



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

MCIEAST-MCB CAMLEJO 5090.16
G-F/BEMD
09 DEC 2013

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

From: Commanding General
To: Distribution List

Subj: DRINKING WATER SYSTEMS AND WATER CONSERVATION

Ref: (a) North Carolina Administrative Code, Title 15A, Chapter 18C,
Drinking Water Quality Standards
(b) 40 CFR 141, National Primary Drinking Water Standards
(c) 42 USC §300f et. Seq, Safe Drinking Water Act (SDWA)
(d) Requirements of the Public Health Security and Bioterrorism
Preparedness and Response Act of 2002 (Bioterrorism Act)
(e) North Carolina Administrative Code, Title 15A, Chapter 2E, Central
Plain Capacity Use Area Rules
(f) North Carolina Administrative Code, Title 15A, §2C, Well
Construction Standards

Encl: (1) Environmental Standard Operating Procedures (ESOP)
(2) Drinking Water Sampling/Monitoring
(3) List of Compounds
(4) Reports Required

1. Situation. In order to protect and maintain drinking water quality, this order establishes and implements requirements outlined in references (a) through (f) for drinking water supply wells, treatment/distribution systems, and water conservation objectives. Construction, operation, maintenance, and repair of the aforementioned areas have the potential to significantly impact the drinking water quality and availability at Marine Corps Installations East-Marine Corps Base Camp Lejeune (MCIEAST-MCB CAMLEJ). MCIEAST-MCB CAMLEJ is responsible for the production and/or distribution of drinking water to MCAS (MCAS) River, the Rifle Range, Verona Loop, Greater Sandy Run training areas, and other outlying Installation locations.

a. MCIEAST-MCB CAMLEJ currently uses approximately 1.65 billion gallons of drinking water annually. The sole drinking water source is the Castle Hayne Aquifer. Approximately 47 million gallons of potable water is procured annually from the Onslow Water and Sewer Authority for the Rifle Range, Verona Loop/Greater Sandy Run Training Areas, and other outlying locations Installation-wide.

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

(1) Four water treatment plants with 48 online drinking water supply wells;

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

(3) A robust water sampling program;

DISTRIBUTION STATEMENT A: Approved for public release; distribution is unlimited.

(a) To ensure the water that is supplied to the Installation population is safe and reliable, MCIEAST-MCB CAMLEJ continues to sample its ~~raw and finished drinking water more frequently than what is required by~~ state and Federal regulations.

(b) Drinking Water Sampling Standing Operating Procedures (SOP). The Drinking Water Sampling SOP, enclosure (1), establishes procedures and guidelines for the drinking water sampling program at MCB CAMLEJ and MCAS New River, in accordance with references (a) and (b). Enclosure (2) provides all mandatory and voluntary sampling for the raw and finished water aboard the Installation. In addition, enclosure (3) is a comprehensive list of constituents that are analyzed at MCB CAMLEJ.

(4) Drinking Water Quality and Conservation Program. In addition to ensuring drinking water quality complies with the requirements of Federal, state, and local environmental regulations, the following plans and programs apply to the management of the Installation's drinking water systems:

(a) Wellhead Management Plan. Land areas which are and will be utilized as well-fields/recharge areas for groundwater sources for Installation drinking water supply wells shall be identified and protected by periodic updates of the Wellhead Management Plan.

1. Master Planning Processes. Master planning processes and resulting land use plans shall carefully consider the requirements of the most current Installation Wellhead Protection Plan and shall give high priority to protection of drinking water quality.

2. Plan Content. The Wellhead Management Plan shall outline specific land use controls, environmental quality monitoring, and water pollution prevention and abatement measures which shall be taken to improve water quality and to minimize the risk of contamination by pollutants. This plan shall be updated annually at a minimum.

(b) Backflow Prevention Plan Program. The drinking water distribution system shall be protected against contamination by continuously implementing and enforcing a formal Backflow Prevention Plan/Program.

(c) Water System Management Plan (WSMP). The purpose of a WSMP is to prove and document that the utility has the management and financial capacity to operate its system and meet reference (c) requirements. This plan is updated when water systems receive major modifications.

(d) Operation and Maintenance (O&M) Plan. The purpose of the O&M Plan is to ensure the utility has the technical capacity required to operate the system and meet reference (c) requirements. "Technical capacity" refers to the ability of the utility personnel to operate and maintain the physical components of the system; this includes the treatment and storage facilities and the distribution infrastructure. This plan is updated when water systems receive major modifications or treatment processes change.

