Total Maximum Daily Load Report for the Kankakee/Iroquois Watershed

FINAL

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U.S. Environmental Protection Agency Region 5, Illinois Environmental Protection Agency, and the Indiana Department of Environmental Management

Prepared by

Tetra Tech, Inc.
1468 West Ninth Street, Suite 620
Cleveland, OH 44113
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EXECUTIVE SUMMARY

The Kankakee/Iroquois River watershed is located on both sides of the Indiana and Illinois border and drains a total of 5,153 square miles. The watershed drains almost 3,000 square miles in northwest Indiana, 2,170 square miles in northeast Illinois, and about 7 square miles in southwest Lower Michigan. The Kankakee River originates near South Bend, Indiana, and then flows westward into Illinois, where it joins with the Des Plaines River to form the Illinois River. The Iroquois River originates in the southern portion of the watershed in Indiana, and is a major tributary to the Kankakee River. It empties into the Kankakee near Kankakee, Illinois. Land use throughout the watershed is predominantly cultivated crops.

The Clean Water Act and U.S. Environmental Protection Agency (EPA) regulations require that states develop Total Maximum Daily Loads (TMDLs) for waters on the Section 303(d) lists. A TMDL is defined as “the sum of the individual wasteload allocations for point sources and load allocations for nonpoint sources and natural background” such that the capacity of the waterbody to assimilate pollutant loadings is not exceeded. A TMDL is also required to be developed with seasonal variations and must include a margin of safety that addresses the uncertainty in the analysis.

Both historical and sampling data from the summer of 2008 by Illinois and Indiana were used for the TMDL analysis. The data indicate that most sites that were sampled experienced at least one violation of water quality standards with the reductions needed to achieve water quality standards range from zero to 99 percent.

Potential sources of E. coli and fecal coliform in the watershed include regulated point sources such as wastewater treatment plants, concentrated animal feeding operations, storm water runoff from Municipal Separate Storm Sewer Systems (MS4s); and illicitly connected “straight pipe” discharges of household waste. Point sources are regulated through the National Pollutant Discharge Elimination System (NPDES). Potential sources also include unregulated nonpoint sources such as runoff from agricultural fields, forests, and undeveloped areas; leaking or faulty septic systems; runoff from lawn fertilizer applications; pet waste; and storm water runoff from outside of MS4 communities.

Determining the specific reasons for high bacteria counts in any given waterbody is challenging because there are so many potential sources and because bacteria counts have a high degree of variability. Within the Kankakee/Iroquois watershed, subwatersheds with relatively high animal unit densities also have the highest average E. coli counts. It is therefore possible that waste generated by livestock in these subwatersheds is contributing to the elevated bacteria counts. However, other factors could also explain this correlation, such as the fact these subwatersheds also tend to experience smaller flows and thus have less dilution. Specific sources of bacteria to each impaired waterbody should be further evaluated during follow-up implementation activities.

An important step in the TMDL process is the allocation of the allowable loads to individual point sources as well as unregulated sources. The Kankakee/Iroquois watershed TMDL includes these allocations, which are presented for each of the HUC 10 subwatersheds.

Nonpoint sources are considered to be the primary sources of the impairments in the Kankakee/Iroquois watershed. Although several NPDES facilities have been found to be in violation of their permit limits for bacteria, the majority of facilities discharge effluent that meets water quality standards. Nonpoint source pollution can be reduced by the implementation of Best Management Practices (BMPs). BMPs are practices used in agriculture, forestry, urban areas, and industry to reduce the potential for damage to natural resources from human activities. A BMP may be structural, that is, something that is built or involves changes in landforms or equipment, or it may be managerial, that is, changing a specific way of using or handling infrastructure or resources. BMPs should be selected based on the goals of a watershed.
management plan. Landowners and urban planners can implement BMPs outside of a watershed
management plan, but the overall success of BMPs is typically enhanced if it is coordinated through a
planning process. Potential implementation plans are outlined in Section 9.0 of the report.
1.0 INTRODUCTION

The Kankakee/Iroquois River watershed is located on both sides of the Indiana and Illinois border and drains a total of 5,153 square miles. The watershed drains almost 3,000 square miles in northwest Indiana, 2,170 square miles in northeast Illinois, and about 7 square miles in southwest Lower Michigan. The Kankakee River originates near South Bend, Indiana, and then flows westward into Illinois, where it joins with the Des Plaines River to form the Illinois River (Figure 1). The Iroquois River originates in the southern portion of the watershed in Indiana, and is a major tributary to the Kankakee River. It empties into the Kankakee near Kankakee, Illinois. Land use throughout the watershed is predominantly cultivated crops.

The Kankakee River, the Iroquois River, and a number of tributaries are listed as impaired for *Escherichia coli* (*E. coli*) in Indiana. The Kankakee and Iroquois Rivers, as well as Sugar Creek, are listed as impaired for fecal coliform bacteria in Illinois (Table 1). A total of thirty-four waterbody segments within the watershed are cited as impaired for fecal coliform and *Escherichia coli* (*E. coli*) on the Illinois and Indiana 2006 303(d) lists. In Indiana and Illinois, these impaired segments account for approximately 327 and 186 miles, respectively.

Because of the size of the Kankakee/Iroquois watershed, it has been divided into six major subwatershed groups. This helps facilitate a better understanding of characteristics, which uniquely affect water quality within each area. The use of subwatershed groups also enables a closer examination of key factors that affect water quality. The subwatershed groups, shown in Figure 1, include:

- Upper Kankakee
- Lower Kankakee
- Middle Kankakee
- Yellow River
- Upper Iroquois
- Lower Iroquois

The Clean Water Act and U.S. Environmental Protection Agency (EPA) regulations require that states develop Total Maximum Daily Loads (TMDLs) for waters on the Section 303(d) lists. A TMDL is defined as “the sum of the individual wasteload allocations for point sources and load allocations for nonpoint sources and natural background” such that the capacity of the waterbody to assimilate pollutant loadings is not exceeded. A TMDL is also required to be developed with seasonal variations and must include a margin of safety that addresses the uncertainty in the analysis.

The overall goals and objectives of the TMDL study for the Kankakee/Iroquois watershed were to:

- Assess the water quality of the impaired waterbodies and identify key issues associated with the impairments and potential pollutant sources.
- Use the best available science and available data to determine the maximum load the waterbodies can receive and fully support all of their designated uses.
- Determine current loads of pollutants to the impaired waterbodies.
- If current loads exceed the maximum allowable loads, determine the load reduction that is needed.
- Inform and involve the public throughout the project to ensure that key concerns are addressed and the best available information is used.
• Submit a final TMDL report to the U.S. Environmental Protection Agency (USEPA) for review and approval.

This report describes the entire analysis and, once finalized, will be submitted to EPA for approval as required by the Clean Water Act.
Figure 1. Location of Kankakee/Iroquois Watershed and streams listed on the 2006 Section 303(d) lists.
<table>
<thead>
<tr>
<th>State</th>
<th>Major Subwatershed</th>
<th>HUC</th>
<th>Waterbody</th>
<th>Segment ID</th>
<th>Parameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Illinois</td>
<td>Kankakee</td>
<td>101</td>
<td>Pine Creek-Horace Miller Ditch</td>
<td>INK0126_00</td>
<td>E. coli</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Potato Creek-Kartoffel Creek</td>
<td>INK0125_00</td>
<td>E. coli</td>
</tr>
<tr>
<td></td>
<td>Upper Kankakee</td>
<td>102</td>
<td>Kankakee River-Mainstem</td>
<td>INK011A_T1001</td>
<td>E. coli</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Little Kankakee River Byron</td>
<td>INK011C_00</td>
<td>E. coli</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Kankakee River</td>
<td>INK011D_T1002</td>
<td>E. coli</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Aldrich Ditch-Schang Ditch</td>
<td>INK0112_00</td>
<td>E. coli</td>
</tr>
<tr>
<td></td>
<td>Indiana</td>
<td>103</td>
<td>Kankakee River-Mainstem</td>
<td>INK0131_T1003</td>
<td>E. coli</td>
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<tr>
<td></td>
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<td>Kankakee River Mainstem</td>
<td>INK0133_T1004</td>
<td>E. coli</td>
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<tr>
<td></td>
<td></td>
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<td>Kankakee River Mainstem</td>
<td>INK0134_T1005</td>
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<tr>
<td></td>
<td></td>
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<td>Kankakee River-Long Ditch</td>
<td>INK0138_00</td>
<td>E. coli</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Kankakee River -Mainstem</td>
<td>INK0138_T1006</td>
<td>E. coli</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Kankakee River Mainstem</td>
<td>INK013C_T1007</td>
<td>E. coli</td>
</tr>
<tr>
<td></td>
<td></td>
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<td>Kankakee River</td>
<td>INK0147_T1009</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Kankakee River</td>
<td>INK0146_T1008</td>
<td>E. coli</td>
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<tr>
<td></td>
<td>Middle Kankakee</td>
<td>104</td>
<td>Kankakee River-English Lake</td>
<td>INK0183_M1011</td>
<td>E. coli</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Kankakee River</td>
<td>INK019F_M1113</td>
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</tr>
<tr>
<td></td>
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<td></td>
<td>Kankakee River</td>
<td>INK019F_M1104</td>
<td>E. coli</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Singleton Ditch-Bryant Ditch</td>
<td>INK01D3_00</td>
<td>E. coli</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Armey Ditch-Headwaters</td>
<td>INK0154_00</td>
<td>E. coli</td>
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<td></td>
<td></td>
<td></td>
<td>Yellow River-Armeys Ditch-Albert Zeiger Ditch</td>
<td>INK0155_00</td>
<td>E. coli</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Stock Ditch-Bunch Branches</td>
<td>INK0157_00</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Yellow River-Riverside Church</td>
<td>INK0158_00</td>
<td>E. coli</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Yellow River-Milner Seltenright Ditch</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Unnamed Ditch</td>
<td>INK0153_T1016</td>
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<td></td>
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<td>Yellow River-Listenber/Cliffton Ditches</td>
<td>INK0165_00</td>
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<tr>
<td></td>
<td></td>
<td></td>
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<td>INK0166_00</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Yellow River-Knox</td>
<td>INK016A_00</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Slough Creek</td>
<td>INK0235_T1019</td>
<td>E. coli</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Slough Creek-Carpenter Creek (Lower)</td>
<td>INK0238_00</td>
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<td></td>
<td></td>
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<td>Iroquois River</td>
<td>INK0223_T1003</td>
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<tr>
<td></td>
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<td>Lower Iroquois</td>
<td>204</td>
<td>Iroquois River</td>
<td>FL-02</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td>Sugar Creek</td>
<td>FLI-02</td>
<td>Fecal Coliform</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Gofield Creek-Iroquois River</td>
<td>FL-04</td>
<td>Fecal Coliform</td>
</tr>
</tbody>
</table>
2.0 DESCRIPTION OF THE WATERSHED

The Kankakee/Iroquois watershed drains 5,153 square miles. It is a part of the upper Illinois River and is comprised of thirty-two 10-digit Assessment Units (AUs) as shown in Table 2 and Figure 2. The watershed drains approximately 2,958 square miles in northwest Indiana and 2,168 square miles in northeast Illinois (a small portion (<1%) of the watershed also lies in Michigan, this portion will not be addressed in the TMDL).

The Kankakee River originates near South Bend, Indiana and flows in a general southwest direction until it turns westward at the confluence of the Iroquois River. The Kankakee River joins with the Des Plaines River to form the Illinois River. The Iroquois River is located in Indiana and Illinois and originates south of the Kankakee River watershed and meets with the Kankakee River in the Lower Kankakee subwatershed. It flows in a northeast to southwest pattern and turns westward where it meets with the Kankakee River. Major tributaries to the Kankakee River include the Iroquois River, the Little Kankakee River, and the Yellow River. The Kankakee/Iroquois watershed includes portions of 19 different counties in Indiana and Illinois (Figure 2).
Table 2. Assessment Units in Kankakee/Iroquois River Watershed

<table>
<thead>
<tr>
<th>Subwatershed</th>
<th>HUC 10</th>
<th>HUC 10 Name (State)</th>
<th>Drainage area (sq. miles)</th>
<th>Percent of Total Drainage area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper Kankakee</td>
<td>101</td>
<td>Pine Creek <em>(IN)</em></td>
<td>114.71</td>
<td>2.23</td>
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<tr>
<td></td>
<td>102</td>
<td>Little Kankakee River-Kankakee River <em>(IN)</em></td>
<td>233.32</td>
<td>4.53</td>
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<tr>
<td></td>
<td>104</td>
<td>Mill Creek-Kankakee River <em>(IN)</em></td>
<td>202.94</td>
<td>5.68</td>
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<tr>
<td></td>
<td>107</td>
<td>Robbins Ditch-Kankakee River <em>(IN)</em></td>
<td>118.20</td>
<td>3.94</td>
</tr>
<tr>
<td>Yellow</td>
<td>103</td>
<td>Headwaters Yellow River <em>(IN)</em></td>
<td>292.65</td>
<td>2.83</td>
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<tr>
<td></td>
<td>105</td>
<td>Yellow River <em>(IN)</em></td>
<td>145.79</td>
<td>1.94</td>
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<tr>
<td></td>
<td>106</td>
<td>Kline Arm <em>(IN)</em></td>
<td>100.08</td>
<td>2.29</td>
</tr>
<tr>
<td>Middle Kankakee</td>
<td>108</td>
<td>Pitner Ditch-Kankakee River <em>(IN)</em></td>
<td>193.65</td>
<td>3.76</td>
</tr>
<tr>
<td></td>
<td>109</td>
<td>Hodge Ditch <em>(IN)</em></td>
<td>84.14</td>
<td>1.63</td>
</tr>
<tr>
<td></td>
<td>110</td>
<td>Crooked Creek-Kankakee River <em>(IN)</em></td>
<td>243.35</td>
<td>4.72</td>
</tr>
<tr>
<td></td>
<td>111</td>
<td>Knight Ditch-Kankakee River <em>(IN)</em></td>
<td>109.11</td>
<td>2.12</td>
</tr>
<tr>
<td></td>
<td>112</td>
<td>Beaver Lake Ditch-Kankakee River <em>(IL/IN)</em></td>
<td>98.59</td>
<td>1.91</td>
</tr>
<tr>
<td></td>
<td>113</td>
<td>Singleton Ditch <em>(IL/IN)</em></td>
<td>254.29</td>
<td>4.93</td>
</tr>
<tr>
<td>Lower Kankakee</td>
<td>114</td>
<td>Spring Creek-Kankakee River <em>(IL/IN)</em></td>
<td>186.66</td>
<td>3.62</td>
</tr>
<tr>
<td></td>
<td>115</td>
<td>Rock Creek <em>(IL)</em></td>
<td>121.20</td>
<td>2.35</td>
</tr>
<tr>
<td></td>
<td>116</td>
<td>Horse Creek <em>(IL)</em></td>
<td>128.32</td>
<td>2.49</td>
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<tr>
<td></td>
<td>117</td>
<td>Forked Creek <em>(IL)</em></td>
<td>135.64</td>
<td>2.63</td>
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<tr>
<td></td>
<td>118</td>
<td>Kankakee River <em>(IL)</em></td>
<td>263.90</td>
<td>5.12</td>
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<tr>
<td>Upper Iroquois</td>
<td>201</td>
<td>Oliver Ditch <em>(IN)</em></td>
<td>82.35</td>
<td>1.60</td>
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<td></td>
<td>202</td>
<td>Slough Creek <em>(IN)</em></td>
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<td>2.82</td>
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<tr>
<td></td>
<td>203</td>
<td>Bruner Ditch-Iroquois River <em>(IN)</em></td>
<td>135.58</td>
<td>2.63</td>
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<td></td>
<td>204</td>
<td>Curtis Creek-Iroquois River <em>(IN)</em></td>
<td>161.72</td>
<td>3.14</td>
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<td></td>
<td>205</td>
<td>Montgomery Ditch-Iroquois River <em>(IL/IN)</em></td>
<td>160.46</td>
<td>3.11</td>
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<tr>
<td>Lower Iroquois</td>
<td>206</td>
<td>Mud Creek <em>(IL)</em></td>
<td>286.01</td>
<td>5.55</td>
</tr>
<tr>
<td></td>
<td>207</td>
<td>Sugar Creek <em>(IL/IN)</em></td>
<td>277.05</td>
<td>5.38</td>
</tr>
<tr>
<td></td>
<td>208</td>
<td>Spring Creek <em>(IL)</em></td>
<td>253.22</td>
<td>4.91</td>
</tr>
<tr>
<td></td>
<td>209</td>
<td>Prairie Creek <em>(IL)</em></td>
<td>89.41</td>
<td>1.74</td>
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<tr>
<td></td>
<td>210</td>
<td>Gofield Creek-Iroquois River <em>(IL)</em></td>
<td>110.06</td>
<td>2.14</td>
</tr>
<tr>
<td></td>
<td>211</td>
<td>Pike Creek <em>(IL)</em></td>
<td>71.00</td>
<td>1.38</td>
</tr>
<tr>
<td></td>
<td>212</td>
<td>Langan Creek <em>(IL)</em></td>
<td>107.33</td>
<td>2.08</td>
</tr>
<tr>
<td></td>
<td>213</td>
<td>Beaver Creek <em>(IL/IN)</em></td>
<td>186.63</td>
<td>3.62</td>
</tr>
<tr>
<td></td>
<td>214</td>
<td>Iroquois River <em>(IL)</em></td>
<td>69.33</td>
<td>1.35</td>
</tr>
</tbody>
</table>
Figure 2. Assessment Units in the Kankakee/Iroquois Watershed. Numbers refer to the HUC 10 Assessment Unit Code.
2.1 Human Population

The human population of the Kankakee/Iroquois River watershed is not directly available but was estimated based on US Census data and the percentage of the total county and urban area that is within the watershed. The estimated population of the watershed is just over 1 million with approximately 77 percent of the population classified as rural residents and 23 percent classified as urban residents. Cities with a population of at least 1,000 are labeled in Figure 3.
Figure 3. Cities in the Kankakee/Iroquois Watershed. Only cities with population greater than 1,000 are labeled.
2.2 Land Use/Land Cover

Land use/land cover patterns provide important clues as to the potential sources of bacteria in a watershed. Land use/land cover in the Kankakee/Iroquois River watershed is primarily agriculture, with crop production (primarily corn and soybeans) comprising 77 percent. Corn and soybean crops are not typically associated with high bacteria loads, unless they have been fertilized with manure. Approximately eight percent of the land is forested and an additional eight percent is developed. Developed lands are characterized by impervious surfaces that increase the potential of storm water events during high flow periods delivering bacteria to downstream streams and rivers. Forested land and wetlands allow water to infiltrate slowly thus reducing the risks of bacteria contaminated water to be washed-off to waterbodies. Pasture/hay represents three percent of the watershed and indicates the presence of animal feedlots that can be significant sources of bacteria. The remaining land categories represent less than 4 percent of the total land area (Table 3 and Figure 4).

Table 3. Land Use and Land Cover of Kankakee/Iroquois Watershed

<table>
<thead>
<tr>
<th>Land Use/Land Cover</th>
<th>Watershed Area</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Acres</td>
<td>Square Miles</td>
</tr>
<tr>
<td>Agricultural Lands</td>
<td>2,531,747</td>
<td>3955</td>
</tr>
<tr>
<td>Developed Land</td>
<td>273,270</td>
<td>427</td>
</tr>
<tr>
<td>Forested Land</td>
<td>268,995</td>
<td>420</td>
</tr>
<tr>
<td>Pasture/Hay</td>
<td>96,702</td>
<td>151.10</td>
</tr>
<tr>
<td>Grasslands and Shrubs</td>
<td>67,458</td>
<td>105</td>
</tr>
<tr>
<td>Wetlands</td>
<td>37,780</td>
<td>59</td>
</tr>
<tr>
<td>Open Water</td>
<td>22,585</td>
<td>35</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>3,298,537</strong></td>
<td><strong>5153.96</strong></td>
</tr>
</tbody>
</table>
Figure 4. Land Use in the Kankakee/Iroquois River Watershed
2.3 Soils

The hydrologic soil group classification is a means for categorizing soils by similar infiltration and runoff characteristics during periods of prolonged wetting. Typically, clay soils that are poorly drained have lower infiltration rates, while well-drained sandy soils have the greatest infiltration rates. The Natural Resources Conservation Service (NRCS) has defined four hydrologic groups for soils (Table 4) (NRCS, 2001) and data for the Kankakee/Iroquois watershed were obtained from the Soil Survey Geographic (SSURGO) database. Downloaded data were summarized based on the major hydrologic group in the surface layers of the map unit and are displayed in Figure 5.

The majority of the watershed is covered by B soils (29%) followed by A soils (26%), C soils (21%) and D soils (11%). Combination of A/D, B/D and C/D soils represent 0.7 percent, 9.5 percent and 3 percent of the watershed respectively. Although Figure 6 suggests that there might be distinct differences in the soil categories of Indiana and Illinois, this is actually due more to differences in the way the soils were mapped or processed in the SSURGO databases than to actual differences in soils between the two states. For example, the Indiana data rely solely on the four categories shown in Table 4 whereas the Illinois data include grouped categories such as A/D, B/D, and C/D.

Soil infiltration rates can affect bacteria loading within a watershed. During high flows, areas with low soil infiltration capacity can flood and therefore discharge high bacteria loads to nearby waterways. In contrast, soils with high infiltration rates can slow the movement of bacteria to streams and act as a filter.

<table>
<thead>
<tr>
<th>Hydrologic Soils Group</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Soils with high infiltration rates. Usually deep, well drained sands or gravels. Little runoff.</td>
</tr>
<tr>
<td>B</td>
<td>Soils with moderate infiltration rates. Usually moderately deep, moderately well drained soils.</td>
</tr>
<tr>
<td>C</td>
<td>Soils with slow infiltration rates. Soils with finer textures and slow water movement.</td>
</tr>
<tr>
<td>D</td>
<td>Soils with very slow infiltration rates. Soils with high clay content and poor drainage. High amounts of runoff.</td>
</tr>
</tbody>
</table>
Figure 5. Hydrologic Soil Groups in the Kankakee/Iroquois River Watershed
2.4 Hydrology

Select US Geological Survey (USGS) gages in the Kankakee/Iroquois watershed are listed in Table 5 and shown in Figure 6. The USGS gages were used to estimate flow at ungaged locations during the development of the TMDLs (see Section 5.1.1 for additional information).

<table>
<thead>
<tr>
<th>Gage ID</th>
<th>Drainage Area</th>
<th>Period of Record</th>
<th>Active</th>
<th>Site Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>5515000</td>
<td>174</td>
<td>1951-2003</td>
<td></td>
<td>Kankakee River near North Liberty</td>
</tr>
<tr>
<td>5515400</td>
<td>3</td>
<td>1970-86</td>
<td></td>
<td>Kingsbury Creek near LaPorte</td>
</tr>
<tr>
<td>5515500</td>
<td>537</td>
<td>1925-2008</td>
<td>X</td>
<td>Kankakee River at Davis</td>
</tr>
<tr>
<td>5516000</td>
<td>135</td>
<td>1955-73</td>
<td></td>
<td>Yellow River at Bremen</td>
</tr>
<tr>
<td>5516500</td>
<td>294</td>
<td>1948-2008</td>
<td>X</td>
<td>Yellow River at Plymouth</td>
</tr>
<tr>
<td>5517000</td>
<td>435</td>
<td>1943-2008</td>
<td>X</td>
<td>Yellow River at Knox</td>
</tr>
<tr>
<td>5517120</td>
<td>44.5</td>
<td>1998-99</td>
<td></td>
<td>Pitner Ditch near LaCrosse</td>
</tr>
<tr>
<td>5517500</td>
<td>1,352</td>
<td>1948-2008</td>
<td>X</td>
<td>Kankakee River at Dunns Bridge</td>
</tr>
<tr>
<td>5517530</td>
<td>1,376</td>
<td>1974-2008</td>
<td>X</td>
<td>Kankakee River near Kouts</td>
</tr>
<tr>
<td>5517900</td>
<td>30.3</td>
<td>1968-2003</td>
<td></td>
<td>Cobb Ditch near Kouts</td>
</tr>
<tr>
<td>5518000</td>
<td>1,779</td>
<td>1923-2008</td>
<td>X</td>
<td>Kankakee River at Shelby</td>
</tr>
<tr>
<td>5518500</td>
<td>34.2</td>
<td>1949-51</td>
<td></td>
<td>Singleton Ditch near Hebron</td>
</tr>
<tr>
<td>5519000</td>
<td>123</td>
<td>1948-2001</td>
<td></td>
<td>Singleton Ditch at Schneider</td>
</tr>
<tr>
<td>5519500</td>
<td>54.7</td>
<td>1948-72</td>
<td></td>
<td>West Creek near Schneider</td>
</tr>
<tr>
<td>5520500</td>
<td>2,294</td>
<td>1905-2008</td>
<td>X</td>
<td>Kankakee River at Momence</td>
</tr>
<tr>
<td>5521000</td>
<td>35.6</td>
<td>1948-2003</td>
<td></td>
<td>Iroquois River at Rosebud</td>
</tr>
<tr>
<td>5521500</td>
<td>66.3</td>
<td>1948-51</td>
<td></td>
<td>Oliver Ditch near Aix</td>
</tr>
<tr>
<td>5522000</td>
<td>144</td>
<td>1949-93</td>
<td></td>
<td>Iroquois River near North Marion</td>
</tr>
<tr>
<td>5522500</td>
<td>203</td>
<td>1948-2008</td>
<td>X</td>
<td>Iroquois River at Rensselaer</td>
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<tr>
<td>5523000</td>
<td>21.8</td>
<td>1949-93</td>
<td></td>
<td>Bice Ditch near South Marion</td>
</tr>
<tr>
<td>5523500</td>
<td>83.7</td>
<td>1948-82</td>
<td></td>
<td>Slough Creek near Collegeville</td>
</tr>
<tr>
<td>5524000</td>
<td>44.8</td>
<td>1948-82</td>
<td></td>
<td>Carpenter Creek at Egypt</td>
</tr>
<tr>
<td>5524500</td>
<td>449</td>
<td>1949-2008</td>
<td>X</td>
<td>Iroquois River near Foresman</td>
</tr>
<tr>
<td>5525000</td>
<td>686</td>
<td>1944-2008</td>
<td>X</td>
<td>Iroquois River at Iroquois</td>
</tr>
<tr>
<td>5525500</td>
<td>446</td>
<td>1948-2008</td>
<td>X</td>
<td>Sugar Creek at Milford</td>
</tr>
<tr>
<td>5526000</td>
<td>2,091</td>
<td>1923-2008</td>
<td>X</td>
<td>Iroquois River near Chebanse</td>
</tr>
<tr>
<td>5526500</td>
<td>4,810</td>
<td>1914-33</td>
<td></td>
<td>Kankakee River at Custer Park</td>
</tr>
<tr>
<td>5526500</td>
<td>12.1</td>
<td>1949-75</td>
<td></td>
<td>Terry Creek near Custer Park</td>
</tr>
<tr>
<td>5527500</td>
<td>5,150</td>
<td>1914-2008</td>
<td>X</td>
<td>Kankakee River near Wilmington</td>
</tr>
</tbody>
</table>
Figure 6. Active USGS Sites in the Kankakee/Iroquois Watershed
Figure 7 illustrates the monthly variation in flow patterns in the Kankakee/Iroquois watershed. Flows in general are greatest during April and May and least in August and September. These two sites also reflect the diverse, complex nature of hydrology in the basin. Both sites are comparable in drainage area but the Kankakee River at Davis is in the northern part of the watershed that is historically rich in wetlands that provide good base flows. These wetland areas also act to buffer wide variations in flow conditions that result from storm events. The Sugar Creek site, on the other hand, is in the southwestern part of the watershed. Soil conditions here do not provide the high base flows observed in the upper Kankakee. Land use in this drainage area is also dominated by row crop agriculture. Many of these fields are tile drained, one factor that contributes to the flashier flows in response to storm events that are evident in Figure 7.
3.0 INVENTORY AND ASSESSMENT OF WATER QUALITY INFORMATION

This section of the report provides information on the water quality standards that apply to the impaired streams in the Kankakee/Iroquois Creek watershed. A unique aspect of this TMDL is that Illinois and Indiana use different pathogen indicators to assess their water quality.

An assessment of the available bacteria data for the watershed is also presented in this section of the report.

3.1 Water Quality Standards and TMDL Target Values

Under the Clean Water Act, every state must adopt water quality standards to protect, maintain, and improve the quality of the nation’s surface waters. These standards represent a level of water quality that will support the Clean Water Act’s goal of “swimmable/fishable” waters. Water quality standards consist of several different components:

- **Designated uses** reflect how the water can potentially be used by humans and how well it supports a biological community. Examples of designated uses include aquatic life support, drinking water supply, and full body contact recreation. Every waterbody in Indiana and Illinois has a designated use or uses; however, not all uses apply to all waters. The Kankakee/Iroquois River TMDLs focus on protecting the designated recreational uses of the waterbodies.
- **Criteria** express the condition of the water that is necessary to support the designated uses. **Numeric criteria** represent the concentration of a pollutant that can be in the water and still protect the designated use of the waterbody. **Narrative criteria** are the general water quality criteria that apply to all surface waters. Numeric criteria for E. coli and fecal coliform were used as the basis of the Kankakee/Iroquois River TMDLs.

3.1.1 Indiana Water Quality Standards

The Kankakee and Iroquois Rivers in Indiana is listed as impaired for **E. coli**. The water quality standard pertaining to **E. coli** in Indiana is described below.

“This subsection establishes bacteriological quality for recreational uses. In addition to subsection (a), the criteria in this subsection are to be used to evaluate waters for full body contact recreational uses, to establish wastewater treatment requirements, and to establish effluent limits during the recreational season, which is defined as the months of April through October, inclusive. E. coli bacteria, shall not exceed one hundred twenty-five (125) per one hundred (100) milliliters as a geometric mean based on not less than five (5) samples equally spaced over a thirty (30) day period nor exceed two hundred thirty-five (235) per one hundred (100) milliliters in any one (1) sample in a thirty (30) day period.” [Source: Indiana Administrative Code Title 327 Water Pollution Control Board. Article 2. Section 1-6(a).]

3.1.2 Illinois Water Quality Standards

The Kankakee and Iroquois Rivers in Illinois are listed as impaired for fecal coliform. The water quality standard pertaining to fecal coliform in Illinois is described below.
Illinois’ General Use Water Quality Standard for fecal coliform bacteria specifies that during the months of May through October, based on a minimum of five samples taken over not more than a 30 day period, fecal coliform bacteria counts shall not exceed a geometric mean of 200 cfu (colony forming units)/100 ml, nor shall more than 10 percent of the samples during any 30 day period exceed 400 #/100 mL (35 Ill. Adm. Code 302.209 [2003]). This standard protects for Primary Contact (i.e., swimming) use of Illinois waters by humans.

3.2 Assessment of Water Quality Data

Table 6 and Table 7 summarize the bacteria data by displaying the maximum and geometric mean concentrations at all stations along with the reduction needed to meet the TMDL target values. Both historical and sampling data from the summer of 2008 by Illinois and Indiana were used for the TMDL analysis. At the Stage 1 meeting in Kankakee, the Iroquois/Ford County Department of Health suggested that additional data be collected for the tributaries to Sugar Creek. Since Illinois EPA could not support the level of sampling suggested, the Department of Health worked in conjunction with the Illinois EPA to monitor 17 additional stations in the watershed.

The percent reductions were calculated as follows:

\[
\text{% Reduction} = \frac{(\text{Target Value} - \text{Observed Maximum})}{\text{Observed Maximum}}
\]

\[
\text{% Reduction} = \frac{(\text{Target Value} - \text{Observed Geomean})}{\text{Observed Geomean}}
\]

The table indicates that most sites that were sampled experienced at least one violation of water quality standards with the reductions needed to achieve water quality standards ranging from zero to 99 percent. More site-specific information regarding existing water quality and the results of the TMDL analysis are presented in Sections 6 and 7.
<table>
<thead>
<tr>
<th>Major Subwatershed</th>
<th>Site Name</th>
<th>Station</th>
<th>Period of Record</th>
<th># Samples</th>
<th>Geomean (#/100 mL)</th>
<th>Maximum (#/100 mL)</th>
<th>Geomean Percent Reduction (125/100mL)</th>
<th>Maximum Percent Reduction (235/100mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lower Iroquois</td>
<td>Beaver Creek</td>
<td>48</td>
<td>6/2/2008 - 6/30/2008</td>
<td>5</td>
<td>330</td>
<td>1,986</td>
<td>62%</td>
<td>88%</td>
</tr>
<tr>
<td></td>
<td>Beaver Creek</td>
<td>46</td>
<td>6/2/2008 - 6/30/2008</td>
<td>5</td>
<td>439</td>
<td>727</td>
<td>72%</td>
<td>68%</td>
</tr>
<tr>
<td></td>
<td>Finigan Ditch</td>
<td>91</td>
<td>6/2/2008 - 6/30/2008</td>
<td>5</td>
<td>237</td>
<td>326</td>
<td>47%</td>
<td>28%</td>
</tr>
<tr>
<td></td>
<td>Iroquois River near Chelanse</td>
<td>05526000</td>
<td>8/4/1988 - 8/9/1990</td>
<td>26</td>
<td>126</td>
<td>8,000</td>
<td>1%</td>
<td>97%</td>
</tr>
<tr>
<td></td>
<td>Mud Creek</td>
<td>92</td>
<td>6/2/2008 - 6/30/2008</td>
<td>5</td>
<td>272</td>
<td>579</td>
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<td>59%</td>
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<td>Salisbury Ditch</td>
<td>44</td>
<td>6/2/2008 - 6/30/2008</td>
<td>5</td>
<td>156</td>
<td>196</td>
<td>20%</td>
<td>0%</td>
</tr>
<tr>
<td></td>
<td>Sugar Creek</td>
<td>88</td>
<td>6/2/2008 - 6/30/2008</td>
<td>5</td>
<td>381</td>
<td>727</td>
<td>67%</td>
<td>68%</td>
</tr>
<tr>
<td></td>
<td>Sugar Creek</td>
<td>90</td>
<td>6/2/2008 - 6/30/2008</td>
<td>5</td>
<td>249</td>
<td>687</td>
<td>50%</td>
<td>66%</td>
</tr>
<tr>
<td>Lower Kankakee</td>
<td>Kankakee River at Momence</td>
<td>05520500</td>
<td>8/3/1988 - 8/9/1990</td>
<td>22</td>
<td>138</td>
<td>8,000</td>
<td>10%</td>
<td>97%</td>
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<tr>
<td></td>
<td>Beaver Lake Ditch</td>
<td>42</td>
<td>6/3/2008 - 7/1/2008</td>
<td>5</td>
<td>222</td>
<td>308</td>
<td>44%</td>
<td>24%</td>
</tr>
<tr>
<td></td>
<td>Beaver Lake Ditch</td>
<td>38</td>
<td>6/3/2008 - 7/1/2008</td>
<td>5</td>
<td>560</td>
<td>866</td>
<td>78%</td>
<td>73%</td>
</tr>
<tr>
<td></td>
<td>Brown Ditch</td>
<td>22</td>
<td>6/3/2008 - 7/1/2008</td>
<td>5</td>
<td>125</td>
<td>291</td>
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<td>19%</td>
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<tr>
<td></td>
<td>Cedar Creek</td>
<td>26</td>
<td>6/3/2008 - 7/1/2008</td>
<td>5</td>
<td>485</td>
<td>687</td>
<td>74%</td>
<td>66%</td>
</tr>
<tr>
<td></td>
<td>Cedar Creek</td>
<td>28</td>
<td>6/3/2008 - 7/1/2008</td>
<td>5</td>
<td>426</td>
<td>1,553</td>
<td>71%</td>
<td>85%</td>
</tr>
<tr>
<td></td>
<td>Cobb Ditch</td>
<td>6</td>
<td>6/3/2008 - 7/1/2008</td>
<td>5</td>
<td>64</td>
<td>435</td>
<td>0%</td>
<td>46%</td>
</tr>
<tr>
<td></td>
<td>Crooked Creek</td>
<td>27</td>
<td>6/2/2008 - 7/14/2008</td>
<td>6</td>
<td>689</td>
<td>1,986</td>
<td>82%</td>
<td>88%</td>
</tr>
<tr>
<td></td>
<td>Dehaan Ditch</td>
<td>20</td>
<td>6/3/2008 - 7/1/2008</td>
<td>5</td>
<td>602</td>
<td>1,300</td>
<td>79%</td>
<td>82%</td>
</tr>
<tr>
<td></td>
<td>Pittner Ditch</td>
<td>7</td>
<td>6/2/2008 - 6/30/2008</td>
<td>5</td>
<td>122</td>
<td>142</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Middle Kankakee</td>
<td>Greiger Ditch</td>
<td>25</td>
<td>6/2/2008 - 7/14/2008</td>
<td>6</td>
<td>284</td>
<td>488</td>
<td>56%</td>
<td>52%</td>
</tr>
<tr>
<td></td>
<td>Griesel Ditch</td>
<td>24</td>
<td>6/3/2008 - 7/1/2008</td>
<td>5</td>
<td>429</td>
<td>1,046</td>
<td>71%</td>
<td>78%</td>
</tr>
<tr>
<td></td>
<td>Heinold Ditch</td>
<td>4</td>
<td>6/2/2008 - 6/30/2008</td>
<td>5</td>
<td>321</td>
<td>649</td>
<td>61%</td>
<td>64%</td>
</tr>
<tr>
<td></td>
<td>Hodge Ditch</td>
<td>12</td>
<td>6/3/2008 - 7/1/2008</td>
<td>5</td>
<td>195</td>
<td>285</td>
<td>36%</td>
<td>18%</td>
</tr>
<tr>
<td></td>
<td>Hunsley Ditch</td>
<td>31</td>
<td>6/4/2008 - 6/30/2008</td>
<td>5</td>
<td>1,079</td>
<td>2,420</td>
<td>88%</td>
<td>90%</td>
</tr>
<tr>
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<td>Kankakee River</td>
<td>36</td>
<td>6/3/2008 - 7/1/2008</td>
<td>5</td>
<td>175</td>
<td>249</td>
<td>29%</td>
<td>6%</td>
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<tr>
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<td>Kankakee River</td>
<td>5</td>
<td>6/2/2008 - 6/30/2008</td>
<td>5</td>
<td>338</td>
<td>488</td>
<td>63%</td>
<td>52%</td>
</tr>
<tr>
<td></td>
<td>Kankakee River</td>
<td>2</td>
<td>6/3/2008 - 7/1/2008</td>
<td>5</td>
<td>241</td>
<td>411</td>
<td>48%</td>
<td>43%</td>
</tr>
<tr>
<td></td>
<td>Kankakee River</td>
<td>16</td>
<td>6/3/2008 - 7/1/2008</td>
<td>5</td>
<td>239</td>
<td>525</td>
<td>48%</td>
<td>55%</td>
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<tr>
<td></td>
<td>Kankakee River</td>
<td>14</td>
<td>6/3/2008 - 7/1/2008</td>
<td>5</td>
<td>198</td>
<td>285</td>
<td>37%</td>
<td>18%</td>
</tr>
</tbody>
</table>
## Table 6. Summary of *E. coli* Data within the Kankakee/Iroquois Watershed

<table>
<thead>
<tr>
<th>Major Subwatershed</th>
<th>Site Name</th>
<th>Station</th>
<th>Period of Record</th>
<th># Samples</th>
<th>Geomean (#/100 mL)</th>
<th>Maximum (#/100 mL)</th>
<th>Geomean Percent Reduction (125/100mL)</th>
<th>Maximum Percent Reduction (235/100mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kankakee River at Dunns Bridge</td>
<td>KR-91</td>
<td>6/30/1999 - 8/25/1999</td>
<td>6</td>
<td>221</td>
<td>720</td>
<td>43%</td>
<td>67%</td>
<td></td>
</tr>
<tr>
<td>Kankakee River at Dunns Bridge</td>
<td>3</td>
<td>6/2/2008 - 6/30/2008</td>
<td>5</td>
<td>307</td>
<td>461</td>
<td>59%</td>
<td>49%</td>
<td></td>
</tr>
<tr>
<td>Kankakee River at Lake/Newton Co, State Line Rd - arbitrary County assignment</td>
<td>UMK120-0001</td>
<td>6/29/1999 - 7/27/1999</td>
<td>5</td>
<td>163</td>
<td>390</td>
<td>23%</td>
<td>40%</td>
<td></td>
</tr>
<tr>
<td>Kankakee River at Shelby (SR 55)</td>
<td>KR-68</td>
<td>4/29/1988 - 8/26/1999</td>
<td>78</td>
<td>119</td>
<td>6,000</td>
<td>0%</td>
<td>96%</td>
<td></td>
</tr>
<tr>
<td>Kankakee River at US 231, Porter and Jasper Co Line</td>
<td>UMK090-0011</td>
<td>6/30/1999 - 8/26/1999</td>
<td>6</td>
<td>258</td>
<td>1,300</td>
<td>51%</td>
<td>82%</td>
<td></td>
</tr>
<tr>
<td>Lawler Ditch</td>
<td>40</td>
<td>6/3/2008 - 7/1/2008</td>
<td>5</td>
<td>204</td>
<td>411</td>
<td>39%</td>
<td>43%</td>
<td></td>
</tr>
<tr>
<td>Phillips Ditch</td>
<td>8</td>
<td>6/3/2008 - 7/1/2008</td>
<td>5</td>
<td>522</td>
<td>866</td>
<td>76%</td>
<td>73%</td>
<td></td>
</tr>
<tr>
<td>Singleton Ditch near Schneider</td>
<td>34</td>
<td>6/3/2008 - 7/1/2008</td>
<td>5</td>
<td>379</td>
<td>517</td>
<td>67%</td>
<td>55%</td>
<td></td>
</tr>
<tr>
<td>Singleton Ditch near Schneider</td>
<td>SD-10</td>
<td>6/29/1999 - 8/23/1999</td>
<td>6</td>
<td>427</td>
<td>870</td>
<td>71%</td>
<td>73%</td>
<td></td>
</tr>
<tr>
<td>Singleton D at SR 55</td>
<td>UMK130-0021</td>
<td>6/29/1999 - 7/27/1999</td>
<td>5</td>
<td>370</td>
<td>600</td>
<td>66%</td>
<td>61%</td>
<td></td>
</tr>
<tr>
<td>Slocum Ditch</td>
<td>29</td>
<td>6/4/2008 - 6/30/2008</td>
<td>5</td>
<td>949</td>
<td>2,419</td>
<td>87%</td>
<td>90%</td>
<td></td>
</tr>
<tr>
<td>Stony Run Ditch</td>
<td>18</td>
<td>6/3/2008 - 7/1/2008</td>
<td>5</td>
<td>635</td>
<td>770</td>
<td>80%</td>
<td>69%</td>
<td></td>
</tr>
<tr>
<td>West Creek</td>
<td>30</td>
<td>6/3/2008 - 7/1/2008</td>
<td>5</td>
<td>509</td>
<td>1,120</td>
<td>75%</td>
<td>79%</td>
<td></td>
</tr>
<tr>
<td>West Creek</td>
<td>32</td>
<td>6/3/2008 - 7/1/2008</td>
<td>5</td>
<td>561</td>
<td>1,733</td>
<td>78%</td>
<td>86%</td>
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<tr>
<td>Wolf Creek</td>
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<td>5</td>
<td>215</td>
<td>291</td>
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<td>19%</td>
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</tr>
<tr>
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<td>68</td>
<td>6/4/2008 - 7/2/2008</td>
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<td>919</td>
<td>2,419</td>
<td>86%</td>
<td>90%</td>
<td></td>
</tr>
<tr>
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<td>70</td>
<td>6/4/2008 - 7/2/2008</td>
<td>5</td>
<td>253</td>
<td>2,419</td>
<td>51%</td>
<td>90%</td>
<td></td>
</tr>
<tr>
<td>Carpenter Cr @ Jasper CR 850 S</td>
<td>UMI030-0014</td>
<td>7/1/1999 - 8/25/1999</td>
<td>6</td>
<td>371</td>
<td>8,000</td>
<td>66%</td>
<td>97%</td>
<td></td>
</tr>
<tr>
<td>Curtis Creek</td>
<td>62</td>
<td>6/4/2008 - 7/2/2008</td>
<td>5</td>
<td>649</td>
<td>2,419</td>
<td>81%</td>
<td>90%</td>
<td></td>
</tr>
<tr>
<td>Darroch Ditch</td>
<td>78</td>
<td>6/2/2008 - 6/30/2008</td>
<td>5</td>
<td>755</td>
<td>1,300</td>
<td>83%</td>
<td>82%</td>
<td></td>
</tr>
</tbody>
</table>
### Table 6. Summary of E. coli Data within the Kankakee/Iroquois Watershed

<table>
<thead>
<tr>
<th>Major Subwatershed</th>
<th>Site Name</th>
<th>Station</th>
<th>Period of Record</th>
<th># Samples</th>
<th>Geomean (#/100 mL)</th>
<th>Maximum (#/100 mL)</th>
<th>Geomean Percent Reduction (125/100mL)</th>
<th>Maximum Percent Reduction (235/100mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hunter Ditch</td>
<td>76</td>
<td>6/2/2008 - 6/30/2008</td>
<td>5</td>
<td>1,122</td>
<td>1,414</td>
<td>89%</td>
<td>83%</td>
</tr>
<tr>
<td></td>
<td>Iroquois River</td>
<td>60</td>
<td>6/4/2008 - 7/2/2008</td>
<td>5</td>
<td>631</td>
<td>1,120</td>
<td>80%</td>
<td>79%</td>
</tr>
<tr>
<td></td>
<td>Iroquois River</td>
<td>74</td>
<td>6/2/2008 - 6/30/2008</td>
<td>5</td>
<td>495</td>
<td>2,419</td>
<td>75%</td>
<td>90%</td>
</tr>
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<td>Iroquois River</td>
<td>80</td>
<td>6/2/2008 - 6/30/2008</td>
<td>5</td>
<td>211</td>
<td>488</td>
<td>41%</td>
<td>52%</td>
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<td>Upper Iroquois</td>
<td>Iroquois River @ US 231</td>
<td>UMI020-0011</td>
<td>6/30/1999 - 7/28/1999</td>
<td>5</td>
<td>164</td>
<td>730</td>
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<td>32%</td>
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<td>33</td>
<td>6/2/2008 - 6/30/2008</td>
<td>5</td>
<td>347</td>
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<td>73%</td>
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<td>Kankakee River</td>
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<td>6/2/2008 - 6/30/2008</td>
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<td>59%</td>
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<td>82%</td>
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Table 6. Summary of *E. coli* Data within the Kankakee/Iroquois Watershed

<table>
<thead>
<tr>
<th>Major Subwatershed</th>
<th>Site Name</th>
<th>Station</th>
<th>Period of Record</th>
<th># Samples</th>
<th>Geomean (#/100 mL)</th>
<th>Maximum (#/100 mL)</th>
<th>Geomean Percent Reduction (125/100 mL)</th>
<th>Maximum Percent Reduction (235/100mL)</th>
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<tbody>
<tr>
<td>Kankakee River</td>
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<td>70%</td>
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<td>6/3/2008 - 7/1/2008</td>
<td>5</td>
<td>331</td>
<td>488</td>
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<td>52%</td>
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<tr>
<td>near Union Center</td>
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<td>6/3/2008 - 7/1/2008</td>
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<td>49%</td>
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<tr>
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<td>331</td>
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<td>52%</td>
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<td>97%</td>
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<td>828</td>
<td>921</td>
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<td>74%</td>
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</tr>
<tr>
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<td>57</td>
<td>6/3/2008 - 7/1/2008</td>
<td>5</td>
<td>828</td>
<td>921</td>
<td>85%</td>
<td>74%</td>
<td></td>
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<td>348</td>
<td>548</td>
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<td>57%</td>
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<td>348</td>
<td>548</td>
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<td>57%</td>
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<td>15%</td>
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<td>83%</td>
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<td>Travis Ditch @ U.S</td>
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<td>6/29/1999 - 7/27/1999</td>
<td>5</td>
<td>528</td>
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<td>76%</td>
<td>86%</td>
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<tr>
<td>6</td>
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<td>6/3/2008 - 7/1/2008</td>
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<td>125</td>
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<td>0%</td>
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<td>Yellow Bank Creek</td>
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<td>6/3/2008 - 7/1/2008</td>
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<td>83%</td>
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<tr>
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<td>68%</td>
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<td>770</td>
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## Table 6. Summary of *E. coli* Data within the Kankakee/Iroquois Watershed

<table>
<thead>
<tr>
<th>Major Subwatershed</th>
<th>Site Name</th>
<th>Station</th>
<th>Period of Record</th>
<th># Samples</th>
<th>Geomean (#/100 mL)</th>
<th>Maximum (#/100 mL)</th>
<th>Geomean Percent Reduction (125/100mL)</th>
<th>Maximum Percent Reduction (235/100mL)</th>
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<td>772</td>
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<td>76%</td>
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<td>4</td>
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<td>79%</td>
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## Table 7. Summary of Fecal Coliform Data within the Kankakee/Iroquois Watershed

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<th>Watershed Group</th>
<th>Site Name</th>
<th>Station</th>
<th>Period of Record</th>
<th># Samples</th>
<th>Geomean (#/100 mL)</th>
<th>Maximum (#/100 mL)</th>
<th>Geomean Percent Reduction (200/100mL)</th>
<th>Maximum Percent Reduction (400/100mL)</th>
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<tbody>
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<td>Lower Iroquois</td>
<td>Gay Creek</td>
<td>FLIDB-01</td>
<td>8/19/2008 - 9/17/2008</td>
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<td>8/19/2008 - 9/17/2008</td>
<td>5</td>
<td>129</td>
<td>222</td>
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<td>0%</td>
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<td>Prairie Creek</td>
<td>FLG-01</td>
<td>8/19/2008 - 9/17/2008</td>
<td>5</td>
<td>645</td>
<td>4,200</td>
<td>69%</td>
<td>90%</td>
</tr>
<tr>
<td></td>
<td>Spring Creek</td>
<td>FLH-02</td>
<td>8/19/2008 - 9/17/2008</td>
<td>5</td>
<td>411</td>
<td>840</td>
<td>51%</td>
<td>52%</td>
</tr>
<tr>
<td></td>
<td>Sugar Creek</td>
<td>FLI-M-D</td>
<td>8/19/2008 - 9/17/2008</td>
<td>8</td>
<td>376</td>
<td>1,100</td>
<td>47%</td>
<td>64%</td>
</tr>
<tr>
<td></td>
<td>Sugar Creek at Milford</td>
<td>05525500</td>
<td>1/19/1978 - 1/25/1996</td>
<td>121</td>
<td>1,354</td>
<td>84,000</td>
<td>85%</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>Sugar Creek at Milford</td>
<td>FLI-02</td>
<td>3/8/1999 - 6/10/2008</td>
<td>46</td>
<td>227</td>
<td>7,455</td>
<td>12%</td>
<td>95%</td>
</tr>
<tr>
<td></td>
<td>Unnamed Trib Mud Creek West</td>
<td>FLIDE-01</td>
<td>8/19/2008 - 9/17/2008</td>
<td>5</td>
<td>912</td>
<td>2,780</td>
<td>78%</td>
<td>86%</td>
</tr>
<tr>
<td></td>
<td>Unnamed Trib Sugar Creek</td>
<td>FLIE-01</td>
<td>8/19/2008 - 9/17/2008</td>
<td>5</td>
<td>328</td>
<td>788</td>
<td>39%</td>
<td>49%</td>
</tr>
<tr>
<td></td>
<td>Whisky Creek</td>
<td>FLIDAA-01</td>
<td>8/19/2008 - 9/17/2008</td>
<td>5</td>
<td>309</td>
<td>3,900</td>
<td>35%</td>
<td>90%</td>
</tr>
<tr>
<td></td>
<td>Beaver Creek</td>
<td>FLD-03</td>
<td>8/19/2008 - 9/17/2008</td>
<td>5</td>
<td>388</td>
<td>1,380</td>
<td>48%</td>
<td>71%</td>
</tr>
<tr>
<td></td>
<td>Iroquois River</td>
<td>FL-07</td>
<td>8/19/2008 - 9/17/2008</td>
<td>5</td>
<td>759</td>
<td>3,200</td>
<td>74%</td>
<td>88%</td>
</tr>
<tr>
<td></td>
<td>Iroquois River</td>
<td>FL-03</td>
<td>8/19/2008 - 9/17/2008</td>
<td>5</td>
<td>780</td>
<td>3,500</td>
<td>74%</td>
<td>89%</td>
</tr>
<tr>
<td></td>
<td>Iroquois River at Iroquois</td>
<td>05525000</td>
<td>1/25/1978 - 1/25/1996</td>
<td>123</td>
<td>333</td>
<td>8,000</td>
<td>40%</td>
<td>95%</td>
</tr>
<tr>
<td></td>
<td>Iroquois River at Iroquois</td>
<td>FL-04</td>
<td>3/31/1999 - 6/10/2008</td>
<td>40</td>
<td>171</td>
<td>7,636</td>
<td>0%</td>
<td>95%</td>
</tr>
<tr>
<td></td>
<td>Iroquois River near Chebanse</td>
<td>05526000</td>
<td>1/25/1978 - 11/25/1996</td>
<td>165</td>
<td>137</td>
<td>70,000</td>
<td>0%</td>
<td>99%</td>
</tr>
<tr>
<td></td>
<td>Iroquois River near Chebanse</td>
<td>FL-02</td>
<td>3/8/1999 - 6/18/2008</td>
<td>42</td>
<td>84</td>
<td>2,500</td>
<td>0%</td>
<td>84%</td>
</tr>
<tr>
<td>Lower Kankakee</td>
<td>Kankakee River at Momence</td>
<td>05520500</td>
<td>12/16/1977 - 11/25/1996</td>
<td>170</td>
<td>170</td>
<td>39,000</td>
<td>0%</td>
<td>99%</td>
</tr>
<tr>
<td></td>
<td>Kankakee River at Momence</td>
<td>F-02</td>
<td>3/8/1999 - 10/17/2006</td>
<td>30</td>
<td>91</td>
<td>700</td>
<td>0%</td>
<td>43%</td>
</tr>
<tr>
<td></td>
<td>Kankakee River near Wilmington</td>
<td>F-16*</td>
<td>1/14/2003 - 6/18/2008</td>
<td>16</td>
<td>61</td>
<td>240</td>
<td>0%</td>
<td>0%</td>
</tr>
</tbody>
</table>
Table 7. Summary of Fecal Coliform Data within the Kankakee/Iroquois Watershed

<table>
<thead>
<tr>
<th>Watershed Group</th>
<th>Site Name</th>
<th>Station</th>
<th>Period of Record</th>
<th># Samples</th>
<th>Geomean (#/100 mL)</th>
<th>Maximum (#/100 mL)</th>
<th>Geomean Percent Reduction (200/100mL)</th>
<th>Maximum Percent Reduction (400/100mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lower Kankakee</td>
<td>Kankakee River near Wilmington</td>
<td>05527500</td>
<td>4/30/1980 - 10/21/1996</td>
<td>128</td>
<td>126</td>
<td>20,000</td>
<td>0%</td>
<td>98%</td>
</tr>
<tr>
<td></td>
<td>Kankakee River near Wilmington</td>
<td>F-01</td>
<td>3/30/1999 - 9/19/2002</td>
<td>21</td>
<td>110</td>
<td>8,900</td>
<td>0%</td>
<td>96%</td>
</tr>
<tr>
<td>Middle Kankakee</td>
<td>Kankakee River at Shelby (SR 55)</td>
<td>KR-68</td>
<td>1/6/1976 - 3/31/1988</td>
<td>118</td>
<td>136</td>
<td>35,000</td>
<td>0%</td>
<td>99%</td>
</tr>
</tbody>
</table>

* Segment F-01 impairment status previously based on data collected at station F-01; impairment status now based on data from station F-16.
4.0 SOURCE ASSESSMENT

This section summarizes the available information on significant sources of bacteria in the six subwatersheds of the Kankakee/Iroquois River watershed. Point (or regulated) sources are presented first, followed by nonpoint (or unregulated) sources.

The term point source refers to any discernible, confined and discrete conveyance, such as a pipe, ditch, channel, tunnel or conduit, by which pollutants are transported to a waterbody. It also includes vessels or other floating craft from which pollutants are or may be discharged. By law, the term “point source” also includes: concentrated animal feeding operations (which are places where animals are confined and fed); storm water runoff from Municipal Separate Storm Sewer Systems (MS4s); and illicitly connected “straight pipe” discharges of household waste. Point sources are regulated through the National Pollutant Discharge Elimination System (NPDES).

Nonpoint sources include all other categories not classified as point sources. In urban areas, nonpoint sources can include leaking or faulty septic systems, runoff from lawn fertilizer applications, pet waste, storm water runoff (outside of MS4 communities), and other sources. In rural areas, nonpoint sources can include runoff from agricultural fields, forests, and undeveloped areas.

4.1 Upper Kankakee

This section of the report presents the available information on the sources of \( E. \ coli \) in the Upper Kankakee subwatershed.

The Upper Kankakee subwatershed lies solely in Indiana, covering nearly 663 square miles of the headwater reaches of the Kankakee River (Figure 8). The Kankakee River drains portions of St. Joseph, La Porte, Marshall, and Starke Counties. In addition to the southern suburbs of South Bend, the Upper Kankakee includes La Porte, Koontz Lake, Walkerton, North Liberty, and New Carlisle. Land use/land cover in the Upper Kankakee (Table 8) is primarily agricultural. Forested areas contribute to 17 percent of the watershed area, and approximately 10 percent of the land is developed.

The potential sources of bacteria in this subwatershed are further discussed in the following sections.

<table>
<thead>
<tr>
<th>Land Use/Land Cover</th>
<th>Area</th>
<th></th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Acres</td>
<td>Square Miles</td>
<td></td>
</tr>
<tr>
<td>Agricultural Land</td>
<td>269,668</td>
<td>421</td>
<td>63.65</td>
</tr>
<tr>
<td>Forested Land</td>
<td>70,282</td>
<td>110</td>
<td>16.59</td>
</tr>
<tr>
<td>Developed Land</td>
<td>40,583</td>
<td>63</td>
<td>9.58</td>
</tr>
<tr>
<td>Pasture/Hay</td>
<td>17,202</td>
<td>27</td>
<td>4.06</td>
</tr>
<tr>
<td>Grassland and Shrubs</td>
<td>11,262</td>
<td>18</td>
<td>2.66</td>
</tr>
<tr>
<td>Wetland</td>
<td>10,056</td>
<td>16</td>
<td>2.37</td>
</tr>
<tr>
<td>Open Water</td>
<td>4,636</td>
<td>7</td>
<td>1.09</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>423,690</strong></td>
<td><strong>662</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>
Figure 8. Land use in the Upper Kankakee Subwatershed
4.1.1 Point Sources

This section summarizes the potential point sources of bacteria in the Upper Kankakee subwatershed.

4.1.1.1 Wastewater Treatment Plants (WWTPs)

There are 10 active facilities that are permitted to discharge wastewater containing bacteria within the Upper Kankakee subwatershed (Table 9 and Figure 9). These facilities include municipal and small domestic wastewater treatment plants. In Indiana municipal and small domestic wastewater treatment plants are both regulated under municipal permits. Municipal facilities in Indiana are required to disinfect their effluent during the recreational season (April 1 to October 31). IDEM does not require disinfection for waste-stabilization lagoons as long as \( E. \ coli \) limits from their permit are met utilizing the lagoon’s retention time. The total design flow\(^1\) of the 10 active facilities is 10.8 million gallons per day (MGD).

<table>
<thead>
<tr>
<th>HUC 10</th>
<th>HUC 10 Name</th>
<th>Permit Number</th>
<th>Facility Name</th>
<th>Receiving Stream</th>
<th>Average Design Flow (MGD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>712000101</td>
<td>Pine Creek</td>
<td>IN0025801</td>
<td>North Liberty WWTP</td>
<td>Kankakee R Via Pine Cr Via Potato C</td>
<td>0.180</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IN0052272</td>
<td>Potato Creek State Park</td>
<td>Kankakee R Via Pine Cr Via Potato C</td>
<td>0.093</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IN0040690</td>
<td>Walkerton Municipal WWTP</td>
<td>Kankakee R Via Pine Creek</td>
<td>0.364</td>
</tr>
<tr>
<td>712000102</td>
<td>Little Kankakee River</td>
<td>IN0036897</td>
<td>New Prairie High School</td>
<td>Um/Kankakee River/Unnamed Swale</td>
<td>0.043</td>
</tr>
<tr>
<td>712000104</td>
<td>Mill Creek-Kankakee River</td>
<td>IN0045471</td>
<td>Kingsbury Utility Corp</td>
<td>Kankakee R Via Travis Ditch</td>
<td>2.500</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IN0023337</td>
<td>Kingsford Heights Municipal WWTP</td>
<td>Kankakee R Via Porter Ditch</td>
<td>0.422</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IN0025577</td>
<td>La Porte Municipal STP</td>
<td>Kankakee R Via Travis Ditch</td>
<td>7.000</td>
</tr>
<tr>
<td>712000107</td>
<td>Robbins Ditch-Kankakee River</td>
<td>IN0040100</td>
<td>Hamlet Municipal STP</td>
<td>Kankakee R Via Danielson Ditch</td>
<td>0.100</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IN0061085</td>
<td>Swan Lake Golf Resort</td>
<td>Um/Kankakee R/Lawrence Pontius D/Un</td>
<td>0.036</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IN0041882</td>
<td>Yogi Bears Jellystone Park</td>
<td>Um/Kankakee R/Yellow R/Bald Ditch</td>
<td>0.105</td>
</tr>
</tbody>
</table>

| Total      |                     |               |                            |                                   | 10.843                    |

\(^1\) A facility’s design flow is the peak volume that it is designed and permitted to discharge.
4.1.1.2 Combined Sewer Overflows (CSOs)

Combined sewer systems are sewers that are designed to collect rainwater runoff, domestic sewage, and industrial wastewater into the same pipe. Most of the time, combined sewer systems transport all of their wastewater to a sewage treatment plant, where it is treated and then discharged to a waterbody. During periods of heavy rainfall or snowmelt, however, the wastewater volume in a combined sewer system can exceed the capacity of the sewer system or treatment plant. For this reason, combined sewer systems are designed to overflow occasionally and discharge excess wastewater directly to nearby streams, rivers, or other water bodies. These overflows, called combined sewer overflows (CSOs), can contain both stormwater and untreated human and industrial waste. Because they are associated with wet weather events, CSOs typically discharge for short periods of time at random intervals.
There are no CSOs in the Upper Kankakee subwatershed.

4.1.1.3 Municipal Separate Storm Sewer System (MS4)

MS4s, generally, are public storm sewer systems (including roads with drainage systems and municipal streets) that are owned or operated by a public body and not part of a combined sewer (i.e., storm and sanitary sewers combined). MS4s can be significant sources of bacteria because they transport urban runoff that can be affected by pet waste, illicit sewer connections, failing septic systems, and other potential sources of bacteria. Regulated small MS4s are identified according to the U.S. Census Bureau definition of urbanized area as established every 10 years in its decennial census. Populations served by these regulated small MS4s range from several hundred to tens of thousands of people, but in most instances these systems serve fewer than about 30,000–50,000 people. There are two MS4 communities in the Upper Kankakee subwatershed as shown in Table 10.

<table>
<thead>
<tr>
<th>MS4 Facility Permit ID</th>
<th>MS4 Name</th>
<th>Area (Square Miles)</th>
</tr>
</thead>
<tbody>
<tr>
<td>INR040107</td>
<td>La Porte County</td>
<td>14.9</td>
</tr>
<tr>
<td>INR040114</td>
<td>South Bend</td>
<td>3.4</td>
</tr>
</tbody>
</table>

4.1.1.4 Concentrated Animal Feeding Operations (CAFOs)

The removal and disposal of manure, litter, or processed wastewater that is generated as the result of concentrated animal feeding operations (CAFOs) is considered a point source that is regulated through the NPDES Program. Indiana regulations for CAFOs can be found in 327 IAC 15-15. In Illinois, the CAFO program is administered by the Illinois EPA through general permit number ILA01 (refer to the following Web site for more details: http://www.epa.state.il.us/water/cafo/). The federal regulations for all CAFOs can be found in 40 CFR Parts 9, 122, and 412 and U.S. EPA requires that CAFOs receive a WLA as part of the TMDL development process. The WLA is typically set at zero for all pollutants to be consistent with the requirement that CAFOs not discharge to waters of the state. Indiana has identified 28 CAFOs in the Kankakee/Iroquois watershed and the WLAs for each is set to zero. No CAFOs were identified by IEPA in the Illinois portion of the watershed, and so the WLA is also equal to zero.

There are three CAFOs within the Upper Kankakee subwatershed as shown in Table 11 and Figure 10.

<table>
<thead>
<tr>
<th>HUC 10</th>
<th>HUC 10 Name</th>
<th>NPDES ID</th>
<th>Operation Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>712000101</td>
<td>Pine Creek</td>
<td>ING802239</td>
<td>Walkerton Farm</td>
</tr>
<tr>
<td>712000102</td>
<td>Little Kankakee River</td>
<td>ING806085</td>
<td>Scher-Way Dairy Farm</td>
</tr>
<tr>
<td>712000107</td>
<td>Robbins Ditch-Kankakee</td>
<td>ING800149</td>
<td>N&amp;L Pork, Inc. - Lee Nagai - Home Site</td>
</tr>
</tbody>
</table>
Figure 10. Feeding Operations in the Upper Kankakee Subwatershed
4.1.2 Nonpoint Sources

This section of the report presents information on the nonpoint sources of bacteria in the Upper Kankakee subwatershed.

4.1.2.1 Onsite Wastewater Treatment Systems

Onsite wastewater treatment systems (e.g., septic systems) that are properly designed and maintained should not serve as a source of contamination to surface waters. However, onsite systems do fail for a variety of reasons. Common soil-type limitations which contribute to failure are: seasonal water tables, compact glacial till, bedrock, coarse sand and gravel outwash and fragipan. When these septic systems fail hydraulically (surface breakouts) or hydrogeologically (inadequate soil filtration) there can be adverse effects to surface waters (Horsely and Witten, 1996). Septic systems contain all the water discharged from homes and business and can be significant sources of pathogens.

Failing septic systems have been a problem in portions of the Kankakee/Iroquois River watershed, and illegal methods of dumping waste through straight pipe discharges and septic systems connected to tile drains have been observed in the watershed (IDEM, 2001). Furthermore, septic system malfunctions pose danger to human health when they contaminate drinking water supplies, wells, and fishing and swimming areas.

A comprehensive database of septic systems within the watershed is not available. Therefore, the rural population of each subwatershed was calculated to obtain a general representation of the number of systems. It is assumed that the numbers of septic systems in the subwatersheds are directly proportional to rural population density. The rural population in the Upper Kankakee subwatershed is shown in Table 12, along with a calculated density (total rural population divided by total area). The rural population density can be used to compare the different major subwatersheds within the Kankakee/Iroquois watershed.

It should also be noted that hydrologic soil group A (50%) and B soils (41%) are dominant in the Upper Kankakee subwatershed. Since these soils have good infiltration rates, there is less risk for failing septic systems due to this factor.

<table>
<thead>
<tr>
<th>County</th>
<th>Area of County in Subwatershed (mi²)</th>
<th>County Population</th>
<th>Urban Population</th>
<th>Rural Population</th>
<th>Rural Population Density (persons/mi²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>La Porte</td>
<td>294</td>
<td>54,332</td>
<td>23,303</td>
<td>31,029</td>
<td>214</td>
</tr>
<tr>
<td>Starke</td>
<td>106</td>
<td>9,278</td>
<td>2,268</td>
<td>7,010</td>
<td>214</td>
</tr>
<tr>
<td>St. Joseph</td>
<td>194</td>
<td>112,736</td>
<td>14,234</td>
<td>98,502</td>
<td>214</td>
</tr>
<tr>
<td>Marshall</td>
<td>69</td>
<td>5,597</td>
<td>106</td>
<td>5,491</td>
<td>214</td>
</tr>
<tr>
<td>Total</td>
<td>663</td>
<td>181,943</td>
<td>39,911</td>
<td>142,032</td>
<td>214</td>
</tr>
</tbody>
</table>
4.1.2.2 Confined Animal Feeding Operations (CFOs) and Animal Feeding Operations (AFOs)

Animal feeding operations that are not classified as CAFOs are known as confined feeding operations (CFOs) in Indiana and as animal feeding operations (AFOs) in Illinois. Non-CAFO animal feeding operations are considered nonpoint sources by US. EPA. CAFOs have federal permits and fall under the jurisdiction of the NPDES Program. Indiana’s CFOs have state issued permits but are not under the jurisdiction of the federal NPDES Program and are therefore categorized as nonpoint sources for the purposes of this TMDL. Indiana’s CFOs are not allowed to discharge under the state permits.

AFOs in Illinois do not have state permits. However, they are subject to state livestock waste regulations and may be inspected by the Illinois EPA, either in response to complaints or as part of the Agency’s field inspection responsibilities to determine compliance by facilities subject to water pollution and livestock waste regulations. In Illinois Animal feeding operation (“AFO”) is defined as a lot or facility (other than an aquatic animal production facility) where the following conditions are met:

1. Animals (other than aquatic animals) have been, are, or will be stabled or confined and fed or maintained for a total of 45 days or more in any 12-month period, and
2. Crops, vegetation, forage growth, or post-harvest residues are not sustained in the normal growing season over any portion of the lot or facility.

Like CAFOs, the animals raised in CFOs and AFOs produce manure that is stored in pits, lagoons, tanks and other storage devices. The manure is then applied to area fields as fertilizer. When stored and applied properly, this beneficial re-use of manure provides a natural source for crop nutrition. It also lessens the need for fuel and other natural resources that are used in the production of fertilizer. CFOs and AFOs, however, can pose environmental concerns, including the following:

- Manure can leak or spill from storage pits, lagoons, tanks, etc.
- Improper application of manure can contaminate surface or ground water.
- Manure overapplication can adversely impact soil productivity.

There are 16 CFOs in the Upper Kankakee subwatershed as shown in Table 13 and Figure 10.
Table 13. CFOs in the Upper Kankakee Subwatershed

<table>
<thead>
<tr>
<th>HUC 10</th>
<th>HUC 10 Name</th>
<th>Farm ID</th>
<th>Operation Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>0712000101</td>
<td>Pine Creek</td>
<td>6203</td>
<td>Leffert Dairy, LLC</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6135</td>
<td>Ginter</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3600</td>
<td>Farm No 2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6072</td>
<td>Sunset Dairy</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4208</td>
<td>Farm #1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4209</td>
<td>Farm #2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>280</td>
<td>Tuholski Farms, Inc.</td>
</tr>
<tr>
<td>0712000102</td>
<td>Little Kankakee River-Kankakee River</td>
<td>4255</td>
<td>Minich</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1110</td>
<td>C.L. Rhoade Corp</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4169</td>
<td>Applegarth</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3983</td>
<td>Schoof</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6096</td>
<td>Wil-Minfarm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2187</td>
<td>Yon Ed Farm, Inc.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>250</td>
<td>Meadowland Farms</td>
</tr>
<tr>
<td>0712000104</td>
<td>Mill Creek-Kankakee River</td>
<td>430</td>
<td>Yankauskas Pork Production</td>
</tr>
<tr>
<td>0712000107</td>
<td>Robbins Ditch-Kankakee River</td>
<td>4676</td>
<td>Tip Top Farms</td>
</tr>
</tbody>
</table>

4.1.2.3 Livestock Population

Livestock are potential source of bacteria to streams, particularly when direct access is not restricted and/or where feeding structures are located adjacent to riparian areas. Watershed specific data are not available for livestock populations. However, county wide data available from the National Agricultural Statistic Service were downloaded and area weighted to estimate animal population in the watershed. There are an estimated 96,620 animal units in the Upper Kankakee subwatershed and the animal unit density is 146 animal units per square mile (Table 14).

