



Town of Highland, Indiana

Water Quality Characterization Report

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Water Quality Characterization Report

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Section One

Summary of Data Collection and Evaluation

A. Summary of General Data on MS4 Entity and System

The following describes the MS4 entity in general, providing a context for the evaluation of the water quality data and other data sources in the preparation of this report.

The Town of Highland, Indiana is a largely residential community located in the Suburban Chicago Metropolitan area of Northwest Indiana. The Town is bounded to the north by Hammond; Munster and Dyer to the west; Schererville to the south; and Griffith to the east. The land area within Town limits comprises approximately 4,400 acres, of which about 85 percent is developed. The population of Highland from the 2020 census was 23,984.

Although existing development is largely residential, storm water runoff in Highland is generated from all types of development including residential, commercial, and industrial areas, as well as highways and bridges. The Town has separate storm water and sanitary conveyance systems.

The majority of Highland's storm water flow is enclosed in underground piping systems, with some channelized flow in select locations.

As Highland and surrounding communities have continued to grow, streams have been forced to accommodate larger volumes of storm water runoff that recur on a more frequent basis. Although Highland has mandated detention for developments larger than an acre for several years now, stream channel erosion and channel bank scour provide direct evidence of water quantity impacts caused by urban storm water.

The change in watershed hydrology associated with urban development has also caused channel widening and scour, and the related introduction of larger amounts of sediment into streams. Visible impacts include eroded and exposed stream banks, fallen trees, sedimentation, and recognizably cloudy water.

B. Summary of Baseline Data Collection and Evaluation

The following describes the process utilized to identify, gather, and evaluate data for this Characterization Report.

In preparing this characterization report, stream data information was gathered from online reports offered by the EPA. Highland's nonstructural BMPs, such as Ordinances, were reviewed. Existing storm sewer, land use, and topographic maps of Highland were reviewed to determine probable sensitive areas, and most of Highland's receiving waters have been photographed to determine their current physical condition.

C. Summary of Evaluation Approach

1. Land-Use Evaluation

A summary of the land use in Highland was provided by the Town of Highland Zoning Map. The specific nature of business and industrial activity was verified by field observation.

2. Evaluation of Structural and Nonstructural BMPs

To determine existing structural BMPs, existing Public Works maintenance and housekeeping policies and the Town's storm water atlas were reviewed. To determine existing nonstructural BMPs, Chapters 12.25, 12.30, 12.50 and 12.55 of the Highland Municipal Code were reviewed.

3. Identification of Sensitive Waters

Criteria used to determine sensitive waters included: proximity to Lake Michigan (which supplies drinking water for the community), condition of stream banks, stability of property adjacent to the stream, water quality data from existing collection efforts, both biotic and chemical in nature.

4. Review of Existing/Available Water Quality Data

Data exists for the Little Calumet River in the Towns east and west of Highland, and on Highland's eastern border. The initial TMDL report was issued in 2005. The most recent data was collected in 2022 by the EPA and posted online as part of the How's My Waterway Report, which lists the following: aquatic life is impaired, fish and shellfish consumption are impaired, and swimming and boating are impaired. The identified issues are bacteria and other microbes, degraded aquatic life, metals, nitrogen and/or phosphorus and PCBs. This waterway is on the 303D list.

One set of data exists for the Cady Marsh Ditch (State Waterbody ID: INK0333_01), at the location where the ditch crosses Kennedy Avenue. The initial data is from 1990, and indicates poor stream conditions, with very low dissolved oxygen concentration. A TMDL report was not conducted for this waterway. The most recent data was collected in 2022 by the EPA and posted online as part of the How's My Waterway Report, which lists the following: aquatic life is impaired, swimming and boating are impaired. The identified issues are bacteria and other microbes, degraded aquatic life, nitrogen and/or phosphorus and salts. This waterway is on the 303D list.

One set of data exists for the Hart Ditch (State Waterbody ID: INK0334_02). The data was collected in 2022 by the EPA and posted online as part of the How's My Waterway Report, which lists the following: aquatic life is impaired and swimming and boating are impaired. The identified issues are bacteria and other microbes, degraded aquatic life, nitrogen and/or phosphorus and salts. This waterway is on the 303D list.

One set of data exists for the Spring Ditch (State Waterbody ID: INK033_T1004). The data was collected in 2022 by the EPA and posted online as part of the How's My

Waterway Report, which lists the following: good for full body contact. This waterway is NOT on the 303D list.

5. Identification of Potential Areas of Concern

Potential areas of concern were defined as: areas adjacent to sensitive waters, areas which have potentially polluting businesses and industries tributary to them, and areas that show early signs of deterioration in field observation. Signs of deterioration included visible tree roots along stream banks, banks that have been undercut, lack of ground cover along stream banks, and evidence of scour under culverts.

