



DEPARTMENT OF VETERANS AFFAIRS
Washington DC 20420

February 3, 2014

The Honorable Carolyn N. Lerner
Special Counsel
U.S. Office of Special Counsel
1730 M Street, NW, Suite 300
Washington, DC 20036

RE: OSC File No. DI-13-4538

Dear Ms. Lerner:

I am responding to your letter regarding a complaint that was filed with the Office of Special Counsel (OSC) by (b)(6) (hereafter, the whistleblower), an Industrial Controls Technician at the Grand Junction Veterans Affairs (VA) Medical Center, Grand Junction, Colorado (hereafter, the Medical Center). The whistleblower's primary allegation was that management has engaged in conduct that may constitute a substantial and specific danger to public health and safety by failing to properly address unsafe conditions that pose health and safety hazards to patients and staff. He specifically alleged failures with *Legionella* testing, *Legionella* eradication procedures, and with the maintenance and cleaning procedures required to prevent *Legionella* bacteria growth. The Secretary has delegated to me the authority to sign the enclosed report and take any actions deemed necessary under 5 United States Code § 1213(d)(5).

The Secretary asked the Under Secretary for Health to review this matter and to take any actions deemed necessary under the above code. He, in turn, directed the Office of the Medical Inspector (OMI) to conduct an investigation, which included a site visit to the Medical Center on September 30–October 2, 2013. In its investigation, OMI substantiated all three primary allegations, substantiated two of his secondary allegations, did not substantiate two others, and could not substantiate two more. OMI made eight recommendations for the Medical Center to improve its conduct of *Legionella* control. OMI did not find a substantial or specific danger to public health and safety. Findings from the investigation are contained in the enclosed report, which I am submitting for your review. I have reviewed these findings and agree with the recommendations in the report.

We will send your office follow-up information describing actions that have been taken by the Medical Center to implement these recommendations. Thank you for the opportunity to respond.

Sincerely,


Jose D. Riojas
Chief of Staff

Enclosure

OFFICE OF THE MEDICAL INSPECTOR

Report to the

Office of Special Counsel

OSC File Number DI-13-4538

Department of Veterans Affairs

Grand Junction Veterans Affairs Medical Center

Grand Junction, Colorado



Veterans Health Administration

Washington, DC

2013-D-1158

Report Date: October 31, 2013

Any information in this report that is the subject of the Privacy Act of 1974 and/or the Health Insurance Portability and Accountability Act of 1996 may only be disclosed as authorized by those statutes. Any unauthorized disclosure of confidential information is subject to the criminal penalty provisions of those statutes.

Executive Summary

The Under Secretary for Health requested that the Office of the Medical Inspector (OMI) investigate a complaint filed with the Office of Special Counsel (OSC) by (b)(6) (hereafter, the whistleblower), an Industrial Controls Technician at the Grand Junction Veterans Affairs (VA) Medical Center, Grand Junction, Colorado (hereafter, the Medical Center). The whistleblower's primary allegation was that management has engaged in conduct that may constitute a substantial and specific danger to public health and safety by failing to properly address unsafe conditions that pose health and safety hazards to patients and staff. He specifically alleged failures with *Legionella* testing, *Legionella* eradication procedures, and with the maintenance and cleaning procedures required to prevent *Legionella* bacteria growth. OMI conducted a site visit to the Medical Center on September 30–October 2, 2013.

Allegations:

1. Testing and building control systems have indicated that the drinking water system in the facility has elevated levels of *Legionella* bacteria;
2. Procedures to eradicate *Legionella* bacteria from the system are not being conducted correctly; and
3. Standard maintenance and cleaning procedures required to prevent bacterial growth are not being performed.

