Valparaiso Lakes Area Conservancy District

Stormwater Master Plan

June 1, 2023

DISCLAIMER: Exhibits and any GIS data used within this report are not intended to be used as legal documents or references. They are intended to serve as an aid in graphic representation only. Information shown in exhibits is not warranted for accuracy or merchantability.

BF&S
CIVIL ENGINEERS

Merrillville Office
8488 Georgia St., Suite C
Merrillville IN 46410
Tel: 219-769-2333

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1.0 INTRODUCTION

1.1 Background

The Valparaiso Lakes Area Conservancy District (VLACD) was established in 1975 in response to concerns about maintaining the quality of Flint Lake. The District was originally established with the three following purposes:

1. Provide water supply, including treatment and distribution for domestic, industrial, and public use.
2. Provide for the collection, treatment, and disposal of sewage and other liquid waste produced within the District.
3. Improve drainage.

In 1983 a petition was granted to expand the District's purposes to also include:

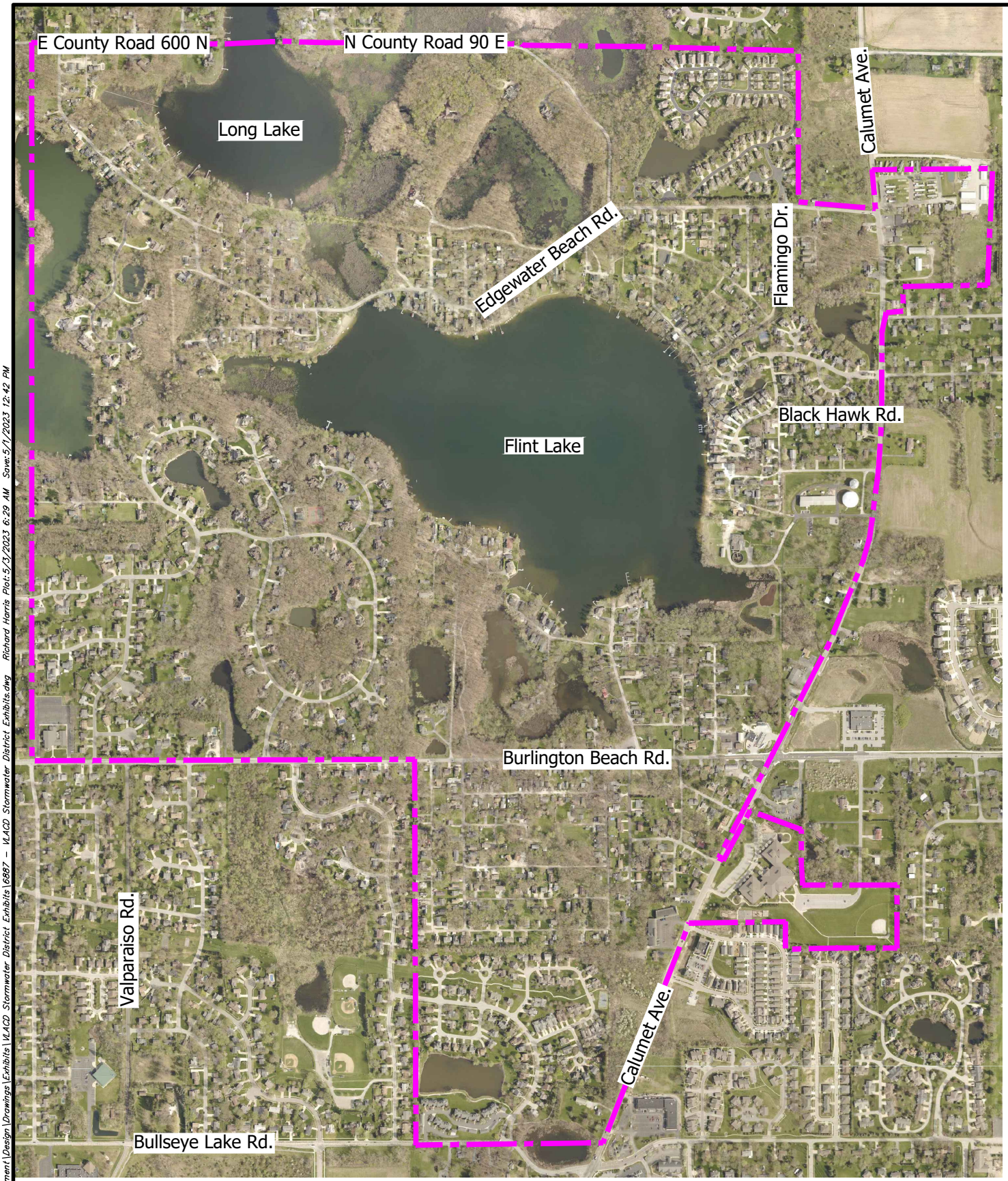
4. Preventing the loss of topsoil from injurious water erosion.
5. Flood prevention and control.

Since the establishment of the Valparaiso Lakes Area Conservancy District, multiple improvements to the water and sanitary sewer systems have been constructed to work towards fulfilling the first two purposes of the District. Additionally, the District has adopted water quality measures to assist in erosion control. To continue the progress, the District has determined that a Stormwater Master Plan is vital in plotting a course towards these goals.

2.0 PROJECT OVERVIEW

2.1 Location

The VLACD territory is located north of the City of Valparaiso and west of State Road 49 in Porter County, Indiana. The territory is bordered on the south and a portion of the east side by the City of Valparaiso and on the north and west sides by unincorporated Porter County. The territory is located within the Kankakee River Watershed and encompasses approximately 790 acres. **Figure 2.1** depicts the VLACD territory.



LEGEND

Corporate Limit

BF&S CIVIL ENGINEERS	DRAWN: RH CHECKED: JWB DATE: 5/3/2023	VLACD TERRITORY FIGURE 2.1 VLACD VALPARAISO, INDIANA	HORIZONTAL SCALE N/A VERTICAL SCALE N/A SHEET 1 OF 1 PROJECT BFS NO. 688700.0000

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2.2 Purpose

The purpose of the Stormwater Master Plan was to evaluate existing conditions within the VLACD service area, review and identify known deficiencies, and provide recommendations for improvement projects in a prioritized manner.

2.3 Scope and Approach

The main tasks involved in the scope of this plan included:

- Review of existing stormwater infrastructure, reports, and studies
- Determination of catchments that impact the study area
- Public information and outreach
- System evaluation
- Development of a project priority list (PPL)
- Development of project cost estimates
- Identification of project funding opportunities

The fundamental tasks of the Stormwater Master Plan were to evaluate the existing system and develop a list of improvement projects to remedy deficiencies within the system, both water quality and quantity. The projects on the list were then prioritized based on a series of metrics in the PPL matrix.. This list would then be used as a guide to assist the District in project selection when funding opportunities became available.

In general, and in addition to the scope above, the approach to involved onsite investigations during dry and wet weather, staff and resident interviews, photographic documentation, public open houses, and survey questionnaires and mailers to aid in the identification of area concerns. Additional meetings were also held with planning and engineering staff from the City of Valparaiso and Porter County Government.

3.0 EXISTING CONDITIONS

3.1 Catchments

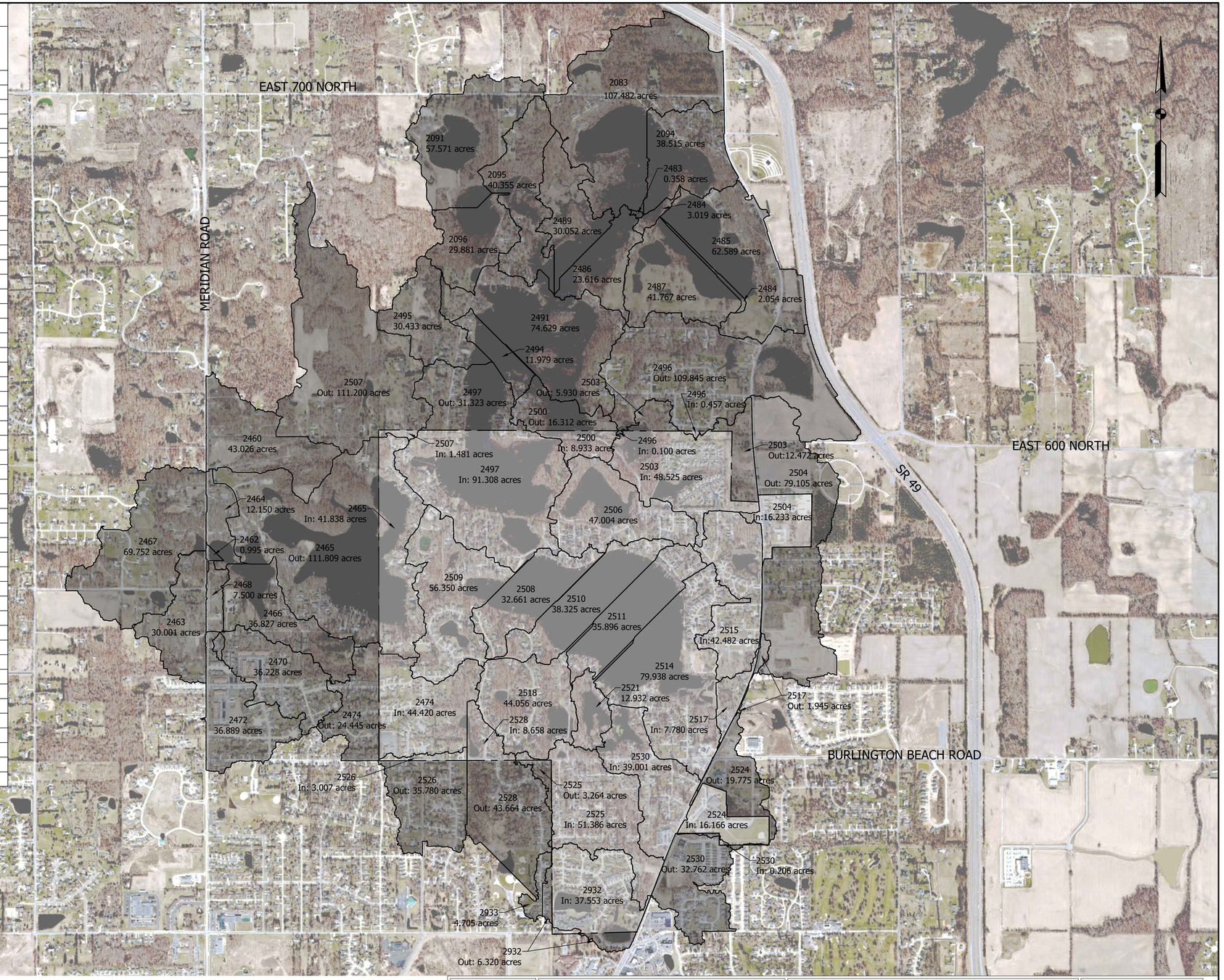
Porter County GIS contour data was analyzed to determine the areas contributing stormwater runoff to the VLACD territory. **Figure 3.1** shows the contributing catchments, the catchment size, and the portion of the catchment area located within VLACD limits. The GIS catchment data identified a stormwater runoff contribution area of approximately 2,322 acres, of which approximately 1,514 acres is located outside of VLACD territory. **Table 3.1** below quantifies the estimated runoff generated by the total catchment area during various rainfall events.

Table 3.1 – Estimated Runoff Generated

Estimated Runoff Volume Generated (MG) per rainfall depth (in)									
0.25		0.5		1		1.5		2	
VLACD	Outside	VLACD	Outside	VLACD	Outside	VLACD	Outside	VLACD	Outside
2.62	4.46	5.24	8.91	10.48	17.82	15.72	26.73	20.96	35.64
7.08		14.15		28.30		42.45		56.60	

VLACD Contributing Catchments

Catchment # (GIS Hydro ID)	Area In VLACD(ac)	Area Outside VLACD(ac)	Jurisdiction	Receiving Lake
2506	47.00	0.00	VLACD	Flint Lake
2509	56.35	0.00	VLACD	Flint Lake
2508	32.66	0.00	VLACD	Flint Lake
2510	38.33	0.00	VLACD	Flint Lake
2511	35.90	0.00	VLACD	Flint Lake
2514	79.94	0.00	VLACD	Flint Lake
2515	42.58	0.00	VLACD	Flint Lake
2518	44.06	0.00	VLACD	Flint Lake
2521	12.93	0.00	VLACD	Flint Lake
2517	9.73	0.00	VLACD	Flint Lake
2057	1.48	111.20	Split	Downstream
2500	8.93	16.31	Split	Long Lake
2497	91.31	31.32	Split	Long Lake
2503	48.53	18.37	Split	Flint Lake
2504	16.23	79.11	Split	Flint Lake
2474	44.42	24.45	Split	Downstream
2526	3.01	35.78	Split	Downstream
2528	8.66	43.66	Split	Downstream
2525	51.39	3.26	Split	Downstream
2530	39.21	32.76	Split	Downstream
2524	16.17	19.78	Split	Downstream
2465	41.84	111.81	Split	Lumis Lake
2932	37.55	6.32	Split	Downstream
2933	0.00	4.70	N/A	Downstream
2083	0.00	107.48	N/A	Wauhob Lake
2091	0.00	57.57	N/A	Moss Lake
2095	0.00	40.36	N/A	Canada Lake
2096	0.00	29.88	N/A	Canada Lake
2094	0.00	38.52	N/A	Canada Lake
2485	0.00	62.59	N/A	Mink Lake
2484	0.00	5.07	N/A	Mink Lake
2489	0.00	30.05	N/A	Canada Lake
2486	0.00	23.62	N/A	Canada Lake
2487	0.00	41.77	N/A	Mink Lake
2490	0.00	0.04	N/A	Canada Lake
2491	0.00	74.63	N/A	Long Lake
2495	0.00	30.43	N/A	Long Lake
2496	0.00	110.40	N/A	Long Lake
2494	0.00	11.98	N/A	Long Lake
2472	0.00	36.89	N/A	Spectacle Lake
2470	0.00	36.23	N/A	Spectacle Lake
2466	0.00	36.83	N/A	Spectacle Lake
2463	0.00	30.00	N/A	Spectacle Lake
2467	0.00	69.75	N/A	Spectacle Lake
2468	0.00	7.50	N/A	Spectacle Lake
2462	0.00	0.99	N/A	Spectacle Lake
2464	0.00	12.15	N/A	Spectacle Lake
2466	0.00	36.83	N/A	Spectacle Lake
2460	0.00	43.02	N/A	Lumis Lake



Legend

- Catchment Area Inside VLACD
- Catchment Area Outside VLACD
- Valparaiso Lakes Area Conservancy District Limits

RECOMMENDED FOR APPROVAL: _____ DESIGN ENGINEER _____ DATE

DESIGNED: _____ DRAWN: JSH

CHECKED: _____ CHECKED: CML

VLACD CONTRIBUTING CATCHMENTS EXHIBIT

VALPARAISO INDIANA

Headquarters
8450 WESTFIELD BLVD., SUITE 300
INDIANAPOLIS, IN. 46240-8302
TEL 317-713-4615
FAX 317-713-4616
www.BFSEngr.com

BF&S CIVIL ENGINEERS

Branch Locations
FORT WAYNE 260-459-1532
LOUISVILLE 502-593-1996
LAFAYETTE 765-423-5602
MERRILLVILLE 219-769-2333
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SOUTH BEND 574-288-5727

HORIZONTAL SCALE
1" = 800'
VERTICAL SCALE
N/A
SHEET
01 OF 01
PROJECT
6887

BFS NO. 6887

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John Holt
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Drainage patterns for the contributing catchment area indicate that stormwater runoff is captured by a series of small lakes that ultimately discharge into Flint Lake. Flint Lake then discharges through a control structure near the southeast section of the lake and into Hutton Ditch leading to Crooked Creek. Table 3.2 below quantifies the amount of runoff directly contributing to each lake and each lake's percentage of the total flow received. Note that Loomis and Spectacle Lake are calculated separately. This is due to the water level of Loomis Lake being controlled by both a control structure connecting Loomis Lake and Flint Lake on the east side and Proffits Dam on the north side. Depending on the intensity of the rainfall event, Loomis Lake will discharge through both features.

