



UNITED STATES MARINE CORPS  
MARINE CORPS INSTALLATIONS EAST-MARINE CORPS BASE  
PSC BOX 20005  
CAMP LEJEUNE NC 28542-0005

MCIEAST-MCB CAMLEJO 5090.16C  
G-F/BEMD  
**MAY 17 2023**

MARINE CORPS INSTALLATIONS EAST-MARINE CORPS BASE CAMP LEJEUNE ORDER  
5090.16C

From: Commanding General  
To: Distribution List

Subj: DRINKING WATER SYSTEMS AND WATER CONSERVATION ON MARINE CORPS  
BASE CAMP LEJEUNE AND MARINE CORPS AIR STATION NEW RIVER

Ref: (a) 15A NCAC 18C, Water Supplies  
(b) 42 U.S.C. §300f-300j-9  
(c) MCO 5090.2  
(d) UG-2029-ENV, "Cross Connection Control and Backflow  
Prevention Program Implementation at Navy Shore  
Facilities," May 1998  
(e) COMMCICOM Policy Letter 6-19 of 24 Jun 19, Sampling and  
Testing for Lead in Drinking Water in Priority Areas  
(f) 15A NCAC 02C.0107, Standards of Construction: Water Supply  
Wells

Encl: (1) ESOP 5090.16.3 - Procedures for Drinking Water Sampling  
Program for MCB CAMLEJ and MCAS New River  
(2) Drinking Water Sampling/Monitoring  
(3) Lists of Monitored Constituents  
(4) Distribution System Water Line Break Notifications Flow  
Chart  
(5) Reports Required  
(6) ESOP 5090.16.4 - Installation of Cross-Connection and  
Backflow Prevention Assemblies and Filling Potable Water  
Trucks

1. Situation

a. This Order summarizes regulatory requirements and policy within the references for Marine Corps Installations East-Marine Corps Base Camp Lejeune (MCIEAST-MCB CAMLEJ) drinking water supply wells and treatment and distribution systems on MCB CAMLEJ and Marine Corps Air Station New River (MCAS NR). MCIEAST-MCB CAMLEJ is also responsible for the production and/or distribution of drinking water to the Rifle Range, the Verona Loop, the Greater Sandy Run training areas, and other outlying installation areas. These installations and areas are collectively referred to as the "Installation" within this Order.

b. MCIEAST-MCB CAMLEJ currently uses approximately 1.94 billion gallons of drinking water annually. The Installation's sole drinking

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water source is the Castle Hayne aquifer. To meet Installation drinking water demands, approximately 72 million gallons of potable water are procured annually from the Onslow Water and Sewer Authority (ONWASA).

c. MCIEAST-MCB CAMLEJ's drinking water program is comprised of the following:

(1) Four potable water treatment plants with 57 online drinking water supply wells;

(2) Six, permitted drinking water distribution systems totaling approximately 2,000 miles of combined raw and finished water lines; and

(3) A robust drinking water sampling program.

(a) Construction, operation, maintenance, and repair of drinking water treatment and distribution systems may significantly impact drinking water quality and availability. To ensure Installation drinking water is safe and reliable, MCIEAST-MCB CAMLEJ continues to sample its raw and finished drinking water more frequently than what state and Federal regulations currently require.

(b) In accordance with references (a) and (b), and the water distribution systems' permits, the Drinking Water Sampling Program Environmental Standard Operating Procedures (ESOP), enclosure (1), publishes procedures and guidelines for the Installation's drinking water sampling program. Enclosure (2) provides all mandatory and voluntary sampling for the raw and finished water on the Installation. In addition, enclosure (3) is a comprehensive list of constituents that are analyzed at the Installation.

d. The MCIEAST-MCB CAMLEJ Drinking Water Quality and Conservation Program's plans and programs listed below support the management of the Installation's drinking water systems. Copies of the published, publicly available plans are available from the MCIEAST-MCB CAMLEJ AC/S G-F Environmental Management Division (EMD), Environmental Quality Branch.

(1) Wellhead Protection Plan (WHPP). The WHPP identifies specific management actions, procedures, and plans for protecting individual drinking water supply wells and groundwater recharge areas. The WHPP is annually reviewed and comprehensively updated at least every five years.

(a) Master planning processes and land use plans must consider the requirements of the WHPP to protect drinking water quality.

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(b) The WHPP identifies well fields/groundwater recharge areas on the Installation. It also outlines land use controls and environmental quality monitoring and water pollution prevention and abatement measures for protecting and improving water quality.

(2) Water System Management Plan (WSMP). The WSMP demonstrates that MCIEAST-MCB CAMLEJ has the capacity to operate its drinking water distribution systems and meet reference (a) and (b) requirements. The WSMP is updated when the water systems receive major modifications.

(3) Operations and Maintenance (O&M) Plan. The O&M Plan ensures MCIEAST-MCB CAMLEJ has the technical capacity required to operate the systems to meet reference (a) and (b) requirements. The term, "Technical capacity," refers to the ability of personnel to operate and maintain the systems, including the treatment and storage facilities and the distribution infrastructure. The O&M Plan is updated when the water systems receive major modifications or treatment processes change.

(4) Emergency Management Plan (EMP). The EMP meets reference (a) and (b) requirements and provides the following:

(a) The identification and phone numbers of utility system personnel and other local, state, and Federal contacts responsible for emergency management;

(b) The identification of foreseeable natural and human-caused emergencies;

(c) A description of the emergency response plan for each identified emergency; and

(d) A description of the emergency notification process. The EMP must be continuously available to drinking water system operators and to North Carolina Department of Environmental Quality (NCDEQ), Public Water Supply Section inspectors. The EMP shall be updated when water systems receive major modifications or treatment processes change.

(5) Emergency Response Plan (ERP). MCIEAST-MCB CAMLEJ prepares an ERP in accordance with reference (b). The ERP includes a threat evaluation, site characterization and response procedures, and recovery and remediation actions that MCIEAST-MCB CAMLEJ shall take following terrorist threats and other acts against the drinking water systems.