Table 14. Animal Unit* Density in the Upper Kankakee Subwatershed

<table>
<thead>
<tr>
<th>Subwatershed Area (sq. miles)</th>
<th>Animal</th>
<th>Number of Head</th>
<th>Number of Animals in One Animal Unit</th>
<th>Number of Animal Units</th>
<th>Animal Unit Density (animal units/mi²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>663</td>
<td>Hogs and Pigs</td>
<td>22,447</td>
<td>2.5</td>
<td>8,979</td>
<td>146</td>
</tr>
<tr>
<td></td>
<td>Cattle and Calves</td>
<td>13,955</td>
<td>1</td>
<td>13,955</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sheep and Lambs</td>
<td>421</td>
<td>10</td>
<td>42</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Horses and Ponies</td>
<td>36,822</td>
<td>0.5</td>
<td>73,645</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>96,620</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* An Animal Unit (AU) represents 1,000 pounds of live animal weight. It serves as a common unit for aggregating animals across farms and across animal types.
4.1.2.4 Wildlife

Wildlife such as deer, geese, ducks, etc. can be sources of bacteria when they have direct access to streams. Since deer population was available for both Indiana and Illinois, it was used to give a general representation of the wildlife population in the watershed. (Population estimates for other types of wildlife are generally not available). Countywide deer data were area weighted to determine the deer population in each subwatershed (Table 15).

<table>
<thead>
<tr>
<th>Subwatershed Area (sq. miles)</th>
<th>County</th>
<th>Deer Population</th>
<th>Deer Density (per/sq. mile)</th>
</tr>
</thead>
<tbody>
<tr>
<td>663</td>
<td>La Porte</td>
<td>917</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Starke</td>
<td>547</td>
<td></td>
</tr>
<tr>
<td></td>
<td>St. Joseph</td>
<td>283</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Marshall</td>
<td>306</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>2,053</td>
<td></td>
</tr>
</tbody>
</table>

4.2 Middle Kankakee Subwatershed

The Middle Kankakee subwatershed lies primarily within Indiana but its most downstream section is in Illinois. The subwatershed drains almost 1,000 square miles and covers portions of LaPorte, Starke, Jasper, Lake, Newton, Will, and Kankakee Counties (Figure 11). Cities within the Middle Kankakee subwatershed include Wanatah, Wheatfield, De Motte, Roselawn, Lowell, Lake Dalecarlia, St. John, and Lakes of the Four Seasons.

Land use in the Middle Kankakee subwatershed (Table 16) is dominated by agricultural land (71%) followed by forest (11%). Developed land and grasslands account for 8 percent and 4 percent, respectively. The remaining land categories contribute less than 6 percent of the watershed area.
Table 16. Land Use/Land Cover in the Middle Kankakee Subwatershed

<table>
<thead>
<tr>
<th>Land Use/Land Cover</th>
<th>Area</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Acres</td>
<td>Square Miles</td>
</tr>
<tr>
<td>Agricultural Land</td>
<td>452,684</td>
<td>707</td>
</tr>
<tr>
<td>Forested Land</td>
<td>68,455</td>
<td>107</td>
</tr>
<tr>
<td>Developed Land</td>
<td>51,325</td>
<td>80</td>
</tr>
<tr>
<td>Grassland and Shrubs</td>
<td>24,333</td>
<td>38</td>
</tr>
<tr>
<td>Pasture/Hay</td>
<td>18,614</td>
<td>29</td>
</tr>
<tr>
<td>Wetland</td>
<td>9,026</td>
<td>14</td>
</tr>
<tr>
<td>Open Water</td>
<td>4,426</td>
<td>7</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>628,863</strong></td>
<td><strong>983</strong></td>
</tr>
</tbody>
</table>
Figure 11. Land use in the Middle Kankakee Subwatershed
4.2.1 Point Sources

This section summarizes the potential point sources of bacteria in the Middle Kankakee subwatershed.

4.2.1.1 Wastewater Treatment Plants (WWTPs) and Industrial Permits

There are 28 active facilities that are permitted to discharge wastewater containing bacteria within the Middle Kankakee subwatershed (Table 17 and Figure 12). The largest of these is the Lowell WWTP, with an average design flow of four MGD.
### Table 17. NPDES Facilities in the Middle Kankakee Subwatershed

<table>
<thead>
<tr>
<th>HUC 10</th>
<th>HUC 10 Name</th>
<th>Permit Number</th>
<th>Facility Name</th>
<th>Receiving Stream</th>
<th>Average Design Flow (MGD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>712000108</td>
<td>Pitner Ditch-Kankakee River</td>
<td>IN0040193</td>
<td>La Crosse Municipal WWTP</td>
<td>Kankakee R Via Marsh Creek Via Trib</td>
<td>0.0670</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IN0053104</td>
<td>Little Co Of Mary Health Facility</td>
<td>Kankakee R Via Drainage Ditch</td>
<td>0.0400</td>
</tr>
<tr>
<td>712000109</td>
<td>Hodge Ditch</td>
<td>IN0058823</td>
<td>Martis Place Bomars River Lg</td>
<td>Um/Kankakee Riv/Marble Powers Ditch</td>
<td>0.0075</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IN0060852</td>
<td>Town Of Monterey WWTP</td>
<td>Um/Kankakee Riv/Marble Powers Ditch</td>
<td>0.0310</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IN0040754</td>
<td>Wheatfield Municipal WWTP</td>
<td>Kankakee R Via Hodge D Via Wolf Cr</td>
<td>0.0770</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IN0045888</td>
<td>Boone Grove Elem &amp; Middle School</td>
<td>Um/Kankakee River/Phillips Ditch</td>
<td>0.0230</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IN0057029</td>
<td>Boone Grove High School WWTP</td>
<td>Kankakee R Via Luddington D - Arm 3</td>
<td>0.0180</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IN0020061</td>
<td>Hebron Municipal WWTP</td>
<td>Cobb Creek/Breyfogel Di/Kankakee R</td>
<td>0.5200</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IN0061450</td>
<td>Hebron WWTP</td>
<td>Kankakee R / Cobb Cr / Storm Sewer</td>
<td>0.0250</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IN0023400</td>
<td>Kouts Municipal WWTP</td>
<td>Kankakee R Via Benkie Ditch</td>
<td>0.3300</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IN0051446</td>
<td>Lake Eliza Conservancy Dist</td>
<td>Kankakee R Via Wolf Cr - Luddington</td>
<td>0.0870</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IN0052248</td>
<td>Morgan Township School</td>
<td>Kankakee R Via Sandy Hook D-Ahigrim</td>
<td>0.0132</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IN0056669</td>
<td>Wanatah Wastewater Treatment Plant</td>
<td>Kankakee R Via Slocum Ditch</td>
<td>0.0780</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IN0057703</td>
<td>Washington Twp School WWTP</td>
<td>Kankakee R Via Hutton Ditch</td>
<td>0.0400</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IN0042978</td>
<td>Westville Correctional Center</td>
<td>Crooked Cr To Kankakee River</td>
<td>0.7500</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IN0024848</td>
<td>Westville WWTP</td>
<td>Crooked Cr Via Crumpacker Arm</td>
<td>0.3500</td>
</tr>
<tr>
<td>712000110</td>
<td>Crooked Creek-Kankakee River</td>
<td>IN0039926</td>
<td>Demotte Municipal WWTP</td>
<td>Kankakee R Via Evers Ditch</td>
<td>0.4960</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IN0031275</td>
<td>Kankakee Rest Area</td>
<td>Kankakee R Via Otis-Boyle Ditch</td>
<td>0.0495</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IN0030503</td>
<td>Lincoln Elementary School</td>
<td>Um/Kankakee River/Hibler Ditch</td>
<td>0.0342</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IN0030651</td>
<td>South Haven Sewer Works WWTP</td>
<td>Lt Calumet R Via Salt Creek</td>
<td>2.0000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IN0039101</td>
<td>Water Services Co Of Indiana</td>
<td>Um/Kankakee R/Candlewood Lateral Dt</td>
<td>0.1550</td>
</tr>
<tr>
<td>712000112</td>
<td>Beaver Lake Ditch-Kankakee River</td>
<td>IN0031143</td>
<td>North Newton Jr Sr High School</td>
<td>Um/Kankakee R/Beaver Cr/Open Ditch</td>
<td>0.0300</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IN0058548</td>
<td>Buckhill Estates WWTP</td>
<td>Um/Kankakee R/Cedar Creek/Foss Ditch</td>
<td>0.0192</td>
</tr>
</tbody>
</table>
Table 17. NPDES Facilities in the Middle Kankakee Subwatershed

<table>
<thead>
<tr>
<th>HUC 10</th>
<th>HUC 10 Name</th>
<th>Permit Number</th>
<th>Facility Name</th>
<th>Receiving Stream</th>
<th>Average Design Flow (MGD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>712000112</td>
<td>Beaver Lake Ditch-Kankakee River</td>
<td>IN0033081</td>
<td>Dalecarlia Utilities Lake Dale</td>
<td>Cedar Cr To Kankakee River</td>
<td>0.0440</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IN0023621</td>
<td>Lowell WWTP</td>
<td>Cedar Cr To Kankakee River</td>
<td>4.0000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IN0040592</td>
<td>Schneider WWTP</td>
<td>Kankakee R Via Brown Ditch</td>
<td>0.0650</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IN0037176</td>
<td>Twin Lakes Utilities</td>
<td>Kankakee R/E Br Stoney Run Crk</td>
<td>1.1000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IN0031127</td>
<td>Winfield Elementary School</td>
<td>Kankakee R Via Stony Run Crk E Fk</td>
<td>0.0100</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Total</strong></td>
<td></td>
<td><strong>10.4596</strong></td>
</tr>
</tbody>
</table>

4.2.1.2 Combined Sewer Overflows (CSOs)

There is only one CSO in the Middle Kankakee subwatershed—an equalization basin overflow in the city of Lowell (Table 18 and Figure 12).

Table 18. CSOs in the Middle Kankakee Subwatershed

<table>
<thead>
<tr>
<th>HUC 10</th>
<th>HUC 10 Name</th>
<th>Permit #</th>
<th>Facility</th>
<th>Outfall #</th>
<th>Pipe Description</th>
<th>Receiving Stream</th>
</tr>
</thead>
<tbody>
<tr>
<td>712000113</td>
<td>Singleton Ditch</td>
<td>IN0023621</td>
<td>Lowell Municipal STP</td>
<td>004C</td>
<td>CSO-Equalization Basin Overflow</td>
<td>Cedar Creek</td>
</tr>
</tbody>
</table>

4.2.1.3 Municipal Separate Storm Sewer System (MS4)

There are eight MS4 communities in the Middle Kankakee subwatershed (Table 19) that total approximately 32 square miles.
### Table 19. MS4 Communities in the Middle Kankakee Subwatershed

<table>
<thead>
<tr>
<th>MS4 Facility Permit ID</th>
<th>MS4 Name</th>
<th>Area (Square Miles)</th>
</tr>
</thead>
<tbody>
<tr>
<td>INR040007</td>
<td>Lakes of the Four Seasons POA</td>
<td>1.1</td>
</tr>
<tr>
<td>INR040046</td>
<td>Town of Lowell</td>
<td>4.2</td>
</tr>
<tr>
<td>INR040047</td>
<td>Town of St. John</td>
<td>4.3</td>
</tr>
<tr>
<td>INR040054</td>
<td>City of Crown Point</td>
<td>0.3</td>
</tr>
<tr>
<td>INR040075</td>
<td>Town of Cedar Lake</td>
<td>7.7</td>
</tr>
<tr>
<td>INR040124</td>
<td>Lake County</td>
<td>9.4</td>
</tr>
<tr>
<td>INR040140</td>
<td>Porter County</td>
<td>3.0</td>
</tr>
<tr>
<td>INR04073 Co-Permit</td>
<td>Valparaiso</td>
<td>1.9</td>
</tr>
</tbody>
</table>

**Figure 12. NPDES Facilities in the Middle Kankakee Subwatershed**
4.2.1.4 **Concentrated Animal Feeding Operations (CAFOs)**

There are eight CAFOs in the Middle Kankakee subwatershed (Table 20 and Figure 13). Six of the CAFOs are located south and southeast of Roselawn.

<table>
<thead>
<tr>
<th>HUC 10</th>
<th>HUC 10 Name</th>
<th>NPDES ID</th>
<th>Operation Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>712000108</td>
<td>Pitner Ditch-Kankakee River</td>
<td>ING806292</td>
<td>David And Brenda Wolfe</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ING801092</td>
<td>Smoker Farms</td>
</tr>
<tr>
<td>712000111</td>
<td>Knight Ditch-Kankakee River</td>
<td>ING804410</td>
<td>Dekock Feedlot, Inc.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ING801782</td>
<td>Dekock Feedlot Inc.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ING802170</td>
<td>Bos Farms-Dry Cow Facility</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ING806155</td>
<td>Bos Dairy Site # 4</td>
</tr>
<tr>
<td>712000112</td>
<td>Beaver Lake Ditch-Kankakee River</td>
<td>ING806015</td>
<td>Fair Oaks Dairy Farm North</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ING806154</td>
<td>Herrema Dairy</td>
</tr>
</tbody>
</table>
Figure 13. Feeding Operations in the Middle Kankakee Subwatershed
4.2.2 Nonpoint Sources

The following section identifies the potential nonpoint sources in the Middle Kankakee subwatershed.

4.2.2.1 Onsite Wastewater Treatment Systems

The rural population in the Middle Kankakee subwatershed is shown in Table 21, along with a calculated density (total rural population divided by total area). The rural population density of the Middle Kankakee is significantly higher than that of the Upper Kankakee (214 persons per square mile).

Hydrologic soil group A (45%) and B soils (28%) are dominant in the Middle Kankakee subwatershed. Soil group C comprises 23 percent of the land area, primarily in the Singleton and Cobb Creek drainages (Figure 5). Due to the slow infiltration rate of C soils, there is an increased likelihood of failing septic systems in this part of the watershed. Other soil categories (A/D, B/D and C/D and D) constitute less than 4 percent of the subwatershed area.

<table>
<thead>
<tr>
<th>County</th>
<th>Area of County in Subwatershed (mi²)</th>
<th>Estimated County Population in Subwatershed</th>
<th>Urban Population</th>
<th>Rural Population</th>
<th>Rural Population Density (persons/mi²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Will</td>
<td>3.89</td>
<td>3,104</td>
<td>0</td>
<td>3,104</td>
<td></td>
</tr>
<tr>
<td>Kankakee</td>
<td>31.18</td>
<td>5,026</td>
<td>0</td>
<td>5,026</td>
<td></td>
</tr>
<tr>
<td>La Porte</td>
<td>171.64</td>
<td>31,697</td>
<td>3,689</td>
<td>28,008</td>
<td></td>
</tr>
<tr>
<td>Porter</td>
<td>219.50</td>
<td>84,053</td>
<td>10,079</td>
<td>73,974</td>
<td></td>
</tr>
<tr>
<td>Lake</td>
<td>224.02</td>
<td>222,765</td>
<td>29,240</td>
<td>193,525</td>
<td>315</td>
</tr>
<tr>
<td>Starke</td>
<td>36.45</td>
<td>3,199</td>
<td>156</td>
<td>3,043</td>
<td></td>
</tr>
<tr>
<td>Jasper</td>
<td>165.32</td>
<td>9,998</td>
<td>7,939</td>
<td>2,059</td>
<td></td>
</tr>
<tr>
<td>Newton</td>
<td>130.94</td>
<td>5,824</td>
<td>4,788</td>
<td>1,036</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>982.94</td>
<td>365,666</td>
<td>55,891</td>
<td>309,775</td>
<td></td>
</tr>
</tbody>
</table>

4.2.2.2 Confined Animal Feeding Operations (CFOs) and Animal Feeding Operations (AFOs)

There are 31 CFOs in the Middle Kankakee subwatershed (Table 22 and Figure 13). They are primarily located in the southern part of the subwatershed near Roselawn and in the northeastern portion of the watershed near Wanatah. The number of AFOs in the Illinois portion of the Middle Kankakee watershed is currently unavailable.
### Table 22. CFOs in the Middle Kankakee Subwatershed

<table>
<thead>
<tr>
<th>HUC 10</th>
<th>Watershed Name</th>
<th>Farm ID</th>
<th>Operation Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>0712000108</td>
<td>Pitner Ditch-Kankakee River</td>
<td>3548</td>
<td>Farm #1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3992</td>
<td>Dgm Pork</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6114</td>
<td>Hoover Farms</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2547</td>
<td>Farm #2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6109</td>
<td>Hardin Farms</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3126</td>
<td>Stull Farm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3925</td>
<td>Rich-Lou Farms</td>
</tr>
<tr>
<td></td>
<td></td>
<td>85</td>
<td>Brian Hunsley</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3896</td>
<td>Phegley</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3045</td>
<td>Hundt</td>
</tr>
<tr>
<td>0712000109</td>
<td>Hodge Ditch</td>
<td>4250</td>
<td>Farm &amp; Feeders, Inc.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4804</td>
<td>Klemp</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1028</td>
<td>Abbring</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1962</td>
<td>Bales</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3498</td>
<td>Mulder</td>
</tr>
<tr>
<td>0712000110</td>
<td>Crooked Creek-Kankakee River</td>
<td>4898</td>
<td>Kresel</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3515</td>
<td>Taber Veal</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2325</td>
<td>Good</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1053</td>
<td>Bucher Hog Farm</td>
</tr>
<tr>
<td>0712000111</td>
<td>Knight Ditch-Kankakee River</td>
<td>1063</td>
<td>Hamstra farms</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4344</td>
<td>Hamstra Brothers</td>
</tr>
<tr>
<td></td>
<td></td>
<td>92</td>
<td>Devries Farms Inc</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3993</td>
<td>Walstra</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4432</td>
<td>H &amp; H Feedlots</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4692</td>
<td>Northern Trust Farm #180</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3716</td>
<td>Vander Molen</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2003</td>
<td>Mathis</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2466</td>
<td>Jonkman</td>
</tr>
<tr>
<td>0712000113</td>
<td>Singleton Ditch</td>
<td>661</td>
<td>Kleine</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1467</td>
<td>Bryantfarm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>810</td>
<td>Huseman Farm Inc.</td>
</tr>
</tbody>
</table>
4.2.2.3 **Livestock Population**

The animal unit density (Table 23) in the Middle Kankakee subwatershed is estimated at 65 animal units per square mile which is considerably less than that of the Upper Kankakee subwatershed.

### Table 23. Livestock Density in the Middle Kankakee Subwatershed

<table>
<thead>
<tr>
<th>Subwatershed Area (sq. miles)</th>
<th>Animal</th>
<th>Number of Head</th>
<th>Number of Animals in One Animal Unit</th>
<th>Number of Animal Units</th>
<th>Animal Unit Density (per square mile)</th>
</tr>
</thead>
<tbody>
<tr>
<td>983</td>
<td>Hogs and Pigs</td>
<td>54,367</td>
<td>2.5</td>
<td>21,747</td>
<td>65</td>
</tr>
<tr>
<td></td>
<td>Cattle and Calves</td>
<td>29,070</td>
<td>1</td>
<td>29,070</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Poultry</td>
<td>681</td>
<td>50</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sheep and Lambs</td>
<td>2,424</td>
<td>10</td>
<td>242</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Horses and Ponies</td>
<td>6,448</td>
<td>0.5</td>
<td>12,896</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>63,969</strong></td>
<td></td>
<td></td>
<td><strong>65</strong></td>
</tr>
</tbody>
</table>

4.2.2.4 **Wildlife**

The deer population in the Middle Kankakee subwatershed is 4,295 and the density is 4 deer per square mile (Table 24).

### Table 24. Deer Density in the Middle Kankakee Subwatershed

<table>
<thead>
<tr>
<th>Subwatershed Area (sq. miles)</th>
<th>County</th>
<th>Deer Population</th>
<th>Deer Density (per sq. mile)</th>
</tr>
</thead>
<tbody>
<tr>
<td>983</td>
<td>Pulaski</td>
<td>16</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Will</td>
<td>127</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Kankakee</td>
<td>824</td>
<td></td>
</tr>
<tr>
<td></td>
<td>La Porte</td>
<td>1,864</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Porter</td>
<td>637</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lake</td>
<td>72</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Starke</td>
<td>421</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Jasper</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Newton</td>
<td>333</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>4,295</strong></td>
<td></td>
</tr>
</tbody>
</table>


4.3 Yellow River

The Yellow River subwatershed lies solely in Indiana, covering nearly 540 square miles of the headwater reaches of the Kankakee. It drains portions of St. Joseph, Kosciusko, Marshall, Starke, and Pulaski and Elkhart Counties. Cities within the Yellow River subwatershed include Bremen, Plymouth, Argos, Knox, and North Judson (Figure 14).

As in the Upper and Middle Kankakee subwatersheds, the land in the Yellow River subwatershed is primarily used for agriculture (68%). Forested, developed and pasture land comprise 14 percent, 8 percent and 4 percent of the total subwatershed area, respectively. Grasslands occupy nearly 2 percent of the total area. Wetlands and open water comprise four percent of the total subwatershed area (Table 25).

<table>
<thead>
<tr>
<th>Land Use/Land Cover</th>
<th>Acres</th>
<th>Square Miles</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agricultural Land</td>
<td>233,992</td>
<td>366</td>
<td>67.94</td>
</tr>
<tr>
<td>Forested Land</td>
<td>47,742</td>
<td>75</td>
<td>13.86</td>
</tr>
<tr>
<td>Developed Land</td>
<td>30,392</td>
<td>47</td>
<td>8.82</td>
</tr>
<tr>
<td>Pasture/Hay</td>
<td>14,179</td>
<td>22</td>
<td>4.12</td>
</tr>
<tr>
<td>Wetland</td>
<td>9,519</td>
<td>15</td>
<td>2.76</td>
</tr>
<tr>
<td>Grassland and Shrubs</td>
<td>5,279</td>
<td>8</td>
<td>1.53</td>
</tr>
<tr>
<td>Open Water</td>
<td>3,324</td>
<td>5</td>
<td>0.97</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>344,426</strong></td>
<td><strong>538</strong></td>
<td><strong>100.00</strong></td>
</tr>
</tbody>
</table>
Figure 14. Land use in the Yellow River Subwatershed
4.3.1 Permitted Point Sources

This section summarizes the potential point sources of bacteria in the Yellow River subwatershed.

4.3.1.1 Wastewater Treatment Plants (WWTPs) and Industrial Facilities

Ten facilities are permitted to discharge bacteria in the Yellow River subwatershed as listed in Table 26 and Figure 15. While the Nappanee Municipal STP lies within the Yellow River Subwatershed, it discharges outside of the watershed. Plymouth is the largest WWTP with an average design flow of 3.5 MGD.

<table>
<thead>
<tr>
<th>HUC 10</th>
<th>HUC 10 Name</th>
<th>Permit Number</th>
<th>Facility Name</th>
<th>Receiving Stream</th>
<th>Average Design Flow (MGD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>712000103</td>
<td>Headwaters Yellow River</td>
<td>IN0020427</td>
<td>Bremen Municipal WWTP</td>
<td>Um/Kankakee R/Yellow River</td>
<td>1.300</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IN0057002</td>
<td>Lake Of The Woods RSD</td>
<td>Yellow R Via Stock Ditch</td>
<td>0.135</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IN0040223</td>
<td>Lapaz Municipal WWTP</td>
<td>Yellow R Via Elmer Seltenright Ditch.</td>
<td>0.126</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IN0021466</td>
<td>Nappanee Municipal STP</td>
<td>Elkhart River</td>
<td>1.900</td>
</tr>
<tr>
<td>712000105</td>
<td>Yellow River</td>
<td>IN0022284</td>
<td>Argos Municipal WWTP</td>
<td>Yellow R/Myers Ditch/Unnmd Ditch</td>
<td>0.212</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IN0025160</td>
<td>Convent Ancilla Dominion</td>
<td>Gilbert Lake To Flat Lake</td>
<td>0.046</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IN0021385</td>
<td>Knox Municipal WWTP</td>
<td>Um/Kankakee River/Yellow River</td>
<td>0.700</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IN0020991</td>
<td>Plymouth WWTP</td>
<td>Yellow R To Kankakee River</td>
<td>3.500</td>
</tr>
<tr>
<td>712000106</td>
<td>Kline Arm</td>
<td>IN0058289</td>
<td>Bass Lake Conservancy District</td>
<td>Craigmile Ditch</td>
<td>0.284</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IN0020877</td>
<td>North Judson Municipal WWTP</td>
<td>Kankakee R Via Pine Creek &amp; Unnamed T</td>
<td>0.470</td>
</tr>
</tbody>
</table>

Total 8.673

4.3.1.2 Combined Sewer Overflows (CSOs)

Combined sewer overflows in Plymouth, Nappanee, and North Judson are potential sources of bacteria in the Yellow River subwatershed (Table 27 and Figure 15).
<table>
<thead>
<tr>
<th>HUC 10</th>
<th>HUC 10 Name</th>
<th>Permit #</th>
<th>Facility</th>
<th>Outfall #</th>
<th>Pipe Description</th>
<th>Receiving Stream</th>
</tr>
</thead>
<tbody>
<tr>
<td>712000105</td>
<td>Yellow River</td>
<td>IN0020991</td>
<td>Plymouth Municipal STP</td>
<td>002C</td>
<td>CSO-S.W. Retent. Basin Overflow</td>
<td>Yellow River</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>009C</td>
<td>CSO-Sixth St. 12-Inch</td>
<td>Yellow River</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>010C</td>
<td>CSO-15-In Overflow Near POTW</td>
<td>Yellow River</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>011C</td>
<td>CSO-Simon St.</td>
<td>Yellow River</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>008C</td>
<td>CSO-Adams/Water St</td>
<td>Yellow River</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>007C</td>
<td>CSO-Cleveland St. Regulator</td>
<td>Yellow River</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>006C</td>
<td>CSO-Bailey St. Regulator</td>
<td>Yellow River</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>005C</td>
<td>CSO-Bird Park</td>
<td>Yellow River</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>004C</td>
<td>CSO-Elliot/Fairbanks Ave</td>
<td>Yellow River</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>003C</td>
<td>CSO-Klinger Ave/Fairbanks Ave</td>
<td>Yellow River</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>013C</td>
<td>CSO-Alley Btw Locke/Clark</td>
<td>Berlin Court Ditch</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>012C</td>
<td>CSO-Clark St.</td>
<td>Berlin Court Ditch</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>011C</td>
<td>CSO-Main St.</td>
<td>Berlin Court Ditch</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>010C</td>
<td>CSO-Elm St.</td>
<td>Berlin Court Ditch</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>009C</td>
<td>CSO-Madison St.</td>
<td>Berlin Court Ditch</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>008C</td>
<td>CSO-Hartman St.</td>
<td>Berlin Court Ditch</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>007C</td>
<td>CSO-Summit St.</td>
<td>Berlin Court Ditch</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>006C</td>
<td>CSO-Jackson St.</td>
<td>Berlin Court Ditch</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>005C</td>
<td>CSO-Woodland Dr.</td>
<td>Berlin Court Ditch</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>004C</td>
<td>CSO-Morningside Drive</td>
<td>Berlin Court Ditch</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>003C</td>
<td>CSO-Marion St.</td>
<td>Berlin Court Ditch</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>002C</td>
<td>CSO-Mariam St</td>
<td>Berlin Court Ditch</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>016C</td>
<td>CSO-Eq Basin At WWTP</td>
<td>Berlin Court Ditch</td>
</tr>
<tr>
<td>712000106</td>
<td>Kline Arm</td>
<td>IN0020877</td>
<td>North Judson Municipal</td>
<td>004C</td>
<td>CSO-ELM St. Lift Station</td>
<td>Unnamed Ditch</td>
</tr>
</tbody>
</table>
4.3.1.3 Municipal Separate Storm Sewer System (MS4)

Plymouth is the only MS4 in the Yellow River subwatershed, covering an area of seven square miles.

4.3.1.4 Concentrated Animal Feeding Operations (CAFOs)

There are 4 CAFOs in the Yellow River watershed (Table 28 and Figure 16).
Table 28. CAFOs in the Yellow River Subwatershed

<table>
<thead>
<tr>
<th>Major Subwatershed</th>
<th>HUC 10</th>
<th>HUC 10 Name</th>
<th>NPDES ID</th>
<th>Operation Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yellow</td>
<td>712000103</td>
<td>Headwaters Yellow River</td>
<td>ING8040910</td>
<td>Fred Beer Farms, Inc.</td>
</tr>
<tr>
<td></td>
<td>712000105</td>
<td>Yellow River</td>
<td>ING804918</td>
<td>Homestead Dairy</td>
</tr>
</tbody>
</table>

Figure 16. Feeding Operations in the Yellow River Subwatershed
4.3.2 Nonpoint Sources

The following section identifies the potential nonpoint sources in the Yellow River subwatershed.

4.3.2.1 Onsite Wastewater Treatment Systems

The rural population in the Yellow River subwatershed is shown in Table 29, along with a calculated rural density of 141 persons per square mile, which is less than that of the Upper and Middle Kankakee subwatersheds.

The dominant soils found in this region are A (42%) and B (38%) with C soils comprising 15 percent of the subwatershed.

<table>
<thead>
<tr>
<th>County</th>
<th>Area of County in Subwatershed (mi²)</th>
<th>Estimated County Population in Subwatershed</th>
<th>Urban Population</th>
<th>Rural Population</th>
<th>Rural Population Density (persons/mi²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elkhart</td>
<td>11.68</td>
<td>4,991</td>
<td>511</td>
<td>4,480</td>
<td></td>
</tr>
<tr>
<td>Kosciusko</td>
<td>56.22</td>
<td>8,006</td>
<td>1,383</td>
<td>6,623</td>
<td></td>
</tr>
<tr>
<td>St Joseph</td>
<td>64.90</td>
<td>37,846</td>
<td>567</td>
<td>37,279</td>
<td>141</td>
</tr>
<tr>
<td>Marshall</td>
<td>270.87</td>
<td>30,561</td>
<td>7,990</td>
<td>22,571</td>
<td></td>
</tr>
<tr>
<td>Starke</td>
<td>120.19</td>
<td>10,546</td>
<td>6,307</td>
<td>4,239</td>
<td></td>
</tr>
<tr>
<td>Pulaski</td>
<td>14.62</td>
<td>468</td>
<td>0</td>
<td>468</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>538.49</td>
<td>92,419</td>
<td>16,758</td>
<td>75,661</td>
<td></td>
</tr>
</tbody>
</table>
4.3.2.2 Confined Animal Feeding Operations (CFOs)

There are 16 CFOs in the Yellow River subwatershed with many of them located along the border of the watershed (Table 30 and Figure 16).

<table>
<thead>
<tr>
<th>Major Subwatershed</th>
<th>HUC 10</th>
<th>HUC 10 Name</th>
<th>Farm ID</th>
<th>Operation Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yellow</td>
<td>0712000103</td>
<td>Headwaters Yellow River</td>
<td>3050</td>
<td>Shively Veal Inc</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3710</td>
<td>Lizzi</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3891</td>
<td>Pick Of The Chick</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2372</td>
<td>Trowbridge Veal</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4349</td>
<td>Dinius</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4330</td>
<td>Farm #1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4254</td>
<td>Huff</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4388</td>
<td>Haas</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2276</td>
<td>Fisher</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2240</td>
<td>Laidig Farm &amp; Management</td>
</tr>
<tr>
<td></td>
<td>0712000105</td>
<td>Yellow River</td>
<td>6151</td>
<td>Houin, Jr.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2100</td>
<td>Argos Holsteins</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>796</td>
<td>Houin Brothers Farms</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2215</td>
<td>Schaller</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>6208</td>
<td>Argos Holsteins</td>
</tr>
<tr>
<td></td>
<td>0712000106</td>
<td>Kline Arm</td>
<td>3908</td>
<td>Bope Farm</td>
</tr>
</tbody>
</table>

4.3.2.3 Livestock Population

There are a large number of hogs, cattle, and poultry in the Yellow River subwatershed and the animal unit density was calculated at 329 units per square mile (Table 31). This value is considerably higher than the densities calculated for the Upper and Middle Kankakee subwatersheds.

<table>
<thead>
<tr>
<th>Subwatershed Area (sq. miles)</th>
<th>Animal</th>
<th>Number of Head</th>
<th>Number of Animals in One Animal Unit</th>
<th>Number of Animal Units</th>
<th>Animal Unit Density (per sq. mile)</th>
</tr>
</thead>
<tbody>
<tr>
<td>538</td>
<td>Hogs and Pigs</td>
<td>179,814</td>
<td>2.5</td>
<td>71,926</td>
<td>329</td>
</tr>
<tr>
<td></td>
<td>Cattle and Calves</td>
<td>90,523</td>
<td>1</td>
<td>90,523</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Poultry</td>
<td>637,530</td>
<td>50</td>
<td>12,751</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sheep and Lambs</td>
<td>244</td>
<td>10</td>
<td>24</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Horses and Ponies</td>
<td>987</td>
<td>0.5</td>
<td>1,974</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td></td>
<td></td>
<td>177,198</td>
<td></td>
</tr>
</tbody>
</table>

* An Animal Unit (AU) represents 1,000 pounds of live animal weight. It serves as a common unit for aggregating animals across farms and across animal types.
4.3.2.4  **Wildlife Population**

The deer population in this subwatershed is estimated at approximately 2,900 (Table 32), which is only slightly higher than that calculated for the Upper and Middle subwatersheds.

<table>
<thead>
<tr>
<th>Subwatershed Area (sq/ miles)</th>
<th>County</th>
<th>Deer Population</th>
<th>Deer Density (per/sq. miles)</th>
</tr>
</thead>
<tbody>
<tr>
<td>538</td>
<td>Elkhart</td>
<td>158</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Kosciusko</td>
<td>167</td>
<td></td>
</tr>
<tr>
<td></td>
<td>St Joseph</td>
<td>1,574</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Marshall</td>
<td>328</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Starke</td>
<td>622</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pulaski</td>
<td>47</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>2,897</strong></td>
<td>5</td>
</tr>
</tbody>
</table>
4.4 Upper Iroquois

The Upper Iroquois subwatershed lies primarily within Indiana but its most downstream section is in Illinois. The subwatershed drains almost 685 square miles and covers portions of Starke, Pulaski, White, Jasper, Newton, Benton, and Iroquois Counties (Figure 17). Cities within the Upper Iroquois subwatershed include Rensselaer, Collegeville, Goodland, Brook, Kentland, and Sheldon.

This subwatershed is predominantly used for agriculture (84%). Developed and forested lands each account for 6 percent of the total watershed area. The remaining land use categories comprise less than 4 percent of the subwatershed area (Table 33).

<table>
<thead>
<tr>
<th>Table 33. Land Use/Land Cover in the Upper Iroquois Subwatershed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land Use/Land Cover</td>
</tr>
<tr>
<td>---------------------</td>
</tr>
<tr>
<td>Agricultural Land</td>
</tr>
<tr>
<td>Forested Land</td>
</tr>
<tr>
<td>Developed Land</td>
</tr>
<tr>
<td>Pasture/Hay</td>
</tr>
<tr>
<td>Grassland and Shrubs</td>
</tr>
<tr>
<td>Wetland</td>
</tr>
<tr>
<td>Open Water</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>
Figure 17. Land use in the Upper Iroquois Subwatershed
4.4.1 Point Sources

This section summarizes the potential point sources of bacteria in the Upper Iroquois subwatershed.

4.4.1.1 Wastewater Treatment Plants (WWTPs) and Industrial Facilities

Eight facilities are permitted to discharge bacteria in the Upper Iroquois River subwatershed as listed in Table 34 and shown in Figure 18. Among these, the Rensselaer Municipal STP is the largest facility with an average design flow of 1.2 MGD.

Table 34. NPDES Facilities in the Upper Iroquois Subwatershed

<table>
<thead>
<tr>
<th>HUC 10</th>
<th>HUC 10 Name</th>
<th>Permit Number</th>
<th>Facility Name</th>
<th>Receiving Stream</th>
<th>Average Design Flow (MGD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>712000202</td>
<td>Slough Creek</td>
<td>IN0020940</td>
<td>Remington WWTP</td>
<td>Iroquois R Via Carpenter Creek</td>
<td>0.429</td>
</tr>
<tr>
<td>712000203</td>
<td>Bruner Ditch-Iroquois River</td>
<td>IN0024414</td>
<td>Rensselaer Municipal STP</td>
<td>Iroquois River</td>
<td>1.200</td>
</tr>
<tr>
<td>712000204</td>
<td>Curtis Creek-Iroquois River</td>
<td>IN0050997</td>
<td>George Ade Mem Health Care Car</td>
<td>Iroquois River</td>
<td>0.014</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IN0040070</td>
<td>Goodland Municipal WWTP</td>
<td>Iroquois R Via Hunter Ditch Trib</td>
<td>0.095</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IN0053422</td>
<td>Grandmas Home Cooking</td>
<td>Iroquois R Via Yeoman Ditch Trib</td>
<td>0.029</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IN0041904</td>
<td>Trail Tree Inn</td>
<td>Iroquois R Via Curtis Creek Trib</td>
<td>0.256</td>
</tr>
<tr>
<td>712000205</td>
<td>Montgomery Ditch-Iroquois River</td>
<td>IN0039764</td>
<td>Brook Municipal WWTP</td>
<td>Iroquois River</td>
<td>0.100</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IN0023329</td>
<td>Kentland Municipal WWTP</td>
<td>Iroquois R Via Montgomery Via Kent</td>
<td>0.460</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Total</td>
<td></td>
<td>2.622</td>
</tr>
</tbody>
</table>
4.4.1.2 Combined Stormwater Overflows (CSOs)

There are nine CSO outfalls in the Upper Iroquois subwatershed, all located in Rensselaer. Information on these outfalls is presented in Table 35 and they are shown in Figure 18.

<table>
<thead>
<tr>
<th>HUC 10</th>
<th>HUC 10 Name</th>
<th>Permit #</th>
<th>Facility</th>
<th>Outfall #</th>
<th>Pipe Description</th>
<th>Receiving Stream</th>
</tr>
</thead>
<tbody>
<tr>
<td>712000203</td>
<td>Bruner Ditch-Iroquois River</td>
<td>IN0024414</td>
<td>Rensselaer Municipal STP</td>
<td>006C</td>
<td>CSO-545 Park Avenue</td>
<td>Iroquois River</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>023C</td>
<td>CSO-Melville St At Iroq. River</td>
<td>Iroquois River</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>003C</td>
<td>CSO-Near Milton St.</td>
<td>Iroquois River</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>007C</td>
<td>CSO- Grace St.</td>
<td>Iroquois River</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>008C</td>
<td>CSO-Corner Of Rutsen/Front St</td>
<td>Iroquois River</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>010C</td>
<td>CSO-Near Harrison/Front Sts.</td>
<td>Iroquois River</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>021C</td>
<td>CSO-W Corner Strarling/Milroy Av</td>
<td>Iroquois River</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>014C</td>
<td>CSO-South of Wash. St.-W. Of River</td>
<td>Iroquois River</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>019C</td>
<td>CSO-Rec Stat-Ne of Lift Stat</td>
<td>Iroquois River</td>
</tr>
</tbody>
</table>
4.4.1.3 Municipal Separate Storm Sewer System (MS4)

There are no MS4 communities in the Upper Iroquois subwatershed.
4.4.1.4 Concentrated Animal Feeding Operations (CAFOs)

There are 12 CAFOs in the Upper Iroquois watershed as listed in Table 36 and shown in Figure 19.

Table 36. CAFOs in the Upper Iroquois Subwatershed

<table>
<thead>
<tr>
<th>HUC 10</th>
<th>HUC 10 Name</th>
<th>NPDES ID</th>
<th>Operation Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>712000201</td>
<td>Oliver Ditch</td>
<td>ING806083</td>
<td>Newberry Farms, LLC</td>
</tr>
<tr>
<td>712000202</td>
<td>Slough Creek</td>
<td>ING802689</td>
<td>Tip Top Pigs Inc #1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ING803422</td>
<td>White County Egg Farm</td>
</tr>
<tr>
<td>712000203</td>
<td>Bruner Ditch-Iroquois River</td>
<td>ING800876</td>
<td>Grow Feedlots</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ING806045</td>
<td>Windy Ridge Dairy</td>
</tr>
<tr>
<td>712000204</td>
<td>Curtis Creek-Iroquois River</td>
<td>ING806207</td>
<td>Seven Hills Dairy, LLC</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ING803372</td>
<td>Newton County Egg Farm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>N/A</td>
<td>Cambalot Swine Breeders</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ING806036</td>
<td>Fair Oaks Dairy Farm South</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ING803732</td>
<td>Calf Land, LLC</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ING806341</td>
<td>Fair Oaks Dairy Farm, LLC. - North Central # 5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ING806065</td>
<td>Fair Oaks Dairy Farm West</td>
</tr>
</tbody>
</table>

*N/A not available*
Figure 19. Feeding Operations in the Upper Iroquois Subwatershed
4.4.2 Nonpoint Sources

The following section identifies the potential nonpoint sources in the Upper Iroquois subwatershed.

4.4.2.1 Onsite Wastewater Treatment Systems

The rural population in the Upper Iroquois subwatershed is shown in Table 37, along with a calculated rural density of 29 persons per square mile, which is significantly less than that of the Upper, Middle, and Yellow River subwatersheds.

This subwatershed is dominated by B soils (40%) and A soils (28%). Soils C, D, and B/D represent 24 percent, 4 percent, and 2 percent of the total land area, respectively.

<table>
<thead>
<tr>
<th>County</th>
<th>Area of County in Subwatershed (mi²)</th>
<th>Estimated County Population in Subwatershed</th>
<th>Urban Population</th>
<th>Rural Population</th>
<th>Rural Population Density (persons/mi²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iroquois</td>
<td>29.06</td>
<td>1,766</td>
<td>1,439</td>
<td>327</td>
<td></td>
</tr>
<tr>
<td>Starke</td>
<td>0.49</td>
<td>46</td>
<td>0</td>
<td>46</td>
<td></td>
</tr>
<tr>
<td>Jasper</td>
<td>368.84</td>
<td>22,298</td>
<td>6,800</td>
<td>15,498</td>
<td></td>
</tr>
<tr>
<td>Pulaski</td>
<td>6.02</td>
<td>192</td>
<td>0</td>
<td>192</td>
<td></td>
</tr>
<tr>
<td>Newton</td>
<td>198.09</td>
<td>5,628</td>
<td>4,127</td>
<td>1,501</td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>22.42</td>
<td>1,082</td>
<td>0</td>
<td>1,082</td>
<td></td>
</tr>
<tr>
<td>Benton</td>
<td>60.49</td>
<td>1,347</td>
<td>0</td>
<td>1,347</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>685.41</td>
<td>32,360</td>
<td>12,366</td>
<td>19,994</td>
<td></td>
</tr>
</tbody>
</table>
4.4.2.2 **Confined Animal Operations (CFOs) and Animal Operations (AFOs)**

There are 23 CFOs in the Upper Iroquois watershed as shown in Table 38 and Figure 19.

<table>
<thead>
<tr>
<th>Major Subwatershed</th>
<th>HUC 10</th>
<th>HUC 10 Name</th>
<th>Farm ID</th>
<th>Operation Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>0712000201</td>
<td>6355</td>
<td>Whitaker</td>
<td>3506</td>
<td>Jasper County Pullets</td>
</tr>
<tr>
<td></td>
<td>4390</td>
<td>Hathaway</td>
<td>516</td>
<td>Jack Rodibaugh &amp; Sons Inc</td>
</tr>
<tr>
<td></td>
<td>745</td>
<td>Frey</td>
<td>3423</td>
<td>White County Pullets</td>
</tr>
<tr>
<td></td>
<td>4260</td>
<td>Streitmatter</td>
<td>2891</td>
<td>Streitmatter</td>
</tr>
<tr>
<td>Upper Iroquois</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0712000202</td>
<td>3700</td>
<td>Iroquois Valley Swine Breeders</td>
<td>4056</td>
<td>Hurley Swine Enterprises #1</td>
</tr>
<tr>
<td></td>
<td>652</td>
<td>Davisfarm</td>
<td>4337</td>
<td>Moore Farms</td>
</tr>
<tr>
<td></td>
<td>230</td>
<td>Bruce Wuethrich Farm</td>
<td>4991</td>
<td>Northwind Pork LLC</td>
</tr>
<tr>
<td></td>
<td>2284</td>
<td>Bailey</td>
<td>4656</td>
<td>G.O.P. Farms</td>
</tr>
<tr>
<td></td>
<td>4235</td>
<td>Parkinson &amp; Rodibaugh</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0712000203</td>
<td>2399</td>
<td>Nursery/Finishing Site</td>
<td>1043</td>
<td>Lyons Enterprises</td>
</tr>
<tr>
<td></td>
<td>651</td>
<td>Korniak &amp; Miller</td>
<td>3279</td>
<td>Oinker Acres</td>
</tr>
<tr>
<td>Curtis Creek-Iroquois River</td>
<td>1680</td>
<td>Carl E Funk Farms</td>
<td>669</td>
<td>Clark</td>
</tr>
</tbody>
</table>
4.4.2.3 Livestock Population

There are a large number of hogs in the Upper Iroquois subwatershed and the animal unit density was calculated at 185 units per square mile (Table 39). This value is higher than the densities calculated for the Upper and Middle Kankakee subwatersheds but less than that of the Yellow River.

<table>
<thead>
<tr>
<th>Subwatershed Area (sq. miles)</th>
<th>Animal</th>
<th>Number of Head</th>
<th>Number of Animals in One Animal Unit</th>
<th>Number of Animal Units</th>
<th>Animal Unit Density (per/sq. mile)</th>
</tr>
</thead>
<tbody>
<tr>
<td>685.41</td>
<td>Hogs and Pigs</td>
<td>237,790</td>
<td>2.5</td>
<td>95,116</td>
<td>185</td>
</tr>
<tr>
<td></td>
<td>Cattle and Calves</td>
<td>29,109</td>
<td>1</td>
<td>29,109</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Poultry</td>
<td>33</td>
<td>50</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sheep and Lambs</td>
<td>1,546</td>
<td>10</td>
<td>155</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Horses and Ponies</td>
<td>1,256</td>
<td>0.5</td>
<td>2,513</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>126,893</td>
<td></td>
<td>185</td>
<td></td>
</tr>
</tbody>
</table>

4.4.2.4 Wildlife Population

The Upper Iroquois subwatershed has an estimated deer density of two deer per square mile (Table 40).

<table>
<thead>
<tr>
<th>Subwatershed Area (sq. miles)</th>
<th>County</th>
<th>Deer Population</th>
<th>Deer Density</th>
</tr>
</thead>
<tbody>
<tr>
<td>685</td>
<td>Iroquois</td>
<td>28</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Starke</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Jasper</td>
<td>993</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pulaski</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Newton</td>
<td>504</td>
<td></td>
</tr>
<tr>
<td></td>
<td>White</td>
<td>43</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Benton</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>1,592</td>
<td></td>
</tr>
</tbody>
</table>
4.5 Lower Iroquois

The Lower Iroquois subwatershed lies primarily within Illinois and drains nearly 1,500 square miles. Counties within the subwatershed include Newton, Kankakee, Benton, Iroquois, Vermilion, and Ford (Figure 20). Cities within the Lower Iroquois subwatershed include Morocco, Fowler, Milford, Watseka, Onarga, Gilman, Clifton, Chebanse, St. Anne, and Kankakee.

Table 41 shows that approximately 87 percent of the land is devoted to agriculture, followed by developed land (7%) and forested land (3%).

<table>
<thead>
<tr>
<th>Land Use/Land Cover</th>
<th>Watershed</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Area</td>
<td>Percent</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Acres</td>
<td>Square Miles</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agricultural Land</td>
<td>806,253</td>
<td>1,260</td>
<td>86.93</td>
<td></td>
</tr>
<tr>
<td>Developed Land</td>
<td>64,735</td>
<td>101</td>
<td>6.98</td>
<td></td>
</tr>
<tr>
<td>Forested Land</td>
<td>27,941</td>
<td>44</td>
<td>3.01</td>
<td></td>
</tr>
<tr>
<td>Pasture/Hay</td>
<td>16,598</td>
<td>26</td>
<td>1.79</td>
<td></td>
</tr>
<tr>
<td>Wetland</td>
<td>6,222</td>
<td>10</td>
<td>0.67</td>
<td></td>
</tr>
<tr>
<td>Open Water</td>
<td>3,178</td>
<td>5</td>
<td>0.34</td>
<td></td>
</tr>
<tr>
<td>Grassland and Shrubs</td>
<td>2,545</td>
<td>4</td>
<td>0.27</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>927,473</strong></td>
<td><strong>1,449</strong></td>
<td><strong>100</strong></td>
<td></td>
</tr>
</tbody>
</table>
Figure 20. Land use in the Lower Iroquois Subwatershed
4.5.1 Point Sources

This section summarizes the potential point sources in the Lower Iroquois subwatershed.

4.5.1.1 Wastewater Treatment Plants (WWTPs) and Industrial Facilities

There are 14 NPDES facilities that are permitted to discharge bacteria in the Lower Iroquois subwatershed (Table 42 and Figure 21). Among them, Watseka is the largest facility with a design flow of 1.6 MGD.

In Illinois a number of WWTPs, including most of those identified in Table 42, have applied for and received disinfection exemptions which allow a facility to discharge wastewater without disinfection. Facilities with year-round disinfection exemptions may be required to provide IEPA with updated information to demonstrate compliance with these requirements and facilities directly discharging into a fecal-impaired segment may have their year-round disinfection exemption revoked through future NPDES permitting actions. Maximum design flows for Illinois NPDES facilities are also listed since they were used to determine allocations at high and moist flows.
Table 42. NPDES Facilities in the Lower Iroquois Subwatershed

<table>
<thead>
<tr>
<th>HUC 10</th>
<th>HUC 10 Name</th>
<th>Permit Number</th>
<th>Facility Name</th>
<th>Receiving Stream</th>
<th>Average Design Flow (MGD)</th>
<th>Maximum Design Flow (MGD)</th>
<th>Exemption Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>712000213</td>
<td>Beaver Creek</td>
<td>IN0060798</td>
<td>Morocco WWTP</td>
<td>Iroquois River Via Beaver Creek</td>
<td>0.1500</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>712000206</td>
<td>Mud Creek</td>
<td>IL0042391</td>
<td>Cissna Park STP</td>
<td>Pigeon Creek</td>
<td>0.1000</td>
<td>0.2500</td>
<td>Year Round</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ILG580122</td>
<td>Rankin STP</td>
<td>Sugar Creek Via Whisky Creek</td>
<td>0.0800</td>
<td>0.3040</td>
<td>Year Round</td>
</tr>
<tr>
<td>712000207</td>
<td>Sugar Creek</td>
<td>IL0023272</td>
<td>Milford STP</td>
<td>Sugar Creek</td>
<td>0.2000</td>
<td>1.3000</td>
<td>Year Round</td>
</tr>
<tr>
<td>712000208</td>
<td>Spring Creek</td>
<td>IL0025062</td>
<td>Gilman-North STP</td>
<td>Gilm Ditch-Spring-Iroquois-Kankake</td>
<td>0.5000</td>
<td>1.1500</td>
<td>Year Round</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IL0076813</td>
<td>Onarga STP</td>
<td>Drainage Tile To Spring Creek</td>
<td>0.2500</td>
<td>0.8780</td>
<td>Year Round</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ILG551072</td>
<td>Il Dot-L-57 Iroquois County</td>
<td>Iroquois R Via Spring Creek</td>
<td>0.0162</td>
<td>0.0405</td>
<td>Year Round</td>
</tr>
<tr>
<td>712000209</td>
<td>Prairie Creek</td>
<td>IL0037397</td>
<td>Prairieview Luthern Home</td>
<td>Unnamed Trib To Prairie Creek</td>
<td>0.0120</td>
<td>0.0300</td>
<td>Year Round</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IL0065358</td>
<td>Swissland Packing Company</td>
<td>Unnamed Creek Trib To Prairie Creek</td>
<td>0.0280</td>
<td>N/A</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ILG551007</td>
<td>Merkle-Knipprath Nursing Home</td>
<td>Iroquois R Via Langan Creek</td>
<td>0.0150</td>
<td>0.0375</td>
<td>Year Round</td>
</tr>
<tr>
<td>712000210</td>
<td>Gofeld Creek-Iroquois River</td>
<td>IL0022161</td>
<td>Watseka STP</td>
<td></td>
<td>1.6000</td>
<td>4.0000</td>
<td>None</td>
</tr>
<tr>
<td>712000212</td>
<td>Langan Creek</td>
<td>IL0037206</td>
<td>Central Hs&amp;Nash Middle School</td>
<td></td>
<td>0.0100</td>
<td>0.0260</td>
<td>Year Round</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IL0047040</td>
<td>Iroquois Mobile Estates</td>
<td></td>
<td>0.0100</td>
<td>0.0250</td>
<td>Year Round</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IL0049573</td>
<td>Clifton STP</td>
<td></td>
<td>0.2000</td>
<td>0.5000</td>
<td>Year Round</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Total</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3.1712</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>7.6600</td>
</tr>
</tbody>
</table>
4.5.1.2 Combined Sewer Overflows (CSOs)

There are two CSO communities (Watseka and Milford) with a total of 16 CSO outfalls in the Lower Iroquois subwatershed (Table 43 and Figure 21).

<table>
<thead>
<tr>
<th>HUC 10</th>
<th>HUC 10 Name</th>
<th>Permit #</th>
<th>Facility</th>
<th>Outfall #</th>
<th>Pipe Description</th>
<th>Receiving Stream</th>
</tr>
</thead>
<tbody>
<tr>
<td>712000207</td>
<td>Sugar Creek</td>
<td>IL0023272</td>
<td>Milford STP</td>
<td>20</td>
<td>CSO-150 Yds Downstream Chicago St.</td>
<td>Sugar Creek</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>30</td>
<td>CSO-West Side</td>
<td>Sugar Creek</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>40</td>
<td>CSO-Far West Side</td>
<td>Sugar Creek</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>50</td>
<td>CSO-Southeast Side</td>
<td>Sugar Creek</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>60</td>
<td>CSO-Kay Street</td>
<td>Kankakee River</td>
</tr>
<tr>
<td>712000210</td>
<td>Gofield Creek-Iroquois River</td>
<td>IL0022161</td>
<td>Watseka STP</td>
<td>A040</td>
<td>CSO-Mulberry St(Gravity Flow)</td>
<td>Sugar Creek</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>B010</td>
<td>CSO-Sewer Treatment Plant CSO</td>
<td>Iroquois River</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>B040</td>
<td>CSO-Mulberry St(Pumped Flow)</td>
<td>Sugar Creek</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>20</td>
<td>CSO-Junction Box F</td>
<td>Iroquois River</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>50</td>
<td>CSO-Maple Street</td>
<td>Sugar Creek</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>A040</td>
<td>CSO-Mulberry St(Gravity Flow)</td>
<td>Sugar Creek</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>B040</td>
<td>CSO-Mulberry St(Pumped Flow)</td>
<td>Sugar Creek</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>50</td>
<td>CSO-Maple Street</td>
<td>Sugar Creek</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>60</td>
<td>CSO-Kay Street</td>
<td>Kankakee River</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>B010</td>
<td>CSO-Sewer Treatment Plant CSO</td>
<td>Iroquois River</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>20</td>
<td>CSO-Junction Box F</td>
<td>Iroquois River</td>
</tr>
</tbody>
</table>
4.5.1.3 Municipal Separate Storm Water Sewer System (MS4)

There are no MS4 communities lying solely within the Lower Iroquois subwatershed; however, small portions of the Kankakee and Kankakee County MS4s drain to this subwatershed (Table 44).

<table>
<thead>
<tr>
<th>MS4 Facility Permit ID</th>
<th>MS4 Name</th>
<th>Area (square miles)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ILR400260</td>
<td>Kankakee County</td>
<td>0.1</td>
</tr>
<tr>
<td>ILR400363</td>
<td>City of Kankakee</td>
<td>0.1</td>
</tr>
</tbody>
</table>
4.5.1.4 **Concentrated Animal Feeding Operations (CAFOs)**

There is only one CAFO in the Lower Iroquois watershed as shown in Table 45 and Figure 22. Illinois CAFO information is not available to Illinois EPA at this time.

<table>
<thead>
<tr>
<th>Major Subwatershed</th>
<th>HUC 10</th>
<th>Watershed Name</th>
<th>NPDES ID</th>
<th>Operation Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lower Iroquois</td>
<td>712000213</td>
<td>Beaver Creek</td>
<td>ING803684</td>
<td>Storey Pork Farm</td>
</tr>
</tbody>
</table>

**Figure 22.** Feeding Operations in the Lower Iroquois Subwatershed
4.5.2 Nonpoint Sources

This section addresses the potential nonpoint sources of bacteria in the Lower Iroquois subwatershed.

4.5.2.1 Onsite Wastewater Treatment Systems

The rural population density in the Lower Iroquois subwatershed is only 22 persons per square mile, which is significantly less than that of the Upper, Middle, and Yellow River subwatersheds (Table 46). The majority (71 percent) of the subwatershed is comprised of soils with low infiltration capacity (A/D, B/D, C/D, and D). A and B soils cover 7 percent and 20 percent of the total subwatershed area, respectively.

<table>
<thead>
<tr>
<th>County</th>
<th>Area of County in Subwatershed (mi²)</th>
<th>Estimated County Population in Subwatershed</th>
<th>Urban Population</th>
<th>Rural Population</th>
<th>Rural Population Density (persons/mi²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vermilion</td>
<td>57.23</td>
<td>5,224</td>
<td>0</td>
<td>5,224</td>
<td>22</td>
</tr>
<tr>
<td>Iroquois</td>
<td>1040.20</td>
<td>27,509</td>
<td>18,654</td>
<td>8,855</td>
<td></td>
</tr>
<tr>
<td>Ford</td>
<td>57.77</td>
<td>1,690</td>
<td>387</td>
<td>1,303</td>
<td></td>
</tr>
<tr>
<td>Kankakee</td>
<td>94.25</td>
<td>15,199</td>
<td>1,212</td>
<td>13,987</td>
<td></td>
</tr>
<tr>
<td>Newton</td>
<td>80.78</td>
<td>2,816</td>
<td>1,127</td>
<td>1,689</td>
<td></td>
</tr>
<tr>
<td>Benton</td>
<td>119.78</td>
<td>2,668</td>
<td>1,671</td>
<td>997</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>1450.01</td>
<td>55,106</td>
<td>23,051</td>
<td>32,055</td>
<td></td>
</tr>
</tbody>
</table>

4.5.2.2 Confined Animal Feeding Operations (CFOs) and Animal Feeding Operations (AFOs)

There are four CFOs in the Lower Iroquois watershed (Table 47 and Figure 22). The number of AFOs in the Illinois portion of the Lower Iroquois watershed is currently unavailable.

<table>
<thead>
<tr>
<th>Major Subwatershed</th>
<th>HUC 10</th>
<th>HUC 10 Name</th>
<th>Farm ID</th>
<th>Operation Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lower Iroquois</td>
<td>0712000207</td>
<td>Sugar Creek</td>
<td>1178</td>
<td>Ewen Gravel Hill Farm</td>
</tr>
<tr>
<td></td>
<td>0712000213</td>
<td>Beaver Creek</td>
<td>3277</td>
<td>C Bar C Farms</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3855</td>
<td>Gibson Fine Swine, Inc.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2484</td>
<td>Sow Production Site</td>
</tr>
</tbody>
</table>
4.5.2.3 **Livestock Population**

Hogs, pigs, and cattle are the dominant livestock in the Lower Iroquois subwatershed and the subwatersheds animal unit density is 53 per square mile (Table 48). The approach used to estimate the number of animal units in the subwatershed is explained in Section 4.1.2.3.

<table>
<thead>
<tr>
<th>Subwatershed Area (sq. miles)</th>
<th>Animal</th>
<th>Number of Head</th>
<th>Number of Animals in One Animal Unit</th>
<th>Number of Animal Units</th>
<th>Animal Unit Density (per sq. mile)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,450</td>
<td>Hogs and Pigs</td>
<td>94,776</td>
<td>2.5</td>
<td>37,910</td>
<td>53</td>
</tr>
<tr>
<td></td>
<td>Cattle and Calves</td>
<td>37,934</td>
<td>1</td>
<td>37,934</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Poultry</td>
<td>2,823</td>
<td>50</td>
<td>56</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sheep and Lambs</td>
<td>707</td>
<td>10</td>
<td>71</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Horses and Ponies</td>
<td>178</td>
<td>0.5</td>
<td>356</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td><strong>76,327</strong></td>
<td></td>
</tr>
</tbody>
</table>

4.5.2.4 **Wildlife Population**

The estimated deer density of the Lower Iroquois subwatershed is 3 deer per square mile (Table 49). The approach used to estimate the number of animal units in the subwatershed is explained in Section 4.1.2.4.

<table>
<thead>
<tr>
<th>Subwatershed Area (sq. mile)</th>
<th>County</th>
<th>Deer Population</th>
<th>Deer Density (per sq. mile)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,450</td>
<td>Vermilion</td>
<td>2,481</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Iroquois</td>
<td>1,009</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ford</td>
<td>130</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Kankakee</td>
<td>346</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Newton</td>
<td>205</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Benton</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td>4,175</td>
<td></td>
</tr>
</tbody>
</table>
4.6 Lower Kankakee

The Lower Kankakee subwatershed lies almost entirely within Illinois and drains almost 834 square miles. Counties within the subwatershed include Will, Kankakee, Newton, Iroquois, Ford, and Grundy. Cities within the Lower Kankakee subwatershed include Herschel, Kankakee, Momence, Bradley, Bourbonnais, Manteno, Peotone, Beecher, Monee, Manhattan, Wilmington, and Lakewood Shores (Figure 23).

Similar to the rest of the Kankakee/Iroquois watershed, agriculture is the dominant land use in the Lower Kankakee subwatershed (Table 50).

<table>
<thead>
<tr>
<th>Land Use/Land Cover</th>
<th>Acres</th>
<th>Square Miles</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agricultural Land</td>
<td>399,161</td>
<td>624</td>
<td>74.82</td>
</tr>
<tr>
<td>Developed Land</td>
<td>59,206</td>
<td>93</td>
<td>11.1</td>
</tr>
<tr>
<td>Forested Land</td>
<td>27,176</td>
<td>42</td>
<td>5.09</td>
</tr>
<tr>
<td>Grassland and Shrubs</td>
<td>21,417</td>
<td>33</td>
<td>4.01</td>
</tr>
<tr>
<td>Pasture/Hay</td>
<td>19,355</td>
<td>30</td>
<td>3.63</td>
</tr>
<tr>
<td>Open Water</td>
<td>5,933</td>
<td>9</td>
<td>1.11</td>
</tr>
<tr>
<td>Wetland</td>
<td>1,214</td>
<td>2</td>
<td>0.23</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>533,460</td>
<td>834</td>
<td>100</td>
</tr>
</tbody>
</table>
Figure 23.  Land use in the Lower Kankakee Subwatershed
4.6.1 Point Sources

This section presents information about the potential point sources of bacteria in the Lower Kankakee subwatershed.

4.6.1.1 Wastewater Treatment Plants (WWTPs) and Industrial Facilities

There are 16 NPDES facilities that discharge bacteria to streams in the Lower Kankakee watershed. Eight facilities have year-round disinfection exemptions and five facilities have seasonal disinfection exemptions (November through April) as shown in Table 51 and Figure 24. The largest facility is the Kankakee River Metro Agency which has an average design flow of 25 MGD and a maximum design flow of 45 MGD.

Table 51. NPDES Facilities in the Lower Kankakee Subwatershed

<table>
<thead>
<tr>
<th>HUC 10</th>
<th>HUC 10 Name</th>
<th>Permit Number</th>
<th>Facility Name</th>
<th>Receiving Stream</th>
<th>Average Design Flow (MGD)</th>
<th>Max Design Flow (MGD)</th>
<th>Exemption Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>712000114</td>
<td>Spring Creek-Kankakee River</td>
<td>IL0022179</td>
<td>Momence STP</td>
<td>Kankakee River</td>
<td>1.6000</td>
<td>3.10000</td>
<td>Seasonal</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IL0045501</td>
<td>Sun River Terrace STP</td>
<td>Kankakee River</td>
<td>0.0750</td>
<td>0.32400</td>
<td>Year Round</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IL0049522</td>
<td>Beecher STP</td>
<td>Trim Creek</td>
<td>0.6000</td>
<td>1.50000</td>
<td>Seasonal</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IL0050717</td>
<td>Grant Park STP</td>
<td></td>
<td>0.3500</td>
<td>0.94000</td>
<td>Year Round</td>
</tr>
<tr>
<td>712000115</td>
<td>Rock Creek</td>
<td>IL0025089</td>
<td>Manteno WPCC</td>
<td>Kankakee River Via South Branch Rock Creek</td>
<td>1.1500</td>
<td>3.50000</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IL0030627</td>
<td>Peotone WWTP</td>
<td>Kankakee R Via Black Walnut Creek</td>
<td>0.8500</td>
<td>2.59000</td>
<td>Year Round</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IL0032051</td>
<td>Il Dot-I57 Will Co Rest Area</td>
<td>Northwest Branch Rock Creek</td>
<td>0.2600</td>
<td>0.65000</td>
<td>Year Round</td>
</tr>
<tr>
<td>712000116</td>
<td>Horse Creek</td>
<td>IL0032832</td>
<td>Herscher STP</td>
<td>Kankakee R Via Horse Creek Via East Br Horse Creek</td>
<td>0.2500</td>
<td>0.87500</td>
<td>Year Round</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IL0076368</td>
<td>Essex STP</td>
<td>Kankakee River</td>
<td>0.1760</td>
<td>0.63900</td>
<td>Year Round</td>
</tr>
<tr>
<td>712000117</td>
<td>Forked Creek</td>
<td>IL0026085</td>
<td>Wilmington STP</td>
<td>Kankakee River</td>
<td>0.7500</td>
<td>1.87500</td>
<td>Seasonal</td>
</tr>
</tbody>
</table>
### Table 51. NPDES Facilities in the Lower Kankakee Subwatershed

<table>
<thead>
<tr>
<th>HUC 10</th>
<th>HUC 10 Name</th>
<th>Permit Number</th>
<th>Facility Name</th>
<th>Receiving Stream</th>
<th>Average Design Flow (MGD)</th>
<th>Max Design Flow (MGD)</th>
<th>Exemption Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>712000118</td>
<td>Kankakee River</td>
<td>IL0021784</td>
<td>Kankakee River Metro Agency</td>
<td>Kankakee River</td>
<td>25.0000</td>
<td>45.0000</td>
<td>Seasonal</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IL0038199</td>
<td>Manteno Mobile Home Park</td>
<td>Exline Slough</td>
<td>0.0210</td>
<td>0.0420</td>
<td>Year Round</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IL0048674</td>
<td>Raymond's Truck Plaza</td>
<td>Kankakee River</td>
<td>0.0060</td>
<td>0.0125</td>
<td>Year Round</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IL0048968</td>
<td>Il State Toll Hwy-Plaza 21 STP</td>
<td>Des Plaines River</td>
<td>0.0005</td>
<td>0.00125</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IL0049093</td>
<td>Il DNR-Kankakee River State Pike</td>
<td>Kankakee R Via Rock Creek</td>
<td>0.0033</td>
<td>0.0083</td>
<td>Seasonal</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IL0055492</td>
<td>Il DNR-Kankakee River State Pike</td>
<td>Kankakee R Via Rock Creek</td>
<td>0.0050</td>
<td>0.0200</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Total</td>
<td>31.096</td>
<td>61.0700</td>
<td></td>
</tr>
</tbody>
</table>
4.6.1.2 Combined Sewer Systems (CSOs)

Grant Park in the Lower Kankakee subwatershed has 2 CSO outfalls as shown in Table 52 and Figure 24.

Table 52. CSOs in the Lower Kankakee Subwatershed

<table>
<thead>
<tr>
<th>HUC 10</th>
<th>HUC 10 Name</th>
<th>Permit #</th>
<th>Facility</th>
<th>Outfall #</th>
<th>Pipe Description</th>
<th>Receiving Stream</th>
</tr>
</thead>
<tbody>
<tr>
<td>712000114</td>
<td>Spring Creek-Kankakee River</td>
<td>IL0050717</td>
<td>Grant Park STP</td>
<td>B010</td>
<td>CSO-STP Bypass</td>
<td>Trim Creek</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>A010</td>
<td>CSO-Raw Sewage Pump Station Overflow</td>
<td>Trim Creek</td>
</tr>
</tbody>
</table>
4.6.1.3 Municipal Separate Storm Sewer System (MS4)

There are seven MS4 communities in the Lower Kankakee subwatershed as shown in Table 53.

<table>
<thead>
<tr>
<th>MS4 Facility Permit ID</th>
<th>MS4 Name</th>
<th>Area (Square Miles)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ILR400015</td>
<td>Bourbonnais Township</td>
<td>2.0</td>
</tr>
<tr>
<td>ILR400260</td>
<td>Kankakee County</td>
<td>28.5</td>
</tr>
<tr>
<td>ILR400299</td>
<td>Village of Bourbonnais</td>
<td>12.0</td>
</tr>
<tr>
<td>ILR400300</td>
<td>Village of Bradley</td>
<td>19.0</td>
</tr>
<tr>
<td>ILR400363</td>
<td>City of Kankakee</td>
<td>29.0</td>
</tr>
<tr>
<td>ILR400495</td>
<td>Kankakee River Metropolitan Agency</td>
<td>93.0</td>
</tr>
<tr>
<td>ILR400619</td>
<td>Beecher Village</td>
<td>0.7</td>
</tr>
</tbody>
</table>

4.6.1.4 Concentrated Animal Feeding Operations (CAFOs)

There is currently no information available on CAFOs in the Lower Kankakee subwatershed
4.6.2 Nonpoint Sources

This section discusses potential nonpoint sources of bacteria in the Lower Kankakee Subwatershed.

4.6.2.1 Onsite Wastewater Treatment Systems

The estimated rural population density of the Lower Kankakee subwatershed is 310 persons per square mile, which is the second highest of the six subwatersheds (the density of the Middle Kankakee is 315 persons per square mile) (Table 54). Most (69%) of the soils have poor infiltration and are categorized as A/D, B/D, C/D, C, or D. A and B soils account for 31 percent of the subwatershed area.

<table>
<thead>
<tr>
<th>County</th>
<th>Area of County in Subwatershed (mi²)</th>
<th>Estimated County Population in Subwatershed</th>
<th>Urban Population</th>
<th>Rural Population</th>
<th>Rural Population Density (persons/mi²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iroquois</td>
<td>4.42</td>
<td>121</td>
<td>0</td>
<td>121</td>
<td></td>
</tr>
<tr>
<td>Ford</td>
<td>7.75</td>
<td>227</td>
<td>0</td>
<td>227</td>
<td></td>
</tr>
<tr>
<td>Grundy</td>
<td>5.14</td>
<td>561</td>
<td>0</td>
<td>561</td>
<td>310</td>
</tr>
<tr>
<td>Newton</td>
<td>0.71</td>
<td>25</td>
<td>0</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>Will</td>
<td>333.22</td>
<td>266,046</td>
<td>16,939</td>
<td>251,989</td>
<td></td>
</tr>
<tr>
<td>Kankakee</td>
<td>484.17</td>
<td>78,048</td>
<td>71,673</td>
<td>6,375</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>835.43</td>
<td>345,028</td>
<td>88,612</td>
<td>259,177</td>
<td></td>
</tr>
</tbody>
</table>

4.6.2.2 Animal Feeding Operations (AFOs)

The number of AFOs in the Lower Kankakee watershed is currently unavailable.

