UNITED STATES MARINE CORPS
MARINE CORPS INSTALLATIONS EAST-MARINE CORPS BASE
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From: Assistant Chief of Staff, G-F, Marine Corps Installations East Marine Corps Base Camp Lejeune
To: Parents and Guardians

Subj: 2021 LEAD IN DRINKING WATER AT PRIORITY AREA (LIPA) FACILITIES SAMPLING

Encl: (1) Facility LIPA Sampling Results
(2) Lead in Drinking Water Fact Sheet
(3) Facility-Specific LIPA Report

1. The United States Marine Corps is committed to protecting the health of our Marines, civilian staff, and their families by providing safe drinking water. We monitor drinking water quality throughout the base, including testing for lead. It is Marine Corps policy to follow U.S. Environmental Protection Agency (EPA) voluntary guidelines for testing and sampling of water from drinking water fountains, faucets, and other fixtures from which children may drink at schools and child care centers.

2. EPA suggests that priority area facilities test their drinking water for lead because high levels of lead in drinking water can cause health problems. Pregnant women, infants, and children under 6 years old are most vulnerable to lead exposure. If lead is found at any water fixture at levels above 15 parts per billion (ppb), Marine Corps policy requires taking action to reduce lead exposure. Enclosure (1) includes a summary of the recent routine water testing results from the school/child care facility your child(ren) attends. Enclosure (2) provides a factsheet with background information about the impacts of lead in drinking water. Enclosure (3) includes a detailed report of the recent routine water testing from the school/child care facility your child(ren) attends.

3. The most common way lead can enter drinking water is by leaching from plumbing materials and fixtures as water moves through them. Lead is more likely to be found in drinking water when the water has not been run for several hours and has been sitting in the system.

4. The Marine Corps' safe drinking water program is outlined in Marine Corps policy (Marine Corps Order 5090.2 Volume 16). This policy provides requirements and guidance regarding sampling and testing of drinking water in priority areas at Marine Corps installations, taking corrective actions, and communicating sampling results. Testing will be conducted on five year intervals or when significant plumbing modifications are made.

5. To answer any questions you may have on the sampling program, contact the Communication Strategy & Operations office at (910) 451-5655. If you have any health questions or concerns, I encourage you to contact your health care providers or, if you are a TRICARE beneficiary, call the Naval Medical Center Camp Lejeune Appointment Line at (910) 450-HELP (4357) to schedule an appointment with your primary care provider.

A. L. LITTERAL
By Direction

Bitz Intermediate School (Bldg. 2028)

2021 Lead in Drinking Water at Priority Area Facilities Sampling Results

Of the 70 water samples we tested at Bitz Intermediate School (Bldg. 2028), 2 samples showed lead levels above the 15 parts per billion (ppb) action level. In other words, 97% of the water fixtures tested did not have any lead detections of concern.

The fixtures with elevated lead levels were classroom sink bubblers (drinking fountains) in rooms C107 (15.8 ppb) and E105 (16.2 ppb). They were taken out of service the day after receiving sampling results. These issues were addressed by cleaning the fixture in room C107 and replacing the fixture in room E105. After completing these corrective actions, resampling results indicated that all samples were below the 15 ppb action level and no additional corrective actions were necessary. Additionally, the base water distribution system (which contains no lead service lines) that serves Bitz Intermediate School was monitored for lead in 2021 and samples collected were all below action levels.

Classroom C107 has seen limited use for several years, and is not currently used, making it highly unlikely that children would consume water from this fixture.

Classroom E105 has been used as the reading specialist classroom since 2016. Unless receiving reading support in this classroom, it is highly unlikely that children would consume water from this fixture. Most students refill water bottles elsewhere in the school, but it is possible that a student could refill a water bottle from this fixture.

You can find a copy of all of our water testing results in Enclosure (3) of this package, at the Bitz Intermediate School main office, which is open Monday – Friday 8:00AM – 4:00PM, or online at https://www.lejeune.marines.mil/Offices-Staff/Environmental-Mgmt/. For more information about drinking water quality, please contact the Communication Strategy & Operations office (COMMSTRAT, formerly Public Affairs) at cljn_globe_web@usmc.mil or 910-451-5655.