(6) Local Water Supply Plan (LWSP). An LWSP is an annual assessment of a water system's current and future water needs and its ability to meet those needs. MCIEAST-MCB CAMLEJ uses an LWSP to

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manage its water supplies, plan for water supply system improvements, and identify future water shortages.

(7) Lead and Copper Rule (LCR). The main objective of the North Carolina Lead and Copper Rule (LCR) is to protect the public from metals resulting from corrosion in the piping system. The LCR requires the water served by all community and non-transient non-community public water systems to meet the "action levels" for lead and copper as measured at the consumer taps and/or provide optimal corrosion control treatment to minimize these corrosion by-products within the distribution system.

(8) Water System Vulnerability Assessment (WSVA). MCIEAST-MCB CAMLEJ is required to prepare a WSVA. The WSVA lists Antiterrorism/Force Protection projects/action items and how past items were addressed.

(9) Water Shortage Response Plan (WSRP). By balancing water availability and demand, the WSRP assesses and manages the Installation's water supplies during short-term water shortages.

(10) Stage 2 Disinfectant/Disinfection Byproduct Plan (DDBP). The DDBP is used to protect drinking water quality from disinfection byproducts that may form when disinfectants are added during treatment processes.

(11) Central Coastal Plain Capacity Use Area (CCPCUA). The CCPCUA program protects the long-term productivity of aquifers supporting the Installation and allows the use of groundwater for beneficial uses at rates that do not exceed aquifer recharge rates. MCIEAST-MCB CAMLEJ voluntarily supports the CCPCUA program by submitting information (e.g., monthly static and pumping levels, daily aquifer water withdrawal total amounts, and annual chloride results for all drinking water supply wells) to the State.

(12) Backflow Prevention Plan Program. Reference (d) provides information necessary to prepare and implement drinking water cross-connection control and backflow prevention programs. The Installation's drinking water distribution systems are protected by continuously implementing and enforcing a cross-connection control and backflow prevention program.

(13) Lead in Priority Areas (LIPA). In accordance with references (c) and (e), Marine Corps installations sample, test, and maintain resultant records for lead in drinking water at designated priority areas.

2. Cancellation. MCIEAST-MCB CAMLEJO 5590.16B.

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3. Mission

a. To protect human health and the environment; protect, sustain, and enhance mission readiness; and promote compliance with all applicable Federal, state, and local requirements and policy concerning the provision of safe drinking water, establish procedures and assign responsibilities supporting the delivery of safe drinking water to consumers on the Installation.

b. Summary of Revision. This Order was annually reviewed to ensure all references, regulations, procedures, and policy regarding MCIEAST-MCB CAMLEJ drinking water systems and water conservation were current. This Order has been substantially revised and should be reviewed in its entirety.

4. Execution

a. Commander's Intent and Concept of Operations

(1) Commander's Intent. To effectively manage, monitor, and maintain the Installation's drinking water systems to ensure their protection and compliance with all applicable Federal, state, and local requirements and policy regarding the provision of safe drinking water.

(2) Concept of Operations. Primary tasks and information for ensuring safe drinking water quality are provided below and in the enclosures.

b. Tasks

(1) MCIEAST-MCB CAMLEJ Assistant Chief of Staff (AC/S), G-F. The AC/S G-F shall:

(a) Oversee, coordinate, and direct the design, construction, operation, protection, maintenance, repair, and regulatory compliance of drinking water systems on the Installation.

(b) Ensure the Environmental Management Division (EMD) Director oversees, coordinates, and directs the following tasks:

1. Implement drinking water environmental compliance evaluation and planning programs and other internal controls required to protect the drinking water systems and ensure compliance with all applicable Federal, state, and local requirements concerning the provision of safe drinking water.

2. Develop, implement, and update drinking water quality monitoring and reporting programs and provide associated in-house and contract laboratory services.

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3. Conduct drinking water sampling as specified in applicable permits and enclosure (1).

4. Release reports to, and provide liaison and interface with, Federal and state regulatory agencies on matters related to the reporting and resolution of environmental compliance inspections and inquiries.

5. Provide drinking water consumers, the general public, and interested agencies timely reports and other information regarding consumer confidence in drinking water quality and drinking water system operations, and coordinate all information to be released with the Commanding General, MCIEAST-MCB CAMLEJ; the AC/S, G-F; the MCIEAST-MCB CAMLEJ Communication Strategy and Operations Office; the Staff Judge Advocate; the Counsel, Eastern Area Counsel Office; the Commanding Officer, Naval Medical Center Camp Lejeune; and other interested Installation and tenant command and staff.

6. Conduct or procure scientific studies to meet applicable drinking water regulatory requirements.

7. Develop, implement, and update a drinking water database for sustained recordkeeping of drinking water sampling data and compliance with all applicable Federal, state, and local requirements concerning the maintenance of agency records and the execution of the drinking water program.

8. Develop procedures to properly collect, transport, and store water samples delivered to EMD or contract laboratory.

9. Supervise environmental laboratory personnel performance and monitor contractor performance of analyses.

10. Review analytical testing results of drinking water sampling and ensure the Commanding General, MCIEAST-MCB CAMLEJ; the AC/S, G-F Public Works Division; the MCIEAST-MCB CAMLEJ Communication Strategy and Operations Office; and the Naval Medical Center Camp Lejeune Occupational Health and Preventive Medicine are timely notified of testing results.

11. Ensure proper resampling/testing is performed following receipt of testing results indicating noncompliance with drinking water standards, variances, exemptions, or failures to comply with water quality sampling/monitoring requirements.

12. Ensure the prompt and proper preparation of required analytical testing reports.

13. Ensure water treatment plant permit applications are completed annually for the Installation and forwarded to the proper state regulatory agency for approval.

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(c) Ensure the Resident Officer-in-Charge of Construction (ROICC) oversees, coordinates, and directs the following tasks:

1. Ensure ROICC personnel and contractor management personnel are informed of applicable environmental requirements for connecting service lines to, or altering, existing drinking water distribution lines.