The whistleblower additionally alleged that:

- Medical Center staff was not conducting routine testing for the presence of *Legionella* bacteria in the drinking water;
- Medical Center management was aware of *Legionella* bacteria in the system during testing in February 2013, but remediation efforts were not performed until April and were limited to an incorrectly conducted heating-and-flushing process;
- The Center for Disease Control and Prevention (CDC) recommended chlorination procedure was not performed after the heating-and-flushing process;
- Water in the system was not heated to the 160–170 degrees Fahrenheit (°F) necessary to kill *Legionella* bacteria, nor was heated water flushed through the system long enough to eradicate the bacteria: bacteria were not only present, but their growth was supported;
- The heat exchangers in the semi-instantaneous water heaters were not routinely cleaned every 30 days; these heat exchangers had not been removed and cleaned since the whistleblower began work at the Medical Center in August of 2009; and

- No “knocking of the pipes” was heard when the heated water was flushed through the end loops of the plumbing system, indicating that a large number of fixtures in the Medical Center did not receive the heating-and-flushing treatment.

Based on its investigation, OMI makes the following conclusions and recommendations.

Conclusions

- OMI substantiated that the Medical Center’s environmental testing has detected *Legionella* in its potable water system since February 2013. (Addresses allegation 1.)
- OMI concluded that the Medical Center misinterpreted the procedures to conduct superheat flushes for thermal eradication found within the Veterans Health Administration (VHA) Directive 2008-010, *Prevention of Legionella Disease*; therefore, OMI substantiated that the Medical Center did not correctly conduct procedures to eradicate *Legionella* bacteria from the system. (Addresses allegation 2 and the fourth additional bulleted allegation.)
- OMI substantiated that the Medical Center did not completely address unsafe conditions that could potentially pose health and safety hazards to Veterans and staff; however, at the time of this report, there is no evidence of clinical consequences resulting from the positive environmental cultures. (Addresses allegation 3.)
- OMI did not substantiate that the Medical Center failed to conduct routine *Legionella* testing. (The first additional bulleted allegation.)
- The Medical Center leadership responded to the notification of positive *Legionella* results by implementing an eradication plan on March 14, 2013. Therefore, OMI did not substantiate the allegation that they waited until April 2013. In addition, they have a vigorous, ongoing plan. (Addresses second additional bulleted allegation.)
- OMI substantiated a need for additional mitigation efforts beyond thermal eradication. Although the VHA Directive and Centers for Disease Control and Prevention do not require superheating to be followed by hyperchlorination, as maintained by the whistleblower, the Medical Center has areas where thermal eradication is not feasible. Therefore, the Medical Center should have utilized an alternative to superheating for *Legionella* eradication in these areas. (Addresses third additional bulleted allegation.)
- OMI could not substantiate whether the computer system indicated conditions sufficient for bacteria growth within the potable water system at the Medical Center; however, *Legionella* was detected in the system. (Addresses the fourth additional bulleted allegation.)

- OMI substantiated that the Medical Center was not following all of the manufacturer's recommendations for maintenance and cleaning procedures of the semi-instantaneous water heaters. (Addresses allegation 3 and the fifth additional bulleted allegation.)
- OMI could not substantiate the allegation regarding the end-loop "knocking of the pipes." (Addresses the sixth additional bulleted allegation.)

Recommendations

The Medical Center should:

1. Ensure that its *Legionella* policy is updated with specific and feasible mitigation plans.
2. Update Medical Center Engineering Service Policy Memorandum 5.42, *Domestic Hot Water System Superheat and Flush Procedures*, to accurately identify components of the hot water distribution system and temperature set points in accordance with VHA Memorandums.
3. Update the Medical Center Engineering Service Policy Memorandum 5.43, *Domestic Hot Water System Superheat and Flushing*, to include thermal eradication parameters established in the VHA Directives.
4. Ensure that the selected *Legionella* mitigation procedure conducted to eradicate the *Legionella* growth is done in accordance with the above VHA Directive, i.e., if thermal eradication is used, ensure that all valves are flushed for 30 minutes with superheated (160-170°F) water.
5. Prior to implementing mitigations, ensure that all involved staff understand mitigation procedures, safety precautions, and document training.
6. Consider expanding the building automation system to include temperature monitoring throughout the hot and cold water building systems, specifically in Building 1.
7. Develop preventive maintenance procedures for semi-instantaneous water heaters, using the manufacturer's requirements, as the basis for establishing time intervals and work to be performed.
8. Ensure redundancy in the water heating system supplying the Community Living Center.

