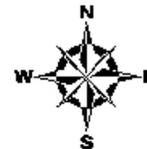
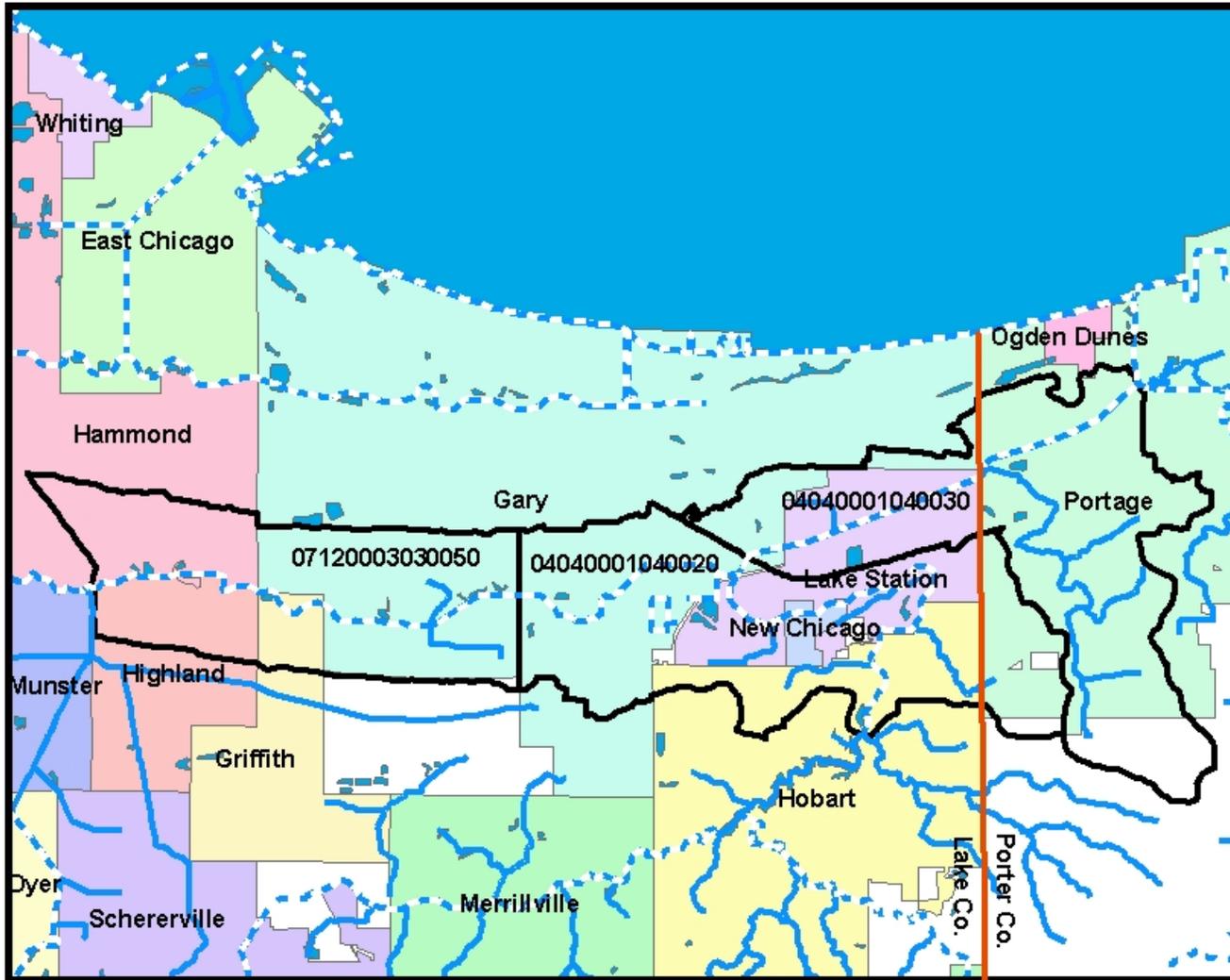


# Little Calumet River Watershed Management Plan

## Legend

-  303d Listed Stream
-  USGS Blueline Stream
-  Lakes



## **Section I: Project Introduction**

The Gary Storm Water Management District (GSWMD) submitted an application for a Clean Water Act Section 319 grant for the Little Calumet River. After some negotiation with the Indiana Department of Environmental Management (IDEM), the grant was approved on \_\_\_\_\_. The grant application stated the purpose was to identify pollutant contributions to the Western Branch of the Little Calumet River resulting from inappropriate or failed on-site sewage disposal systems, stream bank erosion and aquatic habitat degradation and polluted runoff from land development. The approach required by IDEM as part of the grant negotiations included a watershed wide study of this problem.

The majority of the funding for this project was supplied by a Section 319 grant in response to the GSWMD application; with the matching funds being provided by the City of Gary.

### **Designating the Study Area**

A watershed is an area of land that water flows over or under on its way to a common point. Watersheds can be extremely large, covering thousands of square miles, or they can be small, covering areas measured only in square feet. Larger watersheds contain many smaller watersheds within them.

In the United States, watersheds are identified using a hierarchical coding system, Hydrologic Unit Codes (HUC), developed in the mid-1970's by the U. S. Geological Survey (USGS). Based on topographical surface features, this system divided the country into successively smaller hydrologic units with the smaller units contained inside the larger units. These units are broken down into four levels from largest to smallest: regions, sub-regions, accounting units, and cataloguing units. A unique number was assigned to identify each level by starting with the region level. To designate different sub-regions within each region, more digits were added to the region number.

