Water Issues That Affect Affordability And Safety In A Community: The Camden Ohio Experience

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ABSTRACT

This study describes the trials and tribulations of an Ohio township involved in maintaining utility rates at an affordable level while dealing with salt intrusion in drinking water wells that supply the Village. Emphasis is on the political, regulatory, and financial issues faced by management. This research deals exclusively with utility rate and water supply issues within the Village of Camden in Ohio when salt is discovered in the fresh water system. The analysis also discusses affordability as village officials decide whether to improve the existing well field, develop a new well field, or purchase water from an alternative supply.

Keywords: affordable water rates; Village of Camden, Ohio; Salt Intrusion; Watershed Protection

INTRODUCTION

In August of 2010, the Village of Camden Ohio discovered salt had infiltrated two of the three wells servicing the community. The small municipality's water supply was affected by contamination derived from a private corporation's poor warehousing of road salt. This action set in motion two years of consternation in the community and the full solution to the situation will take years more to end. The village of Camden immediately discovered the emotional and financial consequences of groundwater contamination on a community.

Camden, Ohio is nestled in southwest Ohio approximately 20 miles north of Hamilton and 30 miles west of Dayton along the border of Indiana. In addition to being the home of the famous "Black Walnut" festival, Camden is the residence of approximately 2,163 citizens. Camden is also the home of the American novelist, Sherwood Anderson, and the creator of the All-American Soap Box Derby, Myron Scott. The median age in Camden is 32.9 years and the median household income is $28,477. When compared to the median household income for the state of $45,395, it is understandable that citizens take cost increases in water and sewer seriously (Camden profile, 2009).

The water emergency in Camden highlights the issues small governments have in supplying highly regulated services to residents. Often small municipal government administrators and elected officials lack the staff support and depth of knowledge required for the highly technical operation and management of utilities as well as the rate studies required for adequate planning and budgeting. In governments, especially those which have two-year terms of office, leadership turnover can impact a utility operation, losing substantial institutional knowledge. A lack of understanding of utility needs may lead to less than desirable oversight, budgeting and staff training. Only when an emergency develops is the import of proper planning realized.

An example of the need for adequate utility fiscal management and rate studies were the problems created in Camden Ohio by a third party waste generator. In Camden, the storage of salt by a private company caused high chloride and sodium levels in the municipal drinking water supply creating any immediate need for urgent action by

municipal leadership. Road salt was being stored uncovered approximately 200 yards north of Camden's wells. Rainwater run-off leached chemicals from the road salt into the aquifer from which the village was drawing water. The failure of the Village of Camden to maintain adequate water rates and risk management planning exacerbated a two year long process which could have been avoided had plans and utility rate structures been in place. The Village of Camden did not have zoning in place, nor had it implemented a wellhead protection plan after a water source assessment by the Ohio EPA, either of which could have guarded against such contamination.

Expensive projects for water, stormwater and sewer systems are often ignored due to political pressure to keep taxes and fees low while implementing more business development, social and recreational services like ball fields and community cleanliness. It is prudent to ensure that utility services are properly funded. The advent of utility funds to ensure consistent funding mechanisms for utility infrastructure was a most important advancement in service delivery. The emergency at Camden pointed out the need for risk management and mitigation not only in the water system, but the stormwater and sewer systems as well. Perhaps underfunded, the water and waste water utilities may have allowed for reduced water quality testing and reporting (Ware, 2010), and may have resulted in early detection and intervention of the problem.

UTILITY RATE LITERATURE

Water is one of the commodities that every household depends upon on a daily basis. Historically, the cost of water in relation to the household budget was miniscule and not a huge concern to families. Over time, issues such as availability, capital expenses, operating expenses, and environmental protection, have added significant costs to the price of water. Therefore, what does a small farming community like Camden Ohio do when a disaster eliminates the source of water utilized by its citizens?

Water affordability is an issue that affects communities nationwide. On August 3, 2010 Camden Village officials notified the Ohio Environmental Protection Agency (OEPA) that salt had been detected in one of the three wells that serviced the Village with water, and affordability immediately became a prominent issue (OEPA, May 8, 2011). Immediately, several questions needed to be answered; how can the village provide water in the short term, in the long term, and how will the service be financed? Village officials faced a daunting challenge that would be expensive and politically charged.