(e) Emergency Management Plan (EMP). The purpose of the EMP is to provide:

1. Identification and phone numbers of utility system personnel as well as other local, state and Federal contacts responsible for emergency management;

2. Identification of foreseeable natural and human-caused emergencies;

3. Description of the emergency response plan for each identified event; and

4. Description of the notification process. This plan is updated when water systems receive major modifications or treatment processes change.

(f) Emergency Response Plan (ERP). All public water systems serving a population of 3,300 or more are required to prepare an ERP, in accordance with reference (d). The ERP includes threat evaluation, site characterization and response, recovery and remediation actions that MCB CAMLEJ and MCAS New River shall take as a result of terrorist threats and other acts against the water system.

(g) Local Water Supply Plan (LWSP). A LWSP is an assessment of a water system's current and future water needs and its ability to meet those needs. By understanding current and future needs, MCIEAST-MCB CAMLEJ shall be better able to manage water supplies and be better prepared to plan for water supply system improvements. This information is provided to the North Carolina Department of Environment and Natural Resources (NCDENR) on an annual basis via online submittal.

(h) Distribution System Material Survey Evaluation/Lead and Copper Rule Site Selection. The primary purpose of the lead and copper rule is to protect the public water supply users from contaminants which result from corrosion in potable water piping systems. The rule establishes threshold levels for lead and copper levels as measured at the consumer water taps. The rule requires that water systems either meet the specified lead and copper threshold levels or provide optimum corrosion control treatment to minimize the lead and copper contaminant level in the drinking water at consumer taps. Individual sampling sites are classified and designated in priority as Tier 1, 2, and 3. All Tier 1 sites must be designated as sampling sites prior to the selection of Tier 2 sampling sites. All Tier 2 sites must also be designated as sampling sites prior to the designation of Tier 3 sampling sites. The three sampling site Tiers are determined by the building use, plumbing materials, water service line materials, type of solder used to join copper piping, and the construction date of the building's plumbing system.

(i) Drinking Water Vulnerability Assessment (VA). All public water systems serving a population of 3,300 or more are required to prepare a Drinking Water VA. This document contains a list of all Antiterrorism/Force Protection projects/action items and how past issues have been addressed.

(j) Water Conservation and Water Shortage Plan. This plan provides recommendations for water conservation projects and opportunities based on the water consumption information collected during water audits at

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MCB CAMLEJ. This information is provided to NCDENR on an annual basis via online submittal.

(k) Stage 2 Disinfectant/Disinfection Byproduct Plan (DDBP). The main objective of the DDBP is to reduce incidents of disease associated with the disinfection byproducts that form when public water supply systems add disinfectants during the treatment process. The Stage 2 Disinfectant Byproduct Rule supplements existing regulations by requiring water systems to meet disinfection byproduct maximum contaminant levels at each monitoring site in the distribution system. It also contains a risk-targeting approach to better identify monitoring sites where customers are exposed to high levels of disinfection byproducts.

(l) Central Coastal Plain Capacity Use Area (CCPCUA). The State of North Carolina has created the CCPCUA in response to lowering water table levels within the Black Creek Aquifer. Mandated by reference (e), as of 1 August 2002 community water systems are required to report water usage to the Division of Water Resources (DWR). The intent of the CCPCUA is to protect the long-term productivity of aquifers within the designated area and to allow the use of groundwater for beneficial uses at rates which do not exceed the recharge rate of the aquifers. Monthly static and pumping levels and annual chloride results (for all drinking water supply wells) are submitted to NCDENR.

2. Mission. To ensure compliance with drinking water regulations, establish procedures, and assign responsibilities for the delivery of safe drinking water to personnel and residents of MCB CAMLEJ and MCAS New River.

3. Execution

a. Commander's Intent and Concept of Operations

(1) Commander's Intent. To effectively manage, monitor and maintain the drinking water systems aboard MCB CAMLEJ and MCAS New River in an effort to ensure complete compliance with state and Federal regulations, and protect of human health.

(2) Concept of Operations. Specific responsibilities for ensuring safe drinking water quality are provided below.

b. Subordinate Element Missions

(1) All Organizations and Individuals served by the Installation's Drinking Water Systems shall:

(a) Remain informed and support the requirements of the Wellhead Protection Plan.

