STATE OF MISSOURI
Jeremiah W. (Jay) Nixon, Governor Sara Parker Pauley, Director
DEPARTMENT OF NATURAL RESOURCES
dnr.mo.gov

July 6, 2012

Mr. Layne Morrill
Kimberling City Water Company
P.O. Box 307
Kimberling City, MO 65686

Dear Mr. Morrill:

Enclosed is the Report of Inspection for the community water system serving Kimberling City Water Company in Stone County. This report is believed to be self-explanatory and I trust you will direct your attention to the recommendations contained therein.

If you have questions, please feel free to contact Ms. Bailey Pearson of this office by calling 417-891-4300 or via mail at the Southwest Regional Office, 2040 West Woodland, Springfield, Missouri 65807-5912.

Sincerely,

SOUTHWEST REGIONAL OFFICE

Mark Rader, Chief
Water, Air and Land Section

MDR/bpl

Enclosures

c: Mr. Jim Busch, Public Service Commission
Mr. Rick Helms, White River Valley Environmental Services
Ms. Kimberly Wilkins, Public Drinking Water Branch

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MISSOURI DEPARTMENT OF NATURAL RESOURCES
REPORT OF INSPECTION
COMMUNITY PUBLIC WATER SYSTEM
KIMBERLING CITY WATER COMPANY
STONE COUNTY, MISSOURI
PUBLIC WATER SYSTEM ID NUMBER MO5036046

July 6, 2012

INTRODUCTION

A routine inspection was made of the community public water system serving Kimberling City Water Company by Ms. Bailey Pearson of the Missouri Department of Natural Resources (Department) Southwest Regional Office on June 21, 2012. Mr. Layne Morrill, owner, was present representing the facility during the inspection. The purpose of the inspection was to determine compliance with Missouri Safe Drinking Water Law and Regulations.

DISCUSSION

Kimberling City Water Company is served by one state-approved well drilled in 1961. According to Department records, the well was drilled to 410 feet and cased with 302 feet of steel. The well serves 94 service connections and an estimated 250 people. The well and distribution system are interconnected with Kimberling Inn, MO5211572, and separated from each other by a gate valve.

System storage is provided by a 75,000-gallon elevated storage tank. Water is pumped from the storage tank by a single high service booster pump. System pressure is maintained by six Well-X-Trol WX302 bladder tanks with a storage volume of 86 gallons each. The system injects liquid chlorine prior to the storage tank.

The system required a DS-II certified operator due to the use of high service booster pumps. Mr. Rick Helms possesses the adequate DS-III operator's license.

Two drinking water samples were collected from the Shepherd of the Hills Realtor's office and were submitted for microbiological analysis. The samples tested Total Coliform absent or "safe". The free chlorine in the distribution system was 1.81 mg/L and the total residual chlorine level in the system was 2.08 mg/L.

The previous inspection noted that the system was not recording chlorine residuals on the monthly bacteriological sampling cards and not taking daily master meter readings. The system is currently recording chlorine residuals on the bacteriological sample cards. The system is recording master meter readings daily to calculate water usage. As required by Safe Drinking Water Regulation 10 CSR 60-4.055(3)(F) and 10 CSR 60-4.080(3) chlorine residuals must be

collected at daily to ensure that the system maintains a minimum of 0.5 mg/L total chlorine at the entrance to the distribution system and a minimum of 0.2 mg/L total chlorine throughout the system. Also collect and record chlorine readings on the sample cards at the time of sampling.

In view of recent natural catastrophes at other communities in the area, it is strongly recommended that your emergency operation plan and procedures be evaluated and updated to determine if they are adequate for any emergency that may arise. For more information please see the Model Emergency Operating Plan for Public Water Supplies located on the Department website at http://www.dnr.mo.gov/env/wpp/eop/index.html.

In addition, please find enclosed a listing of sampling sites previously used at Kimberling City Water Company, along with a *Microbiological Sample Siting Plan* form to be used to add additional sampling locations needed to ensure the entire distribution system is represented. Because the well is a source water sample location and not considered a part of the distribution system, it should never be used as a routine sampling location. If however, you ever needed to collect a repeat source water sample from the well, the Sample Location ID for Well 1 is WL10825. Please review the enclosed listing and collect monthly routine samples only from those locations. If you are wanting to inactivate, change, or add a sampling location, indicate on the list or the enclosed sampling plan form your revised sampling plan and return it to this office for review. Once approved, we can update the database with your corrections/additions. Remember, we want you to choose routine (distribution) sample locations that have an upstream repeat sampling location within five (5) service connections and a downstream repeat sampling location within five (5) service connections of the routine sample location. For more information or guidance on selecting sampling locations, please read the enclosed *Microbiological Sample Siting Plan* form.