4.6.2.3 Livestock Population

Swine and cattle comprise a majority of the farm animals in the Lower Kankakee subwatershed. The animal unit density of the subwatershed is 37 per square mile, which is the lowest of the six subwatersheds (Table 55).
### Table 55. Animal Unit Density in the Lower Kankakee Subwatershed

<table>
<thead>
<tr>
<th>Subwatershed Area sq. /miles</th>
<th>Animal</th>
<th>Number of Head</th>
<th>Number of Animals in One Animal Unit</th>
<th>Number of Animal Units</th>
<th>Animal Unit Density per sq. mile</th>
</tr>
</thead>
<tbody>
<tr>
<td>834</td>
<td>Hogs and Pigs</td>
<td>41,908</td>
<td>2.5</td>
<td>16,763</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cattle and Calves</td>
<td>11,304</td>
<td>1</td>
<td>11,304</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Poultry</td>
<td>1,654</td>
<td>50</td>
<td>33</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sheep and Lambs</td>
<td>35</td>
<td>10</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Horses and Ponies</td>
<td>1,462</td>
<td>0.5</td>
<td>2,924</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>31,028</strong></td>
<td></td>
<td><strong>37</strong></td>
<td></td>
</tr>
</tbody>
</table>

### 4.6.2.4 Wildlife

Among the six subwatersheds, Lower Kankakee has the highest deer density at six per square mile (Table 56).

### Table 56. Deer Density in the Lower Kankakee Subwatershed

<table>
<thead>
<tr>
<th>Subwatershed Area sq. miles</th>
<th>County</th>
<th>Deer Population</th>
<th>Deer Density per/sq. mile</th>
</tr>
</thead>
<tbody>
<tr>
<td>834</td>
<td>Iroquois</td>
<td>427</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Ford</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Grundy</td>
<td>2,458</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Newton</td>
<td>48</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Will</td>
<td>1,777</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Kankakee</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>4,729</strong></td>
<td></td>
</tr>
</tbody>
</table>
5.0 TECHNICAL APPROACH

This section presents the technical approach used to estimate the current and allowable loads of fecal coliform and *E. coli* in the Kankakee/Iroquois watershed.

5.1 Load Duration Curves

The load duration curve calculates the allowable loadings of a pollutant at different flow regimes by multiplying each flow by the TMDL target value and an appropriate conversion factor. The following steps are taken:

1) A flow duration curve for the stream is developed by generating a flow frequency table and plotting the observed flows in order from highest (left portion of curve) to lowest (right portion of curve).

2) The flow curve is translated into a load duration (or TMDL) curve. To accomplish this, each flow value is multiplied by the TMDL target value and by a conversion factor and the resulting points are graphed. Conversion factors are used to convert the units of the target (e.g., #/100 mL) to loads (e.g., G-org/day) with the following factors used for this TMDL:
   
   a) Flow (cfs) x TMDL Concentration Target (#/100mL) x Conversion Factor (0.024463) = Load (G-org/day)

3) To estimate existing loads, each water quality sample is converted to a load by multiplying the water quality sample concentration by the average daily flow on the day the sample was collected and the appropriate conversion factor. Then, the existing individual loads are plotted on the TMDL graph with the curve.

4) Points plotting above the curve represent deviations from the water quality standard and the daily allowable load. Those points plotting below the curve represent compliance with standards and the daily allowable load.

5) The area beneath the load duration curve is interpreted as the loading capacity of the stream. The difference between this area and the area representing the current loading conditions is the load that must be reduced to meet water quality standards.

Water quality duration curves are created using the same steps as those used for load duration curves except that concentrations, rather than loads, are plotted on the vertical axis.

The stream flows displayed on water quality or load duration curves may be grouped into various flow regimes to aid with interpretation of the load duration curves. The flow regimes are typically divided into 10 groups, which can be further categorized into the following five “hydrologic zones” (USEPA, 2007):

- High flow zone: stream flows that plot in the 0 to 10-percentile range, related to flood flows.
- Moist zone: flows in the 10 to 40-percentile range, related to wet weather conditions.
- Mid-range zone: flows in the 40 to 50 percentile range, median stream flow conditions;
- Dry zone: flows in the 60 to 90-percentile range, related to dry weather flows.
- Low flow zone: flows in the 90 to 100-percentile range, related to drought conditions.

The duration curve approach helps to identify the issues surrounding the impairment and to roughly differentiate between sources. Table 57 summarizes the general relationship between the five hydrologic zones and potentially contributing source areas (the table is not specific to any individual pollutant). For
example, the table indicates that impacts from wastewater treatment plants are usually most pronounced during dry and low flow zones because there is less water in the stream to dilute their loads. In contrast, impacts from channel bank erosion is most pronounced during high flow zones because these are the periods during which stream velocities are high enough to cause erosion to occur. Impacts from abandoned mining areas can occur during all flow zones.

The load duration curve approach also considers critical conditions and seasonal variation in the TMDL development as required by the Clean Water Act and EPA’s implementing regulations. Because the approach establishes loads based on a representative flow regime, it considers seasonal variations and critical conditions attributed to flow conditions.

Table 57. Relationship Between Load Duration Curve Zones and Contributing Bacteria Sources

<table>
<thead>
<tr>
<th>Contributing Source Area</th>
<th>Duration Curve Zone</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>High</td>
</tr>
<tr>
<td>Wastewater treatment plants</td>
<td>M</td>
</tr>
<tr>
<td>Livestock direct access to streams</td>
<td>M</td>
</tr>
<tr>
<td>Wildlife direct access to streams</td>
<td>M</td>
</tr>
<tr>
<td>On-site wastewater systems/Unsewered Areas</td>
<td>M</td>
</tr>
<tr>
<td>Urban stormwater/CSOs</td>
<td>H</td>
</tr>
<tr>
<td>Agricultural runoff</td>
<td>H</td>
</tr>
<tr>
<td>Bacterial re-suspension from stream sediments</td>
<td>H</td>
</tr>
</tbody>
</table>

Note: Potential relative importance of source area to contribute loads under given hydrologic condition (H: High; M: Medium; L: Low)

5.1.1 Stream Flow Estimates

Daily stream flows are necessary to implement the load duration curve approach. These were estimated using the observed flows available at a number of USGS gages in the Kankakee/Iroquois watershed. Most of the sampling sites were on small tributary streams whose flow patterns will vary widely from the active USGS gages which are primarily on larger rivers. To account for these differences historic gage data on smaller tributaries were used in addition to active gages. Table 58 outlines the USGS gages used to make flow estimates for each ungaged subwatershed outlet.

Flows were estimated based on drainage area weighting using the following equation:

\[ Q_{\text{ungaged}} = \frac{A_{\text{ungaged}}}{A_{\text{gaged}}} \times Q_{\text{gaged}} \]

Where,

- \( Q_{\text{ungaged}} \): Flow at the ungaged location
- \( Q_{\text{gaged}} \): Flow at surrogate USGS gage station
- \( A_{\text{ungaged}} \): Drainage area of the ungaged location
- \( A_{\text{gaged}} \): Drainage area of the gaged location

In this procedure, the drainage area of each of the load duration stations was divided by the drainage area of the surrogate USGS gage. The flows for each of the stations were then calculated by multiplying the flows at the surrogate gage by the drainage area ratios. Additional flows were added to certain locations to account for wastewater treatment plants and CSOs that discharge upstream and are not directly accounted for using the drainage area weighting method.
### Table 58. USGS Site Assignments for Estimated Flows at Ungaged Sites

<table>
<thead>
<tr>
<th>Watershed Group</th>
<th>HUC 10</th>
<th>HUC 12</th>
<th>Gage Assigned for Estimating Flows</th>
<th>Gage ID</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Upper Kankakee</strong></td>
<td>107</td>
<td>10701</td>
<td>Kankakee at Davis</td>
<td>05515500</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10702</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>10703</td>
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<td></td>
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<td>10704</td>
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<td></td>
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<tr>
<td></td>
<td></td>
<td>10705</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>104</td>
<td>10405</td>
<td>Kankakee at Davis</td>
<td>05515500</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10407</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>10408</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>102</td>
<td>10203</td>
<td>Kankakee at Davis</td>
<td>05515500</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10204</td>
<td></td>
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<td>10206</td>
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<td>10209</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>101</td>
<td>10102</td>
<td>Kankakee at Davis</td>
<td>05515500</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10103</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>10105</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>10106</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Upper Iroquois</strong></td>
<td>205</td>
<td>20502</td>
<td>Sugar Creek at Milford</td>
<td>05525500</td>
</tr>
<tr>
<td></td>
<td></td>
<td>20503</td>
<td></td>
<td></td>
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<td></td>
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<td>20505</td>
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<td></td>
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<td>20506</td>
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<td></td>
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<tr>
<td></td>
<td></td>
<td>20508</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>204</td>
<td>20401</td>
<td>Iroquois River near Foresman</td>
<td>05524500</td>
</tr>
<tr>
<td></td>
<td></td>
<td>20403</td>
<td></td>
<td></td>
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<tr>
<td></td>
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<td>20404</td>
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<td></td>
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<td>20405</td>
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<td></td>
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<tr>
<td></td>
<td>203</td>
<td>20303</td>
<td>Iroquois River at Rensselaer</td>
<td>05522500</td>
</tr>
<tr>
<td></td>
<td></td>
<td>20304</td>
<td></td>
<td></td>
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<tr>
<td></td>
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<td>20305</td>
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<td></td>
</tr>
<tr>
<td></td>
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<td>20206</td>
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<tr>
<td></td>
<td>201</td>
<td>20103</td>
<td>Iroquois River at Rensselaer</td>
<td>05522500</td>
</tr>
<tr>
<td><strong>Lower Iroquois</strong></td>
<td>206</td>
<td>20604</td>
<td>Sugar Creek at Milford</td>
<td>05525500</td>
</tr>
<tr>
<td></td>
<td></td>
<td>20605</td>
<td></td>
<td></td>
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<tr>
<td></td>
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<td>20702</td>
<td>Sugar Creek at Milford</td>
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<td></td>
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<td></td>
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<tr>
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<td>208</td>
<td>20808</td>
<td>Iroquois at Iroquois, IL</td>
<td>05525000</td>
</tr>
<tr>
<td><strong>Lower Iroquois</strong></td>
<td>209</td>
<td>20902</td>
<td>Iroquois at Iroquois, IL</td>
<td>05525000</td>
</tr>
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<td></td>
<td></td>
<td>21001</td>
<td></td>
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<td>05525000</td>
</tr>
<tr>
<td></td>
<td>211</td>
<td>21102</td>
<td>Iroquois at Iroquois, IL</td>
<td>05525000</td>
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<tr>
<td></td>
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<td>21103</td>
<td></td>
<td>05525000</td>
</tr>
<tr>
<td></td>
<td>212</td>
<td>21202</td>
<td>Iroquois at Iroquois, IL</td>
<td>05525000</td>
</tr>
<tr>
<td></td>
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<td>21203</td>
<td></td>
<td>05525000</td>
</tr>
<tr>
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<td>213</td>
<td>21302</td>
<td>Iroquois at Iroquois, IL</td>
<td>05525000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>21303</td>
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<td></td>
<td>05525000</td>
</tr>
<tr>
<td></td>
<td>214</td>
<td>21402</td>
<td>Iroquois near Chebanse, IL</td>
<td>05526000</td>
</tr>
<tr>
<td>Watershed Group</td>
<td>HUC 10</td>
<td>HUC 12</td>
<td>Gage Assigned for Estimating Flows</td>
<td>Gage ID</td>
</tr>
<tr>
<td>------------------</td>
<td>--------</td>
<td>--------</td>
<td>-----------------------------------</td>
<td>----------</td>
</tr>
<tr>
<td>Yellow</td>
<td>106</td>
<td>10601</td>
<td>10603 10604</td>
<td>05521000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Iroquois River at Rosebud</td>
<td></td>
</tr>
<tr>
<td></td>
<td>105</td>
<td>10501</td>
<td>10503 10504 10505 10506</td>
<td>05516500</td>
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<td></td>
<td></td>
<td>Yellow River at Plymouth</td>
<td></td>
</tr>
<tr>
<td></td>
<td>103</td>
<td>10302</td>
<td>10303 10305 10307 10311 10312</td>
<td>05516500</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Yellow River at Plymouth</td>
<td></td>
</tr>
<tr>
<td>Middle Kankakee</td>
<td>113</td>
<td>11302</td>
<td>11304 11305 11306 11307 11308 11310 11312</td>
<td>05519000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Singleton Ditch at Schneider</td>
<td></td>
</tr>
<tr>
<td></td>
<td>112</td>
<td>11203</td>
<td>11205</td>
<td>05521000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Iroquois River at Rosebud</td>
<td></td>
</tr>
<tr>
<td></td>
<td>111</td>
<td>11101</td>
<td>11103</td>
<td>05521000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Iroquois River at Rosebud</td>
<td></td>
</tr>
<tr>
<td></td>
<td>110</td>
<td>11001</td>
<td>11005 11006 11007 11009 11010</td>
<td>05519000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Singleton Ditch at Schneider</td>
<td></td>
</tr>
<tr>
<td></td>
<td>109</td>
<td>10902</td>
<td>10904</td>
<td>05521000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Iroquois River at Rosebud</td>
<td></td>
</tr>
<tr>
<td></td>
<td>108</td>
<td>10802</td>
<td>10805 10806 10807</td>
<td>05521000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Iroquois River at Rosebud</td>
<td></td>
</tr>
<tr>
<td>Lower Kankakee</td>
<td>118</td>
<td>11806</td>
<td>11809</td>
<td>05527500</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Kankakee River near Wilmington, IL</td>
<td></td>
</tr>
</tbody>
</table>
6.0 LINKAGE ANALYSIS

An essential component of developing a TMDL is establishing a relationship between the source loadings and the resulting water quality. Water quality data within the Kankakee/Iroquois watershed are discussed in Section 3.2 and potential point and nonpoint sources are inventoried in Section 4.0. The purpose of this section of the report is to evaluate which of the various potential sources is most likely to be contributing to the observed water quality impairments.

Establishing a linkage analysis for bacteria is challenging because there are so many potential sources and because bacteria counts have a high degree of variability. While it is difficult to perform a site-specific assessment of the causes of high bacteria for each location in the Kankakee/Iroquois watershed, it is reasonable to expect that general patterns and trends can be used to provide some perspective on the most significant sources.

Table 59 summarizes several of the potential bacteria sources in each subwatershed along with the E. coli data collected by IDEM in 2008. E. coli counts are highest in the Yellow River, Upper Iroquois, and Upper Kankakee subwatersheds which are all characterized by relatively high animal unit densities. It is therefore possible that waste generated by livestock in these subwatersheds is contributing to the elevated bacteria counts. In fact, the animal unit density of each subwatershed is strongly correlated with the geomean of E. coli counts in each subwatershed (Figure 25). Similar trends are not apparent with the other sources listed in Table 59. However, it is also possible that some other factor could explain the higher counts. For example, the Yellow River, Upper Iroquois, and Upper Kankakee are also headwater subwatersheds and many of the sampled tributaries therefore have a relatively small drainage area. Streams with smaller drainage areas generally have relatively higher E. coli counts because there is less opportunity for dilution compared to larger streams. Bacteria patterns associated with drainage areas, as well as flow conditions, are further discussed in the next several sections.

### Table 59. Potential sources of pathogens in the Kankakee/Iroquois Watershed.

<table>
<thead>
<tr>
<th>Source Type or Concern</th>
<th>Upper Kankakee</th>
<th>Middle Kankakee</th>
<th>Yellow River</th>
<th>Upper Iroquois</th>
<th>Lower Iroquois</th>
<th>Lower Kankakee</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean of All 2008 E. coli data (#/100 mL)</td>
<td>760</td>
<td>435</td>
<td>1014</td>
<td>767</td>
<td>473</td>
<td>514</td>
</tr>
<tr>
<td>Geomean of All 2008 E. coli data (#/100 mL)</td>
<td>308</td>
<td>165</td>
<td>545</td>
<td>375</td>
<td>156</td>
<td>139</td>
</tr>
<tr>
<td>Point Source Type or Concern</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Average Design Flow of Wastewater Treatment Plants (MGD)</td>
<td>10.8</td>
<td>10.4</td>
<td>8.6</td>
<td>2.6</td>
<td>3.1</td>
<td>31</td>
</tr>
<tr>
<td>Total Number of Combined Sewer Overflows</td>
<td>0</td>
<td>1</td>
<td>23</td>
<td>9</td>
<td>16</td>
<td>2</td>
</tr>
<tr>
<td>Square Miles of MS4 Storm Water</td>
<td>18.3</td>
<td>31.9</td>
<td>7.0</td>
<td>0</td>
<td>0.2</td>
<td>184.2</td>
</tr>
<tr>
<td>Rural Population Density (persons/square mile)</td>
<td>214</td>
<td>315</td>
<td>141</td>
<td>29</td>
<td>22</td>
<td>310</td>
</tr>
<tr>
<td>Animal Unit Density (units/square mile)</td>
<td>146</td>
<td>65</td>
<td>329</td>
<td>185</td>
<td>53</td>
<td>37</td>
</tr>
<tr>
<td>Deer Density (animals/square mile)</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>2</td>
<td>3</td>
<td>6</td>
</tr>
</tbody>
</table>
Figure 25. Correlation of subwatershed animal unit densities and *E. coli* geomean (based on 2008 sampling data).

6.1 Upper Kankakee

Data collected for the Upper Kankakee in the summer of 2008 indicate that there are *E. coli* exceedances throughout the subwatershed. In fact, only one site within the subwatershed did not exceed the geomean standard (Whitham Ditch, Station #35). The drainage area profile (Figure 26) does not show any definitive patterns within the subwatershed. Most of the 2008 IDEM water quality data were taken during moist and mid-range flow regimes; patterns might emerge if data were available for a wider range of flow conditions.

Figure 27 summarizes the 2008 bacteria data for the Upper Kankakee by tributary and indicates that the tributaries in general exhibit higher *E. coli* counts compared to the mainstem. Counts in the Potato/Pine tributaries are notably higher than in the Headwaters, Little Kankakee, Kingsbury/Robbins, and Upper Kankakee mainstem. A detailed assessment of the sources known to exist in the Potato and Pine Creek tributaries did not reveal any noticeable difference from other tributaries in the Upper Kankakee subwatershed, however.

Most facilities in this subwatershed are in compliance in with their flow and bacteria limits (Table 60).
Table 60. Summary of NPDES facility compliance with design flow and bacteria permit limits in the Upper Kankakee subwatershed (2004 to 2006).

<table>
<thead>
<tr>
<th>NPDES ID</th>
<th>Facility Name</th>
<th>Flow Average Design Flow (MGD)</th>
<th>Number of Violations</th>
<th>Bacteria Limit (#/100 mL)</th>
<th>Number of Violations</th>
</tr>
</thead>
<tbody>
<tr>
<td>IN0023337</td>
<td>Kingsford Heights Municipal WWTP</td>
<td>0.422</td>
<td>0</td>
<td>125</td>
<td>1</td>
</tr>
<tr>
<td>IN0025577</td>
<td>La Porte Municipal STP</td>
<td>7</td>
<td>0</td>
<td>125*</td>
<td>6</td>
</tr>
<tr>
<td>IN0025801</td>
<td>North Liberty WWTP</td>
<td>0.18</td>
<td>1</td>
<td>125</td>
<td>1</td>
</tr>
<tr>
<td>IN0040100</td>
<td>Hamlet Municipal STP</td>
<td>0.1</td>
<td>3</td>
<td>125</td>
<td>ND</td>
</tr>
<tr>
<td>IN0040690</td>
<td>Walkerton Municipal WWTP</td>
<td>0.364</td>
<td>2</td>
<td>125</td>
<td>0</td>
</tr>
<tr>
<td>IN0045471</td>
<td>Kingsbury Utility Corp</td>
<td>2.5</td>
<td>0</td>
<td>125</td>
<td>11</td>
</tr>
</tbody>
</table>

Notes: MGD = Million gallons per day; ND = No data; *data at this facility also showed exceedances 235 standard
Figure 26. Upper Kankakee Drainage Area Profile

Figure 27. Upper Kankakee Tributary versus Mainstem Drainage Area Profile
An *E. coli* duration curve was prepared for sampling station KR-117 which is located on the Kankakee River in the Upper Kankakee subwatershed (Figure 29). Data are available at this station from 1988 to 1999 and the water quality duration curve is shown in Figure 28. The curve indicates that *E. coli* frequently exceeds 235#/100 mL during high flows, moist conditions, and mid-range flows. The geometric mean of all the samples collected during low flows is less than 235#/100 mL. Bacteria sources typically associated with high flow and moist conditions include failing onsite wastewater systems, urban stormwater/CSOs, runoff from agricultural areas, and bacterial re-suspension from the streambed.

![Kankakee River along Route 6, Indiana](image)

**Figure 28.** *E. coli* at Station KR-117
Figure 29. Key Sampling Stations in Kankakee/Iroquois River Watershed
6.2 Middle Kankakee

Data compiled for the Middle Kankakee in the summer of 2008 indicate that there are *E. coli* exceedances throughout the subwatershed. Only three sites within the subwatershed do not exceed the geometric standard (Pitner Ditch, Station # 07; Cobb Ditch, Station #06; and Brown Ditch, Station #22). Five stations have geometric values over 600 #/100 mL: #31 (Hunsley Ditch), #29 (Slocum Ditch), #27 (Crooked Creek), #18 (Stony Run Ditch), and #20 (Dehaan Ditch). A detailed assessment of the sources known to exist in these tributaries did not reveal any noticeable difference from other tributaries in the Middle Kankakee subwatershed, however.

Figure 31 indicates that in general *E. coli* counts are higher in the Middle Kankakee tributaries compared to the mainstem of the Kankakee River. This occurs despite the fact that the Yellow River, which was observed to have very high *E. coli* counts, discharges upstream of the Middle Kankakee. *E. coli* appears to decrease moving downstream due to the larger dilution capacity of the river.

Most facilities in this subwatershed are in compliance with their flow and bacteria limits; however, the Hebron Municipal WWTP exceeded its permit limit 10 times between 2004 and 2006 (Table 61).

<table>
<thead>
<tr>
<th>NPDES ID</th>
<th>Facility Name</th>
<th>Design Flow (MGD)</th>
<th>Number of Violations</th>
<th>Limit (#/100 mL)</th>
<th>Number of Violations</th>
</tr>
</thead>
<tbody>
<tr>
<td>IN0020061</td>
<td>Hebron Municipal WWTP</td>
<td>0.52</td>
<td>9</td>
<td>125*</td>
<td>10</td>
</tr>
<tr>
<td>IN0023400</td>
<td>Kouts Municipal WWTP</td>
<td>0.33</td>
<td>1</td>
<td>125*</td>
<td>1</td>
</tr>
<tr>
<td>IN0023621</td>
<td>Lowell WWTP</td>
<td>4</td>
<td>0</td>
<td>125*</td>
<td>1</td>
</tr>
<tr>
<td>IN0030651</td>
<td>South Haven Sewer Works WWTP</td>
<td>2</td>
<td>5</td>
<td>125*</td>
<td>3</td>
</tr>
<tr>
<td>IN0031127</td>
<td>Winfield Elementary School</td>
<td>0.01</td>
<td>1</td>
<td>125</td>
<td>4</td>
</tr>
<tr>
<td>IN0033081</td>
<td>Dalecarlia Utilities Lake Dale</td>
<td>0.044</td>
<td>0</td>
<td>125*</td>
<td>1</td>
</tr>
<tr>
<td>IN0037176</td>
<td>Twin Lakes Utilities</td>
<td>1.1</td>
<td>3</td>
<td>125*</td>
<td>4</td>
</tr>
<tr>
<td>IN0039101</td>
<td>Water Services Co Of Indiana</td>
<td>0.155</td>
<td>0</td>
<td>125</td>
<td>1</td>
</tr>
<tr>
<td>IN0040754</td>
<td>Wheatfield Municipal WWTP</td>
<td>0.077</td>
<td>5</td>
<td>125</td>
<td>0</td>
</tr>
<tr>
<td>IN0042978</td>
<td>Westville Correctional Center</td>
<td>0.75</td>
<td>1</td>
<td>125*</td>
<td>4</td>
</tr>
<tr>
<td>IN0045888</td>
<td>Boone Grove Elem &amp; Middle School</td>
<td>0.023</td>
<td>1</td>
<td>125</td>
<td>0</td>
</tr>
<tr>
<td>IN0052248</td>
<td>Morgan Township School</td>
<td>0.0132</td>
<td>6</td>
<td>125</td>
<td>0</td>
</tr>
<tr>
<td>IN0056669</td>
<td>Wanatah Wastewater Trmt Plant</td>
<td>0.078</td>
<td>14</td>
<td>125</td>
<td>0</td>
</tr>
<tr>
<td>IN0057029</td>
<td>Boone Grove High School WWTP</td>
<td>0.01875</td>
<td>1</td>
<td>125*</td>
<td>7</td>
</tr>
<tr>
<td>IN0061450</td>
<td>Hebron WWTP</td>
<td>0.025</td>
<td>25</td>
<td>125</td>
<td>0</td>
</tr>
</tbody>
</table>

Notes: MGD = Million gallons per day; ND= No data; *data at this facility also showed exceedances 235 standard
Figure 30. Middle Kankakee Small Watershed Drainage Area Profile

Figure 31. Middle Kankakee Tributary versus Mainstem Drainage Area Profile
An *E. coli* duration curve was prepared for sampling station KR-68 which is located in the Middle Kankakee subwatershed. Data are available at this station from 1988 to 1999 and the duration curve is shown in Figure 32. The curve indicates that *E. coli* frequently exceeds 235 #/100 mL during high flows. Bacteria sources typically associated with high flows include urban stormwater/CSOs, runoff from agricultural areas, and bacterial re-suspension from the streambed. Most samples during dry conditions and low flows meet water quality standards.

**Figure 32.** *E. coli* at Station KR-68
6.3 **Yellow River**

Data compiled for the Yellow River in the summer of 2008 indicate that it had the worst *E. coli* of any of the subwatersheds. Every site sampled in the subwatershed exceeded the geomean standard of 125 #/100 mL. The site with the lowest geomean was on the main stem Yellow River (Site # 69), with a geomean of 239 counts/100 mL. The tributary within the subwatershed with the lowest geomean was Site #67 of Harry Cool Ditch, with a geomean of 330. A detailed assessment of the sources known to exist in these tributaries did not reveal any noticeable difference from other tributaries in the Yellow River subwatershed, however.

The drainage area profile (Figure 33) suggests a slight increasing trend in the Yellow River as drainage area increases. Tributaries to the Yellow River in general have higher *E. coli* counts than does the middle section of the Yellow River (Figure 34).

Water quality duration curves were not prepared for any sites in the Yellow River subwatershed because of the lack of historical *E. coli* data.

Most facilities in this subwatershed are in compliance in with their flow and bacteria limits; however, the Knox Municipal WWTP exceeded its permit limit 20 times between 2004 and 2006 (Table 62).

**Table 62. Summary of NPDES facility compliance with design flow and bacteria permit limits in the Yellow River subwatershed (2004 to 2006).**

<table>
<thead>
<tr>
<th>NPDES ID</th>
<th>Facility Name</th>
<th>Average Design Flow (MGD)</th>
<th>Number of Violations</th>
<th>Limit (#/100 mL)</th>
<th>Number of Violations</th>
</tr>
</thead>
<tbody>
<tr>
<td>IN0020427</td>
<td>Bremen Municipal WWTP</td>
<td>1.3</td>
<td>2</td>
<td>125</td>
<td>No Data</td>
</tr>
<tr>
<td>IN0020877</td>
<td>North Judson Municipal WWTP</td>
<td>0.47</td>
<td>8</td>
<td>125</td>
<td>No Data</td>
</tr>
<tr>
<td>IN0020991</td>
<td>Plymouth WWTP</td>
<td>3.5</td>
<td>2</td>
<td>125</td>
<td>0</td>
</tr>
<tr>
<td>IN0021385</td>
<td>Knox Municipal WWTP</td>
<td>0.7</td>
<td>0</td>
<td>125*</td>
<td>20</td>
</tr>
<tr>
<td>IN0022284</td>
<td>Argos Municipal WWTP</td>
<td>0.212</td>
<td>2</td>
<td>125</td>
<td>0</td>
</tr>
<tr>
<td>IN0025160</td>
<td>Convent Ancilla Dominion</td>
<td>0.046</td>
<td>9</td>
<td>125*</td>
<td>3</td>
</tr>
<tr>
<td>IN0040223</td>
<td>Lapaz Municipal WWTP</td>
<td>0.126</td>
<td>1</td>
<td>125</td>
<td>0</td>
</tr>
<tr>
<td>IN0057002</td>
<td>Lake Of The Woods RSD</td>
<td>0.135</td>
<td>3</td>
<td>125</td>
<td>No Data</td>
</tr>
<tr>
<td>IN0058289</td>
<td>Bass Lake Conservancy District</td>
<td>0.284</td>
<td>1</td>
<td>125</td>
<td>No Data</td>
</tr>
</tbody>
</table>

Notes: MGD = Million gallons per day; ND= No data; *data at this facility also showed exceedances 235 standard
Figure 33. Yellow River Small Watershed Drainage Area Profile

(Data reported by Indiana DEM)

Figure 34. Yellow River Tributary versus Mainstem Drainage Area Profile

(Data reported by Indiana DEM)
6.4 Upper Iroquois

Data compiled for the Upper Iroquois in the summer of 2008 indicate that there are *E. coli* exceedances throughout the Indiana portion of the subwatershed (limited data are available for the Illinois portion of the watershed). Every site sampled in the subwatershed exceeded the geomean standard of 125 #/100 mL. The site with the lowest geomean was on the main stem Iroquois River (Site # 80). The tributary within the subwatershed with the lowest geomean was Site # 70 on Carpenter Creek. The drainage area profile (Figure 35) does not show any definitive patterns within the subwatershed. Three stations have geomean values over 800 #/100 mL: # 68 (Carpenter Creek), # 76 (Hunter Ditch), and # 84 (Montgomery) but a detailed assessment did not reveal any characteristics unique to these streams.

Similar to other subwatersheds, the tributaries to the Upper Iroquois in general have higher *E. coli* counts than the Upper Iroquois itself (Figure 36).

Water quality duration curves were not prepared for any sites in the Upper Iroquois subwatershed because of the lack of historical *E. coli* data.

Most facilities in this subwatershed are in compliance in with their flow and bacteria limits (Table 63).

<table>
<thead>
<tr>
<th>NPDES ID</th>
<th>Facility Name</th>
<th>Average Design Flow (MGD)</th>
<th>Flow</th>
<th>Bacteria</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Number of Violations</td>
<td>Limit (#/100 mL)</td>
</tr>
<tr>
<td>IN0020940</td>
<td>Remington WWTP</td>
<td>0.429</td>
<td>5</td>
<td>125</td>
</tr>
<tr>
<td>IN0023329</td>
<td>Kentland Municipal WWTP</td>
<td>0.46</td>
<td>5</td>
<td>125*</td>
</tr>
<tr>
<td>IN0024414</td>
<td>Rensselaer Municipal STP</td>
<td>1.2</td>
<td>5</td>
<td>125*</td>
</tr>
<tr>
<td>IN0039764</td>
<td>Brook Municipal WWTP</td>
<td>0.1</td>
<td>5</td>
<td>125</td>
</tr>
<tr>
<td>IN0040070</td>
<td>Goodland Municipal WWTP</td>
<td>0.095</td>
<td>8</td>
<td>125</td>
</tr>
<tr>
<td>IN0041904</td>
<td>Trail Tree Inn</td>
<td>0.256</td>
<td>0</td>
<td>125*</td>
</tr>
<tr>
<td>IN0050997</td>
<td>George Ade Mem Health Care Ctr</td>
<td>0.014</td>
<td>1</td>
<td>125*</td>
</tr>
<tr>
<td>IN0053422</td>
<td>Grandmas Home Cooking</td>
<td>0.0289</td>
<td>0</td>
<td>125</td>
</tr>
</tbody>
</table>

Notes: MGD = Million gallons per day; *data at this facility also showed exceedances 235 standard
Figure 35. Upper Iroquois Small Watershed Drainage Area Profile

Figure 36. Upper Iroquois Tributary versus Mainstem Drainage Area Profile
6.5 Lower Iroquois-Indiana

Data compiled for the Lower Iroquois in the summer of 2008 indicate that there are \textit{E. coli} exceedances throughout the Indiana portion of the subwatershed. Every site sampled in the subwatershed exceeded the geometric mean standard of 125 #/100 mL. The drainage area profile (Figure 37) does not show any definitive patterns within the subwatershed and there are limited data to compare the tributaries to the mainstem (Figure 36).

Water quality duration curves were not prepared for any sites in the Indiana portion of the Lower Iroquois subwatershed because of the lack of historical \textit{E. coli} data.

It is difficult to assess whether facilities in this subwatershed are in compliance in with their bacteria limits due to a lack of data reported in PCS; many have violated their flow limits, however (Table 64).

Table 64. Summary of NPDES facility compliance with design flow and bacteria permit limits in the Lower Iroquois subwatershed (2004 to 2007).

<table>
<thead>
<tr>
<th>NPDES ID</th>
<th>Facility Name</th>
<th>Exemption Status</th>
<th>Average Design Flow (MGD)</th>
<th>Number of Violations</th>
<th>Limit (#/100 mL)</th>
<th>Number of Violations</th>
</tr>
</thead>
<tbody>
<tr>
<td>IL0022161</td>
<td>Watseka STP</td>
<td>None</td>
<td>1.6</td>
<td>34</td>
<td>200</td>
<td>39</td>
</tr>
<tr>
<td>IL0023272</td>
<td>Milford STP</td>
<td>Year Round</td>
<td>0.2</td>
<td>33</td>
<td>200</td>
<td>No Data</td>
</tr>
<tr>
<td>IL0025062</td>
<td>Gilman-North STP</td>
<td>Year Round</td>
<td>0.5</td>
<td>33</td>
<td>200</td>
<td>No Data</td>
</tr>
<tr>
<td>IL0042391</td>
<td>Cissna Park STP</td>
<td>Year Round</td>
<td>0.1</td>
<td>27</td>
<td>200</td>
<td>No Data</td>
</tr>
<tr>
<td>ILG551007</td>
<td>Merkle-Knipprath Nursing Home</td>
<td>Year Round</td>
<td>0.015</td>
<td>4</td>
<td>200</td>
<td>No Data</td>
</tr>
<tr>
<td>ILG551072</td>
<td>Il Dot-I-57 Iroquois County Nursing</td>
<td>Year Round</td>
<td>0.0162</td>
<td>13</td>
<td>200</td>
<td>No Data</td>
</tr>
<tr>
<td>ILG580122</td>
<td>Rankin STP</td>
<td>Year Round</td>
<td>0.08</td>
<td>41</td>
<td>200</td>
<td>No Data</td>
</tr>
<tr>
<td>IN0060798</td>
<td>Morocco WWTP</td>
<td>None</td>
<td>0.15</td>
<td>1</td>
<td>125</td>
<td>4</td>
</tr>
<tr>
<td>IL0022161</td>
<td>Watseka STP</td>
<td>None</td>
<td>1.6</td>
<td>34</td>
<td>200</td>
<td>No Data</td>
</tr>
<tr>
<td>IL0023272</td>
<td>Milford STP</td>
<td>Year Round</td>
<td>0.2</td>
<td>33</td>
<td>200</td>
<td>No Data</td>
</tr>
</tbody>
</table>

Notes: MGD = Million gallons per day.
Figure 37. Lower Iroquois Small Watershed Drainage Area Profile

(Data reported by Indiana DEM)

Lower Iroquois Tributary versus Upper Iroquois Mainstem Drainage Area Profile

(Data reported by Indiana DEM)

Figure 38. Lower Iroquois Tributary versus Upper Iroquois Mainstem Drainage Area Profile
6.6 Lower Iroquois-Illinois

Data collected in the Lower Iroquois in the summer of 2008 indicate that there are fecal coliform bacteria exceedances throughout the Illinois portion of the subwatershed. Seventeen sites sampled in the subwatershed exceeded the geomean standard of 200 #/100 mL.

The drainage area profile (Figure 39) displays a slight decreasing trend in fecal coliform as drainage area increases. Fecal coliform counts collected from the Lower Iroquois itself are somewhat lower than those collected from tributaries to the Lower Iroquois (Figure 40).
Figure 39. Lower Iroquois Small Watershed Drainage Area Profile (> 500 square miles)

Figure 40. Lower Iroquois Tributary versus Lower Iroquois Mainstem Drainage Area Profile
A fecal coliform duration curve was prepared for sampling station FL-04 which is located on the Iroquois River at Iroquois. Data are available at this station from 1978 to 2006 and the duration curve is shown in Figure 41. The curve indicates that fecal coliform frequently exceeds 400#/100 mL during high flows and moist conditions. Most samples from mid-range, dry, and low flow conditions meet water quality standards. Many storm event samples (indicated by the red diamonds) also exceed 400#/100 mL, even during mid-range and dry conditions. Bacteria sources typically associated with high flow and storm events include urban stormwater/CSOs, runoff from agricultural areas, and bacterial re-suspension from the streambed.

![Figure 41. Fecal Coliform Bacteria at Station FL-04](image)

A fecal coliform duration curve was also prepared for sampling station FLI-02 which is located on Sugar Creek at Milford in the Lower Iroquois subwatershed. Data are available at this station from 1978 to 2007 and the duration curve is shown in Figure 42. The curve indicates that fecal coliform frequently exceeds 400#/100 mL during all flow conditions. The fact that fecal coliform is high during low flow conditions suggests that there is a constant source of bacteria to this segment, potentially from a large number of homes on failing or illicitly connected septic systems. Elevated bacteria levels at low flow could also result from inadequate disinfection at wastewater treatment plants.
A fecal coliform duration curve was also prepared for sampling station FL-02 located on the Iroquois River near Chebanse. Data are available at this station from 1978 to 2006 and the duration curve is shown in Figure 49. The curve indicates that fecal coliform frequently exceeds 400#/100 mL during high flows but is usually less than 400#/100 mL during other flow conditions.

A potential explanation for the higher *E. coli* counts in FLI-02 compared to FL-02 is the difference in drainage area. FL-02 has a much larger drainage area and is located downstream of the Lower Sugar Creek watershed which receives flows from the Upper Iroquois River. *E. coli* counts might therefore be reduced due to the additional dilution afforded by higher flows.
Figure 43. Fecal Coliform Bacteria at Station FL-02
6.7 Lower Kankakee

Only one station was sampled in the Lower Kankakee in 2008. This was site F-16 on the Kankakee River near Wilmington. The geomean of five fecal coliform samples from this site was only 84 #/100 mL, which is well below the standard. The drainage area at site F-16 is almost 5,000 miles which likely contributes to a great deal of dilution at this location.

Historical data from sites F-02 and F-01 in this subwatershed also suggest that water quality standards are usually met, most likely due to the large drainage area.

It is difficult to assess whether facilities in this subwatershed are in compliance in with their bacteria limits due to a lack of data; many have violated their flow limits, however (Table 65).

Table 65. Summary of NPDES facility compliance with design flow and bacteria permit limits in the Lower Kankakee subwatershed (2004 to 2007).

<table>
<thead>
<tr>
<th>NPDES ID</th>
<th>Facility Name</th>
<th>Exemption Status</th>
<th>Flow</th>
<th>Bacteria</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Average Design Flow (MGD)</td>
<td>Number of Violations</td>
</tr>
<tr>
<td>IL0021784</td>
<td>Kankakee River Metro Agency</td>
<td>Seasonal</td>
<td>25</td>
<td>13</td>
</tr>
<tr>
<td>IL0022179</td>
<td>Momence STP</td>
<td>Seasonal</td>
<td>1.6</td>
<td>36</td>
</tr>
<tr>
<td>IL0025089</td>
<td>Manteno Wpcc</td>
<td>None</td>
<td>1.15</td>
<td>34</td>
</tr>
<tr>
<td>IL0026085</td>
<td>Wilmington STP</td>
<td>Seasonal</td>
<td>0.75</td>
<td>6</td>
</tr>
<tr>
<td>IL0032832</td>
<td>Herscher STP</td>
<td>Year Round</td>
<td>0.25</td>
<td>23</td>
</tr>
<tr>
<td>IL0038199</td>
<td>Manteno Mobile Home Park</td>
<td>Year Round</td>
<td>0.021</td>
<td>28</td>
</tr>
<tr>
<td>IL0045501</td>
<td>Sun River Terrace STP</td>
<td>Year Round</td>
<td>0.075</td>
<td>3</td>
</tr>
<tr>
<td>IL0048968</td>
<td>II State Toll Hwy-Plaza 21 STP</td>
<td>None</td>
<td>0.0005</td>
<td>22</td>
</tr>
<tr>
<td>IL0049522</td>
<td>Beecher STP</td>
<td>Seasonal</td>
<td>0.6</td>
<td>56</td>
</tr>
<tr>
<td>IL0050717</td>
<td>Grant Park STP</td>
<td>Year Round</td>
<td>0.35</td>
<td>17</td>
</tr>
<tr>
<td>IL0076368</td>
<td>Essex STP</td>
<td>Year Round</td>
<td>0.176</td>
<td>1</td>
</tr>
</tbody>
</table>

Notes: MGD = Million gallons per day; *data at this facility also exceeded the maximum criteria of 400 #/100 mL
Figure 44. Fecal Coliform Bacteria at Station F-01

Figure 45. Fecal Coliform Bacteria at Station F-02
7.0 ALLOCATIONS

A TMDL is the total amount of a pollutant that can be assimilated by the receiving water while still achieving water quality standards. TMDLs are composed of the sum of individual wasteload allocations (WLAs) for regulated sources and load allocations (LAs) for unregulated sources and natural background levels. In addition, the TMDL must include a margin of safety (MOS), either implicitly or explicitly, that accounts for the uncertainty in the relationship between pollutant loads and the quality of the receiving waterbody. Conceptually, this is defined by the equation:

\[
\text{TMDL} = \sum \text{WLAs} + \sum \text{LAs} + \text{MOS}
\]

7.1 Results by Assessment Location

The following sections present the allowable \textit{E. coli} loads and associated allocations for each of the impaired waterbodies in the Kankakee/Iroquois watershed. The results are arranged for each of the HUC 10 watersheds in each of the six main subwatersheds.

7.1.1 Upper Kankakee Subwatershed

The Upper Kankakee subwatershed has an area of nearly 670 square miles and is comprised of four HUC 10 subwatersheds and 28 HUC 12 subwatersheds as listed in Table 66. The following sections provide a brief description of each HUC 10 subwatershed and the TMDL allocations.
<table>
<thead>
<tr>
<th>HUC 10</th>
<th>HUC 10 Name</th>
<th>HUC 12</th>
<th>HUC 12 Name</th>
<th>Area (sq. miles)</th>
</tr>
</thead>
<tbody>
<tr>
<td>101</td>
<td>Pine Creek</td>
<td>101</td>
<td>Peter Sarber Ditch-Pine Creek</td>
<td>20.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>102</td>
<td>Yellow Bank Creek</td>
<td>22.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>103</td>
<td>Peter Sarber Ditch-Pine Creek</td>
<td>21.8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>104</td>
<td>Headwaters Potato Creek</td>
<td>17.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>105</td>
<td>Kartoffel Creek-Potato Creek</td>
<td>17.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>106</td>
<td>Horace Miller Ditch-Pine Creek</td>
<td>15.7</td>
</tr>
<tr>
<td></td>
<td></td>
<td>201</td>
<td>Hudson Lake-Geyer Ditch</td>
<td>29.8</td>
</tr>
<tr>
<td>102</td>
<td>Little Kankakee River-Kankakee River</td>
<td>202</td>
<td>Chain-Lakes Ditch-Geyer Ditch</td>
<td>25.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>203</td>
<td>Geyer Ditch</td>
<td>16.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>204</td>
<td>Laskowski Ditch-Kankakee River</td>
<td>19.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>205</td>
<td>Dixon West Place Ditch</td>
<td>20.7</td>
</tr>
<tr>
<td></td>
<td></td>
<td>206</td>
<td>Aldrich Ditch</td>
<td>17.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>207</td>
<td>Clear Lake Basin</td>
<td>22.8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>208</td>
<td>Lower Fish Lake-Little Kankakee River</td>
<td>50.6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>209</td>
<td>County Line Ditch-Kankakee River</td>
<td>31.4</td>
</tr>
<tr>
<td>104</td>
<td>Mill Creek-Kankakee River</td>
<td>401</td>
<td>Breckenridge Ditch</td>
<td>22.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>402</td>
<td>Kingsberry Creek</td>
<td>15.3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>403</td>
<td>Travis Ditch</td>
<td>38.7</td>
</tr>
<tr>
<td></td>
<td></td>
<td>404</td>
<td>Salisbury Ditch</td>
<td>19.8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>405</td>
<td>Johnani Ditch-Kankakee River</td>
<td>48.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>406</td>
<td>Headwaters Mill Creek</td>
<td>23.9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>407</td>
<td>Hickleson Ditch-Mill Creek</td>
<td>19.9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>408</td>
<td>Marquardt Ditch-Kankakee River</td>
<td>15.6</td>
</tr>
<tr>
<td>107</td>
<td>Robbins Ditch-Kankakee River</td>
<td>701</td>
<td>Jain Ditch</td>
<td>28.9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>702</td>
<td>Amy Kelly Ditch-Robbins Ditch</td>
<td>30.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>703</td>
<td>Shearin Ditch-Robbins Ditch</td>
<td>25.9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>704</td>
<td>Bailey Ditch-Kankakee River</td>
<td>19.6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>705</td>
<td>Laramore Ditch-Kankakee River</td>
<td>13.4</td>
</tr>
</tbody>
</table>
7.1.1.1 Pine Creek Subwatershed (10-Digit HUC 101)

The Pine Creek subwatershed has an area of nearly 115 square miles and covers portions of La Porte, Marshall, and St. Joseph counties as shown in Figure 46. Cities within this subwatershed include Koontz Lake, Walkerton, and North Liberty. Figure 47 and Figure 48 display NPDES facilities and CAFOs and CFOs within the subwatershed, respectively. Agriculture (66%) is the dominant land use followed by forest (16%) and developed land (7%) (Table 70).

Two stream segments are impaired for E. coli in this subwatershed (Table 67) and the 2008 pathogen monitoring locations are listed in Table 68. The summary of 2008 pathogen data in this subwatershed is shown in Table 69. All four sites exceeded the geomean standard and three of the four sites exceeded the maximum 235 #/100 mL standard 100 percent of the time. Reductions to meet the geomean criteria of 125 #/100 mL range from 64 to 85 percent.

<table>
<thead>
<tr>
<th>HUC 12</th>
<th>HUC 12 Name</th>
<th>Parameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>106</td>
<td>Horace Miller Ditch-Pine Creek</td>
<td>E. coli</td>
</tr>
<tr>
<td>105</td>
<td>Kartoffel Creek-Potato Creek</td>
<td>E. coli</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>HUC 12</th>
<th>HUC 12 Name</th>
<th>Station #</th>
<th>Stream Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>102</td>
<td>Yellow Bank Creek</td>
<td>ID# 55</td>
<td>Yellow Bank</td>
</tr>
<tr>
<td>103</td>
<td>Peter Sarber Ditch-Pine Creek</td>
<td>ID# 57</td>
<td>Pine Cr</td>
</tr>
<tr>
<td>105</td>
<td>Kartoffel Creek-Potato Creek</td>
<td>ID# 51</td>
<td>Potato Cr</td>
</tr>
<tr>
<td>106</td>
<td>Horace Miller Ditch-Pine Creek</td>
<td>ID# 53</td>
<td>Pine Cr</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Station #</th>
<th>Period of Record</th>
<th>Total Number of Samples</th>
<th>Percent of Samples Exceeding E. coli WQS (#/100 mL)</th>
<th>Minimum (#/100 mL)</th>
<th>Geomean (#/100 mL)</th>
<th>Average (#/100 mL)</th>
<th>Maximum (#/100 mL)</th>
<th>Percent Reduction Based on Geomean (125/100mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>55</td>
<td>6/3/2008 - 7/1/2008</td>
<td>5</td>
<td>100</td>
<td>416</td>
<td>732</td>
<td>948</td>
<td>2,419</td>
<td>83%</td>
</tr>
<tr>
<td>57</td>
<td>6/3/2008 - 7/1/2008</td>
<td>5</td>
<td>100</td>
<td>687</td>
<td>828</td>
<td>832</td>
<td>921</td>
<td>85%</td>
</tr>
<tr>
<td>51</td>
<td>6/3/2008 - 7/1/2008</td>
<td>5</td>
<td>100</td>
<td>225</td>
<td>348</td>
<td>365</td>
<td>548</td>
<td>64%</td>
</tr>
<tr>
<td>53</td>
<td>6/3/2008 - 7/1/2008</td>
<td>5</td>
<td>100</td>
<td>613</td>
<td>838</td>
<td>870</td>
<td>1,300</td>
<td>85%</td>
</tr>
</tbody>
</table>
Figure 46. Location of Pine Creek Subwatershed (HUC10-101)
Figure 47. NPDES Facilities in the Pine Creek Subwatershed (HUC10-101)
Figure 48. Feeding Operations in the Pine Creek Subwatershed (HUC10-101)
Table 70. Land Use/Land Cover in the Pine Creek Subwatershed

<table>
<thead>
<tr>
<th>Land Use/Land Cover</th>
<th>Area</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Acres</td>
<td>Square Miles</td>
</tr>
<tr>
<td>Agricultural Land</td>
<td>48,888.86</td>
<td>76.39</td>
</tr>
<tr>
<td>Forested Land</td>
<td>12,208.32</td>
<td>19.08</td>
</tr>
<tr>
<td>Developed Land</td>
<td>5,351.24</td>
<td>8.36</td>
</tr>
<tr>
<td>Pasture/Hay</td>
<td>3,583.66</td>
<td>5.60</td>
</tr>
<tr>
<td>Wetland</td>
<td>2,436.55</td>
<td>3.81</td>
</tr>
<tr>
<td>Open Water</td>
<td>601.80</td>
<td>0.94</td>
</tr>
<tr>
<td>Grassland and Shrubs</td>
<td>350.27</td>
<td>0.55</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>73,420.70</strong></td>
<td><strong>114.72</strong></td>
</tr>
</tbody>
</table>

Table 71 through Table 74 summarize the subwatershed characteristics as well as the TMDL results for each of the HUC 12 subwatersheds. The TMDL results correspond to the outlet of each HUC 12 subwatershed (i.e., they are based on the flows and loads estimated for the outlet of the subwatershed).

It should be noted that there are no current 303(d) listings in HUC 102 and HUC 103; however, the sampling performed in 2008 suggests that several streams are impaired. Those streams will appear on the 2010 303(d) list in category 4A and TMDLs for those streams are presented here.

There are three NPDES facilities within the Pine Creek subwatershed and the WLAs for the facilities were calculated based on their design flows and *E. coli* permit limits. The individual WLAs are presented in Table 276. There is only one CAFO within this subwatershed and it receives a WLA of zero as described further in Section 7.3.
### Table 71. Yellow Bank Creek Characteristics and TMDL Summary (HUC12-102)

<table>
<thead>
<tr>
<th>Upstream Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Drainage Area</strong></td>
</tr>
<tr>
<td><strong>Sampling Station</strong></td>
</tr>
<tr>
<td><strong>Listed Segments</strong></td>
</tr>
<tr>
<td><strong>Land Use</strong></td>
</tr>
<tr>
<td><strong>Soils</strong></td>
</tr>
<tr>
<td><strong>NPDES Facilities</strong></td>
</tr>
<tr>
<td><strong>MS4 Communities</strong></td>
</tr>
<tr>
<td><strong>CSO Communities</strong></td>
</tr>
<tr>
<td><strong>CAFOs</strong></td>
</tr>
<tr>
<td><strong>CFOs</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TMDL Allocations (billion/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Allocation Category</strong></td>
</tr>
<tr>
<td><strong>LA</strong></td>
</tr>
<tr>
<td><strong>WLA</strong></td>
</tr>
<tr>
<td><strong>MOS (10%)</strong></td>
</tr>
<tr>
<td><strong>TMDL = LA+WLA+MOS</strong></td>
</tr>
</tbody>
</table>

### Table 72. Peter Sarber Ditch-Pine Creek Characteristics and TMDL Summary (HUC12-103)

<table>
<thead>
<tr>
<th>Upstream Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Drainage Area</strong></td>
</tr>
<tr>
<td><strong>Sampling Station</strong></td>
</tr>
<tr>
<td><strong>Listed Segments</strong></td>
</tr>
<tr>
<td><strong>Land Use</strong></td>
</tr>
<tr>
<td><strong>Soils</strong></td>
</tr>
<tr>
<td><strong>NPDES Facilities</strong></td>
</tr>
<tr>
<td><strong>MS4 Communities</strong></td>
</tr>
<tr>
<td><strong>CSO Communities</strong></td>
</tr>
<tr>
<td><strong>CAFOs</strong></td>
</tr>
<tr>
<td><strong>CFOs</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TMDL Allocations (billion/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Allocation Category</strong></td>
</tr>
<tr>
<td><strong>LA</strong></td>
</tr>
<tr>
<td><strong>WLA</strong></td>
</tr>
<tr>
<td><strong>MOS (10%)</strong></td>
</tr>
<tr>
<td><strong>TMDL = LA+WLA+MOS</strong></td>
</tr>
</tbody>
</table>
### Table 73. Kartoffel Creek-Potato Creek Characteristics and TMDL Summary (HUC12-105)

<table>
<thead>
<tr>
<th>Upstream Characteristics</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Drainage Area</strong></td>
<td>32.90 square miles</td>
</tr>
<tr>
<td><strong>Sampling Station</strong></td>
<td>51</td>
</tr>
<tr>
<td><strong>Listed Segments</strong></td>
<td>INK0125_00</td>
</tr>
<tr>
<td><strong>Land Use</strong></td>
<td>Agriculture: 56.78%; Developed Land: 7.03%; Forest: 23.12%; Other: 13.07%</td>
</tr>
<tr>
<td><strong>Soils</strong></td>
<td>A: 31.58%; B: 42.11%; C: 21.93%; D: 21.9%; Unknown: 2.19%</td>
</tr>
<tr>
<td><strong>NPDES Facilities</strong></td>
<td>North Liberty WWTP (IN0025801)</td>
</tr>
<tr>
<td></td>
<td>Potato Creek State Park (IN0052272)</td>
</tr>
<tr>
<td><strong>MS4 Communities</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>CSO Communities</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>CAFOs</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>CFOs</strong></td>
<td>None</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TMDL Allocations (billion/day)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Allocation Category</strong></td>
<td><strong>High Flows</strong></td>
</tr>
<tr>
<td>LA</td>
<td>170.69</td>
</tr>
<tr>
<td>WLA</td>
<td>1.29</td>
</tr>
<tr>
<td>MOS (10%)</td>
<td>19.11</td>
</tr>
<tr>
<td>TMDL = LA+WLA+MOS</td>
<td>191.09</td>
</tr>
</tbody>
</table>
Table 74. Horace Miller Ditch-Pine Creek Characteristics and TMDL Summary (HUC12-106)

<table>
<thead>
<tr>
<th><strong>Upstream Characteristics</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Drainage Area</strong></td>
<td>103.66 square miles</td>
</tr>
<tr>
<td><strong>Sampling Station</strong></td>
<td>53</td>
</tr>
<tr>
<td><strong>Listed Segments</strong></td>
<td>INK0126_00</td>
</tr>
<tr>
<td><strong>Land Use</strong></td>
<td>Agriculture: 66.59%; Developed Land: 7.29%; Forest: 16.63.12%; Other: 9.50%</td>
</tr>
<tr>
<td><strong>Soils</strong></td>
<td>A: 42.74%; B: 38.26%; C: 16.62%; D: 1.45%; Unknown: 0.92%</td>
</tr>
<tr>
<td><strong>NPDES Facilities</strong></td>
<td></td>
</tr>
<tr>
<td>North Liberty WWTP (IN0025801)</td>
<td></td>
</tr>
<tr>
<td>Walkerton Municipal WWTP (IN00406990)</td>
<td></td>
</tr>
<tr>
<td>Potato Creek State Park (IN0052272)</td>
<td></td>
</tr>
<tr>
<td><strong>MS4 Communities</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>CSO Communities</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>CAFOs</strong></td>
<td></td>
</tr>
<tr>
<td>Walkerton Farm (2239)</td>
<td></td>
</tr>
<tr>
<td><strong>CFOs</strong></td>
<td></td>
</tr>
<tr>
<td>Leffert Dairy, LLC (6203)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>TMDL Allocations (billion/day)</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Allocation Category</strong></td>
<td><strong>High Flows</strong></td>
</tr>
<tr>
<td>LA</td>
<td>538.86</td>
</tr>
<tr>
<td>WLA</td>
<td>3.01</td>
</tr>
<tr>
<td>MOS (10%)</td>
<td>60.21</td>
</tr>
<tr>
<td>TMDL = LA+WLA+MOS</td>
<td>602.08</td>
</tr>
</tbody>
</table>
7.1.1.2 Little Kankakee River-Kankakee River Subwatershed (10-Digit HUC 102)

The Little Kankakee River subwatershed has an area of nearly 233 square miles. Cities within this subwatershed include New Carlisle and South Bend as shown in Figure 49. The subwatershed is predominantly used for agricultural purposes (58%) followed by forest (19%) and developed land (10%) as shown in Table 78. The remaining land categories constitute 13 percent of the subwatershed area. There is only one NPDES facility and one CAFO in this subwatershed as shown in Figure 50 and Figure 51, respectively.

There are four 303 (d) listed segments (Table 75) and six monitoring locations (Table 76) in this subwatershed. The summary of 2008 E. coli data in this subwatershed is shown in Table 77. All five sites exceeded the geomean standard. Two of the five sites exceeded the maximum 235 #/100 mL standard 100 percent of the time. Reductions to meet the geomean criteria of 125 #/100 mL range from 29 to 74 percent.

Table 75. 303 (d) Listed Streams in the Little Kankakee River-Kankakee River Subwatershed

<table>
<thead>
<tr>
<th>HUC 12</th>
<th>Subwatershed Name</th>
<th>Segment ID</th>
<th>Waterbody</th>
<th>Stream Length (miles)</th>
<th>Parameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>206</td>
<td>Aldrich Ditch</td>
<td>INK0112_00</td>
<td>Aldrich Ditch - Schang Ditch</td>
<td>12.31</td>
<td>E. coli</td>
</tr>
<tr>
<td>208</td>
<td>Lower Fish Lake-Little Kankakee River</td>
<td>INK011C_00</td>
<td>Little Kankakee River-Byron</td>
<td>17.51</td>
<td>E. coli</td>
</tr>
<tr>
<td>209</td>
<td>County Line Ditch-Kankakee River</td>
<td>INK011A_T1001</td>
<td>Kankakee River-Mainstem</td>
<td>2.12</td>
<td>E. coli</td>
</tr>
<tr>
<td></td>
<td></td>
<td>INK011D_T1002</td>
<td>Kankakee River</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 76. Station Locations in the Little Kankakee River-Kankakee River Subwatershed

<table>
<thead>
<tr>
<th>HUC 12</th>
<th>Subwatershed Name</th>
<th>Station #</th>
<th>Stream Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>203</td>
<td>Geyer Ditch</td>
<td>ID# 43</td>
<td>Geyer D</td>
</tr>
<tr>
<td>204</td>
<td>Laskowski Ditch-Kankakee River</td>
<td>ID# 41</td>
<td>Niespodziany</td>
</tr>
<tr>
<td>206</td>
<td>Aldrich Ditch</td>
<td>ID# 45</td>
<td>Aldrich D</td>
</tr>
<tr>
<td>208</td>
<td>Lower Fish Lake-Little Kankakee River</td>
<td>ID# 39</td>
<td>L Kankakee</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ID# 49</td>
<td>L Kankakee</td>
</tr>
<tr>
<td>209</td>
<td>County Line Ditch-Kankakee River</td>
<td>ID# 47</td>
<td>Kankakee R</td>
</tr>
</tbody>
</table>
### Table 77. Summary of Pathogen Data in the Little Kankakee River-Kankakee River Subwatershed

<table>
<thead>
<tr>
<th>Station #</th>
<th>Period of Record</th>
<th>Total Number of Samples</th>
<th>Percent of Samples Exceeding <em>E. coli</em> WQS (#/100 mL)</th>
<th>Minimum (#/100 mL)</th>
<th>Geomean (#/100 mL)</th>
<th>Average (#/100 mL)</th>
<th>Maximum (#/100 mL)</th>
<th>Percent Reduction Based on Geomean (125/100mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>43</td>
<td>6/3/2008 - 7/1/2008</td>
<td>5</td>
<td>80 20</td>
<td>102</td>
<td>174</td>
<td>203</td>
<td>461</td>
<td>28%</td>
</tr>
<tr>
<td>41</td>
<td>6/3/2008 - 7/1/2008</td>
<td>5</td>
<td>100 100</td>
<td>260</td>
<td>354</td>
<td>372</td>
<td>517</td>
<td>65%</td>
</tr>
<tr>
<td>45</td>
<td>6/3/2008 - 7/1/2008</td>
<td>5</td>
<td>80 20</td>
<td>105</td>
<td>175</td>
<td>182</td>
<td>238</td>
<td>29%</td>
</tr>
<tr>
<td>39</td>
<td>6/3/2008 - 7/1/2008</td>
<td>5</td>
<td>100 80</td>
<td>214</td>
<td>478</td>
<td>752</td>
<td>2,420</td>
<td>74%</td>
</tr>
<tr>
<td>49</td>
<td>6/3/2008 - 7/1/2008</td>
<td>5</td>
<td>100 100</td>
<td>291</td>
<td>354</td>
<td>359</td>
<td>461</td>
<td>65%</td>
</tr>
<tr>
<td>47</td>
<td>6/3/2008 - 7/1/2008</td>
<td>5</td>
<td>100 20</td>
<td>172</td>
<td>215</td>
<td>223</td>
<td>345</td>
<td>42%</td>
</tr>
</tbody>
</table>

### Table 78. Land Use/Land Cover in the Little Kankakee River-Kankakee River Subwatershed

<table>
<thead>
<tr>
<th>Land Use/Land Cover</th>
<th>Subwatershed Area</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Acres</td>
<td>Square Miles</td>
</tr>
<tr>
<td>Agricultural Land</td>
<td>87,398.82</td>
<td>136.56</td>
</tr>
<tr>
<td>Forested Land</td>
<td>28,090.58</td>
<td>43.89</td>
</tr>
<tr>
<td>Developed Land</td>
<td>14,744.72</td>
<td>23.04</td>
</tr>
<tr>
<td>Pasture/Hay</td>
<td>7,976.83</td>
<td>12.46</td>
</tr>
<tr>
<td>Grassland and Shrubs</td>
<td>6,263.73</td>
<td>9.79</td>
</tr>
<tr>
<td>Wetland</td>
<td>2,991.87</td>
<td>4.67</td>
</tr>
<tr>
<td>Open Water</td>
<td>1,835.42</td>
<td>2.87</td>
</tr>
<tr>
<td>Total</td>
<td>149,301.96</td>
<td>233.28</td>
</tr>
</tbody>
</table>
Figure 49. Location of the Little Kankakee River-Kankakee River Subwatershed
Figure 50. NPDES Facilities in the Little Kankakee River-Kankakee River Subwatershed
Table 79 through Table 83 summarize the subwatershed characteristics as well as the TMDL results for each of the HUC 12 subwatersheds. Although there are no current 303(d) listings in HUC 204; the sampling performed in 2008 suggests that several streams are impaired. Those streams will appear on the next 303(d) list and TMDLs for those streams are presented here.

There is one NPDES facility within the Little Kankakee River subwatershed; however it is not upstream of any listed segments. There are two MS4 communities within the Little Kankakee River subwatershed and the WLAs for the communities were calculated based on their area within the subwatershed and E. coli standards. The individual WLAs are presented in Table 276. There is only one CAFO within this subwatershed and it receives a WLA of zero as described further in Section 7.3.
### Table 79. Geyer Ditch Characteristics and TMDL Summary (HUC12-203)

<table>
<thead>
<tr>
<th>Upstream Characteristics</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Drainage Area</strong></td>
<td>69.88 square miles</td>
</tr>
<tr>
<td><strong>Sampling Station</strong></td>
<td>43</td>
</tr>
<tr>
<td><strong>Listed Segments</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>Land Use</strong></td>
<td>Agriculture: 57.44%; Developed Land: 10.80%; Forest: 19.34%; Other: 12.41%</td>
</tr>
<tr>
<td><strong>Soils</strong></td>
<td>A: 18.26%; B: 68.68%; C: 4.25%; D: 4.56%; Unknown: 4.25%</td>
</tr>
<tr>
<td><strong>NPDES Facilities</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>MS4 Communities</strong></td>
<td>South Bend (INR040114): 0.22 square miles</td>
</tr>
<tr>
<td><strong>CSO Communities</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>CAFOs</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>CFOs</strong></td>
<td>Ginter (6135)</td>
</tr>
</tbody>
</table>

### TMDL Allocations (billion/day)

<table>
<thead>
<tr>
<th>Allocation Category</th>
<th>High Flows</th>
<th>Moist Conditions</th>
<th>Mid-Range Flows</th>
<th>Dry Conditions</th>
<th>Low Flows</th>
</tr>
</thead>
<tbody>
<tr>
<td>LA</td>
<td>364.14</td>
<td>207.35</td>
<td>149.7</td>
<td>113.89</td>
<td>84.16</td>
</tr>
<tr>
<td>WLA</td>
<td>1.15</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>MOS (10%)</td>
<td>40.59</td>
<td>23.04</td>
<td>16.63</td>
<td>12.65</td>
<td>9.35</td>
</tr>
<tr>
<td><strong>TMDL = LA+WLA+MOS</strong></td>
<td>405.88</td>
<td>230.39</td>
<td>166.33</td>
<td>126.54</td>
<td>93.51</td>
</tr>
</tbody>
</table>

### Table 80. Laskowski Ditch-Kankakee River and TMDL Summary (HUC12-204)

<table>
<thead>
<tr>
<th>Upstream Characteristics</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Drainage Area</strong></td>
<td>18.96 square miles</td>
</tr>
<tr>
<td><strong>Sampling Station</strong></td>
<td>41</td>
</tr>
<tr>
<td><strong>Listed Segments</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>Land Use</strong></td>
<td>Agriculture: 70.40%; Developed Land: 8.14%; Forest: 13.89%; Other: 7.56%</td>
</tr>
<tr>
<td><strong>Soils</strong></td>
<td>A: 24.81%; B: 75.19%; C: 0%; D: 0%; Unknown: 0%</td>
</tr>
<tr>
<td><strong>NPDES Facilities</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>MS4 Communities</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>CSO Communities</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>CAFOs</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>CFOs</strong></td>
<td>None</td>
</tr>
</tbody>
</table>

### TMDL Allocations (billion/day)

<table>
<thead>
<tr>
<th>Allocation Category</th>
<th>High Flows</th>
<th>Moist Conditions</th>
<th>Mid-Range Flows</th>
<th>Dry Conditions</th>
<th>Low Flows</th>
</tr>
</thead>
<tbody>
<tr>
<td>LA</td>
<td>99.11</td>
<td>56.26</td>
<td>40.62</td>
<td>30.90</td>
<td>22.83</td>
</tr>
<tr>
<td>WLA</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>MOS (10%)</td>
<td>11.01</td>
<td>6.25</td>
<td>4.51</td>
<td>3.43</td>
<td>2.54</td>
</tr>
<tr>
<td><strong>TMDL = LA+WLA+MOS</strong></td>
<td>110.12</td>
<td>62.51</td>
<td>45.13</td>
<td>34.33</td>
<td>25.37</td>
</tr>
</tbody>
</table>
Table 81. Aldrich Ditch Characteristics and TMDL Summary (HUC12-206)

**Upstream Characteristics**

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drainage Area</td>
<td>100.58 square miles</td>
</tr>
<tr>
<td>Sampling Station</td>
<td>45</td>
</tr>
<tr>
<td>Listed Segments</td>
<td>INK0112_00</td>
</tr>
<tr>
<td>Land Use</td>
<td>Agriculture: 55.27%; Developed Land: 13.34%; Forest: 18.23%; Other: 13.16%</td>
</tr>
<tr>
<td>Soils</td>
<td>A: 28.85%; B: 58.49%; C: 5.80%; D: 3.75%; Unknown: 3.11%</td>
</tr>
<tr>
<td>NPDES Facilities</td>
<td>None</td>
</tr>
<tr>
<td>MS4 Communities</td>
<td>South Bend (INR040114): 3.42 square miles</td>
</tr>
<tr>
<td>CSO Communities</td>
<td>None</td>
</tr>
<tr>
<td>CAFOs</td>
<td>None</td>
</tr>
<tr>
<td>CFOs</td>
<td>Ginter (6135)</td>
</tr>
</tbody>
</table>

**TMDL Allocations (billion/day)**

<table>
<thead>
<tr>
<th>Allocation Category</th>
<th>High Flows</th>
<th>Moist Conditions</th>
<th>Mid-Range Flows</th>
<th>Dry Conditions</th>
<th>Low Flows</th>
</tr>
</thead>
<tbody>
<tr>
<td>LA</td>
<td>507.89</td>
<td>298.45</td>
<td>215.46</td>
<td>163.92</td>
<td>121.13</td>
</tr>
<tr>
<td>WLA</td>
<td>17.88</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>MOS (10%)</td>
<td>58.42</td>
<td>33.16</td>
<td>23.94</td>
<td>18.21</td>
<td>13.46</td>
</tr>
<tr>
<td>TMDL = LA+WLA+MOS</td>
<td>584.19</td>
<td>331.61</td>
<td>239.40</td>
<td>182.13</td>
<td>134.59</td>
</tr>
<tr>
<td>Drainage Area</td>
<td>50.34 square miles</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---------------------</td>
<td>--------------------</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sampling Station</td>
<td>39.49</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Listed Segments</td>
<td>INK011C_00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Land Use</td>
<td>Agriculture: 55.68%; Developed Land: 6.80%; Forest: 22.14%; Other: 15.37%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Soils</td>
<td>A: 38.05%; B: 54.28%; C: 3.24%; D: 3.54%; Unknown: 0.88%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NPDES Facilities</td>
<td>None</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MS4 Communities</td>
<td>La Porte County (INR040107): 0.01 square miles</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CAFOs</td>
<td>Scher-Way Dairy Farm (6085)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CFOs</td>
<td>Tuholski Farms, Inc.(280)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Farm No 2 (3600)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Farm #1 (4208)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Farm #2 (4209)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sunset Dairy (6072)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TMDL Allocations</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Allocation Category</td>
<td>High Flows</td>
<td>Moist Conditions</td>
<td>Mid-Range Flows</td>
<td>Dry Conditions</td>
<td>Low Flows</td>
</tr>
<tr>
<td>LA</td>
<td>263.1</td>
<td>149.37</td>
<td>107.84</td>
<td>82.04</td>
<td>60.63</td>
</tr>
<tr>
<td>WLA</td>
<td>0.05</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>MOS (10%)</td>
<td>29.23</td>
<td>16.6</td>
<td>11.98</td>
<td>9.11</td>
<td>6.73</td>
</tr>
<tr>
<td>TMDL = LA+WLA+MOS</td>
<td>292.38</td>
<td>165.97</td>
<td>119.82</td>
<td>91.15</td>
<td>67.36</td>
</tr>
</tbody>
</table>
Table 83. County Line Ditch- Kankakee River Characteristics and TMDL Summary (HUC12-209)

<table>
<thead>
<tr>
<th>Upstream Characteristics</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Drainage Area</td>
<td>201.24 square miles</td>
</tr>
<tr>
<td>Sampling Station</td>
<td>47</td>
</tr>
<tr>
<td>Listed Segments</td>
<td>INK011A_T1001, INK011D_T1002</td>
</tr>
<tr>
<td>Land Use</td>
<td>Agriculture: 59.54%; Developed Land: 9.90%; Forest: 18.07%; Other: 12.49%</td>
</tr>
<tr>
<td>Soils</td>
<td>A: 34.88%; B: 56.04%; C: 4.12%; D: 3.08%; Unknown: 1.88%</td>
</tr>
<tr>
<td>NPDES Facilities</td>
<td>None</td>
</tr>
<tr>
<td>MS4 Communities</td>
<td>La Porte County (INR040107): 0.01 square miles</td>
</tr>
<tr>
<td></td>
<td>South Bend (INR040114): 3.42 square miles</td>
</tr>
<tr>
<td>CSO Communities</td>
<td>None</td>
</tr>
<tr>
<td>CAFOs</td>
<td>Scher-Way Dairy Farm (ING806085)</td>
</tr>
<tr>
<td>CFOs</td>
<td>Tuholski Farms, Inc (280)</td>
</tr>
<tr>
<td></td>
<td>Farm No 2 (3600)</td>
</tr>
<tr>
<td></td>
<td>Farm #1 (4208)</td>
</tr>
<tr>
<td></td>
<td>Farm #2 (4209)</td>
</tr>
<tr>
<td></td>
<td>Ginter (6135)</td>
</tr>
<tr>
<td></td>
<td>Sunset Dairy (6072)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TMDL Allocations (billion/day)</th>
<th>High Flows</th>
<th>Moist Conditions</th>
<th>Mid-Range Flows</th>
<th>Dry Conditions</th>
<th>Low Flows</th>
</tr>
</thead>
<tbody>
<tr>
<td>LA</td>
<td>1034.03</td>
<td>597.14</td>
<td>431.1</td>
<td>327.96</td>
<td>242.36</td>
</tr>
<tr>
<td>WLA</td>
<td>17.93</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>MOS (10%)</td>
<td>116.88</td>
<td>66.35</td>
<td>47.89</td>
<td>36.44</td>
<td>26.93</td>
</tr>
<tr>
<td>TMDL = LA+WLA+MOS</td>
<td>1168.84</td>
<td>663.49</td>
<td>478.99</td>
<td>364.4</td>
<td>269.29</td>
</tr>
</tbody>
</table>
7.1.1.3 **Mil Creek-Kankakee River Subwatershed (10-Digit HUC104)**

The Mill Creek-Kankakee River subwatershed has an area of nearly 202 square miles. Counties within this subwatershed include St. Joseph, Laporte and Stark and the urban areas listed are Kingsford Heights and LaPorte both of which lie completely within this subwatershed (Figure 52). Figure 52 and Figure 53 show the NPDES facilities and feeding operations, respectively. Similar to other HUC 10-subwatersheds in the Upper Kankakee, agriculture is the dominant land use (Table 87).