(b) Submit all proposed actions with the potential to impact the environment to the Installation Environmental Impact Working Group (EIWG) for the appropriate level of review/approval, in accordance with the National Environmental Policy Act (NEPA) Program. All projects submitted to NEPA shall be reviewed for impacts to wellhead protection areas.

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(c) Deliver all required drinking water reports and bulletins in accordance with guidance provided by the Environmental Management Division (EMD), ~~MCIEAST-MCB CAMLEJ.~~

(d) Report water line breaks and other concerns with drinking water to the Installation's utilities staff.

(2) Assistant Chief of Staff (AC/S), G-F shall: Oversee the design, operation, maintenance, and compliance of the drinking water systems aboard the Installation to ensure safe and reliable drinking water is provided to its personnel and residents.

(3) Director, EMD shall:

(a) Oversee the implementation of drinking water environmental compliance evaluation and planning programs and other internal controls required to ensure satisfactory compliance with state, Federal, and Marine Corps regulations.

(b) Oversee the development and implementation of drinking water quality monitoring and reporting program and provides associated in-house and contract laboratory services.

(c) Ensure all drinking water sampling is conducted as specified in enclosure (1).

(d) Release routine reports to and provide liaison and interface with federal and state regulatory agencies on matters related to the reporting and resolution of environmental compliance deficiencies.

(e) Ensure timely initiation of public notification of problems with the drinking water supply system in accordance with state regulations and in coordination with the CG, MCIEAST-MCB CAMLEJ, AC/S, G-F, Public Affairs Office, Staff Judge Advocate, Eastern Area Counsel Office, Naval Hospital, and other cognizant Installation staff offices.

(f) Ensure timely delivery of required drinking water reports to customers.

(g) Oversee funding/allocation of resources for conducting appropriate scientific investigations and meeting all drinking water regulatory requirements.

(h) Oversee the development and implementation of the drinking water database and ensure proper updates are provided periodically.

(4) Head, Environmental Compliance Branch, EMD shall:

(a) Oversee the day-to-day operation of the EMD Laboratory and the procurement/administration of laboratory services contracts required for performance of analysis, maintenance of records, submittal of reports, and use of certified laboratories in compliance with Federal, state, and Marine Corps regulations, and established standard procedures.

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(b) Develop procedures which ensure proper collection, handling and storage of water samples until delivered to either the EMD or contract laboratory.

(c) Oversee environmental laboratory personnel performance and monitor contractor performance of analysis, in accordance with designated standard procedures.

(d) Review analytical results of drinking water and ensure the Command, designated representatives from Public Works Division (PWD), and the Naval Hospital's Occupational Health and Preventive Medicine services are notified of testing results in an appropriate and timely manner.

(e) Ensure proper repeat monitoring is performed in accordance with applicable state regulations in instances of noncompliance with primary drinking water standards, variances, exemptions, or failures to comply with sampling and monitoring requirements.

(f) Oversee the preparation of required reports to the DWR, NCDENR.

(g) Review drinking water quality monitoring data from all sources and informs the Director, EMD of public notification or other special reporting requirements.

(h) Implement environmental data management systems to support environmental planning requirements and compliance with regulatory agency reporting requirements.

(i) Ensure the drinking water database is updated as sampling results are received. Provide quality assurance and quality control analysis to ensure that all drinking water data uploaded into the database is complete and accurate.

(5) Head, Environmental Quality Branch (EQB), EMD shall:

(a) Ensure timely development and revisions, in coordination with PWD, of the following plans, studies and permits:

1. Wellhead Management Plan
2. Backflow Prevention Plan/Inventory/Program
3. WSMP
4. EMP
5. O&M Plan
6. Emergency Response Plan
7. Local Water Supply Plan

Site Selection 8. Distribution System Survey Evaluation and Lead and Copper

9. Drinking Water VA

10. Water Conservation and Water Shortage Plan

11. Stage 2 DDBP

12. CCPCUA Permit

13. Drinking Water Plant Permits

14. Miscellaneous plans, studies, and permits as required

(b) Provide the in-house environmental engineering and planning expertise to ensure timely identification and development of short-term and long-term plans and procedures for addressing emerging environmental/regulatory requirements that pertain to Installation drinking water supply.

(c) Oversee the development and implementation of environmental studies and projects required to maintain complete compliance with drinking water regulations, and conduct appropriate scientific investigations. Resolve unexplained incidents of drinking water contamination, and assist with locating future drinking water well-fields.