Noted utility pundit, Greg Baird, defined several issues facing government entities in relation to the affordability of water. According to Baird 2010, utilities are struggling with the increasing costs of providing service. There are many debates about how to price services to cover the expenses brought on by government regulations and the costs of providing service. Baird (2010) advocates straight talk about full-price costing to ensure realistic customer expectations, availability of options for those who cannot afford the service, and a long term strategy to reduce costs.

The U.S. Environmental Protection Agency (USEPA) identified an affordability level of 2.5% of household income as a standard budget cap for the purchase of water. The affordability rate for water and wastewater combined is 5%. USEPA advocated full-costs pricing of services to allow utilities an opportunity to strategically plan for replacement and management of utilities. Municipalities must then use social programs to help those in need (USEPA, 2010). With a mean household income of $28,477, citizens of Camden are deemed in the affordable category if the cost of water does not exceed $711.92 per year.

The situation in Camden requires that Village officials determine how water will be funded in the future. According to available literature, a successful rate model must meet requirements of the political, financial, environmental, and strategic plan for the municipality it supports. It is extremely important that the governing body is aware of all cost associated with the operation and maintenance of the utility. Additionally, it is important that charges are appropriate and ratepayers, not general tax payers, cover all costs associated with the utility. According to Gerasimos and Wang (2003), the following goal development process must be met:

- Revenue Generation: the utility must cover its costs and by law can only exceed costs by a limited amount.
- Cost Allocation: the structure for allocation of costs of uses and users.

- Incentive Provision: the extent to which the utility will try to influence the behaviors of users through the rate structure.
- Revenue Stability: the predictability and stability of the revenue flow.
- Administrative Costs: the tradeoff between low administrative costs and a more complex rate structure.
- Transparency: the pricing model must be understandable and provide a clear price signal.
- Reliability: the system provides enough capacity for peak usage and expansion.
- Affordability: the pricing model must be fair and equitable to all users and consider the extent of cross subsidies.

Rate studies are more than just a planning or finance document that aids in the decision making process. Considerations include whether rates are distributed fairly among residential and commercial customers. It is important that accurate data is provided by the entity being evaluated and care must be taken to ensure that all expenses to the utility are truly related to the utility function as charged. Dialogue among organization leaders and the rate study team is a necessity in the planning process. A completed rate study serves as a planning methodology for future capital improvements and utility expansion.

A key tool in utility rate structuring is benchmarking with other agencies using similar utilities and a comparable customer base. However, it must be noted that all utilities are different in some respect and the model must ensure that each community's utilities are self-sufficient and meets the needs of the community. Additionally, many rate structures are developed differently based on the community's strategic plan or basic needs. Base rates and volume rates are structured differently in many communities and meter size varies from system to system. Additionally, the age of the system infrastructure plays a key role in pricing.

A utility rate study is a road map for a designated period of time that helps planners make decisions for capital expansion, addition of new utilities, services provided to the community, and other key elements of the long term strategic plan. Rate studies are accomplished when necessary, but at a minimum when rate increases are anticipated. Additionally, a successful rate model can serve as a tool for what-if analysis by planners. In this instance, a capital improvement projection can be measured to determine impact on rates thus aiding the decision making process. Several questions must be answered prior to beginning a rate analysis. These include:

- What will happen to the customer base over the term of the rate study? Will it increase or decrease? Is there anything projected that will change the customer base?
- Will costs escalate over the rate study term? Are increases or decreases in labor, materials, services, or benefits anticipated?
- Will staffing levels or organizational structure change over the rate period? What is the anticipated level of growth for the organization?
- What staff outside of the utility department support water and sewer through a percentage of their jobs? What is the percentage and can it be justified?
- What contribution will need to be made to utility reserves? What is necessary for emergencies?
- What capital improvements are planned over the rate period?
- What capital replacements are projected?
- What debt service is associated with water and sewer? Are any bonds planned for the future or included in capital expansion or improvement?

It is important to remember that the main goal of a rate study is to ensure the utility is completely self-sufficient. Bond sales can be supported by utility rates, but it is important to note that each utility, water or wastewater, should be able to stand on its own. To dip into general funds to pay utility expenses would add an unfair element as non-users would be forced to pay for a service not rendered. The water and wastewater fund should balance at the end of each year.

The Village of Camden Ohio discovered that it had a utility rate issue the hard way when salt was discovered contaminating the local drinking water. Surviving up to this point on artificially low rates for water, the Village was suddenly confronted with unexpected expenses and no set method to pay for them. This small farming

community with a limited tax base was faced with decisions that affected citizen health and fiscal welfare. Affordability of utilities became a major issue.

