

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

CITY OF NEW BERLIN  
WAUKESHA COUNTY, WISCONSIN  
MARCH 2013



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# 2012 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 2012 for the City of New Berlin (CITY):

1. The total amount of water purchased from Milwaukee on a monthly basis. Note: All water used by New Berlin Utility customers is purchased from the City of Milwaukee. **ALL City of New Berlin Wells are out of service.**
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. Average residential per capita use.
5. There is currently NO water pumped from City of New Berlin wells. All wells are out of service.
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 9 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 2009, 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. All City of New Berlin groundwater wells have been abandoned. (Appendix E – pages 1-6)

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 3 columns, the first listing the month, the second representing the cubic feet of water purchased and the third the number of gallons purchased from the City of Milwaukee. All of these totals are determined by the amount of water purchased (and measured) from the City of Milwaukee Water Works. There are **NO** New Berlin groundwater wells in service.

## 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 sub continental 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 determined by applying an average factor of 57.3 percent groundwater pumpage and 42.7 percent Lake Michigan water usage in 2009. 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 year, the total pumpage was multiplied by .573 to estimate the diverted amount. 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. All City of New Berlin wells were disconnected in 2009 after the diversion request was approved. All City of New Berlin groundwater wells have been abandoned. (Appendix E – pages 1-6)

## 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 67.63 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. The per capita residency occupation rate of 2.61 in 2012 is from the MMSD Operating Manual. The calculation method used in Table 6-1 to determine the population served by the water system has been added at the bottom of the page. Information from the MMSD Cost Recovery Manual is found in Appendix E, pages 32-34.

## 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 and includes the revisions made in 2012. The 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. Since acquiring Milwaukee water, the Utility was able to reduce hydrant flushing to once per year. This practice alone has saved substantial water each year (Appendix E – page 7).
- Eliminate unnecessary waste in water use practices. The Water Conservation Plan provides the necessary authority to limit lawn sprinkling on an odd/even basis and time of day schedule. This summer's dry conditions prompted a Press Release limiting water sprinkling (Appendix E - page 8). The Utility posts information on the website, newsletter and Utility bill in an effort to educate customers in water conservation measures (Appendix E – page 9)
- 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. The City has had a Rain Garden display at the recycling center for

several years. This display includes a working rain barrel. Information on the various native plants, where to obtain rain barrels and lists of classes are included on the City's website (<http://www.newberlin.org/index.aspx?nid=422>). The Water Resources Management Utility has also used rain gardens and bioretention in several of their projects (Appendix E - page 10-12)

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. Hydrant flushing is performed in spring and fall. Every other hydrant is flushed in spring and the remaining ones in the fall. This ensures that each hydrant is flushed annually on a scheduled basis for maximum efficiency. 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 down to 67.63 in 2012.

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 per toilet. There were 78 toilets replaced in 2010, 45 toilets in 2011 and 12 in 2012. Customers installed Water Sense 1.28 low flow toilets to replace 3.5 or 5 gallon toilets they currently had. The program will continue in 2012. (For Examples of reduced water consumption after low flow toilet installation, Appendix E - pages 13-18)The Utility also performed 215 leak detection tests in 2012 and provides this service free of charge to utility customers. In addition, the Badger Meter RTR system that we now use can verify whether a customer has a leak. This allows us to notify the customer to set up an appointment to perform a free leak inspection to help reduce the amount of water that is wasted.

In 2013 the Utility began offering customers free toilet leak dye tablets available at City Hall and the Library. The City's website also advertised the EPA's WaterSense "Fix A Leak Week" which gives tips on checking for and fixing leaks.(Appendix D-pgs 21-25)

