Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection

Western Regional Office • 436 Dwight Street, Springfield MA 01103 • 413-784-1100

DEVAL L. PATRICK
Governor

MAEVE VALLELY BARTLETT
Secretary

DAVID W. CASH
Commissioner

NOV 1 0 2014

November 6, 2014

Mr. Paul DeMaio, Chairman
Monson Water and Sewer Department
P.O. Box 388
Monson, MA 01057

Re: Monson-DWP
Monson Water and Sewer Department
PWS ID#: 1191000
Sanitary Survey

Dear Mr. DeMaio,

MassDEP is re-issuing this sanitary survey report due to comments made by your Certified Operator to clarify issues related to the water rate sustainability.

On October 8, 2014, Jim Bumgardner of the Massachusetts Department of Environmental Protection (MassDEP), Drinking Water Program (DWP) conducted a Sanitary Survey of the Monson Water and Sewer Department ("MWSD") public water system. A sanitary survey is an on-site review of the water sources, facilities, equipment, operation and maintenance of a public water system for the purpose of evaluating the system's ability to produce and distribute safe drinking water. The enclosed report includes the system description, findings and compliance plan.

During the course of the survey, MassDEP identified areas in which improvements in the administration, and operation and maintenance of the system could be made. MassDEP's evaluation of the water system, and the specific required and recommended actions, were discussed during a debriefing meeting with Craig Jalbert. This report contains time sensitive requirements, which are summarized in the Compliance Plan Tables. Please review the items noted in the report and Compliance Plan Tables B and C, and return the signature page to MassDEP by **November 60, 2014**. Specifically, MassDEP requires the following actions to remedy items noted in the inspection:

An assessment of this public water system's capacity was conducted by MassDEP for the last sanitary survey report, dated December 29, 2011. There have been no changes in the management of the system since that survey. No violations of Drinking Water Regulations were noted during this survey. Therefore, MassDEP has determined that this system continues to demonstrate adequate capacity.

MWSD has not submitted an up-to-date distribution system map showing the location and size of its distribution mains and bacteria monitoring locations in accordance with the regulations at 310 CMR 22.19. During the inspection, MW indicated that its consultant is in the process of creating a GIS map of its water system. **MassDEP requires that MWSD submit an updated distribution system map showing the location and size of its distribution system water mains and bacteria monitoring locations before December 31, 2015.**

MassDEP has determined that MWSD does not have a written list of the useful life expectancy of its assets or a schedule for replacing its assets. **MassDEP requires that MWSD create an Asset Management Plan with written estimates of the useful life of all assets and a long-term asset replacement plan with a schedule and cost estimates for all assets within its infrastructure inventory before December 31, 2015.**

MassDEP has determined that the MWSD water rates may not be sufficient to cover the true costs of producing and delivering safe drinking water. **MassDEP requires that MWSD develop a plan to create a rate structure under which the water rates are sufficient to cover the true cost of producing and delivering water before December 31, 2015.**

During the inspection of the Palmer Road soda ash treatment facility, MassDEP determined that there is insufficient labeling of the soda ash solution storage tank. **MassDEP requires that MWSD adequately label its soda ash solution tanks before December 31, 2014.**

During the inspection, MassDEP observed a hose that was not protected by a hose bib vacuum breaker was lying on the floor of the Bunyan Road pump station. This location is a hazardous location due to chemical mixing activities. The Certified Operator indicated that he faucet was not plumbed downstream of the RPZ, but was connected to the 100 foot sampling tap. **MassDEP requires that MWSD disconnect the hosebib plumbed into the 100 foot tap and provide a hose bib that is downstream of the RPZ in the treatment building and provide written notice to MassDEP that this is complete before January 31, 2014.**

Questions regarding this document, or other drinking water issues, should be directed to Jim Bumgardner at (413) 755 2270.

Respectfully,

Deirdre Doherty, Section Chief
Drinking Water Program
Bureau of Resource Protection

Attachments: Sanitary Survey Report

cc: Board of Health – Monson, Boston – DWP, Jim Bumgardner, MassDEP WERO, Craig Jalbert

WERO File W:\BRP\WS\CCE-SS\Monson\1191000 - Monson Water and Sewer Department\Monson Water and Sewer Department-jbumgardner-Sanitary Survey-2014.docx

SANITARY SURVEY REPORT

Monson Water and Sewer Department

November 6, 2014

GENERAL DESCRIPTION

The description of the water system is updated from that reported within MassDEP's December 29, 2011 sanitary survey report.

General:

The Town of Monson is located in the lower western section of the Chicopee River watershed. The town abuts Palmer to the north, Wilbraham to the west, Wales in the east, and Connecticut to the south. The Monson Water & Sewer Department (MWSD) provides potable water to an estimated 4,223 customers and 1,375 service connections (approximately half of the town's population).

MWSD is enterprise-funded. The water and sewer department budgets are entirely separate. The personnel employed by MWSD work in both the water and wastewater areas in approximately 60/40 time distribution with 60% of the man hours devoted to the water department.

MWSD bills quarterly and reads the water meters of a third of its system quarterly. The MWSD water rate is $5.35 per 1,000 gallons.

Source:

Water is supplied by four wells; the Bethany Road Well (03G), the Palmer Road Well (04G), and the two Bunyan Road Replacement Wells No. 1 and No. 2 (06G and 07G).

The 24" x 16" gravel packed Palmer Road Well was installed in 1965. It is 78 feet deep with 8.5 feet of screen, and is assigned a maximum approved daily pumping rate of 812 gallons per minute (gpm) or 1.17 million gallons per day (MGD). The well pump was replaced in April 2013 and now produces 485 gpm. The well is housed in a two level brick and cinder block building. The control panel, tank level recorders, 125-hp pump motor, diesel engine, and soda ash batch tank are located on the ground floor. The well pump is a vertical turbine. The pump motor has a right angle drive that can be manually coupled to the diesel engine in the event of a power outage. The right angle drive motor is run in test mode under load every three months for an extended period of time (3-4 hours). A 500-gallon diesel fuel tank is located within a cinder block containment berm in the basement. The well discharge line, surge control valve, soda ash metering pump, chlorine feed system and the venturi flow meter are located in the basement. MWSD has a small portable generator to run controls at this station in the event of a power outage.

