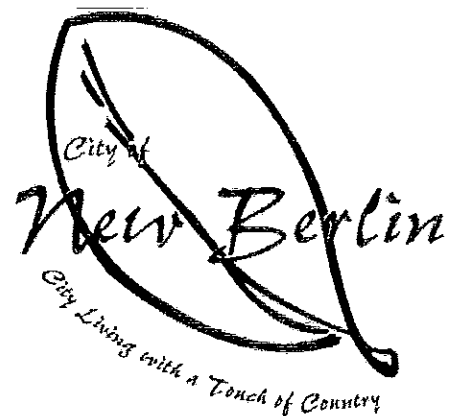


**ANNUAL REPORT OF WATER USE,  
WATER DIVERSION AND RETURN  
FLOW FOR THE CITY OF  
NEW BERLIN, WISCONSIN**

CITY OF NEW BERLIN  
WAUKESHA COUNTY, WISCONSIN

APRIL/2010

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# ANNUAL REPORT OF WATER USE, WATER DIVERSION AND RETURN FLOW FOR THE CITY OF NEW BERLIN, WISCONSIN

## INTRODUCTION

The information contained in this document provides the needed data and related explanations of the data required to satisfy the conditions of the WATER SUPPLY SERVICE AREA PLAN AND DIVERSION APPROVAL issued by the Wisconsin Department of Natural Resources (DNR) dated may 21, 2009. In particular, the data and explanations report the following information for calendar year 2009 for the City of New Berlin (CITY):

1. The total amount of water purchased from Milwaukee.
2. The amount of water sold to each category and the subcategory of customer on a quarterly basis within the City limits.
3. The amount of water sold to each category and the subcategory of customer on a quarterly basis within the approved diversion area.
4. The amount of water diverted to the approved diversion area on a monthly basis (to be estimated by the City).
5. The amount of water pumped from each municipal well from within the City limits on a quarterly basis, noting the basin in which each well is located.
6. Average residential per capita use.
7. A description of the efforts made by the City to improve water conservation and efficiency and minimize the infiltration and inflow into the sanitary system.
8. Estimates of the total monthly sewerage flow within the City.
9. Estimates of the monthly sewerage return flow from within the approved water supply service area and approved diversion area.

The information is presented in nine sections with titles identical to those above. Data is presented in a tabular format preceded by explanation of each table, how the data was obtained and how the data was interpreted using estimating techniques, engineering judgment and data analysis. Table titles first contain the section number they refer to then the number of the table.

## SECTION 1 - THE TOTAL AMOUNT OF WATER PURCHASED FROM THE CITY OF MILWAUKEE

The City of Milwaukee provides all of the water currently used by the CITY. In 2009, the CITY still used groundwater until July for some of their water needs. In July, the improvements needed to allow the entire CITY to be served with Lake Michigan water via the City of Milwaukee were completed, thus allowing for discontinuance of the use of groundwater supplies. These projects were completed following the Diversion Approval mentioned above.

Table 1-1 provides the "Total Amount of Water Purchased from the City of Milwaukee" as measured by Milwaukee and billed to the CITY. Table 1-1 contains two columns, the first listing the month and the second representing the total combined water pumpage from the two Milwaukee water pumping stations serving the CITY. The volumes' reported are in gallons per month and totaled for the year.

SECTION 2 - THE AMOUNT OF WATER SOLD TO EACH CATEGORY AND SUBCATEGORY OF CUSTOMER ON A QUARTERLY BASIS WITHIN THE CITY LIMITS

The CITY records and reports all water sold in a report to the Wisconsin Public Service Commission (PSC) by customer class each year. The four customer classes are Residential, Commercial, Industrial and Public. The CITY can further break these water sales records down by geographic location east and west of the subcontinental divide and by residential units comprised of condominiums and apartments that are tracked as commercial establishments. Table 2-1 provides a breakdown of these water sales on a quarterly basis for the entire City and by the standard PSC customer classes and the subcategories tracked by the CITY.

SECTION 3 - THE AMOUNT OF WATER SOLD TO EACH CATEGORY AND SUBCATEGORY OF CUSTOMER ON A QUARTERLY BASIS WITHIN THE APPROVED DIVERSION AREA

Table 3-1 reports only water used in the Mississippi river basin on a quarterly basis and also provides a breakdown of residential use by condominiums and apartments in the Mississippi Basin.

SECTION 4 - THE AMOUNT OF WATER DIVERTED TO THE APPROVED DIVERSION AREA ON A MONTHLY BASIS (TO BE ESTIMATED BY THE CITY)

Table 4-1 provides the estimates of the diversion amounts. The estimates are based upon actual percentages of total water use for the first six months of the year determined by applying an average factor of 57.3 percent groundwater pumpage and 42.7 lake Michigan water usage from the first six months of the year. This approximates the water use patterns where the groundwater pumpage was Mississippi River basin pumpage and the Lake Michigan pumping stations was Great Lakes basin pumpage for the first six months. For the last six months of the year, the total pumpage was multiplied by .573 to estimate the diverted amount. In July and August, groundwater pumpage was subtracted from that factored number to account for the groundwater pumped. The CITY previously maximized the area where Lake Michigan Water was provided to customers so this method provides a reliable estimate of diverted water pumpage.

SECTION 5 - THE AMOUNT OF WATER PUMPED FROM EACH MUNICIPAL WELL WITHIN THE CITY LIMITS ON A QUARTERLY BASIS, NOTING THE BASIN IN WHICH EACH WELL IS LOCATED

Table 5-1 provides a listing of the current wells that the CITY maintains. The table provides the quarterly pumpage from each well and identifies the basin (Great Lakes or Mississippi) that the well is geographically located in.

SECTION 6 – AVERAGE RESIDENTIAL PER CAPITA USE

Table 6-1 provides a calculation of average residential per capita use. That calculation shows residential per capita use to be 64.39 gallons per capita per day City wide. The calculation takes into account single family residential, condominium residential , and apartment residential and also breaks the information down by basin.



## SECTION 7 – A DESCRIPTION OF THE EFFORTS MADE BY THE CITY TO IMPROVE WATER CONSERVATION AND EFFICIENCY AND MINIMIZE INFILTRATION AND INFLOW TO THE SANITARY SEWER SYSTEM

### Water Conservation

The CITY adopted a Water Conservation Plan on December 8, 2009. A copy of the plan is attached to this document in appendix A. That Plan has six distinct goals to promote water conservation.

- Reduce per capita residential water consumption from January 1, 2008 by not less than ten (10) percent by the year 2020 for utility customers as per an agreement between the City of New Berlin and the Wisconsin Department of Natural resources (WDNR).
- Enable the City to meet future needs of our growing population.
- Protect Ground and surface water supplies from unsustainable depletion.
- Eliminate unnecessary waste in water use practices.
- Reduce wastewater treatment volume and associated municipal expenditures.
- Promote the increased use of harvested and recycled water for irrigation needs through the use of cisterns where appropriate for commercial and industrial development.

Specific accomplishments include the preparation of the plan near the end of the reporting year. That plan includes a savings projected of 9.4 million gallons of water per year by not using water softeners in the diversion area and a savings of 8.7 million gallons by reducing hydrant flushing from twice per year to once per year for a total estimated annual savings of 18.1 million gallons. The CITY also adopted sprinkling restrictions for residents to follow year round. Per capita residential water use decreased city wide from 68.03 in 2007 to 64.89 in 2008 and to 64.39 in 2009. These represent 4.62 percent and 0.77 percent decreases in 2008 and 2009, respectively.

Beginning in April of 2010, the CITY has a toilet rebate program designed to provide incentives for utility customers to abandon 5 gallon per use toilets and install 1.3 gallon per flush toilets. The amount of the rebate is \$100.

With the completion of the conservation plan and use of the CITY web site to provide public education on the need for water conservation, New Berlin is committed to continuing to educate the public. Many previous studies have shown the value of public education is an important component of water conservation efforts. The conservation plan clearly details these efforts.

### Infiltration and Inflow (I/I)

The City has an annual I/I program that has been in place since 1997. The 2009 projects included two large sewer rehab projects and flow monitoring in critical areas of the system to determine the amount of I/I. 2009 I/I study efforts focused on basins 1, 4, 7 and 9. These basins

were identified in previous studies for additional monitoring. The City consultant is preparing a report which is also prepared annually, from the 2009 data. Appendix B contains some additional records of previous expenditures on I/I reduction. The City spent \$1,012,177 in 2009 on I/I reduction. Table 7-1 provides a listing of I/I reduction projects from 2009.

Infiltration and Inflow (I/I) occurs in all sanitary sewerage systems. Infiltration refers to rainwater and groundwater that seeps into the system through defective pipes and joints. Inflow refers to storm water and surface water that enters the sewer directly. Both cause "clear water" to enter the system and increase treatment costs, cause sewer backups, bypassing and overflows.

Wastewater systems all have differing designs, construction, ages and are located in varying climates. With this in mind, there are not national standards for allowable I/I. Rather, EPA has required through the NPDES permit program that all wastewater overflows be eliminated. This requirement has prompted many sewerage systems to take active measures to reduce I/I. The MMSD is one of these.

MMSD addresses I/I reduction by placing limits on peak hourly flow rates. If a metered area exceeds the limits, I/I reduction is required. The requirements for these metered areas, also called "meter sheds" as listed in the MMSD 2035 Facility Plan are:

Sanitary Meter Shed Area ( <u>acres</u> )	Maximum Allowable Peak Hourly Flow Rate ( <u>gallons per acre per day</u> )
Less than 250	18,400
250 to 499	17,700
500 to 999	16,400
1,000 to 2,499	13,700
2,500 to 4,999	9,400
Greater than 5,000	4,000

Based upon the MMSD Facility Plan sewer flows for New Berlin, all areas of the City are currently in compliance with the above limits.

The City of New Berlin annually contracts with a consultant to monitor sewer flows during wet periods and prepare a report quantifying I/I. Preliminary results of the 2009 flow monitoring plan and analysis of flows by the city's consultant are provided in Appendix C.

Precise quantification of I/I is impossible with today's technology. Area and velocity flow meters are used annually by the City to derive estimates of I/I by basin and sub-basin. These meters replace older style "level only" meters and are considered to be more accurate. Still, the environment in which they are placed has flooding, toxic gases, high levels of solids and other impairments which readily affect the meters performance. Data that is collected must be collated and suspect data discarded. The remaining reliable data is then professionally analyzed and reasonable professional estimates of I/I can then be made. This is the program used by New Berlin.

The most current estimates of I/I by the City's consultant indicate that total average daily sewer flows are 6.025 MGD. The attached email correspondence from the City and R.A. Smith indicates how they arrived at this figure. Using basin monitors this flow can be divided into flow east and west of the sub continental divide. We estimate 2.877 MGD of flow for the eastern portion and 3.148 for the western portion of the sewer service area. This was determined by using all of the flow from basins 5 and 6 (Meter 5A) and 50 percent of the flow from basin 7 (Meter 7B). Based upon 2009 metered water use and estimates of sewerage flow the following average daily flows and I/I estimates can be derived:

	<u>Water Pumpage</u>	<u>Sewer Flows</u>	<u>I/I</u>
East of Divide	1.205 MGD	2.877 MGD	1.672 MGD
West of Divide	1.617 MGD	3.148 MGD	1.531 MGD
Total	2.822 MGD	6.025 MGD	3.203 MGD

These are the most current and accurate estimates of I/I available for the City of New Berlin. These volumes change regularly and there will be differing estimates each year depending on a number of factors including groundwater levels and precipitation amounts and severity of precipitation events.

The City has spent \$19.5 million since 1997 on I/I reduction efforts. This includes all capital projects for manhole rehabilitation, studies and sanitary sewer replacement or relining. They received only 1 of 2 awards given by MMSD for their I/I reduction efforts in 2003. There are current budgeted amounts of \$1.0 million and \$0.9 million for 2010 and 2011 respectively. Listings of past projects are attached. Future projects will focus on higher I/I areas as identified by annual studies.

New Berlin ranks 5<sup>th</sup> out of 29 communities in expenditures for I/I reduction. This places them well ahead of many larger and older communities with more I/I.

It is important to realize that the I/I will occur and transmit some quantity of water across the basin divide. It is more important to realize that approval of the diversion has eliminated about 2.0 MGD of pumped water from outside the basin flowing into the basin on a daily basis. This, coupled with the strong commitment to reducing I/I by New Berlin, as evidenced above, absolutely minimizes the amount of water entering the basin from outside the basin.

Going forward, New Berlin proposes to monitor the amount of water used inside and outside the basin by customer water meter. Further, they propose to continue with the annual I/I quantification studies and will use the results of those studies to estimate I/I on both sides of the divide. This information will be available on an annual basis for the previous year.

#### SECTION 8 – ESTIMATES OF TOTAL MONTHLY SEWERAGE FLOW WITHIN THE CITY

Appendix C contains excerpts from an email provided by R.A. Smith to the City on Sewerage flows. These estimates were developed based upon metering performed by that firm and by MMSD during 2009. Please note the estimated monthly sewerage flow City wide is 180.75 million gallons over a 30 day period or 2.199 billion gallons per year.

SECTION 9 – ESTIMATES OF THE MONTHLY SEWERAGE RETURN FLOW FROM  
WITHIN THE APPROVED WATER SUPPLY SERVICE AREA AND DIVERSION AREA

Table 9-1 provides estimated flows both in the great Lakes basin and Mississippi basin. The estimates assume all of basin 5 and 6 and 50 percent of basin 7 provide sewerage flows from the Mississippi basin, and the remaining flow is from the Great lakes basin.