2. Ensure construction contractors working on the Installation comply with lead-free plumbing installation requirements.

3. In accordance with the Drinking Water Backflow ESOP, enclosure (6), ensure proper installation and certification of backflow prevention assemblies or measures, when appropriate.

4. Inform the EMD Director of incidents that may violate any applicable Federal, state, or local requirement concerning the provision of safe drinking water.

5. Ensure all newly constructed drinking water supply wells are properly constructed, disinfected, and sampled in accordance with reference (f).

(d) Ensure the Public Works Department Director/Public Works Officer oversees, coordinates, and directs the following tasks:

1. Support the EMD Director in publishing and implementing MCIEAST-MCB CAMLEJ Drinking Water Quality and Conservation Program's plans and programs

2. Plan, construct, operate, maintain, and repair drinking water utilities systems, including drinking water supply wells, raw water network lines, drinking water treatment plants, and drinking water distribution systems.

3. Contract services as necessary to properly produce and distribute drinking water on the Installation in required quantities.

4. Ensure sufficient resources are sought to construct, operate, protect, maintain, and repair drinking water systems in compliance with applicable standards, sampling and/or monitoring, reporting, recordkeeping, and other regulations and requirements.

5. Ensure proper training and certification of personnel constructing, operating, protecting, maintaining, and repairing the Installation's drinking water supply wells and treatment and distribution systems.

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6. Ensure all environmental planning requirements, including required permit applications, regulatory approvals, and notices, are complete before altering Installation water system operations or facilities.

7. Ensure water system maintenance and repair records are retained for at least three years.

8. Ensure regulatory inspectors surveying or inspecting the drinking water systems are properly escorted and survey and inspection records are properly maintained for at least 10 years.

9. Evaluate drinking water system operations to identify and execute reasonable water conservation alternatives.

10. Conduct testing, inspecting, and certifying of backflow prevention assemblies, and maintain the agency records created within a drinking water backflow prevention database for the Installation.

(2) Commanding Officer, Naval Medical Center Camp Lejeune.  
The Commanding Officer, Naval Medical Center Camp Lejeune, has agreed to the following tasks:

(a) Support MCIEAST-MCB CAMLEJ in informing drinking water consumers regarding their drinking water quality and their health questions.

(b) Provide comprehensive environmental and occupational health surveillance and related technical assistance and training support to MCIEAST-MCB CAMLEJ upon request.

(c) Perform backflow prevention inspections of Naval Medical Center facilities and provide the installation certification records and inventory updates.

(d) Conduct monthly testing and sampling of drinking water and ice in Naval Medical Center Camp Lejeune facilities.

(3) Installation Tenant Organizations

(a) Support WHPP requirements to protect drinking water quality.

(b) Distribute drinking water reports and bulletins in accordance with EMD guidance.

(c) Report water line breaks and direct water line maintenance and repair questions to the Installation's utilities staff in accordance with enclosure (4).

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(d) Coordinate with EMD staff to evaluate alternatives for reducing potable water use.

5. Administration and Logistics

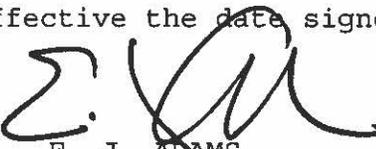
a. Administration. Enclosure (4) is a process flow chart for reporting drinking water distribution system water line breaks. Templates for other drinking water reports are found in enclosure (5). Enclosure (6) lists procedures for controlling water line cross connections, installing backflow prevention assemblies, and filling potable water trucks.

b. Logistics. Not applicable.

6. Command and Signal

a. Command. This Order is applicable to MCIEAST-MCB CAMLEJ and its subordinate and tenant commands and staff sections. It is also applicable to the Naval Medical Center Camp Lejeune.

b. Signal. This Order is effective the date signed.



E. J. ADAMS  
Chief of Staff

DISTRIBUTION: A/C (plus MCAS NR, H&S Bn, and WTBn)

MAY 17 1993

Environmental Standard Operating Procedures (ESOP)

Title: 5090.16.3 PROCEDURES FOR DRINKING WATER SAMPLING PROGRAM FOR  
MCB CAMLEJ AND MCAS NEW RIVER

Purpose: This ESOP establishes procedures and guidelines for the drinking water sampling program at Marine Corps Base Camp Lejeune (MCB CAMLEJ) and Marine Corps Air Station New River (MCAS NR), in accordance with the references.

Applicability: This ESOP applies to the Marine Corps Installations East-Marine Corps Base Camp Lejeune (MCIEAST-MCB CAMLEJ) AC/S G-F.

Responsibility: All personnel who sample/monitor drinking water at MCB CAMLEJ and MCAS NR.

Procedure:

1. Treated (Finished) Water - Regulatory Required Monitoring

a. The groups of constituents listed below, divided by regulatory group or sampling rule, are sampled at the frequency required by Federal, state, and Marine Corps regulatory requirements.

- (1) Revised Total Coliform Rule (RTCR)
- (2) Inorganic Constituents (IOCs)
  - (a) Metals (including lead and copper)
  - (b) Asbestos
  - (c) Nitrates
  - (d) Nitrites
- (3) Organic Constituents
  - (a) Volatile Organic Compounds (VOCs)
  - (b) Synthetic Organic Compounds (SOCs)
- (4) Radionuclides
- (5) Stage 2 Disinfection Byproducts (DBPs)
- (6) Lead and Copper Rule (LCR)
- (7) Perchlorates

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(8) Unregulated Contaminant Monitoring Rule (UCMR)

(9) Lead In Priority Areas (LIPA)

b. Sampling for the above-listed constituents is performed either at locations within the water distribution systems, at the entry points to the distribution systems, or "at the tap" as specified in regulatory guidance.

c. In most instances, samples are collected by Environmental Management Division (EMD) Laboratory personnel and sent to an EMD-approved contracted laboratory for analyses.