UNSATISFACTORY FEATURES

The Ground Water Rule specifies eight elements integral to an effective inspection of a public water system. The eight elements are: Source (protection, physical components, and condition); Treatment; Distribution System; Finished Water Storage; Pumps, Pump Facilities, and Control; Monitoring, Reporting, and Data Verification; Water System Management and Operations; and Operator Compliance with State Requirements. Your public water system was evaluated for compliance with these eight elements and the following list of deficiencies comprises the findings of this inspection.

Significant Deficiencies

Significant Deficiencies cause, or have the potential to cause, the introduction of contaminants into water delivered to customers.

1. During the time of the inspection no **SIGNIFICANT DEFICIENCIES** were cited.

Violations of Missouri Safe Drinking Water Regulations
These violations can result in enforcement action if repeated or not corrected. Some violations are more serious than others, and this is explained in the comments.

2. The public water system failed to collect any microbiological routine samples during June 2011 and July 2011 as required by Safe Drinking Water Regulation 10 CSR 60-4.020(1)(B). Each failure is a major routine monitoring violation. During the time of the violations the system was changing operators.

Public water systems with populations of 25 to 1000 are required to collect one routine microbiological sample per month. Our records show no routine microbiological samples collected for the month listed. Note that samples invalidated by the laboratory because they were outdated, postdated, quantity not sufficient, bottle too full, or excessive chlorine are not counted and must be replaced with a valid sample.

Collect one routine microbiological sample each month, but collect at least five routine samples in the month following an unsafe sample. Collect three repeat samples for each unsafe routine sample within 24 hours of being notified of the unsafe sample, or as directed by the Department. Collect a replacement sample for each invalid sample. Record the correct date, 24-hour time (e.g., 2 p.m. is 1400), system name, I.D. number, sample bottle number, sample location, and chlorine residual (total or free) on each card. Fill out one card for each sample. Mail, hand carry, or use the courier to deliver the samples to the laboratory so that they arrive on a business day within 30 hours of collection. If you need assistance or bottles, contact the Southwest Regional Office.

Other Deficiencies: Findings and Recommendations

3. The well is not equipped with a source water sample tap located at a point where positive pressure is maintained (prior to treatment). The system's current configuration does not allow for a raw water to be sampled from the well. This was cited during the previous inspection.

A sample tap is needed to collect samples directly from the well (prior to treatment) so that distribution and source problems can be distinguished from each other as per 10 CSR 60-4.025 (3)(E). Locating the sample tap at a point where positive pressure is maintained makes it possible to collect samples without starting the pump each time. (Samples collected before treatment reveals the condition of the raw source water).

The Department recommends installing a sample tap (prior to treatment) at a point with positive pressure on the well.

4. The overflow pipe on the elevated storage tank does not terminate at an elevation between 12 and 24 inches above the ground. This was cited during the previous inspection.

The storage tank overflow pipe must terminate near the ground so that the screen can be readily checked and replaced and so that dangerous accumulation of ice does not form during winter overflows.

The Department recommends modifying the overflow pipe on the elevated storage tank to terminate at an elevation between 12 and 24 inches above the ground surface.

5. Each service connection is not individually metered. The system consists of 94 total service connections, in which 70 of those connections are not metered.

Individual meters reduce water usage compared to systems with a flat rate, unmetered charge. Customers have an economic incentive to reduce usage and fix leaks. Totaling individual customer meters and comparing with total well pumpage allows the loss due to leakage to be calculated.

The Department recommends installing meters on each service connection.

6. The public water system does not have adequate emergency electrical power. This was cited during the previous inspection.

When power failure would result in cessation of minimum essential service, an alternate power supply should be provided to meet average day demand. Each public water system should have an emergency electrical power source which may include a permanent or portable generator at each well and pump station, a tractor connection at each well or pump station, or service from two power companies.

The Department recommends providing sufficient emergency electrical power to operate all pumps that are essential to maintaining water supply and pressure.

7. The public water system does not have a ladder gate on the storage tank ladder. Due to the design of the tower, the legs and ladder are accessible and pose a safety hazard. This was cited during the previous inspection.

Safety, security and risk-reduction measures are important, and should be implemented to reduce the water system's vulnerabilities. All water system facilities should be evaluated and re-designed to include measures to provide protection against vandalism, sabotage, terrorist acts, or access by unauthorized personnel. These protection measures should include: a) locked security

doors; b) windows sized or barred to prevent access; and, c) security fencing around vulnerable areas of drinking water facilities (for example, wellheads, manholes, pumphouses, treatment buildings, and storage tanks).

The Department recommends installing a ladder gate on the storage tank ladder, and constructing a chain link fence with a lockable gate around the storage tank to prevent access to the remaining tower legs.