Table 1-1

Total Amount of Water Purchased From the City of Milwaukee  
 Annual Report of Water Use, Water Diversion and Return Flow - 2009  
 City of New Berlin, Wisconsin

Month	Monthly Total Amount of Water Purchased From The City of Milwaukee
January	37,384,000
February	33,479,000
March	38,028,000
April	26,269,000
May	38,593,000
June	47,737,000
July	82,039,000
August	98,503,000
September	95,048,000
October	77,814,000
November	56,222,000
December	73,827,000
Total Annual Pumpage	704,943,000

Source:

City of Milwaukee, Wisconsin Public Service Commission

Table 2-1

Amount of Water Sold to Each Category and Subcategory of Customer on a Quarterly Basis Within the City Limits - 2009  
 Annual Report of Water Use, Water Diversion and Return Flow - 2009  
 City of New Berlin, Wisconsin

	Major Category (all numbers are total gallons sold)				Total
	Residential	Commercial	Industrial	Public	
1st Quarter 2009	112,558,000	91,346,000	15,604,000	3,825,000	223,333,000
2nd Quarter 2009	117,205,000	82,430,000	13,864,000	3,289,000	216,788,000
3rd Quarter 2009	168,695,000	95,559,000	15,728,000	2,998,000	282,980,000
4th Quarter 2009	104,090,000	72,025,000	12,668,000	2,793,000	191,576,000
Total	502,548,000	341,360,000	57,864,000	12,905,000	914,677,000

	Residential Subcategory (all numbers are total gallons sold)		Totals
	Great Lakes Basin	Mississippi Basin	
1st Quarter 2009	72,480,000	40,078,000	112,558,000
2nd Quarter 2009	76,820,000	40,385,000	117,205,000
3rd Quarter 2009	117,639,000	51,056,000	168,695,000
4th Quarter 2009	70,046,000	34,044,000	104,090,000
Total	336,985,000	165,563,000	502,548,000

	Condominium and Apartment Subcategory of Commercial Category		Totals
	Great Lakes Basin	Mississippi Basin	
1st Quarter 2009	16,122,000	24,115,000	40,237,000
2nd Quarter 2009	13,562,000	21,070,000	34,632,000
3rd Quarter 2009	15,728,000	24,476,000	40,204,000
4th Quarter 2009	12,695,000	19,038,000	31,733,000
Total	58,107,000	88,699,000	146,806,000

Source: City of New Berlin, Wisconsin



Table 3-1

Amount of Water Sold to Each Category and Subcategory of Customer on a Quarterly Basis Within the Approved Diversion Area - 2009  
 Annual Report of Water Use, Water Diversion and Return Flow - 2009  
 City of New Berlin, Wisconsin

	Major Category				Total
	Residential	Commercial	Industrial	Public	
1st Quarter 2009	40,078,000	63,524,000	15,604,000	3,135,000	122,341,000
2nd Quarter 2009	40,272,000	56,855,000	13,859,000	2,621,000	113,607,000
3rd Quarter 2009	51,056,000	66,577,000	15,728,000	2,786,000	136,147,000
4th Quarter 2009	34,044,000	49,647,000	12,668,000	2,340,000	98,699,000
Total	165,450,000	236,603,000	57,859,000	10,882,000	470,794,000

Condominium and Apartment Subcategory of Commercial Category	
1st Quarter 2009	24,115,000
2nd Quarter 2009	21,070,000
3rd Quarter 2009	24,476,000
4th Quarter 2009	19,038,000
Total	88,699,000

Source: City of New Berlin, Wisconsin

Table 4-1

Amount of Water Diverted to the Approved Diversion Area on a Monthly Basis  
 Annual Report of Water Use, Water Diversion and Return Flow - 2009  
 City of New Berlin, Wisconsin

Month	Estimated Amount Diverted in Gallons
January	None
February	None
March	None
April	None
May	None
June	None
July	34,116,000
August	55,706,000
September	54,463,000
October	44,587,000
November	32,215,000
December	42,303,000

Source: City of New Berlin, Wisconsin and Ruekert & Mielke, inc.



Table 5-1

Amount of Water Pumped From Each Municipal Well Within the City Limits on a Quarterly Basis  
 Annual Report of Water Use, Water Diversion and Return Flow - 2009  
 City of New Berlin, Wisconsin

Well Number and Name	Basin Well is located In	Well Pumpage in Gallons			
		1st Quarter 2009	2nd Quarter 2009	3rd Quarter 2009	4th Quarter 2009
Well no. 2 - Glen Park	Mississippi River	32,525,000	33,727,000	7,357,000	0
Well no. 3 - Rogers Drive	Mississippi River	8,846,000	13,505,000	5,304,000	0
Well no. 5 - Regal Main	Mississippi River	0	0	0	0
Well no. 7 - National Avenue	Mississippi River	5,147,000	2,777,000	958,000	0
Well no. 8 - Valley View East	Great Lakes-St Lawrence	43,856,000	47,973,000	8,709,000	0
Well no. 9 - Valley View West	Great Lakes-St Lawrence	29,382,000	31,148,000	5,715,000	0
Well no. 10	Mississippi River	21,162,000	23,935,000	4,129,000	0

Source: City of New Berlin

Table 6-1

Average Residential Per Capita Use  
 Annual Report of Water Use, Water Diversion and Return Flow - 2009  
 City of New Berlin, Wisconsin

Basin	Cust Class	2009 Quarter (Use in Gallons)				Total	Population	Average Residential Per capita Use in Gallons per Day
		1st	2nd	3rd	4th			
Great Lakes	C-CONDO/APT	16,122,000	13,562,000	15,728,000	12,695,000	58,107,000	3,304	
Great Lakes	R Residential	72,480,000	76,820,000	117,639,000	70,046,000	336,985,000	13,527	
	TOTALS					395,092	16,831	64.31
Mississippi	C-CONDO/APT	24,115,000	21,070,000	24,476,000	19,038,000	88,699,000	3,458	
Mississippi	R Residential	40,078,000	40,272,000	51,056,000	34,044,000	165,450,000	7,337	
	TOTALS					254,149,000	10,795	64.50
	Combined City Wide Residential Per Capita Water Use					649,241,000	27,626	64.39

Source: City of New Berlin, Milwaukee Metropolitan Sewerage District

Table 7-1

Water Conservation Efforts and I/I Reduction Efforts  
 Annual Report of Water Use, Water Diversion and Return Flow - 2009  
 City of New Berlin, Wisconsin

Project Title	Work Involved	Project Expenditures
Glendale Road	Sewer Rehabilitation, Relining and Manhole Repairs to Reduce I/I	\$711,000
Deer creek Interceptor	Sewer Rehabilitation, Relining and Manhole Repairs to Reduce I/I	\$247,945
I/I Study	Perform Monitoring of Basins identified as having I/I and Report Results	
	Total 2009 Expenditures	\$958,945

Source: City of New Berlin, Wisconsin

Table 9-1

Estimates of the Monthly sewerage return Flow From Withing the Approved Water Supply Service Area and approved Diversion Area  
 Annual Report of Water Use, Water Diversion and Return Flow - 2009  
 City of New Berlin, Wisconsin

Basin	Average Daily Flow (MGD)	Monthly (30-Day Flow Gallons)	Annual Flow (Gallons)
Great Lakes Basin	2.877	86,310,000	1,050,105,000
Mississippi River Basin	3.148	94,440,000	1,149,020,000
Total	6.025	180,750,000	2,199,125,000

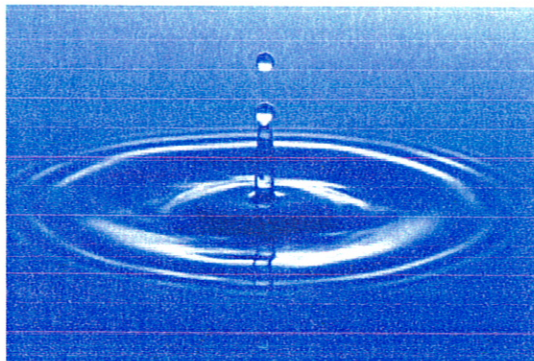
Source: R.A. Smith, City of New Berlin, Milwaukee Metropolitan Sewerage District, Ruekert & Mielke, inc.

# **Appendix A**

## **Water Conservation Plan**



# City of New Berlin Water Conservation Plan



**Prepared By: Gregory W. Kessler, AICP  
Director  
Department of Community Development**  
*(With assistance from the New Berlin Mayor's Office, Department of Community Development staff,  
Utility Department and Utility Committee)*

*Adopted by the New Berlin Common Council on 12/8/09*

## **WATER CONSERVATION PLAN MISSION STATEMENT**

To promote water conservation and protection measures throughout the City of New Berlin to ensure a viable and healthy water supply for future generations.

### **Goals:**

- o Reduce overall water consumption.
- o Enact water protection / conservation ordinances and codes.
- o Protect wellhead recharge areas.
- o Provide incentives for water conservation.
- o Promote 3-Dimensional (groundwater, storm water and surface-water) water management.
- o Implement good storm water Best Management Practices ("BMPs") that enhance recharge areas.

## **INTRODUCTION**

This document presents the City of New Berlin's ("City") Water Conservation Plan. Over the years, the City, as well as the Southeastern Wisconsin Regional Planning Commission (SEWRPC) have conducted a number of water supply studies. All of these studies are referenced in one form or another throughout this document.

New Berlin is uniquely positioned within southeast Wisconsin as it straddles the "Sub-Continental Divide", which runs north-south through the eastern part of the City. Nearly 27 square miles in the western part of the City, or about 73 percent of the City's total land area, is located in the Fox River Watershed. This portion is west of the Sub-Continental Divide and part of the Mississippi River Watershed. The remaining City land area is tributary to the Great Lakes / St. Lawrence River drainage basin.

The Utility Service Area is supplied with water from Lake Michigan which is purchased from the Milwaukee Water Works. In this portion of the City wastewater is returned to Lake Michigan via the Milwaukee Metropolitan Sewerage District sewer system. The western portions of the City, outside of the Utility Service Area, use groundwater / private wells as their water supply source. Four municipal wells are being maintained to act in a reserve capacity. The groundwater that is acquired from these wells is found in two distinct shallow water bearing geologic formations or aquifers. The water from these aquifers is radium compliant.

New Berlin is located within Waukesha County, one of the fastest growing counties within the southeast Wisconsin region. The County's population in 2005 was 377,348. New Berlin is the sixth largest city in terms of land area in the state and the third most populated municipality in the County with a 2005 population of 38,969. Population trends for New Berlin indicate an approximate two to three percent increase in five year increments out to 2020. At that point in time, the estimated New Berlin population is expected to be 42,228. The City has experienced steady, moderate growth over the past 20 years.

There are three City entities that are involved with water conservation and water resource protection; they include the Water Utility, Department of Community Development (DCD) and the Water Resources Management Utility (a division of DCD).

*The Mission of the Water Utility is to be the responsible custodian for and to provide a good quality, potable water supply at adequate pressures and in sufficient quantity for consumption and fire protection purposes, to all current and future Utility customers consistent with State/Federal Regulations and water industry practices and standards, in the most cost effective manner possible, and to educate the public about the benefits of being a good water use steward.*

*The Department of Community Development promotes and maintains the careful development of land, and preservation of the natural resources in the City of New Berlin. To accomplish this, the Department is involved in both current and long-range land use planning, engineering, building and capital improvement planning. This Department regulates every aspect of the development/construction process. DCD reviews, documents, permits, regulates and inspects all development/construction activity in the city. These efforts include reviewing and documenting development, economic development, geographic information systems (GIS)/land information systems (LIS), zoning enforcement, building inspection, construction/field inspections for new development, capital planning, mapping and in-house capital project design. It also includes the dissemination of this information to the public, working and coordinating with county, regional, state, and federal officials.*

*The long-term vision of the Water Resources Management Utility is to "promote a three-dimensional approach to efficiently and effectively manage storm water and to protect the water resource needs of the City of New Berlin". The Utility's Mission is dedicated to the management, construction, maintenance, protections, control, regulation, use, and enhancement of storm & surface water systems, flood protection, water quality, and groundwater recharge through education, coordination, development, maintenance and management of projects & programs in concert with other community development programming in an efficient and cost effective manner that considers the needs for protection of public health, private property, the natural environment, and economic development.*

## **PURPOSE OF THE PLAN**

The City has developed a Water Conservation Plan in order to be good stewards of a finite resource. Its loss can impact the quality of life for residents and dramatically affect policy decisions. In order to maintain quality of life and economic activity, a sustainable water supply is needed. To be good stewards, the City should conserve water by working closely with all residents and businesses to promote water conservation, and work with other governmental jurisdictions in the region to effectively manage water resources.



To this end, the City views water resource management three-dimensionally. That is the protection & management of our groundwater, surface water and storm water through various means and methods. The City has set the following Plan goals to promote water conservation:

- ⇒ Reduce per capita residential water consumption from January 1, 2008 by not less than ten (10) percent by the Year 2020 for Utility customers as per an agreement between the City of New Berlin and the Wisconsin Department of Natural Resources (WDNR)
- ⇒ Enable the City to meet future needs of our growing population
- ⇒ Protect ground and surface water supplies from unsustainable depletion
- ⇒ Eliminate unnecessary waste in water use practices
- ⇒ Reduce wastewater treatment volume and associated municipal expenditures
- ⇒ Promote the increased use of harvested and recycled water for irrigation needs through the use of cisterns where appropriate for commercial and industrial development

Much of this Plan was developed by referencing the numerous water studies and current, relevant industry materials that are available. According to our Department's records, twenty-two (22) studies at a cost of over \$500,000 have been conducted analyzing and studying water issues in New Berlin. This does not include the current ongoing work related to the redevelopment of the New Valley Sand & Gravel quarry site (Mill Valley Business Park). There will be a geo-technical component to that report. A comprehensive list of recent water studies conducted for New Berlin can be found in Appendix A.

### **WATER UTILITY ACCOMPLISHMENTS**

The Water Utility has worked hard to reduce water usage to help conserve a very valuable resource. We have in place an odd-even sprinkling schedule citywide to reduce water usage to lawns and gardens. In addition, we have a program in place whereby we change out water meters on a 10-year cycle instead of the 20-year program that the PSC requires. Changing the meters on a 10-year cycle ensures more accurate water consumption usage totals. Now that water utility customers are supplied with Milwaukee Water throughout the entire service area, the Utility will see reductions in water usage as follows:

1. 90% of all customers will NOT USE water softeners
  - ⇒ 180 gallons of water passes through every time the softener runs
  - ⇒ 9.4 million gallons of water will be saved by not using softeners
2. 8.7 million gallons will be saved annually due to the reduction of hydrant flushing from twice per year to once per year.

A total of 18.1 million gallons of water will be saved annually with just these two changes. Since 2006, the Utility has seen a decrease in the total water pumpage from municipal wells by approximately 189,071,000 gallons or a 14.6% reduction. In

addition, the single day maximum / peak pumpage by gallons from 2006 thru 2008 has dropped by approximately 1,239,000 gallons for a 20.5% reduction.

### **CURRENT REGULATIONS AND ACTIVITIES**

Current development standards, regulations and activities are already being implemented within in the City. The goal of this plan is to expand on the current City actions and implement additional water conservation strategies. Below is a list of current City initiatives:

- ⇒ Codes/ordinances – numerous City regulations are in place to protect water quality and quantity. These ordinances follow DNR requirements for storm water management.
- ⇒ Sprinkling restrictions – the Utility Department has enacted sprinkling restrictions for residents to follow year-round. The restrictions are as follows: even numbered addresses water on even days of each month and odd numbered addresses water on odd days of each month.
- ⇒ Utility activities – the Utility Department utilizes the City webpage to provide information to residents. The webpage includes information on water conservation, kids activities to learn more about water, a water drip calculator and sprinkling restrictions. The Utility Department has also placed informational articles in the City's "Leaflet" quarterly newsletter, and has included conservation techniques in the City's Annual Water Quality Report. The department also offers free "leak test" for customers to have their toilets or water softeners tested for leaks. New meters that are currently being installed have a "leak detection" feature on them for residential and industrial usages.
- ⇒ Development/land use regulations – The Department of Community Development encourages low-impact development techniques when reviewing projects. The Zoning Code has minimum open space requirements to limit the amount of impervious surface on development sites. Alternative storm water Best Management Practices ("Bumps") that use vegetation to naturally infiltrate the ground are also encouraged.
- ⇒ Wellhead protection – the City also has a Wellhead Protection Area in the southeast portion of the City. This area is important to groundwater recharge and regulations are in place to protect the groundwater in this area.
- ⇒ 3-D Storm water regulations (groundwater, surface water and storm water) – the City's ordinances and codes are in place to protect the City's water resources. The regulations work to promote protection of groundwater, surface water and storm water. The DNR regulates many activities surrounding these resources and the City's regulations adhere to the DNR requirements. Currently the City has a storm water management ordinance (Ord. #2193) to set storm water management requirements, an erosion control ordinance (Ord. #2268) to prevent erosion from construction sites and a post-construction storm water management ordinance (Ord. #2267) to prevent erosion for the long-term after construction. The City also has an illicit discharge ordinance to prevent and remedy any illegal

discharges to the storm drain system. The Wellhead Protection area is in place to protect groundwater recharge areas.

