



**DRINKING WATER WATERBORNE
DISEASE OUTBREAK
PRINTERS PARK MEDICAL PLAZA
COLORADO SPRINGS, CO**

OCTOBER 26, 2012-NOVEMBER 7, 2012



Colorado Department
of Public Health
and Environment

DRINKING WATER WATERBORNE
DISEASE OUTBREAK
PRINTERS PARK MEDICAL PLAZA
COLORADO SPRINGS, CO

OCTOBER 26, 2012-NOVEMBER 7, 2012

Jorge Delgado, P.E.

Tyson Ingels, P.E.

Joey Talbott, P.E.

Ron Falco, P.E.

Kelly Jacques, P.E.

Water Quality Control Division
Colorado Safe Drinking Water Program

Special Thanks to;

El Paso County Public Health & Colorado Springs Utilities

FINAL REPORT

April 2013



Colorado Department
of Public Health
and Environment

Table of Contents

Introduction	1
Printers Park Medical Plaza.....	2
Jurisdiction and Authority.....	3
Colorado Department of Public Health and Environment.....	3
El Paso County Health Department.....	4
Pikes Peak Regional Building Department.....	4
Colorado Spring Utilities Public Water System.....	5
Cross Connections in Drinking Water.....	5
Summary of Printers Park Medical Plaza Chemical Contamination Event.....	6
Summary of Conclusions and Recommendations	12

Table of Figures

Figure 1. Map of Colorado and Location of Printers Park Medical Plaza, Colorado Springs, CO (Source: MapQuest).....	1
Figure 2. Printers Park Medical Plaza in Colorado Springs, CO	2
Figure 3. Arial Map of the Printers Park Medical Plaza.....	3
Figure 4. Potable Water Supply Spigot in Plaza Mechanical Room.....	7
Figure 5. HVAC Pressure Gage and Spigot in Plaza Mechanical Room.....	8
Figure 6. HVAC System.....	8
Figure 7. HVAC Liquid in Styrofoam Cup.....	9
Figure 8. Reduced Pressure Backflow Prevention Assembly in Plaza Mechanical Room.....	12

Appendices

- Appendix A: Example Cross Connection Contamination Incidents
- Appendix B: Data Collection Summary Printers Park Medical Plaza
- Appendix C: Data Collection Summary Colorado Springs Utilities Water Quality Analysis
- Appendix D: National Outbreak Reporting System Waterborne Disease Transmission Report
- Appendix E. Printers Park Medical Plaza Mechanical Room Suspected Cross Connection
- Appendix F: Resources

Introduction

This report provides an overview of the drinking water chemical contamination waterborne disease outbreak that occurred at the Printers Park Medical Plaza (Plaza) located in Colorado Springs, Colorado during the period of October 26, 2012 through November 7, 2012 (Figure 1). During this time period, it is estimated that over twenty-six people were affected by the contamination outbreak.

The purpose of this report is to:

- Document the identification of the drinking water contamination event that occurred at the Printers Park Medical Plaza in Colorado Springs, Colorado during the fall of 2012;
- Describe the response to the contamination event performed by the El Paso County Public Health Department (EPCPH) and the Colorado Department of Public Health and Environment (CDPHE);
- Report the follow-up activities conducted by the EPCPH & CDPHE; and
- Offer lessons learned after the contamination event and waterborne disease outbreak.

This report was prepared by the CDPHE Safe Drinking Water (SDW) Program along with the help of the EPCPH and with information provided by Colorado Springs Utilities. The SDW Program functions under the Water Quality Control Division (the Division) of the CDPHE.

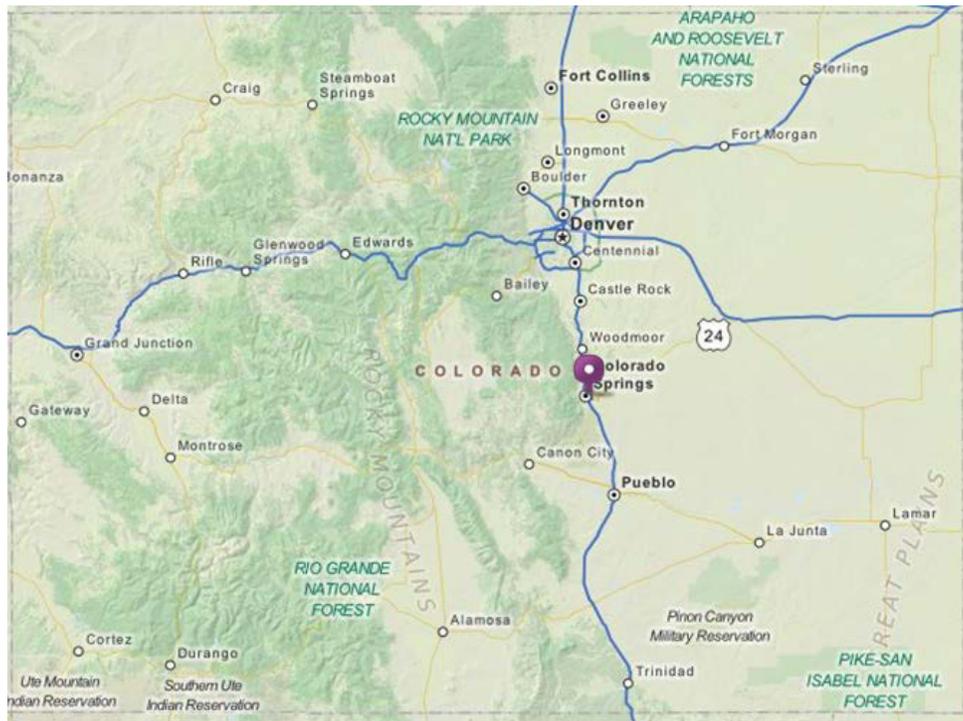


Figure 1. Map of Colorado and Location of Printers Park Medical Plaza Colorado Springs, CO (Source: MapQuest)

Printers Park Medical Plaza

Printers Park Medical Plaza (the Plaza) is a medical facility located on 175 South Union Blvd, Colorado Springs, CO 80910 (Figures 2 & 3). Approximately seventy percent of the building is occupied by Memorial Hospital (MH). Services provided by the MH at the Plaza include Audiology, Breast Care Center, Cardiac Rehabilitation, Disease and Wellness, Laboratory, Outpatient Rehabilitation, Pulmonary Rehabilitation, Radiology, Senior Clinic, Surgery Center, Wound Care Center, and Occupational Medicine. There are several other medical businesses that operate at the Plaza. Other services provided at the Plaza include but are not limited to; orthopedics, prosthetics, and general medical care.

The Plaza receives water from the Colorado Springs Utilities public water system (Public Water System Identification Number (PWSID) CO0121150). There are no other known sources of potable water being utilized at the Plaza. The Plaza is managed by NexCore Properties, LLC. Haynes Mechanical Systems performs operations and maintenance activities for the Plaza's Heating Ventilation and Air Condition (HVAC) system.

Memorial Hospital is a nonprofit, 600-plus-bed, level II trauma center consisting of three hospitals - Memorial Hospital Central, Memorial Hospital North, and Memorial Hospital for Children - and outlying clinics throughout Colorado Springs. Memorial Hospital Central is located on 1400 East Boulder Street, Colorado Springs, CO 80909. MH Central is also the administrative headquarters for Memorial Hospital.



Figure 2. Printers Park Medical Plaza in Colorado Springs, CO

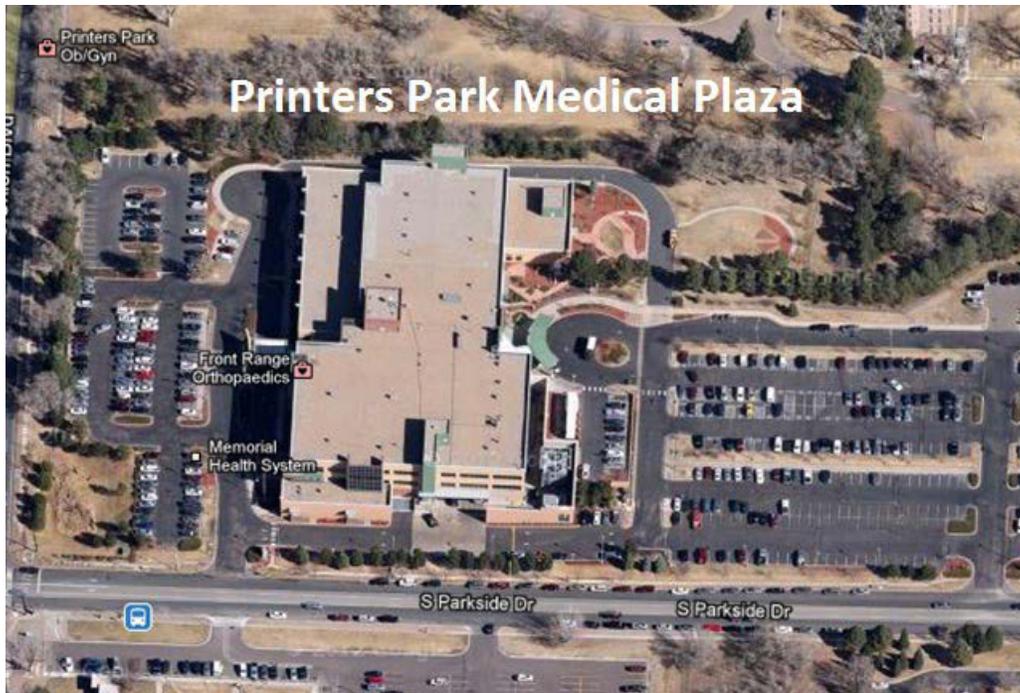


Figure 3. Aerial Map of the MH Central Printers Park Medical Plaza

Jurisdiction and Authority

Colorado Department of Public Health and Environment (CDPHE) – Safe Drinking Water (SDW) Program

The mission of the CDPHE is to protect and improve the health of Colorado’s people and the quality of its environment.

The CDPHE SDW Program regulates public water systems across the state of Colorado. The SDW Program also ensures that potential acute drinking water situations, where members of the public are at risk, are handled in an appropriate manner. The CDPHE issues the requirement for water systems to advise the public to only consume boiled or bottled water when appropriate, helping to ensure that the public does not consume unsafe water. The SDW Program offers technical assistance to those systems affected by potential acute drinking water situations ensuring that the bottle/boiled advisories are not lifted until safe water is being provided.

In the 1960s the state of Colorado passed legislation regarding cross-connection control. The state of Colorado has charged the CDPHE to ensure that water systems supplying water to the public are protected from contamination through cross connections. The State has done this through the Colorado Revised Statutes (C.R.S.) Title 25-1-114. The C.R.S. requires that water systems serving the public are protected from cross connections.