Table 3.2 – Estimated Runoff Collected By Lake

Estimated Runoff Volume Generated (MG) per rainfall depth (in)											
Individual Lake Contributions	0.25		0.5		1		1.5		2		Impact %
	VLACD	Outside	VLACD	Outside	VLACD	Outside	VLACD	Outside	VLACD	Outside	
Flint Lake System Watershed											
Moss Lake	0.00	0.16	0.00	0.33	0.00	0.66	0.00	0.98	0.00	1.31	3%
Deep Lake	0.00	0.10	0.00	0.19	0.00	0.38	0.00	0.58	0.00	0.77	2%
Wauhob Lake	0.00	0.29	0.00	0.58	0.00	1.17	0.00	1.75	0.00	2.33	5%
Canada Lake	0.00	0.41	0.00	0.83	0.00	1.66	0.00	2.48	0.00	3.31	7%
Mink Lake	0.00	0.39	0.00	0.77	0.00	1.54	0.00	2.31	0.00	3.08	7%
Long Lake	0.34	1.09	0.67	2.17	1.35	4.35	2.02	6.52	2.70	8.69	25%
Flint Lake	1.61	0.23	3.23	0.46	6.45	0.93	9.68	1.39	12.91	1.85	32%
Downstream	0.53	0.58	1.05	1.16	2.11	2.32	3.16	3.49	4.21	4.65	19%
TOTAL	**2.48**	**3.25**	**4.96**	**6.50**	**9.91**	**13.00**	**14.87**	**19.50**	**19.82**	**26.00**	**100%**
	5.73		**11.46**		**22.91**		**34.37**		**45.83**		
Loomis Lake System Watershed											
Loomis Lake	0.14	0.48	0.28	0.96	0.57	1.93	0.85	2.89	1.14	3.85	46%
Spectacle Lake	0.00	0.72	0.00	1.45	0.00	2.89	0.00	4.34	0.00	5.79	54%
TOTAL	**0.14**	**1.21**	**0.28**	**2.41**	**0.57**	**4.82**	**0.85**	**7.23**	**1.14**	**9.64**	**100%**
	1.35		**2.69**		**5.39**		**8.08**		**10.78**		

* Individual Lake Contributions include catchments that flow directly to the noted waterbody. Does not include catchments that flow to one waterbody that is hydraulically upstream of the next.

The data above identifies that approximately 65% of the runoff catchment area originates outside of the VLACD territory. Additionally, the lake with the largest contributing catchment area is Flint Lake. Flint Lake has approximately 560 acres of land that contributes runoff directly to the lake based on GIS elevations. This contribution area does not include stormwater discharged into Flint Lake from adjoining lakes or from storm sewer systems outside of the catchment areas, therefore, it is foreseeably slightly higher.

3.2 Stormwater Infrastructure

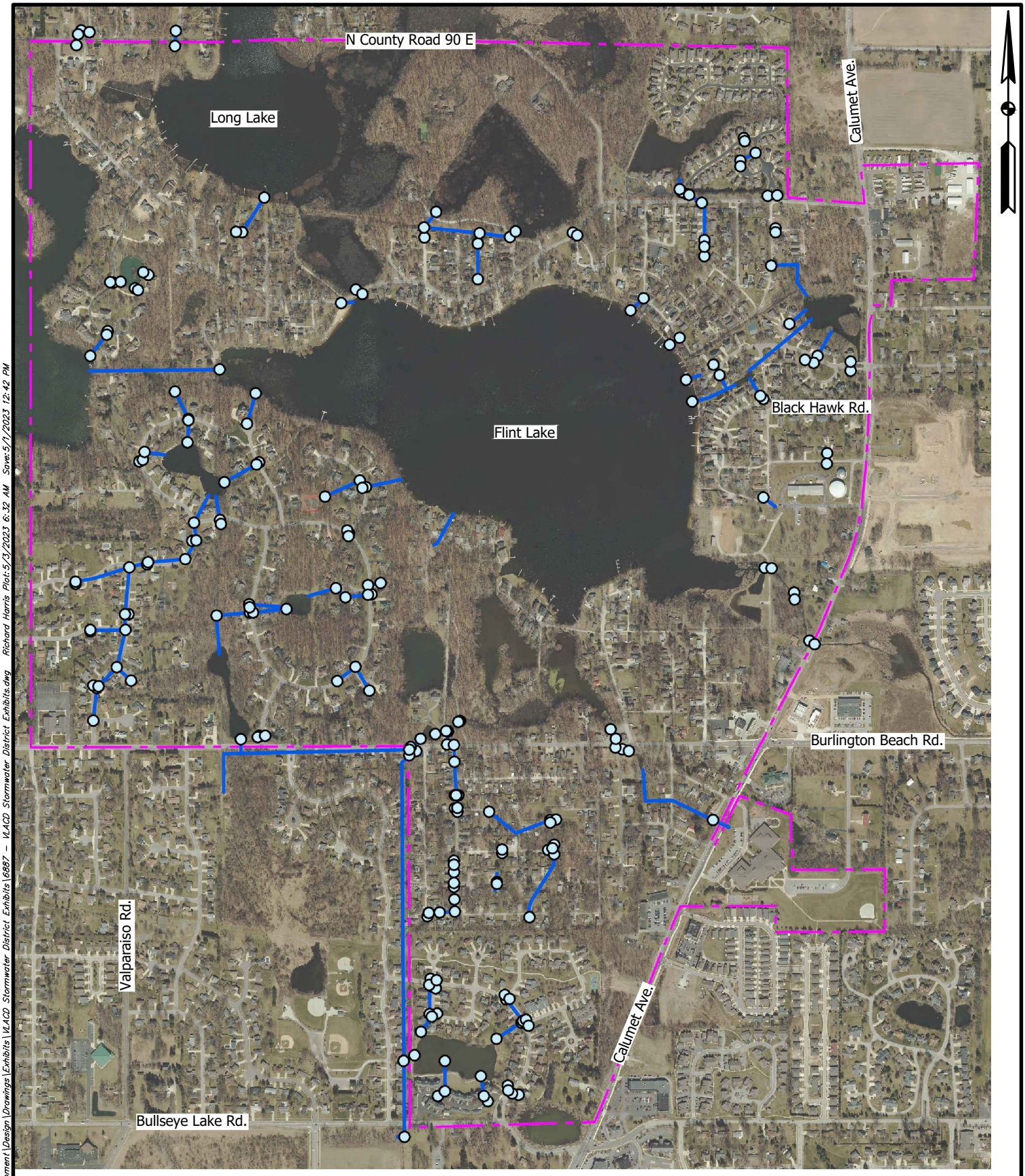
The existing stormwater infrastructure and drainage patterns were evaluated to understand how stormwater runoff is collected and discharged throughout the District. The primary route for all stormwater is through Flint Lake. The water level in Flint Lake is regulated by a control structure located in the southeast region of the lake. Water that travels through this structure is ultimately deposited into Crooked Creek. **Figure 3.2** shows the current storm sewer pipes and structures.

Stormwater conveyance to Flint Lake varies throughout the District. Planned subdivisions built in the last 30 to 40 years constructed storm sewer systems to manage stormwater runoff. These systems consist of a series of storm pipes and structures that collect stormwater runoff and deposit it into a detention pond. These detention ponds were constructed to control water levels and allow for primary treatment of stormwater runoff. Stormwater that passes through these detention ponds is discharged into Flint Lake through additional storm sewer piping.

Older portions of the District and areas that were not planned subdivisions, but rather one lot developments, do not have an organized storm sewer system. These portions of the District rely heavily on ditches and overland sheet flows to convey stormwater to Flint Lake. Storm sewers in older portions of the District tend to consist of a single storm sewer line that discharges directly to Flint Lake or an adjacent waterway. This method of storm sewer design allows for little to no treatment of stormwater runoff prior to discharging into Flint Lake.

Another form of conveyance into the District is through adjacent lakes. These lakes will collect stormwater runoff from their surrounding catchments and connected storm sewer systems. These lakes act as settling basins for incoming stormwater prior to discharging into Flint Lake.

An additional conveyance system of stormwater into Flint Lake is the Listenberger Ditch. The Listenberger Ditch discharges stormwater from Silver Lake and nearby commercial and residential developments primarily located in the City of Valparaiso. At the upper end of the Listenberger Ditch, a series of detention ponds collect stormwater runoff from the surrounding area. The collected stormwater then passes through a control structure and into a storm sewer that leads to a settling basin within the VLACD territory. Upon leaving the settling basin, stormwater flows through culverts and ditches ultimately flowing into Flint Lake.



LEGEND

Corporate Limit — Storm Pipe — Storm Structure

BF&S CIVIL ENGINEERS	DRAWN: RH CHECKED: JWB DATE: 5/3/2023	EXISTING PIPES AND STRUCTURES FIGURE 3.2 VLACD VALPARAISO, INDIANA	HORIZONTAL SCALE N/A VERTICAL SCALE N/A SHEET 1 OF 1 PROJECT BFS NO. 688700.0000

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4.0 PUBLIC INFORMATION AND OUTREACH

4.1 Stormwater Questionnaire

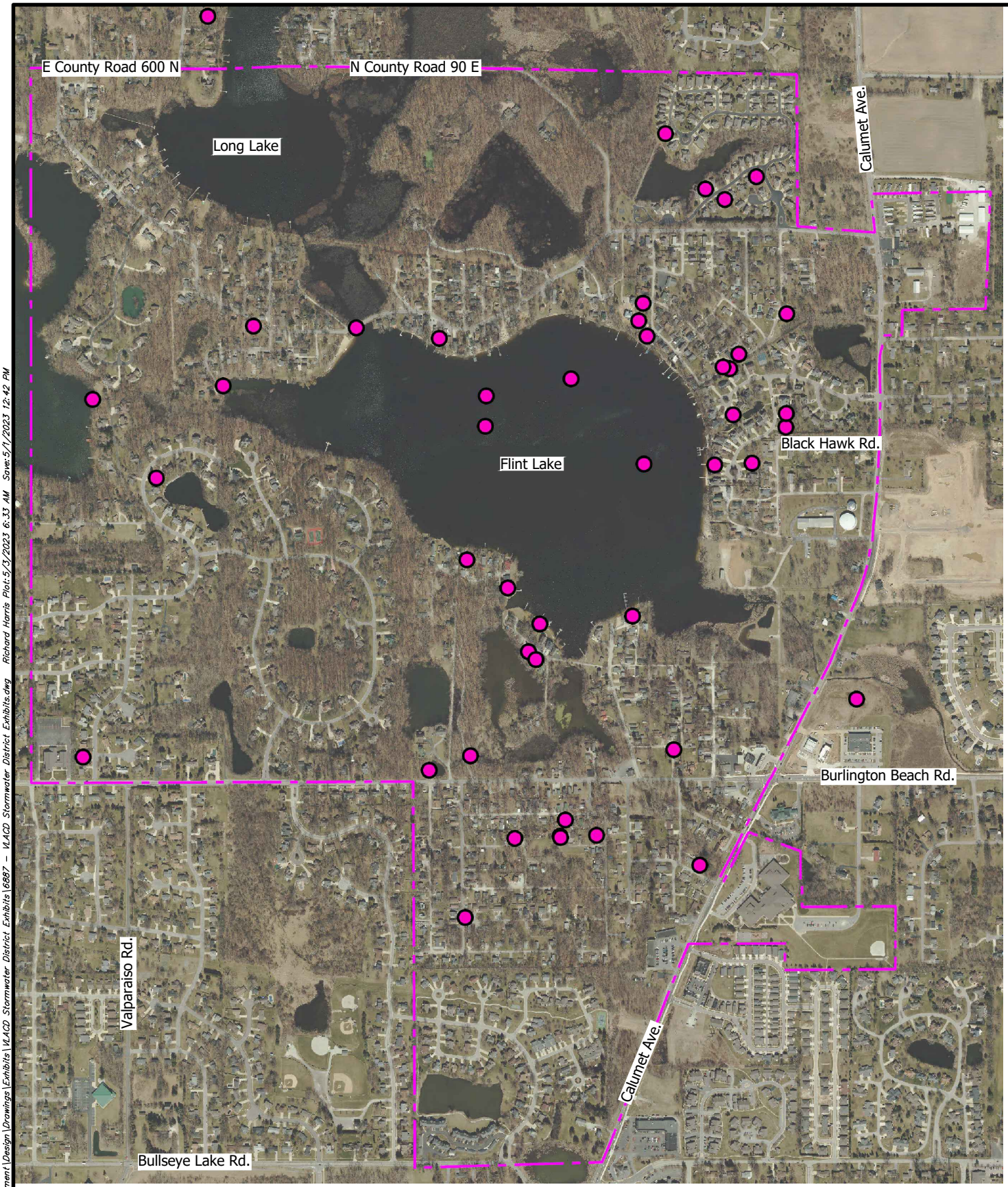
One of the biggest resources in identifying stormwater system deficiencies is the public. The local community has detailed knowledge on when and where stormwater issues occur. The first step taken to gather this information was a stormwater questionnaire. A stormwater questionnaire requesting information on stormwater issues was posted on the VLACD website, mailed to residents with their utility bill, and available at the public meetings. A copy of the stormwater questionnaire can be found in **Appendix A**. Questionnaires were collected and the information tabulated in a spreadsheet found in **Appendix B**.

4.2 Public Meetings

Two meetings were held to inform and gather information from the local community. The meetings were held on November 17, 2022, and March 22, 2023. A total of six people attended the first meeting and forty-six people attended the second meeting. At both meetings a presentation was given identifying the purpose of the Master Plan and the current progress of the plan. The presentation was followed by public questions and comments. A summary of the two meetings can be found in **Appendix C**.

4.3 Geographic Information System (GIS)

As information was received from the public, a method to organize and visualize the data was developed using GIS. Locations of stormwater issues provided by the public were plotted on a GIS map. Each plotted point has information regarding the stormwater issue linked to it. Groupings of plotted points identified areas of concern from the community. **Figure 4.1** shows the plotted stormwater points.



LEGEND

Corporate Limit

Stormwater Issue

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DATE: 5/3/2023

GIS STORMWATER POINTS
FIGURE 4.1

VLACD
VALPARAISO, INDIANA

HORIZONTAL SCALE
N/A
VERTICAL SCALE
N/A
SHEET
1 OF 1
PROJECT

BFS NO. 688700.0000

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5.0 SYSTEM EVALUATION

5.1 Deficiency Identification and Characterization

The VLACD stormwater system was evaluated by first gathering information on how it currently operates. Information about the stormwater system was gathered by means of GIS, information provided by the public, field investigation, and previously completed reports. System deficiencies were identified through analysis and review of this information. System deficiencies were classified into two categories: water quality and water quantity.

Water quality deficiencies identify shortfalls within the system pertaining to the health of the water. Maintaining water quality allows for a hospitable environment for the local plant and animal populations. Additionally, Flint Lake provides recreational use to the surrounding community, and preserving the water quality allows for continued operation without the concern for public health. Water quality deficiencies that lead to poor water health include sedimentation, contamination, and pollution. System deficiencies associated with sedimentation are improper outfalls, unfiltered runoff, and bank erosion. **Figure 5.1** below is an example of poorly stabilized banks and erosion being carried downstream. Contamination and pollution tend to occur when stormwater runoff is untreated prior to entering Flint Lake and when septic system failure occurs.

Figure 5.1 – Listenberger Ditch

Water quantity deficiencies identify shortfalls within the system pertaining to the collection and routing of stormwater. Proper stormwater quantity maintenance prevents flooding, reduces erosion, and extends the useful life of roads. Most of the catchment area draining to Flint Lake occurs unimpeded, however small pockets of localized flooding occur, see **Figure 5.2**. These isolated areas are a result of geographic depressions with no direct outlet to Flint Lake. Stormwater runoff in areas with no storm sewer design or planning tends to form channels that scour the land as soil is washed away into Flint Lake. Areas that are improved to handle stormwater quantity deficiencies also have a positive influence on water quality as well.

Figure 5.2 – Kettle Lake

6.0 IMPROVEMENT PROJECTS AND PRIORITIZATION

6.1 Projects

As deficiencies were identified, projects to resolve these deficiencies were identified as well. The projects below are recommendations to improve stormwater management in areas that have known issues. Exhibits for each project can be found in **Appendix D** and a breakdown of the engineer's opinion of probable cost can be found in **Appendix E.**

6.1.1 Blackhawk Beach Road Drainage Improvements

Location: North side of Blackhawk Beach Road

41°30'55" N 87°2'21" W

Deficiency Characterization: Water Quantity

Engineer's Opinion of Probable Cost: $54,975.00

Project Description: A berm is located north of Burlington Beach Road along the entire length of the roadway. Residence north of the berm have installed drain lines for sump pumps to discharge south of the berm. The sump pump discharge creates excess water along the north side of the road. The project consists of creating a swale along the north side of the road to collect roadway runoff and sump pump discharge. The proposed swale would route water to the west toward an existing inlet along Waters Edge Drive.