The Utility has implemented the cross connection inspection program that was mandated by the DNR for commercial and industrial customers and will be also inspecting residential customers starting in 2012 when meters are replaced or when answering a customer service call. In 2012 there were 140 residential inspections of which 116 were complaint and 24 rechecks in spring due to irrigation systems.(Appendix E - pages 19-22) The Utility began documenting if customers are operating water softeners or have removed or disconnected the unit. Since March 2012 Utility personnel that perform meter pulls have documented whether softeners have been disconnected or removed from residences. They have found over 90% of softeners were not in use. (Appendix E - page 23) In 2005 and also in 2009 when Milwaukee water was delivered to Utility customers on various sides of the continental divide, letters were sent to customers that provided information regarding the changes in water, including water hardness data and encouraged customers to disconnect their

softeners. (Appendix E - pages 24-27) Based on estimates and an average softener regeneration of once a week, the average residential customer would save over 2,600 gallons per year. (Appendix E - pages 28-29). Because of variables such as weather, occupancy rates, economic conditions and the fact that meters are read quarterly in thousand gallon increments, it is difficult to provide an actual water savings realized in 2011 through disconnection of water softeners. Hydrant flushing water usage has reduced since we began this program. (Appendix E - page 7). A 5 Year Water Use Analysis is also listed (see Appendix E - page 30-31)

The Utility repaired 6 water main breaks, 4 service line leaks, performed 5 valve replacement and repairs and replaced 3 hydrants.

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. Along with the Water Conservation Plan, Utility personnel use a "Residential Demand Management Program" to monitor high consumption, show customers the amount of water caused by leaks, and provide informational material on water conservation. (Appendix E - page 32) The Utility also provides classes to area schools and businesses when requested and hands out coloring books, water usage wheels and other brochures in their effort to promote water conservation. (Appendix E - pages 33-39) 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. The City's website contains educational information with kid's pages for water conservation activities and links to a drip calculator and other resource to provide helpful information to utility customers (see Appendix D).

### Infiltration and Inflow (I/I)

The City has an annual I/I program that has been in place since 1997. The City spent \$73,000 in 2012 on I/I reduction. Table 7-1 lists the I/I reduction projects from 2012. The Utility has invested an average of \$784,440 per year from 2000-2012 in I & I reduction. (Appendix B, page 6) Private I & I investigation and implementation will begin in 2013.

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 (acres)	Maximum Allowable Peak Hourly Flow Rate (gallons per acre per day)
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 and 2010-2012 results 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 4.874 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 1.922 MGD of flow for the eastern portion and .71 MGD 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 2012 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	1.155 MGD	2.632 MGD	1.922 MGD
West of Divide	1.532 MGD	2.242 MGD	.710 MGD
<b>Total</b>	<b>2.687 MGD</b>	<b>4.874 MGD</b>	<b>2.632MGD</b>



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 over \$20 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. 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 2009-2012.

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

Table 9-1 provided by R.A. Smith 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 - 2012  
 City of New Berlin, Wisconsin

Month	Cubic Feet	Monthly Total Amount of Water Purchased From The City of Milwaukee
January	102,800	76,894,400
February	90,760	67,888,480
March	93,770	70,139,960
April	97,880	73,214,240
May	112,930	84,471,640
June	139,450	104,308,600
July	164,600	123,120,800
August	118,660	88,757,680
September	111,400	83,327,200
October	109,000	81,532,000
November	91,600	68,516,800
December	82,330	61,582,840
Total Annual Pumpage	1,315,180	983,754,640

**Source:** City of Milwaukee, Wisconsin Public Service Commission and SCADA

**Note:** ALL of water used by the City of New Berlin Utility customers in 2012 was purchased from the City of Milwaukee. New Berlin wells are no longer in service

**Average:** 2.687 million gallons per day  
 81,979,553 gallons per month

**Highest Day:** July 9, 2012 - 5,720,000 gallons

**Lowest Day:** January 14, 2012 - 2,193,000 gallons

Table 2-1

Amount of Water Sold to Each Category and Subcategory of Customer on a Quarterly Basis Within the City Limits - 2012  
 Annual Report of Water Use, Water Diversion and Return Flow - 2012  
 City of New Berlin, Wisconsin

	Major Category (Total Gallons Sold in Thousands)				Total
	Residential	Commercial	Industrial	Public	
1st Quarter 2012	120,625	75,857	16,962	3,665	217,109
2nd Quarter 2012	106,419	76,996	16,659	2,649	202,723
3rd Quarter 2012	203,012	97,984	17,644	4,686	323,326
4th Quarter 2012	110,201	75,880	13,909	3,370	203,360
Total	540,257	326,717	65,174	14,370	946,518

