	0.50	1000	101.9771	70	130	-	1.08	30	-
Nickel (Ni)	1050.356	0.50	1000	105.0356	70	130	-	0.40	30	-
Lead (Pb)	1016.967	0.50	1000	101.6967	70	130	-	0.53	30	-
Antimony (Sb)	1018.810	0.50	1000	101.881	70	130	-	0.03	30	-
Selenium (Se)	980.994	0.50	1000	98.0994	70	130	-	2.37	30	-
Silicon (Si)	9025.732	5.00	10000	90.25732	70	130	-	3.74	30	-
Tin (Sn)	876.102	0.50	1000	87.6102	70	130	-	0.86	30	-
Strontium (Sr)	1003.968	0.50	1000	100.3968	70	130	-	0.59	30	-
Titanium (Ti)	1003.492	0.50	1000	100.3492	70	130	-	0.65	30	-
Thallium (Tl)	1056.829	0.50	1000	105.6829	70	130	-	0.43	30	-
Vanadium (V)	1013.971	0.50	1000	101.3971	70	130	-	0.98	30	-
Aluminum (Al)	2051.248	1.00	2000	102.5624	70	130	-	2.15	30	-

Notes:

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QC Summary Report

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565 Congress St, Ste 204
Portland, ME 04101
412-889-7684

Matrix: Plastic Bottles
Collection Date: 3/21/22 - 3/25/22
Laboratory ID: V220309-3
Date Received: 3/9/2022
Date Reported: 3/25/2022

Method: Total Metals by EPA Method 200.8

Client ID: V220309-3	Sample Type: MSDUP	Units: µg/L	Prep Date: 3/18/2022	Run No: 4
	Batch ID: V220309-3		Analysis Date: 3/21/22-3/25/22	220321, 220322Sb, 220324Al, 220324Si

Analyte:	Result	RL	SPK Value	% Rec	Low Limit	High Limit	RPD Ref Value	% RPD	RPD Limit	Qual
Arsenic (As)	1007.886	0.50	1000	100.7886	70	130	-	0.39	30	-
Barium (Ba)	1026.199	0.50	1000	102.6199	70	130	-	2.61	30	-
Beryllium (Be)	1015.127	0.50	1000	101.5127	70	130	-	2.33	30	-
Cadmium (Cd)	1017.305	0.50	1000	101.7305	70	130	-	0.17	30	-
Cobalt (Co)	1009.852	0.50	1000	100.9852	70	130	-	0.25	30	-
Chromium (Cr)	1006.645	0.50	1000	100.6645	70	130	-	0.40	30	-
Copper (Cu)	915.605	0.50	1000	91.5605	70	130	-	0.08	30	-
Germanium (Ge)	1061.879	0.50	1000	106.1879	70	130	-	20.03	30	-
Lithium (Li)	989.694	0.50	1000	98.9694	70	130	-	7.01	30	-
Manganese (Mn)	1003.686	0.50	1000	100.3686	70	130	-	1.03	30	-
Molybdenum (Mo)	1008.810	0.50	1000	100.881	70	130	-	1.08	30	-
Nickel (Ni)	1054.536	0.50	1000	105.4536	70	130	-	0.40	30	-
Lead (Pb)	1022.420	0.50	1000	102.242	70	130	-	0.53	30	-
Antimony (Sb)	1019.095	0.50	1000	101.9095	70	130	-	0.03	30	-
Selenium (Se)	1004.479	0.50	1000	100.4479	70	130	-	2.37	30	-
Silicon (Si)	8694.596	5.00	10000	86.94596	70	130	-	3.74	30	-
Tin (Sn)	868.585	0.50	1000	86.8585	70	130	-	0.86	30	-
Strontium (Sr)	998.065	0.50	1000	99.8065	70	130	-	0.59	30	-
Titanium (Ti)	1010.018	0.50	1000	101.0018	70	130	-	0.65	30	-
Thallium (Tl)	1052.275	0.50	1000	105.2275	70	130	-	0.43	30	-
Vanadium (V)	1004.051	0.50	1000	100.4051	70	130	-	0.98	30	-
Aluminum (Al)	2007.658	1.00	2000	100.3829	70	130	-	2.15	30	-

Notes:

X-RAY FLUORESCENCE (XRF) RESULTS

Performed by Ecology Center, Ann Arbor MI.

