



Yorkville - Raymond Drainage District

Union Grove Sanitary District Assessment Report January 14, 2014



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INTRODUCTION

The following report was prepared by Nielsen Madsen & Barber, S.C. (NMB), at the request of the Racine County Board of Drainage Commissioners on behalf of the Yorkville Raymond Drainage District hereafter referred to as the “District”, to determine an appropriate assessment for the effluent discharge from the Union Grove Sanitary District. This report details the methodology and results of the assessment.

YORKVILLE RAYMOND DRAINAGE DISTRICT

The Yorkville Raymond Drainage District, which is controlled and maintained by the Racine County Board of Drainage Commissioners, contains land that drains to the West Branch of the Root River Canal. The District contains 4,662 acres of land consisting of 248 parcels and encompasses parts of two municipalities within Racine County: the Town of Raymond (1,524 acres) and the Town of Yorkville (3,138 acres).

The drainage system within the District includes four branch tiles and four branch ditches all of which drain to the West Branch of the Root River Canal. The branch ditches add up to a total of 10,610 linear feet (2.01 miles) of drainage way. The district tiles add up to a total length of 11,550 linear feet (2.19 miles).

The District is obligated, under Section 88.63 of the State Statutes, to maintain and repair District facilities. The cost of maintenance and repair is assessed based upon the benefits each parcel receives per Section 88.23 of the State Statutes. Property owners are assigned, in part, a proportionate “charge” based on the amount of runoff “generated” by their property.

UNION GROVE SANITARY DISTRICT ASSESSMENT ANALYSIS

In addition to the runoff produced by lands within the District, the Union Grove Sanitary District (UGSD) has a sanitary sewer treatment plant which discharges its treated effluent into the West Branch of the Root River Canal. Since the UGSD utilizes District facilities to convey its outfall discharge it is appropriate that they be included in the benefits analysis and receive an appropriate assessment per Wisconsin Administrative Code Chapter ATCP 48.04(3) and ATCP 48.10(1).

In order to calculate an appropriate assessment charge for the UGSD, their annual discharge into District maintained facilities was compared with the overall runoff from the lands within the entire watershed of the West Branch of the Root River Canal. Annual treatment plant discharges from 2004 to the present were provided to NMB by the Village of Union Grove Public Works in a transmittal dated September 3, 2013. This information can be found in Appendix “A” of this report. The partial annual flow from 2013 was removed and the remaining annual flows were averaged (2004-2012). This resulted in an average annual outflow of 368.547 million gallons.

The average annual precipitation for the District was determined using data from the U.S. Department of Commerce National Oceanic and Atmospheric Administration (NOAA) which maintains climate data including annual precipitation from stations across the country. The Village of Union Grove's sanitary sewer treatment plant is the site of one of NOAA's stations. Annual precipitation data from 1981 to 2010 for the Union Grove station was used to determine an average annual precipitation for the District. The year of 1996 was omitted due to incomplete data. The resulting 30-year average annual precipitation (excluding 1996) was 34.15 inches.

According to SEWRPC Community Assistance Planning Report No. 316 ("A Restoration Plan for the Root River Watershed") the West Branch of the Root River watershed contains 25,319.8 acres. According to the Yorkville-Raymond Drainage District 2007 Special Assessment, the average runoff coefficient of the District is 0.172. This average runoff coefficient was assumed to be representative of the remainder of the watershed.

The total annual runoff for the watershed can be calculated by taking the product of the watershed area, the annual precipitation and the average runoff coefficient for the watershed. Per this calculation procedure, the annual District runoff is 539.866 million gallons. When the annual District runoff is added to the 368.547 million gallons of outflow from the UGSD, the total annual flow within District facilities is 908.413 million gallons. The average annual outflow from the UGSD is 40.57% of the total flow through the District facilities. Therefore, the Union Grove Sanitary District should be responsible for 40.57% of the overall Yorkville-Raymond Drainage District assessment.

APPENDIX A
UNION GROVE SANITARY DISTRICT OUTFLOW DATA FROM VILLAGE OF
UNION GROVE DEPARTMENT OF PUBLIC WORKS

| YEAR | FINAL FLOW |
|------|------------|
| 2004 | 370,134 |
| 2005 | 295,060 |
| 2006 | 412,433 |
| 2007 | 403,140 |
| 2008 | 431,082 |
| 2009 | 391,830 |
| 2010 | 348,257 |
| 2011 | 384,779 |
| 2012 | 301,113 |
| 2013 | 294,555 |

*Village of Union Grove WWTP.
Number is in Million Gallons per Year*