CONTAMINATION

The Safe Drinking Water Act of 1974 charged the US Environmental Protection Agency (US EPA) to develop national drinking water standards and reporting procedures for public water systems. The operators of public drinking water systems have a responsibility not only to the public, but state agencies. In Ohio, local government responsibilities include obtaining a drinking water license and approved plan, maintaining a qualified certified operator; testing and reporting the results to Ohio Environmental Protection Agency (OEPA) and customers; notifying both if a violation occurs and correcting compliance issues (Wells and Mancl).

The Source Water Protection Program of the Ohio EPA's Division of Drinking and Ground Waters encourages public water systems to develop local drinking water source protection plans to work in conjunction with a systems assessment phase, consisting of three steps: "(1) delineating the protection area, (2) identifying the potential contaminant sources in that area, and (3) determining the susceptibility of the source water to contamination." (Ohio EPA, 2011 p 2-65)

Contamination may come from a variety of sources including minerals, radioactive material, petroleum products, human or animal waste and viruses. Most water has some types of contaminant but the percentage of contamination is what is important. Tests should occur on a consistent basis to ensure any of these invisible and sometimes tasteless contaminants are not present in the water supply. The maximum containment level (MCL) is the "the highest allowed level of contaminant in drinking" water whereas the secondary maximum containment level (SMCL) is only a guideline for contaminants without adverse health effects but which can cause unpleasant taste, odor or color in the water (Southwest Regional Water District, 2010). The OEPA considers water unpalatable for human consumption as a "water supply emergency".

Stormwater runoff can be a serious threat to water supply due to two major adverse impacts. The first is uncontrolled flooding and the second pollution carried in stormwater. Stormwater runoff may carry pollutants which negatively impact water quality, and may result in fish kills, contamination of recreational waterways and drinking water supplies. According to the Agricultural Extension Service these pollutants can threaten public health (Ohio State University, AEX-442-00).

Pollution prevention consists of source control and runoff control. Source control is to limit or avoid the generation of pollutants. Source control includes proper containment measures, spill prevention and cleanup, and illicit connection control. Runoff control address conveyance systems which are used to drain land areas and direct the flow of runoff to such infrastructure as catch basins, swales, piping and infiltration systems

UTILITY ISSUES – CAMDEN OHIO

The Camden drinking water well field was pumping approximately 254,150 gallons per day from a sand and gravel aquifer at a depth of 5-10 feet below the ground surface. The area around the well is separated into inner and outer protection zones. The inner zone provides groundwater that can be pumped by the well within one year, so it requires rigorous protection. In 2002 the OEPA found the Camden wells to be highly susceptible to contamination and recommended the creation of a source water assessment and protection programs SWAP. (OEPA 2002).

According to the Camden Ohio ground water investigation work plan dated February 16, 2011, elevated levels of sodium were found in Camden's water supply and attributed to the Good Rail & Truck facility. Ohio EPA identified three possible sources; 1) runoff from salt piles infiltrating into the well field, 2) water at the salt piles using dry wells to enter the aquifer, and 3) water traveling through storm drains. To complicate matters, a nearby water tributary, Beasley Creek, was artificially blocked which might have exacerbated the situation. Rod Good Enterprises had removed unpermitted industrial wastewater injection wells at the salt site and replaced them with a horizontal discharge pipe that dumped salty water generated by the facility into a tributary of Seven Mile Creek. This outfall was found to be approximately 200 feet from the Camden public drinking water well.

In August of 2010, the Village of Camden Ohio discovered salt had infiltrated two of the three wells servicing the community. The OEPA ordered Camden to provide citizens with safe and palatable drinking water and OEPA required a plan by September 30 and completion by October 30, 2010. The Village had two alternatives; find or develop a safe well or connect to the Southwest Regional Water District, which serves approximately 15,000 customers mainly in Butler County, but also has customers in southern Preble County (which Camden is part of) and Warren County. Both options came with considerable expenses.