D. Definition of MS4 System and Waters of the State

Receiving waters in Highland are defined using the following parameters:

- 1) Receiving waters are defined as flowing open ditches for a sizable portion or all of their length,
- 2) Receiving waters shall have commonly-known names, as shown on the USGS quadrant for the area,
- 3) Receiving waters are streams that have constant or seasonal base flow,
- 4) Regulated drainage ways maintained by Lake County, Indiana.

Number Added	New Receiving Water for Discharges from MS4
1	none
2	
3	
4	

E. Report on New Data

The EPA updates water quality information for the four receiving waters within Highland on an annual basis. This data is posted online as part of the How's My Waterway Report. The most recent data available is from 2022.

Section Two

Results of Data Evaluation

A. Characterization of MS4 Conditions

1. Sensitive Areas for Priority Attention:

Based on the evaluation of the MS4 land use and other data sources, the following areas have been identified as “sensitive” for priority attention during permit implementation:

1	Hart Ditch – This water body is tributary to the Little Calumet River, which is hydraulically connected during periods of high river levels to Lake Michigan. Since the Hart Ditch receives flow from several other communities, and since Lake Michigan is a drinking water source, Hart Ditch is considered a sensitive area for priority attention.
2	Cady Marsh Ditch – Sample data from this water body show that it is an impaired stream, meaning it will not support a biologically diverse ecosystem. This data point is in the middle of the stream's run through Highland, where the Cady Marsh Ditch intersects Kennedy Avenue. Since Highland receives flow in this stream from other municipalities, and because this stream flows directly into the sensitive waters near Hart Ditch (see above), the entire length of Cady Marsh Ditch should be considered sensitive waters.

2. Areas with Potential for Storm Water Quality Problems

The following list represents areas with potential for storm water quality problems based on land use data evaluation as well as other information gathered during this process.

1	Spring Ditch – Inspections show bank erosion along portions the open channel portion of Spring Ditch. This ditch is partially enclosed along its path through Highland to the Cady Marsh Ditch. Because it runs beside a busy arterial in Highland with many businesses located along that arterial that have the potential to pollute Spring Ditch, this water body has potential to develop storm water quality problems.
2	Little Calumet River – Data from samples taken along the Little Calumet River show that it is relatively biologically diverse, and that it is generally low in pollutants. It is hydraulically connected during periods of high river levels to Lake Michigan, which is a major supply of drinking water for the entire area. However, since the flow direction of the Little Calumet River changes based on river level (low levels flow only to the Gulf of Mexico whereas high levels flow both to the Gulf of Mexico and Lake Michigan) it would be very difficult to determine the effect Highland's storm water management efforts have on the overall health of the Little Calumet River. In addition, a gas station and the Highland Public Works facility are adjacent to the River, and have the potential to contribute pollution. For these reasons, the Little Calumet River should be considered an area with a potential for storm water quality problems.

3. BMP Evaluation Results

The following results were obtained during the evaluation of existing non-structural and structural BMPs located or utilized in the MS4 area.

1) Storm Water Ordinances – Ordinances codified as Chapters 12.25, 12.30, 12.50 and 12.55 of the Highland Municipal Code have been uniformly applied to new developments and property re-development to limit the release rate of storm water from sites and minimize construction site and post-construction erosion and sedimentation, typically requiring new or expanded storm water detention or retention basins. Implementation and enforcement of storm water controls required by these Ordinances is ongoing and helps reduce both storm water runoff peak rates and sediment from entering waterways.

2) Material Collections Program – In cooperation with the Lake County Solid Waste Management District, Highland offers residents the following drop-off programs for materials that could potentially pollute waterways: household hazardous waste, waste oil, prescription drugs, electronics waste, used tires and used batteries. This program is ongoing and helps prevent common residential wastes from entering waterways.

3) Street Sweeping Program – Highland is committed to sweeping streets and municipal parking lots on a rotating 6-week basis and the material collected is disposed in a regulated landfill. This program is ongoing and helps prevent common automobile pollutants and sediment from entering waterways.

4) Catch Basin Cleaning Program – The Town regularly cleans catch basins and disposes the collected debris at the Hammond Sanitary District WWTP for proper treatment and disposal. This program is ongoing and helps prevent common automobile pollutants and sediment from entering waterways.

5) Leaf Collection Program – The Town regularly collects fallen leaves gathered and placed in the parkway by residents and disposes the collected leaves in a managed area at the northeast corner of Town. This program is ongoing on a seasonal basis and helps prevent excessive organic matter from entering waterways.