There is an abandoned well at the Palmer Road facility that was installed as part of a 1963 pumping test. This well is a 36" x 16" gravel packed well located approximately 40 feet south of the active Palmer Road Well. This well is abandoned as a Public Water System source and would require new source approval and extensive infrastructure improvement to activate.

Bunyan Road Replacement Wells No. 1 and No. 2 were installed in 2004 to replace the Bunyan Road Well (05G) that failed in 2002 due to problems associated with iron biofouling. Both wells are 18" x 12" gravel packed wells with 10 feet of screen. Well No.1 is 60 feet deep and approximately 175 feet southeast of the original well. Well No. 2 is 62 feet deep and approximately 250 feet southeast of the original well. The original Bunyan Road well (03G) has been decommissioned by filling and grouting. The original well has been abandoned as a Public Water System source.

Both replacement wells are equipped with submersible pumps and pitless adapters. The pumps have 50 HP motors nominally rated for 300 gpm at 420 feet total dynamic head (TDH). The pitless adapters have an upper barrel diameter of 14 inches, and a discharge pipe diameter of 6 inches. The discharge lines pass through an underground vault installed approximately 20 feet south of Well No. 2 where flow is independently metered. Outside the vault, the lines are manifolded prior to connecting to a 16-inch ductile iron main. The wells are assigned the combined maximum approved daily pumping rate of 591 gpm (0.85 MGD). The two wells are operated on an alternating basis by manually changing from on to the other. The lead pump is alternated daily. Controls and variable frequency drives are located in the upper level of the corrosion control building approximately 600 feet south of the wells.

The Bethany Road Well was installed in 1950. It is a 24" diameter gravel packed well, 58 feet deep with 10 feet of screen. The well rehabilitation project done in 2008 included cleaning and redevelopment, pump replacement, and construction of a new well house. The cleaning and redevelopment effort has resulted in improved yield above the assigned maximum approved daily pumping rate of 310 gpm (0.45 MGD). The replacement pump is a 50 HP vertical turbine pump and motor, nominally rated for 330 gpm at 390 feet TDH and equipped with a variable frequency drive. The pump, controls, analyzers, and sampling taps are located in the upper level of the building. The soda ash hopper, mixer, metering and injection equipment, chlorination equipment and flow meter are located in the lower level. All chemical feed mixing and pumping equipment is located in a containment area.

Storage:

MWSD has two storage tanks located on a hill adjacent to Ely Road. Tank No. 1, installed in 1965 is a 1,000,000 gallon welded steel tank that is 77 feet in diameter and 30 feet high. This tank was rehabilitated and repainted in 2009. Tank No. 2 is a 500,000 gallon pre-cast pre-stressed concrete tank installed in 2008. This tank is 54 feet in diameter, with an overflow height of 29.5 feet, matching the overflow elevation of the steel tank. Each tank has a Tideflex Mixing System®, comprised of tank inlets that are mounted on vertical stand pipes along the tank wall and outlets that are oriented horizontally closer to the bottom of the tank. This system promotes mixing inside the tanks and minimizes the risk of stagnation.

Approximately 150 feet of 12-inch ductile iron water main, including a hydrant, extends from Tank No. 2 to connect with the 12-inch main extending from Tank No. 1. Although provided with isolation valves, the two tanks normally operate as a manifolded pair. The low level alarm is set at 18.6 feet and the high level alarm is set at 29.25 feet. The storage tank water level is currently transmitted via radio telemetry to control the well pumps. All three wells start together at a water level of 20 feet and shut off at a water level of 29 feet.

A pressure transducer is provided on the 12" transmission main exiting Tank No. 1 that is plumbed to measure the level in either tank if only one is on line, or both tanks if they are operating as a manifolded system. MWSD has converted from wired telemetry to radio transmitted control signals due to reliability problems. As part of the improvements, Remote Telemetry Units (RTUs) were mounted and PLC controllers wired into the control panels at the Bethany Road pump station, the Bunyan Road Pump Station and the Ely Road Tank. The Main PLC unit is mounted at the Palmer Road pump station.

Sample taps for the each of the tanks have been provided in the underground valve vaults west of Tank No. 1. The tap for sampling Tank No. 1 is located in the vault nearest Tank No. 1. The tap for sampling Tank No. 2 is located in the second vault west of Tank No. 1. The pressure transducer is also located in this vault.

Both tanks are surrounded by an 8-foot high chain link fence with barbed wire. The finished grade slopes away from each tank. The concrete tank has an 8-inch ductile iron overflow pipe cast into the interior wall that terminates at a height between 18 and 24 inches above a concrete splash pad.

Distribution:

MWSD maintains 30.1 miles of water distribution main. Distribution mains vary from 16 inches along Palmer Road (Route 32) to 4 inches in some areas. The water main is constructed of cast iron (older), ductile iron, and plastic. There is approximately 250 feet of asbestos concrete main in the distribution system that connects a single fire hydrant to the system (with no services, this hydrant and piping may be removed). There are 5 surge valves originally provided to aid in well pump start-up and to protect the distribution system from water hammer. These surge valves are now obsolete due to the installation of the variable frequency drives. MWSD is actively engaged in removing the obsolete surge valves.

The water pressure is typically between 35 psi and 165 psi. Some residences in the higher elevations have installed individual presure boosting systems.

MWSD continues to work at eliminating undersized transmission pipes and dead ends. All pipeline replacement projects utilize 8" ductile iron pipe. In the summer of 2002, the mains along Carpenter Road and Stewart Avenue were connected, eliminating two dead ends. In 2008, MWSD replaced 880 feet of 2-inch line on Fern Hill Road and a portion of 6-inch main on State Avenue with 8-inch water main. Flushing hydrants are installed on each dead-end line. The hydrant at the end of State Avenue provides a potential emergency connection with the Palmer Water District.

MWSD reports that approximately 1 week of preparation and 18 days of hydrant operation are required to complete unidirectional distribution system flushing. Flushing is done every two years and the next round is scheduled for 2016. Deadend mains are flushed every year.