- ⇒ Public awareness/education – the City utilizes the website, “Leaflet” newsletter and mailing inserts to promote water conservation and protection. See the above section regarding the Utility Department’s activities. The Water Resources Management Utility (WRM) has partnered with a number of other communities from Kenosha, Racine, Milwaukee and Waukesha counties (known as the Root-Pike Watershed Initiative Network) to conduct programming to work to protect, restore, and sustain the ecosystems of the Root River and Pike River. The City recently hosted a Rain Garden Workshop that educated participants on ways of keeping storm water runoff from polluting streams, rivers and lakes by learning how to build and maintain a rain garden. The WRM is also involved in a number of other educational initiatives in relation to the City’s Wisconsin Pollutant Discharge Elimination System Permit (WPDES) ranging from neighborhood meetings, development reviews to discussing local water resources issues to newsletter articles.

### **WISCONSIN'S GREAT LAKES COMPACT**

The Great Lakes Basin is comprised of Lake Erie, Lake Huron, Lake Michigan, Lake Ontario, Lake Superior and the St. Lawrence River – represented by eight (8) Great Lakes states and two (2) Canadian Provinces (Minnesota, Wisconsin, Illinois, Indiana, Ohio, Michigan, Pennsylvania, New York, Quebec and Ontario). The Compact, in and of itself is significant as it encompasses ten (10) jurisdictions across international boundaries that have collectively agreed to manage the largest surface freshwater resource in the world. This is the first multi-jurisdictional agreement of this type in the world.

Each state and/or province adopted statutes further implementing the Compact within their respective jurisdictions. The Wisconsin Legislature adopted Act 227 in early 2008. Governor Doyle signed the law into effect on May 27, 2008. Wisconsin Act 227 adopts text of the Compact into state statute and provides implementation provisions for both pre and post Compact. In summary, Act 227 now regulates:

- ⇒ “Interbasin Transfers”
- ⇒ New Statewide Water Supply Planning for Public Water Supply Systems
- ⇒ New Statewide Water Use Regulations & Reporting System
- ⇒ New In-basin Water Use Permitting System; and
- ⇒ New Water Conservation and Efficiency Program

As a complimentary document to Wisconsin Act 227, the Southeastern Wisconsin Regional Planning Commission (SEWRPC) has prepared a draft Regional Water Supply Study. The complete study can be referenced on the SEWRPC website via the following link <http://www.sewrpc.org/water/watersupplystudy>. The scope of this study is as follows:

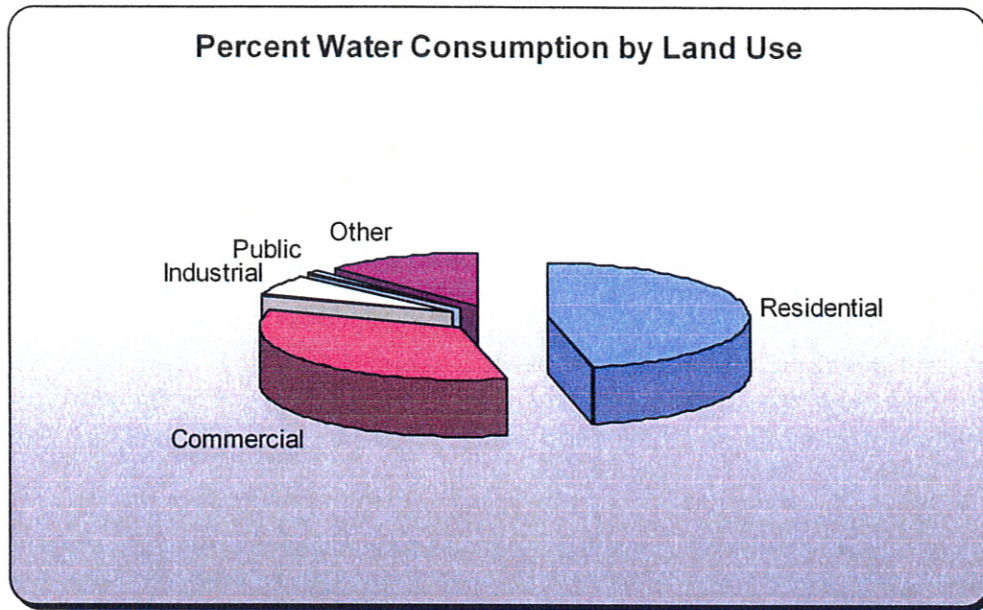
- ⇒ Forecast future water use demand in the Region
- ⇒ Consider potential of water conservation to reduce future demand
- ⇒ Identify groundwater recharge areas which should be protected from development
- ⇒ Assess potential for shallow groundwater recharge through infiltration of storm water runoff
- ⇒ Consider potential alternative sources of supply
  - Shallow groundwater
  - Lake Michigan water replacing groundwater east of the sub-continental divide
  - Lake Michigan water replacing groundwater in “straddling communities” which already have “return flow”
  - Lake Michigan water replacing groundwater in “straddling communities” and “communities in straddling counties” and providing for “return flow”
- ⇒ Estimate costs and impacts of alternatives
  - Groundwater-Surface Water Interdependence and Impacts
- ⇒ Identify any development constraints necessary to assure water supply sustainability
- ⇒ Amend regional land use plan if necessary.

The Regional Water Supply Study has identified and evaluated seven (7) different scenarios for providing adequate and clean water supplies to the region. It is important that this Plan be used as a guide as future water resource planning and conservation policy decisions are made.

#### **EVALUATION OF HISTORICAL WATER USAGE AND PAST & CURRENT CONSERVATION MEASURES**

In 2008, the breakdown, by use, for City Water Utility customers is as follows:

⇒ Residential	47%	
⇒ Commercial	34%	
⇒ Industrial	6%	
⇒ Public	1%	
⇒ Other	12%	<i>(Hydrant flushing, equipment malfunction, lost water, meter inaccuracies)</i>



Source: New Berlin Water Utility

According to numbers provided by the City's Water Utility Department, the total yearly pumpage from municipal wells was as follows:

- ⇒ 2005            1,216,117,000 gallons
- ⇒ 2006            1,291,714,000 gallons
- ⇒ 2007            1,162,095,000 gallons
- ⇒ 2008            1,102,643,000 gallons

Source: New Berlin Water Utility

The maximum pumpage (in gallons – highest day) for the last four years were:

- ⇒ 2005            5.6 million gallons
- ⇒ 2006            6.0 million gallons
- ⇒ 2007            5.6 million gallons
- ⇒ 2008            4.8 million gallons

Source: New Berlin Water Utility

Water usage is tracked by quarterly billing to show high consumption with a high/low report for residential and industrial usage. The average residential water use per residential customer in New Berlin for 2007 was 70 gallons per customer per day (gpcd).

New Berlin has moved ahead with its water conservation measures whether it be through promoting and/or limiting water usage and loss or through land use planning, storm water management and development review. Utility activities implemented to date include:

- ⇒ Sprinkling restriction in effect year round

- ⇒ Notices of sprinkling restrictions on the City's website, quarterly leaflet, utility billings and on the local access cable channel
- ⇒ Leaflets available on the City website and references in the annual consumer confidence report
- ⇒ Rain barrels
- ⇒ Fixture replacement rebate program
- ⇒ Conduct annual water audits assessing utility system water losses
- ⇒ Leak detection program
- ⇒ Flag significant quarterly changes in water meter readings
- ⇒ Meter individual multi-family and residential condominium units
- ⇒ Replace water meters on a 10 year cycle
- ⇒ A water rate service charge that includes certain fixed charges but no water use, encouraging even those with lower water use to conserve
- ⇒ Adoption of the Storm water Management Ordinances
- ⇒ Water rate requests to the Public Service Commission reflecting full cost pricing
- ⇒ There are no bulk water sales within the Utility service area.

#### **LAND USE PLANNING, STORMWATER MANAGEMENT AND DEVELOPMENT REVIEW MEASURES**

The following is a summary of several ways that the Department of Community Development (DCD) furthers water conservation efforts here in New Berlin through the regulation of land use, storm water management and construction activities. Many of these items described below are not directly related to water conservation "per se" but, they do reflect our efforts surrounding water preservation and improving water quality.

The Department of Community Development (DCD) literally aids in the coordination and regulation of all construction activity within the city. The DCD also establishes and coordinates compliance with all storm water regulations. The DCD practices what we call "*three-dimensional water resource planning*". Focusing efforts on protection of groundwater, surface water and storm water resources.

Many of the water studies listed in Appendix A of this report have been utilized over the years in refining the City's Comprehensive Plan and utility needs. This was especially true during the preparation of the Growth and Development Master Plan update to the City's 1987 Comprehensive Plan. Since that time, DCD has been involved in the following initiatives and/or ways of promoting Low Impact Development (LID) in order to preserve our water resources.

- ⇒ The Department promotes the use of alternative "Best Management Practices" ("BMPs") for handling storm water. The encouragement of "green-roofs", bio-retention swales, rain gardens, rain barrels and "prairie restorations", all promote habitat restoration and groundwater recharge. The Department has effectively promoted these ideals over the past two or more years. For example, the Settler's Ridge Subdivision located off of Wehr Road is 15 lots on 75 acres. Our Department required the developer to restore and enhance the open space into a

"prairie habitat" that will be forever preserved offering not only visual benefits but functional as well, for overland flow of storm water allowing for groundwater recharge.

- ⇒ The Department has over the past several years, developed a number of ordinances and policies to assist in our efforts to promote "*Three-Dimensional Water Resource Planning*". This is the protection of groundwater, surface water and managing storm water conveyance. With assistance from Mr. Randall Arendt (one of the nation's foremost experts in conservation subdivision design & development), the City developed a conservation subdivision ordinance that requires that 75% of lands in any given conservation subdivision be set aside for permanent open space preservation for those without public utilities. For those conservation subdivisions with public utilities, our ordinance requires that 65% of the land be set-aside for permanent preservation. To the best of our knowledge, this is one of, if not the strictest conservation requirements within the State in terms of minimum open space requirements. Our ordinance also allows a transfer of density option in order to preserve additional open lands while allowing compensation to the parcels giving away their development rights. In the past, the Department has proposed a purchase of development rights program. However, that program was not funded.
- ⇒ The Deer Creek Inn & Conference is a mixed-use development being constructed on the southwest corner of Moorland Road and Greenfield Avenue and will offer a 405 room hotel, indoor water park, conference center, restaurants and retail shops. Our Department has worked with the developer to include, as part of this development, a "roof-top rain garden / green-roof" that will cover approximately 75% of the roof. The "roof-top rain garden / green-roof" will collect water and transfer it into cisterns located in the lower level. That captured water will then be used to water the landscaping on site and keep the wetlands adjacent to the development within Deer Creek hydrated. In addition, the ramps and walkways will be heated with excess heat from the water park so that no salt will be used during the winter to melt ice.
- ⇒ Another example of how "BMPs" have been incorporated into a new development is the recent Living Word Church project. They are installing bio-infiltration swales that will contain engineered soils. These swales will be planted to follow DNR Technical Standards. They will also have temporary diversion swales during construction, which will protect the bio-infiltration swales.
- ⇒ The recently approved Crossroads Community Church is an additional example of the incorporation of "BMPs". This project will include bio-infiltration swales with engineered soils. A portion of the parking that will be used for larger church services will be grass covered with geo-blocks. This will help treat runoff as it comes off the parking lot before it enters the storm water ponds.
- ⇒ A recent project in the New Berlin Industrial Park was a Dog Day Care. This was a new use to the City. In working with the applicant, Staff had some concerns about the amount of animal waste and runoff from chemicals that this site would generate. Working collectively, DCD staff, DNR staff and the applicant worked on incorporating a rain garden and the proper use of environmentally friendly



chemicals that do not degrade water quality and do not negatively impact the drainage ways and watershed.

- ⇒ Through continuing education, the Department is beginning to learn more about applying the standards found under the Leadership in Energy Efficient Design (LEED) program. With the recently approved Willowtree Development, an approximately 350,000 square foot building, the developer coordinated with our Department and was able to incorporate storm water "BMPs" into the site design and also various LEED design criteria. Besides incorporating energy efficient elements into the building's construction, the property will also be water efficient in terms of watering its landscaping. Water usage will be reduced by 50% or more for the site's landscaping. Irrigation water will be used from the retention pond. In addition, a portion of the parking used for overflow parking will be grass covered with geo-blocks, further allowing infiltration and treating runoff prior to reaching the retention pond.
- ⇒ Another project that is promoting groundwater recharge, enhances aquatic habitat and helps to protect our water resource assets is the Underwood Creek "Prospect Parkway" project being managed by the City's Water Resources Management Utility. Depending upon funding availability, this project is incorporating rain gardens, bio-retention swales, infiltration basins & trenches, native / prairie plantings and providing for additional wetland plantings that will help absorb additional water & pollutants and detaining additional water from entering the creek causing flooding problems downstream.
- ⇒ The current study underway for the redevelopment of the New Valley Sand & Gravel Quarry (Mill Valley Business Center) is being site designed to support 100% groundwater recharge of all storm water. In addition, LEED standards will also be recommended for new development.
- ⇒ The City's upcoming Comprehensive Plan update will focus on neighborhood planning efforts and identification of significant environmental features in the city and ways to preserve their integrity and further our three-dimensional water resource planning ideals.
- ⇒ In 2001, the Department conducted and prepared an Urban Ecological Analysis report. The project used the CITYgreen software that American Forests utilizes to examine the environmental and economic benefits of trees and green spaces within the City. This information is currently used on various maps within the City including the Map of Potential Conservation Lands and the Departments front counter maps to help staff and others quickly see areas of the City and their associated tree canopy.
- ⇒ The Department promotes water quality management measures to meet the City's WPDES Permit requirements by administering and enforcing the provisions of the City's Storm Water Ordinance No. 2193, the Illicit Discharge Ordinance No. 2269, the Erosion Control Ordinance No. 2268 and the Post Construction Ordinance No. 2267. The intent of this enforcement is to reduce the amount of sediment and other pollutants reaching the waters of the State. Our Department, through the Water Resources Management Utility have implemented a strong code compliance program to monitor all on-site construction activities related to erosion control and storm water management to



ensure that all construction sites are in compliance with federal, state and local laws regulating water quality and storm water. All of which ultimately protects our water resources.