6.1.2 Burlington Beach Culvert Pipe

Location: Burlington Beach Road west of Cardinal Lane

41°30'30" N 87°2'47" W

Deficiency Characterization: Water Quality and Quantity

Engineer's Opinion of Probable Cost: $272,875.00

Project Description: During a field inspection, it was noted that the Burlington Beach Culvert crossing may be nearing the end of its useful life. The sheet pile wall displayed signs of rusting through and possible material migration. This project would remove and replace the existing culvert pipe and steel sheeting wall. Outlet protection would also be incorporated to prevent erosion and scouring around the culvert pipe and structure. This project is at the limits of the District's territory and would require coordination with local governmental agencies to design and construct.

6.1.3 Burlington Beach Sediment Basin Excavation

Location: North of Burlington Beach Road and Cardinal Lane intersection.

41°30'26" N 87°2'48" W

Deficiency Characterization: Water Quality

Engineer's Opinion of Probable Cost: $248,265.00

Project Description: The existing basin was designed to remove sediment from the two storm sewer lines that converge south of Burlington Beach Road. These two drain lines include the Listenberger Ditch and the Cooks Corners, Concord Woods, Kingsridge, and Woodside Drain. Over the years sediment has filled this basin and greatly reduced its effectiveness. With the reduced effectiveness of the basin, silt and sediment is flowing

through the basin and being deposited into Flint Lake. This project includes excavating the sediment from the basin that has been deposited over the years. With the deposited sediment removed, the basin can again be used as an effective measure to improve the quality of water flowing to Flint Lake.

6.1.4 Burlington Beach Staged Settlement

Location: North of Burlington Beach Road and east of Claussen Lane

41°30'28" N 87°2'47" W

Deficiency Characterization: Water Quality

Engineer's Opinion of Probable Cost: $404,945.00

Project Description: The existing sediment basin north of Burlington Beach Road provides initial settling of suspended solids from the Listenberger Ditch and the Cooks Corners, Concord Woods, Kingsridge, and Woodside Drain. A secondary settling basin east of Claussen Lane would provide additional protection for Flint Lake. Additionally, a 30-inch storm sewer along Sumac Road discharges east of the existing sediment basin and receives no treatment prior to flowing into Flint Lake. This project would consist of improving the waterway between Claussen Lane and Lowenstines Lane and potentially the stream leading to Flint Lake. The stream between Claussen Lane and Lowenstines Lane would be widened and deepened to allow for additional settling of suspended solids within the stormwater runoff. The stream banks would be stabilized using riprap and native vegetation to prevent scouring. The stream east of Lowenstines Lane would be improved by means of bank stabilization and energy dissipating measures. Stream improvement measures would be determined at the time of design based on proximity of the wetlands to the east of Lowenstines Lane.

6.1.5 Cardinal Lane Paving

Location: Cardinal Lane and adjacent parking area near Burlington Beach Road Sanitary Lift Station

41°30'26" N 87°2'50" W

Deficiency Characterization: Water Quality

Engineer's Opinion of Probable Cost: $73,585.00

Project Description: Stormwater runoff along Cardinal Lane flows north across Burlington Beach Road and into the existing sediment basin. Stormwater travelling down this path is washing out the fines from the gravel road and depositing them into the sediment basin. As the road deteriorates from washout, new gravel with fines is brought in to repair the roadway, thereby repeating the sedimentation process. To prevent future erosion and sediment deposits, this project would pave Cardinal Road and the parking area north of the Burlington Beach Sanitary Lift Station.

6.1.6 Flint Lake Outlet Improvements

Location: Flint Lake outlet control structure to Calumet Avenue

41°30'41" N 87°2'19" W

Deficiency Characterization: Water Quantity

Engineer's Opinion of Probable Cost: $197,960.00

Project Description: The outlet control structure regulates the water level of Flint Lake. Improvements should be made to maintain the operational use of this structure and outlet waterway to the Calumet Avenue culvert. This project would include dredging along the outlet structure and outlet watery way to the Calumet Avenue culvert. The banks around the control structure would be stabilized with riprap to maintain serviceability of the structure. The banks of the outlet waterway would also be stabilized by means of riprap and native plantings. Prior to construction an inspection of the structural integrity of the control structure should be performed and any necessary repairs completed in conjunction with this project.

6.1.7 Kettle Lake Drainage Improvements

Location: East of Oriole Road and Meadowlark Lane intersection.

41°30'22" N 87°2'36" W

Deficiency Characterization: Water Quantity

Engineer's Opinion of Probable Cost: $286,435.00

Project Description: The project is located in a depressed area with no direct outlet to Flint Lake. During rainfall events, the area fills with stormwater flooding adjacent properties. An existing storm sewer provides some relief for this area; however, the pipe is undersized and maintenance is an issue. This project includes constructing a 30-inch storm sewer from the existing storm sewer located at the intersection of Sumac Road and Oriole Road. The proposed sewer would be extended east down Oriole Road to the low point approximately 230 feet east of Meadowlark Lane. Two Catch basins would be installed in the low area to collect the stormwater runoff. Restoration is required for all disturbed areas.

6.1.8 Listenberger Ditch Bank Stabilization

Location: South side of Burlington Beach Road west of Cardinal Lane

41°30'26" N 87°2'50" W

Deficiency Characterization: Water Quality

Engineer's Opinion of Probable Cost: $108,875.00

Project Description: The northern end of the Listenberger Ditch is an open channel flowing towards the Burlington Beach Road culvert. This approximately one-hundred-foot section of open channel has multiple outfalls with no bank stabilization or energy dissipation measures. This project would consist of clearing and dredging the existing channel to provide a defined flow path and stabilizing the banks with riprap and local plantings to prevent scouring. Additionally, flared end sections and energy dissipation measures such as riprap would be constructed at each outfall. This project has potential for partnering with local government agencies to improve drainage.

6.1.9 Oakdale Road Drainage Improvements

Location: Oakdale Road from Flamingo Road to Woodland Bluff Drive

41°30'58" N 87°2'25" W

Deficiency Characterization: Water Quantity

Engineer's Opinion of Probable Cost: $328,805.00

Project Description: Poor to no drainage along Oakdale Road as led to large areas of standing water. The standing water keeps the ground saturated and has led to road failure in multiple places. Additionally, the saturated roadway creates a pumping effect that is removing material from the roadway. Per water main atlases, a 6-inch water main located beneath this roadway may become damaged due to loss of cover and movement of the saturated ground around it. This project would construct a 12-inch storm sewer along Oakdale Road that would discharge into an existing catch basin along Woodland Bluff Drive. A series of catch basins would be constructed in the low spots along Oakdale Road to collect the stormwater runoff. The roadway would also be repaired to protect the existing water main.

6.1.10 Outfall Structure Improvements

Location: Various locations throughout the District Territory

Varies - See Exhibit 10 in Appendix D

Deficiency Characterization: Water Quality

Engineer's Opinion of Probable Cost: $17,850.00 - $75,650.00 Each

Project Description: There are a multitude of storm sewer outfalls discharging into the Flint Lake drainage system. Many outfalls are connected directly to the lake or its adjacent waterways and do not pass through any means of stormwater treatment such as a detention or sediment basin. This project consists of identifying what improvements are needed at each outlet and choosing an improvement option that would best resolve the issue. Outfall improvement options include adding a flared end section, stabilizing the surrounding banks with riprap, headwalls, and native plantings, redirecting outfall flow direction, and energy dissipation measures. Hydrodynamic separators can be constructed along storm sewer lines that have been found to carry large quantities of sediment and pollutants.

6.1.11 Sanitary Lift Station Emergency Overflow Improvements

Location: South side of Burlington Beach Road west of Cardinal Lane

41°30'26" N 87°2'50" W

Deficiency Characterization: Water Quality

Engineer's Opinion of Probable Cost: $29,100.00

Project Description: During a site visit it was noted that the backflow preventer installed on the Burlington Beach Sanitary Lift Station Emergency Overflow line was redirecting the stream flow downward stirring up the stream bed. This project would consist of replacing the existing backflow preventor with a duckbill check valve and reconfiguring the piping within the channel.

6.1.12 Septic System Elimination

Location: N 70 E North of CR 600 N

41°31'19" N 87°3'16" W

Deficiency Characterization: Water Quality

Engineer's Opinion of Probable Cost: $523,305.00

Project Description: Residents along the western shore of Long Lake north of County Road 600 N utilize septic systems to handle sanitary waste. Pollutants can leach into the lake when septic systems aren't functioning properly. This project includes constructing a low-pressure sanitary sewer system to service residents currently using septic systems. Depending on the extent of properties currently using septic systems, the project would consist of approximately 2,000 feet of force main with a service connection for each residence. Alternatively, if a larger service area is anticipated in the future, a gravity sanitary sewer system and lift station may be required.

6.2 Project Determination Matrix

As projects were identified to resolve stormwater deficiencies within the District, a method of prioritizing projects was developed. A project determination matrix was developed based on five project parameters.

A. **Benefit of Project** – The ability of each project to reduce maintenance and/or improve public safety.

B. **Easement Needed** – Identifies if easement acquisition will be required to construct each project.

C. **Cooperation with Outside Agency** – Projects located outside of the District territory will require coordination with outside governmental agencies.

D. **Area of Impact** – Refers to the number of residents positively impacted by the project.

E. **Price** – Cost to construct the recommended improvement.

Values were given to each project parameter based on the recommended improvements. A final score was determined for each project by multiplying the Benefit of the Project by the Easement Needed by the Area of Impact then adding the Cooperation with Outside Agency and the Price or simply put (A x B x D) + C + E. The projects were then organized from highest score to lowest to determine the order of priority. **Appendix F** shows the project priority list.

As projects are completed and the needs of the District change, it is recommended that additional projects be added to the project determination matrix and the projects be re-scored on a three-to-five-year cycle.

6.3 Project Funding

Project funding is a critical part of taking a project from the project priority list planning stage to construction. A rate study is recommended to evaluate the District's ability to fund selected projects within a specific timeline.

External funding through grant and loan programs can assist in funding selected projects. Depending on the plan and scope of a project, below are possible funding assistance opportunities and project criteria:

- Indiana Office of Community & Rural Affairs Grants – Stormwater Improvement
  - Reduce flooding
  - Cut stormwater treatment and energy costs
  - Protect rivers, lakes and vital landscape
- United States Army Corps of Engineers 219 Grant
  - Water-related environmental infrastructure and resource protection and development projects
- NIPSCO, Environmental Action Grants
  - Environmental stewardship projects
- Northwestern Indiana Regional Planning Commission (NIRPC) Environmental & Stormwater Grants

    - Stormwater management
    - Flood resiliency plan
- State Revolving Fund Loan Program
    - Wetland protection and restoration measures
    - On-site sewage disposal systems
    - Flood control

7.0 ADDITIONAL CONSIDERATIONS

7.1 Operation and Maintenance

Sewer system assets that are not sufficiently understood and proactively maintained will typically deteriorate faster than expected and lead to higher replacement and emergency repair costs. It is recommended that the District develop a preventative maintenance plan including cleaning, inspection, and assessment of existing assets. Based on available personnel and limited assets, it may be beneficial for an outside contractor to clean and assess the existing system to provide the District with a baseline. Upon completion of the initial cleaning and assessment, the preventative maintenance plan should have a goal to clean, inspect, and assess the entire system within a 5-year cycle.

7.1 Unique Challenges

With a large portion of contributing stormwater runoff originating outside of the District's territory, coordination with outside agencies becomes vital. It is recommended that any potential projects located along the District's borders be planned as a joint project with neighboring governmental agencies. This provides the benefit of potentially reducing the cost of the project and building a positive relationship with the neighboring communities. Additionally, a line of open communication between the communities in regards to building permit review/issuance, site development and planning, infrastructure ownership and repairs, MS4 compliance for individual sites, and technical standards is advised to keep all parties updated on projects.

The VLACD territory consists of very few roads that have a platted right-of-way or recorded easements. With limited availability to right-of-way or easements, the routing and construction of future storm sewer improvements may also be limited. It is recommended that at the onset of any planned project, easement needs be identified and acquired to facilitate a smooth transition from the planning and design phase to the project construction phase.

8.0 TERMS AND ABBREVIATIONS

GIS – Geographic Information System

VLACD – Valparaiso Lakes Area Conservancy District

Catch Basin – A chamber built for the entry of surface water to a storm sewer or drain, having at its base a sediment sump designed to retain grit and detritus below the point of overflow.

Construction Activity – A disturbance to the land that results in a change in topography, existing soil vegetative and non-vegetative coverage, or existing soil makeup that may result in accelerated stormwater runoff leading to soil erosion and movement of sediment into surface waters or drainage systems.

Conveyance – Any structural method for transferring stormwater between points.

Culvert – A closed conduit used for the conveyance of surface drainage water under a roadway, driveway, or other impediment.

Discharge – Usually the rate of water flow measuring the volume of water passing a point per unit of time commonly expressed as cubic feet per second, gallons per minute, or millions of gallons per day.

District – The Valparaiso Lakes Area Conservancy District.

Ditch – A man-made, open drainage way into which excess surface water or groundwater drained from land, stormwater runoff, or floodwaters flow either continuously or intermittently.

Drain – A buried perforated or slotted pipe or other conduit (subsurface drain) or ditch (open drain) for carrying off surplus groundwater or surface water.

Drainage – The removal of excess surface water or groundwater from land by means of ditches or subsurface drains.

Erosion – The wearing away of the land surface by water, wind, gravity, or other geological agents. The following terms are used to describe different types of water erosion:

Infiltration – The passage or movement of water into the soil.

Outfall – The point source where a municipal separated storm system discharges to a receiving water or where stormwater discharge permanently leaves the boundaries of an MS4. It does not include open conveyances connecting separate storm sewers, pipes, tunnels, or other conveyances that connect segments of the same stream or other surface waters.

Outlet – The point of water disposal from a stream, river, lake, or artificial drain.

Pipe – A closed manmade conveyance device used to transport stormwater between points. This does not include foundation drainpipes, irrigation pipes, land drain tile pipes, culverts, and road sub-grade drainpipes.

APPENDIX A
STORMWATER QUESTIONAIRRE

Valparaiso Lakes Area Conservancy District

Storm Water Questionnaire

Please return by November 25, 2022 to:
1805 Burlington Beach Rd Valparaiso, IN 46383

1.	First Name:	Last Name:	
2.	Street Address:		
	City:	State:	Postal Code:
	(If you have experienced flooding at this address, having this information can help us better understand where flooding occurs.)		
3.	How long have you owned this property?		
4.	Type of Property: ___ Single Family Residential ___ Multi-Family Residential ___ Commercial/Business ___ Other (please specify): _____		
5.	Type of Foundation: ___ Basement ___ Slab ___ Crawlspace ___ Don't know	6.	Type of Basement: ___ Finished ___ Unfinished ___ N/A
7.	Type of Water Supply: ___ Private Well ___ Public Water ___ Don't know	8.	Does your home currently use septic or Valparaiso Lakes Area Conservancy District sewer? ___ Septic ___ Valparaiso Lakes Area Conservancy District Sewer
9.	Type of Sewage Disposal: ___ Gravity Sanitary Sewer ___ Private Septic ___ Grinder Pump System ___ Don't know		
10.	Please indicate if you participate in the National Flood Insurance Program. ___ Yes ___ No, skip to question 12	11.	If YES, please indicate what type of structure(s) have Flood Insurance at this property: . ___ House with attached garage ___ House only ___ House and detached garage ___ Garage only
12.	Would you be willing to provide an easement along roadways or property lines to facilitate the construction of storm-water improvements? ___ Yes ___ No		

Valparaiso Lakes Area Conservancy District

Storm Water Questionnaire

Please return by November 25, 2022 to:
1805 Burlington Beach Rd Valparaiso, IN 46383

13.	Do you have a sewer/basement rider to your homeowner's insurance policy? ___ Yes ___ No		
14.	Has your property ever been flooded? ___ Yes ___ No	15.	If YES, please indicate which year(s) this property has flooded:
16.	Has your property ever had a stormwater drainage problem?: ___ Yes ___ No		
	If, YES, please indicate in what year(s) this property has had stormwater drainage problems:		
	If NO, you have finished this survey! Please accept our sincerest gratitude for your participation!		