MWSD supplies water to the Monson Developmental Center (MDC) located in the north-central area of the Town. MDC is an independently operated Consecutive Public Water System with the MassDEP identification number PWS# 1191001. The systems are separated by a meter, valve, and cross connection prevention device that are owned and operated by MDC. MDC is no longer a Public Water System, however, MDC currently uses about 15 gallons per minute in winter to prevent freezing. MDC also uses water for maintenance purposes.

MWSD now has a portable 150 kwa diesel generator at its disposal so that key components of its water system will function in an extended power outage.

Treatment:

Treatment for pH adjustment/corrosion control and calcium hypochlorite disinfection is provided at all three well locations. Each location is classified as a grade I-T treatment facility and is identified by MassDEP as follows:

WTP ID	WTP Name	Class	Treatment Description
1191000-01T	Bunyan Rd Well WTF	I-T	pH Adjustment and disinfection
1191000-02T	Palmer Rd Well WTF	I-T	pH Adjustment and disinfection
1191000-03T	Bethany Road WTF	I-T	pH Adjustment and disinfection

Table 1: Treatment Plants and Components

Corrosion control was installed at the Bunyan Road building in 1993 and was updated in 2004 when the replacement wells were installed. Corrosion control chemical feed equipment was added to the Palmer Road well house in early 2002 when the original Bunyan Road Well was taken off-line. The installation of corrosion control equipment was part of the Bethany Road Well rehabilitation project in 2008.

All three systems inject a saturated solution of sodium carbonate (soda ash) and water that is prepared by mixing dry soda ash with water in the pumphouse/control building at each location. The soda ash is delivered in pallets of 50 pound bags. The Palmer Road facility has a batch mixer that is refilled manually by emptying bags of soda ash into a 150-gallon day tank equipped with a mixer. The solution flows by gravity to a metering pump in the basement. Two batches of soda ash solution are made each day at the Palmer facility where approximately 200 pounds of soda ash are consumed daily. The Bethany Road and Bunyan Road facilities are equipped with hoppers that automatically feed the dry soda ash to mixers on demand. Soda ash is manually emptied into a hopper where an auger draws a set amount of soda ash into a 35-gallon day tank equipped with a mixer. A metering pump then feeds a set amount of soda ash solution into the discharge pipe every time the well pump activates. The soda ash usage at the Bunyan Road facility is approximately 120 pounds per day.

All three facilities have chemical injection pumps that are wired to operate only when the well pumps are operating. The Palmer Road chemical injection rate is manually adjusted as needed based on the daily pH measurement taken of the treated water. The pH of the treated water is measured from a tap located on the transmission main 250 feet from the chemical injection point and typically ranges from 7.6 to 8.2. The Bunyan Road and Bethany Road facilities have flow paced chemical injection pumps. The dosage at the Bunyan Road facility is typically around 70 mg/L and discharge pH ranging from 7.6 to 8.2. The injection rate at the Bethany Road facility is similar. Sampling lines connected to the transmission mains 100 feet or more downstream of chemical injection are provided for the Bunyan and Bethany Road facilities.

Permanent disinfection systems were installed at all three pump stations in 2011. The systems are identical at each station and consist of a skid–mounted Arch Chemical Model MM-1S tablet chlorinator and skid-mounted Jesco chemical feed system. Containment pallets area included as part of the systems at Bunyan Road and Palmer Road, while the chlorination system is installed within the chemical containment area at Bethany Road. At each station, a water meter is installed on the feed water line to the chlorinator to calculate chlorine usage. At each station, an Analytical Technology, Inc (ATI) Model Q45H/62 analyzer is installed to continuously measure and monitor free chlorine and pH of the finished water. This analyzer has high and low alarms for the chlorine residual and a high pH. AquaGuard eye wash stations are installed at Palmer Road and Bethany Road pump stations. Bunyan Road has installed a piped shower and eyewash station.

In the event of a power outage, the Bunyan Road and Bethany Road facilities have generator hookups with transfer switches that can be used to connect to a portable generator. Once connected to the generator, all pumps, instruments, controls, and treatment equipment will be operational. At the Palmer Road facility, only the pump can be operated (by manual connection to and operation of the diesel engine) in a power outage.

Photo #1: Palmer Road Well (01G)