- ⇒ In addition, our Department is responsible for inspecting all plumbing devices pursuant to Comm 84.20 regarding flow control and flow restricting devices.
- ⇒ Members of our Department also serve on various statewide or regional boards or commissions that focus on improving land use planning and / or improving watershed & water resource management.

Due to increasing and complicated legislation & regulations relating to water resource protection, there needs to be a change in community development programming at all levels of government. Managing water resources is critical in high-quality land use planning and the overall health & integrity of these vital resources.

### **CONSERVATION MEASURES**

Programs or activities to achieve water conservation can be classified into three categories: 1) program actions, 2) voluntary and 3) mandatory. Program actions are those activities that can be directly taken up by the City. Voluntary activities are those that use education or incentives to promote water conservation. Mandatory activities are those that use regulations and ordinances. These measures can be combined or phased in over time.

Suggested/Recommended "Program" Actions:

- ⇒ Install more rain gardens at public buildings
- ⇒ Install low flow fixtures at City Hall or other City buildings and monitor decrease in water usage
- ⇒ Install a rain barrel at City Hall
- ⇒ Remove obstacles in the zoning and building code to allow for rain harvesting tanks in all zoning districts. Encourage new subdivisions through homeowner association declarations of restrictions to allow them as well.
- ⇒ Encourage all new subdivisions to plant trees and use water harvesting for landscape irrigation.
- ⇒ Reduce hydrant flushing from two times to one time per year
- ⇒ Detect and reduce leakage in the New Berlin water system. Leakage from the water system provides an opportunity to reduce the amount of water that is pumped from water supplies by the New Berlin Water Utility. The New Berlin Water Utility should institute a more detailed water audit for the system to identify priority areas for water main replacement. Reducing leaks increases water pressure within the system and reduces energy costs for water pumping.

Suggested/Recommended "Voluntary" Actions:

- ⇒ When brushing your teeth, do not let the water run
- ⇒ Use water conserving shower heads and replace them as necessary
- ⇒ Check every faucet in your home for leaks (just a slow drip can waste 15-20 gallons per day).
- ⇒ Install rain barrels
- ⇒ Use native plantings in landscaping
- ⇒ Install a rain garden
- ⇒ Install low-flow fixtures with rebate assistance from the Utility for installation of water efficient fixtures
- ⇒ Bypass water softener system
- ⇒ Do not water lawns, gardens and landscaping between the hours of 9:00 a.m. and 9:00 p.m.
- ⇒ Cleaning of sidepaths, driveways, parking areas, tennis courts, patios, decks or other hard-surface areas should be accomplished with brooms – the use of water should be avoided
- ⇒ Limit the outdoor use of any water-play apparatus connected to a water source to one hour per day
- ⇒ The operation of outdoor misting systems used to cool people or areas should be avoided unless their use is necessary to alleviate an immediate threat to a person's health or safety
- ⇒ Water obtained by means of a fire hydrant shall not be used for cleaning equipment of any kind
- ⇒ Pools larger than 500 cubic feet should be supplied with water *obtained* from a source on that property's side of the sub-continental divide
- ⇒ The watering of gardens, trees and landscaping (except invasive species) through the use of a hand-held watering can or other hand-held container or hose is encouraged, provided any such watering device is utilized manually and in conjunction with an automatic hand-held shut-off valve
- ⇒ The watering or irrigation of new landscaping would also be allowed

Suggested/Recommended "Mandatory" Actions:

- ⇒ Sprinkling Ordinance – impose fines when not followed (odd/even days)
- ⇒ Sprinkling Ordinance – prohibit sprinkling during a significant portion of the mid-day hours when evaporation rates are high
- ⇒ Require an automatic hand-held shut-off valve for all outdoor domestic water hose use
- ⇒ Require rain and moisture sensors on all new lawn irrigation systems
- ⇒ Require low flow fixtures

The simplest application to minimize impact on City residents is to require conservation measures for all new development, so that it is incorporated from the outset. As new

technology becomes available encourage its implementation into our codes and wide spread use.

### **PROGRAM IMPLEMENTATION**

The City designates the Water Utility and the Department of Community Development (including the WRM) as the responsible departments for implementing this Water Conservation Plan. Each department would work cooperatively in administering, educating and implementing the programs and policies identified herein. To further the Plans implementation, the City should set city-wide and household conservation goals and publicize them.

New Berlin should act as a role model for water conservation. Some of the areas where the City can lead by example are as follows:

- ⇒ Continue to promote three-dimensional water resource planning
- ⇒ Implement best management practices (“BMPs”) for conservation and utilize public lands as pilot projects
- ⇒ Actively coordinate all land use planning elements thru sound community development; and
- ⇒ Provide water resource utility fee credits to property owners who utilize “BMPs” on their property (ie. pervious paving, rain gardens, bio-swales, etc.).

### **REDUCING WATER USE**

Reduce per capita residential water consumption from January 1, 2008 by not less than (10) percent by the Year 2020 for Utility customers as per an agreement between the City of New Berlin and the Wisconsin Department of Natural Resources (WDNR). This goal is based on prior experience with other municipal water conservation programs. New Berlin is also seeking to reduce peak water demand by 1 MGD through controls in water sprinkling. The city will develop a program that provides monetary and other incentives to water users to reduce water use. Many water utilities use incentive-based programs to encourage water use reductions. This is usually done in tandem with a change in the rate structure that discourages increases in water usage.

### **INCENTIVE PROGRAM FOR RESIDENTS (Toilet and Fixture Replacements)**

#### **Toilet Replacements**

The City of New Berlin Water Utility will develop a program to offer rebates of up to \$100 for residential customers who replace their high water using toilets with EPA WaterSense-rated High Efficiency Toilet (HET) models. The program is part of the utility’s Water Conservation Plan to reduce per capita residential water usage 10 percent by the year 2020.

Toilets eligible for rebate must be HETs (which use an average of 1.28 gallons per flush) and must be on the Environmental Protection Agency's (EPA) WaterSense list. Any toilet that meets the criteria and is purchased after January 1, 2010, will be eligible. Rebates will be in the form of checks sent to the customer's residence of record; the check amount will not exceed the purchase price of the toilet.

To apply for the rebate, an applicant must submit two items: the original, dated sales receipt for the toilet showing the manufacturer's model name and number and the completed application form. These items would be submitted to the City's Water Utility Office.

### **Eligibility**

Participants in the program must be residential customers of the New Berlin Water Utility, and the installation address must be in the customer service area of the utility. Qualified customers are those who live in single-family homes, condos, or apartments in buildings no larger than two units. Rebates are for replacement of existing larger-capacity toilets, and are not for new construction. Rebates are first-come, first-served, until funding is exhausted. The program is for only two toilet rebates per household. Eligible replacement toilets must be HETs listed on the EPA [WaterSense website](http://epa.gov/watersense/pp/find_het.htm) ([http://epa.gov/watersense/pp/find\\_het.htm](http://epa.gov/watersense/pp/find_het.htm)).

### **Installation**

Homeowners may install the toilets themselves, or they may hire a plumber or contractor to do the job. Owners are responsible for proper installation and associated costs. All applicable building and/or plumbing permits shall be obtained from the Department of Community Development – Inspection Services Division and pass all inspections. Installation may also be subject to verification by water utility personnel. Toilets may be purchased at any supplier as long as they are on the WaterSense list of HETs. Where applicable, permit fees will be waived for these installations.

### **Rebates**

Rebate checks of up to \$100/toilet (not to exceed actual purchase price) will be sent to the customer's address four to six weeks after applications are processed and the Utility has received notification that the installation has passed inspection. Rebates are not available for the costs of installation. The program will be based upon a "first come-first served" basis and will be limited to the amount budgeted within a given year.

### **Fixture Replacement**

Greater water savings are achieved when ALL fixtures are replaced with High Efficiency ones. In addition to offering rebates for the installation of HETs, the Utility will also offer rebates for the installation of high efficiency showerheads and faucets.

For High Efficiency Showerheads (HES), participants will receive a \$10.00 rebate (not to exceed the purchase price) when they purchase and install 1.5 gallon per minute (gpm) showerheads (maximum of two (2)). Or, participants may exchange their old showerheads for free (maximum of two (2)) for new high efficiency ones at either the City's Utility Office or the Department of Community Development – Permit Application Center. Where applicable, permit fees will be waived for these installations.

Regarding, High Efficiency Faucets (HEF), participants may receive a \$25.00 rebate (not to exceed the purchase price) when they purchase and install 1.5 gallon per minute (gpm) kitchen/bathroom faucet (maximum of two (2)). Faucets must be EPA WaterSense certified.

All rebates shall be granted on a first-come, first-served basis until program funds are exhausted. This program is subject to available funds and the City of New Berlin Utility Committee would reserve the right to alter program funding or program requirements at any time without notice. The Water Utility would not guarantee that program funding would be sufficient nor that all persons submitting applications shall receive a rebate.

Only High-Efficiency Toilets labeled as EPA's WaterSense and 1.5 gallons per minute showerheads and/or faucets qualify for a rebate. Proof of WaterSense labeled High Efficiency Faucet and/or proof of 1.5 gpm Showerhead is required to be submitted with application. No substitutions will be accepted under this Program. Original dated sales receipt for new showerhead or faucet must be submitted with the rebate application. New construction is not covered by this rebate. Rebate amount applies to purchase of approved toilets/faucets/showerheads only.

### **IMPLEMENT CONSERVATION PLAN and CONDUCT PUBLIC OUTREACH & EDUCATION**

The New Berlin Water Utility and Department of Community Development will implement the final conservation plan encompassing the information gathered. The City will circulate the plan to local stakeholders, government officials, and utility staff to generate support for and comment on the plan. The Department's will implement the plan's measures and track progress.

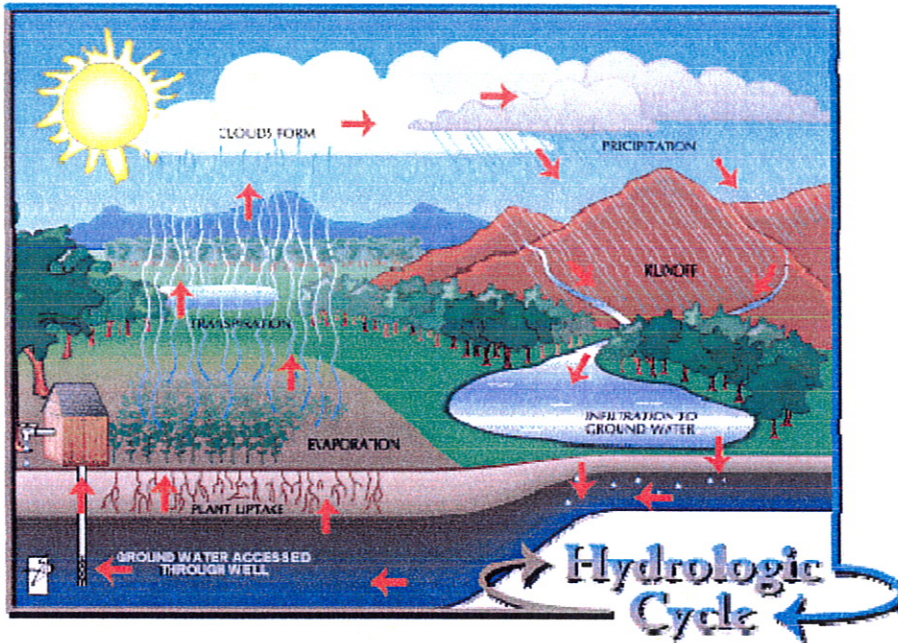
The City will actively promote implementation of the conservation plan through public education and outreach in the New Berlin schools and the press. The City will utilize existing educational and outreach materials available through: the California Urban Water Conservation Council – [www.h2ouse.org](http://www.h2ouse.org); [www.everydrop.org](http://www.everydrop.org); [www.waterwiser.org](http://www.waterwiser.org) and the American Water Works Association at [www.awwa.org](http://www.awwa.org).

The Utility will also conduct an ongoing monitoring program to assess the effectiveness of water use reduction activities through actual water use savings, customer participation, and costs of device maintenance. The Utility will regularly report on the program effectiveness to the Utility Committee and through annual reports to the public.

**APPENDIX A – RECENT NEW BERLIN WATER STUDIES**

⇒ City of New Berlin Application for Water Diversion	2006
⇒ Radium Compliance Study	2002
⇒ Lake Michigan Water Study	2001
⇒ Report on the Geophysical Logging Study on Well 8	2001
⇒ Sand and Gravel Test Boring Results	2001
⇒ New Berlin Energy Park Studies & Groundwater Monitoring	2000
⇒ Report on the Geologic Reconnaissance Study for the Siting of Shallow Sand and Gravel Wells	2000
⇒ Water System Study Update for Impact Fees	1998
⇒ Westbrook Water Service Study	1998
⇒ Update Supply and Storage Analysis	1994
⇒ Geothermal Survey for Dolomite Well Site – Valley View Park	1992
⇒ Geothermal Survey for Locating a Dolomite Well Site – Westridge Subdivision	1992
⇒ Shallow Geothermal Survey for Valley View Park Test Well Site	1992
⇒ Report on the Phase II, Sand and Gravel Well Exploration Studies at the High Pointe and Woodfield Sites in the East Half of the City of New Berlin	1991
⇒ Report on the Phase II, Dolomite Well Exploration Study at the Westridge and Valley View Park Sites in the East Half of the City of New Berlin	1991
⇒ Report on the Phase I Study of the Groundwater Exploration Program for the East Half of the City of New Berlin	1991
⇒ Water System Facilities Study	1989-'91
⇒ Westbrook Water Service Study	1998
⇒ Update Supply and Storage Analysis	1994
⇒ Water System Facilities Study	1989-'91
⇒ Radium Compliance Study	1986
⇒ Section 25 Water Study	1985

**APPENDIX B – GROUNDWATER CYCLE**



***Source:** Illustrations depicting the world water supply and hydrologic cycle were developed by Stephen ADDucci, [studio d'aDDuci](#), for original use in the Purdue Pesticide Programs Pesticide and Water Quality publication PPP-35 (1995). Reuse in this program is by express agreement with the illustrator. Developed in the [Agricultural & Biological Engineering Department](#), Purdue University, 1997. Funded jointly by Purdue and U.S. EPA Region 5.*

*Illustrations depicting the world water supply and hydrologic cycle were developed by Stephen ADDucci, [studio d'aDDuci](#), for original use in the Purdue Pesticide Programs Pesticide and Water Quality publication PPP-35 (1995). Reuse in this program is by express agreement with the illustrator.*





## Toilet Rebate Program

### High Efficiency Toilet Rebate Program beginning April 1, 2010

The City of New Berlin Water & Sewer Utilities are sponsoring a toilet rebate program to encourage customers to replace their old toilets with high efficiency water-wise low-flow toilets.