d. MCIEAST-MCB CAMLEJ shall comply with applicable Federal, state, and Marine Corps requirements (e.g., sampling, reporting, and notifications) for all detections.

e. In accordance with state and Federal regulations, any detections of VOCs or SOCs as well as detections of IOCs greater than the Maximum Contaminant Level (MCL) or detections of radionuclides greater than 50 percent of the MCL may trigger an increase in regulatory monitoring frequency. In addition, any positive detections of RTCR constituents will require immediate resampling. The Installation will voluntarily conduct immediate resampling, as appropriate, for constituents detected during Federal, state and Marine Corps regulatory sampling. A list of constituents for each group is located in enclosure (3).

f. If the result of a sample collected per the LCR exceeds the lead action level (AL), MCIEAST-MCB CAMLEJ will conduct resampling.

g. In the event of a second detection, drinking water wells serving the affected system shall be sampled and analyzed for the detected constituent; depending on the circumstances this may be done on the next regularly scheduled biannual voluntary sampling of supply wells and distribution system entry points.

h. If resampling at any drinking water supply well shows the presence of any of the detected constituents, action shall be taken depending on the circumstance of the detection; to include shutting the well down, limiting well use or continued monitoring.

## 2. Treated (Finished) Water - Voluntary Monitoring

a. The groups below also appear in the Required Monitoring Section, but MCIEAST-MCB CAMLEJ voluntarily samples more frequently than what is required by regulation. The following groups are divided further in enclosures (2) and (3).

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- (1) Metals (semi-annually)
- (2) Organics
  - (a) VOCs (monthly and semi-annually)
  - (b) SOCs (monthly and semi-annually)
  - (c) Total Organic Carbon (TOC) (semi-annually)
- (3) Explosive Constituents, including perchlorate (monthly and semi-annually)
- (4) Stage 2 DBPs (quarterly)
- (5) Chlorate (semi-annually)
- (6) Chloride (annually)
- (7) Per-and Polyfluoroalkyl Substances (PFAS) (semi-annually)

b. Sampling for the above listed constituents is performed at the stated frequency at the entry points to the distribution systems as shown in enclosure (2).

c. In most instances, samples are collected by EMD Laboratory personnel and sent to an EMD approved laboratory for analysis.

d. Any detections of constituents monitored for in the groups shown above shall trigger further action to include resampling as appropriate. A list of constituents for each group is located in enclosure (3). Detections of hexavalent chromium at 3 micrograms per liter ( $\mu\text{g/L}$ ) or below are treated as "routine" (i.e., not requiring additional resampling).

e. In the event of a second detection in resampling, drinking water wells serving the affected system shall be sampled and analyzed for the detected constituent. Depending on the circumstances, this may be done on the next regularly scheduled biannual voluntary sampling of supply wells.

f. If resampling at any drinking water supply well shows the presence of any of the detected constituents, action shall be taken depending on the circumstance of the detection, including shutting the well down, limiting well use, or continuing monitoring.

### 3. Raw (Well) Water - Required Monitoring

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a. Sampling shall be performed in accordance with reference (f) on all newly constructed drinking water supply wells before putting them into service.

b. Annual chloride sampling of all drinking water wells is performed as a requirement of the Installation's Central Coastal Plain Capacity Use Permit. Results are submitted directly into the North Carolina Department of Environmental Quality (NCDEQ) Division of Water Resources website.

c. Bacteriological sampling shall be conducted at all new wells and wells that have been repaired or reconditioned. Additionally, annual sampling for total coliform is performed at Well BA-164 as a requirement of the Wellhead Protection Plan.

4. Raw (Well) Water - Voluntary Monitoring

a. Raw water sampling for the constituents below is not required. However, MCIEAST-MCB CAMLEJ samples the raw water as shown in enclosure (2).

(1) Metals

(2) Organic Constituents

(a) VOCs

(b) SOCs

(c) TOC

(3) Explosive Constituents, including perchlorate

(4) Chlorate

(5) PFAS

b. Sampling for the above-listed constituents is performed semi-annually at drinking water supply wells serving the Hadnot Point, MCAS NR, Holcomb Boulevard, and the Onslow Beach water treatment plants. In addition, all newly constructed drinking water supply wells shall be sampled for constituents (1) through (4), immediately above, before putting the wells into service. If a well in service is unable to be sampled during a sampling event (due to being "offline" for repairs), every effort shall be made to make sure it is sampled during the next round of sampling.

c. Sampling and analysis are performed using a contractor obtained through Naval Facilities Engineering Systems Command (NAVFAC)

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Mid-Atlantic (MIDLANT) EMD provides NAVFAC MIDLANT with required work parameters annually.

d. Any detection will trigger further action, including resampling as appropriate. Detections of hexavalent chromium at 3 µg/L or below are treated as "routine" (i.e., not requiring resampling).

5. Drinking Water Database. All drinking water sampling data (required and voluntary) shall be stored in EMD's Drinking Water Database. The agency records and information shall be added upon receipt.

6. Reporting/Notifications

a. For regulatory compliance sampling, all reporting/notification requirements outlined in references (a) and (c) shall be followed.

b. For LIPA sampling, all reporting/notification requirements outlined in reference (e) shall be followed.

c. The EMD Director shall be immediately notified of any detection in the raw or finished water supply.

d. All regulatory compliance violations shall be reported in MCIEAST-MCB CAMLEJ's Annual Consumer Confidence Report.

e. For second detections in the Rifle Range water distribution system, EMD shall notify the Onslow Water and Sewer Authority and Marine Corps Installations Command.

f. EMD shall develop a report containing all detections from voluntary sampling. A courtesy copy of this report shall be semiannually forwarded to the NCDEQ Wilmington Regional Office.

g. EMD shall report all Maximum Contaminant Level exceedances immediately to the NCDEQ Wilmington Regional Office.

Regulatory Citation: The regulatory requirements and policy for implementing this ESOP are found in the references.