	Residential Subcategory (Total Gallons Sold in Thousands)		Totals
	Great Lakes Basin	Mississippi Basin	
1st Quarter 2012	79,968	40,657	120,625
2nd Quarter 2012	71,795	34,624	106,419
3rd Quarter 2012	143,831	59,181	203,012
4th Quarter 2012	74,950	35,251	110,201
Total	370,544	169,713	540,257

	Condominium and Apartment Subcategory of Commercial Category (Total Gallons Sold in Thousands)		Totals
	Great Lakes Basin	Mississippi Basin	
1st Quarter 2012	13,549	18,626	32,175
2nd Quarter 2012	14,628	20,302	34,930
3rd Quarter 2012	17,233	27,968	45,201
4th Quarter 2012	14,640	19,250	33,890
Total	60,050	86,146	146,196

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 - 2012  
 Annual Report of Water Use, Water Diversion and Return Flow - 2012  
 City of New Berlin, Wisconsin

	Major Category Mississippi Basin (Total Gallons Sold in Thousands)				Total
	Residential	Commercial	Industrial	Public	
1st Quarter 2012	40,657	68,008	24,941	3,003	136,609
2nd Quarter 2012	34,624	51,488	16,876	2,140	105,128
3rd Quarter 2012	59,181	67,960	17,852	4,243	149,236
4th Quarter 2012	35,251	51,104	14,095	2,873	103,323
Total	169,713	238,560	73,764	12,259	494,296

Condominium and Apartment Subcategory of Commercial (Total Gallons Sold in Thousands)

	Mississippi Basin
1st Quarter 2012	18,626
2nd Quarter 2012	20,302
3rd Quarter 2012	27,968
4th Quarter 2012	19,250
Total	86,146

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 - 2012  
 City of New Berlin, Wisconsin

Month	Estimated Amount Diverted In Gallons
January	44,060,491
February	38,900,099
March	40,190,197
April	41,951,759
May	48,402,249
June	59,768,827
July	70,548,218
August	50,858,150
September	47,746,485
October	46,717,836
November	39,260,126
December	35,286,967
Total	563,691,404

Source: City of New Berlin Utility

Estimated use based on 57.3% Mississippi River Basin

Source: 2009 Ruekert & Mielke Diversion Report

Table 5-1

Amount of Water Pumped From Each Municipal Well Within the City Limits on a Quarterly Annual Report of Water Use, Water Diversion and Return Flow - 2012  
 City of New Berlin, Wisconsin

All City of New Berlin wells were disconnected in 2009

Well Number and Name	Basin Well is located In	Status
Well no. 1 - Forest View	Great Lakes-St Lawrence	abandoned
Well no. 2 - Glen Park	Mississippi River	abandoned
Well no. 3 - Rogers Drive	Mississippi River	abandoned
Well no. 4 - Greenridge	Great Lakes-St Lawrence	Well abandoned, converted into Milwaukee water pumping station
Well no. 5 - Regal Main	Mississippi River	abandoned
Well no. 7 - National Avenue	Mississippi River	abandoned
Well no. 8 - Valley View East *	Great Lakes-St Lawrence	abandoned 6/4/12
Well no. 9 - Valley View West *	Great Lakes-St Lawrence	abandoned 5/3/12
Well no. 10 - Westridge *	Mississippi River	abandoned 4/26/12
Well no. 11	Great Lakes-St Lawrence	abandoned

Source: City of New Berlin Water Utility

All water provided to City of New Berlin Utility customers are serviced by City of Milwaukee water. There are NO New Berlin ground water wells in service. All are disconnected and abandoned.