The first level of classification divides the United States into 21 regions. Figure 1.1 shows these 21 regions as they are distributed over the country. Each region is then divided into sub-regions, totaling 221. The third level of classification divides the nation into 378 accounting units contained within the sub-regions. The fourth level of classification subdivides many of the accounting units into cataloguing units. There are 2,264 cataloguing units in the United States. The cataloguing unit is the smallest unit within this classification system and is commonly referred to as 14-digit watershed; though efforts are underway to further subdivide the cataloguing units.

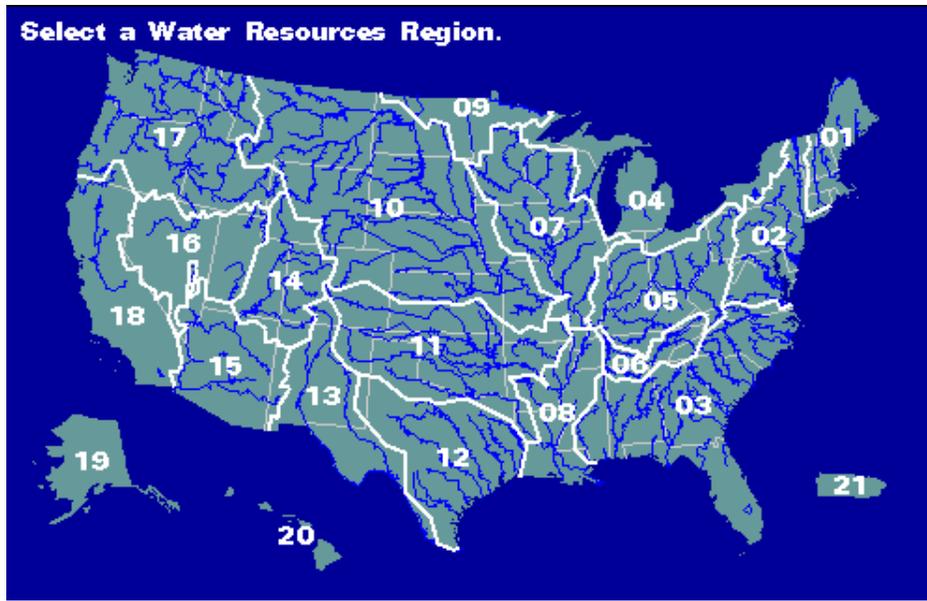


Figure 1.1: Hydrologic Unit Codes 21 regions over the United States.

The three 14-digit HUC watersheds specifically identified for consideration in this watershed management plan are:

071200003030050 – Little Calumet River East-West Split

04040001040020 – Deep River – Little Calumet River

04040001040030 – Burns Ditch - Willow Creek

The watersheds covered by this study consist of the West Branch Little Calumet River, Deep River and Willow Creek. The Little Calumet River includes areas to the east in the City of Portage and west in the City of Hammond and the Town of Highland. Figure 1.2 shows the three 14-digit HUC watersheds and the local communities. The unique location of this river segment crosses the continental divide. It is at this point that the river flow splits and drains east towards the Great Lakes and west towards the Mississippi River.