(d) Ensure periodic updates to the Installation's Wellhead Management Plan are performed and coordinate implementation. Identify and provide procedures for protecting existing and designated future sources of groundwater suitable for the Installation.

(e) Develop Consumer Confidence Reports, post articles in the "Globe" and "ROTOVUE," and ensure proper delivery to each resident.

(f) Ensure water treatment plant permit applications are completed for the Installation and forward them to the proper state regulatory agency for approval.

(g) Maintain water treatment plant permits for the Installation.

(h) Ensure the drinking water database is updated as sampling results are received. Provide quality assurance and quality control analysis to ensure that all drinking water data uploaded into the database is complete and accurate.

(i) Provide periodic updates to the Installation's Geographic Information Systems (GIS) drinking water data through in-house efforts and contracts.

(j) Provide the chairperson for the Environmental Management System Water Quality Working Group. Oversee the development of agendas, lead meeting discussions and assist with briefs for upper management. Provide subject matter expertise on the Water Quality Program and project-related discussions.

(6) Officer-in-Charge of Construction (OICC) shall:

(a) Ensure both OICC personnel and contractor management personnel are fully informed of the environmental constraints on the connection of service lines to, or other alteration of, existing drinking water distribution lines.

(b) Ensure compliance with lead-free plumbing installation requirements by construction contractors working onboard the Installation.

(c) Ensure proper installation and certification of backflow prevention devices or measures, when appropriate.

(d) Ensure EMD is informed of incidents which are likely to result in violations of environmental or public health regulations or standards.

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

(7) Director, PWD Public Works Officer (PWO)/Deputy PWO shall:

(a) Act as principal staff officer for the implementation of, and assist EMD with the development of, the following plans, studies, and permits:

1. Wellhead Management Plan
2. Backflow Prevention Plan/Inventory/Program
3. WSMP
4. EMP
5. O&M Plan
6. Emergency Response Plan
7. Local Water Supply Plan
8. Distribution System Survey Evaluation and Lead and Copper Site Selection
9. Drinking Water VA
10. Water Conservation and Water Shortage Plan
11. Stage 2 DDBP
12. CCPCUA
13. Drinking Water Plant Permits

14. Miscellaneous plans, studies, and permits as required

(b) Serve as the principal staff officer for the facilities planning, construction, operation, maintenance, and repair of utilities systems, to include, but not limited to, drinking water supply wells, raw water network lines, water treatment plants, and potable water distribution.

(c) Ensure contract services required to provide and distribute drinking water in the required quantities are available. Subject services shall comply with all applicable Federal, state, and Marine Corps regulations.

(d) Ensure sufficient resources to operate, maintain, and repair drinking water systems in compliance with applicable standards, sampling and/or monitoring, reporting, recordkeeping, and other regulations and requirements are provided.

(e) Ensure properly trained civilian and/or Marine Corps personnel are appointed to operate and maintain the Installation's drinking water supply wells and treatment and distribution systems. Personnel must be properly trained in accordance with state requirements for testing, inspecting, and certifying backflow prevention devices.

(f) Ensure drinking water supply wells and treatment/distribution systems are permitted/approved, constructed, operated, and maintained in accordance with applicable Federal, state, and Marine Corps regulations.

(g) Ensure permit applications, approvals, and notices required by the DWR are completed either in-house or via contract prior to altering any Installation water system.

(h) Ensure maintenance records of community water systems are retained for at least three years.

(i) Accompany DWR inspectors on periodic sanitary surveys of the water system and maintains survey records for ten years.

(j) Conduct periodic evaluations of their operations in cooperation with Installation environmental and utilities managers in order to identify feasible alternatives for water conservation including, but not limited to:

1. Updating and maintaining the Installation's GIS drinking water data. Providing periodic updates to drinking water GIS data through in-house efforts and contracts.

2. Making changes in day-to-day operations as appropriate to promote water conservation based on results of these evaluations.

(k) ~~Oversee and operate drinking water supply wells and treatment and distribution systems as required to ensure the raw and treated water is protected against contamination during pumping, treatment, storage, and distribution, and that treatment includes the proper processes.~~

(l) Maintain and update the drinking water backflow prevention database for the Installation. Schedule/conduct testing, inspecting, and certifying backflow prevention devices, in accordance with DWR requirements.