*E. coli* impairments are found throughout this subwatershed (Table 84). Recent IDEM *E. coli* sampling data was collected at three locations (Table 85). A summary of the 2008 data in this subwatershed is shown in Table 86. Sampling at station 35 on Hickleson Ditch indicates that there is no exceedance of the geomean standard, however twenty percent of the samples exceeded the maximum 235 #/100 mL standard at this site. Reductions to meet the geomean criteria of 125 #/100 mL range from zero to 64 percent.

### Table 84. 303 (d) Listed Streams in the Mill Creek-Kankakee River Subwatershed

<table>
<thead>
<tr>
<th>HUC 12</th>
<th>HUC 12 Name</th>
<th>Segment ID</th>
<th>Waterbody</th>
<th>Stream Length (miles)</th>
<th>Parameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>408</td>
<td>Marquardt Ditch-Kankakee River</td>
<td>INK013C_T1007</td>
<td>Kankakee River -Mainstem</td>
<td>4.03</td>
<td><em>E. coli</em></td>
</tr>
<tr>
<td>405</td>
<td>Johnani Ditch-Kankakee River</td>
<td>INK0138_T1006</td>
<td>Kankakee River -Mainstem</td>
<td>1.64</td>
<td><em>E. coli</em></td>
</tr>
<tr>
<td></td>
<td></td>
<td>INK0131_T1003</td>
<td>Kankakee River -Mainstem</td>
<td>3.33</td>
<td><em>E. coli</em></td>
</tr>
<tr>
<td></td>
<td></td>
<td>INK0134_T1005</td>
<td>Kankakee River -Mainstem</td>
<td>2.8</td>
<td><em>E. coli</em></td>
</tr>
<tr>
<td></td>
<td></td>
<td>INK0138_00</td>
<td>Kankakee River -Long Ditch</td>
<td>15.82</td>
<td><em>E. coli</em></td>
</tr>
<tr>
<td></td>
<td></td>
<td>INK0133_T1004</td>
<td>Kankakee River -Mainstem</td>
<td>3.7</td>
<td><em>E. coli</em></td>
</tr>
</tbody>
</table>

### Table 85. Station Locations in the Mill Creek-Kankakee River Subwatershed

<table>
<thead>
<tr>
<th>HUC 12</th>
<th>HUC 12 Name</th>
<th>Station #</th>
<th>Stream Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>405</td>
<td>Johnani Ditch-Kankakee River</td>
<td>ID# 37</td>
<td>Kingsbury Cr</td>
</tr>
<tr>
<td>407</td>
<td>Hickleson Ditch-Mill Creek</td>
<td>ID# 35</td>
<td>Whitham D</td>
</tr>
<tr>
<td>408</td>
<td>Marquardt Ditch-Kankakee River</td>
<td>ID# 33</td>
<td>Kankakee R</td>
</tr>
</tbody>
</table>

### Table 86. Summary of Pathogen Data in the Mill Creek-Kankakee River

<table>
<thead>
<tr>
<th>Station #</th>
<th>Period of Record</th>
<th>Total Number of Samples</th>
<th>Percent of Samples Exceeding E. coli WQS (#/100 mL)</th>
<th>Minimum (#/100 mL)</th>
<th>Geomean (#/100 mL)</th>
<th>Average (#/100 mL)</th>
<th>Maximum (#/100 mL)</th>
<th>Percent Reduction Based on Geomean (125/100mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>37</td>
<td>6/3/2008 - 7/1/2008</td>
<td>5</td>
<td>100</td>
<td>219</td>
<td>331</td>
<td>346</td>
<td>488</td>
<td>62%</td>
</tr>
<tr>
<td>35</td>
<td>6/2/2008 - 6/30/2008</td>
<td>5</td>
<td>40</td>
<td>66</td>
<td>125</td>
<td>137</td>
<td>236</td>
<td>0%</td>
</tr>
<tr>
<td>33</td>
<td>6/2/2008 - 6/30/2008</td>
<td>5</td>
<td>100</td>
<td>141</td>
<td>347</td>
<td>409</td>
<td>866</td>
<td>64%</td>
</tr>
</tbody>
</table>
Figure 52. Location of Mill Creek-Kankakee River
Figure 53. NPDES Facilities in the Mill Creek-Kankakee River
Feeding Operations

- CFO
- Sampling Stations
- 303 (d) Listed Streams
- Streams
- Cities
- Counties
- Assessment Units
- Upper Kankakee Subwatershed (HUC 10-104)

Figure 54. Feeding Operations in the Mill Creek-Kankakee River
Table 87. Land Use/Land Cover in the Mill Creek-Kankakee River Subwatershed

<table>
<thead>
<tr>
<th>Land Use/Land Cover</th>
<th>Subwatershed</th>
<th>Area</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Acres</td>
<td>Square Miles</td>
</tr>
<tr>
<td>Agricultural Land</td>
<td>85,029.88</td>
<td>132.86</td>
<td>65.48</td>
</tr>
<tr>
<td>Forested Land</td>
<td>18,252.09</td>
<td>28.52</td>
<td>14.06</td>
</tr>
<tr>
<td>Developed Land</td>
<td>14,443.82</td>
<td>22.57</td>
<td>11.12</td>
</tr>
<tr>
<td>Pasture/Hay</td>
<td>4,364.04</td>
<td>6.82</td>
<td>3.36</td>
</tr>
<tr>
<td>Grassland and Shrubs</td>
<td>3,948.60</td>
<td>6.17</td>
<td>3.04</td>
</tr>
<tr>
<td>Wetland</td>
<td>2,065.60</td>
<td>3.23</td>
<td>1.59</td>
</tr>
<tr>
<td>Open Water</td>
<td>1,752.69</td>
<td>2.74</td>
<td>1.35</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>129,856.72</strong></td>
<td><strong>202.90</strong></td>
<td><strong>100.00</strong></td>
</tr>
</tbody>
</table>

Table 88 through Table 90 summarize the subwatershed characteristics as well as the TMDL results for each of the HUC 12 subwatersheds. There are no current 303(d) listings in HUC 407; however, the sampling performed in 2008 suggests that several streams are impaired. Those streams will appear on the next 303(d) list and TMDLs for those streams are presented here.

There are six NPDES facilities upstream of the Mill Creek subwatershed outlet and the WLAs for the facilities were calculated based on their design flows and E. coli permit limits. There are two MS4 communities within the Little Kankakee River subwatershed and the WLAs for the communities were calculated based on their area within the subwatershed and E. coli standards. The individual WLAs are presented in Table 276. There are two CAFOs within this subwatershed and they receive a WLA of zero as described further in Section 7.3.
### Table 88. Johanni Ditch-Kankakee River Characteristics and TMDL Summary (HUC 12-405)

#### Upstream Characteristics

<table>
<thead>
<tr>
<th>Drainage Area</th>
<th>399.16 square miles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sampling Station</td>
<td>37</td>
</tr>
<tr>
<td>Listed Segments</td>
<td>INK0138_T1006, INK0131_T1003, INK0134_T1005, INK0133_T1004</td>
</tr>
<tr>
<td>Land Use</td>
<td>Agriculture: 60.85%; Developed Land: 10.38%; Forest: 17.36%; Other: 11.41%</td>
</tr>
<tr>
<td>Soils</td>
<td>A: 39.39%; B: 49.44%; C: 6.93%; D: 2.54%; Unknown: 1.71%</td>
</tr>
</tbody>
</table>

#### NPDES Facilities

- North Liberty WWTP (IN0025801)
- La Porte Municipal STP (IN0025577)
- Walkerton Municipal WWTP (IN0040690)
- Kingsbury Utility Corp (IN0045471)
- Potato Creek State Park (IN0052272)

#### MS4 Communities

- La Porte County (INR040107): 14.93 square miles
- South Bend (INR040114): 3.42 square miles

#### CSO Communities

- None

#### CAFOs

- Walkerton Farm (ING802239)
- Scher-Way Dairy Farm (ING806085)

#### CFOs

- Meadowland Farms (250)
- Tuholski Farms, Inc. (280)
- C.L. Rhoade Corp (1110)
- Farm No 2 (3600)
- Farm #1 (4208)
- Farm #2 (4209)
- Sunset Dairy (6072)
- Ginter (6135)
- Leffert Dairy, LLC (6203)

#### TMDL Allocations (billion/day)

<table>
<thead>
<tr>
<th>Allocation Category</th>
<th>High Flows</th>
<th>Moist Conditions</th>
<th>Mid-Range Flows</th>
<th>Dry Conditions</th>
<th>Low Flows</th>
</tr>
</thead>
<tbody>
<tr>
<td>LA</td>
<td>1942.67</td>
<td>1136.47</td>
<td>807.12</td>
<td>602.55</td>
<td>432.77</td>
</tr>
<tr>
<td>WLA</td>
<td>143.88</td>
<td>47.96</td>
<td>47.96</td>
<td>47.96</td>
<td>47.96</td>
</tr>
<tr>
<td>MOS (10%)</td>
<td>231.84</td>
<td>131.6</td>
<td>95.01</td>
<td>72.28</td>
<td>53.41</td>
</tr>
<tr>
<td>TMDL = LA+WLA+MOS</td>
<td>2318.39</td>
<td>1316.03</td>
<td>950.09</td>
<td>722.79</td>
<td>534.14</td>
</tr>
</tbody>
</table>
Table 89. Hickleson Ditch-Mill Creek Characteristics and TMDL Summary (HUC 12-407)

<table>
<thead>
<tr>
<th>Upstream Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Drainage Area</strong></td>
</tr>
<tr>
<td><strong>Sampling Station</strong></td>
</tr>
<tr>
<td><strong>Listed Segments</strong></td>
</tr>
<tr>
<td><strong>Land Use</strong></td>
</tr>
<tr>
<td><strong>Soils</strong></td>
</tr>
<tr>
<td><strong>NPDES Facilities</strong></td>
</tr>
<tr>
<td><strong>MS4 Communities</strong></td>
</tr>
<tr>
<td><strong>CSO Communities</strong></td>
</tr>
<tr>
<td><strong>CAFOs</strong></td>
</tr>
<tr>
<td><strong>CFOs</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TMDL Allocations (billion/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Allocation Category</strong></td>
</tr>
<tr>
<td>LA</td>
</tr>
<tr>
<td>WLA</td>
</tr>
<tr>
<td>MOS (10%)</td>
</tr>
<tr>
<td>$TMDL = LA + WLA + MOS$</td>
</tr>
</tbody>
</table>
Table 90. Marquardt Ditch-Kankakee River Characteristics and TMDL Summary (HUC 12-408)

<table>
<thead>
<tr>
<th>Upstream Characteristics</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Drainage Area</td>
<td>463.58 square miles</td>
</tr>
<tr>
<td>Sampling Station</td>
<td>33</td>
</tr>
<tr>
<td>Listed Segments</td>
<td>INK013C_T1007</td>
</tr>
<tr>
<td>Land Use</td>
<td>Agriculture: 63.35%; Developed Land: 9.80%; Forest: 16.21%; Other: 10.64%</td>
</tr>
<tr>
<td>Soils</td>
<td>A: 42.02%; B: 47.76%; C: 6.30%; D: 2.39%; Unknown: 1.53%</td>
</tr>
<tr>
<td>NPDES Facilities</td>
<td>North Liberty WWTP (IN0025801)</td>
</tr>
<tr>
<td></td>
<td>La Porte Municipal STP (IN0025577)</td>
</tr>
<tr>
<td></td>
<td>Walkerton Municipal WWTP (IN0040690)</td>
</tr>
<tr>
<td></td>
<td>Kingsbury Utility Corp (IN0045471)</td>
</tr>
<tr>
<td></td>
<td>Potato Creek State Park (IN0052272)</td>
</tr>
<tr>
<td></td>
<td>Kingsford Heights Municipal WWTP (IN002337)</td>
</tr>
<tr>
<td>MS4 Communities</td>
<td>La Porte County (INR040107): 14.93 square miles</td>
</tr>
<tr>
<td></td>
<td>South Bend (INR040114): 3.42 square miles</td>
</tr>
<tr>
<td>CSO Communities</td>
<td>None</td>
</tr>
<tr>
<td>CAFOs</td>
<td>Scher-Way Dairy Farm (ING806085)</td>
</tr>
<tr>
<td></td>
<td>Walkerton Farm (ING802239)</td>
</tr>
<tr>
<td>CFOs</td>
<td>Meadowland Farms (250)</td>
</tr>
<tr>
<td></td>
<td>Tuholski Farms, Inc. (280)</td>
</tr>
<tr>
<td></td>
<td>C.L. Rhoades Corp (1110)</td>
</tr>
<tr>
<td></td>
<td>Farm No 2 (3600)</td>
</tr>
<tr>
<td></td>
<td>Farm #1 (4208)</td>
</tr>
<tr>
<td></td>
<td>Farm #2 (4209)</td>
</tr>
<tr>
<td></td>
<td>Sunset Dairy (6072)</td>
</tr>
<tr>
<td></td>
<td>Ginter (6135)</td>
</tr>
<tr>
<td></td>
<td>Leffert Dairy, LLC (6203)</td>
</tr>
<tr>
<td></td>
<td>Yon Ed Farm, Inc. (2187)</td>
</tr>
<tr>
<td></td>
<td>Schoof (3983)</td>
</tr>
<tr>
<td></td>
<td>Applegarth (4169)</td>
</tr>
<tr>
<td></td>
<td>Minich (4255)</td>
</tr>
<tr>
<td></td>
<td>Wil-Minfarm (6096)</td>
</tr>
</tbody>
</table>
### Table 90. Marquardt Ditch-Kankakee River Characteristics and TMDL Summary (HUC 12-408)

<table>
<thead>
<tr>
<th>Allocation Category</th>
<th>High Flows</th>
<th>Moist Conditions</th>
<th>Mid-Range Flows</th>
<th>Dry Conditions</th>
<th>Low Flows</th>
</tr>
</thead>
<tbody>
<tr>
<td>LA</td>
<td>2277.42</td>
<td>1325.62</td>
<td>943.12</td>
<td>705.54</td>
<td>508.35</td>
</tr>
<tr>
<td>WLA</td>
<td>145.88</td>
<td>49.96</td>
<td>49.96</td>
<td>49.96</td>
<td>49.96</td>
</tr>
<tr>
<td>MOS (10%)</td>
<td>269.26</td>
<td>152.84</td>
<td>110.34</td>
<td>83.94</td>
<td>62.03</td>
</tr>
<tr>
<td><strong>TMDL = LA+WLA+MOS</strong></td>
<td><strong>2692.56</strong></td>
<td><strong>1528.42</strong></td>
<td><strong>1103.42</strong></td>
<td><strong>839.44</strong></td>
<td><strong>620.34</strong></td>
</tr>
</tbody>
</table>
7.1.1.4 Robbins Ditch-Kankakee River Subwatershed (10-Digit HUC 107)

The Robbins Ditch subwatershed has an area of nearly 118 square miles. Walkerton and Koontz Lake are the two designated cities located in this subwatershed (Figure 55). Land use comprise of agriculture (67%), forest (17%), developed (8%) and the remaining land categories contribute to eight percent of the total subwatershed area (Table 94). A total of three NPDES facilities and one CAFO are present within this subwatershed as shown in Figure 56 and Figure 57, respectively.

There are two segments impaired for \textit{E. coli} and IDEM sampled five \textit{E. coli} monitoring locations in 2008 as shown in Table 91 and Table 92, respectively. The summary of 2008 data in the subwatershed is shown in Table 93. All five sites exceed the geomean standard. Reductions to meet the geomean criteria of 125 #/100 mL range from 39 to 81 percent.

\begin{table}[h]
\centering
\begin{tabular}{|c|c|c|c|c|}
\hline
HUC 12 & HUC 12 Name & Segment ID & Waterbody & Stream Length (miles) & Parameter \\
\hline
705 & Laramore Ditch Kankakee River & INK0147_T1009 & Kankakee River & 7.29 & \textit{E. coli} \\
 & & INK0146_T1008 & Kankakee River & 1.39 & \textit{E. coli} \\
\hline
\end{tabular}
\caption{303 (d) Listed Streams in the Robbins Ditch-Kankakee River}
\end{table}

\begin{table}[h]
\centering
\begin{tabular}{|c|c|c|c|}
\hline
HUC 12 & HUC 12 Name & Station # & Stream Name \\
\hline
701 & Jain Ditch & ID# 61 & Jain D \\
702 & Amy Kelly Ditch-Robbins Ditch & ID# 59 & Robbins D \\
703 & Shearin Ditch-Robbins Ditch & ID# 23 & Robbins D \\
704 & Bailey Ditch-Kankakee River & ID# 21 & Bailey D \\
705 & Laramore Ditch-Kankakee River & ID# 11 & Kankakee R \\
\hline
\end{tabular}
\caption{Station Locations in the Robbins Ditch-Kankakee River}
\end{table}

\begin{table}[h]
\centering
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|}
\hline
Station # & Period of Record & Total Number of Samples & Percent of Samples Exceeding E. coli WQS (#/100 mL) & Minimum (#/100 mL) & Geomean (#/100 mL) & Average (#/100 mL) & Maximum (#/100 mL) & Percent Reduction Based on Geomean (125/100mL) \\
\hline
61 & 6/4/2008 - 7/2/2008 & 5 & 100 & 40 & 152 & 205 & 211 & 261 & 39% \\
23 & 6/2/2008 - 7/14/2008 & 6 & 83 & 67 & 105 & 284 & 416 & 1,414 & 56% \\
21 & 6/2/2008 - 7/14/2008 & 6 & 100 & 100 & 276 & 662 & 848 & 2,419 & 81% \\
11 & 6/2/2008 - 6/30/2008 & 5 & 100 & 80 & 192 & 334 & 368 & 579 & 63% \\
\hline
\end{tabular}
\caption{Summary of Pathogen Data in the Robbins Ditch-Kankakee River}
\end{table}
Table 94. Land Use/Land Cover in the Robbins Ditch-Kankakee River

<table>
<thead>
<tr>
<th>Land Use/Land Cover</th>
<th>Subwatershed</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Acres</td>
<td>Square Miles</td>
<td>Percent</td>
</tr>
<tr>
<td>Agricultural Land</td>
<td>50,901.97</td>
<td>79.53</td>
<td>67.29</td>
</tr>
<tr>
<td>Forested Land</td>
<td>12,839.03</td>
<td>20.06</td>
<td>16.97</td>
</tr>
<tr>
<td>Developed Land</td>
<td>6,303.31</td>
<td>9.85</td>
<td>8.33</td>
</tr>
<tr>
<td>Wetland</td>
<td>2,602.68</td>
<td>4.07</td>
<td>3.44</td>
</tr>
<tr>
<td>Pasture/Hay</td>
<td>1,735.78</td>
<td>2.71</td>
<td>2.29</td>
</tr>
<tr>
<td>Grassland and Shrubs</td>
<td>796.84</td>
<td>1.25</td>
<td>1.05</td>
</tr>
<tr>
<td>Open Water</td>
<td>461.91</td>
<td>0.72</td>
<td>0.61</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>75,641.52</strong></td>
<td><strong>118.19</strong></td>
<td><strong>100.00</strong></td>
</tr>
</tbody>
</table>

Figure 55. Location of Robbins Ditch-Kankakee River (HUC10-107)
Figure 56. NPDES Facilities in the Robbins Ditch-Kankakee River (HUC10-107)
Table 95 through Table 99 summarize the subwatershed characteristics as well as the TMDL results for each of the HUC 12 subwatersheds. There are no current 303(d) listings in HUC 701, HUC 702, HUC 703, or HUC 704; however, the sampling performed in 2008 suggests that several streams are impaired. Those streams will appear on the next 303(d) list and TMDLs for those streams are presented here.

There are three NPDES facilities within the Robbins Ditch subwatershed and the WLAs for the facilities were calculated based on their design flows and *E. coli* permit limits. There are two MS4 communities within the Robbins Ditch subwatershed and the WLAs for the communities were calculated based on their area within the subwatershed and *E. coli* standards. The individual WLAs are presented in Table 276. There is one CAFO within this subwatershed and it receives a WLA of zero as described further in Section 7.3.
Table 95. Jain Ditch Upstream Characteristics and TMDL Summary (HUC12-701)

<table>
<thead>
<tr>
<th>Upstream Characteristics</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Drainage Area</td>
<td>28.87 square miles</td>
</tr>
<tr>
<td>Sampling Station</td>
<td>61</td>
</tr>
<tr>
<td>Listed Segments</td>
<td>None</td>
</tr>
<tr>
<td>Land Use</td>
<td></td>
</tr>
<tr>
<td>Agriculture: 59.25%; Developed Land: 8.86%; Forest: 28.66%; Other: 3.22%</td>
<td></td>
</tr>
<tr>
<td>Soils</td>
<td></td>
</tr>
<tr>
<td>A: 89.64%; B: 8.81%; C: 1.04%; D: 0.52%; Unknown: 0%</td>
<td></td>
</tr>
<tr>
<td>NPDES Facilities</td>
<td></td>
</tr>
<tr>
<td>Yogi Bears Jellystone Park (IN0041882)</td>
<td></td>
</tr>
<tr>
<td>MS4 Communities</td>
<td>None</td>
</tr>
<tr>
<td>CSO Communities</td>
<td>None</td>
</tr>
<tr>
<td>CAFOs</td>
<td>None</td>
</tr>
<tr>
<td>CFOs</td>
<td>Tip Top Farms (4676)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TMDL Allocations (billion/day)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Allocation Category</td>
<td>High Flows</td>
</tr>
<tr>
<td>LA</td>
<td>150.41</td>
</tr>
<tr>
<td>WLA</td>
<td>0.5</td>
</tr>
<tr>
<td>MOS (10%)</td>
<td>16.77</td>
</tr>
<tr>
<td>TMDL = LA+WLA+MOS</td>
<td>167.68</td>
</tr>
</tbody>
</table>
### Table 96. Amy Kelly Ditch-Robbins Ditch-Kankakee River (HUC12-702)

**Upstream Characteristics**

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drainage Area</td>
<td>30.46 square miles</td>
</tr>
<tr>
<td>Sampling Station</td>
<td>59</td>
</tr>
<tr>
<td>Listed Segments</td>
<td>None</td>
</tr>
<tr>
<td>Land Use</td>
<td>Agriculture: 64.02%; Developed Land: 9.70%; Forest: 19.19%; Other: 7.09%</td>
</tr>
<tr>
<td>Soils</td>
<td>A: 85.22%; B: 10.84%; C: 2.46%; D: 0.00%; 1.48%</td>
</tr>
<tr>
<td>NPDES Facilities</td>
<td>Swan Lake Golf Resort (IN0061085)</td>
</tr>
<tr>
<td>MS4 Communities</td>
<td>None</td>
</tr>
<tr>
<td>CSO Communities</td>
<td>None</td>
</tr>
<tr>
<td>CAFOs</td>
<td>None</td>
</tr>
<tr>
<td>CFOs</td>
<td>None</td>
</tr>
</tbody>
</table>

**TMDL Allocations (billion/day)**

<table>
<thead>
<tr>
<th>Allocation Category</th>
<th>High Flows</th>
<th>Moist Conditions</th>
<th>Mid-Range Flows</th>
<th>Dry Conditions</th>
<th>Low Flows</th>
</tr>
</thead>
<tbody>
<tr>
<td>LA</td>
<td>159.06</td>
<td>90.22</td>
<td>65.08</td>
<td>49.47</td>
<td>36.51</td>
</tr>
<tr>
<td>WLA</td>
<td>0.17</td>
<td>0.17</td>
<td>0.17</td>
<td>0.17</td>
<td>0.17</td>
</tr>
<tr>
<td>MOS (10%)</td>
<td>17.69</td>
<td>10.04</td>
<td>7.25</td>
<td>5.52</td>
<td>4.08</td>
</tr>
<tr>
<td>TMDL = LA + WLA + MOS</td>
<td>176.92</td>
<td>100.43</td>
<td>72.5</td>
<td>55.16</td>
<td>40.76</td>
</tr>
</tbody>
</table>
Table 97. Shearin Ditch-Robbins Ditch Characteristics and TMDL Summary (HUC12-703)

<table>
<thead>
<tr>
<th><strong>Upstream Characteristics</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Drainage Area</strong></td>
<td>85.17 square miles</td>
</tr>
<tr>
<td><strong>Sampling Station</strong></td>
<td>23</td>
</tr>
<tr>
<td><strong>Listed Segments</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>Land Use</strong></td>
<td>Agriculture: 65.96%; Developed Land: 9.33%; Forest: 19.27%; Other: 5.44%</td>
</tr>
<tr>
<td><strong>Soils</strong></td>
<td>A: 90.48%; B: 7.41%; C: 1.23%; D: 0.18%; 0.71%</td>
</tr>
<tr>
<td><strong>NPDES Facilities</strong></td>
<td>Yogi Bears Jellystone Park (IN0041882)</td>
</tr>
<tr>
<td></td>
<td>Swan Lake Golf Resort (IN0061085)</td>
</tr>
<tr>
<td></td>
<td>Hamlet Municipal STP (IN0040100)</td>
</tr>
<tr>
<td><strong>MS4 Communities</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>CSO Communities</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>CAFOs</strong></td>
<td>N&amp;L Pork, Inc. - Lee Nagai - Home Site (149)</td>
</tr>
<tr>
<td><strong>CFOs</strong></td>
<td>Tip Top Farms (4676)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>TMDL Allocations (billion/day)</strong></th>
<th><strong>High Flows</strong></th>
<th><strong>Moist Conditions</strong></th>
<th><strong>Mid-Range Flows</strong></th>
<th><strong>Dry Conditions</strong></th>
<th><strong>Low Flows</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>LA</strong></td>
<td>444.07</td>
<td>251.59</td>
<td>181.31</td>
<td>137.66</td>
<td>101.43</td>
</tr>
<tr>
<td><strong>WLA</strong></td>
<td>1.14</td>
<td>1.14</td>
<td>1.14</td>
<td>1.14</td>
<td>1.14</td>
</tr>
<tr>
<td><strong>MOS (10%)</strong></td>
<td>49.47</td>
<td>28.08</td>
<td>20.27</td>
<td>15.42</td>
<td>11.4</td>
</tr>
<tr>
<td><strong>TMDL = LA+WLA+MOS</strong></td>
<td>494.68</td>
<td>280.81</td>
<td>202.72</td>
<td>154.22</td>
<td>113.97</td>
</tr>
</tbody>
</table>
### Table 98. Bailey Ditch-Kankakee River Characteristics and TMDL Summary (HUC12-704)

#### Upstream Characteristics

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drainage Area</td>
<td>39.21 square miles</td>
</tr>
<tr>
<td>Sampling Station</td>
<td>21</td>
</tr>
<tr>
<td>Listed Segments</td>
<td>None</td>
</tr>
<tr>
<td>Land Use</td>
<td>Agriculture: 77.71%; Developed Land: 5.97%; Forest: 12.03%; Other: 4.30%</td>
</tr>
<tr>
<td>Soils</td>
<td>A: 93.33%; B: 0.74%; C: 0.00%; D: 5.93%; 0.00%</td>
</tr>
<tr>
<td>NPDES Facilities</td>
<td>None</td>
</tr>
<tr>
<td>MS4 Communities</td>
<td>None</td>
</tr>
<tr>
<td>CSO Communities</td>
<td>None</td>
</tr>
<tr>
<td>CAFOs</td>
<td>None</td>
</tr>
<tr>
<td>CFOs</td>
<td>Yankauskas Pork Production (430)</td>
</tr>
</tbody>
</table>

#### TMDL Allocations (billion/day)

<table>
<thead>
<tr>
<th>Allocation Category</th>
<th>High Flows</th>
<th>Moist Conditions</th>
<th>Mid-Range Flows</th>
<th>Dry Conditions</th>
<th>Low Flows</th>
</tr>
</thead>
<tbody>
<tr>
<td>LA</td>
<td>204.97</td>
<td>116.35</td>
<td>84</td>
<td>63.9</td>
<td>47.22</td>
</tr>
<tr>
<td>WLA</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>MOS (10%)</td>
<td>22.77</td>
<td>12.93</td>
<td>9.33</td>
<td>7.1</td>
<td>5.25</td>
</tr>
<tr>
<td>TMDL = LA+WLA+MOS</td>
<td>227.74</td>
<td>129.28</td>
<td>93.33</td>
<td>71</td>
<td>52.47</td>
</tr>
</tbody>
</table>
Table 99. Laramore Ditch-Kankakee River Characteristics and TMDL Summary (HUC12-705)

<table>
<thead>
<tr>
<th>Upstream Characteristics</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Drainage Area</td>
<td>581.78 square miles</td>
</tr>
<tr>
<td>Sampling Station</td>
<td>11</td>
</tr>
<tr>
<td>Listed Segments</td>
<td>INK0147_T1009, INK0146_T1008</td>
</tr>
<tr>
<td>Land Use</td>
<td>Agriculture: 64.07%; Developed Land: 9.53%; Forest: 16.35%; Other: 10.05%</td>
</tr>
<tr>
<td>Soils</td>
<td>A: 50.89%; B: 40.10%; C: 5.35%; D: 2.32%; Unknown: 1.34%</td>
</tr>
<tr>
<td>NPDES Facilities</td>
<td>All facilities upstream of HUC 12-408</td>
</tr>
<tr>
<td></td>
<td>Yogi Bears Jellystone Park (IN0041882)</td>
</tr>
<tr>
<td></td>
<td>Swan Lake Golf Resort (IN0061085)</td>
</tr>
<tr>
<td></td>
<td>Hamlet Municipal STP (IN0040100)</td>
</tr>
<tr>
<td>MS4 Communities</td>
<td>La Porte County (INR040107): 14.93 square miles</td>
</tr>
<tr>
<td></td>
<td>South Bend (INR040114): 3.42 square miles</td>
</tr>
<tr>
<td>CSO Communities</td>
<td>None</td>
</tr>
<tr>
<td>CAFOs</td>
<td>All facilities upstream of HUC 12-408</td>
</tr>
<tr>
<td></td>
<td>N&amp;L Pork, Inc. - Lee Nagai - Home Site (ING800149)</td>
</tr>
<tr>
<td>CFOs</td>
<td>All facilities upstream of HUC 12-408</td>
</tr>
<tr>
<td></td>
<td>Tip Top Farms (4676)</td>
</tr>
<tr>
<td></td>
<td>Yankauskas Pork Production (430)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TMDL Allocations (billion/day)</th>
<th>High Flows</th>
<th>Moist Conditions</th>
<th>Mid-Range Flows</th>
<th>Dry Conditions</th>
<th>Low Flows</th>
</tr>
</thead>
<tbody>
<tr>
<td>LA</td>
<td>2894.15</td>
<td>1675.22</td>
<td>1195.19</td>
<td>897.03</td>
<td>649.56</td>
</tr>
<tr>
<td>WLA</td>
<td>147.02</td>
<td>51.1</td>
<td>51.1</td>
<td>51.1</td>
<td>51.1</td>
</tr>
<tr>
<td>MOS (10%)</td>
<td>337.91</td>
<td>191.81</td>
<td>138.47</td>
<td>105.35</td>
<td>77.85</td>
</tr>
<tr>
<td>TMDL = LA+WLA+MOS</td>
<td>3379.08</td>
<td>1918.13</td>
<td>1384.76</td>
<td>1053.48</td>
<td>778.51</td>
</tr>
</tbody>
</table>
7.1.2 Middle Kankakee Subwatershed

The Middle Kankakee subwatershed covers approximately 984 square miles and is comprised of six HUC 10 subwatersheds and 44 HUC 12 units as shown in Table 100.

Table 100. Hydrologic Unit Code (HUC 10 and 12 in the Middle Kankakee Subwatershed)

<table>
<thead>
<tr>
<th>HUC 10</th>
<th>HUC10 Name</th>
<th>HUC12</th>
<th>HUC 12 Name</th>
<th>Area (sq. miles)</th>
</tr>
</thead>
<tbody>
<tr>
<td>108</td>
<td>Pitner Ditch-Kankakee River</td>
<td>801</td>
<td>Sheldon Arm Hunsley Ditch</td>
<td>19.66</td>
</tr>
<tr>
<td></td>
<td></td>
<td>802</td>
<td>Hanna Arm Tuesburg Ditch</td>
<td>20.09</td>
</tr>
<tr>
<td></td>
<td></td>
<td>803</td>
<td>Eckert Ditch-Kuehn Ditch</td>
<td>21.20</td>
</tr>
<tr>
<td></td>
<td></td>
<td>804</td>
<td>Richman Ditch-Pitner Ditch</td>
<td>22.01</td>
</tr>
<tr>
<td></td>
<td></td>
<td>805</td>
<td>Bessler Ditch-Pitner Ditch</td>
<td>16.85</td>
</tr>
<tr>
<td></td>
<td></td>
<td>806</td>
<td>Origer Ditch-Kankakee River</td>
<td>14.47</td>
</tr>
<tr>
<td></td>
<td></td>
<td>807</td>
<td>Rassmussen Ditch-Kankakee River</td>
<td>29.27</td>
</tr>
<tr>
<td></td>
<td></td>
<td>808</td>
<td>Cook Ditch</td>
<td>26.11</td>
</tr>
<tr>
<td></td>
<td></td>
<td>809</td>
<td>Davis Ditch-Kankakee River</td>
<td>24.18</td>
</tr>
<tr>
<td>109</td>
<td>Hodge Ditch</td>
<td>901</td>
<td>Headwaters Wolf Creek</td>
<td>18.01</td>
</tr>
<tr>
<td></td>
<td></td>
<td>902</td>
<td>Hickam Lateral-Wolf Creek</td>
<td>19.83</td>
</tr>
<tr>
<td></td>
<td></td>
<td>903</td>
<td>Delehanty Ditch-Hodge Ditch</td>
<td>19.71</td>
</tr>
<tr>
<td></td>
<td></td>
<td>904</td>
<td>Cook Ditch-Hodge Ditch</td>
<td>26.69</td>
</tr>
<tr>
<td>110</td>
<td>Crooked Creek-Kankakee River</td>
<td>001</td>
<td>Bloom Ditch</td>
<td>25.71</td>
</tr>
<tr>
<td></td>
<td></td>
<td>002</td>
<td>West Branch Crooked Creek</td>
<td>15.30</td>
</tr>
<tr>
<td></td>
<td></td>
<td>003</td>
<td>Headwaters Crooked Creek</td>
<td>22.02</td>
</tr>
<tr>
<td></td>
<td></td>
<td>004</td>
<td>Koselki Ditch-Crooked Creek</td>
<td>25.30</td>
</tr>
<tr>
<td></td>
<td></td>
<td>005</td>
<td>Reeves Ditch</td>
<td>28.91</td>
</tr>
<tr>
<td></td>
<td></td>
<td>006</td>
<td>Hannon Ditch-Crooked Creek</td>
<td>16.09</td>
</tr>
<tr>
<td></td>
<td></td>
<td>007</td>
<td>Sievers Creek-Cobb Ditch</td>
<td>31.78</td>
</tr>
<tr>
<td></td>
<td></td>
<td>008</td>
<td>Ahlgrim Ditch</td>
<td>21.12</td>
</tr>
<tr>
<td></td>
<td></td>
<td>009</td>
<td>Cornell Ditch-Phillips Ditch</td>
<td>19.66</td>
</tr>
<tr>
<td></td>
<td></td>
<td>010</td>
<td>Cobb Creek-Kankakee River</td>
<td>37.56</td>
</tr>
<tr>
<td>111</td>
<td>Knight Ditch-Kankakee River</td>
<td>101</td>
<td>Dehaan Ditch</td>
<td>36.50</td>
</tr>
<tr>
<td></td>
<td></td>
<td>102</td>
<td>Wentworth Ditch-Knight Ditch</td>
<td>45.07</td>
</tr>
<tr>
<td></td>
<td></td>
<td>103</td>
<td>Brown Levee Ditch-Kankakee River</td>
<td>27.66</td>
</tr>
<tr>
<td>112</td>
<td>Beaver Lake Ditch-Kankakee River</td>
<td>201</td>
<td>Gregory Ditch-Mud Lake Ditch</td>
<td>17.16</td>
</tr>
<tr>
<td></td>
<td></td>
<td>202</td>
<td>Mud Lake Ditch-Beaver Lake Ditch</td>
<td>15.78</td>
</tr>
<tr>
<td></td>
<td></td>
<td>203</td>
<td>Lawler Ditch-Beaver Lake Ditch</td>
<td>24.99</td>
</tr>
<tr>
<td></td>
<td></td>
<td>204</td>
<td>Williams Ditch</td>
<td>16.31</td>
</tr>
<tr>
<td></td>
<td></td>
<td>205</td>
<td>Beaver Lake Ditch-Kankakee River</td>
<td>24.46</td>
</tr>
<tr>
<td>113</td>
<td>Singleton Ditch</td>
<td>301</td>
<td>East Branch Stony Run</td>
<td>15.79</td>
</tr>
<tr>
<td></td>
<td></td>
<td>302</td>
<td>Fisher Pond- Stony Run</td>
<td>18.27</td>
</tr>
<tr>
<td></td>
<td></td>
<td>303</td>
<td>Spring Run</td>
<td>12.75</td>
</tr>
<tr>
<td></td>
<td></td>
<td>304</td>
<td>Greisel Ditch</td>
<td>16.59</td>
</tr>
<tr>
<td></td>
<td></td>
<td>305</td>
<td>Bryant Ditch-Singleton Ditch</td>
<td>23.52</td>
</tr>
<tr>
<td></td>
<td></td>
<td>306</td>
<td>Cedar Creek</td>
<td>31.30</td>
</tr>
<tr>
<td></td>
<td></td>
<td>307</td>
<td>Brown Ditch</td>
<td>21.37</td>
</tr>
<tr>
<td></td>
<td></td>
<td>308</td>
<td>Bull Run-West Creek</td>
<td>21.52</td>
</tr>
</tbody>
</table>
## Table 100. Hydrologic Unit Code (HUC 10 and 12 in the Middle Kankakee Subwatershed)

<table>
<thead>
<tr>
<th>HUC 10</th>
<th>HU C10 Name</th>
<th>HUC12</th>
<th>HU C 12 Name</th>
<th>Area (sq. miles)</th>
</tr>
</thead>
<tbody>
<tr>
<td>113</td>
<td>Singleton Ditch</td>
<td>309</td>
<td>Klaasville-West Creek</td>
<td>17.83</td>
</tr>
<tr>
<td></td>
<td></td>
<td>310</td>
<td>West Creek</td>
<td>16.25</td>
</tr>
<tr>
<td></td>
<td></td>
<td>311</td>
<td>Bruce Ditch-Singleton Ditch</td>
<td>24.71</td>
</tr>
<tr>
<td></td>
<td></td>
<td>312</td>
<td>Bull Creek-Singleton Ditch</td>
<td>20.72</td>
</tr>
<tr>
<td></td>
<td></td>
<td>313</td>
<td>Singleton Ditch</td>
<td>13.85</td>
</tr>
</tbody>
</table>
7.1.2.1 Pitner Ditch-Kankakee River Subwatershed (10-Digit HUC 108)

The Pitner Ditch subwatershed has an area of nearly 194 square miles and covers portions of LaPorte, Starke and Jasper Counties. Wanatah is the only designated city within this subwatershed (Figure 58). Most of the land is used for agriculture purposes as reported in Table 104. Figure 59 and Figure 60 show the NPDES facilities and feeding operations in this subwatershed.

There is only one listed segment (Table 101) and four monitoring locations (Table 102) in the subwatershed. Table 103 summarizes the 2008 data in this subwatershed. Three of the four sites sampled exceeded the geomean standard and necessary reductions range from 59 to 88 percent.

<p>| Table 101. 303 (d) Listed Streams in the Pitner Ditch-Kankakee River |
|-----------------------------|-------------------|-----------------|------------------|-----------------|</p>
<table>
<thead>
<tr>
<th>HUC 12</th>
<th>HUC 12 Name</th>
<th>Segment ID</th>
<th>Waterbody</th>
<th>Stream Length (miles)</th>
<th>Parameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>806</td>
<td>Origer Ditch-Kankakee River</td>
<td>INK0183_M1011</td>
<td>Kankakee River-English Lake</td>
<td>3.51</td>
<td>E. coli</td>
</tr>
</tbody>
</table>

<p>| Table 102. Station Locations in the Pitner Ditch-Kankakee River |
|-----------------------------|-------------------|-----------------|</p>
<table>
<thead>
<tr>
<th>HUC 12</th>
<th>HUC 12 Name</th>
<th>Station #</th>
<th>Stream Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>802</td>
<td>Hanna Arm Tuesburg Ditch</td>
<td>ID# 31</td>
<td>Hunsley D</td>
</tr>
<tr>
<td>805</td>
<td>Bessler Ditch-Pitner Ditch</td>
<td>ID# 07</td>
<td>Pitner D</td>
</tr>
<tr>
<td>807</td>
<td>Rassmussen Ditch-Kankakee River</td>
<td>ID# 03</td>
<td>Kankakee River</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ID# 05</td>
<td>Elkheim D</td>
</tr>
</tbody>
</table>

<p>| Table 103. Summary of Pathogen Data in the Pitner Ditch-Kankakee River |
|-----------------------------|-------------------|-----------------|-----------------|-----------------|-----------------|------------------|----------------|</p>
<table>
<thead>
<tr>
<th>Station #</th>
<th>Period of Record</th>
<th>Total Number of Samples</th>
<th>Percent of Samples Exceeding E. coli WQS (#/100 mL)</th>
<th>Minimum (#/100 mL)</th>
<th>Geomean (#/100 mL)</th>
<th>Average (#/100 mL)</th>
<th>Maximum (#/100 mL)</th>
<th>Percent Reduction Based on Geomean (125/100mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>31</td>
<td>6/4/2008 - 6/30/2008</td>
<td>5</td>
<td>100</td>
<td>100</td>
<td>548</td>
<td>1,079</td>
<td>1,223</td>
<td>2,420</td>
</tr>
<tr>
<td>7</td>
<td>6/2/2008 - 6/30/2008</td>
<td>5</td>
<td>20</td>
<td>0</td>
<td>108</td>
<td>122</td>
<td>122</td>
<td>142</td>
</tr>
<tr>
<td>3</td>
<td>6/2/2008 - 6/30/2008</td>
<td>5</td>
<td>100</td>
<td>60</td>
<td>186</td>
<td>307</td>
<td>330</td>
<td>461</td>
</tr>
<tr>
<td>5</td>
<td>6/2/2008 - 6/30/2008</td>
<td>5</td>
<td>100</td>
<td>100</td>
<td>248</td>
<td>338</td>
<td>348</td>
<td>488</td>
</tr>
</tbody>
</table>
### Table 104. Land Use/Land Cover in the Pitner Ditch-Kankakee River Subwatershed

<table>
<thead>
<tr>
<th>Land Use/Land Cover</th>
<th>Subwatershed Area</th>
<th></th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Acres</td>
<td>Square Miles</td>
<td></td>
</tr>
<tr>
<td>Agricultural Land</td>
<td>96158.26</td>
<td>150.25</td>
<td>77.60</td>
</tr>
<tr>
<td>Forested Land</td>
<td>12925.31</td>
<td>20.20</td>
<td>10.43</td>
</tr>
<tr>
<td>Developed Land</td>
<td>7502.91</td>
<td>11.72</td>
<td>6.05</td>
</tr>
<tr>
<td>Grassland and Shrubs</td>
<td>2760.35</td>
<td>4.31</td>
<td>2.23</td>
</tr>
<tr>
<td>Wetland</td>
<td>2553.53</td>
<td>3.99</td>
<td>2.06</td>
</tr>
<tr>
<td>Pasture/Hay</td>
<td>1473.14</td>
<td>2.30</td>
<td>1.19</td>
</tr>
<tr>
<td>Open Water</td>
<td>550.20</td>
<td>0.86</td>
<td>0.44</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>123,923.70</strong></td>
<td><strong>193.63</strong></td>
<td><strong>100.00</strong></td>
</tr>
</tbody>
</table>

**Figure 58. Location of Pitner Ditch-Kankakee River (HUC 10-108)**

*Map showing location of Pitner Ditch-Kankakee River with labeled regions.*
Figure 59. NPDES Facilities in the Pitner Ditch-Kankakee River (HUC 10-108)
Table 105 through Table 108 summarize the subwatershed characteristics and TMDL results for each of the HUC 12 subwatersheds. It should be noted that there are no current 303(d) listings in HUC 802 or HUC 807; however, the sampling performed in 2008 suggests that several streams are impaired. Those streams will appear on the next 303(d) list and TMDLs for those streams are presented here.

There are two NPDES facilities within the Pitner Ditch subwatershed and the WLAs for the facilities were calculated based on their design flows and *E. coli* permit limits. There are three MS4 communities upstream of the Pitner Ditch subwatershed outlet and the WLAs for the communities were calculated based on their area within the subwatershed and *E. coli* standards. There are three CSO communities with 26 outfalls upstream of this subwatershed outlet. WLAs for CSO communities were calculated based on the maximum observed CSO flow at each outfall multiplied by the *E. coli* criteria. The individual WLAs are presented in Table 276. There are two CAFOs within this subwatershed and they receive a WLA of zero as described further in Section 7.3.
Table 105. Hanna Arm Tuesburg Ditch Characteristics and TMDL Summary (HUC12-802)

<table>
<thead>
<tr>
<th>Upstream Characteristics</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Drainage Area</strong></td>
<td>37.14 square miles</td>
</tr>
<tr>
<td><strong>Sampling Station</strong></td>
<td>31</td>
</tr>
<tr>
<td><strong>Listed Segments</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>Land Use</strong></td>
<td>Agriculture: 81.43%; Developed Land: 9.53%; Forest: 16.35%; Other: 10.05%</td>
</tr>
<tr>
<td><strong>Soils</strong></td>
<td>A: 64.75%; B: 26.82%; C: 8.43%; D: 0.00%; Unknown: 0.00%</td>
</tr>
<tr>
<td><strong>NPDES Facilities</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>MS4 Communities</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>CSO Communities</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>CAFOs</strong></td>
<td>None</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CFOs</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Farm #2 (2547)</td>
<td></td>
</tr>
<tr>
<td>Hundt (3045)</td>
<td></td>
</tr>
<tr>
<td>Farm #1 (3548)</td>
<td></td>
</tr>
<tr>
<td>Dgm Pork (3992)</td>
<td></td>
</tr>
<tr>
<td>Hardin Farms (6109)</td>
<td></td>
</tr>
<tr>
<td>Hoover Farms (6114)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TMDL Allocations (billion/day)</th>
<th>High Flows</th>
<th>Moist Conditions</th>
<th>Mid-Range Flows</th>
<th>Dry Conditions</th>
<th>Low Flows</th>
</tr>
</thead>
<tbody>
<tr>
<td>LA</td>
<td>244.04</td>
<td>89</td>
<td>40.2</td>
<td>18.09</td>
<td>9.77</td>
</tr>
<tr>
<td>WLA</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>MOS (10%)</td>
<td>27.12</td>
<td>9.89</td>
<td>4.46</td>
<td>2.01</td>
<td>1.08</td>
</tr>
<tr>
<td>TMDL = LA+WLA+MOS</td>
<td>271.16</td>
<td>98.89</td>
<td>44.66</td>
<td>20.1</td>
<td>10.85</td>
</tr>
</tbody>
</table>
### Table 106. Bessler Ditch-Pitner Ditch Characteristics and TMDL Summary (HUC12-805)

#### Upstream Characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drainage Area</td>
<td>59.99 square miles</td>
</tr>
<tr>
<td>Sampling Station</td>
<td>7</td>
</tr>
<tr>
<td>Listed Segments</td>
<td>None</td>
</tr>
<tr>
<td>Land Use</td>
<td>Agriculture: 86.92%; Developed Land: 5.97%; Forest: 4.26%; Other: 2.85%</td>
</tr>
<tr>
<td>Soils</td>
<td>A: 79.08%; B: 12.50%; C: 8.42%; D: 0.00%; Unknown: 0.00%</td>
</tr>
<tr>
<td>NPDES Facilities</td>
<td>La Crosse Municipal WWTP (IN0040193)</td>
</tr>
<tr>
<td>MS4 Communities</td>
<td>None</td>
</tr>
<tr>
<td>CSO Communities</td>
<td>None</td>
</tr>
</tbody>
</table>

#### CAFOs
- Smoker Farms (ING801092)
- David And Brenda Wolfe (ING806292)
  - Brian Hunsley (85)
- Stull Farm (3126)
- Phegley (3896)
- Rich-Lou Farms (3925)

#### CFOs
- Rich-Lou Farms (3925)

#### TMDL Allocations (billion/day)

<table>
<thead>
<tr>
<th>Condition</th>
<th>High Flows</th>
<th>Moist Conditions</th>
<th>Mid-Range Flows</th>
<th>Dry Conditions</th>
<th>Low Flows</th>
</tr>
</thead>
<tbody>
<tr>
<td>LA</td>
<td>393.87</td>
<td>143.45</td>
<td>64.61</td>
<td>28.9</td>
<td>15.45</td>
</tr>
<tr>
<td>WLA</td>
<td>0.32</td>
<td>0.32</td>
<td>0.32</td>
<td>0.32</td>
<td>0.32</td>
</tr>
<tr>
<td>MOS (10%)</td>
<td>43.8</td>
<td>15.97</td>
<td>7.21</td>
<td>3.24</td>
<td>1.75</td>
</tr>
<tr>
<td>TMDL = LA+WLA+MOS</td>
<td>437.99</td>
<td>159.74</td>
<td>72.14</td>
<td>32.46</td>
<td>17.52</td>
</tr>
<tr>
<td><strong>Table 107. Origer Ditch-Kankakee River Characteristics and TMDL Summary (HUC12-806)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Upstream Characteristics</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Drainage Area</strong></td>
<td>1229.46 square miles</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Sampling Station</strong></td>
<td>None</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Listed Segments</strong></td>
<td>INK0183_M1011</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Land Use</strong></td>
<td>Agriculture: 66.30%; Developed Land: 9.03%; Forest: 15.00%; Other: 9.67%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Soils</strong></td>
<td>A: 48.40%; B: 39.20%; C: 9.63%; D: 1.60%; Unknown: 1.17%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>NPDES Facilities</strong></td>
<td>All facilities upstream of HUC 12-705, HUC 12-506, HUC 12-604</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>MS4 Communities</strong></td>
<td>La Porte County (INR040107): 14.93 square miles</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>South Bend (INR040114): 3.42 square miles</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Plymouth (INR040064): 6.97 square miles</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>CSO Communities</strong></td>
<td>North Judson Municipal (IN0020877)-1 outfall</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Plymouth Municipal STP (IN0020991-10 outfalls</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Nappanee Municipal STP (IN0021466)-Discharges Outside of The Kankakee/Iroquois Watershed</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>CAFOs</strong></td>
<td>All facilities upstream of HUC 12-705, HUC 12-506, HUC 12-604</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>CFOs</strong></td>
<td>All facilities upstream of HUC 12-705, HUC 12-506, HUC 12-604</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>TMDL Allocations (billion/day)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>High Flows</td>
<td>Moist Conditions</td>
<td>Mid-Range Flows</td>
<td>Dry Conditions</td>
<td>Low Flows</td>
</tr>
<tr>
<td><strong>LA</strong></td>
<td>7145.56</td>
<td>2623.55</td>
<td>1139.23</td>
<td>466.92</td>
<td>213.72</td>
</tr>
<tr>
<td><strong>WLA</strong></td>
<td>276.02</td>
<td>83.15</td>
<td>83.15</td>
<td>83.15</td>
<td>83.15</td>
</tr>
<tr>
<td><strong>MOS (10%)</strong></td>
<td>824.62</td>
<td>300.74</td>
<td>135.82</td>
<td>61.12</td>
<td>32.98</td>
</tr>
<tr>
<td><strong>TMDL = LA+WLA+MOS</strong></td>
<td>8246.2</td>
<td>3007.44</td>
<td>1358.2</td>
<td>611.19</td>
<td>329.85</td>
</tr>
</tbody>
</table>
Table 108. Rassmussen Ditch-Kankakee River Characteristics and TMDL Summary (HUC12-807)

<table>
<thead>
<tr>
<th>Upstream Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Drainage Area</strong></td>
</tr>
<tr>
<td><strong>Sampling Station</strong></td>
</tr>
<tr>
<td><strong>Listed Segments</strong></td>
</tr>
</tbody>
</table>

**Land Use**
Agriculture: 67.27%; Developed Land: 8.83%; Forest: 14.56%; Other: 9.34%

**Soils**
A: 50.66%; B: 37.25%; C: 9.46%; D: 1.53%; Unknown: 1.10%

**NPDES Facilities**
- All facilities upstream of HUC 12-705, HUC 12-506, HUC 12-604
  - La Crosse Municipal WWTP (IN0040193)
  - Little Co Of Mary Health Facility (IN0053104)

**MS4 Communities**
- La Porte County (INR040107): 14.93 square miles
- South Bend (INR040114): 3.42 square miles
- Plymouth (INR040064): 6.97 square miles

**CSO Communities**
- North Judson Municipal (IN0020877)-1 outfall
- Plymouth Municipal STP (IN0020991-10 outfalls)
- Nappanee Municipal STP (IN0021446)-Discharges Outside of The Kankakee/Iroquois Watershed

**CAFOs**
- All facilities upstream of HUC 12-705, HUC 12-506, HUC 12-604
  - Smoker Farms (ING801092)
  - David And Brenda Wolfe (ING806292)

**CFOs**
- All facilities upstream of HUC 12-705, HUC 12-506, HUC 12-604
  - Farm #2 (2547)
  - Hundt (3045)
  - Farm #1 (3548)
  - Dgm Pork (3992)
  - Hardin Farms (6109)
  - Hoover Farms (6114)
  - Brian Hunsley (85)
  - Stull Farm (3126)
  - Rich-Lou Farms (3925)

**TMDL Allocations (billion/day)**

<table>
<thead>
<tr>
<th>High Flows</th>
<th>Moist Conditions</th>
<th>Mid-Range Flows</th>
<th>Dry Conditions</th>
<th>Low Flows</th>
</tr>
</thead>
<tbody>
<tr>
<td>LA</td>
<td>7731.51</td>
<td>2836.92</td>
<td>1235.31</td>
<td>509.88</td>
</tr>
<tr>
<td>WLA</td>
<td>276.53</td>
<td>83.66</td>
<td>83.66</td>
<td>83.66</td>
</tr>
<tr>
<td>MOS (10%)</td>
<td>889.78</td>
<td>324.51</td>
<td>146.55</td>
<td>65.95</td>
</tr>
<tr>
<td>TMDL = LA+WLA+MOS</td>
<td>8897.82</td>
<td>3245.09</td>
<td>1465.52</td>
<td>659.49</td>
</tr>
</tbody>
</table>

7.1.2.2 Hodge Ditch Subwatershed (HUC 10-109)

The Hodge Ditch subwatershed has an area of nearly 84 square miles. This subwatershed is covered by portions of Jasper and Porter counties (Figure 61). Nearly 61 percent of the land is used for agriculture (Table 111). There are three NPDES facilities in this subwatershed (Figure 62). No feeding operations exist within this subwatershed. There are no listed segments in the Hodge Ditch subwatershed. IDEM sampled two sites in this HUC 10 subwatershed (Table 109). Table 110 summarizes the 2008 data in this subwatershed. Both sites exceeded the geomean standard and both require a reduction of approximately 40 percent to meet the geomean standard.
Table 109. Station Locations in the Hodge Ditch Subwatershed

<table>
<thead>
<tr>
<th>HUC 12</th>
<th>HU C12 Name</th>
<th>Station #</th>
<th>Stream Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>902</td>
<td>Hickam Lateral-Wolf Creek</td>
<td>ID# 10</td>
<td>Wolf Cr</td>
</tr>
<tr>
<td>904</td>
<td>Cook Ditch-Hodge Ditch</td>
<td>ID# 12</td>
<td>Hodge D</td>
</tr>
</tbody>
</table>

Table 110. Summary of Pathogen Data in the Hodge Ditch Subwatershed

<table>
<thead>
<tr>
<th>Station #</th>
<th>Period of Record</th>
<th>Total Number of Samples</th>
<th>Percent of Samples Exceeding E. coli WQS (#/100 mL)</th>
<th>Minimum (#/100 mL)</th>
<th>Geomean (#/100 mL)</th>
<th>Average (#/100 mL)</th>
<th>Maximum (#/100 mL)</th>
<th>Percent Reduction Based on Geomean (125/100mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>6/3/2008 - 7/1/2008</td>
<td>5</td>
<td>125</td>
<td>60</td>
<td>155</td>
<td>215</td>
<td>291</td>
<td>42%</td>
</tr>
<tr>
<td>12</td>
<td>6/3/2008 - 7/1/2008</td>
<td>5</td>
<td>235</td>
<td>20</td>
<td>166</td>
<td>195</td>
<td>285</td>
<td>36%</td>
</tr>
</tbody>
</table>

Table 111. Land Use/Land Cover in the Hodge Ditch Subwatershed

<table>
<thead>
<tr>
<th>Land Use/Land Cover</th>
<th>Area</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Acres</td>
<td>Square Miles</td>
</tr>
<tr>
<td>Agricultural Land</td>
<td>39164.24</td>
<td>61.19</td>
</tr>
<tr>
<td>Forested Land</td>
<td>7855.40</td>
<td>12.27</td>
</tr>
<tr>
<td>Developed Land</td>
<td>3782.48</td>
<td>5.91</td>
</tr>
<tr>
<td>Grassland and Shrubs</td>
<td>2203.03</td>
<td>3.44</td>
</tr>
<tr>
<td>Pasture/Hay</td>
<td>610.03</td>
<td>0.95</td>
</tr>
<tr>
<td>Wetland</td>
<td>209.72</td>
<td>0.33</td>
</tr>
<tr>
<td>Open Water</td>
<td>16.90</td>
<td>0.03</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>53,841.80</strong></td>
<td><strong>84.13</strong></td>
</tr>
</tbody>
</table>
Figure 61. Location of Hodge Ditch Subwatershed (HUC10-109)
Figure 62. NPDES Facilities in the Hodge Ditch Subwatershed (HUC 10-109)
Table 112 and Table 113 summarize the subwatershed characteristics as well as the TMDL results for each of the HUC 12 subwatersheds. It should be noted that there are no current 303(d) listings in either HUC; however, the sampling performed in 2008 suggests that several streams are impaired. Those streams will appear on the next 303(d) list and TMDLs for those streams are presented here.

There are three NPDES facilities within the Hodge Ditch subwatershed and the WLAs for the facilities were calculated based on their design flows and \textit{E. coli} permit limits. The individual WLAs are presented in Table 276.

Table 112. Hickman Lateral-Wolf Creek Characteristics and TMDL Summary (HUC12-902)

<table>
<thead>
<tr>
<th>Upstream Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Drainage Area</strong></td>
</tr>
<tr>
<td><strong>Sampling Station</strong></td>
</tr>
<tr>
<td><strong>Listed Segments</strong></td>
</tr>
<tr>
<td><strong>Land Use</strong></td>
</tr>
<tr>
<td><strong>Soils</strong></td>
</tr>
<tr>
<td><strong>NPDES Facilities</strong></td>
</tr>
<tr>
<td><strong>MS4 Communities</strong></td>
</tr>
<tr>
<td><strong>CSO Communities</strong></td>
</tr>
<tr>
<td><strong>CAFOs</strong></td>
</tr>
<tr>
<td><strong>CFOs</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TMDL Allocations (billion/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>High Flows</strong></td>
</tr>
<tr>
<td>LA</td>
</tr>
<tr>
<td>WLA</td>
</tr>
<tr>
<td>MOS (10%)</td>
</tr>
<tr>
<td>TMDL = LA+WLA+MOS</td>
</tr>
</tbody>
</table>
Table 113. Crook Ditch-Hodge Ditch Characteristics and TMDL Summary (HUC12-904)

<table>
<thead>
<tr>
<th><strong>Upstream Characteristics</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Drainage Area</td>
<td>84.14 square miles</td>
</tr>
<tr>
<td>Sampling Station</td>
<td>12</td>
</tr>
<tr>
<td>Listed Segments</td>
<td>None</td>
</tr>
<tr>
<td>Land Use</td>
<td>Agriculture: 72.73%; Developed Land: 7.02%; Forest: 14.59%; Other: 5.66%</td>
</tr>
<tr>
<td>Soils</td>
<td>A: 63.64%; B: 25.13%; C: 10.34%; D: 0.89%; Unknown: 0.00%</td>
</tr>
<tr>
<td>NPDES Facilities</td>
<td>Wheatfield Municipal WWTP (IN0040754)</td>
</tr>
<tr>
<td></td>
<td>Martis Place Bomars River LDG (IN0058823)</td>
</tr>
<tr>
<td></td>
<td>Town Of Monterey WWTP (IN0060852)</td>
</tr>
<tr>
<td>MS4 Communities</td>
<td>None</td>
</tr>
<tr>
<td>CSO Communities</td>
<td>None</td>
</tr>
<tr>
<td>CAFOs</td>
<td>None</td>
</tr>
<tr>
<td>CFOs</td>
<td>None</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>TMDL Allocations (billion/day)</strong></th>
<th>High Flows</th>
<th>Moist Conditions</th>
<th>Mid-Range Flows</th>
<th>Dry Conditions</th>
<th>Low Flows</th>
</tr>
</thead>
<tbody>
<tr>
<td>LA</td>
<td>552.33</td>
<td>201.09</td>
<td>90.52</td>
<td>40.43</td>
<td>21.57</td>
</tr>
<tr>
<td>WLA</td>
<td>0.55</td>
<td>0.55</td>
<td>0.55</td>
<td>0.55</td>
<td>0.55</td>
</tr>
<tr>
<td>MOS (10%)</td>
<td>61.43</td>
<td>22.4</td>
<td>10.11</td>
<td>4.55</td>
<td>2.45</td>
</tr>
<tr>
<td>TMDL = LA+WLA+MOS</td>
<td>614.31</td>
<td>224.04</td>
<td>101.18</td>
<td>45.53</td>
<td>24.57</td>
</tr>
</tbody>
</table>
7.1.2.3 **Crooked Creek-Kankakee River Subwatershed (HUC10-110)**

The Crooked Creek subwatershed has an area of approximately 243 square miles and lies within Porter, La Porte and Jasper counties (Figure 63). As with above watersheds, agriculture is the dominant land use (Table 117). There are 11 facilities in the subwatershed as shown in Figure 64. There are no CAFOs; however, there is one CFO in the subwatershed (Figure 65).

Among the HUC12 units present in this subwatershed, HUC12-010 is the only one that has listed 303 (d) segments (Table 114). IDEM monitoring locations (Table 115) demonstrate impairments at all but one monitoring location (Table 116). Station # 06 did not exceed the geomean standard, however 20 percent of 2008 samples did exceed 235/100mL. The required reductions range from 0 to 87 percent.

### Table 114. 303 (d) Listed Streams in the Crooked Creek-Kankakee River Subwatershed

<table>
<thead>
<tr>
<th>HUC 12</th>
<th>Segment ID</th>
<th>Waterbody</th>
<th>Length (miles)</th>
<th>Parameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>010</td>
<td>INK019F_M1113</td>
<td>Kankakee River</td>
<td>0.59</td>
<td>E. coli</td>
</tr>
<tr>
<td></td>
<td>INK019F_M1104</td>
<td>Kankakee River</td>
<td>6.08</td>
<td>E. coli</td>
</tr>
</tbody>
</table>

### Table 115. Station Locations in the Crooked Creek-Kankakee River Subwatershed

<table>
<thead>
<tr>
<th>HUC 12</th>
<th>Station #</th>
<th>Stream Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>001</td>
<td>ID# 29</td>
<td>Slocum D</td>
</tr>
<tr>
<td>105</td>
<td>ID# 04</td>
<td>Heinold Ditch</td>
</tr>
<tr>
<td></td>
<td>ID# 25</td>
<td>Greiger D</td>
</tr>
<tr>
<td>006</td>
<td>ID# 27</td>
<td>Crooked Cr</td>
</tr>
<tr>
<td>007</td>
<td>ID# 06</td>
<td>Cobb D</td>
</tr>
<tr>
<td>009</td>
<td>ID# 08</td>
<td>Phillips Ditch</td>
</tr>
<tr>
<td>010</td>
<td>ID# 02</td>
<td>Kankakee River</td>
</tr>
<tr>
<td></td>
<td>ID# 16</td>
<td>Kankakee R</td>
</tr>
</tbody>
</table>
### Table 116. Summary of Crooked Creek-Kankakee River Subwatershed

<table>
<thead>
<tr>
<th>Station #</th>
<th>Period of Record</th>
<th>Total Number of Samples</th>
<th>Percent of Samples Exceeding E. coli WQS (#/100 mL)</th>
<th>Minimum (#/100 mL)</th>
<th>Geomean (#/100 mL)</th>
<th>Average (#/100 mL)</th>
<th>Maximum (#/100 mL)</th>
<th>Percent Reduction Based on Geomean (125/100mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>29</td>
<td>6/4/2008 - 6/30/2008</td>
<td>5</td>
<td>100</td>
<td>100</td>
<td>613</td>
<td>949</td>
<td>1,096</td>
<td>2,419</td>
</tr>
<tr>
<td>4</td>
<td>6/2/2008 - 6/30/2008</td>
<td>5</td>
<td>80</td>
<td>80</td>
<td>116</td>
<td>321</td>
<td>371</td>
<td>649</td>
</tr>
<tr>
<td>25</td>
<td>6/2/2008 - 7/14/2008</td>
<td>6</td>
<td>100</td>
<td>67</td>
<td>158</td>
<td>284</td>
<td>306</td>
<td>488</td>
</tr>
<tr>
<td>27</td>
<td>6/2/2008 - 7/14/2008</td>
<td>6</td>
<td>100</td>
<td>83</td>
<td>152</td>
<td>689</td>
<td>878</td>
<td>1,986</td>
</tr>
<tr>
<td>6</td>
<td>6/3/2008 - 7/1/2008</td>
<td>5</td>
<td>20</td>
<td>20</td>
<td>31</td>
<td>64</td>
<td>120</td>
<td>435</td>
</tr>
<tr>
<td>8</td>
<td>6/3/2008 - 7/1/2008</td>
<td>5</td>
<td>100</td>
<td>100</td>
<td>387</td>
<td>522</td>
<td>550</td>
<td>866</td>
</tr>
<tr>
<td>2</td>
<td>6/3/2008 - 7/1/2008</td>
<td>5</td>
<td>100</td>
<td>60</td>
<td>140</td>
<td>241</td>
<td>258</td>
<td>411</td>
</tr>
<tr>
<td>16</td>
<td>6/3/2008 - 7/1/2008</td>
<td>5</td>
<td>80</td>
<td>40</td>
<td>96</td>
<td>239</td>
<td>284</td>
<td>525</td>
</tr>
</tbody>
</table>

### Table 117. Land Use/Land Cover in the Crooked Creek-Kankakee River Subwatershed

<table>
<thead>
<tr>
<th>Land Use/Land Cover</th>
<th>Subwatershed</th>
<th>Area</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Subwatershed</td>
<td>Acres</td>
<td>Square Miles</td>
</tr>
<tr>
<td>Agricultural Land</td>
<td>116508.41</td>
<td>182.04</td>
<td>74.84</td>
</tr>
<tr>
<td>Forested Land</td>
<td>12085.11</td>
<td>18.88</td>
<td>7.76</td>
</tr>
<tr>
<td>Developed Land</td>
<td>12801.89</td>
<td>20.00</td>
<td>8.22</td>
</tr>
<tr>
<td>Pasture/Hay</td>
<td>7533.15</td>
<td>11.77</td>
<td>4.84</td>
</tr>
<tr>
<td>Grassland and Shrubs</td>
<td>4577.09</td>
<td>7.15</td>
<td>2.94</td>
</tr>
<tr>
<td>Wetland</td>
<td>1601.68</td>
<td>2.50</td>
<td>1.03</td>
</tr>
<tr>
<td>Open Water</td>
<td>580.45</td>
<td>0.91</td>
<td>0.37</td>
</tr>
<tr>
<td>Total</td>
<td>155,687.78</td>
<td>243.26</td>
<td>100.00</td>
</tr>
</tbody>
</table>
Figure 63. Location of Crooked Creek-Kankakee River (HUC10-110)
Figure 64. NPDES Facilities in the Crooked Creek-Kankakee River (HUC10-110)
Figure 65. Feeding Operations in the Crooked Creek-Kankakee River (HUC10-110)
Table 118 through Table 123 summarize the subwatershed characteristics as well as the TMDL results for each of the HUC 12 subwatersheds. It should be noted that there are no current 303(d) listings in HUC 001, HUC 005, HUC 006, HUC 007, and HUC 009; however, the sampling performed in 2008 suggests that several streams are impaired. Those streams will appear on the next 303(d) list and TMDLs for those streams are presented here.

There are ten NPDES facilities within the Crooked Creek subwatershed and the WLAs for the facilities were calculated based on their design flows and $E. \text{coli}$ permit limits. There are five MS4 communities upstream of the Crooked Creek subwatershed outlet and the WLAs for the communities were calculated based on their area within the subwatershed and $E. \text{coli}$ standards. There are three CSO communities with 26 outfalls upstream of this subwatershed outlet. WLAs for CSO communities were calculated based on the maximum observed CSO flow at each outfall and $E. \text{coli}$ standards. The individual WLAs are presented in Table 276. There are no CAFOs within this subwatershed, however WLAs of zero will apply to all CAFOs upstream of this subwatershed as described further in Section 7.3.