Contamination Time Table

July, 2009- OEPA notified of road salt operations at Good Rail and Truck facility in Camden.
July 21, 2009- Inspection of Good Rail and Truck facility- OEPA noticed subsurface drainage structures or "tanks".
August 2009- OEPA requested engineering plans for the drainage structures.
October 2009-March 2010- "Tanks" removed -found the structures to really be unpermitted industrial waste injection wells, and, Good failed to submit a required closure plan to the OEPA.
March 2010- Good installed a storm drainage system discharging salty water to a ditch within 300 feet of Camden well No. 3 (unknown to Camden and the OEPA) allowing infiltration into the well field. This is considered another unpermitted industrial waste injection well.
August 3, 2010- Village of Camden receives consumer complaints of salty tasting water, and switched from Well No. 3 to Well no. 2.
August 4, 2010- Well No. 3 tests indicated chloride levels 5 times higher than SMCL and Cyanide at half the MCL
August 25- Village switched to Well No. 1 when well No. 2 testing indicated chloride levels 2 times the SMCL.
August 30- Well No. 1 indicated chloride levels above SMCL.
December 2010- EPA issues a Directive to Good Rail and Truck to submit a plan for salt pile removal, and initiate a ground water investigation work plan

(OEPA, 2010)

As a temporary fix, the Village began pumping from the "Klapper Well" on November 19, 2010. This provided an opportunity for Village officials to weigh options prior to implementation of a final solution. Until the salt issue was discovered, the Village operated three wells with one providing service at a time. The OEPA ordered the Village to use the "Klapper Well" on November 19, 2010. This began months of public debate on the cause of this issue and what to do next (OEPA, May 5, 2011)

On December 22, 2010, the OEPA sent "Final Findings and Orders" to Good Rail & Truck Transfer, Inc. of Camden. This "final action" found that Good Rail & Truck Transfer, Inc. caused the salt contamination through various actions involving road salt stored too close to the water supply system for the village of Camden. According to the OEPA, the following facts about the case were identified in the findings in the "Director's Final Findings and Orders".

- Good Rail & Truck Transfer, Inc leases the property in question on North main Street in Camden Ohio.
- Materials at the site include telephone poles, seed mixes, steel, food-grade products, and de-icing salt. The salt is owned by Cargill, Inc. and Central Salt, LLC. Good rail & Truck Transfer builds piles of salt and, when requested, loads the salt into trucks provided by the two aforementioned companies.
- The piles of salt are generally covered, but were left uncovered to facilitate construction at the site.
- The Village of Camden operates a "public water system (PWS)" to obtain drinking water from three (3) wells. This PWS serves approximately 2,302 people in the Village of Camden.
- The site operated by Good Rail & Truck Transfer, Inc. is located within the source water protection zone and approximately 3000 feet north of the well field. .
- An anonymous complaint received by OEPA in July 2009 brought the salt operation to their attention. A July 21st inspection revealed "evaporation tanks" to rid salt piles of stormwater runoff. An August 7th letter from the OEPA requested engineering plans for the subsurface drainage structures and an inspection to determine their structural integrity.
- Between October 2009 and March 2010, Good Rail & Truck Transfer, Inc removed the subsurface structures from operation finding that they were actually "trench drains", or "dry wells". The company was found in violation as the structures were deemed unpermitted injection wells discharging "point source" pollution into ground water.

- The Village of Camden received the first complaint on August 3, 2010. The Village immediately shut down well # 3 and moved production to well # 2. However, subsequent testing on August 4 and 10 revealed contamination of well # 2. On August 25th, the Village discontinued use of well # 2 and shifted production to well # 1. However, tests on well # 1 on August 30th revealed levels of chlorine greater than the secondary maximum contaminant level (SMCL) allowed by OEPA.
- Investigation of the site in August 2010 showed a drain pipe installed by Good Rail & Truck Transfer, Inc. in March 2010 moved water to a ditch within 200 feet of Camden's well # 3. The pipe was damaged and allowing infiltration directly into the subsurface. Good Rail & Truck Transfer, Inc. failed to produce the necessary permits required by OEPA. The following orders were issued by the Director of OEPA (OEPA, December 22, 2010): (a) Good Rail & Truck Transfer, Inc. was prohibited from using the site as a storage area for salt; (b) Good Rail & Truck Transfer, Inc. must produce a plan for salt removal with twenty-one (21) days, (c) A ground water investigation work plan would be prepared within fourteen (14) days. This plan would determine the extent of damage and identify permanent measures to prevent this problem in the future.

The EPA had a well drilling truck positioned in the area to drill, test and seek a new potable water source. The Reynolds group hired by Good felt the best assurance of potable water in the future was remediation of the well field by intercepting the salt plume and treating it at the sewage plant. This would avoid a $1.2 million dollar plan connection fee to the SRWD.