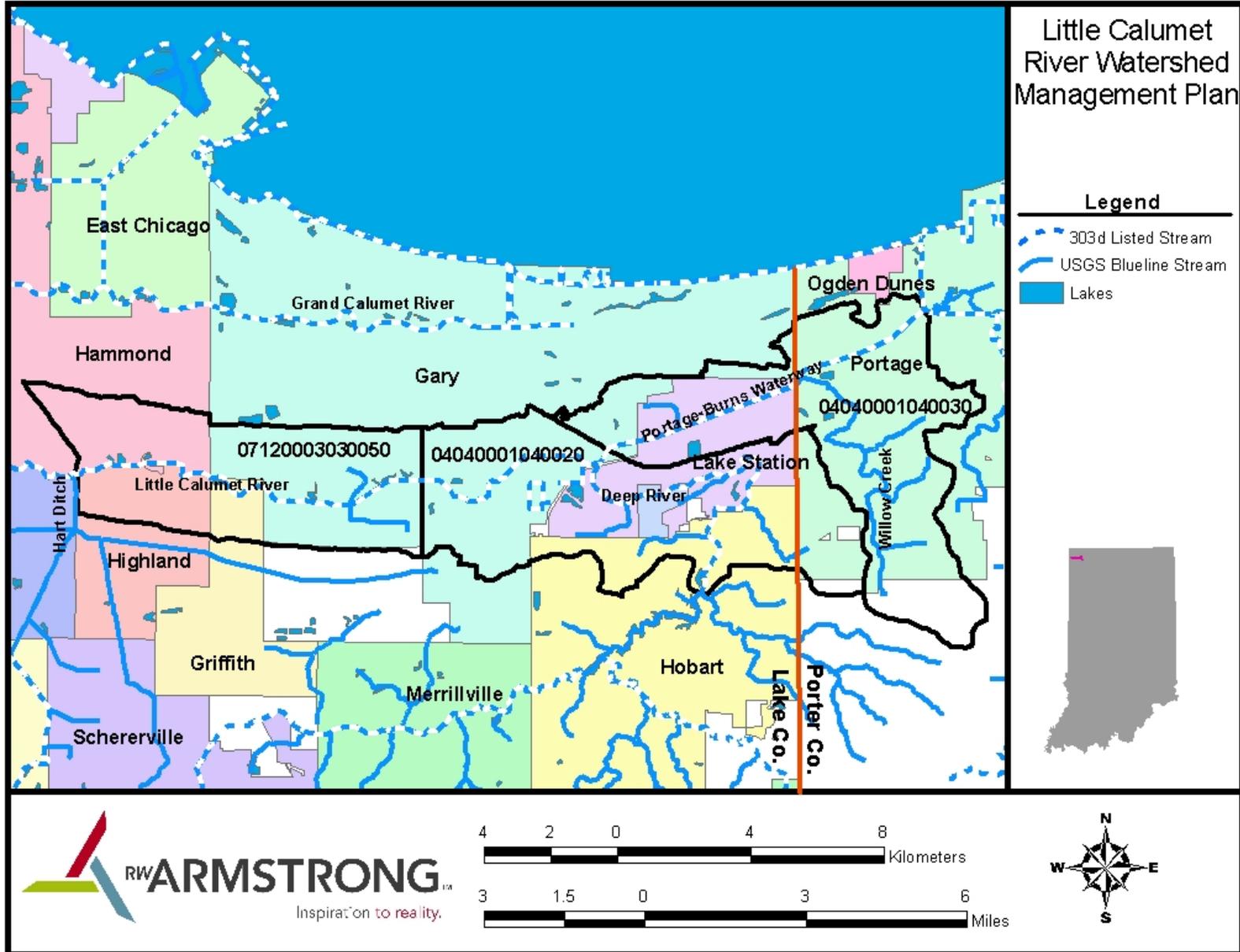


Figure 1.2: Watershed management study area with three 14-digit HUC watersheds delineated.

## **Building Partnerships**

The Gary Storm Water Management District (GSWMD) invited all of the communities and a number of environmental groups located, or affected by, the watershed to participate in a steering committee. This invitation was in the form of a letter sent via U.S. Mail in late summer 2006. A copy of this letter is included in Appendix 1: Stakeholders Invitation. This letter was sent to:

- City of Hammond
- Town of Munster
- Town of Highland
- Town of Griffith
- City of Hobart
- City of Lake Station
- City of Portage
- City of Crown Point
- Lake County
- Porter County
- Save the Dunes Council
- Little Calumet River Basin Development Committee
- Wildlife Habitat Council
- Northwestern Indiana Regional Planning Commission
- Lake Michigan Coastal Program
- Lake County Soil & Water Conservation District

The Steering Committee of the Little Calumet River Watershed Management Plan was composed of representatives from state and local agencies with jurisdiction over at least part of the watershed. Local groups, businesses, and citizens concerned with the current condition of the river were also part of the committee. Members who participated in developing this management plan are listed in Table 1.1.

<b>NAME</b>	<b>ORGANIZATION</b>	<b>NAME</b>	<b>ORGANIZATION</b>
Antwan Clemmons	Yourth Leaders in Action	Joe Eberts	Lake County Parks
Arnie Muzumdar	Northwest Engineering	Joe Exl	LMCP
Bill Meeks	City of Crown Point	John Bach	Town of Highland
Bill Vargo		Kathy Luther	NIRPC
Bob Helmick	RC and D	Kevin Breitzke	Porter County
Bob Theodoru	United Water	Lisa Bihl	EmPower Results
Brenda Scott Henry		Luci Horton	GSD
Carolyn Marsh	Sandy Ridge Audubon Society	Mark Gordish	Hammond
Cecile Petro	Town of Highland	Marshall Giliana	City of Lake Station
Charlotte Read	Save the Dunes Council	Martin J. Brown	GSWMD
Constance Clay	Save the Dunes Council	Mary Wiseman	NIRPC
Dan Gardner	LCRDC	Mary Lee	Glen Park Weed & Seed
Dan Gossman	Lake County Surveyor's Office	Maurice Joiner	United Water
Dan Rieden	Lake County Parks	Michael Gully	Town of Griffith
Dan Vicari	CDM	Murul Sloan	Glen Park CDC
Debi Hammonds	Golden Recognition	Nancy Valentine	
Dorothy Robinson		Nicole Sanders	RW Armstrong
Elizabeth McCloskey	U.S. Fish & Wildlife Service	Phil Gralik	RW Armstrong
Erin Crofton	Save the Dunes Council	Robert Perrine	Town of Burns Harbor
Greg Bright	Biomonitoring	Rodney Littleton	Groundwork Gary
Gregory White	Lake County Surveyor's Office	Roland Cloco	City of Lake Station
Harlee Currie	SWMD	Ronier Scott	6th District Council
Herb Read	Save the Dunes Council	Ruth Moers	Hammond
Howard Fink	Town of Merrillville	Sky Schelle	IDEM
Jeff Jones	Portage Parks	Spencer Cortwright	IU Northwest
Jenny Orsburn	IDNR Coastal Program	Stan Dostatni	City of Hammond
Jerry Haymon		Stan Petintes	SBS
Jill Hoffman	EmPower Results	Steve Truchan	Hobart
Jim Bartos		Steve West	IDEM
Jim Mandon	Town of Munster	Tammi Davis	GSWMD
Jim Meyer	Meyer & Wyatt	Tom Anderson	Save the Dunes Council
Jim Meyer	Meyer & Wyatt		

Table 1.1: Watershed Management Plan Steering Committee members.