Table 118. Bloom Ditch Characteristics and TMDL Summary (HUC12-001)

<table>
<thead>
<tr>
<th>Upstream Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Drainage Area</strong></td>
</tr>
<tr>
<td><strong>Sampling Station</strong></td>
</tr>
<tr>
<td><strong>Listed Segments</strong></td>
</tr>
<tr>
<td><strong>Land Use</strong></td>
</tr>
<tr>
<td><strong>Soils</strong></td>
</tr>
</tbody>
</table>

**NPDES Facilities**
- Wanatah Wastewater Treatment Plant (IN0056669)

**MS4 Communities**
- None

**CSO Communities**
- None

**CAFOs**
- None

**CFOs**
- Taber Veal (3515)
- Kresel (4898)

**TMDL Allocations (billion/day)**

<table>
<thead>
<tr>
<th></th>
<th>High Flows</th>
<th>Moist Conditions</th>
<th>Mid-Range Flows</th>
<th>Dry Conditions</th>
<th>Low Flows</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>LA</strong></td>
<td>196.29</td>
<td>54.59</td>
<td>26.84</td>
<td>14.32</td>
<td>6.16</td>
</tr>
<tr>
<td><strong>WLA</strong></td>
<td>0.37</td>
<td>0.37</td>
<td>0.37</td>
<td>0.37</td>
<td>0.37</td>
</tr>
<tr>
<td><strong>MOS (10%)</strong></td>
<td>21.84</td>
<td>6.11</td>
<td>3.02</td>
<td>1.63</td>
<td>0.73</td>
</tr>
<tr>
<td><strong>TMDL = LA+WLA+MOS</strong></td>
<td>218.5</td>
<td>61.07</td>
<td>30.23</td>
<td>16.32</td>
<td>7.26</td>
</tr>
</tbody>
</table>
Table 119. Reeves Ditch Characteristics and TMDL Summary (HUC12-005)

<table>
<thead>
<tr>
<th>Upstream Characteristics</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Drainage Area</strong></td>
<td>53.19 square miles</td>
</tr>
<tr>
<td><strong>Sampling Station</strong></td>
<td>4, 25</td>
</tr>
<tr>
<td><strong>Listed Segments</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>Land Use</strong></td>
<td>Agriculture: 88.66%; Developed Land: 5.18%; Forest: 3.67%; Other: 2.48%</td>
</tr>
<tr>
<td><strong>Soils</strong></td>
<td>A: 67.57%; B: 20.81%; C: 11.08%; D: 0.54%; Unknown: 0.00%</td>
</tr>
<tr>
<td><strong>NPDES Facilities</strong></td>
<td>Wanatah Wastewater Treatment Plant (IN0056669)</td>
</tr>
<tr>
<td><strong>MS4 Communities</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>CSO Communities</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>CAFOs</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>CFOs</strong></td>
<td>Taber Veal (3515)</td>
</tr>
<tr>
<td></td>
<td>Bucher Hog Farm (1053)</td>
</tr>
<tr>
<td></td>
<td>Kresel (4898)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TMDL Allocations (billion/day)</th>
<th>High Flows</th>
<th>Moist Conditions</th>
<th>Mid-Range Flows</th>
<th>Dry Conditions</th>
<th>Low Flows</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>LA</strong></td>
<td>429.73</td>
<td>119.83</td>
<td>59.14</td>
<td>31.76</td>
<td>13.91</td>
</tr>
<tr>
<td><strong>WLA</strong></td>
<td>0.37</td>
<td>0.37</td>
<td>0.37</td>
<td>0.37</td>
<td>0.37</td>
</tr>
<tr>
<td><strong>MOS (10%)</strong></td>
<td>47.79</td>
<td>13.36</td>
<td>6.61</td>
<td>3.57</td>
<td>1.59</td>
</tr>
<tr>
<td><strong>TMDL = LA+WLA+MOS</strong></td>
<td>477.89</td>
<td>133.56</td>
<td>66.12</td>
<td>35.70</td>
<td>15.87</td>
</tr>
</tbody>
</table>
Table 120. Hannon Ditch-Crooked Creek Characteristics and TMDL Summary (HUC12-006)

<table>
<thead>
<tr>
<th>Upstream Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drainage Area</td>
</tr>
<tr>
<td>Sampling Station</td>
</tr>
<tr>
<td>Listed Segments</td>
</tr>
<tr>
<td>Land Use</td>
</tr>
<tr>
<td>Soils</td>
</tr>
<tr>
<td>NPDES Facilities</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>MS4 Communities</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>CSO Communities</td>
</tr>
<tr>
<td>CAFOs</td>
</tr>
<tr>
<td>CFOs</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TMDL Allocations (billion/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Flows</td>
</tr>
<tr>
<td>LA</td>
</tr>
<tr>
<td>WLA</td>
</tr>
<tr>
<td>MOS (10%)</td>
</tr>
<tr>
<td>TMDL = LA+WLA+MOS</td>
</tr>
<tr>
<td>Moist Conditions</td>
</tr>
<tr>
<td>LA</td>
</tr>
<tr>
<td>WLA</td>
</tr>
<tr>
<td>MOS (10%)</td>
</tr>
<tr>
<td>TMDL = LA+WLA+MOS</td>
</tr>
<tr>
<td>Mid-Range Flows</td>
</tr>
<tr>
<td>LA</td>
</tr>
<tr>
<td>WLA</td>
</tr>
<tr>
<td>MOS (10%)</td>
</tr>
<tr>
<td>TMDL = LA+WLA+MOS</td>
</tr>
<tr>
<td>Dry Conditions</td>
</tr>
<tr>
<td>LA</td>
</tr>
<tr>
<td>WLA</td>
</tr>
<tr>
<td>MOS (10%)</td>
</tr>
<tr>
<td>TMDL = LA+WLA+MOS</td>
</tr>
<tr>
<td>Low Flows</td>
</tr>
<tr>
<td>LA</td>
</tr>
<tr>
<td>WLA</td>
</tr>
<tr>
<td>MOS (10%)</td>
</tr>
<tr>
<td>TMDL = LA+WLA+MOS</td>
</tr>
</tbody>
</table>
### Table 121. Sievers Creek-Cobb Ditch Characteristics and TMDL Summary (HUC12-007)

<table>
<thead>
<tr>
<th><strong>Upstream Characteristics</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Drainage Area</strong></td>
<td>31.79 square miles</td>
</tr>
<tr>
<td><strong>Sampling Station</strong></td>
<td>6</td>
</tr>
<tr>
<td><strong>Listed Segments</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>Land Use</strong></td>
<td>Agriculture: 58.25%; Developed Land: 6.70%; Forest: 16.72%; Other: 18.33%</td>
</tr>
<tr>
<td><strong>Soils</strong></td>
<td>A: 3.41%; B: 40.49%; C: 55.12%; D: 0.98%; Unknown: 0.00%</td>
</tr>
<tr>
<td><strong>NPDES Facilities</strong></td>
<td>Lake Eliza Conservancy Dist (IN0051446)</td>
</tr>
<tr>
<td></td>
<td>Boone Grove High School WWTP (IN0057029)</td>
</tr>
<tr>
<td><strong>MS4 Communities</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>CSO Communities</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>CAFOs</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>CFOs</strong></td>
<td>None</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>TMDL Allocations (billion/day)</strong></th>
<th>High Flows</th>
<th>Moist Conditions</th>
<th>Mid-Range Flows</th>
<th>Dry Conditions</th>
<th>Low Flows</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>LA</strong></td>
<td>256.56</td>
<td>71.34</td>
<td>35.07</td>
<td>18.71</td>
<td>8.04</td>
</tr>
<tr>
<td><strong>WLA</strong></td>
<td>0.5</td>
<td>0.5</td>
<td>0.5</td>
<td>0.5</td>
<td>0.5</td>
</tr>
<tr>
<td><strong>MOS (10%)</strong></td>
<td>28.56</td>
<td>7.98</td>
<td>3.95</td>
<td>2.13</td>
<td>0.94</td>
</tr>
<tr>
<td><strong>TMDL = LA+WLA+MOS</strong></td>
<td>285.62</td>
<td>79.82</td>
<td>39.52</td>
<td>21.34</td>
<td>9.48</td>
</tr>
</tbody>
</table>
Table 122. Cornell Ditch-Phillips Ditch Characteristics and TMDL Summary (HUC12-009)

<table>
<thead>
<tr>
<th>Upstream Characteristics</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Drainage Area</td>
<td>19.64 square miles</td>
</tr>
<tr>
<td>Sampling Station</td>
<td>8</td>
</tr>
<tr>
<td>Listed Segments</td>
<td>None</td>
</tr>
<tr>
<td>Land Use</td>
<td>Agriculture: 78.94%; Developed Land: 5.48%; Forest: 6.92%; Other: 8.67%</td>
</tr>
<tr>
<td>Soils</td>
<td>A: 3.73%; B: 37.31%; C: 58.21%; D: 0.00%; Unknown: 0.75%</td>
</tr>
<tr>
<td>NPDES Facilities</td>
<td>Boone Grove Elementary &amp; Middle Schools (IN0045888)</td>
</tr>
<tr>
<td>MS4 Communities</td>
<td>None</td>
</tr>
<tr>
<td>CSO Communities</td>
<td>None</td>
</tr>
<tr>
<td>CAFOs</td>
<td>None</td>
</tr>
<tr>
<td>CFOs</td>
<td>None</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TMDL Allocations (billion/day)</th>
<th>High Flows</th>
<th>Moist Conditions</th>
<th>Mid-Range Flows</th>
<th>Dry Conditions</th>
<th>Low Flows</th>
</tr>
</thead>
<tbody>
<tr>
<td>LA</td>
<td>158.7</td>
<td>44.27</td>
<td>21.86</td>
<td>11.76</td>
<td>5.16</td>
</tr>
<tr>
<td>WLA</td>
<td>0.11</td>
<td>0.11</td>
<td>0.11</td>
<td>0.11</td>
<td>0.11</td>
</tr>
<tr>
<td>MOS (10%)</td>
<td>17.65</td>
<td>4.93</td>
<td>2.44</td>
<td>1.31</td>
<td>0.59</td>
</tr>
<tr>
<td>TMDL = LA+WLA+MOS</td>
<td>176.46</td>
<td>49.31</td>
<td>24.41</td>
<td>13.18</td>
<td>5.86</td>
</tr>
</tbody>
</table>
Table 123. Cobb Creek-Kankakee River Characteristics and TMDL Summary (HUC12-010)

<table>
<thead>
<tr>
<th>Upstream Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Drainage Area</strong></td>
</tr>
<tr>
<td><strong>Sampling Station</strong></td>
</tr>
<tr>
<td><strong>Listed Segments</strong></td>
</tr>
<tr>
<td><strong>Land Use</strong></td>
</tr>
<tr>
<td><strong>Soils</strong></td>
</tr>
</tbody>
</table>

**NPDES Facilities**
- Wanatah Wastewater Treatment Plant (IN0056669)
- Westville WWTP (IN0024848)
- Washington Twp School WWTP (IN0057703)
- Lake Eliza Conservancy Dist (IN0051446)
- Boone Grove High School WWTP (IN0057029)
- Boone Grove Elementary & Middle Schools (IN0045888)
- Hebron WWTP (IN0061450)
- Hebron Municipal WWTP (IN0020061)
- La Porte County (INR040107): 14.93 square miles
- South Bend (INR040114): 3.42 square miles
- Plymouth (INR040064): 6.97 square miles
- Porter County (INR040140): 2.96 square miles
- Hillsborough County-Valparaiso (INR04073): 1.90 square miles

**MS4 Communities**
- North Judson Municipal (IN0020877)-1 outfall
- Plymouth Municipal STP (IN0020991-10 outfalls
- Nappanee Municipal STP (IN0021466)-Discharges Outside of The Kankakee/Iroquois Watershed

**CAFOs**
- All facilities upstream of HUC12-807
- All facilities upstream of HUC12-807
- Bucher Hog Farm (1053)
- Kresel (4898)
- Taber Veal (3515)
- Good (2325)

**CFOs**
- All facilities upstream of HUC12-807

**TMDL Allocations (billion/day)**

<table>
<thead>
<tr>
<th></th>
<th>High Flows</th>
<th>Moist Conditions</th>
<th>Mid-Range Flows</th>
<th>Dry Conditions</th>
<th>Low Flows</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>LA</strong></td>
<td>11,830</td>
<td>3,316</td>
<td>1,595</td>
<td>819</td>
<td>313</td>
</tr>
<tr>
<td><strong>WLA</strong></td>
<td>362</td>
<td>92</td>
<td>92</td>
<td>92</td>
<td>92</td>
</tr>
<tr>
<td><strong>MOS (10%)</strong></td>
<td>1,355</td>
<td>378</td>
<td>187</td>
<td>101</td>
<td>45</td>
</tr>
<tr>
<td><strong>TMDL = LA+WLA+MOS</strong></td>
<td>13,547</td>
<td>3,786</td>
<td>1,874</td>
<td>1,012</td>
<td>450</td>
</tr>
</tbody>
</table>

7.1.2.4 Knight Ditch-Kankakee River Subwatershed (HUC10-111)

The Knight Ditch subwatershed has an area of approximately 109 square miles and includes the cities of DeMotte and Roselawn (Figure 66). About 70 percent of the land is used for agriculture (Table 126). There are five NPDES facilities (Figure 67) and three CAFOs (Figure 68) in the subwatershed. The
available E. coli data are summarized in Table 125 and indicate that reductions of 37 to 79 percent are needed to achieve a geomean of 125 #/100 mL.

Table 124. Station Locations in the Knight Ditch-Kankakee River Subwatershed

<table>
<thead>
<tr>
<th>HUC 12</th>
<th>HUC 12 Name</th>
<th>Station #</th>
<th>Stream Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>101</td>
<td>Dehaan Ditch</td>
<td>ID# 20</td>
<td>Dehaan D</td>
</tr>
<tr>
<td>103</td>
<td>Brown Levee Ditch-Kankakee R</td>
<td>ID# 14</td>
<td>Kankakee R</td>
</tr>
</tbody>
</table>

Table 125. Summary of Pathogen Data in the Knight-Kankakee River Subwatershed

<table>
<thead>
<tr>
<th>Station #</th>
<th>Period of Record</th>
<th>Total Number of Samples</th>
<th>Percent of Samples Exceeding E. coli WQS (#/100 mL)</th>
<th>Minimum (#/100 mL)</th>
<th>Geomean (#/100 mL)</th>
<th>Average (#/100 mL)</th>
<th>Maximum (#/100 mL)</th>
<th>Percent Reduction Based on Geomean (125/100mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>6/3/2008 - 7/1/2008</td>
<td>5</td>
<td>100</td>
<td>249</td>
<td>602</td>
<td>700</td>
<td>1,300</td>
<td>79%</td>
</tr>
<tr>
<td>14</td>
<td>6/3/2008 - 7/1/2008</td>
<td>5</td>
<td>100</td>
<td>153</td>
<td>198</td>
<td>203</td>
<td>285</td>
<td>37%</td>
</tr>
</tbody>
</table>
Table 126. Land Use/Land Cover in the Knight Ditch-Kankakee River Subwatershed

<table>
<thead>
<tr>
<th>Land Use/Land Cover</th>
<th>Subwatershed</th>
<th>Area</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Acres</td>
<td>Square Miles</td>
</tr>
<tr>
<td>Agricultural Land</td>
<td></td>
<td>44670.94</td>
<td>69.80</td>
</tr>
<tr>
<td>Forested Land</td>
<td></td>
<td>11641.88</td>
<td>18.19</td>
</tr>
<tr>
<td>Developed Land</td>
<td></td>
<td>6360.245</td>
<td>9.94</td>
</tr>
<tr>
<td>Grassland and Shrubs</td>
<td></td>
<td>3079.712</td>
<td>4.81</td>
</tr>
<tr>
<td>Wetland</td>
<td></td>
<td>2920.255</td>
<td>4.56</td>
</tr>
<tr>
<td>Pasture/Hay</td>
<td></td>
<td>700.541</td>
<td>1.09</td>
</tr>
<tr>
<td>Open Water</td>
<td></td>
<td>464.5826</td>
<td>0.73</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>69,838.15</strong></td>
<td><strong>109.12</strong></td>
</tr>
</tbody>
</table>

Figure 66. Location of Knight Ditch-Kankakee River (HUC10-111)
Figure 67. NPDES Facilities in the Knight Ditch-Kankakee River (HUC10-111)
Table 127 and Table 128 summarize the subwatershed characteristics as well as the TMDL results for each of the HUC 12 subwatersheds. It should be noted that there are no current 303(d) listings in either HUC; however, the sampling performed in 2008 suggests that several streams are impaired. Those streams will appear on the next 303(d) list and TMDLs for those streams are presented here.

There are five NPDES facilities within the Knight Ditch subwatershed and the WLAs for the facilities were calculated based on their design flows and *E. coli* permit limits. There are five MS4 communities upstream of the Knight Ditch subwatershed outlet and the WLAs for the communities were calculated based on their area within the subwatershed and *E. coli* standards. There are three CSO communities with 26 outfalls upstream of this subwatersheds outlet. WLAs for CSO communities were calculated based on the maximum observed CSO flow at each outfall and *E. coli* standards. The individual WLAs are presented in Table 276. There are three CAFOs within this subwatershed and they receive a WLA of zero as described further in Section 7.3.
### Table 127. Dehann Ditch Characteristics and TMDL Summary (HUC12-101)

#### Upstream Characteristics

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drainage Area</td>
<td>36.46 square miles</td>
</tr>
<tr>
<td>Sampling Station</td>
<td>20</td>
</tr>
<tr>
<td>Listed Segments</td>
<td>None</td>
</tr>
<tr>
<td>Land Use</td>
<td>Agriculture: 57.40%; Developed Land: 14.64%; Forest: 19.43%; Other: 8.54%</td>
</tr>
<tr>
<td>Soils</td>
<td>A: 80.65%; B: 14.92%; C: 3.23%; D: 0.40%; Unknown: 0.81%</td>
</tr>
</tbody>
</table>

#### NPDES Facilities

- Lincoln Elementary School (IN0030503)
- South Haven Sewer Works WWTP (IN0030651)
- Kankakee Rest Area (IN0031275)
- Water Services Co Of Indiana (IN0039101)
- Demotte Municipal WWTP (IN0039926)

#### MS4 Communities

None

#### CSO Communities

None

#### CAFOs

None

#### CFOs

- Walstra (3993)
- Devries Farms Inc (92)

#### TMDL Allocations (billion/day)*

<table>
<thead>
<tr>
<th></th>
<th>High Flows</th>
<th>Moist Conditions</th>
<th>Mid-Range Flows</th>
<th>Dry Conditions</th>
<th>Low Flows</th>
</tr>
</thead>
<tbody>
<tr>
<td>LA</td>
<td>238.28</td>
<td>86.08</td>
<td>38.16</td>
<td>16.46</td>
<td>8.29</td>
</tr>
<tr>
<td>WLA</td>
<td>12.94</td>
<td>12.94</td>
<td>12.94</td>
<td>12.94</td>
<td>12.94</td>
</tr>
<tr>
<td>MOS (10%)</td>
<td>27.91</td>
<td>11.00</td>
<td>5.68</td>
<td>3.27</td>
<td>2.36</td>
</tr>
<tr>
<td>TMDL = LA+WLA+MOS</td>
<td>279.13</td>
<td>110.02</td>
<td>56.78</td>
<td>32.67</td>
<td>23.59</td>
</tr>
</tbody>
</table>

* Design flows from the NPDES facilities were added to the flow estimates to account for the possibility that the facilities could discharge at this level. Without these modifications the WLA would exceed the TMDL during low flows.
### Table 128. Brown Levee Ditch-Kankakee River Characteristics and TMDL Summary (HUC12-103)

<table>
<thead>
<tr>
<th>Upstream Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Drainage Area</strong></td>
</tr>
<tr>
<td><strong>Sampling Station</strong></td>
</tr>
<tr>
<td><strong>Listed Segments</strong></td>
</tr>
<tr>
<td><strong>Land Use</strong></td>
</tr>
<tr>
<td><strong>Soils</strong></td>
</tr>
</tbody>
</table>

#### NPDES Facilities
- Lincoln Elementary School (IN0030503)
- South Haven Sewer Works WWTP (IN0030651)
- Kankakee Rest Area (IN0031275)
- Water Services Co Of Indiana (IN0039101)
- Demotte Municipal WWTP (IN0039926)

#### MS4 Communities
- La Porte County (INR040107): 14.93 square miles
- South Bend (INR040114): 3.42 square miles
- Plymouth (INR040064): 6.97 square miles
- Porter County (INR040140): 2.96 square miles
- Hillsborough County-Valparaiso (INR04073): 1.90 square miles

#### CSO Communities
- North Judson Municipal (IN0020877)-1 outfall
- Plymouth Municipal STP (IN0020991-10 outfalls)
- Nappanee Municipal STP (IN0021466)-Discharges Outside of The Kankakee/Iroquois Watershed

#### CAFOs
- All facilities upstream of HUC12-010 and HUC12-904
  - Bos Dairy Site # 4 (ING806155)
  - Dekock Feedlot, Inc. (ING804410)
  - Dekock Feedlot Inc. (ING801782)
  - Hamstra Farms (1063)
  - Vander Molen (3716)

#### CFOs
- All facilities upstream of HUC12-010 and HUC12-904
  - Walstra (3993)
  - Hamstra Brothers (4344)
  - Jonkman (2466)
  - H & H Feedlots (4432)
  - Northern Trust Farm #180 (4692)
  - Devries Farms Inc (92)

#### TMDL Allocations (billion/day)

<table>
<thead>
<tr>
<th></th>
<th>High Flows</th>
<th>Moist Conditions</th>
<th>Mid-Range Flows</th>
<th>Dry Conditions</th>
<th>Low Flows</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>LA</strong></td>
<td>10,848</td>
<td>3,972</td>
<td>1,736</td>
<td>724</td>
<td>342</td>
</tr>
<tr>
<td><strong>WLA</strong></td>
<td>330</td>
<td>105</td>
<td>105</td>
<td>105</td>
<td>105</td>
</tr>
<tr>
<td><strong>MOS (10%)</strong></td>
<td>1,242</td>
<td>453</td>
<td>205</td>
<td>92</td>
<td>50</td>
</tr>
<tr>
<td><strong>TMDL = LA+WLA+MOS</strong></td>
<td>12,420</td>
<td>4,530</td>
<td>2,046</td>
<td>921</td>
<td>497</td>
</tr>
</tbody>
</table>
7.1.2.5 Beaver Lake Ditch-Kankakee River Subwatershed (HUC 10-112)

The Beaver Lake Ditch has an area of approximately 99 square miles lies within Jasper, Kankakee, Lake, and Newton counties and does not encompass any urban areas (Figure 69). As in all of the above discussed subwatersheds, agriculture is the dominant land use here as well (Table 131). There is only one NPDES facility and two CAFOs as shown in Figure 70 and Figure 71 respectively. None of the impaired segments lie within this subwatershed; however, sampling at the two HUC 12s (Table 129) has indicated impaired conditions (Table 130). The reductions needed to achieve a geomean of 125 #/100 mL range from 29 to 78 percent.

Table 129. Stations Located in the Beaver Lake Ditch-Kankakee River Subwatershed

<table>
<thead>
<tr>
<th>HUC 12</th>
<th>HUC 12 Name</th>
<th>Station #</th>
<th>Stream Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>203</td>
<td>Lawler Ditch-Beaver Lake D</td>
<td>ID# 40</td>
<td>Lawler D</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ID# 42</td>
<td>Beaver Lake</td>
</tr>
<tr>
<td>205</td>
<td>Beaver Lake Ditch-Kankakee River</td>
<td>ID# 36</td>
<td>Kankakee R</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ID# 38</td>
<td>Beaver Lake</td>
</tr>
</tbody>
</table>

Table 130. Summary of Pathogen Data in the Beaver Lake Ditch-Kankakee River Subwatershed

<table>
<thead>
<tr>
<th>Station #</th>
<th>Period of Record</th>
<th>Total Number of Samples</th>
<th>Percent of Samples Exceeding E. coli WQS (#/100 mL)</th>
<th>Minimum (#/100 mL)</th>
<th>Geomean (#/100 mL)</th>
<th>Average (#/100 mL)</th>
<th>Maximum (#/100 mL)</th>
<th>Percent Reduction Based on Geomean (125/100mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>40</td>
<td>6/3/2008 - 7/1/2008</td>
<td>5</td>
<td>80 40</td>
<td>96</td>
<td>204</td>
<td>232</td>
<td>411</td>
<td>39%</td>
</tr>
<tr>
<td>42</td>
<td>6/3/2008 - 7/1/2008</td>
<td>5</td>
<td>100 60</td>
<td>133</td>
<td>222</td>
<td>231</td>
<td>308</td>
<td>44%</td>
</tr>
<tr>
<td>36</td>
<td>6/3/2008 - 7/1/2008</td>
<td>5</td>
<td>80 40</td>
<td>112</td>
<td>175</td>
<td>184</td>
<td>249</td>
<td>29%</td>
</tr>
<tr>
<td>38</td>
<td>6/3/2008 - 7/1/2008</td>
<td>5</td>
<td>100 100</td>
<td>365</td>
<td>560</td>
<td>595</td>
<td>866</td>
<td>78%</td>
</tr>
</tbody>
</table>
### Table 131. Land Use/Land Cover in the Beaver Lake Ditch-Kankakee River Subwatershed

<table>
<thead>
<tr>
<th>Land Use/Land Cover</th>
<th>Subwatershed</th>
<th>Area</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Acres</td>
<td>Square Miles</td>
</tr>
<tr>
<td>Agricultural Land</td>
<td></td>
<td>44,267.74</td>
<td>69.17</td>
</tr>
<tr>
<td>Forested Land</td>
<td></td>
<td>9,086.57</td>
<td>14.20</td>
</tr>
<tr>
<td>Developed Land</td>
<td></td>
<td>4,136.31</td>
<td>6.46</td>
</tr>
<tr>
<td>Grassland and Shrubs</td>
<td></td>
<td>2,393.18</td>
<td>3.74</td>
</tr>
<tr>
<td>Wetland</td>
<td></td>
<td>1,318.13</td>
<td>2.06</td>
</tr>
<tr>
<td>Pasture/Hay</td>
<td></td>
<td>1,150.89</td>
<td>1.80</td>
</tr>
<tr>
<td>Open Water</td>
<td></td>
<td>723.45</td>
<td>1.13</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>63,076.26</strong></td>
<td><strong>98.56</strong></td>
</tr>
</tbody>
</table>

**Figure 69. Location of Beaver Lake Ditch-Kankakee River Subwatershed (HUC10-112)**
Figure 70. NPDES Facilities in the Beaver Lake Ditch-Kankakee River Subwatershed (HUC10-112)
Table 132 and Table 133 summarize the subwatershed characteristics as well as the TMDL results for each of the HUC 12 subwatersheds. It should be noted that there are no current 303(d) listings in these HUCs; however, the sampling performed in 2008 suggests that several streams are impaired. Those streams will appear on the next 303(d) list and TMDLs for those streams are presented here.

There is one NPDES facility within the Beaver Lake Ditch subwatershed and the WLAs for the facilities were calculated based on their design flows and *E. coli* permit limits. There are five MS4 communities upstream of the Beaver Lake Ditch subwatershed outlet and the WLAs for the communities were calculated based on their area within the subwatershed and *E. coli* standards. There are three CSO communities with 26 outfalls upstream of this subwatershed outlet. WLAs for CSO communities were calculated based on the maximum observed CSO flow at each outfall and *E. coli* standards. The
individual WLAs are presented in Table 276. There are two CAFOs within this subwatershed and they receive a WLA of zero as described further in Section 7.3.

Table 132. Lawler Ditch-Beaver Lake Ditch Characteristics and TMDL Summary (HUC12-203)

<table>
<thead>
<tr>
<th>Upstream Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drainage Area</td>
</tr>
<tr>
<td>Sampling Station</td>
</tr>
<tr>
<td>Listed Segments</td>
</tr>
</tbody>
</table>

| Land Use                  | Agriculture: 78.62%; Developed Land: 5.38%; Forest: 11.90%; Other: 4.90% |
| Soils                     | A: 79.22%; B: 16.36%; C: 4.42%; D: 0.00%; Unknown: 0.00% |
| NPDES Facilities          | North Newton Jr Sr High School (IN0031143) |
| MS4 Communities           | None                                         |
| CSO Communities           | None                                         |
| CFOs                      | None                                         |
| CAFOs                     | Fair Oaks Dairy Farm North (ING806015) |
|                           | Herrema Dairy (ING806154)                     |

<table>
<thead>
<tr>
<th>TMDL Allocations (billion/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Flows</td>
</tr>
<tr>
<td>LA</td>
</tr>
<tr>
<td>WLA</td>
</tr>
<tr>
<td>MOS (10%)</td>
</tr>
<tr>
<td>TMDL = LA+WLA+MOS</td>
</tr>
</tbody>
</table>
### Table 133. Beaver Lake Ditch-Kankakee River Characteristics and TMDL Summary (HUC12-205)

#### Upstream Characteristics

<table>
<thead>
<tr>
<th>Drainage Area</th>
<th>1,799.67 square miles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sampling Station</td>
<td>36, 38</td>
</tr>
<tr>
<td>Listed Segments</td>
<td>None</td>
</tr>
<tr>
<td>Land Use</td>
<td>Agriculture: 68.56%; Developed Land: 8.52%; Forest: 13.80%; Other: 9.12%</td>
</tr>
<tr>
<td>Soils</td>
<td>A: 51.10%; B: 35.96%; C: 10.62%; D: 1.43%; Unknown: 0.90%</td>
</tr>
</tbody>
</table>

#### NPDES Facilities

- All facilities upstream of HUC12-103<sup>a</sup>
  - North Newton Jr Sr High School (IN0031143)

#### MS4 Communities

- La Porte County (INR040107): 14.93 square miles
- South Bend (INR040114): 3.42 square miles
- Plymouth (INR040064): 6.97 square miles
- Porter County (INR040140): 2.96 square miles
- Hillsborough County-Valparaiso (INR04073): 1.90 square miles

#### CSO Communities

- North Judson Municipal (IN0020877): 1 outfall
- Plymouth Municipal STP (IN0020991-10 outfalls)
- Nappanee Municipal STP (IN0021466)-Discharges Outside of The Kankakee/Iroquois Watershed

#### CAFOs

- Fair Oaks Dairy Farm North (ING806015)
- Herrema Dairy (ING806154)

#### CFOs

- All facilities upstream of HUC12-103<sup>a</sup>

#### TMDL Allocations (billion/day)

<table>
<thead>
<tr>
<th></th>
<th>High Flows</th>
<th>Moist Conditions</th>
<th>Mid-Range Flows</th>
<th>Dry Conditions</th>
<th>Low Flows</th>
</tr>
</thead>
<tbody>
<tr>
<td>LA</td>
<td>11,495</td>
<td>4,207</td>
<td>1,842</td>
<td>771</td>
<td>367</td>
</tr>
<tr>
<td>WLA</td>
<td>330</td>
<td>106</td>
<td>106</td>
<td>106</td>
<td>106</td>
</tr>
<tr>
<td>MOS (10%)</td>
<td>1,314</td>
<td>479</td>
<td>216</td>
<td>97</td>
<td>53</td>
</tr>
<tr>
<td>TMDL = LA+WLA+MOS</td>
<td>13,139</td>
<td>4,792</td>
<td>2,164</td>
<td>974</td>
<td>526</td>
</tr>
</tbody>
</table>

<sup>a</sup> Refers to Middle Kankakee HUC12
7.1.2.6 Singleton Ditch Subwatershed (HUC10-113)

The Singleton Ditch subwatershed has an area of nearly 254 square miles. Lake Delecarlia and Lowell are the two cities that lie completely within the subwatershed (Figure 72). Agriculture is the dominant land use in this subwatershed (Table 137). NPDES facilities and feeding operations in this subwatershed are displayed in Figure 73 and Figure 74, respectively. As listed in Table 134, one 303(d) listed segment is reported in this subwatershed. This segment was not sampled in 2008. *E. coli* data at seven locations (Table 135) suggested impaired conditions (Table 136). Station # 22 samples did not exceed the geomean standard, however 20 percent of samples did exceed the not-to-exceed standard. The required reduction based on the geomean of five samples ranges from 0 to 80 percent in this subwatershed.

<table>
<thead>
<tr>
<th>HUC 12</th>
<th>HUC 12 Name</th>
<th>Segment ID</th>
<th>Waterbody</th>
<th>Stream Length (miles)</th>
<th>Parameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>305</td>
<td>Bryant Ditch-Singleton Ditch</td>
<td>INK01D3_00</td>
<td>Singleton Ditch-Bryant Ditch</td>
<td>39.69</td>
<td><em>E. coli</em></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>HUC 12</th>
<th>HUC 12 Name</th>
<th>Station #</th>
<th>Stream Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>302</td>
<td>Fisher Pond-Stony Run</td>
<td>ID# 18</td>
<td>Stony Run D</td>
</tr>
<tr>
<td>304</td>
<td>Greisel Ditch</td>
<td>ID# 24</td>
<td>Greisel D</td>
</tr>
<tr>
<td>306</td>
<td>Cedar Creek</td>
<td>ID# 26</td>
<td>Cedar Cr</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ID# 28</td>
<td>Cedar Cr</td>
</tr>
<tr>
<td>307</td>
<td>Brown Ditch</td>
<td>ID# 22</td>
<td>Brown D</td>
</tr>
<tr>
<td>308</td>
<td>Bull Run-West Creek</td>
<td>ID# 30</td>
<td>West Cr</td>
</tr>
<tr>
<td>310</td>
<td>West Creek</td>
<td>ID# 32</td>
<td>West Cr</td>
</tr>
<tr>
<td>311</td>
<td>Bruce Ditch-Singleton Ditch</td>
<td>ID# 34</td>
<td>Singleton D</td>
</tr>
</tbody>
</table>
### Table 136. Summary of Pathogen Data in the Singleton Ditch Subwatershed

<table>
<thead>
<tr>
<th>Station #</th>
<th>Period of Record</th>
<th>Total Number of Samples</th>
<th>Percent of Samples Exceeding E. coli WQS (#/100 mL)</th>
<th>Minimum (#/100 mL)</th>
<th>Geomean (#/100 mL)</th>
<th>Average (#/100 mL)</th>
<th>Maximum (#/100 mL)</th>
<th>Percent Reduction Based on Geomean (125/100mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>18</td>
<td>6/3/2008 - 7/1/2008</td>
<td>5</td>
<td>100</td>
<td>517</td>
<td>635</td>
<td>641</td>
<td>770</td>
<td>80%</td>
</tr>
<tr>
<td>24</td>
<td>6/3/2008 - 7/1/2008</td>
<td>5</td>
<td>100</td>
<td>282</td>
<td>429</td>
<td>489</td>
<td>1,046</td>
<td>71%</td>
</tr>
<tr>
<td>26</td>
<td>6/3/2008 - 7/1/2008</td>
<td>5</td>
<td>100</td>
<td>378</td>
<td>485</td>
<td>500</td>
<td>687</td>
<td>74%</td>
</tr>
<tr>
<td>28</td>
<td>6/3/2008 - 7/1/2008</td>
<td>5</td>
<td>80</td>
<td>192</td>
<td>426</td>
<td>575</td>
<td>1,553</td>
<td>71%</td>
</tr>
<tr>
<td>22</td>
<td>6/3/2008 - 7/1/2008</td>
<td>5</td>
<td>20</td>
<td>42</td>
<td>125</td>
<td>152</td>
<td>291</td>
<td>0%</td>
</tr>
<tr>
<td>30</td>
<td>6/3/2008 - 7/1/2008</td>
<td>5</td>
<td>100</td>
<td>248</td>
<td>509</td>
<td>589</td>
<td>1,120</td>
<td>75%</td>
</tr>
<tr>
<td>32</td>
<td>6/3/2008 - 7/1/2008</td>
<td>5</td>
<td>100</td>
<td>245</td>
<td>561</td>
<td>740</td>
<td>1,733</td>
<td>78%</td>
</tr>
<tr>
<td>34</td>
<td>6/3/2008 - 7/1/2008</td>
<td>5</td>
<td>100</td>
<td>291</td>
<td>379</td>
<td>388</td>
<td>517</td>
<td>67%</td>
</tr>
</tbody>
</table>

### Table 137. Land Use/Land Cover in the Singleton Ditch Subwatershed

<table>
<thead>
<tr>
<th>Land Use/Land Cover</th>
<th>Subwatershed</th>
<th>Area</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Acres</td>
<td>Square Miles</td>
</tr>
<tr>
<td>Agricultural Land</td>
<td>111,924.88</td>
<td>174.88</td>
<td>68.87</td>
</tr>
<tr>
<td>Forested Land</td>
<td>14,865.92</td>
<td>23.23</td>
<td>9.15</td>
</tr>
<tr>
<td>Developed Land</td>
<td>16,737.59</td>
<td>26.15</td>
<td>10.30</td>
</tr>
<tr>
<td>Grassland and Shrubs</td>
<td>9,321.87</td>
<td>14.57</td>
<td>5.74</td>
</tr>
<tr>
<td>Pasture/Hay</td>
<td>7,149.52</td>
<td>11.17</td>
<td>4.40</td>
</tr>
<tr>
<td>Open Water</td>
<td>2,090.28</td>
<td>3.27</td>
<td>1.29</td>
</tr>
<tr>
<td>Wetland</td>
<td>429.67</td>
<td>0.67</td>
<td>0.26</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>162,519.72</strong></td>
<td><strong>253.94</strong></td>
<td><strong>100.00</strong></td>
</tr>
</tbody>
</table>

Final 185
Figure 72. Location of Singleton Ditch Subwatershed (HUC10-113)
Figure 73. NPDES Facilities in the Singleton Ditch Subwatershed (HUC10-113)
Table 138 through Table 145 summarize the subwatershed characteristics as well as the TMDL results for each of the HUC 12 subwatersheds. It should be noted that there are no current 303(d) listings in HUC 407; however, the sampling performed in 2008 suggests that several streams are impaired. Those streams will appear on the next 303(d) list and TMDLs for those streams are presented here.

There are six NPDES facilities within the Mill Creek subwatershed and the WLAs for the facilities were calculated based on their design flows and \textit{E. coli} permit limits. There are six MS4 communities upstream of the Beaver Lake Ditch subwatershed outlet and the WLAs for the communities were calculated based on their area within the subwatershed and \textit{E. coli} standards. There is one CSO community with 1 outfall upstream of this subwatershed outlet. WLAs for CSO communities were calculated based on the maximum observed CSO flow at each outfall and \textit{E. coli} standards. The individual WLAs are presented in Table 276. There are no CAFOs within this subwatershed.
Table 138. Fish Pond-Stony Run Characteristics and TMDL Summary (HUC12-302)

<table>
<thead>
<tr>
<th>Upstream Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Drainage Area</strong></td>
</tr>
<tr>
<td><strong>Sampling Station</strong></td>
</tr>
<tr>
<td><strong>Listed Segments</strong></td>
</tr>
<tr>
<td><strong>Land Use</strong></td>
</tr>
<tr>
<td><strong>Soils</strong></td>
</tr>
<tr>
<td><strong>NPDES Facilities</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>MS4 Communities</strong></td>
</tr>
<tr>
<td><strong>CSO Communities</strong></td>
</tr>
<tr>
<td><strong>CAFOs</strong></td>
</tr>
<tr>
<td><strong>CFOs</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TMDL Allocations (billion/day)</th>
<th>High Flows</th>
<th>Moist Conditions</th>
<th>Mid-Range Flows</th>
<th>Dry Conditions</th>
<th>Low Flows</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>LA</strong></td>
<td>261.43</td>
<td>71.75</td>
<td>32.87</td>
<td>15.33</td>
<td>3.9</td>
</tr>
<tr>
<td><strong>WLA</strong></td>
<td>14.07</td>
<td>5.25</td>
<td>5.25</td>
<td>5.25</td>
<td>5.25</td>
</tr>
<tr>
<td><strong>MOS (10%)</strong></td>
<td>30.6</td>
<td>8.55</td>
<td>4.23</td>
<td>2.29</td>
<td>1.01</td>
</tr>
<tr>
<td><strong>TMDL = LA+WLA+MOS</strong></td>
<td>306.1</td>
<td>85.55</td>
<td>42.35</td>
<td>22.87</td>
<td>10.16</td>
</tr>
</tbody>
</table>
Table 139. Greisel Ditch Characteristics and TMDL Summary (HUC12-304)

<table>
<thead>
<tr>
<th>Upstream Characteristics</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Drainage Area</strong></td>
<td>29.30 square miles</td>
</tr>
<tr>
<td><strong>Sampling Station</strong></td>
<td>24</td>
</tr>
<tr>
<td><strong>Listed Segments</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>Land Use</strong></td>
<td>Agriculture: 80.37%; Developed Land: 7.03%; Forest: 5.43%; Other: 7.17%</td>
</tr>
<tr>
<td><strong>Soils</strong></td>
<td>A: 9.47%; B: 29.47%; C: 57.89%; D: 2.11%; Unknown: 1.05%</td>
</tr>
<tr>
<td><strong>NPDES Facilities</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>MS4 Communities</strong></td>
<td>Town of Lowell (INR040046): 0.91 square miles</td>
</tr>
<tr>
<td><strong>CSO Communities</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>CAFOs</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>CFOs</strong></td>
<td>None</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TMDL Allocations (billion/day)</th>
<th>High Flows</th>
<th>Moist Conditions</th>
<th>Mid-Range Flows</th>
<th>Dry Conditions</th>
<th>Low Flows</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>LA</strong></td>
<td>229.57</td>
<td>66.21</td>
<td>32.78</td>
<td>17.70</td>
<td>7.87</td>
</tr>
<tr>
<td><strong>WLA</strong></td>
<td>7.36</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td><strong>MOS (10%)</strong></td>
<td>26.32</td>
<td>7.36</td>
<td>3.64</td>
<td>1.97</td>
<td>0.87</td>
</tr>
<tr>
<td><strong>TMDL = LA+WLA+MOS</strong></td>
<td>263.25</td>
<td>73.57</td>
<td>36.42</td>
<td>19.67</td>
<td>8.74</td>
</tr>
</tbody>
</table>
Table 140. Bryant Ditch-Singleton Ditch Characteristics and TMDL Summary (HUC12-305)

<table>
<thead>
<tr>
<th>Upstream Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Drainage Area</strong></td>
</tr>
<tr>
<td><strong>Sampling Station</strong></td>
</tr>
<tr>
<td><strong>Listed Segments</strong></td>
</tr>
<tr>
<td><strong>Land Use</strong></td>
</tr>
<tr>
<td><strong>Soils</strong></td>
</tr>
<tr>
<td><strong>NPDES Facilities</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>MS4 Communities</strong></td>
</tr>
<tr>
<td><strong>CSO Communities</strong></td>
</tr>
<tr>
<td><strong>CAFOs</strong></td>
</tr>
<tr>
<td><strong>CFOs</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TMDL Allocations (billion/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Flows</td>
</tr>
<tr>
<td><strong>LA</strong></td>
</tr>
<tr>
<td><strong>WLA</strong></td>
</tr>
<tr>
<td><strong>MOS (10%)</strong></td>
</tr>
<tr>
<td><strong>TMDL = LA+WLA+MOS</strong></td>
</tr>
</tbody>
</table>
### Table 141. Cedar Creek Characteristics and TMDL Summary (HUC12-306)

#### Upstream Characteristics

<table>
<thead>
<tr>
<th>Drainage Area</th>
<th>31.29 square miles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sampling Station</td>
<td>26.28</td>
</tr>
<tr>
<td>Listed Segments</td>
<td>None</td>
</tr>
<tr>
<td><strong>Land Use</strong></td>
<td>Agriculture: 37.56%; Developed Land: 21.75%; Forest: 17.79%; Other: 22.90%</td>
</tr>
<tr>
<td><strong>Soils</strong></td>
<td>A: 3.88%; B: 9.22%; C: 80.58%; D: 0.49%; Unknown: 5.83%</td>
</tr>
</tbody>
</table>

#### NPDES Facilities

- Lowell WWTP (IN0023621)
- Dalecarlia Utilities Lake Dale (IN0033081)
- Buckhill Estates WWTP (IN0058548)

#### MS4 Communities

- Town of Lowell (INR040046): 2.82 square miles
- City of Crown Point (INR040054): 0.35 square miles
- Town of Cedar Lake (INR040075): 6.35 square miles
- Lake County (INR040124): 9.38 square miles

#### CSO Communities

- Lowell Municipal STP (IN0023621)-1 outfall

#### CAFOs

- None

#### CFOs

- Huseman Farm Inc. (810)

#### TMDL Allocations (billion/day)*

<table>
<thead>
<tr>
<th></th>
<th>High Flows</th>
<th>Moist Conditions</th>
<th>Mid-Range Flows</th>
<th>Dry Conditions</th>
<th>Low Flows</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>LA</strong></td>
<td>450.73</td>
<td>95.74</td>
<td>34.83</td>
<td>17.68</td>
<td>4.94</td>
</tr>
<tr>
<td><strong>WLA</strong></td>
<td>496.84</td>
<td>19.23</td>
<td>19.23</td>
<td>19.23</td>
<td>19.23</td>
</tr>
<tr>
<td><strong>MOS (10%)</strong></td>
<td>105.29</td>
<td>12.77</td>
<td>6</td>
<td>4.09</td>
<td>2.68</td>
</tr>
<tr>
<td><strong>TMDL = LA+WLA+MOS</strong></td>
<td>1052.86</td>
<td>127.74</td>
<td>60.06</td>
<td>41</td>
<td>26.85</td>
</tr>
</tbody>
</table>

* Design flows from the NPDES facilities and Lowell Municipal STP CSO were added to the originally estimated flows. Without these modifications the WLA would exceed the TMDL during high and low flows.
Table 142. Brown Ditch Characteristics and TMDL Summary (HUC12-307)

<table>
<thead>
<tr>
<th>Upstream Characteristics</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Drainage Area</strong></td>
<td>21.35 square miles</td>
</tr>
<tr>
<td><strong>Sampling Station</strong></td>
<td>22</td>
</tr>
<tr>
<td><strong>Listed Segments</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>Land Use</strong></td>
<td>Agriculture: 89.24%; Developed Land: 4.24%; Forest: 2.99%; Other: 3.53%</td>
</tr>
<tr>
<td><strong>Soils</strong></td>
<td>A: 63.89%; B: 36.11%; C: 0.00%; D: 0.00%; Unknown: 0.00%</td>
</tr>
<tr>
<td><strong>NPDES Facilities</strong></td>
<td>Schneider WWTP (IN0040592)</td>
</tr>
<tr>
<td><strong>MS4 Communities</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>CSO Communities</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>CAFOs</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>CFOs</strong></td>
<td>None</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TMDL Allocations (billion/day)</th>
<th>High Flows</th>
<th>Moist Conditions</th>
<th>Mid-Range Flows</th>
<th>Dry Conditions</th>
<th>Low Flows</th>
</tr>
</thead>
<tbody>
<tr>
<td>LA</td>
<td>172.33</td>
<td>47.94</td>
<td>23.58</td>
<td>12.59</td>
<td>5.42</td>
</tr>
<tr>
<td>WLA</td>
<td>0.31</td>
<td>0.31</td>
<td>0.31</td>
<td>0.31</td>
<td>0.31</td>
</tr>
<tr>
<td>MOS (10%)</td>
<td>19.18</td>
<td>5.36</td>
<td>2.65</td>
<td>1.43</td>
<td>0.64</td>
</tr>
<tr>
<td>TMDL = LA+WLA+MOS</td>
<td>191.82</td>
<td>53.61</td>
<td>26.54</td>
<td>14.33</td>
<td>6.37</td>
</tr>
</tbody>
</table>
### Table 143. Bull Run -West Creek Characteristics and TMDL Summary (HUC12-308)

<table>
<thead>
<tr>
<th><strong>Upstream Characteristics</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Drainage Area</strong></td>
<td>21.53 square miles</td>
</tr>
<tr>
<td><strong>Sampling Station</strong></td>
<td>30</td>
</tr>
<tr>
<td><strong>Listed Segments</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>Land Use</strong></td>
<td>Agriculture: 39.24%; Developed Land: 25.16%; Forest: 12.95%; Other: 22.65%</td>
</tr>
<tr>
<td><strong>Soils</strong></td>
<td>A: 4.20%; B: 11.19%; C: 81.12%; D: 2.10%; Unknown: 1.40%</td>
</tr>
<tr>
<td><strong>NPDES Facilities</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>MS4 Communities</strong></td>
<td>Town of Cedar Lake (INR040075): 0.96 square miles</td>
</tr>
<tr>
<td><strong>CSO Communities</strong></td>
<td>Town of St. John (INR040047): 4.29 square miles</td>
</tr>
<tr>
<td><strong>CAFOs</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>CFOs</strong></td>
<td>Kleine (661)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>TMDL Allocations (billion/day)</strong></th>
<th><strong>High Flows</strong></th>
<th><strong>Moist Conditions</strong></th>
<th><strong>Mid-Range Flows</strong></th>
<th><strong>Dry Conditions</strong></th>
<th><strong>Low Flows</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>LA</strong></td>
<td>131.65</td>
<td>48.65</td>
<td>24.09</td>
<td>13.01</td>
<td>5.78</td>
</tr>
<tr>
<td><strong>WLA</strong></td>
<td>42.45</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>MOS (10%)</strong></td>
<td>19.34</td>
<td>5.41</td>
<td>2.67</td>
<td>1.44</td>
<td>0.64</td>
</tr>
<tr>
<td><strong>TMDL = LA+WLA+MOS</strong></td>
<td>193.44</td>
<td>54.06</td>
<td>26.76</td>
<td>14.45</td>
<td>6.42</td>
</tr>
</tbody>
</table>
Table 144.  West Creek Characteristics and TMDL Summary (HUC12-310)

<table>
<thead>
<tr>
<th>Upstream Characteristics</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Drainage Area</td>
<td>55.57 square miles</td>
</tr>
<tr>
<td>Sampling Station</td>
<td>32</td>
</tr>
<tr>
<td>Listed Segments</td>
<td>None</td>
</tr>
<tr>
<td>Land Use</td>
<td>Agriculture: 54.49%; Developed Land: 13.45%; Forest: 13.06%; Other: 19%</td>
</tr>
<tr>
<td>Soils</td>
<td>A: 4.85%; B: 15.09%; C: 77.36%; D: 2.16%; Unknown: 0.54%</td>
</tr>
<tr>
<td>NPDES Facilities</td>
<td>None</td>
</tr>
<tr>
<td>MS4 Communities</td>
<td>Town of Cedar Lake (INR040075): 1.35 square miles</td>
</tr>
<tr>
<td></td>
<td>Town of St. John (INR040047): 4.29 square miles</td>
</tr>
<tr>
<td>CSO Communities</td>
<td>None</td>
</tr>
<tr>
<td>CAFOs</td>
<td>None</td>
</tr>
<tr>
<td>CFOs</td>
<td>Kleine (661)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TMDL Allocations (billion/day)</th>
<th>High Flows</th>
<th>Moist Conditions</th>
<th>Mid-Range Flows</th>
<th>Dry Conditions</th>
<th>Low Flows</th>
</tr>
</thead>
<tbody>
<tr>
<td>LA</td>
<td>403.74</td>
<td>125.58</td>
<td>62.17</td>
<td>33.57</td>
<td>14.92</td>
</tr>
<tr>
<td>WLA</td>
<td>45.61</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>MOS (10%)</td>
<td>49.92</td>
<td>13.95</td>
<td>6.90</td>
<td>3.73</td>
<td>1.66</td>
</tr>
<tr>
<td>TMDL = LA+WLA+MOS</td>
<td>499.27</td>
<td>139.53</td>
<td>69.07</td>
<td>37.30</td>
<td>16.58</td>
</tr>
</tbody>
</table>
Table 145. Bruce Ditch-Singleton Ditch Characteristics and TMDL Summary (HUC12-311)

<table>
<thead>
<tr>
<th><strong>Upstream Characteristics</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Drainage Area</strong></td>
<td>219.77 square miles</td>
</tr>
<tr>
<td><strong>Sampling Station</strong></td>
<td>34</td>
</tr>
<tr>
<td><strong>Listed Segments</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>Land Use</strong></td>
<td>Agriculture: 66.57%; Developed Land: 11.16%; Forest: 9.73%; Other: 12.54%</td>
</tr>
<tr>
<td><strong>Soils</strong></td>
<td>A: 14.41%; B: 23.47%; C: 59.44%; D: 1.03%; Unknown: 1.65%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>NPDES Facilities</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Winfield Elementary School (IN0031127)</td>
<td></td>
</tr>
<tr>
<td>Dalecarlia Utilities Lake Dale (IN0033081)</td>
<td></td>
</tr>
<tr>
<td>Twin Lakes Utilities (IN0037176)</td>
<td></td>
</tr>
<tr>
<td>Schneider WWTP (IN0040592)</td>
<td></td>
</tr>
<tr>
<td>Buckhill Estates WWTP (IN0058548)</td>
<td></td>
</tr>
<tr>
<td>Lowell WWTP (IN0023621)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>MS4 Communities</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Town of Lowell (INR040046): 4.16 square miles</td>
<td></td>
</tr>
<tr>
<td>City of Crown Point (INR040054): 0.35 square miles</td>
<td></td>
</tr>
<tr>
<td>Town of Cedar Lake (INR040075): 7.70 square miles</td>
<td></td>
</tr>
<tr>
<td>Lake County (INR040124): 9.38 square miles</td>
<td></td>
</tr>
<tr>
<td>Lakes of the Four Seasons POA (INR040007): 1.09 square miles</td>
<td></td>
</tr>
<tr>
<td>Town of St. John (INR040047): 4.29 square miles</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>CSO Communities</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Lowell Municipal STP (IN0023621)-1 outfall</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>CAFOs</strong></th>
<th>None</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th><strong>CFOs</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Bryantfarm (1467)</td>
<td></td>
</tr>
<tr>
<td>Huseman Farm Inc. (810)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>TMDL Allocations (billion/day)</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>High Flows</strong></td>
<td></td>
</tr>
<tr>
<td>LA</td>
<td>1513.98</td>
</tr>
<tr>
<td>WLA</td>
<td>263.11</td>
</tr>
<tr>
<td><strong>MOS (10%)</strong></td>
<td>197.45</td>
</tr>
<tr>
<td><strong>TMDL = LA+WLA+MOS</strong></td>
<td>1974.54</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Mid-Range Flows</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>LA</td>
<td>221.08</td>
</tr>
<tr>
<td>WLA</td>
<td>24.79</td>
</tr>
<tr>
<td><strong>MOS (10%)</strong></td>
<td>27.31</td>
</tr>
<tr>
<td><strong>TMDL = LA+WLA+MOS</strong></td>
<td>273.18</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Dry Conditions</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>LA</td>
<td>107.98</td>
</tr>
<tr>
<td>WLA</td>
<td>24.79</td>
</tr>
<tr>
<td><strong>MOS (10%)</strong></td>
<td>14.75</td>
</tr>
<tr>
<td><strong>TMDL = LA+WLA+MOS</strong></td>
<td>147.52</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Low Flows</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>LA</td>
<td>34.22</td>
</tr>
<tr>
<td>WLA</td>
<td>24.79</td>
</tr>
<tr>
<td><strong>MOS (10%)</strong></td>
<td>6.55</td>
</tr>
<tr>
<td><strong>TMDL = LA+WLA+MOS</strong></td>
<td>65.56</td>
</tr>
</tbody>
</table>
7.1.3 Yellow River Subwatershed

Within the Yellow River major subwatershed there are three HUC 10 watersheds and 23 HUC 12 subwatersheds as shown in Table 146. The following sections provide a brief description of each HUC 10 subwatershed and the TMDL allocations.

Table 146. Hydrologic Unit Code (HUC 10 and 12) in the Yellow River Subwatershed

<table>
<thead>
<tr>
<th>HUC 10</th>
<th>HUC 10 Name</th>
<th>HUC 12</th>
<th>HUC 12 Name</th>
<th>Area (sq. miles)</th>
</tr>
</thead>
<tbody>
<tr>
<td>103</td>
<td>Headwaters Yellow River</td>
<td>301</td>
<td>Lateral Ditch No 5</td>
<td>16.81</td>
</tr>
<tr>
<td></td>
<td></td>
<td>302</td>
<td>Kline Rouch Ditch-Yellow River</td>
<td>37.27</td>
</tr>
<tr>
<td></td>
<td></td>
<td>303</td>
<td>Amery Ditch</td>
<td>27.02</td>
</tr>
<tr>
<td></td>
<td></td>
<td>304</td>
<td>Headwaters Stock Ditch</td>
<td>22.71</td>
</tr>
<tr>
<td></td>
<td></td>
<td>305</td>
<td>West Bunch Branch-Stock Ditch</td>
<td>26.14</td>
</tr>
<tr>
<td></td>
<td></td>
<td>306</td>
<td>Fleugel Ditch-Dausman Ditch</td>
<td>17.87</td>
</tr>
<tr>
<td></td>
<td></td>
<td>307</td>
<td>Lemler Ditch-Dausman Ditch</td>
<td>27.03</td>
</tr>
<tr>
<td></td>
<td></td>
<td>308</td>
<td>Dausman Ditch</td>
<td>25.99</td>
</tr>
<tr>
<td></td>
<td></td>
<td>309</td>
<td>Lake of the Woods-Yellow river</td>
<td>34.03</td>
</tr>
<tr>
<td></td>
<td></td>
<td>310</td>
<td>Stone Ditch-Yellow River</td>
<td>22.24</td>
</tr>
<tr>
<td></td>
<td></td>
<td>311</td>
<td>Elmer Seltenright Ditch-Yellow River</td>
<td>18.40</td>
</tr>
<tr>
<td></td>
<td></td>
<td>312</td>
<td>Milner Seltenright Ditch-Yellow River</td>
<td>17.26</td>
</tr>
<tr>
<td>105</td>
<td>Yellow River</td>
<td>501</td>
<td>Town of Argos-Wolf Creek</td>
<td>33.97</td>
</tr>
<tr>
<td></td>
<td></td>
<td>502</td>
<td>Dixon Lake-Yellow River</td>
<td>26.18</td>
</tr>
<tr>
<td></td>
<td></td>
<td>503</td>
<td>Clifton Ditch-Yellow River</td>
<td>18.84</td>
</tr>
<tr>
<td></td>
<td></td>
<td>504</td>
<td>Eagle Creek</td>
<td>37.96</td>
</tr>
<tr>
<td></td>
<td></td>
<td>505</td>
<td>Bickle Ditch-Yellow River</td>
<td>21.27</td>
</tr>
<tr>
<td></td>
<td></td>
<td>506</td>
<td>Cavanaugh Ditch-Yellow River</td>
<td>7.66</td>
</tr>
<tr>
<td>106</td>
<td>Kline Arm</td>
<td>601</td>
<td>Hook Run-Bogus Run</td>
<td>26.71</td>
</tr>
<tr>
<td></td>
<td></td>
<td>602</td>
<td>Cedar Lake Ditch-Craigmile Ditch</td>
<td>19.90</td>
</tr>
<tr>
<td></td>
<td></td>
<td>603</td>
<td>Craigmile Ditch-Kline Arm</td>
<td>33.12</td>
</tr>
<tr>
<td></td>
<td></td>
<td>604</td>
<td>Pine Creek-Bogus Run</td>
<td>20.37</td>
</tr>
</tbody>
</table>
7.1.3.1 **Headwaters Yellow River Subwatershed (HUC10-103)**

The Headwaters Yellow River HUC 10 subwatershed has a drainage area of approximately 293 square miles and lies in St. Joseph, Elkhart, Marshall and Kosciusko counties (Figure 75). Cities within the subwatershed include Plymouth, Bremen and Nappanee. Agriculture is the dominant land use and constitutes about 76 percent of the subwatershed area (Table 150). NPDES facilities and CAFOs located in this subwatershed are shown in Figure 76 and Figure 77, respectively. Six waterbody segments are impaired for *E. coli* in this subwatershed as shown in Table 147 and the sampling stations in this subwatershed are listed in Table 148. A summary of the *E. coli* data is shown in Table 149. All samples in this subwatershed exceeded the maximum 235 #/100 mL standard. The required reduction of pathogen concentrations based on the geomean standard of 5 samples ranges from 85 to 93 percent.

<table>
<thead>
<tr>
<th>HUC 12</th>
<th>HU C12 Name</th>
<th>Segment ID</th>
<th>Waterbody</th>
<th>Stream Length (miles)</th>
<th>Parameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>302</td>
<td>Kline Rouch Ditch-Yellow River</td>
<td>INK0153_T1016</td>
<td>Unnamed Ditch</td>
<td>0.76</td>
<td><em>E. coli</em></td>
</tr>
<tr>
<td>303</td>
<td>Amery Ditch</td>
<td>INK0154_00</td>
<td>Armey Ditch - Headwaters</td>
<td>17.41</td>
<td><em>E. coli</em></td>
</tr>
<tr>
<td></td>
<td></td>
<td>INK0155_00</td>
<td>Yellow River - Armey Ditch - Albert Zeiger Ditch</td>
<td>9.57</td>
<td><em>E. coli</em></td>
</tr>
<tr>
<td>309</td>
<td>Lake of the Woods-Yellow River</td>
<td>INK0158_00</td>
<td>Yellow River - Riverside Church</td>
<td>14.73</td>
<td><em>E. coli</em></td>
</tr>
<tr>
<td>305</td>
<td>West Bunch Branch-Stock Ditch</td>
<td>INK0157_00</td>
<td>Stock Ditch - Bunch Branches</td>
<td>14.4</td>
<td><em>E. coli</em></td>
</tr>
<tr>
<td>312</td>
<td>Milner Seltenright Ditch-Yellow River</td>
<td>INK015F_00</td>
<td>Yellow River - Milner Seltenright Ditch</td>
<td>17.14</td>
<td><em>E. coli</em></td>
</tr>
</tbody>
</table>

Table 148. **Station Locations in the Headwaters Yellow River Subwatershed**

<table>
<thead>
<tr>
<th>HUC 12</th>
<th>HU C12 Name</th>
<th>Station #</th>
<th>Stream Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>311</td>
<td>Elmer Seltenright Ditch-Yellow River</td>
<td>77</td>
<td>Elmer Seltenright Ditch</td>
</tr>
<tr>
<td>312</td>
<td>Milner Seltenright Ditch-Yellow River</td>
<td>79</td>
<td>Yellow River</td>
</tr>
<tr>
<td>309</td>
<td>Lake of the Woods-Yellow river</td>
<td>81</td>
<td>Yellow River</td>
</tr>
<tr>
<td>307</td>
<td>Lemler Ditch-Dausman Ditch</td>
<td>83</td>
<td>Dausman D</td>
</tr>
<tr>
<td>303</td>
<td>Amery Ditch</td>
<td>85</td>
<td>Armey D</td>
</tr>
<tr>
<td>305</td>
<td>West Bunch Branch-Stock Ditch</td>
<td>87</td>
<td>Stock D</td>
</tr>
<tr>
<td>309</td>
<td>Lake of the Woods-Yellow river</td>
<td>89</td>
<td>Yellow River</td>
</tr>
</tbody>
</table>
### Table 149. Summary of Pathogen Data in the Yellow River Subwatershed

<table>
<thead>
<tr>
<th>Station #</th>
<th>Period of Record</th>
<th>Total Number of Samples</th>
<th>Percent of Samples Exceeding E. coli WQS (#/100 mL)</th>
<th>Minimum (#/100 mL)</th>
<th>Geomean (#/100 mL)</th>
<th>Average (#/100 mL)</th>
<th>Maximum (#/100 mL)</th>
<th>Percent Reduction Based on Geomean (125/100 mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>85</td>
<td>6/3/2008 - 7/1/2008</td>
<td>5</td>
<td>100</td>
<td>770</td>
<td>1,112</td>
<td>1,164</td>
<td>1,733</td>
<td>89%</td>
</tr>
<tr>
<td>87</td>
<td>6/3/2008 - 7/1/2008</td>
<td>5</td>
<td>100</td>
<td>517</td>
<td>983</td>
<td>1,173</td>
<td>2,419</td>
<td>87%</td>
</tr>
<tr>
<td>83</td>
<td>6/3/2008 - 7/1/2008</td>
<td>5</td>
<td>100</td>
<td>1,120</td>
<td>1,676</td>
<td>1,762</td>
<td>2,420</td>
<td>93%</td>
</tr>
<tr>
<td>81</td>
<td>6/3/2008 - 7/1/2008</td>
<td>5</td>
<td>100</td>
<td>461</td>
<td>943</td>
<td>1,205</td>
<td>2,419</td>
<td>87%</td>
</tr>
<tr>
<td>89</td>
<td>6/3/2008 - 7/1/2008</td>
<td>5</td>
<td>100</td>
<td>1,046</td>
<td>1,347</td>
<td>1,418</td>
<td>2,419</td>
<td>91%</td>
</tr>
<tr>
<td>77</td>
<td>6/3/2008 - 7/1/2008</td>
<td>5</td>
<td>100</td>
<td>579</td>
<td>1,225</td>
<td>1,384</td>
<td>2,419</td>
<td>90%</td>
</tr>
<tr>
<td>79</td>
<td>6/3/2008 - 7/1/2008</td>
<td>5</td>
<td>100</td>
<td>461</td>
<td>853</td>
<td>1,050</td>
<td>2,419</td>
<td>85%</td>
</tr>
</tbody>
</table>

### Table 150. Land Use/Land Cover in the Headwaters Yellow River Subwatershed

<table>
<thead>
<tr>
<th>Subwatershed</th>
<th>Land Use/Land Cover</th>
<th>Area</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Acres</td>
<td>Square Miles</td>
</tr>
<tr>
<td>Agricultural Land</td>
<td>142,914</td>
<td>223</td>
<td>76.38</td>
</tr>
<tr>
<td>Developed Land</td>
<td>14,462</td>
<td>23</td>
<td>7.73</td>
</tr>
<tr>
<td>Forested Land</td>
<td>13,808</td>
<td>22</td>
<td>7.38</td>
</tr>
<tr>
<td>Pasture/Hay</td>
<td>10,112</td>
<td>16</td>
<td>5.4</td>
</tr>
<tr>
<td>Wetland</td>
<td>4,235</td>
<td>7</td>
<td>2.26</td>
</tr>
<tr>
<td>Grassland and Shrubs</td>
<td>863</td>
<td>1</td>
<td>0.46</td>
</tr>
<tr>
<td>Open Water</td>
<td>707</td>
<td>1</td>
<td>0.38</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>187,101</strong></td>
<td><strong>292</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>
Figure 75. Location of Yellow River Subwatershed (HUC 10-103)
Figure 76. NPDES Facilities in Yellow River Subwatershed (HUC 10-103)
Figure 77. Feeding Operations in the Yellow River Subwatershed (HUC 10-103)

Table 151 through Table 156 summarize the subwatershed characteristics as well as the TMDL results for each of the HUC 12 subwatersheds. It should be noted that there are no current 303(d) listings in HUC 307 or HUC 311; however, the sampling performed in 2008 suggests that several streams are impaired. Those streams will appear on the next 303(d) list and TMDLs for those streams are presented here.