#### How much can you save?

If you currently have a 5 gallon per flush toilet and replace it with a 1.3 gallon toilet, based on 10 flushes per day, the savings are 13,505 gallons per year. At current water and sewer rates, that means an average annual reduction of \$46.31 on your water bill and \$23.61 on your sewer bill for a total savings of \$69.92.

The program is limited to 300 toilet replacements and is on a first come first serve basis. Toilets must be purchased between January 1 and December 31, 2010. Amount of each rebate is \$100. To qualify:

- You must be a current New Berlin Water or Sewer Utility customer
- A Permit Fee of \$25 and a Tech Fee of \$2 must be applied for and paid prior to installation. Upon installation an inspection must be made by the City of New Berlin to ensure that the toilet was replaced with an approved model. Only 1 permit and tech fee is needed per customer.
- Make and model of toilet purchased needs to be from the Water Sense [approved list](#)
- Limit of 2 toilet rebates per customer
- Original receipts (dated between January 1 & December 31, 2010) must be presented along with the completed [application form](#)
- Toilet installation is not included.
- An inspector must verify a qualifying Water Sense Toilet was installed prior to your rebate being approved. Call the Inspection Department for further details (262) 797-2445
- The check amount will not exceed the purchase price of toilet
- You are responsible for disposal of your old toilet\*
- Please allow 4-6 weeks for your rebate check to be mailed

Toilets can be purchased at many local home improvement and hardware stores or through a plumbing contractor.

For further information, please contact the Utility office at  
(262) 786-7086

\*Check with your installer for toilet disposal options or contact your garbage disposal contractor. Veolia will take toilets for free if you take the tank off. Waste Mgt. will pick them up for \$50.00.

For further information, please contact the Utility office at  
(262) 786-7086

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## Billing/Payment Information

to download an explanation of your Utility bill, [click here](#)

Quarter	Billing Period	Bills Mailed	Payment Due
1 <sup>st</sup>	January 1 <sup>st</sup> - April 1 <sup>st</sup>	April 7-10	April 30 <sup>th</sup>
2 <sup>nd</sup>	April 1 <sup>st</sup> - July 1 <sup>st</sup>	July 7-10	July 31 <sup>st</sup>
3 <sup>rd</sup>	July 1 <sup>st</sup> - October 1 <sup>st</sup>	October 7-10	October 31 <sup>st</sup>
4 <sup>th</sup>	October 1 <sup>st</sup> - January 1 <sup>st</sup>	January 7-10	January 31 <sup>st</sup>

Note: During the 3<sup>rd</sup> quarter all residential (1 -2 family) Water and Sewer Customers receive a summer sewer adjustment. Your 3<sup>rd</sup> quarter sewer consumption will be based on your 1<sup>st</sup> quarter sewer consumption unless your 3<sup>rd</sup> quarter is smaller.

**Water Rates - Effective September 1, 2009** All vacant lots are charged \$8.00 per quarter for water availability until the building is connected for service.

### Quarterly Meter User Charge:

5/8-inch meter - \$20.60	3-inch meter - \$136.33
3/4-inch meter - \$20.60	4-inch meter - \$224.18
1-inch meter - \$32.12	6-inch meter - \$330.21
1-1/4-inch meter - \$41.81	8-inch meter - \$496.83
1-1/2-inch meter - \$51.50	10-inch meter - \$714.94
2-inch meter - \$ 77.25	12-inch meter - \$933.06

### Volumetric Usage Charge:

First 35,000 gallons used each quarter - \$3.43 per 1,000 gallons  
 Next 36,000-50,000 gallons used each quarter - \$3.33 per 1,000 gallons  
 Over 50,000 gallons used each quarter - \$2.48 per 1,000 gallons

### Wastewater Rates - Effective January 1<sup>st</sup>, 1996

All vacant lots are charged \$53.89 per quarter for sewer availability until the building is connected for service.

### Residential Sewer User Charges:

\$1.74888 per 1,000 gallons used and a \$130.59 Use and Connection Charge per quarter.

For duplexes add a 76.60 unit charge per quarter.

### Non-Metered Sewer User Charges:

\$162.06 per quarter; this is based on \$76.70 per Unit, plus a \$53.89 Connection Charge, plus estimated volume of 17,995 gallons per quarter.

### Commercial-Industrial-Public Sewer User Charges:

\$6.0111 per 1,000 gallons used plus \$53.89 Connection Charge per quarter.

## PAYMENT OPTIONS

### Night Depository

We strongly encourage you to use the brown drop box located in the City Hall (lower) parking lot to avoid waiting in lines. Please return the payment coupon and your payment in the envelope included with your bill. For your security and ours, please pay by check. Checks should be made payable to: CITY OF NEW BERLIN.

### By Mail

We encourage you to pay by mail to avoid waiting in lines. Please return the payment coupon and payment in the envelope included with your bill. For your security, and ours, please pay by check. Checks should be made payable to: CITY OF NEW BERLIN.

### Credit Card Payments

Payments can be made by credit card using a touch-tone phone OR via the Internet. CREDIT CARD PAYMENTS CANNOT BE ACCEPTED AT THE CASHIER'S OFFICE. **Whichever method you choose, be aware that a convenience fee, based on the amount of each**

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charged payment, will be added to your credit card transaction. It is also very important that you wait for a confirmation/transaction number *before* you conclude your phone call or Internet connection. This number will assist you should there be any problem with your charge payment.

**By Phone:** To use this service, New Berlin customers may call 1-888-272-9829 from any touch-tone phone and enter the City's jurisdiction code (5801). Your Utility account number, daytime phone number, and valid credit card will be required to complete the transaction. Payments may be made using American Express, MasterCard, or Discover Card. VISA is not an accepted form of credit for Utility payments at this time.

**Via Internet:** Click on this link or log on to [www.officialpayments.com](http://www.officialpayments.com). You may either enter your zip code or the City's jurisdiction code (5801) to start your transaction; follow the site's instructions. Here, again, VISA is NOT an accepted form of credit for Utility payments at this time.

**In Person:** Payments can always be made in person at New Berlin City Hall, 3805 S. Casper Drive from 8:00 a.m. to 4:30 p.m., Monday through Friday excluding announced holidays.

City Hall located at  
3805 S. Casper Drive - New Berlin, WI 53151  
Phone: (262) 796-4100  
Fax: (262) 796-4100

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## Authorized Water Rates/Rules

Docket 4090-WR-101

Appendix C

### New Berlin Water Utility

#### Authorized Water Rates and Rules

Public Fire Protection Service - - - F-1

The annual charge for public fire protection service to the City of New Berlin shall be \$759,269.

This service shall include the use of hydrants for fire protection service only and such quantities of water as may be demanded for the purpose of extinguishing fires within the service area. This service shall also include water used for testing equipment and training personnel. For all other purposes, the metered or other rates set forth, or as may be filed with the Public Service Commission, shall apply.

#### Private Fire Protection Service – Unmetered - - - Upf-1

This service shall consist of permanent or continuous unmetered connections to the main for the purpose of supplying water to private fire protection systems such as automatic sprinkler systems, standpipes, and private hydrants. This service shall also include reasonable quantities of water used for testing check valves and other backflow prevention devices.

#### Quarterly Private Fire Protection Service Demand Charges:

<b>1-inch connection</b>	<b>\$12.00</b>
<b>2-inch connection</b>	<b>\$12.00</b>
<b>3-inch connection</b>	<b>\$21.00</b>
<b>4-inch connection</b>	<b>\$36.00</b>
<b>6-inch connection</b>	<b>\$72.00</b>
<b>8-inch connection</b>	<b>\$114.00</b>
<b>10-inch connection</b>	<b>\$162.00</b>
<b>12-inch connection</b>	<b>\$210.00</b>

Billing: Same as schedule Mg-1

#### General Service – Metered - - - Mg-1

Quarterly Service Charges:

$5/8$ -inch meter	\$20.60	3-inch meter	\$136.33
$3/4$ -inch meter	\$20.60	4-inch meter	\$224.18
1-inch meter	\$32.12	6-inch meter	\$330.21
$1\ 1/4$ -inch meter	\$41.81	8-inch meter	\$496.83
$1\ 1/2$ -inch meter	\$51.50	10-inch meter	\$714.94
2-inch meter	\$77.25	12-inch meter	\$933.06

Plus Volume Charge:

- First 35,000 gallons used per quarter - \$3.43 per 1,000 gallons
- Next 465,000 gallons used per quarter - \$3.33 per 1,000 gallons
- Over 500,000 gallons used per quarter - \$2.48 per 1,000 gallons

**Billing:** Bills for water service are rendered quarterly and become due and payable upon issuance following the period for which service is rendered. A late payment charge of 1 percent per month will be applied to the total unpaid balance for utility service, including unpaid late payment charges. This late payment charge is applicable to all customers. The utility customer may be given a written notice that the bill is overdue no sooner than 20 days after the bill is issued. Unless payment or satisfactory arrangement for payment is made within the next 10 days, service may be disconnected pursuant to Wis. Admin. Code ch. PSC 185.

**Combined Metering:** Volumetric meter readings will be combined for billing if the utility for its own convenience places more

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than one meter on a single water service lateral. Multiple meters placed for the purpose of identifying water not discharged into the sanitary sewer are *not* considered for utility convenience and shall not be combined for billing. This requirement does not preclude the utility from combining readings where metering configurations support such an approach. Meter readings from individually metered separate service laterals shall *not* be combined for billing purposes.

#### **Non-Sufficient Funds Charge - - -NSF-1**

A \$25.00 charge will be applied to the customer's account when a check rendered for utility service is returned for non-sufficient funds. This charge may not be in addition to, but may be inclusive of, other non-sufficient funds charges when the check was for payment of multiple services.

Billing: Same as Schedule Mg-1

#### **Public Service - - - Mpa-1**

Water service supplied to municipal buildings, schools, sewer treatment plants, etc. shall be metered and the regular metered service rates applied.

Water used on an intermittent basis for flushing sewers, street sprinkling, flooding skating rinks, drinking fountains, etc., shall be metered where meters can be set to measure the service. Where it is impossible to measure the service, the superintendent shall estimate the volume of water used based on the pressure, size of opening, and period of time water is allowed to be drawn. The estimated quantity shall be billed at the rate of \$3.30 per 1,000 gallons.

Billing: Same as Schedule Mg-1

#### **General Water Service - Unmetered - - - Ug-1**

Where the utility cannot immediately install its water meter, service may be supplied temporarily on an unmetered basis. Such service shall be billed at the rate of \$78.20 per quarter. This rate shall be applied only to single family residential and small commercial customers and approximates the cost of 17,000 gallons of water per quarter under schedule Mg-1. If it is determined by the utility that usage is in excess of 19,000 gallons of water per quarter, an additional charge will be made for the estimated additional usage.

Billing: Same as Schedule Mg-1

#### **Standby Water Service - - - Sws-1**

A standby charge shall apply to each lot or equivalent parcel of land\* for which water system facilities are available but not connected. Where more than one lot or equivalent is used as a unit and a customer is connected, the total charge for water service to customer shall be not less than the standby charge applicable to several lots.

Each lot or equivalent parcel of land - \$8.00 per quarter.

Billing: Same as Schedule Mg-1

\*An equivalent parcel of land shall be each full 100 feet where unplatted. (Example: An unplatted 480 foot piece of land would be 4 equivalent parcels.) Also, any isolated parcel of less than 100 feet shall be equivalent to a lot.

#### **Seasonal, Emergency, or Temporary Service - - - Mgt-1**

Seasonal Customers\* shall pay an annual seasonal service charge equal to four times the applicable service charge in Schedule Mg-1. Water use in any billing period shall be billed at the applicable volume rates in Schedule Mg-1 and the charge added to the annual seasonal service charge.

In addition, customers who have an additional meter pursuant to Schedule Am-1 shall also pay an annual seasonal rental charge equal to four times the applicable additional meter rental charge in Schedule Am-1.

Further, if service has been disconnected or a meter removed, a charge under Schedule R-1 shall be applied at the time of reconnection or meter reinstallation.

\*Seasonal customers are general service customers whose use of water is normally for recurring periods of less than a year. This includes service under Schedule Mg-1 and/or Schedule Am-1.

Billing: Same as Schedule Mg-1.

#### **Building and Construction Water Service - - - Mz-1**

For single family and small commercial buildings, apply the unmetered rate (Schedule Ug-1).

For large commercial, industrial, or multiple apartment buildings, a temporary metered installation shall be made and general metered rates (Schedule Mg-1) applied.

Billing: Same as Schedule Mg-1.

#### **Bulk Water - - - BW-1**

All bulk water supplied from the water system through hydrants or other connections shall be metered, or at the direction of the utility, estimated. Utility personnel or a utility-approved party shall supervise the delivery of water.

Bulk water sales are:

1. Water supplied by tank trucks or from hydrants for the purpose of extinguishing fires outside the utility's immediate service area.
2. Water supplied by tank trucks or hydrants for purposes other than extinguishing fires, such as irrigation or the filling of swimming pools.
3. Water supplied from hydrants or other temporary connections for general service type applications. (Water supplied for construction purposes - see Schedule Mz-1)

A charge for the volume of water used will be billed to the party using the water at \$3.40 per 1,000 gallons. A service charge, in addition to the volumetric charge, will be \$40.00. In addition, for hydrant meters that are in place for more than 30 days, the applicable service charge in Schedule Mg-1 will apply, prorated for the period in excess of 30 days that the meter is in place.

The water utility may require reasonable deposits for consistent application for the temporary use of its equipment under this and other rate schedules. The deposit(s) collected will be refunded upon return of the utility's equipment. Damaged or lost equipment will be repaired or replaced at the customer's expense.

Billing: Same as Schedule Mg-1.

**Reconnection Charges - - - R-1**

During Normal Business Hours	After Normal Business Hours	
Reinstallation of meter, including valving at curb stop	\$40.00	\$60.00
Valve turned on at curb stop	\$30.00	\$50.00

*Note:* No charge for disconnection.

Billing: Same as Schedule Mg-1.

**Water Lateral Installation Charge - - - Cz-1**

Subdivision developers shall be responsible, where the main extension has been approved by the utility, for the water service lateral installation costs from the main through the curb stop and box.

When the cost of a utility main extension is to be collected through assessment by the municipality, the actual average water lateral installation costs from the main through the curb stop and box shall be included in the assessment of the appropriate properties.

The Initial water service lateral(s), not installed as part of a subdivision development or an assessable utility extension, will be installed from the main through the curb stop and box by the utility, for which the actual cost will be charged.

Billing: Same as Schedule Mg-1.

**Rules and Regulations - - - X-1**

Delete Schedule X-1 through X-17. Incorporate the operating rules for municipal water utilities as provided by the public service commission.