(8) Head, Design Branch, PWD shall:

(a) Ensure designs, plans, and specifications for in-house or contractor performed repair and/or construction are submitted to the DWR when required for appropriate review and approval.

(b) Ensure all designs, plans, and specifications for in-house or contractor performed repair and/or construction of drinking water supply wells and treatment and distribution systems contain adequate provisions requiring the following:

1. Backflow prevention and measures;
2. Proper disinfection of water mains, wells, and storage tanks during repair and construction prior to placing these systems in service; and
3. Proper procedures and forms for drinking water extension permits and elevated tank repair work.

(c) Ensure all designs, plans, and specifications include the use of lead-free pipes, solder, and flux. Solders and flux are considered lead free if they contain less than 0.2 percent lead. Pipes and fittings are considered lead free if the lead content is less than 8.0 percent.

(d) Provide professional engineering services required for the development and update of an Installation Backflow Prevention Program and associated maintenance and repair projects to eliminate cross-connections, open or potential, between drinking water systems, and non-potable water sources.

(9) Director, Utilities Branch, PWD shall:

(a) Ensure personnel responsible for the operation of the Installation's drinking water systems are properly trained, licensed, and certified, in accordance with state guidelines.

(b) Oversee the operation of drinking water supply wells and treatment and distribution systems as required to ensure the raw and treated water is protected against contamination during pumping, treatment, storage, and distribution.

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(c) Ensure that drinking water treatment, distribution, and related maintenance and repair activities are performed in compliance with applicable DWR requirements, Navy health regulations, and related recordkeeping and reporting requirements.

(d) Ensure routine drinking water testing and flushing within the distribution system required to ensure adequate residual chlorine and pH is performed.

(e) Maintain operational recordkeeping and reporting required by DWR.

(f) Implement procedures which ensure proper collection and handling of water samples until delivered to either the EMD laboratory or contractor.

(g) Ensure preventative maintenance and repairs on the Installation water treatment and distribution systems are conducted. Ensure spare parts are available.

(h) Ensure proper fluoridation and appropriate fluoride levels are maintained.

(i) Ensure proper notification procedures are in place in the event of an emergency.

(j) Ensure proper disinfection of water mains, wells, and storage tanks during repair and construction prior to placing these systems in service is performed. Ensure NCDENR is properly notified on all repairs and construction.

(k) In coordination with PWO, EQB, and EMD, initiate projects required to repair and upgrade existing facilities as required to ensure adequate quantities and quality of drinking water in compliance with Federal, state, and Marine Corps regulations.

(l) Oversee the routine inspections of drinking water distribution systems required to ensure effective implementation of the Installation Backflow Prevention Program and timely initiation of maintenance and repair projects required to eliminate cross-connections, open or potential, between a system furnishing potable water and a system furnishing non-potable water.

(10) Commanding Officer, Naval Hospital shall:

(a) Provide personnel to assist in implementing public notification of deficiencies in the Installation drinking water supply, and in handling the related public health concerns upon request.

(b) Provide comprehensive environmental and occupational health surveillance and related technical assistance and training support required to identify, prevent and evaluate incidents of suspected contamination of Installation water supplies by backflows into the distribution system or poor operation and maintenance practices involving service lines.

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~~(c) Ensure backflow prevention inspections of Naval Hospital-associated facilities are performed and certification records and inventory updates are provided to the Installation's backflow operator-in-responsible charge.~~

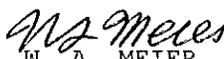
(d) Conduct monthly testing and sampling of potable water and ice for bacterial contamination as required by Federal, state, and Marine Corps regulations.

4. Administration and Logistics. Refer to enclosure (4) for reports required by this Order.

5. Command and Signal

a. Command. This Order is applicable to MCB CAMLEJ, MCAS New River, and its tenant and subordinate commands, contractors, and staff sections.

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


W. A. MEIER
Chief of Staff

DISTRIBUTION: A/C

Environmental Standard Operating Procedures (ESOP)

Title: ESOP 5090.16.3 PROCEDURES FOR DRINKING WATER SAMPLING PROGRAM FOR MARINE CORPS INSTALLATIONS EAST-MARINE CORPS BASE CAMP LEJEUNE

PURPOSE: This ESOP establishes procedures and guidelines for the drinking water sampling program at MCIEAST-MCB CAMLEJ, in accordance with references (a) and (d).