The purpose of testing was to determine concentrations of detectable elements in PET plastic bottles used for beverages.

On completing testing at Vanguard labs, remaining plastic samples (from fourteen bottles were sent to the Ecology Center. Sample numbers and descriptions are identical to those described in Section 1.

XRF spectroscopy measures element levels. The Ecology Center's HD Mobile instrument from XOS is a high-definition XRF that uses monochromatic excitation energies of 7, 17, and 33 keV using a spot size of one millimeter. Elements heavier than aluminum are measurable. Detection limits are in the low parts-per-million (ppm) range for all elements of interest except chlorine and phosphorus, which have limits in the hundreds of ppm. Plastic bottle samples were cut with isopropanol-cleaned scissors, and were tested as a single layer. Full results are below.

From Ecology Center website:

https://www.ecocenter.org/our-work/healthy-stuff-lab/methodology

Methodology

The Healthy Stuff Lab tests products and environmental media using two in-house analytical instruments, an X-ray Fluorescence (XRF) analyzer and a Fourier Transform Infrared Spectrometer (FTIR). We also employ several other test methods at third-party labs and in university research labs.

XRF and FTIR are widely used by academic researchers, product manufacturers and government regulators to screen consumer products for hazardous chemicals. Each test method has its own strengths and limitations.

Each report published by our lab includes a Method section specific to the study done for that report.

X-ray fluoresence spectroscopy

XRF Background Material

- Comparison of Testing of Plastics for Lead by X-ray Fluorescence and Traditional Nitric Acid Digestion/ GFAA After Muffle Furnace Combustion, November 8, 2008. Danielle Cappellini, B.Sc., MHA and

Woodhall Stopford, MD, MSPH, Duke University School of Medicine.

From the Study: "Originally billed as a "screening" technique, these results suggest that in the range of concern, x-ray fluorescence can be used to determine accurately the presence of excessive levels of lead in plastic materials."

- Study of the Effectiveness, Precision, and Reliability of X-ray Fluorescence Spectrometry and Other Alternative Methods for Measuring Lead in Paint, August, 2009. U.S. Consumer Product Safety Commission
- Linking PBDEs in House Dust to Consumer Products using X-ray Fluorescence, Allen, Joeseph, et. al., Environmental Science and Technology April 30, 2008.
- Common Research Uses for XRF Technology - Summary or Detailed Review with Abstracts A summary of over 80 peer review research papers, from dozens of research areas, which utlized XRF testing as a core analytical method. XRF analyzers are usd by US Customs, FDA, EPA, DOE, & Consumer Agencies. Read more about the use of XRFs for compliance screening.

Quality Assurance/Product Variation - We routinely collect XRF readings from certified reference standards to verify accuracy. We also collect periodic repeat or duplicate scans. These include readings taken from a single location on one product to test repeatability and readings taken from different locations on the same sample to assess variability inherent in the sample.

Data Interpretation - We interpreted the results using the concentrations and uncertainties reported by the analyzer, together with visual examination of the spectra generated by the instrument. The analyzer reports concentrations of elements by analyzing the spectra using reference data for the elements it reports, and measuring the area under the curve in the spectrum. We visually examine a some of the collected spectra to confirm visual observation of key peaks matches the software's reporting.

XRF Testing Methodology

We use a High Definition X-Ray Fluorescence (HDXRF) analyzer manufactured by X-Ray Optical Systems (download XRF Factsheet). The HDXRF analyzer measures levels of chemical elements, such as lead, cadmium, chlorine, bromine, arsenic, mercury, tin, and antimony. The major benefit of HDXRF

is that monochromatic excitation eliminates the X-ray scattering background under the fluorescence peaks, greatly enhancing detection performance. This analytical approach results in detection limits in the parts-per-million (ppm) range for many elements of interest in a variety of materials.

Typical HDXRF element detection levels

The elemental composition of the materials reveals the presence of potentially hazardous chemicals, such as metals, and also allows researchers to infer the possible presence of toxic chemicals or materials, including brominated, chlorinated, or phosphorus-based flame retardants and polyvinyl chloride (PVC). There are a number of chemicals of concern that cannot be detected by this technology.