Photo #2: Palmer Road Well Casing Vent

Photo #3: Bunyan Road Well

Photo #4: Bunyan Road Well casing vent

Photo #5: Bunyan Road Replacement Wells

Photo #6: Bunyan Road Sampling Station

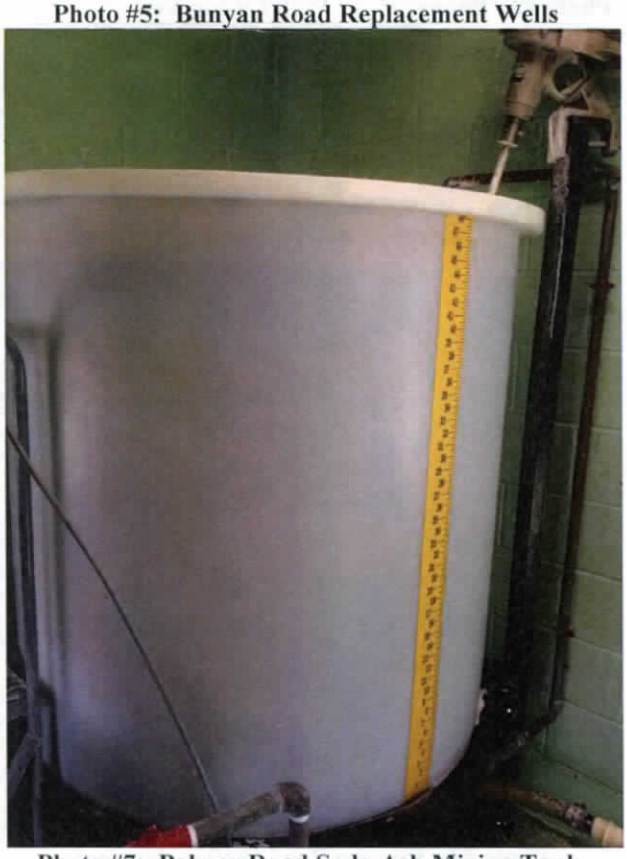

Photo #7: Palmer Road Soda Ash Mixing Tank

Photo #8: Palmer Road Chlorinator

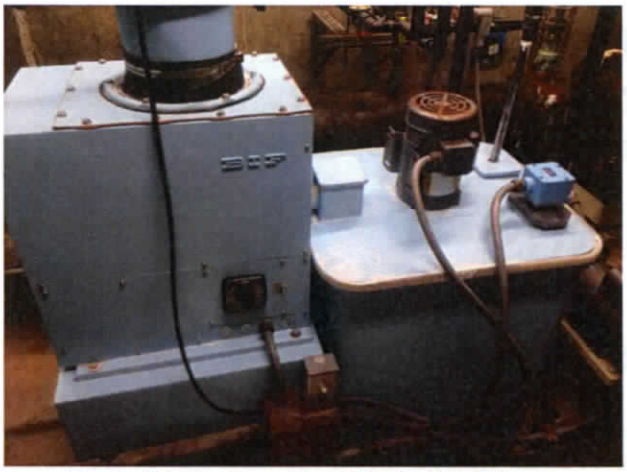

Photo #9: Bethany Road Soda Ash Mixer

Photo #10: Bethany Road Chlorinator

Photo #11: Bunyan Road Chlorinator

Photo #12: Bunyan Road Soda Ash Mixer

SANITARY SURVEY REPORT

Monson Water and Sewer Department

November 6, 2014

FINDINGS

SECTION 1: ADMINISTRATION, MANAGEMENT, AND STAFFING

An assessment of this public water system's capacity was conducted by MassDEP for the last sanitary survey report, dated December 29, 2011. There have been no changes in the management of the system since that survey. No violations of Drinking Water Regulations were noted during this survey. Therefore, MassDEP has determined that this system continues to demonstrate adequate capacity.

System Classification:

MWSD is classified as a Community (COM) public water system (PWS) because the facility regularly serves at least 25 year-round residents.

MassDEP has reviewed the classification status of the MWSD distribution system and has determined that the distribution system should be rated as a **Class II-D** system because it serves a population of 4,125 residents.

Water rates are $5.35 per 1,000 gallons. In FY2014, Annual revenue was $530k, annual expenses (including debt service) were $404.5k. Debt service payments are $105k per year. The MWSD capital reserve accounts contain approximately $600k (this includes $400k from an MTBE settlement). Annual savings rate is $20k.

During the survey, MassDEP observed that MWSD maintains its emergency response plan in a readily available location as required by the regulations at 310 CMR 22.04(13)(a).

MWSD has an infrastructure inventory for all major components of its water system.

MassDEP has determined that MWSD does not have a written list of the useful life expectancy of its assets or a schedule for replacing its assets. **MassDEP requires that MWSD create an Asset Management Plan with written estimates of the useful life of all assets and a long-term asset replacement plan with a schedule and cost estimates for all assets within its infrastructure inventory before December 31, 2015.**

MWSD has a Capital Improvement Plan for large equipment purchased and construction needed in the next 20 years.

MWSD has an Annual Budget that considers funding for personnel, training, testing, operating, contract services, repairs, capital improvement reserves, emergencies, and debt services.

MassDEP has determined that the MWSD water rates may not be sufficient to cover the true costs of producing and delivering safe drinking water. **MassDEP requires that MWSD develop a plan to**

create a rate structure under which the water rates are sufficient to cover the true cost of producing and delivering water before December 31, 2015.

MassDEP recommends reviewing Chapter 11 of the Guidelines and Policies for Public Water Systems for creating an Asset Management Plan and setting water rates. USEPA offers a free easy to use asset management tool for small water systems (CUPSS). The tool includes on line training and application software to help small water systems develop an Asset Management Program. A copy of the program may be obtained at:

http://water.epa.gov/infrastructure/drinkingwater/pws/cupss/index.cfm,

or MassDEP's Asset Management Plan Guidance document at:
http://www.mass.gov/eea/docs/dep/water/drinking/alpha/a-thru-h/capbuild.doc.

Table 2 lists the personnel employed by MWSD for the operation of its PWS.

Operator Name	Grade	License #	Primary Distribution	Primary Treatment	Secondary Distribution	Secondary Treatment
Craig Jalbert	2T/2D	6487/4120	X			
Randy Emerson	2D/1T	12384/12392			X	
Anthony Dart II	1T OI	24212/24448				X
Jan-Michael DeMaio	1T OIT/2D OIT	23721/23770			X	
Thomas Murphy	2D/1T	9892/9891		X		

Table 2: Monson Water and Sewer Department Operators

MWSD therefore meets MassDEP's Certified Operator requirements.

Emergency Response Plan

MWSD has an Emergency Response Plan in a readily accessible location as required.

Consumer Confidence Report:

All Community Water Systems must prepare an annual Consumer Confidence Report (CCR) as specified in 310 CMR 22.16A. The CCR must be completed and delivered to consumers by July 1 of each year. MassDEP will complete CCR reviews on a selected number of systems each year. If the MWSD system is selected for review, MWSD will receive a copy of a CCR compliance checklist, along with any enforcement, if applicable, by December 31, 2014.

MassDEP has prepared Source Water Assessment Reports for all Public Water Systems. Each system must include in the CCR Report, notification to customers of the availability of the report and the means to obtain it.

MassDEP recommends that MWSD utilize the CCR to satisfy the residential education component requirement of the cross connection regulations at 310 CMR 22.22(3)(f).

SECTION 2: OPERATIONS AND MAINTENANCE

MWSD test the diesel engine and right angle drive at the Palmer Road station by running for at least 2 hours four times per year.

MWSD is in compliance with MassDEP requirement that all Community PWSs have redundant sources, capable of supplying system demand with the highest capacity source off-line, or maintain two days available storage capacity. MWSD has a storage capacity of 1.5 million gallons and an average daily demand of .308 million gallons per day.