It is the responsibility of the CDPHE to regulate and enforce the requirements of the C.R.S. Title 25.1.114. If the CDPHE is made aware of a cross connection, (distribution system cross connections, water treatment plant cross connections and or water supply system cross connections) it is the duty of the CDPHE to notify all parties involved of the alleged violation and to ensure that said cross connection is removed or controlled. The CDPHE has the authority to issue violations and take enforcement actions with penalties (e.g., monetary fines, system closure,

etc.) to dissuade individuals, companies, and drinking water systems from creating cross connections.

When controlling a cross connection, different criteria must be met based on the type of cross connection. Distribution system cross connections must be removed or controlled in accordance with Article 12 of the *Colorado Primary Drinking Water Regulations* (CPDWR). Water treatment plant cross connections must be removed or controlled in accordance with the C.R.S. Potable water supply system cross connections must be removed or controlled in accordance with the local jurisdictional plumbing code and the C.R.S. If a local plumbing code does not exist, the cross connection shall be removed or controlled in accordance with the *State of Colorado Plumbing Code* and the C.R.S.

El Paso County Public Health (EPCPH)

It is the mission of the EPCPH “to promote and protect public health and environmental quality in the community through people, prevention and partnerships.”¹ The EPCPH was first established in 1872 and became an organized county health department in 1939. EPCPH serves all residents and visitors of El Paso County, which includes the cities and towns of Colorado Springs, Manitou Springs, Calhan, Fountain, Green Mountain Falls, Monument, Palmer Lake and Ramah.

EPCPH strives to conduct surveillance and control of diseases of public health significance by investigating cases of reportable diseases and suspected outbreaks, implementing appropriate measures to prevent disease transmission and communicate health risks and hazards. C.R.S. Title 25-1-506- County or District Public Health Agency, mandates that counties shall establish and maintain a county public health agency or that the county shall participate in a district public health agency. The agency shall consist of a board of health, a public health director, and employees. C.R.S. Title 25-1-506(3)(b), mandates that the public health agency shall investigate and control the causes of epidemic or communicable diseases and conditions affecting public health. If an investigation reveals findings affecting public health the agency shall take necessary steps to eliminate the conditions affecting public health. The statutes authorize public health agencies to close schools, and public places and to prohibit gatherings of people when necessary to protect public health and if necessary to exercise physical control over property for the protection of public health.

Pikes Peak Regional Building Department (PPRBD)

The PPRBD is responsible for the plan review, permitting, and inspection of all construction activity associated with the building, mechanical, plumbing, electrical, and elevator codes within the unincorporated areas of El Paso County as well as the participating incorporated municipalities within the county. These currently include the cities of Colorado Springs, Fountain and Manitou Springs and the towns of Green Mountain Falls, Monument and Palmer Lake. The PPRBD also licenses and registers contractors who perform work within the jurisdictions served by the PPRBD.

The code in effect for building construction or the installation of systems or equipment is Pikes Peak Regional Building Code 2011 Edition. Section RBC112 – Dangerous Buildings allows for the PPRBD to determine that a building is a “Dangerous Building”. Once a building has been identified as a “Dangerous Building” the code provides for a just, equitable and practical method for a building or structure that may cause and or endanger the life, health, safety and or welfare of the general public or their occupants to be repaired, vacated or demolished. This allows the PPRBD to determine if an unsafe condition exists in any building within its jurisdiction and require the owner to make necessary changes.

Additionally, *Section RBC306 - Plumbing Code* of the Pikes Peak Regional Building Code 2011 Edition adopts the 2009 International Plumbing Code (IPC) as the Plumbing Code for the PPRBD. *Section 602 - Water Required* of the 2009 IPC only allows the use of potable water for plumbing fixtures that provide water for drinking, bathing and other uses where the water comes into contact with the public. *Section 608.1 – General* of the 2009 IPC requires that potable water supply systems are designed, installed and maintained to prevent contamination from nonpotable liquids, through piping and other appurtenances such as cross connections.

Colorado Spring Utilities (CSU)

The CSU Public Water System (PWSID CO0121150) provides drinking water to approximately 500,000 citizens of Colorado. CSU is regulated by CDPHE and the CPDWR. The Regulations require CSU to reliably provide safe drinking water that meets all health-based standards to the public. Reliably providing safe drinking water includes assuring that the drinking water is protected from potential contamination out in the distribution system.

The Plaza, located in Colorado Springs, receives water from CSU via two 6” diameter service connections equipped with master meters and testable cross-connection control devices. As is common in most public water systems, CSU has identified the Plaza as a potential hazardous service cross connection in accordance with Article 12 of the CPDWR. There are two connections of concern: the main service connection and the fire service connection. In accordance with Article 12 of the CPDWR, both service connections are protected via a reduced pressure backflow prevention assemblies and are on an annual inspection schedule due to their classification as hazardous service cross connections.

Cross Connections in Drinking Water

Hazardous cross connections are connections between a potable water system and a system containing water or material of a quality below the minimum general sanitary standards as to the quality of water supplied to the public. During backflow events water from a cross connection can flow back into a potable water supply and an unprotected cross connection could create a potential health hazard to the public of Colorado. To create, install, maintain, or permit a cross connection is illegal in the state of Colorado (C.R.S. Title 25-1-114(h)). There are a number of documented cases where cross connections have been responsible for the contamination of a drinking water system and have led to the spread of disease, sickness, and/or outbreak (Appendix A).

The State of Colorado protects its citizens and visitors from cross connections through the implementation of the *State of Colorado Plumbing Code* and other various codes adopted at local jurisdictional levels and Article 12 of the Regulations. The plumbing code is intended to protect the public while inside a building or structure. One of the aspects of the code focuses on the protection of the potable water supply from cross connections. Article 12 of the Regulations is focused on protecting public water system’s distribution systems.

Summary of the Printers Park Medical Plaza Chemical Contamination Outbreak

Drinking water problems can be identified by routine surveillance of drinking water quality conducted by a water system. Additionally, water borne disease outbreaks can be identified through routine surveillance of disease occurrence reported by laboratories or medical providers and to local, State, and national epidemiology departments. Chemical contamination can be identified by taste and odor in the water and acute health symptoms being experienced by a number of people with access to the same water. According to the Center for Disease Control (CDC), the following two criteria must be met for an event to be defined as a waterborne-disease outbreak associated with drinking water: 1) two or more persons must be epidemiologically linked by location of exposure to water, and by time, and characteristics of illness and 2) the epidemiological evidence must implicate water as the probable source of illness. The Plaza outbreak was first identified when an EPCPH public health official contacted the CDPHE-WQCD. The following provides a summary of the event:

- On October 29, 2012, the CDPHE was notified of a potential acute drinking water situation at the Plaza located at 175 South Union Boulevard, Colorado Springs CO, 80910. The CDPHE was notified by EPCPH that a number of people felt ill after visiting the facility and that the water was frothy and had a noticeable color and odor.
- On October 29, 2012, the tenants of the Plaza were evacuated by NexCore Properties, LLC and Memorial Hospital officials and the building was closed. An email went out to hospital staff and other tenants advising them that if they felt ill they should go to a nearby hospital. The voluntary closure of the Plaza took place at 4:00 PM October 29, 2012. A joint press release issued by NexCore Properties and EPCPH notified the public of the closure.
- It was reported by *The Gazette* website on October 29, 2012 that “About 17 people were treated at Memorial’s emergency department for nausea and other symptoms, then released.”²
- On October 29, 2012 NexCore’s maintenance staff, contractors and consultants performed an inspection of the Plaza’s plumbing system. It was determined that the contamination was likely chemical in nature and originated from the HVAC system in the Plaza’s mechanical room. This determination was based on an identified hose that connected the potable water supply (Figure 4. Potable water supply spigot connection) to a nonpotable HVAC system (Figure 5. HVAC spigot connection). The hose was disconnected from the potable system and from the HVAC system on October 29, 2012. Based on historical information it was assumed by NexCore’s consultants that the primary chemical contained in the HVAC system was propylene glycol. In years previous it was suspected that the HVAC system contained ethylene glycol. NexCore’s consultants determined that the Plaza’s potable supply system should be sampled for propylene glycol and ethylene glycol. NexCore’s consultants collected ten samples. Eight samples were collected throughout the Plaza’s potable supply system while two samples were collected directly from the HVAC system (Appendix B, Note the HVAC samples were incorrectly labeled Boiler #1 and Boiler #3 but after speaking with the NexCore’s consultants who collected the samples it was determined that the samples were collected from the HVAC system). The samples were analyzed October 30, 2012. Results were submitted to EPCPH and CDPHE on October 31, 2012. Analysis showed that two

samples collected from the Plaza's potable supply system contained propylene glycol at concentrations of 540 mg/L and 13 mg/L, while the other six samples were determined to be non-detect for propylene glycol. The two HVAC system samples contained propylene glycol at concentrations of 31,000 mg/L and 25,000 mg/L. All samples collected and analyzed for ethylene glycol were determined to be non-detect for that substance. Additionally, ammonia levels in the boiler and potable water were analyzed. Results indicated a concentration of 45 mg/L in the boiler water while levels in the potable water indicated a concentration of 0.03 mg/L, which is consistent with the potable water within the CSU distribution system, i.e. the supply. NexCore believed that the potential contamination did not originate from the boiler.



Figure 4. Potable Water Supply Spigot in Plaza Mechanical Room

- At 6:00 PM on October 29, 2012 Calcium Control Inc., flushed and disinfected the Plaza's potable water supply system in accordance with the American Water Association Standard C651-92. The flush was completed by approximately 4:30 AM on October 30, 2012. Two pre-flush samples and the six post-flush samples were analyzed for bacteriological contaminants. All pre and post samples collected and analyzed were determined to be absent of Total Coliform and *Escherichia coli* (E. coli).
- The CDPHE and EPCPH determined that the EPCPH was the jurisdiction of authority for the outbreak and should act as the leading public health agency because the incident in no way affected the regulated public water system (CSU). CSU confirmed the integrity and performance of the currently installed backflow prevention assemblies. The CDPHE acted in an advisory role to the EPCPH as of October 30, 2012. EPCPH communicated to NexCore Properties that under the C.R.S. it had the authority to close the building formally when necessary to protect public health and if necessary to exercise physical control over the affected property for the protection of public health. NexCore Properties agreed to voluntarily close Plaza to the public and building tenants until the EPCPH had deemed the building safe. NexCore Properties was cooperative throughout the event.



