

Village of Windsor

Water Operations

JANUARY 2020



OFFICE OF THE NEW YORK STATE COMPTROLLER
Thomas P. DiNapoli, State Comptroller

Contents

- Report Highlights 1**

- Water Operations. 2**
 - How Should Officials Effectively Manage Water Operations? 2
 - Water Bills Were Not Estimated Consistently 2
 - Usage Readings and Estimates Used To Bill Customers Were Not Always Reasonable 3
 - Officials Were Unable To Account for the Majority of Water Produced. 4
 - What Do We Recommend? 5

- Appendix A – Response From Village Officials 6**

- Appendix B – Audit Methodology and Standards 10**

- Appendix C – Resources and Services. 13**

Report Highlights

Village of Windsor

Audit Objective

Determine whether Village officials accurately billed customers for water usage and reconciled water produced to water billed.

Key Findings

- Village officials do not periodically read all customer meters to ensure customers are accurately billed.
- The Clerk-Treasurer used an inconsistent methodology for estimating water bills.
- Estimated and customer-submitted water usages used by Village officials to bill customers did not always appear to be accurate.
- 85 percent of the water produced, or 74.9 million gallons, is considered non-revenue (lost) water.

Key Recommendations

- Develop procedures to measure unmetered water usage and periodically read customer meters.
- Continue to work on identifying leaks and upgrading the Village's water system infrastructure to help reduce the amount of non-revenue water.

Village officials agreed with our findings and recommendations and indicated they have taken, or planned to take, corrective action.

Background

The Village of Windsor (Village) is located in the Town of Windsor in Broome County.

The Village is governed by an elected four-member Board of Trustees, including an elected Mayor (Board). The Board is the legislative body responsible for oversight and general management of financial operations. The Clerk-Treasurer is the Village's chief fiscal officer and is responsible for billing, collecting and recording water user charges. She is assisted by a Deputy Clerk-Treasurer. The Department of Public Works (DPW) Superintendent oversees the day-to-day water operations with the help of the DPW Assistant Superintendent.

Quick Facts

Village Population	916
Water Customers	342
2019-20 Total Budgeted Appropriations	\$757,668
2019-20 Budgeted Water Appropriations	\$101,488

Audit Period

March 1, 2018 – April 30, 2019

We extended the scope back to October 1, 2006 to review water billing histories and forward to October 11, 2019 to read customer water meters and trace payments.

Water Operations

Water meter readings are collected and billed semiannually for 342 water accounts in October and April.¹ Most of the customer accounts (254, or 74 percent) are based on customer-submitted readings.

How Should Officials Effectively Manage Water Operations?

The board should adopt a billing policy that establishes water rates, penalties and fees, and the calculation methodology to be used when the billings are based on estimates. The Clerk-Treasurer is responsible for presenting accurate bills to residents based on water consumption. Officials should periodically read meters to ensure that water consumption is accurate.

Additionally, officials are responsible for controlling the cost of operating the Village's water system by tracking water use throughout the system, comparing water purchased with water billed, and determining whether there is a large volume of water loss. A large volume of water loss could be a warning sign of significant infrastructure problems, such as broken meters or leaking pipes. The American Water Works Association (AWWA) has established that all water produced in a water system should be accounted for. It defines any water consumption that is lost, or unbilled, as non-revenue water (NRW) and determined average NRW is approximately 24 percent. Procedures should be in place to monitor and identify the causes of water loss.

Water Bills Were Not Estimated Consistently

Officials do not periodically read all meters nor verify whether customer-submitted readings are accurate. When customers do not submit meter readings, they are charged a \$25 fee and their usage is estimated. The Clerk-Treasurer estimates the usage based on the previous six billed usage amounts, and then rounds up or down.

We reviewed the 43 accounts with estimated usage for the April 2019 period and found that the Clerk-Treasurer did not consistently apply the same rounding method. Even though usage above 20,000 gallons is billed per 1,000 gallons, accounts were rounded up and down by varying amounts ranging from rounding up to the nearest 5,000 gallons to rounding down more than 30,000 gallons. For perspective, if these bills were calculated by rounding the average usage up to the nearest 1,000 gallons, 18 bills would have increased by a total of \$727 and two would have decreased by a total of \$28 for the April 2019 billing period. The Board has not adopted or approved of an estimation methodology as part of the billing policy.

¹ Each semiannual billing is split into two payment periods which are due in November, February, May and August.