Methodological Limitations

The levels of lead, cadmium, chlorine, and other elements shown in this website are those reported by the HDXRF analyzer manufactured by X-Ray Operating Systems. Our testing methodology uses standards with known levels of certain elements to check the accuracy of the analyzer in one type of matrix material. However, the products we tested are made of many different types of materials, in some cases even within the same product. A multi-component or multi-layered sample may interfere with the analyzer's ability to quantify the elements accurately. When the component materials in a sample are not homogeneous, the test results may vary depending on the orientation between the object under test and the testing device.

Therefore, the levels we report provide a general indication of the levels in the products in order to guide consumers on product choices. More exhaustive testing with XRF, as well as laboratory testing, could provide more detailed findings on the levels of elements and associated compounds.

RESULTS OF TESTING PET PLASTIC BOTTLES FOR ELEMENTS - For a key to the elements abbreviations, see: https://www.lenntech.com/periodic/name/alphabetic.htm

C – concentration (in parts per million, or ppm)

U - uncertainty (in ppm)

* two samples from these products

		2	4	4 *	6	7	8	10	10 *	11	11 *	12	13	14	18	19	20	21	21 *
Al	C	ND<6470	ND<8176	ND<7038	ND<5981	ND<7358	ND<6141	ND<6224	ND<7958	ND<6382	ND<7607	ND<5930	ND<7764	ND<8100	ND<7934	ND<3388	ND<7948	ND<5446	ND<5797
Al	U	±6470	±8176	±7038	±5981	±7358	±6141	±6224	±7958	±6382	±7607	±5930	±7764	±8100	±7934	±3388	±7948	±5446	±5797
Si	C	ND<1337	ND<1374	ND<900	ND<1103	ND<897	ND<109	ND<1113	ND<1226	ND<1147	ND<1323	ND<940	ND<1146	ND<1455	ND<1069	ND<618	ND<1151	ND<948	ND<998
Si	U	±1337	±1374	±900	±1103	±897	±1090	±1113	±1226	±1147	±1323	±940	±1146	±1455	±1069	±618	±1151	±948	±998
P	C	ND<342	ND<327	ND<423	ND<322	ND<422	ND<504	ND<330	ND<319	ND<448	ND<494	ND<593	ND<583	ND<496	ND<545	ND<160	ND<496	ND<567	ND<465
P	U	±342	±327	±423	±322	±422	±504	±330	±319	±448	±494	±593	±583	±496	±545	±160	±496	±567	±465
S	C	ND<199	ND<187	ND<192	ND<212	ND<194	ND<203	ND<175	ND<203	308	ND<187	ND<185	ND<189	ND<180	ND<202	586	ND<211	ND<189	ND<187
S	U	±199	±187	±192	±212	±194	±203	±175	±203	±219	±187	±185	±189	±180	±202	±174	±211	±189	±187
Cl	C	ND<114	ND<97.3	ND<107	ND<88.3	ND<74.6	ND<122	ND<78.7	ND<94.7	ND<88.8	ND<73.8	ND<68.5	ND<78.4	ND<87.0	ND<135	1050	ND<88.9	ND<79.3	ND<90.1
Cl	U	±114	±97.3	±107	±88.3	±74.6	±122	±78.7	±94.7	±88.8	±73.8	±68.5	±78.4	±87.0	±135	±116	±88.9	±79.3	±90.1