17.	Please indicate where the flooding occurs and how often the flooding occurs at your property.					
		All the time	Frequently	Infrequently	Seldom	Not at all
	During light rainfall?					
	During moderate rainfall?					
	During heavy rainfall?					
	During severe storms? (e.g. April 2013)					

18.	Please indicate where the flooding occurs and characterize how severe it typically is.				
	Severity	Not a problem	Nuisance	Moderate	Severe
	Yard				
	Garage				
	Crawl Space				
	Basement				
	First Floor				

19.	Please indicate how deep the flooding typically is:				
	Depth	1-6 inches	6-12 inches	1-3 feet	3 feet or more
	Yard				
	Garage				
	Street				
	Crawl Space				
	Basement				
	First Floor				

Valparaiso Lakes Area Conservancy District

Storm Water Questionnaire

Please return by November 25, 2022 to:
1805 Burlington Beach Rd Valparaiso, IN 46383

20.	What do you believe to be the main source(s) of this flooding? (Check all that apply)	
	Sump pump failure/power failure	
	Sanitary sewer backup	
	Overland flow from nearby lake or stream	
	Overland flow from adjacent property or public right-of-way (e.g. street)	
	Overland flow from this property (e.g. yard, rooftop, driveway)	
	Water entering through a building opening (e.g. door, window)	
	Water seeping through foundation cracks or joints (e.g. basement wall, basement floor)	
	Improper/poor grading of this property	
	Improper/poor grading of adjacent property or public right-of-way (e.g. street)	
	Poor/inadequate drainage of this property	
	Poor/inadequate drainage on adjacent property or public right-of-way (e.g. street)	
	Poorly maintained stormwater management infrastructure adjacent to this property (e.g. clogged ditches, culverts, inlets, or storm sewers)	
	Inadequate stormwater management infrastructure adjacent to this property (e.g. too few or poorly placed inlets; undersized ditches, culverts, or storm sewers)	
	Out of manholes/gullies on property	
	Out of manholes on the road	
	Out of gullies on the road	
	Out of cellar drain	
	Runs off the road	
	Other (please specify):	
21.	What additional mitigation measures have been taken? (Check all that apply)	
	Installed a sump pump	
	Installed a back-up sump pump	
	Installed a backup power system/generator	
	Installed overhead sewers or a sanitary sewer backup prevention valve	
	Installed a sanitary sewer plug or sandpipe	
	Sealed foundation/waterproof walls	
	Regraded yard to keep water away from building	
	Installed a ditch or storm sewer to drain water away from building	
	Installed larger downspouts	
	Disconnected downspouts	
	Installed a rain barrel or cistern	
	Installed a rain garden	
	Replaced traditional landscaping with native plants	
	Replaced typical hardscape materials (e.g. concrete) with materials (e.g. permeable pavers) that allow water to soak into the ground	

22.	What impact does the flooding have? (Check all that apply) ___ No visible damage ___ Repairable, no permanent damage ___ Irreparable damage to carpet, furniture, fittings ___ Property becomes uninhabitable following flooding ___ Damage to materials, stock, good, crops ___ Loss of production / business ___ Temporary closure of shop / factory / business due to flooding
23.	Was the flooding sewage, surface water, or combined? ___ Foul sewage ___ Surface water ___ Combined
24.	Are there any flood-reducing actions not listed above that you have implemented?
25.	Do you have any additional comments about flooding and/or stormwater management issues in your community?
26.	Are there any projects or programs that you believe would help reduce flooding and/or improve local stormwater management efforts?
27.	Would you be interested in further discussing the flooding occurring on your property? If so, please provide your name, email address, and/or phone number below.

First Name:	Last Name:
Email:	
Phone Number:	

Please return by November 25, 2022 to:
1805 Burlington Beach Rd Valparaiso, IN 46383

Thank you again! We appreciate your time and responses to this questionnaire!

APPENDIX B
STORMWATER QUESTIONAIRRE RESPONSE SPREADSHEET

Address	Question 3	Question 4				Question 5				Question 6			Question 7			Q 8		Question 9				Q 10		Question 11				Q 12		Q 13		Q 14		Q 16		Question 17			
	How long have you owned this property?	Single Family	Multi-Family	Commercial/Business	Other	Basement	Slab	Crawl Space	Don't Know	Finished	Unfinished	N/A	Private Well	Public Water	Don't Know	Septic	VLACD	Gravity Sanitary Sewer	Private Septic	Grinder Pump System	Don't Know	Yes	No	House with Attatched Garage	House Only	House and Detatched Garage	Garage Only	Yes	No	Yes	No	Yes	No	Yes	No	During Light Rainfall	During Moderate Rainfall	During Heavy Rainfall	During Severe Storms
1828 Briar Road	30+ years	X						X				X			X						X		X					X		X	X		X		A	A	A	A
4700 Lowenstine Lane	22 years	X						X				X		X			X	X				X		X				X			X		X	X		N/a	N/a	I	I
1902 Crimson Dr.	10 years	X				X				X				X			X	X					X					X		X			X	X				I
1416 Island Rd.	2 years	X				X					X			X			X				X	X			X			X			X		X	X		S	I	F	A
4706 Lowenstines Ln.		X						X						X			X	X					X						X		X		X		N/a	N/a	N/a	S
1413 Island Rd.	27 years	X						X						X			X			X			X					X			X	X		X		N/a		A	A
5010 Waters Edge	22 years	X				X				X				X			X	X				X		X				X				X		X		I	F	A	A
1418 Island Rd.	6 years	X				X				X				X			X			X			X						X	X		X		X	N/a	N/a	N/a	N/a
5016 Waters Edge Dr.	22 years	X				X				X				X			X						X					X				X		X				A	A
1707 Clayton St.	20 years	X				X					X			X			X				X	X		X				X		X		X		X		I	F	A	A
1401 Oriole Rd.	18 years	X						X			X			X			X	X					X								X		X				F	
4907 Waters Edge Dr.	9 years	X				X				X				X			X	X					X					X			X		X		X				
1301 Robin Rd.	25+ years	X						X				X		X			X												X		X			X			A	A	A
1804 Woodmere	13 years	X				X				X				X			X	X					X									X		X					
1803 Crimson Dr.	3 1/2 years	X				X				X				X			X	X					X							X				X					
1728 Briam Circle Dr.		X				X				X				X			X	X					X	X							X			X					
4908 Waters Edge Dr.	9 years	X					X					X		X			X	X		X			X						X	X		X			X	N/a	N/a	F	A
1804 Crimson Dr.	10 years	X				X				X				X			X	X					X						X	X			X	X			F	F	F
4207 Wildwood	20 years	X				X					X			X			X	X					X					X				X		X		F	F	A	A
3284 Chimney Hill	5 years	X				X					X			X			X	X					X					X			X		X		X				
718 Brandonbury Dr.	2 years	X				X				X				X			X				X		X						X	X			X		X				
1610 Woodland Bluff	20 years	X				X				X				X			X	X					X					X		X			X		X				
5303 Agape	20 years	X					X							X			X	X					X					X			X		X		X				
4303 Kingsdale Dr.	2 years	X				X				X				X			X	X				X		X				X			X		X	X		I	F	F	F
1508 Redwing	9-10 years	X					X	X				X		X			X	X					X					X			X	X		X				A	A
1212 Edgewater Beach Rd.	40 years	X				X				X				X			X	X					X					X			X		X		X				
1609 Baker Rd.	20+ years	X						X						X			X			X			X					X			X	X		X					S
605-2 N 70 E	30 years	X				X		X			X			X			X			X			X						X		X		X		X				
5311 Agape Lane	1 year	X				X					X			X			X	X					X					X			X	X		X		S	I	F	A
5308 Flamingo Rd.	13 years	X						X					X				X	X					X					X			X	X					A	A	

Address	Question 18					Question 19						Question 20																		
	Yard	Garage	Crawl Space	Basement	First Roll	Yard	Garage	Street	Crawl Space	Basement	First Floor	Sump Pump Failure	Sanitary Sewer Backup	Overland Flow From Nearby Lake	Overland Flow From Adjacent Property	Overland Flow From This Property	Water Entering Through A Building Opening	Water Seeping Through Cracks	Improper/Poor Grading Of This Property	Improper/Poor Grading Of Adjacent Property	Poor/Inadequate Drainge Of This Property	Poor/Inadequate Drainage On Adjacent Property	Poorly Maintained Stormwater Management Infrastructure Adjacent To Property	Inadequate Stormwater Management Infrastructure Adjacent To Property	Out Of Manholes/Gullies On Property	Out Of Manholes On The Road	Out Of Gullies On The Road	Out Of Cellar Drain	Runs Off The Road	Other
1828 Briar Road	S		S	N/a	N/a	A		B	A						X	X			X	X	X	X		X					X	
4700 Lowenstine Lane	N	N/a	S	N/a	N/a				A					X																
1902 Crimson Dr.	M					A										X														
1416 Island Rd.	N	N/a	N/a	M	N/a	B				B					X	X		X			X	X		X						
4706 Lowenstines Ln.	N/a	N/a	N/a	N/a	N/a	A																								
1413 Island Rd.	N	N	S			A			B														X	X						
5010 Waters Edge	S					C									X	X		X			X	X		X						
1418 Island Rd.	N/a	N/a	N/a	N/a	N/a	N/a		N/a	N/a	N/a														X					X	
5016 Waters Edge Dr.	S	N/a	N/a	N/a	N/a	B									X				X	X	X	X		X						
1707 Clayton St.	S	N/a	N/a	N/a	N/a	B		A							X	X					X	X	X	X					X	
1401 Oriole Rd.				S						A					X			X				X		X						
4907 Waters Edge Dr.																														
1301 Robin Rd.	S		S		N/a	C			D						X	X		X					X	X	X		X		X	
1804 Woodmere																														
1803 Crimson Dr.																														
1728 Briam Circle Dr.																														
4908 Waters Edge Dr.	N	N/a	N/a	N/a	M	A	N/a	A	N/a	N/a	A				X					X										
1804 Crimson Dr.	M	N/a	N/a	N	N/a	A	A	A	A	A	A				X						X	X								
4207 Wildwood	S	N/a	N/a	S	N/a	C	N/a	A	N/a	B	N/a			X	X		X	X		X			X					X		X	
3284 Chimney Hill																														
718 Brandonbury Dr.																														
1610 Woodland Bluff																														
5303 Agape																														
4303 Kingsdale Dr.	M	N/a	N/a	N/a	N/a	A																								
1508 Redwing			S		S	A			A				X		X			X			X	X	X	X			X		X	
1212 Edgewater Beach Rd.																														
1609 Baker Rd.	N/a	N/a	N/a	N/a	N/a	A									X															
605-2 N 70 E																														
5311 Agape Lane	N/a	N		M	N/a		A			A					X	X		X	X	X	X								X	
5308 Flamingo Rd.	S		S			A			A						X	X														

Address	Question 21															Question 22							Q 23		
	Installed A Sump Pump	Installed A Backup Sump Pump	Installed A Backup Power System/Generator	Installed Overhead Sewers Or A Sanitary Sewer Backup Prevention Valve	Installed A Sanitary Sewer Plug Or Sandpipe	Sealed Foundation/Waterproof Walls	Regraded Yard To Keep Water Away From Building	Storm Sewer To Drain Water Away From Building	Installed Larger Downspouts	Disconnected Downspouts	Installed A Rain Barrel Or Cistern	Installed A Rain Garden	Replaced Traditional Landscaping With Native Plants	Replaced Typical Hardscape Materials With Materials That Allow Water To Soak Into The Ground	No Visible Damage	Repairable, No Permanent Damage	Irreparable Damage To Carpet, Furniture, And Fittings	Property Becomes Uninhabitable Following Flooding	Damage To Materials, Stock, Goods, And Crops	Loss Of Production/Business	Temporary Closure Of Shop/Factory/Business Due To Flooding	Foul Sewage	Surface Water	Combined
1828 Briar Road																		X					X	X
4700 Lowenstine Lane	X	X	X						X						X								X	
1902 Crimson Dr.																X							X	
1416 Island Rd.						X		X								X							X	
4706 Lowenstines Ln.															X									
1413 Island Rd.																X							X	
5010 Waters Edge	X	X					X												X				X	
1418 Island Rd.																							X	
5016 Waters Edge Dr.								X		X								X						
1707 Clayton St.									X														X	
1401 Oriole Rd.						X										X							X	
4907 Waters Edge Dr.																								
1301 Robin Rd.	X	X	X																					
1804 Woodmere																								
1803 Crimson Dr.																								
1728 Briam Circle Dr.																								
4908 Waters Edge Dr.	X						X	X	X							X							X	
1804 Crimson Dr.		X	X																				X	
4207 Wildwood	X					X	X	X									X						X	
3284 Chimney Hill																								
718 Brandonbury Dr.																								
1610 Woodland Bluff																								
5303 Agape																								
4303 Kingsdale Dr.																								
1508 Redwing							X	X						X		X	X					X	X	
1212 Edgewater Beach Rd.						X																		
1609 Baker Rd.															X								X	
605-2 N 70 E																								
5311 Agape Lane	X		X				X	X																
5308 Flamingo Rd.															X								X	

Address	Q 24		Question 25
	Yes	No	Do You Have Any Additional Comments About Flooding And/Or Stormwater Management Issues In Your Community?
1828 Briar Road			Roadways Are Craters And They Are Mosquito Farms
4700 Lowenstine Lane			
1902 Crimson Dr.			
1416 Island Rd.			
4706 Lowenstines Ln.			
1413 Island Rd.	X		More Outflow
5010 Waters Edge			
1418 Island Rd.			
5016 Waters Edge Dr.			
1707 Clayton St.		X	I Have Video Of How The Water Runs Down Calumet Then Turns Onto Clayton
1401 Oriole Rd.	X		
4907 Waters Edge Dr.			
1301 Robin Rd.			
1804 Woodmere			
1803 Crimson Dr.			
1728 Briam Circle Dr.			
4908 Waters Edge Dr.	X		The Water From Homes On Aaron Street Flows Into The Woodmere Subivision Because There Is Nowhere For It To Go
1804 Crimson Dr.		X	
4207 Wildwood	X		New Construction In Area Makes Problem Worse
3284 Chimney Hill			
718 Brandonbury Dr.			
1610 Woodland Bluff			
5303 Agape			
4303 Kingsdale Dr.			
1508 Redwing	X		It Appears There Is No Management, No Drainage Plan, No Storm Sewers, And No Drainage Of Low Areas
1212 Edgewater Beach Rd.			
1609 Baker Rd.			
605-2 N 70 E			
5311 Agape Lane			
5308 Flamingo Rd.			

Address	Question 26
	Are There Any Projects Or Programs That You Believe Would Help Reduce Flooding And/Or Improve Local Stormwater Management Efforts?
1828 Briar Road	
4700 Lowenstine Lane	Pave Roads, Correct Legacy To Private Property
1902 Crimson Dr.	
1416 Island Rd.	
4706 Lowenstines Ln.	
1413 Island Rd.	More Outflow
5010 Waters Edge	
1418 Island Rd.	
5016 Waters Edge Dr.	
1707 Clayton St.	
1401 Oriole Rd.	Kettle Lake Project
4907 Waters Edge Dr.	
1301 Robin Rd.	
1804 Woodmere	
1803 Crimson Dr.	
1728 Briam Circle Dr.	
4908 Waters Edge Dr.	
1804 Crimson Dr.	
4207 Wildwood	Restrict Impermeable Surface Permitted For New Construction
3284 Chimney Hill	
718 Brandonbury Dr.	
1610 Woodland Bluff	
5303 Agape	
4303 Kingsdale Dr.	
1508 Redwing	Build Retention Ponds, Build A System Of Draws To Feed These, Revamp Redwing Road To Control Rapid Downhill Flow Of Water In Heavy Downfall
1212 Edgewater Beach Rd.	
1609 Baker Rd.	
605-2 N 70 E	
5311 Agape Lane	
5308 Flamingo Rd.	