On average, the above 43 estimated accounts had not submitted meter readings in approximately six years. Readings for two accounts have not been Village-read in over 10 years. We could not obtain a reading for one of these accounts because the owner does not live locally. However, we obtained a meter reading for the other account, which had not been read since April 2006, and found that the current reading obtained by Village officials was significantly less than the previous customer-submitted reading.

Officials said they do not have enough manpower to periodically read meters. All meters have to be read manually by the DPW Superintendent and/or Assistant Superintendent, who are also responsible for all other DPW functions. Further, because many customers are not home during the day, DPW cannot gain access to read the meters, which are typically housed in residential basements.

Usage Readings and Estimates Used To Bill Customers Were Not Always Reasonable

We selected a sample of 79 accounts and requested that Village officials obtain actual meter readings for them.² The DPW Superintendent was unable to access 30 of these meters; of the remaining 49 accounts, 14 either had no service or did not have a meter. We obtained actual readings over a four-month period for the other 35 accounts.³

Customer-Submitted Readings – Of the 35 accounts, 22 had customer-submitted readings for the April 2019 billing period. We projected usage to the October 2019 billing period for these accounts based on the provided actual readings and found one account that had a projected actual usage of more than three times its average billed usage. This would result in a bill for 22,000 gallons, or \$57, more than the highest bill sent to the customer during the last five billing periods. This large increase could be the result of an undetected leak, meter malfunction, increased consumption or incorrect customer-submitted readings. The remaining 21 accounts (95 percent) had projected usages that appeared to be within reason.⁴

Village-Estimated Usage – The remaining 13 accounts had estimated usages for the April 2019 billing period. Based on the actual usage from their last submitted meter readings, three accounts appeared to have meters that malfunctioned, which officials were unaware of. Four accounts were billed accurately and six accounts (46 percent) were billed inaccurately. Figure 1 shows billed usage for

² See Appendix B for details on sample selection.

³ Ibid.

⁴ If projected usage was less than 1.5 times greater than the last five bills' maximum recorded usage, we deemed it to be reasonable.

these six accounts, based on the Village’s estimates, and the difference had the billings reflected actual usage.

Figure 1: Estimated Billed Usage vs. Actual Usage Since Last Meter Reading (as of April 2019)

Account	Estimated Bills	Billed Usage (Gallons)	Total Billed	Actual Usage (Gallons)	Total Recalculated Billing	(Underbilled)/ Overbilled
A	20	755,000	\$3,473	1,658,400	\$7,443	(\$3,970)
B	2	50,000	\$230	227,540	\$837	(\$607)
C	6	230,000	\$1,058	242,990	\$1,032	(\$26)
D	6	175,000	\$805	103,430	\$552	\$253
E	11	325,000	\$1,576	203,310	\$1,067	\$509
F	14	450,010	\$2,162	246,960	\$1,288	\$874

While these differences in usage are estimates and water usage can fluctuate, the periodic reading of meters will help mitigate the risk of incorrect meter readings being used to bill customers. In addition, officials would be made aware of broken meters that would otherwise go undetected and be able to fix them.

Officials Were Unable To Account for the Majority of Water Produced

Officials monitored the amount of water produced daily and periodically compared water production to the amount of water sold. However, from May 2018 through April 2019, the Village pumped approximately 88.5 million gallons of water, but could only account for 13.6 million gallons; leaving approximately 74.9 million gallons, or 85 percent of the water pumped, unaccounted for, or NRW. This far exceeds the AWWA’s industry average of 24 percent.

Officials believe that the NRW is the result of frequent leaks, and unmetered usage such as municipal use for the Village’s buildings, Town and County shared road projects, and the Fire Department’s fire protection. According to officials, the Village’s water system infrastructure is old and prone to leaks. DPW officials periodically use leak detection equipment and monitor the master meter to detect leaks. The aging water lines are upgraded as leaks are detected and repairs are made. The Village averaged eight repaired leaks per year from 2015 to 2019. Nine leaks were discovered and repaired during the audit period. Officials stated that they continually work on getting grants to upgrade the Village’s water system and purchase equipment to assist in measuring unmetered water use since they do not want to burden taxpayers with these costs.

To provide perspective, the average Village water user consumed approximately 24,000 gallons of water during the April 2019 billing period. Considering this

average usage and the amount of unaccounted-for water, the Village lost water equal to 3,075 user accounts, equivalent to nine villages of equal size.

What Do We Recommend?