APPLICABILITY: This ESOP applies to the G-F, EMD, PWO Utilities Branch, and Atlantic Marine Corps Communities.

RESPONSIBILITY: All personnel who engage in sampling/monitoring drinking water at MCB CAMLEJ and MCAS New River.

PROCEDURE:

1. Treated (Finished) Water - Regulatory Required Monitoring

a. The group of contaminants listed below is sampled at the frequency required by Federal, state, and Marine Corps regulatory requirements:

- (1) Coliform
- (2) Asbestos
- (3) Inorganics
- (4) Nitrates
- (5) Nitrites
- (6) Volatile Organic Compounds (VOCs)
- (7) Synthetic Organic Chemicals (SOCs)
- (8) Radionuclides
- (9) Trihalomethanes (THMs) and Haloacetic Acids (HAAs)
- (10) Lead/Copper
- (11) Perchlorate

b. Sampling for the above listed contaminants is either performed at locations within the distribution system (Coliform, Radionuclides, THMs/HAAAs, Lead/Copper) or (for the remaining contaminants) at the entry point to the water distribution systems (drinking water plants and in the case of the Rifle Range, and the pump house entering the complex).

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

d. The Installation shall comply with state and federal regulatory requirements (with regards to follow-up sampling, reporting, and notifications) for all detections.

e. Any detections of inorganics, VOCs, SOCs, or Perchlorate (with some exceptions such as THM constituents detected in VOCs sample results or secondary drinking water parameters in inorganic chemicals) shall trigger an increase in monitoring frequency. The Installation has also decided to voluntarily conduct an immediate follow-up sampling event.

f. 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.

g. If follow-up sampling at any drinking water supply well shows the presence of any of the detected constituent, action shall be taken depending on circumstance of the detection; this may include shutting the well down or continued monitoring.

2. Treated (Finished) Water - Voluntary Monitoring

a. The groups below also appear in the Required Monitoring Section, but MCB CAMLEJ voluntarily samples on a more frequent basis than what appears in the regulation. The following groups are broken down further in enclosures (2) and (3):

- (1) VOCs
- (2) SOCs
- (3) Explosive Constituents
- (4) Perchlorate

b. Sampling for the above listed constituents is performed monthly at the entry point to the water distribution systems (drinking water plants and in the case of the Rifle Range, the pump house entering the complex).

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

d. Any detection (with some exceptions such as THM constituents detected in VOCs sample results) shall trigger further action to include possible sampling as appropriate.

e. In the event of a second detection in follow-up sampling, 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 follow-up sampling at any drinking water supply well shows the presence of any of the detected constituent, action shall be taken depending on circumstance of the detection; this may include shutting the well down or continued monitoring.

3. Raw (Well) Water - Required Monitoring

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

b. Chloride. Annual chloride sampling of all the drinking water wells is performed as a requirement of the Installation's Central Coastal Plain Capacity Use Permit. Results are forwarded to the NCDENR.

c. Bacteriological. Annual sampling for total coliform is performed at Well BA-164 as a requirement of the Wellhead Management Plan.

4. Raw (Well) Water - Voluntary Monitoring

a. Sampling for the groups below are not required; however, MCIEAST-MCB CAMLEJ voluntarily samples on a more regular basis as shown in enclosure (3).

- (1) VOCs
- (2) SOCs
- (3) Explosive Constituents
- (4) Metals (inorganics)

b. Sampling for the above listed constituents is performed biannually at drinking water supply wells serving the Hadnot Point, MCAS New River, Holcomb Boulevard, and the Onslow Beach water treatment plants. In addition, all newly constructed drinking water supply wells shall be sampled for these constituents prior to putting the well into service. If a well 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 the subsequent round of sampling.

c. Sampling and analysis is performed utilizing a contractor obtained through Facility Support Contracts (FSC), PWD. EMD provides FSC with required parameters annually.

d. Any detection (with some exceptions such as THM constituents detected in VOCs sample results) will trigger further action to include possible re-sampling as appropriate.

5. Drinking Water Database. All drinking water sampling data (required and voluntary) shall be stored in EMD's Drinking Water Database. This information shall be populated by each respective program manager periodically as data is received.