APPENDIX C
PUBLIC INFORMATION AND OUTREACH MEETING SUMMARY

VLACD Public Information Meeting 11/17/22

Public Comments

Areas of Concern:

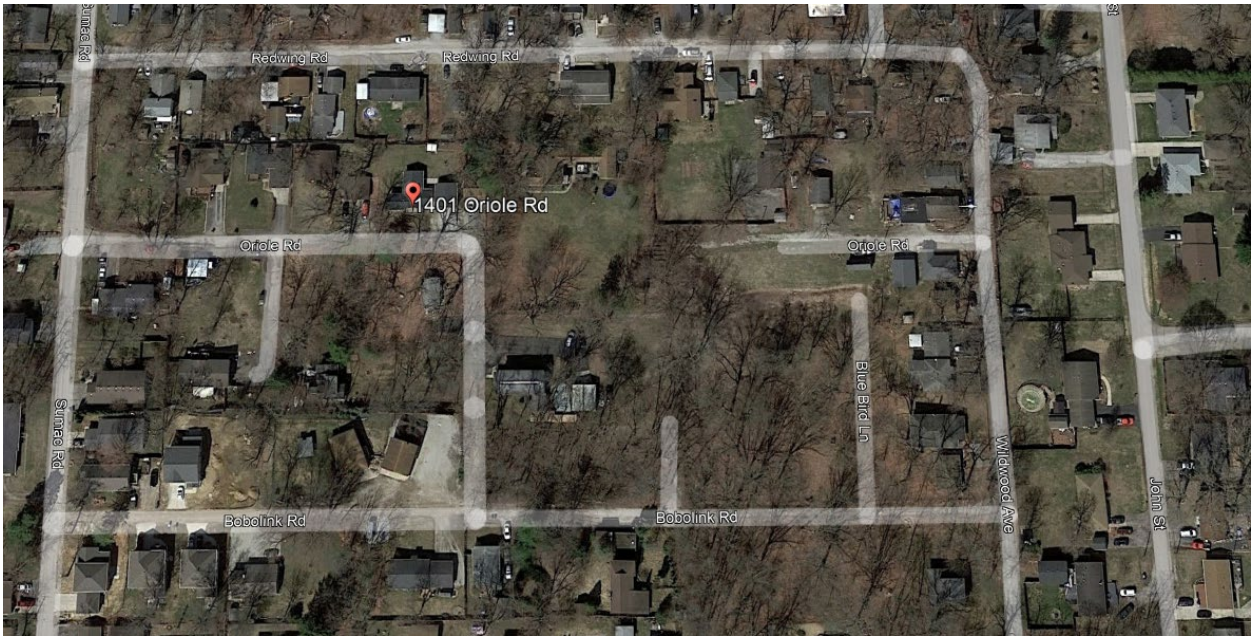
1. Silt and sedimentation from the Listenberger Ditch.
2. Protection of wetlands.
3. Burlington Beach sediment pond maintenance.
4. Kettle Lake flooding.
5. Impact of development in adjacent communities on water quality.
6. Flooding along Oakdale Road.
7. Silting of the Hollenbeck Nature Greenway.

VLACD Public Information Meeting 3/22/23

Public Comments

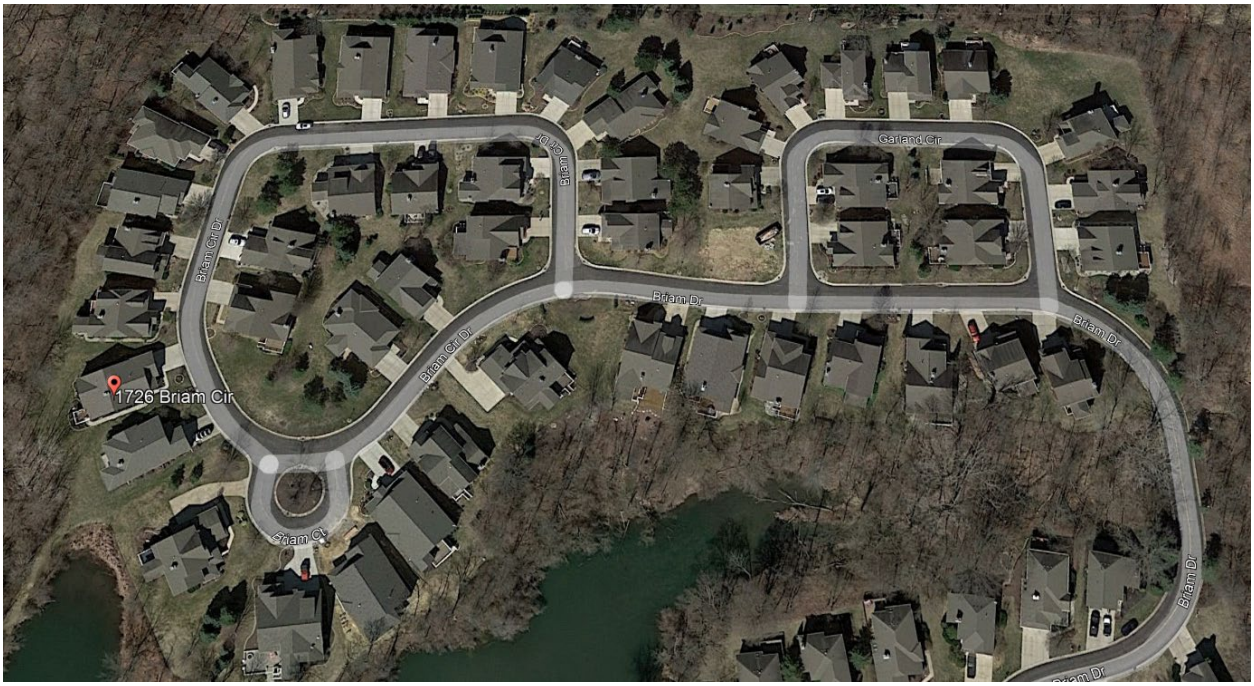
1. Address: 1413 Island Rd
   Comment/Question: Has Shed damage from flooding in the area.

2. Address: 1401 Oriel Rd.
   Comment/Question: Curious if they redo the road then the city comes and redoes the road will they put it back the same how it was.

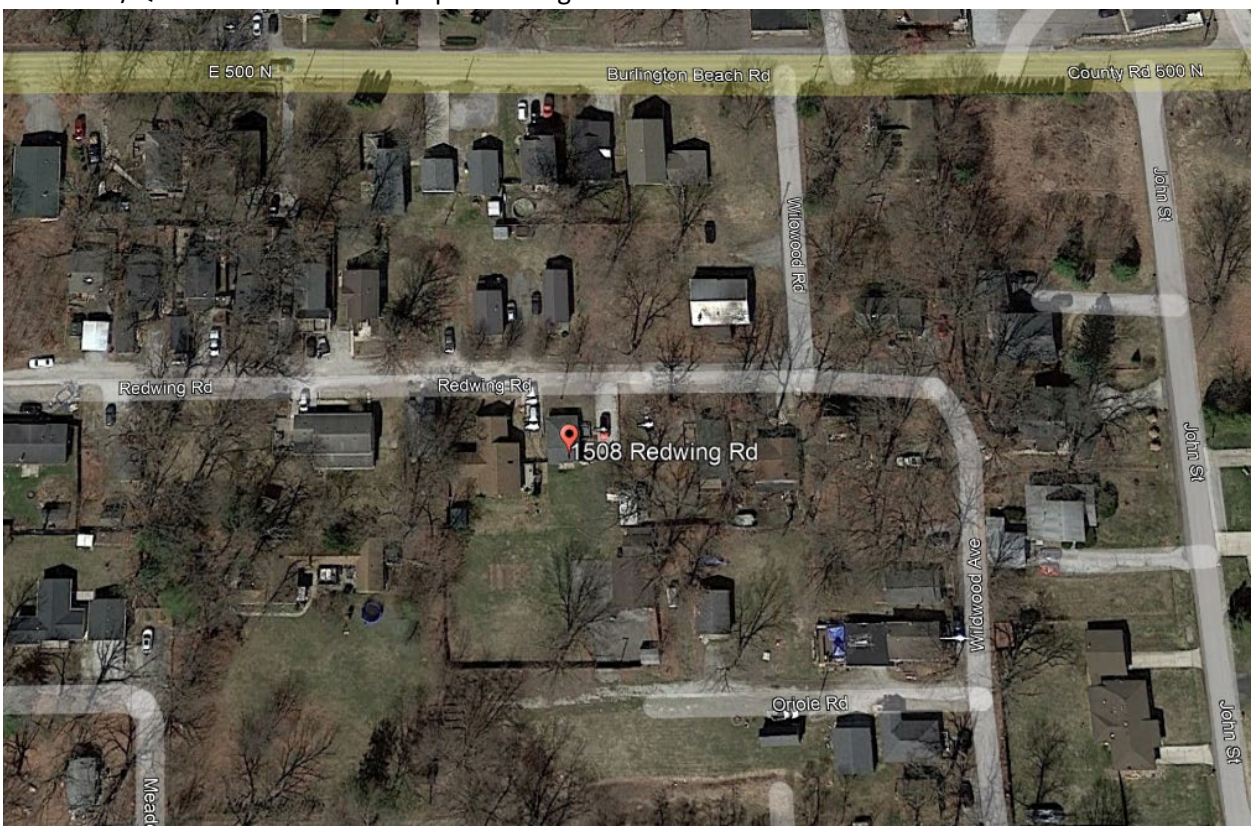


3. Address: 4904 Waters Edge Dr.
   Comment/Question: Will the Culvert across Calumet reduce the water in the East side of Calumet.

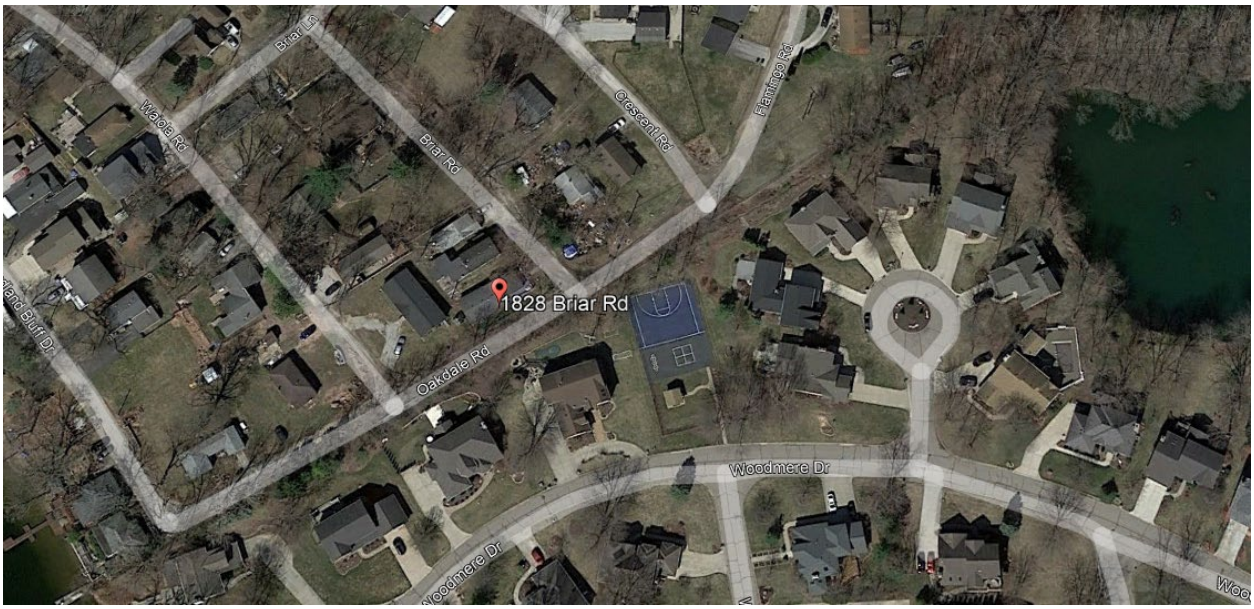
4. Address: 1726 Briam Cir
   Comment/Question: Culvert came in and destroyed the neighborhood. Also, curious if a culvert goes into Mudlake will it overflow into the neighborhood.



5. Address: 1508 Redwing Rd.
   Comment/Question: There is no proper drainage in this area.



6. Address: 1828 Briar Rd.
   Comment/Question: This spot is a low spot. They raised the building 3 cinder blocks up and it has not helped at all. The water over there is like a mosquito pit and it floods constantly in this area.



7. Address: 4411 Ostedt Dr.
   Comment/Question: The water comes down the street and settles in the garage and then goes to the neighbors.

8. Address: 1424 Island Rd.
   Comment/Question: Curious of dredging plans?

9. Address: 1505 Redwing Rd.
   Comment/Question: Flooding in the area and is curious about elevation in the area?

10. Address: 1312 Edgewater Beach Rd.
    Comment/Question: Wants the wildlife to come back and is also curious if this plan happens will the water become clean again?

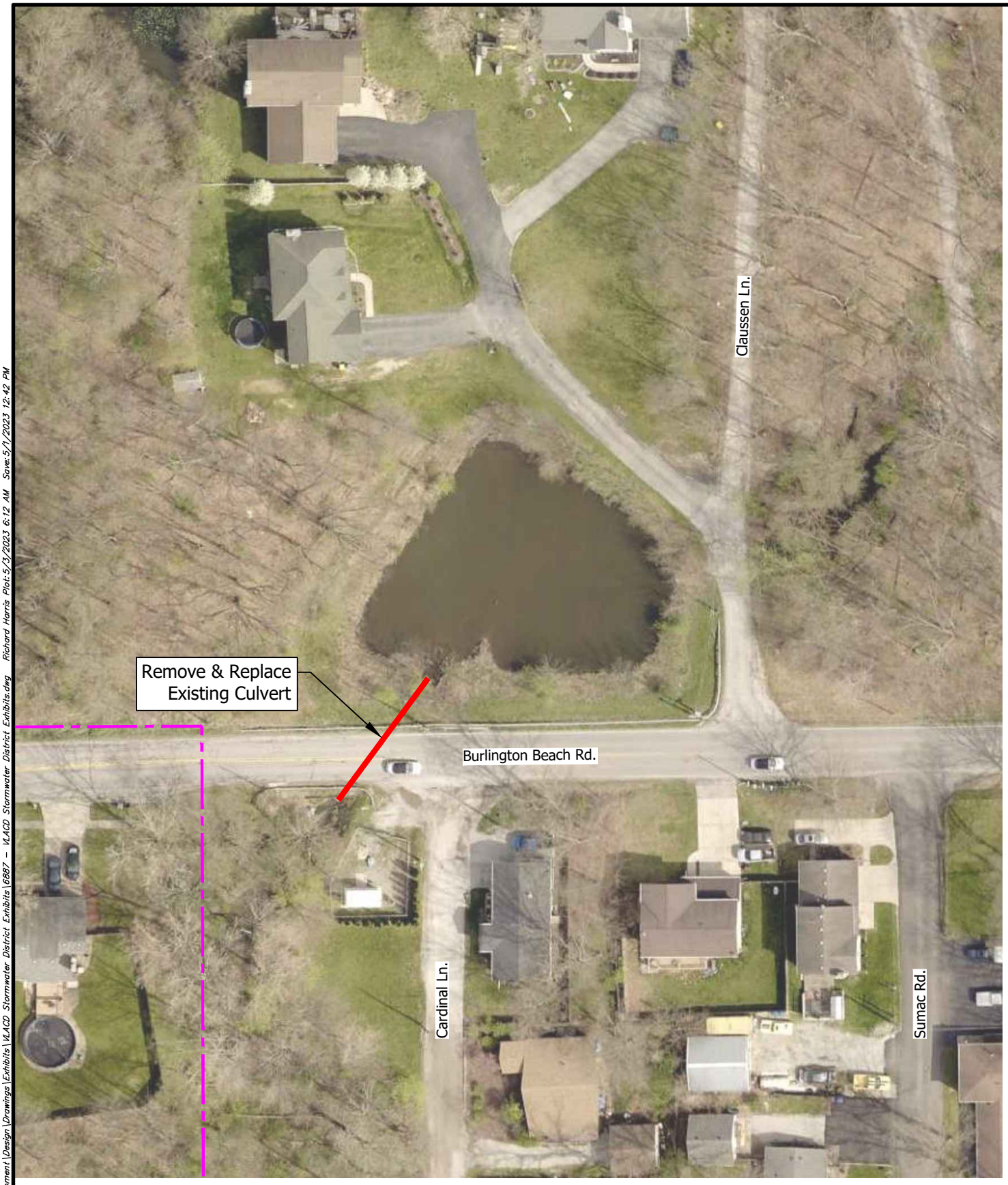
APPENDIX D
PROJECT EXHIBITS

LEGEND

Corporate Limit

BF&S CIVIL ENGINEERS	DRAWN: RH CHECKED: JWB DATE: 5/31/2023	BLACKHAWK BEACH BERM DRAINAGE EXHIBIT 1 VLACD VALPARAISO, INDIANA	HORIZONTAL SCALE N/A VERTICAL SCALE N/A SHEET 1 OF 1 PROJECT BFS NO. 688700.0000