Summary Statement

OMI's investigation and review of its findings did not reveal violations or apparent violations of statutory laws, mandatory rules, or regulations.

I. Introduction

The Under Secretary for Health requested that the Office of the Medical Inspector (OMI) investigate a complaint filed with the Office of Special Counsel (OSC) by (b)(6) (hereafter, the whistleblower), an Industrial Controls Technician at the Grand Junction Veterans Affairs (VA) Medical Center, Grand Junction, Colorado (hereafter, the Medical Center). The whistleblower's primary allegation was that management has engaged in conduct that may constitute a substantial and specific danger to public health and safety by failing to properly address unsafe conditions that pose health and safety hazards to patients and staff. He specifically alleged failures with *Legionella* testing, *Legionella* eradication procedures, and with the maintenance and cleaning procedures required to prevent *Legionella* bacteria growth. OMI conducted a site visit to the Medical Center on September 30–October 2, 2013.

II. Facility Profile

The Medical Center, part of Veterans Integrated Service Network (VISN) 19, is a complexity Level 2 facility that operates 19 acute care beds, 8 mental health beds, and 30 community living center (CLC) beds. It provides primary and secondary care, including acute medical, surgical, and psychiatric inpatient services, as well as a full range of outpatient services. Patients requiring tertiary level care are referred to the VA Health Care System in Salt Lake City, Utah, or the VA Eastern Colorado Health Care System in Denver, Colorado. The Medical Center has a community-based outpatient clinic, located approximately 65 miles southeast of Grand Junction in Montrose, Colorado. It also has telehealth outreach centers in Craig and Glenwood Springs, Colorado, as well as in Moab, Utah.

III. Background

The Veterans Health Administration (VHA) has established policy and guidelines on preventing and controlling *Legionella*, a gram-negative bacterium that causes respiratory diseases, including pneumonia. Pathogenic *Legionella* bacteria are naturally present in water and are known to be widespread globally. Healthcare-associated *Legionella* disease (HCA-LD) is most often associated with the presence of the bacteria in hot water systems, respiratory equipment, fountains, hot tubs, and cooling towers. VHA Directive 2008-010, *Prevention of Legionella Disease*, and VHA Directive 2009-009, *Domestic Hot Water Temperature Limits for Legionella Prevention and Scald Control*, establishes guidelines for the annual evaluation of *Legionella* risk at VHA inpatient facilities. These directives also describe policy, monitoring, reporting, and mitigation techniques for prevention of HCA-LD, and outline preventive measures including: maintenance of appropriate hospital hot water temperatures to limit the growth of *Legionella*, use of a water supply that is municipally-treated with monochloramine, or the implementation of temporary or ongoing mitigation methods, all of which can reduce the amount of *Legionella* in facility water systems.

A January 25, 2013, Center for Disease Control and Prevention (CDC) *Legionella* report on another VA facility noted the following about thermal eradication and chlorination processes:

Implement short-term systematic potable water system mitigation as referenced in American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. Guideline 12-2000: *Minimizing the Risk of Legionellosis Associated with Building Water Systems*. Hyperchlorination to greater than or equal to 2 parts per million at all distal sites and flushing at all points of use, and/or superheating *and* flushing of the potable water system to 160-170 Fahrenheit (F).

Therefore, the mitigation method and/or combination of methods used are a facility decision.