TRAINING: APPLICABLE PERSONNEL SHOULD BE TRAINED ON ALL PROVISIONS OF THIS ESOP.

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Drinking Water Sampling/Monitoring

Required Monitoring for MCB CAMLEJ's Drinking Water Systems						
	HADNOT POINT 04-67-041	MCAS NEW RIVER 04-67-042	HOLCOMB BLVD 04-67-043	ONSLow BEACH 04-67-048	RIFLE RANGE 04-67-046	VERONA LOOP 04-67-556
RTCR (Coliform)	Monthly	Monthly	Monthly	Quarterly	Monthly	Quarterly
Asbestos	Every 3 years	Every 3 years	Every 3 years	Not Required	Every 3 years	Not Required
Metals	Every 3 years	Every 3 years	Every 3 years	Not Required	Not Required	Not Required
Nitrates	Annually	Annually	Annually	Annually	Not Required	Not Required
Nitrites	As requested by DEQ	As requested by DEQ	As requested by DEQ	As requested by DEQ	As requested by DEQ	As requested by DEQ
VOCs	Every 3 years	Every 3 years	Every 3 years	Not Required	Not Required	Not Required
SOCs, Pesticides, PCBs	Every 3 years	Every 3 years	Every 3 years	Not Required	Not Required	Not Required
DBPs (TTHMs and HAAs)	Quarterly	Quarterly	Quarterly	Not Required	Quarterly	Not Required
LCR	Every 3 years	Every 3 years	Every 3 years	Not Required	Every 3 years	Not Required
Radiologicals (Gross Alpha)	Every 9 years	Every 9 years	Every 9 years	Not Required	Not Required	Not Required
Radiologicals (Uranium & Radium)	Every 6 years	Every 6 years	Every 6 years	Not Required	Not Required	Not Required
Perchlorate	Every 3 years	Every 3 years	Every 3 years	Not Required	Not Required	Not Required
UCMR	When required by USEPA	When required by USEPA	When required by USEPA	When required by USEPA	Not Required	Not Required
LIPA	Every 5 years	Every 5 years	Every 5 years	No priority areas	No priority areas	No priority areas

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Voluntary Monitoring for MCB CAMLEJ's Drinking Water Systems						
	HADNOT POINT 04-67- 041	MCAS NEW RIVER 04-67- 042	HOLCOMB BLVD 04-67- 043	ONSLow BEACH 04-67- 048	RIFLE RANGE 04-67- 046	VERONA LOOP 04-67-556
VOCs	Monthly*	Monthly*	Monthly*	Monthly*	Monthly	
SOCs	Monthly*	Monthly*	Monthly*	Monthly*	Monthly	
DBPs	Quarterl Y	Quarterl Y	Quarterl Y		Quarterl Y	
Explosives	Monthly*	Monthly*	Monthly*	Monthly*	Monthly	
Perchlorat e	Monthly*	Monthly*	Monthly*	Monthly*	Monthly	
Metals	Semi- annually	Semi- annually	Semi- annually	Semi- annually		
Hexavalent Chromium	Semi- annually	Semi- annually	Semi- annually	Semi- annually		
Chloride	Annually	Annually	Annually	Annually		
Chlorate	Semi- annually	Semi- annually	Semi- annually	Semi- annually		
TOC	Semi- annually	Semi- annually	Semi- annually	Semi- annually		
PFAS	Semi- annually	Semi- annually	Semi- annually	Semi- annually		

\* In addition to monthly sampling, the drinking water systems are monitored semi-annually.

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<b>Required Monitoring for MCB CAMLEJ's Drinking Water Supply Wells</b>						
	<b>HADNOT POINT 04-67-041</b>	<b>MCAS NEW RIVER 04-67-042</b>	<b>HOLCOMB BLVD 04-67-043</b>	<b>ONSLow BEACH 04-67-048</b>	<b>RIFLE RANGE 04-67- 046</b>	<b>VERONA LOOP 04-67- 556</b>
Chloride	Annually	Annually	Annually	Annually		
BACT				Annual Sampling at BA-164		
BACT	<p><b>All new drinking water supply wells will be sampled per 15A NCAC 18C .0402 before putting any well into service.</b></p>					
VOCs						
SOCs						
Metals						
Explosives						
Radiologicals						

<b>Voluntary Monitoring for MCB CAMLEJ's Drinking Water Supply Wells</b>						
	<b>HADNOT POINT 04-67-041</b>	<b>MCAS NEW RIVER 04-67-042</b>	<b>HOLCOMB BLVD 04-67-043</b>	<b>ONSLow BEACH 04-67-048</b>	<b>RIFLE RANGE 04-67-046</b>	<b>VERONA LOOP 04-67-556</b>
VOCs	Semi-annually	Semi-annually	Semi-annually	Semi-annually		
SOCs	Semi-annually	Semi-annually	Semi-annually	Semi-annually		
Explosives	Semi-annually	Semi-annually	Semi-annually	Semi-annually		
Metals	Semi-annually	Semi-annually	Semi-annually	Semi-annually		
Hexavalent Chromium	Semi-annually	Semi-annually	Semi-annually	Semi-annually		
Chlorate	Semi-annually	Semi-annually	Semi-annually	Semi-annually		
TOC	Semi-annually	Semi-annually	Semi-annually	Semi-annually		
PFAS	Semi-annually	Semi-annually	Semi-annually	Semi-annually		

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Required Monitoring Constituents List (Finished Water)

RTCR Constituents [Enclosure (1): 1a(1)]

Total Coliforms  
*E. Coli*

Inorganic Constituents [Enclosure (1): 1a(2)]

<u>Metals</u>	<u>Asbestos</u>
Antimony	Chrysotile
Arsenic	Amphibole
Barium	Total Asbestos
Beryllium	
Cadmium	<u>Nitrate/Nitrite</u>
Chromium	
Iron	Nitrate Nitrogen
Manganese	
Mercury	Nitrite Nitrogen
Selenium	
Sulfate	<u>Other Non-Metals</u>
Thallium	Cyanide
	Fluoride