SECTION 3: TREATMENT

During the inspection, the following characteristics were noted for the hypochlorite units at the Palmer Road, Bethany Road, and Bunyan Road locations. The treatment units are all operated using manual control to select between automatic (interlocked) and manual (hand) operation. MWSD is not currently required to provide 4-log virus removal. The chlorine residuals are tested on a daily basis. The chlorine alarms are tested on a quarterly basis. Alarm testing logs were available at the time of the survey. The hypochlorite feed rate is checked and adjusted frequently. The target chlorine concentration range is 0.3 mg/L to 0.35 mg/L. The hypochorite injection pumps are interlocked with the flow of each station. The chemical injection interlock is tested on a quarterly basis. The chlorine injection feed rates are calibrated on a weekly basis.

During the inspection of hypochlorinator unitss, the following items were inspected and found to be in compliance with the Guidelines or adequate to provide safe drinking water: spill containment, back-up chlorination units, chemical supply on site, and chemical storage labeling.

During the inspection of the Palmer Road soda ash treatment facility, MassDEP determined that there is insufficient labeling of the soda ash solution storage tank. **MassDEP requires that MWSD adequately label its soda ash solution tanks before December 31, 2014**.

SECTION 4: DISTRIBUTION, STORAGE, AND PUMPING FACILITIES

MWSD has a water meter or meters capable of measuring the total production from each of its water sources.

MWSD has not submitted an up-to-date distribution system map showing the location and size of its distribution mains and bacteria monitoring locations in accordance with the regulations at 310 CMR 22.19. During the inspection, MW indicated that its consultant is in the process of creating a GIS map of its water system. **MassDEP requires that MWSD submit an updated distribution system map showing the location and size of its distribution system water mains and bacteria monitoring locations before December 31, 2015.**

MWSD conducts regular leak detection and calculates its Unaccounted-for Water (UAW) percentage on a quarterly basis to determine if there are any significant leaks emerging.

Distribution system pressure is generally in the range of 35 - 165 psi.

A cross connection program review was completed during the inspection. Follow up distribution system checks are conducted on a regular basis.

All systems may be subject to a cross connection audit by MassDEP, to ascertain whether the water system is in compliance with the cross connection regulations as outlined in Section 22.22 (16)(e) of the Massachusetts Drinking Water Regulations.

The following elements of the MWSD Cross Connection program were reviewed and determined to be functioning to MassDEP's satisfaction:

- Adequate Cross Connection surveyors and testers
- Annual testing of all testable devices
- Appropriate enforcement of cross connection violations and device repair or replacement

MWSD hires an outside contractor to conduct all backflow prevention device testing. The contractor charges MWSD $40 per test and MWSD charges the customer $50.

MWSD communicates with the plumbing inspector and the planning department to identify facilities that may need a cross connection survey.

During the inspection, MassDEP observed a hose that was not protected by a hose bib vacuum breaker was lying on the floor of the Bunyan Road pump station. This location is a hazardous location due to chemical mixing activities. The Certified Operator indicated that he faucet was not plumbed downstream of the RPZ, but was connected to the 100 foot sampling tap. **MassDEP requires that MWSD disconnect the hosebib plumbed into the 100 foot tap and provide a hose bib that is downstream of the RPZ in the treatment building and provide written notice to MassDEP that this is complete before January 31, 2014.**

SECTION 5: WATER QUANTITY

No water quantity issues were identified during the Sanitary Survey inspection.

The average daily demand for MWSD was 307,811 gallons per day based on the 2013 Annual Statistical Report. The average daily withdrawal for MWSD exceeds the Water Management Act (WMA) permitting threshold and therefore requires MassDEP approval for its withdrawal. MassDEP issues two types of approvals, for water withdrawals in excess of 100,000 gallons per day, WMA registrations and permits. Water Management Act withdrawal registrations are based on a system's water withdrawal from 1981 to 1985 and are reviewed for renewal every 10 years. The MWSD WMA registration was last reviewed and renewed in 2008.

WMA registration and permit volumes are additive. The permit volume is authorized for withdrawals above any withdrawal volume registered to the PWS. The MWSD authorized WMA registration and/or permit volumes are as follows:

Registered Withdrawal Volume:	**0.92 mgd**
Permitted Withdrawal Volume:	**0.00 mgd**
Total Approved Withdrawal Volume:	**0.92 mgd**
Actual System Withdrawal based on the 2013Annual Statistics Report:	**0.31 mgd**

MWSD is therefore in compliance with the WMA water withdrawal volume requirements.

WMA conservation standards have been created to insure water withdrawn from the State's water resources goes to supply the water system demand, not to waste or uses that are unaccounted for. The Water Management Act residential water conservation goal is 65 gallons per person per day. Based on the 2013 Annual Statistical Report, MWSD residential use is 51 gallons per person per day. The Water Management Act water conservation goal for leakage is 10% Unaccounted for Water (UAW). Based on the 2013 Annual Statistical Report, MWSD UAW is 8.5%.

SECTION 6: WATER QUALITY MONITORING AND REPORTING

MassDEP reviewed the most recent MWSD Water Quality Sampling Schedule (WQSS) dated December 16, 2016. MWSD is required to collect water quality samples according to that schedule.

Bacteriological Monitoring

The required number of total coliform samples is based primarily on population and system characteristics. If the MWSD population changes such that it exceeds or falls below a threshold listed in Table I of 310 CMR 22.05 MWSD must contact the MassDEP regional office to update its Coliform Monitoring Plan. System characteristics such as storage, treatment facilities, source water quality, and the number of sources also affect the total number of required coliform sampling locations. For those systems that treat the source water, the Coliform Monitoring Plan must include an additional sample collected from the raw water source(s) under 310 CMR 22.05(1)(a).

MassDEP reviewed the current Coliform Bacteria Sample Plan dated November 24, 2008. The schedule was determined to satisfy the following criteria from the regulations at 310 CMR 22.05 (1):

- Sites representative of the water throughout the distribution system: Gate House - Old Wales Road, Fire Station, MDC Meter Building
- Sites representative of raw water prior to treatment: Bethany Road, Palmer Road, Bunyan Road
- Sites representative of treated water: Bethany Road, Palmer Road, Bunyan Road
- Sites representative of storage: Ely Road Tank #1, Ely Road Tank #2

Chemical Monitoring

The current monitoring period for 2014–2016 represents the second period of a 9-year monitoring cycle. All monitoring waivers decisions have been made. Your Water Quality Sample Schedule (WQSS) for 2014-2016 has been issued and reflects those decisions. The new schedules reflect changes to Disinfection Byproduct monitoring that include sampling in specific months and particular weeks of those specific months. See the MWSD WQSS for details on DBPR monitoring. Some Community and Non-transient Non-community systems that monitor disinfection by-products, e.g., Trihalomethanes (THMs) and Haloacetic Acids (HAA5s), during the "month of warmest water temperature" must take these samples in August. The schedule will show "AUG" for those systems. Other systems will have specific months specified in a given quarter (e.g., June, September, December, etc.). The particular week of the month in which sampling must occur is included on the schedule if required.