LEAD *in* DRINKING WATER

The United States Marine Corps is committed to protecting the health of our Marines, civilian staff, and their families by providing safe drinking water. Drinking water quality, including testing for lead, is monitored throughout the installation. It is Marine Corps policy to follow Environmental Protection Agency (EPA) voluntary guidelines for testing and sampling of water fixtures from which children may drink at schools, childcare centers, hospital pediatric wards, and maternity wards. If you have any questions about how Marine Corps Base Camp Lejeune implements the safe drinking water policy, please contact the Base Communication Strategy & Operations office (COMMSTRAT, formerly Public Affairs) at (910) 451-5655.

WHAT IS LEAD?

- Lead is a naturally occurring metal that can be harmful if inhaled or swallowed.
- Lead can be found in air, soil, dust, food, and water, and is common in plumbing materials and water service lines.
- Exposure to high levels of lead can result in adverse health effects.

WHAT ARE THE HEALTH RISKS OF LEAD EXPOSURE?

- Pregnant women, infants, and children under 6 years old are the most vulnerable to lead exposure.
- Growing children absorb lead more rapidly and are negatively impacted by a level of lead exposure that would have little effect on an adult.
- A child's mental and physical development can be irreversibly impaired by over-exposure to lead.
- EPA estimates that drinking water can make up 20% or more of a person's total lead exposure.
- Infants who consume mostly mixed formula can receive 40% to 60% of their exposure to lead from drinking water.

HOW DOES LEAD GET INTO A FACILITY'S DRINKING WATER?

- Even though drinking water from water treatment plants may meet federal, state, local, and overseas standards, a facility may still encounter elevated lead levels at the fixture or spigot due to lead in plumbing materials.
- Lead most frequently enters drinking water from corrosion of materials containing lead in the water distribution system, such as plumbing pipes, solder, water coolers, and faucets.
- Many factors contribute to corrosion, including the acidity of the water, and how long water stands in the plumbing system.

HOW MUCH LEAD IN DRINKING WATER IS TOO MUCH?

- Marine Corps policy sets a screening level of 15 parts per billion (ppb) in school or childcare settings to protect children who are exposed to lead in drinking water on a recurrent basis.
- EPA recommends that schools collect samples from water fountains and fixtures when they are first used during the day, which maximizes the likelihood that the highest concentrations of lead are found because water remained in plumbing overnight.
- When sampling results show lead levels exceeding 15 ppb, those fountains and fixtures are taken out of service until remediation is complete.

WHAT IS REMEDIATION?

- Remediation refers to both short- and long-term actions taken to reduce the levels of lead in drinking water if test results indicate that there is a lead issue at a school or childcare facility.
- EPA's school sampling protocol was designed to identify specific fountains and faucets that require remediation, such as water cooler replacement.

WHAT CAN I DO TO PROTECT MY CHILD FROM LEAD EXPOSURE?

- Actions at home to reduce lead exposure are just as important as steps schools or childcare centers take to reduce lead. EPA's lead poisoning home checklist (available at https://www.epa.gov/sites/production/files/2014-05/documents/lead_poisoning_home_checklist.pdf) can help assess lead risks at home. Steps to reduce lead exposure in drinking water at home include:
  - ✓ Running the cold water faucet for 15-30 seconds to flush taps if water has been unused for more than six hours.
  - ✓ Using only cold water for drinking and cooking.
  - ✓ Using bottled water.

LEAD *in* DRINKING WATER

WHERE CAN I FIND MORE INFORMATION?

- More information on the health effects of lead can be found on EPA's website at https://www.epa.gov/lead or at the Centers for Disease Control and Prevention (CDC) website at https://www.cdc.gov/nceh/lead/.
- If you have any health questions or concerns, you can contact your health care providers or, if you are a TRICARE beneficiary, you can call the Naval Medical Center Camp Lejeune Appointment Line at (910) 450-HELP (4357) to schedule an appointment with your primary care provider.
- You can contact the Base COMMSTRAT (formerly Public Affairs) office at (910) 451-5655 or cljn_globe_web@usmc.mil and they can provide you with information about your facility's water supply.
- Marine Corps Base Camp Lejeune's Water Quality (Consumer Confidence) Reports can be found at https://www.lejeune.marines.mil/Offices-Staff/Environmental-Mgmt/Annual-Reports/.