**Water Main Extension Rules - - - X-2**

Water Mains will be extended for new customers on the following basis:

1. Where the cost of the extension is to immediately be collected through assessment by the municipality against the abutting property, the procedure set forth under Wis. § 66.0703 will apply, and no additional customer contribution will be required.
2. Where the municipality is unwilling or unable to make a special assessment, the extension will be made on a customer financed basis as follows:
  1. The applicant(s) will advance as a contribution in aid of construction the total amount equivalent to that which would have been assessed for all property under A.
  2. Part of the contribution required in B.1 will be refundable. When additional customers are connected to the extended main within 10 years of the date of completion, contributions in aid of construction will be collected equal to the amount of which would have been assessed under A. for the abutting property being served. This amount will be refunded to the original contributor(s). In no case will the contributions received from additional customers exceed the proportionate amount which would have been required under A., nor will it exceed the total assessable cost of the original extension.
1. When a customer connects to a transmission main or connecting loop installed at utility expense within 10 years of the date of completion, there will be a contribution required of an amount equivalent to that which would have been assessed under A.

**Water Main Installations in Platted Subdivisions - - - X-3**

Application for installation of water mains in regularly platted real estate development subdivisions shall be filed with the utility.

If the developer, or a contractor employed by the developer, is to install the water mains (with the approval of the utility), the developer shall be responsible for the total cost of construction.

If the utility or its contractor is to install the water mains, the developer shall be required to advance to the utility, prior to the beginning of construction, the total estimated cost of the extension. If the final costs exceed estimated costs, an additional billing will be made for the balance of the cost due. This balance is to be paid within 30 days. If final costs are less than estimated, a refund of the overpayment will be made by the water utility.





## Lawn Sprinkling Schedule

### Lawn Sprinkling Water Conservation Schedule

The City of New Berlin Utility Department is asking customers to gear up for a dry summer by following the Lawn Sprinkling Water Conservation Schedule all year round.



This lawn sprinkling water conservation schedule will assure that the Utility will have sufficient water resources to meet the needs of the customer and have a good supply in the reservoirs for fire protection, without adding additional strain on our pumps. We are asking residents to sprinkle only on even and odd days (depending on your address). Please help us conserve our water resources.

Please follow the Lawn Sprinkling Water Conservation Schedule below:

EVEN numbered addresses (i.e. 2500, 2502, 2504), water on EVEN days of each month, (2nd, 4th, 6th, etc)

ODD numbered addresses (i.e. 2501, 2503, 2505), water on ODD days of each month (1st, 3rd, 5th, etc.)

- Light hand watering of annuals and perennials or your garden are permitted at any time.
- Special permits for the watering of newly installed lawns may be obtained from the Utility Department

For further information on how and when to sprinkling, check out <http://www.acmehowto.com/howto/garden/lawn/lawnwater.php>



For further information please call the Utility office at 262-786-7086. Thank you.

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City Hall located at  
2505 E. Lincoln Drive New Berlin, WI 53151  
Ph: (262) 786-7010  
M-F: Monday-Friday 9:00 am-4:30 pm

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# **Appendix B**

## **I/I Reduction Efforts**

**II Reduction Projects  
City of New Berlin - Sanitary Sewer System**

Year	Project Location (Section No's.)	Project Description	Total Cost	Category*	Result of 2010 Facilities Plan (yes/no)
1997	Sanitary sewer syst	CCTV Inspection - Manholes & Mains - 3 yr period	\$336,000	1	No
1997	Sanitary sewer syst	Compile CCTV-MHI Data by Severity	\$5,000	1	No
1997	Sewered Areas-3 yr	Manhole Rehab with Street Resurfacing Projects	\$171,838	2	No
1997	21 Sites	Sewerline Relay & Spot Repairs	\$181,000	3	No
1997	CIPP Relining	1,456 LF - 15" Concrete Sewer Pipe	\$125,615	3	No
		<b>Yr 1997 Total Projects</b>	<b>\$819,453</b>		
1998	Sewered Areas	MH Rehab with Street Resurfacing Projects	\$172,083	2	No
1998	CIPP Relining	2,444 LF - 15" & 18" Concrete Sewer Pipe	\$235,674	3	No
		<b>Yr 1998 Total Projects</b>	<b>\$407,757</b>		
1999	Sewered Areas subject to Ponding	Critical MH Lid Replacement	\$5,000	2	Yes
1999	Buena Park Area	MHI-SLI Inspections & Rehab	\$347,978	1 & 2	Yes
		<b>Yr 1999 Total Projects</b>	<b>\$352,978</b>		
1999-2000	Entire Sewered Area	LSSSES Study - 165 miles Sewer + 4141 MH's	\$688,763	1	Yes
2000	All lids having holes	Manhole Lid Replacement Project	\$247,058	2	Yes
2000	Basins 2,3,4,5, & 7	Priority Basins - Manhole Rejab Project - 1,123 MH's	\$1,480,000	2	Yes
		<b>Yr 2000 Total Projects</b>	<b>\$2,415,821</b>		
2001	Buena Park Area	Pilot I/I Study - Focus on Private Property Sources	\$155,000	1	Yes
2001	Sewered Areas	Phase II - Manhole Rehab Project	\$1,262,500	2	Yes
		<b>Yr 2001 Total Projects</b>	<b>\$1,417,500</b>		
2002	15 Sub-Basin Areas, 10 Lift Stations, & 6 Rain Gauges	Sewer Flow Monitoring & Analyses	\$38,250	1	Yes
		<b>Yr 2002 Total Projects</b>	<b>\$38,250</b>		



I/I Reduction	City of New Berlin Sanitary Sewer System				
2002-2003	Phase III-Manhole Rehab Project (1,000+/- MH's)		\$1,174,200	2	Yes
2003	I/I Reduction Analyses - Define Success of Basin Rehab work		\$12,000	1	Yes
2003	15 Sub-Basin Areas, 10 Lift Stations, & 6 Rain Gauges		\$54,700	1	Yes
2003	Sewer Flow Monitoring and Analyses		\$257,800	1	Yes
2003	Maintenance, line cleaning & CCTV use PACP Methodology		\$1,498,700		
2004	City-wide Sewer Line Maintenance, rehab?		\$20,000	2	Yes
2004	Basins 1,3,4,5, & 6 I/I Reduction Study Work		\$48,800	1	Yes
2005	Basin 7 CIPP Relining 9,793 LF - 18,27,30,36 & 42" Diameter		\$1,302,100	2 & 3	Yes
2005	Brookside Parkway MH & SL & Lat Rehab, Lat Relay 420 LF + MH Grout 43		\$467,200	2 & 3	Yes
2006	Gatewood Sub Sewer Relining		\$601,500	1	Yes
2006-2010	Sanitary Sewer Syst I/I Investigation & Identification		\$250,000	1	Yes
2006-2010	Sanitary Sewer Syst Manhole & Sewerline & Lateral Rehab		\$1,250,000	2 & 3	Yes
	<b>Yr 2003 Total Projects</b>		<b>\$1,769,300</b>		
	<b>Yr 2004 Total Projects</b>				
	<b>Yr 2005 Total Projects</b>				
	<b>Yr 2006 Total Projects</b>				
	<b>Yr 2007 Total Projects</b>				
	<b>Yr 2008 Total Projects</b>				

	<b>Yr 2005 Total Projects</b>		<b>\$860,631</b>		
	<b>Yr 2006 Total Projects</b>		<b>\$544,788</b>		
	<b>Yr 2007 Total Projects</b>		<b>\$192,847</b>		
	<b>Yr 2008 Total Projects</b>		<b>\$1,570,444</b>		

		Yr 2009 Total Projects			
				\$958,745	
Year	Project Location (Section No's.)	Project Description	Total Cost	Category*	Result of 2010 Facilities Plan (yes/no)
1996-97	SP-2 Pond	Design	\$64,300	4	No
1998	SP-2 Pond	Construction	\$500,000	4	No
		<b>Yr 1998 Total Projects</b>	<b>\$564,300</b>		
2002	Gatewood Sub - Woodside Drive	Storm Sewer Installation	\$55,000	2 & 4	Yes
2002	Westridge Business Park - E of Moorland	Design & Inspection Services	\$111,550	4	No
2002	(above)	Construction	\$210,000	4	No
2002	City-Wide	Drainage Improvements: including ditch grading, cross culverts & misc landscaping restoration	\$406,629	2 & 4	Yes- Some No - Others
		<b>Yr 2002 Total Projects</b>	<b>\$783,179</b>		
2003	Calhoun Park (above)	Streambank Restoration	\$87,000	4	No
	Deer Creek; near Buena Park & NB Industrial Park	Construction Services	\$69,749	4	No
2003	Gatewood Sub	Watershed Study and Detention Basin - Design	\$90,721	4	No
2003	Malone Park	Storm Sewer - Design	\$57,300	2 & 4	Yes
		Design - Underground Storage System	\$41,200	4	No
2003	City-Wide	Drainage Improvements including ditch grading, cross culverts & misc landscaping - restoration	\$369,279	2 & 4	Yes - Some No - Others
		<b>Yr 2003 Total Projects</b>	<b>\$715,249</b>		
2004	Malone Park - Underground Detention Facility (above)	Construction	\$374,595	4	Yes
	New Berlin Hills Golf Course	Inspection - Coordination Services	\$29,040	4	Yes
2004		Streambank Stabilization	\$189,417	4	No

	1/1 Reduction	City of New Berlin - Storm Water Drainage				
2004	Buena Park Sub	Drainage Improvements: including storm sewer, ditches, driveway culverts & concrete invert	\$1,400,000	2 & 4	Yes	
2004	Gatewood Sub	Storm Sewer - Construction	\$1,200,000	2 & 4	Yes	
	Upper Root River Tributary area - N Central part of City	Watershed Study and Design	\$95,000	4	Yes	
2004	City-Wide	Drainage Improvements: including ditch grading, cross culverts & misc landscaping - restoration	\$403,765	2 & 4	Yes - Some No - Others	
		<b>Yr 2004 Total Projects</b>	<b>\$3,691,817</b>			
2005	Kelly Lake - Upsream at Frances Ave & St. Marys Dr	Streambank & Wetland Restoration	\$45,000	4	No	
2005	Inez Dr & Overlook	Storm Sewer Design & Installation	\$280,000	4	No	
	N Central Industrial Park (Deer Creek Tributary area)	Stormwater Quality & Quantity Control Management Plan	\$141,000	4	Yes	
2005	City-Wide	Drainage Improvements: including ditch grading, cross culverts & misc landscaping - restoration	\$394,631	2 & 4	Yes - Some No - Others	
2006-2010	City-Wide proposals under review			4	Yes - Some No - Others	

\*Categories

- 1 = 1/1 Investigation
- 2 = 1/1 Reduction
- 3 = Sewer Relay/Upgrade
- 4 = Stormwater Management

## I & I COSTS HIGH - LOW 2005-2007

	INSPECTION	REHABILITATION	TOTAL
Milwaukee	\$884,449	\$9,948,030	\$10,924,529
Whitefish Bay	\$256,000	\$4,355,000	\$4,611,000
Wauwatosa	\$211,314	\$4,357,641	\$4,569,955
West Allis	\$295,000	\$3,793,650	\$4,088,650
New Berlin	\$443,591	\$2,401,318	\$2,844,909
Greenfield	\$400,788	\$1,972,117	\$2,320,705
Milwaukee County	\$832,637	\$1,275,000	\$2,107,638
Brookfield	\$103,450	\$1,520,900	\$1,624,350
Bayside	\$102,532	\$1,429,241	\$1,531,773
Hales Corner	\$32,807	\$1,346,760	\$1,379,007
Cudahy	\$289,703	\$949,089	\$1,238,342
Fox Point	\$128,605	\$919,006	\$1,047,911
Glendale	\$122,740	\$707,600	\$807,140
Megunon	\$99,125	\$675,935	\$744,060
Greendale	\$35,848	\$614,150	\$649,998
Franklin	\$278,092	\$207,244	\$485,336
Menomonee Falls	\$25,510	\$272,082	\$297,592
River Hills	\$105,696	\$176,294	\$281,927
Oak Creek	\$172,500	\$84,800	\$257,300
Brown Deer	\$57,646	\$186,544	\$248,106
Shorewood	\$6,812	\$189,876	\$196,688
Elm Grove	\$10,959	\$162,330	\$173,288
Thiensville	\$45,452	\$123,487	\$163,939
Germantown	\$81,600	\$13,545	\$95,145
St. Francis	\$20,524	\$40,491	\$61,015
West Milwaukee	\$3,140	\$54,175	\$57,315
Muskego	\$21,100	\$15,000	\$36,100
Caledonia	\$7,900	\$18,000	\$25,900
Butler	\$8,869	\$3,800	\$12,669

*Note: Totals are from MMSD Reports for 2005-2007 expenditures for I & I*

# Appendix C

## Sewage Flow Estimates

## Schultz, Steve

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**From:** Schultz, Steve  
**Sent:** Tuesday, April 27, 2010 1:40 PM  
**To:** Schultz, Steve  
**Subject:** FW: 2009 New Berlin Sewer Flow Estimates

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**From:** Stamborski, Chris M. [mailto:Chris.Stamborski@rasmithnational.com]  
**Sent:** Friday, April 23, 2010 3:41 PM  
**To:** Schultz, Steve  
**Cc:** 'Johnson, Rick'  
**Subject:** 2009 New Berlin Sewer Flow Estimates

Steve-

As I indicated in my voice message to you, the previous estimate that we provided to Rick was for 2006 monitoring efforts in the City of New Berlin. In 2006 we performed a wider spectrum of monitoring throughout the City that has since been pared down to focus on the basins with the highest levels of I/I. Based on that, please review the following for flow information we have logged for the City using the summary chart from last year as a basis:

The following is a summary of the basins that we monitored for the Utility as part of last year's monitoring program. The monitoring took place between March 1, 2009 and October 31, 2009. The flow listed is the average daily flow for each monitoring location.

New Berlin Basins 1, 4, 5, and 6

Meter 1B = 0.53 cfs → 0.34 MGD (captures almost all of basin 1)

Meter 1C = no metering performed in this basin

Meter 4A = 0.31 cfs → 0.20 MGD (captures all of basin 4)

Meter 5A = no metering performed in this basin

**Total = incomplete**

New Berlin Basin 9

Meter 9A = 0.35 cfs → 0.23 MGD (captures the north end of basin 9)

Meter 9B = 1.03 cfs → 0.66 MGD (captures the south end of basin 9)

**Total = 1.38 cfs → 0.89 MGD**

New Berlin Basins 7 & 10

Meter 7B = 2.55 cfs → 1.65 MGD (captures the majority of basin 7, 99%)

Meter 10A = no metering performed in this basin

**Total = incomplete**

The following information is what we were provided by MMSD. This information includes all monitoring performed at their meters. I believe that it should still give you a good idea of the flows that were experienced at each of their locations.