\\bfsnt241\Jobs\688700.0000\ProjDevelopment\Design\Drawings\Exhibits\VLACD Stormwater District Exhibits\6887 – VLACD Stormwater District Exhibits.dwg Richard Harris Plot:5/31/2023 5:44 AM Save:5/31/2023 5:41 AM



LEGEND

Corporate Limit

BF&S CIVIL ENGINEERS

DRAWN: RH
CHECKED: JWB
DATE: 5/3/2023

BURLINGTON BEACH CULVERT PIPE
EXHIBIT 2

VLACD
VALPARAISO, INDIANA

HORIZONTAL SCALE
N/A
VERTICAL SCALE
N/A
SHEET
1 OF 1
PROJECT

BFS NO. 688700.0000

\\bfsn1241\Jobs\688700.0000\ProjDevelopment\Design\Drawings\Exhibits\VLACD Stormwater District Exhibits\6887 – VLACD Stormwater District Exhibits.dwg Richard Harris Plot:5/3/2023 6:12 AM Sove:5/1/2023 12:42 PM

LEGEND

Corporate Limit

BF&S CIVIL ENGINEERS	DRAWN: RH CHECKED: JWB DATE: 5/31/2023	BURLINGTON BEACH SEDIMENT BASIN EXCAVATION EXHIBIT 3 VLACD VALPARAISO, INDIANA	HORIZONTAL SCALE N/A VERTICAL SCALE N/A SHEET 1 OF 1 PROJECT BFS NO. 688700.0000

\\bfsnt241\Jobs\688700.0000\ProjDevelopment\Design\Drawings\Exhibits\VLACD Stormwater District Exhibits\6887 – VLACD Stormwater District Exhibits.dwg Richard Harris Plot:5/31/2023 5:48 AM Save:5/31/2023 5:41 AM

LEGEND

Corporate Limit

\\bfsnt241\Jobs\688700.0000\ProjDevelopment\Design\Drawings\Exhibits\VLACD Stormwater District Exhibits\6887 – VLACD Stormwater District Exhibits.dwg Richard Harris Plot:5/3/2023 6:14 AM Save:5/1/2023 12:42 PM

BF&S CIVIL ENGINEERS

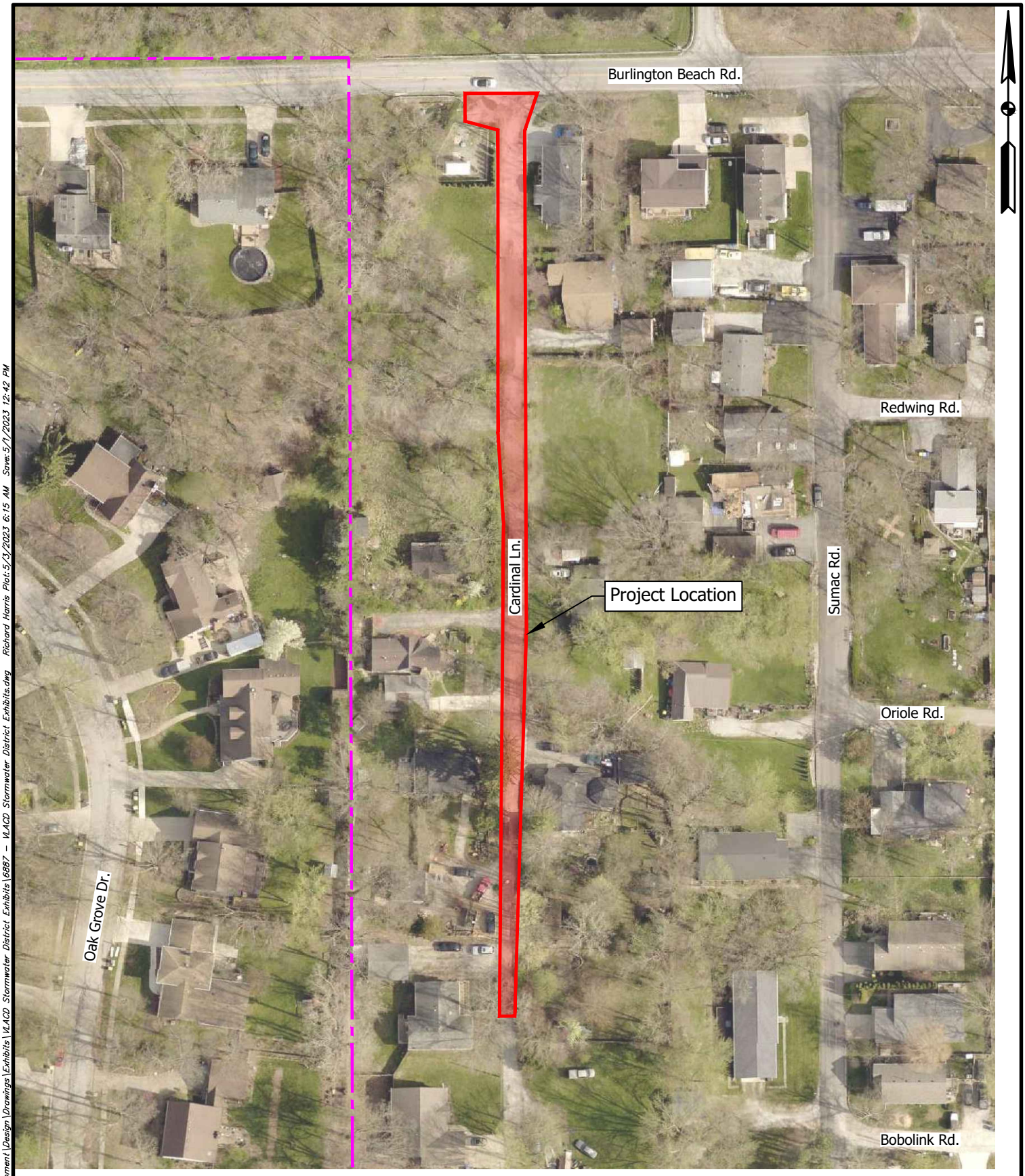
DRAWN: RH
CHECKED: JWB
DATE: 5/3/2023

BURLINGTON BEACH STAGED SETTLEMENT
EXHIBIT 4

VLACD
VALPARAISO, INDIANA

HORIZONTAL SCALE
N/A
VERTICAL SCALE
N/A
SHEET
1 OF 1
PROJECT

BFS NO. 688700.0000



LEGEND

Corporate Limit

BF&S CIVIL ENGINEERS	DRAWN: RH CHECKED: JWB DATE: 5/3/2023	CARDINAL LANE PAVING EXHIBIT 5 VLACD VALPARAISO, INDIANA	HORIZONTAL SCALE N/A VERTICAL SCALE N/A SHEET 1 OF 1 PROJECT BFS NO. 688700.0000

\\fsnt241\Jobs\688700.0000\ProjDevelopment\Design\Drawings\Exhibits\VLACD Stormwater District Exhibits\6887 – VLACD Stormwater District Exhibits.dwg Richard Harris Plot:5/3/2023 6:15 AM Save:5/1/2023 12:42 PM

LEGEND

Corporate Limit

BF&S CIVIL ENGINEERS

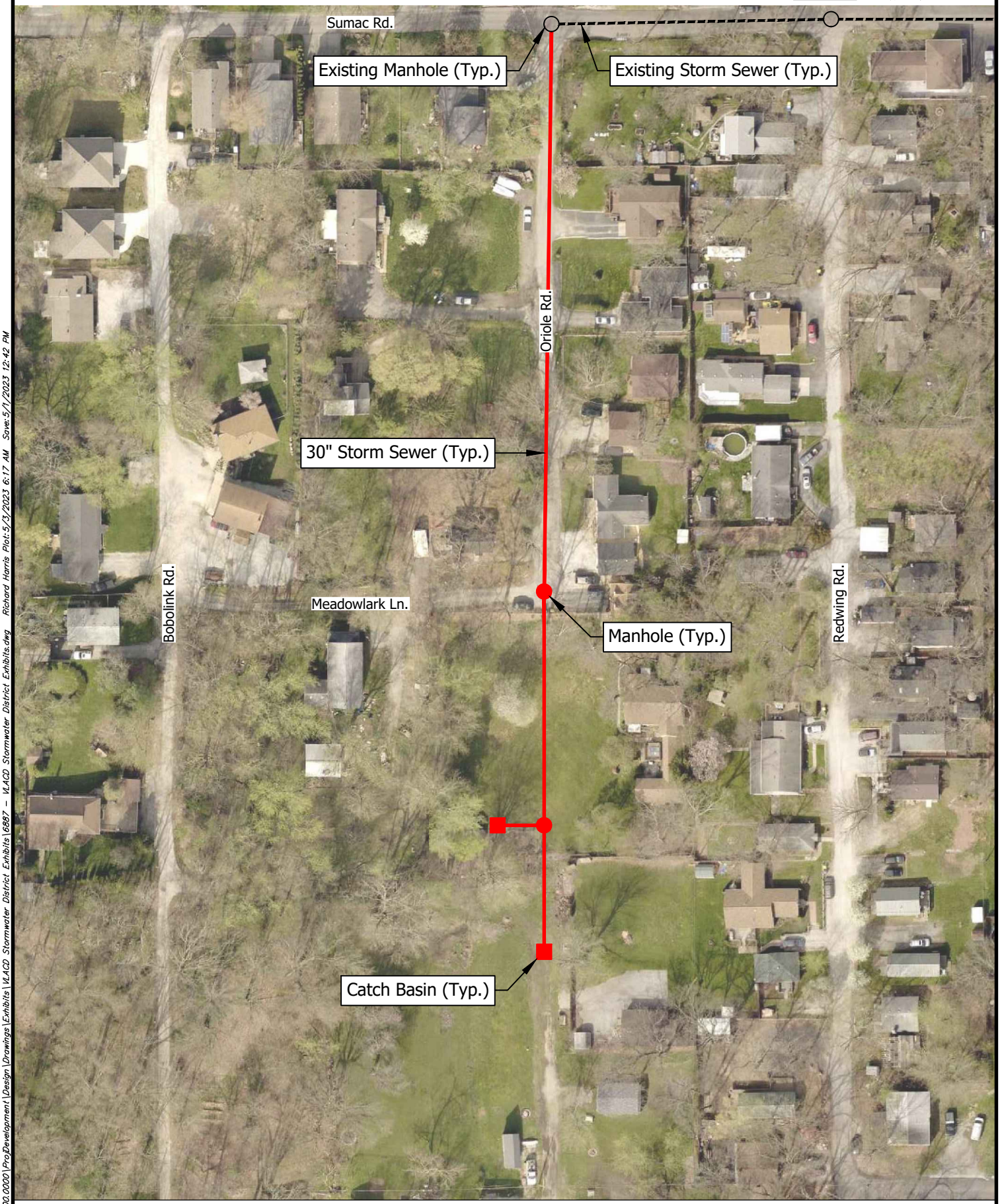
DRAWN: RH
CHECKED: JWB
DATE: 5/3/2023

FLINT LAKE OUTLET IMPROVEMENTS
EXHIBIT 6

VLACD
VALPARAISO, INDIANA

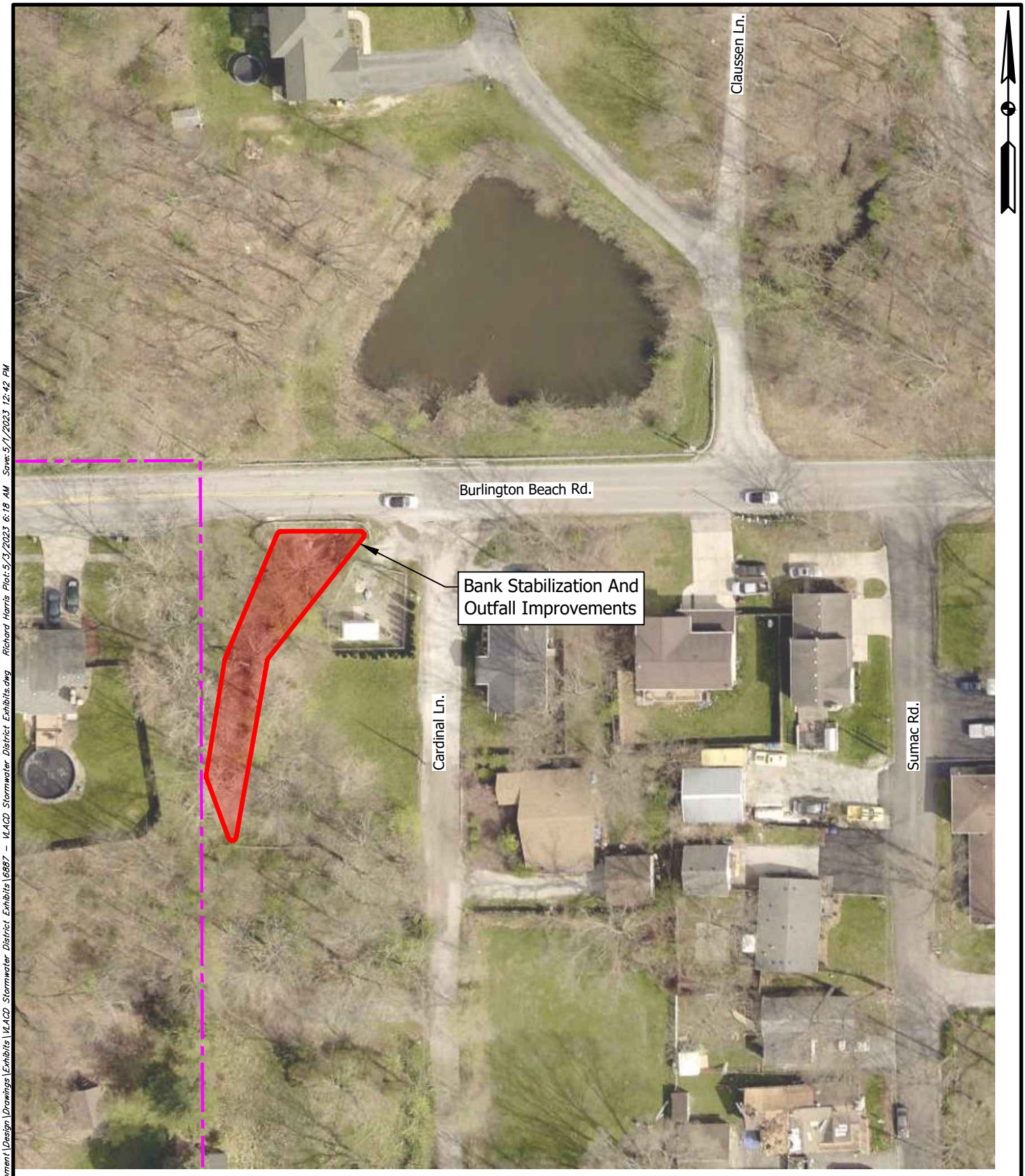
HORIZONTAL SCALE
N/A
VERTICAL SCALE
N/A
SHEET
1 OF 1
PROJECT
BFS NO. 688700.0000

\\bfsnt241\Jobs\688700.0000\ProjDevelopment\Design\Drawings\Exhibits\VLACD Stormwater District Exhibits\6887 – VLACD Stormwater District Exhibits.dwg Richard Harris Plot:5/3/2023 6:17 AM Save:5/1/2023 12:42 PM



BF&S CIVIL ENGINEERS	DRAWN: RH CHECKED: JWB DATE: 5/3/2023	KETTLE LAKE DRAINAGE IMPROVEMENTS EXHIBIT 7 VLACD VALPARAISO, INDIANA	HORIZONTAL SCALE N/A VERTICAL SCALE N/A SHEET 1 OF 1 PROJECT BFS NO. 688700.0000

\\bfsnt241\Jobs\688700.0000\ProjDevelopment\Design\Drawings\Exhibits\VLACD Stormwater District Exhibits\6887 – VLACD Stormwater District Exhibits.dwg Richard Harris Plot:5/3/2023 6:17 AM Save:5/1/2023 12:42 PM