Radionuclides [Enclosure (1): 1a(4)]

Combined Radium	Gross Alpha
Radium 226	Combined Uranium
Radium 228	

Stage 2 Disinfection Byproducts [Enclosure (1): 1a(5)]

Total Halo acetic Acids	Total Trihalomethanes
Dibromoacetic Acid	Dibromochloromethane
Monobromoacetic Acid	Bromodichloromethane
Trichloroacetic Acid	Bromoform
Dichloroacetic Acid	Chloroform
Monochloroacetic Acid	

Lead and Copper Rule Contaminants [Enclosure (1): 1a(6)]

Lead  
Copper

Perchlorates [Enclosure (1): 1a(6)]

Organic Constituents [Enclosure (1): 1a(3)]

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Volatile Organic Compounds

1,2-Dichlorobenzene (o)  
1,4-Dichlorobenzene (p)  
1,2-Dichloroethane  
1,1-Dichloroethylene  
cis-1,2-Dichloroethylene  
trans-1,2-Dichloroethylene  
1,2-Dichloropropane  
1,1,1-Trichloroethane  
1,1,2-Trichloroethane  
1,2,4-Trichlorobenzene  
Benzene  
Carbon Tetrachloride  
Chlorobenzene  
Dichloromethane  
EthylBenzene  
Styrene  
Tetrachloroethylene  
Toluene  
Trichloroethylene  
Vinyl Chloride  
Xylenes, Total

Synthetic Organic Compounds

1,2-Dibromo-3-chloropropane  
2,4-D  
2,4,5-TP  
Alachlor (Lasso)  
Atrazine  
Benzo(a)pyrene  
Carbofuran  
Chlordane  
Dalapon  
Di(2-ethylhexyl)adipate  
Di(2-ethylhexyl)phthalate  
Dinoseb  
Endrin  
Ethylene Dibromide (EDB)  
Heptachlor  
Heptachlor Epoxide  
Hexachlorobenzene  
Hexachlorocyclopentadiene  
Lindane (BHC-Gamma)  
Methoxychlor  
Oxamyl  
Pentachlorophenol  
Picloram  
Simazine  
Total Polychlorinated Biphenyls  
(PCBs)  
Toxaphene

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Voluntary Monitoring Parameter ListMetals [Enclosure (1): 2a(1)]

Antimony	Magnesium
Arsenic	Manganese
Barium	Mercury
Beryllium	Nickel
Cadmium	Potassium
Calcium	Selenium
Chromium	Sodium
Cobalt	Strontium
Copper	Thallium
Hexavalent Chromium	Vanadium
Iron	Zinc
Lead	

Volatile Organic Compounds [Enclosure (1) 2a(2)(a)]

Benzene	1,2-Dichloropropane
Bromobenzene	1,3-Dichloropropane
Bromochloromethane	2,2-Dichloropropane
Bromodichloromethane	1,1-Dichloropropene
Bromoform	cis-1,3-Dichloropropene
Bromomethane	trans-1,3-Dichloropropene
n-Butylbenzene	Ethylbenzene*
sec-Butylbenzene	Hexachlorobutadiene
tert-Butylbenzene	4-Isopropyltoluene
Carbon tetrachloride	(p-Isopropyltoluene)
Chlorobenzene*	Methyl-tert-butylether (MTBE)
Chloroethane	Methylene Chloride
Chloroform	Napthalene
Chloromethane	N-Propylbenzene
2-Chlorotoluene	Styrene*
4-Chlorotoluene	1,1,1,2-Tetrachloroethane
Dibromochloromethane	1,1,2,2-Tetrachloroethane
1,2-Dibromo-3-chloropropane	Tetrachloroethene*
1,2-Dibromoethane	Toluene*
Dibromomethane	1,2,3-Trichlorobenzene
1,2-Dichlorobenzene*	1,2,4-Trichlorobenzene*
1,3-Dichlorobenzene	1,1,1-Trichloroethane*
1,4-Dichlorobenzene*	1,1,2-Trichloroethane
Dichlorodifluoromethane	Trichloroethene
1,1-Dichloroethane	Trichlorofluoromethane
1,2-Dichloroethane*	1,2,3-Trichloropropane
1,1-Dichloroethene*	1,2,4-Trimethylbenzene
cis-1,2-Dichloroethene*	1,3,5-Trimethylbenzene
trans-1,2-Dichloroethene*	Vinyl Chloride*
	Xylenes (total)*

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**Synthetic Organic Compounds [Enclosure (1): 2a(2)(b)]**

Alachlor	Endrin*
Aldicarb	Ethylene Dibromide (EDB*)
Aldicarb Sulfone	Heptachlor*
Aldicarb Sulfoxide	Heptachlor Epoxide*
Aldrin	Hexachlorobenzene*
Atrazine*	Hexachlorocyclopentadiene*
Benzo(a)pyrene*	3-Hydroxycarbofuran
Butachlor	Lindane
Carbaryl	Methomyl
Carbofuran*	Methoxychlor*
Chlordane*	Metolachlor*
2,4-D*	Metrabuzin
Dalapon*	Oxamyl (Vydate®)*
DBCP*	PCBs*
4,4-DDD	Pentachlorophenol*
Di(2-ethylhexyl)adipate*	Picloram*
Di(2-ethylhexyl)phthalate*	Propachlor
Dicamba	Simazine
Dieldrin	Toxaphene*
Dinoseb*	2,4,5-TP (Silvex)*