The Board should:

1. Work with the Clerk-Treasurer to adopt a standard estimation methodology as part of the water billing policy.
2. Consult with Village counsel to determine whether the Village should seek to recoup funds that may have been underbilled and/or reimburse potentially overbilled water users.

Village officials should:

3. Develop procedures to measure unmetered water usage and periodically read customer meters.
4. Continue to work on identifying leaks and upgrading the Village's water system infrastructure.

Appendix A: Response From Village Officials

Village of Windsor



107 Main Street
Windsor, NY 13865
www.VillageofWindsor.org

Phone (607)655-2024
Fax (607) 655-4095

Email: VillageofWindsor@Echoes.net

January 8, 2020

Office of the New York State Comptroller
Binghamton Region

██████████
██████████
State Office Building, Room 1702
44 Hawley Street
Binghamton, New York 3901-4417

Re: Village of Windsor Water Operation Audit 2019M-210

Dear ██████████,

The Village of Windsor has reviewed your draft "Report of Examinations" dated 12/9/2019.

We are offering this response letter as a combination of both response and Corrective Action Plan (CAP). Both the response and CAP are identified under discrete heading as follows:

RESPONSE

The Village of Windsor agrees with your detailed review and analysis of the report. We further wish to acknowledge some information we have shared informally throughout the examination process.

The conditions of poor accounting for Non -Revenue Water (NRW) have existed since the development of the Village water system beginning in 1899. Due to absent or poor main metering and reservoir level controls, the severity of this situation was not discovered until 2006, when a new accurate main flow meter and analog reservoir level controls were installed in the system. Following these upgrades the NRW values began to become apparent. This statement is in no way intended as any excuse, but rather as a statement of fact that for a majority of the life of the Village water system the NRW issue was simply obscured.

For many years the water meters in each residence were inspected and read by Village DPW staff. This activity resulted in a fairly accurate accounting of individual consumer consumption. As the demands for our DPW labor commitments increased, and the number

Village of Windsor



107 Main Street
Windsor, NY 13865
www.VillageofWindsor.org

Phone (607)655-2024
Fax (607) 655-4095

Email: VillageofWindsor@Echoes.net

of “vacant during the day” homes increased, this effort became untenable. The Village opted to move to mailed out “reading cards” directing consumers to read the water meter and return the card to the Village office. While this direction has been moderately successful, various individual accounts remain problematic due to lack of “real” meter reading information. The Village clerk has done an admirable job in attempting to estimate these lost readings and recover revenue using the best knowledge available and consulting with the Mayor and board members.

A summary response is the Village agrees with the findings of the audit report, acknowledges that it was aware of the poor NRW values, and it was not aware of the billing inaccuracies identified in the report.

CORRECTIVE ACTION PLAN

The CAP activities presented are segregated to identify actions to remedy revenue billing inconsistencies, and resolve NRW values. Although these two issues are somewhat linked together, we believe it is best to resolve them as separate issues.

Revenue Billing

- 1) Meter automation: The closure solution to individual revenue billing issues is to replace the existing local read mechanical meters with units capable of remote reading of water volume measured either by access connection outside the structure, or radio telemetry means. The replacement of the meters will resolve the “unread meter” situation and eliminate any estimate requirements of the clerk. The Village proposes to pursue meter replacement grant support funding to alleviate this cost burden. It is further noted that the Village will endeavor to install a metering system that is hardware and software capable of accomplishing a “district metering” calculation which provide an accurate snapshot of real-time metered consumption and unaccounted system leaks.
- 2) Billing Software: The Village has procured new water revenue accounting and billing software to replace the “custom” spreadsheet format that has been previously utilized. The new software is specifically designed for municipal water system tracking and billing, this will eliminate any possible inaccuracies due to inaccurate data entry of the spreadsheet software. The new software will be implemented by the end of Jan 2020.
- 3) Estimation reduction: Accounting errors due to manual estimation will be minimized by a combination of new water account management procedures preventing excessive periods of unaccounted water consumption and clearly

Village of Windsor

107 Main Street
Windsor, NY 13865
www.VillageofWindsor.org



Phone (607)655-2024
Fax (607) 655-4095

Email: VillageofWindsor@Echoes.net

defining estimate values for short term meter reading deficiencies. The Village is drafting new water shutoff procedures to prevent unread users from continuing past a one year period without proper usage reconciliation. In addition the clerk will be given specific procedures for estimation values. These procedures along with the water shutoff procedures will be formalized through board action.