Figure 5. HVAC Pressure Gage and Spigot in Plaza Mechanical Room

- On October 30, 2012, NexCore’s consultants collected 14 post-flush samples from the Plaza’s potable water supply and one sample from the HVAC system. Samples were analyzed for propylene glycol and ethylene glycol.
- CSU was made aware of the potential contamination event at the Plaza on October 29, 2012 through various media outlets and calls from the public inquiring if the water being provided was safe to drink. CSU verified that on-site backflow prevention assemblies for domestic and fire lines had been tested in accordance with Article 12 of the Regulations, and that the assemblies had been determined to be functioning properly as of June 2012. On October 30, 2012 CSU tested for various water quality parameters (Appendix C) at hydrants downstream and upstream of the Plaza to verify that on-site containment devices were functioning, ensuring that liquid from the Plaza had not backflowed into the CSU distribution system. Chemical analysis indicated that there appeared to be no apparent issues with CSU distribution system water at these locations. CSU was consulted with regards to disposal of the contaminated water and allowed for the Plaza to dispose of the contaminated water through sanitary sewer.



Figure 6. HVAC System

- An investigation was performed on-site on October 31, 2012 by the EPCPH and CDPHE. The EPCPH and CDPHE met with representatives from NexCore, Hayden Mechanical Systems, Calcium Control Inc., Jeff Pohast and Associates, and Environ International Corp., at the Plaza. The investigation was focused on maintenance activities performed at the Plaza and the activities performed in association with flushing and sampling the Plaza's potable supply system. The investigation also focused on the Plaza's mechanical room including the boiler and the HVAC system (Figure 6. HVAC system) and various other areas of the Plaza where chemicals could have been introduced into the potable supply system, such as a scope sterilizer and/or a chemical sterilant. A water sample of the HVAC system water was collected and observed. The liquid was yellow and had a sweet odor that gave some people when they smelled the liquid nausea (Figure 7 HVAC liquid in Styrofoam cup). It was also noted that on October 29, 2012 the hot water had a stronger chemical odor than the cold water.



Figure 7. HVAC Liquid in Styrofoam Cup drawn from Spigot in Figure 5

- Hayden Mechanical System employees were performing maintenance on the Plaza's HVAC system on October 26, 2012. Hayden Mechanical Systems was replacing a pump within the HVAC system. Due to the pump replacement, the HVAC system required supplemental water to be fully operational. The Plaza's potable water supply was used to supplement the water needed by the HVAC system. A Hayden Mechanical Systems staff member commented that at around 4:30 PM October 26, 2012 the hose connecting the potable supply system to the HVAC system was valved shut but not disconnected. When the mechanical room was visited on Monday, October 29, 2012, the hose connecting the potable supply system to the HVAC system was found valved opened. The staff member did believe that the spigot connection to the potable water supply was protected via a hose connection vacuum breaker backflow assembly (Figure 5).

A hose connection vacuum breaker is a specialized atmospheric type of vacuum breaker. The device does not provide a robust or sufficient level of protection in this installation. The Plaza's mechanical room housed the building domestic potable water heating system. This high water use system could create a backflow condition known as backsiphonage in the Plaza's potable supply system. The main potable water line in the mechanical room was approximately 15 feet above the spigot used to connect to the HVAC system. This path allows for the potential of the contaminant to enter either the domestic hot water system or the cold water system.

- After performing chemical analysis on water from the Plaza's potable supply system, it was determined that the system had been contaminated with, at a minimum, propylene glycol and potentially other anti-corrosion chemicals used in the HVAC system. Sections of the potable water supply in the Plaza were sampled and analysis indicated concentrations of propylene glycol at 540 mg/L and 13 mg/L. Additionally, after the first flushing and disinfection of the potable water system, one sample result indicated a concentration of 4.4 mg/L of propylene glycol in the potable supply system. The only known source of propylene glycol at the Plaza was the HVAC system. The liquid in the HVAC system indicated a concentration of propylene glycol at approximately 25,000-31,000 mg/L. After performing the site visit and interviewing maintenance personnel, it was determined that a conveyance (hose connecting the potable water supply system to the HVAC system) was created which could allow the liquid from the HVAC system to backflow into the potable supply system. Therefore, given the results of all sampling and the investigation, it appeared that the contamination most likely came from the HVAC system.
- After the investigation, the EPCPH & CDPHE discussed potential actions that would have to be taken before the Plaza could reopen. The CDPHE recommended that EPCPH request the following information;
 - Post flush lab analysis results for ethylene glycol and propylene glycol samples;
 - MSDS sheets for all chemicals used in the HVAC system and the Boiler that are not stored on-site;
 - Written procedures used for the flushing for the potable supply system;
 - Written ice maker and coffee maker cleaning procedures;
 - Two chlorine residual analysis from different taps on each floor; and
 - On-site cross connection inspection by a person skilled to identify cross connections to eliminate all other possibilities was highly recommended but not required.

This information was communicated to NexCore and their consultants in an exit interview on-site. The EPCPH reinforced that all information received would be reviewed by the EPCPH and CDPHE thoroughly and that a high standard of proof demonstrating that the potable water in the building was safe to the public would be required before the building could be reopened.

- On October 31, 2012, the EPCPH and CDPHE reviewed the post flush analysis for 14 samples collected from the Plaza's potable water supply. One of the 14 samples results indicated a concentration of 4.4 mg/L of propylene glycol leading both EPCPH and CDPHE to believe that the potable water system needed to be flushed and disinfected again.
- On November 1, 2012, the EPCPH and CDPHE met via teleconference. CDPHE made the following recommendations to the EPCPH which were intended to be communicated to the Plaza;
 - Step 1: Take background water quality data. The water quality parameters listed below should be measured in the:
 - A. Cold potable water supply system (two samples on each floor)
 - B. Hot potable water supply system (two samples on each floor)

- C. Boiler system
- D. HVAC system
- E. Offsite potable water distribution system to test background CSU water quality
 - Parameters to analyze included:
 - i. pH;
 - ii. Total and free chlorine residual;
 - iii. Propylene glycol;
 - iv. Ammonia (NH₃);
 - v. Nitrate (NO₃);
 - vi. Total Kjeldahl Nitrogen (total N); and
 - vii. Total Organic Carbon
 - Step 2: Check cross connections
 - test devices in boiler room by certified technician
 - inventory rest of building for potential cross connections - test any devices found
 - Step 3: Disinfect and flush building's potable water system - according to C651 and C652 (AWWA)
 - to be overseen by EPCPH staff and a building or plumbing inspector as appropriate
 - verify the flush was successful by analyzing chlorine residual to ensure the return to background post flush levels
 - Step 4: Repeat water quality sampling from Step 1 with the expectation that all data show no evidence of contamination in order to declare potable water system free from contamination
- On November 2, 2012, the EPCPH staff met with NexCore, their consultants and Memorial Hospital staff and hand delivered a written communication to NexCore requesting the information provided above. The EPCPH contacted PPRBD to establish expectations for flushing and disinfection of a potable supply system. The PPRBD recommended that the flushing and disinfection be performed by a licensed plumber in accordance with new building disinfection and flushing standards. The EPCPH laboratory officials supervised sampling activities for the 18 samples collected.
- On November 2, 2012, EPCPH officials participated in a cross connection identification survey of the Plaza with the building's maintenance staff. The CDPHE assisted in this effort. It was determined that any potential hazard, such as the scope sterilizer and/or a chemical sterilant, identified in the Plaza at this time such were protected from backflow.
- NexCore Properties provided the information requested to EPCPH. The potable supply water system was flushed and disinfected by a licensed plumber. After reviewing the requested data and conferring with the CDPHE, EPCPH consulted with CSU. The EPCPH and CSU evaluated the water quality data. After conferring with CSU, EPCPH allowed for the Plaza to reopen on November 7, 2012.

Summary of Conclusions and Recommendations

The following conclusions were made as a result of this investigation:

- On October 29, 2012, the potable water system in the Plaza was contaminated by chemical(s) likely related to the cross connection between the buildings HVAC and potable water system. Twenty six known people exhibited nausea and other digestive symptoms due to suspected exposure.
- The Plaza's potable supply system was contaminated with propylene glycol. Sections of the potable water supply in the Plaza were sampled and analysis indicated concentrations of propylene glycol at 540 mg/L and 13 mg/L. Additionally, after the first flushing and disinfection of the potable water system, one sample result indicated a concentration of 4.4 mg/L of propylene glycol.
- The liquid in the HVAC system indicated a concentration of propylene glycol at approximately 25,000-31,000 mg/L.
- After performing the site visit and interviewing maintenance personnel it was determined that a conveyance (hose connecting the potable water supply system to the HVAC system) was created which could allow the liquid from the HVAC system to backflow into the potable supply system.
- It is possible that the potable supply system may have been contaminated with other anti-corrosion chemicals used in the HVAC system.



Figure 8. Reduced Pressure Backflow Prevention Assembly in the Plaza's Mechanical Room

- The potable water supply spigot in the mechanical room was upstream of a reduced pressure backflow prevention assembly which had been tested July 2012 (Figure 8. reduced backflow pressure assembly). Had the spigot been installed downstream of the backflow prevention assembly the chemical most likely would not have entered the potable supply system.
- Voluntary closure of the Plaza on October, 29, 2012 appeared to stop public exposure to the contaminated water and ended reported symptoms of the outbreak.

- It is possible that other chemicals from the HVAC system may have contaminated the potable supply system but due to system flushing it was difficult to detect any other chemical presence other than propylene glycol in the samples collected.
- The drinking water outbreak was similar to other reported outbreaks related to contamination from cross connections. Commonalities include chemical exposure associated with commercial building operations and maintenance activities, odor and color in the potable water, and acute health symptoms experienced by a large number of people apparently exposed to the contaminated drinking water.
- When a water contamination outbreak occurs within a building potable supply system and the outbreak is not associated directly with the quality of water being served by a public water system, generally the Local County and/or Regional Health Department has authority and jurisdiction. If the Local County and/or Regional Health Department chooses not to exercise its authority the CDPHE has authority under the C.R.S. Title 25-1.5-102. The CDPHE will provide assistance to the Local County and/or Regional Health Department. The EPCPH discussed potential closure of the building with the PPRBD prior to both the voluntary and mandatory closure of the building. Such action was not necessary due to the voluntary closure of the building.
- Unprotected cross connections pose a health risk to the public. Temporary conditions conducive to allowing backflow events exist in nearly all plumbing systems due to changes in water pressure and velocity. This creates opportunities for chemicals to enter the potable supply system if it is not properly protected from backflow. In this case, the Plaza's HVAC system, containing propylene glycol and other anti-corrosion chemicals, was connected to the buildings potable supply system without proper cross-connection control measures for approximately three days.