6) Branch Collection Program – The Town regularly collects and chips branches gathered and placed in the parkway by residents and disposes the chippings in a managed area at the northeast corner of Town. This program is ongoing on a seasonal basis and helps prevent excessive organic matter from entering waterways.

7) Illicit Discharge Detection Program – The Town receives and responds to complaints regarding storm water quality issues and suspected dumping and discharges. This program is ongoing and helps respond to and stop suspected illicit discharges.

8) Lakeside Pond – This pond is in excellent shape, as is its outlet structure.

9) Grimmer Pond – Some bank erosion on the west edge of this basin is evidenced by the unevenness of terrain and its lack of ground cover. Also, the runoff from the adjacent parking lot has no grass buffer before draining into the pond. This BMP needs improvement.

10) White Oak North Pond – This pond is showing very few signs of bank erosion, and an aeration system keeps the water from turning brackish.

11) White Oak West Pond – This pond shows no signs of bank erosion, and the outlet appears to be functioning as designed, and an aeration system keeps the water from turning brackish.

12) White Oak East Pond – This pond was apparently designed to be a dry-bottom pond, but serves as a wet bottom instead. The shallow depth of the pond has made it prone to stagnation, and native plants have overgrown the pond bottom. Bank erosion does not appear to be a problem, but the fence around the property has apparently made trash removal difficult, since the pond holds quite a bit of litter. This pond could use some improvement, but it is not an urgent situation.

13) Sandalwood West Pond – This pond shows no signs of bank erosion, and has emergent wetland plant species around a good portion of the shoreline. A large grass buffer surrounds this pond. Outlet structure appears to be in good working condition.

14) Sandalwood East Pond – In a condition similar to Sandalwood West Pond, above.

15) Highland Plaza Pond – It is evident this pond has suffered some erosion along the banks, because rubber mats have been used in an attempt to protect the bank. A large pile of floatables sits next to the outlet control structure. While this pond does appear to be functioning, it could use some improvement.

4. Potential Sites for Additional BMPs

1) Hart Ditch, Cady Marsh Ditch, Spring Ditch – Provisions to stop erosion of the stream banks. Since each of these waterways are County regulated drains, the Lake County Drainage Board would be responsible for maintenance and improvements.

2) Organized and scheduled collection and disposal of debris at major storm water pump stations, with quantification of disposal amounts.

3) Review of the existing detention facilities for evaluation of potential retrofits to enhance sediment and floatable removal.

4) Review sites for potential installation of sedimentation and floatable removal facilities such as hydrodynamic vortex separators or filtration systems.

B. Characterization of Water Quality Data

1. Key Observations on Water Quality

The following key observations were developed during the data review and evaluation process regarding the existing water quality conditions in the MS4 area.

Little Calumet River – This waterway receives runoff from numerous municipalities and areas within the States of Indiana and Illinois in addition to Highland. Improvements to existing water quality would require a regional approach across multiple jurisdictions. The Little Calumet River Basin Commission is undertaking efforts to maintain and improve the waterway on a regional basis. The Town's approach will be to minimize the impact of its outfalls into this waterway through the Town's structural and non-structural BMPs.

Hart Ditch – This waterway receives runoff from numerous municipalities and areas within the States of Indiana and Illinois in addition to Highland, and discharges all of its flow into the Little Calumet River. This waterway has a long-standing erosion control problem along its banks. As a regulated drain, the Lake County Drainage Board is responsible for its maintenance and improvement. The Town's approach will be to minimize the impact of its outfalls into this waterway through the Town's structural and non-structural BMPs.

Cady Marsh Ditch – This waterway receives runoff from Griffith and a portion of unincorporated Lake County in addition to Highland, and discharges all of its flow into Hart Ditch. As a regulated drain, the Lake County Drainage Board is responsible for its maintenance and improvement. The Town's approach will be to minimize the impact of its outfalls into this waterway through the Town's structural and non-structural BMPs.

Spring Ditch – This waterway receives runoff from Schererville and a portion of unincorporated Lake County in addition to Highland, and discharges all of its flow into the Cady Marsh Ditch. As a regulated drain, the Lake County Drainage Board is responsible for its maintenance and improvement. The Town's approach will be to minimize the impact of its outfalls into this waterway through the Town's structural and non-structural BMPs.

2. Conclusions from Data Analysis

The following conclusions have been drawn from the analysis of the existing available data.