NRW Value Reduction

The Village recognizes that NRW situations exist in all municipal water systems and there are typically multiple sources of NRW. Accounting for the NRW beyond lost meter revenue may not result in significant economic benefits to the village. However the Village acknowledges that this significantly high NRW value requires the following CAP items be implemented.

- 1) The Village recognizes the existing water meters suffer from a certain lack of accuracy particularly a very low flow conditions. Meter inaccuracies are known as commercial losses, and they are inherent in municipal water systems. A “meter inaccuracy” factor will be applied to the revenue metered water value provide accounting of these commercial losses.
- 2) Water usage for fire department activities is an authorized NRW consumption. The Village will apply an estimated NRW value to this use based upon reported use estimates and estimated inaccuracies.
- 3) Water usage for municipal DPW facilities, offices and community centers and the fire station are authorized NRW consumption. The Village will apply an estimated NRW value to these consumption points based upon reported estimates.
- 4) Through diligent system monitoring the Village DPW has eliminated tankage overflows and monitors to tackle larger system leakage as identified by significant daily flow increases. These activities do not account for typical system leaks from both piping mains and customer service connections. The Village will apply an estimated NRW value to these distribution system losses based upon reported estimates.

The draft Report of Examinations references an AWWA industry standard for NRW of 24%. Each water system will have an NRW value that aligns with an economically viable and sustainable value that is related to system age, number and type of users and the relative value of the pumped water. Given this level of complexity the Village has not established an NRW target. Clearly the above factors are critical in system balance accounting and must be integrated into proper yearly reports. It is unlikely that the NRW reduction plan will achieve a balance alignment of 24%.

Village of Windsor



107 Main Street
Windsor, NY 13865
www.VillageofWindsor.org

Phone (607)655-2024
Fax (607) 655-4095

Email: VillageofWindsor@Echoes.net

CAP SUMMARY

The Village commits to the following summary plan for the listed CAP items:

- A. The Village will pursue grant opportunities for replacement water meters, and will move to implement the meter replacements including the specified new meters by 2021.
- B. The Village will formalize the draft water estimate/shutoff procedures by June 2020
- C. The Village will formalize and implement the NRW calculations to improve the NRW accounting by June 2020

Sincerely,

Ron Harting

Mayor

CC. Village Board

Mr. Robert McKertich Esq Coughlin and Gerhart Law

Appendix B: Audit Methodology and Standards

We conducted this audit pursuant to Article V, Section 1 of the State Constitution and the State Comptroller's authority as set forth in Article 3 of the New York State General Municipal Law. To achieve the audit objective and obtain valid audit evidence, our audit procedures included the following:

- We interviewed Village officials and reviewed Village policies, Board minutes, water operation reports, and various water financial and billing records to gain an understanding of the water operations related to billing for water usage and monitoring of unaccounted-for water.
- We compared water produced based on master meter readings to billed usage for May 1, 2018 through April 30, 2019 to calculate the amount of unaccounted-for water.
- We used our professional judgment to select a sample of 79 water customers and tested all payments made from March 1, 2019 through May 31, 2019 to determine whether they were properly recorded, assessed appropriate fees and deposited. Our sample was selected based on multiple factors:
 - Two due to the last six meter readings being customer-submitted and billed usages being between 20,000 and 15,000 gallons.
 - Three due to their last meter reading being adjusted.
 - Five due to their April 2019 billed usage being over 20,000 gallons less than their October 2018 billed usage.
 - Four due to their October 2018 billed usage being over 20,000 gallons less than their October 2017 billed usage.
 - Ten due to having both their April 2019 and October 2018 billed usages estimated.
 - Eight due to being multi-unit customers.
 - Ten due to customer names or last names matching Village officials or employees.
 - One due to having a new meter installed.
 - Nine due to being listed as not having a meter.
 - Fourteen due to not having a meter reading since April 2016.
 - Three due to the range in the last five billed usages being over 20,000 gallons and more than twice the historic average.
 - Six due to being relieved on the Village tax rolls in four of the last five years.
 - Four due to the April 2019 billed usage being at least 10,000 gallons lower than the statistically calculated low outlier.