Options for mitigation as outlined in VHA Directive 2008-010, *Prevention of Legionella Disease* include, but are not limited to:

- thermal eradication (superheat and flush), a method where a water temperature of 160–170°F is used to flush the system by opening all valves for at least 30 minutes;
- hyperchlorination, a method that involves increasing the chlorine level such that a free chlorine residual of at least 2 milligrams per liter of water (mg/L) is maintained throughout the system for at least 2 hours (but not exceeding 24 hours);
- copper-silver ionization, a control method that involves the addition of a copper-silver ionization system to the facility water system for *Legionella* control;
- point of use filters attached at distal water sites, such as faucets and showers, a method to prevent exposure of patients to even low levels of *Legionella* in the water, especially useful in areas that treat high risk patients; and
- chlorine dioxide, a gas approved by the Environmental Protection Agency, a method for disinfection of water systems.

The thermal eradication and the hyperchlorination methods are temporary; the *Legionella* species typically reappears 1 to 3 months after the procedure. Copper-silver ionization, point of use filters, and chlorine dioxide can be utilized for ongoing *Legionella* suppression.

It is VHA policy that all inpatient facilities implement an annual evaluation for *Legionella* disease prevention in accordance with their written plan. This plan may contain a *Legionella* risk assessment, a component of the facility *Legionella* evaluation plan that necessitates the collection of environmental or clinical samples for *Legionella* testing to determine if mitigation is necessary. In addition, a mitigation plan must be in place

when the facility has a positive environmental risk assessment or when the facility identifies a positive clinical result. Previous CDC and VHA guidance was to initiate a mitigation process to reduce the percentage of *Legionella*-positive cultures in distal water distribution sites below a 30 percent threshold level. On February 5, 2013, during testimony before the U.S. House of Representatives Veterans' Affairs Subcommittee on Oversight and Investigations, CDC stated, "there is no safe level of *Legionella* in a water system." New VHA guidance was adopted and published on August 28, 2013, in the *Legionella Disease Prevention-Updated Requirement and Information for Future Planning* Memorandum, section 2 (a) stating, "it is no longer permissible to have a threshold of percent positive distal sites for triggering action. The action trigger will be any positive site, not the 30 percent or any percentage a facility may have previously chosen. (Zero tolerance for positive results)." Therefore, a mitigation process should be implemented for any positive result.

IV. Conduct of Investigation

An OMI team consisting of (b)(6) (), Deputy Medical Inspector; (b)(6) (), Registered Nurse, Clinical Program Manager; and (b)(6) (), Energy and Operations Engineer, Certified Energy Manager, conducted the site visit and reviewed reports, memorandums, and other relevant documents. A list of these documents is in Attachment A.

OMI held an entrance briefing with the Medical Center leadership, including: (b)(6) (), Acting Medical Center Director; (b)(6) (), Acting Chief of Staff; (b)(6) (), Associate Director for Patient Care Services (AD/PCS); (b)(6) (), Acting Associate Director (AD); (b)(6) (), Quality Management (QM) Supervisor; and (b)(6) (), VISN 19 Safety Officer.

OMI, accompanied by the AD, the QM Supervisor, and the Chief Engineer, toured specific areas of the Medical Center that housed the hot water distribution system, including mechanical rooms in Building 1, rooms B100 and S2639; Building 20, room 148; and Building 9, the Medical Center's boiler/chiller plant. The team inspected the semi-instantaneous water heaters in Building 1 and 20, and conducted an additional unannounced tour of the Medical Center's boiler/chiller plant one evening during the site visit.

After the initial tour, OMI interviewed the whistleblower, and subsequently held individual interviews with the following Medical Center staff during the site visit: (b)(6) (), Acting Medical Center Director in her role as AD; (b)(6) (), Acting Chief of Staff; (b)(6) (), QM; (b)(6) (), Infection Control Nurse; (b)(6) (), Patient Safety Manager; (b)(6) (), Green Environmental Management Service (GEMS) Coordinator/Industrial Hygienist (IH); (b)(6) (), Chief, Engineering; (b)(6) (), Laboratory Supervisor; (b)(6) (), Assistant Chief, Engineering; (b)(6) (), Maintenance and Operations Foreman; (b)(6) (), a refrigeration technician (at the request of the whistleblower); and, (b)(6) () and (b)(6) (), boiler/chiller plant operators.