The following comments and recommendations were made based on this investigation:

- This outbreak investigation involved complex jurisdictional issues and numerous parties were involved (EPCPH, CDPHE, CSU, Property Managers, Consultants, and Contract Operators). Such coordination requires a substantial communication effort.
- Local County and/or Regional Health Departments need to be aware of their statutory authority and need to be able to communicate that authority when it is required.
- The CDPHE is currently undertaking a project to create a formal business process to address identified cross connections in areas such as water treatment plants, distribution systems, and building potable water supplies. This business process will address procedural concerns as well as jurisdictional roles and responsibilities.
- The CDPHE should document all aspects of an outbreak during the event, or at the first opportunity after the initial response is completed, and immediately begin working on an outbreak investigation report. All outbreaks associated with a public water system will be documented in a timely manner. Outbreak reports take a considerable amount of time to comprise. The report needs to be completed in a timely manner to allow for interested parties and internal staff to perform a thorough review.
- Local County and/or Regional Health Departments should document all aspects of an outbreak during the event, or at the first opportunity after the initial response is completed, and consider development of an outbreak investigation report.
- A hose connection vacuum breaker is not an acceptable device for protection from a pressurized chemical system. A hose connection vacuum breaker is considered a specialized atmospheric type vacuum breaker. The device does not provide a robust or

sufficient level of protection based on the degree of hazard posed by the HVAC system. While the device is considered a *specialized* atmospheric type vacuum breaker as defined in the *Colorado Cross Connection Control Manual*, the device is not intended to be used in systems with direct connections to specific hazards. The use of the device is meant to protect from possible backflow events that may occur while a hose is attended during temporary use. The correct device(s) to prevent proper cross-contamination is a reduced pressure type backflow preventer or a backflow preventer with an intermediate atmospheric vent.

- Staff from the CDPHE Field Services Section, Engineering Section, Capacity Building Unit, and Operator Certification Unit should continue to work closely together and ensure that cross connection awareness knowledge is distributed not only to public water systems and their operators but to members of the public as well.
- Water should be sampled routinely in any potential outbreak where water may be a potential transmission route. Public Health Departments and the CDPHE should be consulted during these events to help provide sampling advice (e.g., number of samples to collect, sampling locations, analysis to be performed, and sampling procedures). For every bacteriological sample a disinfectant residual should be collected at the time of the sampling event.
- Staff from the Local County and/or Regional Health Department and the CDPHE should visit any potential drinking water disease outbreak site at the beginning of any investigation.
- Public water systems should have an emergency response plan for situations where a building that they serve has been determined to be contaminated. The plan should include backflow assembly performance verification, retesting of devices when necessary, and upstream and downstream chemical analysis. If appropriate backflow protection conditions are determined to be deficient (no device, or device has not been adequately tested) the public water system may need to consider potable water shutoff to the affected area until an appropriate backflow prevention assembly has been installed and performance has been verified through a test.
- Flushing and disinfection procedures of a potable water supply system should be followed in accordance with appropriate AWWA recommended procedures or local plumbing codes.
- The CDPHE, Local County and/or Regional Health Departments, and public water systems should promote and/or continue to promote cross-connection control awareness to the public.
- Local County and/or Regional Health Departments should promote the benefits of permitting processes for any changes made to plumbing systems. Permitting processes are in place to ensure that inspectors are allowed to inspect new plumbing systems and/or changes to the system to ensure public health and safety has not been compromised.
- All SDW Program staff and designated Local County and/or Regional Health Department staff should receive basic training on waterborne disease outbreaks.

Appendix A. Example Cross Connection Contamination Incidents

Table A.1. Example Cross Connection Contamination Incidents in Colorado that Occurred Between 1986 and 1997

Contamination Event Year	State	System Type	Number of Persons Affected	Case Description
1997	CO	University of Colorado (Boulder) Library & Eckley Building	Unknown	A complaint of brown water and air coming from faucets in a building near the campus library triggers a cross connection investigation. A hose connecting a newly installed non-potable chilled water system to the potable water system was located in the Eckley Building's mechanical room. The same installation was found in the Norlin Library's mechanical room but connecting valves were left open. Warning signs were immediately posted at all locations where water could be consumed and contacted to not use the water. The potable water supply systems were flushed and the cross connections removed.
1990	CO	School	8	Antifreeze enters a Brighton, Colorado middle school's drinking water system. Eight students sent to the hospital, 450 students sent home. A valve was left open between the building's reservoir system containing antifreeze and the potable water system. A backflow prevention assembly was not installed allowing for antifreeze to backflow into the building's potable water supply.
1986	CO	School	6	Antifreeze enters Platte Canyon High School in near Bailey, CO. Three hundred students were sent home and six students were given medication to induce vomiting. It is suspected that an undetermined amount of antifreeze from the buildings solar heating system entered the potable water supply through a malfunctioning valve. This is an example of an inadequate backflow prevention assembly installation or improper maintenance and testing of the assembly.

APPENDIX B. Data Collection Summary Printers Park Medical Plaza

Table B.1. Pre-Flush Samples of Propylene Glycol and Ethylene Glycol

Date Collected	Sample Location	Polypropylene Glycol, mg/L	Ethylene Glycol, mg/L	Notes
				The samples collected that are reported on this table were received 10/30/2012. The samples were received by the lab at a temperature of 21.4° C. The samples were not preserved in accordance with any standard methods. The samples were also received in improper plastic containers and contained large amounts of headspace.
10/29/2012	Basement Mechanical Room	ND	ND	
10/29/2012	Basement Bath Closest to AHU #3	540	ND	
10/29/2012	Cardiology #345 Rest Room Sink	ND	ND	
10/29/2012	Breast Care #340 Rest Room Sink	ND	ND	
10/29/2012	Room #360	ND	ND	
10/29/2012	RM200, FRO, Rest Room	ND	ND	
10/29/2012	Post-Op Discharge #1210	13	ND	
10/29/2012	Boiler #1	31000	ND	This sample came directly from the HVAC system after discussion with sampler and not the boiler.
10/29/2012	Boiler #3	25000	ND	This sample came directly from the HVAC system after discussion with sampler and not the boiler.
10/29/2012	Room #305	ND	ND	

ND = Non Detect

APPENDIX B. Data Collection Summary Printers Park Medical Plaza

Table B.2. Pre-Flush and Post Flush Bacteriological Sample Analysis

Date Collected	Sample Location	Total Coliform, presence/absence	Fecal Coliform, presence/absence	Notes
				Chlorine residual was not analyzed at the time of sample collection
10/29/2012	1st Floor Mop Sink	ABS	ABS	Pre Flush & Disinfection
10/29/2012	3rd Floor Mop Sink	ABS	ABS	Pre Flush & Disinfection
10/30/2012	Adult Rehab Sink	ABS	ABS	Post Flush & Disinfection
10/30/2012	Breast Care Ultrasound Sink	ABS	ABS	Post Flush & Disinfection
10/30/2012	Dailey Brew Sink	ABS	ABS	Post Flush & Disinfection
10/30/2012	Front Range Orthopedic Sink	ABS	ABS	Post Flush & Disinfection
10/30/2012	Health & Wellness Sink	ABS	ABS	Post Flush & Disinfection
10/30/2012	OR #4 Sink	ABS	ABS	Post Flush & Disinfection

ABS= Absence

APPENDIX B. Data Collection Summary Printers Park Medical Plaza

Table B.3. Post Flush Chemical Sample Analysis

Date Collected	Sample Location	Propylene Glycol, mg/L	Ethylene Glycol, mg/L	Notes
				The chemical analyzes for these samples did not have a description identifying the location where the sample was collected. The locations were identified as 1-15
10/30/2012	1	ND	ND	Pre Flush & Disinfection
10/30/2012	2	4.4	ND	Pre Flush & Disinfection
10/30/2012	3	ND	ND	Post Flush & Disinfection
10/30/2012	4	ND	ND	Post Flush & Disinfection
10/30/2012	5	ND	ND	Post Flush & Disinfection
10/30/2012	6	ND	ND	Post Flush & Disinfection
10/30/2012	7	ND	ND	Post Flush & Disinfection
10/30/2012	8	ND	ND	Post Flush & Disinfection
10/30/2012	9	ND	ND	Post Flush & Disinfection
10/30/2012	10	ND	ND	Post Flush & Disinfection
10/30/2012	11	ND	ND	Post Flush & Disinfection
10/30/2012	12	ND	ND	Post Flush & Disinfection
10/30/2012	13	ND	ND	Post Flush & Disinfection
10/30/2012	14	ND	ND	Post Flush & Disinfection
10/30/2012	15	25000	ND	Post Flush & Disinfection