There are four NPDES facilities within the Headwaters Yellow River subwatershed and the WLAs for the facilities were calculated based on their design flows and *E. coli* permit limits. There is one MS4 community upstream of the Headwaters Yellow River subwatershed outlet and the WLAs for the community were calculated based on the area within the watersheds drainage and *E. coli* standards. WLAs for CSO communities were calculated based on the maximum observed CSO flow at each outfall and *E. coli* standards. The individual WLAs are presented in Table 276. There are three CAFOs within this subwatershed and they receive a WLA of zero as described further in Section 7.3.
Table 151. Kline Rouch Ditch-Yellow River Characteristics and TMDL Summary (HUC 12-302)

<table>
<thead>
<tr>
<th>Upstream Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drainage Area</td>
</tr>
<tr>
<td>Sampling Station</td>
</tr>
<tr>
<td>Listed Segments</td>
</tr>
<tr>
<td>Land Use</td>
</tr>
<tr>
<td>Soils</td>
</tr>
<tr>
<td>NPDES Facilities</td>
</tr>
<tr>
<td>MS4 Communities</td>
</tr>
<tr>
<td>CSO Communities</td>
</tr>
<tr>
<td>CAFOs</td>
</tr>
<tr>
<td>CFOs</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TMDL Allocations (billion/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allocation Category</td>
</tr>
<tr>
<td>LA</td>
</tr>
<tr>
<td>WLA</td>
</tr>
<tr>
<td>MOS (10%)</td>
</tr>
<tr>
<td>TMDL = LA+WLA+MOS</td>
</tr>
</tbody>
</table>
Table 152. Armery Ditch Characteristics and TMDL Summary (HUC 12-303)

<table>
<thead>
<tr>
<th><strong>Upstream Characteristics</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Drainage Area</strong></td>
<td>27.02 square miles</td>
</tr>
<tr>
<td><strong>Sampling Station</strong></td>
<td>85</td>
</tr>
<tr>
<td><strong>Listed Segments</strong></td>
<td>INK0154, INK0155_00</td>
</tr>
<tr>
<td><strong>Land Use</strong></td>
<td>Agriculture: 66%; Developed Land: 13%; Forest: 9%; Other: 12%</td>
</tr>
<tr>
<td><strong>Soils</strong></td>
<td>A: 7%; B: 54%; C: 38%; D: 1%</td>
</tr>
<tr>
<td><strong>NPDES facilities</strong></td>
<td>Nappanee Municipal STP (IN0021466)-Discharges outside of the Kankakee/Iroquois Watershed</td>
</tr>
<tr>
<td><strong>MS4 Communities</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>CSO Communities</strong></td>
<td>Nappanee Municipal STP (IN0021466)-Discharges Outside of The Kankakee/Iroquois Watershed</td>
</tr>
<tr>
<td><strong>CAFOs</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>CFOs</strong></td>
<td>Evan L Huff (ID # 4254)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TMDL Allocations (billion/day)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Allocation Category</strong></td>
<td><strong>High Flows</strong></td>
</tr>
<tr>
<td><strong>LA</strong></td>
<td>227.64</td>
</tr>
<tr>
<td><strong>WLA</strong></td>
<td>0.00</td>
</tr>
<tr>
<td><strong>MOS (10%)</strong></td>
<td>25.29</td>
</tr>
<tr>
<td><strong>TMDL = LA+WLA+MOS</strong></td>
<td>252.93</td>
</tr>
</tbody>
</table>
Table 153.  West Bunch Branch-Stock Ditch Characteristics and TMDL Summary (HUC 12-305)

<table>
<thead>
<tr>
<th>Upstream Characteristics</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Drainage Area</td>
<td>44.47 square miles</td>
</tr>
<tr>
<td>Sampling Station</td>
<td>87</td>
</tr>
<tr>
<td>Listed Segments</td>
<td>INK0157_00</td>
</tr>
<tr>
<td>Land Use</td>
<td>Agriculture: 73%; Developed Land: 5%; Forest: 8%; Other: 14%</td>
</tr>
<tr>
<td>Soils</td>
<td>A: 10%; B: 55%; C: 33%; D: 2%</td>
</tr>
<tr>
<td>NPDES Facilities</td>
<td>Lake of the Woods Regional Sewer District (IN0057002)</td>
</tr>
<tr>
<td>MS4 Communities</td>
<td>None</td>
</tr>
<tr>
<td>CSO Communities</td>
<td>None</td>
</tr>
<tr>
<td>CAFOs</td>
<td>Walnut Grove Dairy (INA006440)</td>
</tr>
<tr>
<td>CFOs</td>
<td>None</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TMDL Allocations (billion/day)</th>
<th>High Flows</th>
<th>Moist Conditions</th>
<th>Mid-Range Flows</th>
<th>Dry Conditions</th>
<th>Low Flows</th>
</tr>
</thead>
<tbody>
<tr>
<td>LA</td>
<td>374.01</td>
<td>91.36</td>
<td>43.9</td>
<td>23.51</td>
<td>12.68</td>
</tr>
<tr>
<td>WLA</td>
<td>0.64</td>
<td>0.64</td>
<td>0.64</td>
<td>0.64</td>
<td>0.64</td>
</tr>
<tr>
<td>MOS (10%)</td>
<td>41.62</td>
<td>10.22</td>
<td>4.95</td>
<td>2.68</td>
<td>1.48</td>
</tr>
<tr>
<td>TMDL = LA+WLA+MOS</td>
<td>416.27</td>
<td>102.22</td>
<td>49.49</td>
<td>26.83</td>
<td>14.8</td>
</tr>
</tbody>
</table>
Table 154. Lemler Ditch Dausman Ditch Subwatershed Characteristics and TMDL Summary (HUC 12-307)

<table>
<thead>
<tr>
<th>Upstream Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Drainage Area</strong></td>
</tr>
<tr>
<td><strong>Sampling Station</strong></td>
</tr>
<tr>
<td><strong>Listed Segments</strong></td>
</tr>
<tr>
<td><strong>Land Use</strong></td>
</tr>
<tr>
<td><strong>Soils</strong></td>
</tr>
<tr>
<td><strong>NPDES Facilities</strong></td>
</tr>
<tr>
<td><strong>MS4 Communities</strong></td>
</tr>
<tr>
<td><strong>CSO Communities</strong></td>
</tr>
<tr>
<td><strong>CAFOs</strong></td>
</tr>
<tr>
<td><strong>CFOs</strong></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TMDL Allocations (billion/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Allocation Category</strong></td>
</tr>
<tr>
<td><strong>LA</strong></td>
</tr>
<tr>
<td><strong>WLA</strong></td>
</tr>
<tr>
<td><strong>MOS (10%)</strong></td>
</tr>
<tr>
<td><strong>TMDL = LA+WLA+MOS</strong></td>
</tr>
</tbody>
</table>
### Table 155. Lake of the Woods-Yellow River Characteristics and TMDL Summary (HUC12-309)

<table>
<thead>
<tr>
<th><strong>Upstream Characteristics</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Drainage Area</strong></td>
<td>158.33 square miles</td>
</tr>
<tr>
<td><strong>Sampling Station</strong></td>
<td>89</td>
</tr>
<tr>
<td><strong>Listed Segments</strong></td>
<td>INK0158_00</td>
</tr>
<tr>
<td><strong>Land Use</strong></td>
<td>Agriculture: 73%; Developed Land: 7%; Forest: 8%; Other: 12%</td>
</tr>
<tr>
<td><strong>Soils</strong></td>
<td>A: 13%; B: 53%; C: 32%; D: 0.5%; Unknown: 1.5%</td>
</tr>
<tr>
<td><strong>NPDES Facilities</strong></td>
<td>Nappanee Municipal STP (IN0021466) - Discharges Outside of The Kankakee/Iroquois Watershed</td>
</tr>
<tr>
<td></td>
<td>Bremen Municipal WWTP</td>
</tr>
<tr>
<td></td>
<td>Lake of the Woods Regional Sewer District (IN0057002)</td>
</tr>
<tr>
<td><strong>MS4 Communities</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>CSO Communities</strong></td>
<td>Nappanee Municipal STP (IN0021466)- Discharges Outside of The Kankakee/Iroquois Watershed</td>
</tr>
<tr>
<td><strong>CAFOs</strong></td>
<td>Fred Beer Farms (ING804010)</td>
</tr>
<tr>
<td></td>
<td>J &amp; T Laidig Farms (ING800005)</td>
</tr>
<tr>
<td></td>
<td>Walnut Gove Dairy, LLC (INA006440)</td>
</tr>
<tr>
<td></td>
<td>Laidig Farm And Management - Site 331 (ID #2240)</td>
</tr>
<tr>
<td></td>
<td>Pick Of The Chick (ID#3891)</td>
</tr>
<tr>
<td></td>
<td>Evan L Huff (ID #4254)</td>
</tr>
<tr>
<td></td>
<td>Billie Fisher (ID#2276)</td>
</tr>
<tr>
<td></td>
<td>Todd Lemler (ID#2372)</td>
</tr>
<tr>
<td></td>
<td>Shively Veal Inc (ID#3050)</td>
</tr>
<tr>
<td></td>
<td>Charles L. Long - Farm #1 (ID#4330)</td>
</tr>
<tr>
<td></td>
<td>Don Haas (ID # 4388)</td>
</tr>
<tr>
<td><strong>CFOs</strong></td>
<td></td>
</tr>
<tr>
<td><strong>TMDL Allocations (billion/day)</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Allocation Category</strong></td>
<td><strong>High Flows</strong></td>
</tr>
<tr>
<td><strong>LA</strong></td>
<td>1327.08</td>
</tr>
<tr>
<td><strong>WLA</strong></td>
<td>6.79</td>
</tr>
<tr>
<td><strong>MOS (10%)</strong></td>
<td>148.21</td>
</tr>
<tr>
<td><strong>TMDL = LA+WLA+MOS</strong></td>
<td>1482.08</td>
</tr>
</tbody>
</table>
### Table 156. Elmer Seltenright Ditch-Yellow River Characteristics and TMDL Summary (HUC12-311)

**Upstream Characteristics**

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drainage Area</td>
<td>13.44 square miles</td>
</tr>
<tr>
<td>Sampling Station</td>
<td>77</td>
</tr>
<tr>
<td>Listed Segments</td>
<td>None</td>
</tr>
<tr>
<td>Land Use</td>
<td>Agriculture: 61%; Developed Land: 20%; Forest: 12%; Other: 7%</td>
</tr>
<tr>
<td>Soils</td>
<td>A: 26%; B: 62%; C: 10%; D: 2%</td>
</tr>
<tr>
<td>NPDES Facilities</td>
<td>Lapaz Municipal WWTP (IN0040223)</td>
</tr>
<tr>
<td>MS4 Communities</td>
<td>Plymouth (INR040064): 2.36 Square Miles</td>
</tr>
<tr>
<td>CSO Communities</td>
<td>None</td>
</tr>
<tr>
<td>CAFOs</td>
<td>None</td>
</tr>
<tr>
<td>CFOs</td>
<td>None</td>
</tr>
</tbody>
</table>

**TMDL Allocations (billion/day)**

<table>
<thead>
<tr>
<th>Allocation Category</th>
<th>High Flows</th>
<th>Moist Conditions</th>
<th>Mid-Range Flows</th>
<th>Dry Conditions</th>
<th>Low Flows</th>
</tr>
</thead>
<tbody>
<tr>
<td>LA</td>
<td>92.75</td>
<td>27.21</td>
<td>12.87</td>
<td>6.7</td>
<td>3.43</td>
</tr>
<tr>
<td>WLA</td>
<td>20.48</td>
<td>0.6</td>
<td>0.6</td>
<td>0.6</td>
<td>0.6</td>
</tr>
<tr>
<td>MOS (10%)</td>
<td>12.58</td>
<td>3.08</td>
<td>1.49</td>
<td>0.81</td>
<td>0.44</td>
</tr>
<tr>
<td>TMDL = LA+WLA+MOS</td>
<td>125.81</td>
<td>30.89</td>
<td>14.96</td>
<td>8.11</td>
<td>4.47</td>
</tr>
</tbody>
</table>
### Table 157. Milner-Seltenright Ditch-Yellow River Characteristics and TMDL Summary (HUC 12-312)

<table>
<thead>
<tr>
<th><strong>Upstream Characteristics</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Drainage Area</strong></td>
<td>257.20 square miles</td>
</tr>
<tr>
<td><strong>Sampling Station</strong></td>
<td>79</td>
</tr>
<tr>
<td><strong>Listed Segments</strong></td>
<td>INK015F_00</td>
</tr>
<tr>
<td><strong>Land Use</strong></td>
<td>Agriculture: 77%; Developed Land: 7%; Forest: 7%; Other: 9%</td>
</tr>
<tr>
<td><strong>Soils</strong></td>
<td>A: 17%; B: 55%; C: 26%; D: 0.5%; Unknown: 1.6%</td>
</tr>
<tr>
<td><strong>NPDES Facilities</strong></td>
<td>Nappanee Municipal STP (IN0021466) - Discharges Outside of The Kankakee/Iroquois Watershed</td>
</tr>
<tr>
<td></td>
<td>Bremen Municipal WWTP (IN0020427)</td>
</tr>
<tr>
<td></td>
<td>Lake of the Woods Regional Sewer District (IN0057002)</td>
</tr>
<tr>
<td><strong>MS4 Communities</strong></td>
<td>Plymouth (INR040064): 0.55 Square Miles</td>
</tr>
<tr>
<td><strong>CSO Communities</strong></td>
<td>Nappanee Municipal STP (IN0021466) - Discharges Outside of The Kankakee/Iroquois Watershed</td>
</tr>
<tr>
<td></td>
<td>Fred Beer Farms (ING804010)</td>
</tr>
<tr>
<td></td>
<td>J &amp; T Laidig Farms (ING800005)</td>
</tr>
<tr>
<td></td>
<td>Walnut Grove Dairy, LLC (INA006440)</td>
</tr>
<tr>
<td></td>
<td>Laidig Farm Management - Site 331 (ID #2240)</td>
</tr>
<tr>
<td></td>
<td>Pick Of The Chick (ID #3891)</td>
</tr>
<tr>
<td></td>
<td>Linda Lizzi (ID #3710)</td>
</tr>
<tr>
<td></td>
<td>Evan L Huff (ID #4254)</td>
</tr>
<tr>
<td></td>
<td>David Dunis (ID #4388)</td>
</tr>
<tr>
<td></td>
<td>Billie Fisher (ID #2276)</td>
</tr>
<tr>
<td></td>
<td>Todd Lemler (ID #2372)</td>
</tr>
<tr>
<td></td>
<td>Shively Veal Inc (ID #3050)</td>
</tr>
<tr>
<td></td>
<td>Charles L. Long - Farm #1 (ID #4330)</td>
</tr>
<tr>
<td></td>
<td>Don Haas (ID #4388)</td>
</tr>
</tbody>
</table>

#### TMDL Allocations (billion/day)

<table>
<thead>
<tr>
<th>Allocation Category</th>
<th>High Flows</th>
<th>Moist Conditions</th>
<th>Mid-Range Flows</th>
<th>Dry Conditions</th>
<th>Low Flows</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>LA</strong></td>
<td>2155.40</td>
<td>525.28</td>
<td>250.82</td>
<td>132.85</td>
<td>70.25</td>
</tr>
<tr>
<td><strong>WLA</strong></td>
<td>11.42</td>
<td>6.79</td>
<td>6.79</td>
<td>6.79</td>
<td>6.79</td>
</tr>
<tr>
<td><strong>MOS (10%)</strong></td>
<td>240.76</td>
<td>59.12</td>
<td>28.62</td>
<td>15.52</td>
<td>8.56</td>
</tr>
<tr>
<td><strong>TMDL = LA+WLA+MOS</strong></td>
<td>2407.58</td>
<td>591.19</td>
<td>286.23</td>
<td>155.16</td>
<td>85.60</td>
</tr>
</tbody>
</table>
7.1.3.2 **Yellow River Subwatershed (HUC10-Digit 105)**

The Yellow River subwatershed has an area of approximately 146 square miles and lies within Stark and Marshall counties. Cities within this subwatershed include Argos, Plymouth and Knox (Figure 78). Agriculture is the dominant land use followed by forest and developed land (Table 161). Possible pathogen sources such as NPDES facilities and feeding operations in this subwatershed are shown in Figure 79 and Figure 80. As listed in Table 158 and Table 159, there are three impaired segments and eight *E. coli* monitoring locations within this subwatershed. Impairments are prevalent at these monitoring sites (Table 160). The required reductions range from 48 to 88 percent in this subwatershed.

### Table 158. 303 (d) Listed Streams in the Yellow River Subwatershed

<table>
<thead>
<tr>
<th>HUC 12</th>
<th>HUC 12 Name</th>
<th>Segment ID</th>
<th>Waterbody</th>
<th>Stream Length (miles)</th>
<th>Parameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>503</td>
<td>Clifton Ditch-Yellow River</td>
<td>INK0165_00</td>
<td>Yellow River - Listenberger/Clifton Ditches</td>
<td>19.72</td>
<td><em>E. coli</em></td>
</tr>
<tr>
<td>505</td>
<td>Bickle Ditch-Yellow River</td>
<td>INK0166_00</td>
<td>Yellow River - Ober</td>
<td>29.34</td>
<td><em>E. coli</em></td>
</tr>
<tr>
<td>506</td>
<td>Cavanaugh Ditch-Yellow River</td>
<td>INK016A_00</td>
<td>Yellow River-Knox</td>
<td>20.69</td>
<td><em>E. coli</em></td>
</tr>
</tbody>
</table>

### Table 159. Station Locations in the Yellow River Subwatershed

<table>
<thead>
<tr>
<th>HUC 12</th>
<th>HUC 12 Name</th>
<th>Station #</th>
<th>Stream Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>501</td>
<td>Town of Argos-Wolf Creek</td>
<td>ID# 73</td>
<td>Wolf Cr</td>
</tr>
<tr>
<td>503</td>
<td>Clifton Ditch-Yellow River</td>
<td>ID# 10</td>
<td>Clifton D</td>
</tr>
<tr>
<td>504</td>
<td>Eagle Creek</td>
<td>ID# 95</td>
<td>Clifton D</td>
</tr>
<tr>
<td>505</td>
<td>Bickle Ditch-Yellow River</td>
<td>ID# 79</td>
<td>Clifton D</td>
</tr>
<tr>
<td>506</td>
<td>Cavanaugh Ditch-Yellow River</td>
<td>ID# 19</td>
<td>Yellow River</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ID# 63</td>
<td>Yellow River</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ID# 65</td>
<td>Yellow River</td>
</tr>
</tbody>
</table>
Table 160. Summary of Pathogen Data in the Yellow River Subwatershed

<table>
<thead>
<tr>
<th>Station #</th>
<th>Period of Record</th>
<th>Total Number of Samples</th>
<th>Percent of Samples Exceeding E. coli WQS (#/100 mL)</th>
<th>Minimum (#/100 mL)</th>
<th>Geomean (#/100 mL)</th>
<th>Average (#/100 mL)</th>
<th>Maximum (#/100 mL)</th>
<th>Percent Reduction Based on Geomean (125/100Mi)</th>
</tr>
</thead>
<tbody>
<tr>
<td>73</td>
<td>6/4/2008 – 7/2/2008</td>
<td>5</td>
<td>100</td>
<td>517</td>
<td>1,085</td>
<td>1153</td>
<td>1414</td>
<td>88%</td>
</tr>
<tr>
<td>71</td>
<td>6/4/2008 – 7/2/2008</td>
<td>5</td>
<td>100</td>
<td>291</td>
<td>589</td>
<td>775</td>
<td>1,986</td>
<td>79%</td>
</tr>
<tr>
<td>75</td>
<td>6/4/2008 – 7/2/2008</td>
<td>5</td>
<td>100</td>
<td>248</td>
<td>772</td>
<td>948</td>
<td>1,414</td>
<td>84%</td>
</tr>
<tr>
<td>69</td>
<td>6/4/2008 – 7/2/2008</td>
<td>5</td>
<td>80</td>
<td>102</td>
<td>239</td>
<td>293</td>
<td>649</td>
<td>48%</td>
</tr>
<tr>
<td>19</td>
<td>6/2/2008 – 6/30/2008</td>
<td>5</td>
<td>100</td>
<td>140</td>
<td>591</td>
<td>722</td>
<td>1,046</td>
<td>79%</td>
</tr>
<tr>
<td>63</td>
<td>6/2/2008 – 7/14/2008</td>
<td>6</td>
<td>100</td>
<td>83</td>
<td>214</td>
<td>461</td>
<td>543</td>
<td>73%</td>
</tr>
<tr>
<td>65</td>
<td>6/2/2008 – 7/14/2008</td>
<td>6</td>
<td>100</td>
<td>83</td>
<td>204</td>
<td>445</td>
<td>545</td>
<td>72%</td>
</tr>
</tbody>
</table>

Table 161. Land Use/Land Cover in the Yellow River Subwatershed

<table>
<thead>
<tr>
<th>Land Use/Land Cover</th>
<th>Subwatershed</th>
<th>Area</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Acres</td>
<td>Percent</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Square Miles</td>
<td></td>
</tr>
<tr>
<td>Agricultural Land</td>
<td>54249.89</td>
<td>84.77</td>
<td>58.18</td>
</tr>
<tr>
<td>Forested Land</td>
<td>18912.60</td>
<td>29.55</td>
<td>20.28</td>
</tr>
<tr>
<td>Developed Land</td>
<td>10653.78</td>
<td>16.65</td>
<td>11.43</td>
</tr>
<tr>
<td>Wetland</td>
<td>4607.34</td>
<td>7.20</td>
<td>4.94</td>
</tr>
<tr>
<td>Pasture/Hay</td>
<td>2842.86</td>
<td>4.44</td>
<td>3.05</td>
</tr>
<tr>
<td>Open Water</td>
<td>1060.60</td>
<td>1.66</td>
<td>1.14</td>
</tr>
<tr>
<td>Grassland and Shrubs</td>
<td>915.82</td>
<td>1.43</td>
<td>0.98</td>
</tr>
<tr>
<td>Total</td>
<td>93,242.89</td>
<td>145.69</td>
<td>100.00</td>
</tr>
</tbody>
</table>
Figure 78. Location of Yellow River Subwatershed (HUC10-105)
Figure 79. NPDES Facilities in the Yellow River Subwatershed (HUC 10-105)

Figure 80. Feeding Operations in the Yellow River Subwatershed (HUC 10-105)

Table 162 through Table 166 summarize the subwatershed characteristics as well as the TMDL results for each of the HUC 12 subwatersheds. It should be noted that there are no current 303(d) listings in HUC 501 or HUC 504; however, the sampling performed in 2008 suggests that several streams are impaired. Those streams will appear on the next 303(d) list and TMDLs for those streams are presented here.
There are four NPDES facilities within the Mill Creek subwatershed and the WLAs for the facilities were calculated based on their design flows and *E. coli* permit limits. There is one MS4 community upstream of the Little Kankakee River subwatershed outlet and the WLA for the community was calculated based on the area with the watersheds drainage and *E. coli* standards. There are two CSO communities with 25 outfalls upstream of this subwatershed. WLAs for CSO communities were calculated based on the maximum observed CSO flow at each outfall and *E. coli* standards. The individual WLAs are presented in Table 276. There is one CAFO within this subwatershed and it receives a WLA of zero as described further in Section 7.3.

<table>
<thead>
<tr>
<th>Table 162. Town of Argos-Wolf Creek Characteristics and TMDL Summary (HUC12-501)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Upstream Characteristics</strong></td>
</tr>
<tr>
<td><strong>Drainage Area</strong></td>
</tr>
<tr>
<td><strong>Sampling Station</strong></td>
</tr>
<tr>
<td><strong>Listed Segments</strong></td>
</tr>
<tr>
<td><strong>Land Use</strong></td>
</tr>
<tr>
<td><strong>Soils</strong></td>
</tr>
<tr>
<td><strong>NPDES Facilities</strong></td>
</tr>
<tr>
<td><strong>MS4 Communities</strong></td>
</tr>
<tr>
<td><strong>CSO Communities</strong></td>
</tr>
<tr>
<td><strong>CAFOs</strong></td>
</tr>
<tr>
<td><strong>CFOs</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>TMDL Allocations (billion/day)</strong></td>
</tr>
<tr>
<td>Allocation Category</td>
</tr>
<tr>
<td>LA</td>
</tr>
<tr>
<td>WLA</td>
</tr>
<tr>
<td>MOS (10%)</td>
</tr>
<tr>
<td>TMDL = LA+WLA+MOS</td>
</tr>
</tbody>
</table>
Table 163. Clifton Ditch-Yellow River Characteristics and TMDL Summary (HUC12-503)

<table>
<thead>
<tr>
<th><strong>Upstream Characteristics</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Drainage Area</td>
<td>329.16 square miles</td>
</tr>
<tr>
<td>Sampling Station</td>
<td>71</td>
</tr>
<tr>
<td>Listed Segments</td>
<td>INK0165_00</td>
</tr>
<tr>
<td><strong>Land Use</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Agriculture: 74.46%; Developed Land: 9.01%; Forest: 8.06%; Other: 8.47%</td>
</tr>
<tr>
<td><strong>Soils</strong></td>
<td>A: 22.75%; B: 54.71%; C: 21.52%; D 0.66%; Unknown:0.37</td>
</tr>
<tr>
<td><strong>NPDES Facilities</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>All the facilities upstream of HUC 12-312 and HUC 12-311</td>
</tr>
</tbody>
</table>
| | Plymouth WWTP (IN0020991)
| | Argos Municipal WWTP (IN0022284) |
| **MS4 Communities** | |
| | Plymouth (INR040064): 6.97 Square Miles |
| **CSO Communities** | |
| | Plymouth Municipal STP (IN0020991)-10 outfalls |
| | Nappanee Municipal STP (IN0021466)-Discharges Outside of The Kankakee/Iroquois Watershed |
| **CAFOs** | |
| | All the facilities upstream of HUC 12-312 and HUC 12-311 |
| | Homestead Dairy (ING804918) |
| **CFOs** | |
| | All the facilities upstream of HUC 12-312 and HUC 12-311 |
| | Houin Brothers Farms( 7916) |
| | Argos Holsteins (2100) |
| | Argos Holsteins (6208) |
| | Dan Houin (6151) |

| **TMDL Allocations (billion/day)** | |
|---|---|---|---|---|---|
| Allocation Category | High Flows | Moist Conditions | Mid-Range Flows | Dry Conditions | Low Flows |
| LA | 2687.12 | 655.99 | 304.74 | 153.76 | 73.65 |
| WLA | 85.94 | 24.95 | 24.95 | 24.95 | 24.95 |
| MOS (10%) | 308.12 | 75.66 | 36.63 | 19.85 | 10.95 |
| TMDL = LA+WLA+MOS | 3081.18 | 756.6 | 366.32 | 198.56 | 109.55 |
Table 164. Eagle Creek Characteristics and TMDL Summary (HUC 12-504)

<table>
<thead>
<tr>
<th>Upstream Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Drainage Area</strong></td>
</tr>
<tr>
<td>37.92 square miles</td>
</tr>
<tr>
<td><strong>Sampling Station</strong></td>
</tr>
<tr>
<td>67.75</td>
</tr>
<tr>
<td><strong>Listed Segments</strong></td>
</tr>
<tr>
<td>None</td>
</tr>
<tr>
<td><strong>Land Use</strong></td>
</tr>
<tr>
<td>Agriculture: 45.12%; Developed Land: 6.76%; Forest: 36.42%; Other: 11.70%</td>
</tr>
<tr>
<td><strong>Soils</strong></td>
</tr>
<tr>
<td>A: 70.36%; B: 19.76%; C: 3.95%; D 2.37%; Unknown:3.56</td>
</tr>
<tr>
<td><strong>NPDES Facilities</strong></td>
</tr>
<tr>
<td>Convent Ancilla Domini (IN0025160)</td>
</tr>
<tr>
<td><strong>MS4 Communities</strong></td>
</tr>
<tr>
<td>None</td>
</tr>
<tr>
<td><strong>CSO Communities</strong></td>
</tr>
<tr>
<td>None</td>
</tr>
<tr>
<td><strong>CAFOs</strong></td>
</tr>
<tr>
<td>None</td>
</tr>
<tr>
<td><strong>CFOs</strong></td>
</tr>
<tr>
<td>Herbert W Schaller (2215)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TMDL Allocations (billion/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Allocation Category</strong></td>
</tr>
<tr>
<td><strong>High Flows</strong></td>
</tr>
<tr>
<td><strong>Moist Conditions</strong></td>
</tr>
<tr>
<td><strong>Mid-Range Flows</strong></td>
</tr>
<tr>
<td><strong>Dry Conditions</strong></td>
</tr>
<tr>
<td><strong>Low Flows</strong></td>
</tr>
<tr>
<td><strong>LA</strong></td>
</tr>
<tr>
<td>319.25</td>
</tr>
<tr>
<td>78.23</td>
</tr>
<tr>
<td>37.76</td>
</tr>
<tr>
<td>20.37</td>
</tr>
<tr>
<td>11.14</td>
</tr>
<tr>
<td><strong>WLA</strong></td>
</tr>
<tr>
<td>0.22</td>
</tr>
<tr>
<td>0.22</td>
</tr>
<tr>
<td>0.22</td>
</tr>
<tr>
<td>0.22</td>
</tr>
<tr>
<td>0.22</td>
</tr>
<tr>
<td><strong>MOS (10%)</strong></td>
</tr>
<tr>
<td>35.49</td>
</tr>
<tr>
<td>8.71</td>
</tr>
<tr>
<td>4.22</td>
</tr>
<tr>
<td>2.29</td>
</tr>
<tr>
<td>1.26</td>
</tr>
<tr>
<td><strong>TMDL = LA+WLA+MOS</strong></td>
</tr>
<tr>
<td>354.96</td>
</tr>
<tr>
<td>87.16</td>
</tr>
<tr>
<td>42.2</td>
</tr>
<tr>
<td>22.88</td>
</tr>
<tr>
<td>12.62</td>
</tr>
</tbody>
</table>
Table 165. Bickel Ditch-Yellow River Characteristics and TMDL Summary (HUC 12-505)

<table>
<thead>
<tr>
<th>Upstream Characteristics</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Drainage Area</strong></td>
<td>350.42 square miles</td>
</tr>
<tr>
<td><strong>Sampling Station</strong></td>
<td>69</td>
</tr>
<tr>
<td><strong>Listed Segments</strong></td>
<td>INK0166_00</td>
</tr>
<tr>
<td><strong>Land Use</strong></td>
<td>Agriculture: 73.48%; Developed Land: 8.86%; Forest: 9.05%; Other: 8.60%</td>
</tr>
<tr>
<td><strong>Soils</strong></td>
<td>A: 26.21%; B: 52.31%; C: 20.39%; D: 0.74%; Unknown: 0.35</td>
</tr>
<tr>
<td><strong>NPDES Facilities</strong></td>
<td>All the facilities upstream of HUC 12-503</td>
</tr>
<tr>
<td><strong>MS4 Communities</strong></td>
<td>Plymouth (INR040064): 6.97 Square Miles</td>
</tr>
<tr>
<td><strong>CSO Communities</strong></td>
<td>Plymouth Municipal STP (IN0020991)-10 outfalls</td>
</tr>
<tr>
<td></td>
<td>Nappanee Municipal STP (IN0021466)-Discharges Outside of The Kankakee/Iroquois Watershed</td>
</tr>
<tr>
<td><strong>CAFOs</strong></td>
<td>All the facilities upstream of HUC 12-503</td>
</tr>
<tr>
<td><strong>CFOs</strong></td>
<td>All the facilities upstream of HUC 12-503</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TMDL Allocations (billion/day)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Allocation Category</strong></td>
<td>High Flows</td>
</tr>
<tr>
<td><strong>LA</strong></td>
<td>2866.22</td>
</tr>
<tr>
<td><strong>WLA</strong></td>
<td>85.94</td>
</tr>
<tr>
<td><strong>MOS (10%)</strong></td>
<td>328.02</td>
</tr>
<tr>
<td><strong>TMDL = LA+WLA+MOS</strong></td>
<td>3280.18</td>
</tr>
</tbody>
</table>
### Table 166. Cavanaugh Ditch-Yellow River Characteristics and TMDL Summary (HUC 12-506)

#### Upstream Characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drainage Area</td>
<td>395.99 square miles</td>
</tr>
<tr>
<td>Sampling Station</td>
<td>19,63,65</td>
</tr>
<tr>
<td>Listed Segments</td>
<td>INK0166A_00</td>
</tr>
<tr>
<td>Land Use</td>
<td>Agriculture: 70.27%; Developed Land: 8.96%; Forest: 11.66%; Other: 9.11%</td>
</tr>
<tr>
<td>Soils</td>
<td>A: 31.16%; B: 48.59%; C: 18.58%; D 1.01%; Unknown: 0.66</td>
</tr>
<tr>
<td>NPDES Facilities</td>
<td>All the facilities upstream of HUC 12-505 and HUC 12-504</td>
</tr>
<tr>
<td></td>
<td>Knox Municipal WWTP (IN0021385)</td>
</tr>
<tr>
<td>MS4 Communities</td>
<td>Plymouth (INR040064): 6.97 Square Miles</td>
</tr>
<tr>
<td>CSO Communities</td>
<td>Plymouth Municipal STP (IN0020991)-10 outfalls</td>
</tr>
<tr>
<td></td>
<td>Nappanee Municipal STP (IN0021466)-Discharges Outside of The Kankakee/Iroquois Watershed</td>
</tr>
<tr>
<td>CAFOs</td>
<td>All the facilities upstream of HUC 12-505 and HUC 12-504</td>
</tr>
<tr>
<td>CFOs</td>
<td>All the facilities upstream of HUC 12-505 and HUC 12-504</td>
</tr>
</tbody>
</table>

#### TMDL Allocations (billion/day)

<table>
<thead>
<tr>
<th>Allocation Category</th>
<th>High Flows</th>
<th>Moist Conditions</th>
<th>Mid-Range Flows</th>
<th>Dry Conditions</th>
<th>Low Flows</th>
</tr>
</thead>
<tbody>
<tr>
<td>LA</td>
<td>3246.61</td>
<td>790.71</td>
<td>368.14</td>
<td>186.51</td>
<td>90.14</td>
</tr>
<tr>
<td>WLA</td>
<td>89.47</td>
<td>28.48</td>
<td>28.48</td>
<td>28.48</td>
<td>28.48</td>
</tr>
<tr>
<td>MOS (10%)</td>
<td>370.67</td>
<td>91.02</td>
<td>44.07</td>
<td>23.89</td>
<td>13.18</td>
</tr>
<tr>
<td>TMDL = LA+WLA+MOS</td>
<td>3706.75</td>
<td>910.21</td>
<td>440.69</td>
<td>238.88</td>
<td>131.8</td>
</tr>
</tbody>
</table>
7.1.3.3 Kline Arm Subwatershed (HUC10-Digit 106)

The Kline Arm subwatershed has an area of nearly 100 square miles. The subwatershed lies in Starke and Pulaski Counties and contains the city of North Hudson (Figure 81). About 57 percent of the land is used for agriculture (Table 169). The NPDES facilities and feeding operations in this subwatershed are presented in Figure 82 and Figure 83. No listed segments lie in this subwatershed. However, the five monitoring stations (Table 167) show pathogen violations (Table 168). The required reductions of pathogen concentrations based on the geomean of five samples ranges from 68 to 81 percent in this subwatershed.

Table 167. Station Locations in the Kline Arm Subwatershed

<table>
<thead>
<tr>
<th>HUC 12</th>
<th>HU C12 Name</th>
<th>Station #</th>
<th>Stream Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>601</td>
<td>Hook Run-Bogus Run</td>
<td>ID# 01</td>
<td>Bogus Run</td>
</tr>
<tr>
<td>603</td>
<td>Craigmile Ditch-Kline Arm</td>
<td>ID# 15</td>
<td>Craigmile D</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ID# 17</td>
<td>Kline Arm D</td>
</tr>
<tr>
<td>604</td>
<td>Pine Creek-Bogus Run</td>
<td>ID# 09</td>
<td>Yellow River</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ID# 13</td>
<td>Bogus Run</td>
</tr>
</tbody>
</table>

Table 168. Summary of Pathogen Data in the Kline Arm Subwatershed

<table>
<thead>
<tr>
<th>Station #</th>
<th>Period of Record</th>
<th>Total Number of Samples</th>
<th>Percent of Samples Exceeding E. coli WQS (#/100 mL)</th>
<th>Minimum (#/100 mL)</th>
<th>Geomean (#/100 mL)</th>
<th>Average (#/100 mL)</th>
<th>Maximum (#/100 mL)</th>
<th>Percent Reduction Based on Geomean (125/100mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>6/2/2008 - 6/30/2008</td>
<td>5</td>
<td>100</td>
<td>100</td>
<td>236</td>
<td>522</td>
<td>625</td>
<td>76%</td>
</tr>
<tr>
<td>15</td>
<td>6/2/2008 - 6/30/2008</td>
<td>5</td>
<td>100</td>
<td>100</td>
<td>285</td>
<td>667</td>
<td>773</td>
<td>81%</td>
</tr>
<tr>
<td>17</td>
<td>6/2/2008 - 6/30/2008</td>
<td>5</td>
<td>100</td>
<td>100</td>
<td>326</td>
<td>499</td>
<td>518</td>
<td>75%</td>
</tr>
<tr>
<td>9</td>
<td>6/2/2008 - 6/30/2008</td>
<td>5</td>
<td>100</td>
<td>60</td>
<td>199</td>
<td>427</td>
<td>499</td>
<td>816</td>
</tr>
<tr>
<td>13</td>
<td>6/2/2008 - 6/30/2008</td>
<td>5</td>
<td>100</td>
<td>100</td>
<td>299</td>
<td>395</td>
<td>419</td>
<td>727</td>
</tr>
</tbody>
</table>
Table 169. Land Use/Land Cover in the Kline Arm Subwatershed

<table>
<thead>
<tr>
<th>Land Use/Land Cover</th>
<th>Area</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Acres</td>
<td>Square Miles</td>
</tr>
<tr>
<td>Agricultural Land</td>
<td>36,773.51</td>
<td>57.46</td>
</tr>
<tr>
<td>Forested Land</td>
<td>15,012.26</td>
<td>23.46</td>
</tr>
<tr>
<td>Developed Land</td>
<td>5,258.73</td>
<td>8.22</td>
</tr>
<tr>
<td>Grassland and Shrubs</td>
<td>3,496.92</td>
<td>5.46</td>
</tr>
<tr>
<td>Open Water</td>
<td>1,556.76</td>
<td>2.43</td>
</tr>
<tr>
<td>Pasture/Hay</td>
<td>1,219.83</td>
<td>1.91</td>
</tr>
<tr>
<td>Wetland</td>
<td>676.52</td>
<td>1.06</td>
</tr>
<tr>
<td>Total</td>
<td>63,994.53</td>
<td>99.99</td>
</tr>
</tbody>
</table>

Figure 81. Location of Kline Arm Subwatershed (HUC10-106)
Figure 82. NPDES Facilities in the Kline Arm Subwatershed (HUC10-106)
Figure 83. Feeding Operations in the Kline Arm Subwatershed (HUC10-106)

Table 170 through Table 172 summarize the subwatershed characteristics as well as the TMDL results for each of the HUC 12 subwatersheds. It should be noted that there are no current 303(d) listings in this subwatershed; however, the sampling performed in 2008 suggests that several streams are impaired. Those streams will appear on the next 303(d) list and TMDLs for those streams are presented here.

There are two NPDES facilities within the Kline Arm subwatershed and the WLAs for the facilities were calculated based on their design flows and E. coli permit limits. There is one CSO community with 1 outfall upstream of this subwatershed. WLAs for CSO communities were calculated based on the maximum observed CSO flow at each outfall and E. coli standards. The individual WLAs are presented in Table 276.
Table 170.  Hook Run-Bogus Run Characteristics and TMDL Summary (HUC12-601)

<table>
<thead>
<tr>
<th>Upstream Characteristics</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Drainage Area</td>
<td>26.71 square miles</td>
</tr>
<tr>
<td>Sampling Station</td>
<td>1</td>
</tr>
<tr>
<td>Listed Segments</td>
<td>None</td>
</tr>
<tr>
<td>Land Use</td>
<td>Agriculture: 68.24%; Developed Land: 4.80%; Forest: 22.60%; Other: 4.36%</td>
</tr>
<tr>
<td>Soils</td>
<td>A: 95.56%; B: 3.89%; C: 0.00%; D 0.56%; Unknown:0.00</td>
</tr>
<tr>
<td>NPDES Facilities</td>
<td>None</td>
</tr>
<tr>
<td>MS4 Communities</td>
<td>None</td>
</tr>
<tr>
<td>CSO Communities</td>
<td>None</td>
</tr>
<tr>
<td>CAFOs</td>
<td>None</td>
</tr>
<tr>
<td>CFOs</td>
<td>Bope Farm (3908)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TMDL Allocations (billion/day)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Allocation Category</td>
<td>High Flows</td>
</tr>
<tr>
<td>LA</td>
<td>175.51</td>
</tr>
<tr>
<td>WLA</td>
<td>0</td>
</tr>
<tr>
<td>MOS (10%)</td>
<td>19.5</td>
</tr>
<tr>
<td>TMDL = LA+WLA+MOS</td>
<td>195.01</td>
</tr>
</tbody>
</table>
Table 171. Craigmile Ditch-Kline Arm Characteristics and TMDL Summary (HUC12-603)

<table>
<thead>
<tr>
<th><strong>Upstream Characteristics</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Drainage Area</strong></td>
<td>53.00 square miles</td>
</tr>
<tr>
<td><strong>Sampling Station</strong></td>
<td>15,17</td>
</tr>
<tr>
<td><strong>Listed Segments</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>Land Use</strong></td>
<td>Agriculture: 55.72%; Developed Land: 8.13%; Forest: 23.55%; Other: 12.59%</td>
</tr>
<tr>
<td><strong>Soils</strong></td>
<td>A: 93.18%; B: 1.99%; C: 0.00%; D 0.57%; Unknown: 4.26</td>
</tr>
<tr>
<td><strong>NPDES Facilities</strong></td>
<td>Bass Lake Conservancy District (IN0058289)</td>
</tr>
<tr>
<td><strong>MS4 Communities</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>CSO Communities</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>CAFOs</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>CFOs</strong></td>
<td>None</td>
</tr>
</tbody>
</table>

| **TMDL Allocations (billion/day)** | |
|-------------------------------|--|--|--|--|--|
| **Allocation Category** | **High Flows** | **Moist Conditions** | **Mid-Range Flows** | **Dry Conditions** | **Low Flows** |
| LA | 346.91 | 125.67 | 56.02 | 24.47 | 12.59 |
| WLA | 1.34 | 1.34 | 1.34 | 1.34 | 1.34 |
| MOS (10%) | 38.70 | 14.11 | 6.37 | 2.87 | 1.55 |
| TMDL = LA+WLA+MOS | 386.95 | 141.12 | 63.73 | 28.68 | 15.48 |
Table 172. Pine Creek-Bogus Run Characteristics and TMDL Summary (HUC12-604)

<table>
<thead>
<tr>
<th>Upstream Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drainage Area</td>
</tr>
<tr>
<td>Sampling Station</td>
</tr>
<tr>
<td>Listed Segments</td>
</tr>
<tr>
<td>Land Use</td>
</tr>
<tr>
<td>Soils</td>
</tr>
<tr>
<td>NPDES Facilities</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>MS4 Communities</td>
</tr>
<tr>
<td>CSO Communities</td>
</tr>
<tr>
<td>CFOs</td>
</tr>
<tr>
<td>CAFOs</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TMDL Allocations (billion/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allocation Category</td>
</tr>
<tr>
<td>LA</td>
</tr>
<tr>
<td>WLA</td>
</tr>
<tr>
<td>MOS (10%)</td>
</tr>
<tr>
<td>TMDL = LA+WLA+MOS</td>
</tr>
</tbody>
</table>
7.1.4 Upper Iroquois Subwatershed

The Upper Iroquois subwatershed has five HUC 10 watersheds and 27 HUC 12 watersheds. Brief descriptions of the HUC 10 watersheds are provided in the following sections.

Table 173. Hydrologic Unit Code (HUC 10 and 12) in the Upper Iroquois Subwatershed

<table>
<thead>
<tr>
<th>HUC 10</th>
<th>HUC 10 Name</th>
<th>HUC 12</th>
<th>HUC 12 Name</th>
<th>Area (sq. miles)</th>
</tr>
</thead>
<tbody>
<tr>
<td>201</td>
<td>Oliver Ditch</td>
<td>101</td>
<td>Ringneck Lake-Oliver Ditch</td>
<td>26.58</td>
</tr>
<tr>
<td></td>
<td></td>
<td>102</td>
<td>Lateral No 77 Ditch-Oliver Ditch</td>
<td>25.47</td>
</tr>
<tr>
<td></td>
<td></td>
<td>103</td>
<td>Junes Ditch-Oliver Ditch</td>
<td>30.32</td>
</tr>
<tr>
<td>202</td>
<td>Slough Creek</td>
<td>201</td>
<td>Keefe Ditch</td>
<td>17.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td>202</td>
<td>Jordan Ditch-Slough Creek</td>
<td>32.67</td>
</tr>
<tr>
<td></td>
<td></td>
<td>203</td>
<td>Nessius Ditch-Bice Ditch</td>
<td>21.84</td>
</tr>
<tr>
<td></td>
<td></td>
<td>204</td>
<td>Headwaters Carpenter Creek</td>
<td>23.47</td>
</tr>
<tr>
<td></td>
<td></td>
<td>205</td>
<td>Carpenter Creek</td>
<td>30.67</td>
</tr>
<tr>
<td></td>
<td></td>
<td>206</td>
<td>Bice Ditch-Slough Creek</td>
<td>19.55</td>
</tr>
<tr>
<td>203</td>
<td>Bruner Ditch-Iroquois River</td>
<td>301</td>
<td>Headwaters Iroquois River</td>
<td>25.86</td>
</tr>
<tr>
<td></td>
<td></td>
<td>302</td>
<td>Iliff Slough Lateral-Ryan Ditch</td>
<td>25.70</td>
</tr>
<tr>
<td></td>
<td></td>
<td>303</td>
<td>Dexter Ditch-Iroquois River</td>
<td>27.06</td>
</tr>
<tr>
<td></td>
<td></td>
<td>304</td>
<td>Ryan Ditch</td>
<td>28.18</td>
</tr>
<tr>
<td></td>
<td></td>
<td>305</td>
<td>Moore Ditch-Iroquois River</td>
<td>28.82</td>
</tr>
<tr>
<td>204</td>
<td>Curtis Creek-Iroquois River</td>
<td>401</td>
<td>Headwaters Curtis Creek</td>
<td>38.65</td>
</tr>
<tr>
<td></td>
<td></td>
<td>402</td>
<td>Turner Ditch-Iroquois River</td>
<td>21.95</td>
</tr>
<tr>
<td></td>
<td></td>
<td>403</td>
<td>Hunter Ditch</td>
<td>42.71</td>
</tr>
<tr>
<td></td>
<td></td>
<td>404</td>
<td>Bower Ditch-Daroch Ditch</td>
<td>17.13</td>
</tr>
<tr>
<td></td>
<td></td>
<td>405</td>
<td>Hickory Branch-Iroquois River</td>
<td>41.34</td>
</tr>
<tr>
<td>205</td>
<td>Montgomery Ditch - Iroquois River</td>
<td>501</td>
<td>Clark Ditch-Thompson Ditch</td>
<td>17.54</td>
</tr>
<tr>
<td></td>
<td></td>
<td>502</td>
<td>Whaley Ditch</td>
<td>21.39</td>
</tr>
<tr>
<td></td>
<td></td>
<td>503</td>
<td>Strole Ditch-Iroquois River</td>
<td>20.27</td>
</tr>
<tr>
<td></td>
<td></td>
<td>504</td>
<td>Headwaters Montgomery Ditch</td>
<td>17.67</td>
</tr>
<tr>
<td></td>
<td></td>
<td>505</td>
<td>Kent Ditch-Montgomery Ditch</td>
<td>31.50</td>
</tr>
<tr>
<td></td>
<td></td>
<td>506</td>
<td>Montgomery Ditch</td>
<td>26.25</td>
</tr>
<tr>
<td></td>
<td></td>
<td>507</td>
<td>North Sheldon South Concord Ditch-Iroquois River</td>
<td>11.72</td>
</tr>
<tr>
<td></td>
<td></td>
<td>508</td>
<td>Blackstone Branch-Iroquois River</td>
<td>14.14</td>
</tr>
</tbody>
</table>
7.1.4.1 Oliver Ditch Subwatershed (HUC10-201)

The Oliver Ditch subwatershed has an area of approximately 82 square miles and lies within Jasper, Starke and Pulaski counties (Figure 84). Agriculture (58.03%) followed by forested land (14.83%) are the primary land uses in this subwatershed (Table 176). There is one CAFO and no NPDES facilities within this subwatershed (Figure 85). Sampling at four locations (Table 174) has exceeded the geomean standard (Table 175). The required reductions range from 62 to 80 percent in this subwatershed.

Table 174. Station Locations in the Oliver Ditch Subwatershed

<table>
<thead>
<tr>
<th>HUC 12</th>
<th>HU C12 Name</th>
<th>Station #</th>
<th>Stream Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>103</td>
<td>Jungles Ditch-Oliver Ditch</td>
<td>ID# 50</td>
<td>Oliver D</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ID# 52</td>
<td>Jungle D</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ID# 54</td>
<td>Oliver D</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ID# 56</td>
<td>Oliver D</td>
</tr>
</tbody>
</table>

Table 175. Summary of Pathogen Data in the Oliver Ditch Subwatershed

<table>
<thead>
<tr>
<th>Station #</th>
<th>Period of Record</th>
<th>Total Number of Samples</th>
<th>Percent of Samples Exceeding E. coli WQS (#/100 mL)</th>
<th>Minimum (#/100 mL)</th>
<th>Geomean (#/100 mL)</th>
<th>Average (#/100 mL)</th>
<th>Maximum (#/100 mL)</th>
<th>Percent Reduction Based on Geomean (125/100mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>6/2/2008 - 6/30/2008</td>
<td>5</td>
<td>100</td>
<td>131</td>
<td>392</td>
<td>527</td>
<td>980</td>
<td>68%</td>
</tr>
<tr>
<td>52</td>
<td>6/2/2008 - 6/30/2008</td>
<td>5</td>
<td>100</td>
<td>387</td>
<td>628</td>
<td>657</td>
<td>866</td>
<td>80%</td>
</tr>
<tr>
<td>54</td>
<td>6/2/2008 - 6/30/2008</td>
<td>5</td>
<td>100</td>
<td>199</td>
<td>395</td>
<td>469</td>
<td>921</td>
<td>68%</td>
</tr>
<tr>
<td>56</td>
<td>6/2/2008 - 6/30/2008</td>
<td>5</td>
<td>100</td>
<td>179</td>
<td>325</td>
<td>419</td>
<td>1,046</td>
<td>62%</td>
</tr>
</tbody>
</table>

Table 176. Land Use/Land Cover in the Oliver Ditch Subwatershed

<table>
<thead>
<tr>
<th>Land Use/Land Cover</th>
<th>Subwatershed Area</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Acres</td>
<td>Square Miles</td>
</tr>
<tr>
<td>Agricultural Land</td>
<td>37139.12</td>
<td>58.03</td>
</tr>
<tr>
<td>Forested Land</td>
<td>9490.44</td>
<td>14.83</td>
</tr>
<tr>
<td>Developed Land</td>
<td>2600.01</td>
<td>4.06</td>
</tr>
<tr>
<td>Grassland and Shrubs</td>
<td>1184.47</td>
<td>1.85</td>
</tr>
<tr>
<td>Pasture/Hay</td>
<td>1161.12</td>
<td>1.81</td>
</tr>
<tr>
<td>Wetland</td>
<td>904.25</td>
<td>1.41</td>
</tr>
<tr>
<td>Open Water</td>
<td>188.59</td>
<td>0.29</td>
</tr>
<tr>
<td>Total</td>
<td>52,668.00</td>
<td>82.29</td>
</tr>
</tbody>
</table>
Figure 84. Location of Oliver Ditch Subwatershed (HUC10-201)
Table 177 summarizes the subwatershed characteristics as well as the TMDL results for HUC12-103. It should be noted that there are no current 303(d) listings in HUC 103; however, the sampling performed in 2008 suggests that several streams are impaired. Those streams will appear on the next 303(d) list and TMDLs for those streams are presented here.

There is one CAFO within this subwatershed and it receives a WLA of zero as described further in Section 7.3.
Table 177. Jungles Ditch-Oliver Ditch Characteristics and TMDL Summary (HUC12-103)

<table>
<thead>
<tr>
<th>Upstream Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Drainage Area</strong></td>
</tr>
<tr>
<td>82.35 square miles</td>
</tr>
<tr>
<td><strong>Sampling Station</strong></td>
</tr>
<tr>
<td>50,52,54,56</td>
</tr>
<tr>
<td><strong>Listed Segments</strong></td>
</tr>
<tr>
<td>None</td>
</tr>
<tr>
<td><strong>Land Use</strong></td>
</tr>
<tr>
<td>Agriculture: 70.46%; Developed Land: 4.93%; Forest: 18.01%; Other: 6.60%</td>
</tr>
<tr>
<td><strong>Soils</strong></td>
</tr>
<tr>
<td>A: 63.37%; B: 30.55%; C: 3.09%; D: 2.18%; Unknown: 0.91%</td>
</tr>
<tr>
<td><strong>NPDES Facilities</strong></td>
</tr>
<tr>
<td>None</td>
</tr>
<tr>
<td><strong>MS4 Communities</strong></td>
</tr>
<tr>
<td>None</td>
</tr>
<tr>
<td><strong>CSO Communities</strong></td>
</tr>
<tr>
<td>None</td>
</tr>
<tr>
<td><strong>CAFOs</strong></td>
</tr>
<tr>
<td>Newberry Farms, LLC (ING806083)</td>
</tr>
<tr>
<td><strong>CFOs</strong></td>
</tr>
<tr>
<td>Whitaker Farms (6355)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TMDL Allocations (billion/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Allocation Category</strong></td>
</tr>
<tr>
<td><strong>High Flows</strong></td>
</tr>
<tr>
<td>LA</td>
</tr>
<tr>
<td>WLA</td>
</tr>
<tr>
<td>MOS (10%)</td>
</tr>
<tr>
<td>TMDL = LA+WLA+MOS</td>
</tr>
</tbody>
</table>
7.1.4.2 Slough Creek Subwatershed (HUC10-202)

The Slough Creek subwatershed has an area of nearly 145 square miles and includes the cities of Collegeville and Remington (Figure 86). Agriculture account for 84.77 percent of the total subwatershed area followed by forested (6.73%) and developed land (6.05%) as shown in Table 181. Wastewater treatment plants and feeding operations are displayed in Figure 87 and Figure 88, respectively.

There are two listed segments (Table 178) and four sampling stations (Table 179) within this subwatershed. The summary of 2008 data in this subwatershed is shown in Table 180 and the required reductions range from 51 to 86 percent.

<table>
<thead>
<tr>
<th>HUC 12</th>
<th>HUC 12 Name</th>
<th>Segment ID</th>
<th>Waterbody</th>
<th>Stream Length (miles)</th>
<th>Parameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>206</td>
<td>Bice Ditch-Slough Creek</td>
<td>INK0235_T1019</td>
<td>Slough Creek</td>
<td>6.8</td>
<td>E. coli</td>
</tr>
<tr>
<td>205</td>
<td>Carpenter Creek</td>
<td>INK0238_00</td>
<td>Slough Creek-Carpenter Creek (Lower)</td>
<td>10.21</td>
<td>E. coli</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>HUC 12</th>
<th>HUC 12 Name</th>
<th>Station #</th>
<th>Stream Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>204</td>
<td>Headwaters Carpenter Creek</td>
<td>ID# 70</td>
<td>Carpenter Cr</td>
</tr>
<tr>
<td>205</td>
<td>Carpenter Creek</td>
<td>ID# 68</td>
<td>Carpenter Cr</td>
</tr>
<tr>
<td>206</td>
<td>Bice Ditch-Slough Creek</td>
<td>ID# 64</td>
<td>Slough Cr</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ID# 66</td>
<td>Slough Cr</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Station #</th>
<th>Period of Record</th>
<th>Total Number of Samples</th>
<th>Percent of Samples Exceeding E. coli WQS (#/100 mL)</th>
<th>Minimum (#/100 Mi)</th>
<th>Geomean (#/100 Mi)</th>
<th>Average (#/100 Mi)</th>
<th>Maximum (#/100 Mi)</th>
<th>Percent Reduction Based on Geomean (125/100 Mi)</th>
</tr>
</thead>
<tbody>
<tr>
<td>70</td>
<td>6/4/2008 – 7/2/2008</td>
<td>5</td>
<td>60</td>
<td>76</td>
<td>253</td>
<td>636</td>
<td>2,419</td>
<td>51%</td>
</tr>
<tr>
<td>68</td>
<td>6/4/2008 – 7/2/2008</td>
<td>5</td>
<td>100</td>
<td>411</td>
<td>919</td>
<td>1,128</td>
<td>2,419</td>
<td>86%</td>
</tr>
<tr>
<td>64</td>
<td>6/4/2008 – 7/2/2008</td>
<td>5</td>
<td>100</td>
<td>365</td>
<td>711</td>
<td>915</td>
<td>2,419</td>
<td>82%</td>
</tr>
<tr>
<td>66</td>
<td>6/4/2008 – 7/2/2008</td>
<td>5</td>
<td>100</td>
<td>179</td>
<td>583</td>
<td>994</td>
<td>2,419</td>
<td>79%</td>
</tr>
</tbody>
</table>
### Table 181. Land Use/Land Cover in the Slough Creek Subwatershed

<table>
<thead>
<tr>
<th>Land Use/Land Cover</th>
<th>Acres</th>
<th>Square Miles</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agricultural Land</td>
<td>78,614.71</td>
<td>122.84</td>
<td>84.77</td>
</tr>
<tr>
<td>Forested Land</td>
<td>6,242.60</td>
<td>9.75</td>
<td>6.73</td>
</tr>
<tr>
<td>Developed Land</td>
<td>5,608.78</td>
<td>8.76</td>
<td>6.05</td>
</tr>
<tr>
<td>Pasture/Hay</td>
<td>1,871.89</td>
<td>2.92</td>
<td>2.02</td>
</tr>
<tr>
<td>Grassland and Shrubs</td>
<td>171.69</td>
<td>0.27</td>
<td>0.19</td>
</tr>
<tr>
<td>Open Water</td>
<td>146.34</td>
<td>0.23</td>
<td>0.16</td>
</tr>
<tr>
<td>Wetland</td>
<td>89.18</td>
<td>0.14</td>
<td>0.10</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>92,745.18</strong></td>
<td><strong>144.91</strong></td>
<td><strong>100.00</strong></td>
</tr>
</tbody>
</table>

---

**Figure 86. Location of Slough Creek Subwatershed (HUC10-202)**
Figure 87. NPDES Facilities in the Slough Creek Subwatershed (HUC10-202)
Table 182 through Table 184 summarize the subwatershed characteristics as well as the TMDL results for each of the HUC 12 subwatersheds. It should be noted that there are no current 303(d) listings in HUC 204; however, the sampling performed in 2008 suggests that several streams are impaired. Those streams will appear on the next 303(d) list and TMDLs for those streams are presented here.

There is one NPDES facilities within the Slough Creek subwatershed and the WLAs for that facility were calculated based on design flows and *E. coli* permit limits. The individual WLAs are presented in Table 276. There are two CAFOs within this subwatershed and they receive a WLA of zero as described further in Section 7.3.
### Table 182. Headwaters Carpenter Creek Characteristics and TMDL Summary (HUC12-204)

#### Upstream Characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drainage Area</td>
<td>23.46 square miles</td>
</tr>
<tr>
<td>Sampling Station</td>
<td>70</td>
</tr>
<tr>
<td>Listed Segments</td>
<td>None</td>
</tr>
<tr>
<td>Land Use</td>
<td>Agriculture: 90.32%; Developed Land: 7.19%; Forest: 0.74%; Other: 1.74%</td>
</tr>
<tr>
<td>Soils</td>
<td>A: 0.00%; B: 62.58%; C: 36.77%; D: 0.65%; Unknown: 0.00%</td>
</tr>
<tr>
<td>NPDES Facilities</td>
<td>Remington WWTP (IN0020940)</td>
</tr>
<tr>
<td>MS4 Communities</td>
<td>None</td>
</tr>
<tr>
<td>CSO Communities</td>
<td>None</td>
</tr>
<tr>
<td>CAFOs</td>
<td>None</td>
</tr>
<tr>
<td>CFOs</td>
<td>None</td>
</tr>
</tbody>
</table>

#### TMDL Allocations (billion/day)

<table>
<thead>
<tr>
<th>Allocation Category</th>
<th>High Flows</th>
<th>Moist Conditions</th>
<th>Mid-Range Flows</th>
<th>Dry Conditions</th>
<th>Low Flows</th>
</tr>
</thead>
<tbody>
<tr>
<td>LA</td>
<td>203.59</td>
<td>55.49</td>
<td>19.83</td>
<td>5.45</td>
<td>0.71</td>
</tr>
<tr>
<td>WLA</td>
<td>2.03</td>
<td>2.03</td>
<td>2.03</td>
<td>2.03</td>
<td>2.03</td>
</tr>
<tr>
<td>MOS (10%)</td>
<td>22.85</td>
<td>6.39</td>
<td>2.43</td>
<td>0.83</td>
<td>0.3</td>
</tr>
<tr>
<td>TMDL = LA+WLA+MOS</td>
<td>228.47</td>
<td>63.91</td>
<td>24.29</td>
<td>8.31</td>
<td>3.04</td>
</tr>
</tbody>
</table>
### Table 183. Carpenter Creek Characteristics and TMDL Summary (HUC12-205)

#### Upstream Characteristics

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drainage Area</td>
<td>54.09 square miles</td>
</tr>
<tr>
<td>Sampling Station</td>
<td>68</td>
</tr>
<tr>
<td>Listed Segments</td>
<td>INK0238_00</td>
</tr>
<tr>
<td>Land Use</td>
<td>Agriculture: 87.97%; Developed Land: 6.85%; Forest: 2.96%; Other: 2.22%</td>
</tr>
<tr>
<td>Soils</td>
<td>A: 20.33%; B: 43.18%; C: 32.03%; D: 4.46%; Unknown: 0.00%</td>
</tr>
<tr>
<td>NPDES Facilities</td>
<td>Remington WWTP (IN0020940)</td>
</tr>
<tr>
<td>MS4 Communities</td>
<td>None</td>
</tr>
<tr>
<td>CSO Communities</td>
<td>None</td>
</tr>
<tr>
<td>CAFOs</td>
<td>Tip Top Pigs Inc #1 (ING802689)</td>
</tr>
<tr>
<td>CFOs</td>
<td>Jasper County Pullets (3506)</td>
</tr>
<tr>
<td></td>
<td>Ronald Hathaway (4390)</td>
</tr>
</tbody>
</table>

#### TMDL Allocations (billion/day)

<table>
<thead>
<tr>
<th>Allocation Category</th>
<th>High Flows</th>
<th>Moist Conditions</th>
<th>Mid-Range Flows</th>
<th>Dry Conditions</th>
<th>Low Flows</th>
</tr>
</thead>
<tbody>
<tr>
<td>LA</td>
<td>472.15</td>
<td>130.61</td>
<td>48.37</td>
<td>15.21</td>
<td>4.27</td>
</tr>
<tr>
<td>WLA</td>
<td>2.03</td>
<td>2.03</td>
<td>2.03</td>
<td>2.03</td>
<td>2.03</td>
</tr>
<tr>
<td>MOS (10%)</td>
<td>52.69</td>
<td>14.74</td>
<td>5.60</td>
<td>1.92</td>
<td>0.70</td>
</tr>
<tr>
<td>TMDL = LA+WLA+MOS</td>
<td>526.87</td>
<td>147.38</td>
<td>56.00</td>
<td>19.16</td>
<td>7.00</td>
</tr>
</tbody>
</table>
Table 184. Bice Ditch-Slough Creek Characteristics and TMDL Summary (HUC12-206)

<table>
<thead>
<tr>
<th>Upstream Characteristics</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Drainage Area</td>
<td>145.11 square miles</td>
</tr>
<tr>
<td>Sampling Station</td>
<td>64,66</td>
</tr>
<tr>
<td>Listed Segments</td>
<td>INK0235_T1019</td>
</tr>
<tr>
<td>Land Use</td>
<td>Agriculture: 84.65%; Developed Land: 6.04%; Forest: 6.72%; Other: 2.59%</td>
</tr>
<tr>
<td>Soils</td>
<td>A: 42.90%; B: 35.03%; C: 19.69%; D: 2.28%; Unknown: 0.10%</td>
</tr>
<tr>
<td>NPDES Facilities</td>
<td>Remington WWTP (IN0020940)</td>
</tr>
<tr>
<td>MS4 Communities</td>
<td>None</td>
</tr>
<tr>
<td>CSO Communities</td>
<td>None</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CAFOs</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>White County Egg Farm (ING803422)</td>
<td></td>
</tr>
<tr>
<td>Tip Top Pigs Inc #1 (ING802689)</td>
<td></td>
</tr>
<tr>
<td>Jack Rodibaugh &amp; Sons Inc (516)</td>
<td></td>
</tr>
<tr>
<td>Frey Farm (745)</td>
<td></td>
</tr>
<tr>
<td>Mark And Rebecca Streitmatter (2891)</td>
<td></td>
</tr>
<tr>
<td>White County Pullets (3423)</td>
<td></td>
</tr>
<tr>
<td>Keith Streitmatter (4260)</td>
<td></td>
</tr>
<tr>
<td>Jasper County Pullets (3506)</td>
<td></td>
</tr>
<tr>
<td>Ronald Hathaway (4390)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CFOs</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Ronald Hathaway (4390)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TMDL Allocations (billion/day)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Allocation Category</td>
<td>High Flows</td>
</tr>
<tr>
<td>LA</td>
<td>1269.84</td>
</tr>
<tr>
<td>WLA</td>
<td>2.03</td>
</tr>
<tr>
<td>MOS (10%)</td>
<td>141.32</td>
</tr>
<tr>
<td>TMDL = LA+WLA+MOS</td>
<td>1413.19</td>
</tr>
</tbody>
</table>
7.1.4.3 Bruner Ditch-Iroquois River Subwatershed (HUC10-203)

The Bruner Ditch subwatershed has an area of approximately 136 square miles and lies in Jasper County (Figure 89). Agriculture is the dominant land use (Table 188). There is only one NPDES facility and two CAFOs within the subwatershed as documented in Figure 90 and Figure 91, respectively. The subwatershed has two listed segments (Table 185). Table 186 lists the sampling locations and Table 187 summarizes the 2008 data. The required reductions range from 64 to 80 percent in this subwatershed.

<table>
<thead>
<tr>
<th>HUC 12</th>
<th>HU C12 Name</th>
<th>Segment ID</th>
<th>Waterbody</th>
<th>Stream Length (miles)</th>
<th>Parameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>303</td>
<td>Dexter Ditch-Iroquois</td>
<td>INK0223_T1003</td>
<td>Iroquois River</td>
<td>3.51</td>
<td>E. coli</td>
</tr>
<tr>
<td>305</td>
<td>Moore Ditch _Iroquois</td>
<td>INK0226_T1004</td>
<td>Iroquois River</td>
<td>10.9</td>
<td>E. coli</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>HUC 12</th>
<th>HU C12 Name</th>
<th>Station #</th>
<th>Stream Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>304</td>
<td>Ryan Ditch</td>
<td>ID# 58</td>
<td>Ryan D</td>
</tr>
<tr>
<td>305</td>
<td>Moore Ditch-Iroquois</td>
<td>ID# 60</td>
<td>Iroquois R</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Station #</th>
<th>Period of Record</th>
<th>Total Number of Samples</th>
<th>Percent of Samples Exceeding E. coli WQS (#/100 mL)</th>
<th>Minimum (#/100 mL)</th>
<th>Geomean (#/100 mL)</th>
<th>Average (#/100 mL)</th>
<th>Maximum (#/100 mL)</th>
<th>Percent Reduction Based on Geomean (125/100mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>58</td>
<td>6/4/2008 - 7/2/2008</td>
<td>5</td>
<td>100</td>
<td>40</td>
<td>162</td>
<td>343</td>
<td>665</td>
<td>2,419</td>
</tr>
<tr>
<td>60</td>
<td>6/4/2008 - 7/2/2008</td>
<td>5</td>
<td>100</td>
<td>100</td>
<td>365</td>
<td>631</td>
<td>672</td>
<td>1,120</td>
</tr>
</tbody>
</table>
## Table 188. Land Use/Land Cover in the Bruner Ditch-Iroquois River Subwatershed

<table>
<thead>
<tr>
<th>Land Use/Land Cover</th>
<th>Subwatershed</th>
<th>Acres</th>
<th>Square Miles</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agricultural Land</td>
<td></td>
<td>72,477.52</td>
<td>113.25</td>
<td>83.57</td>
</tr>
<tr>
<td>Forested Land</td>
<td></td>
<td>4,947.38</td>
<td>7.73</td>
<td>5.70</td>
</tr>
<tr>
<td>Developed Land</td>
<td></td>
<td>5,619.67</td>
<td>8.78</td>
<td>6.48</td>
</tr>
<tr>
<td>Pasture/Hay</td>
<td></td>
<td>2,570.65</td>
<td>4.02</td>
<td>2.96</td>
</tr>
<tr>
<td>Grassland and Shrubs</td>
<td></td>
<td>693.65</td>
<td>1.08</td>
<td>0.80</td>
</tr>
<tr>
<td>Open Water</td>
<td></td>
<td>320.69</td>
<td>0.50</td>
<td>0.37</td>
</tr>
<tr>
<td>Wetland</td>
<td></td>
<td>97.41</td>
<td>0.15</td>
<td>0.11</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>86,726.97</strong></td>
<td><strong>135.51</strong></td>
<td><strong>100.00</strong></td>
</tr>
</tbody>
</table>

Figure 89. Location of Bruner Ditch-Iroquois River (HUC10-203)
Figure 90. NPDES Facilities in the Bruner Ditch-Iroquois River (HUC 10-203)
Table 189 through Table 191 summarize the subwatershed characteristics as well as the TMDL results for each of the HUC 12 subwatersheds. It should be noted that there are no current 303(d) listings in HUC 304; however, the sampling performed in 2008 suggests that several streams are impaired. Those streams will appear on the next 303(d) list and TMDLs for those streams are presented here.

There is one NPDES facility within the Bruner Ditch subwatershed and the WLAs for the facility were calculated based on the design flows and E. coli permit limits. There is one CSO community with 9 outfalls upstream of this subwatershed. WLAs for CSO communities were calculated based on the maximum observed CSO flow at each outfall and E. coli standards. The individual WLAs are presented in Table 276. There are two CAFOs within this subwatershed and they receive a WLA of zero as described further in Section 7.3.
Table 189.  Dexter Ditch-Iroquois River Characteristics and TMDL Summary (HUC12-303)

<table>
<thead>
<tr>
<th>Upstream Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Drainage Area</strong></td>
</tr>
<tr>
<td><strong>Sampling Station</strong></td>
</tr>
<tr>
<td><strong>Listed Segments</strong></td>
</tr>
<tr>
<td><strong>Land Use</strong></td>
</tr>
<tr>
<td><strong>Soils</strong></td>
</tr>
<tr>
<td><strong>NPDES Facilities</strong></td>
</tr>
<tr>
<td><strong>MS4 Communities</strong></td>
</tr>
<tr>
<td><strong>CSO Communities</strong></td>
</tr>
<tr>
<td><strong>CAFOs</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>CFOs</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TMDL Allocations (billion/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Allocation Category</strong></td>
</tr>
<tr>
<td>LA</td>
</tr>
<tr>
<td>WLA</td>
</tr>
<tr>
<td>MOS (10%)</td>
</tr>
<tr>
<td>TMDL = LA+WLA+MOS</td>
</tr>
</tbody>
</table>
### Table 190. Ryan Ditch-Iroquois River Characteristics and TMDL Summary (HUC12-304)

<table>
<thead>
<tr>
<th>Upstream Characteristics</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Drainage Area</strong></td>
<td>53.87 square miles</td>
</tr>
<tr>
<td><strong>Sampling Station</strong></td>
<td>58</td>
</tr>
<tr>
<td><strong>Listed Segments</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>Land Use</strong></td>
<td>Agriculture: 90.36%; Developed Land: 3.66%; Forest: 3.08%; Other: 2.90%</td>
</tr>
<tr>
<td><strong>Soils</strong></td>
<td>A: 22.65%; B: 56.91%; C: 14.64%; D: 5.52%; Unknown: 0.28%</td>
</tr>
<tr>
<td><strong>NPDES Facilities</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>MS4 Communities</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>CSO Communities</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>CAFOs</strong></td>
<td>None</td>
</tr>
</tbody>
</table>

**CFOs**
- Bruce Wuethrich Farm (230)
- Hurley Swine Enterprises #1 (4056)
- Parkinson & Rodibaugh (4235)
- G.O.P. Farms (4656)
- Moore Farms (4337)
- Northwind Pork LLC (4991)

<table>
<thead>
<tr>
<th>TMDL Allocations (billion/day)</th>
<th>High Flows</th>
<th>Moist Conditions</th>
<th>Mid-Range Flows</th>
<th>Dry Conditions</th>
<th>Low Flows</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>LA</strong></td>
<td>474.71</td>
<td>127.07</td>
<td>52.58</td>
<td>20.45</td>
<td>8.04</td>
</tr>
<tr>
<td><strong>WLA</strong></td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td><strong>MOS (10%)</strong></td>
<td>52.74</td>
<td>14.12</td>
<td>5.84</td>
<td>2.27</td>
<td>0.89</td>
</tr>
<tr>
<td><strong>TMDL = LA+WLA+MOS</strong></td>
<td>527.45</td>
<td>141.19</td>
<td>58.42</td>
<td>22.72</td>
<td>8.93</td>
</tr>
</tbody>
</table>
Table 191. Moore Ditch-Iroquois River Characteristics and TMDL Summary (HUC12-305)

<table>
<thead>
<tr>
<th><strong>Upstream Characteristics</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Drainage Area</strong></td>
</tr>
<tr>
<td><strong>Sampling Station</strong></td>
</tr>
<tr>
<td><strong>Listed Segments</strong></td>
</tr>
<tr>
<td><strong>Land Use</strong></td>
</tr>
<tr>
<td><strong>Soils</strong></td>
</tr>
<tr>
<td><strong>NPDES Facilities</strong></td>
</tr>
<tr>
<td><strong>MS4 Communities</strong></td>
</tr>
<tr>
<td><strong>CSO Communities</strong></td>
</tr>
<tr>
<td><strong>CAFOs</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>CFOs</strong></td>
</tr>
<tr>
<td></td>
</tr>
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</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

**TMDL Allocations (billion/day)**

<table>
<thead>
<tr>
<th>Allocation Category</th>
<th>High Flows</th>
<th>Moist Conditions</th>
<th>Mid-Range Flows</th>
<th>Dry Conditions</th>
<th>Low Flows</th>
</tr>
</thead>
<tbody>
<tr>
<td>LA</td>
<td>1056.13</td>
<td>508.42</td>
<td>207.05</td>
<td>77.05</td>
<td>26.82</td>
</tr>
<tr>
<td>WLA</td>
<td>864.35</td>
<td>5.68</td>
<td>5.68</td>
<td>5.68</td>
<td>5.68</td>
</tr>
<tr>
<td>MOS (10%)</td>
<td>213.39</td>
<td>57.12</td>
<td>23.64</td>
<td>9.19</td>
<td>3.61</td>
</tr>
<tr>
<td>TMDL = LA+WLA+MOS</td>
<td>2133.87</td>
<td>571.22</td>
<td>236.37</td>
<td>91.92</td>
<td>36.11</td>
</tr>
</tbody>
</table>
7.1.4.4 **Curtis Creek-Iroquois River Subwatershed (HUC10-204)**

The Curtis Creek subwatershed has an area of nearly 162 square miles and is located within Jasper, Newton and Benton counties (Figure 92). A significant portion of the land (86.34%) is used for agriculture. Developed land accounts for 9.83 percent. The remaining land categories comprise 7.58 percent of the total subwatershed area (Table 194). The NPDES facilities and feeding operations that are potential sources of pathogen in this subwatershed are shown in Figure 93 and Figure 94, respectively. Although no segments were listed in 2006, the 2008 data suggest impaired conditions (Table 192 and Table 193). The required reductions range from 75 to 89 percent in this subwatershed.