**Other Compounds [Enclosure (1): 2a(2c) - 2a(7)]**

Total Organic Carbon (TOC)	Chloride
Chlorate	PFAS

**Explosive Constituents [Enclosure (1): 2a(3)]**

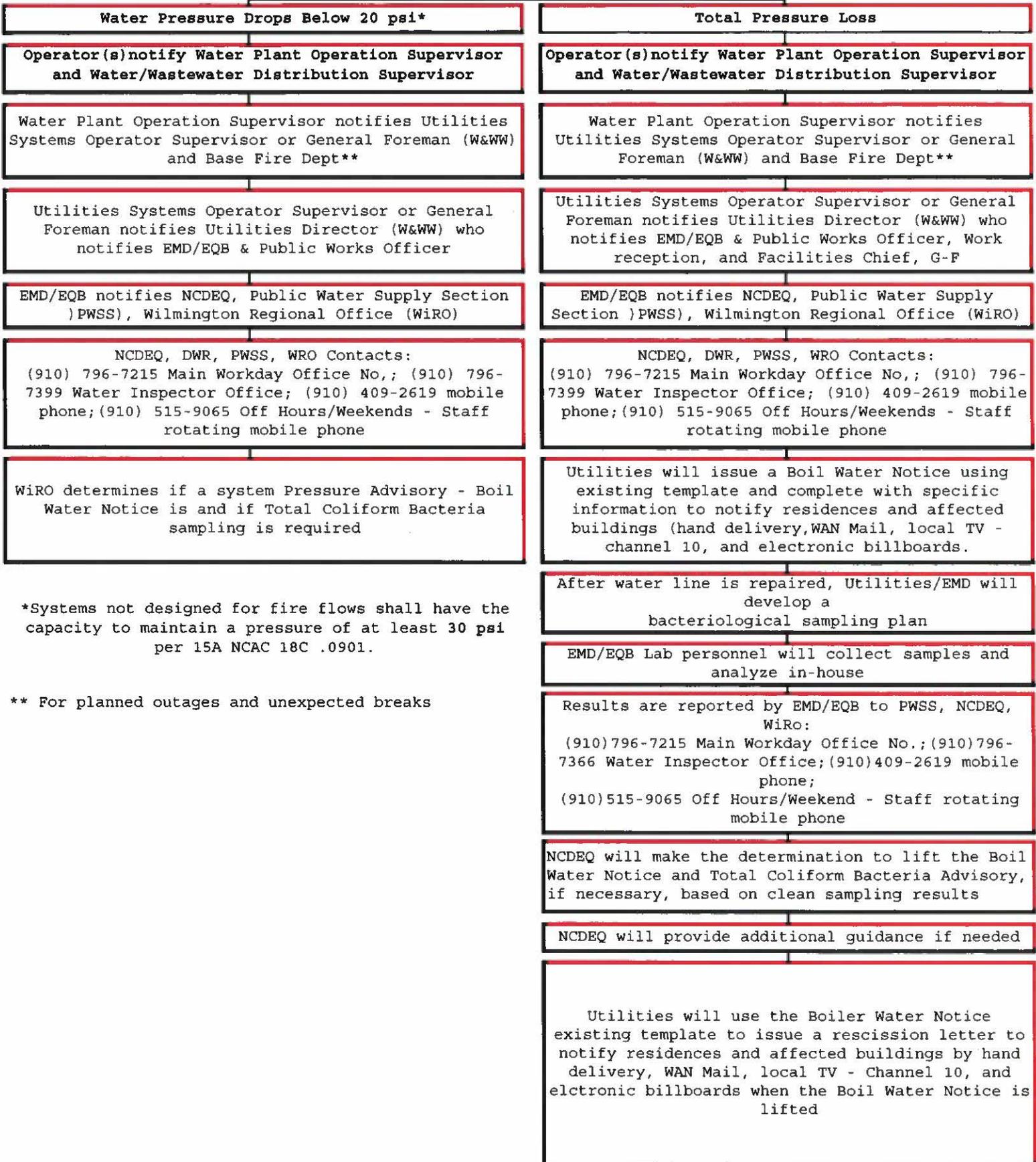
2-Amino-4,6-Dinitrotoluene	3-Nitrotoluene (m-Nitrotoluene)
4-Amino-2,6-Dinitrotoluene	4-Nitrotoluene
1,3-Dinitrobenzene	Perchlorate
2,4-Dinitrotoluene	PETN
2,6-Dinitrotoluene	RDX
HMX	Tetryl
Nitrobenzene	1,3,5-Trinitrobenzene
Nitroglycerin	2,4,6-Trinitrotoluene (TNT)
2-Nitrotoluene	

**Stage 2 Disinfection Byproducts [Enclosure (1); 2a(4)]**

Total Haloacetic Acids	Total Trihalomethanes
Dibromoacetic Acid	Chlorodibromomethane
Monobromoacetic Acid	Bromodichloromethane
Trichloroacetic Acid	Bromoform
Dichloroacetic Acid	Chloroform
Monochloroacetic Acid	

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**Distribution System Water Line Break Notification Flow Chart**



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Reports Required

	<u>REPORT TITLE</u>	<u>REPORT CONTROL SYMBOL</u>	<u>PARAGRAPH</u>
I.	Monthly Static and Pumping Levels Usage Report	MCIEAST-MCB CAMLEJ- 5090.16B-01	1.d(11)
II.	Water Line Break Report	MCIEAST-MCB CAMLEJ- 5090.16B-02	Encl. (4)
III.	Routine Inspection of Drinking Water Distribution Systems	MCIEAST-MCB CAMLEJ- 5090.16B-03	4.b. (1) (d) 2
IV.	Monthly NCDEQ DWR Drinking Water BAC-T Regulatory Report	MCIEAST-MCB CAMLEJ- 5090.16B-04	4.b. (1) (b) 2
V.	Monthly Distribution Facility Operating Report-Chlorine	MCIEAST-MCB CAMLEJ- 5090.16B-05	4.b. (1) (b) 2
VI.	Monthly Treatment Facility Operating Report-Chlorine	MCIEAST-MCB CAMLEJ- 5090.16B-06	4.b. (1) (b) 2
VII.	Monthly Compliance Monitoring Report for Systems Conducting 4-Log Treatment for Viruses Using Chemical Disinfection	MCIEAST-MCB CAMLEJ- 5090.16B-07	4.b. (1) (b) 2
VIII.	Annual Chloride Report	MCIEAST-MCB CAMLEJ- 5090.16B-08	4.b(1) (b) 2
IX.	Annual Local Water Supply Plan Update	MCIEAST-MCB CAMLEJ- 5090.16B-09	1.d. (6)
X.	NCDEQ Notification- Repairs and Construction	MCIEAST-MCB CAMLEJ- 5090.16B-10	4.b. (1) (d) 2
XI.	Semi-Annual Consumer Confidence Reports	MCIEAST-MCB CAMLEJ- 5090.16B-05	4.b. (1) (b) 5