6. Reporting/Notifications

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- a. For regulatory compliance sampling, all reporting/notification requirements outlined in references (a) and (e) shall be followed.
 - b. The EMD Director shall be notified immediately of any detection in the raw or finished water supply.
 - c. All detections shall be reported in MCIEAST-MCB CAMLEJ's Annual Consumer Confidence Report.
 - d. For second detections in the Rifle Range water distribution system, EMD shall notify the Onslow Water and Sewer Authority and Headquarters, U. S. Marine Corps.
 - e. EMD shall develop a report that contains all detections from voluntary and compliance sampling. A courtesy copy of this report shall be forwarded to the NCDENR Wilmington Regional Office on a semiannual basis.
 - f. EMD shall report all Maximum Contaminant Level surpluses immediately to NCDENR Wilmington Regional Office.

7. Training. Applicable personnel should be trained on all provisions of this ESOP.

Drinking Water Sampling/Monitoring

Required Monitoring for MCIEAST-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	GREATER SANDY RUN 04-67-558
Coliform	Monthly (40)	Monthly (10)	Monthly (15)	Monthly (1)	Monthly (1)	Quarterly (1)	Quarterly (1)
Asbestos	Every 3 years	Every 3 years	Every 3 years	Not Required	Every 3 years	Not Required	Not Required
Inorganics	Every 3 years	Every 3 years	Every 3 years	Not Required	Not Required	Not Required	Not Required
Nitrates	Annually	Annually	Annually	Annually	Not Required	Not Required	Annually
Nitrites	*	*	*	*	*	*	*
VOCs	Every 3 years	Every 3 years	Every 3 years	Not Required	Not Required	Not Required	Not Required
SOCs, Pesticides PCBs	Every 3 years	Every 3 years	Every 3 years	Not Required	Not Required	Not Required	Not Required
Radiological	* Based on 2006 Results	* Based on 2008 Results	* Based on 2006 Results	Not Required	Not Required	Not Required	Not Required
THMs & HAAs	Annually	Annually	Annually	Not Required	Annually	Not Required	Not Required
Lead & Copper	Every 3 years	Every 3 years	Every 3 years	Not Required	Every 3 years	Not Required	Not Required
Perchlorates	Every 3 years	Every 3 years	Every 3 years	Not Required	Not Required	Not Required	Not Required
UCMR 3	Twice in 12-month period	Twice in 12-month period	Twice in 12-month period	Not Required	Not Required	Not Required	Not Required

* Sampled at State's Discretion

Drinking Water Sampling/Monitoring

Voluntary Monitoring for MCIEAST-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	GREATER SANDY RUN 04-67- 558
VOCs	Monthly Since 2000	Monthly Since 2000	Monthly Since 2000	Monthly Since 2000	Monthly Since 2000		
SOCs - (Partial List Herbicides)	Monthly Since 2004	Monthly Since 2004	Monthly Since 2004	Monthly Since 2004	Monthly Since 2004		
THMs	Quarterly	Quarterly	Quarterly		Quarterly		
Explosive Constituents	Monthly Since 2004	Monthly Since 2004	Monthly Since 2004	Monthly Since 2004	Monthly Since 2004		
Perchlorates	Monthly Since 2004	Monthly Since 2004	Monthly Since 2004	Monthly Since 2004	Monthly Since 2004		

Drinking Water Sampling/Monitoring

Required Monitoring for MCIEAST-MCB CAMLEJ' s Drinking Water Supply Wells							
	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	GREATER SANDY RUN 04-67- 558
Chloride	Annual Sampling of All Drinking Water Supply Wells Per Central Coastal Plain Capacity Use Permit	Annual Sampling of All Drinking Water Supply Wells Per Central Coastal Plain Capacity Use Permit	Annual Sampling of All Drinking Water Supply Wells Per Central Coastal Plain Capacity Use Permit	Annual Sampling of All Drinking Water Supply Wells Per Central Coastal Plain Capacity Use Permit			
BACT				Annual Sampling at BA-164 per 2002 Wellhead Management Plan Recommendations			
BACT VOC' s SOC' s Inorganics Radiologicals	All new drinking water supply wells will be sampled per 15A NCAC 18C.0402 guidelines prior to putting any well into service.						

Drinking Water Sampling/Monitoring

Voluntary Monitoring for MCIEAST-MCB CAMLEJ' s Drinking Water Supply Wells							
	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	GREATER SANDY RUN 04-67- 558
VOCs and SOCs (Complete List)	Semi- annually	Semi- annually	Semi- annually	Semi- annually			
Explosive Constituents and Perchlorates	Semi- annually	Semi- annually	Semi- annually	Semi- annually			
Metals	Semi- annually	Semi- annually	Semi- annually	Semi- annually			
Explosive Constituents and Perchlorate	All new drinking water supply wells will be sampled for explosive constituents prior to putting any well into service.						