<table>
<thead>
<tr>
<th>Station #</th>
<th>Period of Record</th>
<th>Total Number of Samples Exceeding E. coli WQS (#/100 mL)</th>
<th>Minimum (#/100 mL)</th>
<th>Geomean (#/100 mL)</th>
<th>Average (#/100 mL)</th>
<th>Maximum (#/100 mL)</th>
<th>Percent Reduction Based on Geomean (125/100mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>62</td>
<td>6/4/2008 - 7/2/2008</td>
<td>5 100 100</td>
<td>326</td>
<td>649</td>
<td>882</td>
<td>2,419</td>
<td>81%</td>
</tr>
<tr>
<td>76</td>
<td>6/2/2008 - 6/30/2008</td>
<td>5 100 100</td>
<td>866</td>
<td>1,122</td>
<td>1,144</td>
<td>1,414</td>
<td>89%</td>
</tr>
<tr>
<td>78</td>
<td>6/2/2008 - 6/30/2008</td>
<td>5 100 100</td>
<td>276</td>
<td>755</td>
<td>866</td>
<td>1,300</td>
<td>83%</td>
</tr>
<tr>
<td>72</td>
<td>6/2/2008 - 6/30/2008</td>
<td>5 100 80</td>
<td>131</td>
<td>495</td>
<td>805</td>
<td>2,419</td>
<td>77%</td>
</tr>
<tr>
<td>74</td>
<td>6/2/2008 - 6/30/2008</td>
<td>5 100 100</td>
<td>276</td>
<td>544</td>
<td>608</td>
<td>1,120</td>
<td>75%</td>
</tr>
</tbody>
</table>
Table 194. Land Use/Land Cover in the Curtis Creek-Iroquois River Subwatershed

<table>
<thead>
<tr>
<th>Land Use/Land Cover</th>
<th>Subwatershed</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Area</td>
<td>Percent</td>
</tr>
<tr>
<td></td>
<td>Acres</td>
<td>Square Miles</td>
</tr>
<tr>
<td>Agricultural Land</td>
<td>89,350.55</td>
<td>139.61</td>
</tr>
<tr>
<td>Forested Land</td>
<td>4,048.90</td>
<td>6.33</td>
</tr>
<tr>
<td>Developed Land</td>
<td>6,291.75</td>
<td>9.83</td>
</tr>
<tr>
<td>Pasture/Hay</td>
<td>3,008.32</td>
<td>4.70</td>
</tr>
<tr>
<td>Grassland and Shrubs</td>
<td>217.06</td>
<td>0.34</td>
</tr>
<tr>
<td>Open Water</td>
<td>178.80</td>
<td>0.28</td>
</tr>
<tr>
<td>Wetland</td>
<td>394.30</td>
<td>0.62</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>103,489.69</strong></td>
<td><strong>161.70</strong></td>
</tr>
</tbody>
</table>

Figure 92. Location of Curtis Creek-Iroquois River Subwatershed (HUC10-204)
Figure 93. NPDES Facilities in the Curtis Creek-Iroquois River Subwatershed (HUC10-204)
Figure 94. Feeding Operations in Curtis Creek-Iroquois River Subwatershed (HUC10-204)

Table 195 through Table 198 summarize the subwatershed characteristics as well as the TMDL results for each of the HUC 12 subwatersheds. It should be noted that there are no current 303(d) listings in this subwatershed; however, the sampling performed in 2008 suggests that several streams are impaired. Those streams will appear on the next 303(d) list and TMDLs for those streams are presented here.

There are three NPDES facilities within the Mill Creek subwatershed and the WLAs for the facilities were calculated based on their design flows and *E. coli* permit limits. There is one CSO community with 9 outfalls upstream of this subwatershed. WLAs for CSO communities were calculated based on the maximum observed CSO flow at each outfall and *E. coli* standards. The individual WLAs are presented in Table 276. There are six CAFOs within this subwatershed and they receive a WLA of zero as described further in Section 7.3.
### Table 195. Headwaters Curtis Creek Characteristics and TMDL Summary (HUC12-401)

<table>
<thead>
<tr>
<th>Upstream Characteristics</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Drainage Area</td>
<td>38.66 square miles</td>
</tr>
<tr>
<td>Sampling Station</td>
<td>62</td>
</tr>
<tr>
<td>Listed Segments</td>
<td>None</td>
</tr>
<tr>
<td>Land Use</td>
<td>Agriculture: 72.70%; Developed Land: 7.73%; Forest: 9.50%; Other: 10.07%</td>
</tr>
<tr>
<td>Soils</td>
<td>A: 48.65%; B: 40.93%; C: 8.11%; D: 2.32%; Unknown: 0.00%</td>
</tr>
<tr>
<td>NPDES Facilities</td>
<td>Trail Tree Inn (IN0041904)</td>
</tr>
<tr>
<td></td>
<td>Grandmas Home Cooking (IN0053422)</td>
</tr>
<tr>
<td>MS4 Communities</td>
<td>None</td>
</tr>
<tr>
<td>CSO Communities</td>
<td>None</td>
</tr>
<tr>
<td>CAFOs</td>
<td>Cambalot Swine Breeders *</td>
</tr>
<tr>
<td></td>
<td>Calf Land, LLC (ING803732)</td>
</tr>
<tr>
<td></td>
<td>Fair Oaks Dairy Farm South (ING806036)</td>
</tr>
<tr>
<td></td>
<td>Fair Oaks Dairy Farm West (ING806065)</td>
</tr>
<tr>
<td></td>
<td>Fair Oaks Dairy Farm, LLC. - North Central # 5 (ING806341)</td>
</tr>
<tr>
<td>CFOs</td>
<td>None</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TMDL Allocations (billion/day)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Allocation Category</td>
<td>High Flows</td>
</tr>
<tr>
<td>LA</td>
<td>337.50</td>
</tr>
<tr>
<td>WLA</td>
<td>1.35</td>
</tr>
<tr>
<td>MOS (10%)</td>
<td>37.65</td>
</tr>
<tr>
<td>TMDL = LA+WLA+MOS</td>
<td>376.50</td>
</tr>
</tbody>
</table>

* ID not available
Table 196. Hunter Ditch Characteristics and TMDL Summary (HUC12-403)

<table>
<thead>
<tr>
<th><strong>Upstream Characteristics</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Drainage Area</strong></td>
<td>42.66 square miles</td>
</tr>
<tr>
<td><strong>Sampling Station</strong></td>
<td>76</td>
</tr>
<tr>
<td><strong>Listed Segments</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>Land Use</strong></td>
<td>Agriculture: 92.65%; Developed Land: 6.16%; Forest: 0.27%; Other: 0.92%</td>
</tr>
<tr>
<td><strong>Soils</strong></td>
<td>A: 6.69%; B: 47.54%; C: 44.01%; D: 1.76%; Unknown: 0.00%</td>
</tr>
<tr>
<td><strong>NPDES Facilities</strong></td>
<td>Goodland Municipal WWTP (IN0040070)</td>
</tr>
<tr>
<td><strong>MS4 Communities</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>CSO Communities</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>CAFOs</strong></td>
<td>Seven Hills Dairy, LLC (ING806207)</td>
</tr>
<tr>
<td><strong>CFOs</strong></td>
<td>Oinker Acres (3279)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>TMDL Allocations (billion/day)</strong></th>
<th>High Flows</th>
<th>Moist Conditions</th>
<th>Mid-Range Flows</th>
<th>Dry Conditions</th>
<th>Low Flows</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>LA</strong></td>
<td>373.46</td>
<td>104.14</td>
<td>39.29</td>
<td>13.15</td>
<td>4.52</td>
</tr>
<tr>
<td><strong>WLA</strong></td>
<td>0.45</td>
<td>0.45</td>
<td>0.45</td>
<td>0.45</td>
<td>0.45</td>
</tr>
<tr>
<td><strong>MOS (10%)</strong></td>
<td>41.55</td>
<td>11.62</td>
<td>4.42</td>
<td>1.51</td>
<td>0.55</td>
</tr>
<tr>
<td><strong>TMDL = LA+WLA+MOS</strong></td>
<td>415.46</td>
<td>116.21</td>
<td>44.16</td>
<td>15.11</td>
<td>5.52</td>
</tr>
</tbody>
</table>
Table 197. Bower Ditch –Darroch Ditch Characteristics and TMDL Summary (HUC12-404)

<table>
<thead>
<tr>
<th>Upstream Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drainage Area</td>
</tr>
<tr>
<td>Sampling Station</td>
</tr>
<tr>
<td>Listed Segments</td>
</tr>
<tr>
<td>Land Use</td>
</tr>
<tr>
<td>Soils</td>
</tr>
<tr>
<td>NPDES Facilities</td>
</tr>
<tr>
<td>MS4 Communities</td>
</tr>
<tr>
<td>CSO Communities</td>
</tr>
<tr>
<td>CAFOs</td>
</tr>
<tr>
<td>CFOs</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TMDL Allocations (billion/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allocation Category</td>
</tr>
<tr>
<td>---------------------</td>
</tr>
<tr>
<td>LA</td>
</tr>
<tr>
<td>WLA</td>
</tr>
<tr>
<td>MOS (10%)</td>
</tr>
<tr>
<td>TMDL = LA+WLA+MOS</td>
</tr>
</tbody>
</table>
Table 198. Hickory Branch –Iroquois River Characteristics and TMDL Summary (HUC12-405)

<table>
<thead>
<tr>
<th>Upstream Characteristics</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Drainage Area</strong></td>
<td>524.76 square miles</td>
</tr>
<tr>
<td><strong>Sampling Station</strong></td>
<td>72.74</td>
</tr>
<tr>
<td><strong>Listed Segments</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>Land Use</strong></td>
<td>Agriculture: 82.65%; Developed Land: 5.99%; Forest: 7.36%; Other: 4.00%</td>
</tr>
<tr>
<td><strong>Soils</strong></td>
<td>A: 35.58%; B: 39.75%; C: 19.64%; D: 4.74%; Unknown: 0.29%</td>
</tr>
<tr>
<td><strong>NPDES Facilities</strong></td>
<td>Facilities Upstream of HUC12-206&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>Trail Tree Inn (IN0041904)</td>
</tr>
<tr>
<td></td>
<td>Goodland Municipal WWTP (IN0040070)</td>
</tr>
<tr>
<td></td>
<td>Grandmas Home Cooking (IN0053422)</td>
</tr>
<tr>
<td></td>
<td>George Ade Mem Health Care Car (IN0050997)</td>
</tr>
<tr>
<td><strong>MS4 Communities</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>CSO Communities</strong></td>
<td>Rensselaer Municipal STP (IN0024414)-9 outfalls</td>
</tr>
<tr>
<td><strong>CAFOs</strong></td>
<td>Facilities Upstream of HUC12-206&lt;sup&gt;a&lt;/sup&gt; and HUC12-205&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>Seven Hills Dairy, LLC (ING06207)</td>
</tr>
<tr>
<td><strong>CFOs</strong></td>
<td>Facilities Upstream of HUC12-206&lt;sup&gt;a&lt;/sup&gt; and HUC12-205&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>Oinker Acres (3279)</td>
</tr>
</tbody>
</table>

**TMDL Allocations (billion/day)**

<table>
<thead>
<tr>
<th>Allocation Category</th>
<th>High Flows</th>
<th>Moist Conditions</th>
<th>Mid-Range Flows</th>
<th>Dry Conditions</th>
<th>Low Flows</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>LA</strong></td>
<td>3731.22</td>
<td>1276.99</td>
<td>479.33</td>
<td>157.69</td>
<td>51.54</td>
</tr>
<tr>
<td><strong>WLA</strong></td>
<td>868.24</td>
<td>9.57</td>
<td>9.57</td>
<td>9.57</td>
<td>9.57</td>
</tr>
<tr>
<td><strong>MOS (10%)</strong></td>
<td>511.05</td>
<td>142.95</td>
<td>54.32</td>
<td>18.58</td>
<td>6.79</td>
</tr>
<tr>
<td><strong>TMDL = LA+WLA+MOS</strong></td>
<td>5110.51</td>
<td>1429.51</td>
<td>543.22</td>
<td>185.84</td>
<td>67.9</td>
</tr>
</tbody>
</table>

<sup>a</sup>: Refers to Upper Iroquois HUC12
7.1.4.5  Montgomery Ditch-Iroquois River Subwatershed (HUC10-205)

The Montgomery Ditch subwatershed has an area of nearly 160 square miles. Incorporated cities with this subwatershed include Sheldon and Kentland (Figure 95). As with the above watersheds, agriculture is the dominant land use covering 88.70 percent of the subwatershed area (Table 201). There are two NPDES facilities (Figure 96) and no CAFO (Figure 97) in this subwatershed. The subwatershed does not have any 303 (d) listed segments within it. The summary of the E. coli data at the four monitoring locations (Table 199) is listed in Table 200. The required reductions range from 41 to 85 percent.

<table>
<thead>
<tr>
<th>HUC 12</th>
<th>HUC 12 Name</th>
<th>Station #</th>
<th>Stream Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>502</td>
<td>Whaley Ditch</td>
<td>ID# 82</td>
<td>Thompson D</td>
</tr>
<tr>
<td>503</td>
<td>Strole Ditch-Iroquois River</td>
<td>ID# 80</td>
<td>Iroquois R</td>
</tr>
<tr>
<td>505</td>
<td>Kent Ditch-Montgomery Ditch</td>
<td>ID# 86</td>
<td>Montgomery</td>
</tr>
<tr>
<td>506</td>
<td>Montgomery Ditch</td>
<td>ID# 84</td>
<td>Montgomery</td>
</tr>
</tbody>
</table>

Table 199. Station Locations in the Montgomery Ditch -Iroquois River Subwatershed

<table>
<thead>
<tr>
<th>Station #</th>
<th>Period of Record</th>
<th>Total Number of Samples</th>
<th>Percent of Samples Exceeding E. coli WQS (#/100 mL)</th>
<th>Minimum (#/100 mL)</th>
<th>Geomean (#/100 mL)</th>
<th>Average (#/100 mL)</th>
<th>Maximum (#/100 mL)</th>
<th>Percent Reduction Based on Geomean (125/100mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>82</td>
<td>6/2/2008 - 6/30/2008</td>
<td>5</td>
<td>100</td>
<td>80</td>
<td>214</td>
<td>361</td>
<td>414</td>
<td>866</td>
</tr>
<tr>
<td>80</td>
<td>6/2/2008 - 6/30/2008</td>
<td>5</td>
<td>80</td>
<td>40</td>
<td>102</td>
<td>211</td>
<td>252</td>
<td>488</td>
</tr>
<tr>
<td>86</td>
<td>6/2/2008 - 6/30/2008</td>
<td>5</td>
<td>100</td>
<td>100</td>
<td>345</td>
<td>581</td>
<td>632</td>
<td>1,046</td>
</tr>
<tr>
<td>84</td>
<td>6/2/2008 - 6/30/2008</td>
<td>5</td>
<td>100</td>
<td>100</td>
<td>411</td>
<td>813</td>
<td>877</td>
<td>1,300</td>
</tr>
</tbody>
</table>

Table 200. Summary of Pathogen Data in Montgomery Ditch-Iroquois River Subwatershed

<table>
<thead>
<tr>
<th>Subwatershed</th>
<th>Land Use/Land Cover</th>
<th>Acres</th>
<th>Square Miles</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agricultural Land</td>
<td>91,053.20</td>
<td>142.27</td>
<td>88.70</td>
<td></td>
</tr>
<tr>
<td>Developed Land</td>
<td>6,550.84</td>
<td>10.24</td>
<td>6.38</td>
<td></td>
</tr>
<tr>
<td>Forested Land</td>
<td>2,462.12</td>
<td>3.85</td>
<td>2.40</td>
<td></td>
</tr>
<tr>
<td>Pasture/Hay</td>
<td>2,023.34</td>
<td>3.16</td>
<td>1.97</td>
<td></td>
</tr>
<tr>
<td>Open Water</td>
<td>247.97</td>
<td>0.39</td>
<td>0.24</td>
<td></td>
</tr>
<tr>
<td>Wetland</td>
<td>236.85</td>
<td>0.37</td>
<td>0.23</td>
<td></td>
</tr>
<tr>
<td>Grassland and Shrubs</td>
<td>78.28</td>
<td>0.12</td>
<td>0.08</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>102,652.60</td>
<td>160.39</td>
<td>100.00</td>
<td></td>
</tr>
</tbody>
</table>
Figure 95. Location of Montgomery Ditch-Iroquois River Subwatershed (HUC10-205)
Figure 96. NPDES Facilities in the Montgomery Ditch-Iroquois River Subwatershed (HUC 10-205)
Figure 97. Feeding Operations in the Montgomery Ditch-Iroquois River Subwatershed (HUC10-205)

Table 202 through Table 205 summarize the subwatershed characteristics as well as the TMDL results for each of the HUC 12 subwatersheds. It should be noted that there are no current 303(d) listings in the subwatershed; however, the sampling performed in 2008 suggests that several streams are impaired. Those streams will appear on the next 303(d) list and TMDLs for those streams are presented here.

There are two NPDES facilities within the Montgomery Ditch subwatershed and the WLAs for the facilities were calculated based on their design flows and E. coli permit limits. There is one CSO community with 9 outfalls upstream of this subwatershed. WLAs for CSO communities were calculated based on the maximum observed CSO flow at each outfall and E. coli standards. The individual WLAs are presented in Table 276. There are two CAFOs within this subwatershed and they receive a WLA of zero as described further in Section 7.3.
### Table 202. Whaley Ditch Characteristics and TMDL Summary (HUC 12-502)

<table>
<thead>
<tr>
<th>Upstream Characteristics</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Drainage Area</strong></td>
<td>38.93 square miles</td>
</tr>
<tr>
<td><strong>Sampling Station</strong></td>
<td>82</td>
</tr>
<tr>
<td><strong>Listed Segments</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>Land Use</strong></td>
<td>Agriculture: 91.54%; Developed Land: 5.44%; Forest: 1.95%; Other: 4.00%</td>
</tr>
<tr>
<td><strong>Soils</strong></td>
<td>A: 7.66%; B: 54.60%; C: 32.57%; D: 5.17%; Unknown: 0.00%</td>
</tr>
<tr>
<td><strong>NPDES Facilities</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>MS4 Communities</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>CSO Communities</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>CAFOs</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>CFOs</strong></td>
<td>Gary A Clark (669)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TMDL Allocations (billion/day)</th>
<th>High Flows</th>
<th>Moist Conditions</th>
<th>Mid-Range Flows</th>
<th>Dry Conditions</th>
<th>Low Flows</th>
</tr>
</thead>
<tbody>
<tr>
<td>LA</td>
<td>365.13</td>
<td>78.80</td>
<td>25.70</td>
<td>5.28</td>
<td>1.63</td>
</tr>
<tr>
<td>WLA</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>MOS (10%)</td>
<td>40.57</td>
<td>8.75</td>
<td>2.86</td>
<td>0.59</td>
<td>0.18</td>
</tr>
<tr>
<td>TMDL = LA+WLA+MOS</td>
<td>405.70</td>
<td>87.55</td>
<td>28.56</td>
<td>5.87</td>
<td>1.81</td>
</tr>
</tbody>
</table>
### Table 203. Strole Ditch-Iroquois River Characteristics and TMDL Summary (HUC 12-503)

<table>
<thead>
<tr>
<th>Upstream Characteristics</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Drainage Area</strong></td>
<td>545.01 Square miles</td>
</tr>
<tr>
<td><strong>Sampling Station</strong></td>
<td>80</td>
</tr>
<tr>
<td><strong>Listed Segments</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>Land Use</strong></td>
<td>Agriculture: 82.69%; Developed Land: 5.96%; Forest: 7.35%; Other: 4.00%</td>
</tr>
<tr>
<td><strong>Soils</strong></td>
<td>A: 34.47%; B: 40.17%; C: 20.44%; D: 4.65%; Unknown: 0.28%</td>
</tr>
<tr>
<td><strong>NPDES Facilities</strong></td>
<td>All facilities upstream of HUC12-405^a</td>
</tr>
<tr>
<td></td>
<td>Brook Municipal WWTP (IN0039764)</td>
</tr>
<tr>
<td><strong>MS4 Communities</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>CSO Communities</strong></td>
<td>Rensselaer Municipal STP (IN0024414)-9 outfalls</td>
</tr>
<tr>
<td></td>
<td>Brook Municipal WWTP (IN0039764)</td>
</tr>
<tr>
<td><strong>CAFOs</strong></td>
<td>All facilities upstream of HUC12-405^a</td>
</tr>
<tr>
<td><strong>CFOs</strong></td>
<td>All facilities upstream of HUC12-405^a</td>
</tr>
</tbody>
</table>

### TMDL Allocations (billion/day)

<table>
<thead>
<tr>
<th>High Flows</th>
<th>Moist Conditions</th>
<th>Mid-Range Flows</th>
<th>Dry Conditions</th>
<th>Low Flows</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>LA</strong></td>
<td>4243.04</td>
<td>1093.03</td>
<td>349.8</td>
<td>63.95</td>
</tr>
<tr>
<td><strong>WLA</strong></td>
<td>868.72</td>
<td>10.04</td>
<td>10.04</td>
<td>10.04</td>
</tr>
<tr>
<td><strong>MOS (10%)</strong></td>
<td>567.97</td>
<td>122.56</td>
<td>39.98</td>
<td>8.22</td>
</tr>
<tr>
<td><strong>TMDL = LA+WLA+MOS</strong></td>
<td>5679.73</td>
<td>1225.63</td>
<td>399.82</td>
<td>82.21</td>
</tr>
</tbody>
</table>

*a: Refers to Upper Iroquois HUC 12*
Table 204. Kent Ditch-Montgomery Ditch Characteristics and TMDL Summary (HUC 12-505)

<table>
<thead>
<tr>
<th>Upstream Characteristics</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Drainage Area</strong></td>
<td>49.15 square miles</td>
</tr>
<tr>
<td><strong>Sampling Station</strong></td>
<td>86</td>
</tr>
<tr>
<td><strong>Listed Segments</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>Land Use</strong></td>
<td>Agriculture: 90.50%; Developed Land: 7.01%; Forest: 0.18%; Other: 2.31%</td>
</tr>
<tr>
<td><strong>Soils</strong></td>
<td>A: 0.92%; B: 50.15%; C: 47.71%; D: 1.22%; Unknown: 0.00%</td>
</tr>
<tr>
<td><strong>NPDES Facilities</strong></td>
<td>Kentland Municipal WWTP (IN0023329)</td>
</tr>
<tr>
<td><strong>MS4 Communities</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>CSO Communities</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>CAFOs</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>CFOs</strong></td>
<td>Carl E Funk Farms (1680)</td>
</tr>
</tbody>
</table>

**TMDL Allocations (billion/day)**

<table>
<thead>
<tr>
<th></th>
<th>High Flows</th>
<th>Moist Conditions</th>
<th>Mid-Range Flows</th>
<th>Dry Conditions</th>
<th>Low Flows</th>
</tr>
</thead>
<tbody>
<tr>
<td>LA</td>
<td>460.07</td>
<td>98.57</td>
<td>31.54</td>
<td>5.76</td>
<td>1.15</td>
</tr>
<tr>
<td>WLA</td>
<td>2.18</td>
<td>2.18</td>
<td>2.18</td>
<td>2.18</td>
<td>2.18</td>
</tr>
<tr>
<td>MOS (10%)</td>
<td>51.36</td>
<td>11.19</td>
<td>3.74</td>
<td>0.88</td>
<td>0.37</td>
</tr>
<tr>
<td>TMDL = LA+WLA+MOS</td>
<td>513.61</td>
<td>111.94</td>
<td>37.46</td>
<td>8.82</td>
<td>3.7</td>
</tr>
</tbody>
</table>

* Design flows from the Kentland Municipal WWTP facility were added to the originally estimated flows. Without these modifications the WLA would exceed the TMDL during low flows.
Table 205. Montgomery Ditch Characteristics and TMDL Summary (HUC 12-506)

<table>
<thead>
<tr>
<th>Upstream Characteristics</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Drainage Area</td>
<td>75.39 square miles</td>
</tr>
<tr>
<td>Sampling Station</td>
<td>84</td>
</tr>
<tr>
<td>Listed Segments</td>
<td>None</td>
</tr>
<tr>
<td>Land Use</td>
<td>Agriculture: 90.56%; Developed Land: 6.48%; Forest: 0.73%; Other: 2.23%</td>
</tr>
<tr>
<td>Soils</td>
<td>A: 0.80%; B: 51.29%; C: 45.02%; D: 2.89%; Unknown: 0.00%</td>
</tr>
<tr>
<td>NPDES Facilities</td>
<td>Kentland Municipal WWTP (IN0023329)</td>
</tr>
<tr>
<td>MS4 Communities</td>
<td>None</td>
</tr>
<tr>
<td>CSO Communities</td>
<td>None</td>
</tr>
<tr>
<td>CAFOs</td>
<td>None</td>
</tr>
<tr>
<td>CFOs</td>
<td>Carl E Funk Farms (1680)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TMDL Allocations (billion/day)</th>
<th>High Flows</th>
<th>Moist Conditions</th>
<th>Mid-Range Flows</th>
<th>Dry Conditions</th>
<th>Low Flows</th>
</tr>
</thead>
<tbody>
<tr>
<td>LA</td>
<td>705.01</td>
<td>150.43</td>
<td>47.6</td>
<td>8.06</td>
<td>0.99</td>
</tr>
<tr>
<td>WLA</td>
<td>2.18</td>
<td>2.18</td>
<td>2.18</td>
<td>2.18</td>
<td>2.18</td>
</tr>
<tr>
<td>MOS (10%)</td>
<td>78.58</td>
<td>16.95</td>
<td>5.53</td>
<td>1.13</td>
<td>0.35</td>
</tr>
<tr>
<td>TMDL = LA+WLA+MOS</td>
<td>785.77</td>
<td>169.56</td>
<td>55.31</td>
<td>11.37</td>
<td>3.52</td>
</tr>
</tbody>
</table>
7.1.5 Lower Iroquois Subwatershed

The Lower Iroquois Subwatershed is comprised of nine HUC 10 and forty seven HUC 12 subwatersheds. Note that HUC 10 subwatersheds 206, 208, 209, 211, and 212 do not have impaired segments, but 2008 sampling of monitoring locations showed impairments. Therefore, TMDLs are calculated for these subwatersheds.

<table>
<thead>
<tr>
<th>HUC 10</th>
<th>HUC 12</th>
<th>Area (sq. miles)</th>
</tr>
</thead>
<tbody>
<tr>
<td>601</td>
<td>71200020601</td>
<td>16.59125</td>
</tr>
<tr>
<td>602</td>
<td>71200020602</td>
<td>18.7441</td>
</tr>
<tr>
<td>603</td>
<td>Headwaters Pigeon Creek</td>
<td>30.8068</td>
</tr>
<tr>
<td>604</td>
<td>Pigeon Creek</td>
<td>15.96917</td>
</tr>
<tr>
<td>605</td>
<td>Whiskey Creek</td>
<td>21.2739</td>
</tr>
<tr>
<td>606</td>
<td>Town of Hickman</td>
<td>19.16795</td>
</tr>
<tr>
<td>607</td>
<td>Fountain Creek</td>
<td>45.60417</td>
</tr>
<tr>
<td>608</td>
<td>Gay Creek</td>
<td>21.97431</td>
</tr>
<tr>
<td>609</td>
<td>Town of Hallock</td>
<td>35.96924</td>
</tr>
<tr>
<td>610</td>
<td>Little Mud Creek-Mud Creek</td>
<td>60.06453</td>
</tr>
<tr>
<td>701</td>
<td>Upper Sugar Creek-Sugar Creek</td>
<td>22.23759</td>
</tr>
<tr>
<td>702</td>
<td>Coon Creek-Mud Creek</td>
<td>38.54219</td>
</tr>
<tr>
<td>703</td>
<td>Kult Ditch-Mud Creek</td>
<td>16.00688</td>
</tr>
<tr>
<td>704</td>
<td>Cole Creek-Mud Creek</td>
<td>15.40805</td>
</tr>
<tr>
<td>705</td>
<td>Yeagers Curve-Sugar Creek</td>
<td>32.14466</td>
</tr>
<tr>
<td>706</td>
<td>Town of Stockland</td>
<td>21.12238</td>
</tr>
<tr>
<td>707</td>
<td>City of Milford-Sugar Creek</td>
<td>15.30333</td>
</tr>
<tr>
<td>708</td>
<td>Jefferson Creek</td>
<td>20.80353</td>
</tr>
<tr>
<td>709</td>
<td>Possum Trot Ditch</td>
<td>16.81788</td>
</tr>
<tr>
<td>710</td>
<td>Coon Creek</td>
<td>30.81923</td>
</tr>
<tr>
<td>711</td>
<td>Sugar Creek</td>
<td>48.07788</td>
</tr>
<tr>
<td>801</td>
<td>801</td>
<td>17.07744</td>
</tr>
<tr>
<td>802</td>
<td>Louis Creek</td>
<td>23.43562</td>
</tr>
<tr>
<td>803</td>
<td>City of Roberts</td>
<td>18.92303</td>
</tr>
<tr>
<td>804</td>
<td>Town of Dalrey</td>
<td>41.12784</td>
</tr>
<tr>
<td>805</td>
<td>Headwaters Spring Creek</td>
<td>55.80779</td>
</tr>
<tr>
<td>806</td>
<td>Sharetail Creek</td>
<td>31.4288</td>
</tr>
<tr>
<td>807</td>
<td>Town of Leonard</td>
<td>20.31431</td>
</tr>
<tr>
<td>808</td>
<td>Spring Creek</td>
<td>45.22072</td>
</tr>
<tr>
<td>901</td>
<td>City of Ashkum</td>
<td>10.4721</td>
</tr>
<tr>
<td>902</td>
<td>Prairie Creek</td>
<td>78.95901</td>
</tr>
<tr>
<td>100</td>
<td>Eastburo Hollow-Iroquois River</td>
<td>52.59964</td>
</tr>
<tr>
<td>101</td>
<td>City of Watseka-Iroquois River</td>
<td>57.56998</td>
</tr>
<tr>
<td>102</td>
<td>North Martinton Ditch</td>
<td>37.05092</td>
</tr>
<tr>
<td>103</td>
<td>Pike Creek</td>
<td>34.08338</td>
</tr>
<tr>
<td>201</td>
<td>Headwaters Langan Creek</td>
<td>24.28199</td>
</tr>
<tr>
<td>202</td>
<td>Langan Creek</td>
<td>83.05827</td>
</tr>
</tbody>
</table>

Table 206. Hydrologic Unit Code (HUC 10 and 12) in the Lower Iroquois Subwatershed
### Table 206. Hydrologic Unit Code (HUC 10 and 12) in the Lower Iroquois Subwatershed

<table>
<thead>
<tr>
<th>HUC 10</th>
<th>HU C10 Name</th>
<th>HUC 12</th>
<th>HU C12 Name</th>
<th>Area (sq. miles)</th>
</tr>
</thead>
<tbody>
<tr>
<td>213</td>
<td>Beaver Creek</td>
<td>301</td>
<td>Hanger Ditch-Beaver Creek</td>
<td>23.82794</td>
</tr>
<tr>
<td></td>
<td></td>
<td>302</td>
<td>Deardruff Ditch-Beaver Creek</td>
<td>18.62002</td>
</tr>
<tr>
<td></td>
<td></td>
<td>303</td>
<td>Carlson Ditch-Beaver Creek</td>
<td>17.33211</td>
</tr>
<tr>
<td></td>
<td></td>
<td>304</td>
<td>Hooper Branch</td>
<td>22.00391</td>
</tr>
<tr>
<td></td>
<td></td>
<td>305</td>
<td>North Hooper-Beaver Creek</td>
<td>13.93102</td>
</tr>
<tr>
<td></td>
<td></td>
<td>306</td>
<td>Headwaters Little Beaver Creek</td>
<td>29.04992</td>
</tr>
<tr>
<td></td>
<td></td>
<td>307</td>
<td>Little Beaver Creek</td>
<td>31.93209</td>
</tr>
<tr>
<td></td>
<td></td>
<td>308</td>
<td>Beaver Creek</td>
<td>30.13464</td>
</tr>
<tr>
<td>214</td>
<td>Iroquois River</td>
<td>401</td>
<td>Minnie Creek</td>
<td>22.81042</td>
</tr>
<tr>
<td></td>
<td></td>
<td>402</td>
<td>Iroquois River</td>
<td>46.59147</td>
</tr>
</tbody>
</table>
7.1.5.1 Mud Creek Subwatershed (HUC10-206)

The Mud Creek subwatershed lies in Iroquois, Vermillion, and Ford counties (Figure 98). The two dominant land uses in this subwatershed are agriculture (90.85%) and developed land (5.67%). The remaining land categories all contribute less than 3 percent of the subwatershed area (Table 210). The NPDES facilities are shown in Figure 99. There are no listed segments on the current 303(d) list in this subwatershed, anticipated 2010 303(d) listed streams are shown in Table 207. There are six monitoring station in the subwatershed (Table 208). Statistical summaries of the water quality data are presented in Table 209. The reductions needed to achieve a geomean of 200 #/100 mL range from 0 to 78 percent.

Table 207. Anticipated 2010 303(d) Listed Streams in the Mud Creek Subwatershed

<table>
<thead>
<tr>
<th>HUC 12</th>
<th>HUC C12 Name</th>
<th>Segment ID</th>
<th>Waterbody</th>
<th>Stream Length (miles)</th>
<th>Parameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>604</td>
<td>Pigeon Creek</td>
<td>FLIDDc</td>
<td>Pigeon Creek</td>
<td>4.93</td>
<td>Fecal Coliform</td>
</tr>
<tr>
<td>605</td>
<td>Whiskey Creek</td>
<td>FLIDAA</td>
<td>Whiskey Creek</td>
<td>16.00</td>
<td>Fecal Coliform</td>
</tr>
<tr>
<td>608</td>
<td>Gay Creek</td>
<td>FLIDB</td>
<td>Gay Creek</td>
<td>12.01</td>
<td>Fecal Coliform</td>
</tr>
<tr>
<td>609</td>
<td>Town of Halllock</td>
<td>FLIDE-01</td>
<td>Unnamed Trib Mud Creek West</td>
<td>15.08</td>
<td>Fecal Coliform</td>
</tr>
<tr>
<td>610</td>
<td>Little Mud Creek-Mud Creek</td>
<td>FLID-02</td>
<td>Mud Creek West</td>
<td>8.18</td>
<td>Fecal Coliform</td>
</tr>
</tbody>
</table>

Table 208. Station Locations in the Mud Creek Subwatershed

<table>
<thead>
<tr>
<th>HUC 12</th>
<th>HUC C12 Name</th>
<th>Station #</th>
<th>Stream Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>604</td>
<td>Pigeon Creek</td>
<td>FLIDD-CP-C3</td>
<td>Pigeon Creek</td>
</tr>
<tr>
<td>605</td>
<td>Whiskey Creek</td>
<td>FLIDAA-01</td>
<td>Whisky Creek</td>
</tr>
<tr>
<td>607</td>
<td>Fountain Creek</td>
<td>FLIDA-01</td>
<td>Fountain Creek</td>
</tr>
<tr>
<td>608</td>
<td>Gay Creek</td>
<td>FLIDB-01</td>
<td>Gay Creek</td>
</tr>
<tr>
<td>609</td>
<td>Town of Halllock</td>
<td>FLIDE-01</td>
<td>Unnamed Trib Mud Creek West</td>
</tr>
<tr>
<td>610</td>
<td>Little Mud Creek-Mud Creek</td>
<td>FLID-02</td>
<td>Mud Creek West</td>
</tr>
</tbody>
</table>
Table 209. Summary of Pathogen Data in Mud Creek Subwatershed (IL)

<table>
<thead>
<tr>
<th>Station #</th>
<th>Period of Record</th>
<th>Total Number of Samples</th>
<th>Percent of Samples Exceeding Fecal Coliform WQS (#/100 mL)</th>
<th>Minimum (#/100 mL)</th>
<th>Geomean (#/100 mL)</th>
<th>Average (#/100 mL)</th>
<th>Maximum (#/100 mL)</th>
<th>Percent Reduction Based on Geomean (200/#/100mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FLIDD-CP-C3</td>
<td>10/3/2000 - 9/17/2008</td>
<td>6</td>
<td>6</td>
<td>10</td>
<td>514</td>
<td>1,081</td>
<td>2,500</td>
<td>61%</td>
</tr>
<tr>
<td>FLIDAA-01</td>
<td>8/19/2008 - 9/17/2008</td>
<td>5</td>
<td>4</td>
<td>96</td>
<td>309</td>
<td>924</td>
<td>3,900</td>
<td>35%</td>
</tr>
<tr>
<td>FLIDA-01</td>
<td>8/19/2008 - 9/17/2008</td>
<td>5</td>
<td>6</td>
<td>0</td>
<td>60</td>
<td>129</td>
<td>222</td>
<td>0%</td>
</tr>
<tr>
<td>FLIDB-01</td>
<td>8/19/2008 - 9/17/2008</td>
<td>5</td>
<td>100</td>
<td>270</td>
<td>700</td>
<td>1,134</td>
<td>3,600</td>
<td>71%</td>
</tr>
<tr>
<td>FLIDE-01</td>
<td>8/19/2008 - 9/17/2008</td>
<td>5</td>
<td>100</td>
<td>570</td>
<td>912</td>
<td>1,115</td>
<td>2,780</td>
<td>78%</td>
</tr>
<tr>
<td>FLID-02</td>
<td>8/19/2008 - 9/17/2008</td>
<td>5</td>
<td>8</td>
<td>108</td>
<td>502</td>
<td>796</td>
<td>2,100</td>
<td>60%</td>
</tr>
</tbody>
</table>

Table 210. Land Use/land Cover in the Mud Creek Subwatershed

<table>
<thead>
<tr>
<th>Land Use/Land Cover</th>
<th>Subwatershed Area</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Acres</td>
<td>Square Miles</td>
</tr>
<tr>
<td>Agricultural Land</td>
<td>166132.29</td>
<td>259.58</td>
</tr>
<tr>
<td>Developed Land</td>
<td>10367.34</td>
<td>16.20</td>
</tr>
<tr>
<td>Pasture/Hay</td>
<td>3809.61</td>
<td>5.95</td>
</tr>
<tr>
<td>Forested Land</td>
<td>1715.32</td>
<td>2.68</td>
</tr>
<tr>
<td>Wetland</td>
<td>619.14</td>
<td>0.97</td>
</tr>
<tr>
<td>Open Water</td>
<td>103.64</td>
<td>0.16</td>
</tr>
<tr>
<td>Grassland and Shrubs</td>
<td>106.97</td>
<td>0.17</td>
</tr>
<tr>
<td>Total</td>
<td>182,854.32</td>
<td>285.71</td>
</tr>
</tbody>
</table>
Figure 98. Location of Mud Creek Subwatershed (HUC10-206)
Figure 99. NPDES Facilities in the Mud Creek Subwatershed (HUC10-206)

Table 211 through Table 216 summarize the subwatershed characteristics as well as the TMDL results for each of the HUC 12 subwatersheds. It should be noted that there are no current 303(d) listings in this subwatershed; however, the sampling performed in 2008 suggests that several streams are impaired. Those streams will appear on the next 303(d) list and TMDLs for those streams are presented here.

There are two NPDES facilities within the Mud Creek subwatershed and the WLAs for the facilities were calculated based on their design flows and fecal coliform permit limits. The individual WLAs are presented in Table 276.
Table 211. Pigeon Creek Characteristics and TMDL Summary (HUC12-604)

<table>
<thead>
<tr>
<th>Upstream Characteristics</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Drainage Area</td>
<td>65.49 square miles</td>
</tr>
<tr>
<td>Sampling Station</td>
<td>FLIDD-CP-C3</td>
</tr>
<tr>
<td>Listed Segments</td>
<td>FLIDDc</td>
</tr>
<tr>
<td>Land Use</td>
<td>Agriculture: 97.52%; Developed Land: 6.20%; Forest: 0.65%; Other: 2.48%</td>
</tr>
<tr>
<td>Soils</td>
<td>A: 0.00%; B: 5.26%; C: 15.22%; D: 79.29%; Unknown: 0.23%</td>
</tr>
<tr>
<td>NPDES Facilities</td>
<td>Cissna Park STP (IL0042391)</td>
</tr>
<tr>
<td></td>
<td>Rankin STP (ILG580122)</td>
</tr>
</tbody>
</table>

| MS4 Communities          | None |
| CSO Communities          | None |
| CAFOs                    | None |
| CFOS                     | None |

<table>
<thead>
<tr>
<th>TMDL Allocations (billion/day)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Allocation Category</td>
<td>High Flows</td>
</tr>
<tr>
<td>LA</td>
<td>849.29</td>
</tr>
<tr>
<td>WLA</td>
<td>4.19</td>
</tr>
<tr>
<td>MOS (10%)</td>
<td>94.83</td>
</tr>
<tr>
<td>TMDL = LA+WLA+MOS</td>
<td>948.31</td>
</tr>
</tbody>
</table>
Table 212. Whiskey Creek Characteristics and TMDL Summary (HUC12-605)

<table>
<thead>
<tr>
<th>Upstream Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drainage Area</td>
</tr>
<tr>
<td>Sampling Station</td>
</tr>
<tr>
<td>Listed Segments</td>
</tr>
<tr>
<td>Land Use</td>
</tr>
<tr>
<td>Soils</td>
</tr>
<tr>
<td>NPDES Facilities</td>
</tr>
<tr>
<td>MS4 Communities</td>
</tr>
<tr>
<td>CSO Communities</td>
</tr>
<tr>
<td>CAFOs</td>
</tr>
<tr>
<td>CFOs</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TMDL Allocations (billion/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allocation Category</td>
</tr>
<tr>
<td>-----------------------</td>
</tr>
<tr>
<td>LA</td>
</tr>
<tr>
<td>WLA</td>
</tr>
<tr>
<td>MOS (10%)</td>
</tr>
<tr>
<td>TMDL = LA + WLA + MOS</td>
</tr>
</tbody>
</table>

Table 213. Fountain Creek Characteristics and TMDL Summary (HUC12-607)

<table>
<thead>
<tr>
<th>Upstream Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drainage Area</td>
</tr>
<tr>
<td>Sampling Station</td>
</tr>
<tr>
<td>Listed Segments</td>
</tr>
<tr>
<td>Land Use</td>
</tr>
<tr>
<td>Soils</td>
</tr>
<tr>
<td>NPDES Facilities</td>
</tr>
<tr>
<td>MS4 Communities</td>
</tr>
<tr>
<td>CSO Communities</td>
</tr>
<tr>
<td>CAFOs</td>
</tr>
<tr>
<td>CFOs</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TMDL Allocations (billion/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allocation Category</td>
</tr>
<tr>
<td>-----------------------</td>
</tr>
<tr>
<td>LA</td>
</tr>
<tr>
<td>WLA</td>
</tr>
<tr>
<td>MOS (10%)</td>
</tr>
<tr>
<td>TMDL = LA + WLA + MOS</td>
</tr>
</tbody>
</table>
**Table 214. Gay Creek Characteristics and TMDL Summary (HUC12-608)**

<table>
<thead>
<tr>
<th>Upstream Characteristics</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Drainage Area</strong></td>
<td>21.97 square miles</td>
</tr>
<tr>
<td><strong>Sampling Station</strong></td>
<td>FLIDB-01</td>
</tr>
<tr>
<td><strong>Listed Segments</strong></td>
<td>FLIDB-01</td>
</tr>
<tr>
<td><strong>Land Use</strong></td>
<td>Agriculture: 90.48%; Developed Land: 6.43%; Forest: 0.84%; Other: 2.25%</td>
</tr>
<tr>
<td><strong>Soils</strong></td>
<td>A: 0.00%; B: 65.97%; C: 4.17%; D: 29.86%; Unknown: 0.00%</td>
</tr>
<tr>
<td><strong>NPDES Facilities</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>MS4 Communities</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>CSO Communities</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>CAFOs</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>CFOs</strong></td>
<td>None</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TMDL Allocations (billion/day)</th>
<th>High Flows</th>
<th>Moist Conditions</th>
<th>Mid-Range Flows</th>
<th>Dry Conditions</th>
<th>Low Flows</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>LA</strong></td>
<td>286.32</td>
<td>53.25</td>
<td>16.49</td>
<td>3.91</td>
<td>1.39</td>
</tr>
<tr>
<td><strong>WLA</strong></td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td><strong>MOS (10%)</strong></td>
<td>31.81</td>
<td>5.92</td>
<td>1.83</td>
<td>0.43</td>
<td>0.15</td>
</tr>
<tr>
<td><strong>TMDL = LA+WLA+MOS</strong></td>
<td>318.13</td>
<td>59.17</td>
<td>18.32</td>
<td>4.34</td>
<td>1.54</td>
</tr>
</tbody>
</table>
### Table 215. Town of Hallock Characteristics and TMDL Summary (HUC12-609)

**Upstream Characteristics**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Drainage Area</td>
<td>35.96 square miles</td>
</tr>
<tr>
<td>Sampling Station</td>
<td>FLIDE-01</td>
</tr>
<tr>
<td>Listed Segments</td>
<td>FLIDE-01</td>
</tr>
<tr>
<td><strong>Land Use</strong></td>
<td>Agriculture: 92.23%; Developed Land: 5.72%; Forest: 0.73%; Other: 1.32%</td>
</tr>
<tr>
<td><strong>Soils</strong></td>
<td>A: 0.00%; B: 71.31%; C: 2.53%; D: 26.16%; Unknown: 0.00%</td>
</tr>
<tr>
<td>NPDES Facilities</td>
<td>None</td>
</tr>
<tr>
<td>MS4 Communities</td>
<td>None</td>
</tr>
<tr>
<td>CSO Communities</td>
<td>None</td>
</tr>
<tr>
<td>CAFOs</td>
<td>None</td>
</tr>
<tr>
<td>CFOs</td>
<td>None</td>
</tr>
</tbody>
</table>

**TMDL Allocations (billion/day)**

<table>
<thead>
<tr>
<th></th>
<th>High Flows</th>
<th>Moist Conditions</th>
<th>Mid-Range Flows</th>
<th>Dry Conditions</th>
<th>Low Flows</th>
</tr>
</thead>
<tbody>
<tr>
<td>LA</td>
<td>468.64</td>
<td>87.16</td>
<td>26.98</td>
<td>6.39</td>
<td>2.27</td>
</tr>
<tr>
<td>WLA</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>MOS (10%)</td>
<td>52.07</td>
<td>9.68</td>
<td>3.00</td>
<td>0.71</td>
<td>0.25</td>
</tr>
<tr>
<td>TMDL = LA+WLA+MOS</td>
<td>520.71</td>
<td>96.84</td>
<td>29.98</td>
<td>7.10</td>
<td>2.52</td>
</tr>
</tbody>
</table>
### Table 216. Little Mud Creek-Mud Creek Characteristics and TMDL Summary (HUC12-610)

#### Upstream Characteristics

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drainage Area</td>
<td>286.02 square miles</td>
</tr>
<tr>
<td>Sampling Station</td>
<td>FLID-02</td>
</tr>
<tr>
<td>Listed Segments</td>
<td>FLIDE-02</td>
</tr>
<tr>
<td>Land Use</td>
<td>Agriculture: 90.76%; Developed Land: 5.66%; Forest: 0.94%; Other: 2.64%</td>
</tr>
<tr>
<td>Soils</td>
<td>A: 0.00%; B: 24.54%; C: 20.61%; D: 54.74%; Unknown: 0.11%</td>
</tr>
<tr>
<td>NPDES Facilities</td>
<td>Cissna Park STP (IL0042391)</td>
</tr>
<tr>
<td></td>
<td>Rankin STP (ILG580122)</td>
</tr>
<tr>
<td>MS4 Communities</td>
<td>None</td>
</tr>
<tr>
<td>CSO Communities</td>
<td>None</td>
</tr>
<tr>
<td>CAFOs</td>
<td>None</td>
</tr>
<tr>
<td>CFOs</td>
<td>None</td>
</tr>
</tbody>
</table>

#### TMDL Allocations (billion/day)

<table>
<thead>
<tr>
<th></th>
<th>High Flows</th>
<th>Moist Conditions</th>
<th>Mid-Range Flows</th>
<th>Dry Conditions</th>
<th>Low Flows</th>
</tr>
</thead>
<tbody>
<tr>
<td>LA</td>
<td>3723.26</td>
<td>689.06</td>
<td>213.25</td>
<td>49.47</td>
<td>16.71</td>
</tr>
<tr>
<td>WLA</td>
<td>4.19</td>
<td>4.19</td>
<td>1.36</td>
<td>1.36</td>
<td>1.36</td>
</tr>
<tr>
<td>MOS (10%)</td>
<td>414.16</td>
<td>77.03</td>
<td>23.85</td>
<td>5.65</td>
<td>2.01</td>
</tr>
<tr>
<td>TMDL = LA+WLA+MOS</td>
<td>4141.61</td>
<td>770.28</td>
<td>238.46</td>
<td>56.48</td>
<td>20.08</td>
</tr>
</tbody>
</table>
7.1.5.2 **Sugar Creek Subwatershed (HUC10-207)**

The Sugar Creek subwatershed incorporates the towns of Watseka, Milford and Fowler as shown in Figure 100, and lies in both Indiana and Illinois. The two dominant land uses in this subwatershed are agriculture (89.73%) and developed land (5.96%). The remaining land categories contribute less than 2 percent of the subwatershed area (Table 222). The NPDES facilities and feeding operations are shown in Figure 101 and Figure 102, respectively.

The listed 303(d) segment lies in Illinois (Table 217). Among the nine monitoring locations, four of them are in Indiana and five in Illinois (Table 219). Furthermore, as Indiana and Illinois use *E. coli* and fecal coliform, respectively for the pathogen standards, separate statistical summaries of the data are presented in Table 220 and Table 221. The required reductions in Indiana range from 47 to 67 percent and the required reductions in Illinois range from 39 to 61 percent. Historical reductions based on the geomean of all samples in the Illinois portion of this watershed are 12 percent.

<table>
<thead>
<tr>
<th>HUC 12</th>
<th>HUC12 Name</th>
<th>Segment ID</th>
<th>Waterbody</th>
<th>Stream Length (miles)</th>
<th>Parameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>711</td>
<td>Sugar Creek</td>
<td>IL_FLI-02</td>
<td>Sugar Creek</td>
<td>23.14</td>
<td>Fecal Coliform</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>HUC 12</th>
<th>HUC12 Name</th>
<th>Segment ID</th>
<th>Waterbody</th>
<th>Stream Length (miles)</th>
<th>Parameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>704</td>
<td>Cole Creek-Mud Creek</td>
<td>FLIC-04</td>
<td>Mud Creek-East</td>
<td>4.94</td>
<td>Fecal Coliform</td>
</tr>
<tr>
<td>706</td>
<td>Town of Stockland</td>
<td>FLIE-01</td>
<td>Unnamed Trib to Sugar Creek</td>
<td>19.28</td>
<td>Fecal Coliform</td>
</tr>
<tr>
<td>707</td>
<td>City of Milford-Sugar Creek</td>
<td>FLI-03</td>
<td>Sugar Creek</td>
<td>14.52</td>
<td>Fecal Coliform</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>HUC 12</th>
<th>HUC12 Name</th>
<th>Station # (State)</th>
<th>Stream Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>702</td>
<td>Coon Creek-Mud Creek</td>
<td>ID# 92 (IN)</td>
<td>Mud Cr</td>
</tr>
<tr>
<td>703</td>
<td>Kult Ditch-Mud Creek</td>
<td>ID# 91 (IN)</td>
<td>Finigan D</td>
</tr>
<tr>
<td>705</td>
<td>Yeagers Curve-Sugar Creek</td>
<td>ID# 88 (IN)</td>
<td>Sugar Cr</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ID# 90 (IN)</td>
<td>Sugar Cr</td>
</tr>
<tr>
<td>711</td>
<td>Sugar Creek</td>
<td>FLI-02 (IL)</td>
<td>Sugar Cr</td>
</tr>
<tr>
<td>711</td>
<td>Sugar Creek</td>
<td>FLI-01 (IL)</td>
<td>Sugar Creek</td>
</tr>
<tr>
<td>704</td>
<td>Cole Creek-Mud Creek</td>
<td>FLIC-04 (IL)</td>
<td>Mud Creek East</td>
</tr>
<tr>
<td>706</td>
<td>Town of Stockland</td>
<td>FLIE-01 (IL)</td>
<td>Unnamed Trib Sugar Creek</td>
</tr>
<tr>
<td>707</td>
<td>City of Milford-Sugar Creek</td>
<td>FLI-M-C2 (IL)</td>
<td>Sugar Creek</td>
</tr>
<tr>
<td></td>
<td></td>
<td>FLI-M-D (IL)</td>
<td>Sugar Creek</td>
</tr>
</tbody>
</table>
### Table 220. Summary of Pathogen Data in Sugar Subwatershed (IN)

<table>
<thead>
<tr>
<th>Station #</th>
<th>Period of Record</th>
<th>Total Number of Samples</th>
<th>Percent of Samples Exceeding E. coli WQS (#/100 mL)</th>
<th>Minimum (#/100 mL)</th>
<th>Geomean (#/100 mL)</th>
<th>Average (#/100 mL)</th>
<th>Maximum (#/100 mL)</th>
<th>Percent Reduction Based on Geomean (125/100mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>92</td>
<td>6/2/2008 - 6/30/2008</td>
<td>5</td>
<td>100 40</td>
<td>144</td>
<td>272</td>
<td>316</td>
<td>579</td>
<td>54%</td>
</tr>
<tr>
<td>91</td>
<td>6/2/2008 - 6/30/2008</td>
<td>5</td>
<td>80 60</td>
<td>109</td>
<td>237</td>
<td>255</td>
<td>326</td>
<td>47%</td>
</tr>
<tr>
<td>88</td>
<td>6/2/2008 - 6/30/2008</td>
<td>5</td>
<td>100 80</td>
<td>214</td>
<td>381</td>
<td>415</td>
<td>727</td>
<td>67%</td>
</tr>
<tr>
<td>90</td>
<td>6/2/2008 - 6/30/2008</td>
<td>5</td>
<td>80 40</td>
<td>115</td>
<td>249</td>
<td>311</td>
<td>687</td>
<td>50%</td>
</tr>
</tbody>
</table>

### Table 221. Summary of Pathogen Data in Sugar Creek Subwatershed (IL)

<table>
<thead>
<tr>
<th>Station #</th>
<th>Period of Record</th>
<th>Total Number of Samples</th>
<th>Percent of Samples Exceeding Fecal Coliform WQS (#/100 mL)</th>
<th>Minimum (#/100 mL)</th>
<th>Geomean (#/100 mL)</th>
<th>Average (#/100 mL)</th>
<th>Maximum (#/100 mL)</th>
<th>Percent Reduction Based on Geomean (200/100mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FLIC-04</td>
<td>8/19/2008 - 9/17/2008</td>
<td>5</td>
<td>80 20</td>
<td>110</td>
<td>377</td>
<td>904</td>
<td>3,600</td>
<td>47%</td>
</tr>
<tr>
<td>FLIE-01</td>
<td>8/19/2008 - 9/17/2008</td>
<td>5</td>
<td>80 40</td>
<td>200</td>
<td>328</td>
<td>388</td>
<td>788</td>
<td>39%</td>
</tr>
<tr>
<td>FLI-M-D</td>
<td>8/19/2008 - 9/17/2008</td>
<td>8</td>
<td>88 38</td>
<td>176</td>
<td>376</td>
<td>436</td>
<td>1,100</td>
<td>47%</td>
</tr>
<tr>
<td>FLI-02</td>
<td>3/8/1999 - 6/10/2008</td>
<td>46</td>
<td>50 37</td>
<td>10</td>
<td>227</td>
<td>678</td>
<td>7,455</td>
<td>12%</td>
</tr>
<tr>
<td>FLI-01</td>
<td>8/19/2008 - 9/17/2008</td>
<td>5</td>
<td>100 80</td>
<td>292</td>
<td>514</td>
<td>550</td>
<td>860</td>
<td>61%</td>
</tr>
</tbody>
</table>
Table 222. Land Use/land Cover in the Sugar Creek Subwatershed

<table>
<thead>
<tr>
<th>Land Use/Land Cover</th>
<th>Area</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Acres</td>
<td>Square Miles</td>
</tr>
<tr>
<td>Agricultural Land</td>
<td>159017.91</td>
<td>248.47</td>
</tr>
<tr>
<td>Developed Land</td>
<td>10569.50</td>
<td>16.51</td>
</tr>
<tr>
<td>Forested Land</td>
<td>3049.69</td>
<td>4.77</td>
</tr>
<tr>
<td>Pasture/Hay</td>
<td>2884.89</td>
<td>4.51</td>
</tr>
<tr>
<td>Wetland</td>
<td>1337.92</td>
<td>2.09</td>
</tr>
<tr>
<td>Grassland and Shrubs</td>
<td>246.63</td>
<td>0.39</td>
</tr>
<tr>
<td>Open Water</td>
<td>106.97</td>
<td>0.17</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>177,213.52</strong></td>
<td><strong>276.90</strong></td>
</tr>
</tbody>
</table>

Figure 100. Location of Sugar Creek Watershed (HUC10-207)
Figure 101. NPDES Facilities in the Sugar Creek Watershed (HUC10-207)
Table 223 through Table 229 summarize the subwatershed characteristics as well as the TMDL results for each of the HUC 12 subwatersheds. It should be noted that there are no current 303(d) listings in HUC 702, HUC 703, HUC 704, HUC 705, HUC 706, or HUC 707; however, the 2008 sampling data indicate that the \textit{E. coli} and fecal coliform bacteria criteria are not met in these HUCs and so TMDL results are presented here.

There is one NPDES facility within the Sugar Creek subwatershed and the WLAs for the facility was calculated based on their design flows and \textit{E. coli} and fecal coliform permit limits. There is one CSO community with 10 outfalls upstream of this subwatershed. WLAs for CSO communities were calculated based on the maximum observed CSO flow at each outfall and \textit{E. coli} and fecal coliform standards. The individual WLAs are presented in Table 276.
### Table 223. Coon Creek-Mud Creek Characteristics and TMDL Summary (HUC12-702)

<table>
<thead>
<tr>
<th><strong>Upstream Characteristics</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Drainage Area</strong></td>
<td>38.53 square miles</td>
</tr>
<tr>
<td><strong>Sampling Station</strong></td>
<td>92</td>
</tr>
<tr>
<td><strong>Listed Segments</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>Land Use</strong></td>
<td>Agriculture: 89.90%; Developed Land:6.11%; Forest:0.53%; Other: 3.46%</td>
</tr>
<tr>
<td><strong>Soils</strong></td>
<td>A: 0.77%; B: 52.51%; C: 44.40%; D:2.32%; Unknown:0.00%</td>
</tr>
<tr>
<td><strong>NPDES Facilities</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>MS4 Communities</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>CSO Communities</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>CAFOs</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>CFOs</strong></td>
<td>Ewen Gravel Hill Farm (1178)</td>
</tr>
</tbody>
</table>

#### TMDL Allocations (billion/day)

<table>
<thead>
<tr>
<th>Allocation Category</th>
<th>High Flows</th>
<th>Moist Conditions</th>
<th>Mid-Range Flows</th>
<th>Dry Conditions</th>
<th>Low Flows</th>
</tr>
</thead>
<tbody>
<tr>
<td>LA</td>
<td>361.38</td>
<td>77.99</td>
<td>25.44</td>
<td>5.23</td>
<td>1.62</td>
</tr>
<tr>
<td>WLA</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>MOS (10%)</td>
<td>40.15</td>
<td>8.66</td>
<td>2.83</td>
<td>0.58</td>
<td>0.18</td>
</tr>
<tr>
<td>TMDL = LA+WLA+MOS</td>
<td>401.53</td>
<td>86.65</td>
<td>28.27</td>
<td>5.81</td>
<td>1.80</td>
</tr>
</tbody>
</table>
Table 224. Kult Ditch-Mud Creek Characteristics and TMDL Summary (HUC12-703)

<table>
<thead>
<tr>
<th>Upstream Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Drainage Area</strong></td>
</tr>
<tr>
<td><strong>Sampling Station</strong></td>
</tr>
<tr>
<td><strong>Listed Segments</strong></td>
</tr>
<tr>
<td><strong>Land Use</strong></td>
</tr>
<tr>
<td><strong>Soils</strong></td>
</tr>
<tr>
<td><strong>NPDES Facilities</strong></td>
</tr>
<tr>
<td><strong>MS4 Communities</strong></td>
</tr>
<tr>
<td><strong>CSO Communities</strong></td>
</tr>
<tr>
<td><strong>CAFOs</strong></td>
</tr>
<tr>
<td><strong>CFOs</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TMDL Allocations (billion/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allocation Category</td>
</tr>
<tr>
<td>LA</td>
</tr>
<tr>
<td>WLA</td>
</tr>
<tr>
<td>MOS (10%)</td>
</tr>
<tr>
<td><strong>TMDL = LA+WLA+MOS</strong></td>
</tr>
</tbody>
</table>

Table 225. Cole Creek-Mud Creek Characteristics and TMDL Summary (HUC12-704)

<table>
<thead>
<tr>
<th>Upstream Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Drainage Area</strong></td>
</tr>
<tr>
<td><strong>Sampling Station</strong></td>
</tr>
<tr>
<td><strong>Listed Segments</strong></td>
</tr>
<tr>
<td><strong>Land Use</strong></td>
</tr>
<tr>
<td><strong>Soils</strong></td>
</tr>
<tr>
<td><strong>NPDES Facilities</strong></td>
</tr>
<tr>
<td><strong>MS4 Communities</strong></td>
</tr>
<tr>
<td><strong>CSO Communities</strong></td>
</tr>
<tr>
<td><strong>CAFOs</strong></td>
</tr>
<tr>
<td><strong>CFOs</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TMDL Allocations (billion/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allocation Category</td>
</tr>
<tr>
<td>LA</td>
</tr>
<tr>
<td>WLA</td>
</tr>
<tr>
<td>MOS (10%)</td>
</tr>
<tr>
<td><strong>TMDL = LA+WLA+MOS</strong></td>
</tr>
</tbody>
</table>
### Table 226. Yeagers Curve-Sugar Creek Characteristics and TMDL Summary (HUC12-705)

<table>
<thead>
<tr>
<th>Upstream Characteristics</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Drainage Area</strong></td>
<td>92.87 square miles</td>
</tr>
<tr>
<td><strong>Sampling Station</strong></td>
<td>88,90</td>
</tr>
<tr>
<td><strong>Listed Segments</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>Land Use</strong></td>
<td>Agriculture: 91.88%; Developed Land: 5.25%; Forest: 0.75%; Other: 2.12%</td>
</tr>
<tr>
<td><strong>Soils</strong></td>
<td>A: 0.65%; B: 44.88%; C: 45.53%; D: 8.94%; Unknown: 0.00%</td>
</tr>
<tr>
<td><strong>NPDES Facilities</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>MS4 Communities</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>CSO Communities</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>CAFOs</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>CFOs</strong></td>
<td>Ewen Gravel Hill Farm (1178)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TMDL Allocations (billion/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Allocation Category</strong></td>
</tr>
<tr>
<td><strong>LA</strong></td>
</tr>
<tr>
<td><strong>WLA</strong></td>
</tr>
<tr>
<td><strong>MOS (10%)</strong></td>
</tr>
<tr>
<td><strong>TMDL = LA+WLA+MOS</strong></td>
</tr>
</tbody>
</table>

### Table 227. Town of Stockland Characteristics and TMDL Summary (HUC12-706)

<table>
<thead>
<tr>
<th>Upstream Characteristics</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Drainage Area</strong></td>
<td>21.10 square miles</td>
</tr>
<tr>
<td><strong>Sampling Station</strong></td>
<td>FLIE-01</td>
</tr>
<tr>
<td><strong>Listed Segments</strong></td>
<td>FLIE-01</td>
</tr>
<tr>
<td><strong>Land Use</strong></td>
<td>Agriculture: 92.75%; Developed Land: 5.42%; Forest: 0.43%; Other: 1.39%</td>
</tr>
<tr>
<td><strong>Soils</strong></td>
<td>A: 0.00%; B: 71.43%; C: 6.43%; D: 22.14%; Unknown: 0.00%</td>
</tr>
<tr>
<td><strong>NPDES Facilities</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>MS4 Communities</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>CSO Communities</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>CAFOs</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>CFOs</strong></td>
<td>None</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TMDL Allocations (billion/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Allocation Category</strong></td>
</tr>
<tr>
<td><strong>LA</strong></td>
</tr>
<tr>
<td><strong>WLA</strong></td>
</tr>
<tr>
<td><strong>MOS (10%)</strong></td>
</tr>
<tr>
<td><strong>TMDL = LA+WLA+MOS</strong></td>
</tr>
</tbody>
</table>
Table 228.  City of Milford-Sugar Creek Characteristics and TMDL Summary (HUC12-707)

<table>
<thead>
<tr>
<th>Upstream Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drainage Area</td>
</tr>
<tr>
<td>Sampling Station</td>
</tr>
<tr>
<td>Listed Segments</td>
</tr>
<tr>
<td>Land Use</td>
</tr>
<tr>
<td>Soils</td>
</tr>
<tr>
<td>NPDES Facilities</td>
</tr>
<tr>
<td>MS4 Communities</td>
</tr>
<tr>
<td>CSO Communities</td>
</tr>
<tr>
<td>CFOs</td>
</tr>
</tbody>
</table>

TMDL Allocations (billion/day)

<table>
<thead>
<tr>
<th>Allocation Category</th>
<th>High Flows</th>
<th>Moist Conditions</th>
<th>Mid-Range Flows</th>
<th>Dry Conditions</th>
<th>Low Flows</th>
</tr>
</thead>
<tbody>
<tr>
<td>LA</td>
<td>2093.62</td>
<td>389.38</td>
<td>120.54</td>
<td>28.55</td>
<td>10.15</td>
</tr>
<tr>
<td>WLA</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>MOS (10%)</td>
<td>232.62</td>
<td>43.26</td>
<td>13.39</td>
<td>3.17</td>
<td>1.13</td>
</tr>
<tr>
<td>TMDL = LA+WLA+MOS</td>
<td>2326.24</td>
<td>432.64</td>
<td>133.93</td>
<td>31.72</td>
<td>11.28</td>
</tr>
</tbody>
</table>
Table 229. Sugar Creek Characteristics and TMDL Summary (HUC12-711)

<table>
<thead>
<tr>
<th>Upstream Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Drainage Area</strong></td>
</tr>
<tr>
<td><strong>Sampling Station</strong></td>
</tr>
<tr>
<td><strong>Listed Segments</strong></td>
</tr>
<tr>
<td><strong>Land Use</strong></td>
</tr>
<tr>
<td><strong>Soils</strong></td>
</tr>
<tr>
<td><strong>NPDES Facilities</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>MS4 Communities</strong></td>
</tr>
<tr>
<td><strong>CSO Communities</strong></td>
</tr>
<tr>
<td><strong>CAFOs</strong></td>
</tr>
<tr>
<td><strong>CFOs</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TMDL Allocations (billion/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>LA</td>
</tr>
<tr>
<td>WLA</td>
</tr>
<tr>
<td>MOS (10%)</td>
</tr>
<tr>
<td>TMDL = LA+WLA+MOS</td>
</tr>
</tbody>
</table>
7.1.5.3  **Spring Creek Subwatershed (HUC10-208)**

The Spring Creek subwatershed incorporates the cities of Gilman and Onarga as shown in Figure 103. The Spring Creek subwatershed lies in Iroquois and Ford counties in Illinois (Figure 103). The two dominant land uses in this subwatershed are agriculture (85.18%) and developed land (9.19%). The remaining land categories contribute less than 2 percent of the subwatershed area (Table 233). The NPDES facilities are shown in Figure 104.

There are no currently listed 303(d) segments in this subwatershed. 2008 sampling at one monitoring station in the subwatershed indicated an impairment that will lead to a listing on the 2010 303 (d) list (Table 230). The monitoring station is located on Spring Creek in HUC 20808 (Table 231). A statistical summary of the water quality is presented in Table 232. The reduction needed to achieve a geomean of 200 #/100 mL is 51 percent.

### Table 230. Anticipated 2010 303 (d) Listed Streams in the Spring Creek Subwatershed

<table>
<thead>
<tr>
<th>HUC 12</th>
<th>HU C12 Name</th>
<th>Segment ID</th>
<th>Waterbody</th>
<th>Stream Length (miles)</th>
<th>Parameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>808</td>
<td>Spring Creek</td>
<td>IL-FLH-02</td>
<td>Spring Creek</td>
<td>62.00</td>
<td>Fecal Coliform</td>
</tr>
</tbody>
</table>

### Table 231. Station Locations in the Spring Creek Subwatershed

<table>
<thead>
<tr>
<th>HUC 12</th>
<th>HU C12 Name</th>
<th>Station #</th>
<th>Stream Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>808</td>
<td>Spring Creek</td>
<td>FLH-02</td>
<td>Spring Creek</td>
</tr>
</tbody>
</table>

### Table 232. Summary of Pathogen Data in Spring Creek Subwatershed

<table>
<thead>
<tr>
<th>Station #</th>
<th>Period of Record</th>
<th>Total Number of Samples</th>
<th>Percent of Samples Exceeding Fecal Coliform WQS (#/100 mL)</th>
<th>Minimum (#/100 mL)</th>
<th>Geomean (#/100 mL)</th>
<th>Average (#/100 mL)</th>
<th>Maximum (#/100 mL)</th>
<th>Percent Reduction Based on Geomean (200/100mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FLH-02</td>
<td>8/19/2008 - 9/17/2008</td>
<td>5</td>
<td>80</td>
<td>188</td>
<td>411</td>
<td>470</td>
<td>840</td>
<td>51%</td>
</tr>
</tbody>
</table>
Table 233. Land Use/land Cover in the Spring Creek Subwatershed

<table>
<thead>
<tr>
<th>Land Use/Land Cover</th>
<th>Subwatershed</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Area</td>
<td>Acres</td>
<td>Square Miles</td>
<td>Percent</td>
</tr>
<tr>
<td>Agricultural Land</td>
<td>137912.50</td>
<td>215.49</td>
<td>85.18</td>
<td></td>
</tr>
<tr>
<td>Developed Land</td>
<td>14872.82</td>
<td>23.24</td>
<td>9.19</td>
<td></td>
</tr>
<tr>
<td>Forested Land</td>
<td>3097.95</td>
<td>4.84</td>
<td>1.91</td>
<td></td>
</tr>
<tr>
<td>Pasture/Hay</td>
<td>3648.82</td>
<td>5.70</td>
<td>2.25</td>
<td></td>
</tr>
<tr>
<td>Wetland</td>
<td>1625.03</td>
<td>2.54</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>Grassland and Shrubs</td>
<td>289.11</td>
<td>0.45</td>
<td>0.18</td>
<td></td>
</tr>
<tr>
<td>Open Water</td>
<td>467.03</td>
<td>0.73</td>
<td>0.29</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>161,913.26</strong></td>
<td><strong>252.99</strong></td>
<td><strong>100.00</strong></td>
<td></td>
</tr>
</tbody>
</table>
Figure 103. Location of Spring Creek Watershed (HUC10-208)
Table 234 summarizes the subwatershed characteristics as well as the TMDL results for HUC 12-808. It should be noted that there are no current 303(d) listings in this HUC; however, the 2008 sampling data indicate that the fecal coliform bacteria criteria are not met in this HUC and so TMDL results are presented here.

There are three NPDES facilities within the Spring Creek subwatershed and the WLAs for the facilities were calculated based on their design flows and fecal coliform permit limits. The individual WLAs are presented in Table 276.
Table 234. Spring Creek Characteristics and TMDL Summary (HUC12-808)

<table>
<thead>
<tr>
<th>Upstream Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Drainage Area</strong></td>
</tr>
<tr>
<td><strong>Sampling Station</strong></td>
</tr>
<tr>
<td><strong>Listed Segments</strong></td>
</tr>
<tr>
<td><strong>Land Use</strong></td>
</tr>
<tr>
<td><strong>Soils</strong></td>
</tr>
<tr>
<td><strong>NPDES Facilities</strong></td>
</tr>
<tr>
<td><strong>MS4 Communities</strong></td>
</tr>
<tr>
<td><strong>CSO Communities</strong></td>
</tr>
<tr>
<td><strong>CAFOs</strong></td>
</tr>
<tr>
<td><strong>CFOs</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TMDL Allocations (billion/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allocation Category</td>
</tr>
<tr>
<td>LA</td>
</tr>
<tr>
<td>WLA</td>
</tr>
<tr>
<td>MOS (10%)</td>
</tr>
<tr>
<td><strong>TMDL = LA+WLA+MOS</strong></td>
</tr>
</tbody>
</table>
7.1.5.4 Prairie Creek Subwatershed (HUC10-209)

The Prairie Creek subwatershed incorporates the towns of Gilman and Clifton as shown in Figure 105. The Prairie Creek subwatershed lies almost entirely within Iroquois county in Illinois. The two dominant land uses in this subwatershed are agriculture (90.06%) and developed land (8.85%). The remaining land categories contribute less than 1 percent of the subwatershed area (Table 237). The NPDES facilities are shown in Figure 106.

