

COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENERGY & ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION
OFFICE OF ADMINISTRATIVE APPEALS & DISPUTE RESOLUTION

In the Matter of
Town of Shrewsbury
WMA Permit 2014

OADR Docket No. 2014-002

Shrewsbury

UNACCOUNTED-FOR WATER COMPLIANCE PLAN

The parties¹ to this administrative appeal have entered into a Settlement Agreement (“Agreement”) which incorporates by reference this “Unaccounted-for Water Compliance Plan” (“UAW Compliance Plan”) and to which the UAW Compliance Plan is an attachment. As part of their Agreement, the Parties developed the terms and conditions of the UAW Compliance Plan as a means whereby the Town can meet, or exceed, the “Performance Standard for Unaccounted-for Water”² set out in the Town’s “Water Withdrawal Permit” (Permit # 9P4-2-12-271.01) at Special Condition 6 of the January 2014 Permit. The requirements of the UAW Compliance Plan as so agreed are hereby incorporated in the Final Permit (submitted with the Agreement) as follows:

LEAK DETECTION & REPAIR

- 1) The Town completed a full town-wide leak detection survey in June 2013 and has completed all of the identified repairs (one main, 3 residential service leaks and 36

¹ Being the Department of Environmental Protection (“DEP”), the Town of Shrewsbury (“the Town”) and the Blackstone River Coalition, the Blackstone Headwaters Coalition, the Blackstone River Watershed Association and a group of Twelve Citizens (“the Petitioners”) hereinafter collectively “the Parties”,

² The Performance Standard for UAW as established by the “Conservation Standards” of the Water Resources Commission is 10%.

open hydrants). The Town will provide a detailed report to DEP of the repairs which have been made within twenty (20) days of the date of issuance of the Final Permit.

- 2) The Town will conduct continuing town-wide leak detection in 2014, and each year thereafter until such time as its Annual Statistical Report documents to DEP's satisfaction that the Town has met, or is below the 10% UAW Standard. If DEP determines that the UAW Standard is not met, the Town will continue to conduct annual town-wide leak detection surveys and provide DEP with written reports on leaks detected within sixty (60) days of survey completion. Leak repairs shall be made no later than the deadlines in the schedule set forth in Table 6, item 4 of the Final Permit.
- 3) The results of all annual leak detection surveys and repairs made shall be reported in the Town's Annual Statistical Report ("ASR") for the year in which the leak detection survey was performed. The written reports of repairs provided in the ASR shall include a report on actions taken to meet the 10% UAW Standard, an analysis of the failure to meet the Standard, a description and schedule of the actions to be taken to meet it and an analysis of how the actions to be taken will address the failure to meet the Standard. As required by the Final Permit, Appendix B, if DEP determines that the UAW standard is not met by December 2015, the Town will submit to DEP, in addition to continuing to meet the requirements of the UAW Compliance Plan, a UAW Functional Equivalence Plan that shall include the items outlined in Appendix B of the Final Permit and any additional Best Management Practices ("BMPs") recommended in the Town's Water Audit(s). If DEP determines that the Town has

met the 10% UAW Standard, leak detection surveys shall be conducted in accordance with the schedule set forth in Table 6, Item 1 of the Final Permit.

- 4) The provisions of Special Condition 6 and Table 6 of the Final Permit govern all other requirements regarding system Water Audits and Leak Detection.

WATER MAIN REPLACEMENT

- 5) In 2012, the Town initiated a multi-year water main replacement program. In 2012 the Town replaced 1,600 feet of twelve inch line and in 2013 the Town replaced 9,660 feet of twelve inch line and 3,445 inch of eight inch line. The May 2014 Annual Town Meeting appropriated \$1.275 million dollars to continue the water main replacement program on Maple Avenue, West View Avenue, Prospect Street, North Street, Vista Drive and the water main on the Lake Quinsigamond (Stringer) Dam. This water main replacement will be completed on or before October 31, 2015 and a written report on the replacements made shall be submitted to DEP within ninety (90) days of completion of the replacements and also in the Town's ASR for 2015. The Town agrees to plan the Fiscal Year 2016 water main replacement project and submit the projected cost for appropriation at the Annual Town Meeting in May 2015 and report the results of the Town Meeting vote to DEP in writing within twenty (20) days of the end of the Annual Town Meeting with a contingency plan(s) for continuing the water main replacement project should the appropriation not pass.