LEGEND

Corporate Limit

CIVIL ENGINEERS

DRAWN: RH
CHECKED: JWB
DATE: 5/3/2023

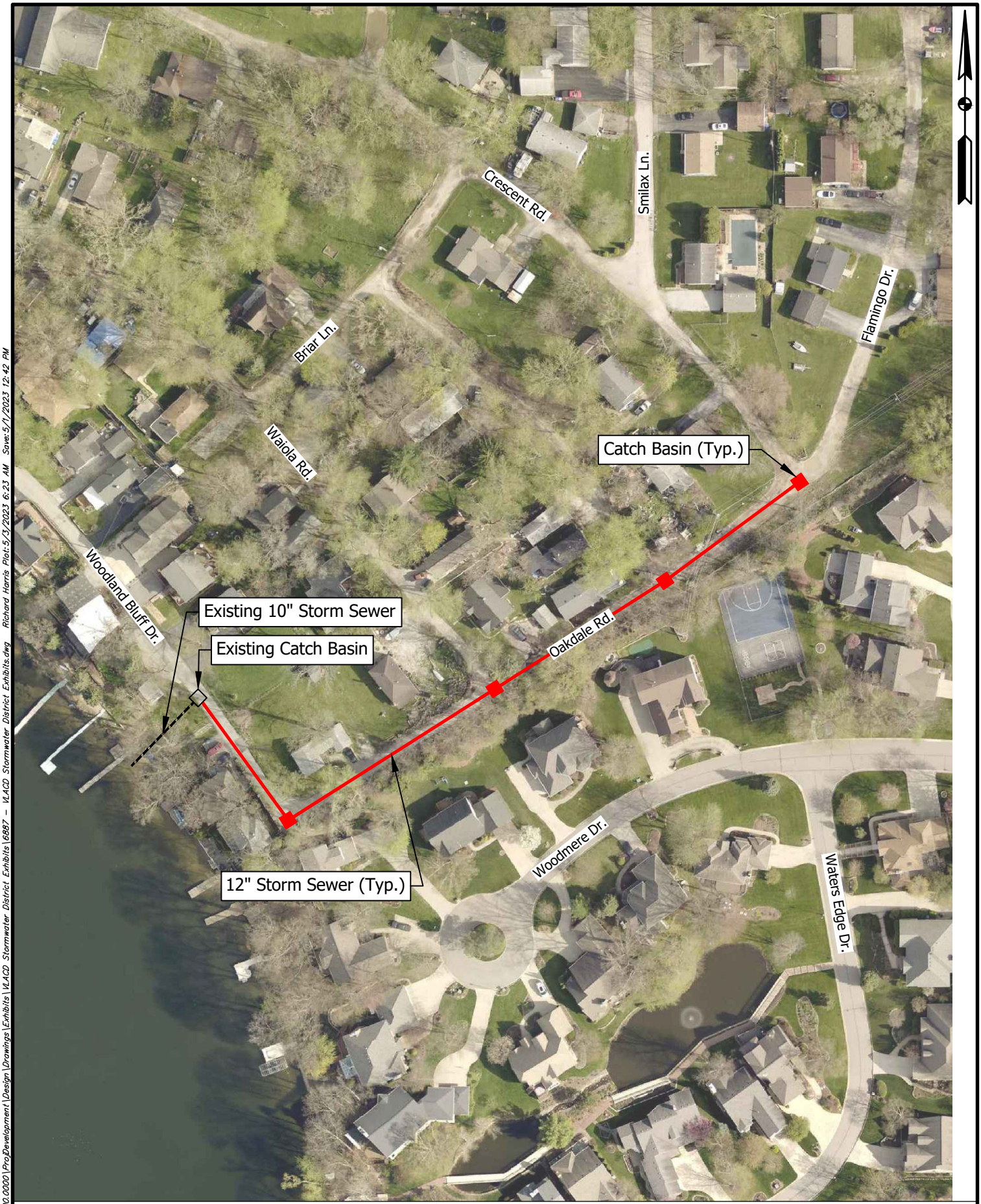
LISTENBERGER DITCH BANK STABILIZATION
EXHIBIT 8

VLACD
VALPARAISO, INDIANA

HORIZONTAL SCALE
N/A
VERTICAL SCALE
N/A
SHEET
1 OF 1
PROJECT

BFS NO. 688700.0000

\\fsnt241\Jobs\688700.0000\ProjDevelopment\Design\Drawings\Exhibits\VLACD Stormwater District Exhibits\6887 – VLACD Stormwater District Exhibits.dwg Richard Harris Plot:5/3/2023 6:18 AM Save:5/1/2023 12:42 PM



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BF&S CIVIL ENGINEERS

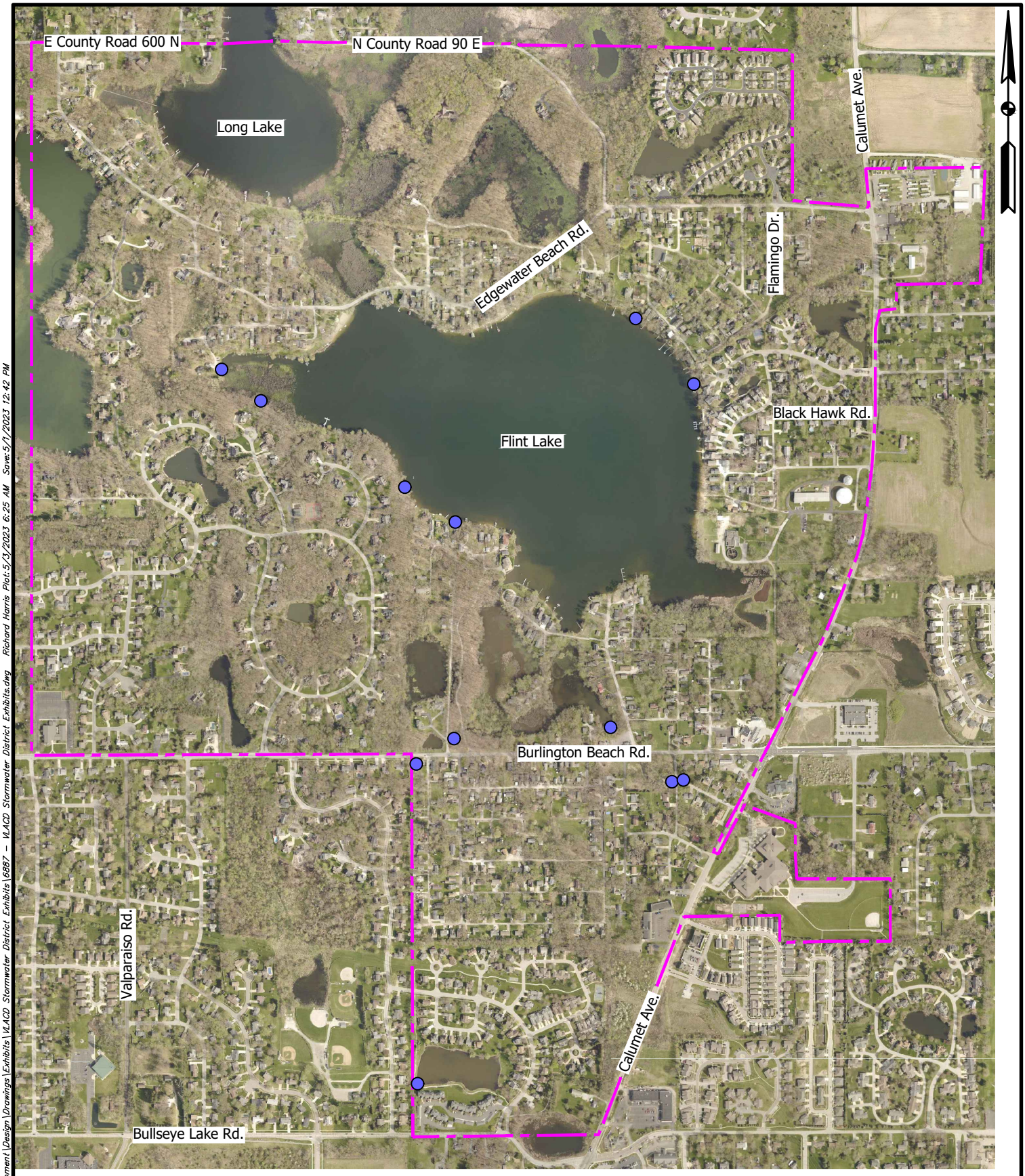
DRAWN: RH
CHECKED: JWB
DATE: 5/3/2023

OAKDALE ROAD DRAINAGE IMPROVEMENTS
EXHIBIT 9

VLACD
VALPARAISO, INDIANA

HORIZONTAL SCALE
N/A
VERTICAL SCALE
N/A
SHEET
1 OF 1
PROJECT

BFS NO. 688700.0000



LEGEND

Corporate Limit Project Location

BF&S CIVIL ENGINEERS	DRAWN: RH CHECKED: JWB DATE: 5/3/2023	OUTFALL STRUCTURE IMPROVEMENTS EXHIBIT 10 VLACD VALPARAISO, INDIANA	HORIZONTAL SCALE N/A VERTICAL SCALE N/A SHEET 1 OF 1 PROJECT BFS NO. 688700.0000

\\bfsnt241\Jobs\688700.0000\ProjDevelopment\Design\Drawings\Exhibits\VLACD Stormwater District Exhibits\6887 – VLACD Stormwater District Exhibits.dwg Richard Harris Plot:5/3/2023 6:25 AM Save:5/1/2023 12:42 PM

LEGEND

Corporate Limit

BF&S CIVIL ENGINEERS	DRAWN: RH CHECKED: JWB DATE: 5/3/2023	SANITARY LIFT STATION EMERGENCY OVERFLOW IMPROVEMENTS - EXHIBIT 11 VLACD VALPARAISO, INDIANA	HORIZONTAL SCALE N/A VERTICAL SCALE N/A SHEET 1 OF 1 PROJECT BFS NO. 688700.0000

\\bfsnt241\Jobs\688700.0000\ProjDevelopment\Design\Drawings\Exhibits\VLACD Stormwater District Exhibits\6887 – VLACD Stormwater District Exhibits.dwg Richard Harris Plot:5/3/2023 6:26 AM Save:5/1/2023 12:42 PM

LEGEND

Corporate Limit

BF&S CIVIL ENGINEERS

DRAWN: RH
CHECKED: JWB
DATE: 5/31/2023

SEPTIC SYSTEM ELIMINATION
EXHIBIT 12

VLACD
VALPARAISO, INDIANA

HORIZONTAL SCALE
N/A
VERTICAL SCALE
N/A
SHEET
1 OF 1
PROJECT

BFS NO. 6887.0000

\\bfsnt241\Jobs\6887000.0000\ProjDevelopment\Design\Drawings\Exhibits\VLACD Stormwater District Exhibits\6887 – VLACD Stormwater District Exhibits.dwg Richard Harris Plot:5/31/2023 5:52 AM Save:5/31/2023 5:51 AM

APPENDIX E
ENGINEER'S OPINION OF PROBABLE COST

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST
VALPARAISO LAKES AREA CONSERVANCY DISTRICT

Project costs do not include funding for engineering, inspection, or land/easement acquisition costs. Due to volatility, prices are subject to change and should be reviewed at the time of construction.

BLACKHAWK BEACH DRAINAGE IMPROVEMENTS

Item Number	Item Description	Qty.	Unit	Unit Cost	Extend Cost
1.0	Maintenance of Traffic	1	LS	$ 1,500.00	$ 1,500.00
2.0	Mobilization and Demobilization	1	LS	$ 3,500.00	$ 3,500.00
3.0	Clearing of Site	1	LS	$ 2,500.00	$ 2,500.00
4.0	Construction Engineering	1	LS	$ 2,500.00	$ 2,500.00
5.0	Stormwater Management Budget	5,000	DOL	$ 1.00	$ 5,000.00
6.0	Excavation, Common	210	CY	$ 50.00	$ 10,500.00
7.0	Site Grading	1	LS	$ 10,000.00	$ 10,000.00
8.0	Fence Removal and Replacement	10	LF	$ 150.00	$ 1,500.00
9.0	4 In. Topsoil	105	CY	$ 45.00	$ 4,725.00
10.0	Mulched Seeding, Class U Type 2	1,250	SY	$ 5.00	$ 6,250.00
				Contingency (15%)	$ 7,000.00
				Total	**$ 54,975.00**

BURLINGTON BEACH CULVERT PIPE

Item Number	Item Description	Qty.	Unit	Unit Cost	Extend Cost
1.0	Maintenance of Traffic	1	LS	$ 5,000.00	$ 5,000.00
2.0	Mobilization and Demobilization	1	LS	$ 10,000.00	$ 10,000.00
3.0	Clearing of Site	1	LS	$ 7,500.00	$ 7,500.00
4.0	Construction Engineering	1	LS	$ 7,000.00	$ 7,000.00
5.0	Stormwater Management Budget	15,000	DOL	$ 1.00	$ 15,000.00
6.0	Excavation, Common	725	CY	$ 50.00	$ 36,250.00
7.0	Pavement Removal	220	SY	$ 15.00	$ 3,300.00
8.0	HMA Patching, Type B	10	TON	$ 150.00	$ 1,500.00
9.0	Subgrade Treatment, Type 1C	220	SY	$ 40.00	$ 8,800.00
10.0	Structure, Reinforced Concrete, Box Section	80	LF	$ 1,300.00	$ 104,000.00
11.0	Guardrail	340	LF	$ 50.00	$ 17,000.00
12.0	Riprap w/ Geotextile	250	SY	$ 60.00	$ 15,000.00
13.0	4 In. Topsoil	65	CY	$ 45.00	$ 2,925.00
14.0	Mulched Seeding, Class U Type 2	720	SY	$ 5.00	$ 3,600.00
				Contingency (15%)	$ 36,000.00
				Total	**$ 272,875.00**

BURLINGTON BEACH SEDIMENT BASIN EXCAVATION

Item Number	Item Description	Qty.	Unit	Unit Cost	Extend Cost
1.0	Maintenance of Traffic	1	LS	$ 10,000.00	$ 10,000.00
2.0	Mobilization and Demobilization	1	LS	$ 10,000.00	$ 10,000.00
3.0	Clearing of Site	1	LS	$ 3,000.00	$ 3,000.00
4.0	Construction Engineering	1	LS	$ 5,000.00	$ 5,000.00
5.0	Stormwater Management Budget	10,000	DOL	$ 1.00	$ 10,000.00
6.0	Excavation, Common	2,750	CY	$ 55.00	$ 151,250.00
7.0	Bypass Pumping	1	LS	$ 20,000.00	$ 20,000.00
8.0	4 In. Topsoil	67	CY	$ 45.00	$ 3,015.00
9.0	Mulched Seeding, Class U Type 2	800	SY	$ 5.00	$ 4,000.00
				Contingency (15%)	$ 32,000.00
				Total	**$ 248,265.00**

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST
VALPARAISO LAKES AREA CONSERVANCY DISTRICT

Project costs do not include funding for engineering, inspection, or land/easement acquisition costs. Due to volatility, prices are subject to change and should be reviewed at the time of construction.