Radiological Monitoring

Monitoring waivers are not considered for radiological monitoring. Monitoring frequencies for radionuclides are pre-determined by the Standardized Monitoring Framework and have been incorporated into the WQSS by MassDEP/DWP/WERO. These frequencies are based on either the grandfathered results of samples collected before December 8, 2003 or from results collected since that date.

MassDEP reviewed the most recent MWSD Water Quality Sampling Schedule (WQSS) dated December 16, 2016. MWSD is required to collect water quality samples according to that schedule. A spreadsheet is available on-line that contains the monitoring requirements for every PWS in the Commonwealth. Public users can download the spreadsheet from:

http://www.mass.gov/dep/water/drinking/locid.xls.

A review of MassDEP records indicates that MWSD has been approved for reduced Lead and Copper monitoring to **20** samples every three years. MWSD is required to collect the next round of **20** samples during the period between June and September of 2017.

The following tips may be useful in complying with the Lead and Copper regulations in the future:

- All samples must be collected within the required time frame. Late sample data submitted will not be accepted.
- Once a sample bottle has been accepted by the water system and delivered to the laboratory, the results cannot be invalidated due to sampling practices.
- MWSD must collect 2 samples (kitchen and bubbler) from two schools served by the water system during each sampling round. School results are not included in the 90th percentile calculation. Samples from schools are to be 250 milliliters in volume, not 1 liter.

MassDEP has recently released a web-based water quality data submission feature in its electronic submission website (eDEP). eDEP now allows certified labs to submit water quality data electronically. PWS users have the ability to view their data on-line. To start using eDEP or to learn more about electronic submission of water quality data, please visit: https://edep.dep.mass.gov/DEPHome.aspx on the world-wide web.

SECTION 7: SOURCE AND SOURCE PROTECTION

The protection of a groundwater recharge area is critical to maintaining a safe and ample supply of water to the MWSD customers. Protection zones become more critical to water quality, and the activities within the zone more restrictive, as the wellhead is approached. Zone I is the most vulnerable and restrictive protection zone around a well. Depending upon pumping volume, a Zone I ranges from a radius of 100 to 400 feet around the wellhead. The Regulations at 310 CMR 22.21 (3) specify that only activities that are directly related to the water system and/or non-threatening to water quality occur within this zone. Zone I should be owned or controlled by the water supplier. The Zone II or Interim Wellhead Protection Area (IWPA) encompasses a larger area around a wellhead. Zone IIs are established using pumping test observations and groundwater modeling to estimate the contributing area to a groundwater source. Table 3 lists the sources and the dimensions of their wellhead protection zones.

Suffix	Source Name	Wellhead Protection Rate	Units	Zone I (ft.)	Method	IWPA (ft.)
03G	GP WELL 1 (BETHANY RD)	310	gpm	400		Zone II
04G	GP WELL 2 (PALMER RD)	812	gpm	400		Zone II
06G	BUNYAN ROAD REPLACEMENT WELL 1	591	gpm	400		Zone II
07G	BUNYAN ROAD REPLACEMENT WELL 2	591	gpm	400		Zone II

Table 3: Wellhead Protection Zones

MWSD is hereby notified that the wells with nonconforming activities noted in Table 4 are in nonconformance with the MassDEP's requirement (310 CMR 22.21(1)(b)(5)) that Zone I activities be limited to those directly related to the provision of public water or will have no significant adverse impact on water quality (as specified in Policy 94-03A). To the extent possible, efforts should be made to reduce or eliminate the impacts of non-conforming uses within the Zone I. **Pursuant to 310 CMR 22.04(1) and 22.21(a), MWSD must notify MassDEP if it plans to modify, increase water use, or expand its source or to replace any wells. At the time of such notification of a proposed modification, expansion, or replacement, MassDEP may require MWSD to comply with the Zone I requirement that all Zone I activities be limited to those directly related to water supply or will have no significant impact on water quality.** The following table lists the potential contamination sources observed in the inspection.

PWSID	Source Name	Non-Conforming Activities in Zone I - Zone A	Activities in IWPA-Zone II
1191000-03G	Gp Well #1 (bethany Rd)	Railroad track, roadway, residential development, commercial development	
1191000-04G	Gp Well #2 (palmer Rd)	Railroad track, roadway	
1191000-05G	Gp Well #3 (bunyan Rd)	Railroad track, roadway	

Table 4: Nonconforming Activities within wellhead or surface water protection areas

MassDEP conducted an assessment of the system for the Source Water Assessment and Protection Program (SWAP) and a report was sent on June 10, 2002.

During the inspection, MassDEP observed that the Bunyan Road wells are manifolded together prior to entering the pump house, and the routine raw water bacteria monitoring location is the tap on that manifold to cover the monthly testing for both wells. Each well also has a dedicated raw water sample tap on the well discharge lines near the pitless adaptors. In the event MWSD has a detection of coliform bacteria in its distribution system, it would be required by the Ground Water Rule to test for enterococci at the raw water sampling taps on each well's discharge line without representative monitoring location approval for the manifolded tap. **MassDEP recommended that MWSD apply for GWR Form C -**

Representative Monitoring Location approval at the time of the sanitary survey inspection. An application for this approval was submitted prior to this sanitary survey report being issued.