Dilemma Facing Camden

1)	Ensure Citizens have clean, safe drinking water.
2)	Comply with OEPA requirements
3)	Should they drill an alternative well?
4)	Should they connect to SRWD system?
5)	How do they pay for this disaster?

The Village of Camden now faced a dilemma as to whether to seek alternative wells or to connect to the Southwest Regional Water District's water system. An analysis of costs associated with alternatives would require time. The OEPA notified the Village of Camden that they must connect to the Southwest Regional Water District's system, at least temporarily, until a permanent solution could be found. This action could be completed by connecting to a neighboring line that runs within 3,500 feet of the Camden system. At this point, there are no cost estimates available for this action. The OEPA issued permission to research possible alternative well systems on August 20th. The OEPA required that Camden connect to Southwest Regional Water District by September 30th or face fines (Larsen, Aug 26, 2010).

Affordability became an immediate issue when the Village discovered that connecting to the Southwest Regional Water District would cost in excess of $400,000. The engineer's estimate on a notice to bidders dated November 1, 2010 was $1,082,000. The exact costs are unknown but guaranteed to exceed expectations. The Village was forced to seek alternatives. The Klapper well was a temporary fix and not approved by OEPA as a permanent solution. There was a significant cost to purchasing land for a new well system. In a letter dated October 5, 2010 from the OEPA, the Village of Camden was notified that they were not in compliance of a "Findings and Orders" letter from OEPA dated September 14, 2010. The Village tabled payment options for engineering plans required to determine alternative solutions to this issue. The Village's request to delay connection to a viable water source until December 24th does not meet the OEPA requirement of October 30th. The Village was notified that it could face up to $25,000 per day fines if compliance was not sufficient (OEPA, October 5, 2010).

Financing any change in the water system became an immediate issue. Village administrators voted on October 21st, 2010 to raise water rates $5 per month to qualify for available grants. At a previous meeting, a representative of the Ohio Rural Community Assistance program informed officials that the Village did not qualify for grants due to failure to increase rates for a specified time period. The Village was offered the option of an interest free loan for the Ohio Water Development Agency (OWDA). The $5 per month raise satisfied the 2.3% required by OWDA for qualification. (Zimmerman, October 27, 2010) The loan issued by OWDA was eventually used by Reynolds to connect to new well with a budget encumbrance of $1.48 million.

During the October 21st meeting citizens expressed caution where connecting to the Southwest Regional Water District's system was concerned. Village citizens wanted an affordable solution. As noted earlier, the OEPA approved an alternative well, the Klapper well, on November 18, 2010. The Klapper well is extremely high in iron, and although the addition of phosphate in the well's treatment was supposed to alleviate the iron content, some residents brought water to council meetings with iron sediment collected at the bottom of the container. The quality of this water spawned the Facebook page "I want clean water in Camden, Ohio." This action provided time for the Village of Camden to determine if they should connect to the Southwest Regional Water District or search for a new well field, but village water employees had to flush fire hydrants throughout the village to attempt to reduce the iron sediment. Finding a new well in Camden could be a cheaper response, but at this time there was no way of knowing if a suitable site is available. (OEPA, November 19, 2010).

The Village elected not to connect to Southwest Regional's water supply due to failure to reach an acceptable agreement during negotiations. According to council members, the contract would have given the village water, but the water could only be used for drinking. The village could not use the water for firefighting in the contract. Also, according to council members, the connection to Southwest Regional would become Southwest Regional's property after Camden financed it. As noted, Camden elected to connect to a temporary well that was high in iron content. The land for the new well was originally offered to Camden for approximately $150,000. However, Council elected not to purchase the land and it was sold to Jered Corporation. When the Village determined that they would need the land for a well site, the land was offered by to Camden at a price of approximately $450,000. Council originally voted to pay $444,000 for the land, but later changed to file for eminent domain. The Village filed in court for eminent domain and was awarded the land for an unknown fair market value price. Camden hired Reynolds, Inc. The Reynolds contract for the well-drilling and connection was approximately $1.4 million to drill a new well on the purchased land. In the meantime, Camden is spending $1,500 per day to operate the temporary well. Once the new well is completed, a water treatment center will be built (Zimmerman, August 23, 2011).