ND = Non detect

APPENDIX C: Colorado Springs Utilities Water Quality Analysis 10/30/2012

Hydrant 301A			Hydrant 302A		
Analyte	Results	Units	Analyte	Results	Units
Ammonia (total) as Nitrogen	<0.6	mg/L	Ammonia (total) as Nitrogen	<0.6	mg/L
Nitrate as Nitrogen (Screen)	3	mg/L	Nitrate as Nitrogen (Screen)	2	mg/L
Ortho-Phosphate	0.01	mg/L	Ortho-Phosphate	0.01	mg/L
Nitrite+Nitrate as Nitrogen	<0.10	mg/L	Nitrite+Nitrate as Nitrogen	<0.10	mg/L
Aluminum (Total Recoverable)	55.7	ug/L	Aluminum (Total Recoverable)	43.4	ug/L
Antimony (Total Recoverable)	<30.0	ug/L	Antimony (Total Recoverable)	<30.0	ug/L
Arsenic (Total Recoverable)	<50.0	ug/L	Arsenic (Total Recoverable)	<50.0	ug/L
Barium (Total Recoverable)	13.2	ug/L	Barium (Total Recoverable)	14.7	ug/L
Beryllium (Total Recoverable)	<2.00	ug/L	Beryllium (Total Recoverable)	<2.00	ug/L
Boron (Total Recoverable)	<30.0	ug/L	Boron (Total Recoverable)	<30.0	ug/L
Cadmium (Total Recoverable)	<5.00	ug/L	Cadmium (Total Recoverable)	<5.00	ug/L
Calcium (Total Recoverable)	10200	ug/L	Calcium (Total Recoverable)	9890	ug/L
Chromium (Total Recoverable)	<5.00	ug/L	Chromium (Total Recoverable)	<5.00	ug/L
Cobalt (Total Recoverable)	<5.00	ug/L	Cobalt (Total Recoverable)	<5.00	ug/L
Copper (Total Recoverable)	<5.00	ug/L	Copper (Total Recoverable)	<5.00	ug/L
Iron (Total Recoverable)	<20.0	ug/L	Iron (Total Recoverable)	20.7	ug/L
Lead (Total Recoverable)	<30.0	ug/L	Lead (Total Recoverable)	<30.0	ug/L
Magnesium (Total Recoverable)	1710	ug/L	Magnesium (Total Recoverable)	1610	ug/L
Manganese (Total Recoverable)	<5.00	ug/L	Manganese (Total Recoverable)	<5.00	ug/L
Molybdenum (Total Recoverable)	<10.0	ug/L	Molybdenum (Total Recoverable)	<10.0	ug/L
Nickel (Total Recoverable)	<10.0	ug/L	Nickel (Total Recoverable)	<10.0	ug/L
Potassium (Total Recoverable)	3170	ug/L	Potassium (Total Recoverable)	826	ug/L
Selenium (Total Recoverable)	<100	ug/L	Selenium (Total Recoverable)	<100	ug/L
Silver (Total Recoverable)	<10.0	ug/L	Silver (Total Recoverable)	<10.0	ug/L
Sodium (Total Recoverable)	7010	ug/L	Sodium (Total Recoverable)	6340	ug/L
Thallium (Total Recoverable)	<40.0	ug/L	Thallium (Total Recoverable)	<40.0	ug/L
Zinc (Total Recoverable)	<10.0	ug/L	Zinc (Total Recoverable)	<10.0	ug/L
Microtox Acute Toxicity	Normal		Microtox Acute Toxicity	Normal	
E. coli (presence/absence)	Absence		E. coli (presence/absence)	Absence	
Total coliform (presence/absence)	Absence		Total coliform (presence/absence)	Absence	
1,1,-Trichloroethane	<0.50	ug/L	1,1,-Trichloroethane	<0.50	ug/L
1,1,2-Trichloroethane	<0.50	ug/L	1,1,2-Trichloroethane	<0.50	ug/L
1,1-Dichloroethane	<0.50	ug/L	1,1-Dichloroethane	<0.50	ug/L
1,2,4-Trichlorobenzene	<0.50	ug/L	1,2,4-Trichlorobenzene	<0.50	ug/L
1,2-Dichlorobenzene	<0.50	ug/L	1,2-Dichlorobenzene	<0.50	ug/L
1,2-Dichloroethane	<0.50	ug/L	1,2-Dichloroethane	<0.50	ug/L
1,2-Dichloropropane	<0.50	ug/L	1,2-Dichloropropane	<0.50	ug/L
1,4-Dichlorobenzene	<0.50	ug/L	1,4-Dichlorobenzene	<0.50	ug/L
Benzene	<0.50	ug/L	Benzene	<0.50	ug/L
Bromodichloromethane	3.91	ug/L	Bromodichloromethane	4.20	ug/L
Bromoform	<0.50	ug/L	Bromoform	<0.50	ug/L
Carbon Tetrachloride	<0.50	ug/L	Carbon Tetrachloride	<0.50	ug/L
Chlorobenzene	<0.50	ug/L	Chlorobenzene	<0.50	ug/L
Chloroform	24.0	ug/L	Chloroform	29.5	ug/L
Dibromochloromethane	<0.50	ug/L	Dibromochloromethane	<0.50	ug/L
Ethylbenzene	<0.50	ug/L	Ethylbenzene	<0.50	ug/L
Methylene Chloride	<0.50	ug/L	Methylene Chloride	<0.50	ug/L
Styrene	<0.50	ug/L	Styrene	<0.50	ug/L
Tetrachloroethene	<0.50	ug/L	Tetrachloroethene	<0.50	ug/L
Vinyl Chloride	<0.50	ug/L	Vinyl Chloride	<0.50	ug/L
cis-1,2Dichloroethene	<0.50	ug/L	cis-1,2Dichloroethene	<0.50	ug/L
m,p-Xylene	<0.50	ug/L	m,p-Xylene	<0.50	ug/L
trans-1,2-Dichloroethene	<0.50	ug/L	trans-1,2-Dichloroethene	<0.50	ug/L
Organic Carbon Total	1.05	mg/L	Organic Carbon Total	1.00	mg/L
Alkalinity (Total)	40	mg/L	Alkalinity (Total)	60	mg/L
Ammonia as Nitrogen (Screen)	<0.25	mg/L	Ammonia as Nitrogen (Screen)	<0.25	mg/L
Hardness as CaCO3	50	mg/L	Hardness as CaCO3	60	mg/L
Conductivity	101	umhos/cm	Conductivity	97	umhos/cm
Temperature	12	C°	Temperature	14	C°
Chlorine Residual (Free)	0.44	mg/L	Chlorine Residual (Free)	0.42	mg/L
pH	7.0	SU	pH	7.0	SU

Appendix D: National Outbreak Reporting System Waterborne Disease Transmission Report

General



National Outbreak Reporting System

Waterborne Disease Transmission



This form is used to report waterborne disease outbreak investigations. This form has 6 parts, indicated by tabs at the top of each page. Part 1 asks for the minimum or basic information about the outbreak investigation. Part 2 asks for epidemiological data and clinical specimen test results. Parts 3, 4, 5 and 6 collect information about types of water exposure (treated recreational water, untreated recreational water, drinking water, and water not intended for drinking/unknown intent). Only 1 of those 4 water exposure parts should be completed for an outbreak investigation report.

CDC USE ONLY

CDC Report ID

State Report ID

2012-21-049

Form Approved
OMB No. 0920-0004

General Section

Primary Mode of Transmission (check one)

Food (Complete CDC 52.13)

Person-to-person (Complete CDC 52.13)

Water (Complete tabs for General, Water-General and type of water exposure)

Environmental contamination other than food/water (Complete CDC 52.13)

Animal contact (Complete CDC 52.13)

Indeterminate/Other/Unknown (Complete CDC 52.13)

Investigation Methods (check all that apply)

Interviews only of ill persons

Case-control study

Cohort study

Food preparation review

Water system assessment: Drinking water

Water system assessment: Nonpotable water

Treated or untreated recreational water venue assessment

Investigation at factory/production/treatment plant

Investigation at original source (e.g., farm, water source, etc.)

Food product or bottled water traceback

Environment/food/water sample testing

Other

Comments
Testing of HVAC cross contamination included potable hot and cold water outlets

Dates (mm/dd/yyyy)

Date first case became ill (required) 10/27/12 Date last case became ill 10/30/12

Date of initial exposure 10/29/12 10/26/12 Date of last exposure 10/29/12

Date of report to CDC (other than this form) _____

Date of notification to State/Territory or Local/Tribal Health Authorities 10/29/12

Geographic Location

Reporting state: Colorado

Exposure occurred in multiple states

Exposure occurred in a single state but cases resided in multiple states

Other states: _____

Reporting county: El Paso

Exposure occurred in multiple counties in reporting state

Exposure occurred in a single county but cases resided in multiple counties in reporting state

Other counties: _____

City/Town/Place of exposure: Colorado Springs

Do not include proprietary or private facility names

Primary Cases

Number of Primary Cases		Sex (estimated percent of the primary cases)			
# Lab-confirmed cases		Male	3	12	%
# Probable cases	26	Female	23	88	%
# Estimated total primary cases	26				
# Cases	Total # of cases for whom info is available	Approximate percent of primary cases in each age group			
# Died	0	<1 year	%	20-49 years	69 % 18
# Hospitalized	0	1-4 years	%	50-74 years	31 % 8
# Visited Emergency Room	26	5-9 years	%	≥ 75 years	%
# Visited health care provider (excluding ER visits)	UNK	10-19 years	%	Unknown	%

Appendix D: National Outbreak Reporting System Waterborne Disease Transmission Report

General					
Incubation Period, Duration of Illness, Signs or Symptoms for Primary Cases only					
Incubation Period (select appropriate units)			Duration of Illness (among recovered cases select appropriate units)		
Shortest		Min, Hours, Days	Shortest		Min, Hours, Days
Median		Min, Hours, Days	Median		Min, Hours, Days
Longest		Min, Hours, Days	Longest		Min, Hours, Days
Total # of cases for whom info is available			Total # of cases for whom info is available		
<input checked="" type="checkbox"/> Unknown incubation period			<input checked="" type="checkbox"/> Unknown duration of illness		
Signs or Symptoms					
Feature	# Cases with signs or symptoms		Total # cases for whom info available		
Vomiting	3		26		
Diarrhea	5		"		
Bloody stools	0		"		
Fever	0		"		
Abdominal cramps	9		"		
HUS	0		"		
Asymptomatic	0		"		
Secondary Cases					
Mode of Secondary Transmission (check one)			Number of Secondary Cases		
<input type="checkbox"/> Food <input type="checkbox"/> Water <input type="checkbox"/> Animal contact <input type="checkbox"/> Person-to-person <input type="checkbox"/> Environmental contamination other than food/water <input type="checkbox"/> Indeterminate/Other/Unknown <p style="text-align: center; font-size: 2em;">NONE</p>			# Lab-confirmed secondary cases	0	
			# Probable secondary cases	0	
			Estimated total secondary ill	0	
			Total # of cases (Primary + Secondary)		
Environmental Health Specialists Network (if applicable)					
EHS-Net Evaluation ID: 1.) _____ 2.) _____ 3.) _____					
Traceback (for food and bottled water only, not public water)					
<input type="checkbox"/> Please check if traceback conducted					
Source name (if publicly available)	Source type (e.g. poultry farm, tomato processing plant, bottled water factory)	Location of source		Comments	
		State	Country		
Recall					
<input type="checkbox"/> Please check if any food or bottled water product was recalled					
Type of item recalled:					
Comments:					
Reporting Agency					
Agency name: <u>El Paso County Public Health</u>		E-mail: <u>bill@leton.com</u>			
Contact name: <u>Bill Letson</u>		Contact title: <u>Medical Director</u>			
Phone no.: <u>719-528-3258</u>		Fax no.: <u>719-525-8664</u>			
Remarks (Briefly describe important aspects of the outbreak not covered above. Please indicate if any adverse outcomes occurred in special populations (e.g., pregnant women, immunocompromised persons))					
<u>Outbreak was point source - contaminated potable H2O resulting from cross contamination of HVAC H2O w/ potable H2O systems</u>					

Appendix D: National Outbreak Reporting System Waterborne Disease Transmission Report

Water-General

Waterborne Disease and Outbreaks - General

Type of Water Exposure (check ONE box)

- Water intended for recreational purposes – treated venue (e.g., pool, spa/whirlpool/hot tub, spray pad)
 Water intended for recreational purposes – untreated venue (e.g., freshwater lake, hot spring, marine beach)
 Water intended for drinking (includes water used for bathing/showering)
 Water not intended for drinking or water of unknown intent (e.g., cooling/industrial, occupational, decorative/display)

Geographic Location

Percent of primary cases living in reporting state: 100 %

Symptoms

For each category, indicate # of persons with:

- Gastrointestinal symptoms/conditions 23
 Respiratory symptoms/conditions 0
 Skin symptoms/conditions 1
 burning hands
 Ear symptoms/conditions 0
 Eye symptoms/conditions 1
 Burning eyes
 Neurologic symptoms/conditions 3
 Sleepiness, fuzzy
 Wound infections 0
 Other, specify (e.g., hepatitis A, leptospirosis): 13
 Headache

Route of Entry

- Ingestion
 Contact
 Inhalation
 Other, specify: _____
 Unknown

Associated Events

Was exposure associated with a specific event or gathering?