BURLINGTON BEACH STAGED SETTLEMENT

Item Number	Item Description	Qty.	Unit	Unit Cost	Extend Cost
1.0	Maintenance of Traffic	1	LS	$ 5,000.00	$ 5,000.00
2.0	Mobilization and Demobilization	1	LS	$ 8,000.00	$ 8,000.00
3.0	Clearing of Site	1	LS	$ 25,000.00	$ 25,000.00
4.0	Construction Engineering	1	LS	$ 7,500.00	$ 7,500.00
5.0	Stormwater Management Budget	15,000	DOL	$ 1.00	$ 15,000.00
6.0	Excavation, Common	5,000	CY	$ 50.00	$ 250,000.00
7.0	Riprap w/ Geotextile	425	SY	$ 60.00	$ 25,500.00
8.0	4 In. Topsoil	71	CY	$ 45.00	$ 3,195.00
9.0	Native Plantings	850	SY	$ 15.00	$ 12,750.00
			Contingency (15%)		$ 53,000.00
			Total		**$ 404,945.00**

CARDINAL LANE PAVING

Item Number	Item Description	Qty.	Unit	Unit Cost	Extend Cost
1.0	Maintenance of Traffic	1	LS	$ 5,000.00	$ 5,000.00
2.0	Mobilization and Demobilization	1	LS	$ 5,000.00	$ 5,000.00
3.0	Clearing of Site	1	LS	$ 3,000.00	$ 3,000.00
4.0	Construction Engineering	1	LS	$ 3,000.00	$ 3,000.00
5.0	Stormwater Management Budget	5,000	DOL	$ 1.00	$ 5,000.00
6.0	Milling, Asphalt, 1.5"	1,400	SY	$ 6.00	$ 8,400.00
7.0	HMA Surface, Type B, 1.5"	116	TON	$ 120.00	$ 13,920.00
8.0	HMA Intermediate, Type B, 2.5"	193	TON	$ 105.00	$ 20,265.00
			Contingency (15%)		$ 10,000.00
			Total		**$ 73,585.00**

FLINT LAKE OUTLET IMPROVEMENTS

Item Number	Item Description	Qty.	Unit	Unit Cost	Extend Cost
1.0	Maintenance of Traffic	1	LS	$ 1,500.00	$ 1,500.00
2.0	Mobilization and Demobilization	1	LS	$ 7,500.00	$ 7,500.00
3.0	Clearing of Site	1	LS	$ 25,000.00	$ 25,000.00
4.0	Construction Engineering	1	LS	$ 3,000.00	$ 3,000.00
5.0	Stormwater Management Budget	20,000	DOL	$ 1.00	$ 20,000.00
6.0	Excavation, Common	900	CY	$ 55.00	$ 49,500.00
7.0	Riprap w/ Geotextile	450	SY	$ 60.00	$ 27,000.00
8.0	Structural Repairs	1	LS	$ 30,000.00	$ 30,000.00
9.0	4 In. Topsoil	38	CY	$ 45.00	$ 1,710.00
10.0	Native Plantings	450	SY	$ 15.00	$ 6,750.00
			Contingency (15%)		$ 26,000.00
			Total		**$ 197,960.00**

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST
VALPARAISO LAKES AREA CONSERVANCY DISTRICT

Project costs do not include funding for engineering, inspection, or land/easement acquisition costs. Due to volatility, prices are subject to change and should be reviewed at the time of construction.

KETTLE LAKE DRAINAGE IMPROVEMENTS

Item Number	Item Description	Qty.	Unit	Unit Cost	Extend Cost
1.0	Maintenance of Traffic	1	LS	$ 5,000.00	$ 5,000.00
2.0	Mobilization and Demobilization	1	LS	$ 10,000.00	$ 10,000.00
3.0	Clearing of Site	1	LS	$ 7,500.00	$ 7,500.00
4.0	Construction Engineering	1	LS	$ 7,000.00	$ 7,000.00
5.0	Stormwater Management Budget	5,000	DOL	$ 1.00	$ 5,000.00
6.0	Excavation, Common	50	CY	$ 50.00	$ 2,500.00
7.0	Pavement Removal	220	SY	$ 15.00	$ 3,300.00
8.0	HMA Patching, Type B	48	TON	$ 150.00	$ 7,260.00
9.0	Subgrade Treatment, Type 1C	220	SY	$ 40.00	$ 8,800.00
10.0	12 In., Storm Sewer Pipe, PVC SDR-35	115	LF	$ 135.00	$ 15,525.00
11.0	30 In., Storm Sewer Pipe, RCP	600	LF	$ 250.00	$ 150,000.00
12.0	Catch Basin, 36 In. Diameter	2	EA	$ 4,000.00	$ 8,000.00
13.0	Manhole, 60 In. Diameter	2	EA	$ 8,000.00	$ 16,000.00
14.0	4 In. Topsoil	40	CY	$ 45.00	$ 1,800.00
15.0	Mulched Seeding, Class U Type 2	350	SY	$ 5.00	$ 1,750.00
			Contingency (15%)		$ 37,000.00
			Total		**$ 286,435.00**

LISTENBERGER DITCH BANK STABILIZATION

Item Number	Item Description	Qty.	Unit	Unit Cost	Extend Cost
1.0	Maintenance of Traffic	1	LS	$ 1,500.00	$ 1,500.00
2.0	Mobilization and Demobilization	1	LS	$ 5,000.00	$ 5,000.00
3.0	Clearing of Site	1	LS	$ 7,500.00	$ 7,500.00
4.0	Construction Engineering	1	LS	$ 3,000.00	$ 3,000.00
5.0	Stormwater Management Budget	10,000	DOL	$ 1.00	$ 10,000.00
6.0	Excavation, Common	160	CY	$ 50.00	$ 8,000.00
7.0	Riprap w/ Geotextile	450	SY	$ 60.00	$ 27,000.00
8.0	Flared End Section	5	EA	$ 5,000.00	$ 25,000.00
9.0	4 In. Topsoil	25	CY	$ 45.00	$ 1,125.00
10.0	Native Plantings	450	SY	$ 15.00	$ 6,750.00
			Contingency (15%)		$ 14,000.00
			Total		**$ 108,875.00**

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST
VALPARAISO LAKES AREA CONSERVANCY DISTRICT

Project costs do not include funding for engineering, inspection, or land/easement acquisition costs. Due to volatility, prices are subject to change and should be reviewed at the time of construction.

OAKDALE ROAD DRAINAGE IMPROVEMENTS

Item Number	Item Description	Qty.	Unit	Unit Cost	Extend Cost
1.0	Maintenance of Traffic	1	LS	$ 5,000.00	$ 5,000.00
2.0	Mobilization and Demobilization	1	LS	$ 10,000.00	$ 10,000.00
3.0	Clearing of Site	1	LS	$ 7,500.00	$ 7,500.00
4.0	Construction Engineering	1	LS	$ 7,500.00	$ 7,500.00
5.0	Stormwater Management Budget	5,000	DOL	$ 1.00	$ 5,000.00
6.0	Excavation, Common	300	CY	$ 50.00	$ 15,000.00
7.0	HMA Surface, Type B, 1.5"	155	TON	$ 120.00	$ 18,600.00
8.0	HMA Intermediate, Type B, 2.5"	255	TON	$ 105.00	$ 26,775.00
9.0	Subgrade Treatment, Type 1C	1,825	SY	$ 40.00	$ 73,000.00
10.0	12 In., Storm Sewer Pipe, PVC SDR-35	725	LF	$ 135.00	$ 97,875.00
11.0	Catch Basin, 36 In. Diameter	4	EA	$ 4,000.00	$ 16,000.00
12.0	4 In. Topsoil	34	CY	$ 45.00	$ 1,530.00
13.0	Mulched Seeding, Class U Type 2	405	SY	$ 5.00	$ 2,025.00
			Contingency (15%)		$ 43,000.00
			Total		**$ 328,805.00**

OUTFALL STRUCTURE MINOR IMPROVEMENTS

Item Number	Item Description	Qty.	Unit	Unit Cost	Extend Cost
1.0	Maintenance of Traffic	1	LS	$ 500.00	$ 500.00
2.0	Mobilization and Demobilization	1	LS	$ 2,000.00	$ 2,000.00
3.0	Clearing of Site	1	LS	$ 1,500.00	$ 1,500.00
4.0	Construction Engineering	1	LS	$ 1,000.00	$ 1,000.00
5.0	Stormwater Management Budget	1,000	DOL	$ 1.00	$ 1,000.00
6.0	Excavation, Common	25	CY	$ 50.00	$ 1,250.00
7.0	Riprap w/ Geotextile	45	SY	$ 60.00	$ 2,700.00
8.0	Flared End Section	1	EA	$ 5,000.00	$ 5,000.00
9.0	4 In. Topsoil	5	CY	$ 45.00	$ 225.00
10.0	Native Plantings	45	SY	$ 15.00	$ 675.00
			Contingency (15%)		$ 2,000.00
			Total		**$ 17,850.00**

OUTFALL STRUCTURE MAJOR IMPROVEMENTS

Item Number	Item Description	Qty.	Unit	Unit Cost	Extend Cost
1.0	Maintenance of Traffic	1	LS	$ 1,000.00	$ 1,000.00
2.0	Mobilization and Demobilization	1	LS	$ 5,000.00	$ 5,000.00
3.0	Clearing of Site	1	LS	$ 2,000.00	$ 2,000.00
4.0	Construction Engineering	1	LS	$ 3,500.00	$ 3,500.00
5.0	Stormwater Management Budget	2,500	DOL	$ 1.00	$ 2,500.00
6.0	Excavation, Common	25	CY	$ 50.00	$ 1,250.00
7.0	Riprap w/ Geotextile	45	SY	$ 60.00	$ 2,700.00
8.0	Flared End Section	1	EA	$ 5,000.00	$ 5,000.00
9.0	4 In. Topsoil	15	CY	$ 45.00	$ 675.00
10.0	Native Plantings	135	SY	$ 15.00	$ 2,025.00
11.0	Hydrodynamic Separator	1	EA	$ 40,000.00	$ 40,000.00
			Contingency (15%)		$ 10,000.00
			Total		**$ 75,650.00**

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST
VALPARAISO LAKES AREA CONSERVANCY DISTRICT

Project costs do not include funding for engineering, inspection, or land/easement acquisition costs. Due to volatility, prices are subject to change and should be reviewed at the time of construction.

SANITARY LIFT STATION EMERGENCY OVERFLOW IMPROVEMENTS

Item Number	Item Description	Qty.	Unit	Unit Cost	Extend Cost
1.0	Maintenance of Traffic	1	LS	$ 500.00	$ 500.00
2.0	Mobilization and Demobilization	1	LS	$ 1,500.00	$ 1,500.00
3.0	Clearing of Site	1	LS	$ 1,500.00	$ 1,500.00
4.0	Construction Engineering	1	LS	$ 1,000.00	$ 1,000.00
5.0	Stormwater Management Budget	5,000	DOL	$ 1.00	$ 5,000.00
6.0	Excavation, Common	25	CY	$ 50.00	$ 1,250.00
7.0	Riprap w/ Geotextile	45	SY	$ 60.00	$ 2,700.00
8.0	8 In., Storm Sewer Pipe, PVC SDR-35	25	LF	$ 130.00	$ 3,250.00
9.0	Duckbill Backflow Preventor	1	EA	$ 7,500.00	$ 7,500.00
10.0	4 In. Topsoil	5	CY	$ 45.00	$ 225.00
11.0	Native Plantings	45	SY	$ 15.00	$ 675.00
				Contingency (15%)	$ 4,000.00
				Total	**$ 29,100.00**

SEPTIC SYSTEM ELIMINATION

Item Number	Item Description	Qty.	Unit	Unit Cost	Extend Cost
1.0	Maintenance of Traffic	1	LS	$ 8,500.00	$ 8,500.00
2.0	Mobilization and Demobilization	1	LS	$ 12,500.00	$ 12,500.00
3.0	Clearing of Site	1	LS	$ 12,500.00	$ 12,500.00
4.0	Construction Engineering	1	LS	$ 12,500.00	$ 12,500.00
5.0	Stormwater Management Budget	10,000	DOL	$ 1.00	$ 10,000.00
6.0	Excavation, Common	300	CY	$ 50.00	$ 15,000.00
7.0	Pavement Removal	2,225	SY	$ 15.00	$ 33,375.00
8.0	HMA Surface, Type B, 1.5"	185	TON	$ 120.00	$ 22,200.00
9.0	HMA Intermediate, Type B, 2.5"	310	TON	$ 105.00	$ 32,550.00
10.0	Subgrade Treatment, Type 1C	2,225	SY	$ 40.00	$ 89,000.00
11.0	3 In., Sanitary Sewer Pipe, PVC DR-11	2,000	LF	$ 60.00	$ 120,000.00
12.0	Air Release and Structure	2	EA	$ 7,500.00	$ 15,000.00
13.0	Valve and Vault Structure	3	EA	$ 7,500.00	$ 22,500.00
14.0	Service Line	22	EA	$ 2,000.00	$ 44,000.00
15.0	4 In. Topsoil	54	CY	$ 45.00	$ 2,430.00
16.0	Mulched Seeding, Class U Type 2	650	SY	$ 5.00	$ 3,250.00
				Contingency (15%)	$ 68,000.00
				Total	**$ 523,305.00**

APPENDIX F
PROJECT PRIORITY LIST

VLACD STORM WATER DISTRICT - PROJECT DETERMINATION MATRIX
UPDATED - 5/1/2023

2023 RANK	2024 RANK	Trend	PROJECT DESCRIPTION	A - BENEFIT OF PROJECT			B - EASEMENT NEEDED		C - COOPERATION W/ OUTSIDE AGENCY		D - AREA OF IMPACT				E - PRICE				SCORE
				LOW	MEDIUM	HIGH	NO	YES	NO	YES	LOW	MODERATE	HIGH	VERY HIGH	LOW	MEDIUM	HIGH	VERY HIGH	
				1	3	5	4	1	5	0	1	2	3	4	4	3	2	1	(A x B x D) +C + E
1			Burlington Beach Sediment Basin Excavation			5	4		5					4		3			88
2			Listenberger Ditch Bank Stabilization		3		4		5				3			3			44
3			Outfall Structure Improvements		3		4		5			2			4				33
4			Burlington Beach Staged Settlement			5		1	5					4			2		27
5			Kettle Lake Drainage Improvements			5		1	5				3				2		22
6			Oakdale Road Drainage Improvements			5		1	5				3				2		22
7			Flint Lake Outlet Improvements		3		4		5		1					3			20
8			Septic System Elimination			5		1	5			2						1	16
9			Blackhawk Beach Road Drainage Improvments		3			1	5			2			4				15
10			Burlington Beach Culvert Pipe		3		4			0	1						2		14
11			Cardinal Lane Paving	1			4		5		1				4				13
12			Sanitary Lift Station Emergency Overflow Improvements	1			4		5		1				4				13

A - BENEFIT OF PROJECT
LOW
Benefit of project is limited to a small maintenance reduction and/or public safety improvement
MEDIUM
Benefit of project is limited to a moderate maintenance reduction and/or public safety improvement
HIGH
Benefit of project is limited to a large maintenance reduction and/or public safety improvement

B -EASEMENT NEEDED
NO
Right-of-way and/or easements are already owned and no acquistion is required
YES
Easement acquistion is required

C - COOPERATION W/ OUTSIDE AGENCY
NO
Project is entirely located within District territory and does not require coordination with outside agencies.
YES
Project is partially or entirely located outside of District territory and coordination is required with outside agencies.

D -AREA OF IMPACT
LOW - VERY HIGH
Range is based on number of residents positively impacted by the project.
Low being very few residents and very high be almost all residents.

E - PRICE
LOW
$0 - $100,000
MEDIUM
$100,001 - $250,000
HIGH
$250,001 - $500,000
VERY HIGH
$500,001+

SCORE
Determined by multiplying the BENEFIT OF THE PROJECT (A) by EASMENT NEEDED (B) by AREA OF IMPACT (D) and adding the COOPERATION W/ OUTSIDE AGENCY (C) and the PRICE (E).
(AxBxD)+C+E

TREND
Tracks project's change in position ranking from previous year.

VLACD STORM WATER DISTRICT - PROJECT DETERMINATION MATRIX
UPDATED - 5/1/2023

2023 RANK	2024 RANK	Trend	PROJECT DESCRIPTION	A - BENEFIT OF PROJECT			B - EASEMENT NEEDED		C - COOPERATION W/ OUTSIDE AGENCY		D - AREA OF IMPACT				E - PRICE				SCORE
				LOW	MEDIUM	HIGH	NO	YES	NO	YES	LOW	MODERATE	HIGH	VERY HIGH	LOW	MEDIUM	HIGH	VERY HIGH	
				1	3	5	4	1	5	0	1	2	3	4	4	3	2	1	(A x B x D) +C + E
1			Blackhawk Beach Road Drainage Improvments																0
2			Burlington Beach Culvert Pipe																0
3			Burlington Beach Sediment Basin Excavation																0
4			Burlington Beach Staged Settlement																0
5			Cardinal Lane Paving																0
6			Flint Lake Outlet Improvements																0
7			Kettle Lake Drainage Improvements																0
8			Listenberger Ditch Bank Stabilization																0
9			Oakdale Road Drainage Improvements																0
10			Outfall Structure Improvements																0
11			Sanitary Lift Station Emergency Overflow Improvements																0
12			Septic System Elimination																0

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Benefit of project is limited to a large maintenance reduction and/or public safety improvement

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Right-of-way and/or easements are already owned and no acquistion is required
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Easement acquistion is required

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$500,001+

SCORE
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(AxBxD)+C+E

TREND
Tracks project's change in position ranking from previous year.