EPA 3T Drinking Water Assessment
for
Marine Corps Base Camp Lejeune
and
Marine Corps Air Station New River

Prepared for

MCB Lejeune
Environmental Quality Branch
Environmental Management Division
MCB Camp Lejeune, NC 28547

December 2021

Building B2028 – Bitz Intermediate School Report

Table of Contents

Acronyms and Abbreviations and Definitions

CDC	Child Development Center
COVID-19	Coronavirus Disease 2019
DoDEA	Department of Defense Education Activity
EPA	U.S. Environmental Protection Agency
LCCA	Lead Contamination Control Act
LOQ	Limit of Quantitation
MCAS	Marine Corps Air Station
MCB	Marine Corps Base
MCO	Marine Corps Order
MDL	Method Detection Limit
ml	milliliter
ppb	parts per billion
SDWA	Safe Drinking Water Act
USEPA	U.S. Environmental Protection Agency
USMC	U.S. Marine Corps
3T	Training, Testing and Taking Action

1 BACKGROUND

1.1 Introduction and Purpose

Marine Corps installations are required by Marine Corps Policy Letter 3-21 dated 1 July 2021 to perform sampling and testing for lead in drinking water in priority places on each installation. The policy requirements follow the U.S. EPA "3T" guidelines (Training, Testing, and Taking Action). The focus is on sampling of drinking water for lead from water fountains, faucets, and other faucets used primarily by children within priority areas (primary and secondary schools, child development centers (CDC), school-age centers, and youth and teen centers.

The performance of this sampling event is intended to meet the 5-year review requirements of the EPA's 3T guidelines and USMC policy. Initial sampling requirements were conducted under an earlier, similar policy in 2014.

The EPA recommends a two-step sampling process be utilized for identifying lead contamination. First, initial samples are collected to identify faucets in priority areas that are providing water with elevated lead levels. Follow-up samples are taken from faucets initially identified as potential problem locations. Sample results are then compared to determine the potential sources of lead contamination and to determine appropriate corrective actions. Below is a brief explanation as to why lead is a concern in drinking water, followed by a brief description of sampling methodology used, sampling results, and any corrective actions required.

1.2 Lead and Drinking Water

Lead is a toxic metal that is harmful to human health and has no known benefit to the human body. Within the body, lead is indistinguishable from calcium, an element that is essential for human health. Due to this fact, lead can remain in the blood stream and body organs for months. What does not get excreted is absorbed into the bones, where it can accumulate over a lifetime of exposure.

Metals such as lead generally pose a more significant health risk to children that are ages 6 and under. This is due to frequent hand-to-mouth contact and smaller body size. Children also absorb lead more easily than adults. Children's nervous systems are still undergoing development and are more susceptible to the toxic effects caused by lead. Lead is also harmful to developing fetuses of pregnant women.

No safe blood level for lead has been determined. Lead can affect almost all organs and systems, with the most sensitive being the central nervous system. Lead also damages kidneys and the reproductive system.

Lead can enter drinking water in two ways: by being present at the source water; or through the interaction between water and the plumbing materials that contain lead. The latter is the focus of this water sampling effort.

Lead can enter the water supply through contact with plumbing fixtures and materials that contain lead. This can include pipe, lead solder (common until 1986), faucets, valves, and other plumbing components that contain brass. It is important to note that brass plumbing components can contain lead.

Corrosion can release lead from plumbing materials that the water comes in contact with on its way from the water treatment system to the tap. The occurrence and rate of corrosion depends on the physical and chemical properties of the water itself, the amount of lead in the plumbing material used, the corrosion control practices at the water system, and the age of the plumbing materials in the building. The longer water stays in contact with the plumbing materials, the higher concentration of lead. Most lead in school and childcare facility drinking water results from corrosion of older plumbing materials containing lead. Interior lead solder, leaded brass fittings, valves, and various drinking water faucets (e.g., water fountains and faucets) that contain lead materials are the primary contributors.