Yes No Unknown

If Yes, what type of event or gathering was involved?

Cleaning/drainage of building HVAC system

If outbreak occurred during a defined event, dates of event:

Start date: 10/26/12 End date: 10/29/12
 (mm/dd/yyyy) (mm/dd/yyyy)

Epidemiologic Data

1. Estimated total number of persons with primary exposure: ~600

2. Were data collected from comparison groups to estimate risk? Yes (specify in table below) No Unknown
 If No or Unknown, was water the only common source shared by persons who were ill? Yes No Unknown

Exposure (Vehicle/Setting) (e.g., pool—waterpark; hot spring, well water)	Total # Exposed (A)	# Ill Exposed (B)	Total # Not Exposed	# Ill Not Exposed	Attack Rate (%) (B/A)	Odds Ratio	Relative Risk	p-Value (provide exact value)	95% Confidence Interval
<u>Drinking H2O</u>	<u>600</u>	<u>29</u>	<u>?</u>	<u>?</u>	<u>5%</u>				

Attack rate for residents of reporting state: 5.5 %

Attack rate for non-residents of reporting state: _____ %

Appendix D: National Outbreak Reporting System Waterborne Disease Transmission Report

Water-General

Clinical Specimens - Laboratory Results (refer to the laboratory findings from the outbreak investigation)

1. Were clinical diagnostic specimens taken from persons? Yes No (go to next tab) Unknown (go to next tab)

If Yes, from how many persons were specimens taken? _____

Specimen Type*	Specimen Subtype**	Tested for § (list all that apply)

* Specimen Type: 1-Autopsy Specimen (specify subtype), 2-Biopsy (specify), 3-Blood, 4-Bronchial Alveolar Lavage (BAL), 5-Cerebrospinal Fluid (CSF), 6-Conjunctiva/Eye Swab, 7-Ear Swab, 8-Endotracheal Aspirate, 9-Saliva, 10-Serum, 11-Skin Swab, 12-Sputum, 13-Stool, 14-Urine, 15-Vomit, 16-Wound Swab, 17-Unknown

** Specimen Subtype: 1-Bladder, 2-Brain, 3-Dura, 4-Hair, 5-Intestine, 6-Kidney, 7-Liver, 8-Lung, 9-Nails, 10-Skin, 11-Stomach, 12-Wound, 13-Other, 14-Unknown

§ Tested for: 1-Bacteria, 2-Chemicals/Toxins, 3-Fungi, 4-Parasites, 5-Viruses

Report the confirmed and/or suspected etiological agent(s) in the table below.

Clinical Specimen Row Number	Genus/ Chemical/ Toxin	Species	Serotype/ Serogroup/ Serovar	Genotype/ Subtype
1	Propylene glycol derivatives found in drinking H ₂ O	Lactic formic acid		
2				
3				
4				

Clinical Specimen Row Number	Confirmed as Etiology?	Concentration (numerical value)	Unit	Specimen Type*	Specimen Subtype**
1	<input type="checkbox"/> Yes				
2	<input type="checkbox"/> Yes				
3	<input type="checkbox"/> Yes				
4	<input type="checkbox"/> Yes				

Clinical Specimen Row Number	Test Type §	Total # People Tested	Total # People Positive
1		0	
2			
3			
4			

* Specimen Type: 1-Autopsy Specimen (specify subtype), 2-Biopsy (specify), 3-Blood, 4-Bronchial Alveolar Lavage (BAL), 5-Cerebrospinal Fluid (CSF), 6-Conjunctiva/Eye Swab, 7-Ear Swab, 8-Endotracheal Aspirate, 9-Saliva, 10-Serum, 11-Skin Swab, 12-Sputum, 13-Stool, 14-Urine, 15-Vomit, 16-Wound Swab, 17-Unknown

** Specimen Subtype: 1-Bladder, 2-Brain, 3-Dura, 4-Hair, 5-Intestine, 6-Kidney, 7-Liver, 8-Lung, 9-Nails, 10-Skin, 11-Stomach, 12-Wound, 13-Other, 14-Unknown

§ Test Type: 1-Culture, 2-DNA or RNA Amplification/Detection (e.g., PCR, RT-PCR), 3-Microscopy (e.g., fluorescent, EM), 4-Serological/Immunological Test (e.g., EIA, ELISA), 5-Phage Typing, 6-Chemical Testing, 7-Tissue Culture Infectivity Assay

Isolates

State Lab Isolate ID	Specimen Profile 1 (e.g., the PFGE, MLVA, or genotype sequence)	Specimen Profile 2 (e.g., the PFGE, MLVA, or genotyping method used)

Appendix D: National Outbreak Reporting System Waterborne Disease Transmission Report

Drinking Water

Drinking Water Vehicle Description

Drinking Water Vehicle Description

Water Type* (e.g., commercially-bottled water, community water system, individual water system)	Public Water System EPA ID Number**	Water Source (select ground water, surface water or unknown)	Water Source Description (e.g., spring; well; lake)	Setting of Exposure (e.g., airport, mobile home park)	USUAL Water Treatment Provided (e.g., no treatment, disinfection, home filtration)	Water Treatment Subtype (disinfection or filtration; e.g., boiling; chlorination; rapid sand filter; reverse osmosis)
Individual system		Surface	City utility	Medical office Building	City filtration + chlorination	filtered chlorinated

*Water system definitions: Community and noncommunity water systems are public water systems that have ≥ 15 service connections or serve an average of ≥ 25 residents for ≥ 60 days/year. A community water system serves year-round residents of a community, subdivision, or mobile home park. A noncommunity water system serves an institution, industry, camp, park, hotel, or business and can be nontransient or transient. Nontransient systems serve ≥ 25 of the same persons for > 6 months of the year but not year-round (e.g., factories and schools), whereas transient systems provide water to places in which persons do not remain for long periods (e.g., restaurants, highway rest stations, and parks). Individual water systems are small systems not owned or operated by a water utility that have < 15 connections or serve < 25 persons.

** Number used for EPA reporting that uniquely identifies the water system within a specific state. The water system ID number can be found at <http://www.epa.gov/safewater/dwinfo/index.html> by first selecting a state and then selecting a county.

Drinking Water Quality

Did the drinking water system have any monitoring violations in the 1 month prior to the outbreak?

Yes No Unknown Not applicable

If Yes, explain: _____

Did the drinking water system have any maximum contaminant level (MCL) violations in the 1 month prior to the outbreak?

Yes No Unknown Not applicable

If Yes, explain: _____

Did the drinking water system have any violations in the 12 months prior to the outbreak?***

Yes No Unknown Not applicable

If Yes, explain: _____

***Sources of information about past violations can be obtained from utility records, consumer confidence reports (water quality reports), or violation records from state or local health departments

Laboratory Section - Drinking Water

Was drinking water tested? Yes (specify in table below) No Unknown

Results	1	2	3	4	5
Sample					
Source of Sample	Drinking Fountains	Exam Room Sinks Hot + cold	Post OP discharge H ₂ O	Bath closet Hot + cold	HVAC unit
Additional Description (e.g., kitchen faucet, well, reservoir)	0 C. H. Street P. H. Street	0	0	0	0
Date: (mm/dd/yyyy)	10/29/12	10/29/12	10/29/12	10/29/12	10/29/12
Volume Tested	Number	2	2	1	2
	Unit	50cc	50cc	50cc	50cc
Temperature	Number	2	2	1	2
	Unit	21.4°C	21.4°C	21.4°C	21.4°C
Residual/Free Disinfectant Level (if total and combined disinfectant levels given, total - combined = free)	Number				
	Unit				
pH					
Turbidity (NTU)					

Appendix D: National Outbreak Reporting System Waterborne Disease Transmission Report

Drinking Water

Water Quality Indicator

Sample Number	Type (e.g., fecal coliforms)	Concentration (numerical value)	Unit

Microbiology or Chemical/Toxin Analysis (refer to the laboratory findings from the outbreak investigation)

Sample Number	Genus/ Chemical/ Toxin	Species	Serotype/ Serogroup/ Serovar	Genotype/ Subtype	PFGE Pattern
9	Coliform negative in all areas tested for glycols				

Sample Number	Test Results Positive?	Concentration (numerical value)	Unit	Test Type*	Test Method (reference: National Environmental Methods Index: http://www.nemi.gov)
	<input type="checkbox"/> Yes	See laboratory section/ drinking H ₂ O			
	<input type="checkbox"/> Yes				
	<input type="checkbox"/> Yes				

* Test Type: 1-Culture, 2-DNA or RNA Amplification/Detection (e.g., PCR, RT-PCR), 3-Microscopy (e.g., fluorescent, EM), 4-Serological/Immunological Test (e.g., EIA, ELISA), 5-Phage Typing, 6-Chemical Testing, 7-Tissue Culture Infectivity Assay

Factors Contributing to Drinking Water Contamination and/or Increased Exposure to Contaminated Drinking Water

Did a problem with the source water (i.e., ground water or surface water) contribute to the disease or outbreak?
 Yes (specify in table below) No Unknown