8. The public water system does not have an adequate tank interior inspection and cleaning program. This was cited during the previous inspection

The public water system should have a tank interior inspection and cleaning program with the following elements: a) Each tank interior should be inspected and cleaned every two to five years depending on silt build up; b) the type and general condition of the interior paint should be determined, especially on any paint that appears to be high in lead or chromium; c) glass-coated interiors should be inspected for cracking, corrosion and other signs of coating deterioration (spalling, cracking, leaking, etc.); d) if rusting is present, determine the approximate percent of rusted area, the extent, nature and depth of pitting, and the condition of the remaining coating (chalking, blistering, loose, blotchy, etc.); and, e) concrete structures should be inspected for signs of deterioration (spalling, cracking, leaking, etc.). All work shall be conducted in a clean and sanitary manner, and all surfaces shall be thoroughly cleaned and disinfected before a storage facility is returned to service. It is the responsibility of the public water system to either conduct or require water quality tests to demonstrate the good sanitary condition of the tank interior before it is returned to service. Follow all environmental laws and rules to dispose of chlorinated water, sludge debris and other wastes.

The Department recommends developing and instituting an adequate tank interior inspection and cleaning program. It is recommended at the time of the tank cleaning to evaluate the exterior paint condition as well.

9. Duplicate high service pumps are not provided. This was cited during the previous inspection.

Each booster pumping station shall contain not less than two pumps with capacities such that peak demand can be satisfied with the largest pump out of service.

The Department recommends installing duplicate high service pumps.

10. The booster pump is not sufficiently valved to permit bypassing. Specifically, there are not valves on the inlet and outlet piping to the booster pump.

Booster pumps should and piped to allow pumps to be taken offline and repaired without causing a loss of pressure in the distribution system. This shall include sufficient valves to the storage tank to permit continuous operation of the system even with the booster pump offline.

The Department recommends installing the necessary valves on the inlet and outlet piping to the booster pump to allow it to be taken offline without causing a loss of pressure in the distribution system.

11. The well casing was not protected against physical damage.

The well casing and discharge piping must be protected against deterioration, physical damage, and freezing. Paint protects the metal casing from corrosion. An insulated well house prevents freezing.

The Department recommends painting the exterior of the well casing and discharge piping.

12. The public water system has installed a fire hydrant on a water main not designed to carry fire flow. During the inspection Mr. Morrill mentioned that a fire hydrant is supplied by the water system. It was also mentioned that the local fire department cannot use the hydrant for full fire flow of 250 gallons per minute for a minimum of two hours.

When fire protection is to be provided, system design should be such that fire flows and facilities meet the classification criteria of the state Insurance Services Office (ISO). The minimum size of a water main providing fire protection and serving fire hydrants shall be six (6) inch in diameter. Larger mains shall be required if, during the withdrawal of the required fire flow, the minimum residual pressure of 20 pounds per square inch cannot be maintained throughout the distribution system. Water mains not designed to carry fire flows shall not have fire hydrants connected to them.

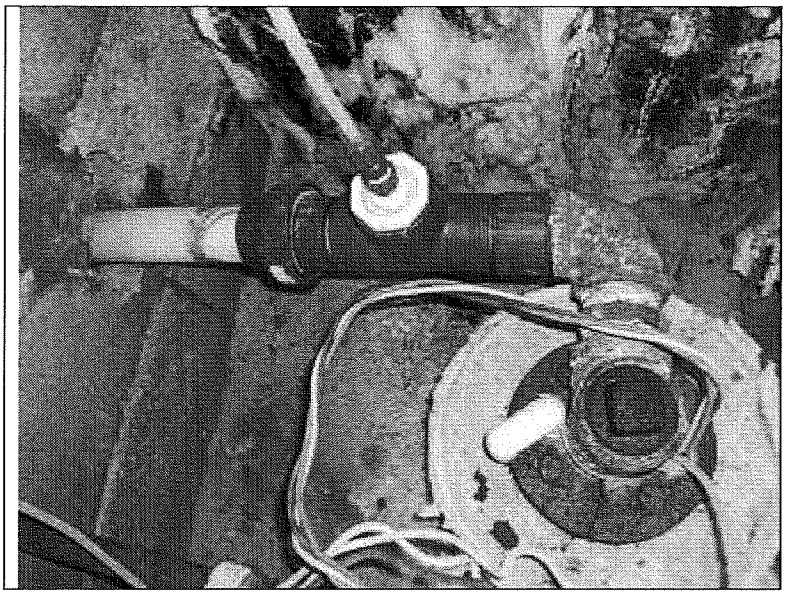
The Department recommends either removing fire hydrants that are on water mains not designed to carry fire flow, replace it with a flush hydrant, or obtain a construction permit from the Missouri Department of Natural Resources Public Drinking Water Branch and construct water mains of sufficient capacity to meet the required fire flow while maintaining the minimum residual pressure of 20 pounds per square inch throughout the distribution system. To obtain this construction permit, submit two copies of an engineering report, plans, and specifications each bearing the seal of a professional engineer registered in Missouri along with an application for a construction permit to Missouri Department of Natural Resources, Public Drinking Water Branch, P.O Box 176, Jefferson City, Missouri 65102, 573-751-5331.