WATER AUDIT REPORT

- 6) The Town completed a Water Audit in February 2014 and, by letter dated February 19, 2014 to DEP, proposed that the recommendations in Section 10 of the Water Audit be included in its Unaccounted-for Water Compliance Plan. DEP accepts, and the Parties agree, to incorporate these recommendations in this UAW Compliance Plan with the exception of Items 1, 3 and 4. The timing for leak repairs will be governed by the schedule set out in Table 6, Item 4 of the Final Permit. As provided herein, the Town will conduct annual town-wide leak detection surveys until such time as DEP finds that the Town meets the 10% UAW Standard. A copy of the Water Audit Recommendations is attached hereto and its recommendations are incorporated herein by reference as permit requirements with the exceptions set forth in this paragraph. The Town will annually update its Water Audit in order to incorporate additional efficiencies as set out in the AWWA Water Loss Control software version 4.2 (2010) "M36 Audit for Small and Medium Systems" recommended by the MWWA.

RETROFITTING OF MUNICIPAL BUILDINGS

- 7) The Town is in the process of completing the retrofitting of municipal buildings with water saving fixtures as set out in its February 19, 2014 letter to DEP. These buildings include the Town Hall, Spring Street School, Coolidge School and Paton School, which have been partially retrofitted, and the Police Station, the Donahue Rowing Center and Beal School. The May 2014 Annual Town Meeting appropriated \$20,000.00 dollars to fund the completion of the retrofitting of town buildings. The

Town completed these retrofits on or before February 1, 2015 and shall submit a written report to DEP in the ASR for 2015 confirming that all remaining retrofits have been completed. The only municipal building not on this list is the town library, which will be partially razed and substantially rebuilt beginning in the fall of 2014. The library will be retrofitted in conjunction with the reconstruction and the Town will confirm this retrofit in its ASR for the year in which it is completed.

METER REPLACEMENT

8) The May 2014 Annual Town Meeting appropriated \$1 million dollars to continue the Town's ongoing meter replacement program. To date approximately 40% of the Town's residential meters have been replaced. This fiscal 2015 appropriation will allow the Town to replace another 50% or more of the residential meters, leaving approximately 10% of the residential meters to be funded by appropriation in Fiscal Year 2016, which the Town agrees to seek from the 2015 Annual Town Meeting. A bid will go out by September 1, 2014, for approximately 5000 meters (50% or more of the residential meters) to be installed by June 30, 2016. The remaining approximately 10% of the meters will be purchased from funds expected for fiscal year 2016 with an anticipated completion date of December 31, 2016. If this completion date cannot be met, the Town shall advise DEP in writing of the status of the meter replacement work, the reasons for any delay(s) and will request that DEP extend the completion deadline. Once 100% of the residential meters are replaced, the Town will consider the feasibility of going to monthly billing and will report on it to DEP in its 2016 ASR. Water bills contain a chart showing a three year lookback at quarterly water consumption in gallons. The Town shall report the

status of the meter replacement program to DEP and the anticipated completion schedule in its 2014, 2015 and 2016 ASRs.

9) The Town completed replacement of all Industrial/Commercial/Institutional (“ICI”) meters including down-sizing larger meters to improve accuracy by September 30, 2014, and reported this completion to DEP in a letter dated April 9, 2015.

10) The Town continues to replace the master meters at the well sites with magnetic meters to improve accuracy and reliability. The Sewell Street, Lambert and Home Farm Wells 6-4 and 6-3 have been changed. Home Farm (6-1 and 6-2) have difficult pipe configurations with small space underground in the vault area making replacement extremely difficult. These meters shall be calibrated annually for accuracy. While the meters for wells 6-1 and 6-2 shall be calibrated annually for accuracy, the Town will prepare a contingency plan for their replacement when the annual calibrations are no longer reliable and will provide this plan to DEP in its next (2015) ASR.

SECTION 10 - Recommendations

10.1 Recommendations

The following recommendations are a result of this water audit report. These recommendations will improve record keeping and increase the validity score for the data as shown in the AWWA water audit. They will also assist in lowering the Town's unaccounted-for water as shown in the WMAP water audit.