The Ohio EPA worked diligently to help Camden resolve this issue. On November 19, 2010 the Ohio EPA notified citizens that the Village of Camden would switch to the Klapper Well temporarily. On December 22, 2010 an order was issued to Good truck and Rail Transfer, Inc. that prohibits 1) Good from placing any more salt in storage until a permit is issued, 2) Good must submit within 14 days a work plan that determines the extent of ground water contamination and preventative measure for future contamination issues, and 3) a plan to remove existing salt. The ground water investigation plan was approved by the Ohio EPA on February 24, 2011. The Ohio EPA is pursuing action against Good for missing required deadlines.

The Village of Camden also missed its March 15, 2011 deadline to receive approval for the Klapper Well. Camden was notified that they would be referred to the Director for enforcement for possible action. On April 8, 2011 the Ohio EPA found Good Enterprises in violation of their work agreement. On July 14, 2011 the Ohio EPA met with officials to inform the village of the requirement for water quality data for both the temporary (Klapper) well and the permanent water treatment facility and connection to the system (OhioEPA, May 8, 2011)

The citizens of Camden remained patient through most of the process, but by August of 2011, the issue was over a year old and frustrating residents. The Village Council worked diligently to solve the issue and save taxpayer money. One councilperson contended that collectively they saved over a million dollars by patiently working through the process. However, citizens were left with cloudy water and uncertainty for the future (Zimmerman, August 24, 2011).

On October 20, 2011 Reynolds, Inc. informed the village Council that both new wells were complete and undergoing testing. Their analysis indicated that the water supply still contained a high level of iron, but this was an ongoing Southwest Ohio issue and would not go away. Reynolds informed Council that they were installing connection lines from the new wells. They indicated that a temporary treatment facility would be online by mid-December, but they have not received approval from Ohio EPA for the permanent facility. Reynolds noted that citizens would not see an immediate increase in water quality when the new wells were opened. It will take approximately thirty days for lines to flush and results to be noticed in homes (Zimmerman, October 26, 2011).

The Camden Village maintenance department informed Council on December 15, 2011 that Camden would be connected to its water source by January 2012. This connection would be to the temporary treatment facility while the new facility was completed at the water tower (Zimmerman, December 21, 2011). On March 15, 2011 Council was informed that they would need a wellhead protection plan delivered to the Ohio EPA prior to completion of the permanent treatment facility. It was noted that Ohio EPA could be contracted to write the plan or the Village could solicit Ohio Rural Water Association (ORWA) to work on the plan. Camden is a member of ORWA which should reduce the cost (Zimmerman, March 28, 2012).

The availability and quality of water affects not only daily living, but may impact home sales and business opportunity. Reduction in home sales also impacts a community budget by reducing the taxable income to the community government. City-data.com reported home sales began increasing in 2009 after an economy induced lull but then began a straight line decline third quarter 2010 when the salt water was identified, only increasing again in the second quarter of 2011 after the Klapper well was in use. The median price had dropped from $75,000 when the water concerns first started to $45,000 by late 2010 and picked up to $80,000 in at the end of 2011 (Camden Profile, 2009).

AFFORDABILITY

The main issue as the Village moved forward was affordability as water is becoming an expensive commodity in Camden. The Village of Camden kept water and sewer rates low due to the high percentage of low and moderate income citizens in the Village, with 23.9 percent of residents living in poverty in 2009 (Camden Profile, 2009). For years, citizens enjoyed relatively low cost, low maintenance water from the three wells servicing the Village. According the to 2009 OEPA Sewer and Water Rate Survey of 2004 and 2009, annual residential water rates (based on 7,756 gal./mo.) were $116 from 1993 to 2002 and $358 from 2005 to 2009 (OEPA 2009 and 2004). Water rates have remained less expensive than nearby Gratis, but more expensive than nearby Eaton, and in 2009 rates are on par with the City of Dayton. The connection fees are rather inexpensive at $250.

Camden Village staff reported the current base rate for water is $29.08 for the first 3000 gallons with a fee of $3 per thousand gallons over the base volume. With only two full time public employees in the Village, the water utility personal cost at 15.2% of the Village 2007 personnel budget ($24,312 annually) was a large portion of the Village expenses. The operations budget in 2002 of $100,000 was 12.7% while the sewage operations were 19% (Camden Profile, 2009).

Typically governments are not permitted to obtain bank loans, but instead used bonding to perform infrastructure projects that they otherwise would have insufficient funds to complete. Bonding capability is a difficult task for a small municipality since a community must have substantial ability to repay the bonds as well as bonding capacity available. An alternative source is often state or federal bonds or revolving loan funds where the larger agency funds or bonds the project and the town repays it through a low interest loan. These option require advance planning.