\*Copy of abandonment paperwork for Wells 8-10 have been included in Appendix E

Table 6-1

Average Residential Per Capita Use  
Annual Report of Water Use, Water Diversion and Return Flow - 2012  
City of New Berlin, Wisconsin

Basin	Cust Class	2012 Quarter (Use in Thousands Gallons)				Total	Population	Average Residential Per capita Use in Gallons per Day
		1st	2nd	3rd	4th			
		Cons	Cons	Cons	Cons			
Great Lakes	C-CONDO/APT	13,549	14,628	17,233	14,640	60,050	3,319	
Great Lakes	R Residential	79,968	71,795	143,831	74,950	370,544	13,340	
	TOTALS					430,594	16,659	70.82
Mississippi	C-CONDO/APT	18,626	20,302	27,968	19,250	86,146	3,904	
Mississippi	R Residential	40,657	34,624	59,181	35,251	169,713	7,245	
	TOTALS					255,859	11,149	62.87
	Combined City Wide Residential Per Capita Water Use					686,453	27,808	67.63

Source: City of New Berlin, Milwaukee Metropolitan Sewerage District

Calculations: We took the average number of residential connections & multiplied it by the occupancy factor, then we broke down the apartments by number of bedrooms & multiplied that by the appropriate occupancy factor and finally added the number of condos multiplied by their occupancy factor. We took the occupancy factors out of MMSD's Cost Recovery Manual. The calculation is complicated by 2 factors, first: a significant portion of the city is not served by municipal water and second; the PSC & DNR have different classification methods for "residential" customers, specifically condo and apartment units.

2012 Connections

Basin	Cust Class	Q1		Q2		Q3		Q4		Average	Occupancy Factor	Population
		Count	Count	Count	Count	Count	Count	Count	Count			
MILW	C-CONDO/APT	286	286	286	286	286	286	286	286			
MILW	R Residential	5,112	5,112	5,112	5,112	5,111	5,111	5,111	5,111	5,111	2.61	13,340
MISB	C-CONDO/APT	816	820	821	821	821	821	904	904			
MISB	R Residential	2,773	2,776	2,778	2,778	2,778	2,779	2,779	2,779	2,776	2.61	7,245

2012 - Condo/Apartment population Calculation

Basin	Bedroom	Units	Factor	Population
MILW	1	452	1.50	678
MILW	2	909	2.50	2,272
MILW	3	79	2.61	206
MILW		109	1.50	163
				3,319
MISB	1	363	1.50	545
MISB	2	886	2.50	2,215
MISB	3	26	2.61	68
MISB		718	1.50	1,077
				3,904
TOTAL				27,808



Table 7-1

Water Conservation Efforts and I/I Reduction Efforts  
 Annual Report of Water Use, Water Diversion and Return Flow - 2012  
 City of New Berlin, Wisconsin

Year	Project Title	Work Involved	Project Expenditures
2009	Glendale Road	Sewer Rehabilitation, Relining and Manhole Repairs to Reduce I/I	\$711,000
2009	Deer Creek Interceptor	Sewer Rehabilitation, Relining and Manhole Repairs to Reduce I/I	\$247,945
2010	Various Areas	Sewer Rehabilitation, Relining and Manhole Repairs to Reduce I/I	\$352,785
2011	Greenridge/Various	Sewer Rehabilitation, Relining and Manhole Repairs to Reduce I/I	\$283,000
2012	124th & Greenfield	Relay Section of sewer main, Relining and Manhole Repairs to Reduce I/I	\$73,000
	Total		\$1,667,730

Source: City of New Berlin Utility Department

Table 8-1

Estimates of the Monthly sewerage return flow From Within the City  
Annual Report of Water Use, Water Diversion and Return Flow - 2012  
City of New Berlin, Wisconsin

Currently there is no sewer service in the southwest corner of the city that is within the approved MMSD Service area.  
See Table 9-1 for sewer return flow in the approved Lake Water Service area and Expanded Lake Water Service area

Source: R.A. Smith and Milwaukee Metropolitan Sewerage District

Table 9-1

Estimates of the Monthly sewerage return flow From Within the Approved Water Supply Service Area and approved Diversion Area  
 Annual Report of Water Use, Water Diversion and Return Flow - 2012  
 City of New Berlin, Wisconsin

Basin	Average Daily Flow (MGD)	Monthly (30-Day) Flow Gallons	Annual Flow (Gallons)
Great Lakes Basin	2.632	78,960,000	960,680,000
Mississippi River Basin	2.242	67,260,000	818,330,000
Total	4.874	146,220,000	1,779,010,000

Source: R.A. Smith and Milwaukee Metropolitan Sewerage District