OMI held an exit briefing with the Acting Medical Center Director, the Acting Chief of Staff, the AD/PCS, the AD, the QM, the Patient Safety Manager, the GEMS/IH, the Chief, Engineering, the Chief, Laboratory/Pathology, and the VISN 19 Safety Officer. Attending by phone were: (b)(6), the VISN 19 Network Director, and (b)(6), the VISN 19 Deputy Network Director.

The Office of the General Counsel reviewed OMI's findings to determine whether there were violations or apparent violations of statutory laws, mandatory rules, or regulations.

OMI **substantiated** allegations when the facts and findings supported that the alleged events or actions took place. OMI **did not substantiate** allegations when the facts showed the allegations were unfounded. OMI **could not substantiate** allegations when there was no conclusive evidence to either sustain or refute the allegations.

V. Allegations

The whistleblower became aware of positive test results and the need to begin eradication procedures at the facility through work place correspondence and e-mails; he also had access to the building computer systems that indicated the conditions necessary for bacteria growth existed within the plumbing network at the facility. He made the primary allegation that management failed to properly address unsafe conditions that pose health and safety hazards to patients and staff, specifically alleging that:

1. Testing and building control systems have indicated that the drinking water system in the facility has elevated levels of *Legionella* bacteria;
2. Procedures to eradicate *Legionella* bacteria from the system are not being conducted correctly; and
3. Standard maintenance and cleaning procedures required to prevent bacterial growth are not being performed.

The whistleblower additionally alleged that:

- Medical Center staff was not conducting routine testing for the presence of *Legionella* bacteria in the drinking water;
- Medical Center management was aware of *Legionella* bacteria in the system during testing in February 2013, but remediation efforts were not performed until April and were limited to an incorrectly conducted heating-and-flushing process;
- The CDC recommended chlorination procedure was not performed after the heating-and-flushing process;

- Water in the system was not heated to the 160–170°F necessary to kill *Legionella* bacteria, nor was heated water flushed through the system long enough to eradicate the bacteria: bacteria were not only present, but their growth was supported;
- The heat exchangers in the semi-instantaneous water heaters were not routinely cleaned every 30 days; these heat exchangers had not been removed and cleaned since the whistleblower began work at the Medical Center in August of 2009; and
- No “knocking of the pipes” was heard when the heated water was flushed through the end loops of the plumbing system, indicating that a large number of fixtures in the Medical Center did not receive the heating-and-flushing treatment.

VI. Findings

The Medical Center had a plan in place that outlined annual testing for *Legionella*. In 2011, 2012, and 2013, the staff conducted routine annual *Legionella* environmental testing, which entailed collecting water samples from the water distribution system, and culturing these samples for *Legionella* growth.

The Medical Center determined testing requirements as outlined in the Annual *Legionella* Facility Evaluation Algorithm, (VHA Directive 2008-010, Attachment B), and reported that prior to 2013, they never had a positive environmental culture for *Legionella*. OMI viewed both the 2011 and 2012 routine testing results, which were negative for *Legionella* growth.

The 2013 testing samples were sent for analysis on February 27, 2013, and were reported to the Medical Center on March 13, 2013, indicating that 4 out of 22 of the samples, or 18 percent, were positive for *Legionella*. The Medical Center’s trigger for mitigation was 30 percent, which was in compliance with VHA policy at that time. However, as this was a new finding, after years of negative results, the leadership responded immediately, and on March 14, the engineering staff conducted thermal eradication to eliminate the positive growth. Prior to the thermal eradication, the Patient Safety Manager sent out an e-mail message, informing all staff about the positive growth and the plan to superheat and flush the system. In addition, she notified the staff of the timing of the superheating and the areas of the facility that would be impacted. The staff were also advised of all safety precautions to be taken to protect both Veterans and staff.