SUBMITTED BY:

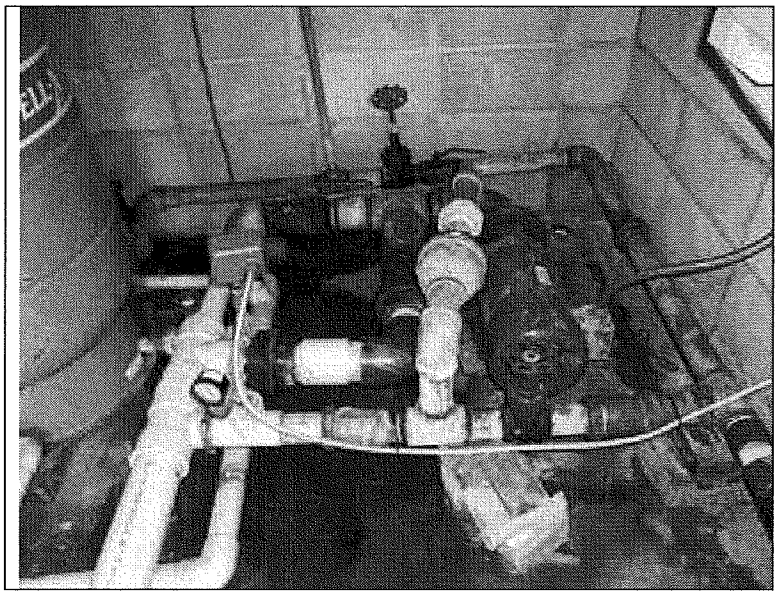
Bailey Pearson
Environmental Specialist

APPROVED BY:

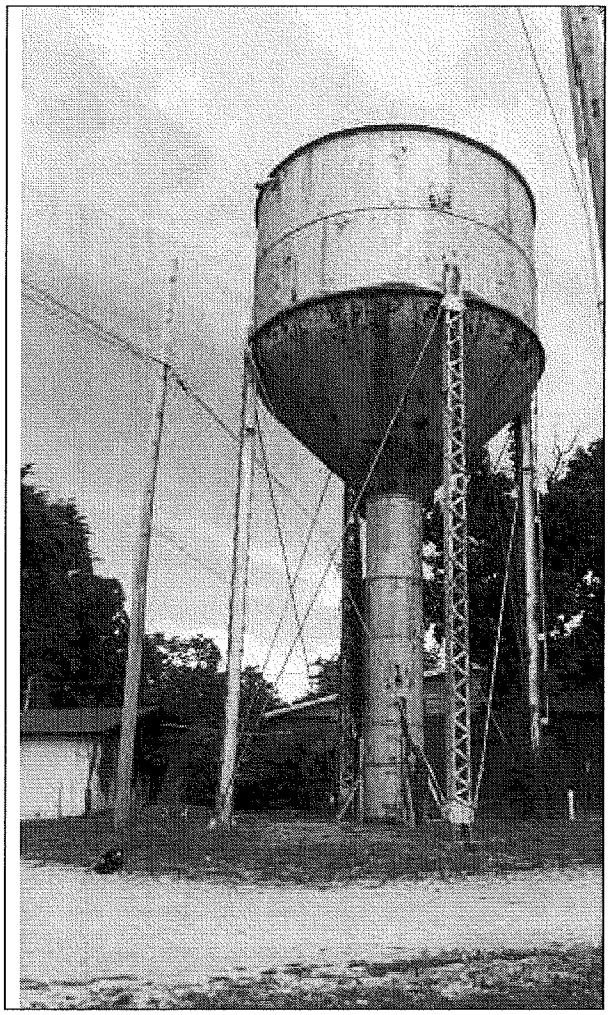
Randy Bradley, Chief
Drinking Water Inspection Unit



Location: Kimberling City Water Company
Photographer: Bailey Pearson
Photograph Date: June 21, 2012
Comments: Well head with chlorine injection port



Location: Kimberling City Water Company
Photographer: Bailey Pearson
Photograph Date: June 21, 2012
Comments: One high service booster pump and piping to storage tank



Location: Kimberling City Water Company
Photographer: Bailey Pearson
Photograph Date: June 21, 2012
Comments: Ground storage tank

Mr. Rick Helms
White River Valley Environmental Services
536 Roark Branch Drive
Branson West, MO 65737

Mr. Jim Busch
Public Service Commission
PO Box 360
Jefferson City, MO 65102