## **Mission Statement**

The Mission Statement as developed by the Steering Committee is:

(The Little Calumet River Watershed Group) exists to effectively and aggressively reduce pollutant loads in the subwatersheds of the Little Calumet River through coordinated planning, public education, and structural BMP implementation.

## **Plan Development Process**

The Steering Committee, comprised of watershed stakeholders, met for the first time on November 30, 2006 at the offices of the Gary Sanitary District (GSD) in Gary, Indiana. The meeting started with introductions of those in attendance and a brief introduction of the project. A draft Mission Statement was developed as well as a list of the issues and concerns of the steering committee. The list of issues developed at this meeting is included in Appendix 2: Issues Identification. Full minutes of this meeting can be found in Appendix 3: Steering Committee Meeting Minutes.

The second Steering Committee meeting was held on January 11, 2007, at the GSD offices in Gary, Indiana. The draft Mission Statement was reviewed and a goal setting exercise was conducted. The date for the first public meeting was set for March 1, 2007. Full minutes of this meeting are located in Appendix 3: Steering Committee Meeting Minutes.

The first public meeting was held at the Indiana University Northwest Library on March 1, 2007. Local politicians, citizens, and steering committee members attended. A list of public concerns was developed and prioritized by those in attendance.

The third Steering Committee meeting was held on March 14, 2007, again at the GSD offices in Gary, Indiana. Sampling Plan alternatives were presented to the committee and can be found in Appendix 4: Sampling Plan Alternatives. Ultimately, the steering committee chose to take grab samples to test for specific water quality parameters and to employ two rounds of long term *E.coli* sampling in order to determine “hot zones.” Full minutes of this meeting are located in Appendix 3: Steering Committee Meeting Minutes.

The fourth Steering Committee meeting was held on July 17, 2007 at the Northwest Indiana Regional Planning Commission (NIRPC) building in Portage, Indiana. The major discussion during this meeting regarded the land use inventory and the maps created to show this. Potential “hot spots” were identified by committee members and a strategy development session was conducted by Jill Hoffman of Empower Results. Full meeting minutes can be found in Appendix 3: Steering Committee Meeting Minutes.

The next Steering Committee Meeting was held at the Genesis Convention Center in Gary, Indiana on October 11, 2007 and was considered the fifth committee meeting. Items covered during this meeting included a review of the water quality data collected and the updated land use maps and inventory created in response to the comments at the fourth committee meeting. The problem statements, goals and strategies were reviewed and an update on the upcoming public workshop was conducted.

The sixth Steering Committee Meeting was held at the GSD Board Room in Gary, Indiana on November 28, 2007. An update was given as to the results of the public outreach activity conducted in mid-October. The Stream Reach Survey results were also reviewed to give a better idea as to the current condition of the river. A review of the problem statements, goals and strategies was completed and critical areas began discussion. A few load reduction targets were set with the knowledge that they could change depending of the BMP selections.

The seventh meeting held by the Steering Committee was on January 17, 2008 at the GSD Board Room in Gary, Indiana. During this meeting the load reduction targets and indicators were discussed and a review was held of sources and critical areas defined from these source locations. Best Management Practices (BMPs) were selected for implementation and the implementation plan was discussed with tasks and dates being developed.

The eighth and final Steering Committee meeting was held on January 30, 2008 at the GSD board room in Gary, Indiana. This meeting had discussion on the updated critical areas and load reduction targets as well as the implementation plan. The monitoring plan was discussed and indicators and responsible parties identified.

A final public meeting was held on March 13, 2008 at the Indiana University Northwest Library. The meeting allowed RW Armstrong and the Steering Committee to present the findings and plan to the public and allow public input to be considered before the final submittal of the Watershed Management Plan.

### **Watershed Activity**

A Hoosier River Watch Day was held on Saturday, October 13, 2007, in the City of Gary along the Little Calumet River. The event was held in order to gauge the level of knowledge the public had concerning the river and the associated watershed area. As part of the River Watch Day a number of activities were organized that the public could participate in.

The activities organized and sponsored for the public to participate in included a nature walk along the river, using the levee system trails that allowed participants to identify different plant and animal species. Water quality testing was conducted by Joe Exl and a bike ride was led by Dorreen Carey. EmPower Results had a game station that allowed participants to roll a weighted die in an attempt to make their way through an ecological environment. Each station that

was visited by a roll of the dice had a different color bead that could be used to make a bracelet. The point was to show how difficult it was to get out of some environments along the river.

The water quality testing conducted by Joe Exl included a chemical monitoring sheet, a biological monitoring sheet and qualitative habitat evaluation index. The results of this water testing were similar in value to the water quality results from this study and previous studies conducted on the Little Calumet River and can be seen in Appendix 5: Watershed Activity Event.

As part of the Hoosier River Watch Day participants were given a survey to complete regarding their knowledge of the Little Calumet River, the recreational features associated with the river and the pollutant and flood concerns. A total of 76 responses were received for the survey between the River Watch Day participants and a class of Indiana University Northwest environmental engineering students. The survey results and answers to the question, "Regarding the river, my biggest concerns are:" can be found in Appendix 5: Watershed Activity Event.