Lead is rarely present in the source water for the nation's drinking water supplies (i.e., untreated water from streams, rivers, lakes, or underground aquifers that is used to supply private wells and public drinking water). While lead can enter source water from contaminated runoff or water pollution, treatment plant technologies can remove lead from these sources.

Lead is regulated in public drinking water systems under a federal regulation known as the Lead and Copper Rule. This regulation was initially issued in 1991 and, in part, requires water systems to test for lead and copper and to take actions that reduce corrosivity and protect public health. Base water systems are monitored for lead every 3 years, and the most recent samples collected were all below action levels.

Requirements addressing lead in water include specific provisions in:

- The Safe Drinking Water Act (SDWA) Lead Ban (1986)
- The Lead Contamination Control Act (LCCA) (1988)
- The Lead and Copper Rule (1991) – Revised 2021
- The Reduction of Lead in Drinking Water Act (2011)

2 METHODOLOGY

2.1 Priority Areas

All priority areas aboard Marine Corps Base (MCB), Camp Lejeune and Marine Corps Air Station (MCAS), New River had to be identified prior to developing a sampling and analysis plan. These "priority areas" are defined as faucets in primary and secondary schools, CDCs, School Age Centers, and Youth and Teen Centers. Priority areas do not include on-base or off-base residences (e.g., Family Child Care Homes) used for childcare purposes, out-patient medical centers, or schools that are not owned or managed by the Department of Defense. Since the June 2013 Navy Medicine Enterprise Nursing Procedures Manual mandates the use of sterile water to reconstitute powdered formula and as recommended by Bureau of Medicine and Surgery, hospital pediatric and maternity wards are not included in the priority area definition. Priority areas aboard MCB Camp Lejeune and MCAS New River are shown in Table 2-1.

Table 2-1. Priority Areas Aboard MCB Camp Lejeune and MCAS New River

Facility Name	Facility No.	Facility Type
Air Station CDC	AS1000	CDC
Bitz Intermediate School	B2028	School
Brewster CDC**	B631	CDC
Brewster Middle School	B883	School
Courthouse Bay CDC	BB353	CDC
Delalio Elementary School	TC1500***	School
Heroes Elementary School	PP201	School
Heroes Manor I CDC	PP100	CDC
Heroes Manor II CDC	PP200	CDC
Johnson Primary School	B2027	School
Lejeune High School	B835	School
Paradise Point Officer's Club*	B2615	Kitchen
Stone Street Pavilion Youth Center	B842	Youth/Teen
Tarawa Terrace I CDC	TT86	CDC
Tarawa Terrace II CDC	TT113	CDC
Tarawa Terrace Elementary	TT84	School
Tarawa Terrace Youth Pavilion	TT19	Youth/Teen

* The Paradise Point Officer's Club is not considered a priority area by definition. However, since they cater meals to the CDCs, Paradise Point Officer's Club was included in this sampling effort.

** The Brewster CDC is undergoing extensive renovation work and could not be accessed or sampled.

*** During sampling the facility was numbered TC1500 but has since then been renumbered to AS990.

2.2 Field Investigation

A 3rd party contractor evaluated all water supply faucets located at the priority areas (as determined by the criteria set forth in MCO 5090) listed in Table 2-1 using the methods described in the most current USEPA 3T Manual. During these site visits, the contractor looked for faucets potentially used by children under the age of 6 years and/or pregnant women (e.g., drinking fountains, nurses' office sinks, classrooms used for early childhood education, kitchen sinks, teachers' lounges).

Additionally, facility operators were asked how the children generally used the water faucets in each facility. Faucets that are not used for human consumption, such as sinks in janitor's closets, outdoor hoses, or science lab sinks were not included in the sampling effort. For sinks where consumption might not seem typical but could be possible (accounting for the age of the student body, location, proximity to other more suitable water sources, etc.) the sampling team erred on the side of caution and collected a sample.