Village Council met to discuss raising sewer rates due to the rising cost of subsidizing citizens from the General Fund on October 6, 2011. They were considering up to a $36 dollar increase. After discussion, there was no increase, but members agreed that the issue had to be addressed in the future. The Village lost a significant percentage of local government funding due to low water rates, which that amounted to approximately $70,000. Council member Kelly Doran indicated that the Village has not raised sewer rates in at least eight years, but subsidized operations every year from the General Fund (Zimmerman, Oct 12, 2011).

The Village used support from the state to seek the best option for the Village. The OEPA Small Systems Technical Assistance Program Annual Report SFY 2011 reported they assisted Camden complete an Ohio Water Development Authority (OWDA) Construction Loan Application and met with Southwest Regional Water to see about a bulk purchase agreement while providing technical assistance to Camden to determine if bulk purchasing or developing well field & water treatment plant was best option. Meanwhile the OEPA's Drinking Water Assistance Fund (DWAF) assist with locating and procuring sources of funding in addition to the Drinking Water Revolving Loan Fund and Emergency Loan Fund. The EPA Wellhead Protection Set-aside Annual Report listed as part of

their accomplishments that staff "participated in numerous meetings related to investigation (by a private consultant) of the chloride plume" and participated in efforts to locate an alternate source of drinking water (the Klapper well) which included using a local domestic well as an emergency public water supply well, assessing proposed new well sites, and encouraging Camden to tie in with a nearby public water system.**.** (Ohio Environmental Protection Agency 2011)

Despite the water problems facing Camden and the need for government funds, on November 30, 2011 Camden officials were notified that the distribution of Local Government Funds (LGF) was even less than Camden anticipated. Council members were especially concerned that the reduction in funds would jeopardize the issuance permits. It was noted that Camden received $39,000 in LGF and that averaged approximately $19 per citizen, in contrast, other agencies received up to $35 per citizen. (Zimmerman, November 9, 2011).

This situation has created expenses that are unfunded and an atmosphere of uncertainty. There are questions to be answered, but it could take years to show results. In the meantime, temporary service, a new well, a treatment plant, and other expenses fall on the citizens and Village. There may be monies from legal action in the future, retroactive grants are a possibility, State funding is possible, but at the moment Village officials are faced with difficult choices and a population that wants clean, affordable water.

INTERGOVERNMENTAL COMMUNICATION

The situation at Camden highlighted that better communication and response is necessary between government agencies when problems arise. All parties involved could have better communicated or responded to communications in a more appropriate manner which may have reduced the impact to the community in both cost and stress. The EPA had knowledge of a possible contamination in July, 2009 yet did not inform the Village of Camden until salt complaints were reported on August 2010. (EPA Camden webpage). Clearly the EPA failed to convey to the Good Company the importance of the salt and stormwater problem and need for permitting of any drainage infrastructure, which "allowed" Good time to install more problematic infrastructure which then caused immediate, severe and possible permanent damage to the well field. Although communication is important, an appropriate reaction is not always the response. According to the Camden Ground Water Investigation Work Plan submitted by Reynolds, Inc., the salt piles were not removed until January, 2011. (Reynolds, 2011)

The Village Council of Camden failed to maintain open communications that sufficiently satisfied its community that they were doing all they could to obtain quality water at reasonable prices.

The EPA did develop a community awareness program using a written "Citizen Advisory" format and providing speakers for community meetings once the drinking water was sufficiently tainted. And, the Good family of companies did hire a communications firm to implement an immediate PR campaign to deflect blame and suggest the Village of Camden was responsible stating "If the Village had adopted zoning or similar resolutions in accordance with [OEPA's suggested Source Water Protection Plan], Rod's company may not have even been allowed to place the salt on the Camden Property" (Good, 2010).

Although an unfortunate outcome at Camden, the result was a survey by the OEPA of all salt piles and permitted community drinking water sources in 2011. The survey had an excellent response of 67% (506) of the 750 letters and emails sent to operators and administrators of susceptible water sources. The results indicate rather limited coordination and implementation of source water assessment and protection programs (SWAP's) with 30% of the respondents coordinating most readily with the health departments (30 percent) and 25% with local emergency response offices. And while almost 12 percent reported SWAP zoning ordinances in place only 11 percent reported implementing source water protection activities were part of a job description. The survey found that a large number of reported updating their contingency with a chemical spills response plan, but only 40 percent felt emergency responders knew of the plan. (Lubberger, 2011).