Ca	C	224	120	117	234	200	229	95.5	104	113	135	219	192	230	172	109	171	209	185
Ca	U	±26.7	±18.4	±18.0	±27.3	±24.9	±27.1	±15.7	±16.6	±17.5	±19.5	±26.3	±24.2	±27.0	±22.7	±12.5	±22.6	±25.5	±23.8
Ti	C	20.2	ND<7.3	ND<7.3	ND<7.8	ND<6.8	ND<6.6	ND<7.4	ND<7.2	ND<6.9	ND<6.8	ND<6.8	ND<6.1	ND<6.8	ND<6.3	ND<5.2	ND<7.0	ND<6.6	ND<6.4
Ti	U	±7.2	±7.3	±7.3	±7.8	±6.8	±6.6	±7.4	±7.2	±6.9	±6.8	±6.8	±6.1	±6.8	±6.3	±5.2	±7.0	±6.6	±6.4
Cr	C	ND<1.7	ND<1.8	ND<1.8	ND<1.9	ND<1.8	ND<1.8	ND<1.8	ND<1.8	ND<1.7	ND<1.9	7.4	ND<1.9	ND<2.0	ND<1.7	103	ND<1.8	ND<1.9	ND<1.8
Cr	U	±1.7	±1.8	±1.8	±1.9	±1.8	±1.8	±1.8	±1.8	±1.7	±1.9	±2.5	±1.9	±2.0	±1.7	±4.4	±1.8	±1.9	±1.8
Mn	C	ND<0.7	ND<0.7	ND<0.6	ND<0.9	ND<0.6	ND<0.7	ND<0.7	ND<0.7	ND<0.8	ND<0.7	ND<0.8	ND<0.9	ND<0.8	ND<0.8	ND<0.8	ND<0.7	ND<0.7	ND<0.8
Mn	U	±0.7	±0.7	±0.6	±0.9	±0.6	±0.7	±0.7	±0.7	±0.8	±0.7	±0.8	±0.9	±0.8	±0.8	±0.8	±0.7	±0.7	±0.8
Fe	C	34.2	ND<0.8	ND<0.8	83.6	ND<0.8	17.1	ND<0.6	ND<0.6	ND<0.6	ND<0.6	110	ND<0.6	62.6	46.7	9.2	ND<0.9	65.9	77.8
Fe	U	±1.9	±0.8	±0.8	±3.0	±0.8	±1.4	±0.6	±0.6	±0.6	±0.6	±3.3	±0.6	±2.6	±2.3	±0.9	±0.9	±2.6	±2.8
Ni	C	2	1.4	1.6	1.8	1.1	1.6	1.8	1.8	1.8	1.7	1.8	1.5	2.1	1.7	ND<0.3	1.4	1.6	1.8
Ni	U	±0.4	±0.4	±0.4	±0.5	±0.4	±0.4	±0.4	±0.4	±0.5	±0.4	±0.4	±0.6	±0.5	±0.4	±0.3	±0.4	±0.4	±0.4
Cu	C	7.5	13.7	14.2	7	7.5	7.7	7.4	6.7	11.9	11.6	7.3	6.4	7.2	6.9	115	6.9	7.2	7.5
Cu	U	±0.5	±0.7	±0.7	±0.5	±0.5	±0.5	±0.5	±0.5	±0.6	±0.6	±0.5	±0.5	±0.5	±0.5	±1.4	±0.5	±0.5	±0.5
Zn	C	1.6	0.7	0.9	0.8	0.9	1.2	0.6	0.7	0.9	0.6	0.7	0.5	0.6	0.6	1144	0.6	0.6	1
Zn	U	±0.3	±0.2	±0.2	±0.2	±0.2	±0.3	±0.2	±0.2	±0.2	±0.2	±0.2	±0.2	±0.2	±0.2	±5.2	±0.2	±0.2	±0.2
Ga	C	0.4	ND<0.2	ND<0.2	ND<0.2	ND<0.2	0.5	ND<0.2	ND<0.2	ND<0.2	ND<0.2	ND<0.2	ND<0.2	ND<0.2	ND<0.2	2	ND<0.2	ND<0.2	0.4
Ga	U	±0.2	±0.2	±0.2	±0.2	±0.2	±0.2	±0.2	±0.2	±0.2	±0.2	±0.2	±0.2	±0.2	±0.2	±0.3	±0.2	±0.2	±0.2
Ge	C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ge	U	±0.0	±0.0	±0.0	±0.0	±0.0	±0.0	±0.0	±0.0	±0.0	±0.0	±0.0	±0.0	±0.0	±0.0	±0.0	±0.0	±0.0	±0.0
As	C	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	27	ND<0.1	ND<0.1	ND<0.1
As	U	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±1.1	±0.1	±0.1	±0.1
Se	C	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	3.1	ND<0.1	ND<0.1	ND<0.1
Se	U	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.2	±0.1	±0.1	±0.1
Br	C	ND<0.1	8.2	8.6	1.4	ND<0.1	ND<0.1	9.3	9.4	9.7	9.5	ND<0.1	ND<0.1	ND<0.1	ND<0.1	757	ND<0.1	ND<0.1	ND<0.1
Br	U	±0.1	±0.3	±0.3	±0.1	±0.1	±0.1	±0.3	±0.3	±0.3	±0.3	±0.1	±0.1	±0.1	±0.1	±3.5	±0.1	±0.1	±0.1