### **Issues/Problems Identified**

Two forums were utilized to identify issues within this watershed. The first was to conduct exercises at the steering committee meetings to list concerns in the watershed. The brainstorming session produced a long list of concerns that can be summarized in five categories.

The five categories and the associated statements made by the **steering committee** are:

#### **1. Water Quality Concerns**

- Low flow water quality
- Flood control impacts on water quality
- *E coli* sources
- CSOs (discharge & impacts on use)
- Sediment loads (TSS) & upstream erosion problems
- Increase in large rain events - flooding water quality
- Quantity & quality from east reach

2. **"Other" Natural Resource Concerns**
  - Downstream impacts (Lake Michigan)
  - Impact of altered hydrology
  - Fishery condition – fish health
  - Impacts on recreational uses
  - Impacts on neighborhood's – aesthetic & habitat
  - Preservation of waterways and riparian areas
  - Restoration of natural areas/habitat
  
3. **Public Involvement/Education Needs or Concerns**
  - Risk communication to community
  - *E.coli* communication/education with public
  - Who's in charge of what?
  - Getting local buy-in or participation
  
4. **Local Coordination Needs or Concerns**
  - Coordination with other watershed projects (DNR 6217 coordination)
  - Coordination with flood control project
  - TMDL coordination
  - Septic systems and social issues
  - Flood diversion away from Illinois
  - Coordination with planning & zoning
  - Communication with ACOE
  - Development awareness
  - Community cooperation and improved uniformity
  
5. **Resource Needs or Concerns (data, financial, people)**
  - Planning tools to assess downstream impacts
  - Public access

During the first public meeting, the public also went through an issue identification and prioritization exercise. A brainstorming session was first held with every issue mentioned added to a list on easels at the front of the room.

<b>Ranking</b>	<b>Identified Issue</b>	<b>Red Dots</b>	<b>Yellow Dots</b>	<b>Green Dots</b>	<b>Total Points</b>	<b>% Points</b>
1	Flooding	15	3	0	255	19.7%
2	Impact on Lake Michigan	7	4	0	145	11.2%
3	Watershed Education for Public*	8	1	2	140	10.8%
4	Erosion	6	1	2	110	8.5%
5	Connecting People to their Watersheds	6	0	0	90	7.0%
6	Increasing Recreational Uses	2	4	2	80	6.2%
7	Holistic Conservation Planning	2	3	3	75	5.8%
8	Coordination with Other Studies	0	6	2	70	5.4%
9	Fishery	3	1	2	65	5.0%
10	Brownfields	2	1	3	55	4.3%
11	Change in Impervious Areas	2	1	1	45	3.5%
12	Public Workshops	1	2	1	40	3.1%
13	Public Education - Who to Call*	1	1	2	35	2.7%
14	Coordination of Local Projects	0	2	2	30	2.3%
15	Map Parks, Land Trusts, & Natural Areas	1	1	1	30	2.3%
16	Interpretation Opportunities	1	0	1	20	1.5%
17	Diked areas in Watershed	0	0	2	10	0.8%
Red Dot = 15 points Yellow Dot = 10 points Green Dot = 5 points * Both Issues are Public Education, but with a different focus						

Table 1.2: Issues presented and values given by public meeting participants.

Moderators of the exercise relied on the list of issues identified in the steering committee meeting to start the exercise. When all of the additional issues identified had been recorded, each person in the audience was given three stickers. The stickers were color coded by a red dot representing the most important issue, a yellow dot for the second most important issue and a green dot to be placed on the third most important issue, in their opinion. The audience then placed the stickers on the easel pads. The issues and the prioritization are tabulated in Table 1.2.

No issue was left without some vote next to it at the completion of the exercise. Point values for each dot were assigned as noted in the table and summarized. Clearly, the most important issue was flooding which included areas outside the levee system and throughout the watershed.

Combining the issues identified by both groups under the five categories established yields the following list.

**1. Water Quality Concerns**

- Low flow water quality
- Flood control impacts on water quality
- *E.coli* sources

- CSOs (discharge & impacts on use)
  - Sediment loads (TSS) & upstream erosion problems
  - Increase in large rain events - flooding water quality
  - Quantity & quality from east reach
  - Impact on Lake Michigan
- 2. "Other" Natural Resource Concerns**
- Downstream impacts (Lake Michigan)
  - Impact of altered hydrology
  - Fishery condition – fish health
  - Impacts on recreational uses
  - Impacts on neighborhood's – aesthetic & habitat
  - Preservation of waterways and riparian areas
  - Restoration of natural areas/habitat
  - Flooding concerns
  - Erosion concerns
  - Change in impervious areas
  - Diked areas in watershed
- 3. Public Involvement/Education Needs or Concerns**
- Risk communication to community
  - *E.coli* communication/education with public
  - Who's in charge of what?
  - Getting local buy-in or participation
  - Watershed education for the public
  - Connecting people to their watershed
  - Need for public workshops
  - Educating the public on whom to call with concerns or for information
  - Interpretation opportunities
- 4. Local Coordination Needs or Concerns**
- Coordination with other watershed projects (DNR 6217 coordination)
  - Coordination with flood control project
  - TMDL coordination
  - Septic systems and social issues
  - Flood diversion away from Illinois
  - Coordination with planning & zoning
  - Communication with ACOE
  - Development awareness
  - Community cooperation and improved uniformity
  - Holistic conservation planning
  - Coordination with other studies and projects
  - Brownfield impacts
  - Map parks, land trusts, and natural areas
- 5. Resource Needs or Concerns (data, financial, people)**
- Planning tools to assess downstream impacts
  - Public access
  - Increasing recreational uses

## **Previous Work/Studies in the Watershed**

### **Sampling**

The Indiana Department of Environmental Management (IDEM) established a fixed monitoring station along the Little Calumet River in 1990 in the eastern portion of the study area. This location was sampled multiple times a year for physical and chemical water quality as well as bacteria (Fecal Coliform and *E.coli*). Four additional sampling locations (three along the Little Calumet River and one along Willow Creek) were established in 2000 as part of the IDEM *E.coli* Sampling Program. This data is included in Appendix 6: IDEM Fixed Station Data and is discussed further in Section IV of this report.