1. Continue to conduct partial leak detection surveys of the entire system every year according to the standard operating procedures for leak detection surveys.
2. Continue to document leaks found during the survey and in everyday operation by staff and customers. Leak records should include the location, date and time the leak was found, the approximate size of the leak, the type of leak (hydrant, main, service, etc.) and an estimate of approximately how long it has been leaking.
3. Leaks should continue to be repaired in accordance with the established priority system:
 - All leaks of 3 gpm or more shall be repaired as soon as possible and no later than within 12 months of detection.
 - Leaks of less than 3 gpm at hydrants and appurtenances shall be repaired promptly and no later than within 12 months of detection.
 - Leaks of less 3 gpm in local roadways, arterial or collector roadways shall be repaired when related work on the roadway is being performed.
4. It is recommended that at a minimum, monies for a full leak detection survey be completed and budgeted every three years. The estimated cost of a leak detection survey is approximately \$120 per mile of main or approximately \$24,000 for the Shrewsbury distribution system.
5. It is recommended that the Town continue to test and calibrate the master meters for the main sources of water on a yearly basis in accordance with MassDEP recommendations.
6. Shrewsbury should continue with their ongoing service meter replacement program. Once all service meters are replaced with radio read meters, the meters should be read and customers billed monthly. Reading all meters on a monthly basis will allow the Town to compare the water pumped and water billed on a monthly basis and allow the Town to better track meter anomalies and errors.
7. The Town should continue to keep well written records regarding unmetered water uses so that the volume of such usage can be reasonably estimated. One component of this recordkeeping program includes reporting the time of discovery and/or how a leak was reported, as well as the estimated volume of lost water. By reporting when leaks are discovered and/or reported, Shrewsbury can keep an accurate record of how long it takes for the leak to be repaired and the related costs. This information is and will continue to be useful in identifying problem areas within the distribution system and coordinating

and managing personnel time. Other recordkeeping components Shrewsbury may consider include documentation of areas of Town requiring additional water quality flushing. The Town should meter the amount of water used during any authorized municipal use, such as construction, street cleaning, etc., whenever possible. This will enable Shrewsbury to more precisely quantify the amount of water used.

8. The Town should continue with its efforts to promote water conservation within the community through water conservation outreach and educational programs. These include implementing additional water use restriction bylaws, distributing water conservation education information through various outlets and formats, visiting local schools, increased public service announcements, producing local cable or newspaper announcements, and low water use concepts to agricultural, commercial, industrial, and residential consumers. The Town should continue to implement their Rain Barrel Program, update their website with indoor and outdoor conservation tips, and update links to conservation related websites.
9. The Town should continue to effectively and accurately record all miscellaneous water losses and authorized water uses. MassDEP has calculation worksheets for estimating water lost due to flow testing, street cleaning, and water main breaks. These worksheets are located in Appendix D and should be completed and attached to the Town's ASR.
10. The Town should investigate whether master meter venturis and transmitters are regularly subjected to flows which are either higher than or lower than their operating range.
11. Test customer meters with zero or low flow readings. These meters should be repaired or replaced if found to not be registering properly.
12. For all meters that are 1 1/2-inches and larger, continue to identify the highest and lowest registering meters and begin a process of data logging those meters to establish they are the proper meter type and size. Replacement of oversized and incorrectly typed meters can significantly increase revenues and reduce apparent losses.
13. The Water Research Foundation Project No. 4028 also found that while meter manufacturers claim that their new meters meet AWWA accuracy requirements they in fact often do not. Shrewsbury should consider testing all new meters themselves in accordance with AWWA M6 prior to field installation.
14. Regularly review and consider new meter technology which provides economic benefit to the Town.
15. Establish a program for the local fire departments to track location and the length of time a hydrant was flowed and an estimate of the flow rate. This will give Shrewsbury the ability to estimate the quantity of water used each year for fire protection and training. This will improve the data validity score for the unbilled unmetered category.

16. The Town should perform periodic checks on accounts that have been terminated for nonpayment. Curb stops that have been closed should be checked to ensure that they have not illegally been reopened.
17. The Town should perform regular internal audits of the data trail from data read at the customer meter to the creation of the customer bill. This will determine the accuracy of the consumption data.
18. The Town should field verify all water storage tank level instrumentation equipment and compare to SCADA readings to prevent tank overflows.
19. We recommend Shrewsbury continue to review the SCADA data each day and highlight anomalies and provide a summary report for review. In this way, errors may be corrected on a systematic and timely basis.
20. The Water Audit Report should be updated to include 2013 data once it is available.