There are no currently listed 303(d) segments in this subwatershed. 2008 sampling at one monitoring station in the subwatershed indicated an impairment that will lead to a listing on the 2010 303 (d) list (Table 235). The monitoring station is located on Spring Creek in HUC 20902 (Table 236). A statistical summary of the water quality is presented in Table 237. The reduction needed to achieve a geomean of 200 #/100 mL is 69 percent.

Table 235. Anticipated 2010 303 (d) Listed Streams in the Prairie Creek Subwatershed

<table>
<thead>
<tr>
<th>HUC 12</th>
<th>HU C12 Name</th>
<th>Segment ID</th>
<th>Waterbody</th>
<th>Stream Length (miles)</th>
<th>Parameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>902</td>
<td>Prairie Creek</td>
<td>FLG</td>
<td>Prairie Creek</td>
<td>34.35</td>
<td>Fecal Coliform</td>
</tr>
</tbody>
</table>

Table 236. Station Locations in the Prairie Creek Subwatershed

<table>
<thead>
<tr>
<th>HUC 12</th>
<th>HU C12 Name</th>
<th>Station #</th>
<th>Stream Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>902</td>
<td>Prairie Creek</td>
<td>FLG-01</td>
<td>Prairie Creek</td>
</tr>
</tbody>
</table>

Table 237. Summary of Pathogen Data in Prairie Creek Subwatershed (IL)

<table>
<thead>
<tr>
<th>Station #</th>
<th>Period of Record</th>
<th>Total Number of Samples</th>
<th>Percent of Samples Exceeding Fecal Coliform WQS (#/100 mL)</th>
<th>Minimum (#/100 mL)</th>
<th>Geomean (#/100 mL)</th>
<th>Average (#/100 mL)</th>
<th>Maximum (#/100 mL)</th>
<th>Percent Reduction Based on Geomean (200/100mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FLG-01</td>
<td>8/19/2008 - 9/17/2008</td>
<td>5</td>
<td>80</td>
<td>40</td>
<td>130</td>
<td>645</td>
<td>1,681</td>
<td>4,200</td>
</tr>
</tbody>
</table>

Table 238. Land Use/land Cover in the Prairie Creek Subwatershed

<table>
<thead>
<tr>
<th>Land Use/Land Cover</th>
<th>Subwatershed Area</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Acres</td>
<td>Square Miles</td>
</tr>
<tr>
<td>Agricultural Land</td>
<td>51532.02</td>
<td>80.52</td>
</tr>
<tr>
<td>Developed Land</td>
<td>5065.69</td>
<td>7.92</td>
</tr>
<tr>
<td>Forested Land</td>
<td>63.83</td>
<td>0.10</td>
</tr>
<tr>
<td>Pasture/Hay</td>
<td>463.25</td>
<td>0.72</td>
</tr>
<tr>
<td>Wetland</td>
<td>26.69</td>
<td>0.04</td>
</tr>
<tr>
<td>Grassland and Shrubs</td>
<td>3.56</td>
<td>0.01</td>
</tr>
<tr>
<td>Open Water</td>
<td>67.61</td>
<td>0.11</td>
</tr>
<tr>
<td>Total</td>
<td>57,222.63</td>
<td>89.41</td>
</tr>
</tbody>
</table>
Figure 105. Location of Prairie Creek Watershed (HUC10-209)
Figure 106. NPDES Facilities in the Prairie Creek Watershed (HUC10-209)
Table 239 summarizes the subwatershed characteristics as well as the TMDL results for HUC 12-809. It should be noted that there are no current 303(d) listings in this HUC; however, the 2008 sampling data indicate that the fecal coliform bacteria criteria are not met in this HUC and so TMDL results are presented here.

There are three NPDES facilities within the Prairie Creek subwatershed and the WLAs for the facilities were calculated based on their design flows and fecal coliform permit limits. The individual WLAs are presented in Table 276.
## Table 239. Prairie Creek Characteristics and TMDL Summary (HUC12-902)

### Upstream Characteristics

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drainage Area</td>
<td>89.42 square miles</td>
</tr>
<tr>
<td>Sampling Station</td>
<td>FLG-01</td>
</tr>
<tr>
<td>Listed Segments</td>
<td>FLG</td>
</tr>
<tr>
<td>Land Use</td>
<td>Agriculture: 90.05%; Developed Land: 8.85%; Forest: 0.11%; Other: 0.991%</td>
</tr>
<tr>
<td>Soils</td>
<td>A: 0.33%; B: 35.54%; C: 13.29%; D: 50.67%; Unknown: 0.17%</td>
</tr>
</tbody>
</table>

### NPDES Facilities
- Prairieview Luthern Home (IL0037397)
- Swissland Packing Company (IL0065358)
- Merkle-Knipprath Nursing Home (ILG551007)

### MS4 Communities
- None

### CSO Communities
- None

### CAFOs
- None

### CFOs
- None

### TMDL Allocations (billion/day)

<table>
<thead>
<tr>
<th>Allocation Category</th>
<th>High Flows</th>
<th>Moist Conditions</th>
<th>Mid-Range Flows</th>
<th>Dry Conditions</th>
<th>Low Flows</th>
</tr>
</thead>
<tbody>
<tr>
<td>LA</td>
<td>1107.04</td>
<td>261.01</td>
<td>91.99</td>
<td>28.85</td>
<td>11.06</td>
</tr>
<tr>
<td>WLA</td>
<td>0.72</td>
<td>0.72</td>
<td>0.42</td>
<td>0.42</td>
<td>0.42</td>
</tr>
<tr>
<td>MOS (10%)</td>
<td>123.08</td>
<td>29.08</td>
<td>10.27</td>
<td>3.25</td>
<td>1.27</td>
</tr>
<tr>
<td>TMDL = LA+WLA+MOS</td>
<td>1230.84</td>
<td>290.81</td>
<td>102.68</td>
<td>32.52</td>
<td>12.75</td>
</tr>
</tbody>
</table>
7.1.5.5  **Gofield Creek-Iroquois River Subwatershed (HUC10-210)**

The Gofield Creek subwatershed has an area of approximately 110 square miles and completely lies in Iroquois county (Figure 107). Agriculture is the dominant land use here as well (Table 244). There is only one NPDES facility as shown in Figure 108. No feeding operations exist within this subwatershed.

The listed segment and sampling locations are shown in Table 240 and Table 242. Table 243 summarizes the available water quality data. Forty five percent of all data available for FL-04 exceeds the geomean fecal coliform standard and twenty five percent of all data available for FL-04 exceed the not-to-exceed fecal coliform standard. The reductions needed to achieve a geomean of 200 #/100 mL at stations FL-07 and FL-03 is 74 percent.

| Table 240. 303 (d) Listed Streams in the Gofield Creek-Iroquois River Subwatershed |
|-----------------------------------|-----------------|----------------|-------------------|------------------|
| **HUC 12** | **HU C12 Name** | **Segment ID** | **Waterbody** | **Stream Length (miles)** | **Parameter** |
| 001 | Eastburo Hollow-Iroquois River | IL_FL-04 | Iroquois River | 22.24 | Fecal Coliform |

| Table 241. Anticipated 2010 303 (d) Listed Streams in the Gofield Creek-Iroquois River Subwatershed |
|-----------------------------------|-----------------|----------------|-------------------|------------------|
| **HUC 12** | **HU C12 Name** | **Segment ID** | **Waterbody** | **Stream Length (miles)** | **Parameter** |
| 002 | City of Watseka-Iroquois River | FL-05 | Iroquois River | 23.63 | Fecal Coliform |

| Table 242. Station Locations in the Gofield Creek-Iroquois River Subwatershed |
|-----------------------------------|-----------------|----------------|
| **HUC 12** | **HU C12 Name** | **Stream Name** |
| 001 | Eastburo Hollow-Iroquois River | Iroquois River |
| 001 | Eastburo Hollow-Iroquois River | Iroquois River |
| 002 | City of Watseka-Iroquois River | Iroquois River |

| Table 243. Summary of Pathogen Data in Gofield Creek-Iroquois River Subwatershed |
|-----------------------------------|-----------------|-----------------|-------------------|------------------|-----------------|-----------------|-----------------|
| **Station #** | **Period of Record** | **Total Number of Samples** & **Percent of Samples Exceeding Fecal Coliform WQS (#/100 mL)** | **Minimum (#/100 mL)** | **Geomean (#/100 mL)** | **Average (#/100 mL)** | **Maximum (#/100 mL)** | **Percent Reduction Based on Geomean (200/100mL)** |
| FL-04 | 3/31/1999 - 6/10/2008 | 40 | 45 | 25 | 10 | 171 | 551 | 7,636 | 0% |
| FL-07 | 8/19/2008 - 9/17/2008 | 5 | 60 | 60 | 164 | 759 | 1,229 | 3,200 | 74% |
| FL-03 | 8/19/2008 - 9/17/2008 | 5 | 80 | 60 | 68 | 780 | 1,563 | 3,500 | 74% |
Table 244. Land Use/Land Cover in the Gofield Creek-Iroquois River Subwatershed

<table>
<thead>
<tr>
<th>Land Use/Land Cover</th>
<th>Subwatershed</th>
<th>Area</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Acres</td>
<td>Square Miles</td>
</tr>
<tr>
<td>Agricultural Land</td>
<td>59,132.33</td>
<td>92.39</td>
<td>83.95</td>
</tr>
<tr>
<td>Developed Land</td>
<td>5,530.94</td>
<td>8.64</td>
<td>7.85</td>
</tr>
<tr>
<td>Forested Land</td>
<td>2,634.03</td>
<td>4.12</td>
<td>3.74</td>
</tr>
<tr>
<td>Pasture/Hay</td>
<td>1,524.73</td>
<td>2.38</td>
<td>2.16</td>
</tr>
<tr>
<td>Wetland</td>
<td>867.78</td>
<td>1.36</td>
<td>1.23</td>
</tr>
<tr>
<td>Grassland and Shrubs</td>
<td>83.62</td>
<td>0.13</td>
<td>0.12</td>
</tr>
<tr>
<td>Open Water</td>
<td>666.51</td>
<td>1.04</td>
<td>0.95</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>70,439.95</strong></td>
<td><strong>110.06</strong></td>
<td><strong>100.00</strong></td>
</tr>
</tbody>
</table>
Figure 107. Location of Gofield Creek-Iroquois River (HUC10-210)
Table 245 and Table 246 summarize the subwatershed characteristics as well as the TMDL results for HUC 12-21001 and HUC 12-21002. There are ten NPDES facilities within the Gofield Creek subwatershed and the WLAs for the facilities were calculated based on their design flows and fecal coliform permit limits. There are two CSO communities upstream of this subwatershed. WLAs for CSO communities were calculated based on the maximum observed CSO flow reported in the DMR and fecal coliform standards. The individual WLAs are presented in Table 277.
### Table 245. Eastburo Hollow-Iroquois River Characteristics and TMDL Summary (HUC12-001)

<table>
<thead>
<tr>
<th>Upstream Characteristics</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Drainage Area</strong></td>
<td>737.77 square miles</td>
</tr>
<tr>
<td><strong>Sampling Station</strong></td>
<td>FL-04, FL-07</td>
</tr>
<tr>
<td><strong>Listed Segments</strong></td>
<td>IL_FL-04</td>
</tr>
<tr>
<td><strong>Land Use</strong></td>
<td>Agriculture: 83.78%; Developed Land: 6.31%; Forest: 6.13%; Other: 3.78%</td>
</tr>
<tr>
<td><strong>Soils</strong></td>
<td>A: 27.01%; B: 44.70%; C: 22.08%; D: 5.96%; Unknown: 0.24%</td>
</tr>
<tr>
<td><strong>NPDES Facilities</strong></td>
<td>All the facilities upstream of HUC12-503, HUC 12-506</td>
</tr>
<tr>
<td></td>
<td>Watseka STP (IL0022161)</td>
</tr>
<tr>
<td><strong>MS4 Communities</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>CSO Communities</strong></td>
<td>Watseka STP (IL0022161)-6 outfalls</td>
</tr>
<tr>
<td><strong>CAFOs</strong></td>
<td>All the facilities upstream of HUC12-503, HUC 12-506</td>
</tr>
<tr>
<td><strong>CFOs</strong></td>
<td>All the facilities upstream of HUC12-503, HUC 12-506</td>
</tr>
<tr>
<td><strong>TMDL Allocations (billion/day)</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>High Flows</td>
</tr>
<tr>
<td><strong>LA</strong></td>
<td>9051.99</td>
</tr>
<tr>
<td><strong>WLA</strong></td>
<td>87.69</td>
</tr>
<tr>
<td><strong>MOS (10%)</strong></td>
<td>1015.52</td>
</tr>
<tr>
<td><strong>TMDL = LA+WLA+MOS</strong></td>
<td>10155.20</td>
</tr>
</tbody>
</table>

---

*a*: Refers to Upper Iroquois HUC12
### Table 246. City of Watseka-Iroquois River Characteristics and TMDL Summary (HUC12-002)

<table>
<thead>
<tr>
<th>Upstream Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Drainage Area</strong></td>
</tr>
<tr>
<td><strong>Sampling Station</strong></td>
</tr>
<tr>
<td><strong>Listed Segments</strong></td>
</tr>
<tr>
<td><strong>Land Use</strong></td>
</tr>
<tr>
<td><strong>Soils</strong></td>
</tr>
<tr>
<td><strong>NPDES Facilities</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
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<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>MS4 Communities</strong></td>
</tr>
<tr>
<td><strong>CSO Communities</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>CAFOs</strong></td>
</tr>
<tr>
<td><strong>CFOs</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TMDL Allocations (billion/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allocation Category</td>
</tr>
<tr>
<td>--------------------</td>
</tr>
<tr>
<td><strong>LA</strong></td>
</tr>
<tr>
<td><strong>WLA</strong></td>
</tr>
<tr>
<td><strong>MOS (10%)</strong></td>
</tr>
<tr>
<td><strong>TMDL = LA+WLA+MOS</strong></td>
</tr>
</tbody>
</table>

a: Refers to Upper Iroquois HUC12
7.1.5.6 **Pike Creek Subwatershed (HUC10-211)**

The Pike Creek subwatershed lies entirely within Iroquois county in Illinois (Figure 109). The two dominant land uses in this subwatershed are agriculture (89.71%) and developed land (7.06%). The remaining land categories contribute less than 2 percent of the subwatershed area (Table 237). There are not any NPDES Facilities or CFOs within the subwatershed.

There are no currently listed 303(d) segments in this subwatershed. 2008 sampling at one monitoring station in the subwatershed indicated an impairment that will lead to a listing on the 2010 303 (d) list (Table 247). The monitoring station is located on Pike Creek in HUC 21102 (Table 236). A statistical summary of the water quality is presented in Table 249. The reduction needed to achieve a geomean of 200 #/100 mL is 44 percent.

**Table 247. Anticipated 2010 303 (d) Listed Streams in the Pike Creek Subwatershed**

<table>
<thead>
<tr>
<th>HUC 12</th>
<th>HU C12 Name</th>
<th>Segment ID</th>
<th>Waterbody</th>
<th>Stream Length (miles)</th>
<th>Parameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>102</td>
<td>Pike Creek</td>
<td>FLF-01</td>
<td>Pike Creek</td>
<td>17.95</td>
<td>Fecal Coliform</td>
</tr>
</tbody>
</table>

**Table 248. Station Locations in the Pike Creek Subwatershed**

<table>
<thead>
<tr>
<th>HUC 12</th>
<th>HUC12 Name</th>
<th>Station #</th>
<th>Stream Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>102</td>
<td>Pike Creek</td>
<td>FLF-01</td>
<td>Pike Creek</td>
</tr>
</tbody>
</table>

**Table 249. Summary of Pathogen Data in Pike Creek Subwatershed (IL)**

<table>
<thead>
<tr>
<th>Station #</th>
<th>Period of Record</th>
<th>Total Number of Samples</th>
<th>Percent of Samples Exceeding Fecal Coliform WQS (#/100 mL)</th>
<th>Minimum (#/100 mL)</th>
<th>Geomean (#/100 mL)</th>
<th>Average (#/100 mL)</th>
<th>Maximum (#/100 mL)</th>
<th>Percent Reduction Based on Geomean (200/100mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FLF-01</td>
<td>8/19/2008 - 9/17/2008</td>
<td>5</td>
<td>80 40</td>
<td>84</td>
<td>358</td>
<td>583</td>
<td>1,800</td>
<td>44%</td>
</tr>
</tbody>
</table>
Table 250. Land Use/land Cover in the Pike Creek Subwatershed

<table>
<thead>
<tr>
<th>Land Use/Land Cover</th>
<th>Subwatershed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Area</td>
</tr>
<tr>
<td></td>
<td>Acres</td>
</tr>
<tr>
<td>Agricultural Land</td>
<td>40765.92</td>
</tr>
<tr>
<td>Developed Land</td>
<td>3205.81</td>
</tr>
<tr>
<td>Forested Land</td>
<td>519.29</td>
</tr>
<tr>
<td>Pasture/Hay</td>
<td>782.38</td>
</tr>
<tr>
<td>Wetland</td>
<td>134.99</td>
</tr>
<tr>
<td>Grassland and Shrubs</td>
<td>23.13</td>
</tr>
<tr>
<td>Open Water</td>
<td>6.67</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>45,438.20</strong></td>
</tr>
</tbody>
</table>
Table 251 summarizes the subwatershed characteristics as well as the TMDL results for HUC 12-102. It should be noted that there are no current 303(d) listings in this HUC; however, the 2008 sampling data indicate that the fecal coliform bacteria criteria are not met in this HUC and so TMDL results are presented here. There are no point sources in this subwatershed.
### Table 251. Pike Creek Characteristics and TMDL Summary (HUC12-102)

#### Upstream Characteristics

<table>
<thead>
<tr>
<th>Drainage Area</th>
<th>71.00 square miles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sampling Station</td>
<td>FLF-01</td>
</tr>
<tr>
<td>Listed Segments</td>
<td>FLF-01</td>
</tr>
<tr>
<td><strong>Land Use</strong></td>
<td>Agriculture: 89.71%; Developed Land: 7.05%; Forest: 1.14%; Other: 2.09%</td>
</tr>
<tr>
<td>Soils</td>
<td>A: 13.40%; B: 49.68%; C: 5.91%; D: 31.01%; Unknown: 0.00%</td>
</tr>
<tr>
<td>NPDES Facilities</td>
<td>None</td>
</tr>
<tr>
<td>MS4 Communities</td>
<td>None</td>
</tr>
<tr>
<td>CSO Communities</td>
<td>None</td>
</tr>
<tr>
<td>CAFOs</td>
<td>None</td>
</tr>
<tr>
<td>CFOs</td>
<td>None</td>
</tr>
</tbody>
</table>

#### TMDL Allocations (billion/day)

<table>
<thead>
<tr>
<th>Allocation Category</th>
<th>High Flows</th>
<th>Moist Conditions</th>
<th>Mid-Range Flows</th>
<th>Dry Conditions</th>
<th>Low Flows</th>
</tr>
</thead>
<tbody>
<tr>
<td>LA</td>
<td>879.57</td>
<td>207.81</td>
<td>73.38</td>
<td>23.24</td>
<td>9.12</td>
</tr>
<tr>
<td>WLA</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>MOS (10%)</td>
<td>97.73</td>
<td>23.09</td>
<td>8.15</td>
<td>2.58</td>
<td>1.01</td>
</tr>
<tr>
<td>TMDL = LA+WLA+MOS</td>
<td>977.30</td>
<td>230.90</td>
<td>81.53</td>
<td>25.82</td>
<td>10.13</td>
</tr>
</tbody>
</table>
7.1.5.7  **Langan Creek Subwatershed (HUC10-212)**

The Langan Creek subwatershed incorporates the cities of Clifton and Chebanse as shown in Figure 110. The Langan Creek subwatershed lies within Iroquois and Kankakee counties in Illinois (Figure 110). The two dominant land uses in this subwatershed are agriculture (90.59%) and developed land (7.16%). The remaining land categories contribute less than 2 percent of the subwatershed area (Table 255). There are no NPDES Facilities or CFOs within the subwatershed (Figure 110).

There are no currently listed 303(d) segments in this subwatershed. 2008 sampling at one monitoring station in the subwatershed indicated an impairment that will lead to a listing on the 2010 303 (d) list (Table 252). The monitoring station is located on Langan Creek in HUC 21202 (Table 253). A statistical summary of the water quality is presented in Table 254. The reductions needed to achieve a geomean of 200 #/100 mL 56 percent.

**Table 252. Anticipated 2010 303 (d) Listed Streams in the Langan Creek Subwatershed**

<table>
<thead>
<tr>
<th>HUC 12</th>
<th>HUC 12 Name</th>
<th>Segment ID</th>
<th>Waterbody</th>
<th>Stream Length (miles)</th>
<th>Parameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>202</td>
<td>Langan Creek</td>
<td>FLE-01</td>
<td>Langan Creek</td>
<td>9.45</td>
<td>Fecal Coliform</td>
</tr>
</tbody>
</table>

**Table 253. Station Locations in the Langan Creek Subwatershed**

<table>
<thead>
<tr>
<th>HUC 12</th>
<th>HUC 12 Name</th>
<th>Station #</th>
<th>Stream Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>202</td>
<td>Langan Creek</td>
<td>FLE-01</td>
<td>Langan Creek</td>
</tr>
</tbody>
</table>

**Table 254. Summary of Pathogen Data in Langan Creek Subwatershed (IL)**

<table>
<thead>
<tr>
<th>Station #</th>
<th>Period of Record</th>
<th>Total Number of Samples</th>
<th>Percent of Samples Exceeding Fecal Coliform WQS (#/100 mL)</th>
<th>Minimum (#/100 mL)</th>
<th>Geomean (#/100 mL)</th>
<th>Average (#/100 mL)</th>
<th>Maximum (#/100 mL)</th>
<th>Percent Reduction Based on Geomean (200/100mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FLE-01</td>
<td>8/19/2008 - 9/17/2008</td>
<td>5</td>
<td>80</td>
<td>60</td>
<td>48</td>
<td>451</td>
<td>886</td>
<td>2,800</td>
</tr>
</tbody>
</table>
Table 255. Land Use/land Cover in the Langan Creek Subwatershed

<table>
<thead>
<tr>
<th>Land Use/Land Cover</th>
<th>Subwatershed</th>
<th>Area</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Acres</td>
<td>Square Miles</td>
</tr>
<tr>
<td>Agricultural Land</td>
<td></td>
<td>62190.47</td>
<td>97.17</td>
</tr>
<tr>
<td>Developed Land</td>
<td></td>
<td>4914.68</td>
<td>7.68</td>
</tr>
<tr>
<td>Forested Land</td>
<td></td>
<td>360.72</td>
<td>0.56</td>
</tr>
<tr>
<td>Pasture/Hay</td>
<td></td>
<td>806.85</td>
<td>1.26</td>
</tr>
<tr>
<td>Wetland</td>
<td></td>
<td>282.00</td>
<td>0.44</td>
</tr>
<tr>
<td>Grassland and Shrubs</td>
<td></td>
<td>82.51</td>
<td>0.13</td>
</tr>
<tr>
<td>Open Water</td>
<td></td>
<td>16.68</td>
<td>0.03</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>68,653.91</strong></td>
<td><strong>107.27</strong></td>
</tr>
</tbody>
</table>
Table 256 summarizes the subwatershed characteristics as well as the TMDL results for HUC 12-202. It should be noted that there are no current 303(d) listings in this HUC; however, the 2008 sampling data indicate that the fecal coliform bacteria criteria are not met in this HUC and so TMDL results are presented here.

There are three NPDES facilities within the Langan Creek subwatershed and the WLAs for the facilities were calculated based on their design flows and fecal coliform permit limits. The individual WLAs are presented in Table 276.
### Table 256. Langan Creek Characteristics and TMDL Summary (HUC12-202)

#### Upstream Characteristics

<table>
<thead>
<tr>
<th>Drainage Area</th>
<th>107.33 square miles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sampling Station</td>
<td>FLE-01</td>
</tr>
<tr>
<td>Listed Segments</td>
<td>FLE-01</td>
</tr>
<tr>
<td><strong>Land Use</strong></td>
<td>Agriculture: 90.53%; Developed Land: 0.02%; Forest: 7.15%; Other: 2.29%</td>
</tr>
<tr>
<td><strong>Soils</strong></td>
<td>A: 0.77%; B: 39.66%; C: 22.01%; D: 37.551%; Unknown: 0.00%</td>
</tr>
</tbody>
</table>

#### NPDES Facilities

- Central Hs&Nash Middle School (IL0037206)
- Iroquois Mobile Estates (IL0047040)
- Clifton STP (IL0049573)

#### MS4 Communities

- None

#### CSO Communities

- None

#### CAFOs

- None

#### CFOs

- None

#### TMDL Allocations (billion/day)

<table>
<thead>
<tr>
<th>Allocation Category</th>
<th>High Flows</th>
<th>Moist Conditions</th>
<th>Mid-Range Flows</th>
<th>Dry Conditions</th>
<th>Low Flows</th>
</tr>
</thead>
<tbody>
<tr>
<td>LA</td>
<td>1325.46</td>
<td>309.98</td>
<td>109.25</td>
<td>33.47</td>
<td>12.11</td>
</tr>
<tr>
<td>WLA</td>
<td>4.17</td>
<td>4.17</td>
<td>1.67</td>
<td>1.67</td>
<td>1.67</td>
</tr>
<tr>
<td>MOS (10%)</td>
<td>147.74</td>
<td>34.91</td>
<td>12.32</td>
<td>3.90</td>
<td>1.53</td>
</tr>
<tr>
<td>TMDL = LA+WLA+MOS</td>
<td>1477.37</td>
<td>349.06</td>
<td>123.24</td>
<td>39.04</td>
<td>15.31</td>
</tr>
</tbody>
</table>
7.1.5.8 **Beaver Creek Subwatershed (HUC 10-213)**

The Beaver Creek subwatershed has an area of 187 square miles (Figure 111). Agriculture constitutes the primary land use in this area (Table 261). There are no listed segments within this subwatershed and there is only one NPDES facility (Figure 112). Feeding operations are shown in Figure 113.

There are four monitoring locations in this subwatershed (Table 258) and the summary of the 2008 data in is shown in Table 259 and Table 260. The reductions needed to achieve a fecal coliform geomean of 200 #/100 mL for the Illinois station is 48 percent. The reductions needed to achieve an *E. coli* geomean of 125 #/100 mL ranges from 20 to 72 percent.

<table>
<thead>
<tr>
<th>HUC 12</th>
<th>HUC 12 Name</th>
<th>Segment ID</th>
<th>Waterbody</th>
<th>Stream Length (miles)</th>
<th>Parameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>305</td>
<td>North-Hooper Beaver Creek</td>
<td>FLD-03*</td>
<td>Beaver Creek</td>
<td>4.2</td>
<td>Fecal Coliform</td>
</tr>
<tr>
<td>308</td>
<td>Beaver Creek</td>
<td></td>
<td></td>
<td>17.87</td>
<td></td>
</tr>
</tbody>
</table>

*Segment FLD-03 lies in two subwatersheds.

<table>
<thead>
<tr>
<th>HUC 12</th>
<th>HUC 12 Name</th>
<th>Station # (State)</th>
<th>Stream Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>302</td>
<td>Deardruff Ditch-Beaver Creek</td>
<td>ID# 48 (IN)</td>
<td>Beaver Cr</td>
</tr>
<tr>
<td>303</td>
<td>Carlson Ditch-Beaver Creek</td>
<td>ID# 44 (IN)</td>
<td>Salisbury D</td>
</tr>
<tr>
<td>308</td>
<td>Beaver Creek</td>
<td>FLD-03 (IL)</td>
<td>Beaver Creek</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Station #</th>
<th>Period of Record</th>
<th>Total Number of Samples</th>
<th>Percent of Samples Exceeding <em>E. coli</em> WQS (#/100 mL)</th>
<th>Minimum (#/100 mL)</th>
<th>Geomean (#/100 mL)</th>
<th>Average (#/100 mL)</th>
<th>Maximum (#/100 mL)</th>
<th>Percent Reduction Based on Geomean (125/100mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>48</td>
<td>6/2/2008 - 6/30/2008</td>
<td>5</td>
<td>80, 60</td>
<td>120</td>
<td>330</td>
<td>578</td>
<td>1,986</td>
<td>62%</td>
</tr>
<tr>
<td>44</td>
<td>6/2/2008 - 6/30/2008</td>
<td>5</td>
<td>80, 0</td>
<td>93</td>
<td>156</td>
<td>161</td>
<td>196</td>
<td>20%</td>
</tr>
<tr>
<td>46</td>
<td>6/2/2008 - 6/30/2008</td>
<td>5</td>
<td>100, 100</td>
<td>326</td>
<td>439</td>
<td>457</td>
<td>727</td>
<td>72%</td>
</tr>
</tbody>
</table>
Table 260. Summary of Pathogen Data in the Beaver Creek Subwatershed (IL)

<table>
<thead>
<tr>
<th>Station #</th>
<th>Period of Record</th>
<th>Total Number of Samples</th>
<th>Percent of Samples Exceeding Fecal Coliform WQS (#/100 mL)</th>
<th>Minimum (#/100 mL)</th>
<th>Geomean (#/100 mL)</th>
<th>Average (#/100 mL)</th>
<th>Maximum (#/100 mL)</th>
<th>Percent Reduction Based on Geomean (200/100mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FLD-03</td>
<td>8/19/2008 - 9/17/2008</td>
<td>5</td>
<td>100</td>
<td>220</td>
<td>388</td>
<td>510</td>
<td>1,380</td>
<td>48%</td>
</tr>
</tbody>
</table>

Table 261. Land Use/Land Cover in the Beaver Creek Subwatershed

<table>
<thead>
<tr>
<th>Land Use/Land Cover</th>
<th>Area</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Acres</td>
<td>Square Miles</td>
</tr>
<tr>
<td>Agricultural Land</td>
<td>91,283.82</td>
<td>142.63</td>
</tr>
<tr>
<td>Forested Land</td>
<td>15,463.72</td>
<td>24.16</td>
</tr>
<tr>
<td>Developed Land</td>
<td>7,206.45</td>
<td>11.26</td>
</tr>
<tr>
<td>Pasture/Hay</td>
<td>1,683.30</td>
<td>2.63</td>
</tr>
<tr>
<td>Grassland and Shrubs</td>
<td>1,602.79</td>
<td>2.50</td>
</tr>
<tr>
<td>Open Water</td>
<td>1,208.71</td>
<td>1.89</td>
</tr>
<tr>
<td>Wetland</td>
<td>957.18</td>
<td>1.50</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>119,405.99</strong></td>
<td><strong>186.57</strong></td>
</tr>
</tbody>
</table>
Figure 111. Location of Beaver Lake Ditch-Kankakee River Subwatershed (HUC10-112)
Figure 112. NPDES Facilities in the Beaver Lake Ditch-Kankakee River Subwatershed (HUC10-112)
Figure 113. Feeding Operations in the Beaver Lake Ditch-Kankakee River Subwatershed (HUC10-112)

Table 262 through Table 264 summarize the subwatershed characteristics as well as the TMDL results for each of the HUC 12 subwatersheds. It should be noted that there are no current 303(d) listings in this subwatershed; however, the 2008 sampling data indicate that the *E. coli* and fecal coliform bacteria criteria are not met in this subwatershed and so TMDL results are presented here.

There is one NPDES facility within the Beaver Creek subwatershed and the WLAs for the facility was calculated based on their design flows and *E. coli* and fecal coliform bacteria permit limits. The individual WLAs are presented in Table 276. There is one CAFO within this subwatershed and it receives a WLA of zero as described further in Section 7.3.
### Table 262. Deardruff ditch-Beaver Creek Characteristics and TMDL Summary (HUC12-302)

<table>
<thead>
<tr>
<th>Upstream Characteristics</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Drainage Area</td>
<td>42.40 square miles</td>
</tr>
<tr>
<td>Sampling Station</td>
<td>44, 48</td>
</tr>
<tr>
<td>Listed Segments</td>
<td>None</td>
</tr>
<tr>
<td>Land Use</td>
<td>Agriculture: 83.07%; Developed Land: 5.59%; Forest: 6.58%; Other: 4.76%</td>
</tr>
<tr>
<td>Soils</td>
<td>A: 67.84%; B: 22.97%; C: 8.48%; D: 0.71%; Unknown: 0.00%</td>
</tr>
<tr>
<td>NPDES Facilities</td>
<td>None</td>
</tr>
<tr>
<td>MS4 Communities</td>
<td>None</td>
</tr>
<tr>
<td>CSO Communities</td>
<td>None</td>
</tr>
<tr>
<td>CAFOs</td>
<td>Storey Pork Farm (ING803684)</td>
</tr>
<tr>
<td></td>
<td>Gibson Fine Swine, Inc. (3855)</td>
</tr>
<tr>
<td>CFOs</td>
<td>Sow Production Site (2484)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TMDL Allocations (billion/day)</th>
<th>High Flows</th>
<th>Moist Conditions</th>
<th>Mid-Range Flows</th>
<th>Dry Conditions</th>
<th>Low Flows</th>
</tr>
</thead>
<tbody>
<tr>
<td>LA</td>
<td>367.41</td>
<td>104.44</td>
<td>36.06</td>
<td>9.87</td>
<td>3.40</td>
</tr>
<tr>
<td>WLA</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>MOS (10%)</td>
<td>40.82</td>
<td>11.60</td>
<td>4.01</td>
<td>1.09</td>
<td>0.38</td>
</tr>
<tr>
<td>TMDL = LA+WLA+MOS</td>
<td>408.23</td>
<td>116.04</td>
<td>40.07</td>
<td>10.96</td>
<td>3.78</td>
</tr>
</tbody>
</table>
Table 263.  Carlson Ditch-Beaver Creek Subwatershed Characteristics and TMDL Summary (HUC12-303)

<table>
<thead>
<tr>
<th>Upstream Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Drainage Area</strong></td>
</tr>
<tr>
<td><strong>Sampling Station</strong></td>
</tr>
<tr>
<td><strong>Listed Segments</strong></td>
</tr>
<tr>
<td><strong>Land Use</strong></td>
</tr>
<tr>
<td><strong>Soils</strong></td>
</tr>
<tr>
<td><strong>NPDES Facilities</strong></td>
</tr>
<tr>
<td><strong>MS4 Communities</strong></td>
</tr>
<tr>
<td><strong>CSO Communities</strong></td>
</tr>
<tr>
<td><strong>CAFOs</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>CFOs</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TMDL Allocations (billion/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Allocation Category</strong></td>
</tr>
<tr>
<td>LA</td>
</tr>
<tr>
<td>WLA</td>
</tr>
<tr>
<td>MOS (10%)</td>
</tr>
<tr>
<td>TMDL = LA+WLA+MOS</td>
</tr>
</tbody>
</table>
### Table 264. Beaver Creek Subwatershed Characteristics and TMDL Summary (HUC12-308)

**Upstream Characteristics**

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drainage Area</td>
<td>186.63 square miles</td>
</tr>
<tr>
<td>Sampling Station</td>
<td>FLD-03</td>
</tr>
<tr>
<td>Listed Segments</td>
<td>FLD-03</td>
</tr>
<tr>
<td>Land Use</td>
<td>Agriculture: 76.42%; Developed Land: 6.03%; Forest: 12.95%; Other: 4.60%</td>
</tr>
<tr>
<td>Soils</td>
<td>A: 47.24%; B: 24.57%; C: 10.28%; D: 16.94%; Unknown: 0.97%</td>
</tr>
<tr>
<td>NPDES Facilities</td>
<td>Morocco WWTP (IN0060798)</td>
</tr>
<tr>
<td>MS4 Communities</td>
<td>None</td>
</tr>
<tr>
<td>CSO Communities</td>
<td>None</td>
</tr>
<tr>
<td>CAFOs</td>
<td>None</td>
</tr>
<tr>
<td>CFOs</td>
<td>None</td>
</tr>
</tbody>
</table>

**TMDL Allocations (billion/day)**

<table>
<thead>
<tr>
<th>Allocation Category</th>
<th>High Flows</th>
<th>Moist Conditions</th>
<th>Mid-Range Flows</th>
<th>Dry Conditions</th>
<th>Low Flows</th>
</tr>
</thead>
<tbody>
<tr>
<td>LA</td>
<td>2310.88</td>
<td>545.12</td>
<td>191.73</td>
<td>59.96</td>
<td>22.82</td>
</tr>
<tr>
<td>WLA</td>
<td>1.14</td>
<td>1.14</td>
<td>1.14</td>
<td>1.14</td>
<td>1.14</td>
</tr>
<tr>
<td>MOS (10%)</td>
<td>256.89</td>
<td>60.69</td>
<td>21.43</td>
<td>6.78</td>
<td>2.66</td>
</tr>
<tr>
<td>TMDL = LA+WLA+MOS</td>
<td>2568.91</td>
<td>606.95</td>
<td>214.30</td>
<td>67.88</td>
<td>26.62</td>
</tr>
</tbody>
</table>
7.1.5.9  Iroquois River Subwatershed (HUC10-214)

The Iroquois River subwatershed has an area of nearly 69 square miles and lies entirely in Illinois. The land in this subwatershed is primarily used for agricultural purposes (Table 268). The subwatershed does not have NPDES facilities or feeding operations within its borders (Figure 114).

There is one listed segment in the subwatershed (Table 265). The sampling station (Table 266) located on Iroquois River shows pathogen violations (Table 267). Twenty six percent of all data observed at station FL-02 exceeds the geomean standard while 12 percent of all samples exceed the not-to-exceed standard.

| Table 265. 303 (d) Listed Streams in the Iroquois River Subwatershed |
|------------------|------------------|------------------|------------------|------------------|
| HUC 12 | HUC 12 Name | Segment ID | Waterbody | Stream Length (miles) | Parameter |
| 402 | Iroquois River | IL_FL_02 | Iroquois River | 11.37 | Fecal Coliform |

| Table 266. Station Locations in the Iroquois River Subwatershed |
|------------------|------------------|------------------|
| HUC 12 | HUC 12 Name | Station # | Stream Name |
| 402 | Iroquois River | FL-02 | Iroquois River |

| Table 267. Summary of Pathogen Data in the Iroquois River Subwatershed |
|------------------|------------------|------------------|------------------|------------------|------------------|
| Station # | Period of Record | Total Number of Samples | Percent of Samples Exceeding Fecal Coliform WQS (#/100 mL) | Minimum (#/100 mL) | Geomean (#/100 mL) | Average (#/100 mL) | Maximum (#/100 mL) | Percent Reduction Based on Geomean (200/100mL) |
| FL-02 | 3/8/1999 - 6/18/2008 | 42 | 12 | 10 | 84 | 198 | 2,500 | 0% |

| Table 268. Land Use/Land Cover in the Iroquois River Subwatershed |
|------------------|------------------|------------------|------------------|
| Land Use/Land Cover | Subwatershed Area | Percent |
| | Acres | Square Miles | |
| Agricultural Land | 38306.91 | 59.85 | 86.32 |
| Developed Land | 3019.89 | 4.72 | 6.80 |
| Forested Land | 1040.14 | 1.63 | 2.34 |
| Pasture/Hay | 996.10 | 1.56 | 2.24 |
| Wetland | 371.84 | 0.58 | 0.84 |
| Grassland and Shrubs | 106.97 | 0.17 | 0.24 |
| Open Water | 534.41 | 0.84 | 1.20 |
| Total | 44,376.27 | 69.34 | 100.00 |
Figure 114. Location of Iroquois River Subwatershed (HUC10-214)

Table 269 summarizes the subwatershed characteristics as well as the TMDL results for HUC 12-402. There are two MS4 communities within the Iroquois River subwatershed and the WLAs for the communities were calculated based on their area within the subwatershed and fecal coliform standards. The individual WLAs are presented in Table 276. WLAs for CSO communities were calculated based on the maximum observed CSO flow reported in the DMR and fecal coliform standards.
### Table 269. Iroquois River Characteristics and TMDL Summary (HUC12-402)

#### Upstream Characteristics

<table>
<thead>
<tr>
<th>Drainage Area</th>
<th>2135.30 square miles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sampling Station</td>
<td>FL_02</td>
</tr>
<tr>
<td>Listed Segments</td>
<td>IL_FL_02</td>
</tr>
</tbody>
</table>

#### Land Use

- Agriculture: 85.97%; Developed Land: 6.69%; Forest: 4.03%; Other: 3.30%

#### Soils

- A: 15.10%; B: 36.68%; C: 20.92%; D: 27.03%; Unknown: 0.27%

#### NPDES Facilities

- All facilities upstream HUC12-001
  - Cissna Park STP (IL0042391)
  - Rankin STP (ILG580122)
  - Milford STP (IL0023272)
  - Gilman-North STP (IL0025062)
  - Onarga STP (IL0076813)
- II Dot-I-57 Iroquois County (ILG551072)
- Prairievlew Luthern Home (IL0037397)
- Swissland Packing Company (IL0065358)
- Merkle-Knipprath Nursing Home (ILG551007)
- Central Hs&Nash Middle School (IL0037206)
- Clifton STP (IL0049573)
- Morroco WWTP (IL0060798)
- Iroquois Mobile Estates (IL0047040)

#### MS4 Communities

- City of Kankakee (ILR400363): 0.069 square miles
- Kankakee County (ILR400260): 0.068 square miles

#### CSO Communities

- Watseka STP (IL0022161)-6 outfalls
- Milford STP (IL0023272)-10 outfalls
- Rensselaer Municipal STP (IN0024414)-9 outfalls

#### CAFOs

- All facilities upstream HUC12-001
  - Storey Pork Farm (3684)

#### CFOs

- All facilities upstream HUC12-001
  - Ewen Gravel Hill Farm (1178)
  - Sow Production Site (2484)
  - Gibson Fine Swine, Inc.(3855)
  - C Bar C Farms (3277)

#### TMDL Allocations (billion/day)

<table>
<thead>
<tr>
<th>Allocation Category</th>
<th>High Flows</th>
<th>Moist Conditions</th>
<th>Mid-Range Flows</th>
<th>Dry Conditions</th>
<th>Low Flows</th>
</tr>
</thead>
<tbody>
<tr>
<td>LA</td>
<td>24612.76</td>
<td>4468.02</td>
<td>1791.04</td>
<td>487.03</td>
<td>154.28</td>
</tr>
<tr>
<td>WLA</td>
<td>1512.45</td>
<td>1512.45</td>
<td>43.57</td>
<td>43.57</td>
<td>43.57</td>
</tr>
<tr>
<td>MOS (10%)</td>
<td>2902.80</td>
<td>664.50</td>
<td>203.85</td>
<td>58.95</td>
<td>21.98</td>
</tr>
<tr>
<td>TMDL = LA+WLA+MOS</td>
<td>29028.01</td>
<td>6644.97</td>
<td>2038.46</td>
<td>589.55</td>
<td>219.83</td>
</tr>
</tbody>
</table>

*a: Refers to Lower Iroquois HUC12*
7.1.6 Lower Kankakee Subwatershed

The Lower Kankakee subwatershed has five HUC 10 and 26 HUC 12 units (Table 270). The only sampling stations are located in HUC 10-118. Therefore information is only presented for this subwatershed. There are no listed segments in this subwatershed.

Table 270. Hydrologic Unit Code (HUC 10 and 12) in the Lower Kankakee Subwatershed

<table>
<thead>
<tr>
<th>HUC 10</th>
<th>HUC 10 Name</th>
<th>HUC 12</th>
<th>Subwatershed Name</th>
<th>Area (sq. miles)</th>
</tr>
</thead>
<tbody>
<tr>
<td>114</td>
<td>Spring Creek-Kankakee River</td>
<td>401</td>
<td>Pike Creek</td>
<td>26.01</td>
</tr>
<tr>
<td></td>
<td></td>
<td>402</td>
<td>Trim Creek</td>
<td>37.82</td>
</tr>
<tr>
<td></td>
<td></td>
<td>403</td>
<td>Mirror Lake-Kankakee River</td>
<td>37.64</td>
</tr>
<tr>
<td></td>
<td></td>
<td>404</td>
<td>Tower Creek</td>
<td>17.81</td>
</tr>
<tr>
<td></td>
<td></td>
<td>405</td>
<td>Spring Creek</td>
<td>27.59</td>
</tr>
<tr>
<td></td>
<td></td>
<td>406</td>
<td>Farr Creek-Kankakee River</td>
<td>39.95</td>
</tr>
<tr>
<td>115</td>
<td>Rock Creek</td>
<td>501</td>
<td>Black Walnut Creek</td>
<td>20.59</td>
</tr>
<tr>
<td></td>
<td></td>
<td>502</td>
<td>South Branch Rock Creek</td>
<td>39.53</td>
</tr>
<tr>
<td></td>
<td></td>
<td>503</td>
<td>Headwaters Rock Creek</td>
<td>36.60</td>
</tr>
<tr>
<td></td>
<td></td>
<td>504</td>
<td>Rock Creek</td>
<td>24.52</td>
</tr>
<tr>
<td>116</td>
<td>Horse Creek</td>
<td>601</td>
<td>Lehigh Raymond Run</td>
<td>16.09</td>
</tr>
<tr>
<td></td>
<td></td>
<td>602</td>
<td>East Branch Horse Creek</td>
<td>56.32</td>
</tr>
<tr>
<td></td>
<td></td>
<td>603</td>
<td>West Branch Horse Creek</td>
<td>31.45</td>
</tr>
<tr>
<td></td>
<td></td>
<td>604</td>
<td>Horse Creek</td>
<td>24.48</td>
</tr>
<tr>
<td>117</td>
<td>Forked Creek</td>
<td>701</td>
<td>South Branch Forked Creek</td>
<td>35.62</td>
</tr>
<tr>
<td></td>
<td></td>
<td>702</td>
<td>Headwaters Forked Creek</td>
<td>60.08</td>
</tr>
<tr>
<td></td>
<td></td>
<td>703</td>
<td>Forked Creek</td>
<td>40.04</td>
</tr>
<tr>
<td>118</td>
<td>Kankakee River</td>
<td>801</td>
<td>Exline Slough</td>
<td>43.93</td>
</tr>
<tr>
<td></td>
<td></td>
<td>802</td>
<td>Bur Creek Ditch</td>
<td>26.24</td>
</tr>
<tr>
<td></td>
<td></td>
<td>803</td>
<td>Baker Creek</td>
<td>27.21</td>
</tr>
<tr>
<td></td>
<td></td>
<td>804</td>
<td>Terry Creek</td>
<td>12.44</td>
</tr>
<tr>
<td></td>
<td></td>
<td>805</td>
<td>Rayns Creek-Kankakee River</td>
<td>63.31</td>
</tr>
<tr>
<td></td>
<td></td>
<td>806</td>
<td>City of Wilmington-Kankakee River</td>
<td>21.50</td>
</tr>
<tr>
<td></td>
<td></td>
<td>807</td>
<td>Headwaters Prairie Creek</td>
<td>33.36</td>
</tr>
<tr>
<td></td>
<td></td>
<td>808</td>
<td>Prairie Creek</td>
<td>18.22</td>
</tr>
<tr>
<td></td>
<td></td>
<td>809</td>
<td>Kankakee River</td>
<td>17.75</td>
</tr>
</tbody>
</table>
7.1.6.1  **Kankakee River Subwatershed (HUC 10-118)**

The Kankakee River subwatershed has an area of approximately 263 square miles and includes the sampling stations listed in Table 271 and shown in Figure 115. Table 272 summarizes fecal coliform data for this subwatershed. Agriculture is the dominant land use followed by developed land (Table 273). There are no feeding operations within this subwatershed and the NPDES facilities are shown in Figure 116. It should be noted that the impairment status for segment F-01 previously relied on data from station F-01; impairment status is now based on data collected at station F-16.

**Table 271. Station Locations in the Kankakee River Subwatershed**

<table>
<thead>
<tr>
<th>HUC 12</th>
<th>HUC 12 Name</th>
<th>Station #</th>
<th>Stream Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>806</td>
<td>City of Wilmington-Kankakee River</td>
<td>F-16</td>
<td>Kankakee River</td>
</tr>
<tr>
<td>809</td>
<td>Kankakee River</td>
<td>F-01</td>
<td>Kankakee River</td>
</tr>
</tbody>
</table>

**Table 272. Summary of Pathogen Data in the Kankakee River Subwatershed**

<table>
<thead>
<tr>
<th>Station #</th>
<th>Period of Record</th>
<th>Total Number of Samples</th>
<th>Percent of Samples Exceeding Fecal Coliform WQS (#/100 mL)</th>
<th>Minimum (#/100 mL)</th>
<th>Geomean (#/100 mL)</th>
<th>Average (#/100 mL)</th>
<th>Maximum (#/100 mL)</th>
<th>Percent Reduction Based on Geomean (200/100mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>F-16</td>
<td>1/14/2003 - 6/18/2008</td>
<td>16</td>
<td>25</td>
<td>0</td>
<td>20</td>
<td>61</td>
<td>104</td>
<td>240</td>
</tr>
<tr>
<td>F-01</td>
<td>3/30/1999 - 9/19/2002</td>
<td>21</td>
<td>38</td>
<td>19</td>
<td>7</td>
<td>110</td>
<td>652</td>
<td>8,900</td>
</tr>
</tbody>
</table>

**Table 273. Land Use/Land Cover in the Kankakee River Subwatershed**

<table>
<thead>
<tr>
<th>Land Use/Land Cover</th>
<th>Subwatershed Area</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Acres</td>
<td>Square Miles</td>
</tr>
<tr>
<td>Agricultural Land</td>
<td>105,089.60</td>
<td>164.20</td>
</tr>
<tr>
<td>Developed Land</td>
<td>26,906.33</td>
<td>42.04</td>
</tr>
<tr>
<td>Forested Land</td>
<td>13,080.10</td>
<td>20.44</td>
</tr>
<tr>
<td>Pasture/Hay</td>
<td>8,126.72</td>
<td>12.70</td>
</tr>
<tr>
<td>Wetland</td>
<td>555.54</td>
<td>0.87</td>
</tr>
<tr>
<td>Grassland and Shrubs</td>
<td>9,524.02</td>
<td>14.88</td>
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<tr>
<td>Open Water</td>
<td>4815.27</td>
<td>7.52</td>
</tr>
<tr>
<td>Total</td>
<td>168,097.59</td>
<td>262.65</td>
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</table>
Figure 115. Location of Kankakee River Subwatershed (HUC 10-118)
Table 274 through Table 275 summarize the subwatershed characteristics for each of the HUC 12 subwatersheds. It should be noted that there are no current 303(d) listings in this subwatershed and the sampling performed in 2008 does not suggest any new impairment; therefore no TMDLs were developed.
### Table 274. City of Wilmington-Kankakee River Characteristics (HUC12-806)

<table>
<thead>
<tr>
<th>Upstream Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drainage Area</td>
</tr>
<tr>
<td>Sampling Station</td>
</tr>
<tr>
<td>Listed Segments</td>
</tr>
<tr>
<td>Land Use</td>
</tr>
<tr>
<td>Soils</td>
</tr>
<tr>
<td>NPDES Facilities</td>
</tr>
<tr>
<td>MS4 Communities</td>
</tr>
<tr>
<td>CSO Communities</td>
</tr>
<tr>
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<tr>
<td></td>
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<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>CAFOs</td>
</tr>
<tr>
<td>CFOs</td>
</tr>
</tbody>
</table>

*HUC12-806 is near the mouth of the Kankakee River; all sources listed previously in the document are upstream of this HUC.

### Table 275. Kankakee River Characteristics (HUC12-809)

<table>
<thead>
<tr>
<th>Upstream Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drainage Area</td>
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<tr>
<td>Sampling Station</td>
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<tr>
<td>Listed Segments</td>
</tr>
<tr>
<td>Land Use</td>
</tr>
<tr>
<td>Soils</td>
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<tr>
<td>NPDES Facilities</td>
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<td>MS4 Communities</td>
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<tr>
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<tr>
<td>CAFOs</td>
</tr>
<tr>
<td>CFOs</td>
</tr>
</tbody>
</table>

*HUC12-806 is at the mouth of the Kankakee River; all sources listed previously in the document are upstream of this HUC.*
7.2 Load Allocations

Load Allocations represent the portion of the allowable load that is reserved for nonpoint sources and natural background. Load allocations for the Kankakee/Iroquois watershed TMDLs are based on subtracting the WLAs and the MOS from the allowable load for each pollutant. The Load Allocations are presented by individual location in Section 7.1. CFOs receive a zero discharge permit from the state of Indiana and therefore receive a load allocation (LA) of zero for all pollutants.

7.3 Wasteload Allocations

There are 87 known NPDES facilities within the Kankakee/Iroquois watershed with the potential to discharge fecal coliform or E. coli. Seventy of these facilities discharge to streams with TMDLs. As required by the Clean Water Act, individual WLAs were developed for these permittees as part of the TMDL development process. For Indiana, WLAs were calculated based on each facility’s average design flow multiplied by E. coli permit limits and appropriate conversion factors. For Illinois, each facility’s maximum design flow was used to calculate the WLA for the high flow and moist flow zones and the average design flow was used for all other flow zones. Illinois assumes that facilities will have to discharge at their maximum flow during both high and moist flows based on the following:

For municipal NPDES permits in Illinois, page 2 of the NPDES permit lists 2 design flows: a design average flow (DAF) and a design maximum flow (DMF). These are defined in 35 Ill. Adm. Code 370.211(a) and (b) (see http://www.ipcb.state.il.us/documents/dsweb/Get/Document-12042/). Since rain (and to a certain extent, high ground water) causes influent flows to wastewater treatment facilities to increase and precipitation also leads to higher river levels, a correlation between precipitation and treatment flows exists. The load limits in these permits gives a tiered load limit, one based on DAF for flows of DAF and below, and another load limit in the permit for flows above DAF through DMF.

Indiana E. coli WLAs are based on the already established permit limits. The E. coli WLA is based on the 125 #/100 mL standard. Illinois fecal coliform WLAs are based on the already established permit limits. The fecal coliform WLA is based on the 200 #/100 mL standard.

There are four CSOs in the Indiana portion of the watershed and three in the Illinois portion of the watershed (Table 277). One CSO in Illinois does not discharge to any 303 (d) listed segments and therefore did not receive a WLA. The WLAs for all the CSOs were calculated to be equal to the maximum observed daily flow (as reported on the 2006 discharge monitoring reports) multiplied by 125#/100 mL for E. coli and 200#/100 mL for fecal coliform. During the development of Long-Term Control Plans for the CSO communities each state may decide to modify the WLA if deemed appropriate.

There are seven permitted MS4 communities in the Indiana portion of the watershed and 11 in the Illinois portion of the watershed (Table 278). Seven of the Illinois MS4 communities do not discharge to impaired stream segments; these communities therefore did not receive a WLA. Different WLAs were established for each MS4 depending on the area of the MS4 upstream of the each assessment location. The jurisdictional areas of townships, municipalities, and urbanized areas were used as surrogates for the regulated area of each MS4. These areas were then used to calculate WLAs based on the proportion of the upstream drainage area located within the MS4 boundaries by multiplying that proportional area by the loading capacity of the assessment location. The MS4 WLAs therefore are equal to the estimated flows from the MS4 multiplied by either 125#/100 mL for E. coli or 200#/100 mL for fecal coliform.
Indiana has identified 28 CAFOs in the Kankakee/Iroquois watershed and the WLAs for each is set to zero. The zero allocation is based on the Effluent Limitations Guidelines and New Source Performance Standards requiring, in general, zero discharge from these areas. This limit on load is reasonable due to the requirement for the proper design, construction, operation, and maintenance of the structures to contain all manure, litter, and process wastewater including the runoff and direct precipitation from a 25 year, 24-hour rainfall event. Further, the allocation is based on the conditions of the NPDES general permit providing that water quality standards shall not be exceeded in the event of an overflow from production areas. No CAFOs were identified by IEPA in the Illinois portion of the watershed; therefore the WLA for Illinois CAFOs is also zero (Table 279).

WLAs from illicitly connected onsite systems (i.e., straight pipe dischargers) in the watershed are set equal to zero.
Table 276. Individual WLAs for NPDES Facilities in the Kankakee/Iroquois watershed TMDLs.

<table>
<thead>
<tr>
<th>Major Subwatershed</th>
<th>Facility Name</th>
<th>Permit ID</th>
<th>Applicable to the Loading Capacities at the Following Segments</th>
<th>Design Flow (MGD)</th>
<th>Fecal coliform WLA (Billion/day)</th>
<th>E. Coli WLA (Billion/day)</th>
<th>Max Design Flow (MGD)</th>
<th>Fecal coliform WLA (Billion/day)</th>
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</thead>
<tbody>
<tr>
<td>Central Hs&amp;Nash Middle School</td>
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<tr>
<td>Cissna Park STP</td>
<td>IL0042391 IL_FL_02, IL_FL_02, FL-05</td>
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<td>0.76</td>
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<td>0.25</td>
<td>1.89</td>
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<tr>
<td>Clifton STP</td>
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<td>Gilman-North STP</td>
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<td>8.71</td>
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<td>Illinois Nov-57</td>
<td>ILG551072 IL_FL_02, FL-05</td>
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<td>0.0405</td>
<td>0.31</td>
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<td>IN0045888 HUC11009, INK019F_M1113, INK019F_M1104, HUC11103, HUC11205</td>
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<tr>
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<td>Permit ID</td>
<td>Applicable to the Loading Capacities at the Following Segments</td>
<td>Design Flow (MGD)</td>
<td>Fecal coliform WLA (Billion/day)</td>
<td>E. Coli WLA (Billion/day)</td>
<td>Max Design Flow (MGD)</td>
<td>Fecal coliform WLA (Billion/day)</td>
</tr>
<tr>
<td>-------------------</td>
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<td>Middle Kankakee</td>
<td>Hebron Municipal WWTP</td>
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<td>Permit ID</td>
<td>Applicable to the Loading Capacities at the Following Segments</td>
<td>Design Flow (MGD)</td>
<td>Fecal coliform WLA (Billion/day)</td>
<td>E. Coli WLA (Billion/day)</td>
<td>Max Design Flow (MGD)</td>
<td>Fecal coliform WLA (Billion/day)</td>
</tr>
<tr>
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<tr>
<td>George Ade Mem Health Care Ctr</td>
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<td>Permit ID</td>
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<td>Design Flow (MGD)</td>
<td>Fecal coliform WLA (Billion/day)</td>
<td>E. Coli WLA (Billion/day)</td>
<td>Max Design Flow (MGD)</td>
<td>Fecal coliform WLA (Billion/day)</td>
</tr>
<tr>
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<td>IN0041904</td>
<td>HUC20401, HUC20405, IL_FL-04, HUC20503, IL_FL_02</td>
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<td>Kingsbury Utility Corp</td>
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### Table 276. Individual WLAs for NPDES Facilities in the Kankakee/Iroquois watershed TMDLs.

<table>
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<tr>
<th>Major Subwatershed</th>
<th>Facility Name</th>
<th>Permit ID</th>
<th>Applicable to the Loading Capacities at the Following Segments</th>
<th>Design Flow (MGD)</th>
<th>Fecal coliform WLA (Billion/day)</th>
<th>E. Coli WLA (Billion/day)</th>
<th>Max Design Flow (MGD)</th>
<th>Fecal coliform WLA (Billion/day)</th>
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<td>North Liberty WWTP</td>
<td>IN0025801</td>
<td>INK0126_00, INK0125_00, INK0138_T1006, INK0131_T1003, INK0134_T1005, INK0133_T1004, INK013C_T1007, INK0147_T1009, INK0146_T1008, INK0183_M1011, HUC10807, INK019F_M1113, INK019F_M1104, HUC11103, HUC11205</td>
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<td>1.36</td>
<td>0.85</td>
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### Table 276. Individual WLAs for NPDES Facilities in the Kankakee/Iroquois watershed TMDLs.

<table>
<thead>
<tr>
<th>Major Subwatershed</th>
<th>Facility Name</th>
<th>Permit ID</th>
<th>Applicable to the Loading Capacities at the Following Segments</th>
<th>Design Flow (MGD)</th>
<th>Fecal coliform WLA (Billion/day)</th>
<th>E. Coli/ WLA (Billion/day)</th>
<th>Max Design Flow (MGD)</th>
<th>Fecal coliform WLA (Billion/day)</th>
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<tbody>
<tr>
<td></td>
<td>Potato Creek State Park</td>
<td>IN0052272</td>
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<td>Upper Kankakee</td>
<td>Swan Lake Golf Resort</td>
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<td>Walkerton Municipal WWTP</td>
<td>IN0040690</td>
<td>HUC10103, INK0126_00, INK0138_T1006, INK0131_T1003, INK0134_T1005, INK0133_T1004, INK0136_T1007, INK0147_T1009, INK0146_T1008, INK0183_M1011, HUC10807, INK019F_M1113, INK019F_M1104, HUC11103, HUC11205</td>
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<td>2.76</td>
<td>1.72</td>
<td>0.36</td>
<td>2.76</td>
</tr>
<tr>
<td>Major Subwatershed</td>
<td>Facility Name</td>
<td>Permit ID</td>
<td>Applicable to the Loading Capacities at the Following Segments</td>
<td>Design Flow (MGD)</td>
<td>Fecal coliform WLA (Billion/day)</td>
<td>E. Coli WLA (Billion/day)</td>
<td>Max Design Flow (MGD)</td>
<td>Fecal coliform WLA (Billion/day)</td>
</tr>
<tr>
<td>-------------------</td>
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<tr>
<td>Upper Kankakee</td>
<td>Yogi Bears Jellystone Park</td>
<td>IN0041882</td>
<td>INK0147_T1009, INK0146_T1008, INK0183_M1011, HUC10807, INK019F_M1113, INK019F_M1104, HUC10701, HUC11103, HUC11205, HUC10703</td>
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<td>1.61</td>
<td>1.00</td>
<td>0.21</td>
<td>1.61</td>
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<tr>
<td>Bass Lake Conservancy District</td>
<td>IN0058289</td>
<td>INK0183_M1011, HUC10807, INK019F_M1113, INK019F_M1104, HUC11103, HUC11205, HUC10601, HUC10604, HUC10603</td>
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<td>2.15</td>
<td>1.34</td>
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<td>2.15</td>
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<td>Yellow River</td>
<td>Bremen Municipal WWTP</td>
<td>IN0020427</td>
<td>INK0183_M1011, HUC10807, INK019F_M1113, INK019F_M1104, HUC11103, HUC11205, HUC1058_00, INK015F_00, INK0165_00, INK0166A_00, INK0166_00</td>
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<td>Convent Ancilla Domini</td>
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Table 276. Individual WLAs for NPDES Facilities in the Kankakee/Iroquois watershed TMDLs.

<table>
<thead>
<tr>
<th>Major Subwatershed</th>
<th>Facility Name</th>
<th>Permit ID</th>
<th>Applicable to the Loading Capacities at the Following Segments</th>
<th>Design Flow (MGD)</th>
<th>Fecal coliform WLA (Billion/day)</th>
<th>E. Coli WLA (Billion/day)</th>
<th>Max Design Flow (MGD)</th>
<th>Fecal coliform WLA (Billion/day)</th>
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<td>Lake Of The Woods Reg Sew Dist</td>
<td>IN0057002</td>
<td>IN0183_M1011, HUC10807, IN019F_M1113, HUC11103, HUC11205, IN0157_00, IN0158_00, IN015F_00, IN0165_00, IN0166A_00, IN0166_00</td>
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<td>1.02</td>
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<td>IN0183_M1011, HUC10807, IN019F_M1113, HUC11103, HUC11205, HUC10311, IN0165_00, IN0166A_00, IN0166_00</td>
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*Fecal Coliform WLA values for Indiana Permits are represented here for the purpose of calculating the total WLA for the TMDL only. This fecal coliform WLA will not be incorporated into Indiana facility permits. It is assumed that by meeting their $E. \text{ coli}$ WLA Indiana permits will also be meeting the Fecal coliform WLA. The two standards are considered equal.
Table 277. Individual WLAs for CSO Communities in the Kankakee/Iroquois watershed TMDLs.

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<tr>
<th>Major Subwatershed</th>
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<th>Facility</th>
<th>Fecal coliform WLA (Billion/day)</th>
<th>E. Coli WLA (Billion/day)</th>
<th>Applicable to the Loading Capacities at the Following Segments</th>
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<td>Major Subwatershed</td>
<td>Facility</td>
<td>Permit ID</td>
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<td>Area in Drainage (sq miles)</td>
<td>Fecal coliform WLA (Billion/day)</td>
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<td><strong>Lower Kankakee</strong></td>
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### Table 278. Individual WLAs for MS4 Communities in the Kankakee/Iroquois watershed TMDLs.

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<th>Major Subwatershed</th>
<th>Facility</th>
<th>Permit ID</th>
<th>Applicable to the Loading Capacities at the Following Segments</th>
<th>Area in Drainage (sq miles)</th>
<th>Fecal coliform WLA (Billion/day)</th>
<th>E. Coli WLA (Billion/day)</th>
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7.4 Margin of Safety

Section 303(d) of the Clean Water Act and U.S. EPA regulations at 40 CFR 130.7 require that “TMDLs shall be established at levels necessary to attain and maintain the applicable narrative and numeric water quality standards with seasonal variations and a margin of safety which takes into account any lack of knowledge concerning the relationship between limitations and water quality.” U.S. EPA guidance explains that the MOS may be implicit (i.e., incorporated into the TMDL through conservative assumptions in the analysis) or explicit (i.e., expressed in the TMDL as loadings set aside for the MOS).

A moderate explicit MOS has been applied as part of all the Kankakee/Iroquois watershed TMDLs by reserving ten percent of the allowable load (see allocation tables in Section 7.1). Ten percent was considered an appropriate MOS based on the following considerations:

- The use of the load duration curve approach minimizes a great deal of uncertainty associated with the development of TMDLs because the calculation of the loading capacity is simply a function of flow multiplied by the target value. Most of the uncertainty is therefore associated with the estimated flows in each assessed segment which were based on extrapolating flows from the nearest downstream USGS gage.
- The fecal coliform and *E. coli* TMDLs include an implicit MOS in that they were based on the geometric mean component of the standard rather than the not-to-exceed standard. Using the not-to-exceed standard would have resulted in larger loading capacities. The ten percent MOS helps to ensure that allocations will not exceed the load associated with the minimum flow in each zone.
- An additional implicit MOS for fecal coliform and *E. coli* is included because the load duration analysis does not address die-off of pathogens.

7.5 Seasonal Variation

A TMDL must consider seasonal variation in the derivation of the allocation. The load duration approach accounts for seasonality by evaluating allowable loads on a daily basis over the entire range of observed flows and presenting daily allowable loads that vary by flow. Seasonal variations for fecal coliform and *E. coli* are also addressed in this TMDL by only assessing conditions during the season when the water quality standard applies (April through October).
8.0 PUBLIC PARTICIPATION

Public participation is an important and required component of the TMDL development process. The following public meetings were held in the watershed to discuss this project:

- Kickoff public meetings were held in Rensaleer, IN on May 19, 2008 and Kankakee, IL on May 20, 2008. IDEM, IEPA, and Tetra Tech explained the TMDL process during these meetings, presented initial information regarding the Kankakee/Iroquois watershed, and answered questions from the public.
- Draft TMDL public meetings will be held in the watershed in the Spring of 2009. The draft findings of the TMDL will be presented at these meetings and the public will have the opportunity ask questions and provide information to be included in the final TMDL report.

IDEM and IEPA will also accept and address written comments on the draft TMDL report for a period of 30 days following its release.

9.0 IMPLEMENTATION AND REASONABLE ASSURANCE

Rural and, to a lesser extent, urban runoff are considered to be the primary sources of the bacteria impairments in the Kankakee/Iroquois watershed. Although several NPDES facilities have been found to be in violation of their permit limits for bacteria, the majority of facilities discharge effluent that meets water quality standards. Meeting bacteria water quality standards in the watershed will therefore rely primarily on encouraging activities to address runoff from urban and agricultural areas. This section provides a brief description of the types of appropriate practices and the programs that are in place to promote them.

Rural and urban runoff is reduced through the implementation of Best Management Practices (BMPs). A BMP may be structural, something that is built or involves changes in landforms or equipment. BMPs may also be managerial, that is, changing a specific way of using or handling infrastructure or resources. BMPs should be selected based on the goals of a watershed management plan, a TMDL implementation plan, or an equivalent process. Livestock owners, farmers, and urban planners can implement BMPs outside of a watershed management plan. However, the success of BMPs is typically enhanced if they are coordinated as part of a larger planning effort. The following is a partial list of BMPs that may be used to reduce pathogen loads:

- Riparian Area Management - Management of riparian areas protects stream banks and river banks with a buffer zone of vegetation, either grasses, legumes, or trees.
- Manure Collection and Storage - Collecting, storing, and handling manure in such a way that nutrients or bacteria do not run off into surface waters or leach down into ground water.
- Conservation Tillage – Use of tillage practices and residue management to control erosion and surface transport of pollutants from fields used for crop production.
- Contour Row Crops - Farming with row patterns and field operations aligned at or nearly perpendicular to the slope of the land.
- Manure Nutrient Testing - If manure application is desired, sampling and chemical analysis of manure should be performed to determine nutrient content for establishing the proper manure application rate in order to avoid overapplication and run-off.
- Drift Fences - Drift fences (short fences or barriers) can be installed to direct livestock movement. A drift fence parallel to a stream keep animals out and prevents direct input of E. coli to the stream.
- Pet Clean-up / Education - Education programs for pet owners can improve water quality of runoff from urban areas.
Septic Management/Public Education - Programs for management of septic systems can provide a systematic approach to reducing septic system pollution. Education on proper maintenance of septic systems as well as the need to remove illicit discharges could alleviate some anthropogenic sources of pathogens.

Participation of landowners will be essential to reducing nonpoint sources of pollution and improving water quality, but resistance to change and upfront costs may deter participation. However, educational efforts and cost share programs can increase participation to levels needed to protect water quality. The following provides a brief summary of a few of the federal cost share programs that are available; other federal programs and programs that are unique to each state are also available.

9.1 Nonpoint Source Management Program

Illinois EPA and Indiana DEM receive federal funds through Section 319(h) of the Clean Water Act to help implement the Nonpoint Source Management Program. The purpose of the Program is to work cooperatively with local units of government and other organizations toward the mutual goal of protecting the quality of water by controlling NPS pollution. The program emphasizes funding for implementing cost-effective corrective and preventative BMPs on a watershed scale; funding is also available for BMPs on a non-watershed scale and the development of information/education NPS pollution control programs. The maximum federal funding available is 60 percent, with the remaining 40 percent coming from local match. The program period is two years unless otherwise approved. Applications are accepted June 1 through August 1.

9.2 Environmental Quality Incentives Program (EQIP)

Several cost share programs are available to landowners who voluntarily implement resource conservation practices in the Kankakee/Iroquois watershed. The most comprehensive is the NRCS Environmental Quality Incentives Program (EQIP) which offers cost sharing and incentives to farmers who utilize approved conservation practices to reduce pollutant loading from agricultural lands.

9.3 Conservation Reserve Program (CRP)

The Farm Service Agency of the USDA supports the Conservation Reserve Program (CRP) which rents land converted from crop production to grass or forestland for the purposes of reducing erosion and protecting sensitive waters. This program is available to farmers who establish vegetated filter strips or grassed waterways. The program typically provides 50 percent of the upfront cost to establish vegetative cover and $185/acre/year for up to 15 years.
REFERENCES


Illinois Administrative Code Title 35 Environmental Protection. Subtitle C. Water Pollution. Chapter 1. Pollution Control Board. Part 302.

Indiana Administrative Code Title 327 Water Pollution Control Board. Article 2. Section 1-6(a). Last updated November 1, 2003.