Sampling has also been performed by the United States Army Corps of Engineers (ACOE), the Indiana Department of Natural Resources (Hoosier Riverwatch Program), local utilities, and universities. Also, Total Maximum Daily Loads (TMDLs) were established for *E.coli* on the Little Calumet River and Potage Burns Waterway in 2004. Sampling was performed as part of the Data Report (December 2002).

### **U.S. Army Corp of Engineers Flood Control Project**

The Little Calumet River Basin Development Commission (LCRBDC) is the local sponsor for a federal flood control project building levee systems along the west branch of the Little Calumet River.

As part of this project, earthen levees and I-walls are being constructed from the Illinois State line to the eastern boundary of the City of Gary. This line of protection limits the location of discharges to the river and allows stormwater flows to enter the river through 12 pumping stations and 11 outfalls. A map of the line of protection showing the location of these discharge points is shown in Figure 1.3 and a larger version of the same map is included in Appendix 7: ACOE Levee System.

Note the diversion structure shown in Figure 1.3 on the Little Calumet River just west of Hart Ditch, the western edge of the watershed. This diversion structure is planned to divert high flows to the east and limit the volume of flows traveling west toward the State of Illinois. This addition will change the western boundary of this watershed under high flow conditions.

Mitigation of wetlands is taking place in the Hobart Marsh area due to the effect that the levee system is having on the existing wetlands. No stormwater quality measures are currently being included by the Army Corp of Engineers. Trails, canoe launches, fishing piers, observation decks, and other amenities have been added along the river.