Delayed Communication Chart

1. Problem at Good Truck and Rail
• July, 2009 OEPA observes salt and drainage structures
• March, 2010 Good exacerbates problem
2. Camden Observes Problem
• August 3, 2010 Camden switches from Well 3 to Well 2
• August 25 Camden switches from Well 2 to Well 1
3. Camden Obtains New Water Source
• November 18, 2010 - Temporary Klapper well is used
• New final well drilled and in operation

The results of the survey and other salt related investigations of SWAP areas since the Camden incident began resulted in 81 in inspections and 10 sites to be further examined, and 5 locations were found where nearby road salt may be causing high chloride concentrations. The Ohio Water Resources Council reportedly asked the State to form a workgroup to determine developing guidance for salt storage facilities and stormwater permits prevent future contamination. (Lubberger, 2011)

At this time the Village has requested the assistance of the RCAP to develop a water rate study and community survey, however, is not yet complete. The Village is receiving water from its permanent well field with a temporary treatment center and must complete an EPA approved source water protection plan for the well field prior to final OEPA approval of the permanent well. (Zimmerman, 2012) They Village requested the EPA to provide technical assistance to write the plan.

CONCLUSION

The emergency at Camden sheds light on what small communities may face in coming years if natural and man-made activities threaten to result in water supply loss. According to the OEPA, the Marcellus Shale in western Ohio is thinner. Ohio is seeing less shale drilling than other states but is likely see an increase in the future since experts predict it may hold natural gas and oil reserves (OEPA 2012). The increase in fracking continues to be of concern to the OEPA (whether it be from the fracking itself or the disposal of fracking fluid) and other states (Helman, 2012). Likewise sea level rise which threatens to create salt infiltration into communities wells in coastal states are a threat to drinking water. The cost of analyzing these threats as well as implementing alternative planning strategies may be costly to utilities. These and any actual threats will have to be considered in ratemaking procedures for local governments and water agencies.

As noted, the Village of Camden was faced with two possible choices. They could connect to a guaranteed source at SRWD and add a substantial financial burden to its citizens, but reduce water source uncertainty. They could also connect to a new well at a reduced cost, but with the risk of a repeat episode at a future date and a delayed clean water source. Neither option was desirable and both came with uncertainty regarding the short term and long term funding mechanisms. The Village Council initially decided to connect to SRWD, but reversed its decision and decided to connect temporarily to the Klapper well while pursuing a new permanent well for the Village's water supply. This turn-about eroded public trust. The Village council was especially raising citizen concerns by meeting in closed door sessions. Although the Council may have felt public discussion of sensitive financing issues and construction options should not be scrutinized in the public eye and may impede negotiations, a transparent policy where it concerns public health and water quality may be warranted to reduce the public's fears.

This paper indicates the need for up-to-date rate studies, municipal leader education and contingency plans for small municipalities. Camden was caught in a financial conundrum when the state determined that a lack of rate studies and utility income and expenditures stopped the Village from immediately obtaining a grant for financial assistance. The emergency also highlights the need for intergovernmental communication between the EPA, health departments and local governments.

While risk management is a necessary component of a utilities program not every risk can be planned for, but even small municipal agencies can develop a comprehensive emergency management operations document.

Small cities can be assisted by EPA and Homeland security tools and templates to develop municipal electric, water and wastewater planning documents to address such problems as sudden failure of the utility system (i.e. contamination, explosions, fire in a treatment plant, drought, etc.). It is recommended that Camden task a capable community group to develop emergency management and hazard mitigation plan for the security of their sewer and water systems. Also, a stormwater pollution prevent plan is recommended which addresses community education and includes business licensing and land-use ordinances to ensure that utility staff know when a business is using hazardous chemicals is within the village. As it is said, an ounce of pollution prevention is worth a pound of cure to protect a local water source.

This research is a base document to support future research in the area of water and wastewater utility pricing. The paper attempts to identify elements of the demand function and pricing methodology that affects utility pricing. While it is virtually impossible to cover every model and variable in a short paper, this research identifies the basic elements of a utility rate study. Future research will explore individual pricing and demand models in an attempt to develop an optimal water and wastewater pricing model.

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