SECTION 8: CURRENT AND FUTURE REGULATORY REQUIREMENTS

Emergency Plans, Response and Reporting Requirements:

On May 2, 2008, MassDEP issued revised regulations regarding emergency plans, response and reporting requirements. As of that date, Public Water Systems were required to have prepared an Emergency Response Plan, which includes appropriate response actions to potential or actual emergencies, including but not limited to:

1. Loss of water supply from a source;
2. Loss of water supply due to major component failure;
3. Damage to power supply equipment or loss of power;
4. Contamination of water in the distribution system from backflow or other causes;
5. Collapse of a reservoir, reservoir roof, or pump house structure;
6. Break in a transmission or distribution line that could result in a loss of service to customers for more than four hours;
7. Potential or imminent threat of chemical or microbiological contamination of the water supply over limits specified by MassDEP's Office of Research and Standards' as set forth in the *Standards and Guidelines for Contaminants in Massachusetts Drinking Waters.* (available on-line at http://www.mass.gov/dep/water/laws/regulati.htm#chems);
8. Potential or imminent threat of an overfeed of an approved drinking water treatment chemical into the system;
9. An act of vandalism or sabotage that has the potential to impact or impacts water quality or the quantity of water available to the system.
10. A shortage or lack of resources that could affect the operations of the system, such as:
    a. Staffing shortages:
    b. Receipt of notice from a power utility of lengthy power outages; or
    c. Imminent depletion of treatment chemical inventory; and
11. Any other failure of part or all of the water supply system due to equipment failure, human acts (deliberate or accidental) or natural or human made disasters.

These requirements are described in sections 310 CMR 22.04(13) of the Regulations.

Section 310 CMR 22.15(9) of the regulations incorporates 2-hour and 24-hour emergency notification requirements to both MassDEP and the Board of Health, for specified emergency. Within 30-days of a reportable emergency, the water supplier must complete an Emergency Response Report and submit a copy of that Report to MassDEP for Level III, Level IV or Level V emergencies, Cross Connection incidents, and any of the emergency incidents listed in Items #1 through #11 above.

UIC Issues

The Underground Injection Control (UIC) Program regulates discharges to the ground via Class V wells such as dry wells, septic systems tied to industrial processes, leaching catch basins and other subsurface leaching systems. The UIC Regulations list authorized activities in 310 CMR 27.05, including heat exchanger return water, non-contact cooling water, storm water drainage, waste fluids other than sanitary waste, aquifer recharge wells, and salt water barrier intrusion wells. Prohibited activities are listed in 310

CMR 27.04, and generally, include the introduction of fluid containing any pollutant that would likely cause a violation of the Massachusetts Drinking Water Regulations, the groundwater discharge standards listed in 314 CMR 5.10 or adversely affect the health of persons. One common unpermitted UIC application is for floor drains in a boiler room piped to a drywell or septic systems in facilities that are unsewered. Contact Richard Larson at (413) 755-2207 if the PWS source area has any unregistered UICs.

Radionuclides Rule

This rule applies to community water systems of all sizes and is currently in effect. This rule retains the existing MCLs for combined radium-226 and radium-228, and gross alpha particle radioactivity, and specifies an MCL of 30 ug/L for uranium. Please refer to the MWSD Water Quality Sampling Schedule for specific testing requirements.

Arsenic Rule

On January 23, 2001, The Environmental Protection Agency (EPA) issued a Final Rule to reduce the public health risk from arsenic in drinking water by changing the Maximum Contaminant Level (MCL) for arsenic from the current 50 parts per billion (ppb) to 10 ppb. EPA's Rule is in response to the requirements of the 1996 amendments to the Safe Drinking Water Act. This rule will affect community and non-transient, non-community water systems and was effective January 23, 2006.

Groundwater Rule

EPA finalized this rule on October 12, 2006 and MassDEP adopted the Rule into regulation on December 25, 2009. The rule applies to all public water systems that rely on groundwater sources. PWS compliance with this rule is now mandatory. Major components of the rule include:

1. MassDEP must conduct regular, comprehensive sanitary surveys on Ground Water Systems (GWS -PWSs with groundwater sources that do not disinfect) and identify significant deficiencies. Beginning in 2009, all community GWSs must be surveyed every three years unless they are classified as exceptional by the State. All non-community GWSs must be surveyed every five years.
2. All GWSs are required to sample and test their groundwater sources for fecal contamination (fecal indicator) within 24 hours of any detection of Total Coliform in any routine distribution system bacteria monitoring sample. The triggered monitoring sample must be taken at a location representative of the source, prior to storage. MassDEP requires that all GWSs have the ability to get this source sample on short notice and requires that sampling ports be installed on all groundwater sources if not available.
3. The fecal indicator for Community systems serving greater than 3,300 persons is enterococci. The fecal indicator for all other GWSs is ecoli. Furthermore, if ecoli is detected in any groundwater source, regardless of population, the fecal indicator is ecoli. If a source sample is collected on the same day as a distribution system sample, and the distribution system sample is total coliform positive, then the source sample can be used to satisfy the triggered monitoring component of the GWR, and consequently the fecal indicator is ecoli.
4. Any GWS with significant deficiencies or source sampling indicating fecal contamination must take corrective action including using alternative sources of water, correcting and removing the source of contamination, or providing 4-log removal of viruses.
5. The rule specifies that nanofiltration, certain types of microfiltration, chemical disinfection using chlorine or ozone will provide 4-log removal of viruses when used in stand-alone applications.

6. The rule does not specify that ultraviolet (UV) disinfection can be used in a stand-alone application to achieve 4-log removal of viruses.
7. GWSs that install a treatment technique to comply with the GWR are required to conduct " compliance monitoring" that verifies the effectiveness of their virus removal. GWSs that employ a treatment technique and serve greater than 3,300 persons must install continuous chlorine monitoring at or before the first customer. GWSs that employ a treatment technique and serve 3,300 persons or less are required to monitor their process once per day at or before the first customer.

The text of the Rule regulations is available on-line at http://www.epa.gov/safewater/disinfection/gwr/.

Beaver Conflict Resolution

In July 2000, the Massachusetts Legislature enacted a new law that provides any parties who are experiencing public health threats as a result of beaver or muskrat flooding may apply to the local municipal Board of Health (BOH) to abate those threats. The Division of Fisheries & Wildlife regulations that oversee this process (321 CMR 2.08) further state that the MassDEP's Drinking Water Program would make the determination of a threat in all cases involving Public Water Systems. This determination is to be used to obtain an Emergency Permit from the local BOH. Depending upon the situation, the local Conservation Commission may also become involved. MassDEP's policy applies to surface water reservoirs, ground water wells and pump stations.