Stream level data from the USGS is detailed and continuous for a few sites located within and nearby Highland's MS4 boundary. Precipitation and pump runtime data from Highland's SCADA system is detailed and continuous for every storm water pump station located across the Town. While both pump station discharge and stream level changes due to precipitation impact water quality primarily due to and However, on-going water quality data is limited and available from few sources (i.e. EPA's How's My Waterway Report). The most recent comprehensive water quality data available is from the official TMDL report for the Little Calumet River that is 18 years old.

C. Strategy for Continued Characterization Efforts

The following strategy is being considered for inclusion in the SWQMP for on-going water quality characterization efforts during the life of the permit.

Highland plans to continue its existing illicit discharge detection and elimination program and outfall screening program for on-going water quality characterization of the Town's four waterways. The Town may consider the feasibility of developing a monitoring program for streams in Town. Such an effort would be best coordinated with the municipalities within the watershed, the Lake County Drainage Board and the Little Calumet River Basin Commission.

Appendices

Appendix A: Data Sources Utilized

Appendix B: Updated List of “Waters of the State”

Appendix C: Inventory of BMPs Evaluated and Potential New Sites for Structural BMP Implementation

Appendix D: Land Use Characterization by Residential, Commercial, Industrial, Open Space

Appendix A

Data Sources Utilized

List of Data Sources Utilized in this Report	
1	Highland Zoning Map
2	Highland Plan Commission records
3	IDEM Surveys section for stream physical and chemical data, including: dissolved oxygen content, water temperature, saturation percentage, pH, specific conductivity, and turbidity
4	IDEM TMDL Section, to determine if any TMDLs have been set for Highland's receiving waters
5	IDEM Biological Studies section, for Fish Community studies and macroinvertebrate data
6	IDEM Lake and River Enhancement Program
7	IDNR Riverwatch program
8	USGS Fixed sampling stations
9	Highland staff interviews
10	Northwest Indiana Times newspaper
11	Highland Storm Water Atlas
12	Preliminary Storm Water Master Plan – Highland
13	EPA's How's My Waterway Report from 2022
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Appendix B

Updated List of Waters of the State

The following is a complete list of Waters of the State (receiving waters of discharges from MS4), including the original list submitted in the NOI and updated based on the data evaluation completed for the Characterization Report.

Waters of the State (Receiving Discharges from MS4)	
1	Little Calumet River
2	Cady Marsh Ditch
3	Hart Ditch
4	Spring Ditch
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Appendix C

List of BMPs Evaluated and Potential New Sites for Structural and Non-structural BMPs

		E= Existing P= Proposed S= Structural N=Non-structural				
	BMP Location	E	P	S	N	Condition
1	Storm Water Ordinance	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	In Force
2	Material Collections Program	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Ongoing
3	Street Sweeping Program	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Ongoing
4	Catch Basin Cleaning Program	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Ongoing
5	Leaf Collection Program	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Ongoing
6	Branch Collection Program	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Ongoing
7	Illicit Discharge Detection Program	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Ongoing
8	Lakeside Pond	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Located in the Lakeside neighborhood, south of 45th Street and east of Kennedy Avenue.
9	Grimmer Pond	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Located north of Main Street and east of the ConRail tracks, at the rear of Grimmer Construction company.
10	White Oak North Pond	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Located along the southern edge of the Grand Trunk Railroad tracks, west of Indianapolis Boulevard.
11	White Oak West Pond	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Located in the western portion of White Oak subdivision.
12	White Oak East Pond	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Located in the eastern portion of White Oak subdivision.
13	Sandalwood West Pond	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Located in Sandalwood subdivision, west of Kleinman and south of the NIPSCO right-of-way.
14	Sandalwood East Pond	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Located in Sandalwood subdivision, east of Kleinman and south of the NIPSCO right-of-way.
15	Highland Plaza Pond	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Located behind the Highland Plaza shopping center along the west side of the abandoned railroad right-of-way.
16	Hart Ditch	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Stop bank erosion
17	Cady Marsh Ditch	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Stop bank erosion
18	Spring Ditch	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Stop bank erosion
19	Sediment and floatables removal and quantification	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Highland storm water pump stations
20	Labels to deter dumping	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Highland drainage inlets and storm sewer manhole lids
21	Addition of debris separators	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Selected Highland drainage inlets
22	Addition of sediment and floatable traps	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Selected Highland detention areas

23		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
26		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
28		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
29		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
30		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
31		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
32		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
33		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
34		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
35		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
36		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
38		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
39		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
40		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Appendix D

Land Use Characterization by Residential, Commercial, Industrial, Open Space

The following data represents the land use by the categories of residential, commercial, industrial and open space by percent of total community.

Land Use Category	Percent
Residential (including multifamily)	70
Commercial (light and heavy)	4
Industrial (light and heavy)	4
Open Space	12