The Medical Center’s *Legionella* mitigation policy stated that superheating should be done at 160°F for 20 minutes. This policy was not in compliance with VHA recommendations of 160–170°F for 30 minutes. The engineering staff stated that they flushed selected distal outlets with water heated to 140°F for 20 minutes, which required adjusting the mixing valves. The next morning, the refrigeration technician noted the adjustments to the mixing valves and instructed his colleagues to bypass the mixing

values to superheat the system. OMI asked members of the engineering staff why the water was not heated to the required 160–170°F, and was told that the Medical Center was trying to balance heating the system with preventing scalding at the distal sites. After the initial superheating, the Medical Center repeated environmental cultures, which were again positive for *Legionella*.

Medical Center leadership developed a multi-pronged response to this issue and, by the time of OMI's visit, had accomplished the following in an attempt to prevent and mitigate *Legionella* growth:

- Purchased and installed a copper-silver deionization system; currently awaiting certification from the City of Grand Junction in order to operate the system.
- Requested capital funding for Water Tower Improvements.
- Completed a survey of potential stagnation points in the hot water distribution system and requested capital funding for corrective action.
- Canvassed the entire facility to ensure that all aerators were removed.
- Conducted superheat thermal eradication weekly since March.
- Conducted water sampling twice a month.
- Formed a multidisciplinary Water Quality Committee which meets monthly and reports to the Safety Committee, with communication to the Infection Control Committee.
- Removed and soaked all shower heads in a bleach solution.
- Completed monthly preventative maintenance on water heaters and thermostatic mixing valves with repairs scheduled or made, as needed.
- Conducted a retroactive review of all pneumonia cases since the reported positive environmental cultures.

OMI reviewed the above actions and found the following:

The review of the pneumonia cases revealed no cases of *Legionella* pneumonia.

The superheat flushes are conducted at night in order to decrease disruption of clinical care and risk to Veterans. The whistleblower, not a plumber, reported to OMI that he did not get to participate in the overtime opportunities made available to the plumbers who were conducting the flushes.

Under Medical Center procedures for superheat flushes, during the current superheating episodes, the water temperature was increased to 160–170°F. The valves were opened only at the most distal sites during the 30 minutes of superheat flushing. The Medical Center staff had an extensive discussion with OMI explaining why they concluded that distal site valve opening was sufficient; they were unaware that the VHA Directive requires the opening of every valve for 30 minutes. In addition, during this discussion, OMI identified that it is not possible to superheat flush for 30 minutes certain types of sinks, e.g., hand motion-regulated sinks with automatic shutoffs, such as those on the locked mental health unit.

The Medical Center uses semi-instantaneous water heaters that, according to policy, should discharge water into the circulating distribution system at 130°F. It uses three hot water recirculating distribution loops to service Buildings 1 and 20. Two of the hot water distribution loops feed Building 1. In Building 1, one loop begins in the Mechanical Room B100 and has two semi-instantaneous water heaters that distribute hot water throughout the acute care areas of the Medical Center. The other loop is located in Mechanical Room 2639 and also has two semi-instantaneous water heaters that distribute the hot water. The acute care hot water requirements of the loops can be met with only one of the semi-instantaneous water heaters in operation. Therefore, the loops have redundancy, or a backup semi-instantaneous water heater, that would continue to supply hot water in the event of a steam failure, exchanger failure, or when one unit is undergoing maintenance. Additionally, the systems in Building 1 are piped parallel to a master thermostatic mixing valve in such a way that it can be bypassed in the event of failure, or if there is a need for thermal eradication. In Building 20, the CLC has only one hot water distribution loop maintained by a single semi-instantaneous water heater that feeds into a master thermostatic mixing valve, where it is then distributed throughout the CLC. Consequently, the CLC does not have hot water redundancy or back up. The CLC's master thermostatic mixing valve is piped similarly to Building 1 where it can be bypassed, if needed.

OMI noted that two of the five semi-instantaneous water heaters were out of service for repairs. Located in Building 1, both have been out of service since May and July 2013, respectively. According to engineering leadership, the repairs have been delayed by the purchasing process, incorrect parts coming in, and lead time for the coils. Repairs were completed in October 2013.