2.3 Sample Collection

Sample collection followed the guidance provided in the revised USEPA 3T guidance manual. Samples were collected in clean, laboratory supplied 250-ml plastic bottles with approximately 2 ml of nitric acid preservative added. All bottleware was provided by Pace Analytical Services via their Pace Analytical Gulf Coast lab located in Baton Rouge, Louisiana. Additionally, Pace Analytical Gulf Coast provided all analytical services for this project.

The sampling procedure described by the USEPA 3T guidance manual emphasized the need for the potential sample water to have between 8 and no more than 18 hours of contact time with the pipes and plumbing fixtures prior to sampling. Due to the nature of the activities conducted in the priority areas, it is not possible to determine/predict/identify which fixtures get used throughout the course of a given day. To minimize assumptions when analyzing sample results, the contractor would visit and purge each water fixture for one to two minutes at least 8 hours before any samples were collected. After all fixtures at the location were purged, the sampling team would secure the site and return between 8 and 18 hours later to collect the sample. One 250 ml bottle of water would be collected from each fixture at this time.

Each sample identifier contained two parts, ex. 2028-1. The first part of the identifier represented the facility and the last part represented a specific location/fixture that was keyed to a facility floor plan. The identifier shown in the example describes a sample obtained from "Building B2028 (Bitz Intermediate School)" at fixture "1".

3 RESULTS AND CORRECTIVE ACTIONS

3.1 Water Testing Results

Samples were collected from Bitz Intermediate School on 29 March 2021. Table 3-1 shows the initial sampling results received on 14 April 2021.

USEPA 3Ts guidance recommends that action be taken for samples that exceed 15 parts per billion (ppb). The term "part per billion" expresses an exceedingly small unit of measure that can be difficult to envision. An example of the scale of this unit of measure given by the University of Wisconsin is approximately eight drops of water in an Olympic-sized swimming pool.

Table 3-1. Bitz Intermediate School, Bldg. B2028 – Initial Sampling Results

Sample ID Number	Lead Concentration (ppb)	Sample ID Number	Lead Concentration (ppb)
2028-1	0.5 U	2028-38	13.8
2028-2	0.71 J	2028-39	12.8
2028-3	0.5 U	2028-40	5.89
2028-4	0.5 U	2028-41	10.9
2028-5	0.5 U	2028-42	0.58 J
2028-6	0.5 U	2028-43	11.7
2028-7	1.05	2028-44	1
2028-8	0.84 J	2028-45	4.57
2028-9	0.5 U	2028-48	1.1
2028-10	2.65	2028-49	1.19
2028-11	0.5 U	2028-50	0.74 J
2028-12	0.31 J	2028-51	4.06
2028-13	0.5 U	2028-52	1.3
2028-14	0.54 J	2028-53	3.03
2028-15	0.5 U	2028-54	0.86 J
2028-18	0.29 J	2028-55	16.2
2028-19	3	2028-56	3.38
2028-20	0.44 J	2028-57	3.98
2028-21	1.13	2028-58	2.56
2028-22	0.83 J	2028-59	2.41
2028-23	8.72	2028-60	3.84
2028-24	3.04	2028-61	6.8
2028-25	15.8	2028-62	1.83
2028-26	0.95 J	2028-63	2.89
2028-27	2.94	2028-64	4.44
2028-28	3.73	2028-65	3.13
2028-29	4.79	2028-66	1.45
2028-30	0.36 J	2028-67	2.17

Table 3-1. Bitz Intermediate School, Bldg. B2028 – Initial Sampling Results			
Sample ID Number	Lead Concentration (ppb)	Sample ID Number	Lead Concentration (ppb)
2028-31	6.61	2028-68	2.26
2028-32	0.88 J	2028-69	5.71
2028-33	4.83	2028-70	2.56
2028-34	1.86	2028-71	1.78
2028-35	14.9	2028-72	0.43 J
2028-36	0.52 J	2028-73	2.97
2028-37	4.35	2028-74	2.04

J – Indicates the result is between the MDL (method detection limit) and LOQ (limit of quantitation)
U – Indicates the compound was analyzed but not detected

As shown in Table 3-1, 97% of all samples taken contained a lead concentration on 15-ppb or less. Only two samples exceeded the USEPA 3Ts guidance threshold of 15-ppb, and therefore required immediate corrective action.