MassDEP may determine a threat to human health and safety exists if beaver or muskrats or dams or active lodges are observed within designated areas. In some cases, documented water quality degradation is required before a threat to human health and safety is determined.

The MassDEP contact for beaver conflict resolution issues in western Massachusetts is James Gibbs (413-755-2299).

SANITARY SURVEY COMPLIANCE PLAN
RESPONSE FORM for TABLE A or B

Within 30 days of receipt of this inspection report, you must complete and submit this response form if your system has TABLE A –Violations and/or TABLE B-Deficiencies (see attached Compliance Tables). Attach a copy of the completed tables listing the date that the corrective action was or will be taken by your system and all other applicable documentation. (310 CMR 22.04(12))

Please note that violations listed in TABLE A of the Compliance Plan are also a Notice of Noncompliance (NON) pursuant to M.G.L. c.21A, §16 and 310 C.M.R. 5.00 and may require the submission of quarterly written progress reports on the identified violations.

The following corrective actions listed in the Sanitary Survey Compliance Plan(s) TABLE A and/or B has been taken by the public water system. (Please check all that apply).

☐ My system has taken **ALL** of the corrective actions listed within the timeframes specified in the Sanitary Survey Compliance Plan(s).
- For each item, I have listed the completion date of the corrective action within each table.
- I have attached copies of supporting documentation as required.

☐ My system has taken **SOME BUT NOT ALL** of the corrective actions listed within the timeframes specified in the Sanitary Survey Compliance Plan(s). My system **HAS NOT** complied with **ALL** of the requirements set forth in the Sanitary Survey Compliance Plan(s).
- For each item, I have listed the actual or anticipated completion date of the corrective action within each table.
- I have attached copies of supporting documentation as required.
- I have attached a revised corrective action schedule establishing timelines for my system to address outstanding items and I will submit a written progress report each quarter (every 3 months) until all items have been addressed. I understand that my system may be subject to further enforcement action.

☐ My system is **UNABLE** to comply with some or all of the corrective actions within the timeframes specified in the Sanitary Survey Compliance Plan(s). I understand that my system may be subject to further enforcement action.
- An explanation is attached.

I hereby acknowledge receipt of the inspection findings and compliance plan table(s) of the sanitary survey conducted by the Department of Environmental Protection's Drinking Water Program. I certify that under penalty of law I am the person authorized to fill out this form and the information contained herein is true, accurate and complete to the best of my knowledge and belief.

Water Commissioner, Owner, Owner Representative or Other Responsible Party:

Signature: _____ Date: _____

Print Name: _____ Title: _____

Return this form, a copy of each Compliance Plan Table and all attachments to:
DEP-BRP Drinking Water Program, 436 Dwight Street, Springfield, MA 01103
Attention: Jim Bumgardner

SANITARY SURVEY
COMPLIANCE PLAN- SECTION B – REQUIREMENTS

Sanitary survey items that are required to be corrected to improve the protection of drinking water and public health pursuant to M.G.L. 111§ 160. MassDEP/DWP will provide technical assistance to systems responding to these deficiencies. Please call your regional DWP office for referral to the appropriate staff person.

Section	Deficiencies	Corrective Actions	Deadline for Taking Corrective Actions	Sig. Def.?	Completed Date
Administration	MassDEP has determined that the MWSD water rates may not be sufficient to cover the true costs of producing and delivering safe drinking water.	MassDEP requires that MWSD develop a plan to create a rate structure under which the water rates are sufficient to cover the true cost of producing and delivering water.	December 31, 2015	No	
Administration	MassDEP has determined that MWSD does not have a written list of the useful life expectancy of its assets or a schedule for replacing its assets.	MassDEP requires that MWSD create an Asset Management Plan with written estimates of the useful life of all assets and a long-term asset replacement plan with a schedule and cost estimates for all assets within its infrastructure inventory.	December 31, 2015	No	
Treatment	During the inspection of the Palmer Road soda ash treatment facility, MassDEP determined that there is insufficient labeling of the soda ash solution storage tank.	MassDEP requires that MWSD adequately label its soda ash solution tanks.	December 31, 2014	No	
Distribution	MWSD has not submitted an up-to-date distribution system map showing the location and size of its distribution mains and bacteria monitoring locations in accordance with the regulations at 310 CMR 22.19. During the inspection, MW indicated that its consultant is in the process of creating a GIS map of its water system.	MassDEP requires that MWSD submit an updated distribution system map showing the location and size of its distribution system water mains and bacteria monitoring locations.	December 31, 2015	No	
Distribution Protection	During the inspection, MassDEP observed a hose that was not protected by a hose bib vacuum breaker was lying on the floor of the Bunyan Road pump station. This location is a hazardous location due to chemical mixing activities. The Certified Operator indicated that he faucet was not plumbed downstream of the RPZ, but was connected to the	MassDEP requires that MWSD disconnect the hosebib plumbed into the 100 foot tap and provide a hose bib that is downstream of the RPZ in the treatment building and provide written notice to MassDEP that this is complete.	January 31, 2014	No	

	100 foot sampling tap.				

SANITARY SURVEY

COMPLIANCE PLAN- SECTION C - RECOMMENDATIONS

Recommendations that are intended to improve the protection of drinking water and public health. DEP/DWP will provide technical assistance to systems responding to these recommendations. Please call your regional DWP office for referral to the appropriate staff person.

Section	Identified Concern	Action	Recommended Deadline for Taking Corrective Actions
Resource Protection	During the inspection, MassDEP observed that the Bunyan Road wells are manifolded together prior to entering the pump house, and the routine raw water bacteria monitoring location is the tap on that manifold to cover the monthly testing for both wells. Each well also has a dedicated raw water sample tap on the well discharge lines near the pitless adaptors. In the event MWSD has a detection of coliform bacteria in its distribution system, it would be required by the Ground Water Rule to test for enterococci at the raw water sampling taps on each well's discharge line without representative monitoring location approval for the manifolded tap.	MassDEP recommended that MWSD apply for GWR Form C - Representative Monitoring Location approval at the time of the sanitary survey inspection. An application for this approval was submitted prior to this sanitary survey report being issued.	