(New Berlin Basins 1, 4, 5, and 6) = 2.812 MGD

MMSD Meter 027C = 0.160 MGD  
(New Berlin Basins 3A and 3B)

MMSD Meter 027D = 0.343 MGD

(New Berlin Basins 3C, 3D, and 3E)

(New Berlin Basin 9) = 0.403 MGD

MMSD Meter MS0210 = 2.292 MGD  
(New Berlin Basins 7 and 10)

The flow from New Berlin Basin 8 (Lift Station 5 and 6 predominantly) flow unmetered through Muskego. The following is total flow data from lift station 5 and 6 to get an estimate of the total flows produced by these areas, even though there are gravity areas that are not included in these numbers.

New Berlin Lift Station 5 = 0.012 MGD  
(New Berlin Basin 8C)

New Berlin Lift Station 6 = 0.003 MGD

**Total Average Daily Flow = 6.025 MGD →  $6.025 * 365 = 2.199$  Billion Gallons Per Year  
(approximately a 10% increase from**

**2006 numbers)**

I think that it would be best to use the numbers from MMSD's meters, as they show lower flows than some of the meters that we have installed (especially the ones that we know are still level-only measurement for MMSD), and also because we do not have complete coverage for the intermediate meters in the areas of question. If this becomes an issue it can easily be addressed yet this year and in future flow monitoring efforts in the City.

Please let me know if you have any more questions.

Chris

Chris M. Stamborski, P.E.  
**R.A. Smith National, Inc.**  
262-317-3337



Public Or Private	Municipality	YEAR	Type	Table Name	Inspection Costs	Rehabilitation Costs	Total Costs
PUBLIC	Bayside	2005	PUBLIC MANHOLE	B	1,231.86		1,231.86
PUBLIC	Bayside	2005	ILLEGAL CONNECTION	E	2,050.00		2,050.00
PUBLIC	Bayside	2005	PRIVATE MANHOLE	B			
PUBLIC	Bayside	2005	PUBLIC SEWER	C			
PUBLIC	Bayside	2005	PRIVATE SEWER	C			
PUBLIC	Bayside	2005	PRIVATE BUILDING SEWER	D			
PUBLIC	Bayside	2005	OTHER	F			
PUBLIC	Bayside	2006	PUBLIC MANHOLE	B		29,241.00	29,241.00
PRIVATE	Bayside	2006	PRIVATE MANHOLE	B			
PUBLIC	Bayside	2006	PUBLIC SEWER	C	97,150.00	1,400,000.00	1,497,150.00
PRIVATE	Bayside	2006	PRIVATE SEWER	C			
PRIVATE	Bayside	2006	PRIVATE BUILDING SEWER	D			
PUBLIC	Bayside	2006	ILLEGAL CONNECTION	E	2,100.00		2,100.00
PUBLIC	Brookfield	2005	PUBLIC MANHOLE	B		162,000.00	162,000.00
PRIVATE	Brookfield	2005	PRIVATE MANHOLE	B	500.00		500.00
PUBLIC	Brookfield	2005	PUBLIC SEWER	C	14,000.00		14,000.00
PRIVATE	Brookfield	2005	PRIVATE SEWER	C	1,000.00		1,000.00
PUBLIC	Brookfield	2006	PUBLIC MANHOLE	B	2,175.00	378,200.00	380,375.00
PUBLIC	Brookfield	2006	PUBLIC SEWER	C	20,000.00	800,000.00	820,000.00
PRIVATE	Brookfield	2006	PRIVATE MANHOLE	B	375.00	2,100.00	2,475.00
PRIVATE	Brookfield	2006	PRIVATE SEWER	C	2,000.00	8,000.00	10,000.00
PUBLIC	Brookfield	2007	PUBLIC MANHOLE	B	13,400.00	49,600.00	63,000.00
PUBLIC	Brookfield	2007	PUBLIC SEWER	C	50,000.00	0.00	50,000.00
PUBLIC	Brown Deer	2005	PUBLIC MANHOLE	B	1,776.00	49,856.00	51,632.00
PUBLIC	Brown Deer	2005	PRIVATE MANHOLE	B	153.00	0.00	153.00
PUBLIC	Brown Deer	2005	PUBLIC SEWER	C	38,996.00	106,180.00	145,176.00
PUBLIC	Brown Deer	2005	PRIVATE SEWER	C	0.00	0.00	0.00
PUBLIC	Brown Deer	2005	PRIVATE BUILDING SEWER	D	1,814.00	0.00	1,814.00
PUBLIC	Brown Deer	2005	ILLEGAL CONNECTION	E	3,642.00	0.00	3,642.00
PUBLIC	Brown Deer	2006	PRIVATE MANHOLE	B	253.75	1,218.00	1,471.75
PUBLIC	Brown Deer	2006	PRIVATE SEWER	C	0.00	0.00	0.00
PUBLIC	Brown Deer	2006	PRIVATE BUILDING SEWER	D	0.00	0.00	0.00
PUBLIC	Brown Deer	2006	PUBLIC MANHOLE	B	7,917.00	29,290.00	37,207.00
PUBLIC	Brown Deer	2006	PUBLIC SEWER	C			
PUBLIC	Brown Deer	2006	ILLEGAL CONNECTION	E	3,095.70	0.00	3,095.70
PUBLIC	Brown Deer	2006	OTHER	F			
PUBLIC	Brown Deer	2007	PUBLIC MANHOLE	B			
PUBLIC	Brown Deer	2007	PUBLIC SEWER	C			
PUBLIC	Brown Deer	2007	PRIVATE BUILDING SEWER	D			

Public Or Private	Municipality	YEAR	Type	Table Name	Inspection Costs	Rehabilitation Costs	Total Costs
PUBLIC	Brown Deer	2007	PRIVATE BUILDING SEWER	E			
PUBLIC	Brown Deer	2007	OTHER	F		3,800.00	4,100.00
PUBLIC	Butler	2006	PUBLIC MANHOLE	B	300.00		
PUBLIC	Butler	2007	PUBLIC SEWER	C	8,569.00	0.00	8,569.00
PUBLIC	Butler	2007	PUBLIC MANHOLE	B	0.00	0.00	0.00
PUBLIC	Caledonia	2006	PUBLIC MANHOLE	G	7,900.00	18,000.00	25,900.00
PUBLIC	Caledonia	2007	PUBLIC MANHOLE	B	0.00	0.00	0.00
PUBLIC	Cudahy	2005	PUBLIC MANHOLE	B	2,481.00	153,691.00	156,172.00
PUBLIC	Cudahy	2005	PUBLIC SEWER	C	6,733.00	63,885.00	70,618.00
PUBLIC	Cudahy	2005	ILLEGAL CONNECTION	E	240.00		240.00
PUBLIC	Cudahy	2005	OTHER	F	79,511.00		79,511.00
PUBLIC	Cudahy	2006	PUBLIC MANHOLE	B	980.00	3,535.00	4,515.00
PRIVATE	Cudahy	2006	PRIVATE MANHOLE	B			
PUBLIC	Cudahy	2006	PUBLIC SEWER	C	6,528.00		6,528.00
PRIVATE	Cudahy	2006	PRIVATE SEWER	C			
PRIVATE	Cudahy	2006	PRIVATE BUILDING SEWER	D			
PUBLIC	Cudahy	2006	ILLEGAL CONNECTION	E	240.00		240.00
PUBLIC	Cudahy	2006	OTHER	F	87,306.00		87,306.00
PUBLIC	Cudahy	2007	PUBLIC MANHOLE	B	1,200.00	22,129.00	23,329.00
PUBLIC	Cudahy	2007	PRIVATE MANHOLE	B			
PUBLIC	Cudahy	2007	PUBLIC SEWER	C	34,223.00	705,849.00	740,072.00
PUBLIC	Cudahy	2007	PRIVATE SEWER	C			
PUBLIC	Cudahy	2007	PRIVATE BUILDING SEWER	D			
PUBLIC	Cudahy	2007	ILLEGAL CONNECTION	E	180.00		180.00
PUBLIC	Cudahy	2007	OTHER	F	70,081.00		70,081.00
PUBLIC	Elm Grove	2006	PUBLIC SEWER	C	6,650.00	140,000.00	146,650.00
PUBLIC	Elm Grove	2007	PUBLIC SEWER	C	4,309.00	22,330.00	26,638.00
PUBLIC	Fox Point	2007	PUBLIC MANHOLE	B	10,810.00	94,708.00	105,518.00
PUBLIC	Fox Point	2007	PUBLIC SEWER	C	34,995.00	306,598.00	341,593.00
PUBLIC	Fox Point	2006	PUBLIC MANHOLE	B	4,700.00	44,800.00	49,800.00
PUBLIC	Fox Point	2006	PUBLIC SEWER	C	78,100.00	472,900.00	551,000.00
PUBLIC	Franklin	2006	PUBLIC MANHOLE	B	51,490.00	1,158.00	52,648.00
PUBLIC	Franklin	2006	PUBLIC SEWER	C	63,102.00	197,586.00	260,688.00
PUBLIC	Franklin	2007	PUBLIC MANHOLE	C	61,500.00	8,500.00	70,000.00
PUBLIC	Franklin	2007	PUBLIC SEWER	C	102,000.00		102,000.00
PUBLIC	Germanatown	2005	PUBLIC MANHOLE	B	16,500.00	13,545.00	30,045.00
PUBLIC	Germanatown	2005	PUBLIC SEWER	C	16,500.00		16,500.00
PRIVATE	Germanatown	2005	PRIVATE BUILDING SEWER	D	25,200.00		25,200.00
PUBLIC	Germanatown	2005	ILLEGAL CONNECTION	E	10,800.00		10,800.00

Public Or Private	Municipality	YEAR	Type	Table Name	Inspection Costs	Rehabilitation Costs	Total Costs
PUBLIC	Germantown	2005	OTHER	F	12,600.00		12,600.00
PUBLIC	Germantown	2007	DEFAULT OBJECT TYPE	F	0.00	0.00	0.00
PUBLIC	Glendale	2007	PUBLIC MANHOLE	B	7,000.00	13,100.00	20,100.00
PRIVATE	Glendale	2007	PRIVATE MANHOLE	B	0.00	0.00	0.00
PUBLIC	Glendale	2007	PUBLIC SEWER	C	28,840.00	135,200.00	164,040.00
PRIVATE	Glendale	2007	PRIVATE SEWER	C	0.00	0.00	0.00
PRIVATE	Glendale	2007	PRIVATE BUILDING SEWER	D	0.00	0.00	0.00
PRIVATE	Glendale	2007	ILLEGAL CONNECTION	E	2,800.00	0.00	2,800.00
PUBLIC	Glendale	2007	OTHER	F	0.00	0.00	0.00
PUBLIC	Glendale	2005	PUBLIC MANHOLE	B	7,900.00	9,750.00	17,650.00
PUBLIC	Glendale	2005	PRIVATE MANHOLE	B	0.00	0.00	0.00
PUBLIC	Glendale	2005	PUBLIC SEWER	C	41,300.00	124,950.00	166,250.00
PUBLIC	Glendale	2005	PRIVATE SEWER	C	0.00	0.00	0.00
PUBLIC	Glendale	2005	PRIVATE BUILDING SEWER	D	0.00	0.00	0.00
PUBLIC	Glendale	2005	ILLEGAL CONNECTION	E	2,500.00	0.00	2,500.00
PUBLIC	Glendale	2006	PUBLIC MANHOLE	B	8,600.00	14,600.00	23,200.00
PUBLIC	Glendale	2006	PUBLIC SEWER	C	21,000.00	410,000.00	431,000.00
PUBLIC	Glendale	2006	ILLEGAL CONNECTION	E	2,800.00	0.00	2,800.00
PUBLIC	Greendale	2006	PUBLIC MANHOLE	B	18,540.00	22,950.00	41,490.00
PUBLIC	Greendale	2006	PUBLIC SEWER	C	4,860.00		4,860.00
PUBLIC	Greendale	2006	PRIVATE SEWER	D	1,690.00	6,000.00	7,690.00
PUBLIC	Greendale	2007	PUBLIC MANHOLE	B	7,000.00	575,200.00	582,200.00
PUBLIC	Greendale	2007	PUBLIC SEWER	C	3,008.00	0.00	3,008.00
PUBLIC	Greendale	2007	PRIVATE SEWER	D	750.00	10,000.00	10,750.00
PUBLIC	Greenfield	2007	PUBLIC MANHOLE	B	79,856.00	587,149.00	667,005.00
PUBLIC	Greenfield	2007	PUBLIC SEWER	C	62,732.00	13,390.00	76,122.00
PUBLIC	Greenfield	2007	OTHER	F	121,200.00	0.00	121,200.00
PUBLIC	Greenfield	2006	PUBLIC MANHOLE	B	79,000.00	784,477.28	863,477.28
PUBLIC	Greenfield	2006	PUBLIC SEWER	C	58,000.00	587,101.00	592,901.00
PUBLIC	Hales Corners	2006	PUBLIC MANHOLE	B	1,500.00	8,300.00	9,800.00
PUBLIC	Hales Corners	2006	PRIVATE MANHOLE	B	0.00	0.00	0.00
PUBLIC	Hales Corners	2006	PUBLIC SEWER	C	18,272.00	1,332,400.00	1,350,672.00
PUBLIC	Hales Corners	2006	PRIVATE SEWER	C	0.00	0.00	0.00
PUBLIC	Hales Corners	2006	PRIVATE BUILDING SEWER	D	0.00	0.00	0.00
PUBLIC	Hales Corners	2006	ILLEGAL CONNECTION	E	0.00	0.00	0.00
PUBLIC	Hales Corners	2006	OTHER	F	0.00	0.00	0.00
PUBLIC	Hales Corners	2007	PUBLIC MANHOLE	B	2,000.00	3,600.00	5,600.00
PRIVATE	Hales Corners	2007	PRIVATE MANHOLE	B	0.00	0.00	0.00
PUBLIC	Hales Corners	2007	PUBLIC SEWER	C	10,535.00	2,460.00	12,935.00