Enclosure (5)

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Drinking Water Backflow Environmental Standard Operating Procedures  
(ESOP)

Title: 5090.16.4 INSTALLATION OF CROSS-CONNECTION AND BACKFLOW PREVENTION ASSEMBLIES AND FILLING POTABLE WATER TRUCKS

Purpose: This ESOP establishes procedures for installing cross-connection and backflow prevention assemblies and filling potable water trucks on Marine Corps Base Camp Lejeune (MCB CAMLEJ) and Marine Corps Air Station New River (MCAS NR). Improper drinking water distribution system water line cross-connections, backflows, and water truck filling could threaten drinking water quality.

Applicability: This ESOP applies to all personnel installing cross-connection and backflow prevention assemblies and filling water trucks on MCB CAMLEJ and MCAS NR.

Responsibility: All personnel installing cross-connection and backflow prevention assemblies to, and filling water trucks from, drinking water distribution systems on MCB CAMLEJ and MCAS NR.

Procedures:

1. Follow these procedures when installing cross-connection and backflow prevention assemblies:

a. Before installation, contact the Backflow Cross Connection Inspector at (910) 451-0869 for assistance in proper assembly selection and installation;

b. Backflow prevention assemblies shall be installed in accordance with manufacturer's recommendations and specifications and shall not be modified in the field;

c. Backflow prevention assemblies shall be located and installed to function as designed; be accessible for testing, maintenance, and inspection; and include all necessary test cocks and drains for testing. Valves shall be installed in the line at both ends of the backflow prevention assembly to provide for replacement and maintenance;

d. All water pipes shall be ductile iron, cast iron, or other material designed for potable water system service and meeting applicable standards for drinking water systems;

e. Backflow prevention assemblies 3/4 inch and one inch in size shall be installed in an enclosure at least 12 inches high, 19 inches wide, and 24 inches long. Backflow prevention assemblies 1/2 inches and two inches in size shall be installed in an enclosure at least 18 inches deep, 27 inches wide, and 40 inches long. The assemblies shall

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be installed in the center of the enclosure to allow adequate clearance for testing and/or repair;

f. The bottom of the enclosure shall be gravel with a minimum height of 12 inches. Installation in wet areas will require Environmental Management Division Water Quality Section approval before installation; and

g. All backflow prevention assembly installations shall be inspected, tested for proper operation, and approved by a certified tester of backflow prevention assemblies/assemblies. Test and inspection results shall be returned to the Planning and Estimating (P&E) Section in Building (Bldg.) 1005 and given to the MCB CAMLEJ Cross Connection Control System Operator before connecting to the drinking water distribution system. High-health hazard assemblies shall be tested semiannually, and low-health hazard assemblies shall be tested annually.

2. Follow these instructions for installing reduced pressure principle assemblies (i.e., assemblies):

a. A reduced pressure principle assembly may be installed as protection for either high-health or low-health hazard;

b. Reduced pressure principle assemblies shall be installed above ground or below ground in a vault with positive gravity drainage to atmosphere employing a drain of sufficient size to handle the full flow of discharge from a discharging assembly, 12-inch minimum clearance from vault walls and floor, and in accordance with manufacturer's recommendations. To prevent obstruction during the testing or repair, additional piping and/or valves shall not be located within and/or under the vault;

c. The reduced pressure principle assembly shall be installed at least five feet from the nearest potable water flow meter;

d. Each reduced pressure principle assembly installed indoors shall be a minimum of 12 inches from the walls, 12 inches above the floor, and no higher than four feet above the floor. Adequate clearance shall be maintained around the assembly for testing or repair;

e. Reduced pressure principle assemblies installed outdoors shall be covered when necessary to protect against freezing. Landscaping is allowed around any assembly provided it does not interfere with testing or repair; and

f. Backflow prevention assemblies 2 1/2 inches or larger shall be supported to allow for the weight of the backflow prevention assembly. Support construction can consist of cinder block, brick, or steel.

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Supports shall have a proper footing for supports to rest on. Supports should be spaced so they do not interfere with the testing or repair.

3. Follow these instructions for installation of double check valve assemblies:

a. Double check valve assemblies shall be installed as protection for a low-health hazard only;

b. Double check valve assemblies shall be installed either vertically or horizontally and above ground or below ground in a vault with positive drainage to the atmosphere; and

c. Double check valve assemblies 2 1/2 inches and above shall be installed above ground.

4. Follow these instructions for filling water trucks:

a. If the filling station has an air gap minimum of two (2) pipe diameters between the fill discharge and the tank there is no need for a backflow prevention assembly; or

b. If it is a direct connect, a reduced pressure principle backflow preventer (RPZ) is required. The backflow preventer shall be tested for proper operation by a certified tester and left in place or retested each time it is disconnected/reconnected to the water supply. A copy of the test report along with the tester certification and the test equipment calibration certificate shall be sent to the Backflow Cross Connection Inspector before connection is made; and

c. Filling stations shall have signage indicating "For DOD and Authorized Use Only".

References:

1. 15A NCAC 18C .0406 Water Supplies - Distribution Systems
2. North Carolina Building Code Volume II

Training:

1. North Carolina Rural Water Association Backflow Prevention Assembly Certified Tester Training - for licensed installers and certified testers/repairers.
2. Penetration Prerequisite Training - Provided by Public Works for all individuals receiving authorization to penetrate the potable water system.