The manufacturer's maintenance instructions recommend various component schedules for the semi-instantaneous water heaters from weekly to bi-annually. During his interview, the whistleblower indicated that the semi-instantaneous water heater coils should be pulled monthly for cleaning and inspection; however, the manufacturer recommends that the semi-instantaneous water heater coil maintenance be completed on a bi-annual (every 2 years) schedule. The engineering leadership indicated the bi-annual preventive maintenance (PM) had not been completed due to staffing vacancies; however, the coils were recently pulled for repairs. Additional review of the PM records for all five semi-instantaneous water heaters showed that the required monthly inspections had been completed.

The Medical Center uses a limited building automation system (BAS), manufactured by Johnson Control, which utilizes communications protocols and components to record and trend temperature points of measurement, through a centralized computer. Temperature readings for the hot water semi-instantaneous water heaters in Building 1 are not automated through the BAS, and are manually recorded by staff. The plumbing personnel in Building 1 keep manual weekly temperature logs. The BAS in Building 20 electronically monitors the water temperature for the CLC. This system records only a 24-hour history of hot water temperature measurements; therefore, temperature readings recorded by the BAS, for the timeframe in the whistleblower's complaint, were unavailable for review by the OMI. OMI reviewed the available Johnson Control System 24-hour recorded hot water temperature printouts and found that the Medical Center was in compliance with standards.

The engineering staff interviewed could not relate the "knocking of the pipes" to issues related to flushing.

VII. Conclusions

- OMI substantiated that the Medical Center's environmental testing has detected *Legionella* in its potable water system since February 2013. (Addresses allegation 1.)
- OMI concluded that the Medical Center misinterpreted the procedures to conduct superheat flushes for thermal eradication found within the Veterans Health Administration (VHA) Directive 2008-010, *Prevention of Legionella Disease*; therefore, OMI substantiated that the Medical Center did not correctly conduct procedures to eradicate *Legionella* bacteria from the system. (Addresses allegation 2 and the fourth additional bulleted allegation.)
- OMI substantiated that the Medical Center did not completely address unsafe conditions that could potentially pose health and safety hazards to Veterans and staff; however, at the time of this report, there is no evidence of clinical consequences resulting from the positive environmental cultures. (Addresses allegation 3.)
- OMI did not substantiate that the Medical Center failed to conduct routine *Legionella* testing. (The first additional bulleted allegation.)
- The Medical Center leadership responded to the notification of positive *Legionella* results by implementing an eradication plan on March 14, 2013. Therefore, OMI did not substantiate the allegation that they waited until April 2013. In addition, they have a vigorous, ongoing plan. (Addresses second additional bulleted allegation.)
- OMI substantiated a need for additional mitigation efforts beyond thermal eradication. Although the VHA Directive and Centers for Disease Control and Prevention do not require superheating to be followed by hyperchlorination, as maintained by the whistleblower, the Medical Center has areas where thermal

eradication is not feasible. Therefore, the Medical Center should have utilized an alternative to superheating for *Legionella* eradication in these areas. (Addresses third additional bulleted allegation.)

- OMI could not substantiate whether the computer system indicated conditions sufficient for bacteria growth within the potable water system at the Medical Center; however, *Legionella* was detected in the system. (Addresses the fourth additional bulleted allegation.)
- OMI substantiated that the Medical Center was not following all of the manufacturer's recommendations for maintenance and cleaning procedures of the semi-instantaneous water heaters. (Addresses allegation 3 and the fifth additional bulleted allegation.)
- OMI could not substantiate the allegation regarding the end-loop "knocking of the pipes." (Addresses the sixth additional bulleted allegation.)