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List of Compounds

Volatile Organic Compound (VOC) List - Raw Water Sampling

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

List of Compounds
Volatile Organic Compound (VOC) List - Finished Water Sampling

Contaminant

Benzene
Carbon tetrachloride
Chlorobenzene
1,2-Dichlorobenzene
1,4-Dichlorobenzene
1,2-Dichloroethane
cis-1,2-Dichloroethene
1,2-Dichloropropane
Ethylbenzene
Methylene Chloride
Styrene
Tetrachloroethene
Toluene
1,1,1-Trichloroethane
1,1,2-Trichloroethane
Trichloroethene
1,2,4-Trichlorobenzene
Vinyl Chloride
Xylenes (total)
1,1-Dichloroethylene
trans 1,2-Dichloroethylene

List of Compounds

Synthetic Organic Compound (SOC) List - Raw Water Sampling

Contaminant

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

List of Compounds

Synthetic Organic Compound (SOC) List - Finished Water Sampling

Contaminant

Endrin
Lindane
Methoxychlor
Toxaphene
Dalapon
Di(2-ethylhexyl)adipate
Oxamyl (vydate)
Simazine
Picloram
Dinoseb
Hexachlorocyclopentadiene
Carbofuran
Atrazine
Alachlor
Heptachlor
Heptachlor Epoxide
2,4-D
2,4,5-TP (Silvex)
Hexachlorobenzene
Di(2-ethylhexyl)phthalate
Benzo(a)pyrene
Pentachlorophenol
PCBs
DBCP
Ethylene Dibromide (EDB)
Chlordane

List of Compounds
Explosive Constituents List - Raw Water Sampling

Contaminant

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

List of Compounds
Explosive Constituents List - Finished Water Sampling

Contaminant

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

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List of Compounds
Metals Constituent List - Raw Water Sampling

Contaminant

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

List of Compounds
Metals Constituent List - Finished Water Sampling

Contaminant

Antimony
Arsenic
Barium
Beryllium
Cadmium
Chromium
Copper
Iron
Lead
Manganese
Mercury
Nickel
Selenium
Sodium
Thallium

Reports Required

	<u>REPORT</u>	
	<u>CONTROL SYMBOL</u>	<u>PARAGRAPH</u>
<u>REPORT TITLE</u>		
I. Monthly Static and Pumping Levels Usage Report	MCIEAST-MCB CAMLEJ-5090.16-01	para. 1.b.(4).(1)
II. Water Line Break Report	MCIEAST-MCB CAMLEJ-5090.16-02	para. 3.b.(1).(d)
III. Routine Inspection of Drinking Water Distribution Systems	MCIEAST-MCB CAMLEJ-5090.16-03	para. 3.b.(10).(1)
IV. Monthly BACH Report- Drinking Water Report	MCIEAST-MCB CAMLEJ-5090.16-04	para. 3.b.(1).(c) para. 3.b.(4).(f)
V. Monthly BACH Report- Quality Monitoring	MCIEAST-MCB CAMLEJ-5090.16-04	para. 3.b.(4).(b)
VI. Monthly BACH Report- Routine Reports	MCIEAST-MCB CAMLEJ-5090.16-04	para. 3.b.(4).(d)
VII. Monthly BACH Report- DWR and NCDENR Reports	MCIEAST-MCB CAMLEJ-5090.16-04	para. 3.b.(5).(f)
VIII. Monthly BACH Report- Regulatory Reports	MCIEAST-MCB CAMLEJ-5090.16-04	para. 3.b.(5).(h)
IX. Monthly BACH Report- DWR Report	MCIEAST-MCB CAMLEJ-5090.16-04	para. 3.b.(10).(e)
X. Monthly BACH Report- State and Federal Report on Detection	MCIEAST-MCB CAMLEJ-5090.16-04	Encl (1) para. 3.a.(4)
XI. NCDRENr Notification- Repairs and Construction	MCIEAST-MCB CAMLEJ-5090.16-05	para.3.b.(10).(j)
XII. Annual Consumer Confidence Report	MCIEAST-MCB CAMLEJ-5090.16-06	Encl (1) para. 3.f.(3)