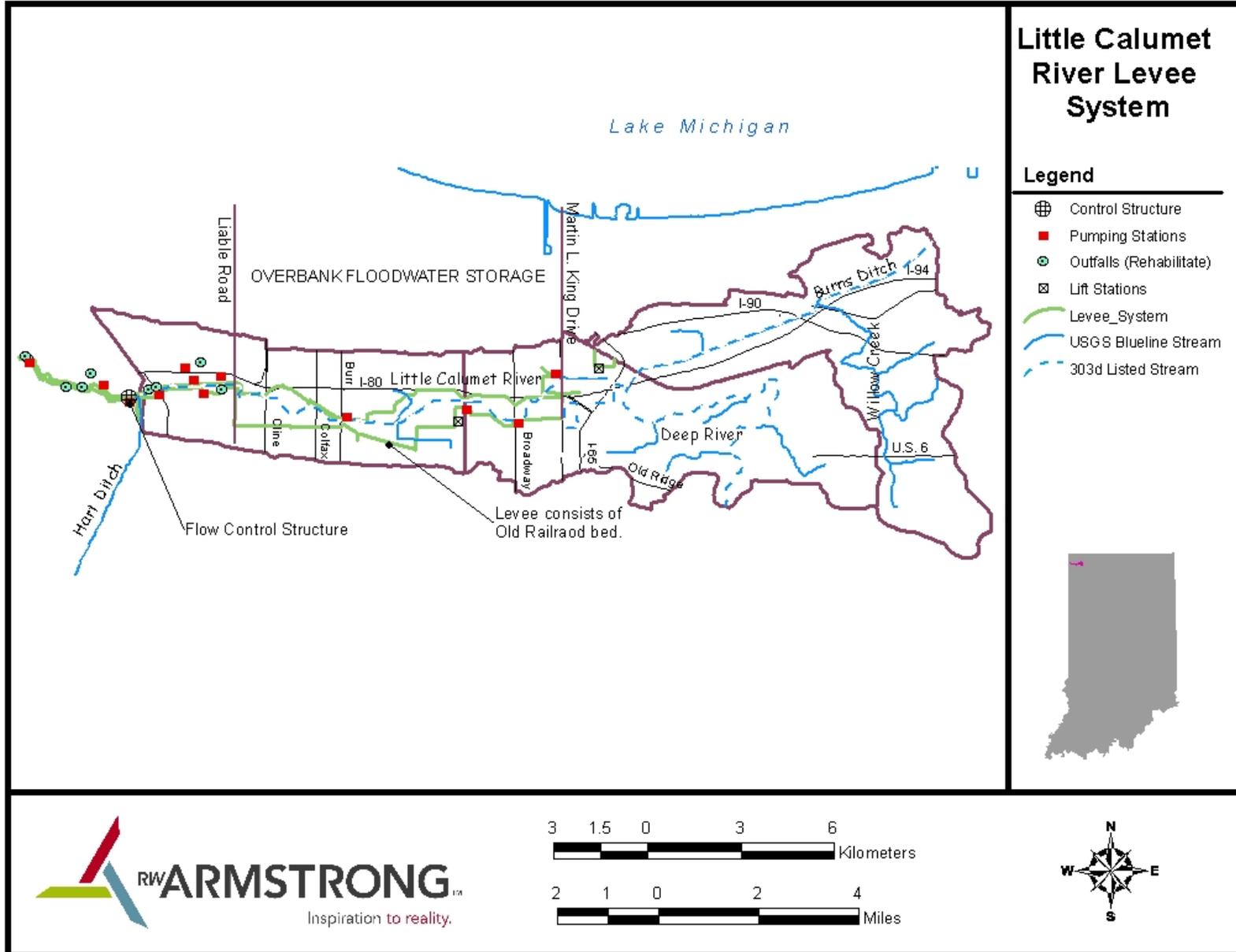


Figure 1.3: Levee system being completed by the Little Calumet River Basin Development Commission and the Army Corp of Engineers.

The long term operations and maintenance of the levee system is being negotiated with the local communities where the ACOE construction is complete. Some form of organization will most likely continue to exist, even after construction is complete and the operations and maintenance is delegated to the proper parties, to centralize and maintain records as required by the Army Corp of Engineers.

The final completion of the system should occur around 2013.

**Phase II - Combined Sewer Overflow Master – Little Calumet River Sampling Program – The Sanitary District of Hammond, Indiana (November 1995)**

This study monitored pump station discharges and water quality during combined sewer overflow (CSO) events. CSO events on August 11, 1994, October 8, 1994, and October 31, 1994 were sampled and analyzed. Four of the eleven sampling sites, three water quality and one CSO discharge sampling site, provided information pertinent to this watershed plan. One significant piece of data was that the water quality sampling site on Hart Ditch showed significant amounts of *E.coli* and other pollutants. A map of the sample sites and the data collected is included in Appendix 8: CSO Master Plan Phase II for the Hammond Sanitary District and discussed further in Section IV of this plan.

**The Watershed Diagnostic Study of the Little Calumet-Galien River Watershed prepared for the IN DNR-Division of Water Resources (April 2001)**

This study summarized the available existing data within the Little Calumet-Galien River Watershed. The goals and objectives of the study were to:

- Describe and map trends in water resources within the Little Calumet-Galien River Watershed.
- Identify potential non-point source water quality problems.
- Identify and prioritize watershed land treatment projects to address existing and potential problems.
- Project the probability of achieving program success and provide specific directions for future work to optimize success.

The study included two of the three watersheds included in this watershed management plan:

04040001040020 – Deep River – Little Calumet River

04040001040030 –Burns Ditch - Willow Creek

It did **not** include one of the three watersheds contained within this watershed management plan:

071200003030050 – Little Calumet River East-West Split

This study provides an excellent discussion of the history of this watershed and the timelines for its development. No specific, hard data was provided; however, a summary of potential point and non-point sources was included.

A comparison of the locations where high levels of pollutants were encountered within the Little Calumet-Galien River watershed with those of EPA- permitted discharges was done to determine whether point sources or non-point sources were more likely responsible for high pollutant loads. None of the locations showing excessive concentrations of lead, copper, zinc, nitrogen, phosphorus, total suspended solids, low dissolved oxygen or pH were along the Little Calumet River or Willow Creek. Fecal Coliforms were located downstream from four (4) small waste water treatment plants with no location given.

This study also states that contaminated sediments are a serious issue in the Grand Calumet River and the Indiana Harbor and Ship Canal but does not discuss sediments within the Little Calumet River.

#### **Little Calumet River Stream Reach Characterization and Evaluation Report (October 2002)**

This study was completed in October 2002 by Greeley and Hansen for the Gary Sanitary District. The aim of the study was to identify the concentrations of pollutants in the West Branch of the Little Calumet River being generated by the Combined Sewer Overflows (CSOs). The study was conducted as part of a requirement within Attachment A, Part III, of the GSD National Pollutant Discharge Elimination System (NPDES) Permit No. IN 0022977. The results of the study were also used to assist in determination of a Long Term Control Plan (LTCP) for the City of Gary.

#### **The Little Calumet-Galien Watershed Restoration Action Strategy (WRAS) developed for IDEM (2002)**

This study was reported in two parts. Part 1 provided a reference point and map to assist local citizens with improving water quality. The major water quality concerns and recommended management strategies were addressed in Part 2.

The strategy presented was not intended to dictate management and activities at the stream site or segment level, but rather the watershed as a whole. Water quality management decisions and activities for individual portions of the watershed are most effective and efficient when managed through subwatershed plans.

That being said, the summarizations of management strategies, funding sources, and superfund sites were useful in the preparation of the subwatershed plan being conducted now.

### **Gary Green Link Master Plan (2003-2005)**

This study was completed in February 2005 with the goal to “develop, through a public process, a Master Plan for implementation and management of a natural resources greenway and recreation corridor, the Gary Green Link, which will ring the City of Gary, connecting the Grand Calumet River, Little Calumet River, and the Lake Michigan shoreline.”

Some of the relevant objectives of this project were to:

- Identify, protect, and restore globally significant natural resources
- Identify, protect, and restore other locally significant natural resources, natural areas, and open spaces
- Extend the green corridor that is already part of the Indiana Dunes National Lakeshore and other protected public lands
- Provide recreational opportunity as a bicycle / pedestrian multi-use trail

This project produced useful land inventory maps of natural areas along the Little Calumet River in the City of Gary. The land inventory maps can be found in Appendix 9: Gary Green Link Master Plan.