VIII. Recommendations

The Medical Center should:

1. Ensure that its *Legionella* policy is updated with specific and feasible mitigation plans.
2. Update Medical Center Engineering Service Policy Memorandum 5.42, *Domestic Hot Water System Superheat and Flush Procedures*, to accurately identify components of the hot water distribution system and temperature set points in accordance with VHA Memorandums.
3. Update the Medical Center Engineering Service Policy Memorandum 5.43, *Domestic Hot Water System Superheat and Flushing*, to include thermal eradication parameters established in the VHA Directives.
4. Ensure that the selected *Legionella* mitigation procedure conducted to eradicate the *Legionella* growth is done in accordance with the above VHA Directive, i.e., if thermal eradication is used, ensure that all valves are flushed for 30 minutes with superheated (160-170°F) water.
5. Prior to implementing mitigations, ensure that all involved staff understand mitigation procedures, safety precautions, and document training.
6. Consider expanding the building automation system to include temperature monitoring throughout the Medical Center.

7. Develop preventive maintenance procedures for semi-instantaneous water heaters, using the manufacturer's requirements, as the basis for establishing time intervals and work to be performed.
8. Ensure redundancy in the water heating system supplying the Community Living Center.

Attachment A

Documents Reviewed by OMI:

1. CDC. *Guidance for Preventing Healthcare-associated Pneumonia, Recommendations of CDC and the Healthcare Infection Control Practices Advisory Committee* MMWR 53 (RR03):1-36; 2003.
2. CDC. Testimony before the House Committee on Veterans' Affairs Subcommittee on Oversight and Investigations, U.S. House of Representatives, February 5, 2013.
3. American Society of Heating, Refrigerating, and Air-Conditioning Engineers, Inc. Guideline 12-2000: *Minimizing the Risk of Legionellosis Associated with Building Water Systems*.
4. VHA Directive 2008-010, *Prevention of Legionella Disease*, February 11, 2008.
5. VHA Directive 2009-009, *Domestic Hot Water Temperature Limits for Legionella Prevention and Scald Control* (corrected copy), February 25, 2009.
6. Under Secretary for Health's Information Letter 10-2013-001, *Prevention of Legionella Disease*, January 1, 2013, (rescinded by Information Letter 10-2013-006).
7. Under Secretary for Health's Information Letter 10-2013-006, *Prevention of Legionella Disease*, May 3, 2013.
8. VHA Directive 2006-007, *Ensuring the Security and Availability of Potable Water at VHA Facilities*, February 6, 2006.
9. Deputy Under Secretary for Health for Operations and Management Memorandum, *Legionella Disease Prevention-Updated Requirement and Information for Future Planning*. VAIQ#7390389, August 28, 2013.
10. Assistant Deputy Under Secretary for Health for Administrative Operations Memorandum, *Suppression of Legionella Growth: Planning for Anticipated Engineering Requirements*.
11. Medical Center Memorandum 003-39, *Legionnaire's Disease Prevention Program*, April 2013.
12. Medical Center Memorandum 007-26, *Legionnaire's Disease Prevention Program*, April 2013.
13. Medical Center Memorandum 007-26, Attachment A, *Environmental Water System Sampling Protocol*, August 2013.

14. Medical Center Memorandum, 007-27, *Water Quality Committee*, July 2013.
15. Medical Center Engineering Service Policy Memorandum 5.43, *Domestic Hot Water System Superheat and Flushing*, July 15, 2013.
16. Medical Center Engineering Service Policy Memorandum 5.42, *Domestic Hot Water System Superheat and Flush Procedures*, December 13, 2012.
17. Medical Center's *Legionella* Risk Assessment 2011 and 2012.
18. Medical Center's Infection Control minutes 2010-2012.
19. Medical Center's Water Quality Committee minutes, June–September 2013.
20. Medical Center's Project Committee minutes February–September 2013.
21. Medical Center's Clinical Executive Board minutes for FY 2013.
22. Medical Center's engineering Johnson Control readouts, temperature records, PM records, environmental testing records.
23. Medical Center's environmental cultures 2011-2013.
24. Medical Center's emails providing instructions and informing all staff about the planned time and dates for superheat flushing and scalding precautions
25. Medical Center's Issue Briefs dated March 13, April 23, and September 26, 2013.