Source Water Factors (check all that apply)**	Documented/Observed***	Suspected***
Sanitary sewer overflow (SSO) ****	<input type="checkbox"/>	<input type="checkbox"/>
Combined sewer overflow (CSO) ****	<input type="checkbox"/>	<input type="checkbox"/>
Malfunctioning on-site wastewater treatment system **** =	<input type="checkbox"/>	<input type="checkbox"/>
Sewage treatment plant malfunction ***	<input type="checkbox"/>	<input type="checkbox"/>
Sewer line break ***	<input type="checkbox"/>	<input type="checkbox"/>
Poor siting/design of on-site wastewater treatment system **** ≠	<input type="checkbox"/>	<input type="checkbox"/>
Nearby biosolid/land application site (e.g., human or animal waste application)	<input type="checkbox"/>	<input type="checkbox"/>
Contamination from agricultural chemical application (e.g., fertilizer, pesticides)	<input type="checkbox"/>	<input type="checkbox"/>
Contamination from chemical pollution not related to agricultural application	<input type="checkbox"/>	<input type="checkbox"/>
Contamination by a chemical that the current treatment methods were not designed to remove	<input type="checkbox"/>	<input type="checkbox"/>
Domestic animal contamination (e.g., livestock, concentrated feeding operations, pets)	<input type="checkbox"/>	<input type="checkbox"/>
Wildlife contamination - Birds	<input type="checkbox"/>	<input type="checkbox"/>
Wildlife contamination - Mammals	<input type="checkbox"/>	<input type="checkbox"/>
Wildlife contamination - Fish kill	<input type="checkbox"/>	<input type="checkbox"/>
Flooding/heavy rains	<input type="checkbox"/>	<input type="checkbox"/>
Algal bloom	<input type="checkbox"/>	<input type="checkbox"/>
Seasonal variation in water quality (e.g., lake/reservoir turnover events, resort community with seasonal loading)	<input type="checkbox"/>	<input type="checkbox"/>
Low water table (e.g., drought, over-pumping)	<input type="checkbox"/>	<input type="checkbox"/>
Ground water under direct influence of surface water (e.g., shallow well)≠	<input type="checkbox"/>	<input type="checkbox"/>
Contamination through limestone or fissured rock (e.g., karst)	<input type="checkbox"/>	<input type="checkbox"/>
Contaminated recharge water	<input type="checkbox"/>	<input type="checkbox"/>
Use of an alternate source of water by a water utility	<input type="checkbox"/>	<input type="checkbox"/>
Mixing of raw water from different sources	<input type="checkbox"/>	<input type="checkbox"/>
Improper construction or location of a well or spring	<input type="checkbox"/>	<input type="checkbox"/>
Water system intake failure (e.g., cracked well casing, cracked intake pipe)	<input type="checkbox"/>	<input type="checkbox"/>
Intentional contamination (explain in remarks)	<input type="checkbox"/>	<input type="checkbox"/>
Other, specify: <u>Cross contamination between potable H₂O & HVAC</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Unknown	<input type="checkbox"/>	<input type="checkbox"/>

** Only check off what was found during investigation.

*** "Documented/Observed" refers to information gathered through document reviews, direct observations, and/or interviews. "Suspected" refers to factors that probably occurred but for which no documentation (as defined previously) is available.

**** The release of sewage does not have to occur on the property in which persons have become ill. The sewage release may have occurred at a distant site but still affected the property in question.

= "On-site wastewater treatment system" refers to a system designed to treat and dispose of wastewater at the point of generation, generally on the property where the wastewater is generated (e.g., septic systems or other advanced on-site systems). However, contamination that originates from these systems can still occur off the property where treatment and disposal takes place due to migration of contaminants from malfunctioning systems or poor siting and design.

≠ Any water beneath the surface of the ground with substantial occurrence of insects or other macroorganisms, algae, or large-diameter pathogens (e.g., *Giardia intestinalis* or *Cryptosporidium*), or substantial and relatively rapid shifts in water characteristics (e.g., turbidity, temperature, conductivity, or pH) that closely correlate with climatic or surface water conditions. Direct influence must be determined for individual sources in accordance with criteria established by the state.

Appendix D: National Outbreak Reporting System Waterborne Disease Transmission Report

Drinking Water

Factors Contributing to Drinking Water Contamination and/or Increased Exposure to Contaminated Drinking Water

Did a problem with the water treatment prior to entry into a house or building contribute to the disease or outbreak?

Yes (specify in table below) No Unknown

Treatment Factors (check all that apply)*	Documented/ Observed**	Suspected**
Change in treatment process (explain in remarks)	<input type="checkbox"/>	<input type="checkbox"/>
No disinfection	<input type="checkbox"/>	<input type="checkbox"/>
Temporary interruption of disinfection	<input type="checkbox"/>	<input type="checkbox"/>
Chronically inadequate disinfection	<input type="checkbox"/>	<input type="checkbox"/>
No filtration	<input type="checkbox"/>	<input type="checkbox"/>
Inadequate filtration	<input type="checkbox"/>	<input type="checkbox"/>
Deficiencies in other treatment processes	<input type="checkbox"/>	<input type="checkbox"/>
Corrosion in or leaching from pipes or storage tanks	<input type="checkbox"/>	<input type="checkbox"/>
Pipe/component failure or break (e.g., pipes, tanks, valves)	<input type="checkbox"/>	<input type="checkbox"/>
Contamination during construction or repair of pipes/components	<input type="checkbox"/>	<input type="checkbox"/>
Construction or repair of pipes/components without evidence of contamination	<input type="checkbox"/>	<input type="checkbox"/>
Operator error <i>Valves between HVAC + potable H2O left open for 12 hours plus inadvertent</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Other, specify:	<input type="checkbox"/>	<input type="checkbox"/>
Unknown	<input type="checkbox"/>	<input type="checkbox"/>

Did a problem with the distribution system contribute to the disease or outbreak? Yes (specify in table below) No Unknown

(NOTE: For a community water system, the distribution system refers to the pipes and storage infrastructure under the jurisdiction of the water utility prior to the water meter (or property line if the system is not metered). For noncommunity and nonpublic water systems, the distribution system refers to the pipes and storage infrastructure prior to entry into a building or house)

Distribution and Storage Factors (check all that apply)*	Documented/ Observed**	Suspected**
Cross-connection of potable and nonpotable water pipes resulting in backflow	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Low pressure or change in water pressure in the distribution system	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Change in water flow direction in the distribution system	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Mixing of treated water from different sources	<input type="checkbox"/>	<input type="checkbox"/>
Pipe/component failure or break (e.g., pipes, tanks, valves)	<input type="checkbox"/>	<input type="checkbox"/>
Corrosion in or leaching from pipes or storage tanks	<input type="checkbox"/>	<input type="checkbox"/>
Contamination of mains during construction or repair	<input type="checkbox"/>	<input type="checkbox"/>
Construction or repair of mains without evidence of contamination	<input type="checkbox"/>	<input type="checkbox"/>
Scheduled flushing of the distribution system	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Contamination of storage facility	<input type="checkbox"/>	<input type="checkbox"/>
Aging water distribution components (e.g., pipes, tanks, valves)	<input type="checkbox"/>	<input type="checkbox"/>
Water temperature $\geq 30^{\circ}\text{C}$ ($\geq 86^{\circ}\text{F}$)	<input type="checkbox"/>	<input type="checkbox"/>
Intentional contamination (explain in remarks)	<input type="checkbox"/>	<input type="checkbox"/>
Other, specify:	<input type="checkbox"/>	<input type="checkbox"/>
Unknown	<input type="checkbox"/>	<input type="checkbox"/>

Did a problem occur after the water meter or outside the jurisdiction of a water utility that contributed to the disease or outbreak? (e.g., in a service line leading to a house/building, in the plumbing inside a house/building, during shipping/hauling, during storage other than in the distribution system, at the point of use, involving commercially-bottled water)

Yes (specify in table below) No Unknown

Factors Not Under the Jurisdiction of a Water Utility or Factors at the Point of Use (check all that apply)*	Documented/ Observed**	Suspected**
<i>Legionella</i> species in water system	<input type="checkbox"/>	<input type="checkbox"/>
Cross-connection of potable and nonpotable water pipes resulting in backflow	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Lack of backflow prevention in plumbing	<input type="checkbox"/>	<input type="checkbox"/>
Low pressure or change in water pressure in the plumbing	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Change in water flow direction in the plumbing	<input type="checkbox"/>	<input type="checkbox"/>
Corrosion in or leaching from pipes or storage tanks	<input type="checkbox"/>	<input type="checkbox"/>
Pipe/component failure or break (e.g., pipes, tanks, valves)	<input type="checkbox"/>	<input type="checkbox"/>
Aging plumbing components (e.g., pipes, tanks, valves)	<input type="checkbox"/>	<input type="checkbox"/>
Contamination of plumbing during construction or repair	<input type="checkbox"/>	<input type="checkbox"/>
Construction or repair of plumbing without evidence of contamination	<input type="checkbox"/>	<input type="checkbox"/>
Deficiency in building/home-specific water treatment after the water meter or property line	<input type="checkbox"/>	<input type="checkbox"/>
Deficiency or contamination of equipment/devices using or distributing water	<input type="checkbox"/>	<input type="checkbox"/>
Contamination during commercial bottling	<input type="checkbox"/>	<input type="checkbox"/>
Contamination during shipping, hauling, or storage	<input type="checkbox"/>	<input type="checkbox"/>
Contamination at point of use - Tap	<input type="checkbox"/>	<input type="checkbox"/>
Contamination at point of use - Hose	<input type="checkbox"/>	<input type="checkbox"/>
Contamination at point of use - Commercially-bottled water	<input type="checkbox"/>	<input type="checkbox"/>
Contamination at point of use - Container, bottle, or pitcher	<input type="checkbox"/>	<input type="checkbox"/>
Contamination at point of use - Unknown	<input type="checkbox"/>	<input type="checkbox"/>
Water temperature $\geq 30^{\circ}\text{C}$ ($\geq 86^{\circ}\text{F}$)	<input type="checkbox"/>	<input type="checkbox"/>
Intentional contamination (explain in remarks)	<input type="checkbox"/>	<input type="checkbox"/>
Other, specify:	<input type="checkbox"/>	<input type="checkbox"/>
Unknown	<input type="checkbox"/>	<input type="checkbox"/>

* Only check off what was found during investigation.

** "Documented/Observed" refers to information gathered through document reviews, direct observations, and/or interviews. "Suspected" refers to factors that probably occurred but for which no documentation (as defined previously) is available.