3.2 Corrective Actions

Building B2028 (Bitz Intermediate School) contained only two fixtures that exceeded the 15-ppb action level currently described in both the current USEPA 3T guidance and MCO 5090. Based on these analytical results the USEPA suggests corrective action be taken at the fixtures to protect children from possible exposure to lead. Upon receipt of the analytical data, MCB Camp Lejeune Environmental Management Division personnel were notified of the exceedances. It was recommended to immediately shut off the water at the initial exceedance locations. The contractor further described additional steps that could be taken to limit exposure and begin the remedial process for this location.

A discussion including details and corrective action measures for the sample points that exceeded the 15-ppb action level can be found below.

3.2.1 2028-25

Sample fixture 2028-25 is a bubbler type fixture located in room C107 at a classroom sink. This classroom has seen limited use for several years and is not currently used making it highly unlikely that children would have consumed water from this fixture.

Initial sample results were received on 14 April 2021 and showed a lead concentration of 15.8-ppb which is an exceedance of the 15-ppb threshold. After results were received the water was shut off at the bubbler and the bubbler was manually cleaned.

Resampling was conducted on 5 May 2021 and included a resample 1st draw and sequential 2nd and 3rd draw. Resampling results were received on 21 May 2021. The results of the resample 1st draw and sequential 2nd and 3rd draw were 10.9-, 3.67- and

2.29-ppb. The bubbler achieved compliance. Sample location 2028-25 requires no further action.

3.2.2 2028-55

Sample fixture 2028-55 is a bubbler type fixture located in room E105 at a classroom sink. This classroom has been used as the reading specialist classroom since 2016. Unless receiving reading support in this classroom, it is highly unlikely that children would consume water from this fixture. Most students refill water bottles elsewhere in the school, but it is possible that a student could refill a water bottle from this fixture.

Initial sample results were received on 14 April 2021 and showed a lead concentration of 15.8-ppb which is an exceedance of the 15-ppb threshold. After results were received the water was shut off at the bubbler and the bubbler was manually cleaned.

Resampling was conducted on 5 May 2021 and included a resample 1st draw and sequential 2nd and 3rd draw. Resampling results were received on 21 May 2021. The results of the resample 1st draw and sequential 2nd and 3rd draw were 64.4-, 2.93- and 3.83-ppb. The bubbler remained non-compliant, so it was recommended to replace the bubbler.

After the bubbler was replaced, confirmatory sampling was conducted on 25 August 2021 and results were received on 9 September 2021. Compliance was achieved with the confirmatory sampling result at 2.32-ppb. Sample location 2028-55 requires no further action.

4 NEXT STEPS

MCB Camp Lejeune completed the recommended remediation at all fixtures with known exceedances of the 15-ppb USEPA action level for lead. All fixtures that were included in this 3T Drinking Water Assessment at B2028 (Bitz Intermediate School) have demonstrated compliance with the USEPA 3T program guidance.

The public health response to the COVID-19 pandemic has altered the way students and faculty consume water during the school day. It is possible that some fixtures in schools and child development centers may be used only intermittently until the threat of COVID-19 is minimized and/or eliminated. As additional fixtures are brought back into more regular service and used for consumption, it will be important to follow the flushing practices described on pages 49 and 50 of the revised 3T Manual.

MCB Camp Lejeune will continue to monitor for lead in drinking water in priority areas. In accordance with USMC policy, sampling efforts will be conducted when any new priority area facilities are constructed. Fixtures will also be sampled at existing priority area facilities when water treatment processes are added or modified in any way that has the potential to increase lead concentrations in drinking water. However, after January 2014, if the contractor of newly constructed facilities can adequately demonstrate that all materials used in plumbing conform to section 1417 of the Safe Drinking Water Act (SDWA), which requires less than 0.25% lead, then the requirement to test new construction is waived. Installations are also required to resample priority areas every five years, or more frequently if required by regulatory agencies.