Public Or Private	Municipality	YEAR	Type	Table Name	Inspection Costs	Rehabilitation Costs	Total Costs
PUBLIC	Hales Corners	2007	PRIVATE SEWER	C	0.00	0.00	0.00
PRIVATE	Hales Corners	2007	PRIVATE BUILDING SEWER	D	0.00	0.00	0.00
PRIVATE	Hales Corners	2007	ILLEGAL CONNECTION	E	0.00	0.00	0.00
PUBLIC	Hales Corners	2007	OTHER	F	0.00	0.00	0.00
PUBLIC	Menomonee Falls	2005	PUBLIC MANHOLE	B	7,832.00	17,087.00	24,919.00
PRIVATE	Menomonee Falls	2005	PRIVATE MANHOLE	B	428.00	0.00	428.00
PUBLIC	Menomonee Falls	2006	PUBLIC MANHOLE		5,000.00	10,000.00	15,000.00
PUBLIC	Menomonee Falls	2007	PUBLIC SEWER		12,250.00	244,995.00	257,245.00
PUBLIC	Mequon	2006	PUBLIC SEWER	C	11,250.00	0.00	11,250.00
PRIVATE	Mequon	2006	ILLEGAL CONNECTION	E	15,750.00	200.00	15,950.00
PUBLIC	Mequon	2006	PUBLIC MANHOLE	B	0.00	230,000.00	230,000.00
PUBLIC	Mequon	2007	PUBLIC MANHOLE	B	9,600.00	130,350.00	139,950.00
PUBLIC	Mequon	2007	PUBLIC SEWER	C	35,305.00	175,903.00	211,208.00
PRIVATE	Mequon	2007	PRIVATE SEWER	C	26,220.00	139,482.00	165,702.00
PUBLIC	Milw County	2006	PUBLIC MANHOLE	A	222,637.91	0.00	222,637.91
PUBLIC	Milw County	2007			610,000.00	1,275,000.00	1,885,000.00
PUBLIC	Milwaukee	2006	DEFAULT OBJECT TYPE	B	197,000.00	1,362,340.00	1,559,340.00
PUBLIC	Milwaukee	2006	DEFAULT OBJECT TYPE	C	268,900.00	2,428,847.00	2,697,747.20
PUBLIC	Milwaukee	2006	DEFAULT OBJECT TYPE	F			92,000.00
PUBLIC	Milwaukee	2007	PUBLIC MANHOLE	B	149,000.00	1,090,840.00	1,239,840.00
PUBLIC	Milwaukee	2007	PUBLIC SEWER	C	216,842.00	5,066,003.00	5,282,845.00
PUBLIC	Milwaukee	2007	OTHER	F	52,757.00	0.00	52,757.00
PUBLIC	MMSD	2007	PRIVATE BUILDING SEWER	G	23,002.00	11,234.00	34,236.00
PUBLIC	Muskego	2006	PUBLIC MANHOLE	B	20,000.00	0.00	20,000.00
PRIVATE	Muskego	2006	PRIVATE MANHOLE	B	0.00	0.00	0.00
PUBLIC	Muskego	2006	PUBLIC SEWER	C	0.00	0.00	0.00
PRIVATE	Muskego	2006	PRIVATE SEWER	C	0.00	0.00	0.00
PRIVATE	Muskego	2006	PRIVATE BUILDING SEWER	D	0.00	0.00	0.00
PRIVATE	Muskego	2006	ILLEGAL CONNECTION	E	0.00	0.00	0.00
PUBLIC	Muskego	2006	OTHER	F	0.00	0.00	0.00
PUBLIC	Muskego	2007	ILLEGAL CONNECTION	E	100.00	100.00	100.00
PUBLIC	Muskego	2007	PUBLIC MANHOLE	B	1,000.00	15,000.00	16,000.00
PUBLIC	Muskego	2005	PUBLIC MANHOLE	B	17,865.75	14,835.00	32,700.75
PUBLIC	New Berlin	2005	PUBLIC SEWER	C	80,758.29	1,272,942.23	1,353,700.52
PUBLIC	New Berlin	2006	PUBLIC MANHOLE	B	13,549.11	32,100.80	45,649.91
PUBLIC	New Berlin	2006	PUBLIC SEWER	C	217,686.47	1,075,678.70	1,293,365.17
PUBLIC	New Berlin	2006	PUBLIC MANHOLE	B	13,549.11	32,100.80	45,649.91
PUBLIC	New Berlin	2006	PUBLIC SEWER	C	217,686.47	1,075,678.70	1,293,365.17
PUBLIC	New Berlin	2007	PUBLIC MANHOLE	DEFAULT VALUE	8,430.71	5,761.39	14,192.10

Public Or Private	Municipality	YEAR	Type	Table Name	Inspection Costs	Rehabilitation Costs	Total Costs
PUBLIC	New Berlin	2007	PUBLIC SEWER	DEFAULT VALUE	105,301.00	0.00	105,301.00
PUBLIC	Oak Creek	2005	PUBLIC MANHOLE	B	8,000.00	25,000.00	33,000.00
PUBLIC	Oak Creek	2005	PUBLIC SEWER	C	35,000.00	2,500.00	37,500.00
PUBLIC	Oak Creek	2006	PUBLIC MANHOLE	B	30,500.00	10,300.00	40,800.00
PUBLIC	Oak Creek	2006	PUBLIC SEWER	C	36,000.00	3,000.00	39,000.00
PUBLIC	Oak Creek	2007	PUBLIC MANHOLE	B	30,000.00	43,000.00	73,000.00
PUBLIC	Oak Creek	2007	PUBLIC SEWER	C	33,000.00	1,000.00	34,000.00
PUBLIC	Oak Creek	2007	PUBLIC MANHOLE	B	30,000.00	43,000.00	73,000.00
PUBLIC	Oak Creek	2007	PUBLIC SEWER	C	33,000.00	1,000.00	34,000.00
PUBLIC	River Hills	2005	PUBLIC MANHOLE	B	5,685.00	3,600.00	9,285.00
PUBLIC	River Hills	2005	PUBLIC SEWER	C	29,341.00		29,341.00
PUBLIC	River Hills	2006	PUBLIC MANHOLE	B	14,692.00	12,828.00	27,457.00
PUBLIC	River Hills	2006	PUBLIC SEWER	C	18,859.00	54,190.00	73,049.00
PUBLIC	River Hills	2007	PUBLIC MANHOLE	G	6,025.00	4,573.00	10,598.00
PUBLIC	River Hills	2007	PUBLIC SEWER	G	31,094.00	101,103.00	132,197.00
PUBLIC	Shorewood	2006	PUBLIC MANHOLE	B	1,362.00	36,600.00	37,962.00
PUBLIC	Shorewood	2006	PUBLIC SEWER	C	5,450.00	31,455.50	36,905.50
PUBLIC	Shorewood	2007	PUBLIC MANHOLE	C			
PUBLIC	Shorewood	2007	PUBLIC SEWER	C		11,488.02	11,488.02
PRIVATE	Shorewood	2007	PRIVATE SEWER	D		110,332.75	110,332.75
PUBLIC	St. Francis	2005	PUBLIC MANHOLE	B	6,000.00	8,850.00	14,850.00
PUBLIC	St. Francis	2005	PUBLIC SEWER	C	0.00	8,685.00	8,685.00
PUBLIC	St. Francis	2006	PUBLIC SEWER	C	4,524.00	14,616.00	19,140.00
PUBLIC	St. Francis	2006	PUBLIC MANHOLE	B	0.00	2,340.00	2,340.00
PUBLIC	St. Francis	2007	PUBLIC SEWER	C	10,000.00		10,000.00
PUBLIC	St. Francis	2007	PUBLIC MANHOLE	B		6,000.00	6,000.00
PUBLIC	Thiensville	2007	PUBLIC MANHOLE	B	25,000.00	40,000.00	65,000.00
PUBLIC	Thiensville	2007	PRIVATE MANHOLE	B	500.00	8,120.00	8,620.00
PUBLIC	Thiensville	2006	PUBLIC MANHOLE	B	14,952.00	70,367.00	85,319.00
PUBLIC	Thiensville	2006	ILLEGAL CONNECTION	E	5,000.00	5,000.00	5,000.00
PUBLIC	Wauwatosa	2005	PUBLIC MANHOLE	B	22,720.00	216,357.00	239,077.00
PUBLIC	Wauwatosa	2005	PRIVATE SEWER	B			
PUBLIC	Wauwatosa	2005	PUBLIC SEWER	C	45,608.00	786,060.00	831,668.00
PUBLIC	Wauwatosa	2005	PRIVATE SEWER	C			
PUBLIC	Wauwatosa	2005	PRIVATE BUILDING SEWER	D	2,672.00	89,135.00	91,807.00
PUBLIC	Wauwatosa	2005	ILLEGAL CONNECTION	E	3,360.00	56,000.00	59,360.00
PUBLIC	Wauwatosa	2005	OTHER	F			
PUBLIC	Wauwatosa	2005	OTHER	H	3,100.00	267,936.00	271,036.00
PUBLIC	Wauwatosa	2006	PUBLIC MANHOLE	B	64,108.00	570,451.00	634,559.00

Public Or Private	Municipality	YEAR	Type	Table Name	Inspection Costs	Rehabilitation Costs	Total Costs
PRIVATE	Wauwatosa	2006	PRIVATE MANHOLE	B	0.00	0.00	0.00
PUBLIC	Wauwatosa	2006	PUBLIC SEWER	C	5,734.00	394,597.00	400,331.00
PRIVATE	Wauwatosa	2006	PRIVATE SEWER	C	0.00	0.00	0.00
PRIVATE	Wauwatosa	2006	PRIVATE BUILDING SEWER	D	9,550.00	153,989.00	163,539.00
PRIVATE	Wauwatosa	2006	ILLEGAL CONNECTION	E	0.00	90,000.00	90,000.00
PUBLIC	Wauwatosa	2006	OTHER	H	0.00	403,493.00	403,493.00
PUBLIC	Wauwatosa	2007	PUBLIC MANHOLE	B	36,300.00	395,595.00	432,895.00
PRIVATE	Wauwatosa	2007	PRIVATE MANHOLE	B	0.00	0.00	0.00
PUBLIC	Wauwatosa	2007	PUBLIC SEWER	C	10,062.00	448,954.00	459,016.00
PRIVATE	Wauwatosa	2007	PRIVATE SEWER	C	0.00	0.00	0.00
PRIVATE	Wauwatosa	2007	PRIVATE BUILDING SEWER	D	8,100.00	223,873.00	231,973.00
PRIVATE	Wauwatosa	2007	ILLEGAL CONNECTION	E	0.00	144,650.00	144,650.00
PUBLIC	Wauwatosa	2007	OTHER	H	0.00	116,551.00	116,551.00
PUBLIC	West Allis	2006	PUBLIC MANHOLE	B	5,000.00	50,000.00	55,000.00
PUBLIC	West Allis	2006	PUBLIC SEWER	C	75,000.00	1,898,650.00	1,973,650.00
PUBLIC	West Allis	2007	PUBLIC MANHOLE	B	75,000.00	140,000.00	215,000.00
PUBLIC	West Allis	2007	PUBLIC SEWER	C	140,000.00	1,589,000.00	1,729,000.00
PUBLIC	West Allis	2007	PRIVATE BUILDING SEWER	D	0.00	116,000.00	116,000.00
PUBLIC	West Milwaukee	2007	PUBLIC MANHOLE	B	1,440.00	260.00	1,700.00
PUBLIC	West Milwaukee	2007	PUBLIC SEWER	C	1,500.00	47,915.00	49,415.00
PRIVATE	West Milwaukee	2007	PRIVATE SEWER	D	200.00	6,000.00	6,200.00
PUBLIC	Whitefish Bay	2006	PUBLIC SEWER	C	140,000.00	3,380,000.00	3,520,000.00
PUBLIC	Whitefish Bay	2006	OTHER	F	0.00	5,000.00	5,000.00
PRIVATE	Whitefish Bay	2007	PRIVATE BUILDING SEWER	D	15,000.00	320,000.00	335,000.00
PUBLIC	Whitefish Bay	2007	PUBLIC MANHOLE	B	3,000.00	3,000.00	3,000.00
PUBLIC	Whitefish Bay	2007	ILLEGAL CONNECTION	E	13,000.00	13,000.00	13,000.00
PUBLIC	Whitefish Bay	2007	PUBLIC SEWER	E	85,000.00	650,000.00	735,000.00

See pdf file for 1997-2004 costs

# Appendix C

## Sewage Flow Estimates



## Schultz, Steve

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**From:** Schultz, Steve  
**Sent:** Tuesday, April 27, 2010 1:40 PM  
**To:** Schultz, Steve  
**Subject:** FW: 2009 New Berlin Sewer Flow Estimates

**From:** Stamborski, Chris M. [mailto:Chris.Stamborski@rasmithnational.com]  
**Sent:** Friday, April 23, 2010 3:41 PM  
**To:** Schultz, Steve  
**Cc:** 'Johnson, Rick'  
**Subject:** 2009 New Berlin Sewer Flow Estimates

Steve-

As I indicated in my voice message to you, the previous estimate that we provided to Rick was for 2006 monitoring efforts in the City of New Berlin. In 2006 we performed a wider spectrum of monitoring throughout the City that has since been pared down to focus on the basins with the highest levels of I/I. Based on that, please review the following for flow information we have logged for the City using the summary chart from last year as a basis:

The following is a summary of the basins that we monitored for the Utility as part of last year's monitoring program. The monitoring took place between March 1, 2009 and October 31, 2009. The flow listed is the average daily flow for each monitoring location.

### New Berlin Basins 1, 4, 5, and 6

Meter 1B = 0.53 cfs → 0.34 MGD (captures almost all of basin 1)

Meter 1C = no metering performed in this basin

Meter 4A = 0.31 cfs → 0.20 MGD (captures all of basin 4)

Meter 5A = no metering performed in this basin

**Total = incomplete**

### New Berlin Basin 9

Meter 9A = 0.35 cfs → 0.23 MGD (captures the north end of basin 9)

Meter 9B = 1.03 cfs → 0.66 MGD (captures the south end of basin 9)

**Total = 1.38 cfs → 0.89 MGD**

### New Berlin Basins 7 & 10

Meter 7B = 2.55 cfs → 1.65 MGD (captures the majority of basin 7, 99%)

Meter 10A = no metering performed in this basin

**Total = incomplete**

The following information is what we were provided by MMSD. This information includes all monitoring performed at their meters. I believe that it should still give you a good idea of the flows that were experienced at each of their locations.

(New Berlin Basins 1, 4, 5, and 6) = 2.812 MGD

MMSD Meter 027C = 0.160 MGD  
(New Berlin Basins 3A and 3B)

MMSD Meter 027D = 0.343 MGD

(New Berlin Basins 3C, 3D, and 3E)

(New Berlin Basin 9) = 0.403 MGD

MMSD Meter MS0210 = 2.292 MGD  
(New Berlin Basins 7 and 10)

The flow from New Berlin Basin 8 (Lift Station 5 and 6 predominantly) flow unmetered through Muskego. The following is total flow data from lift station 5 and 6 to get an estimate of the total flows produced by these areas, even though there are gravity areas that are not included in these numbers.

New Berlin Lift Station 5 = 0.012 MGD  
(New Berlin Basin 8C)

New Berlin Lift Station 6 = 0.003 MGD

**Total Average Daily Flow = 6.025 MGD →  $6.025 * 365 = \underline{2.199 \text{ Billion Gallons Per Year}}$   
(approximately a 10% increase from**

**2006 numbers)**

I think that it would be best to use the numbers from MMSD's meters, as they show lower flows than some of the meters that we have installed (especially the ones that we know are still level-only measurement for MMSD), and also because we do not have complete coverage for the intermediate meters in the areas of question. If this becomes an issue it can easily be addressed yet this year and in future flow monitoring efforts in the City.

Please let me know if you have any more questions.

Chris

Chris M. Stamborski, P.E.  
**R.A. Smith National, Inc.**  
262-317-3337