Drinking Water

Remarks

Appendix D: National Outbreak Reporting System Waterborne Disease Transmission Report

WNID/WUI

Water Not Intended for Drinking or Water of Unknown Intent (WNID/WUI)

Intent for Use

What was the intended use for the implicated water? (check all that apply)

- Cooling/Air Conditioning (e.g., cooling tower, swamp cooler)
- Mister (e.g., produce in grocery store, public cooling system)
- Ornamental (e.g., a decorative non-interactive fountain intended for public display and not designed for swimming or recreational use)
- Industrial/Occupational (e.g., steam cleaner)
- Agricultural Irrigation
- Waste water
- Other (specify): _____
- Unknown

Water Description

Water Type (e.g., cooling tower, drainage ditch, fountain-ornamental)	Setting of Exposure (e.g., airport, hospital, health care facility, nursing home, park, state park)	USUAL Water Treatment Provided (e.g., no treatment, disinfection, settling/sedimentation)	Water Treatment Subtype (disinfection or filtration: e.g., boiling, chlorine, rapid sand filter, reverse osmosis)
HVAC	Medical office Building	City of Colorado Springs Utility	disinfection + filtration

Laboratory Section - Water Not Intended for Drinking or Water of Unknown Intent

Was the implicated water tested? Yes (specify in table below) No Unknown

Results	1	2	3	4	5
Sample					
Source of Sample	HVAC-Boiler 1	HVAC-Boiler 3			
Additional Description (e.g., time of day, specific location, etc.)	overnight	overnight			
Date (mm/dd/yyyy)	10/29/12	10/29/12			
Volume Tested	400cc	400cc			
Temperature	21.4°C	21.4°C			
Residual/Free Disinfectant Level (if total and combined disinfectant levels given, total - combined = free)					
Turbidity (NTU)					
pH					

Water Quality Indicator

Sample Number	Type (e.g., fecal coliforms)	Concentration (numerical value)	Unit
	no fecal coliforms found anywhere in system		

Appendix D: National Outbreak Reporting System Waterborne Disease Transmission Report

WNID/WUI

Microbiology or Chemical/Toxin Analysis (refer to the laboratory findings from the outbreak investigation)

Sample Number	Genus/ Chemical/ Toxin	Species	Serotype/ Serogroup/ Serovar	Genotype/ Subtype	PFGE Pattern
	No ethylene glycol found				

Sample Number	Test Results Positive?	Concentration (numerical value)	Unit	Test Type*	Test Method (reference: National Environmental Methods Index: http://www.nemi.gov)
Boiler 1	<input checked="" type="checkbox"/> Yes	25,000 mg/L		Propylene glycol	NELAC standard
Boiler 3	<input checked="" type="checkbox"/> Yes	31,000 mg/L	GWL	"	NELAC standard
	<input type="checkbox"/> Yes				
	<input type="checkbox"/> Yes				

* Test Type: 1-Culture, 2-DNA or RNA Amplification/Detection (e.g., PCR, RT-PCR), 3-Microscopy (e.g., fluorescent, EM), 4-Serological/Immunological Test (e.g., EIA, ELISA), 5-Phage Typing, 6-Chemical Testing, 7-Tissue Culture Infectivity Assay

Factors Contributing to Contamination and/or Increased Exposure to Contaminated Water

Factors (check all that apply)*	Documented/ Observed**	Suspected**
Cooling tower/evaporative condenser – shutdown for >3 days without draining to waste	<input type="checkbox"/>	<input type="checkbox"/>
Cooling tower/evaporative condenser – lack of a maintenance program	<input type="checkbox"/>	<input type="checkbox"/>
Cooling tower/evaporative condenser – lack of a qualified water quality specialist	<input type="checkbox"/>	<input type="checkbox"/>
Cooling tower/evaporative condenser – presence of scale or corrosion	<input type="checkbox"/>	<input type="checkbox"/>
Cooling tower/evaporative condenser – presence of dirt, organic matter, or other debris in the cold water basin	<input type="checkbox"/>	<input type="checkbox"/>
Cooling tower/evaporative condenser – absence of drift eliminators	<input type="checkbox"/>	<input type="checkbox"/>
Cooling tower/evaporative condenser – presence of damaged drift eliminators	<input type="checkbox"/>	<input type="checkbox"/>
Cooling tower/evaporative condenser – history of recent repairs to the device	<input type="checkbox"/>	<input type="checkbox"/>
Cooling tower/evaporative condenser – siting of device near building air intakes	<input type="checkbox"/>	<input type="checkbox"/>
Cooling tower/evaporative condenser – siting of device near windows that can be opened	<input type="checkbox"/>	<input type="checkbox"/>
Cooling tower/evaporative condenser – siting of device in immediate area of kitchen exhaust fans, live plants, truck bays, or other sources of organic matter	<input type="checkbox"/>	<input type="checkbox"/>
Cooling tower/evaporative condenser – construction on the premises of the device within 6 months before the index case	<input type="checkbox"/>	<input type="checkbox"/>
Cooling tower/evaporative condenser – construction within 100 meters of the premises of the device within 6 months before the index case	<input type="checkbox"/>	<input type="checkbox"/>
Ornamental fountain – presence of submerged lighting	<input type="checkbox"/>	<input type="checkbox"/>
Ornamental fountain – lack of a written cleaning and maintenance program	<input type="checkbox"/>	<input type="checkbox"/>
Ornamental fountain – presence of dirt, organic matter, or other debris in the water basin	<input type="checkbox"/>	<input type="checkbox"/>
Broken/damaged sewer pipe	<input type="checkbox"/>	<input type="checkbox"/>
Recycling of water	<input type="checkbox"/>	<input type="checkbox"/>
Water temperature ≥30°C (≥86°F)	<input type="checkbox"/>	<input type="checkbox"/>
Other, specify:	<input type="checkbox"/>	<input type="checkbox"/>
Unknown	<input type="checkbox"/>	<input type="checkbox"/>

* Only check off what was found during investigation.
 ** "Documented/Observed" refers to information gathered through document reviews, direct observations, and/or interviews. "Suspected" refers to factors that probably occurred but for which no documentation (as defined previously) is available.

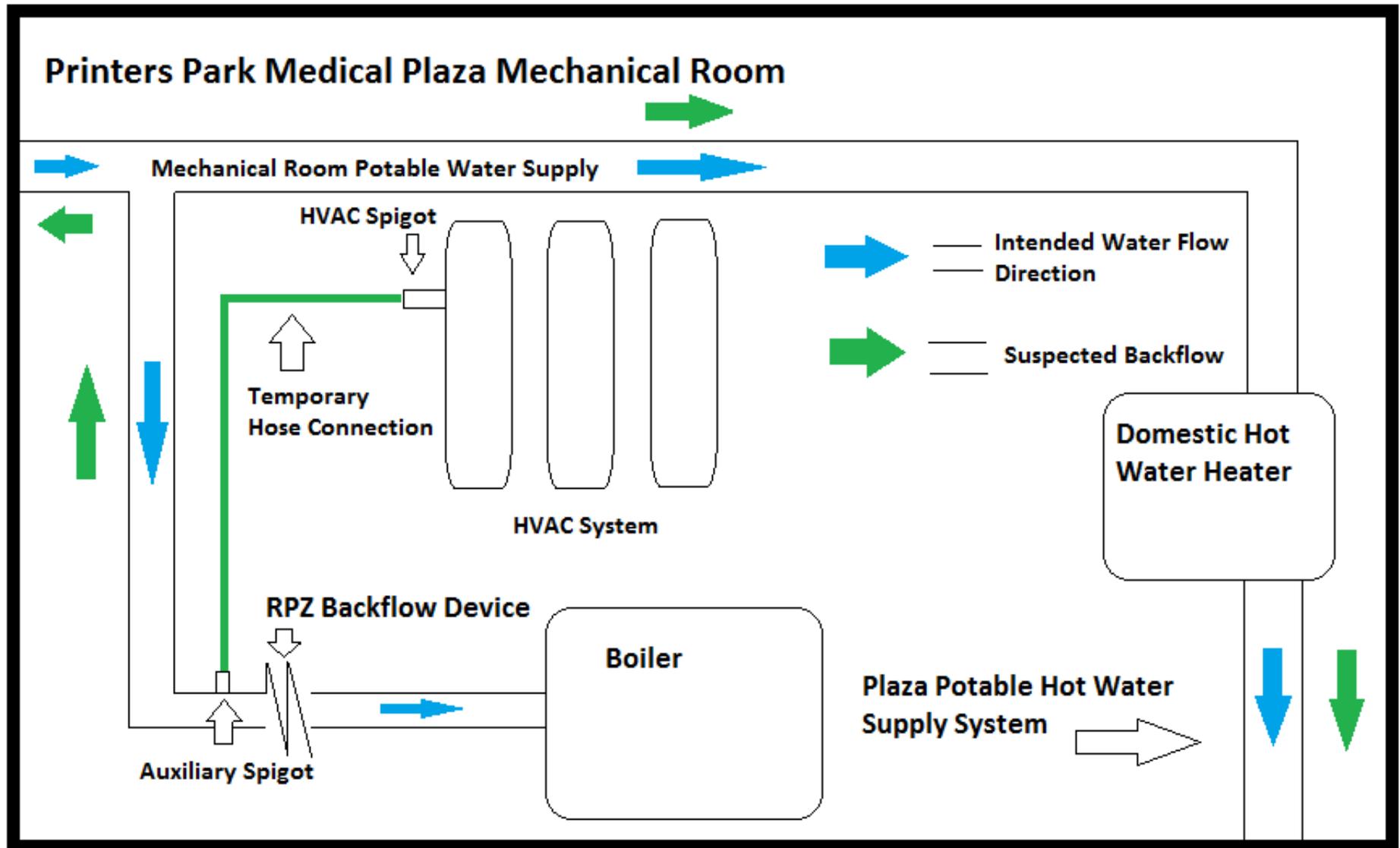
Remarks

(This area is currently blank in the provided image.)

Epidemic and laboratory assistance for the investigation of a waterborne disease outbreak is available upon request by the State Health Department to the Centers for Disease Control and Prevention. Please enter this report into the National Outbreak Reporting System (NORS). State/local investigation reports and questionnaires can also be attached to the report in the electronic system. Communications and requests for epidemic and laboratory assistance may be directed to: Waterborne Disease and Outbreak Surveillance Coordinator, Division of Parasitic Diseases, National Center for Zoonotic, Vector-Borne, and Enteric Diseases, Coordinating Center for Infectious Diseases, CDC 4770 Buford Highway, NE, MS F-22, Atlanta, GA, 30341-3724 or (770) 486-7775

Public reporting burden of this collection of information is estimated to average 20 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. An agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a currently valid OMB control number. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to CDC, Project Clearance Office, 1600 Clifton Road, MS D-24, Atlanta, GA, 30333, ATTN: PRA (0920-0044) ← DO NOT MAIL CASE REPORTS TO THIS ADDRESS.

Appendix E. Printers Park Medical Plaza Mechanical Room Suspected Cross Connection



Appendix F; Resources

Regulations, Codes & Manuals;

- Colorado Revised Statutes - Title 25
- Colorado Primary Drinking Water Regulations – 5CCR 1003-1
- Colorado Cross-Connection Control Manual
- EPA Cross-Connection Control Manual
- 2009 International Plumbing Code
- Pikes Peak Regional Building Department Code

Health Departments;

- Colorado Department of Public Health and Environment
 - www.colorado.gov/cdphe
- El Paso County Public Health Department
 - www.elpasocountyhealth.org

Public Water Systems;

- Colorado Springs Utilities
 - www.csu.org

Citations;

1. El Paso County Public Health Mission, “About El Paso County Public Health”, www.elpasocountyhealth.org, El Paso County Public Health, Web. 14, 2013.
2. Cotter, Barbara, “Building’s water problem sickens 17 Memorial employees”, www.gazette.com. Colorado Springs The Gazette, 29 October 2012. Web. 14, Jan. 2013.