### **Integrated Storm Water Drainage Plan for the Little Calumet River Watershed Study (2003-2004)**

The goal of this project was to develop an integrated stormwater drainage plan for the Little Calumet River Drainage Basin (LCRDB) and the remaining areas to the south located within the Gary city limits. This integrated stormwater plan had multiple objectives; including evaluation of the existing conditions, identification of stormwater related issues and a recommended plan of action. This plan encompassed a comprehensive and holistic approach by looking at the river as a total system and not its individual parts. The end product of this project was a capital improvement plan for the City of Gary to implement to improve stormwater drainage in the study area. The improvements proposed in this plan will impact flows to and in the Little Calumet River within the City of Gary and downstream of the city limits.

### **Little Calumet and Portage Burns Waterway TMDL for *E.coli* Bacteria (September 2004)**

This report was prepared for the Indiana Department of Environmental Management (IDEM) in response to their listing of over 30 miles of the Little Calumet River and Portage Burns Waterway on the 303(d) list of impaired waters for *E.coli* bacteria. The intent of this report was to determine the Total Maximum Daily Load (TMDL) for this pollutant in these waters as required by the Clean Water Act. This report inventoried available data, evaluated the documented sources of *E.coli* within the study's boundaries, and modeled the river system to determine the TMDL.

The report was not designed to address CSO contributions to the Little Calumet River. It relies on the Long Term Control Plans (LTCP) prepared by the Hammond Sanitary District and the Gary Sanitary District to address these sources. The TMDL report noted that “There were no apparent patterns to the water quality violations relating to *E.coli* that would suggest that violations were more common during a certain time of year or under some critical flow or weather conditions. From the available data, one could not identify the magnitude of any single source of *E.coli*.” It also noted “The major sources of the *E.coli* bacteria impairment in the Little Calumet-Portage Burns Waterway appears to be non-point sources. Non-point sources most likely to be contributing to the impairment of the water quality include: failing septic systems, unknown illicit discharges of sewage, wildlife, small agriculture operations, bacteria laden sediments, and urban runoff. Point sources are well below water quality standards. Therefore, point sources of *E.coli* make up such a small percent of the total load that further reductions would not significantly improve water quality. CSO’s are a known source of *E.coli* and play a major role in the water quality impairment when they occur. However, CSO’s did not coincide with the dates of the simulated events, indicating that the waterbody was impaired by other sources in addition to CSO’s.” The report also stated that “There is a strong correlation between impervious area in a watershed and bacteria concentrations in the receiving stream.”

The TMDL report concluded that a reduction of over 90% in non-point source loads would be required to meet the water quality standards for the rivers’ designated uses. The report states the designated use of the Little Calumet River is full-body contact recreation and is designated for warm water communities.

The report also states that flow from Hart Ditch travels east through the reach of the Little Calumet River covered by this watershed management plan. This is contrary to the observations of steering committee members that the east/west flow divide is east of that confluence. The TMDL report gives an estimated travel time from the Hart ditch confluence to Lake Michigan of four days.

### **NIRPC’s Watershed Management Framework Plan (October 2005)**

This study provided a broad framework for smaller watersheds in Lake, Porter, and LaPorte Counties, in northwest Indiana, to develop and implement their own watershed plan.

Many of the participants in the development of the Regional Watershed Management Plan concurrently participated in the development of the Indiana Lake Michigan Coastal Program Non-point Pollution Control Plan (6217 Plan). Because many of the same issues were identified during both processes, the 6217 Plan was used as a foundation for this plan as adopted by the Watershed Advisory Group. Though the 6217 Plan addresses only the Little Calumet-Galien basin the plan management measures are consistent with the issues identified in the Kankakee River Basin, covering the Chicago Watershed.

The goals and objectives of the Watershed Management Framework Plan were:

- Implement urban and rural non-point source practices in northwest Indiana to the extent practicable to achieve and maintain applicable water quality standards and improve quality of life.
- Implement agricultural non-point source practices in northwest Indiana to the extent practicable to achieve and maintain applicable water quality standards and improve quality of life.
- Ensure the protection of northwest Indiana's water bodies from further impacts of hydromodification and wetland loss to meet and maintain applicable water quality standards.

The NIRPC Framework Plan did provide some useful historical information for this watershed management plan. Its findings did correspond to other studies and reports utilized in the production of this plan.

### **Lake Michigan Coastal Program Nonpoint Source Pollution Control Plan(6217 Plan)**

The Indiana Lake Michigan Coastal Program (LMCP) was required by the National Oceanic and Atmospheric Administration (NOAA) and the USEPA to complete a Coastal Non-point Source Pollution Management Plan (6217 plan) as part of becoming a Coastal Zone State. The plan included a series of management measures for agricultural runoff, forestry runoff, marinas and recreational boating, channel modification, dams and erosion of stream banks and the shoreline, wetlands, riparian areas, and vegetated treatment systems.

The management measures for urban/rural areas, agricultural sources, and those for wetlands, riparian areas, and vegetated treatment systems were applicable to this plan. The management measures for hydromodification and for marinas and recreational boating were not applicable to this plan. The list of potential sources for non-point source pollution was especially useful in identifying probable sources of non-point source pollutants for this watershed study area.