		2	4	4 *	6	7	8	10	10 *	11	11 *	12	13	14	18	19	20	21	21 *
Ag	C	ND<2.1	ND<1.9	ND<2.0	ND<1.6	ND<2.3	ND<2.5	ND<1.6	ND<1.7	ND<1.6	ND<1.7	ND<1.9	ND<1.6	ND<1.5	ND<1.7	ND<1.6	ND<1.7	ND<2.2	ND<2.1
Ag	U	±2.1	±1.9	±2.0	±1.6	±2.3	±2.5	±1.6	±1.7	±1.6	±1.7	±1.9	±1.6	±1.5	±1.7	±1.6	±1.7	±2.2	±2.1
Cd	C	11.2	9.5	9.7	11.3	12.4	13.3	11.7	11.3	12.9	10.8	9.3	11.3	13.3	11.8	141	12.1	11.9	9.2
Cd	U	±2.7	±2.6	±2.6	±2.2	±3.1	±3.4	±2.3	±2.2	±2.3	±2.3	±2.5	±2.1	±2.2	±2.2	±4.6	±2.3	±3.0	±2.8
Sn	C	ND<5.6	ND<5.4	ND<5.7	ND<4.5	ND<6.2	ND<6.6	ND<4.5	ND<4.3	ND<4.6	ND<4.4	ND<5.0	ND<4.2	ND<4.4	ND<4.5	94.7	ND<4.6	ND<5.8	ND<5.9
Sn	U	±5.6	±5.4	±5.7	±4.5	±6.2	±6.6	±4.5	±4.3	±4.6	±4.4	±5.0	±4.2	±4.4	±4.5	±4.8	±4.6	±5.8	±5.9
Sb	C	238	ND<3.3	ND<3.4	300	289	265	ND<2.7	ND<2.8	ND<4.7	ND<2.9	310	264	309	321	102	255	306	285
Sb	U	±12.0	±3.3	±3.4	±10.3	±14.4	±14.7	±2.7	±2.8	±4.7	±2.9	±12.3	±9.7	±10.2	±10.7	±6.5	±10.1	±14.0	±13.6
Ba	C	ND<10.6	ND<10.2	ND<10.0	ND<13.3	ND<9.0	ND<9.5	ND<12.1	ND<12.8	ND<12.4	ND<12.9	ND<11.5	ND<12.4	ND<12.8	ND<12.1	ND<11.0	ND<12.4	ND<9.6	ND<10.5
Ba	U	±10.6	±10.2	±10.0	±13.3	±9.0	±9.5	±12.1	±12.8	±12.4	±12.9	±11.5	±12.4	±12.8	±12.1	±11.0	±12.4	±9.6	±10.5
Gd	C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gd	U	±0.0	±0.0	±0.0	±0.0	±0.0	±0.0	±0.0	±0.0	±0.0	±0.0	±0.0	±0.0	±0.0	±0.0	±0.0	±0.0	±0.0	±0.0
Hg	C	ND<0.3	ND<0.1	ND<0.1	ND<0.1	ND<0.2	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.2	ND<0.2	ND<0.1	ND<0.1	24.2	ND<0.2	ND<0.3	ND<0.1
Hg	U	±0.3	±0.1	±0.1	±0.1	±0.2	±0.1	±0.1	±0.1	±0.1	±0.1	±0.2	±0.2	±0.1	±0.1	±0.6	±0.2	±0.3	±0.1
Tl	C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tl	U	±0.0	±0.0	±0.0	±0.0	±0.0	±0.0	±0.0	±0.0	±0.0	±0.0	±0.0	±0.0	±0.0	±0.0	±0.0	±0.0	±0.0	±0.0
Pb	C	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	95.4	ND<0.1	ND<0.1	ND<0.1
Pb	U	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±2.0	±0.1	±0.1	±0.1
Bi	C	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.2	ND<0.1	ND<0.1	ND<0.1
Bi	U	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.2	±0.1	±0.1	±0.1