-
- We obtained readings for 31 accounts from July through August 2019 and four accounts from September through October 2019 for 35 accounts in our sample and estimated past billed usage to determine whether bills would increase or decrease.
 - We projected October 2019 billings for 22 accounts by first calculating the average monthly usage between the customer-submitted meter reading for April 2019 and our actual reading from August 2019. We then applied the average monthly usage to the six-month billing period. We then compared our projected bill amounts to the highest billed amounts since October 2016.
 - We calculated the actual usage for 13 accounts between the last customer-submitted meter reading and our actual reading from August 2019. We then estimated historic billing based on the average usage per billing period and compared it to actual billed amounts.
 - We scanned billing records and documented any adjustments made on bills for the October 2018 and April 2019 billings and determined whether they were appropriate and Board-approved by reviewing notes in the billing records and interviewing the Clerk-Treasurer. We followed up with the Board on any adjustments that did not appear appropriate.
 - We compared the calculations used to estimate usage for all customers who did not send in meter readings for October 2018 and April 2019 to determine whether a consistent estimation methodology was used and how it affected the bills.
 - We traced all April 2019 water meter reading entries to billed amounts to determine whether the billing program maintained integrity for calculating water bills.
 - We traced all recorded cash payments made from March 1, 2019 through May 31, 2019 to receipts and bank statements to determine whether all cash payments were properly recorded and deposited intact.
 - We used our professional judgment to select four months (May, November and December 2018 and May 2019) and traced all receipts to bank statements, and all savings account bank activity to water payment receipts, cash receipts journals, and other Village bank accounts to determine whether all activity was properly accounted for and deposited.
 - We traced all 29 unpaid water accounts to tax levies to determine whether unpaid water bills were properly relieved.

We conducted this performance audit in accordance with GAGAS (generally accepted government auditing standards). Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objective.

We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objective.

Unless otherwise indicated in this report, samples for testing were selected based on professional judgment, as it was not the intent to project the results onto the entire population. Where applicable, information is presented concerning the value and/or size of the relevant population and the sample selected for examination.

A written corrective action plan (CAP) that addresses the findings and recommendations in this report should be prepared and provided to our office within 90 days, pursuant to Section 35 of General Municipal Law. For more information on preparing and filing your CAP, please refer to our brochure, *Responding to an OSC Audit Report*, which you received with the draft audit report. We encourage the Village Board to make the CAP available for public review in the Clerk-Treasurer's office.

Appendix C: Resources and Services

Regional Office Directory

www.osc.state.ny.us/localgov/regional_directory.pdf

Cost-Saving Ideas – Resources, advice and assistance on cost-saving ideas

www.osc.state.ny.us/localgov/costsavings/index.htm

Fiscal Stress Monitoring – Resources for local government officials experiencing fiscal problems

www.osc.state.ny.us/localgov/fiscalmonitoring/index.htm

Local Government Management Guides – Series of publications that include technical information and suggested practices for local government management

www.osc.state.ny.us/localgov/pubs/listacctg.htm#lgmg

Planning and Budgeting Guides – Resources for developing multiyear financial, capital, strategic and other plans

www.osc.state.ny.us/localgov/planbudget/index.htm

Protecting Sensitive Data and Other Local Government Assets – A non-technical cybersecurity guide for local government leaders

www.osc.state.ny.us/localgov/pubs/cyber-security-guide.pdf

Required Reporting – Information and resources for reports and forms that are filed with the Office of the State Comptroller

www.osc.state.ny.us/localgov/finreporting/index.htm

Research Reports/Publications – Reports on major policy issues facing local governments and State policy-makers

www.osc.state.ny.us/localgov/researchpubs/index.htm

Training – Resources for local government officials on in-person and online training opportunities on a wide range of topics

www.osc.state.ny.us/localgov/academy/index.htm

Contact

Office of the New York State Comptroller
Division of Local Government and School Accountability
110 State Street, 12th Floor, Albany, New York 12236

Tel: (518) 474-4037 • Fax: (518) 486-6479 • Email: localgov@osc.ny.gov

www.osc.state.ny.us/localgov/index.htm

Local Government and School Accountability Help Line: (866) 321-8503

BINGHAMTON REGIONAL OFFICE – Ann C. Singer, Chief Examiner

State Office Building, Suite 1702 • 44 Hawley Street • Binghamton, New York 13901-4417

Tel (607) 721-8306 • Fax (607) 721-8313 • Email: Muni-Binghamton@osc.ny.gov

Serving: Broome, Chenango, Cortland, Delaware, Otsego, Schoharie, Sullivan, Tioga, Tompkins counties



Like us on Facebook at facebook.com/nyscomptroller

Follow us on Twitter [@nyscomptroller](https://twitter.com/nyscomptroller)